

FED. RD. DIV. NO.	PROJECT NUMBER	HIGHWAY NUMBER	
6	STP 2022(861)HES	US 287, ETC.	
STATE	DISTRICT	COUNTY	
TEXAS	BRYAN	FREESTONE, ETC.	
CONTROL	SECTION	JOB	SHEET NO.
0122	03	033,ETC.	1

SEE SHEET 2
FOR INDEX OF SHEETS
AND SHEET 3-4 FOR
PROJECT LOCATION MAP

STATE OF TEXAS DEPARTMENT OF TRANSPORTATION

PLANS OF PROPOSED STATE HIGHWAY IMPROVEMENT

PROJECT NUMBER: STP 2022(861)HES

**US 287, ETC.
FREESTONE COUNTY, ETC.**

TOTAL LENGTH OF PROJECT = 2,201.76 FT= 0.417 MILES, ETC.

FOR THE CONSTRUCTION OF ADDING A LEFT TURN LANE, ETC.

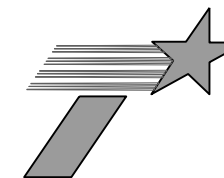
FINAL PLANS

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

DESIGN SPEED: 40 MPH (US 287)

DESIGN SPEED: 70 MPH (SH 75)

LOCATION NO.	HIGHWAY	CONTROL NO.	LIMITS	2022/2042 ADT	REFERENCE MARKERS		TOTAL LENGTH (FT)	BRIDGE LENGTH (FT)	RDWY LENGTH (FT)
					BEGIN	END			
1	US 287	0122-03-033	FROM: 0.1 MI W OF FM 488 TO: 0.1 MI E OF FM 488	2,568/3,595	RM 564+1.56 MI (1.559 MI)	RM 564+1.979 MI (1.976 MI)	2,201.76	0.00	2,201.76
2	SH 75	0166-07-067	FROM: 0.25 MI N OF SPUR 67 TO: 0.25 MI S OF SPUR 67	2,611/3,655	RM 406+0.227 MI (16.144 MI)	RM 406+0.713 MI (16.629 MI)	2,560.80	0.00	2,560.80



TEXAS DEPARTMENT OF TRANSPORTATION®

SUBMITTED FOR LETTING: 6/3/2022
 FOR LETTING: DocuSigned by:
Rakshanda Mahar P.E.
095D0909B13241E DISTRICT DESIGN ENGINEER

RECOMMENDED FOR LETTING: 6/3/2022
 FOR LETTING: DocuSigned by:
Doug Trainor, P.E.
DAA3B0B0A0E04 DIRECTOR OF TRANSPORTATION
 PLANNING AND DEVELOPMENT

APPROVED FOR LETTING: 6/3/2022
 FOR LETTING: DocuSigned by:
Chad Bohne
60E5537715D24E DISTRICT ENGINEER

NO EXCEPTIONS
NO EQUATIONS
NO RAILROAD CROSSINGS

SPECIFICATIONS ADOPTED BY THE TEXAS DEPARTMENT OF TRANSPORTATION, NOVEMBER 1, 2014, AND SPECIFICATION ITEMS LISTED AS FOLLOWS, SHALL GOVERN ON THIS PROJECT:
 REQUIRED CONTRACT PROVISIONS FOR ALL FEDERAL-AID CONSTRUCTION CONTRACTS (FORM FHWA 1273, MAY, 2012)

© 2022 By Texas Department of Transportation;
all rights reserved.

REV DATE: 2-12-2015
CS: 0122-03-033
FILENAME: pw:\txdot\projectswisdomline.com\TXDOT4\Documents\17 - BRY\Design Projects\012203033\4 - Design\Plan Set\1. General\1.A. TitleSheet\Title sheet

INDEX OF SHEETS

SHEET NO.	DESCRIPTION	SHEET NO.	DESCRIPTION	SHEET NO.	DESCRIPTION
1	TITLE SHEET	68	~ GF(31)-19	155	~ SMD(TWT)-08
2	INDEX OF SHEETS	69-70	~ GF(31)TR TL3-20	156	~ SPRFBA(1)-13
3	LOCATION MAP (FREESTONE, US 287)	71	~ GF(31)MS-19	157	~ TS-FD-12
4	LOCATION MAP (MADISON, SH 75)	72	~ SGT(10S)31-16	158-159	~ TSR(3)-13 THRU TSR(4)-13
5	TYPICAL SECTION (US 287)	73	~ SGT(11S)31-18	160	ENVIRONMENTAL
6	TYPICAL SECTION (SH 75)	74	~ SGT(12S)31-18	161	
7, 7A-7G	GENERAL NOTES	45	~ SGT(15)31-20	162-163	
8, 8A-8C	ESTIMATE AND QUANTITY	76	* T5 T501 T502TR (MOD)	164-165	
9	CONSOLIDATED SUMMARY OF ROADWAY QUANTITIES	77	~ CCCG-21	166-168	
10	SUMMARY OF ROADWAY QUANTITIES (US 287)	78-79	~ CSB(1)-10	169	TXDOT STORM WATER POLLUTION PREVENTION PLAN (SW3P)
11	SUMMARY OF ROADWAY QUANTITIES (SH 75)	80-83	~ MB(1)-21 THRU MB(4)-21		SW3P LAYOUT (US 287)
12	SUMMARY OF DRIVEWAYS & MAILBOXES (SH 75)	84	~ MB(14)-21		SW3P LAYOUT (SH 75)
13	SUMMARY OF MBGF ITEMS (US 287)				~ EC(1)-16 THRU EC(2)-16
14	CONSOLIDATED SUMMARY OF DRAINAGE ITEMS	85			~ EC(9)-16
15	SUMMARY OF DRAINAGE ITEMS (US 287)	86	DRAINAGE AREA MAP WITH H&H DATA(US 287)		ENVIRONMENTAL PERMITS, ISSUES AND COMMITMENTS (EPIC)
16	SUMMARY OF DRAINAGE ITEMS (SH 75)	87	DRAINAGE AREA MAP WITH H&H DATA(SH 75)		
17	CONSOLIDATED SUMMARY OF SIGN ITEMS	88-90	STRUCTURE LAYOUT (US 287)		
18	SUMMARY OF SIGN ITEMS (US 287)	91	STRUCTURE LAYOUT (SH 75)		
19	SUMMARY OF SIGN ITEMS (SH 75)	92	CUT & RESTORE PAVEMENT DETAIL (US 287)		
20	CONSOLIDATED SUMMARY OF PAVEMENT MARKINGS AND MARKER	93	BSC (SH 75)		
21	SUMMARY OF PAVEMENT MARKINGS & TCP QUANTITIES (US 287)	94	~ PSET-SP		
22	SUMMARY OF PAVEMENT MARKINGS AND MARKERS (SH 75)	95	~ PSET-RP		
23	CONSOLIDATED SUMMARY OF SW3P	96	~ PSET-RR		
24	SUMMARY OF SW3P (US 287)	97	~ PSET-SC		
25	SUMMARY OF SW3P (SH 75)	98	~ PSET-RC		
26	SCHEDULE OF MATERIALS (SH 75)	99-100	~ PW		
27	TCP NARRATIVE (US 287)	101-102	~ SCC-3&4		
28-29	SEQUENCE OF WORK (US 287)	103	~ SCC-5&6		
30	CRASH CUSHION SUMMARY SHEET (US 287)	104	~ SCC-MD		
31	TCP NARRATIVE (SH 75)	105	~ SCP-3		
32-33	SEQUENCE OF WORK (SH 75)	106-108	~ SCP-5		
34-45	~ BC(1)-21 THRU BC(12)-21	109-110	~ SETB-FW-0		
46-47	~ TCP(1-1)-18 THRU TCP(1-2)-18	111	~ SETP-CD		
48-49	~ TCP(2-1)-18 THRU TCP(2-2)-18		~ SETP-PD		
50	TRAFFIC CONTROL ~ TCP(2-8)-18	112	SIGNING AND STRIPING LAYOUT (US 287)		
51	~ TCP(3-1)-13	113	SUMMARY OF SMALL SIGNS (US 287)		
52	~ TCP(3-3)-14	114	SMALL SIGN DETAILS (US 287)		
53	~ TCP(7-1)-13	115	SIGNING AND STRIPING LAYOUT (SH 75)		
54-55	~ TCP(S-1)-08A THRU TCP(S-2)-08A	116-117	SUMMARY OF SMALL SIGNS (SH 75)		
56	~ TCP(S-2c)-10	118	ILLUMINATION LAYOUT (SH 75)		
57	~ TREATMENT FOR VARIOUS EDGE CONDITION TREATMENT	119-120	~ D & OM(1)-20 THRU D & OM(2)-20		
58	~ WZ(RS)-16	121-122	~ D & OM(4)-20 THRU D & OM(5)-20		
59	~ WZ(STPM)-13	123	~ D & OM(VIA)-20		
60	~ WZ(UL)-13	124-135	~ ED(1)-14 THRU ED(12)-14		
61	ROADWAY LAYOUT (US 287)	136	~ LUM-A-12		
62	INTERSECTION DETAILS (US 287 & FM 488)	137-139	~ PM(1)-20 THRU PM(3)-20		
63	MBGF LAYOUT (US 287)	140	~ RFBA-13		
64	ROADWAY LAYOUT (SH 75)	141-143	~ RID(1)-20 THRU RID(3)-20		
65	INTERSECTION DETAILS (SH 75 & SPUR 67)	144-147	~ RIP(1)-19 THRU RIP(4)-19		
66	DRIVEWAY DETAILS (SH 75)	148-149	~ RS(3)-13 THRU RS(4)-13		
67	MAILBOX TURNOUT DETAILS (SH 75)	150	~ SMD(GEN)-08		
		151-153	~ SMD(SLIP-1)-08 THRU SMD(SLIP-3)-08		
		154	~ SMD(TY G)-08		

THE STANDARD SHEETS SPECIFICALLY IDENTIFIED ABOVE WITH A TILDE (~), AND STANDARD SHEET *T5/T501/T502 (MOD) WHICH HAVE BEEN MODIFIED, HAVE BEEN SELECTED BY ME, OR UNDER MY RESPONSIBLE SUPERVISION, AS BEING APPLICABLE TO THIS PROJECT.



PRINT DATE	REVISION DATE
5/26/2022	

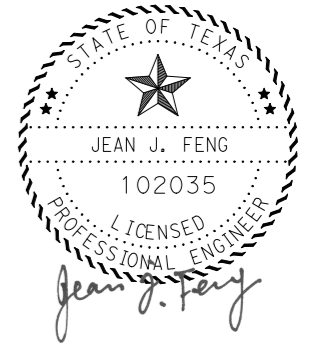
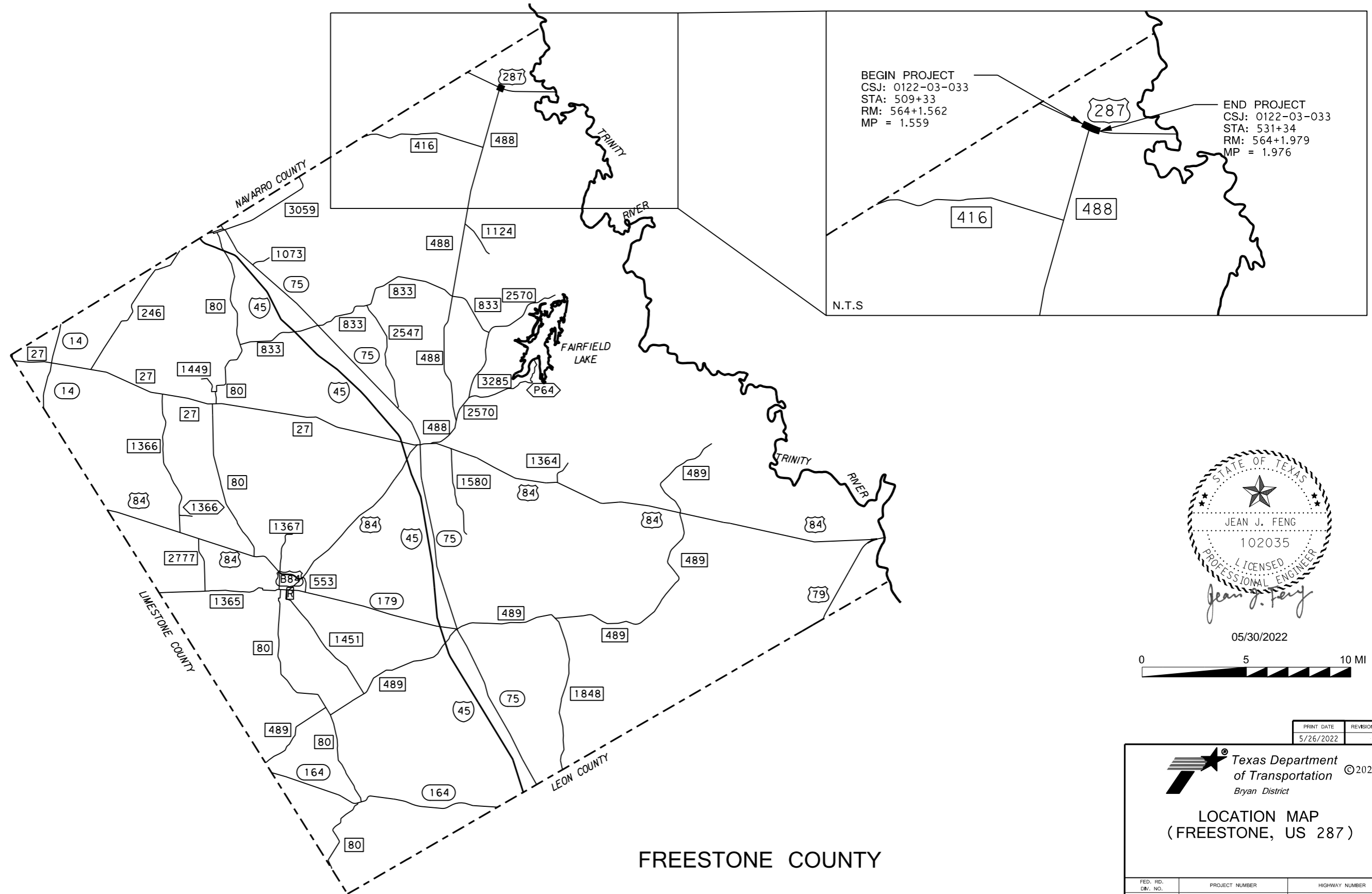
Texas Department of Transportation ©2022
Bryan District

INDEX OF SHEETS

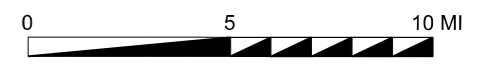
FED. RD. DIV. NO.	PROJECT NUMBER	HIGHWAY NUMBER
6		US 287, ETC.
STATE	DISTRICT	COUNTY
TEXAS	BRYAN	FREESTONE, ETC.
CONTROL	SECTION	JOB SHEET NO.
0122	03	033,ETC. 2

REV DATE: 2-12-2015
 CSJ: 002-03-033
 FILENAME: pw:\tdot\projectsonline.com\TXDOT4\Documents\17 - BRY\Design Projects\01203033\4 - Design\Plan Set\1. General\A. TitleSheet\INDEX OF SHEETS.dgn
 5/2022

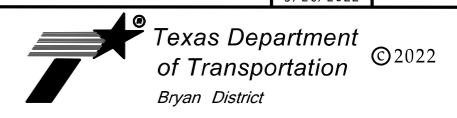
REV DATE: 2-12-2015
 CSJ: 0122-03-033
 FILENAME: p:\txdot\projectswisconsin.com\TXDOT\Documents\17 - BRY\Design Projects\012203033\4 - Design\Plan Set\1. General\B. Project\Layout\Location Map2.dgn



05/30/2022



PRINT DATE	REVISION DATE
5/26/2022	

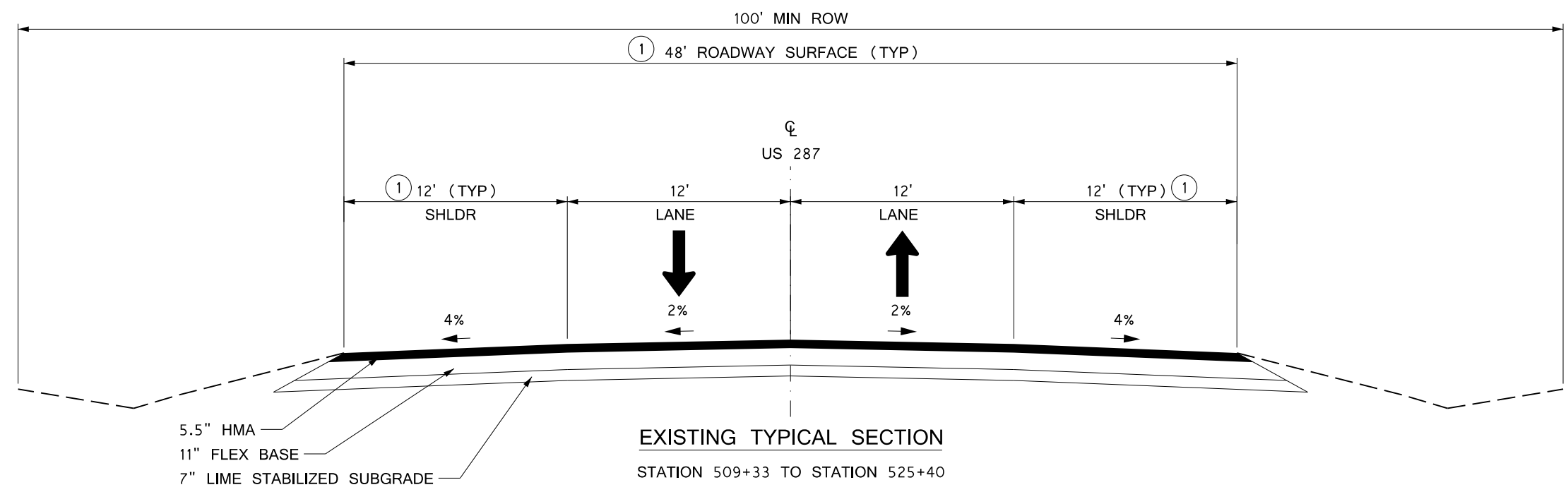


**LOCATION MAP
(FREESTONE, US 287)**

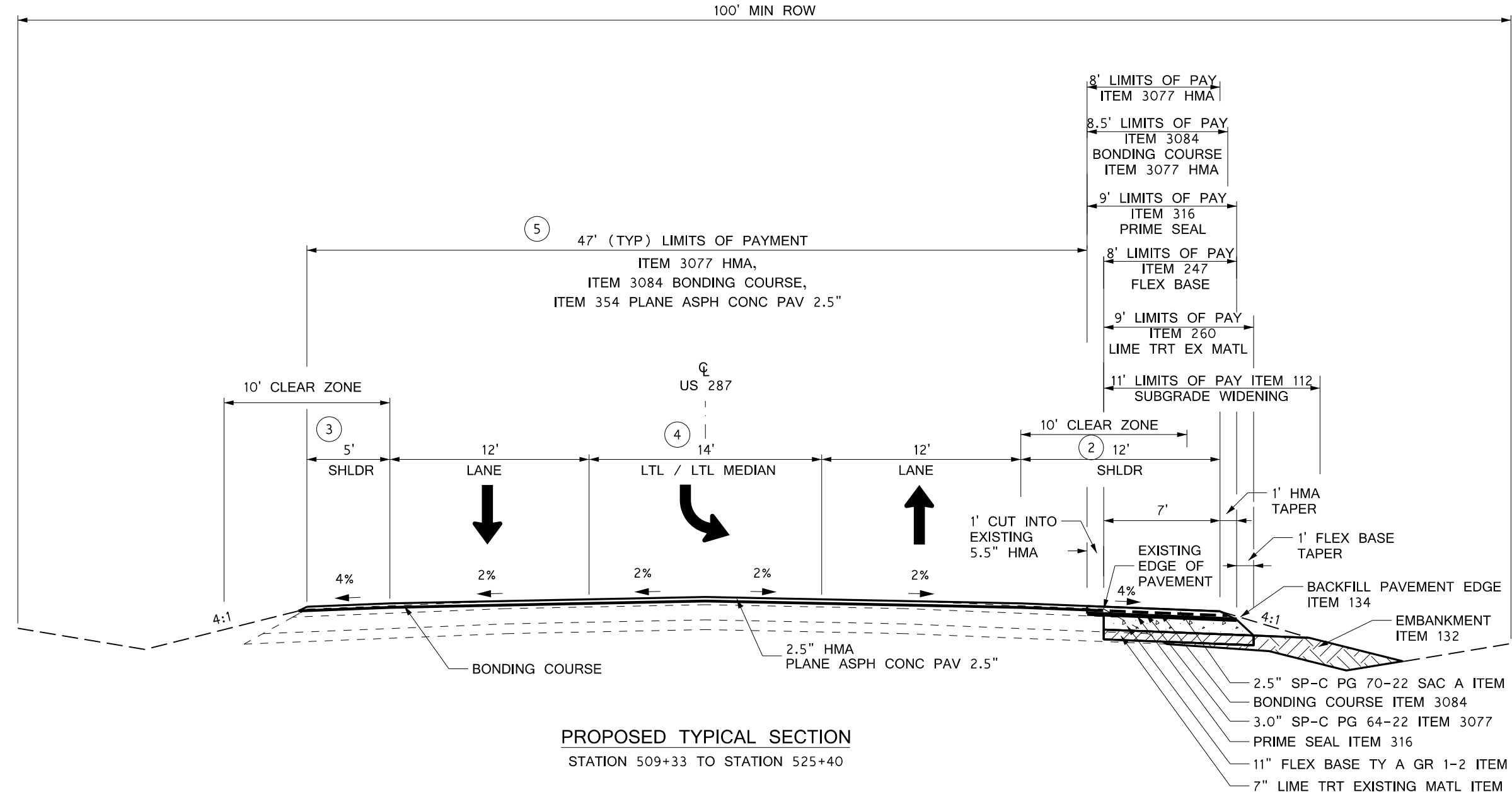
FED. RD. DIV. NO.	PROJECT NUMBER	HIGHWAY NUMBER	
6		US 287, ETC.	
STATE	DISTRICT	COUNTY	
TEXAS	BRYAN	FREESTONE, ETC.	
CONTROL	SECTION	JOB	SHEET NO.
0122	03	033.ETC.	3

FREESTONE COUNTY

REV DATE: 2-12-2015
 CSJ: 0122-03-033
 FILENAME: pw:\txdot\projectsonline.com\TXDOT4\Documents\17 - BRY\Design Projects\012203033\4 - Design\Plan Set\1. General\1.C. Typical Sections\Typical Sections.dgn



EXISTING TYPICAL SECTION
 STATION 509+33 TO STATION 525+40



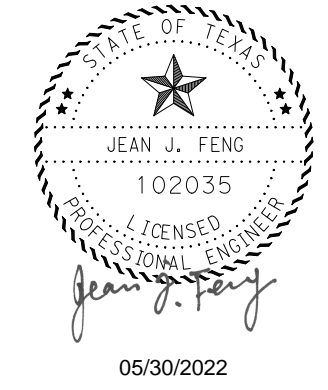
PROPOSED TYPICAL SECTION
 STATION 509+33 TO STATION 525+40

- NOTES:
- ① EXISTING SHOULDER WIDTH VARIES FROM 12' TO 8', ROADWAY SURFACE WIDTH FROM 48' TO 40' FROM STATION 521+46 TO 525+40
 - ② PROPOSED SHOULDER WIDTH WILL TAPER FROM 12' TO 8' STARTING AT STATION 520+96
 - ③ PROPOSED SHOULDER WIDTH VARIES FROM 12' TO 5' FROM STATION 510+46 TO 512+93

 PROPOSED SHOULDER WIDTH VARIES FROM 5' TO 8' FROM STATION 522+86 TO 525+31
 - ④ LTL TAPERS FROM 0' TO 14' FROM STATION 510+48 TO 512+93

 LTL TAPERS FROM 14' TO 0' FROM STATION 522+86 TO 525+40
 - ⑤ LIMITS OF PAYMENT VARIES FROM 47' TO 39' FROM STATION 521+46 TO 525+40

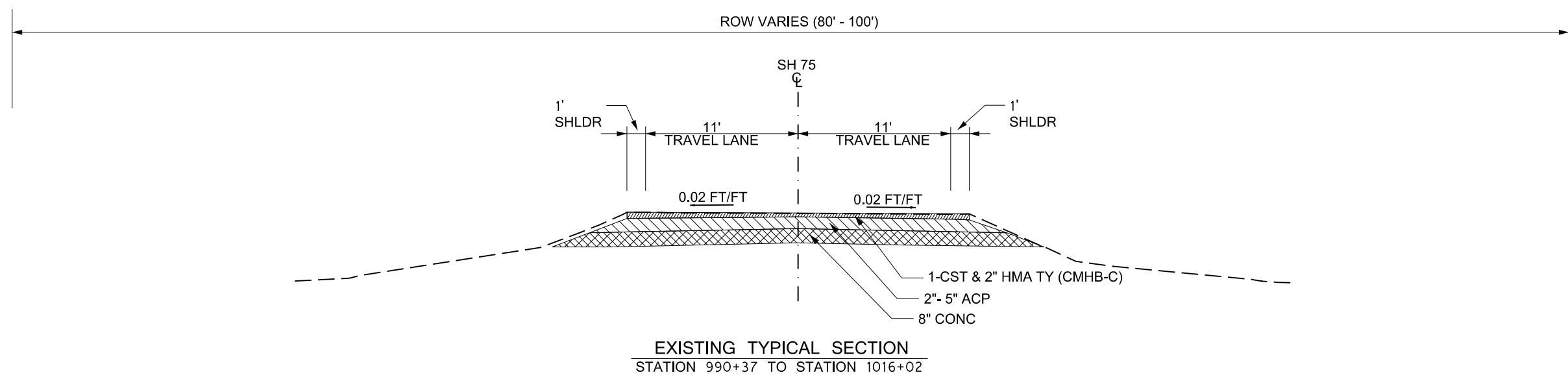
SEE SHEET "ROADWAY LAYOUT (US 287)" FOR MORE INFORMATION OF ROADWAY WIDTH VARIATIONS.



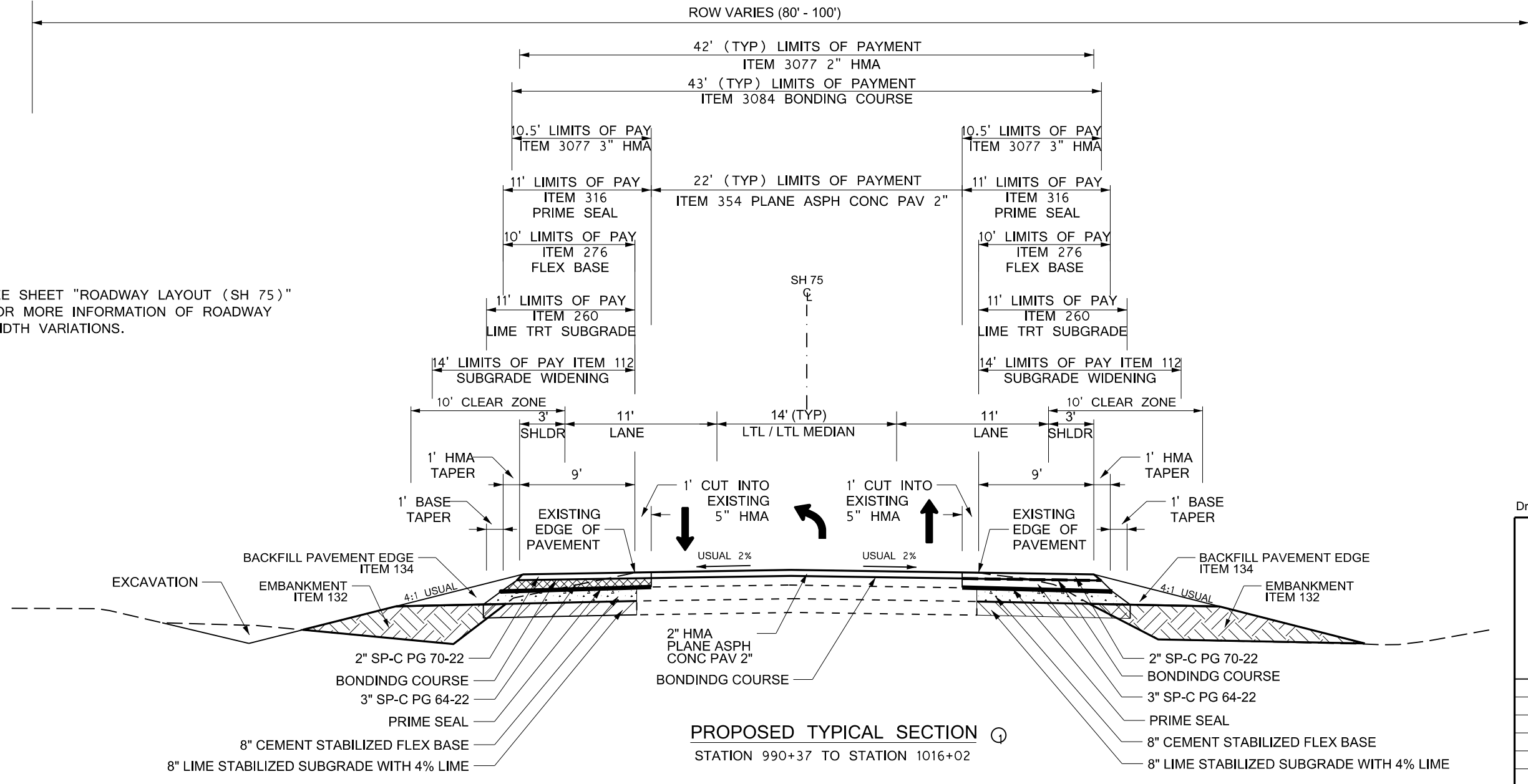
Drawings Not To Scale

Texas Department of Transportation Bryan District		©2022
TYPICAL SECTIONS (US 287)		
FED. RD. DIV. NO.	PROJECT NUMBER	HIGHWAY NUMBER
6		US 287, ETC.
STATE	DISTRICT	COUNTY
TEXAS	BRYAN	FREESTONE, ETC.
CONTROL	SECTION	JOB SHEET NO.
0122	03	033, ETC. 5

REV DATE: 2-12-2015
 CSJ: 0122-03-033
 FILENAME: pw:\txdot\projectsonline.com\TXDOT4\Documents\17 - BRY\Design Projects\016607067\4 - Design\Plan Set - Design\Plan Set\1 - Proposed Typical Sections\SH75 - PROPOSED TYPICAL SECTION.dgn

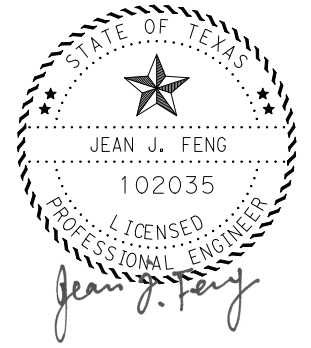


EXISTING TYPICAL SECTION
 STATION 990+37 TO STATION 1016+02



PROPOSED TYPICAL SECTION ①
 STATION 990+37 TO STATION 1016+02

① SEE SHEET "ROADWAY LAYOUT (SH 75)" FOR MORE INFORMATION OF ROADWAY WIDTH VARIATIONS.



05/30/2022

Drawings Not To Scale



TYPICAL SECTIONS (SH 75)

FED. RD. DIV. NO.	PROJECT NUMBER	HIGHWAY NUMBER	
6		US 287, ETC.	
STATE	DISTRICT	COUNTY	
TEXAS	BRYAN	FREESTONE, ETC.	
CONTROL	SECTION	JOB	SHEET NO.
0122	03	033, ETC.	6

Project Number: STP 2022(861)HES
 Highway: US 287, ETC.
 County: FREESTONE, ETC.

Sheet:7
 Control: 0122-03-033, ETC.

BASIS OF ESTIMATE (US 287, 0122-03-033)					
ITEM	DESCRIPTION	COURSE	RATE	AMOUNT	QUANTITY
168-6001	Vegetative Watering		10 GAL/SY	4,891 SY	49 MG
260-6002	Lime (Hydrated Lime Slurry) (7") (4%)	7"	0.013 TON/SY	1,174 SY	15 TON
316-6029	ASPH (RC-250)	PRIME SEAL	0.28 GAL/SY	1,174 SY	329 GAL
316-6403	AGGR (TY-B GR-5 OR TY-L GR-5)	PRIME SEAL	1 CY/135 SY	1,174 SY	9 CY
3077-6011	SP-C PG64-22	3"	330 LB/SY	1,032 SY	170 TONS
3077-6022	SP-C PG70-22 SAC A	2.5"	275 LB/SY	10,820 SY	1,488 TONS
3084-6001	Bonding Course		0.10 GAL/SY	10,962 SY	1,096 GAL

BASIS OF ESTIMATE (US 287, 0122-03-033) * for contractor's information only					
ITEM	DESCRIPTION	COURSE	RATE	AMOUNT	QUANTITY
166*	FERTILIZER **		60 LBS/AC	1.01 AC	0.03 TON

Note: Rates are for estimating purposes only. Actual Rates will be determined in the field.
 ** Tonnage represents Nitrogen content only.

Project Number: STP 2022(861)HES
 Highway: US 287, ETC.
 County: FREESTONE, ETC.

Sheet:7
 Control: 0122-03-033, ETC.

BASIS OF ESTIMATE (SH 75, 0166-07-067)					
ITEM	DESCRIPTION	COURSE	RATE	AMOUNT	QUANTITY
168-6001	Vegetative Watering		10 GAL/SY	20,224 SY	202 MG
260-6002	Lime (Hydrated Lime Slurry) (8") (4%)	8"	0.015 TON/SY	4,705 SY	71 TON
316-6029	ASPH (RC-250)	PRIME SEAL	0.28 GAL/SY	4,705 SY	1,317 CY
316-6403	AGGR (TY-B GR-5 OR TY-L GR-5)	PRIME SEAL	1 CY/135 SY	4,705 SY	35 GAL
3077-6011	SP-C PG64-22	3"	330 LB/SY	4,562 SY	753 TON
3077-6022	SP-C PG70-22 SAC-A	2"	220 LB/SY	10,691 SY	1,176 TON
3084	BONDING COURSE		0.10 GAL/SY	10,975 SY	1,098 GAL

BASIS OF ESTIMATE (SH 75, 0166-07-067) * for contractor's information only					
ITEM	DESCRIPTION	COURSE	RATE	AMOUNT	QUANTITY
166*	FERTILIZER **		60 LBS/AC	4.2 AC	0.13 TON
530*	TURNOUTS (ACP) SUPERPAVE MIXTURES SP-C SAC-A PG70-22	2"	220 LB/SY	34 SY	4 TON
530*	INTERSECTION (ACP) SUPERPAVE MIXTURES SP-C SAC-A PG70-22	2"	220 LB/SY	766 SY	84 TON
530*	DRIVEWAYS (SURF TREAT) ASPH (RC-250)		0.28 GAL/SY	381 SY	107 GAL
530*	DRIVEWAYS (SURF TREAT) AGGREGATE (TY-PB GR-4 OR TY-PL GR-4 SAC-A)		1 CY/135 SY	381 SY	3 CY

Note: Rates are for estimating purposes only. Actual Rates will be determined in the field.
 ** Tonnage represents Nitrogen content only.

Project Number: STP 2022(861)HES

Sheet:7A

Highway: US 287, ETC.

Control: 0122-03-033, ETC.

County: FREESTONE, ETC.

GENERAL:

Contractor questions on this project are to be addressed to the following individuals:

Delmy Reyes, P.E., A.E., Delmy.Reyes@txdot.gov

Matt Hensarling, P.E., A.A.E., Matt.Hensarling@txdot.gov

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

All contractor questions will be reviewed by the Engineer. Once a response is developed, it will be posted to TxDOT's Public FTP at the following address:

<https://ftp.dot.state.tx.us/pub/txdot-info/Pre-Letting%20Responses/>

All questions submitted that generate a response will be posted through this site. The site is organized by District, Project Type (Construction or Maintenance), Letting Date, CCSJ/Project Name.

Send eligible shop plan submittals with PDF attachments directly to the reviewing office.

ITEM 5 "CONTROL OF THE WORK"

When a precast or cast-in-place concrete element is included in the plans, a precast concrete alternate may be submitted in accordance with "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 7 "LEGAL RELATIONS AND RESPONSIBILITIES"

State contract mowers will mow the right of way during the growing season. The Contractor will be notified by the Engineer one week in advance of the anticipated time when mowers will be in the limits of the project. Clean the right of way to such a condition that allows the mowing contractors to safely mow.

In the event of the declaration of a hurricane watch, warning, other severe weather warning or national or state emergency that requires the roadways in the vicinity be used as evacuation routes, cease all work that requires the Contractor's, sub-contractors' or material suppliers' vehicles to enter the stream of traffic on these primary or secondary evacuation routes. This work includes material hauling and delivery, and mobilization or demobilization of equipment.

The following roadways are recognized evacuation routes in the Bryan District:

Project Number: STP 2022(861)HES

Sheet:7A

Highway: US 287, ETC.

Control: 0122-03-033, ETC.

County: FREESTONE, ETC.

Primary Evacuation Routes: IH 45, US 290, SH 6, SH 36.

Secondary Evacuation Routes: US 79, US 84, SH 7, SH 30, SH 21, SH 105.

Other routes may be designated.

No significant traffic generator events identified.

ITEM 8 "PROSECUTION AND PROGRESS"

No more than 2 miles of non-surfaced roadway will be allowed at any time. The Engineer may consider extending the 2-mile limit or allow alternating 2-mile sections of concurrent work, only if the Contractor can demonstrate adequate workforce, equipment, material deliveries, work plan, and quality of work sufficient to handle the longer work zones. If the 2 miles of non-surfaced roadway are extended by the Engineer in writing, this will not exempt the Contractor from not exceeding the 5 minute delay and any additional signing/traffic control will be considered subsidiary to Item 502, Barricades, Signs, and Traffic Handling.

At the end of each work day, remove all grade differentials transverse to centerline.

At the end of each work day, provide 100 foot minimum grade tapers longitudinal to the centerline to transition differences in the profile grade line or roadway grade.

By noon of each Wednesday, provide the Engineer a written outline of the daily work schedule for the following week. Include in the outline the times and places for proposed traffic control changes, lane and shoulder closures, and moving operations or other operations that affect traffic on the roadway. Unless otherwise authorized by the Engineer, prosecute the work on this project in accordance with the following sequence of work:

US 287 (CSJ 0122-03-033)

- 1) Set advance signing and barricades.
- 2) Follow SEQUENCE OF WORK, phase I through phase III.
- 3) Final cleanup.

SH 75 (CSJ 0166-07-067)

- 1) Set advance signing and barricades.
- 2) Follow SEQUENCE OF WORK, phase I through phase IV.
- 3) Final cleanup.

Some of these operations may be performed simultaneously.

Prepare Progress Schedule Bar Chart.

Project Number: STP 2022(861)HES

Highway: US 287, ETC.

County: FREESTONE, ETC.

Sheet:7B

Control: 0122-03-033, ETC.

Work is allowed to be performed during the nighttime.

Work in the travel lanes (including lane closures) is not allowed from 6 am to 9 am and from 4pm to 7pm, Monday through Friday on SH 75.

Equipment and material may be pre-staged at approved locations.
The 90-day delayed start allowed after authorization under SP008-003 is for Contractor time for material acquisition.

ITEM 100 “PREPARING RIGHT OF WAY”

During burn bans obtain written approval from the Commissioners Court prior to burning brush.

Prevent ashes from burned vegetation to be transported into any stream.

If burning is not allowed, all trees and brush will be disposed of by shredding, logging or other methods approved by the Engineer. Create a windrow, stockpile, or topdress biomass on disturbed areas along the project at locations approved by necessary permits and the Engineer.

ITEM 132 “EMBANKMENT”

Provide Embankment material for areas within the limits of the Pavement Structure that meet one of the following requirements:
Sources outside the ROW provide material with a plasticity index between 10 and 25 and with less than 30% silt.
Sources within the ROW provide material with a plasticity index between 10 and 25 and with less than 30% silt.

Provide Embankment material for areas outside the limits of the Pavement Structure with a plasticity index between 10 and 35.

ITEM 134 “BACKFILLING PAVEMENT EDGES”

Furnish Type A or B material meeting one of the following requirements:
Item 247, Type D Grade 3;
Reclaimed Asphalt Pavement (RAP) with 95% of the RAP passing the 2 inch sieve.

Place emulsified asphalt (SS-1, CSS-1, or as approved by the Engineer) at an application rate of 0.15 gal/SY.

Project Number: STP 2022(861)HES

Highway: US 287, ETC.

County: FREESTONE, ETC.

Sheet:7B

Control: 0122-03-033, ETC.

ITEM 160 “TOPSOIL”

All slopes requiring topsoil will be tracked immediately upon final grading to prevent erosion per standard sheet EC(1)-16. Tracking slopes to prevent erosion will not be measured or paid for directly, but will be subsidiary to pertinent Items.
Topsoil may be obtained from the right of way at sites of proposed excavation and embankment.

ITEM 162 “SODDING FOR EROSION CONTROL”

Furnish and place block Bermuda sod.

ITEM 166 “FERTILIZER”

Fertilize all areas of project that are being seeded or sodded.

ITEM 168 “VEGETATIVE WATERING”

Vegetative watering is required for all areas of the project that are being seeded or sodded.

ITEM 247 “FLEXIBLE BASE”

Place flexible base in equal lifts of 4 to 8 in. in depth unless otherwise approved by the Engineer.

Project Number: STP 2022(861)HES
Highway: US 287, ETC.
County: FREESTONE, ETC.

Sheet:7C
Control: 0122-03-033, ETC.

TEM 276 “CEMENT TREATMENT (PLANT-MIXED)”

**Table 1
Flexible Base Material Requirements Before Cement Treatment**

Property	Test Method	Grade 4
Master gradation sieve size		% Retained
2-1/2 in.	Tex-110-E	0
1-3/4 in.		0-10
7/8 in.		-
3/8 in.		-
No. 4		45-75
No. 40		60-85
Liquid limit, %max. ¹	Tex-104-E	40
Plasticity index, max. ¹	Tex-106-E	12
Linear shrinkage, min	Tex-107-E	2
Wet Ball mill, %max	Tex-116-E	45
Wet ball mill, % max. increase passing the No. 40 sieve.		20

Determine plastic index in accordance with Tex-107-E (linear shrinkage) when liquid limit is unattainable as defined in Tex-104-E.

If the cement treated base fails these requirements a different flexible base source will be required. The Engineer may accept a mixture design from the Contractor that is performed in accordance with Test Method Tex-120-E, Part I and meets the moisture susceptibility requirement shown above.

ITEM 301 “ASPHALT ANTISTRIPPING AGENT”

When the Contractor adds lime as an anti-stripping agent (or an equivalent anti-stripping agent) the lime or equivalent shall be added to the asphaltic concrete in the methods specified in this item unless otherwise approved by the Engineer. If an alternate method is proposed, the Engineer’s approval will be based on test method Tex-242-F performed on the asphaltic concrete produced through the plant.

Project Number: STP 2022(861)HES
Highway: US 287, ETC.
County: FREESTONE, ETC.

Sheet:7C
Control: 0122-03-033, ETC.

TEM 316 “SEAL COAT”

Remove vegetation and blade pavement edges.
When placing surface treatment on base material, prepare surface by sweeping or other approved methods. Before applying bituminous material, lightly sprinkle the surface with water. When directed, sweep the surface after sprinkling with water. Do not apply bituminous material when water is puddling on the surface.

Sweep excess aggregate no sooner than 2 hours after rolling or as directed.

Vehicles used to haul aggregate from the stockpile to the chip spreader will not be overloaded. Any damage to the roadway caused by the vehicles will be repaired by the Contractor at his expense and subsequent loads will be reduced so as not to cause further damage.

Transverse variance rates shall be used as directed. The nozzles outside the wheel paths will output up to 20% more asphalt by volume than the nozzles over the wheel paths.

The Contractor may be required to furnish and set string line to insure straight and uniform alignment as directed by the Engineer. The Contractor may use other methods subject to approval of the Engineer.

Surface treat the metal beam guard fence widening areas after placing the MBGF to ensure that the entire widened areas are properly sealed.

If electing to place the MBGF after placing the surface treatment, reseal the widened areas to the satisfaction of the Engineer.

Surface treat driveways before the roadway is surface treated (second course only).

Cure surface treatments placed with a cutback asphalt binder for 21 days before placing subsequent surface courses unless otherwise directed by the engineer.

Cure surface treatments placed with an emulsion asphalt binder for 7 days before placing subsequent surface courses unless otherwise directed by the engineer.

Air and surface temperature for asphalt material application will be in accordance with the specification and the manufacturer’s recommendation. However, the engineer may limit the use of an asphalt material due to the time of year.

Project Number: STP 2022(861)HES

Sheet:7D

Highway: US 287, ETC.

Control: 0122-03-033, ETC.

County: FREESTONE, ETC.

ITEM 320 “EQUIPMENT FOR ASPHALT CONCRETE PAVEMENT”

Unless otherwise approved by the Engineer, provide a Material Transfer Device with remixing capabilities as specified in Item 320.2.3.3 Placement and Compaction Equipment for all asphaltic concrete pavement.

ITEM 354 “PLANING AND TEXTURING PAVEMENT”

Schedule the work so that a seal coat is placed no more than two weeks after milling has been performed on any pavement surface, unless otherwise approved by the Engineer. The Engineer may require the seal coat to be placed sooner than two weeks in cases when base materials are exposed or when the pavement structure is showing signs of distress.

Existing raised pavement markers in the proposed work area are to be removed prior to planning operations. This item will be considered subsidiary.

Construct a fine milling pattern by adjusting the speed of the drum and the machine, as approved by the Engineer.

TxDOT will keep possession of all the reclaimed asphalt material. For US 287, RAP material can be stockpiled at FM 488, Latitude: 31°55'7.99"N and Longitude: 96° 6'37.64"W. For SH 75, RAP material is taken to the Madison County Maintenance Yard at 910 North May Street, Madisonville, TX 77864.

Schedule the work so that HMA is placed the same work day that the milling has been performed on any pavement surface, unless otherwise approved by the Engineer.

ITEM 416 “DRILLED SHAFT FOUNDATIONS”

Stake foundation locations and have them approved by the Engineer before installation. The Engineer together with the Contractor will calculate the vertical signal head clearance before placing any traffic signal pole foundation.

Notify the Engineer 48 hours prior to forming and placing concrete in any unit of all the Signal Pole and Controller Foundations. Do not place concrete without an Inspector present. Failure to inform the Engineer and provide adequate time to arrive on the job site may result in removing and replacing the foundation.

Project Number: STP 2022(861)HES

Sheet:7D

Highway: US 287, ETC.

Control: 0122-03-033, ETC.

County: FREESTONE, ETC.

ITEM 432 “RIPRAP”

The fifty foot (50') approach taper to the MBGF end treatment will be concrete Mow Strip unless otherwise shown in the plans or otherwise directed by the Engineer.

ITEM 464 “REINFORCED CONCRETE PIPE”

Seal joints using cold applied plastic asphalt sewer compound or cold applied preformed plastic gaskets. When cohesionless material is used for backfill, wrap the joints prior to backfilling with sand proof tape following the manufacturer's recommendations or with an equivalent material and method.

ITEM 467 “SAFETY END TREATMENTS”

All Type II SET's shall have riprap aprons as shown on the plans. Riprap aprons are considered subsidiary to Type II SET's.

ITEM 502 “BARRICADES, SIGNS AND TRAFFIC HANDLING”

Where shown on applicable TCP standards, channelizing devices on the centerline are required at all times; including when a pilot vehicle is used to lead traffic. Mount a G20-4 sign at a conspicuous location on the rear of the vehicle. Traffic delays caused by one-lane, two-way traffic control, will not be allowed to exceed 5 minutes unless approved by the Engineer.

During one-way operations, station flaggers at all county roads and any other locations, such as private businesses, that may have traffic entering the work area.

Prior to beginning pulverization operations, place an approved channelizing device along both sides of the travelway the entire length of the operation in accordance with the BC standards. Do not remove the channelizing devices until permanent edge striping is placed.

Place "Pavement Ends" (CW8-3), "Slow Down On Wet Road" (CW8-5a), "No Centerline Stripe", and "Loose Gravel" signs before pulverization of the existing pavement.

Removal of ground mounted temporary signs and supports as specified on standard sheet BC(5), shall include the immediate backfilling of support holes with Type B embankment material and the compaction of the backfill material.

The Contractor Force Account “Safety Contingency” that has been established for this project is

Project Number: STP 2022(861)HES

Sheet:7E

Highway: US 287, ETC.

Control: 0122-03-033, ETC.

County: FREESTONE, ETC.

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

Law enforcement assistance will be required for this project and is expected to be required for major traffic control changes and lane closures. Coordinate with local law enforcement and arrange for law enforcement as directed or agreed by the Engineer. Complete the weekly tracking form provided by the department and submit invoices that agree with the tracking form for payment at the end of each month approved services were provided.

ITEM 512 "PORTABLE TRAFFIC BARRIER"

Do not pin PTB on bridge decks.

ITEM 540 "METAL BEAM GUARD FENCE"

Furnish and Install only one type of timber post.

ITEM 544 "GUARDRAIL END TREATMENTS"

Furnish and install only MASH compliant guardrail end treatments.

Furnish and install a single type of guardrail end treatments project-wide (either wood post or steel post).

Use TYPE III post and tube option when using wood post guardrail end treatments.

ITEM 560 "MAILBOX ASSEMBLIES"

Notify the postmaster prior to installation for approval of type and temporary and permanent locations.

Retain and re-use newspaper holders removed or relocated during construction for placement on new mailbox assemblies in accordance with mailbox standard sheets.

Project Number: STP 2022(861)HES

Sheet:7E

Highway: US 287, ETC.

Control: 0122-03-033, ETC.

County: FREESTONE, ETC.

ITEM 585 "RIDE QUALITY FOR PAVEMENT SURFACES"

Pay adjustment schedule 3 will be used to evaluate ride quality of the travel lanes in accordance with Item 585, "Ride Quality for Pavement Surfaces."

ITEM 628 "ELECTRICAL SERVICES"

Prior to installing the electrical services at the designated location detailed in the plans the Contractor is to:

1. Contact the power company to obtain a meter can.
2. Verify any requirements by the power company.
3. Verify there is the correct type of transformer at the location to provide power to the new electrical service.

The power company is stated in the plans on the electrical service data sheet. For the installation of new electrical services, the Contractor shall set up the account in its name. Once all equipment is connected to the new electrical service, and has been inspected and turned on, the Contractor shall provide TxDOT with a bill receipt to start the process to transfer the account over to TxDOT. For the replacement of existing electrical services, TxDOT will provide the Contractor with the necessary information to temporarily disconnect and reconnect power to the existing TxDOT account.

Ensure that the electrical service is constructed by the manufacturer in accordance with the plans

It is the Contractor's responsibility to contact power company and set up ES in contractor's name to be reimbursed by TxDOT.

ITEM 644 "SMALL ROADSIDE SIGN ASSEMBLIES"

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

ITEM 658 "DELINEATORS AND OBJECT MARKER ASSEMBLIES"

GF2 delineators will be provided by TxDOT. Installation will be performed by the contractor. Notify the Engineer when ready to install delineators to coordinate material acquisition.

ITEM 662 "WORK ZONE PAVEMENT MARKINGS"

Paint and beads may be used for non-removable work zone pavement markings.

Project Number: STP 2022(861)HES
Highway: US 287, ETC.
County: FREESTONE, ETC.

Sheet:7F
Control: 0122-03-033, ETC.

All striping limits must be approved by the Engineer before striping operations may begin.

ITEM 666 “REFLECTORIZED PAVEMENT MARKINGS”

Unless authorized by the Engineer, the Contractor will not place the pavement markings on the resurfaced roadway until it has cured for 3 days.

All striping limits must be approved by the Engineer before striping operations may begin.

ITEM 672 “RAISED PAVEMENT MARKERS”

Use flexible bituminous adhesive for applications on all pavement types.

ITEM 678 “PAVEMENT SURFACE PREPARATION FOR MARKINGS”

It is not anticipated that pavement surface preparation for markings will be needed. If the Engineer determines that it is needed, payment for work will be determined in accordance with Article 9.7 “Payment for Extra Work and Force Account Method”.

ITEM 3077 “SUPERPAVE MIXTURES”

Hamburg Wheel Test Requirements			
High-Temperature Binder Grade	Test Method	Laboratory Mixture Design or Trial Batch	Production and Placement Test¹
		Minimum # of Passes @ 0.5" Rut Depth, Tested @122°F	Minimum # of Passes @ 0.5" Rut Depth, Tested @122°F
PG 64 or lower	Tex-242-F	7,000	7,000

¹. The Engineer may accept if no more than 1 of the 5 most recent Hamburg Wheel tests is below the specified number of passes and the failing test is no more than 2,000 passes below the specified number of passes.

Aggregates used on ramps are required to meet SAC requirements.

Add one (1.0) percent hydrated lime, commercial lime slurry, or an equivalent anti-stripping agent, based on the total aggregate weight, as mix enhancer for all mixture types unless otherwise approved by the Engineer. Provide hydrated lime or commercial lime slurry in accordance with DMS-6350, “Lime and Lime Slurry”. Add hydrated lime, commercial lime slurry, or an equivalent anti-stripping agent in accordance with Section 301.4.2.

Project Number: STP 2022(861)HES
Highway: US 287, ETC.
County: FREESTONE, ETC.

Sheet:7F
Control: 0122-03-033, ETC.

Apply tack coat through a distributor spray bar in accordance with Section 316.3.1. Distributor. If residual from emulsion tack is not tacky, then the Engineer can require the use of PG binder.

RAS is not permitted in thin level-up courses.

ITEM 6001 “PORTABLE CHANGEABLE MESSAGE SIGN”

Furnish, install, and operate up to (2) Portable Changeable Message Signs (PCMS) for this project. The signs can be used both on the project and within a ten (10) mile radius of the project. Locations, messages, and durations of use will be specified by the Engineer. The primary uses will be to inform the public of special events, lane and road closures, and changes in traffic control. Signs will be paid for only when used as directed by the Engineer.

ITEM 6185 “TRUCK MOUNTED ATTENUATOR (TMA) AND TRAILER ATTENUATOR (TA)”

provide one (1) shadow vehicle with TMA for TCP (1-1)-18 as detailed on General Note 4 of this standard sheet.

provide one (1) shadow vehicle with TMA for TCP (1-2)-18 as detailed on General Note 5 of this standard sheet.

provide one (1) shadow vehicle with TMA for TCP (2-1)-18 as detailed on General Note 4 of this standard sheet.

provide one (1) shadow vehicle with TMA for TCP (2-2)-18 as detailed on General Note 6 of this standard sheet.

provide two (2) (shadow and trail) vehicles with TMA for TCP (3-1)-13 as detailed on General Note 3 of this standard sheet.

provide two (2) (shadow and trail) vehicles with TMA for TCP (3-3)-14 as detailed on General Note 3 of this standard sheet.

Therefore, nine (8) total shadow vehicles with TMA will be required for this type of work. The contractor will be responsible for determining 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.

US 287

35 (thirty-five) TMA days are provided in the project estimate for stationary operations.

3 (three) TMA days are provided in the project estimate for mobile operations.

Project Number: STP 2022(861)HES

Sheet:7G

Highway: US 287, ETC.

Control: 0122-03-033, ETC.

County: FREESTONE, ETC.

SH 75

105 (one hundred and five) TMA days are provided in the project estimate for stationary operations.

3 (three) TMA days are provided in the project estimate for mobile operations.



Estimate & Quantity Sheet

CONTROLLING PROJECT ID 0122-03-033

DISTRICT Bryan
HIGHWAY SH 75, US 287

COUNTY Freestone, Madison

CONTROL SECTION JOB				0122-03-033		0166-07-067		TOTAL EST.	TOTAL FINAL
PROJECT ID				A00178723		A00178707			
COUNTY				Freestone		Madison			
HIGHWAY				US 287		SH 75			
ALT	BID CODE	DESCRIPTION	UNIT	EST.	FINAL	EST.	FINAL		
	100-6002	PREPARING ROW	STA	15.980		25.650		41.630	
	104-6017	REMOVING CONC (DRIVEWAYS)	SY			66.000		66.000	
	112-6001	SUBGRADE WIDENING (ORD COMP)	STA	15.980		25.650		41.630	
	132-6005	EMBANKMENT (FINAL)(ORD COMP)(TY C)	CY	58.000		163.000		221.000	
	132-6006	EMBANKMENT (FINAL)(DENS CONT)(TY C)	CY	149.000		879.000		1,028.000	
	134-6004	BACKFILL (TY A OR B)	STA	15.980		25.650		41.630	
	160-6003	FURNISHING AND PLACING TOPSOIL (4")	SY	4,891.000		20,224.000		25,115.000	
	162-6002	BLOCK SODDING	SY	40.000				40.000	
	164-6001	BROADCAST SEED (PERM) (RURAL) (SANDY)	SY	4,891.000				4,891.000	
	164-6003	BROADCAST SEED (PERM) (RURAL) (CLAY)	SY			20,224.000		20,224.000	
	164-6071	BROADCAST SEED (TEMP)(WARM OR COOL)	SY	4,891.000		20,224.000		25,115.000	
	168-6001	VEGETATIVE WATERING	MG	49.000		202.000		251.000	
	247-6232	FL BS (CMP IN PLACE)(TY A GR 1-2)(11")	SY	996.000				996.000	
	260-6002	LIME (HYDRATED LIME (SLURRY))	TON	15.000		71.000		86.000	
	260-6053	LIME TRT (EXIST MATL) (7")	SY	1,174.000				1,174.000	
	260-6073	LIME TRT (SUBGRADE)(8")	SY			4,705.000		4,705.000	
	276-6258	CEM TRT(PLNT MX)(CL M)(TY A)(GR 4)(8")	SY	981.000		4,278.000		5,259.000	
	316-6029	ASPH (RC-250)	GAL	329.000		1,317.000		1,646.000	
	316-6403	AGGR (TY-B GR-5 OR TY-L GR-5)	CY	9.000		35.000		44.000	
	354-6045	PLANE ASPH CONC PAV (2")	SY			6,269.000		6,269.000	
	354-6064	PLANE ASPH CONC PAV (2 1/2")	SY	8,284.000				8,284.000	
	400-6005	CEM STABIL BKFL	CY	220.400		41.000		261.400	
	400-6006	CUT & RESTORING PAV	SY	54.000				54.000	
	401-6001	FLOWABLE BACKFILL	CY			3.000		3.000	
	402-6001	TRENCH EXCAVATION PROTECTION	LF	133.000				133.000	
	403-6001	TEMPORARY SPL SHORING	SF	206.000		324.000		530.000	
	416-6029	DRILL SHAFT (RDWY ILL POLE) (30 IN)	LF			24.000		24.000	
	420-6009	CL A CONC (COLLAR)	EA			2.000		2.000	
	432-6009	RIPRAP (CONC) (CL B) (4")	CY			1.050		1.050	
	432-6045	RIPRAP (MOW STRIP)(4 IN)	CY	44.000				44.000	
	459-6007	GABION MATTRESSES (GALV)(12 IN)	SY			19.000		19.000	
	462-6045	CONC BOX CULV (3 FT X 2 FT)(EXTEND)	LF			24.000		24.000	
	462-6051	CONC BOX CULV (5 FT X 3 FT)(EXTEND)	LF			30.000		30.000	
	464-6003	RC PIPE (CL III)(18 IN)	LF			68.000		68.000	
	464-6005	RC PIPE (CL III)(24 IN)	LF	290.000		118.000		408.000	
	466-6178	WINGWALL (PW - 1) (HW=3 FT)	EA			1.000		1.000	
	466-6195	WINGWALL (PW - 2) (HW=6 FT)	EA			1.000		1.000	



Estimate & Quantity Sheet

CONTROLLING PROJECT ID 0122-03-033

DISTRICT Bryan
HIGHWAY SH 75, US 287

COUNTY Freestone, Madison

CONTROL SECTION JOB				0122-03-033		0166-07-067		TOTAL EST.	TOTAL FINAL
PROJECT ID				A00178723		A00178707			
COUNTY				Freestone		Madison			
HIGHWAY				US 287		SH 75			
ALT	BID CODE	DESCRIPTION	UNIT	EST.	FINAL	EST.	FINAL		
	467-6106	SET (TY I)(S=3 FT)(HW=3FT)(4:1)(C)	EA			1.000		1.000	
	467-6175	SET (TY I)(S= 5 FT)(HW= 4 FT)(3:1) (C)	EA			1.000		1.000	
	467-6363	SET (TY II) (18 IN) (RCP) (6: 1) (P)	EA			6.000		6.000	
	467-6390	SET (TY II) (24 IN) (RCP) (4: 1) (C)	EA	4.000				4.000	
	467-6395	SET (TY II) (24 IN) (RCP) (6: 1) (P)	EA			6.000		6.000	
	496-6006	REMOV STR (HEADWALL)	EA	2.000		6.000		8.000	
	496-6007	REMOV STR (PIPE)	LF	286.000				286.000	
	496-6016	REMOV STR (PIPE)	EA			4.000		4.000	
	500-6001	MOBILIZATION	LS	0.350		0.650		1.000	
	502-6001	BARRICADES, SIGNS AND TRAFFIC HANDLING	MO	4.000		6.000		10.000	
	506-6002	ROCK FILTER DAMS (INSTALL) (TY 2)	LF	60.000		140.000		200.000	
	506-6011	ROCK FILTER DAMS (REMOVE)	LF	60.000		140.000		200.000	
	506-6038	TEMP SEDMT CONT FENCE (INSTALL)	LF	300.000		1,540.000		1,840.000	
	506-6039	TEMP SEDMT CONT FENCE (REMOVE)	LF	300.000		1,540.000		1,840.000	
	506-6041	BIODEG EROSN CONT LOGS (INSTL) (12")	LF	112.000				112.000	
	506-6043	BIODEG EROSN CONT LOGS (REMOVE)	LF	112.000				112.000	
	510-6003	ONE-WAY TRAF CONT (PORT TRAF SIG)	MO	0.250				0.250	
	512-6005	PORT CTB (FUR & INST)(F-SHAPE)(TY 1)	LF	60.000				60.000	
	512-6029	PORT CTB (MOVE)(F-SHAPE)(TY 1)	LF	60.000				60.000	
	512-6053	PORT CTB (REMOVE)(F-SHAPE)(TY 1)	LF	60.000				60.000	
	529-6032	CONCRETE GUTTER (MODIFIED)	LF	204.000		389.000		593.000	
	530-6002	INTERSECTIONS (ACP)	SY	623.000		766.000		1,389.000	
	530-6004	DRIVEWAYS (CONC)	SY			60.000		60.000	
	530-6006	DRIVEWAYS (SURF TREAT)	SY			381.000		381.000	
	530-6008	TURNOUTS (ACP)	SY			34.000		34.000	
	533-6003	RUMBLE STRIPS (SHOULDER) ASPHALT	LF	2,570.000		4,960.000		7,530.000	
	533-6004	RUMBLE STRIPS (CENTERLINE) ASPHALT	LF	2,220.000		4,790.000		7,010.000	
	540-6001	MTL W-BEAM GD FEN (TIM POST)	LF	400.000				400.000	
	540-6006	MTL BEAM GD FEN TRANS (THRIE-BEAM)	EA	4.000				4.000	
	542-6001	REMOVE METAL BEAM GUARD FENCE	LF	678.000				678.000	
	542-6004	RM MTL BM GD FENCE TRANS (THRIE-BEAM)	EA	4.000				4.000	
	544-6001	GUARDRAIL END TREATMENT (INSTALL)	EA	4.000				4.000	
	544-6003	GUARDRAIL END TREATMENT (REMOVE)	EA	4.000				4.000	
	545-6003	CRASH CUSH ATTEN (MOVE & RESET)	EA	2.000				2.000	
	545-6005	CRASH CUSH ATTEN (REMOVE)	EA	2.000				2.000	
	545-6019	CRASH CUSH ATTEN (INSTL)(S)(N)(TL3)	EA	2.000				2.000	
	560-6014	MAILBOX INSTALL-S (TWG-POST) TY 4	EA			1.000		1.000	



Estimate & Quantity Sheet

CONTROLLING PROJECT ID 0122-03-033

DISTRICT Bryan
HIGHWAY SH 75, US 287

COUNTY Freestone, Madison

CONTROL SECTION JOB				0122-03-033		0166-07-067		TOTAL EST.	TOTAL FINAL
PROJECT ID				A00178723		A00178707			
COUNTY				Freestone		Madison			
HIGHWAY				US 287		SH 75			
ALT	BID CODE	DESCRIPTION	UNIT	EST.	FINAL	EST.	FINAL		
	560-6022	MAILBOX INSTALL-D (TWG-POST) TY 4	EA			1.000		1.000	
	610-6254	IN RD IL (TY ST) 40T-8 (250W EQ) LED	EA			3.000		3.000	
	618-6023	CONDT (PVC) (SCH 40) (2")	LF			210.000		210.000	
	618-6024	CONDT (PVC) (SCH 40) (2") (BORE)	LF			120.000		120.000	
	620-6008	ELEC CONDR (NO.8) INSULATED	LF			990.000		990.000	
	624-6008	GROUND BOX TY C (162911)W/APRON	EA			2.000		2.000	
	628-6145	ELC SRV TY D 120/240 060(NS)SS(E)SP(O)	EA			1.000		1.000	
	636-6001	ALUMINUM SIGNS (TY A)	SF			18.000		18.000	
	644-6001	IN SM RD SN SUP&AM TY10BWG(1)SA(P)	EA	8.000		8.000		16.000	
	644-6004	IN SM RD SN SUP&AM TY10BWG(1)SA(T)	EA			1.000		1.000	
	644-6007	IN SM RD SN SUP&AM TY10BWG(1)SA(U)	EA			1.000		1.000	
	644-6030	IN SM RD SN SUP&AM TYS80(1)SA(T)	EA	3.000		2.000		5.000	
	644-6034	IN SM RD SN SUP&AM TYS80(1)SA(U-1EXT)	EA			2.000		2.000	
	644-6076	REMOVE SM RD SN SUP&AM	EA	11.000		11.000		22.000	
	658-6062	INSTL DEL ASSM (D-SW)SZ 1(BRF)GF2(BI)	EA	16.000				16.000	
	658-6101	INSTL OM ASSM (OM-2Z)(WFLX)SRF)SRF	EA	2.000		6.000		8.000	
	662-6004	WK ZN PAV MRK NON-REMOV (W)4"(SLD)	LF			4,960.000		4,960.000	
	662-6032	WK ZN PAV MRK NON-REMOV (Y)4"(BRK)	LF			616.000		616.000	
	662-6034	WK ZN PAV MRK NON-REMOV (Y)4"(SLD)	LF			2,385.000		2,385.000	
	662-6063	WK ZN PAV MRK REMOV (W)4"(SLD)	LF	1,080.000				1,080.000	
	662-6111	WK ZN PAV MRK SHT TERM (TAB)TY Y-2	EA	431.000		304.000		735.000	
	666-6029	REFL PAV MRK TY I (W)8"(DOT)(090MIL)	LF	25.000				25.000	
	666-6035	REFL PAV MRK TY I (W)8"(SLD)(090MIL)	LF	300.000		780.000		1,080.000	
	666-6047	REFL PAV MRK TY I (W)24"(SLD)(090MIL)	LF	12.000		14.000		26.000	
	666-6176	REFL PAV MRK TY II (W) 8" (DOT)	LF			150.000		150.000	
	666-6302	RE PM W/RET REQ TY I (W)4"(SLD)(090MIL)	LF	3,121.000		4,960.000		8,081.000	
	666-6314	RE PM W/RET REQ TY I (Y)4"(SLD)(090MIL)	LF	5,218.000		6,480.000		11,698.000	
	668-6077	PREFAB PAV MRK TY C (W) (ARROW)	EA	2.000		3.000		5.000	
	668-6085	PREFAB PAV MRK TY C (W) (WORD)	EA	2.000		3.000		5.000	
	672-6007	REFL PAV MRKR TY I-C	EA	16.000		40.000		56.000	
	672-6009	REFL PAV MRKR TY II-A-A	EA	262.000		412.000		674.000	
	677-6001	ELIM EXT PAV MRK & MRKS (4")	LF	2,160.000				2,160.000	
	682-6003	VEH SIG SEC (12")LED(YEL)	EA			4.000		4.000	
	684-6010	TRF SIG CBL (TY A)(12 AWG)(5 CONDR)	LF			24.000		24.000	
	685-6004	INSTL RDS D FLSH BCN ASSM (SOLAR PWRD)	EA			2.000		2.000	
	3077-6011	SP MIXESSP-CPG64-22	TON	170.000		753.000		923.000	
	3077-6022	SP MIXESSP-CSAC-A PG70-22	TON	1,488.000		1,176.000		2,664.000	

DISTRICT	COUNTY	CCSJ	SHEET
Bryan	Freestone	0122-03-033	8B



Estimate & Quantity Sheet

CONTROLLING PROJECT ID 0122-03-033

DISTRICT Bryan
HIGHWAY SH 75, US 287

COUNTY Freestone, Madison

CONTROL SECTION JOB				0122-03-033		0166-07-067		TOTAL EST.	TOTAL FINAL
PROJECT ID				A00178723		A00178707			
COUNTY				Freestone		Madison			
HIGHWAY				US 287		SH 75			
ALT	BID CODE	DESCRIPTION	UNIT	EST.	FINAL	EST.	FINAL		
	3084-6001	BONDING COURSE	GAL	1,096.000		1,097.000		2,193.000	
	6001-6002	PORTABLE CHANGEABLE MESSAGE SIGN	EA	2.000		2.000		4.000	
	6185-6002	TMA (STATIONARY)	DAY	35.000		105.000		140.000	
	6185-6005	TMA (MOBILE OPERATION)	DAY	3.000		3.000		6.000	
	18	SAFETY CONTINGENCY: CONTRACTOR FORCE ACCOUNT WORK (PARTICIPATING)	LS	1.000				1.000	
		CONTRACTOR FORCE ACCOUNT WORK (PARTICIPATING)	LS	1.000				1.000	
		EROSION CONTROL MAINTENANCE: CONTRACTOR FORCE ACCOUNT WORK (PART)	LS	1.000				1.000	


REV DATE: 2-12-2015
 CSJ: 0122-03-033
 FILENAME: pw:\tdot\projectswiseline.com:TXDOT4\Documents\17 - BRY\Design Projects\012203033\4 - Design Plan Set\1. General\G. QuantitySummarySheets\Project Totals of Roadway Quantities.dgn

CONSOLIDATED SUMMARY OF ROADWAY QUANTITIES (US 287 AND SH 75)										
DESCRIPTION	ITEM 100	ITEM 112	ITEM 132	ITEM 134	ITEM 247	ITEM 260 ②		ITEM 276	ITEM 316 ②	
	6002	6001	6006	6004	6232	6053	6073	6258	6029	6403
	PREPARING ROW ①	SUBGRADE WIDENING (ORD COMP)	EMBANKMENT (FINAL) (DENS CONT) (TY C)	BACKFILL (TYP A OR B)	FL BS (CMP IN PLACE) (TY A GR 1-2)(11")	LIME TRT (EXIST MATL) (7")	LIME TRT (SUBGRADE) (8")	CEM TRT (PLNT MX) (CL M) (TY A) (GR 4) (8")	ASPH (RC-250)	AGGR (TY-B GR-5 OR TY-L GR-5)
	STA	STA	CY	STA	SY	SY	SY	SY	SY	SY
CSJ 0122-03-033 TOTAL	15.98	15.98	149	15.98	996	1,174	0	0	1,174	1,174
CSJ 0166-07-067 TOTAL	25.65	25.65	879	25.65	0	0	4,705	4,278	4,705	4,705
PROJECT TOTALS	41.63	41.63	1,028	41.63	996	1,174	4,705	4,278	5,879	5,879

CONSOLIDATED SUMMARY OF ROADWAY QUANTITIES (US 287 AND SH 75)							
DESCRIPTION	ITEM 354		ITEM 529	ITEM 530	ITEM 3077 ②		ITEM 3084
	6045	6064	6032	6002	6011	6022	6001
	PLANE ASPH CONC PAV (2")	PLANE ASPH CONC PAV (2 1/2")	CONCRETE GUTTER (MODIFIED) ③	INTERSECTIONS (ACP)	SP MIXES SP-C PG64-22	SP MIXES SP-C SAC-A PG70-22	BONDING COURSE ②
	SY	SY	LF	SY	SY	SY	SY
CSJ 0122-03-033 TOTAL	0	8,284	204	623	1,032	10,820	10,962
CSJ 0166-07-067 TOTAL	6,269	0	389	0	4,562	10,691	10,975
PROJECT TOTALS	6,269	8,284	593	623	5,594	21,511	21,937

- ① INCLUDES TREE TRIMMING, AND POSSIBLE TREE REMOVAL AT CROSS DRAINAGE STRUCTURES.
- ② REFER TO "BASIS OF ESTIMATE" FOR APPLICATION RATES AND QUANTITIES.
- ③ SEE SHEET "INTERSECTION AND CONCRETE CURB DETAIL" FOR MORE INFORMATION.

PRINT DATE	REVISION DATE
6/1/2022	



Texas Department of Transportation ©2022
 Bryan District

CONSOLIDATED SUMMARY OF ROADWAY QUANTITIES

SHEET 1 OF 3 SHEETS

FED. RD. DIV. NO.	PROJECT NUMBER	HIGHWAY NUMBER	
6		US 287, ETC.	
STATE	DISTRICT	COUNTY	
TEXAS	BRYAN	FREESTONE, ETC.	
CONTROL	SECTION	JOB	SHEET NO.
0122	03	033,ETC.	9

SUMMARY OF ROADWAY QUANTITIES (US 287)

DESCRIPTION	STA	STA	LENGTH	ITEM 100	ITEM 112	ITEM 132	ITEM 134	ITEM 247		ITEM 260 ②		ITEM 316 ②		
				6002	6001	6006	6004	WIDTH	6232	WIDTH	6053	WIDTH	6029	6403
				PREPARING ROW ③	SUBGRADE WIDENING (ORD COMP)	EMBANKMENT (FINAL) (DENS CONT) (TY C)	BACKFILL (TYP A OR B)		FL BS (CMP IN PLACE) (TY A GR 1-2) (11")		LIME TRT (EXIST. MATL) (7")		ASPH (RC-250)	AGGR (TY-B GR-5 OR TY-L GR-5)
LF	STA	STA	CY	STA	LF	SY	LF	SY	LF	SY	SY			
LTL TAPER	509+33	515+73	640	6.40	6.40		6.40	AVG 4	284	AVG 5	356	AVG 5	356	356
FULL WIDTH TYP SECT	515+73	522+16	643	6.43	6.43		6.43	8	572	9	643	9	643	643
SHOULDER TAPER (RT)	522+16	525+31	315	3.15	3.15		3.15	AVG 4	140	AVG 5	175	AVG 5	175	175
MILL & INLAY	525+31	525+40	9	-										
FM 488 INTERSECTION	86' & 102' FLUSH CURB ①													
CSJ 0122-03-033 TOTAL				15.98	15.98	149	15.98		996		1,174		1,174	1,174


SUMMARY OF ROADWAY QUANTITIES (US 287)

DESCRIPTION	STA	STA	LENGTH	ITEM 354		ITEM 529	ITEM 530	ITEM 3077			ITEM 3084		
				WIDTH	6064	6032	6002	WIDTH	6011	WIDTH	6022	WIDTH ④	6001
					PLANE ASPH CONC PAV (2 1/2")	CONCRETE GUTTER (MODIFIED)	INTERSECTIONS (ACP)		SP MIXES SP-C PG64-22		SP MIXES SP-C SAC-A PG70-22		BONDING COURSE ②
LF	LF	SY	LF	SY	LF	SY	LF	SY	LF	SY			
LTL TAPER	509+33	515+73	640	47	6,700			AVG 4	284	AVG 51	3627	AVG 52	3,698
FULL WIDTH TYP SECT	515+73	522+16	643					8.5	607	55	3929	55.5	3,965
SHOULDER TAPER (RT)	522+16	525+31	315	AVG 44	1,584			AVG 4	140	AVG 48	1680	AVG 49	1,715
MILL & INLAY	525+31	525+40	9							AVG 44	1,584	AVG 44	1,584
FM 488 INTERSECTION	86' & 102' FLUSH CURB ①					204	622.4						
CSJ 0122-03-033 TOTAL				8,284	204	623	1,032		10,820		10,962		

- ① SEE SHEET "INTERSECTION DETAIL (US 287)" FOR MORE INFORMATION.
- ② REFER TO "BASIS OF ESTIMATE" FOR APPLICATION RATES AND QUANTITIES.
- ③ INCLUDES TREE TRIMMING, AND POSSIBLE TREE REMOVAL AT CROSS DRAINAGE STRUCTURES.
- ④ INCLUDING BONDING COURSE AFTER 3" HMA AND 2.5" MILLING

REV DATE: 2-12-2015
CSJ: 0122-03-033
FILENAME: pw:\tdot\projectswiseline.com:TXDOT4\Documents\17 - BRY\Design Projects\012203033\4 - Design Plan Set\1. General\G. Quantity\SummarySheets\Summary of Roadway Quantities.dgn

PRINT DATE	REVISION DATE
6/1/2022	



Texas Department of Transportation ©2022
Bryan District

SUMMARY OF ROADWAY QUANTITIES (US 287)
SHEET 2 OF 3 SHEETS

FED. RD. DIV. NO.	PROJECT NUMBER	HIGHWAY NUMBER
6		US 287, ETC.
STATE	DISTRICT	COUNTY
TEXAS	BRYAN	FREESTONE, ETC.
CONTROL	SECTION	JOB SHEET NO.
0122	03	033,ETC. 10

SUMMARY OF ROADWAY QUANTITIES (SH 75)

DESCRIPTION	STA	STA	LENGTH	ITEM 100	ITEM 112	ITEM 132			ITEM 134	ITEM 260 ②		ITEM 276		ITEM 316 ②		
				6002	6001	EXCAVATION	EMBANKMENT	6006	6004	WIDTH	6073	WIDTH	6258	WIDTH	6029	6403
				PREPARING ROW ①	SUBGRADE WIDENING (ORD COMP)			EMBANKMENT (FINAL) (DENS CONT) (TY C)	BACKFILL (TY A OR B)		LIME TRT (SUBGRADE) (8")		CEM TRT (PLNT MX) (CL M)(TY A) (GR 4)(8")		ASPH (RC-250)	AGGR (TY-B GR-5 OR TY-L GR-5)
LF	STA	STA	CY	CY	CY	STA	LF	SY	LF	SY	LF	SY	SY			
TRANSITION: MEDIAN TAPER	990+37	996+77	640	6.40	6.40	182	72		6.40	AVG 11	782	AVG 10	711	AVG 11	782	782
TYP SECTION: FULL WIDTH	996+77	1009+62	1,285	12.85	12.85	429	1,308	879	12.85	22	3,141	20	2,856	22	3,141	3,141
TRANSITION: LTL TAPER	1009+62	1016+02	640	6.40	6.40	139	18		6.40	AVG 11	782	AVG 10	711	AVG 11	782	782
SPUR 67 INTERSECTION	999+05	999+05														
CSJ 0166-07-067			2,565	25.65	25.65	750	1,398	879	25.65		4,705		4,278		4,705	4,705


SUMMARY OF ROADWAY QUANTITIES (SH 75) (CONT'D)

DESCRIPTION	STA	STA	LENGTH	ITEM 354		ITEM 529	ITEM 3077 ②				ITEM 3084 ②	
				WIDTH	6045	6032	WIDTH	6011	WIDTH	6022	WIDTH	6001
					PLANE ASPH CONC PAV (2")	CONCRETE GUTTER (MODIFIED) 3						
LF	LF	SY	LF	LF	SY		SY	LF	SY			
TRANSITION: MEDIAN TAPER	990+37	996+77	640	22	1,564		AVG 11	782	AVG 33	2,347	AVG 34	2,418
TYP SECTION: FULL WIDTH	996+77	1009+62	1,285	22	3,141		21	2,998	42	5,997	43	6,139
TRANSITION: LTL TAPER	1009+62	1016+02	640	22	1,564		AVG 11	782	AVG 33	2,347	AVG 34	2,418
SPUR 67 INTERSECTION	999+05	999+05				389						
CSJ 0166-07-067			2,565		6,269	389		4,562		10,691		10,975

- ① INCLUDES TREE TRIMMING, AND POSSIBLE TREE REMOVAL AT CROSS DRAINAGE STRUCTURES.
- ② REFER TO "BASIS OF ESTIMATE" FOR APPLICATION RATES AND QUANTITIES.
- ③ SEE SHEET "INTERSECTION DETAIL (SH 75 & SPUR 67)" FOR DETAILS.

REV DATE: 2-12-2015
CSJ: 0122-03-033
FILENAME: pw:\tdot\projectswiseline.com:TXDOT\Documents\17 - BRY\Design Projects\016607067\4 - Design\Plan Set\1. General\IG. QuantitySummarySheets\SUMMARY OF ROADWAY QUANTITIES (SH 75).dgn

PRINT DATE	REVISION DATE
6/1/2022	



Texas Department of Transportation ©2022
Bryan District

SUMMARY OF ROADWAY QUANTITIES
(SH 75)
SHEET 3 OF 3 SHEETS

FED. RD. DIV. NO.	PROJECT NUMBER	HIGHWAY NUMBER	
6		US 287, ETC.	
STATE	DISTRICT	COUNTY	
TEXAS	BRYAN	FREESTONE, ETC.	
CONTROL	SECTION	JOB	SHEET NO.
0122	03	033,ETC.	11

SUMMARY OF DRIVEWAYS (SH 75)

STATION	EXIST PIPE	PROPOSED PIPE	D FT	L (LENGTH) ① FT	W (WIDTH) ① FT	R1/R2 (RADII) ① FT		ITEM 104	ITEM 530			ITEM 464	ITEM 464	ITEM 467		ITEM 496	REMARKS
								6017	6002	6004	6006	6003	6005	6363	6395	6016	
								REMOVING CONC (DRIVEWAYS) SY	INTERSECTIONS (ACP) ② SY	DRIVEWAYS (CONC) SY	DRIVEWAYS (SURF TREAT) ② SY	RC PIPE (CL III) (18 IN) LF	RC PIPE (CL III) (24 IN) LF	SET (TY II) (18 IN) (RCP) (6: 1)(P) EA	SET (TY II) (24 IN) (RCP) (6: 1)(P) EA	REMOV STR (PIPE) ③ EA	
991+80 LT				15	43	15	30					96					
991+99 RT	12" RCP	18" RCP	21	30	16	15	15					64	22	2		1	
992+80 LT				21	21	15	15	66		60							
998+34 LT	12" RCP	18" RCP	14	26	16	15	15					57					
999+01 LT	12" RCP	18" RCP	16	31	16	15	15					66	22	2		1	
999+03 RT	24" RCP			139	31	80	75		766				42		2		SPUR 67
1002+17 LT	24" CMP	24" RCP	21	25	14	15	15					50		32		2	1
1011+64 RT	18" CMP	18" RCP	22	28	12	15	15					48	24	2		1	
CSJ 0166-07-067								66	766	60	381	68	74	6	4	4	

- ① SEE SHEET "DRIVEWAY DETAILS".
- ② REFER TO THE "BASIS OF ESTIMATE" FOR QUANTITIES AND APPLICATION RATES
- ③ INCLUDING SETS.


SUMMARY OF MAILBOX TURNOUTS & INSTALLATIONS (SH 75)

STATION	LT/RT	NUMBER OF MAILBOXES	ITEM 530 TURNOUTS (ACP)			ITEM 560 MAILBOX INSTALL	
			TYPE I	TYPE II	6008	6014	6022
					SURFACE AREA ④	MAILBOX INSTALL-S (TWG-POST) TY 4	MAILBOX INSTALL-D (TWG-POST) TY 4
(EA)	(EA)	(SY)	(EA)	(EA)			
992+54	LT	2	1		17		1
1002+01	LT	1	1		17	1	
CSJ 0166-07-067		3	2	0	34	1	1

- ④ REFER TO THE "BASIS OF ESTIMATE" FOR QUANTITIES AND APPLICATION RATES.

REV DATE: 2-12-2015
CSJ: 0122-03-033
FILENAME: pw:\tdot\project\online.com:TXDOT4\Documents\17 - BRY\Design Projects\016607067\4 - Design\Plan Set\1. General\G. QuantitySummarySheets\SUMMARY OF MAILBOX QUANTITIES (SH75).dgn

PRINT DATE	REVISION DATE
6/1/2022	



Texas Department of Transportation ©2022
Bryan District


SUMMARY OF DRIVEWAYS & MAILBOXES (SH 75)

FED. RD. DIV. NO.	PROJECT NUMBER	HIGHWAY NUMBER
6		US 287, ETC.
STATE	DISTRICT	COUNTY
TEXAS	BRYAN	FREESTONE, ETC.
CONTROL	SECTION	JOB SHEET NO.
0122	03	033,ETC. 12

REV DATE: 2-12-2015
 CSJ: 0122-03-033
 FILENAME: pw:\tdot\projectsonline.com\TXDOT\Documents\17 - BRY\Design Projects\012203033\4 - Design\Plan Set\General\G. QuantitySummarySheets\Summary of MBGF

SUMMARY OF METAL BEAM GUARD FENCE (US 287)											
DESCRIPTION	BEGIN STA	END STA	LENGTH (FT)	ITEM 542		ITEM 544	ITEM 432	ITEM 540		ITEM 544	ITEM 658
				6001	6004	6003	6045	6001	6006	6001	6062
				REMOVE METAL BEAM GUARD FENCE	RM MTL BM GD FENCE TRANS (THRIE-BEAM)	GUARDRAIL END TREATMENT (REMOVE)	RIPRAP (MOW STRIP) (4 IN)	MTL W-BEAM GD FEN (TIM POST)	MTL BEAM GD FEN TRANS (THRIE-BEAM)	GUARDRAIL END TREATMENT (INSTALL)	INSTL DEL ASSM (D-SW) SZ 1(BRF)GF2(BI)
				LF	EA	EA	CY	LF	EA	EA	EA
EASTBOUND UPSTREAM	523+01	525+75	274	195	1	1	12	150	1	1	4
EASTBOUND DOWNSTREAM	528+82	531+05	223	95	1	1	10	50	1	1	4
WESTBOUND UPSTREAM	528+60	531+34	274	195	1	1	12	150	1	1	4
WESTBOUND DOWNSTREAM	523+32	525+56	224	193	1	1	10	50	1	1	4
CSJ 0122-03-033 TOTAL				678	4	4	44	400	4	4	16
PROJECT TOTALS				678	4	4	44	400	4	4	16

PRINT DATE	REVISION DATE
6/1/2022	



Texas Department of Transportation ©2022
 Bryan District

SUMMARY OF MBGF ITEMS (US 287)

FED. RD. DIV. NO.	PROJECT NUMBER	HIGHWAY NUMBER	
6		US 287, ETC.	
STATE	DISTRICT	COUNTY	
TEXAS	BRYAN	FREESTONE, ETC.	
CONTROL	SECTION	JOB	SHEET NO.
0122	03	033,ETC.	13

REV DATE: 2-12-2015
 CSJ: 0122-03-033
 FILENAME: pw:\tdot\projectswiseline.com:TXDOT4\Documents\17 - BRY\Design Projects\012203033\4 - Design\Plan Set\1. General\G. Quantity\SummarySheets\Project Totals of Drainage Items.dgn


CONSOLIDATED SUMMARY OF DRAINAGE ITEMS (US 287 & SH 75)												
DESCRIPTION	ITEM 132	ITEM 276	ITEM 400		ITEM 401	ITEM 402	ITEM 403	ITEM 420	ITEM 459	ITEM 462		ITEM 464
	6005	6258	6005	6006	6001	6001	6001	6009	6007	6045	6051	6005
	EMBANKMENT (FINAL) (ORD COMP) (TY C) ①	CEM TRT (PLNT MX) (CL M) (TY A) (GR 4) (8")	CEM STABIL BKFL	CUT & RESTORE PAV	FLOWABLE BACKFILL	TRENCH EXCAVATION PROTECTION	TEMPORARY SPL SHORING	CL A CONC (COLLAR)	GABION MATTRESSES (GALV) (12 IN)	CONC BOX CULV (3 FT X 2 FT) (EXTEND)	CONC BOX CULV (5 FT X 3 FT) (EXTEND)	RC PIPE (CL III) (24 IN)
	CY	SY	CY	SY	CY	LF	SF	EA	SY	LF	LF	LF
CSJ 0122-03-033 TOTAL	58	981	220.4	54	0	133	206	0	0	0	0	290
CSJ 0166-07-067 TOTAL	163	0	41	0	3	0	324	2	19	24	30	44
PROJECT TOTALS	221	981	261.4	54	3.0	133	530	2	19	24	30	334

CONSOLIDATED SUMMARY OF DRAINAGE ITEMS (US 287 & SH 75)									
DESCRIPTION	ITEM 466		ITEM 467				ITEM 496		ITEM 658
	6178	6195	6106	6175	6390	6395	6006	6007	6101
	WINGWALL (PW - 1) (HW=3 FT)	WINGWALL (PW - 2) (HW=6FT)	SET (TY I) (S=3 FT) (HW=3FT) (4:1)C	SET (TY I) (S= 5 FT) (HW= 4 FT) (3:1) C	SET (TY II) (24 IN) (RCP) (4:1) (C)	SET (TY II) (24 IN) (RCP) (6:1) (P)	REMOV STR (HEADWALL) ②	REMOV STR (PIPE)	INSTL OM ASSM (OM-2Z) (WFLX)SRF SRF
	EA	EA	EA	EA	EA	EA	EA	LF	EA
CSJ 0122-03-033 TOTAL	0	0	0	0	4	0	2	286	2
CSJ 0166-07-067 TOTAL	1	1	1	1	0	2	6	0	6
PROJECT TOTALS	1	1	1	1	4	2	8	286	8

① TO BE USED IF NECESSARY FOR FILL WHEN EXTENDING STRUCTURES AND PLACING HEADWALLS/WINGWALLS OR SETS

② THE REMOVAL OF WINGWALLS IS SUBSIDIARY TO ITEM 496 6006

PRINT DATE	REVISION DATE
6/1/2022	



Texas Department of Transportation ©2022
Bryan District

CONSOLIDATED SUMMARY OF DRAINAGE ITEMS

SHEET 1 OF 3 SHEETS

FED. RD. DIV. NO.	PROJECT NUMBER	HIGHWAY NUMBER	
6		US 287, ETC.	
STATE	DISTRICT	COUNTY	
TEXAS	BRYAN	FREESTONE, ETC.	
CONTROL	SECTION	JOB	SHEET NO.
0122	03	033,ETC.	14

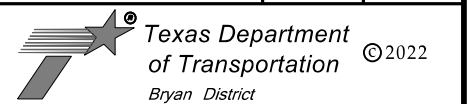
REV DATE: 2-12-2015
 CSJ: 0122-03-033
 FILENAME: pw:\txdot\projectsonline.com\TXDOT4\Documents\17 - BRY\Design Projects\012203033\4 - Design\Plan Set\1. General\G. Quantity\SummarySheets\Summary of Drainage Items.dgn

SUMMARY OF DRAINAGE ITEMS (US 287)												
STRUCTURE NO	STRUCTURE LOCATION	ITEM 132	ITEM 276	ITEM 400		ITEM 402	ITEM 403	ITEM 464	ITEM 467	ITEM 496		ITEM 658
		6005	6258	6005	6006	6001	6001	6005	6390	6006	6007	6101
		EMBANKMENT (FINAL) (ORD COMP) (TY C) ①	CEM TRT (PLNT MX) (CL M) (TY A) (GR 4) (8")	CEM STABIL BKFL	CUT & RESTORE PAV	TRENCH EXCAVATION PROTECTION	TEMPORARY SPL SHORING	RC PIPE (CL III) (24 IN)	SET (TY II) (24 IN) (RCP) (4:1) (C)	REMOV STR (HEADWALL) ②	REMOV STR (PIPE)	INSTL OM ASSM (OM-2Z) (WFLX)SRF) SRF
		CY	SY	CY	SY	LF	SF	LF	EA	EA	LF	EA
STRUCTURE 1	STA 512+58	58	981	220.4	54	133	206	290	4	2	286	2
CSJ 0122-03-033 TOTAL		58	981	220.4	54	133	206	290	4	2	286	2

① TO BE USED IF NECESSARY FOR FILL WHEN EXTENDING STRUCTURES AND PLACING HEADWALLS/WINGWALLS OR SETS

② THE REMOVAL OF WINGWALLS IS SUBSIDIARY TO ITEM 496 6006

PRINT DATE	REVISION DATE
6/1/2022	



**SUMMARY OF
DRAINAGE ITEMS
(US 287)**

SHEET 2 OF 3 SHEETS

FED. RD. DIV. NO.	PROJECT NUMBER		HIGHWAY NUMBER
6			US 287, ETC.
STATE	DISTRICT	COUNTY	
TEXAS	BRYAN	FREESTONE, ETC.	
CONTROL	SECTION	JOB	SHEET NO.
0122	03	033,ETC.	15

SUMMARY OF DRAINAGE ITEMS (SH 75)

LOCATION	ITEM 132	ITEM 400	ITEM 401	ITEM 403	ITEM 420	ITEM 459	ITEM 462		ITEM 464
	6005	6005	6001	6001	6009	6007	6045	6051	6005
	EMBANKMENT (FINAL) (ORD COMP) (TY C) ①	CEM STABIL BACKFILL	FLOWABLE BACKFILL	TEMPORARY SPL SHORING	CL A CONC (COLLAR)	GABION MATTRESSES (GALV) (12 IN)	CONC BOX CULV (3 FT X 2 FT) (EXTEND)	CONC BOX CULV (5 FT X 3 FT) (EXTEND)	RC PIPE (CL III) (24 IN)
	CY	CY	CY	SF	EA	SY	LF	LF	LF
STR NO 1 - STA 1000+89	65	18		324		19		30	
STR NO 2 - STA 1006+41	80	5					24		
STR NO 3 - SPUR 67 INTERSECTION	18	18	3		2				44
CSJ 0166-07-067	163	41	3	324	2	19	24	30	44

① TO BE USED IF NECESSARY FOR FILL WHEN EXTENDING STRUCTURES AND PLACING HEADWALLS/WINGWALLS OR SETS.


SUMMARY OF DRAINAGE ITEMS (SH 75) (CONT'D)

LOCATION	ITEM 466		ITEM 467			ITEM 496	ITEM 658
	6178	6195	6106	6175	6395	6006	6101
	WINGWALL (PW - 1) (HW=3 FT)	WINGWALL (PW - 2) (HW=6FT)	SET (TY I) (S=3 FT) (HW=3FT) (4:1)C	SET (TY I) (S= 5 FT) (HW= 4 FT) (3:1) C	SET (TY II) (24 IN) (RCP) (6:1) (P)	REMOV STR (HEADWALL) ②	INSTL OM ASSM (OM-2Z) (WFLX)SRF SRF
	EA	EA	EA	EA	EA	EA	EA
STR NO 1 - STA 1000+89		1		1		2	2
STR NO 2 - STA 1006+41	1		1			2	2
STR NO 3 - SPUR 67 INTERSECTION					2	2	2
CSJ 0166-07-067	1	1	1	1	2	6	6

② THE REMOVAL OF WING WALLS IS SUBSIDIARY TO ITEM 496 6006

REV DATE: 2-12-2015
CSJ: 0122-03-033
FILENAME: pw:\\hxdot\project\online.com\TXDOT4\Documents\17 - BRY\Design Projects\016607067\4 - Design\Plan Set\1. General\G. Quantity\SummarySheets\SUMMARY OF DRAINAGE QUANTITIES.dgn

PRINT DATE	REVISION DATE
6/1/2022	



Texas Department of Transportation ©2022
Bryan District

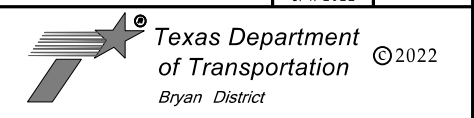
SUMMARY OF DRAINAGE ITEMS (SH 75)
SHEET 3 OF 3 SHEETS

FED. RD. DIV. NO.	PROJECT NUMBER	HIGHWAY NUMBER	
6		US 287, ETC.	
STATE	DISTRICT	COUNTY	
TEXAS	BRYAN	FREESTONE, ETC.	
CONTROL	SECTION	JOB	SHEET NO.
0122	03	033,ETC.	16

REV DATE: 2-12-2015
 CSJ: 0122-03-033
 FILENAME: pw:\\ttdot\projectswisconsin.com\TXDOT4\Documents\17 - BRY\Design Projects\012203033\4 - Design\Plan Set\1. General\1.G. QuantitySummarySheets\Project Totals of Sign Items

CONSOLIDATED SUMMARY OF SIGN ITEMS						
DESCRIPTION	ITEM 644					
	IN SM RD SN SUP & AM					6076
	6001	6004	6007	6030	6034	
	TY10BWG(1) SA (P)	TY10BWG(1) SA (T)	TY10BWG(1) SA (U)	TYS80(1) SA(T)	TYS80(1) SA (U-1EXT)	REMOVE SM RD
EA	EA	EA	EA	EA	EA	
CSJ 0122-03-033 TOTAL	8	0	0	3	0	11
CSJ 0166-07-067 TOTALS	7	1	1	2	2	2
PROJECT TOTALS	15	1	1	5	2	13

PRINT DATE	REVISION DATE
6/1/2022	



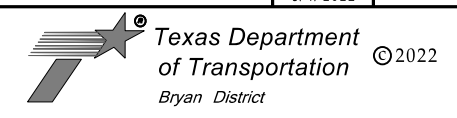
**CONSOLIDATED SUMMARY
OF SIGN ITEMS**

FED. RD. DIV. NO.	PROJECT NUMBER	HIGHWAY NUMBER	
6		US 287, ETC.	
STATE	DISTRICT	COUNTY	
TEXAS	BRYAN	FREESTONE, ETC.	
CONTROL	SECTION	JOB	SHEET NO.
0122	03	033,ETC.	17

REV DATE: 2-12-2015
 CSJ: 0122-03-033
 FILENAME: pw:\\ttdot\projectsonline.com\TXDOT4\Documents\17 - BRY\Design Projects\012203033\4 - Design\Plan Set\ - General\G. QuantitySummarySheets\Summary of Sign Items

SUMMARY OF SIGNS ITEMS (US 287)			
PLAN SHEET NO.	ITEM 644		
	6001	6030	6076
	IN SM RD SN SUP & AM		REMOVE SM RD SN SUP & AM
	TY10BWG(1) SA(P)	TYS80(1) SA(T)	
	EA	EA	EA
SHEET 1 OF 1	8	3	11
CSJ 0122-03-033 TOTALS	8	3	11

PRINT DATE	REVISION DATE
6/1/2022	



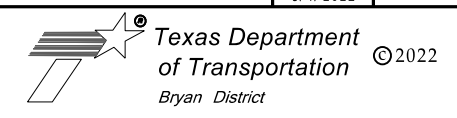
**SUMMARY OF SIGN ITEMS
(US 287)**

FED. RD. DIV. NO.	PROJECT NUMBER	HIGHWAY NUMBER	
6		US 287, ETC.	
STATE	DISTRICT	COUNTY	
TEXAS	BRYAN	FREESTONE, ETC.	
CONTROL	SECTION	JOB	SHEET NO.
0122	03	033,ETC.	18

REV DATE: 2-12-2015
 CSJ: 0122-03-033
 FILENAME: pw:\\ttdot\projectsonline.com\TXDOT4\Documents\17 - BRY\Design Projects\01667067\4 - Design\Plan Set\1. General\G. Quantity\SummarySheets\Summary of Sign Items-75.dgn

SUMMARY OF SIGNS ITEMS (SH 75)					
PLAN SHEET NO.	ITEM 644				
	IN SM RD SN SUP & AM				6076
	6001	6007	6030	6034	
	TY10BWG(1) SA (P)	TY10BWG(1) SA (U)	TYS80(1) SA(T)	TYS80(1) SA	REMOVE SM RD
EA	EA	EA	EA	EA	
SHEET 1 OF 2	2	1	1	2	6
SHEET 2 OF 2	6	0	1	0	5
CSJ 0166-07-067 TOTALS	8	1	2	2	11

PRINT DATE	REVISION DATE
6/1/2022	



**SUMMARY OF SIGN ITEMS
(SH 75)**


FED. RD. DIV. NO.	PROJECT NUMBER	HIGHWAY NUMBER	
6		US 287, ETC.	
STATE	DISTRICT	COUNTY	
TEXAS	BRYAN	FREESTONE, ETC.	
CONTROL	SECTION	JOB	SHEET NO.
0122	03	033,ETC.	19

REV DATE: 2-12-2015
 CSJ: 0122-03-033
 FILENAME: pw:\tdot\projectsonline.com\TXDOT4\Documents\17 - BRY\Design Projects\012203033\4 - Design Plan Set\1. General\G. Quantity\SummarySheets\Project Totals of Pavement Markings.dgn

CONSOLIDATED SUMMARY OF PAVEMENT MARKINGS AND MARKERS (US 287 & SH 75)

DESCRIPTION	ITEM 533		ITEM 662					ITEM 666					ITEM 668		ITEM 672		ITEM 677	
	RUMBLE STRIPS		WK ZN PAV MRK					REFL PAV MRK TY I			REFL PAV MRK TY II	RE PM W/RET REQ TY I		PREFAB PAV MRK TY C		REFL PAV MRKR		ITEM 677
	6003	6004	6004	6034	6032	6111	6063	6029	6035	6047	6176	6302	6314	6077	6085	6007	6009	6001
	(SHOULDER) ASPHALT	(CENTERLINE) ASPHALT	NON-REMOV (W) 4" (SLD)	NON-REMOV (Y) 4" (SLD)	NON-REMOV (Y) 4" (BRK)	SHT TERM (TAB) TY Y-2	REMOV (W) 4" (SLD)	(W) 8" (DOT) (90MIL)	(W) 8" (SLD) (90MIL)	(W) 24" (SLD) (090MIL)	(W) 8" (DOT)	(W) 4" (SLD) (90MIL)	(Y) 4" (SLD) (90MIL)	(W) ARROW	(W) WORD	TY I-C	TY II-A-A	ELI EXT PAV MRK & MRKS (4")
LF	LF	LF	LF	LF	EA	LF	LF	LF	LF	LF	LF	LF	EA	EA	EA	EA	LF	
CSJ 0122-03-033 TOTAL	2,570	2,220	0	0	0	431	1,080	25	300	12	0	3,121	5,218	2	2	16	262	2,160
CSJ 0166-07-067 TOTAL	4,960	4,790	4,960	616	2,385	304	0	0	780	14	150	4,960	6,408	3	3	40	412	0
PROJECT TOTALS	7,530	7,010	4,960	616	2,385	735	1,080	25	1,080	26	150	8,081	11,626	5	5	56	674	2,160

PRINT DATE	REVISION DATE
6/1/2022	



Texas Department of Transportation ©2022
Bryan District

CONSOLIDATED SUMMARY OF PAVEMENT MARKINGS AND MARKERS

SHEET 1 OF 3 SHEETS

FED. RD. DIV. NO.	PROJECT NUMBER	HIGHWAY NUMBER	
6		US 287, ETC.	
STATE	DISTRICT	COUNTY	
TEXAS	BRYAN	FREESTONE, ETC.	
CONTROL	SECTION	JOB	SHEET NO.
0122	03	033,ETC.	20

REV DATE: 2-12-2015
 CSJ: 0122-03-033
 FILENAME: pw:\\hxdot\projectswiseline.com\TXDOT4\Documents\17 - BRY\Design Projects\012203033\4 - Design\Plan Set\1. General\G. Quantity\SummarySheets\Summary of Pavement Markings.dgn

SUMMARY OF PAVEMENT MARKINGS AND MARKERS (US 287)																
STATION	LENGTH	ITEM 533		ITEM 662		ITEM 666					ITEM 668		ITEM 672		ITEM 677	
		RUMBLE STRIPS		WK ZN PAV MRK		REFL PAV MRK TY I			RE PM W/RET REQ TY I		PREFAB PAV MRK TY C		REFL PAV MRKR		ITEM 677	
		6003	6004	6111	6063	6029	6035	6047	6302	6314	6077	6085	6007	6009	6001	
		(SHOULDER) ASPHALT	(CENTERLINE) ASPHALT	SHT TERM (TAB) TY Y-2	REMOV (W) 4" (SLD)	(W) 8" (DOT) (90MIL)	(W) 8" (SLD) (90MIL)	(W) 24" (SLD) (90MIL)	(W) 4" (SLD) (90MIL)	(Y) 4" (SLD) (90MIL)	(W) ARROW	(W) WORD	TY I-C	TY II-A-A	ELI EXT PAV MRK & MRKS (4")	
LF	LF	EA	LF	LF	LF	LF	LF	LF	EA	EA	EA	EA	LF			
509+33	521+00	1167	1480	1480	301	1080	0	214	12	2,259	3,664	1	1	11	184	2,160
521+00	531+34	1034	1090	740	130	0	25	86	0	862	1,554	1	1	5	78	0
CSJ 0122-03-033 TOTAL			2,570	2,220	431	1,080	25	300	12	3,121	5,218	2	2	16	262	2,160

SUMMARY OF TCP ITEMS (US 287)							
PHASES	ITEM 510	ITEM 512			ITEM 545		
	6003	PORT CTB			CRASH CUSH ATTN		
	ONE-WAY TRAFFIC CONTROL (PORT TRAF	(FUR & INSTL) (F-SHAPE) (TY 1)	(MOVE) (F-SHAPE) (TY 1)	(REMOVE) (F-SHAPE) (TY 1)	(INSTL) (S)(N) (TL3)	(MOVE & RESET)	(REMOVE)
	MO	LF	LF	LF	EA	EA	EA
PHASE 1	0.25	60	0	0	2	0	0
PHASE 2	0	0	60	60	0	2	2
CSJ 0122-03-033 TOTALS	0.25	60	60	60	2	2	2

PRINT DATE	REVISION DATE
6/1/2022	



Texas Department of Transportation ©2022
Bryan District

SUMMARY OF PAVMENT MARKINGS & TCP QUANTITIES (US 287)

SHEET 2 OF 3 SHEETS


FED. RD. DIV. NO.	PROJECT NUMBER	HIGHWAY NUMBER	
6		US 287, ETC.	
STATE	DISTRICT	COUNTY	
TEXAS	BRYAN	FREESTONE, ETC.	
CONTROL	SECTION	JOB	SHEET NO.
0122	03	033,ETC.	21

REV DATE: 2-12-2015
 CSJ: 0122-03-033
 FILENAME: pw:\tdot\projectswiseline.com:TXDOT4\Documents\17 - BRY\Design Projects\016607067\4 - Design\Plan Set\ - General\G. Quantity\SummarySheets\SUMMARY OF PAVEMENT MARKINGS AND MARKERS (SH 75).dgn

SUMMARY OF PAVEMENT MARKINGS AND MARKERS (SH 75)

FROM STATION	TO STATION	LENGTH	ITEM 533		ITEM 662				ITEM 666					ITEM 668		ITEM 672	
			6003	6004	6004	6032	6034	6111	6035	6047	6176	6302	6314	6077	6085	6007	6009
			RUMBLE STRIPS (SHOULDER) ASPHALT	RUMBLE STRIPS (CENTERLINE) ASPHALT	WK ZN PAV MRK NON-REMOV (W) 4" (SLD)	WK ZN PAV MRK NON-REMOV (Y) 4" (BRK)	WK ZN PAV MRK NON-REMOV (Y) 4" (SLD)	WK ZN PAV MRK SHT TERM (TAB) TY Y-2	REFL PAV MRK TY I (W) 8" (SLD) (90MIL)	REFL PAV MRK TY I (W) 24" (SLD) (090MIL)	REFL PAV MRKTY II (W) 8" (DOT)	RE PM W/RET REQ TY I (W) 4" (SLD) (090MIL)	RE PM W/RET REQ TY I (Y) 4" (SLD) (090MIL)	PREFAB PAV MRK TY C (W) (ARROW)	PREFAB PAV MRK TY C (W) (WORD)	REFL PAV MRKR TY I-C	REFL PAV MRKR TY II-A-A
LF	LF	LF	LF	LF	EA	LF	LF	LF	LF	LF	EA	EA	EA	EA			
990+37	1004+00	1,363	2,556	2,386	2,556	316	1,363	163	418	14	150	2,556	3,500	2	2	21	202
1004+00	1016+02	1,202	2,404	2,404	2,404	301	1,022	141	362			2,404	2,908	1	1	19	210
CSJ 0166-07-067			4,960	4,790	4,960	616	2,385	304	780	14	150	4,960	6,408	3	3	40	412

PRINT DATE	REVISION DATE
6/1/2022	



Texas Department of Transportation ©2022
 Bryan District

SUMMARY OF PAVEMENT MARKINGS AND MARKERS (SH 75)

SHEET 3 OF 3 SHEETS


FED. RD. DIV. NO.	PROJECT NUMBER	HIGHWAY NUMBER	
6		US 287, ETC.	
STATE	DISTRICT	COUNTY	
TEXAS	BRYAN	FREESTONE, ETC.	
CONTROL	SECTION	JOB	SHEET NO.
0122	03	033,ETC.	22

REV DATE: 2-12-2015
 CSJ: 0122-03-033
 FILENAME: pw:\txdot\projectswisconsin.com\TXDOT4\Documents\17 - BRY\Design Projects\012203033\4 - Design\Plan Set\1. General\G. Quantity\SummarySheets\Project Totals of SW3P.dgn

CONSOLIDATED SW3P SUMMARY (US 287 & SH 75)												
DESCRIPTION	ITEM 160	ITEM 162	ITEM 164			ITEM 168	ITEM 506					
	6003	6002	6001	6003	6071	6001	6002	6011	6038	6039	6041	6043
	FURNISHING AND PLACING TOPSOIL (4") ②	BLOCK SODDING	BROADCAST SEED			VEGETATIVE WATERING ①	ROCK FILTER DAMS (INSTALL) (TY 2)	ROCK FILTER DAMS (REMOVE)	TEMPORARY SEDIMENT CONTROL FENCE INSTALL	TEMPORARY SEDIMENT CONTROL FENCE REMOVE	BIODEG EROSN CONT LOGS	
			(PERM) (RURAL) (SANDY)	(PERM) (RURAL) (CLAY)	(TEMP) (WARM OR COLD)						(INSTL) (12")	(REMOVE)
SY	SY	SY	SY	SY	SY	LF	LF	LF	LF	LF	LF	
CSJ 0122-03-033 TOTAL	4891	40	4891	0	4891	4891	60	60	300	300	112	112
CSJ 0166-07-067 TOTAL	20,224	0	0	20,224	20,224	20,224	140	140	1,540	1,540	0	0
PROJECT TOTALS	25,115	40	4,891	20,224	25,115	25,115	200	200	1,840	1,840	112	112

- ① FOR CONTRACTORS INFORMATION ONLY. SEE BASIS OF ESTIMATE FOR RATES AND QUANTITIES.
- ② ALL EXISTING TOPSOIL TO BE DISTURBED SHALL BE SALVAGED AND MAY BE USED IN ITEM 160-6003

PRINT DATE	REVISION DATE
6/1/2022	



Texas Department of Transportation ©2022
 Bryan District

CONSOLIDATED SUMMARY OF SW3P

SHEET 1 OF 3 SHEETS


FED. RD. DIV. NO.	PROJECT NUMBER	HIGHWAY NUMBER	
6		US 287, ETC.	
STATE	DISTRICT	COUNTY	
TEXAS	BRYAN	FREESTONE, ETC.	
CONTROL	SECTION	JOB	SHEET NO.
0122	03	033,ETC.	23

REV DATE: 2-12-2015
 CSJ: 0122-03-033
 FILENAME: pw:\dot\project\online.com:TXDOT4\Documents\17 - BRY\Design Projects\012203033\4 - Design\Plan Set\1. General\IG. QuantitySummarySheets\SW3P SUMMARY

SW3P SUMMARY (US 287)													
PLAN SHEET NO.	LENGTH	WIDTH	ITEM 160	ITEM 162	ITEM 164		ITEM 168	ITEM 506					
			6003	6002	6001	6071	6001	6002	6011	6038	6039	6041	6043
			FURNISHING AND PLACING TOPSOIL (4") ②	BLOCK SODDING	BROADCAST SEED		VEGETATIVE WATERING ①	ROCK FILTER DAMS (INSTALL) (TY 2)	ROCK FILTER DAMS (REMOVE)	TEMPORARY SEDIMENT CONTROL FENCE INSTALL	TEMPORARY SEDIMENT CONTROL FENCE REMOVE	BIODEG EROSN CONT LOGS	
					(PERM) (RURAL) (SANDY)	(TEMP) (WARM OR COOL)						(INSTL) (12")	(REMOVE)
SY	SY	SY	SY	SY	LF	LF	LF	LF	LF	LF	LF		
SHEET 1 OF 1	2201	20	4891	40	4891	4891	4891	60	60	300	300	112	112
CSJ 0122-03-033 TOTAL			4891	40	4891	4891	4891	60	60	300	300	112	112

- ① FOR CONTRACTORS INFORMATION ONLY. SEE BASIS OF ESTIMATE FOR RATES AND QUANTITIES.
- ② ALL EXISTING TOPSOIL TO BE DISTURBED SHALL BE SALVAGED AND MAY BE USED IN ITEM 160-6003

PRINT DATE	REVISION DATE
6/1/2022	



Texas Department of Transportation ©2022
Bryan District

SUMMARY OF SW3P (US 287)
SHEET 2 OF 3 SHEETS


FED. RD. DIV. NO.	PROJECT NUMBER	HIGHWAY NUMBER	
6		US 287, ETC.	
STATE	DISTRICT	COUNTY	
TEXAS	BRYAN	FREESTONE, ETC.	
CONTROL	SECTION	JOB	SHEET NO.
0122	03	033,ETC.	24

REV DATE: 2-12-2015
 CSJ: 0122-03-033
 FILENAME: pw:\\hxdot\projectsonline.com\TXDOT4\Documents\17 - BRY\Design Projects\01667067\4 - Design\Plan Set\1. General\G. Quantity\SummarySheets\SUMMARY OF SW3P QUANTITIES (SH 75).dgn

SUMMARY OF SWP3 QUANTITIES (SH 75)								
ITEM	160	164		168	506			
DESCRIPTION	6003	6003	6071	6001	6002	6011	6038	6039
SW3P LAYOUT	FURNISHING AND PLACING TOPSOIL (4") ②	BROADCAST SEED (PERM) (RURAL) (CLAY)	BROADCAST SEED (TEMP) (WARM OR COLD)	VEGETATIVE WATERING ①	ROCK FILTER DAMS (INSTALL) (TY 2)	ROCK FILTER DAMS (REMOVE)	TEMP SEDMT CONT FENCE (INSTALL)	TEMP SEDMT CONT FENCE (REMOVE)
	SY	SY	SY	SY	LF	LF	LF	LF
SHEET 1 OF 2	15,951	15,951	15,951	15,951	140	140	1,540	1,540
SHEET 2 OF 2	4,273	4,273	4,273	4,273	-	-	-	-
CSJ 0166-07-067	20,224	20,224	20,224	20,224	140	140	1,540	1,540

- ① SEE "BASIS OF ESTIMATE" FOR APPLICATION RATES
- ② ALL EXISTING TOPSOIL TO BE DISTURBED SHALL BE SALVAGED AND MAY BE USED IN ITEM 160-6003

PRINT DATE	REVISION DATE
6/1/2022	



Texas Department of Transportation ©2022
Bryan District

SUMMARY OF SW3P (SH 75)

SHEET 3 OF 3 SHEETS

FED. RD. DIV. NO.	PROJECT NUMBER	HIGHWAY NUMBER	
6		US 287, ETC.	
STATE	DISTRICT	COUNTY	
TEXAS	BRYAN	FREESTONE, ETC.	
CONTROL	SECTION	JOB	SHEET NO.
0122	03	033,ETC.	25

REV DATE: 2-12-2015
 CSJ: 0122-03-033
 FILENAME: pw:\tdot\project\online.com\TXDOT4\Documents\17 - BRY\Design Projects\016607067\4 - Design\Plan Set\1. General\G. Quantity\SummarySheets\SCHEDULE OF MATERIALS (SH75).dgn

SH 75 @ SPUR 67 SCHEDULE OF ILLUMINATION POLES			
CONDUIT LABEL	ITEM 618		ITEM 620
	6023	6024	6008
	CONDT (PVC) (SCH 40) (2")	CONDT (PVC) (SCH 40) (2") BORE	ELEC CONDR (NO. 8) INSULATED
	LF	LF	LF
1	20		3-20(60)
2	75	120	3-195(585)
3	90		3-90(270)
4	25		3-25(75)
TOTALS	210	120	990

SH 75 @ SPUR 67 SCHEDULE OF ILLUMINATION POLES			
LUMINAIRE POLE LABEL	ITEM 610-6254	ITEM 416-6029	ITEM 432-6009
	IN RD IL (TY ST) 40T-8 (250W EQ) LED	DRILL SHAFT (RDWY ILL POLE) (30 IN)	RIPRAP (CONC) (CL B) (4")
	EA	LF	CY
LP1	1	8	0.35
LP2	1	8	0.35
LP3	1	8	0.35
TOTALS	3	24	1.05

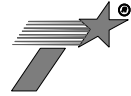
SH 75 @ SPUR 67 SCHEDULE OF SIGNS & BEACONS			
LABEL	ITEM 636	ITEM 682	ITEM 685
	6001	6003	6004
	ALUMINUM SIGNS (TY A)	VEH SIG SEC (12") LED	INSTL RDS D FLSH BCN ASSM (SOLAR PWRD)
	SF	EA	EA
FB 1	9	2	1
FB 2	9	2	1
TOTALS	18	4	2

ELECTRICAL SERVICE DATA**													
ITEM 628-6145													
ELEC. SERVICE ID	POWER COMPANY	METER NUMBER	ELECTRICAL SERVICE DESCRIPTION (SEE ED (5)-14)	SERVICE CONDUIT SIZE (RMC)	SERVICE CONDUCTORS NO./SIZE	SAFETY SWITCH AMPS	MAIN DISCONNECT CKT. BRK. POLE/AMP	TWO-POLE CONTACTOR AMPS	PANELBD/LOADCENTER AMP RATING (MIN)	CIRCUIT NO.	BRANCH CKT. BRK. POLE/AMPS	BRANCH CIRCUIT AMPS	K/A LOAD
SH75 @ SPUR 67	MIDSOUTH ELECTRIC	TBD	ELC SRV TY D 120/240 060 (NS) SS (E) SP (O)	2"	3/ #6	N/A	2P/60	40	100	SPARE 120 SPARE 120 SAFETY LIGHTING SPARE 240	30 30 20 20	- - 3 -	<1

*"SAFETY LIGHTING" AND "SPARE 240" BRANCH CIRCUITS SHALL BE INSTALLED THROUGH THE LIGHTING CONTACTOR.

**CONTRACTOR SHALL VERIFY WITH THE POWER COMPANY THE LOCATION OF THE SERVICE, THE TRANSFORMER, AND INSTALLATION REQUIREMENTS, AND OBTAIN THE APPROPRIATE METER ENCLOSURE TO INSTALL ON THE NEW SERVICE POLE.

SH 75 @ SPUR 67 SCHEDULE OF GROUND BOXES	
GROUND BOX LABEL	ITEM 624-6008
	GROUND BOX TY C (162911) W/APRON
	EA
GB1	1
GB2	1
TOTALS	2

PRINT DATE 6/1/2022		REVISION DATE	
 Texas Department of Transportation ©2022 Bryan District SCHEDULE OF MATERIALS (SH 75)			
FED. RD. DIV. NO.	PROJECT NUMBER	HIGHWAY NUMBER	
6		US 287, ETC.	
STATE	DISTRICT	COUNTY	
TEXAS	BRYAN	FREESTONE, ETC.	
CONTROL	SECTION	JOB	SHEET NO.
0122	03	033,ETC.	26

SET UP

STEP 1: SET UP ADVANCED WARNING SIGNS AND BARRICADES IN ACCORDANCE WITH TEXAS MUTCD AND BC STANDARDS.

STEP 2: INSTALL TEMPORARY SEDIMENT CONTROL DEVICES AS SHOWN ON THE SW3P LAYOUT.

PHASE I - CULVERT AND DRAINAGE

STEP 1: PREPARE ROW. CUT PAVEMENT SECTION ON ONE SIDE AND REMOVE/REPLACE HALF OF CULVERT PER SEQUENCE OF WORK. INSTALL CONCRETE TEMPORARY BARRIER PER TXDOT STANDARDS. USE ONE-LANE WITH TWO WAY OPERATION CONTROLLED BY USING PORTABLE TRAFFIC SIGNALS PER TXDOT STANDARDS AND RESTORE PAVEMENT PER CUT AND RESTORE DETAIL SHEET.

STEP 2: CUT REMAINING OF PAVEMENT SECTION OF PAVEMENT AND REMOVE/REPLACE REMAINING HALF OF CULVERT PER SEQUENCE OF WORK. USE ONE-LANE WITH TWO WAY OPERATION CONTROLLED BY USING PORTABLE TRAFFIC SIGNALS TXDOT STANDARDS AND RESTORE PAVEMENT PER CUT AND RESTORE DETAIL SHEET.

PHASE II - ROADWAY

STEP 1: CONSTRUCT A SMOOTH VERTICAL CUT ALONG EDGE OF EXISTING ROADWAY AND EXCAVATE AREA TO WIDTH OF PROPOSED SUBGRADE. CLOSE SHOULDER AND SET UP TCP PER TXDOT STANDARDS.

STEP 2: SUBGRADE WIDENING AND LIME TREAT TOP 7" OF MATERIAL.

STEP 3: PLACE 11" FLEX BASE.

STEP 4: PLACE PRIME SEAL.

STEP 5: PLACE 3" HMA.

PHASE III - ROADWAY

STEP 1: MILL AND INLAY 2.5" ON ONE SIDE OF ROAD. USE TXDOT TCP STANDARDS.

STEP 2: PLACE TEMPORARY WORK ZONE TABS PER TXDOT STANDARDS.

STEP 3: MILL AND INLAY 2.5" ON THE REMAINING SIDE. USE TXDOT TCP STANDARDS.

STEP 4: REMOVE/REPLACE MBGF PER TXDOT STANDARDS.

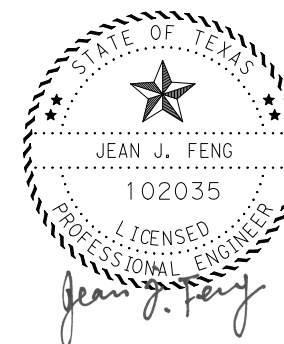
STEP 5: PLACE PERMANENT SIGNING AND STRIPING. REFER TO TXDOT STANDARDS FOR MOBILE TRAFFIC OPERATION DETAILS.

STEP 6: PLACE FINAL VEGETATION ACCORDING TO THE PLANS.

STEP 7: FINAL CLEAN UP.

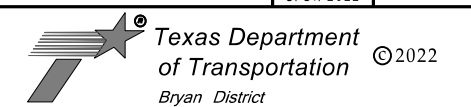
CONSTRUCTION NOTES:

- 1) CONTRACTOR SHALL SUBMIT A CONSTRUCTION LIMIT PLAN FOR APPROVAL THAT ENSURES THE PAVEMENT CONSTRUCTED DURING THE DAY CAN BE OPENED TO TRAFFIC AT NIGHT WITHOUT THE USE OF FLAGGERS OR AS DIRECTED BY THE ENGINEER IN THE FIELD.
- 2) UPON COMPLETION OF THE WORK AND BEFORE FINAL ACCEPTANCE AND FINAL PAYMENT IS MADE. THE CONTRACTOR SHALL CLEAR AND REMOVE FROM THE SITE ALL SURPLUS AND DISPLACED MATERIALS AND DEBRIS OF EVERY KIND AND LEAVE THE ENTIRE PROJECT IN A SMOOTH, NEAT AND SLIGHTLY CONDITION.
- 3) PERFORM THE CROSS DRAINAGE CULVERT WIDENING WORK PRIOR TO THE BEGINNING ROADWAY WIDENING ACTIVITIES.
- 4) THE PORTION OF THIS PROJECT THAT COINCIDES WITH EXISTING ROADS AND/OR PRIVATE DRIVES SHALL BE MAINTAINED AS ALL-WEATHER ROADS AND KEPT OPEN AT ALL TIMES UNLESS OTHERWISE APPROVED BY THE ENGINEER.
- 5) THE CONTRACTOR MAY NOT BEGIN WORK ADJACENT TO DRIVEWAYS/SIDE ROADS UNTIL A SUFFICIENT AMOUNT OF ALL-WEATHER MATERIAL IS STOCKPILED ON THE PROJECT SITE.
- 6) ALL PHASES USING CHANNELIZING DEVICES SHALL BE CONES AS DESCRIBED IN SEQUENCE OF WORK. OTHER APPROVED DEVICES MAY BE USED AT THE CONTRACTOR'S OPTION AND BY THE ENGINEER'S APPROVAL. (SEE SEQUENCE OF WORK)
- 7) PLACE FINAL STRIPING ONCE ALL PHASES AND OVERLAY IS COMPLETED.
- 8) THE 3:1 MINIMUM SAFETY SLOPE BACKFILL FOR END OF WORK OPERATIONS SHALL BE DURABLE CRUSHED STONE OF FLEXIBLE BASE OR OTHER MATERIALS APPROVED BY THE ENGINEER. WHEN WORK IS RESUMED ON THIS EXCAVATED AREA THIS BACKFILL MATERIAL SHALL BE INCORPORATED INTO THE ROAD WORK OR DISPOSED OF AS APPROVED BY THE ENGINEER. MATERIALS AND LABOR FOR THIS WORK WILL NOT BE PAID FOR DIRECTLY, BUT SHALL BE CONSIDERED SUBSIDIARY TO VARIOUS BID ITEMS.
- 9) OTHER TCP PHASING OPTIONS MAY BE USED IF PREVIOUSLY APPROVED BY THE ENGINEER. SUBMIT PROPOSED TCP IN WRITING AT LEAST TWO WEEKS PRIOR TO BEGINNING THE REVISED PHASE OF WORK.
- 10) BARRICADE AND CONSTRUCTION STANDARDS ARE REQUIRED FOR ALL PHASES. REFER TO "WORK ZONE" AND "TCP" STANDARD SHEETS FOR ADDITIONAL DETAILS. STANDARDS SHOWN ARE CONSIDERED TO BE THE MINIMUM REQUIREMENTS FOR WORK ZONE SIGNING AND TRAFFIC CONTROL. ADDITIONAL OR OTHER DEVICES MAY BE REQUIRED AS DIRECTED BY THE ENGINEER.
- 11) STAKE EXISTING PASSING LANE ZONES PRIOR TO PAVEMENT MARKING REMOVAL. PLACE AND MAINTAIN STAKES ALONG ROW FOR PROJECT DURATION.
- 12) REFER TO TXDOT STANDARD "WORKSHEET FOR EDGE CONDITION TREATMENT TYPES" WHEN APPLICABLE.



06/01/2022

PRINT DATE	REVISION DATE
5/31/2022	

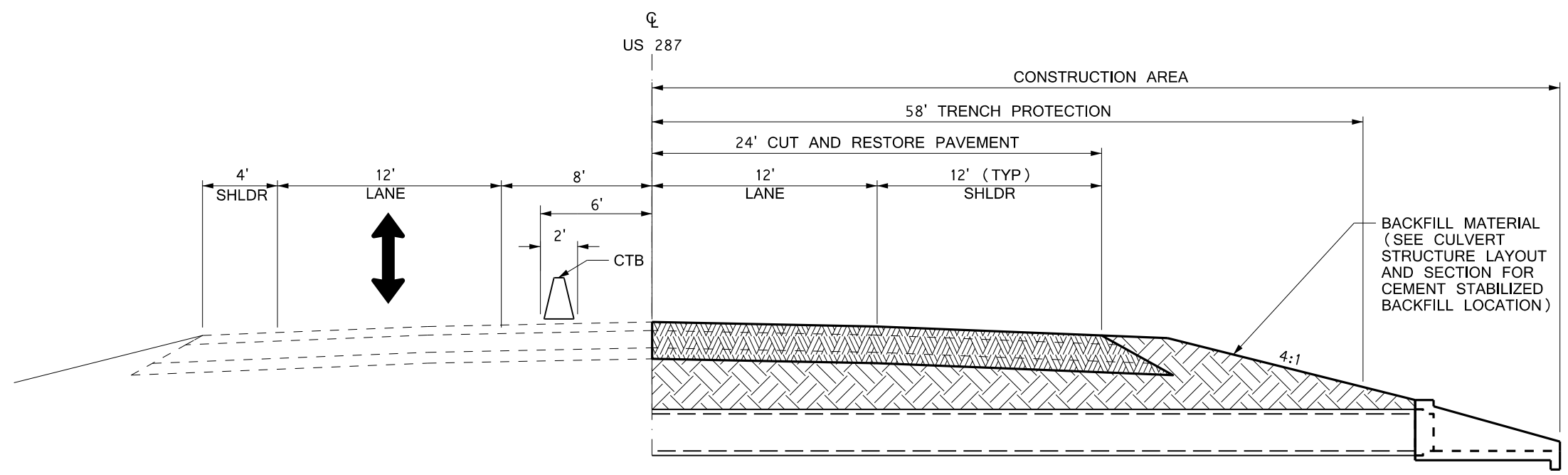


TCP NARRATIVE (US 287)

FED. RD. DIV. NO.	PROJECT NUMBER	HIGHWAY NUMBER	
6		US 287, ETC.	
STATE	DISTRICT	COUNTY	
TEXAS	BRYAN	FREESTONE, ETC.	
CONTROL	SECTION	JOB	SHEET NO.
0122	03	033,ETC.	27

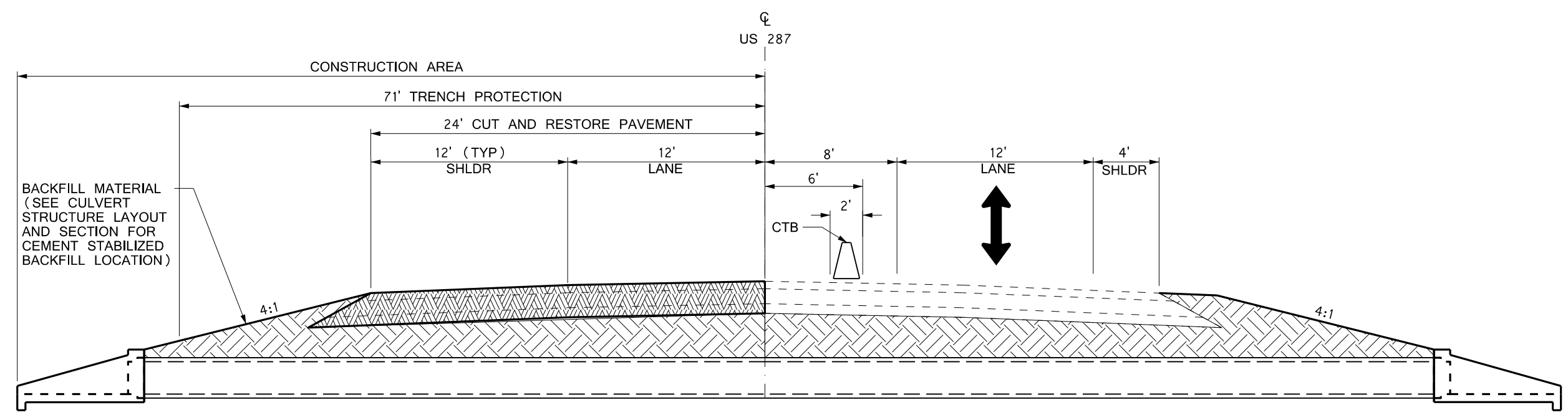
REV DATE: 2-12-2015
 CSJ: 0122-03-033
 FILENAME: pw:\tdot\projectsonline.com\TXDOT4\Documents\17 - BRY\Design Projects\012203033\4 - Design\Plan Set\2. TCP\TCP Narrative.dgn

REV DATE: 2-12-2015
 CS: 0122-03-033
 FILENAME: pw:\tdot\projectswisconsin.com\TXDOT4\Documents\17 - BRY\Design\Projects\012203033\4 - Design\Plan Set\1. General\1.C. TypicalSections\SEQUENCE OF WORK.dgn



PHASE I STEP I
 CUT AND RESTORE PAVEMENT, CULVERT REPLACEMENT

LEGEND
 CUT & RESTORE PAV



PHASE I STEP II
 CUT AND RESTORE PAVEMENT, CULVERT REPLACEMENT

STATE OF TEXAS

 JEAN J. FENG
 102035
 LICENSED PROFESSIONAL ENGINEER
 Jean J. Feng
 06/01/2022

Drawings Not To Scale
 PRINT DATE: 5/31/2022
 REVISION DATE:

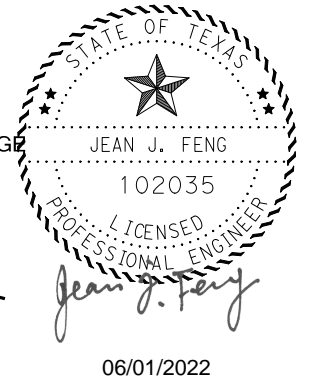
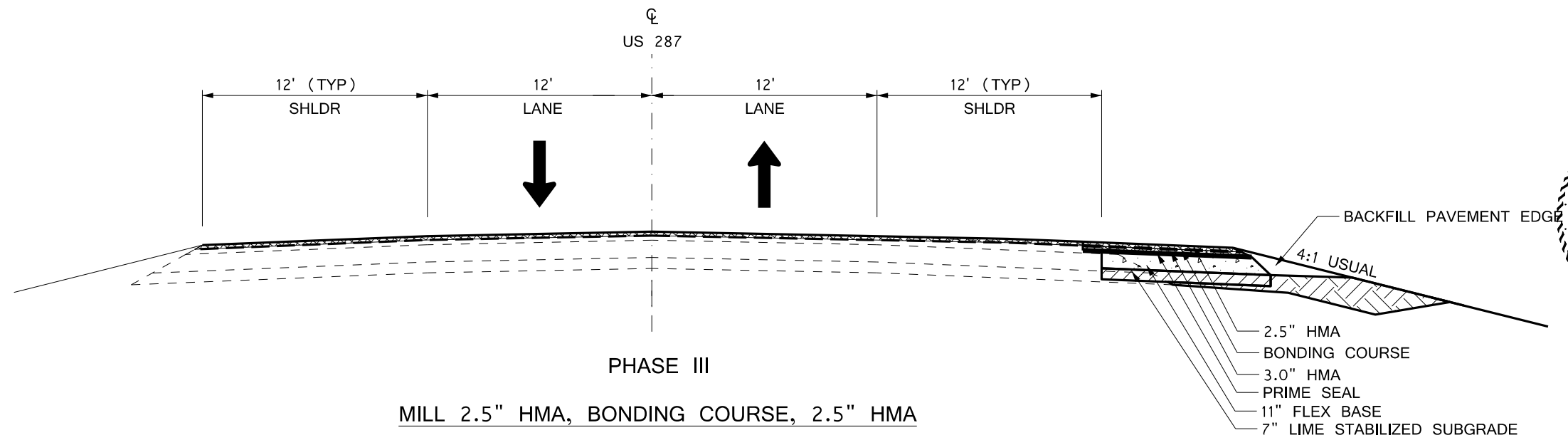
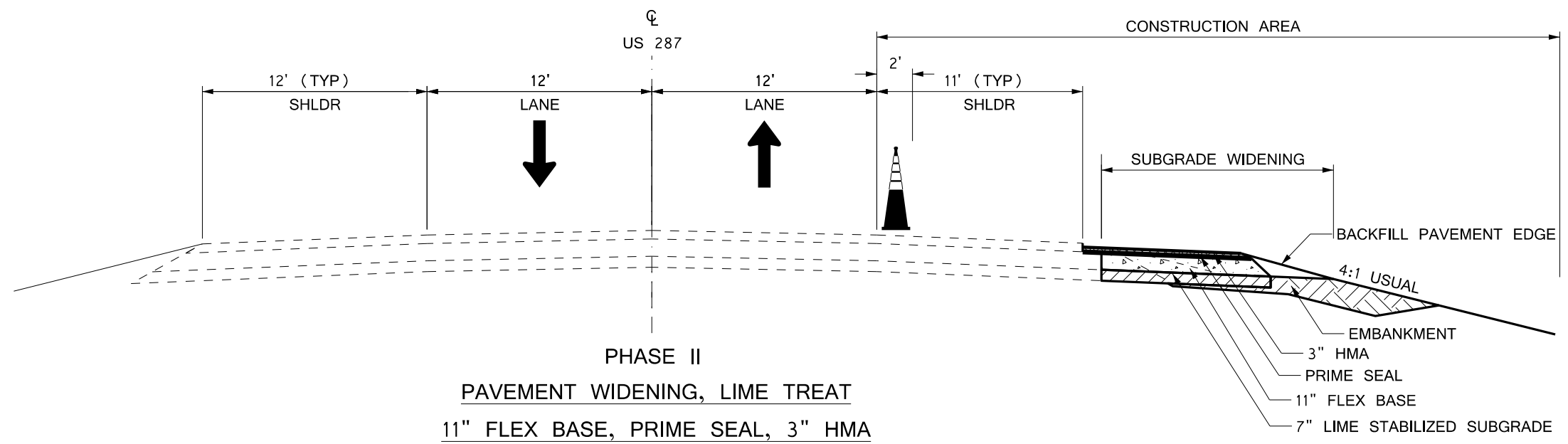
Texas Department of Transportation ©2022
 Bryan District

**SEQUENCE OF WORK
(US 287)**

SHEET 1 OF 2 SHEETS

FED. RD. DIV. NO.	PROJECT NUMBER	HIGHWAY NUMBER	
6		US 287, ETC.	
STATE	DISTRICT	COUNTY	
TEXAS	BRYAN	FREESTONE, ETC.	
CONTROL	SECTION	JOB	SHEET NO.
0122	03	033, ETC.	28

REV DATE: 2-12-2015
 CSJ: 0122-03-033
 FILENAME: pw:\txdot\projectsonline.com\TXDOT4\Documents\17 - BRY\Design Projects\012203033\4 - Design Plan Set\1. General\1.C. Typical Sections\SEQUENCE OF WORK.dgn



Drawings Not To Scale

PRINT DATE	REVISION DATE
5/31/2022	

Texas Department of Transportation ©2022
 Bryan District

SEQUENCE OF WORK
 (US 287)

SHEET 2 OF 2 SHEETS

FED. RD. DIV. NO.	PROJECT NUMBER	HIGHWAY NUMBER	
6		US 287, ETC.	
STATE	DISTRICT	COUNTY	
TEXAS	BRYAN	FREESTONE, ETC.	
CONTROL	SECTION	JOB	SHEET NO.
0122	03	033, ETC.	29

REV DATE: 2-12-2015
 CSJ: 0122-03-033
 FILENAME: pw:\txdot\projectswisconsin.com\TXDOT4\Documents\17 - BRY\Design Projects\016607067\4 - Design\Plan Set\2. TCP\2A. TCP Sheets\TCP NARRATIVE.dgn

SEQUENCE OF WORK

GENERAL:

- 1) PLACE ADVANCED WARNING SIGNS AND BARRICADES AS SHOWN IN TXDOT STANDARDS
- 2) MAINTAIN CONTINUOUS ACCESS TO ABUTTING PROPERTIES DURING ALL PHASES OF CONSTRUCTION.
- 3) PLACE TEMPORARY EROSION CONTROL DEVICES AS SHOWN IN PLANS AND AS DIRECTED BY THE ENGINEER PRIOR TO BEGINNING ANY OTHER WORK.
- 4) AT THE END OF EACH WORK DAY, MOVE ALL ADVANCED SIGNING AND BARRICADES FROM THE TRAVEL LANES TO THE SHOULDER TO ALLOW THE USE OF EXISTING LANES.

PHASE I:

CULVERT

- 1) EXTEND CULVERT AT ONE SIDE OF ROADWAY PER SEQUENCE OF WORK.
 USE ONE LANE WITH TWO-WAY OPERATIONS CONTROLLED BY PILOT CAR AND FLAGGER PER TXDOT STANDARDS.
- 2) REPEAT PREVIOUS STEP 1) ON OTHER SIDE OF CULVERT PER SEQUENCE OF WORK.

PHASE II:

ROADWAY

- 1) USE ONE LANE WITH TWO-WAY OPERATIONS CONTROLLED BY PILOT CAR AND FLAGGER PER TXDOT STANDARDS.
 BOTH LANES SHOULD OPEN AT END OF EACH WORKING DAY.
- 2) ROADWAY PAVEMENT WORK INCLUDES THE FOLLOWING STEPS, PER SEQUENCE OF WORK:
 STEP 1: WINDROW MATERIALS OUTSIDE 24' EXISTING PAVEMENT (LATER ON USE FOR TOPSOIL NEXT TO THE SUBGRADE)
 STEP 2: SUBGRADE WIDENING;
 STEP 3: LIME TREAT 8" SUBGRADE;
 STEP 4: REPLACE 3" HMA ON WIDENING SECTION;
 STEP 5: PLACE 2" HMA ON 3' OF WIDENING SECTION FOR TRAFFIC SHIFTING.

PHASE III:

ROADWAY

- 1) REMOVE EXISTING CENTERLINE PAVEMENT MARKINGS. PLACE TEMPORARY PAVEMENT MARKINGS. OPEN UP BOTH TRAVEL LANES;
- 2) REPEAT STEP 1 THROUGH STEP 4 FOR THE OTHER SIDE OF ROADWAY, PER SEQUENCE OF WORK AND TXDOT STANDARDS.

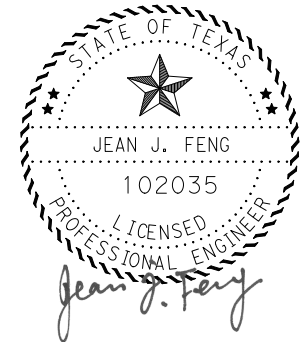
PHASE IV:

ROADWAY

- 1) MILL 2" OF EXISTING ROADWAY, PLACE BONDING COURSE, 2" HMA, PER SEQUENCE OF WORK AND TXDOT STANDARDS.
- 2) BACK FILL PAVEMENT EDGE;
- 3) PLACE PERMANENT PAVEMENT MARKINGS AND MARKERS.

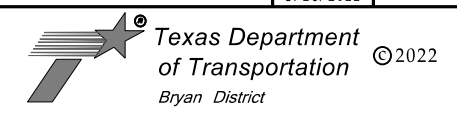
NOTES:

AT THE END OF EACH WORKING DAY, THE CONTRACTOR SHALL OPEN THE ROAD TO THE TWO LANE TWO-WAY TRAFFIC UNLESS APPROVED BY THE ENGINEER.



05/30/2022

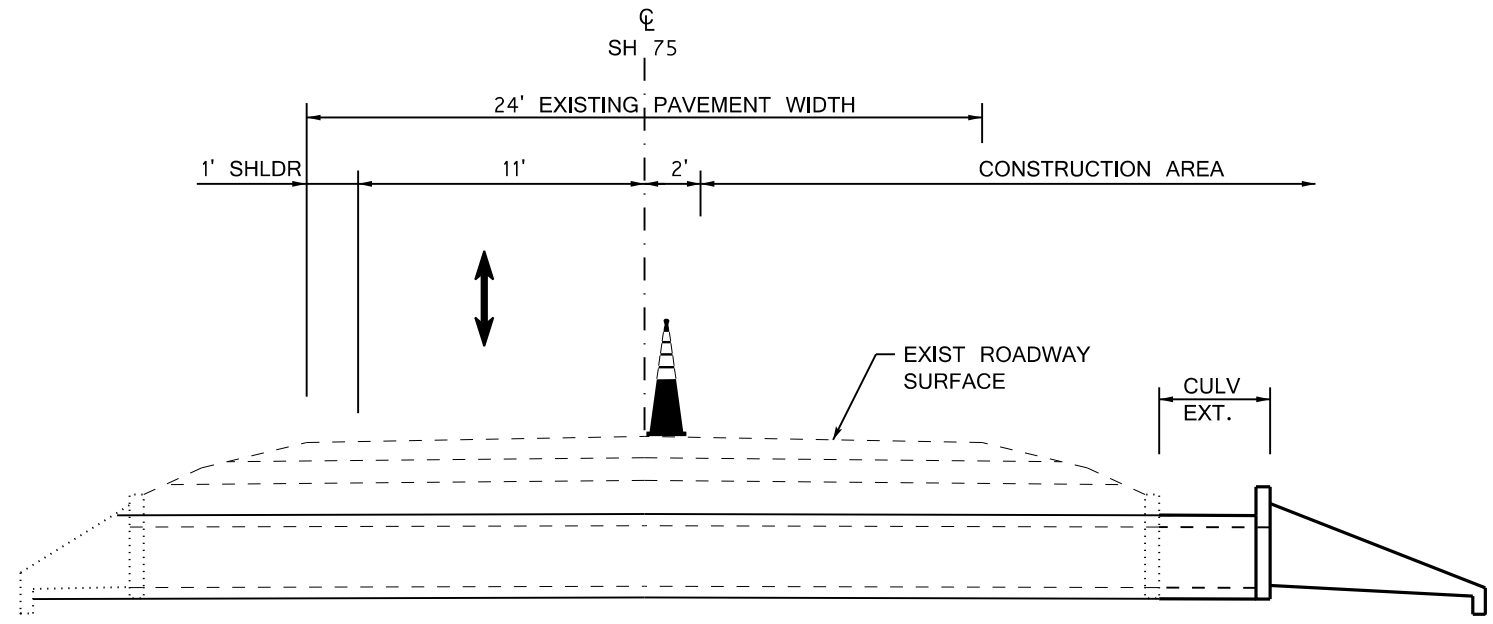
PRINT DATE	REVISION DATE
5/26/2022	



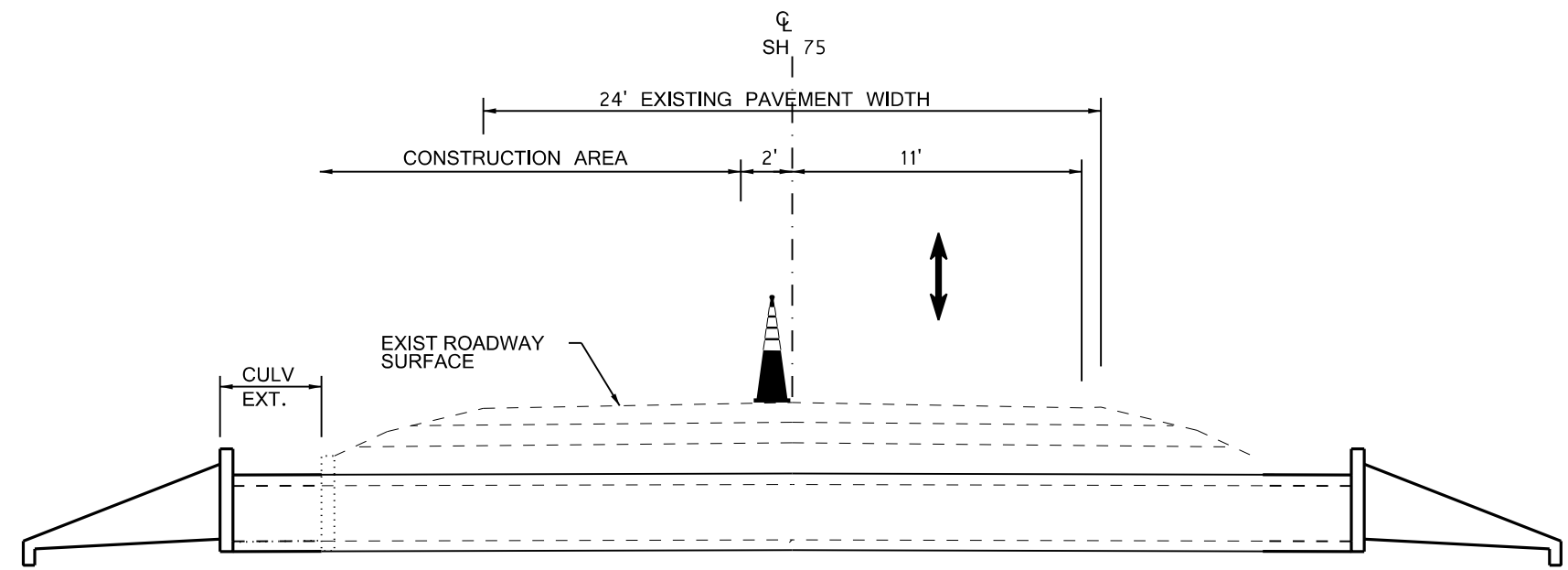
TCP NARRATIVE
(SH 75)

FED. RD. DIV. NO.	PROJECT NUMBER	HIGHWAY NUMBER	
6		US 287, ETC.	
STATE	DISTRICT	COUNTY	
TEXAS	BRYAN	FREESTONE, ETC.	
CONTROL	SECTION	JOB	SHEET NO.
0122	03	033,ETC.	31

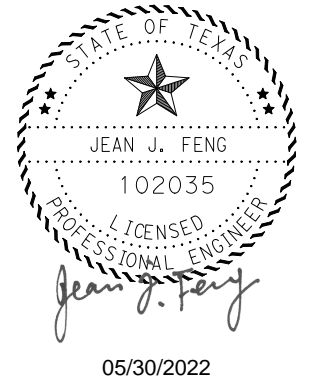
REV DATE: 2-12-2015
 CSJ: 0122-03-033
 FILENAME: pw:\tdot\project\online.com:\TXDOT4\Documents\17 - BRY\Design Projects\01667067\4 - Design\Plan Set\2. TCP\2A. TCP Sheets\SEQUENCE OF WORK.dgn




**PHASE I: STEP 1 - RIGHT SIDE
 CULVERT EXTENSION**

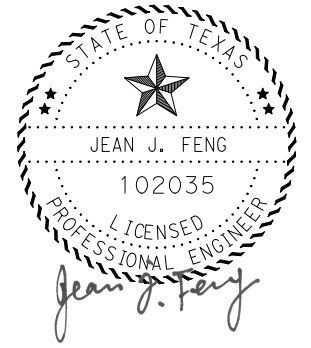
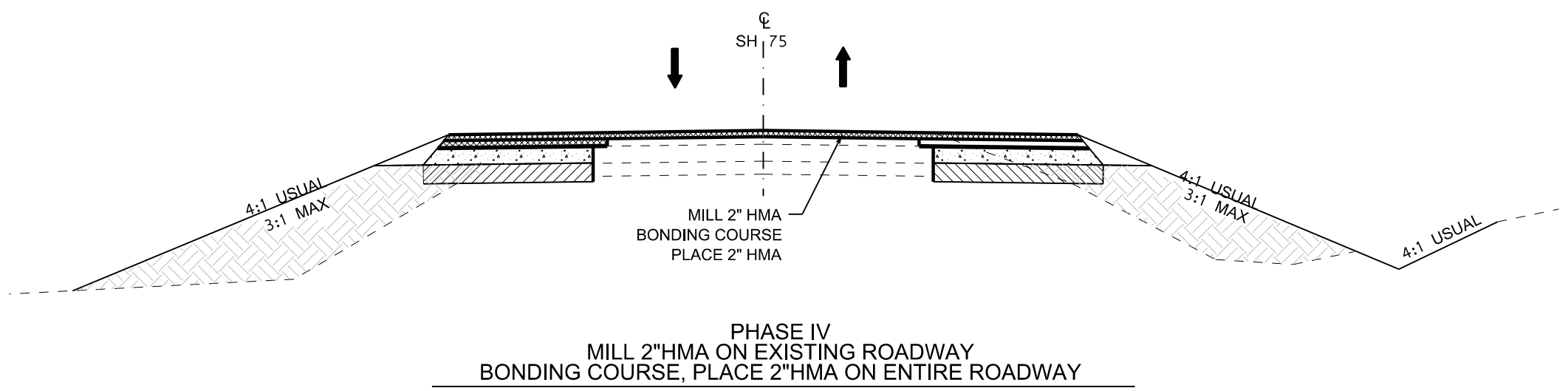
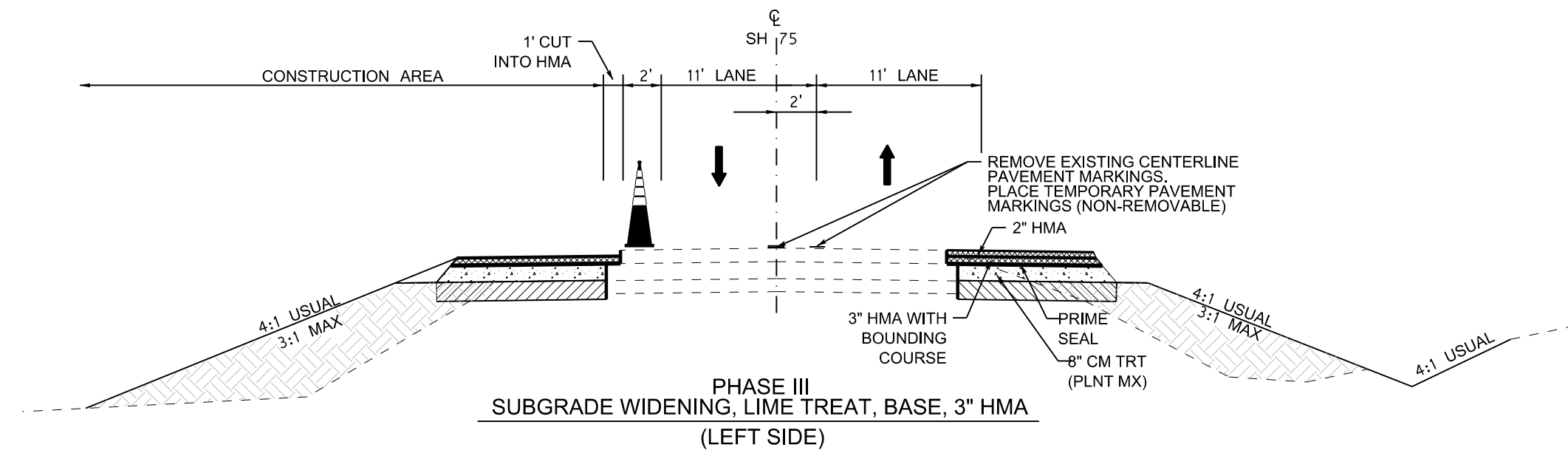
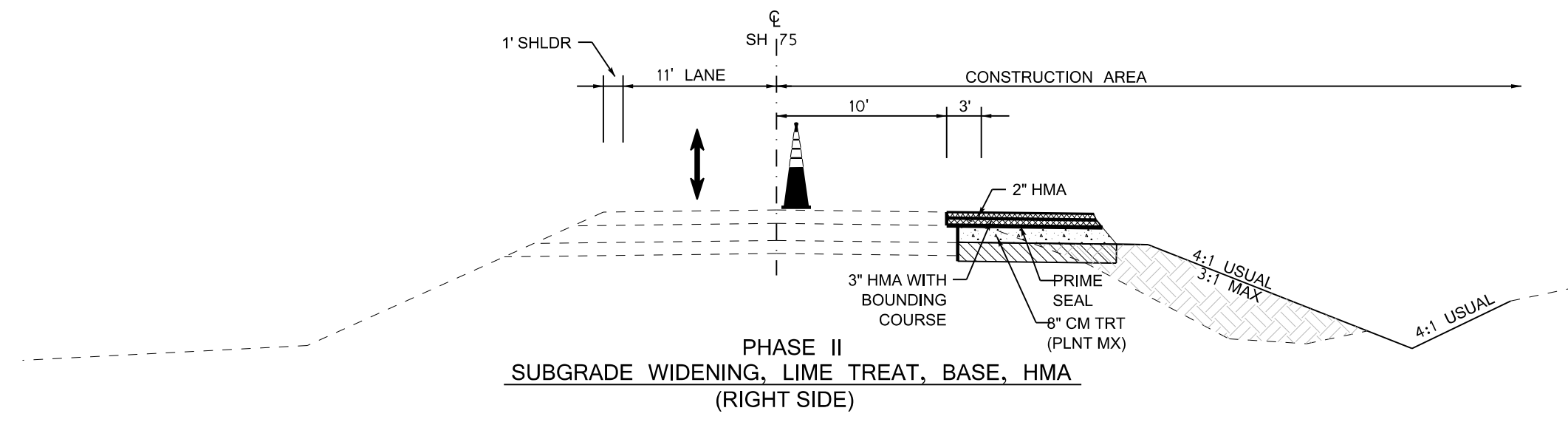


**PHASE I: STEP 2 - LEFT SIDE
 CULVERT EXTENSION**



PRINT DATE		REVISION DATE	
5/26/2022			
 Texas Department of Transportation ©2022 Bryan District			
SEQUENCE OF WORK (SH 75)			
SHEET 1 OF 2 SHEETS			
FED. RD. DIV. NO.	PROJECT NUMBER	HIGHWAY NUMBER	
6		US 287, ETC.	
STATE	DISTRICT	COUNTY	
TEXAS	BRYAN	FREESTONE, ETC.	
CONTROL	SECTION	JOB	SHEET NO.
0122	03	033, ETC.	32

REV DATE: 2-12-2015
 CSJ: 0122-03-033
 FILENAME: pw:\txdot\projectsonline.com\TXDOT4\Documents\17 - BRY\Design Projects\016607067\4 - Design Plan Set\2. TCP\2A. TCP Sheets\SEQUENCE OF WORK.dgn



05/30/2022

FED. RD. DIV. NO.	PROJECT NUMBER	HIGHWAY NUMBER	
6		US 287, ETC.	
STATE	DISTRICT	COUNTY	
TEXAS	BRYAN	FREESTONE, ETC.	
CONTROL	SECTION	JOB	SHEET NO.
0122	03	033, ETC.	33

Texas Department of Transportation ©2022
 Bryan District

SEQUENCE OF WORK (SH 75)

SHEET 2 OF 2 SHEETS

DISCLAIMER: The use of this standard is governed by the "Texas Engineering Practice Act". No warranty of any kind is made by TxDOT for any purpose whatsoever. TxDOT assumes no responsibility for the conversion of this standard to other formats or for incorrect results or damages resulting from its use.

DATE:
 FILE:

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).

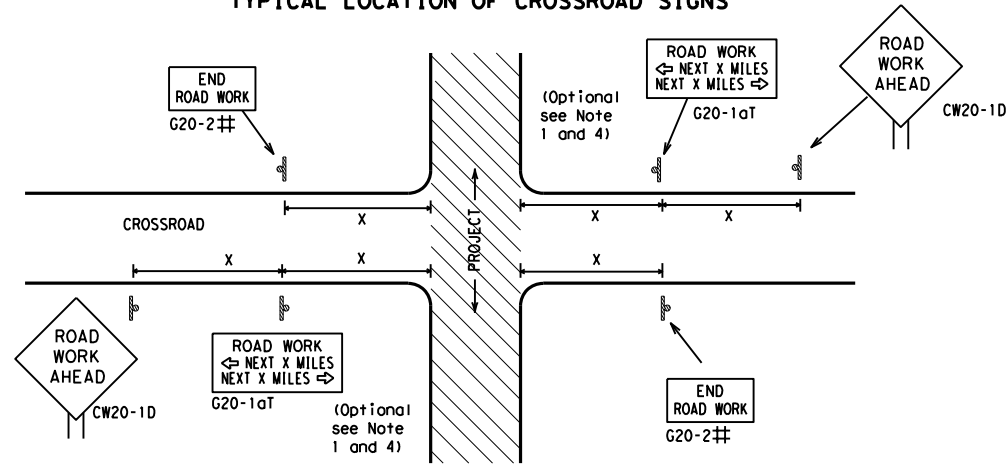
<p>THE DOCUMENTS BELOW CAN BE FOUND ON-LINE AT http://www.txdot.gov</p>
COMPLIANT WORK ZONE TRAFFIC CONTROL DEVICES LIST (CWZTCD)
DEPARTMENTAL MATERIAL SPECIFICATIONS (DMS)
MATERIAL PRODUCER LIST (MPL)
ROADWAY DESIGN MANUAL - SEE "MANUALS (ONLINE MANUALS)"
STANDARD HIGHWAY SIGN DESIGNS FOR TEXAS (SHSD)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

SHEET 1 OF 12

 Texas Department of Transportation		 Traffic Safety Division Standard	
<p>BARRICADE AND CONSTRUCTION GENERAL NOTES AND REQUIREMENTS</p> <p>BC (1) - 21</p>			
FILE:	bc-21.dgn	DN:	TxDOT
© TxDOT	November 2002	CK:	TxDOT
		DW:	TxDOT
		CK:	TxDOT
		CON:	0122
		SECT:	03
		JOB:	033,ETC.
		HIGHWAY:	US 287, ETC.
4-03	7-13	DIST:	COUNTY
9-07	8-14		SHEET NO.
5-10	5-21	BRY:	FREESTONE, ETC.
			34

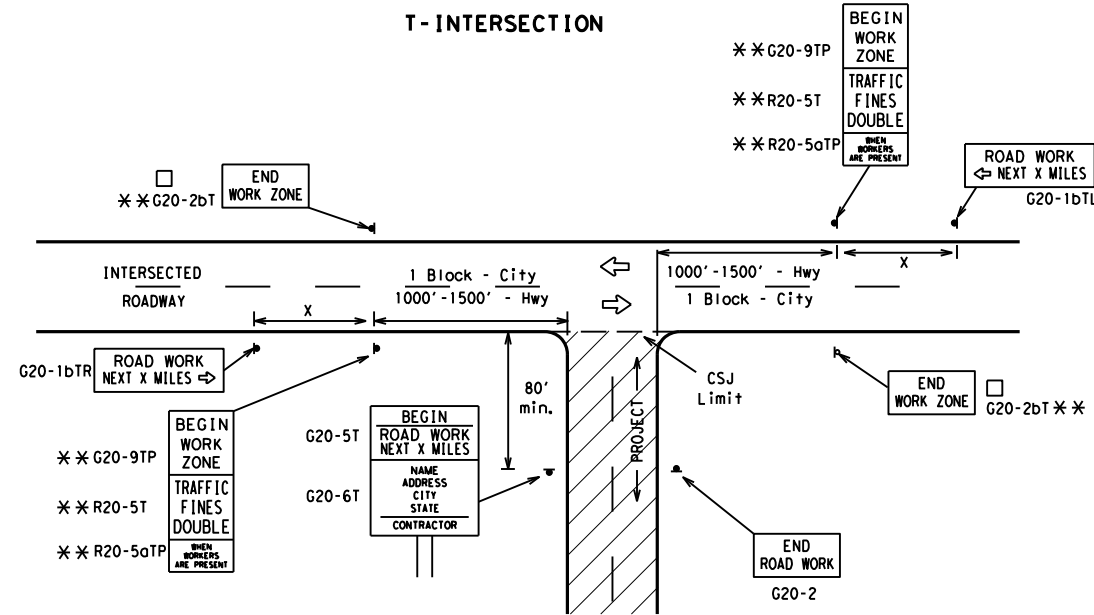
DISCLAIMER: The use of this standard is governed by the "Texas Engineering Practice Act". No warranty of any kind is made by TxDOT for any purpose whatsoever. TxDOT assumes no responsibility for the conversion of this standard to other formats or for incorrect results or damages resulting from its use.

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)
- 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.
 - 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.
 - 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.
 - 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.
 - Additional traffic control devices may be shown elsewhere in the plans for higher volume crossroads.
 - 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

- 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.
- 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}

Sign Number or Series	SIZE		SPACING	
	Conventional Road	Expressway/Freeway	Posted Speed MPH	Sign Δ Spacing "x" Feet (Apprx.)
CW20 ⁴	48" x 48"	48" x 48"	30	120
CW21			35	160
CW22			40	240
CW23			45	320
CW25			50	400
CW1, CW2, CW7, CW8, CW9, CW11, CW14	36" x 36"	48" x 48"	55	500 ²
CW3, CW4, CW5, CW6, CW8-3, CW10, CW12	48" x 48"	48" x 48"	60	600 ²
			65	700 ²
			70	800 ²
			75	900 ²
			80	1000 ²
			*	* ³

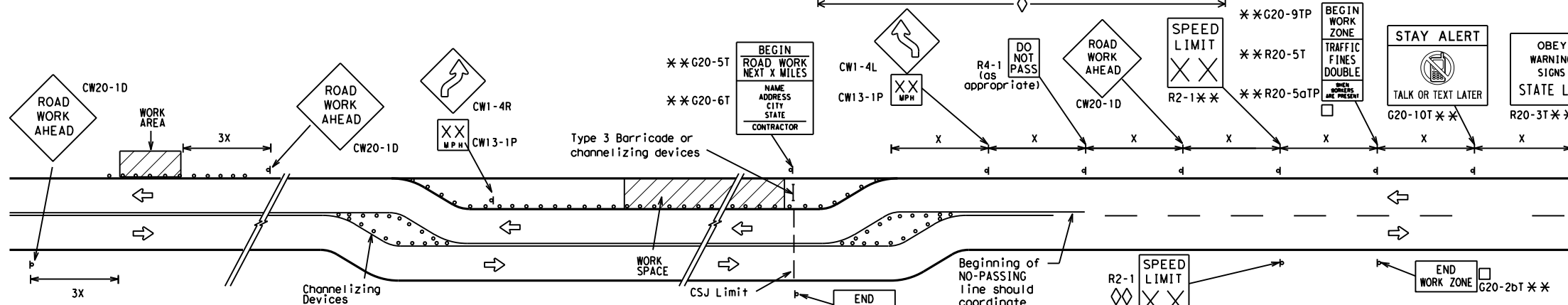
* For typical sign spacings on divided highways, expressways and freeways, see Part 6 of the "Texas Manual on Uniform Traffic Control Devices" (TMUTCD) typical application diagrams or TCP Standard Sheets.

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

GENERAL NOTES

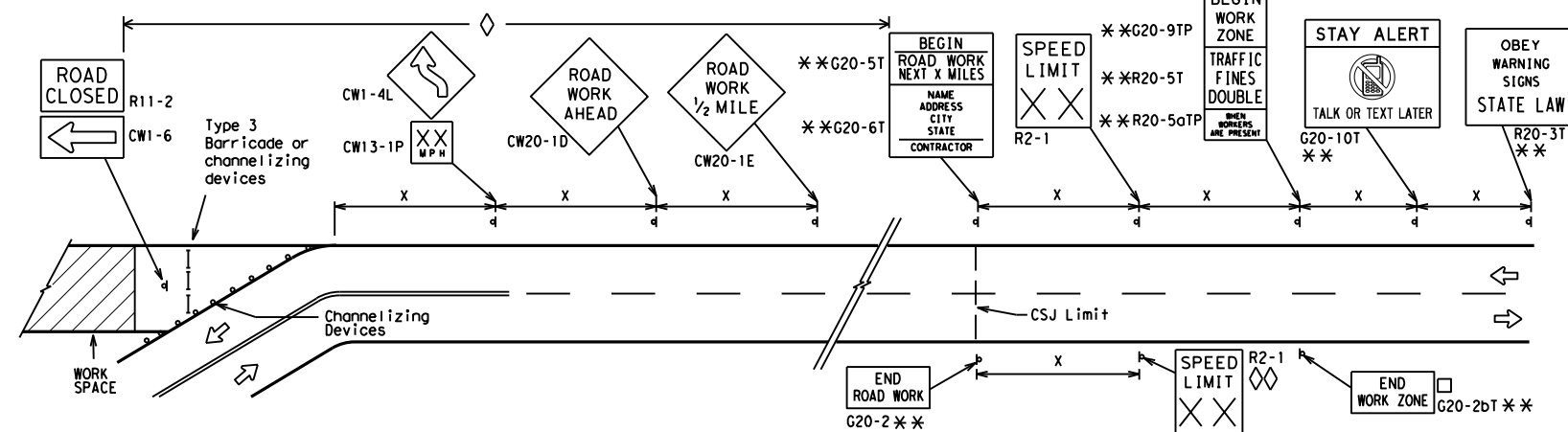
- Special or larger size signs may be used as necessary.
- Distance between signs should be increased as required to have 1500 feet advance warning.
- Distance between signs should be increased as required to have 1/2 mile or more advance warning.
- 36" x 36" "ROAD WORK AHEAD" (CW20-1D) signs may be 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".
- Only diamond shaped warning sign sizes are indicated.
- See sign size listing in "TMUTCD", Sign Appendix or the "Standard Highway Sign Designs for Texas" manual for complete list of available sign design sizes.

WORK AREAS IN MULTIPLE LOCATIONS WITHIN CSJ LIMITS



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

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



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.

SHEET 2 OF 12



BARRICADE AND CONSTRUCTION PROJECT LIMIT

BC(2)-21

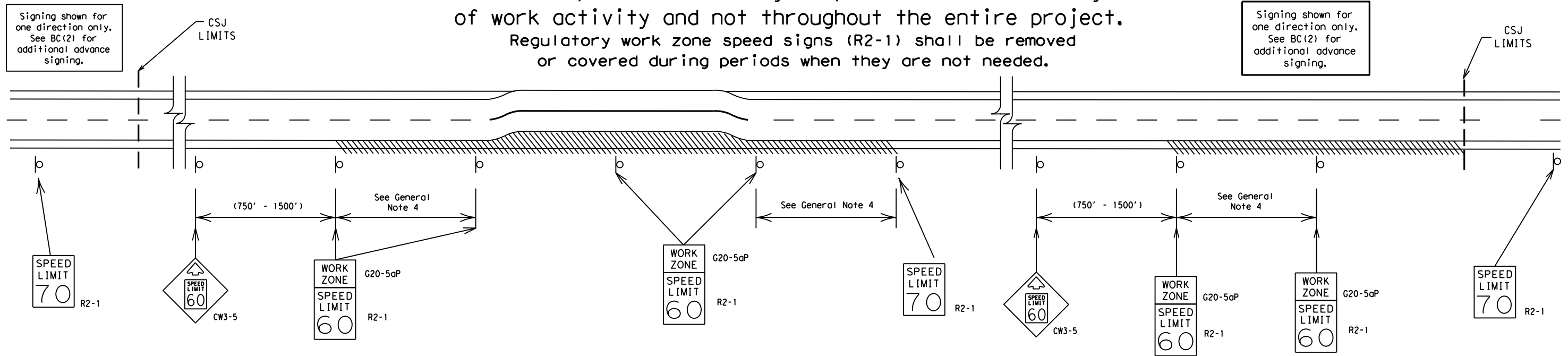
FILE: bc-21.dgn	DN: TxDOT	CK: TxDOT	DW: TxDOT	CR: TxDOT
© TxDOT November 2002	CONT	SECT	JOB	HIGHWAY
REVISIONS	0122	03	033,ETC.	US 287, ETC.
9-07 8-14	DIST	COUNTY	SHEET NO.	
7-13 5-21	BRY	FREESTONE, ETC.	35	

DATE: FILE:

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:

- rough road or damaged pavement surface
- substantial alteration of roadway geometrics (diversions)
- construction detours
- grade
- width
- 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

- Regulatory work zone speed limits should be used only for sections of construction projects where speed control is of major importance.
- Regulatory work zone speed limit signs shall be placed on supports at a 7 foot minimum mounting height.
- Speed zone signs are illustrated for one direction of travel and are normally posted for each direction of travel.
- 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
- Regulatory speed limit signs shall have black legend and border on a white reflective background (See "Reflective Sheeting" on BC(4)).
- 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.
- Turning signs from view, laying signs over or down will not be allowed, unless as otherwise noted under "REMOVING OR COVERING" on BC(4).
- Techniques that may help reduce traffic speeds include but are not limited to:
 - Law enforcement.
 - Flagger stationed next to sign.
 - Portable changeable message sign (PCMS).
 - Low-power (drone) radar transmitter.
 - Speed monitor trailers or signs.
- Speeds shown on details above are for illustration only. Work Zone Speed Limits should only be posted as approved for each project.
- 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.

DISCLAIMER: The use of this standard is governed by the "Texas Engineering Practice Act". No warranty of any kind is made by TxDOT for any purpose whatsoever. TxDOT assumes no responsibility for the conversion of this standard to other formats or for incorrect results or damages resulting from its use.

DATE:
FILE:

SHEET 3 OF 12



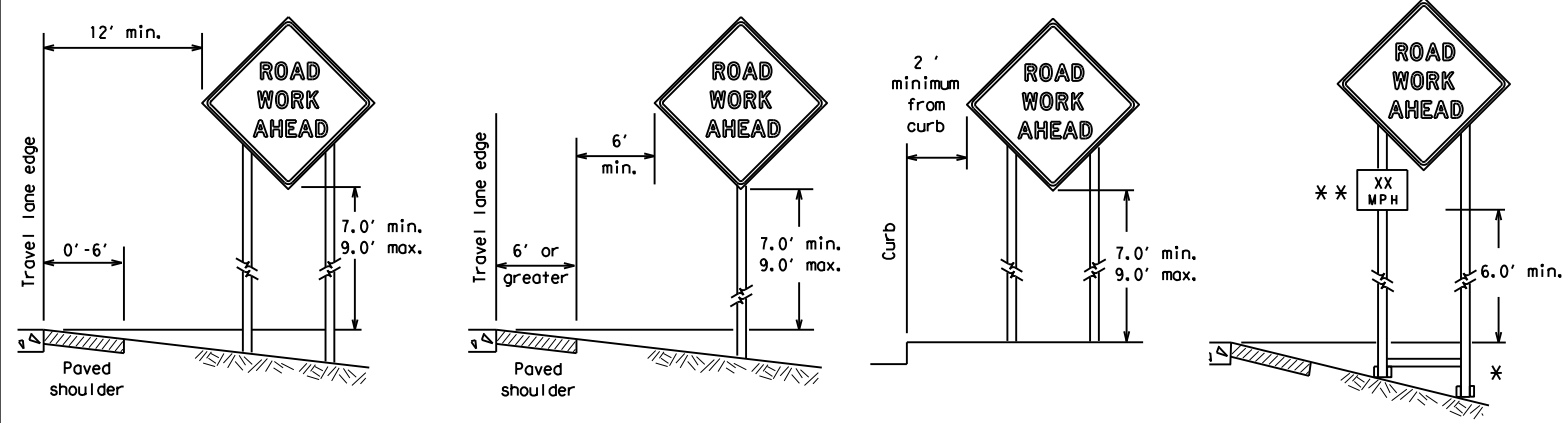
BARRICADE AND CONSTRUCTION WORK ZONE SPEED LIMIT

BC (3) - 21

FILE:	bc-21.dgn	DW:	TxDOT	CK:	TxDOT	DW:	TxDOT	CK:	TxDOT
© TxDOT	November 2002	CONT	SECT	JOB	HIGHWAY				
REVISIONS		0122	03	033, ETC.		US 287, ETC.			
9-07	8-14	DIST		COUNTY		SHEET NO.			
7-13	5-21	BRY		FREESTONE, ETC.		36			

DISCLAIMER: The use of this standard is governed by the "Texas Engineering Practice Act". No warranty of any kind is made by TxDOT for any purpose whatsoever. TxDOT assumes no responsibility for the conversion of this standard to other formats or for incorrect results or damages resulting from its use.

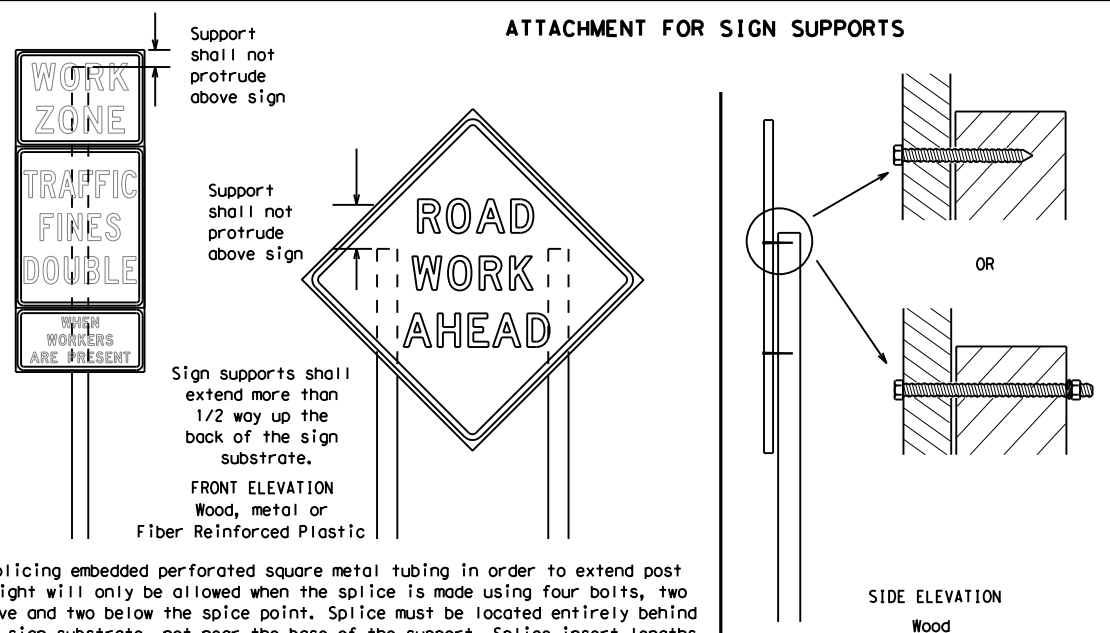
TYPICAL MINIMUM CLEARANCES FOR LONG TERM AND INTERMEDIATE TERM SIGNS



* 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



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 splice 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.

GENERAL NOTES FOR WORK ZONE SIGNS

- Contractor shall install and maintain signs in a straight and plumb condition and/or as directed by the Engineer.
- Wooden sign posts shall be painted white.
- Barricades shall NOT be used as sign supports.
- 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.
- 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.
- 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.
- 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.
- 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.
- 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)

- 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.
 - Long-term stationary - work that occupies a location more than 3 days.
 - 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.
 - Short-term stationary - daytime work that occupies a location for more than 1 hour in a single daylight period.
 - Short, duration - work that occupies a location up to 1 hour.
 - Mobile - work that moves continuously or intermittently (stopping for up to approximately 15 minutes.)

SIGN MOUNTING HEIGHT

- 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.
- 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.
- Long-term/Intermediate-term Signs may be used in lieu of Short-term/Short Duration signing.
- 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.
- 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

- 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

- 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.
- "Mesh" type materials are NOT an approved sign substrate, regardless of the tightness of the weave.
- 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

- 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).
- White sheeting, meeting the requirements of DMS-8300 Type A, shall be used for signs with a white background.
- 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

- 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

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

SIGN SUPPORT WEIGHTS

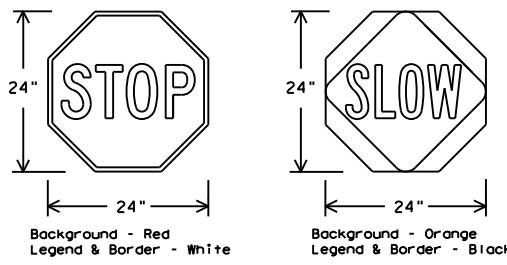
- Where sign supports require the use of weights to keep from turning over, the use of sandbags with dry, cohesionless sand should be used.
- The sandbags will be tied shut to keep the sand from spilling and to maintain a constant weight.
- Rock, concrete, iron, steel or other solid objects shall not be permitted for use as sign support weights.
- 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.
- 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.
- 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.
- Sandbags shall NOT be placed under the skid and shall not be used to level sign supports placed on slopes.

FLAGS ON SIGNS

- 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.

STOP/SLOW PADDLES

- STOP/SLOW paddles are the primary method to control traffic by flaggers. The STOP/SLOW paddle size should be 24" x 24".
- STOP/SLOW paddles shall be retroreflective when used at night.
- STOP/SLOW paddles may be attached to a staff with a minimum length of 6' to the bottom of the sign.
- 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

- 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.
- 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.
- When existing permanent signs are moved and relocated due to construction purposes, they shall be visible to motorists at all times.
- 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.
- 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.
- 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.

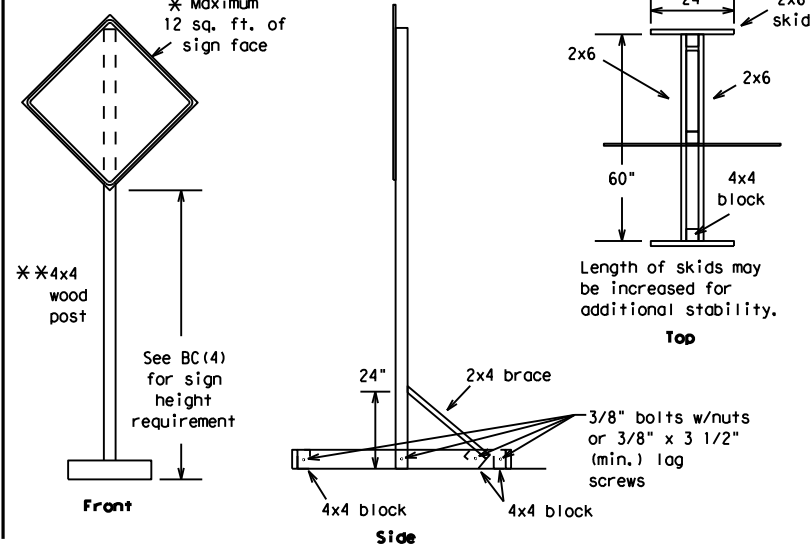
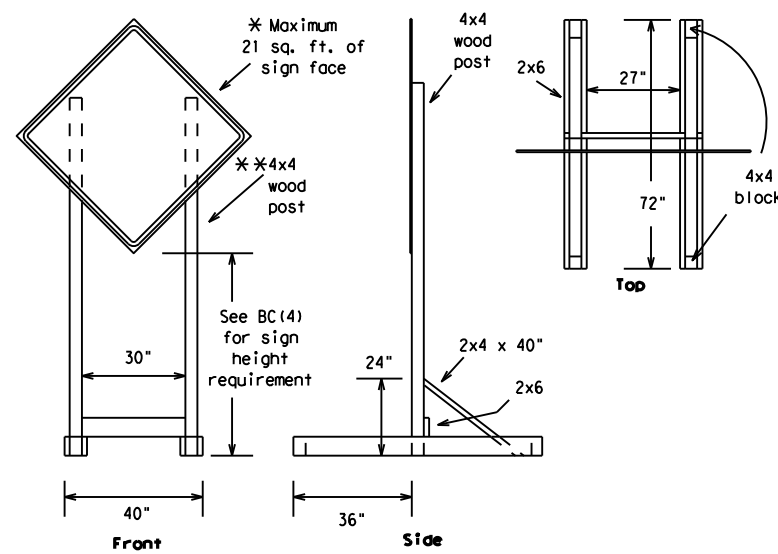


BARRICADE AND CONSTRUCTION TEMPORARY SIGN NOTES

BC (4) - 21

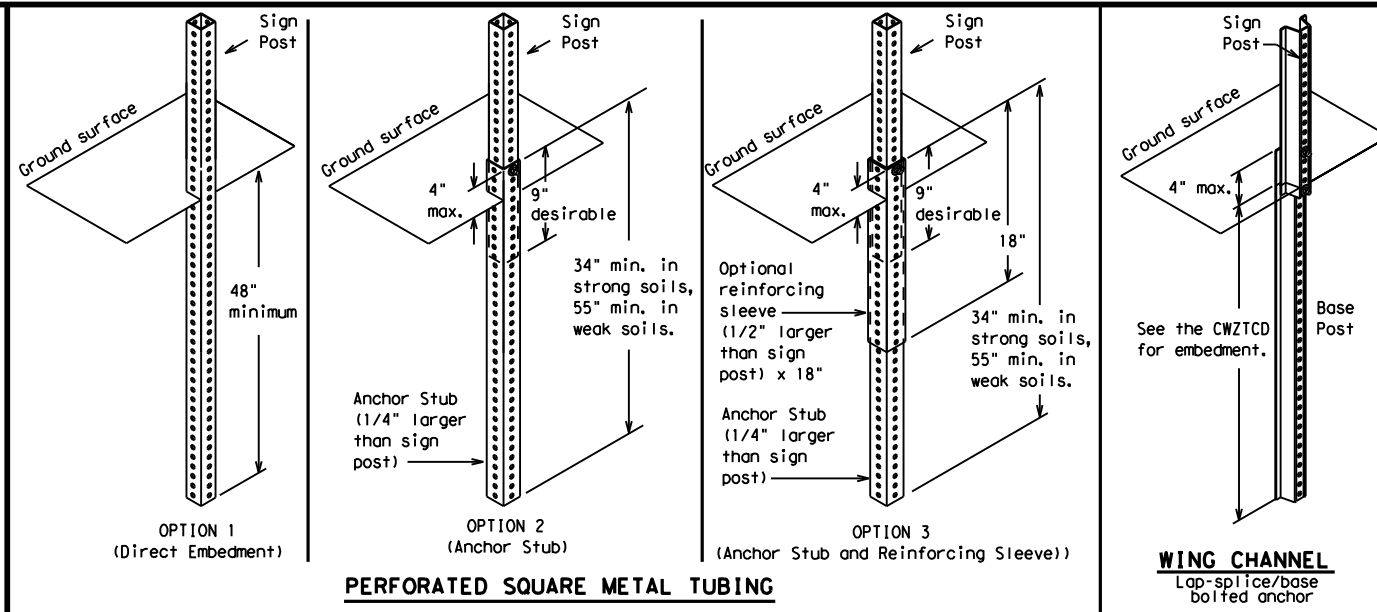
FILE:	bc-21.dgn	DN:	TxDOT	CR:	TxDOT	OW:	TxDOT	CK:	TxDOT
© TxDOT	November 2002	CONT	SECT	JOB	HIGHWAY				
REVISIONS		0122	03	033,ETC.	US 287, ETC.				
9-07	8-14	DIST	COUNTY		SHEET NO.				
7-13	5-21	BRY	FREESTONE, ETC.		37				

DISCLAIMER: The use of this standard is governed by the "Texas Engineering Practice Act". No warranty of any kind is made by TxDOT for any purpose whatsoever. TxDOT assumes no responsibility for the conversion of this standard to other formats or for incorrect results or damages resulting from its use.



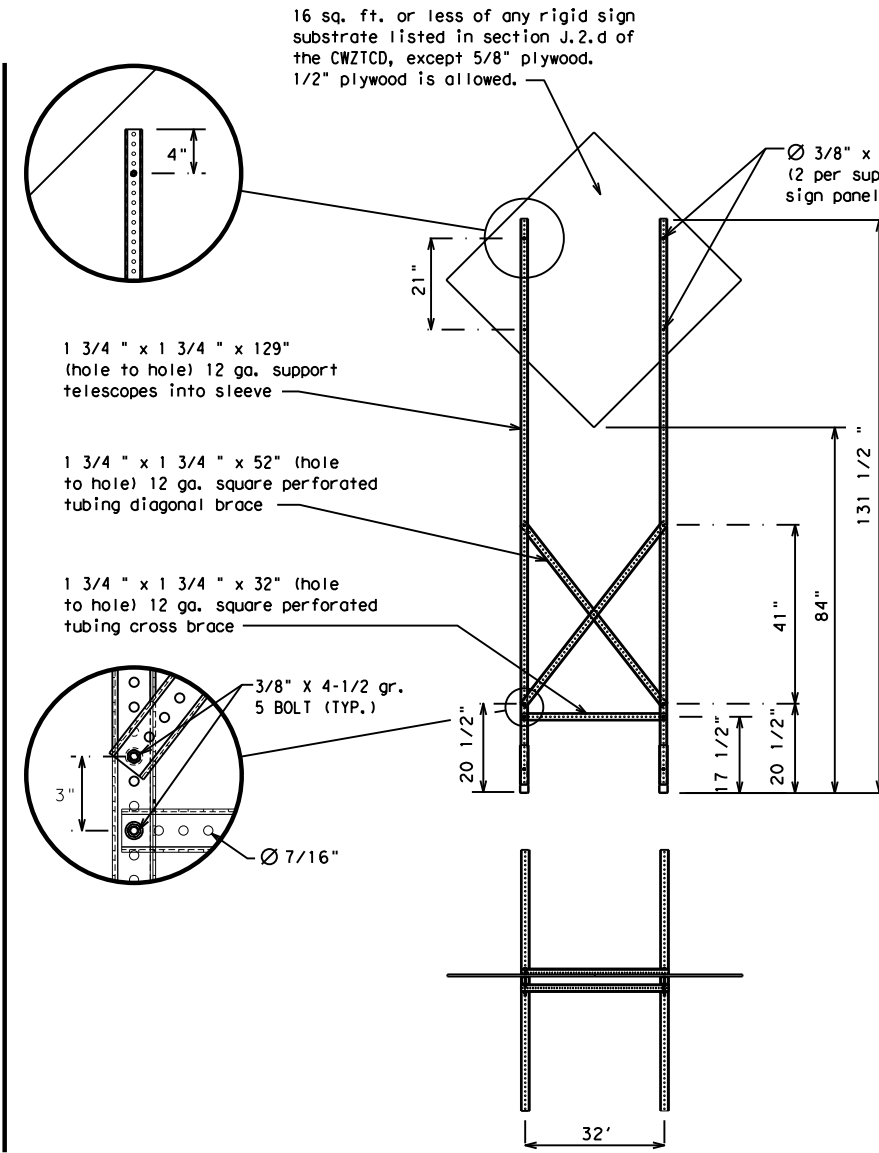
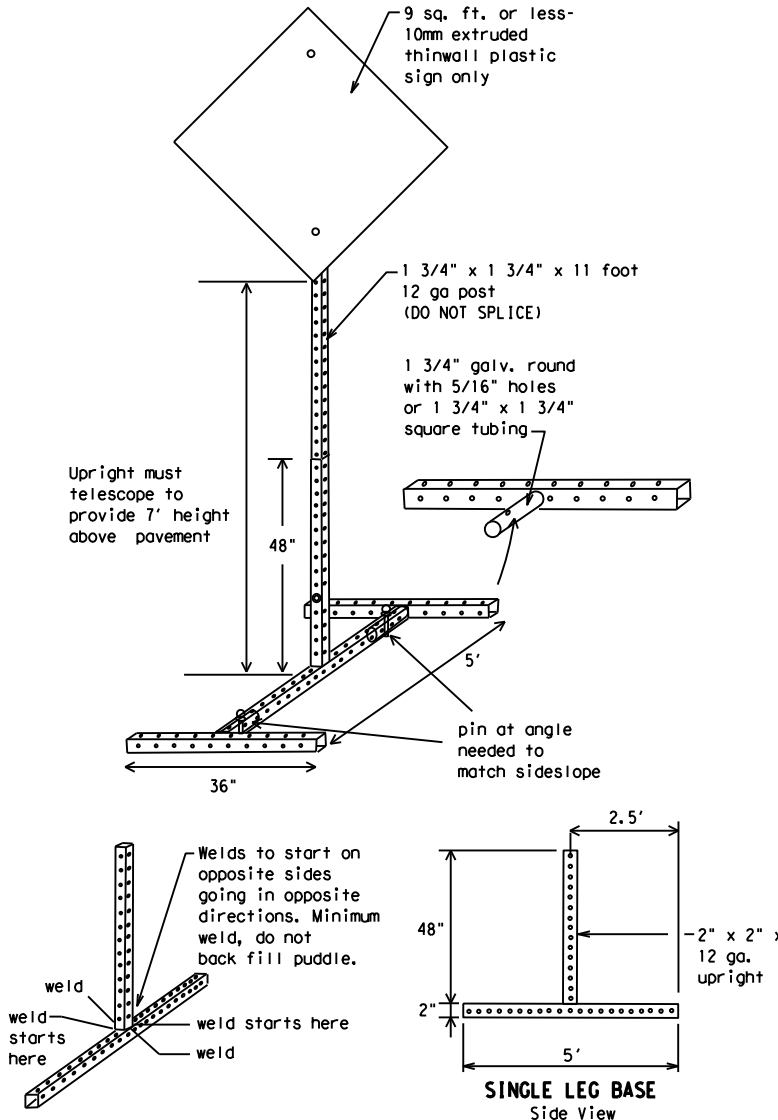
SKID MOUNTED WOOD SIGN SUPPORTS

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



GROUND MOUNTED SIGN SUPPORTS

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



SKID MOUNTED PERFORATED SQUARE STEEL TUBING SIGN SUPPORTS

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

WEDGE ANCHORS

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

OTHER DESIGNS

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

GENERAL NOTES

- 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.
- No more than 2 sign posts shall be placed within a 7 ft. circle, except for specific materials noted on the CWZTCD List.
- 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.

SHEET 5 OF 12



BARRICADE AND CONSTRUCTION TYPICAL SIGN SUPPORT

BC(5) - 21

FILE:	bc-21.dgn	DN:	TxDOT	CK:	TxDOT	DW:	TxDOT	CR:	TxDOT
© TxDOT	November 2002	CONT	SECT	JOB	HIGHWAY				
REVISIONS		0122	03	033,ETC.	US 287, ETC.				
9-07	8-14	DIST	COUNTY	SHEET NO.					
7-13	5-21	BRY	FREESTONE, ETC.	38					

DATE:
FILE:

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

RECOMMENDED PHASES AND FORMATS FOR PCMS MESSAGES DURING ROADWORK ACTIVITIES

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

PORTABLE CHANGEABLE MESSAGE SIGNS

- The Engineer/Inspector shall approve all messages used on portable changeable message signs (PCMS).
- 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.
- 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.
- Use the word "EXIT" to refer to an exit ramp on a freeway; i.e., "EXIT CLOSED." Do not use the term "RAMP."
- Always use the route or interstate designation (IH, US, SH, FM) along with the number when referring to a roadway.
- When in use, the bottom of a stationary PCMS message panel should be a minimum 7 feet above the roadway, where possible.
- 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.
- 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.
- Do not "flash" messages or words included in a message. The message should be steady burn or continuous while displayed.
- 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.
- Do not use the word "Danger" in message.
- Do not display the message "LANES SHIFT LEFT" or "LANES SHIFT RIGHT" on a PCMS. Drivers do not understand the message.
- Do not display messages that scroll horizontally or vertically across the face of the sign.
- 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.
- 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.
- Each line of text should be centered on the message board rather than left or right justified.
- 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.

DISCLAIMER: The use of this standard is governed by the "Texas Engineering Practice Act." No warranty of any kind is made by TxDOT for any purpose whatsoever. TxDOT assumes no responsibility for the conversion of this standard to other formats or for incorrect results or damages resulting from its use.

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
XXXXXXXX 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

** See Application Guidelines Note 6.

WORD OR PHRASE	ABBREVIATION	WORD OR PHRASE	ABBREVIATION
Access Road	ACCS RD	Major	MAJ
Alternate	ALT	Miles	MI
Avenue	AVE	Miles Per Hour	MPH
Best Route	BEST RTE	Minor	MNR
Boulevard	BLVD	Monday	MON
Bridge	BRDG	Normal	NORM
Canal	CANT	North	N
Center	CTR	Northbound	(route) N
Construction Ahead	CONST AHD	Parking	PKING
CROSSING	XING	Road	RD
Detour Route	DETOUR RTE	Right Lane	RT LN
Do Not	DONT	Saturday	SAT
East	E	Service Road	SERV RD
Eastbound	(route) E	Shoulder	SHLDR
Emergency	EMER	Slippery	SLIP
Emergency Vehicle	EMER VEH	South	S
Entrance, Enter	ENT	Southbound	(route) S
Express Lane	EXP LN	Speed	SPD
Expressway	EXPWY	Street	ST
XXXX Feet	XXXX FT	Sunday	SUN
Fog Ahead	FOG AHD	Telephone	PHONE
Freeway	FRWY, FWY	Temporary	TEMP
Freeway Blocked	FWY BLKD	Thursday	THURS
Friday	FRI	To Downtown	TO DWNTN
Hazardous Driving	HAZ DRIVING	Traffic	TRAF
Hazardous Material	HAZMAT	Travelers	TRVLR
High-Occupancy Vehicle	HOV	Tuesday	TUES
Highway	HWY	Time Minutes	TIME MIN
Hour(s)	HR, HRS	Upper Level	UPR LEVEL
Information	INFO	Vehicles (s)	VEH, VEHS
It Is	ITS	Warning	WARN
Junction	JCT	Wednesday	WED
Left	LFT	Weight Limit	WT LIMIT
Left Lane	LFT LN	West	W
Lane Closed	LN CLOSED	Westbound	(route) W
Lower Level	LWR LEVEL	Wet Pavement	WET PVMT
Maintenance	MAINT	Will Not	WONT

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

APPLICATION GUIDELINES

- Only 1 or 2 phases are to be used on a PCMS.
- The 1st phase (or both) should be selected from the "Road/Lane/Ramp Closure List" and the "Other Condition List".
- A 2nd phase can be selected from the "Action to Take/Effect on Travel, Location, General Warning, or Advance Notice Phase Lists".
- A Location Phase is necessary only if a distance or location is not included in the first phase selected.
- 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.
- 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

- The words RIGHT, LEFT and ALL can be interchanged as appropriate.
- Roadway designations IH, US, SH, FM and LP can be interchanged as appropriate.
- EAST, WEST, NORTH and SOUTH (or abbreviations E, W, N and S) can be interchanged as appropriate.
- Highway names and numbers replaced as appropriate.
- ROAD, HIGHWAY and FREEWAY can be interchanged as needed.
- AHEAD may be used instead of distances if necessary.
- FT and MI, MILE and MILES interchanged as appropriate.
- AT, BEFORE and PAST interchanged as needed.
- 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

- 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.
- 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.
- 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.
- 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.

SHEET 6 OF 12



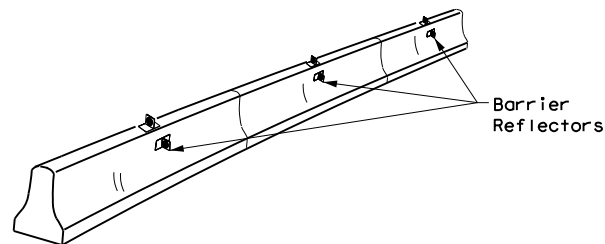
BARRICADE AND CONSTRUCTION PORTABLE CHANGEABLE MESSAGE SIGN (PCMS)

BC (6) - 21

FILE: bc-21.dgn	DN: TxDOT	CR: TxDOT	DW: TxDOT	CK: TxDOT
© TxDOT November 2002	CONT	SECT	JOB	HIGHWAY
REVISIONS	0122	03	033,ETC.	US 287, ETC.
9-07 8-14	DIST	COUNTY	SHEET NO.	
7-13 5-21	BRY	FREESTONE, ETC.	39	

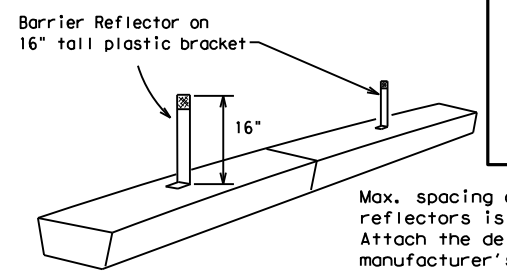
DISCLAIMER: The use of this standard is governed by the "Texas Engineering Practice Act". No warranty of any kind is made by TxDOT for any purpose whatsoever. TxDOT assumes no responsibility for the conversion of this standard to other formats or for incorrect results or damages resulting from its use.

- 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).
- 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)

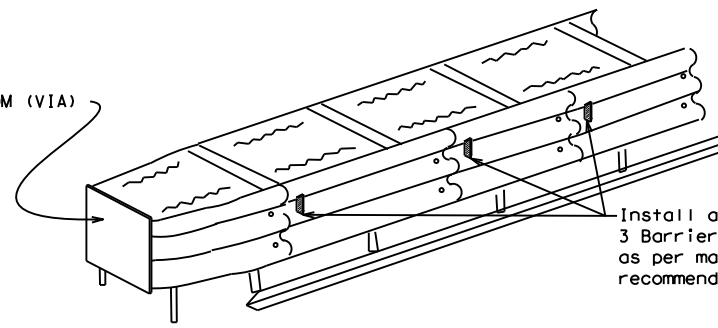
- Where traffic is on one side of the CTB, two (2) Barrier Reflectors shall be mounted in approximately the midsection of each section of CTB. An alternate mounting location is uniformly spaced at one end of each CTB. This will allow for attachment of a barrier grapple without damaging the reflector.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



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.

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

LOW PROFILE CONCRETE BARRIER (LPCB)



DELINEATION OF END TREATMENTS

END TREATMENTS FOR CTB'S USED IN WORK ZONES
 End treatments used on CTB's in work zones shall meet the appropriate 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

WARNING LIGHTS

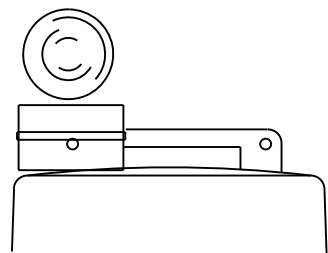
- Warning lights shall meet the requirements of the TMUTCD.
- Warning lights shall NOT be installed on barricades.
- Type A-Low Intensity Flashing Warning Lights are commonly used with drums. They are intended to warn of or mark a potentially hazardous area. Their use shall be as indicated on this sheet 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.
- 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".
- The Engineer/Inspector or the plans shall specify the location and type of warning lights to be installed on the traffic control devices.
- 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.
- 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.
- The location of warning lights and warning reflectors on drums shall be as shown elsewhere in the plans.

WARNING LIGHTS MOUNTED ON PLASTIC DRUMS

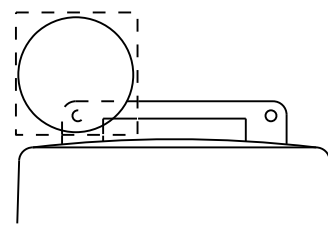
- Type A flashing warning lights are intended to warn drivers that they are approaching or are in a potentially hazardous area.
- Type A random flashing warning lights are not intended for delineation and shall not be used in a series.
- A series of sequential flashing warning lights placed on channelizing 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.
- 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.
- Type A, Type C and Type D warning lights shall be installed at locations as detailed on other sheets in the plans.
- Warning lights shall not be installed on a drum that has a sign, chevron or vertical panel.
- 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

- 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.
- 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.
- The warning reflector shall have a minimum retroreflective surface area (one-side) of 30 square inches.
- Round reflectors shall be fully reflectorized, including the area where attached to the drum.
- 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.
- 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.
- When used near two-way traffic, both sides of the warning reflector shall be reflectorized.
- The warning reflector should be mounted on the side of the handle nearest approaching traffic.
- The maximum spacing for warning reflectors should be identical to the channelizing device spacing requirements.



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

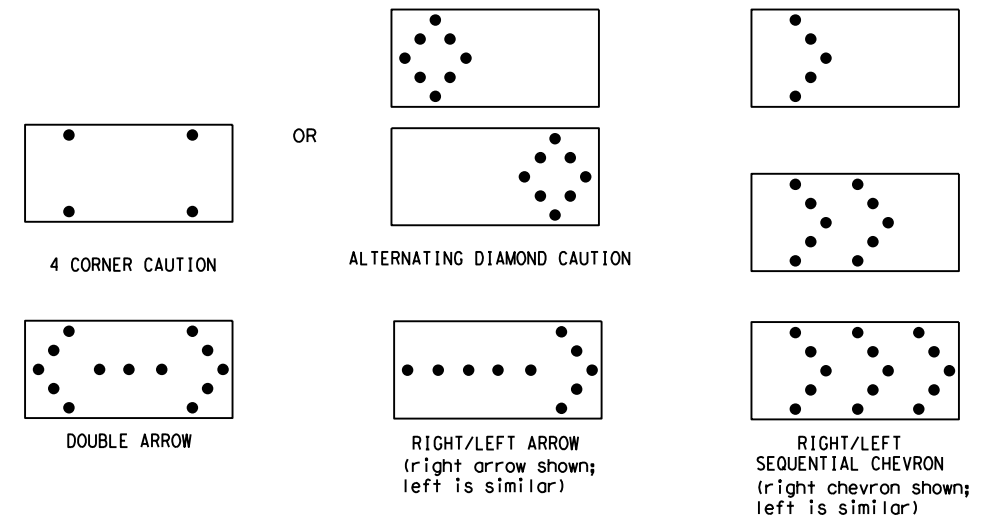


Warning reflector may be round or square. Must have a yellow reflective surface area of at least 30 square inches

DATE:
FILE:

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.

- 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.
- 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.
- 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.
- The Flashing Arrow Board should be able to display the following symbols:



- The "CAUTION" display consists of four corner lamps flashing simultaneously, or the Alternating Diamond Caution mode as shown.
- The straight line caution display is NOT ALLOWED.
- 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.
- 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.
- The sequential arrow display is NOT ALLOWED.
- The flashing arrow display is the TxDOT standard; however, the sequential chevron display may be used during daylight operations.
- The Flashing Arrow Board shall be mounted on a vehicle, trailer or other suitable support.
- A Flashing Arrow Board SHALL NOT BE USED to laterally shift traffic.
- 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.
- 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

SHEET 7 OF 12

TRUCK-MOUNTED ATTENUATORS

- Truck-mounted attenuators (TMA) used on TxDOT facilities must meet the requirements outlined in the Manual for Assessing Safety Hardware (MASH).
- Refer to the CWZTCD for the requirements of Level 2 or Level 3 TMAs.
- Refer to the CWZTCD for a list of approved TMAs.
- TMAs are required on freeways unless otherwise noted in the plans.
- 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.
- 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.



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

BC (7) -21

FILE:	bc-21.dgn	DN:	TxDOT	CR:	TxDOT	OW:	TxDOT	CK:	TxDOT
© TxDOT	November 2002	CONT	SECT	JOB	HIGHWAY				
REVISIONS		0122	03	033,ETC.	US 287, ETC.				
9-07	8-14	DIST	COUNTY		SHEET NO.				
7-13	5-21	BRY	FREESTONE, ETC.		40				

DISCLAIMER: The use of this standard is governed by the "Texas Engineering Practice Act". No warranty of any kind is made by TxDOT for any purpose whatsoever. TxDOT assumes no responsibility for the conversion of this standard to other formats or for incorrect results or damages resulting from its use.

GENERAL NOTES

- For long term stationary work zones on freeways, drums shall be used as the primary channelizing device.
- 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.
- 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.
- 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).
- 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.
- 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:

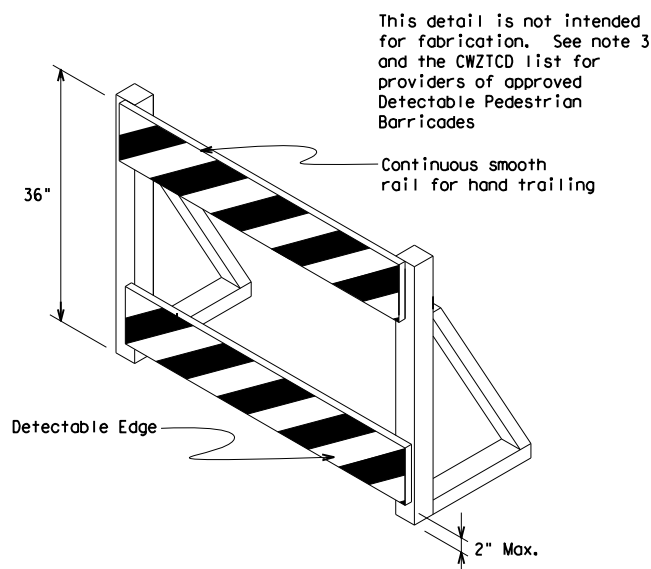
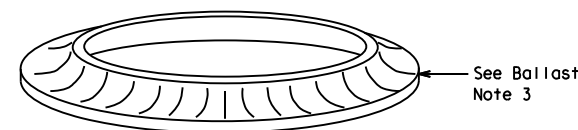
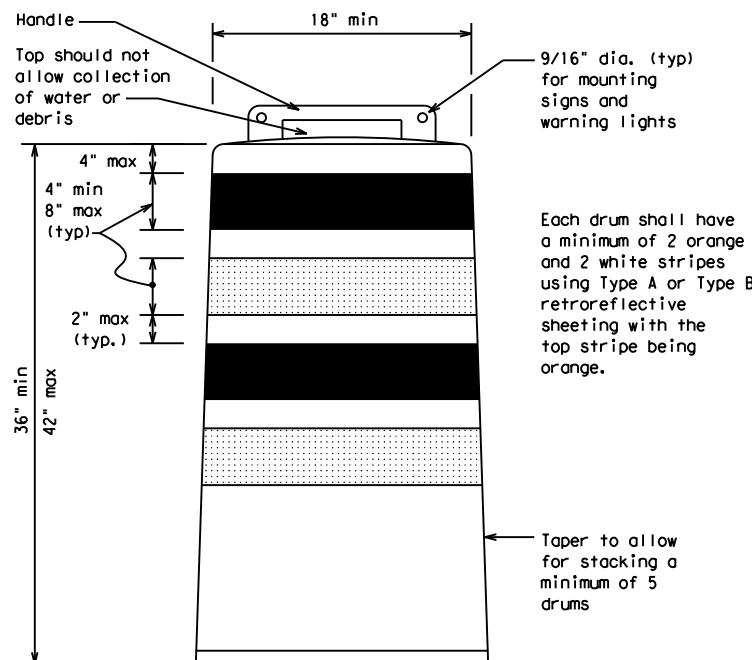
- Plastic drums shall be a two-piece design; the "body" of the drum shall be the top portion and the "base" shall be the bottom.
- The body and base shall lock together in such a manner that the body separates from the base when impacted by a vehicle traveling at a speed of 20 MPH or greater but prevents accidental separation due to normal handling and/or air turbulence created by passing vehicles.
- 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.
- 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.
- 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.
- 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.
- 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.
- Plastic drums shall be constructed of ultra-violet stabilized, orange, high-density polyethylene (HDPE) or other approved material.
- Drum body shall have a maximum unballasted weight of 11 lbs.
- Drum and base shall be marked with manufacturer's name and model number.

RETROREFLECTIVE SHEETING

- 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.
- 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.

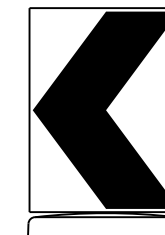
BALLAST

- 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.
- 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.
- Recycled truck tire sidewalls may be used for ballast on drums approved for this type of ballast on the CWZTCD list.
- 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.
- 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.
- Ballast shall not be placed on top of drums.
- Adhesives may be used to secure base of drums to pavement.

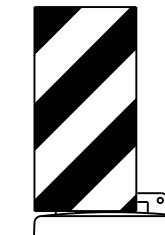


DETECTABLE PEDESTRIAN BARRICADES

- 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.
- 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.
- 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.
- 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.
- Warning lights shall not be attached to detectable pedestrian barricades.
- 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

- Signs used on plastic drums shall be manufactured using substrates listed on the CWZTCD.
- 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.
- 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.
- 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.
- Signs shall be installed using a 1/2 inch bolt (nominal) and nut, two washers, and one locking washer for each connection.
- Mounting bolts and nuts shall be fully engaged and adequately torqued. Bolts should not extend more than 1/2 inch beyond nuts.
- 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.
- 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.

SHEET 8 OF 12



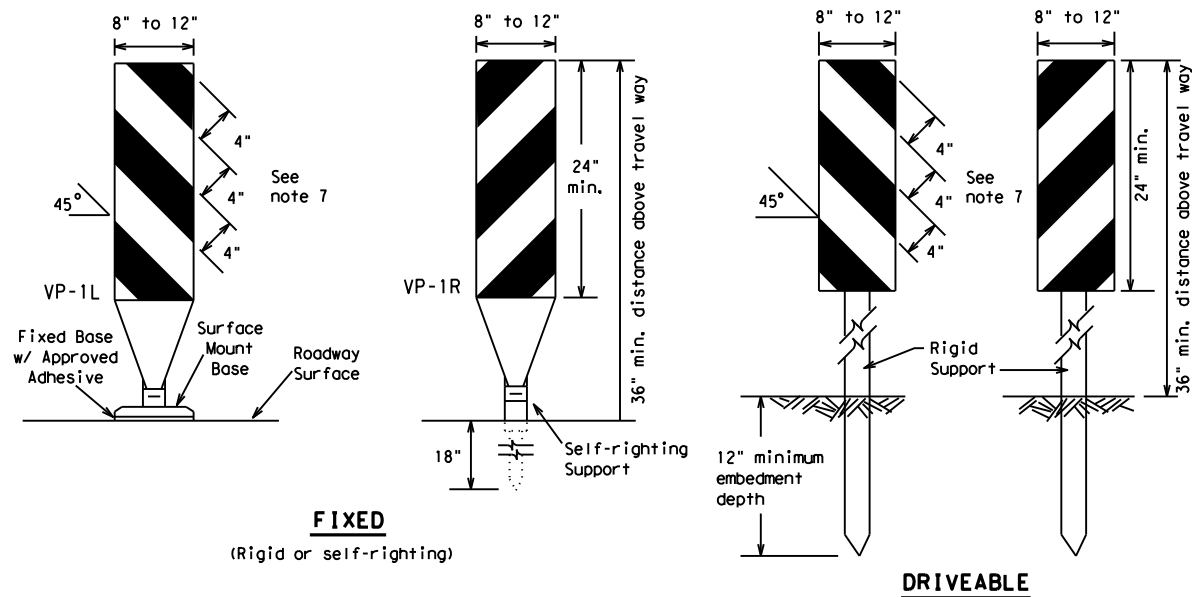
BARRICADE AND CONSTRUCTION CHANNELIZING DEVICES

BC (8) - 21

FILE:	bc-21.dgn	DW:	TxDOT	CK:	TxDOT	DW:	TxDOT	CK:	TxDOT
© TxDOT	November 2002	CONT:	0122	SECT:	03	JOB:	033,ETC.	US 287, ETC.	HIGHWAY
REVISIONS		DIST		COUNTY		SHEET NO.			
4-03	8-14								
9-07	5-21								
7-13		BRY		FREESTONE, ETC.				41	

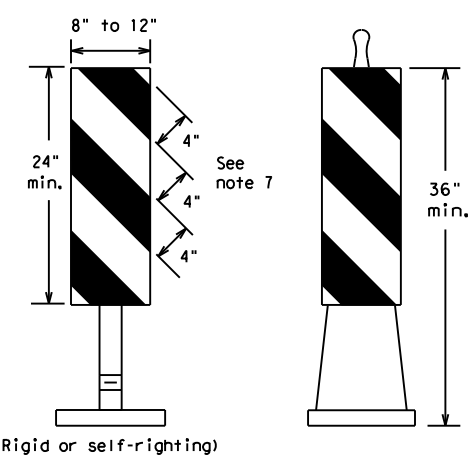
DATE:
FILE:

DISCLAIMER: The use of this standard is governed by the "Texas Engineering Practice Act". No warranty of any kind is made by TxDOT for any purpose whatsoever. TxDOT assumes no responsibility for the conversion of this standard to other formats or for incorrect results or damages resulting from its use.



FIXED
(Rigid or self-righting)

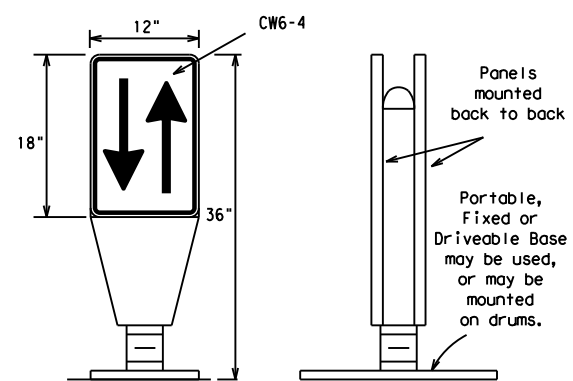
DRIVEABLE



PORTABLE

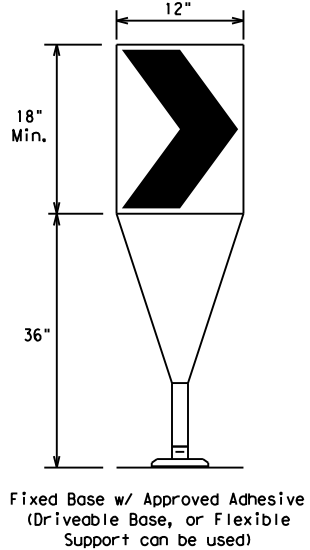
VERTICAL PANELS (VPs)

- Vertical Panels (VP's) are normally used to channelize traffic or divide opposing lanes of traffic.
- 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.
- 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.
- VP's used on expressways and freeways or other high speed roadways, may have more than 270 square inches of retroreflective area facing traffic.
- Self-righting supports are available with portable base. See "Compliant Work Zone Traffic Control Devices List" (CWZTCD).
- Sheeting for the VP's shall be retroreflective Type A or Type B conforming to Departmental Material Specification DMS-8300, unless noted otherwise.
- Where the height of reflective material on the vertical panel is 36 inches or greater, a panel stripe of 6 inches shall be used.



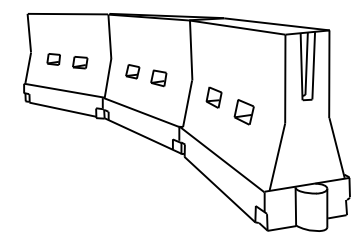
OPPOSING TRAFFIC LANE DIVIDERS (OTLD)

- 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.
- The OTLD may be used in combination with 42" cones or VPs.
- Spacing between the OTLD shall not exceed 500 feet. 42" cones or VPs placed between the OTLD's should not exceed 100 foot spacing.
- 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.



- The chevron shall be a vertical rectangle with a minimum size of 12 by 18 inches.
- 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.
- 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.
- To be effective, the chevron should be visible for at least 500 feet.
- 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.
- 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



LONGITUDINAL CHANNELIZING DEVICES (LCD)

- 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.
- LCDs may be used instead of a line of cones or drums.
- LCDs shall be placed in accordance to application and installation requirements specific to the device, and used only when shown on the CWZTCD list.
- LCDs should not be used to provide positive protection for obstacles, pedestrians or workers.
- LCDs shall be supplemented with retroreflective delineation as required for temporary barriers on BC(7) when placed roughly parallel to the travel lanes.
- 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

- 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.
- 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.
- 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.
- 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.
- 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

GENERAL NOTES

- 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).
- 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.
- 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).
- 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.
- Portable bases shall be fabricated from virgin and/or recycled rubber. The portable bases shall weigh a minimum of 30 lbs.
- 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.
- 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.

Posted Speed	Formula	Minimum Desirable Taper Lengths * *			Suggested Maximum Spacing of Channelizing Devices	
		10' Offset	11' Offset	12' Offset	On a Taper	On a Tangent
30	L = 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



BARRICADE AND CONSTRUCTION CHANNELIZING DEVICES

BC (9) - 21

FILE: bc-21.dgn	DN: TxDOT	CR: TxDOT	DW: TxDOT	CK: TxDOT
© TxDOT November 2002	CONT	SECT	JOB	HIGHWAY
REVISIONS	0122	03	033,ETC.	US 287, ETC.
9-07 8-14	DIST	COUNTY	SHEET NO.	
7-13 5-21	BRY	FREESTONE, ETC.	42	

DATE: FILE:

DISCLAIMER: The use of this standard is governed by the "Texas Engineering Practice Act". No warranty of any kind is made by TxDOT for any purpose whatsoever. TxDOT assumes no responsibility for the conversion of this standard to other formats or for incorrect results or damages resulting from its use.

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.

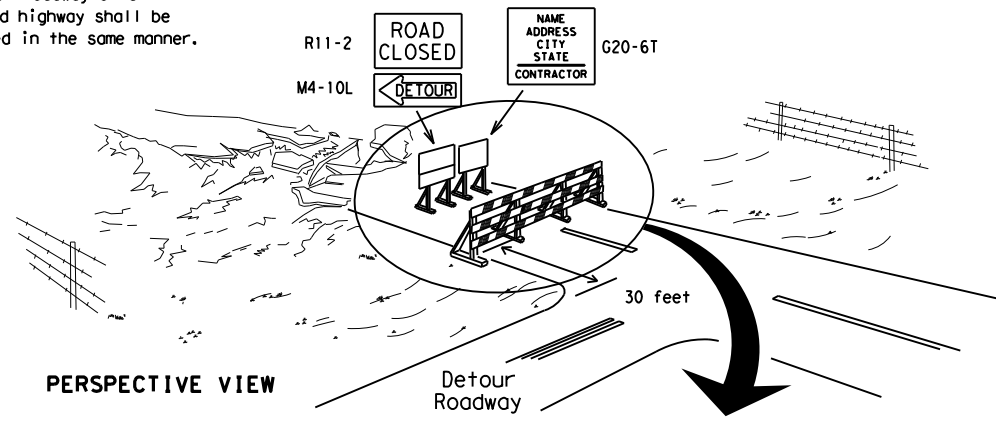


TYPICAL STRIPING DETAIL FOR BARRICADE RAIL



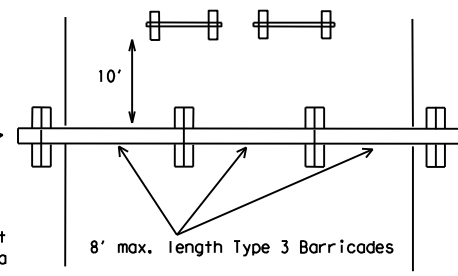
TYPICAL PANEL DETAIL FOR SKID OR POST TYPE BARRICADES

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



PERSPECTIVE VIEW

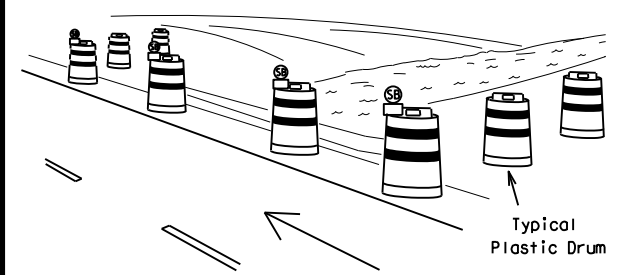
The three rails on Type 3 barricades shall be reflectorized orange and reflective white stripes on one side facing one-way traffic and both sides for two-way traffic. Barricade striping should slant downward in the direction of detour.



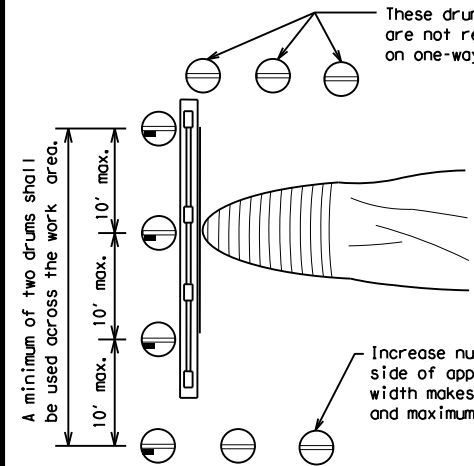
PLAN VIEW

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

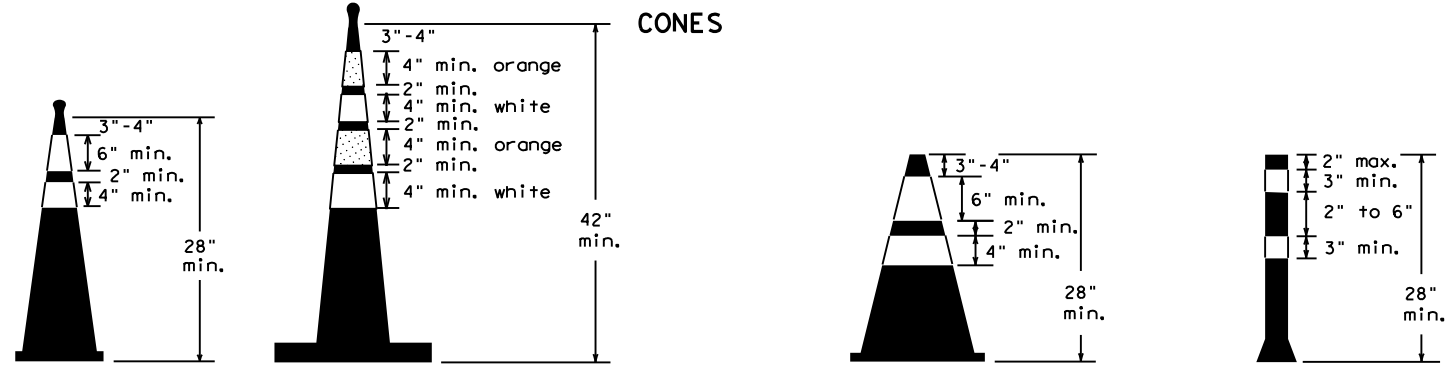


PLAN VIEW

CULVERT WIDENING OR OTHER ISOLATED WORK WITHIN THE PROJECT LIMITS

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

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



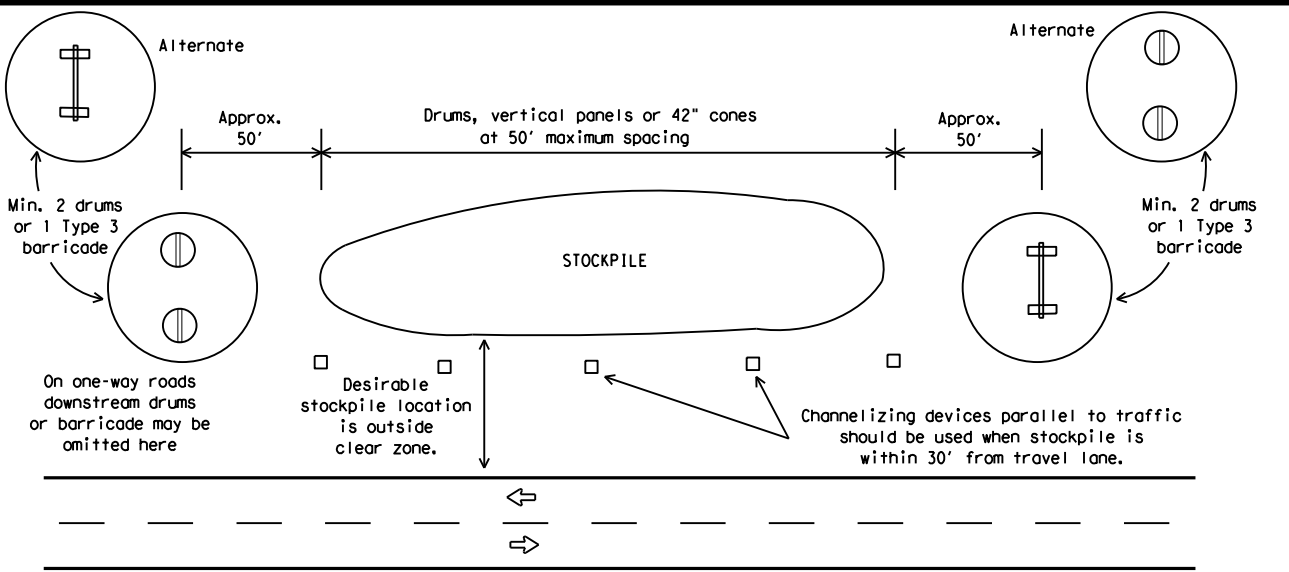
Two-Piece cones

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

BARRICADE AND CONSTRUCTION CHANNELIZING DEVICES

BC (10) - 21

FILE: bc-21.dgn	DN: TxDOT	CK: TxDOT	OW: TxDOT	CR: TxDOT
© TxDOT November 2002	CONT	SECT	JOB	HIGHWAY
REVISIONS	0122	03	033,ETC.	US 287, ETC.
9-07 8-14	DIST	COUNTY	SHEET NO.	
7-13 5-21	BRY	FREESTONE, ETC.	43	

WORK ZONE PAVEMENT MARKINGS

GENERAL

- 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.
- Color, patterns and dimensions shall be in conformance with the "Texas Manual on Uniform Traffic Control Devices" (TMUTCD).
- Additional supplemental pavement marking details may be found in the plans or specifications.
- Pavement markings shall be installed in accordance with the TMUTCD and as shown on the plans.
- 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).
- 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.
- All work zone pavement markings shall be installed in accordance with Item 662, "Work Zone Pavement Markings."

RAISED PAVEMENT MARKERS

- Raised pavement markers are to be placed according to the patterns on BC(12).
- 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

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

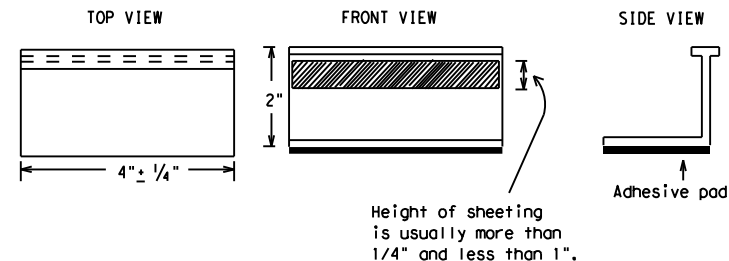
MAINTAINING WORK ZONE PAVEMENT MARKINGS

- The Contractor will be responsible for maintaining work zone pavement markings within the work limits.
- 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.
- 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.
- 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

- 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.
- 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.
- 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".
- The removal of pavement markings may require resurfacing or seal coating portions of the roadway as described in Item 677.
- Subject to the approval of the Engineer, any method that proves to be successful on a particular type pavement may be used.
- Blast cleaning may be used but will not be required unless specifically shown in the plans.
- Over-painting of the markings SHALL NOT BE permitted.
- Removal of raised pavement markers shall be as directed by the Engineer.
- 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.
- 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**

- Temporary flexible-reflective roadway marker tabs used as guidemarks shall meet the requirements of DMS-8242.
- 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.
 - 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.
 - 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.
- Small design variances may be noted between tab manufacturers.
- 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

- Raised pavement markers used as guidemarks shall be from the approved product list, and meet the requirements of DMS-4200.
- All temporary construction raised pavement markers provided on a project shall be of the same manufacturer.
- 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).

SHEET 11 OF 12



BARRICADE AND CONSTRUCTION PAVEMENT MARKINGS

BC(11)-21

FILE: bc-21.dgn	DN: TxDOT	CK: TxDOT	DW: TxDOT	CR: TxDOT
© TxDOT February 1998	CONT	SECT	JOB	HIGHWAY
REVISIONS		0122	03	033, ETC.
2-98	9-07	5-21		
1-02	7-13			
11-02	8-14			
	DIST	COUNTY		SHEET NO.
	BRY	FREESTONE, ETC.		44

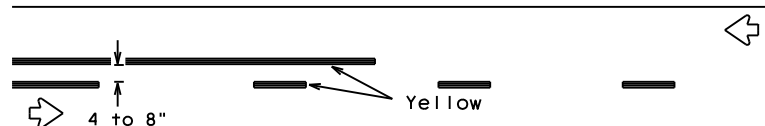
DISCLAIMER: The use of this standard is governed by the "Texas Engineering Practice Act". No warranty of any kind is made by TxDOT for any purpose whatsoever. TxDOT assumes no responsibility for the conversion of this standard to other formats or for incorrect results or damages resulting from its use.

DATE:
FILE:

PAVEMENT MARKING PATTERNS

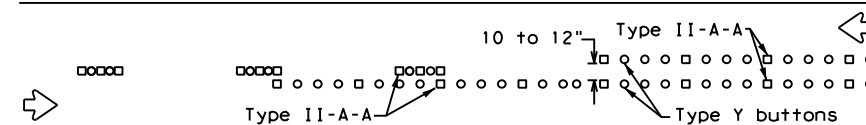


REFLECTORIZED PAVEMENT MARKINGS - PATTERN A

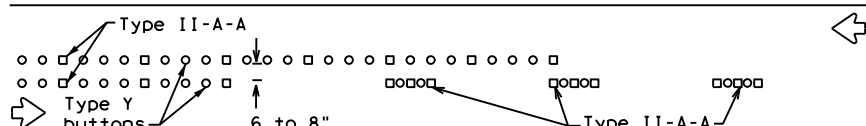


REFLECTORIZED PAVEMENT MARKINGS - PATTERN B

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.



RAISED PAVEMENT MARKERS - PATTERN A



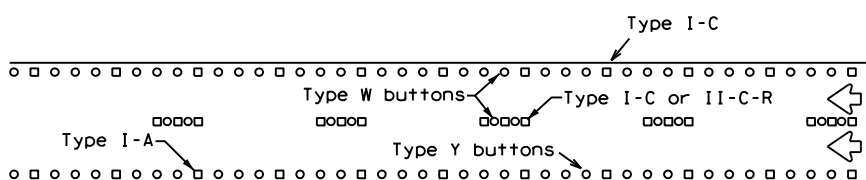
RAISED PAVEMENT MARKERS - PATTERN B

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



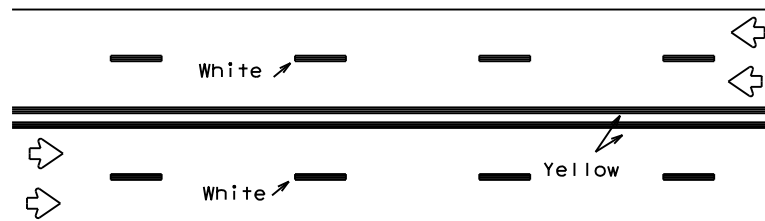
REFLECTORIZED PAVEMENT MARKINGS

Prefabricated markings may be substituted for reflectORIZED pavement markings.



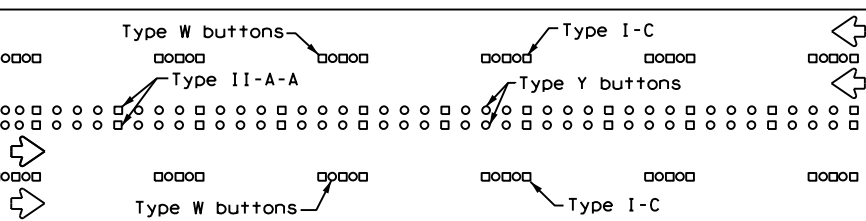
RAISED PAVEMENT MARKERS

EDGE & LANE LINES FOR DIVIDED HIGHWAY



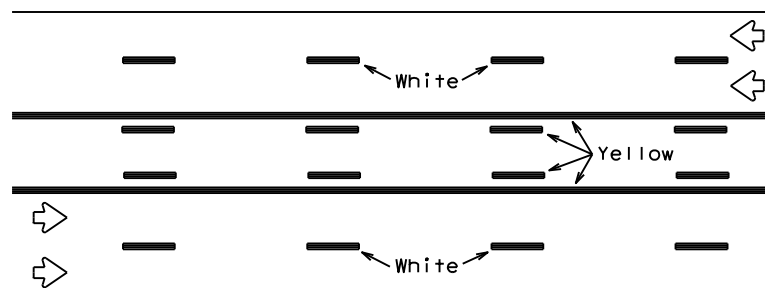
REFLECTORIZED PAVEMENT MARKINGS

Prefabricated markings may be substituted for reflectORIZED pavement markings.



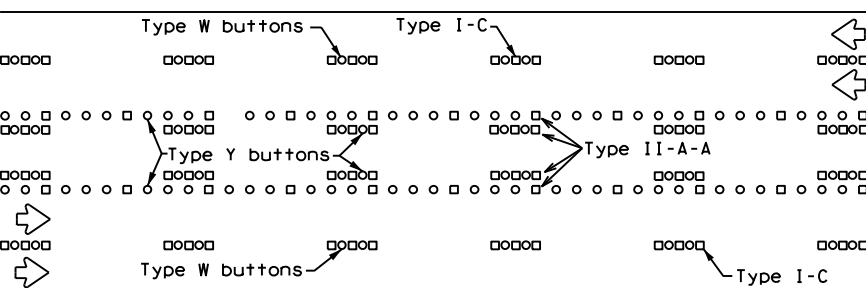
RAISED PAVEMENT MARKERS

LANE & CENTER LINES FOR MULTILANE UNDIVIDED HIGHWAYS



REFLECTORIZED PAVEMENT MARKINGS

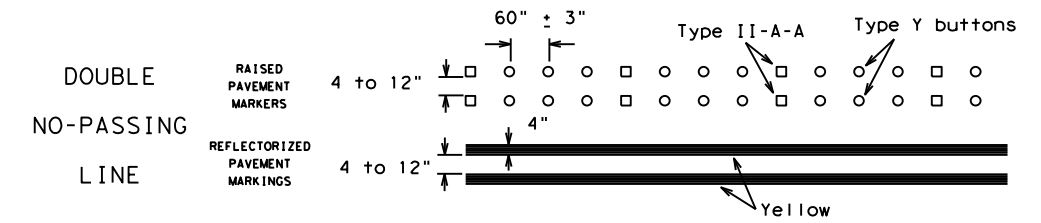
Prefabricated markings may be substituted for reflectORIZED pavement markings.



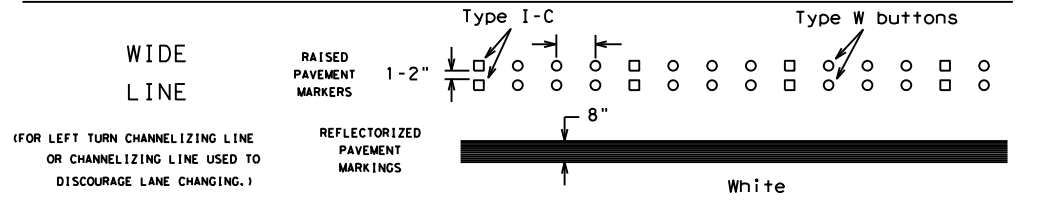
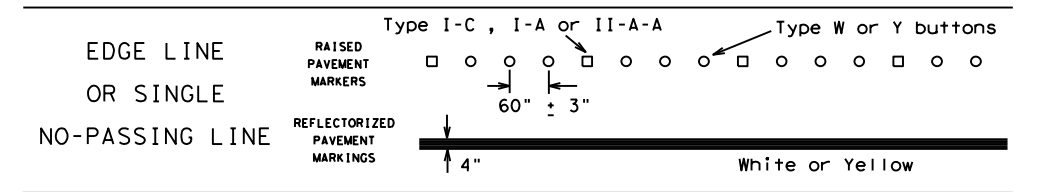
RAISED PAVEMENT MARKERS

TWO-WAY LEFT TURN LANE

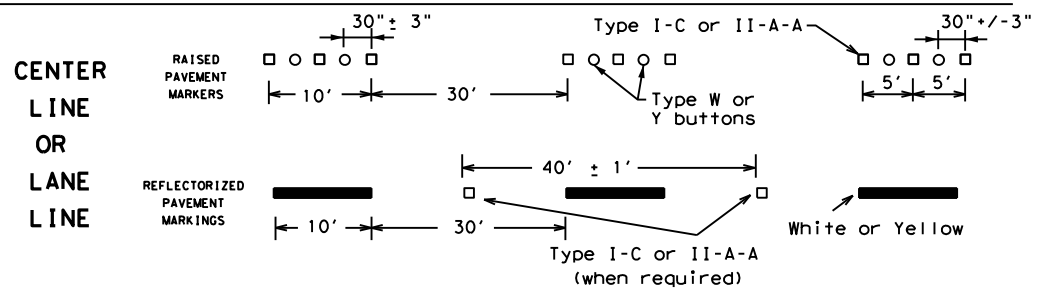
STANDARD WORK ZONE PAVEMENT MARKINGS DETAILS



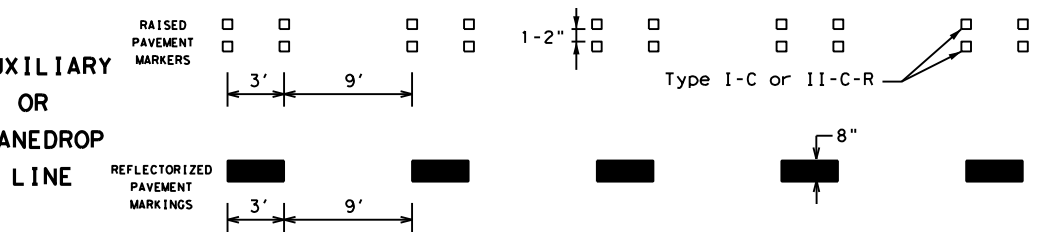
SOLID LINES



BROKEN LINES

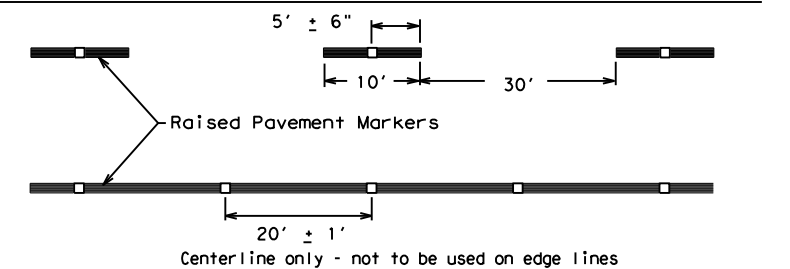


AUXILIARY OR LANEDROP LINE



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.



SHEET 12 OF 12



BARRICADE AND CONSTRUCTION PAVEMENT MARKING PATTERNS

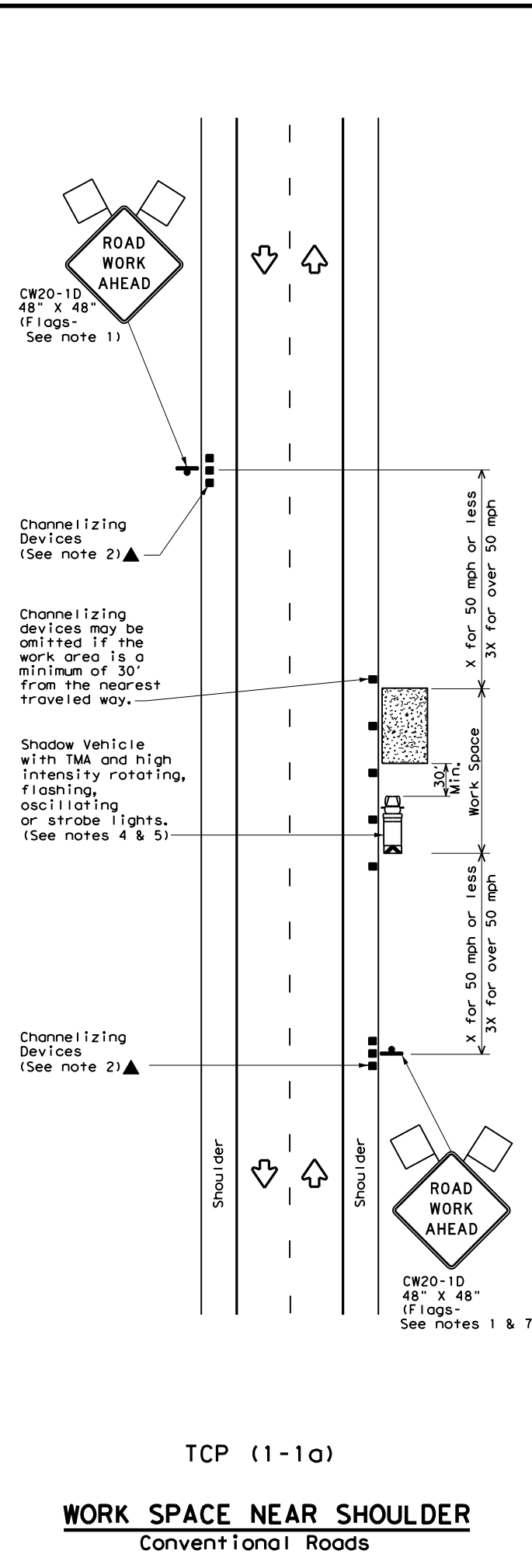
BC(12)-21

FILE: bc-21.dgn	DN: TxDOT	CK: TxDOT	OW: TxDOT	CK: TxDOT
©TxDOT February 1998	CONT	SECT	JOB	HIGHWAY
REVISIONS	0122	03	033,ETC.	US 287, ETC.
1-97 9-07 5-21	DIST	COUNTY	SHEET NO.	
2-98 7-13	BRY	FREESTONE, ETC.	45	
11-02 8-14				

DISCLAIMER: The use of this standard is governed by the "Texas Engineering Practice Act". No warranty of any kind is made by TxDOT for any purpose whatsoever. TxDOT assumes no responsibility for the conversion of this standard to other formats or for incorrect results or damages resulting from its use.

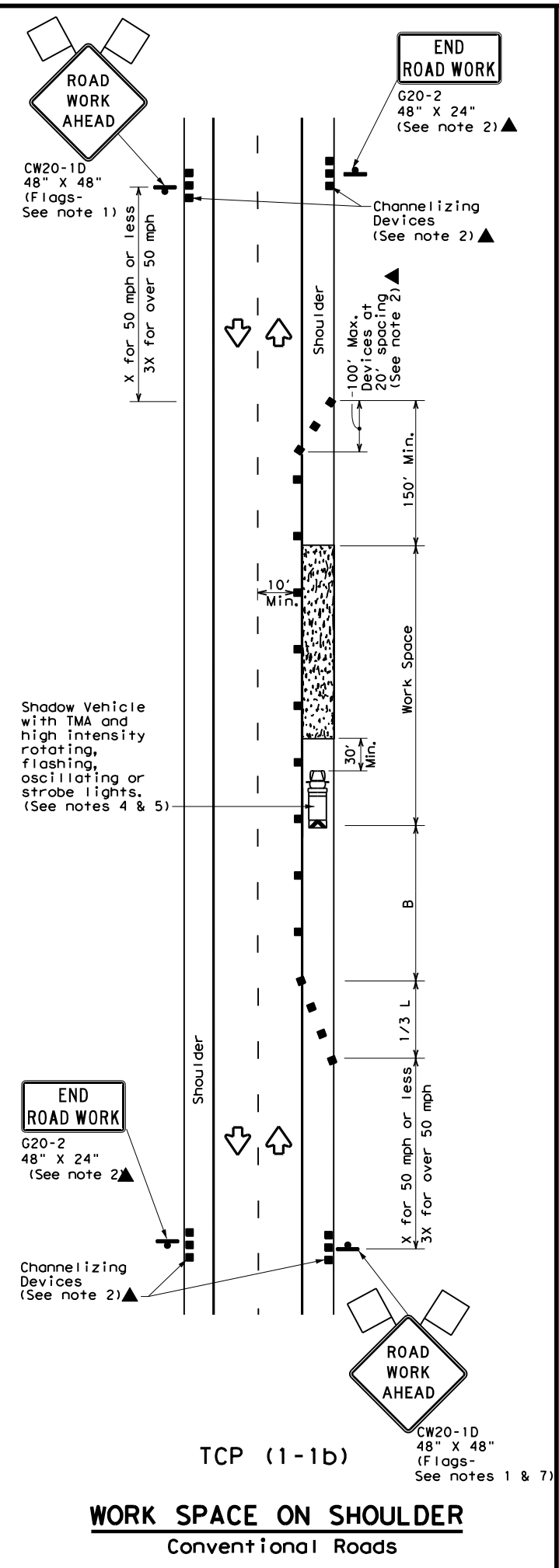
DATE: FILE:

DATE: 5/26/2022 4:32:54 PM
 FILE: \\txdot.projectwiseonline.com:TXDOT4\Documents\17 - BRY\Design Projects\17-0909\17-0909.dgn
 DISCLAIMER: The use of this standard is governed by the "Texas Engineering Practice Act". No warranty of any kind is made by TxDOT for any purpose whatsoever. TxDOT assumes no responsibility for the conversion of this standard to any other format or for any errors or omissions that may appear hereon.



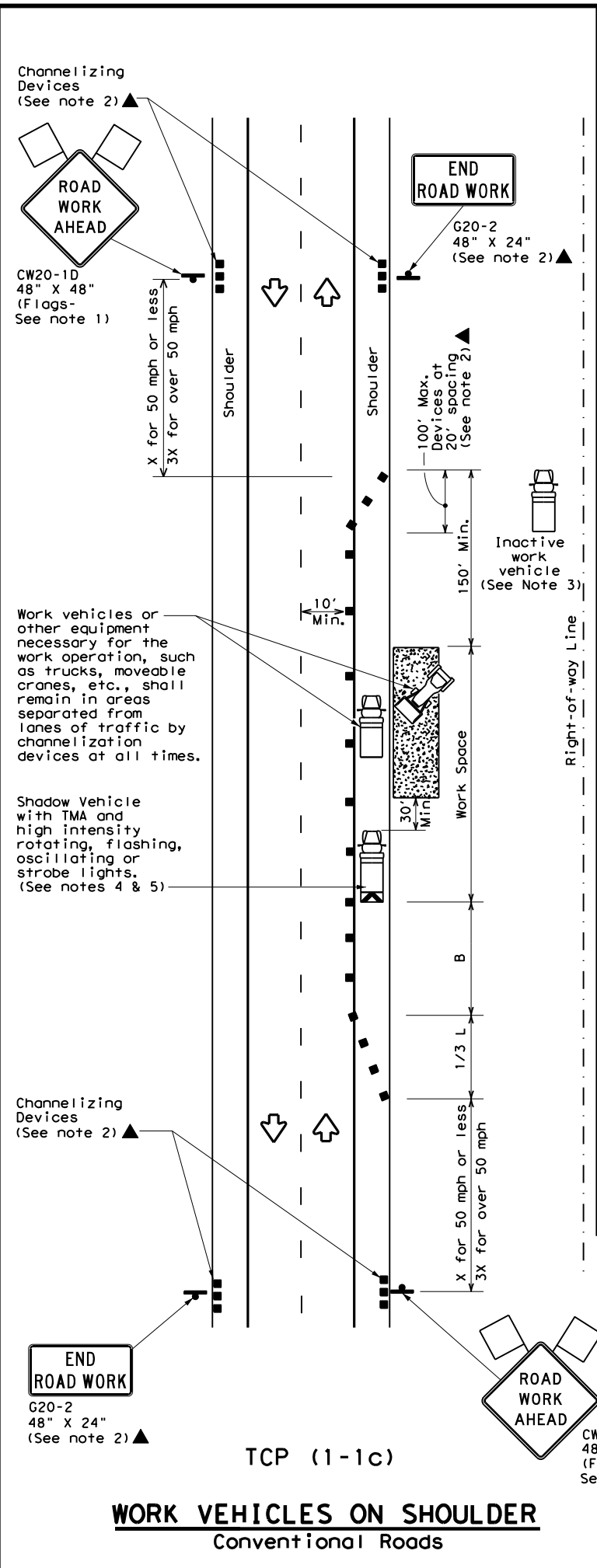
TCP (1-1a)

WORK SPACE NEAR SHOULDER
 Conventional Roads



TCP (1-1b)

WORK SPACE ON SHOULDER
 Conventional Roads



TCP (1-1c)

WORK VEHICLES ON SHOULDER
 Conventional Roads

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

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

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

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

- GENERAL NOTES**
- Flags attached to signs where shown are REQUIRED.
 - 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.
 - Inactive work vehicles or other equipment should be parked near the right-of-way line and not parked on the paved shoulder.
 - 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.
 - Additional Shadow Vehicles with TMAs may be positioned off the paved surface, next to those shown in order to protect wider work spaces.
 - See TCP(5-1) for shoulder work on divided highways, expressways and freeways.
 - CW21-5 "SHOULDER WORK" signs may be used in place of CW20-1D "ROAD WORK AHEAD" signs for shoulder work on conventional roadways.



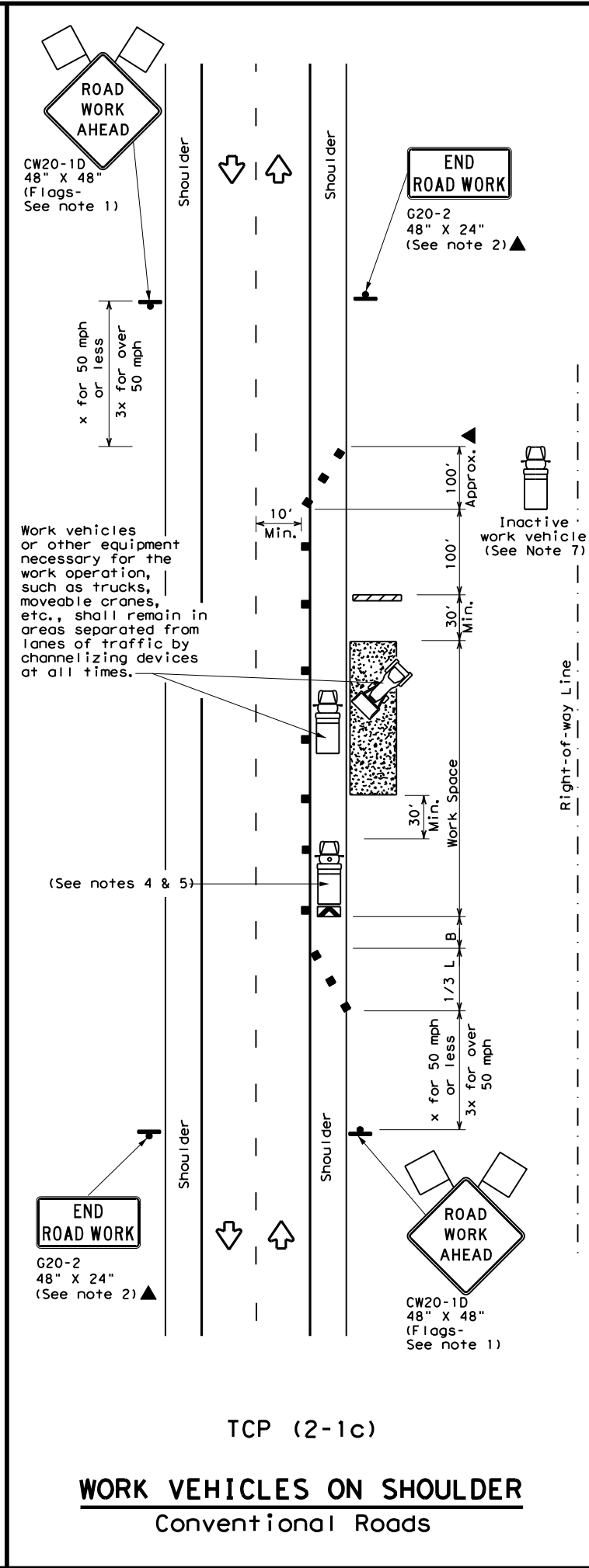
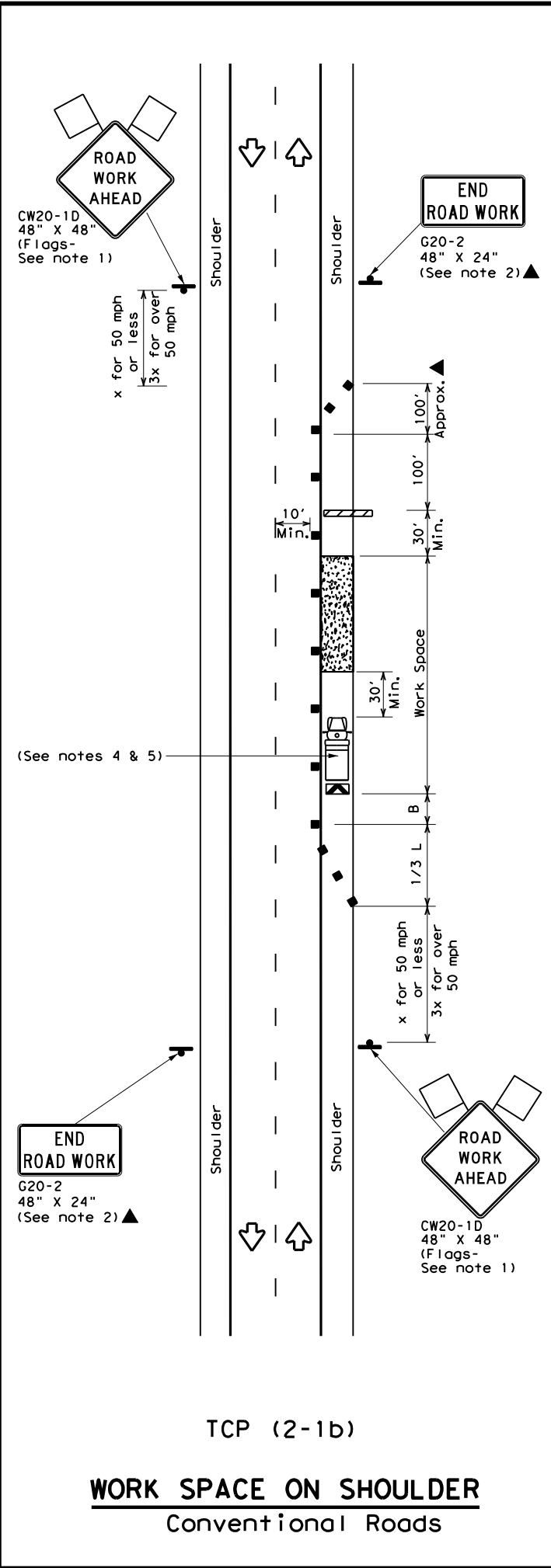
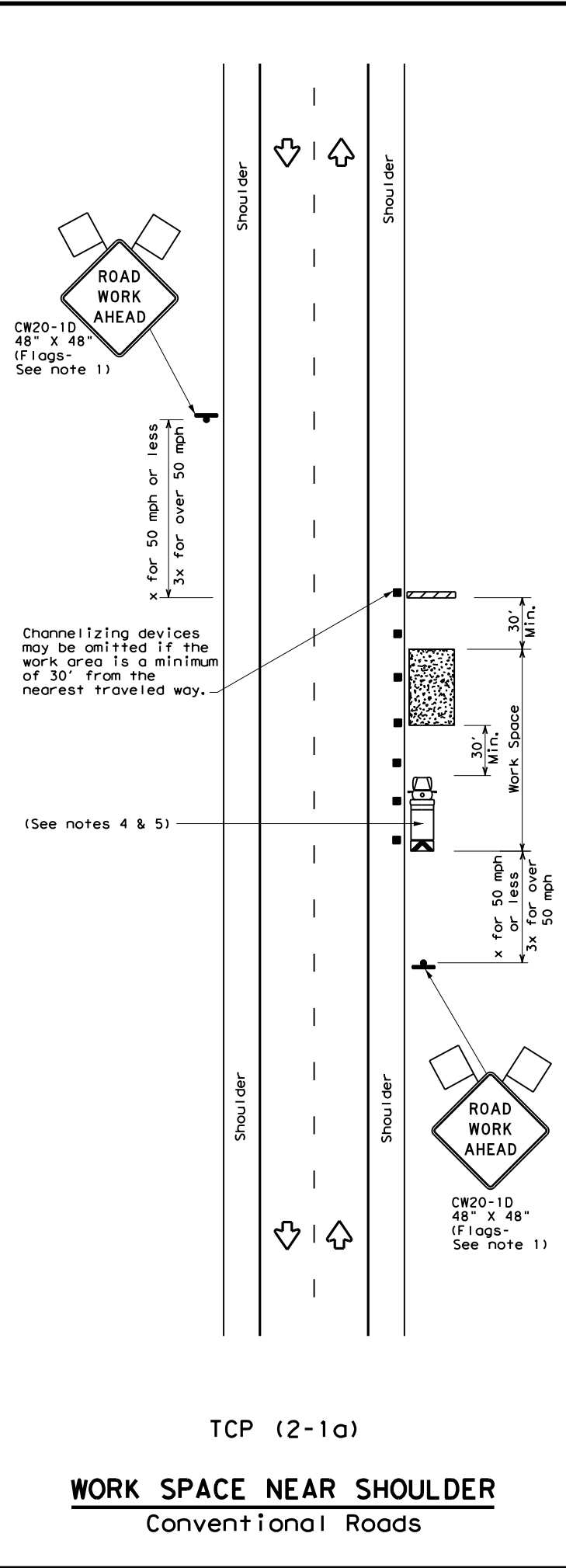
TRAFFIC CONTROL PLAN
CONVENTIONAL ROAD
SHOULDER WORK

TCP (1-1) - 18

FILE: tcp1-1-18.dgn	DN:	CK:	DW:	CK:
© TxDOT December 1985	CONT	SECT	JOB	HIGHWAY
REVISIONS	0122	03	033, ETC	US 287, ETC
2-94 4-98	DIST	COUNTY	SHEET NO.	
8-95 2-12	BRY	FREESTONE, ETC	46	
1-97 2-18				

DISCLAIMER: The use of this standard is governed by the "Texas Engineering Practice Act". No warranty of any kind is made by TxDOT for any purpose whatsoever. TxDOT assumes no responsibility for the conversion of units or the use of this standard in any project.

DATE: 5/26/2022 4:33:04 PM
 FILE: \\txdot\project\wiseonline.com\TXDOT4\Documents\17 - BRY\Design\Projects\17-0909\17-0909.dgn



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

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

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

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

- GENERAL NOTES**
- Flags attached to signs where shown, are REQUIRED.
 - 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.
 - Stockpiled material should be placed a minimum of 30 feet from nearest traveled way.
 - 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.
 - Additional Shadow Vehicles with TMAs may be positioned off the paved surface, next to those shown in order to protect a wider work space.
 - See TCP(5-1) for shoulder work on divided highways, expressways and freeways.
 - Additional work vehicles or other equipment should be parked near the right-of-way line and not parked on the paved shoulder.
 - CW21-5 "SHOULDER WORK" signs may be used in place of CW20-1D "ROAD WORK AHEAD" signs for shoulder work on conventional roadways.

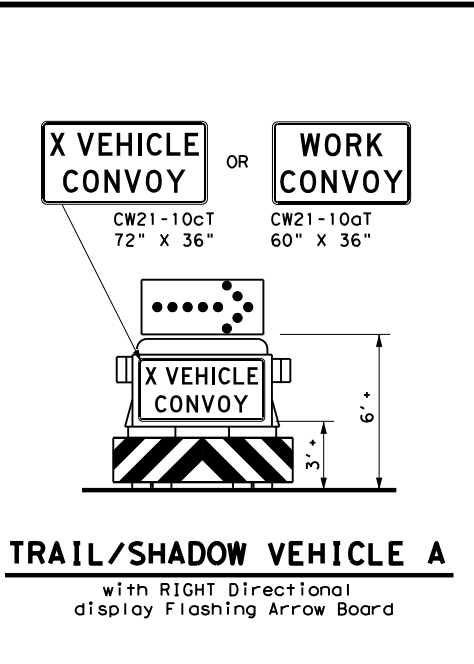
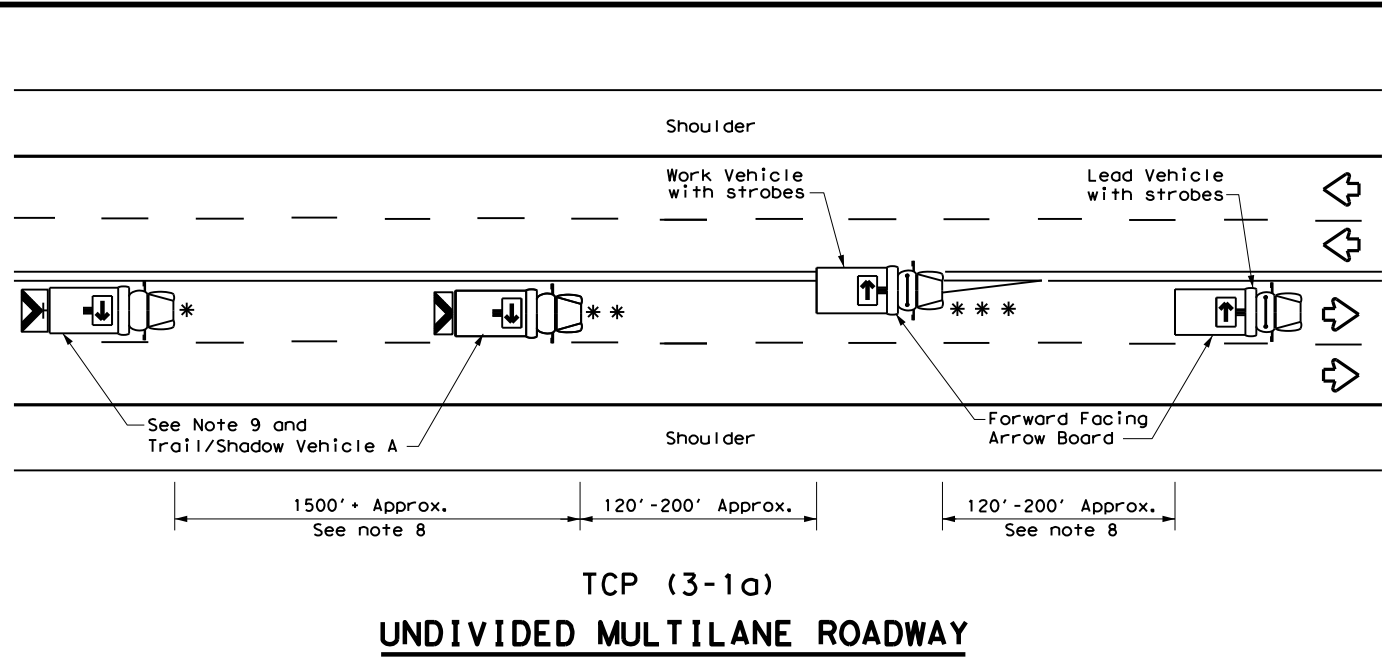
Texas Department of Transportation
 Traffic Operations Division Standard

TRAFFIC CONTROL PLAN
CONVENTIONAL ROAD
SHOULDER WORK

TCP (2-1) - 18

FILE: tcp2-1-18.dgn	DN:	CK:	DW:	CK:
© TxDOT December 1985	CONT	SECT	JOB	HIGHWAY
REVISIONS	0122	03	033, ETC	US 287, ETC
2-94 4-98	DIST	COUNTY	SHEET NO.	
8-95 2-12	BRY	FREESTONE, ETC	48	
1-97 2-18				

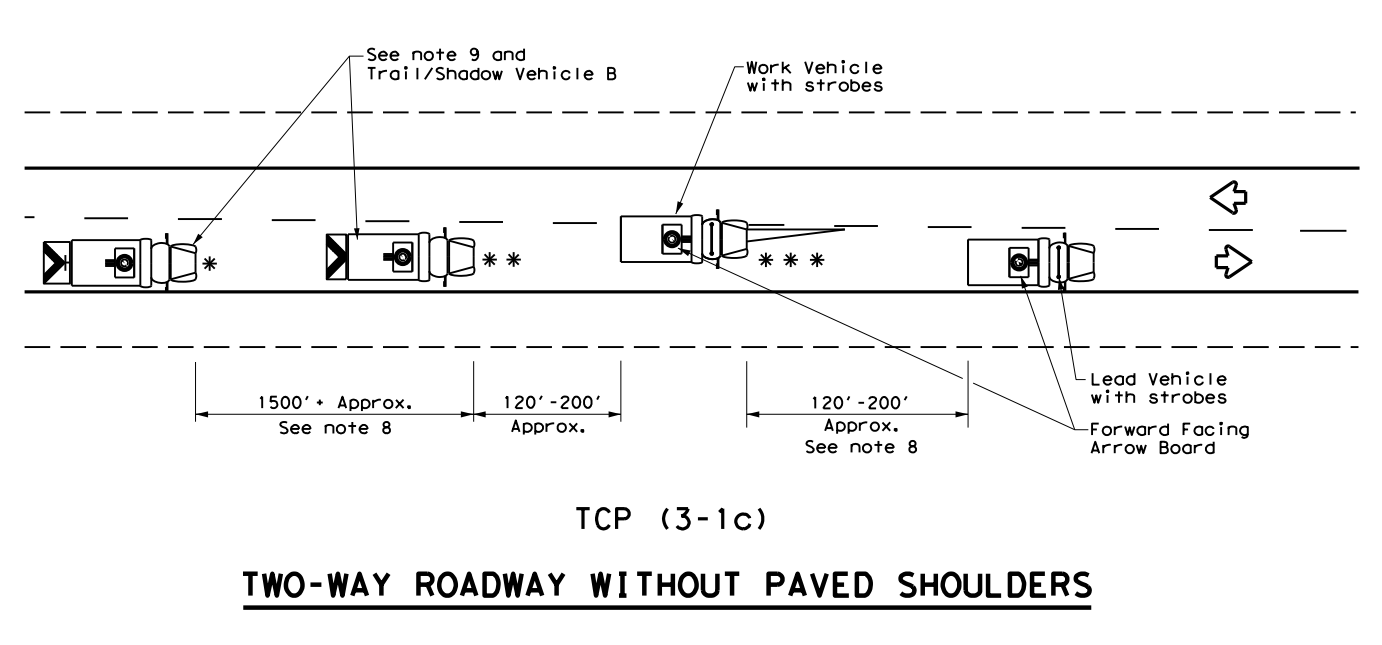
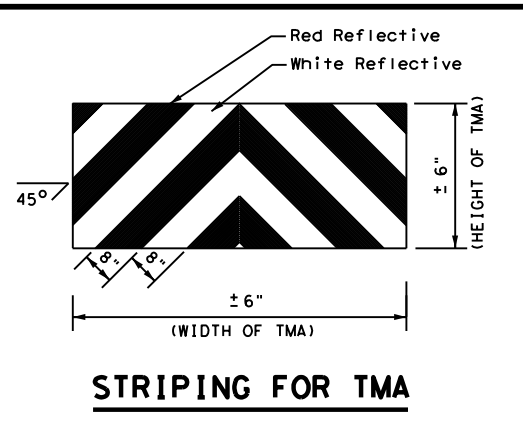
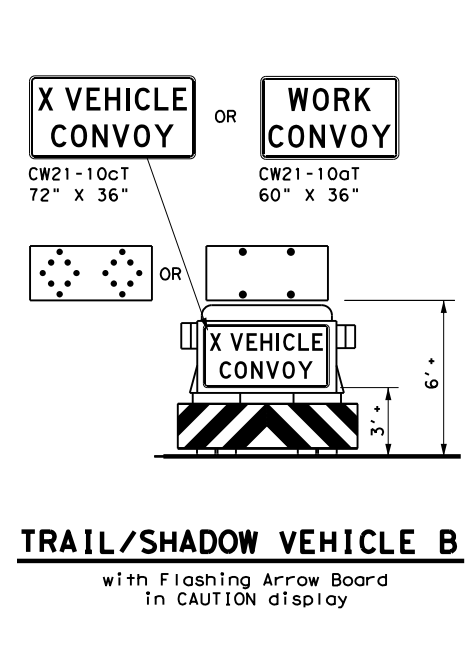
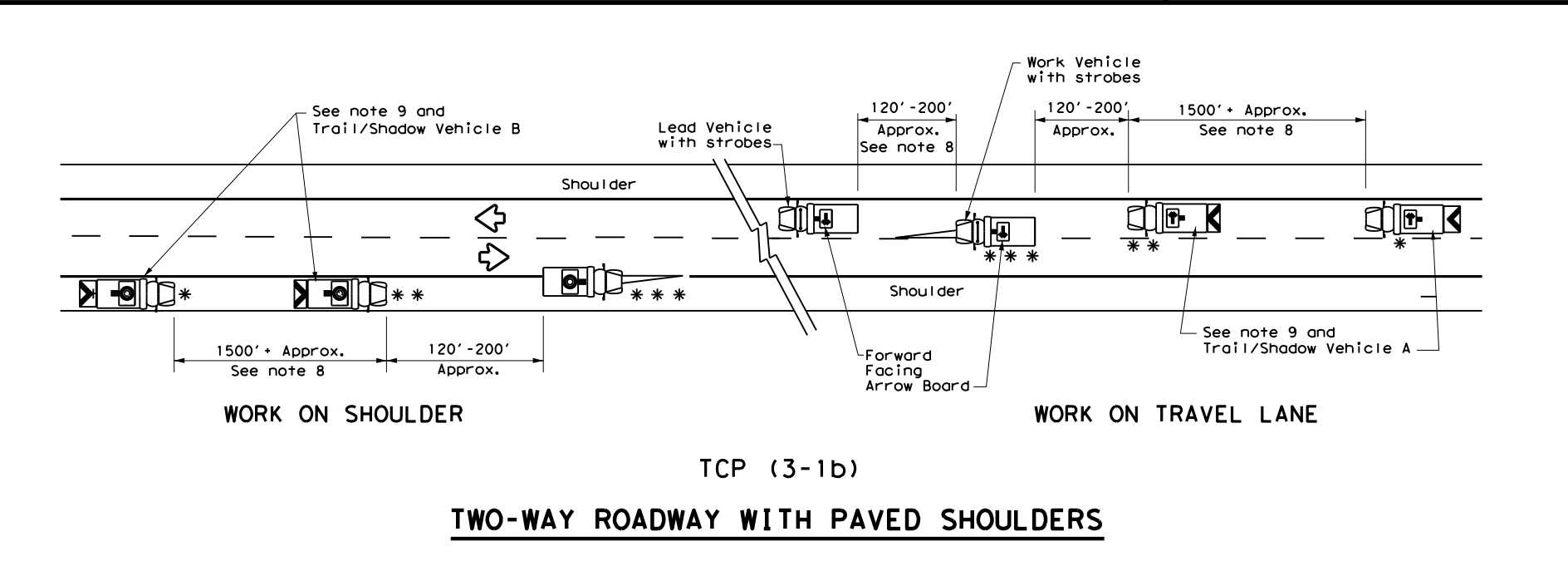
DATE: 5/26/2022 4:33:18 PM
 FILE: \\txdot\project\wiseon\line.com\TXDOT4\Documents\17 - BRY\Design Project\170903\170903.dwg
 The use of this standard is governed by the "Texas Engineering Practice Act". No warranty of any kind is made by TxDOT for any purpose whatsoever. TxDOT assumes no responsibility for the conversion of electronic files to paper.



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**
- 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.
 - 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.
 - The use of truck mounted attenuators (TMA) on the SHADOW VEHICLE and TRAIL VEHICLE are required.
 - 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.
 - 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.
 - Each vehicle shall have two-way radio communication capability.
 - When work convoys must change lanes, the TRAIL VEHICLE should change lanes first to shadow the other convoy vehicles.
 - 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.
 - "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.
 - On two-lane two-way roadways, the work and protection vehicles should pull over periodically to allow motor vehicle traffic to pass. If motorists are not allowed to pass the work convoy, a "DO NOT PASS" (R4-1) sign should be placed on the back of the rearmost protection vehicle.



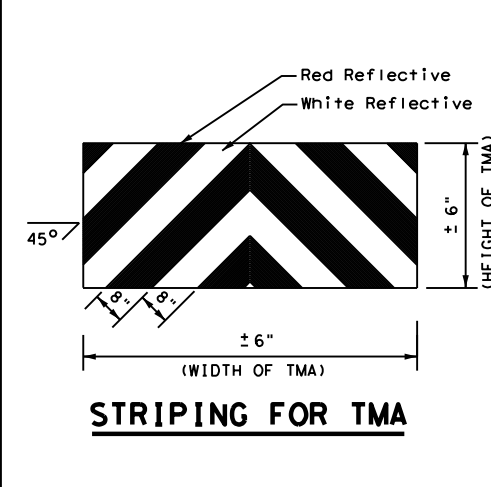
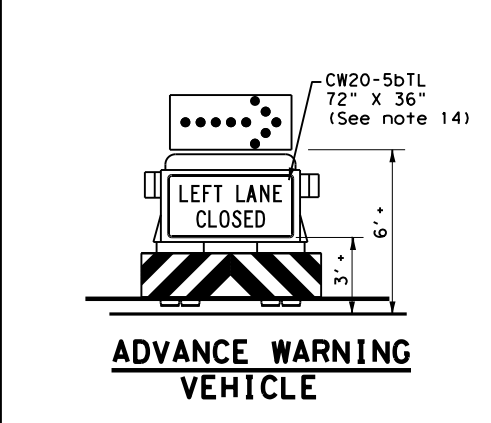
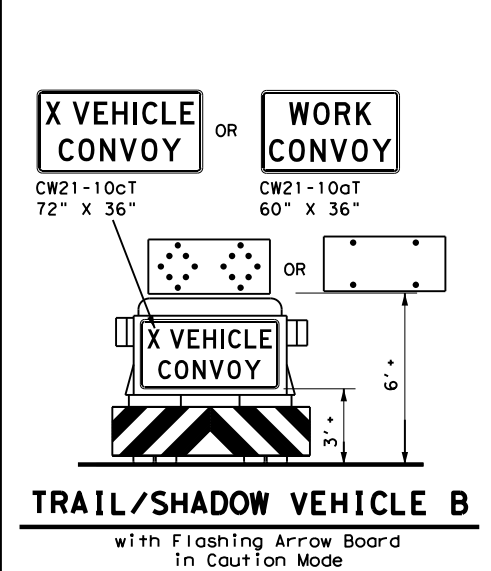
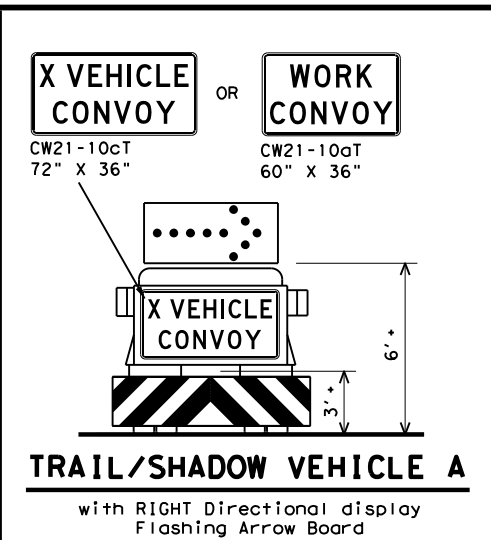
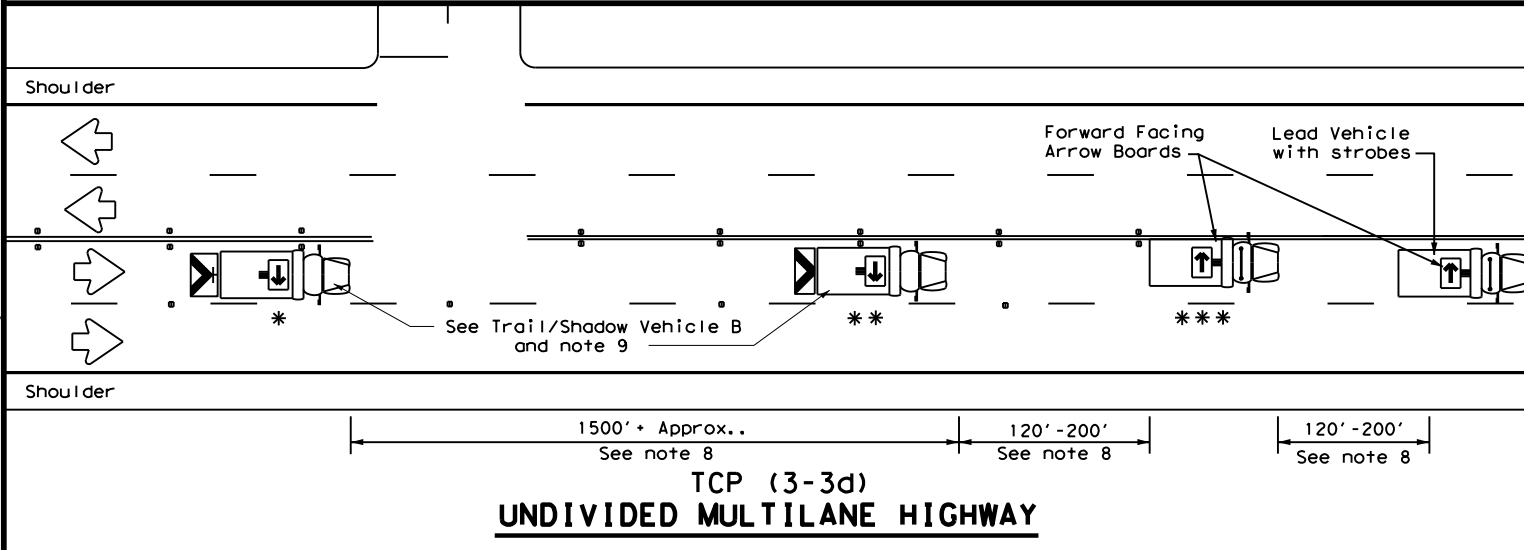
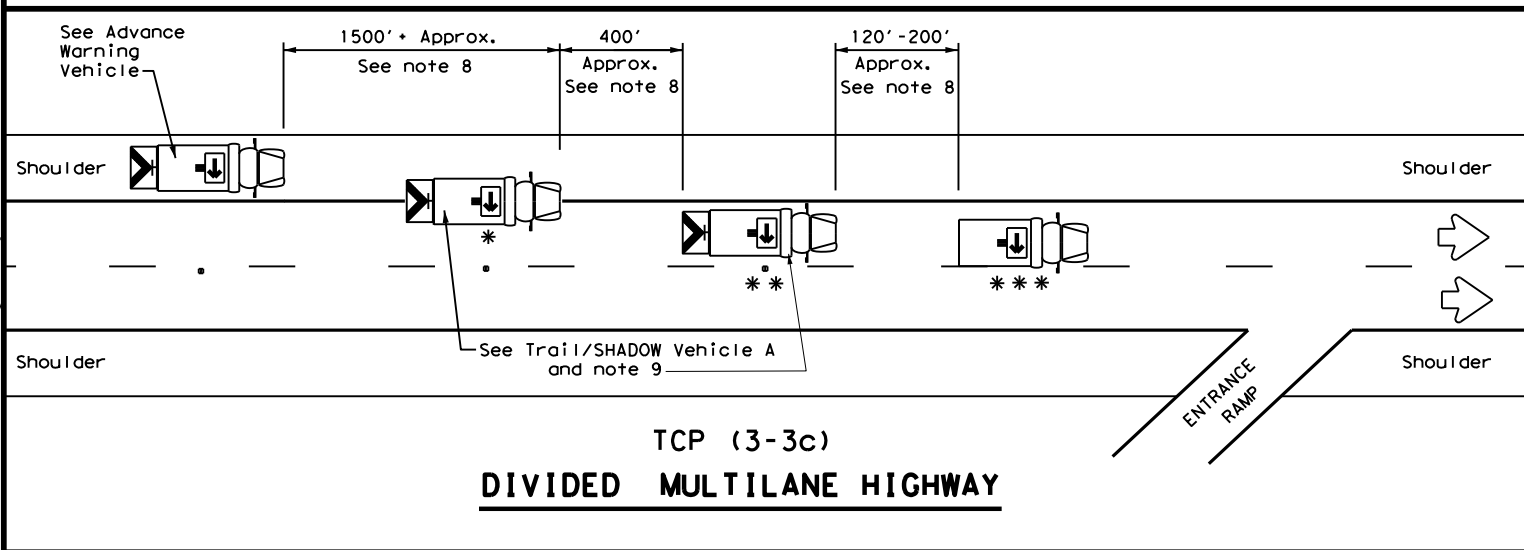
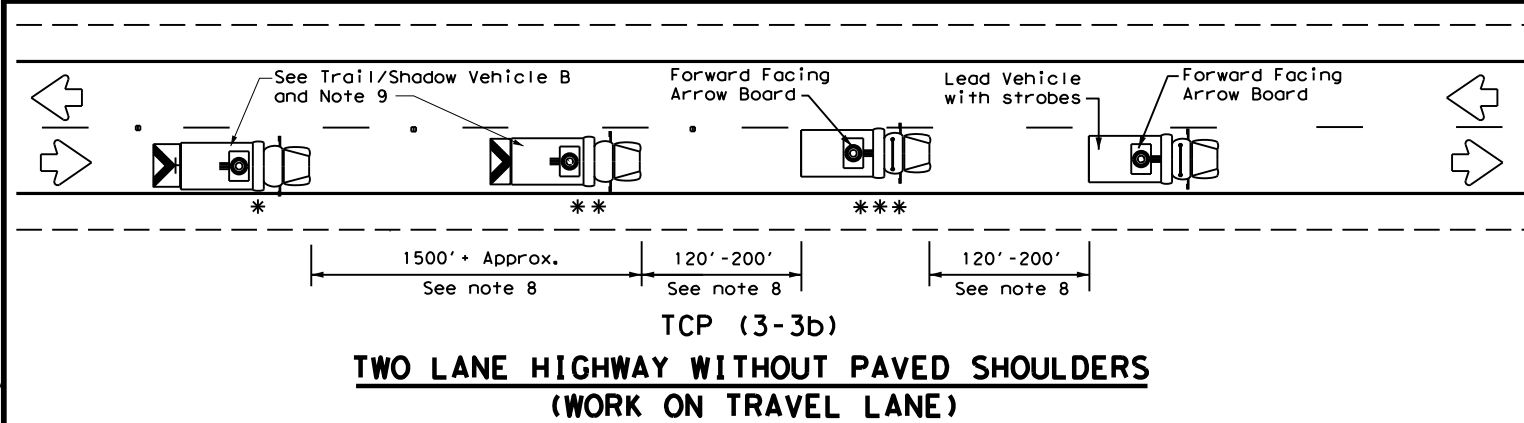
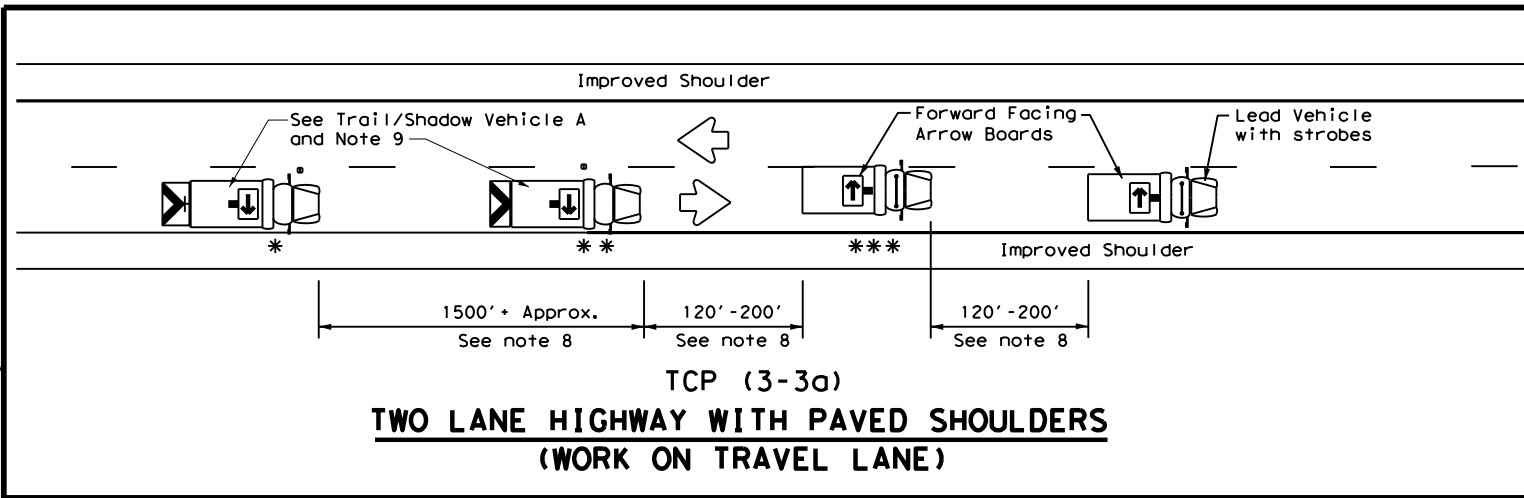
Texas Department of Transportation
Traffic Operations Division Standard

**TRAFFIC CONTROL PLAN
MOBILE OPERATIONS
UNDIVIDED HIGHWAYS**

TCP(3-1)-13

FILE: tcp3-1.dgn	DN: TxDOT	CK: TxDOT	DW: TxDOT	CK: TxDOT
© TxDOT December 1985	CONT	SECT	JOB	HIGHWAY
REVISIONS	0122	03	033, ETC	US 287, ETC
2-94 4-98	DIST	COUNTY	SHEET NO.	
8-95 7-13	BRY	FREESTONE, ETC	51	
1-97				

DATE: 5/26/2022 4:33:23 PM
 FILE: \\txdot\project\wiseonline.com\TXDOT4\Documents\17 - BRY\Design Projects\170903\170903.dgn
 The use of this standard is governed by the "Texas Engineering Practice Act". No warranty of any kind is made by TxDOT for any purpose whatsoever. TxDOT assumes no responsibility for the conversion of any information from its use.



LEGEND		
* Trail Vehicle	ARROW BOARD DISPLAY	
** Shadow Vehicle		
*** Work Vehicle		RIGHT Directional
		LEFT Directional
		Double Arrow
		CAUTION (Alternating Diamond or 4 Corner Flash)

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

GENERAL NOTES

- TRAIL, SHADOW, and LEAD vehicles shall be equipped with arrow boards as illustrated. When a LEAD vehicle is not used on two way roads the WORK vehicle must have an arrow board. For divided roadways, the arrow board on the WORK vehicle is optional based on the type of work being performed. The Engineer will determine if the LEAD vehicle and/or TRAIL vehicle are required based on prevailing roadway conditions, traffic volume, and sight distance restrictions.
- 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.
- The use of truck mounted attenuators (TMA) on the SHADOW VEHICLE, ADVANCE WARNING and TRAIL VEHICLE are required.
- 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.
- 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.
- Each vehicle shall have two-way radio communication capability.
- When work convoys must change lanes, the TRAIL VEHICLE should change lanes first to shadow the other convoy vehicles.
- Vehicle spacing between the TRAIL VEHICLE and the SHADOW VEHICLE will vary depending on sight distance restrictions. Motorists approaching the convoy should be able to see the TRAIL VEHICLE in time to slow down and/or change lanes as they approach the TRAIL VEHICLE. Vehicle spacing between the WORK VEHICLE and SHADOW VEHICLE and vehicle spacing between WORK VEHICLE and LEAD VEHICLE may vary according to terrain, work activity and other factors.
- 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.
- For divided highways with two or three lanes in one direction, the appropriate LEFT LANE CLOSED (CW20-5bTL), RIGHT LANE CLOSED (CW20-5bTR), or CENTER LANE CLOSED (CW20-5dT) sign should be used on the Advance Warning Vehicle. As an option, a portable changeable message sign (PCMS) or truck mounted changeable message sign (TMCMS) with a minimum character height of 12", and displaying the same legend may be substituted for these signs. An appropriate directional arrow display, simulating the size and legibility of the flashing arrow board may be used in the second phase of the PCMS/TMCMS message. When this is done, the arrow board will not be required on the Advance Warning Vehicle.
- A double arrow shall not be displayed on the arrow board on the Advance Warning Vehicle.
- For divided highways with three or four lanes in each direction, use TCP(3-2).
- Standard diamond shape versions of the CW20-5 series signs may be used as an option if the rectangular signs shown are not available.
- The Advance Warning Vehicle may straddle the edgeline when Shoulder width makes it necessary.
- On two-lane two-way roadways, the work and protection vehicles should pull over periodically to allow motor vehicle traffic to pass. If motorists are not allowed to pass the work convoy, a DO NOT PASS (R4-1) sign should be placed on the back of the rearmost protection vehicle.

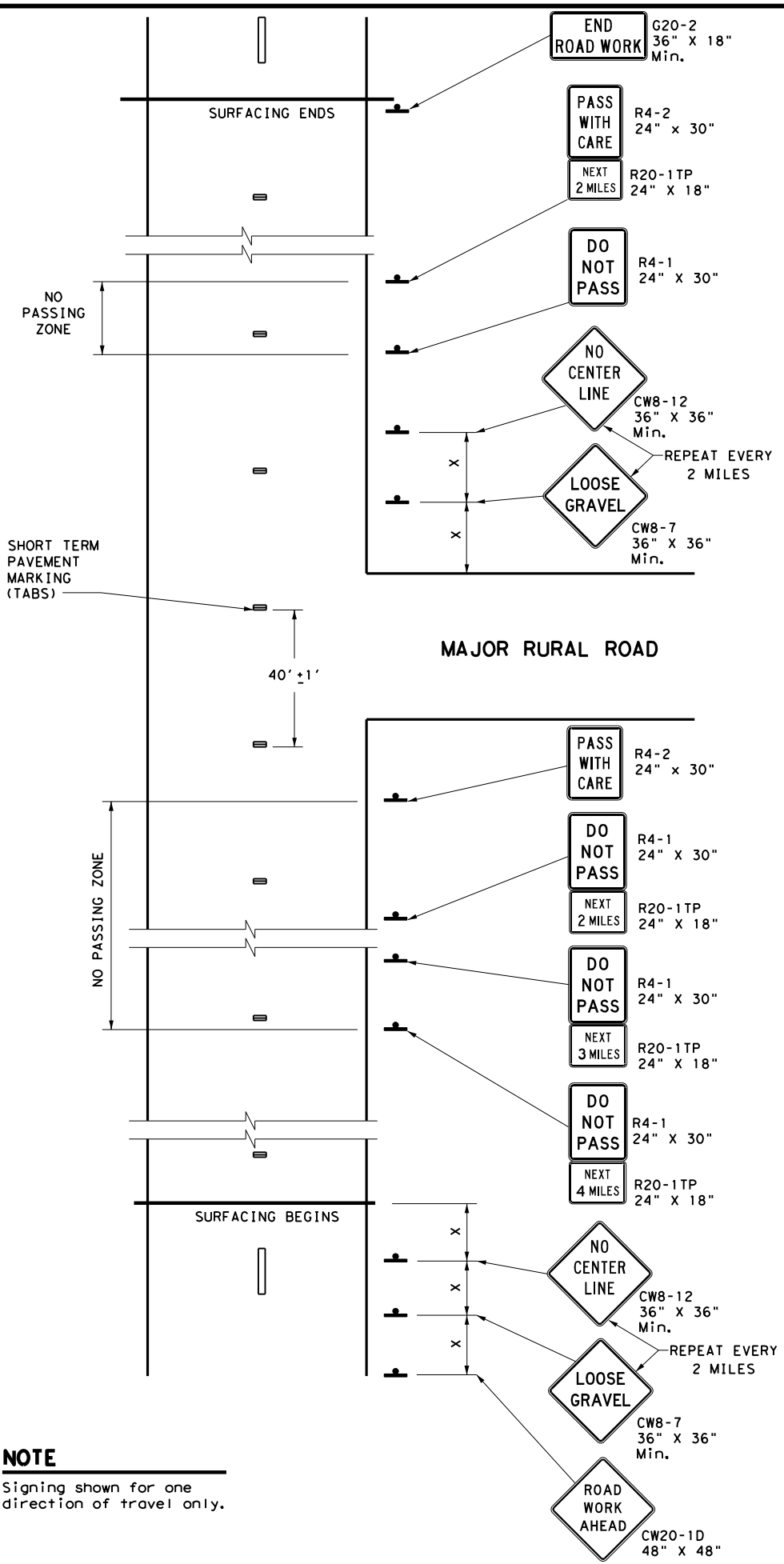
Texas Department of Transportation

Traffic Operations Division Standard

TRAFFIC CONTROL PLAN
MOBILE OPERATIONS
RAISED PAVEMENT
MARKER INSTALLATION/
REMOVAL
TCP (3-3) - 14

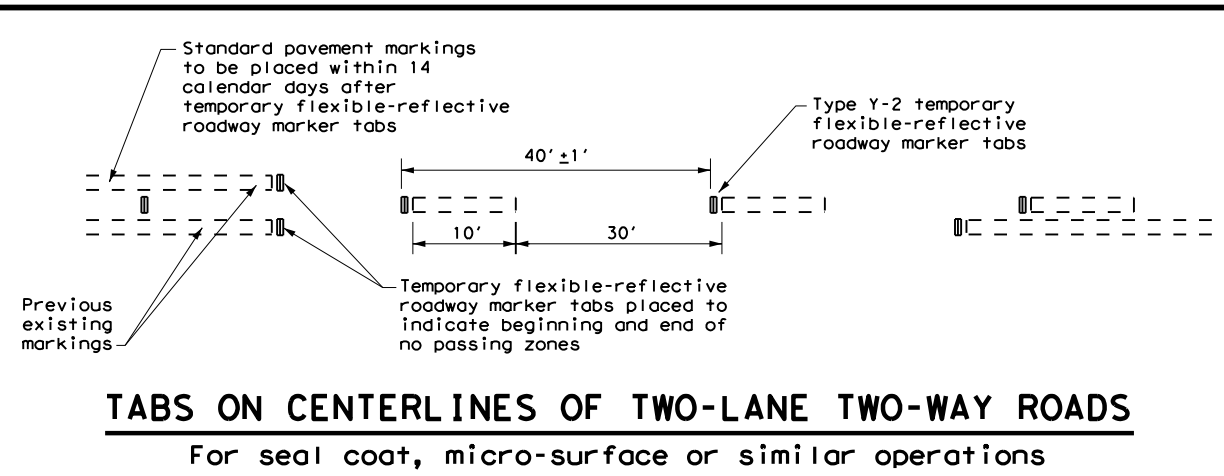
FILE: tcp3-3.dgn	DN: TxDOT	CK: TxDOT	OW: TxDOT	CK: TxDOT
© TxDOT September 1987	CONT	SECT	JOB	HIGHWAY
REVISIONS	0122	03	033, ETC	US 287, ETC
2-94 4-98				
8-95 7-13				
1-97 7-14				
	DIST	COUNTY		SHEET NO.
	BRY	FREESTONE, ETC		52

DISCLAIMER: The use of this standard is governed by the "Texas Engineering Practice Act". No warranty of any kind is made by TxDOT for any purpose whatsoever. TxDOT assumes no responsibility for the conversion of units or the accuracy of the information contained herein. TxDOT is not responsible for the use of this standard in any project. DATE: 5/26/2022 4:33:27 PM FILE: \\txdot\project\wiseonline.com:TXDOT4\Documents\17 - BRY\Design Projects\170909\170909.dgn



NOTE
 Signing shown for one direction of travel only.

NO PASSING ZONES ON TWO-LANE TWO-WAY ROADS



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

- A. Prior to the beginning of construction, all currently striped no-passing zones shall be signed with the DO NOT PASS (R4-1) signs and PASS WITH CARE (R4-2) signs placed at the beginning and end of each zone for each direction of travel except as otherwise provided herein. Signs marking these individual no-passing zones need not be covered prior to construction if the signs supplement the existing pavement markings.
- B. At the discretion of the Engineer, in areas of numerous no-passing zones, several zones may be combined as a single zone. If passing is to be prohibited over one or more lengthy sections, a DO NOT PASS sign and a NEXT XX MILES (R20-1TP) plaque may be used at the beginning of such zones. The DO NOT PASS sign and the NEXT XX MILES plaque should be repeated every mile to the end of the no-passing zone. In areas where there is considerable distance between no-passing zones, the end of the no-passing zone may be signed with a PASS WITH CARE sign and a NEXT XX MILES plaque.
- C. Depending on traffic volumes and length of sections, it may be desirable to prohibit passing throughout the project to prevent damage to windshield and lights. The DO NOT PASS sign and NEXT XX MILES plaque should be used and repeated as often as necessary for this purpose. Where several existing zones are to be combined into one individual no-passing zone, the sign at the beginning of the zone should be covered until the surfacing operation has passed this location so as not to have the DO NOT PASS sign conflict with the existing pavement markings. Also, unless one days operation completes the entire length of such combined zones, appropriate DO NOT PASS and PASS WITH CARE signs should be placed at the beginning and end of the no-passing zones where the surfacing operation has stopped for the day.
- D. R4-1 and R4-2 are to remain in place until standard pavement markings are installed.

"NO CENTER LINE" SIGN (CW8-12)

- A. Center line markings are yellow pavement markings that delineate the separation of travel lanes that have opposite directions of travel on a roadway. Divided highways do not typically have center line markings.
- B. At the time construction activity obliterates the existing center line markings (low volume roads may not have an existing centerline), a NO CENTER LINE (CW8-12) sign should be erected at the beginning of the work area, at approximately 2 mile intervals within the work area, beyond major intersections and other locations deemed necessary by the Engineer.
- C. The NO CENTER LINE signs are to remain in place until standard pavement markings are installed.

"LOOSE GRAVEL" SIGN (CW8-7)

- A. When construction begins, a LOOSE GRAVEL (CW8-7) sign should be erected at each end of the work area and repeated at intervals of approximately 2 miles in rural areas and closer in urban areas.
- B. The LOOSE GRAVEL signs are to remain in place until the condition no longer exists.

PAVEMENT MARKINGS

- A. Temporary markings for surfacing projects shall be Temporary Flexible-reflective Roadway Marker Tabs unless otherwise approved by the Engineer. Tabs are to be installed to provide true alignment for striping crews or as directed by the Engineer. Tabs will be placed at the spacing indicated. Tabs should be applied to the pavement no more than two (2) days before the surfacing is applied. After the surfacing is rolled and swept, the cover over the reflective strip shall be removed.
- B. Tabs shall not be used to simulate edge lines.
- C. Tab placement for overlay/inlay operations shall be as shown on the WZ(STPM) standard sheet.

COORDINATION OF SIGN LOCATIONS

- A. The location of warning signs at the beginning and end of a work area are to be coordinated with other signing typically shown on the Barricade and Construction Standards for project limits to ensure adequate sign spacing.
- B. Where possible the ROAD WORK AHEAD (CW20-1D), LOOSE GRAVEL (CW8-7), and NO CENTER LINE (CW8-12) signs should be placed in the sequence shown following the OBEY WARNING SIGNS STATE LAW (R20-3T) and the TRAFFIC FINES DOUBLE (R20-5T) sign, and one "X" sign spacing prior to the CONTRACTOR (G20-6T) sign typically located at or near the limits of surfacing. LOOSE GRAVEL and NO CENTER LINE signs will then be repeated as described above.

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

* Conventional Roads Only

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

GENERAL NOTES

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



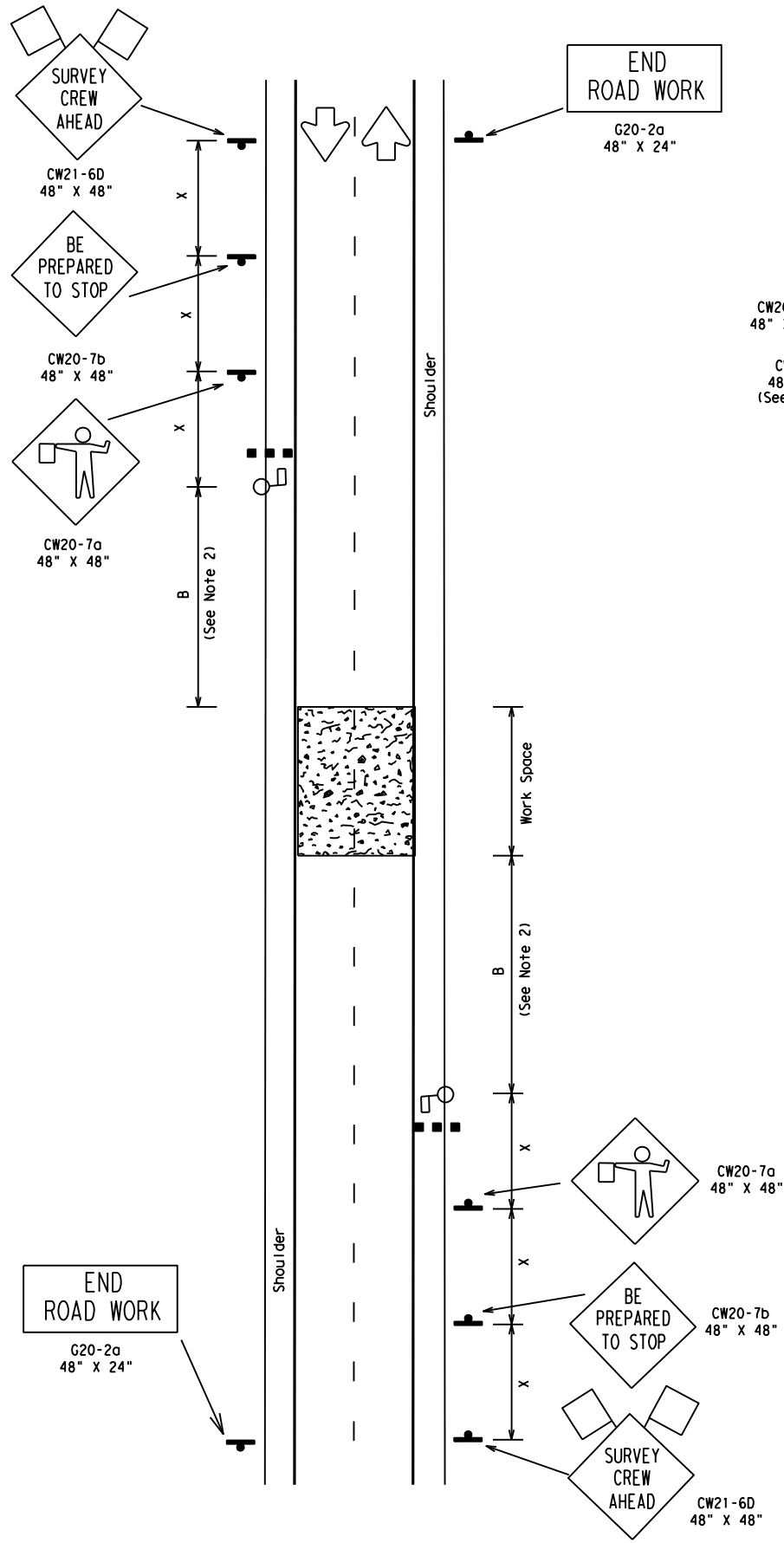
TRAFFIC CONTROL DETAILS FOR SURFACING OPERATIONS

TCP (7-1) - 13

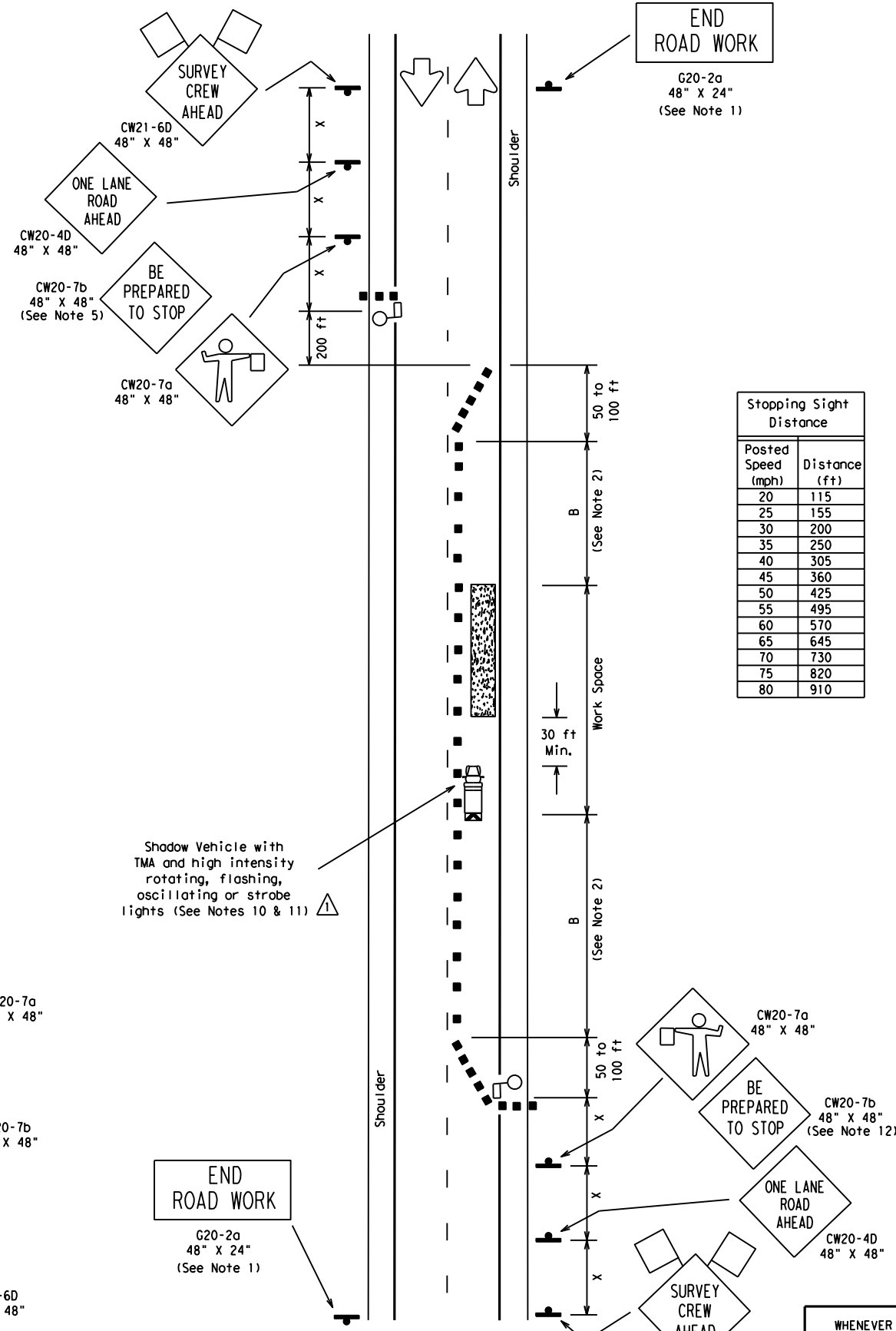
FILE: tcp7-1.dgn	DW: TxDOT	CK: TxDOT	DW: TxDOT	CK: TxDOT
© TxDOT March 1991	CONT	SECT	JOB	HIGHWAY
REVISIONS	0122	03	033, ETC	US 287, ETC
4-92 4-98	DIST	COUNTY	SHEET NO.	
1-97 7-13	BRY	FREESTONE, ETC	53	

DISCLAIMER: The use of this standard is governed by the "Texas Engineering Practice Act". No warranty of any kind is made by TxDOT for any purpose whatsoever. TxDOT assumes no responsibility for the conversion of this standard to other formats or for incorrect results or damages resulting from its use.

DATE: 5/26/2022 4:33:33 PM
 FILE: \\txdot\project\wiseon\line.com\TXDOT14\Documents\17 - BRY\Design Projects\012203033\4 - Design\Plan Set\2 - TCP\2B - TCP\Standards\tcps2.dgn



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



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

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

LEGEND

- Type III Barricade
- Channelizing Devices
- Flag
- Heavy Work Vehicle
- Truck Mounted Attenuator (TMA)
- Trailer Mounted Flashing Arrow Panel
- Portable Changeable Message Sign (PCMS)
- Flagger
- Sign Post

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

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

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

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

- GENERAL NOTES:**
- The G20-2a "END ROAD WORK" sign may be placed on the back of the CW21-6D "SURVEY CREW AHEAD" sign or may be omitted for short duration (less than 1 hour) work.
 - Adequate Stopping Sight Distance (see Stopping Sight Distance table) should be maintained from approaching traffic to the flagger or a queue of stopped vehicles. The Buffer Space "B" should be extended around curves or other obstacles, when necessary, to have adequate Stopping Sight Distance to the flagger station.
 - Flaggers should use two-way radios or other means of communication while flagging.
 - The length of the work space should be based on the ability of the flaggers to communicate.
 - CW20-1D "ROAD WORK AHEAD" signs may be substituted for CW21-6D "SURVEY CREW AHEAD" signs.
 - The CW21-6D "SURVEY CREW AHEAD" sign for low volume intersecting side roads is desirable, but is not required when working less than 15 minutes in area of the side road, as determined by the Engineer.
- TCP (S-2a)**
- Road closures shall be less than 20 minutes. Closures less than 5 minutes are desirable.
 - Sign spacing should be increased if traffic repeatedly queues past the CW20-7b "BE PREPARED TO STOP" sign.
 - The surveying instrument should not be located on the paved surface.
- TCP (S-2b)**
- For short duration work the Shadow Vehicle with a TMA may be replaced by another Work Vehicle with high intensity rotating, flashing or strobe lights.
 - Shadow Vehicles with a TMA are desirable when workers or equipment are in the work space. When approved by the engineer, Type III barricades or other channelizing devices may be substituted for the Shadow Vehicle.
 - The CW20-7b "BE PREPARED TO STOP" sign is optional. When used, it should be installed after the CW20-4D "ONE LANE ROAD AHEAD" sign.

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

8-18-08 Revision
 Corrected reference to notes.

Texas Department of Transportation
 Traffic Operations Division

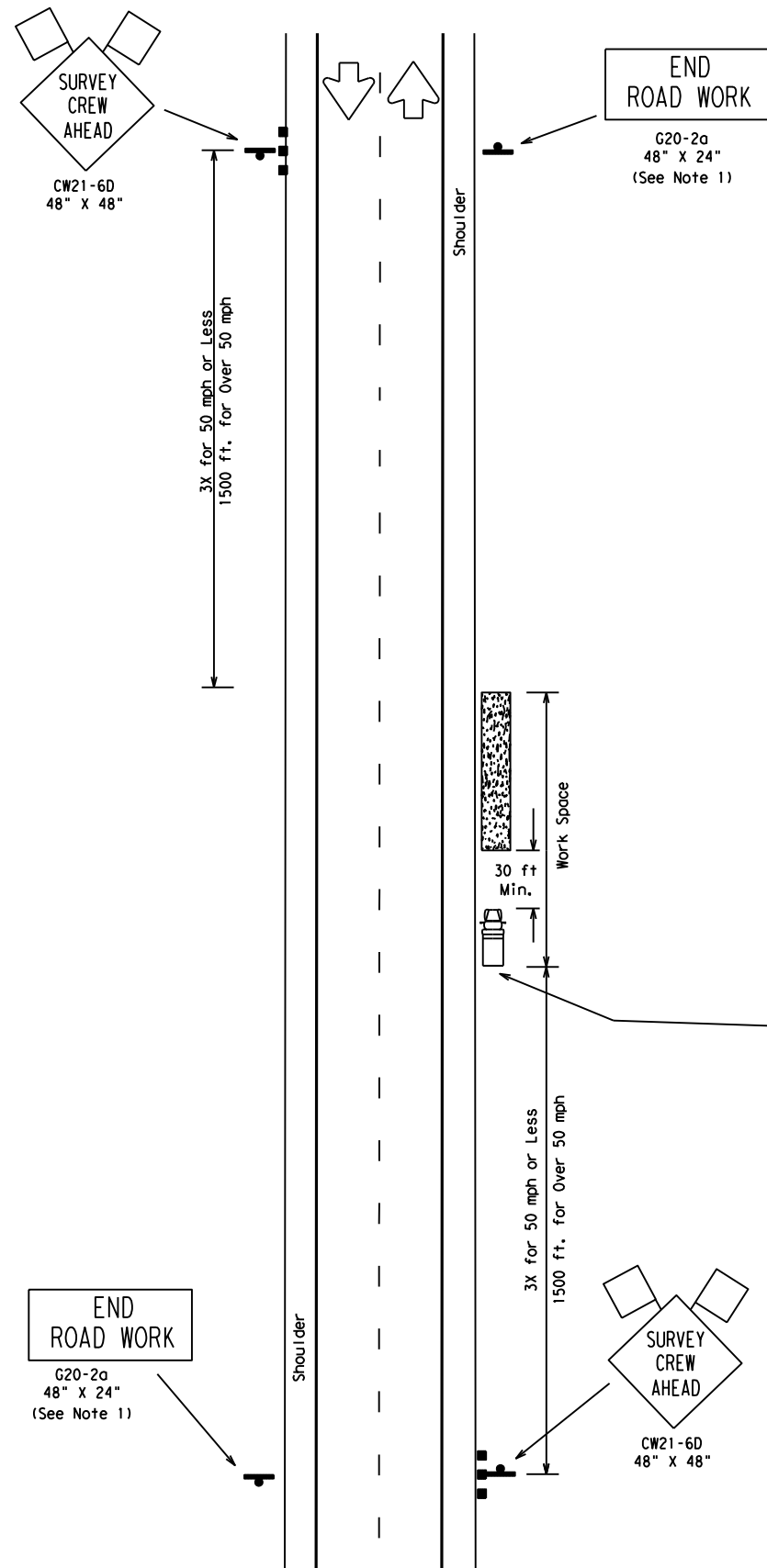
TRAFFIC CONTROL PLAN FOR SURVEYING OPERATIONS

TCP (S-2) - 08A

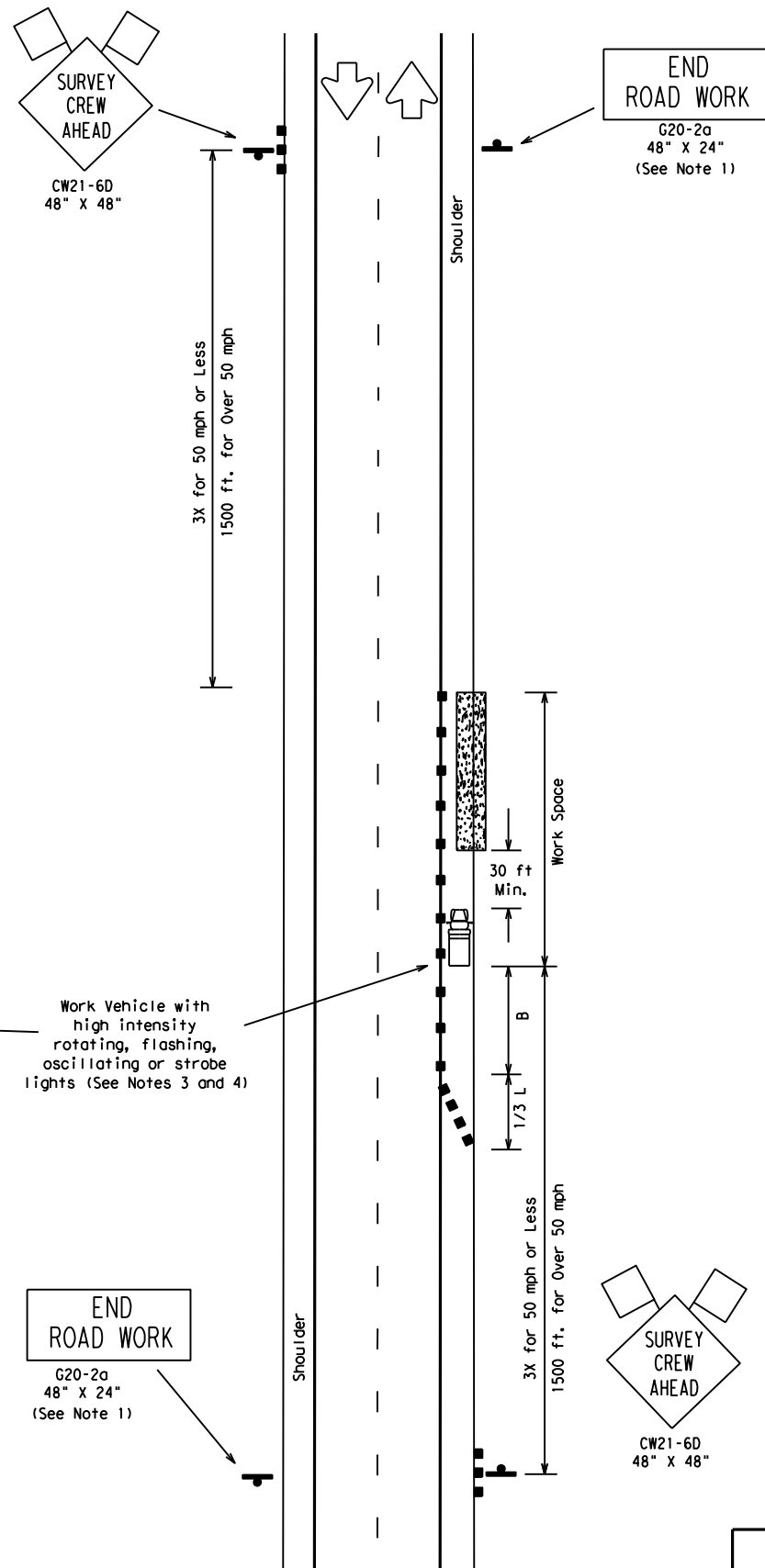
© TxDOT August 2008	DN: TXDOT	CK: TXDOT	DW: TXDOT	CK: TXDOT
8-08	REVISIONS	CONTRACT	SECTION	JOB
		0122	03	033, ETC
		DIST	COUNTY	US 287, ETC
		BRY	FREESTONE, ETC	SHEET NO. 55

DISCLAIMER: The use of this standard is governed by the "Texas Engineering Practice Act". No warranty of any kind is made by TxDOT for any purpose whatsoever. TxDOT assumes no responsibility for the conversion of this standard to other formats or for incorrect results or damages resulting from its use.

DATE: 5/26/2022 4:33:38 PM
 FILE: \\txdot.projectwiseonline.com:TXDOT4\Documents\17 - BRY\Design Projects\012203033\4 - Design\Plan Set\2 - TCP\2B - TCP Standard\tcps1.dgn



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



TCP (S-1b)
 WORK ON SHOULDER

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

8-18-08 Revision
 Corrected misspelling.

LEGEND

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

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

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

TYPICAL USAGE:

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

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

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

TCP (S-1a)
 8. Cones may be placed at edge of pavement adjacent to the work space to enhance safety.

Texas Department of Transportation
 Traffic Operations Division

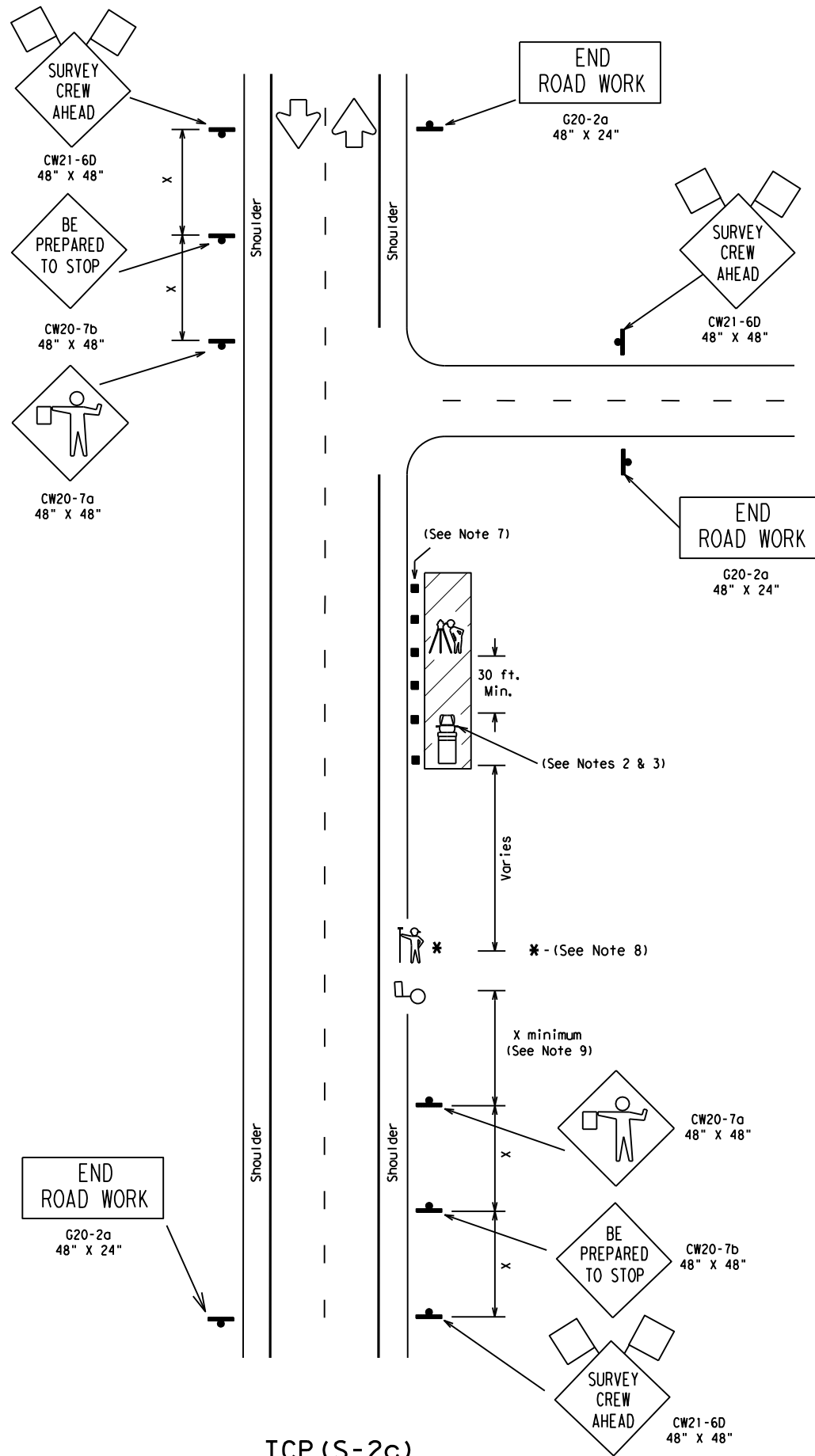
TRAFFIC CONTROL PLAN FOR SURVEYING OPERATIONS

TCP (S-1) - 08A

© TxDOT August 2008		DN: TxDOT	CK: TxDOT	DW: TxDOT	CK: TxDOT
8-08	REVISIONS	CONT	SECT	JOB	HIGHWAY
		0122	03	033, ETC	US 287, ETC
		DIST	COUNTY		SHEET NO.
		BRY	FREESTONE, ETC		54

DATE: 5/26/2022 4:33:44 PM
 FILE: \\txdot.projectwiseonline.com:TXDOT14\Documents\17 - BRY\Design Projects\012203033\4 - Design\Plan Set\2 - TCP\2B - TCP\Plan Set\2 - TCP\2B - TCP\2C.dgn

DISCLAIMER: The use of this standard is governed by the "Texas Engineering Practice Act". No warranty of any kind is made by TxDOT for any purpose whatsoever. TxDOT assumes no responsibility for the conversion of this standard to other formats or for incorrect results or damages resulting from its use.



TCP (S-2c)

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

LEGEND

- Type III Barricade
- Channelizing Devices
- Flag
- Work Vehicle
- Truck Mounted Attenuator (TMA)
- Flagger
- Sign Post
- Survey Rodman
- Instrument Person

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

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

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

DEFINITIONS:
 MOBILE - work that moves continuously or intermittently (stopping up to approximately 15 minutes).
 SHORT DURATION - work that occupies a location up to 1 hour.
 SHORT TERM STATIONARY - daytime work that occupies a location for more than 1 hour within a single daylight period.

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

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

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



TRAFFIC CONTROL PLAN FOR SURVEYING OPERATIONS

TCP (S-2c) - 10

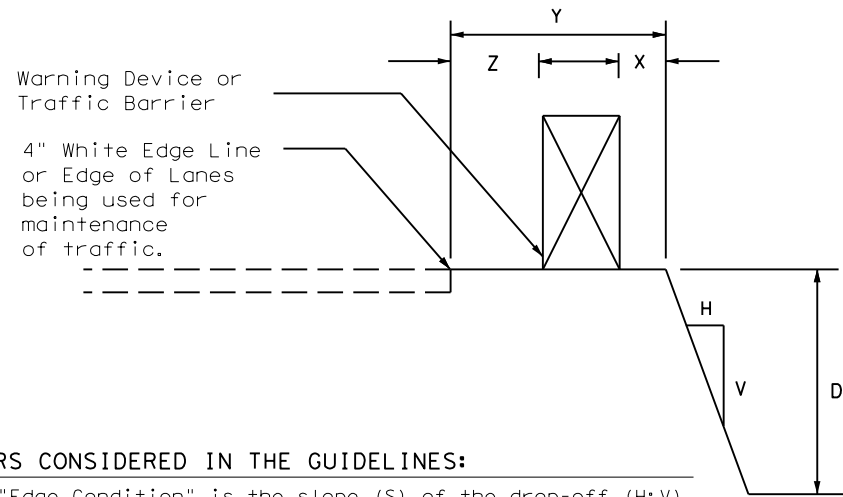
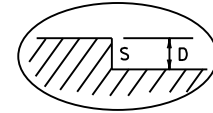
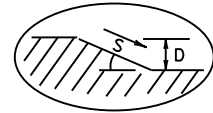
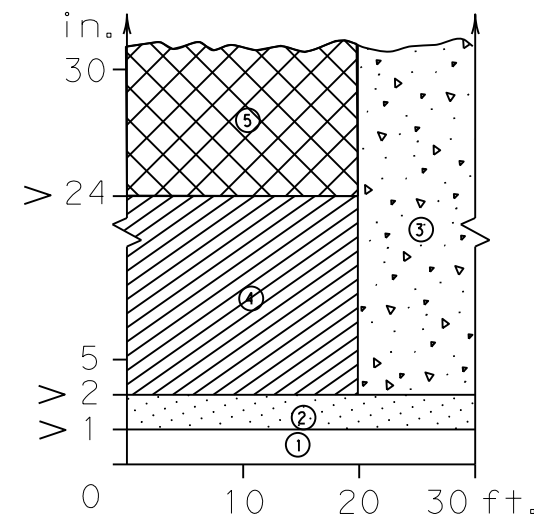
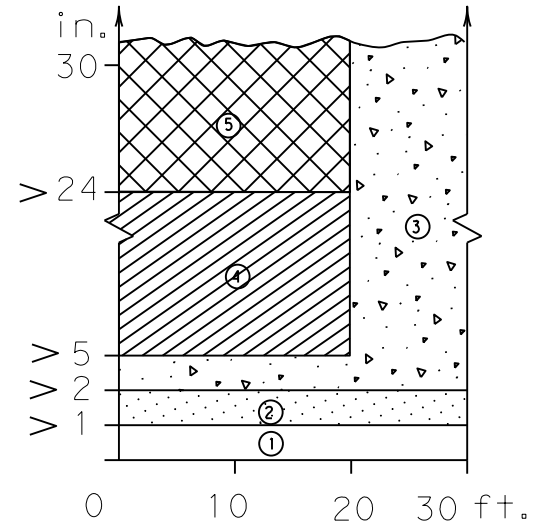
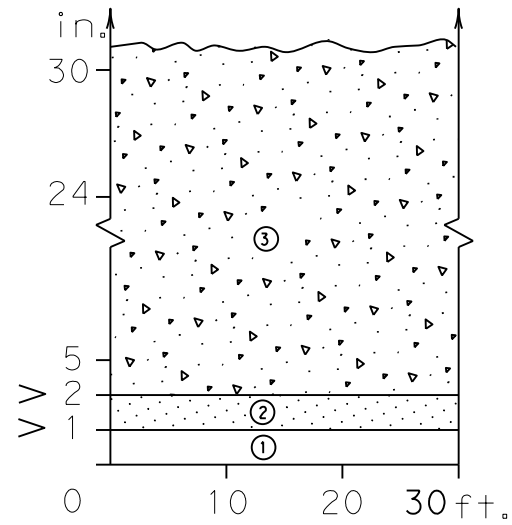
© TxDOT January 2010		DN: TXDOT	CK: TXDOT	DW: TXDOT	CK: TXDOT
REVISIONS		CONT	SECT	JOB	HIGHWAY
		0122	03	033, ETC	US 287, ETC
		DIST	COUNTY		SHEET NO.
		BRY	FREESTONE, ETC		56

DISCLAIMER: The use of this standard is governed by the "Texas Engineering Practice Act". No warranty of any kind is made by TxDOT for any purpose whatsoever. TxDOT assumes no responsibility for the conversion of units or the accuracy of the information provided herein. This document is for informational purposes only and does not constitute a contract. For more information, contact the Texas Department of Transportation, 4901 Westheimer, Houston, TX 77056.

DATE: 5/26/2022 4:33:57 PM
 FILE: \\txdot.projectwiseonline.com:TXDOT4\Documents\17 - BRY\Design Projects\17-0333\17-0333-11.dwg

DEFINITION OF TREATMENT ZONES FOR VARIOUS EDGE CONDITIONS

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



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	CW8-9a or CW 8-11, signs plus drums. Where restricted space precludes the use of drums, use vertical panels. An edge slope to that of the proferred 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.

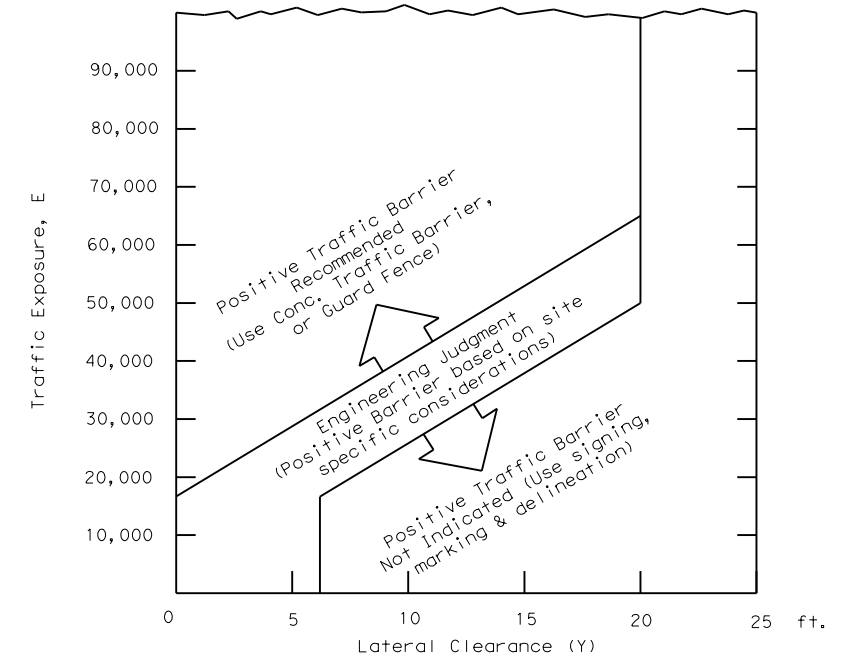
FACTORS CONSIDERED IN THE GUIDELINES:

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

Edge Condition Notes:

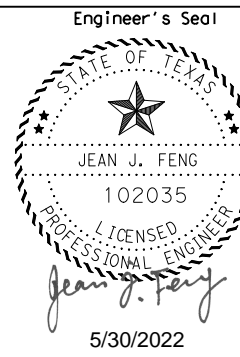
- Edge Condition I: Most vehicles are able to traverse an edge condition with a slope rate of (3 to 1) or flatter. The slope must be constructed with a compacted material capable of supporting vehicles.
- Edge Condition II: Most vehicles are able to traverse an edge condition with a slope between (2.99 to 1) and (1 to 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" exceeds 24 inches, the possibility for rollover is greater in most vehicles.
- 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.
- 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 ([Cross-hatched])



- $E = ADT \times T$
 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.
- 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.
- An approved end treatment should be provided for any positive barrier end located within the clear zone.

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.



Date 5/30/2022



TREATMENT FOR VARIOUS EDGE CONDITIONS

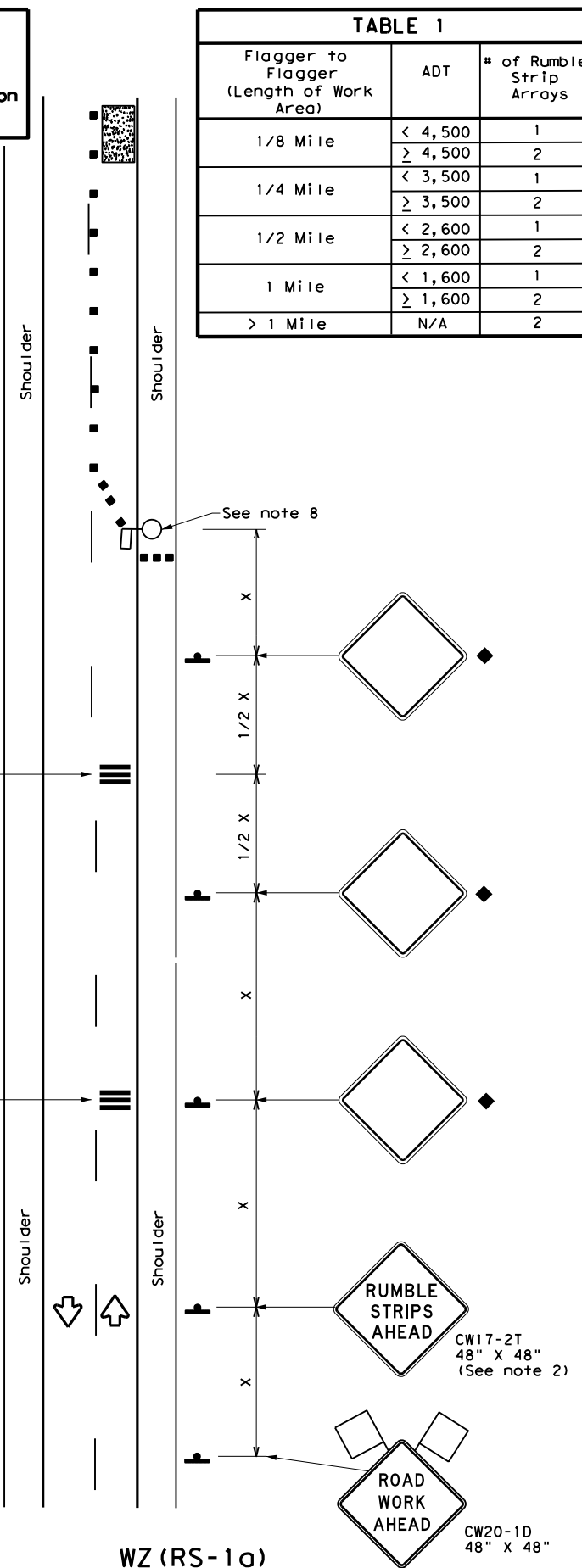
FILE: edgecon.dgn	DN:	CK:	DW:	CK:
© TxDOT August 2000	CONT	SECT	JOB	HIGHWAY
03-01 08-01 9-21	0122	03	033, ETC	US 287, ETC
DIST	COUNTY		SHEET NO.	
BRY	FREESTONE, ETC		57	

DISCLAIMER: The use of this standard is governed by the "Texas Engineering Practice Act". No warranty of any kind is made by TxDOT for any purpose whatsoever. TxDOT assumes no responsibility for the conversion of units or the accuracy of the information contained herein. The user of this standard shall be responsible for its proper use.

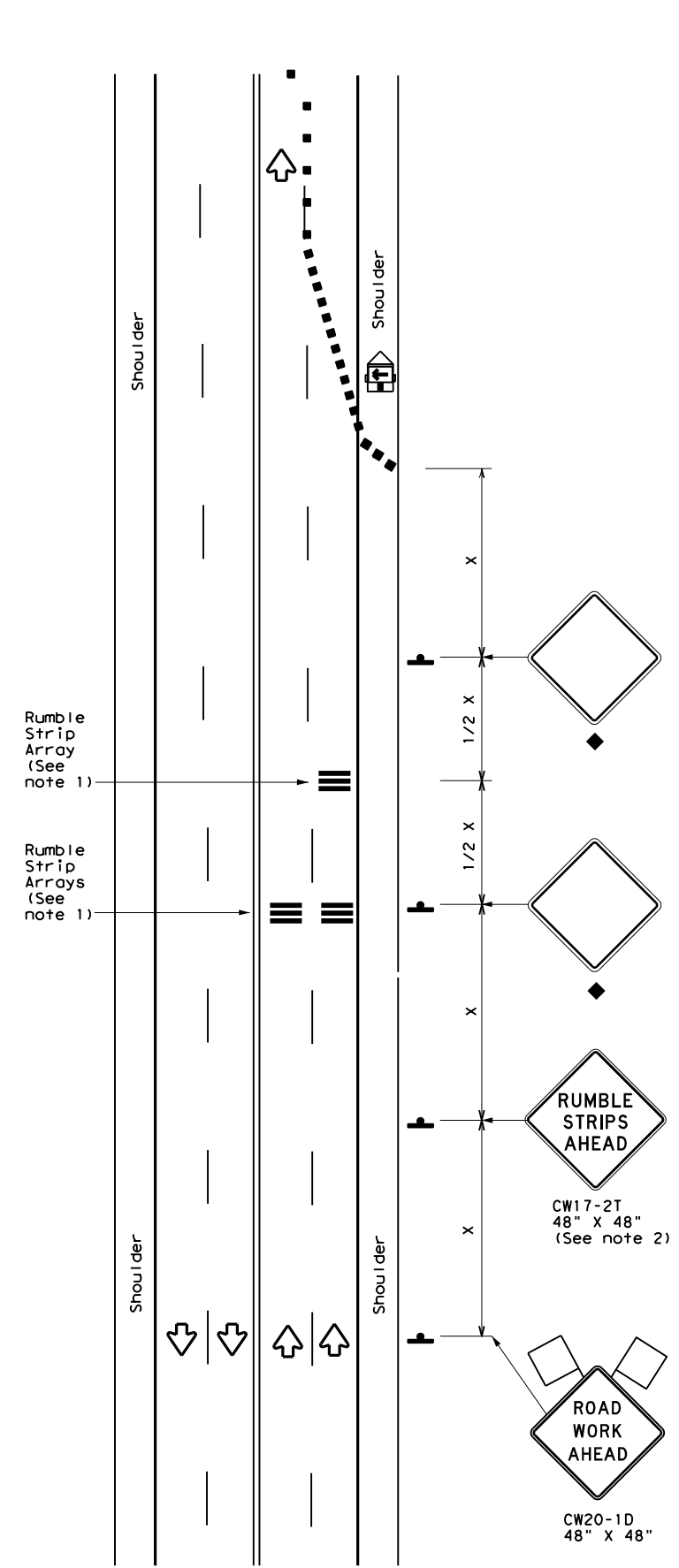
DATE: 5/26/2022 4:34:09 PM
 FILE: \\txdot\project\wiseonline.com:TXDOT4\Documents\17 - BRY\Design Projects\17090909\17090909.dgn

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

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



WZ (RS-1a)
75 mph or Less
RUMBLE STRIPS ON ONE-LANE TWO-WAY APPLICATION



WZ (RS-1b)
75 mph or Less
RUMBLE STRIPS FOR LANE CLOSURE ON CONVENTIONAL ROADWAY

GENERAL NOTES

- 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.
- 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.
- Temporary Rumble Strips will be considered subsidiary to Item 502, and shall be a product listed on the Compliant Work Zone Traffic Control Devices.
- Removal of the Temporary Rumble Strips should be accomplished before removing the advance warning signs.
- Temporary Rumble Strips should not be used on horizontal curves, loose gravel, soft or bleeding asphalt, heavily rutted pavements or unpaved surfaces.
- Temporary Rumble Strips shall be installed and maintained as per manufacturer's recommendations.
- This standard sheet shall be used in conjunction with other appropriate TCP standard, TMUTCD typical application or project specific detail for the project.
- The one-lane two-way application may utilize a flagger, an AFAD or a portable traffic signal.
- Temporary Rumble Strips may be used on freeways or expressways based on engineering judgment.

Speed	Approximate distance between strips in an Array
≤ 40 MPH	10'
> 40 MPH & ≤ 55 MPH	15'
> 55 MPH	20'

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

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

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.

Texas Department of Transportation
 Traffic Operations Division Standard

TEMPORARY RUMBLE STRIPS

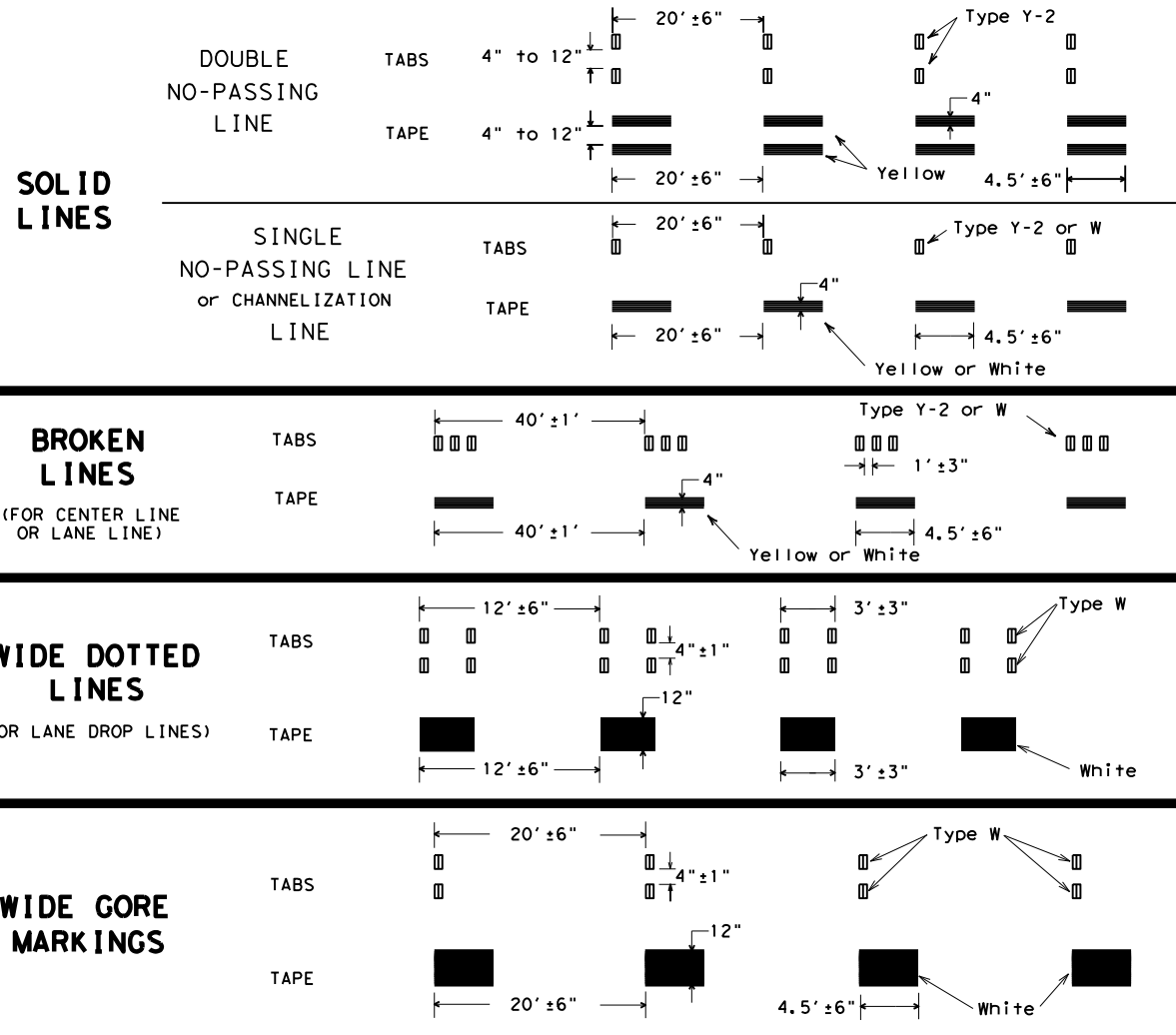
WZ (RS) - 16

FILE: wzrs16.dgn	DN: TxDOT	CK: TxDOT	DW: TxDOT	CK: TxDOT
© TxDOT November 2012	CONT	SECT	JOB	HIGHWAY
REVISIONS	0122	03	033, ETC	US 287, ETC
2-14	DIST	COUNTY	SHEET NO.	
4-16	BRY	FREESTONE, ETC	58	

DISCLAIMER: The use of this standard is governed by the "Texas Engineering Practice Act". No warranty of any kind is made by TxDOT for any purpose whatsoever. TxDOT assumes no responsibility for the conversion of units or the accuracy of the information contained herein.

DATE: 5/26/2022 4:34:14 PM
 FILE: \\txdot.projectwiseonline.com:TXDOT14\Documents\17 - BRY\Design Projects\1709093104\1709093104.dgn

WORK ZONE SHORT TERM PAVEMENT MARKINGS DETAILS



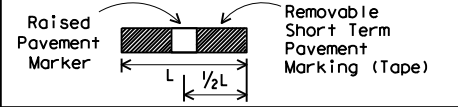
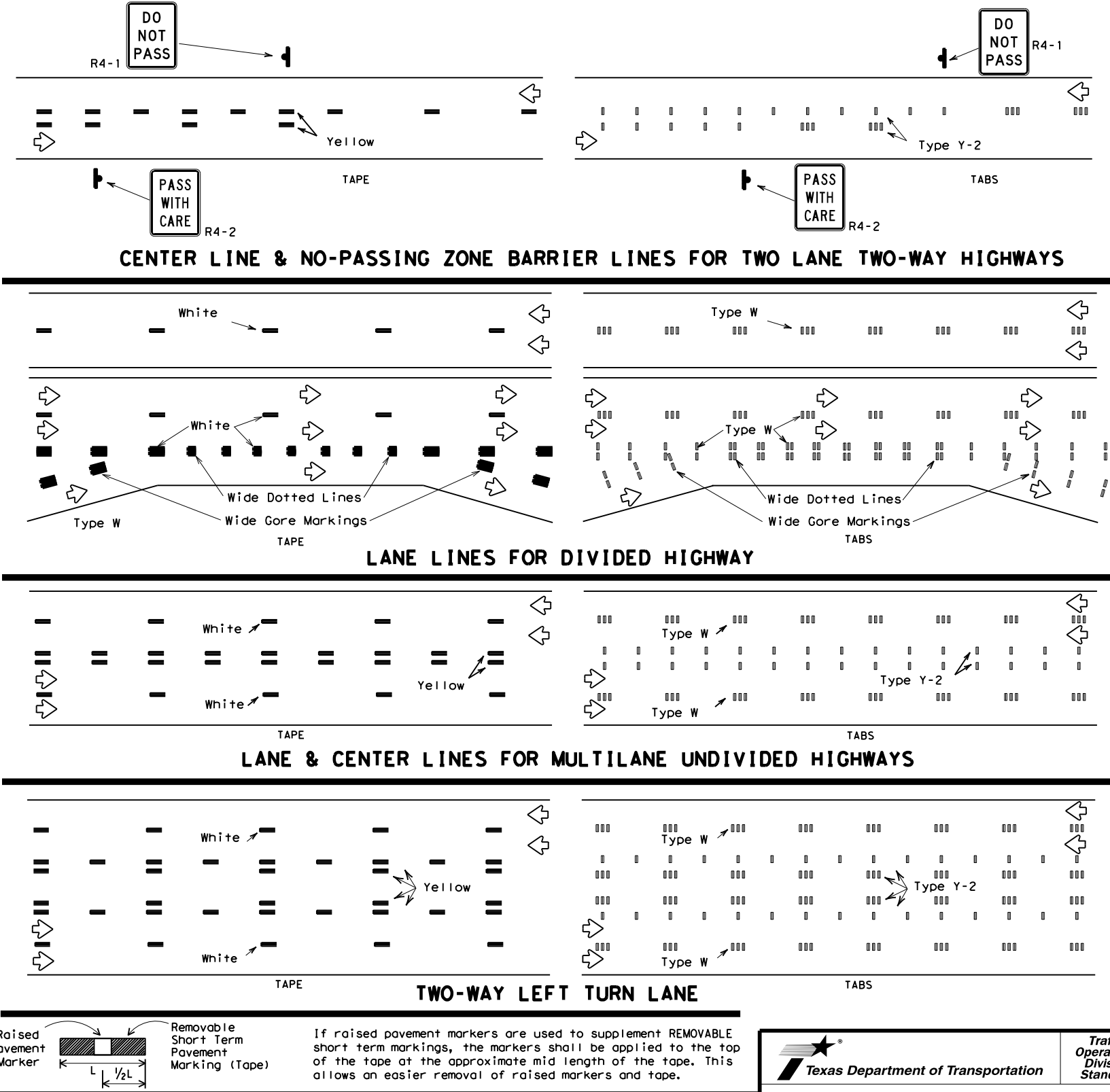
NOTES:

- Short term pavement markings may be prefabricated markings (stick down tape) or temporary flexible-reflective roadway marker tabs unless otherwise specified elsewhere in plans.
- Short term pavement markings shall NOT be used to simulate edge lines.
- 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.
- 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.
- 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.
- 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.
- 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).
- 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)

- 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).
- Tabs shall meet requirements of Departmental Material Specification DMS-8242.
- 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.
- 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



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

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

RAISED PAVEMENT MARKERS

- 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)

- 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

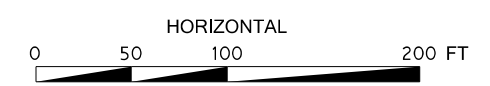
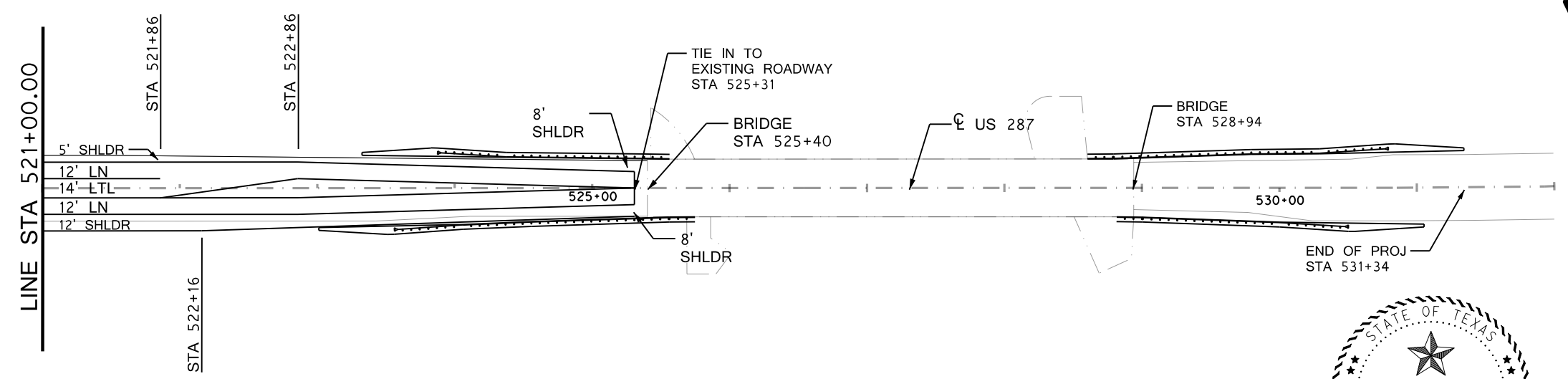
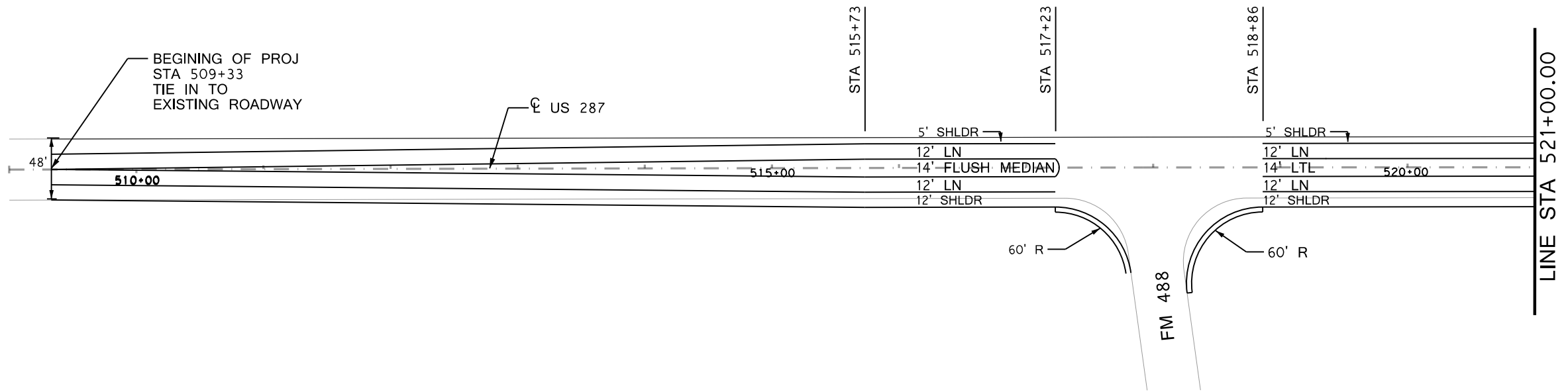


WORK ZONE SHORT TERM PAVEMENT MARKINGS

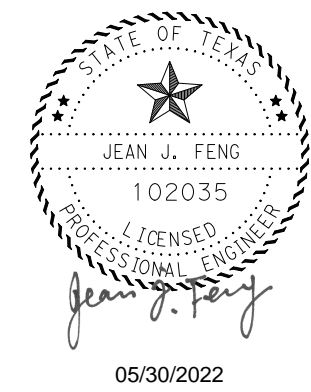
WZ (STPM) - 13


FILE:	wzstpm-13.dgn	DN:	TxDOT	CK:	TxDOT	DW:	TxDOT	CK:	TxDOT
© TxDOT	April 1992	CONT	0122	SECT	03	JOB	033, ETC	US	287, ETC
REVISIONS		DIST		COUNTY		SHEET NO.			
1-97		BRY		FREESTONE, ETC					59
3-03									
7-13									

REV DATE: 2-12-2015
 CSJ: 0122-03-033
 FILENAME: pw:\txdot\projectswiseline.com\TXDOT4\Documents\17 - BRY\Design\Projects\012203033\4 - Design\Plan_Ser\ - General\1B - ProjectLayout\sheet1.dgn



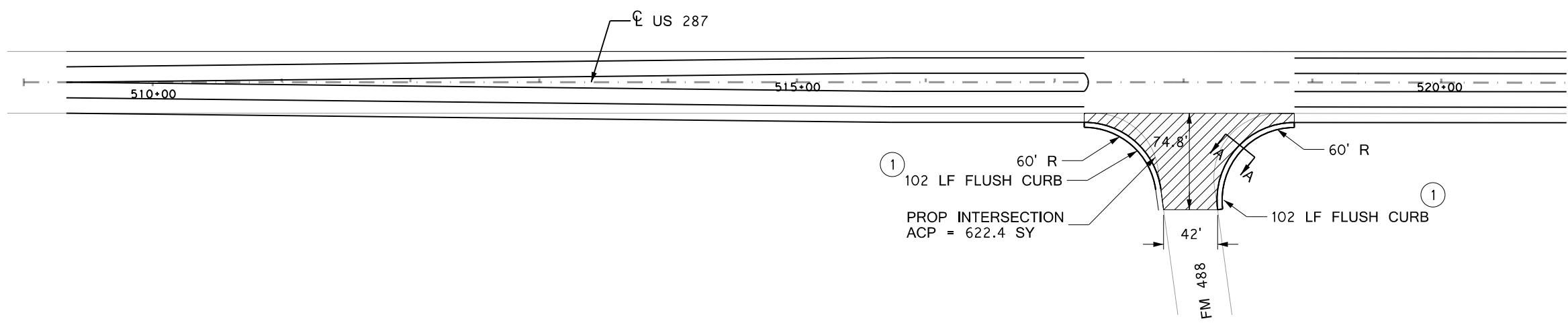
PRINT DATE	REVISION DATE
5/26/2022	



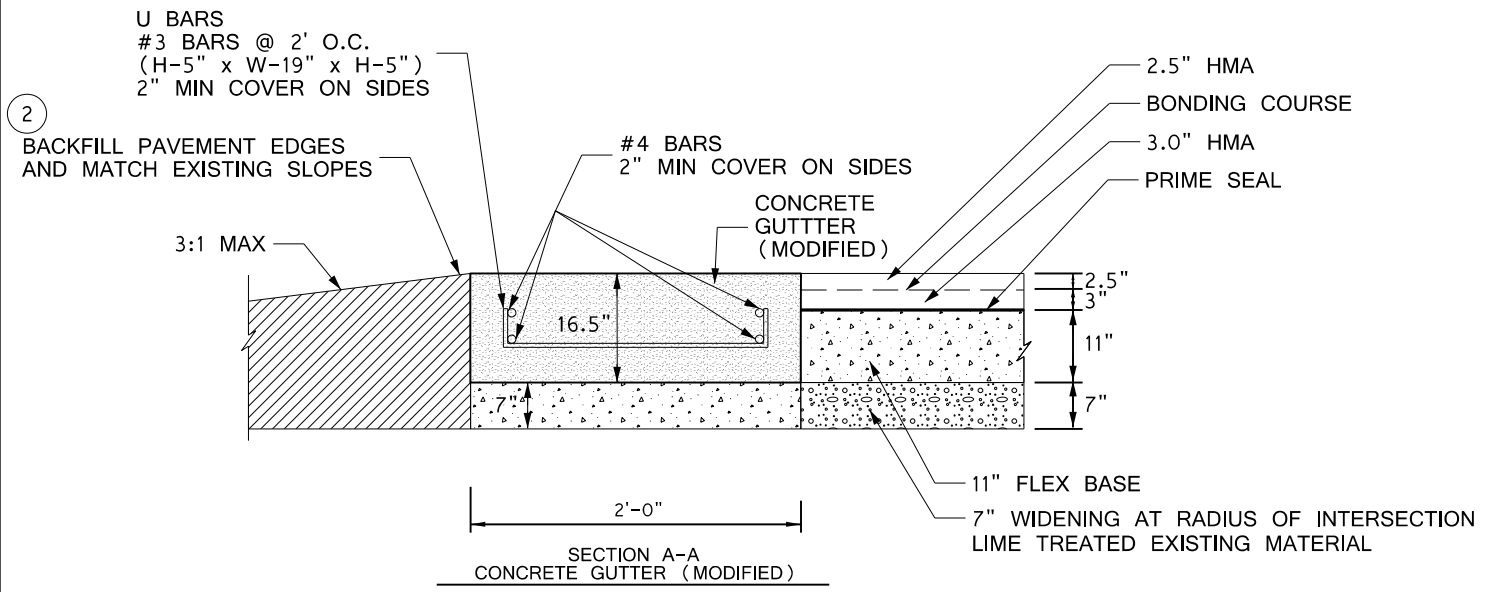

Texas Department of Transportation ©2022
 Bryan District
ROADWAY LAYOUT (US 287)

FED. RD. DIV. NO.	PROJECT NUMBER	HIGHWAY NUMBER
6		US 287, ETC.
STATE	DISTRICT	COUNTY
TEXAS	BRYAN	FREESTONE, ETC.
CONTROL	SECTION	JOB SHEET NO.
0122	03	033,ETC. 61

REV DATE: 2-12-2015
 CSJ: 0122-03-033
 FILENAME: pw:\ttdot\projectswisconsin.com\TXDOT4\Documents\17 - BRY\Design\Projects\012203033\4 - Design\Plan Set\3. Roadway\3E. Intersection\Details\Intersection_Details.dgn



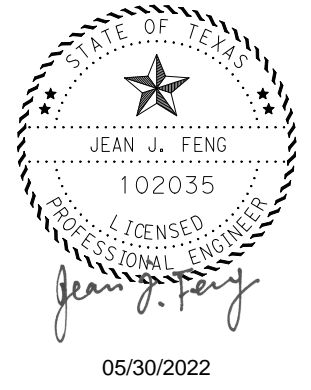
① 60' R
 102 LF FLUSH CURB
 74.8'
 60' R
 ①
 PROP INTERSECTION
 ACP = 622.4 SY
 42'
 FM 488



NOTES:
 CONCRETE SHALL BE CLASS C.

① SEE CONCRETE GUTTER DETAIL FOR DIMENSIONS OF CONCRETE GUTTER (MODIFIED)

② BACKFILL PAVEMENT EDGE IS SUBSIDIARY TO ITEM 529 CONCRETE GUTTER.



Drawings Not To Scale

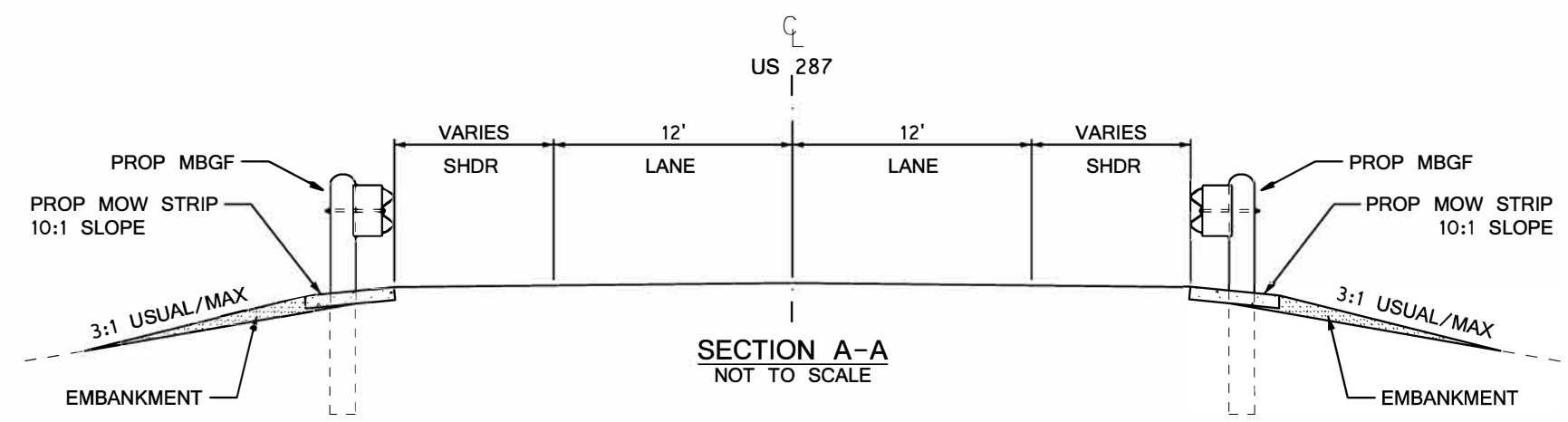
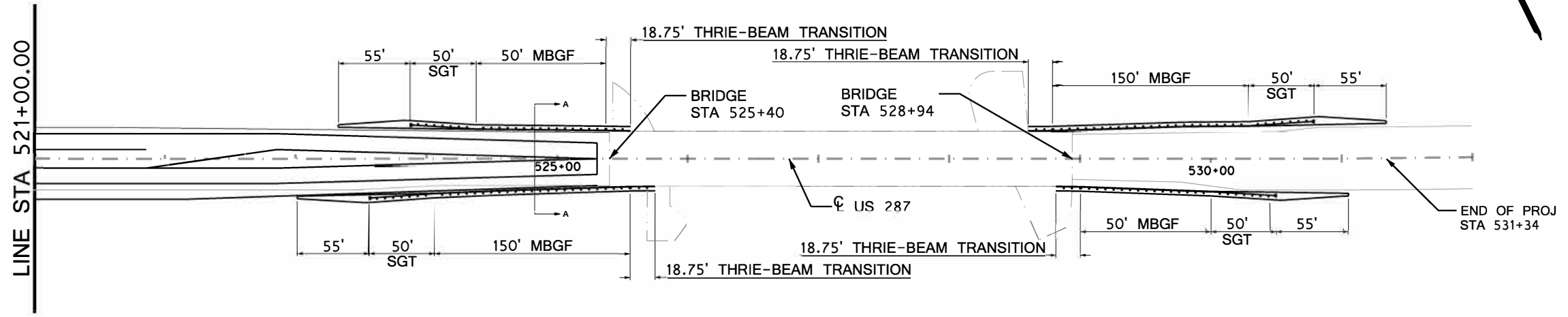
PRINT DATE	REVISION DATE
5/26/2022	



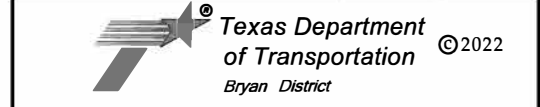
**INTERSECTION DETAIL
 (US 287 & FM 488)**

FED. RD. DIV. NO.	PROJECT NUMBER	HIGHWAY NUMBER	
6		US 287, ETC.	
STATE	DISTRICT	COUNTY	
TEXAS	BRYAN	FREESTONE, ETC.	
CONTROL	SECTION	JOB	SHEET NO.
0122	03	033, ETC.	62

REV DATE: 2-12-2015
 CSJ: 0122-03-033
 FILENAME: pw:\tbdot\projectwiseonline.com\TXDOT\Documents\17 - BRYAN\Design Projects\012203033\4 - Design\Plan Set\3. Roadway\3.1. Mbgf Detail\MBGF Detail.dgn



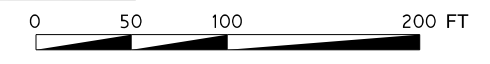
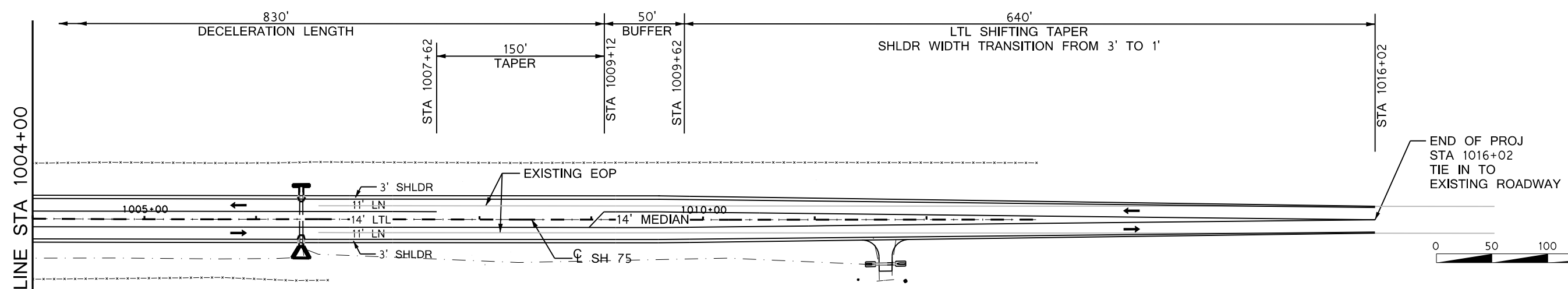
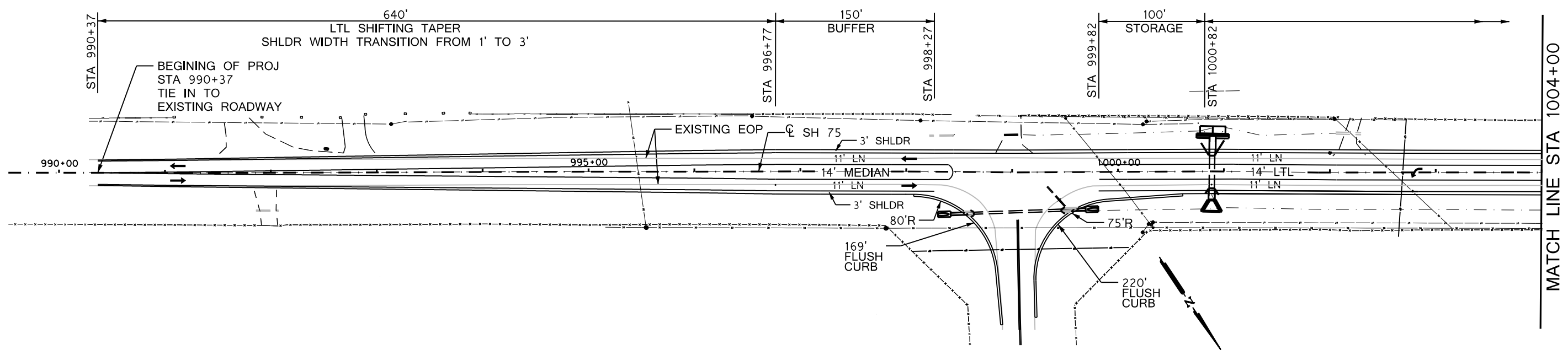
NOT TO SCALE
 PRINT DATE: 5/31/2022
 REVISION DATE:



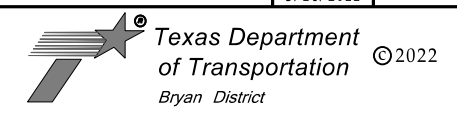
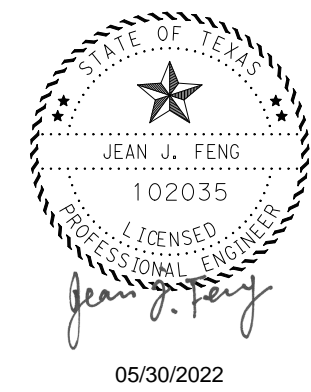
**MBGF LAYOUT
(US 287)**

FED. RD. DIV. NO.	PROJECT NUMBER	HIGHWAY NUMBER	
6		US 287, ETC.	
STATE	DISTRICT	COUNTY	
TEXAS	BRYAN	FREESTONE, ETC.	
CONTROL	SECTION	JOB	SHEET NO.
0122	03	033,ETC.	63

REV DATE: 2-12-2015
 CSJ: 0122-03-033
 FILENAME: pw:\tdot\projectswisconsin.com\TXDOT4\Documents\17 - BRY\Design Projects\016607067\4 - Design\Plan Set\1. General\1.B. Project\Layout\ROADWAY\LAYOUI (SH 75).dgn



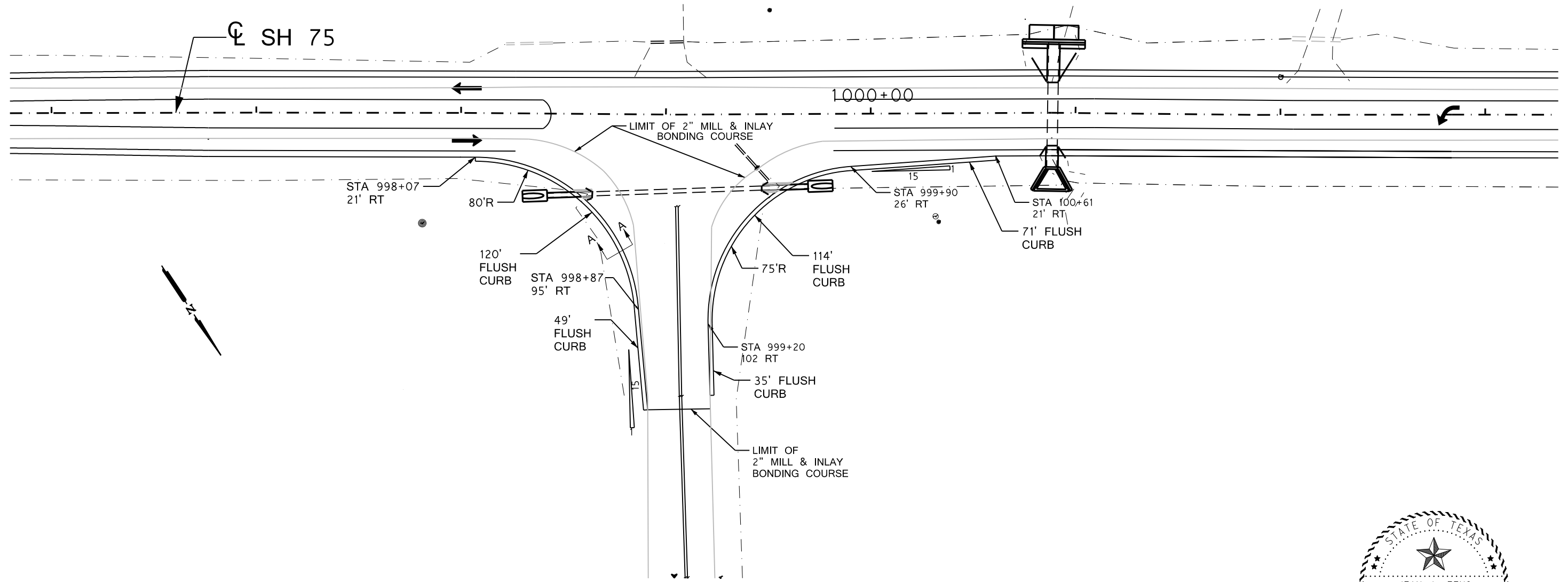
PRINT DATE	REVISION DATE
5/26/2022	



**ROADWAY LAYOUT
(SH 75)**

FED. RD. DIV. NO.	PROJECT NUMBER	HIGHWAY NUMBER	
6		US 287, ETC.	
STATE	DISTRICT	COUNTY	
TEXAS	BRYAN	FREESTONE, ETC.	
CONTROL	SECTION	JOB	SHEET NO.
0122	03	033, ETC.	64

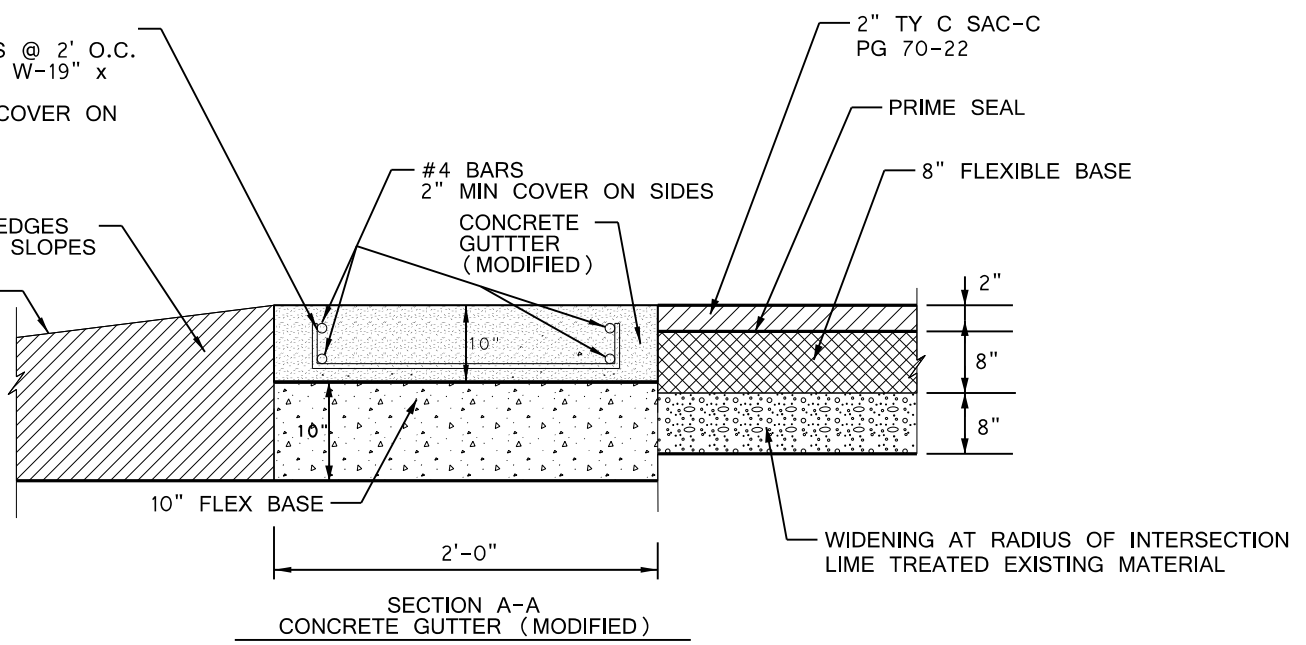
REV DATE: 2-12-2015
 CSJ: 0122-03-033
 FILENAME: pw:\tdot\projectswisconsin.com\TXDOT4\Documents\17 - BRY\Design Projects\016607067\4 - Design Plan Set\3. Roadway\3E. IntersectionDetails\INTERSECTION_LAYOUT (SH 75).dgn



U BARS
 #3 BARS @ 2' O.C.
 (H-5" x W-19" x
 H-5")
 2" MIN COVER ON
 SIDES

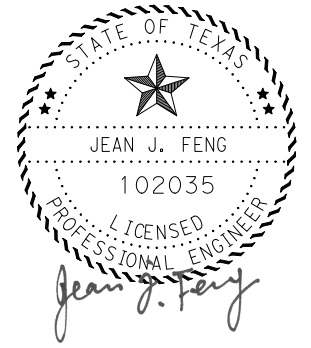
② BACKFILL PAVEMENT EDGES
 AND MATCH EXISTING SLOPES

3:1 MAX

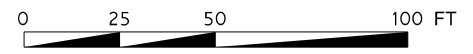


SECTION A-A
 CONCRETE GUTTER (MODIFIED)

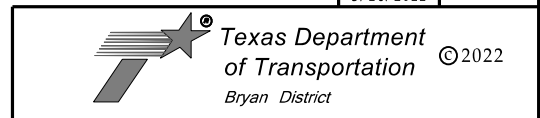
NOTES:
 CONCRETE SHALL BE CLASS C.
 ① SEE CONCRETE GUTTER DETAIL FOR DIMENSIONS OF CONCRETE GUTTER (MODIFIED)
 ② BACKFILL PAVEMENT EDGE IS SUBSIDIARY TO ITEM 529 CONCRETE GUTTER.



05/30/2022



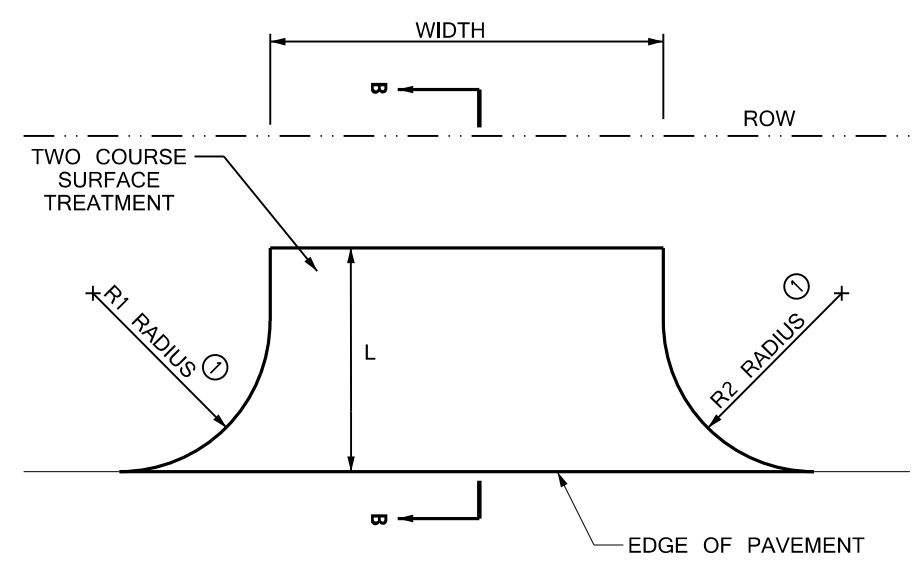
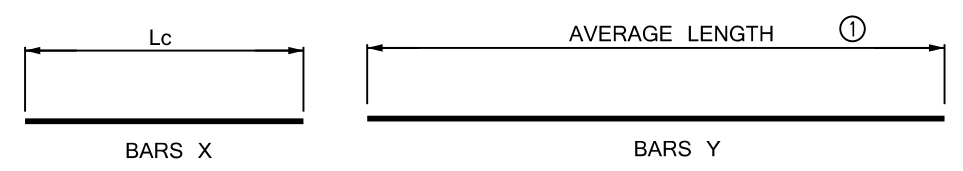
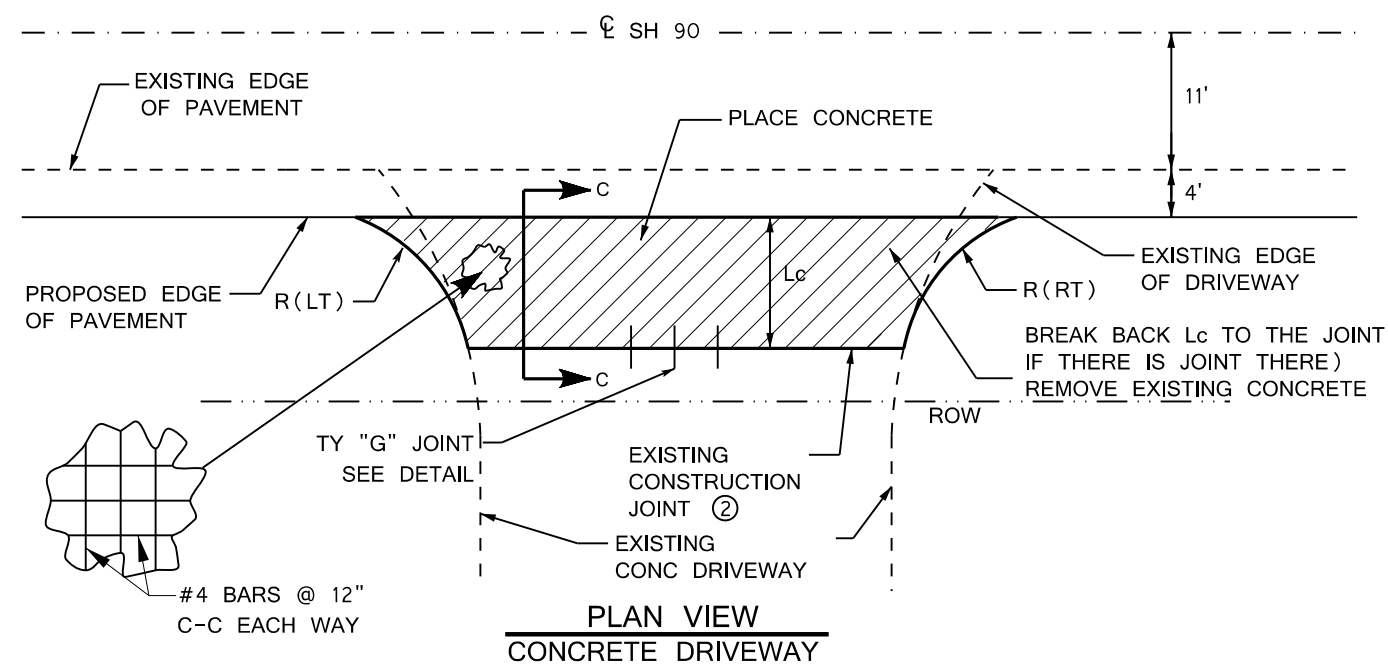
PRINT DATE	REVISION DATE
5/26/2022	



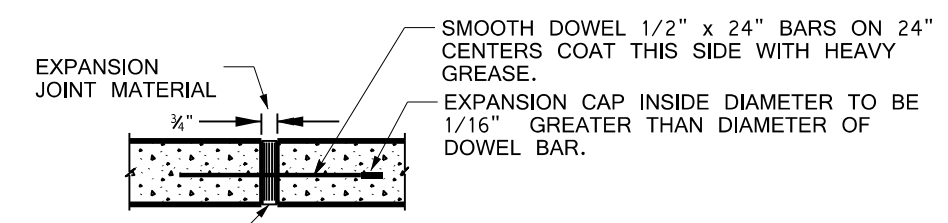
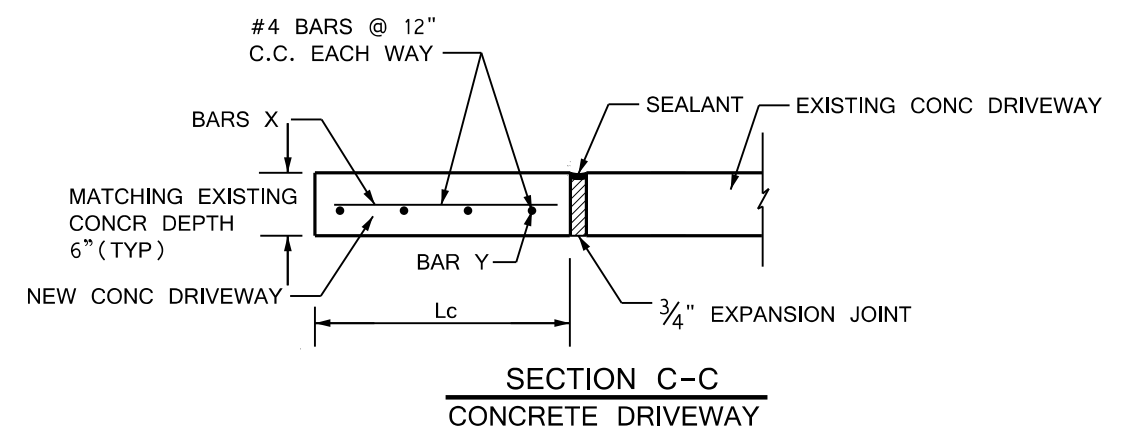
INTERSECTION DETAIL
 (SH 75 & SPUR 67)

FED. RD. DIV. NO.	PROJECT NUMBER	HIGHWAY NUMBER	
6		US 287, ETC.	
STATE	DISTRICT	COUNTY	
TEXAS	BRYAN	FREESTONE, ETC.	
CONTROL	SECTION	JOB	SHEET NO.
0122	03	033, ETC.	65

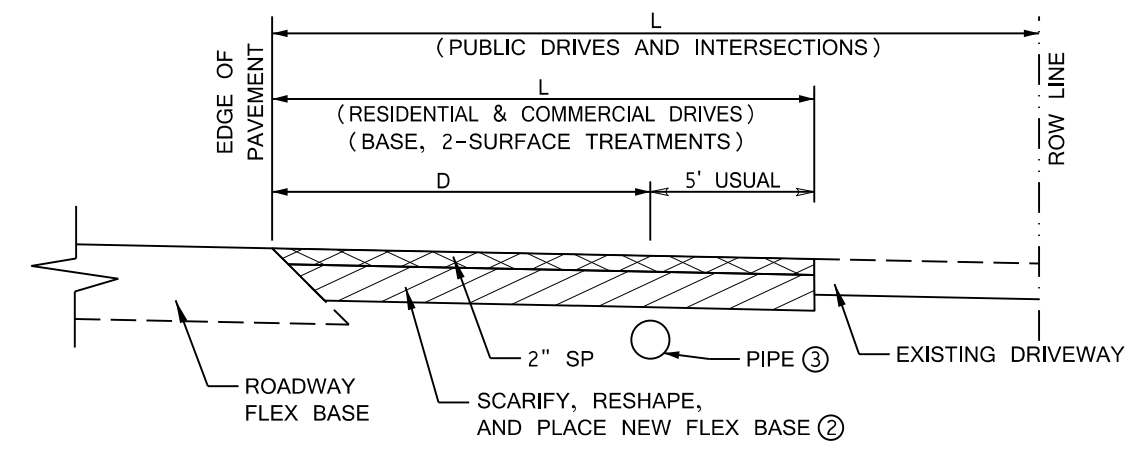
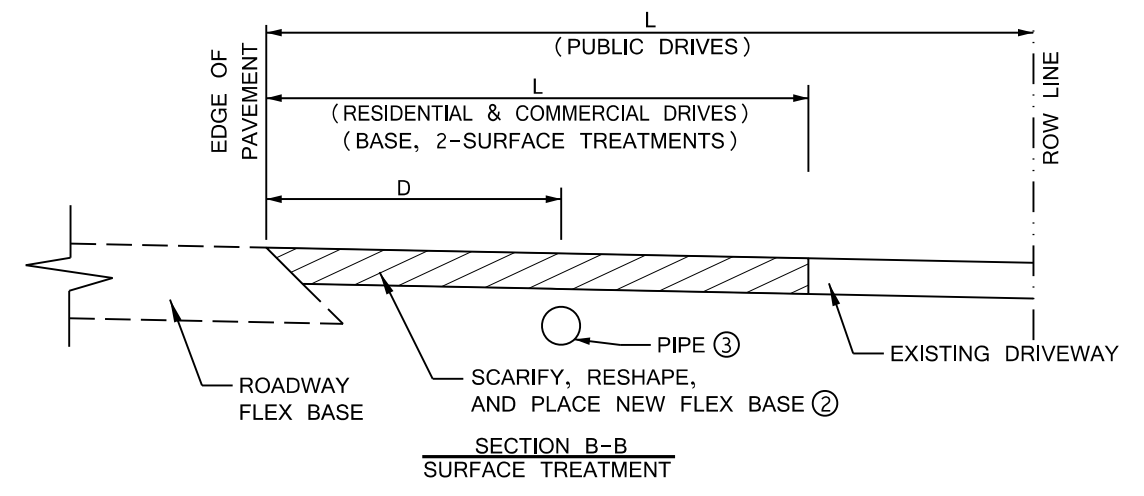
REV DATE: 2/5/2015
 CS: 0103-03-009 ETC. FILENAME: pw:\tdot\project\online.com:TXDOT4\Documents\17 - BRY\Design Projects\016607067\4 - Design\Plan Set\3. Roadway\3F. DrivewayDetails\Driveway Details (SH 75).dgn



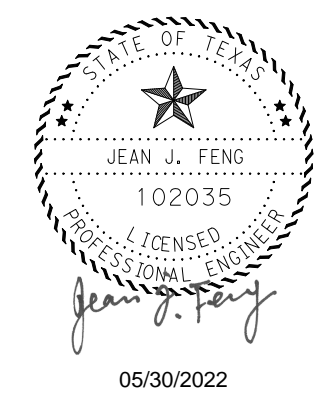
- ① PRIVATE DRIVE: 12% MAX GRADE
PUBLIC/COMMERCIAL: 8% MAX GRADE
- ② FLEX BASE IS 6" FOR PRIVATE,
8" FOR PUBLIC STREET
- ③ MINIMUM 6" COVER ON DRIVEWAY PIPES



FIBER BOARD TO BE RECESSED AND COVERED WITH RUBBERIZED JOINT SEAL MATERIAL APPROVED BY THE ENGINEER.
 USE JOINT WHEN CONCRETE DRIVEWAYS MUST BE PLACED IN HALF WIDTHS.

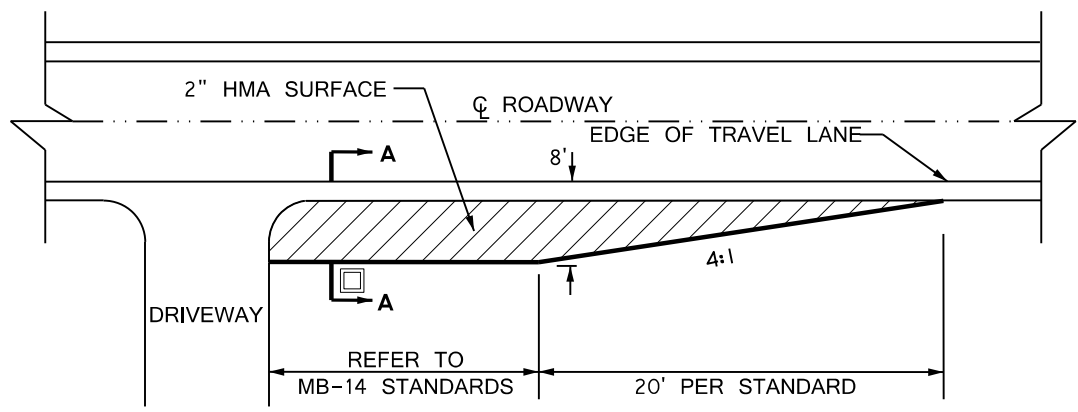


NOTE:
 AREAS NOT AFFECTED BY WIDENINGS OR PIPE WPRK TO GET AN OVERLAY ONLY.

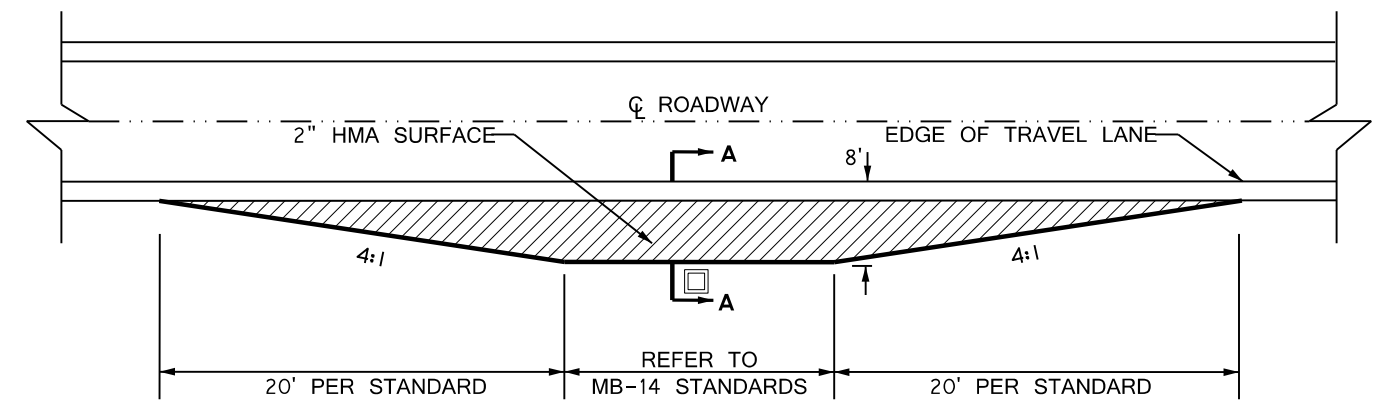


PRINT DATE		REVISION DATE	
5/26/2022			
Texas Department of Transportation ©2022 Bryan District		DRIVEWAY DETAILS (SH 75)	
6		US 287, ETC.	
STATE	DISTRICT	COUNTY	
TEXAS	BRYAN	FREESTONE, ETC.	
CONTROL	SECTION	JOB	SHEET NO.
0122	03	033,ETC.	66

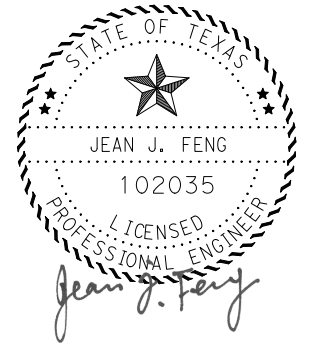
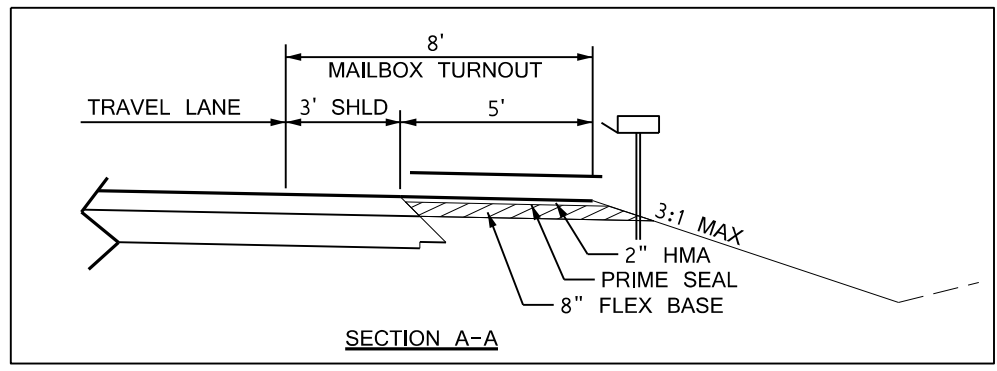
REV DATE: 2-12-2015
 CSJ: 0122-03-033
 FILENAME: pw:\txdot\projectsonline.com\TXDOT4\Documents\17 - BRY\Design Projects\016607067\4 - Design\Plan Set\3. Roadway\3F. DrivewayDetails\Driveway_Details (SH 75).dgn



TYPE I MAILBOX TURNOUT
 ADDITIONAL SURFACE EST @ 17 SY/EA



TYPE II MAILBOX TURNOUT
 ADDITIONAL SURFACE EST @ 22 SY/EA



05/30/2022

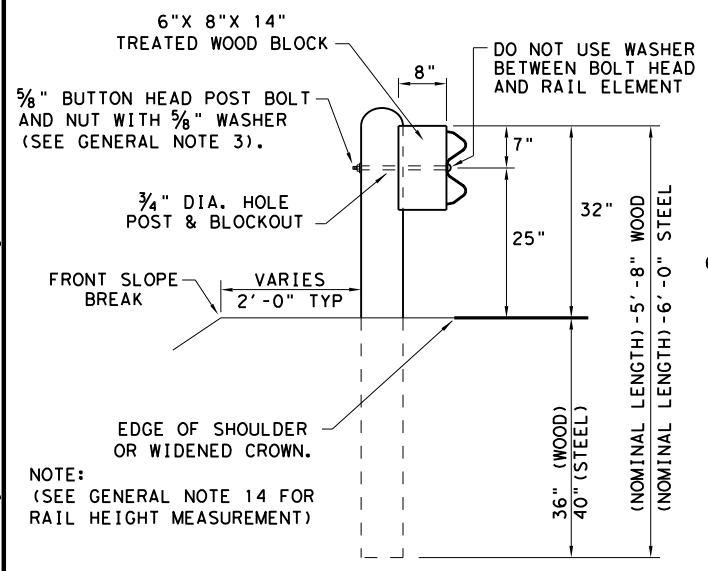
PRINT DATE	REVISION DATE
5/26/2022	

Texas Department of Transportation ©2022
 Bryan District

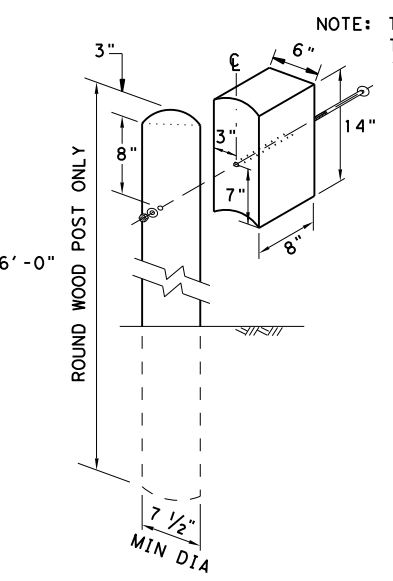
MAILBOX TURNOUT DETAILS (SH 75)

FED. RD. DIV. NO.	PROJECT NUMBER	HIGHWAY NUMBER	
6		US 287, ETC.	
STATE	DISTRICT	COUNTY	
TEXAS	BRYAN	FREESTONE, ETC.	
CONTROL	SECTION	JOB	SHEET NO.
0122	03	033, ETC.	67

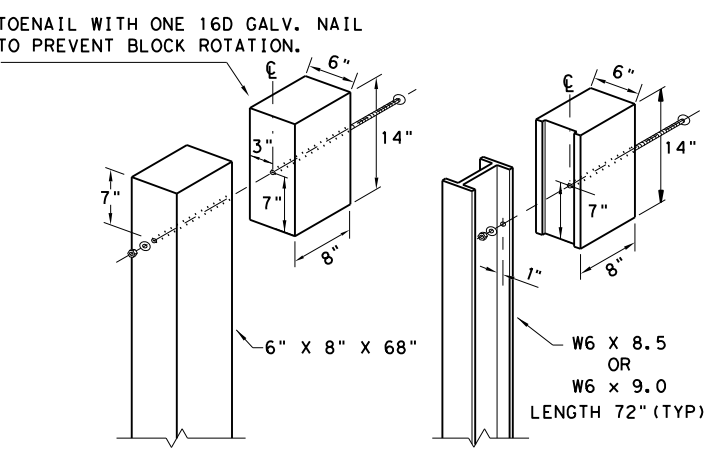
DATE: 5/26/2022
 FILE: \\txdot\project\wiseonline.com\TXDOT14\Documents\17 - BRY\Design Projects\012203033\4 - Design\Plan Set\3. Roadway\3H. RoadwayStandard\GF (31) -19.dgn
 DISCLAIMER: THE USE OF THIS STANDARD IS GOVERNED BY THE "TEXAS ENGINEERING PRACTICE ACT". NO WARRANTY OF ANY KIND IS MADE BY TXDOT FOR ANY PURPOSE WHATSOEVER. TXDOT ASSUMES NO RESPONSIBILITY FOR THE CONVERSION OF THIS STANDARD TO OTHER FORMATS OR FOR INCORRECT RESULTS OR DAMAGES RESULTING FROM ITS USE.



TYPICAL POST PLACEMENT

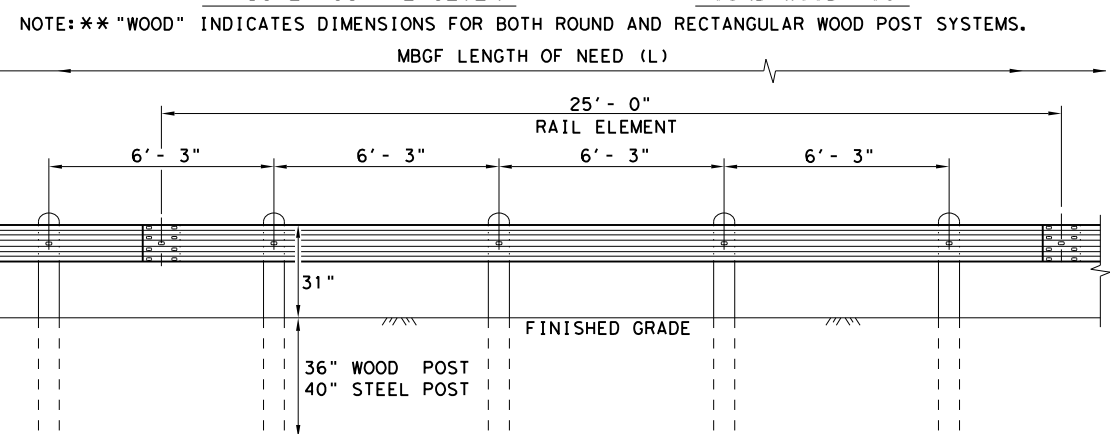


WOOD BLOCK TO ROUND WOOD POST



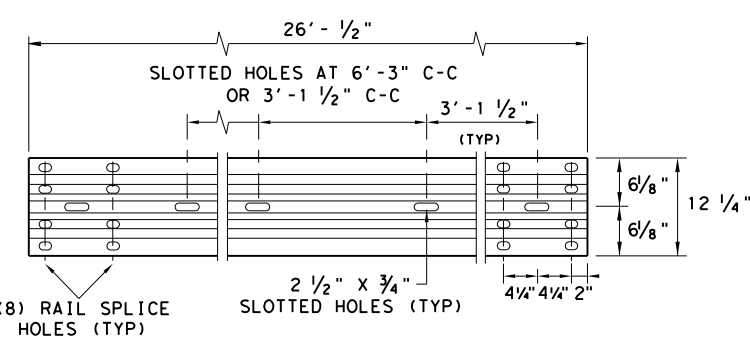
WOOD BLOCK TO RECTANGULAR WOOD POST **ROUTED WOOD BLOCK TO I-BEAM STEEL POST**

- 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 1/2" 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 5/8" WASHER (FWC16G) 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.



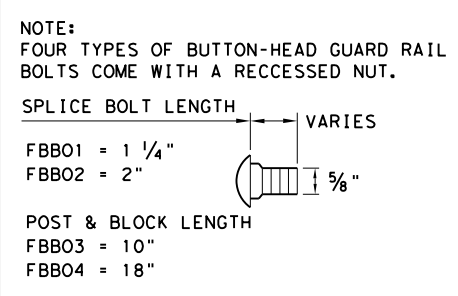
ELEVATION MID-SPAN RAIL SPLICE

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



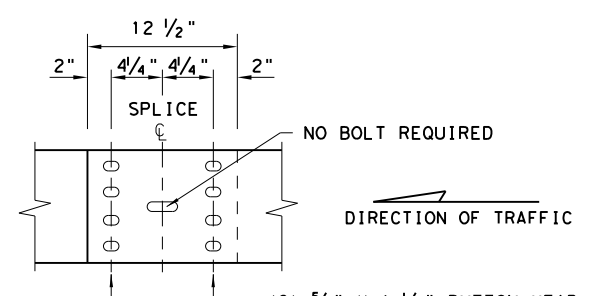
ELEVATION 25'-0" (NOM.) W-BEAM SECTION

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



BUTTON HEAD BOLT

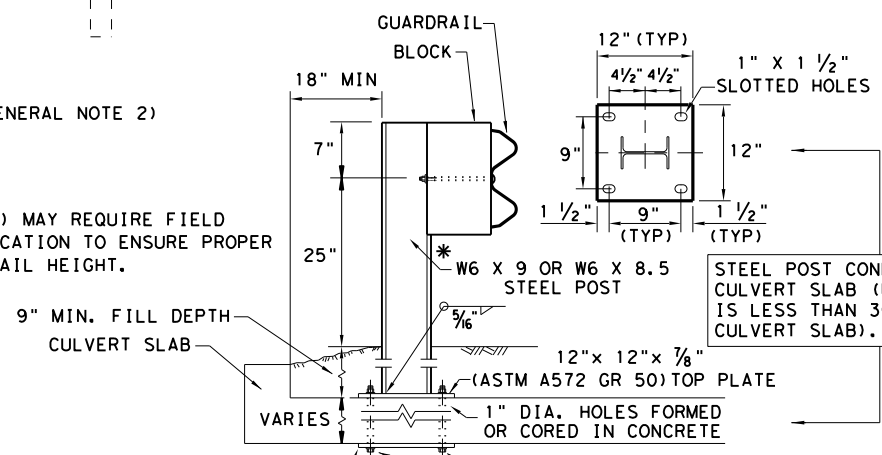
NOTE: SEE GENERAL NOTE 3 FOR SPLICE & POST BOLT DETAILS.



MID-SPAN RAIL SPLICE DETAIL

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

* POST(S) MAY REQUIRE FIELD MODIFICATION TO ENSURE PROPER GUARDRAIL HEIGHT.



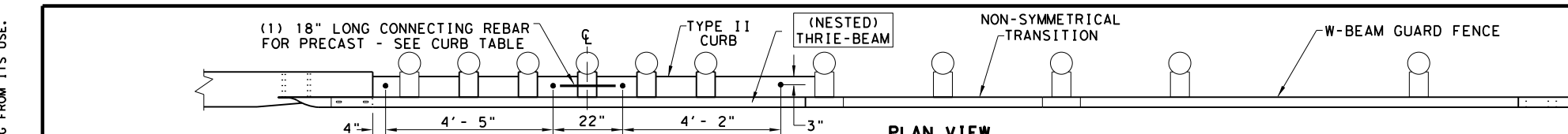
LOW FILL CULVERT POST

- NOTE: TWO INSTALLATION OPTIONS.
1. **BOLT-THROUGH OPTION:** REQUIRES A 6" MIN. SLAB THICKNESS. 5/8" DIA (ASTM A449) HEAVY HEX BOLTS WITH TWO HARDENED WASHER EACH AND HEAVY HEX NUTS. NOTE: BOLT LENGTH = SLAB PLUS 2 1/4" MIN.
 2. **EPOXY ANCHOR OPTION:** THIS OPTION MAY ONLY BE USED IF THE CULVERT SLAB IS 9" MIN. THICK. THREADED ANCHOR RODS MUST BE 5/8" 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 1/4" MIN. BEYOND NUT.

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

		Design Division Standard	
METAL BEAM GUARD FENCE TL-3 MASH COMPLIANT GF (31) -19			
FILE: gf3119.dgn	DN: TXDOT	CK: KM	DW: VP
© TXDOT: NOVEMBER 2019	CONT	SECT	JOB
REVISIONS		0122 03	033, ETC
DIST	COUNTY	US 287, ETC	SHEET NO.
BRY	FREESTONE, ETC		68

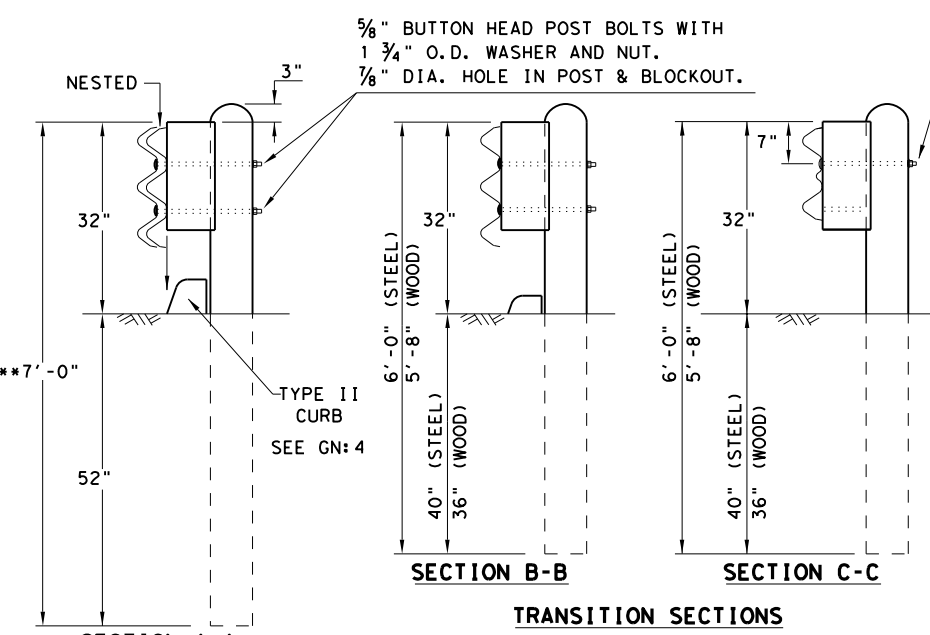
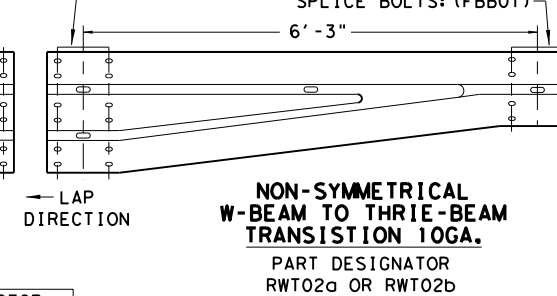
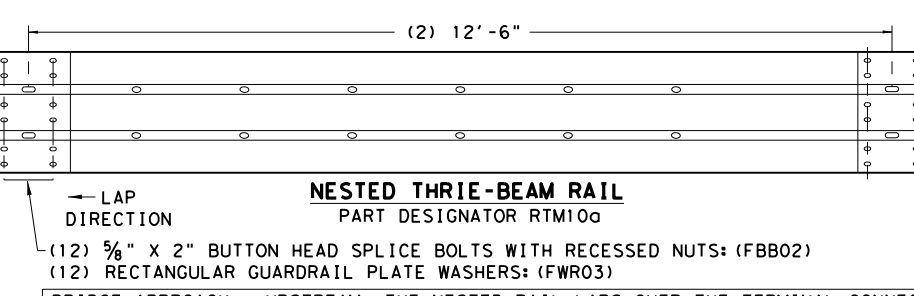
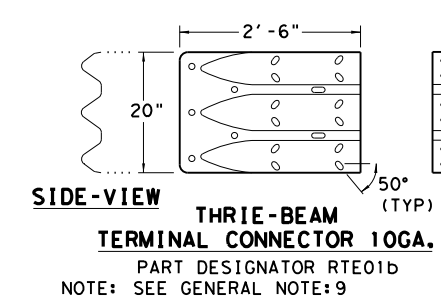
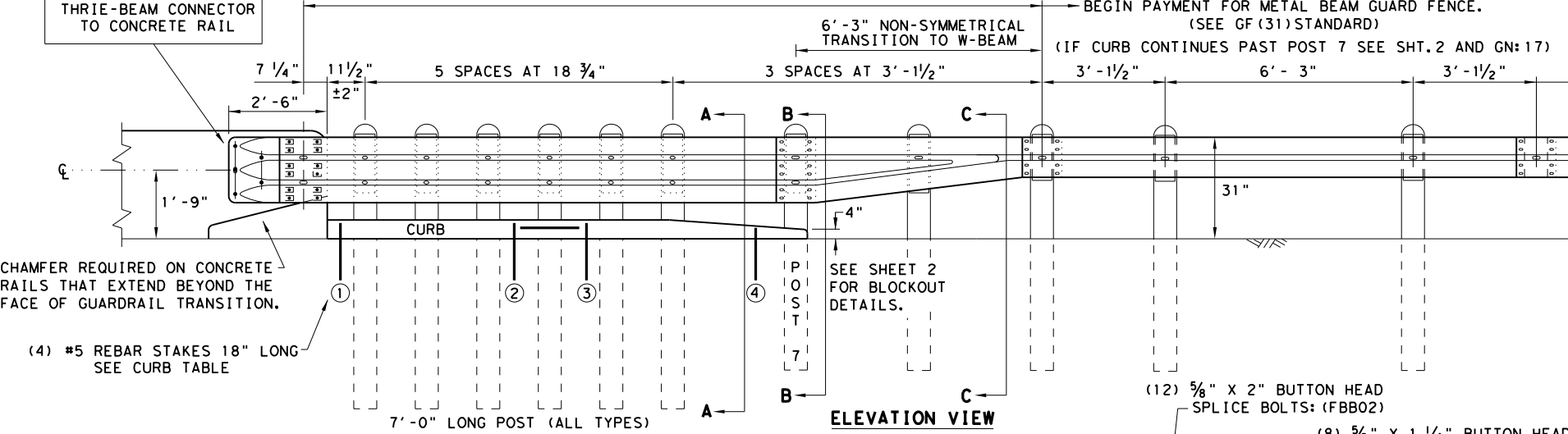
DISCLAIMER: THE USE OF THIS STANDARD IS GOVERNED BY THE "TEXAS ENGINEERING PRACTICE ACT". NO WARRANTY OF ANY KIND IS MADE BY TxDOT FOR ANY PURPOSE WHATSOEVER. TxDOT ASSUMES NO RESPONSIBILITY FOR THE CONVERSION OF THIS STANDARD TO OTHER FORMATS OR FOR INCORRECT RESULTS OR DAMAGES RESULTING FROM ITS USE.



- (5) 1" DIA. HOLES.
- (5) 7/8" DIA. HEAVY HEX HEAD BOLTS (FACING TRAFFIC SIDE) (ASTM F3125 GR A325 OR A449).
- (10) 1 3/4" O.D. WASHER UNDER EACH HEX BOLT HEAD AND NUT.
- (5) 7/8" DIA. HEAVY HEX NUTS (ASTM A194 OR A563).

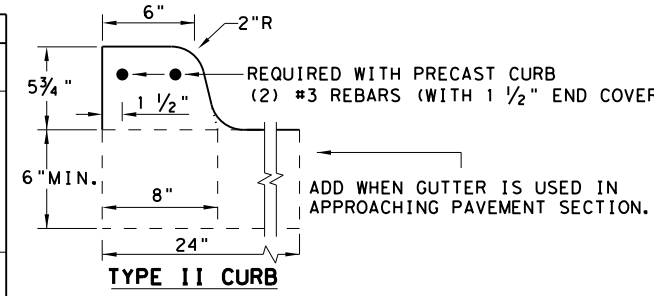
NOTE: HEAVY HEX BOLT LENGTH WILL VARY DEPENDING ON WIDTH CONCRETE RAIL, LEAVE 1" OF BOLT LENGTH PAST THE 7/8" HEX NUT. TRIM AS REQUIRED.

NOTE: CURB IS A REQUIRED COMPONENT FOR THE TRANSITION TO FUNCTION PROPERLY. SEE GENERAL NOTES: 2-4 AND 16-17.



THRIE-BEAM TERMINAL - CURB TABLE	
PRECAST CURB FULL LENGTH EQUALS 12'- 2"	
THE PRECAST CURB MAY BE FORMED INTO TWO SECTIONS.	
CURB (1) LENGTH	5'- 8"
CURB (2) LENGTH	6'- 6"
TAPER CURB (2) TO A HEIGHT OF 4" AT POST 7	
CONNECTING PRECAST CURB SECTIONS (1) & (2):	
FORM OR CORE	1" DIA. HOLE 9" LONG INTO EACH CURB END.
USE	(1) #5 GR.60 REBAR 18" LONG TO CONNECT BOTH CURBS.
SECURING PRECAST OR CAST-IN-PLACE TO FINISHED GRADE *:	
FORM OR CORE	(4) 1" DIA. HOLES, SEE PLAN AND ELEVATION VIEWS FOR HOLE LOCATIONS. DRIVE (4) #5 GR.60 REBAR STAKES 18" LONG INTO THE GROUND AND 1/2" BELOW TOP OF CURB.
	FILL HOLES WITH APPROVED GROUT MIXTURE.

* 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.



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

GENERAL NOTES

1. CONTACT THE DESIGN DIVISION FOR DRAINAGE CUT OUT OPTIONS NEEDED WITHIN THE CURB SECTION OF THE THRIE-BEAM TRANSITION. (512) 416-2678
2. CONCRETE CURB MAY BE CAST-IN-PLACE OR PRECAST AS SHOWN ON THIS SHEET. WHEN USED IN CONJUNCTION WITH THE THRIE-BEAM TRANSITIONS, CURB SHALL BE TYPE II (5- 3/4" HEIGHT); SEE CURRENT CCGG STANDARD SHEET FOR FURTHER DETAILS. IF OTHER CURB HEIGHTS ARE SHOWN IN THE PLANS IN CONJUNCTION WITH THE TRANSITION, THE CURB HEIGHT MAY BE FROM 4" TO 8" WITH A RELATIVELY VERTICAL FACE. CONCRETE CURB SHALL BE CONTINUOUS TO THE SEVENTH POST UNLESS OTHERWISE SHOWN IN THE PLANS. SEE GENERAL NOTE:17 FOR CIRCUMSTANCES WHERE CURB CONTINUES PAST POST 7.
3. CONCRETE CURB TYPE II SUBSIDIARY TO "METAL BEAM GUARD FENCE TRANSITION". IF NO ADDITIONAL CURB IS INDICATED BEYOND THE TRANSITION, THEN ANY CURB HEIGHT GREATER THAN 4" WILL BE TAPERED DOWN BEGINNING AT THE LAST 7 FT. POST TO A MAXIMUM HEIGHT OF 4" AT POST 7. IF SHOWN ELSEWHERE IN THE PLANS, ADDITIONAL CURB UNDERNEATH GUARDRAIL WILL BE PAID FOR BY THE LINEAR FOOT.
4. UNLESS OTHERWISE SHOWN IN THE PLANS, TRANSITIONS SHALL BE PLACED WITH THE BLOCKOUT FACE IN FRONT OF OR DIRECTLY ABOVE THE CURB FACE. SEE SECTION A-A.
5. FOR ROUND WOOD POST SYSTEMS, ALL ROUND WOOD POSTS SHALL BE 7 1/2" DIA. MINIMUM THROUGHOUT THE THRIE-BEAM TRANSITION.
6. THE TYPE OF POST (ROUND WOOD POST, RECTANGULAR WOOD POST OR STEEL POST) WILL BE AS SHOWN IN THE PLANS. REFER TO GF (31) STANDARD SHEET.
7. THE POST LENGTH SHALL BE MARKED ON ALL 7'- 0" LONG POSTS BY THE MANUFACTURER. THE MARK SHALL BE LOCATED WITHIN THE TOP 1 FT. REGION OF THE POST, AT LEAST 5/8" IN HEIGHT, AND VISIBLE AFTER INSTALLATION. WOODEN POSTS SHALL BE MARKED WITH A BRAND, AND STEEL POSTS WITH A STENCIL BEFORE GALVANIZING.
8. POSTS SHALL NOT BE SET IN CONCRETE, OF ANY DEPTH.
9. RAIL ELEMENTS SHALL MEET THE REQUIREMENTS OF ITEM 540, "METAL BEAM GUARD FENCE" EXCEPT AS MODIFIED ON THE PLANS. THE THRIE-BEAM TERMINAL CONNECTOR AND THE THRIE-BEAM TRANSITION TO W-BEAM SHALL BE OF THE SAME MATERIAL, BUT SHALL NOT BE LESS THAN 10 GAUGE. CONTRACTOR SHALL VERIFY THAT THE LOCATIONS OF BOLT HOLES MATCH THOSE IN THE THRIE-BEAM TERMINAL CONNECTOR PRIOR TO ORDERING MATERIALS.
10. BUTTON HEAD "POST BOLTS & NUTS" SHALL MEET THE REQUIREMENTS OF (ASTM A307), AND SHALL BE OF SUFFICIENT LENGTH TO EXTEND THROUGH THE FULL THICKNESS OF THE NUT AND 5/8" WASHER (FWC16G) 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.

HIGH-SPEED TRANSITION
SHEET 1 OF 2

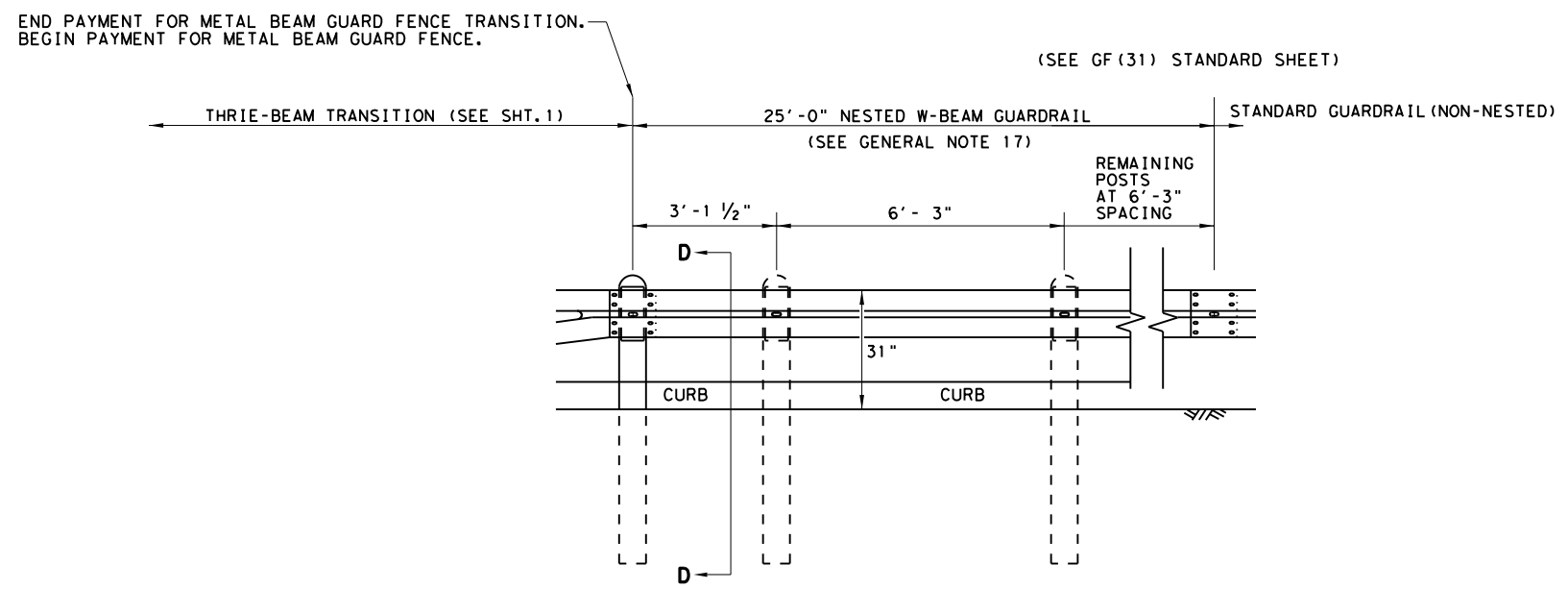
		Design Division Standard
METAL BEAM GUARD FENCE THRIE-BEAM TRANSITION TL-3 MASH COMPLIANT GF (31) TR TL3-20		
FILE: gf31tr+1320.dgn	DN: TxDOT	CK: KM
© TxDOT: NOVEMBER 2020	CONT: 0122	JOB: 033.ETC.
REVISIONS	DIST: BRY	COUNTY: FREESTONE, ETC.
		SHEET NO. 69

DATE: FILE:

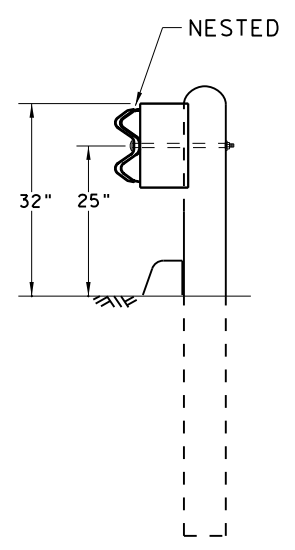
DISCLAIMER: THIS STANDARD IS GOVERNED BY THE "TEXAS ENGINEERING PRACTICE ACT". NO WARRANTY OF ANY KIND IS MADE BY TXDOT FOR ANY PURPOSE WHATSOEVER. TXDOT ASSUMES NO RESPONSIBILITY FOR THE CONVERSION OF THIS STANDARD TO OTHER FORMATS OR FOR INCORRECT RESULTS OR DAMAGES RESULTING FROM ITS USE.

DATE:
 FILE:

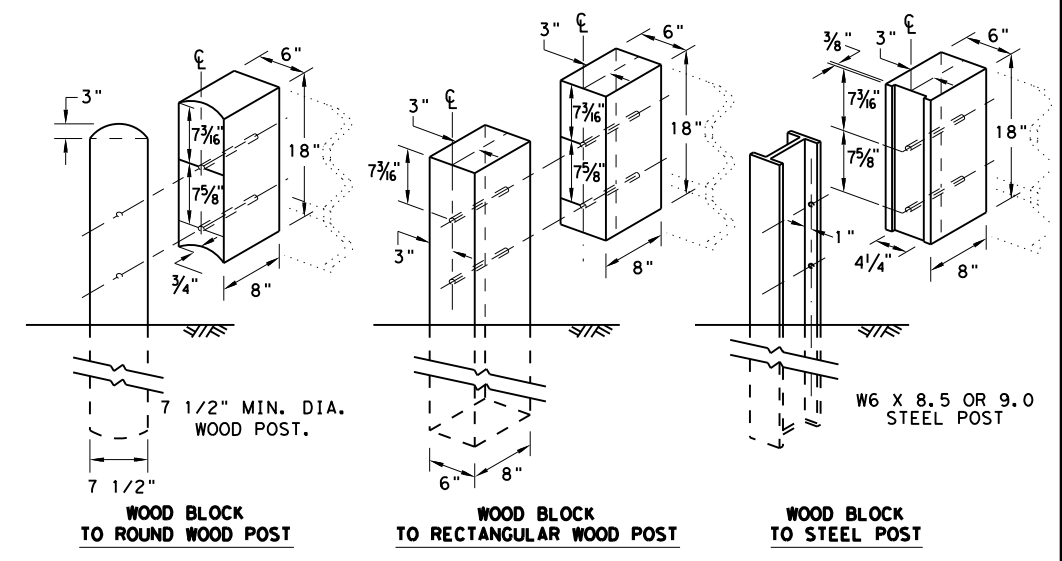
REQUIRED ALTERNATIVE FOR CONTINUOUS CURB EXTENDING PAST POST 7 (SEE SHT. 1 GENERAL NOTE 17)



ELEVATION VIEW



SECTION D-D



THREE BEAM TRANSITION BLOCKOUT DETAILS

HIGH-SPEED TRANSITION

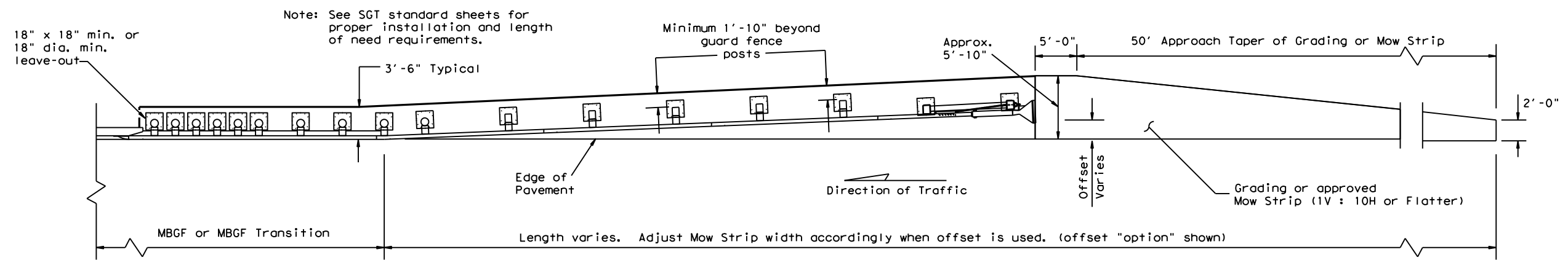
SHEET 2 OF 2



METAL BEAM GUARD FENCE
 THREE-BEAM TRANSITION
 TL-3 MASH COMPLIANT
 GF (31) TR TL3-20

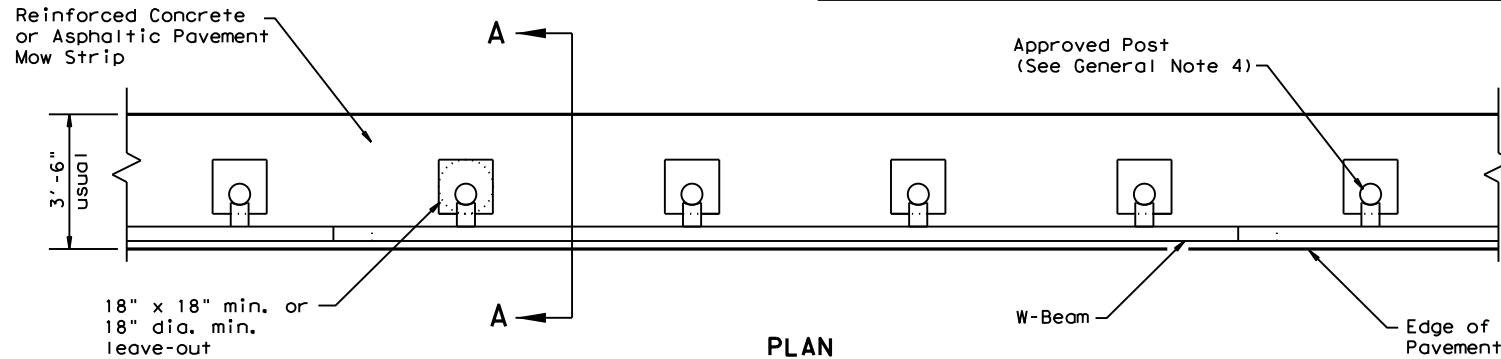
FILE: gf31tr+1320.dgn	DN: TxDOT	CK: KM	DW: KM	CK: CGL/AG
©TXDOT: NOVEMBER 2020	CONT	SECT	JOB	HIGHWAY
REVISIONS	0122	03	033,ETC.	US 287, ETC.
	DIST	COUNTY		SHEET NO.
	BRY	FREESTONE, ETC.		70

DATE: 5/26/2022
 FILE: \\txdot.projectwiseonline.com\TXDOT14\Documents\17 - BRY\Design Projects\012203033\4 - Design\Plan Set\3. Roadway\3H. RoadwayStandards\GF (31)MS-19.dgn
 DISCLAIMER: THE USE OF THIS STANDARD IS GOVERNED BY THE "TEXAS ENGINEERING PRACTICE ACT". NO WARRANTY OF ANY KIND IS MADE BY TXDOT FOR ANY PURPOSE WHATSOEVER. TXDOT ASSUMES NO RESPONSIBILITY FOR THE CONVERSION OF THIS STANDARD TO OTHER FORMATS OR FOR INCORRECT RESULTS OR DAMAGES RESULTING FROM ITS USE.



GRADING AND MOW STRIP AT GUARDRAIL END TREATMENTS

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.

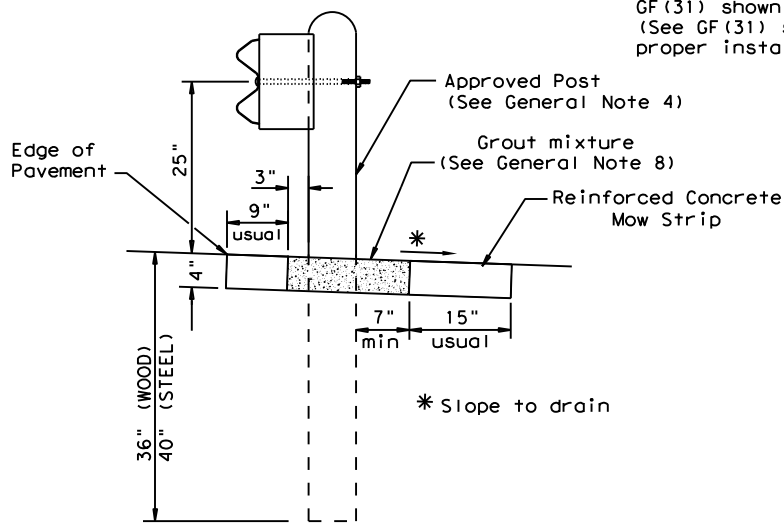


PLAN

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

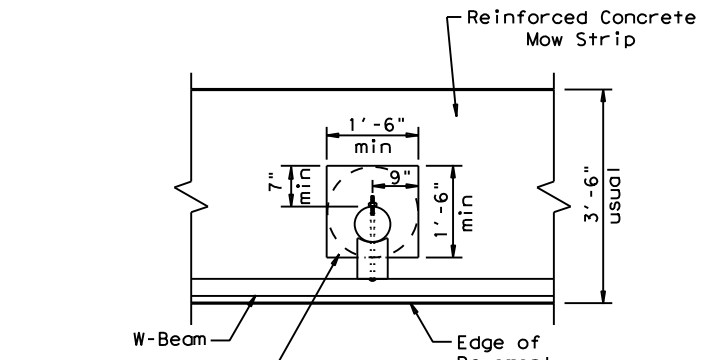
GENERAL NOTES

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 1/2" 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.



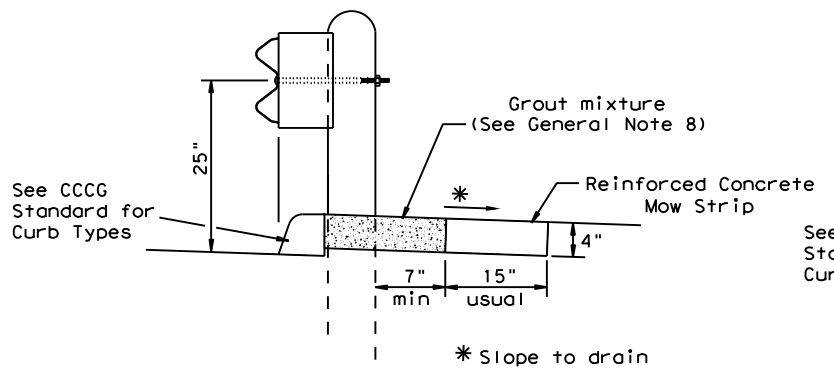
SECTION A-A

Typical



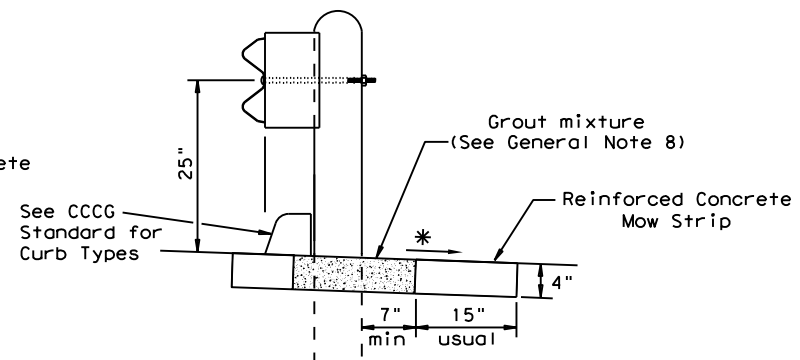
MOW STRIP DETAIL

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



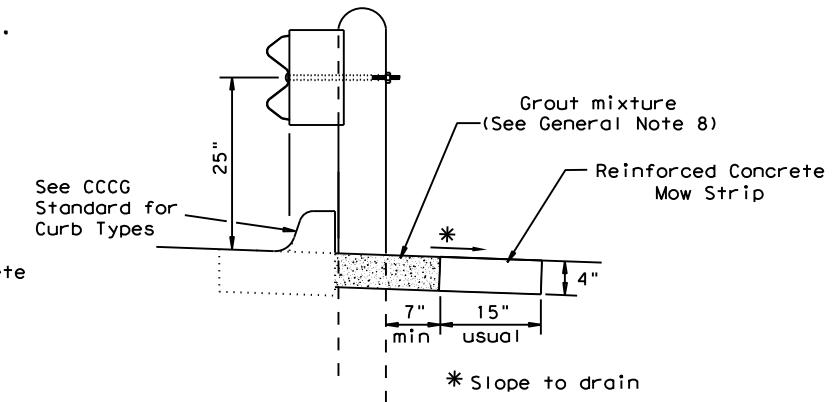
CURB OPTION (1)

This option will increase the post embedment throughout the system.



CURB OPTION (2)

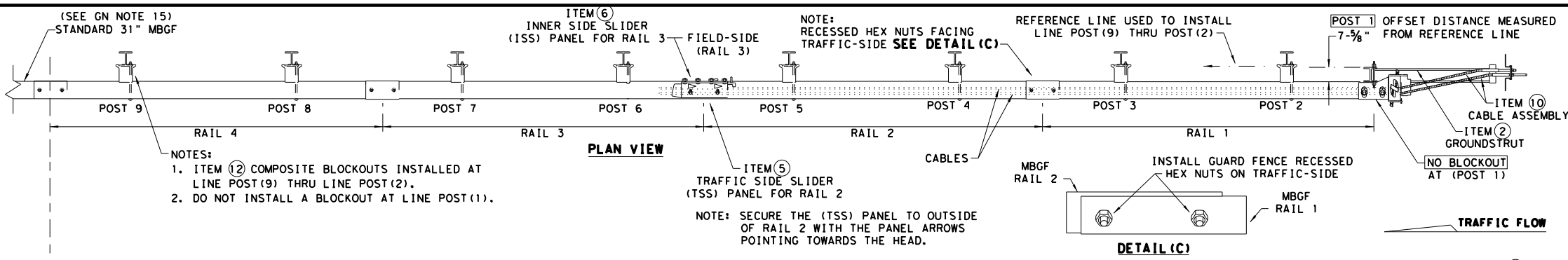
Curb shown on top of mow strip



CURB OPTION (3)

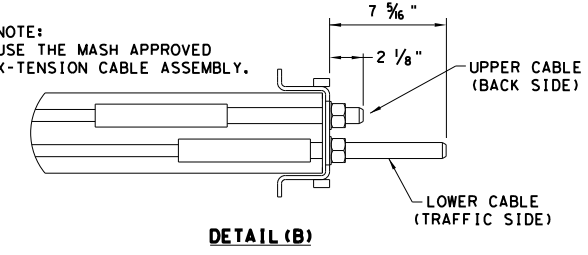
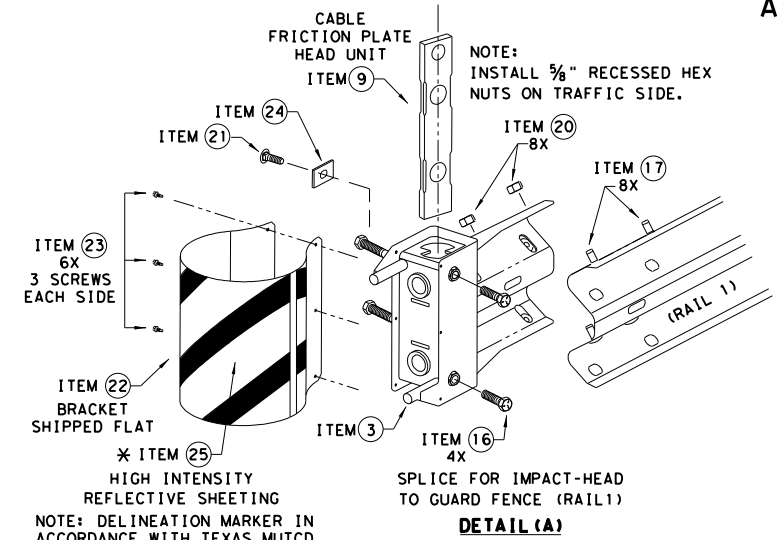
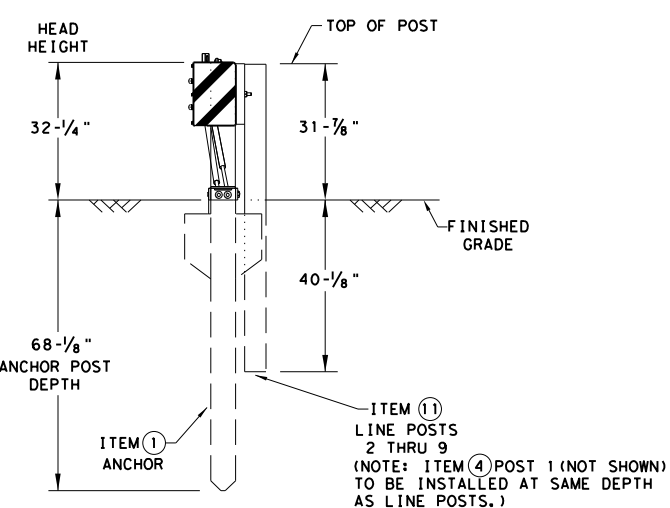
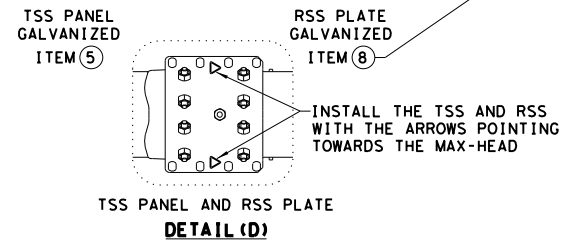
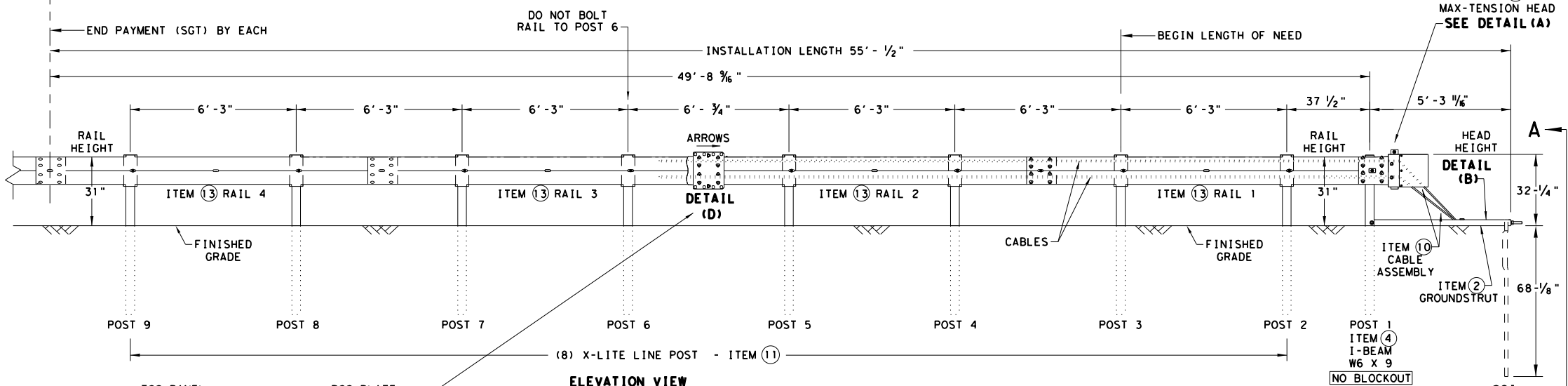
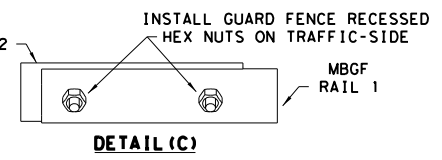
		Design Division Standard	
METAL BEAM GUARD FENCE (MOW STRIP) TL-3 MASH COMPLIANT GF (31)MS-19			
FILE: gf31ms19.dgn	DN:TXDOT	CK: KM	DW: VP
©TXDOT: NOVEMBER 2019	CONT	SECT	JOB
REVISIONS	0122	03	033, ETC
	DIST	COUNTY	SHEET NO.
	BRY	FREESTONE, ETC	71

DATE: 5/26/2022
 FILE: \\txdot\project\wiseonline.com\TXDOT4\Documents\17 - BRY\Design Projects\170331\170331.dwg
 DISCLAIMER: The use of this standard is governed by the "Texas Engineering Practice Act". No warranty of any kind is made by TxDOT for any purpose whatsoever. TxDOT assumes no responsibility for the conversion of this standard to any other format or for any errors or omissions in this standard.



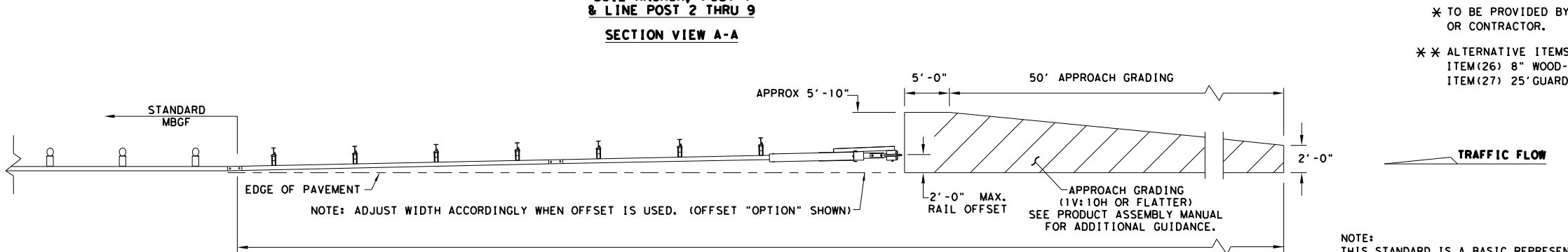
NOTES:
 1. ITEM ② COMPOSITE BLOCKOUTS INSTALLED AT LINE POST (9) THRU LINE POST (2).
 2. DO NOT INSTALL A BLOCKOUT AT LINE POST (1).

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



- GENERAL NOTES**
- FOR SPECIFIC INFORMATION REGARDING INSTALLATION AND TECHNICAL GUIDANCE OF THE SYSTEM, CONTACT: LINDSAY TRANSPORTATION SOLUTIONS (LTS) - BARRIER SYSTEMS, INC. AT (707) 374-6800
 - FOR INSTALLATION, REPAIR, & MAINTENANCE REFER TO THE: MAX-TENSION INSTALLATION INSTRUCTION MANUAL, P/N MANMAX REV D (ECN 3516).
 - 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.
 - FOR POST (LEAVE-OUT) INSTALLATION AND GUIDANCE SEE TXDOT'S LATEST ROADWAY MOW STRIP STANDARD.
 - ALL STEEL COMPONENTS ARE GALVANIZED PER ASTM A123 OR EQUIVALENT UNLESS OTHERWISE STATED.
 - SYSTEM SHOWN USING STEEL WIDE FLANGE POST WITH COMPOSITE BLOCKOUTS.
 - 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.
 - REFER TO INSTALLATION MANUAL FOR SPECIFIC PANEL LAPPING GUIDANCE.
 - IF SOLID ROCK IS ENCOUNTERED SEE THE MANUFACTURER'S INSTALLATION MANUAL FOR INSTALLATION GUIDANCE.
 - POSTS SHALL NOT BE SET IN CONCRETE.
 - 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.
 - MAX-TENSION SYSTEM SHALL NEVER BE INSTALLED WITHIN A CURVED SECTION OF GUARDRAIL.
 - IF A DELINEATION MARKER IS REQUIRED, MARKER SHALL BE IN ACCORDANCE WITH TEXAS MUTCD.
 - THE SYSTEM IS SHOWN WITH 12'-6" MBGF PANELS, 25'-0" MBGF PANELS ARE ALSO ALLOWED.
 - 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	5/8" X 7" THREAD BOLT HH (GR.5) GEOMET	1
16	BSI-2001885	3/4" X 3" ALL-THREAD BOLT HH (GR.5) GEOMET	4
17	4001115	5/8" X 1 1/4" GUARD FENCE BOLTS (GR.2) MGAL	48
18	2001840	5/8" X 10" GUARD FENCE BOLTS MGAL	8
19	2001636	5/8" WASHER F436 STRUCTURAL MGAL	2
20	4001116	5/8" RECESSED GUARD FENCE NUT (GR.2) MGAL	59
21	BSI-2001888	5/8" X 2" ALL THREAD BOLT (GR.5) GEOMET	1
22	BSI-1701063-00	DELINEATION MOUNTING (BRACKET)	1
23	BSI-2001887	1/4" X 3/4" SCREW SD HH 410SS	7
24	4002051	GUARDRAIL WASHER RECT AASHTO FWRO3	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



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

APPROACH GRADING AT GUARDRAIL END TREATMENTS

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

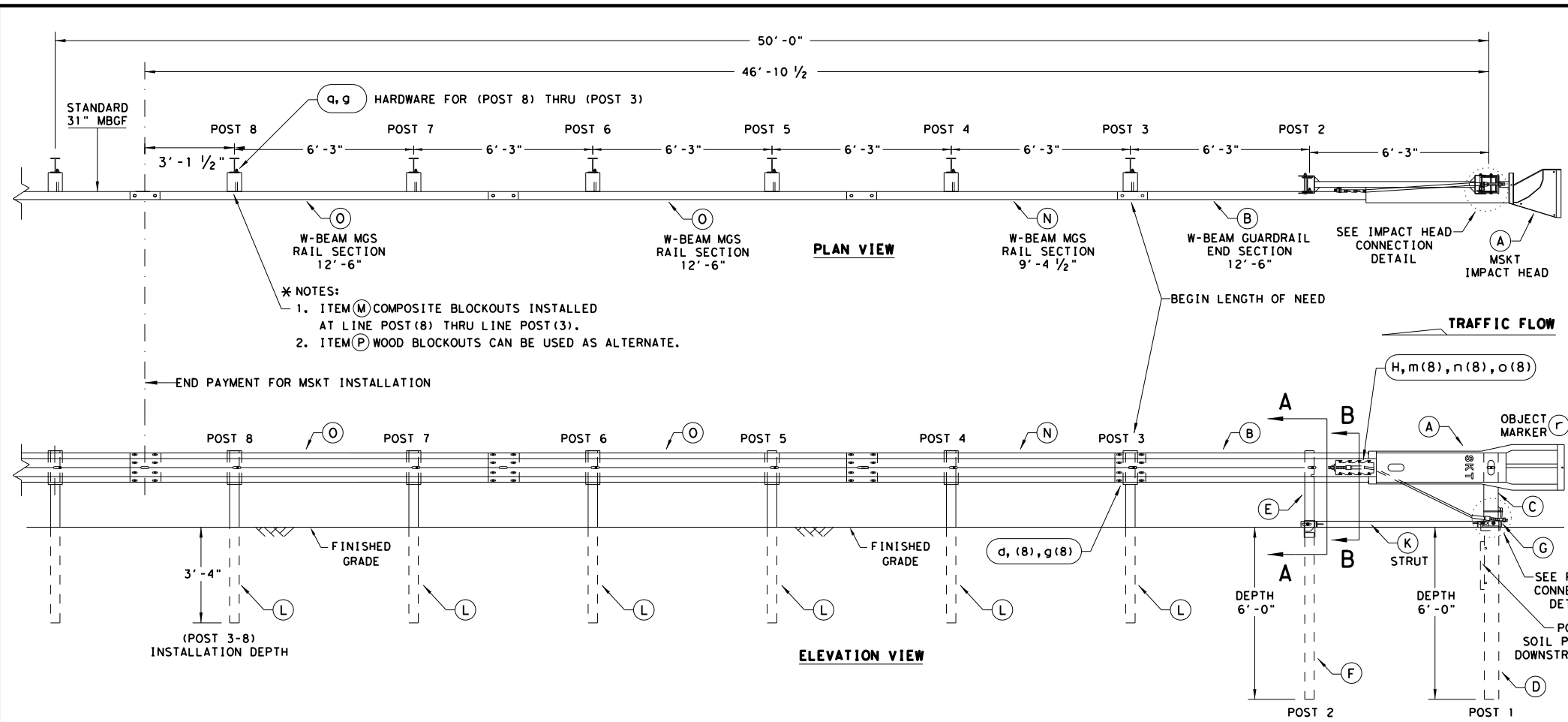
* TO BE PROVIDED BY DISTRIBUTOR OR CONTRACTOR.
 ** ALTERNATIVE ITEMS NOT SHOWN. ITEM (26) 8" WOOD-BLOCKOUTS ITEM (27) 25' GUARD FENCE PANELS

Texas Department of Transportation
 Design Division Standard

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

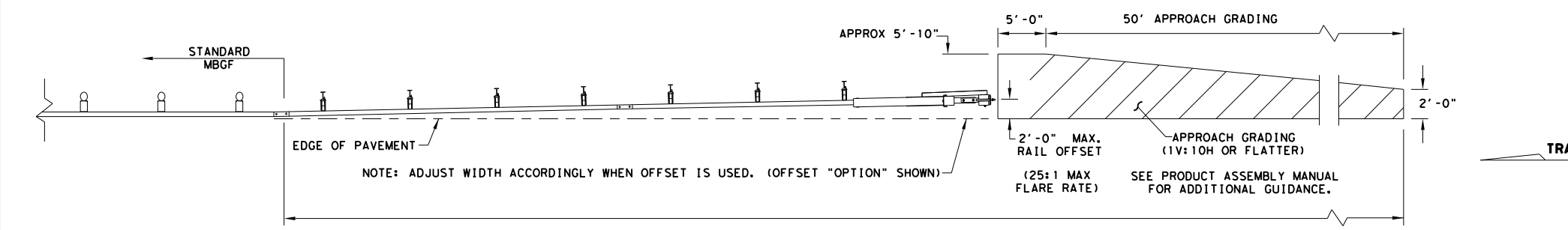
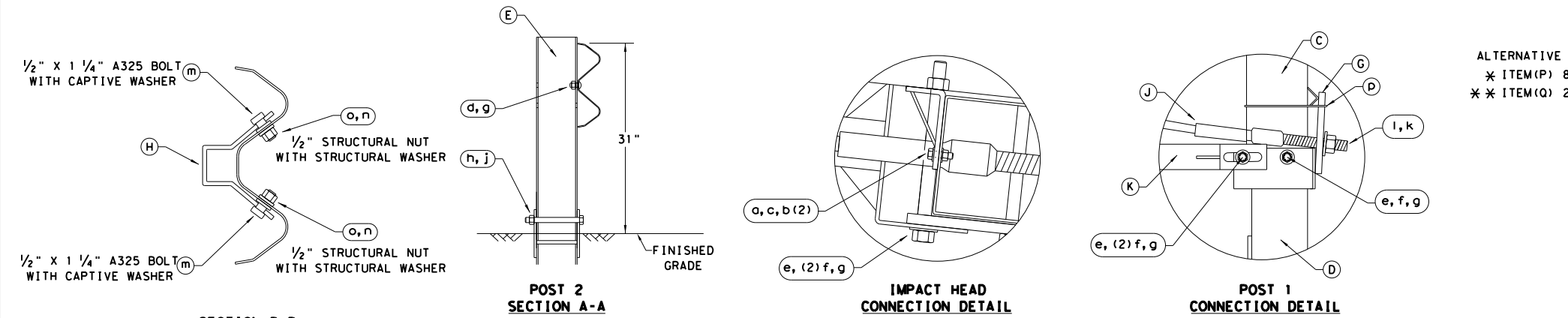
FILE: sg11s3118.dgn	DN: TxDOT	CK: KM	DW: TxDOT	CK: CL
© TxDOT: FEBRUARY 2018	CONT	SECT	JOB	HIGHWAY
REVISIONS	0122	03	033, ETC	US 287, ETC
	DIST	COUNTY		SHEET NO.
	BRY	FREESTONE, ETC		73

DATE: 5/26/2022
 FILE: \\txdot.projectwiseonline.com:TXDOT14\Documents\17 - BRY\Design Projects\012203033\4 - Design\Plan Set\3. Roadway\3H. RoadwayStandard.dwg
 DISCLAIMER: THIS STANDARD IS GOVERNED BY THE "TEXAS ENGINEERING PRACTICE ACT". NO WARRANTY OF ANY KIND IS MADE BY TXDOT FOR ANY PURPOSE WHATSOEVER. TXDOT ASSUMES NO RESPONSIBILITY FOR THE CONVERSION OF THIS STANDARD TO OTHER FORMATS OR FOR INCORRECT RESULTS OR DAMAGES RESULTING FROM ITS USE.



- GENERAL NOTES**
- 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
 - FOR INSTALLATION, REPAIR AND MAINTENANCE REFER TO THE: MSKT END TERMINAL, PRODUCT DESCRIPTION ASSEMBLY MANUAL (PUBLICATION-062717).
 - 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.
 - FOR POST (LEAVE-OUT) INSTALLATION AND GUIDANCE SEE TXDOT'S LATEST ROADWAY MOW STRIP STANDARD.
 - HARDWARE (BOLTS, NUTS, & WASHERS) SHALL BE GALVANIZED IN ACCORDANCE WITH ITEM 445, "GALVANIZING". FITTINGS SHALL BE SUBSIDIARY TO THE BID ITEM.
 - SYSTEM SHOWN USING STEEL WIDE FLANGE POSTS WITH COMPOSITE BLOCKOUTS.
 - 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.
 - IF SOLID ROCK IS ENCOUNTERED IN THE AREA OF (POST 1) AND / OR (POST 2) CONTACT THE MANUFACTURER, & REFER TO THE LATEST ROADWAY MBSG STANDARD FOR INSTALLATION GUIDANCE.
 - POSTS SHALL NOT BE SET IN CONCRETE.
 - SYSTEM MUST BE ATTACHED TO STANDARD 31" MBSG.
 - UNDER NO CIRCUMSTANCES SHALL THE GUARDRAIL WITHIN THE MSKT SYSTEM BE CURVED.
 - A FLARE RATE OF UP TO 25:1 MAY BE USED TO PREVENT THE TERMINAL HEAD FROM ENCRANCHING ON THE SHOULDER. THE FLARE MAY BE DECREASED OR ELIMINATED FOR SPECIFIC INSTALLATIONS, IF DIRECTED BY THE ENGINEER.
 - THE SYSTEM IS SHOWN WITH TWO 12'-6" MBSG PANELS, ONE 25'-0" MBSG PANEL IS ALSO ALLOWED IN ITS PLACE.
 - 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 Go.	SF1303
C	1	POST 1 - TOP (6" X 6" X 1/8" 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 1/2")	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	3/8" x 1" HEX BOLT (GRD 5)	B5160104A
b	4	3/8" WASHER	W0516
c	2	3/8" HEX NUT	N0516
d	25	3/8" Dia. x 1 1/4" SPLICE BOLT (POST 2)	B580122
e	2	3/8" Dia. x 9" HEX BOLT (GRD A449)	B580904A
f	3	3/8" WASHER	W050
g	33	3/8" Dia. H.G.R NUT	N050
h	1	3/4" Dia. x 8 1/2" HEX BOLT (GRD A449)	B340854A
j	1	3/4" Dia. HEX NUT	N030
k	2	1 ANCHOR CABLE HEX NUT	N100
l	2	1 ANCHOR CABLE WASHER	W100
m	8	1/2" x 1 1/4" A325 BOLT WITH CAPTIVE WASHER	SB12A
n	8	1/2" STRUCTURAL NUTS	N012A
o	8	1 1/8" O.D. x 3/8" I.D. STRUCTURAL WASHERS	W012A
p	1	BEARING PLATE RETAINER TIE	CT-100ST
q	6	3/8" x 10" H.G.R. BOLT	B581002
r	1	OBJECT MARKER 18" X 18"	E3151



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.

Design Division Standard

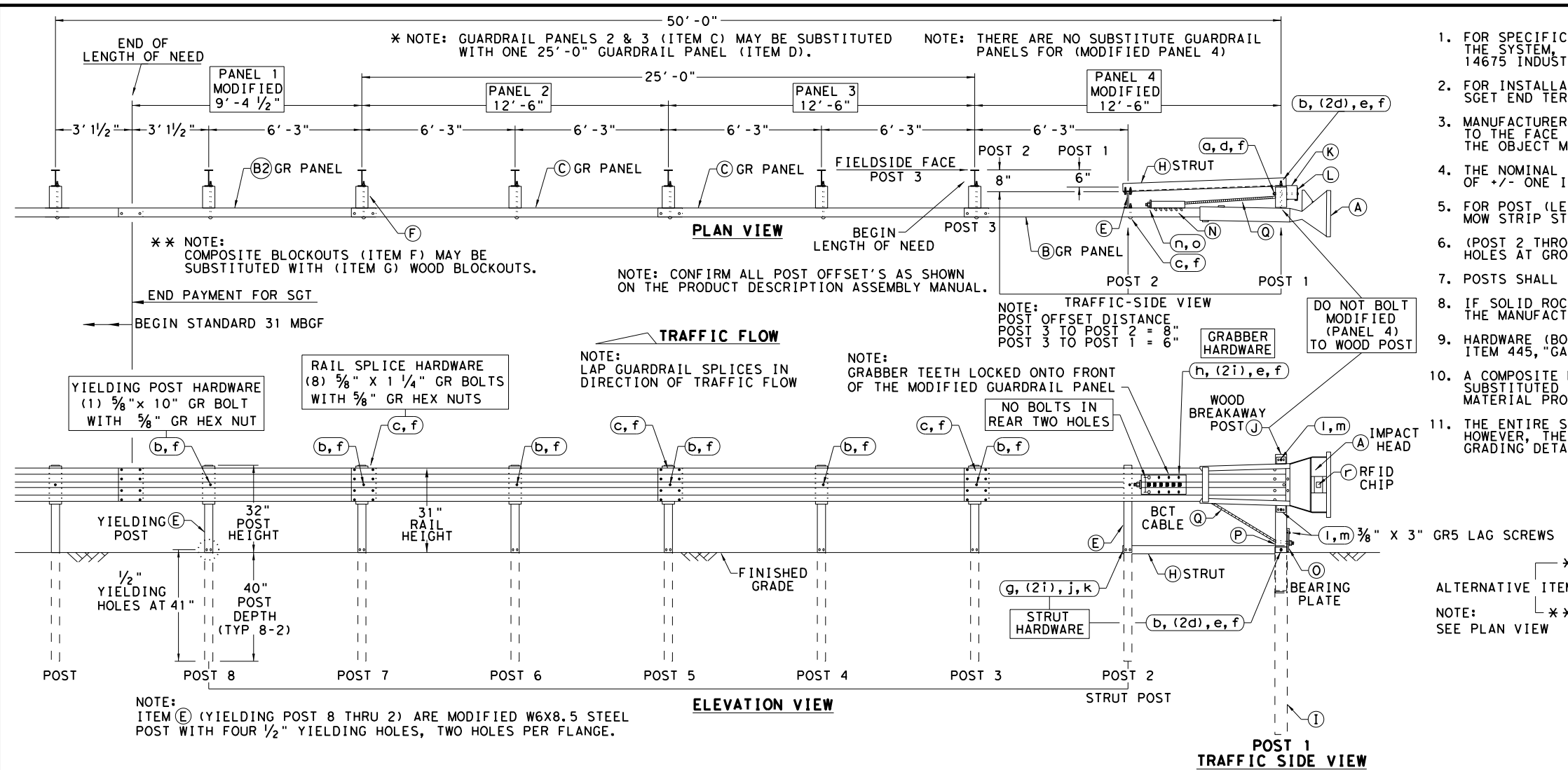
SINGLE GUARDRAIL TERMINAL

MSKT-MASH-TL-3

SGT (12S) 31-18

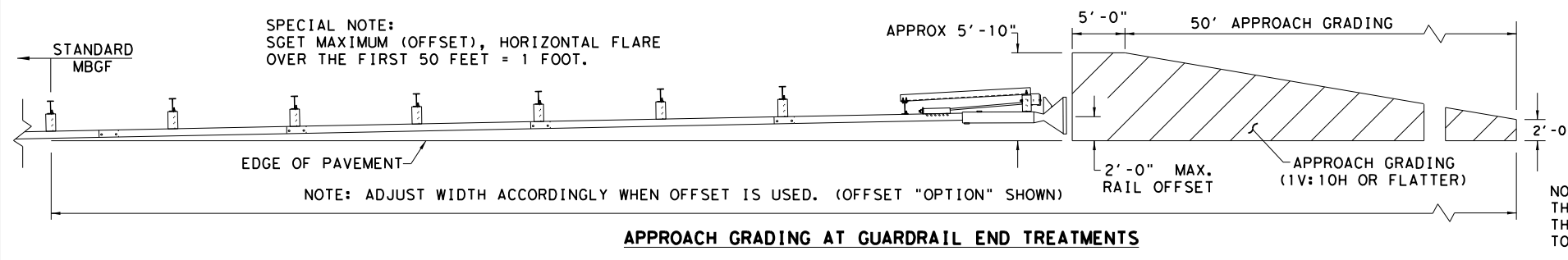
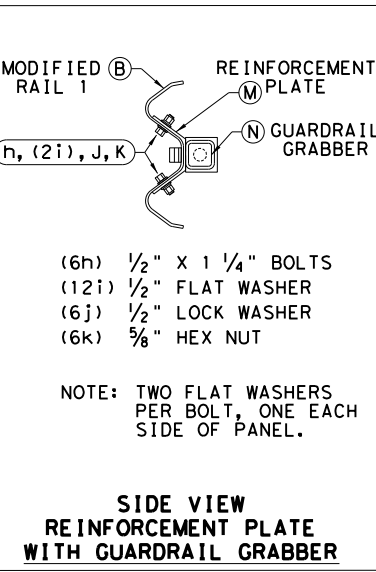
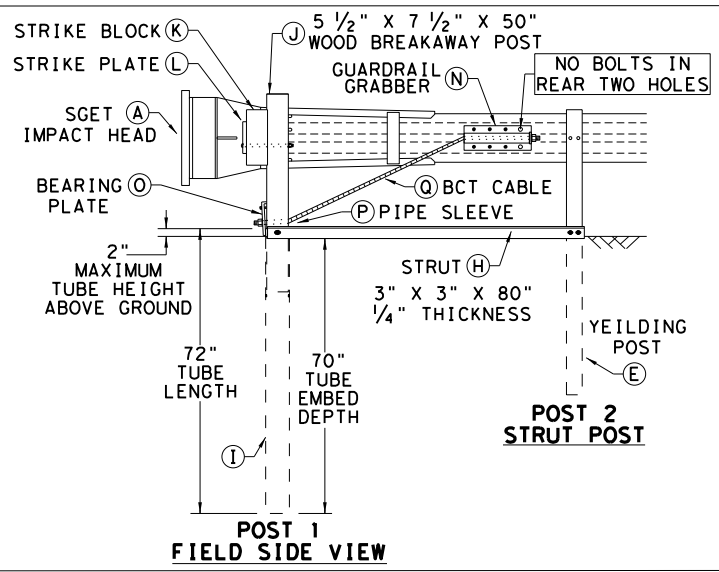
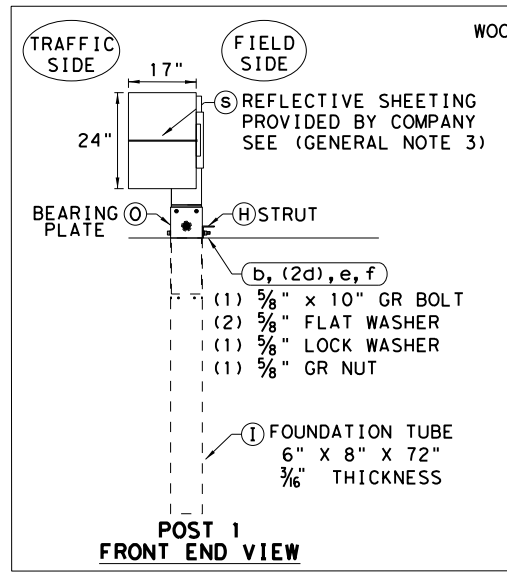
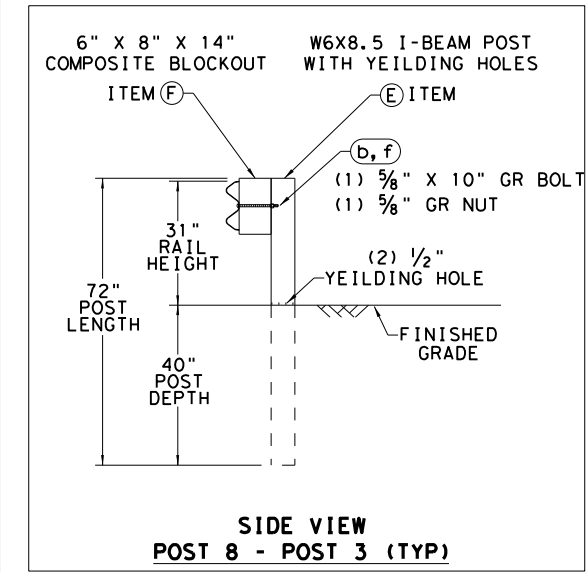
FILE: sgt12s3118.dgn	DN: TXDOT	CK: KM	DW: VP	CK: CL
© TXDOT: APRIL 2018	CONT	SECT	JOB	HIGHWAY
REVISIONS	0122	03	033, ETC	US 287, ETC
	DIST	COUNTY		SHEET NO.
	BRY	FREESTONE, ETC		74

DATE: 5/26/2022
 FILE: \\txdot\projectwiseonline.com\BRY\Design Projects\17 - BRY\Design Projects\0122030334 - Design\Plan Set\3. Roadway\Plan Set\153120.dgn
 DISCLAIMER: THE USE OF THIS STANDARD IS GOVERNED BY THE "TEXAS ENGINEERING PRACTICE ACT". NO WARRANTY OF ANY KIND IS MADE BY TXDOT FOR ANY PURPOSE WHATSOEVER. TXDOT ASSUMES NO RESPONSIBILITY FOR THE CONVERSION OF THIS STANDARD TO OTHER FORMATS OR FOR INCORRECT RESULTS OR DAMAGES RESULTING FROM ITS USE.



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

ITEM	QTY	MAIN SYSTEM COMPONENTS	ITEM #
A	1	SGET IMPACT HEAD	SIH1A
B	1	MODIFIED GUARDRAIL PANEL 12'-6" 12GA	126SPZGP
B2	1	MODIFIED GUARDRAIL PANEL 9'-4 1/2" 12GA	GP94
C	2	STANDARD GUARDRAIL PANEL 12'-6" 12GA	GP126
D	1	STANDARD GUARDRAIL PANEL 25'-0" 12GA	GP25
E	7	MODIFIED YIELDING I-BEAM POST W6x8.5	YP6MOD
F	6	COMPOSITE BLOCKOUT 6" X 8" X 14"	CBO8
G	6	WOOD BLOCKOUT 6" X 8" X 14"	WBO8
H	1	STRUT 3" X 3" X 80" X 1/4" A36 ANGLE	STR80
I	1	FOUNDATION TUBE 6" X 8" X 72" X 3/8"	FNDT6
J	1	WOOD BREAKAWAY POST 5 1/2" X 7 1/2" X 50"	WBRK50
K	1	WOOD STRIKE BLOCK	WSBLK14
L	1	STRIKE PLATE 1/4" A36 BENT PLATE	SPLT8
M	1	REINFORCEMENT PLATE 12 GA. GR55	REPLT17
N	1	GUARDRAIL GRABBER 2 1/2" X 2 1/2" X 16 1/2"	GGR17
O	1	BEARING PLATE 8" X 8 5/8" X 5/8" A36	BPLT8
P	1	PIPE SLEEVE 4 1/4" X 2 3/8" O.D. (2 1/8" I.D.)	PSLV4
Q	1	BCT CABLE 3/4" X 81" LENGTH	CBL81
SMALL HARDWARE			
q	1	5/8" X 12" GUARDRAIL BOLT 307A HDG	12GRBLT
b	7	5/8" X 10" GUARDRAIL BOLT 307A HDG	10GRBLT
c	33	5/8" X 1 1/4" GR SPlice BOLTS 307A HDG	1GRBLT
d	3	5/8" FLAT WASHER F436 A325 HDG	58FW436
e	1	5/8" LOCK WASHER HDG	58LW
f	39	5/8" GUARDRAIL HEX NUT HDG	58HN563
g	2	1/2" X 2" STRUT BOLT A325 HDG	2BLT
h	6	1/2" X 1 1/4" PLATE BOLT A325 HDG	125BLT
i	16	1/2" FLAT WASHER F436 A325 HDG	12FWF436
j	8	1/2" LOCK WASHER HDG	12LW
k	8	1/2" HEX NUT A563 HDG	12HN563
l	4	3/8" X 3" HEX LAG SCREW GR5 HDG	38LS
m	4	3/8" FLAT WASHER F436 A325 HDG	38FW844
n	2	1" FLAT WASHER F436 A325 HDG	1FWF436
o	2	1" HEX NUT A563HDG	1HN563
p	1	18" TO 24" LONG ZIP TIE RATED 175-200LB	ZPT18
q	1	1 1/2" X 4" SCH-40 PVC PIPE	PSPCR4
r	1	RFID CHIP RATED MIL-STD-810F	RFID810F
s	1	IMPACT HEAD REFLECTIVE SHEETING	RS30M



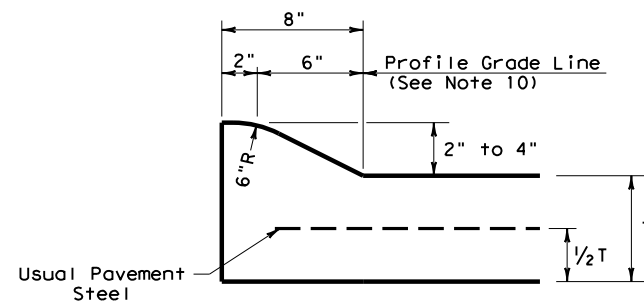
NOTE: THIS STANDARD IS A BASIC REPRESENTATION OF THE SGET TERMINAL SYSTEM AND IS NOT INTENDED TO REPLACE THE MANUFACTURER'S ASSEMBLY MANUAL.

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

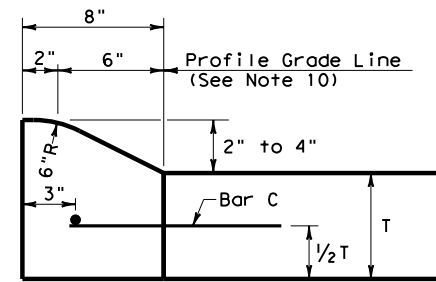
FILE: sg153120.dgn	DN: TXDOT	CK: KM	DW: VP	CK: VP
© TXDOT: APRIL 2020	CONT: 0122	SECT: 03	JOB: 033, ETC	US: 287, ETC
REVISIONS	0122	03	033, ETC	US 287, ETC
	DIST: BRY	COUNTY: FREESTONE, ETC	SHEET NO. 75	

DISCLAIMER: The use of this standard is governed by the "Texas Engineering Practice Act". No warranty of any kind is made by TxDOT for any purpose whatsoever. TxDOT assumes no responsibility for the conversion of this standard to other formats or for incorrect results or damages resulting from its use.

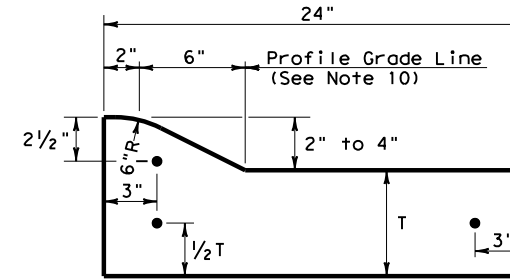
DATE:
FILE:



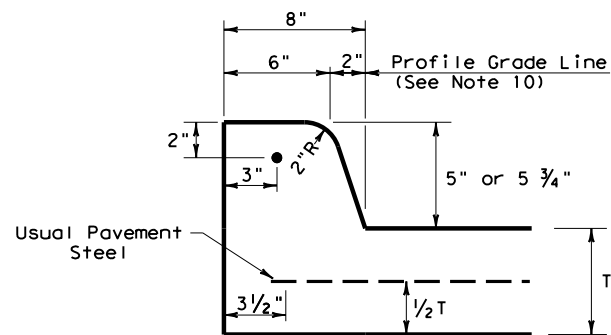
**TYPE I CURB (MONOLITHIC)
2" - 4" HEIGHT**



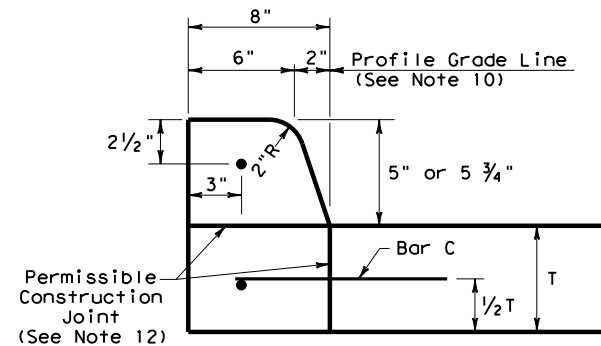
**TYPE I CURB
2" - 4" HEIGHT**



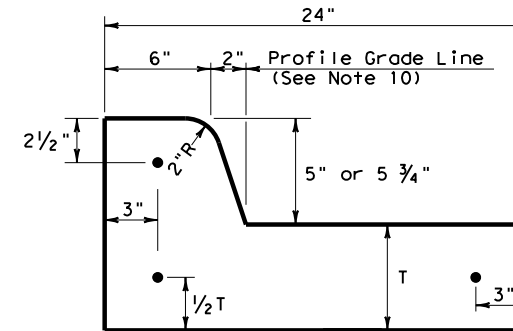
**TYPE I CURB AND GUTTER
2" - 4" HEIGHT**



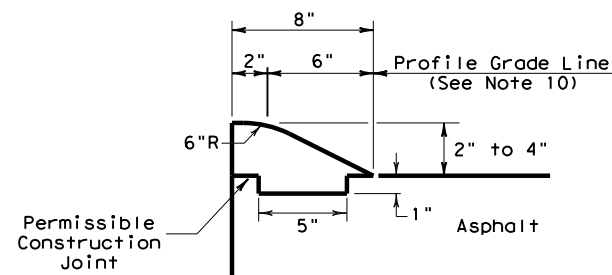
**TYPE II CURB (MONOLITHIC)
5" - 5 3/4" HEIGHT**



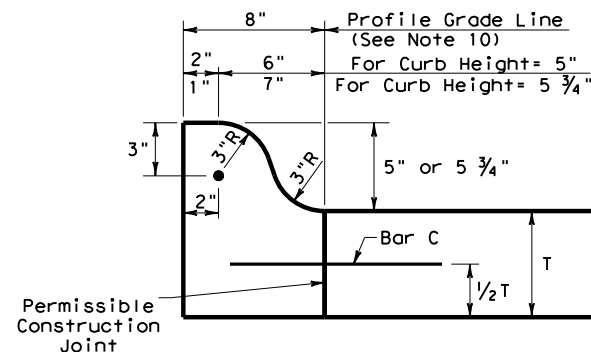
**TYPE II CURB
5" - 5 3/4" HEIGHT**



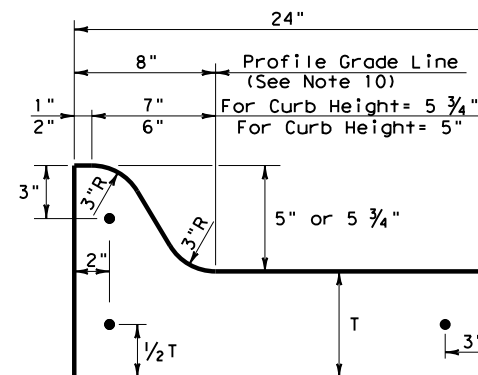
**TYPE II CURB AND GUTTER
5" - 5 3/4" HEIGHT**



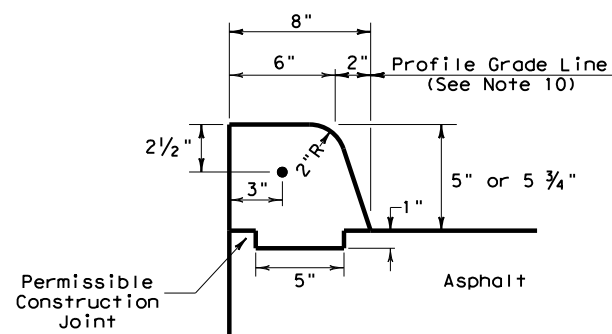
**TYPE III CURB (KEYED)
2" - 4" HEIGHT**



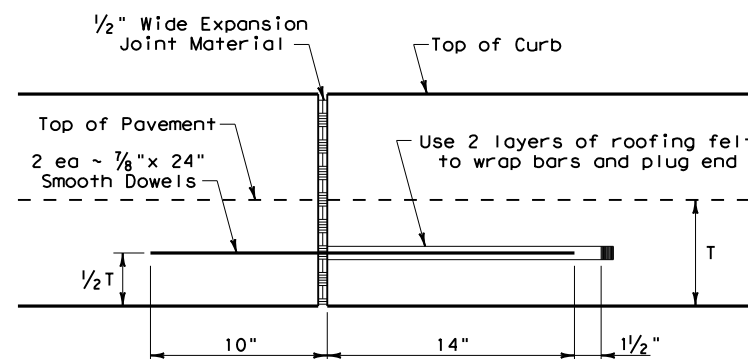
**TYPE IIa CURB
5" - 5 3/4" HEIGHT**



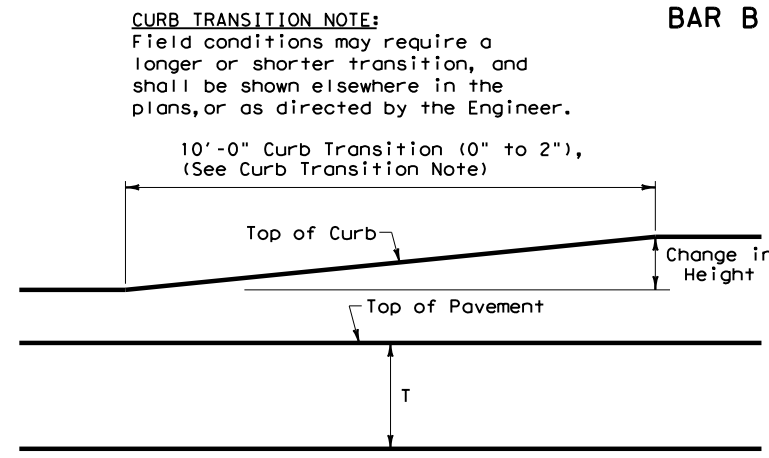
**TYPE IIa CURB AND GUTTER
5" - 5 3/4" HEIGHT**



**TYPE IV CURB (KEYED)
5" - 5 3/4" HEIGHT**



EXPANSION JOINT DETAIL

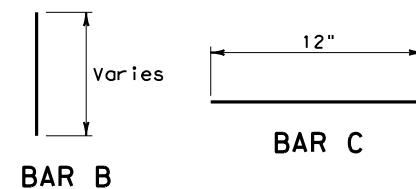


CURB TRANSITION

Note: To be paid for as Highest Curb

GENERAL NOTES

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

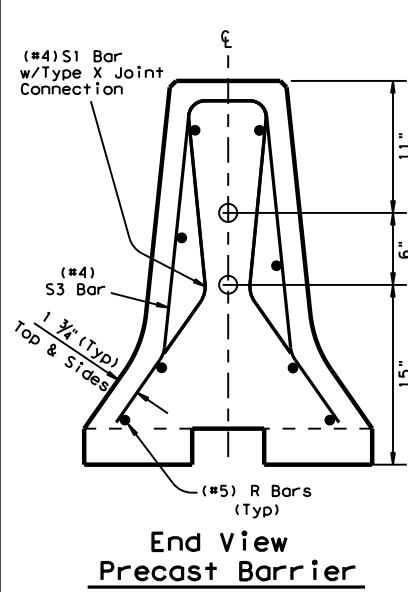


CURB TRANSITION NOTE:
Field conditions may require a longer or shorter transition, and shall be shown elsewhere in the plans, or as directed by the Engineer.

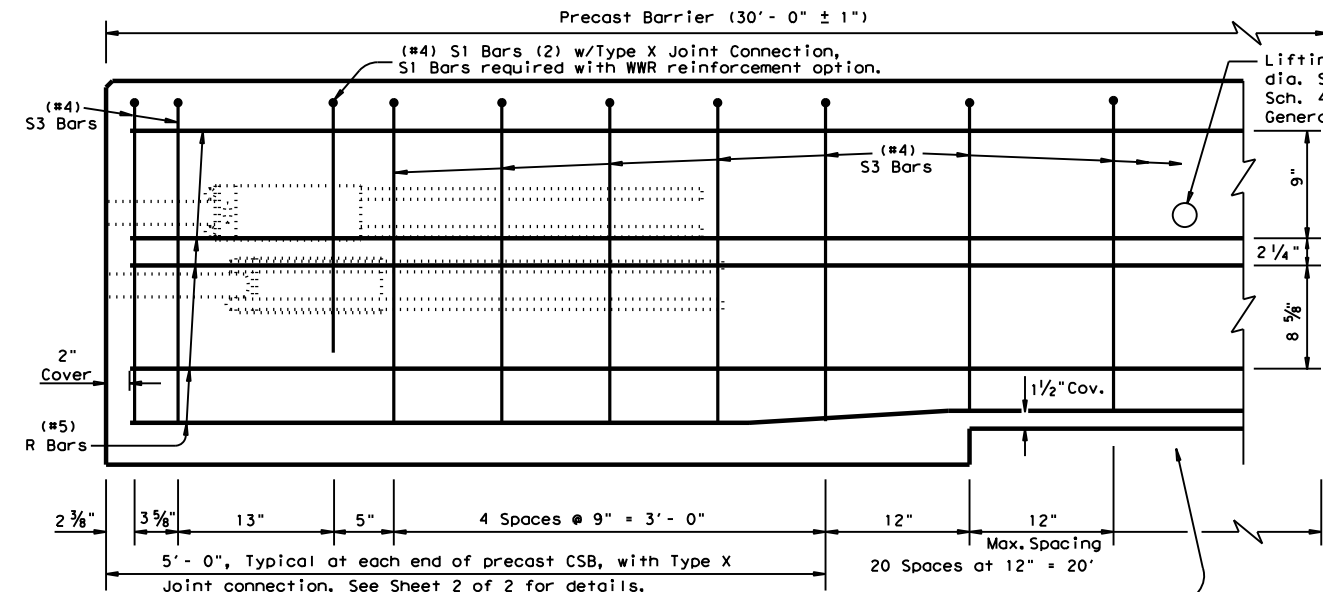
				Design Division Standard	
CONCRETE CURB AND GUTTER					
CCCG-21					
FILE: cccg21.dgn	DN: TxDOT	CK: AN	DW: SS	CK: KM	
© TxDOT: FEBRUARY 2021	CONT	SECT	JOB	HIGHWAY	
REVISIONS	0122	03	033,ETC.	US 287, ETC.	
	DIST	COUNTY	SHEET NO.		
	BRY	FREESTONE, ETC.	77		

DISCLAIMER: The use of this standard is governed by the "Texas Engineering Practice Act". No warranty of any kind is made by TxDOT for any purpose whatsoever. TxDOT assumes no responsibility for the conversion of this standard to other formats or for incorrect results or damages resulting from its use.

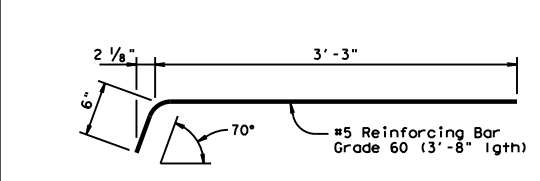
DATE: 5/26/2022 4:36:39 PM
 FILE: \\txdot.projectwiseonline.com:TXDOT4\Documents\17 - BRY\Design Projects\012203033\4 - Design\Plan Set\3. Roadway\3H. RoadwayStandard\csb110.dgn



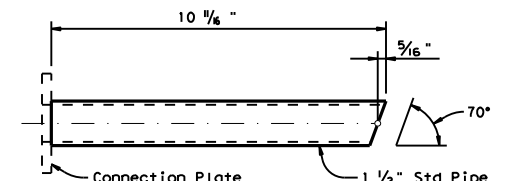
End View Precast Barrier
 See sheet 2 of 3 for Joint connection Type X



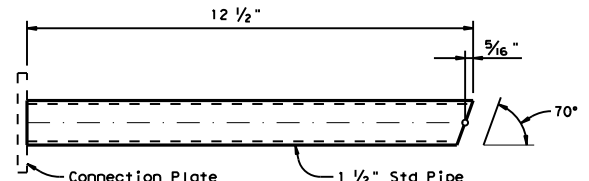
Reinforcement for Precast (CSB) Concrete Safety Barrier (Type 1)
 Showing reinforcement for Joint Type X



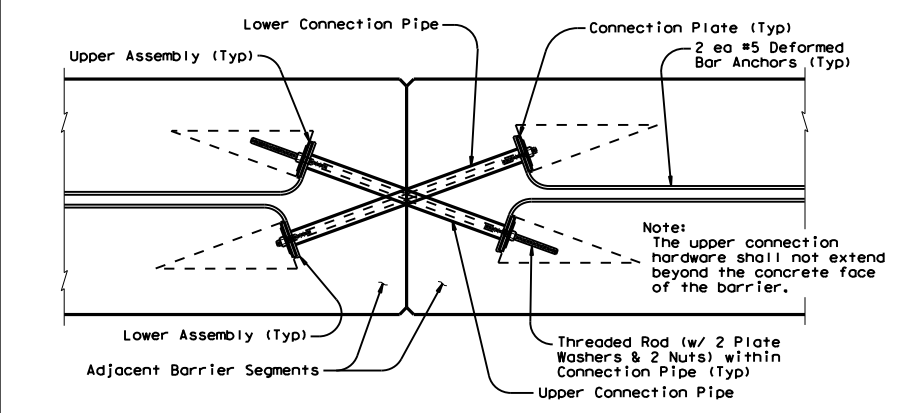
DEFORMED BAR ANCHOR DETAILS
 Two (2) Bars required per assembly. Eight (8) required per joint.



UPPER CONNECTION PIPE DETAILS
 One (1) Steel Pipe required per Upper Assembly. Two (2) required per joint.



LOWER CONNECTION PIPE DETAILS
 One (1) Steel Pipe required per Lower Assembly. Two (2) required per joint.



TYPE X JOINT INSTALLATION DETAIL
 Barrier reinforcing and Type X Joint Leave-Out dimensions not shown for clarity.

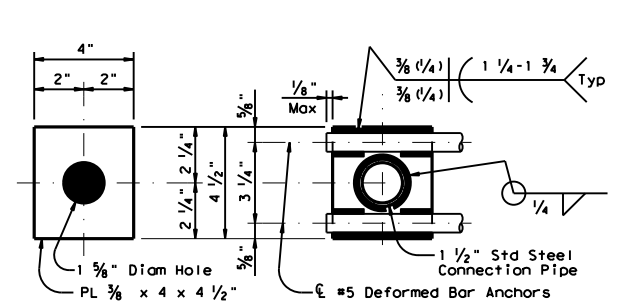
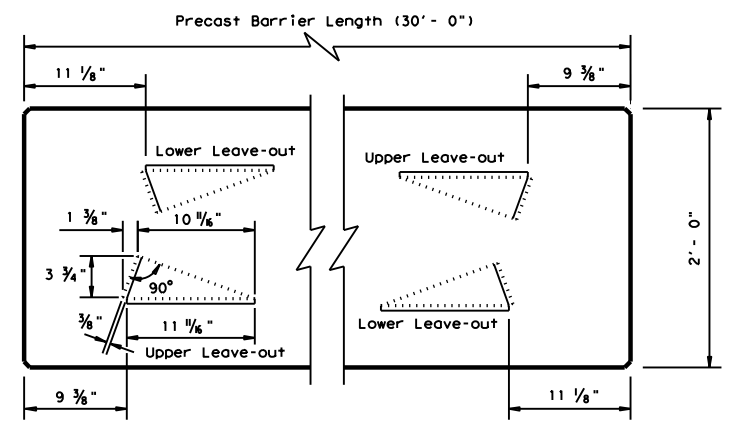
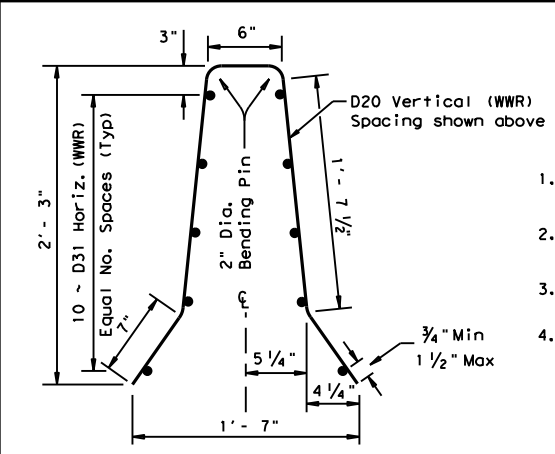


PLATE DIMENSIONS WELDING DETAILS CONNECTION PLATE DETAILS
 One (1) Plate required per assembly. Four (4) required per joint. All steel fittings for joint Type X shall be galvanized after fabrication in accordance with Item 445.

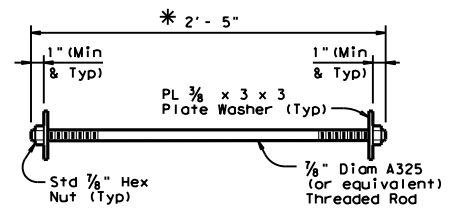


BARRIER PLAN AT END JOINTS

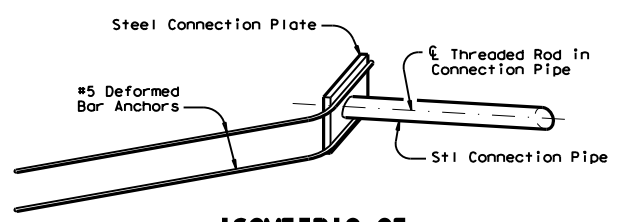


Welded Wire Reinforcement (WWR) Option for Bars R and S3
 (WWR) General Notes

- Deformed Welded Wire Reinforcement (WWR) shall conform to ASTM A497.
- Welded wire cage may be cut or bent to accommodate the Type X joint connection and drainage slots, as directed by the Engineer.
- All reinforcement shall comply with Item 440, "Reinforcing Steel."
- Combinations of reinforcing steel and WWR will be permitted, as directed by the Engineer. The dimension from the end of the barrier section to the first wire shall not exceed 3".

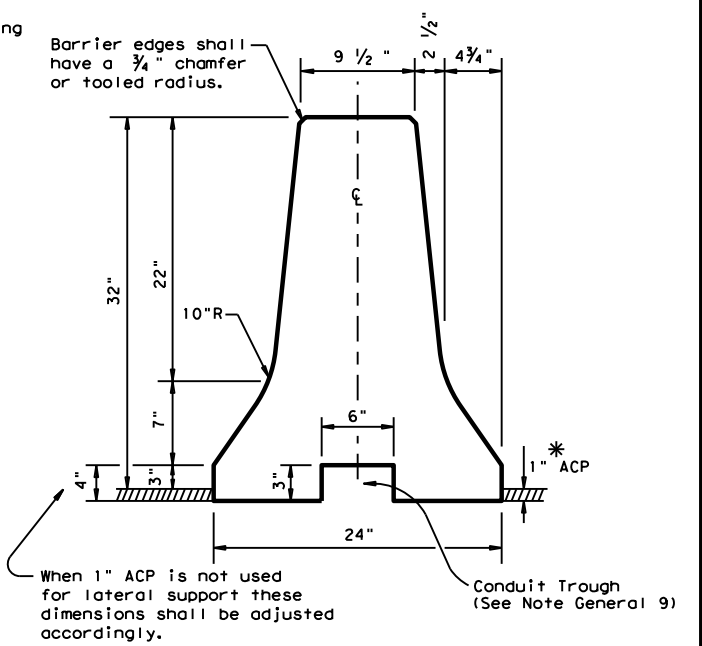


CONNECTION BOLT OR THREADED ROD DETAIL
 Two (2) Threaded Rods (or Equivalent Hex Hd. Bolts) (w/ Two (2) PL 3/8 x 3 x 3 Plate Washers & Two (2) Std Hex Nuts) required per joint.



ISOMETRIC OF TYPICAL WELDED ASSEMBLY
 Four (4) [2 Upper & 2 Lower] Assemblies required per joint.

Weight of one Precast 30 ft. (CSB) segment = Approx. 6.5 Tons or 440 lbs per ft.



Concrete Safety Barrier

* When 1" ACP is "not" used as lateral support for permanent barrier placement. A permissible method of attaining the equivalent lateral support may be used, See CSB(6) sheet.

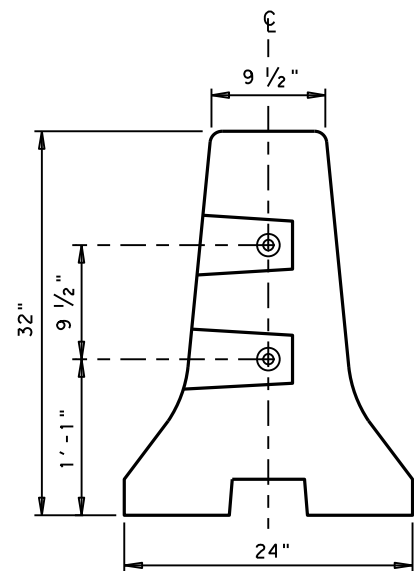
GENERAL NOTES

- Concrete shall be Class H with a minimum compressive strength of 3,600 psi.
- Where used, rebar reinforcement shall be Grade 60 and conform to ASTM A615.
- Precast barrier length shall be 30 ft. unless otherwise specified on the plans.
- All precast barrier edges shall have a 3/4 inch chamfer or tooling radius.
- All concrete, reinforcement, joint connection systems, grout etc. as shown, are considered as part of the barrier payment.
- All steel assemblies for joint shall be galvanized after fabrication in accordance with Item 445, "Galvanizing."
- Regardless of the method of handling, barrier lifting points shall be approx. 7.5 feet from the ends of the barrier. Lifting devices and attachments to barrier sections shall be approved by the Engineer.
- Surface finishing and grouting (where required) shall be two parts sand one part cement with enough water to make the mixture plastic. Grouting shall be done in a manner that will assure a smooth surface. Surface finishing shall be considered subsidiary to the various bid items involved.
- Conduit trough when required shall be shown elsewhere on the plans, or as directed by the Engineer.

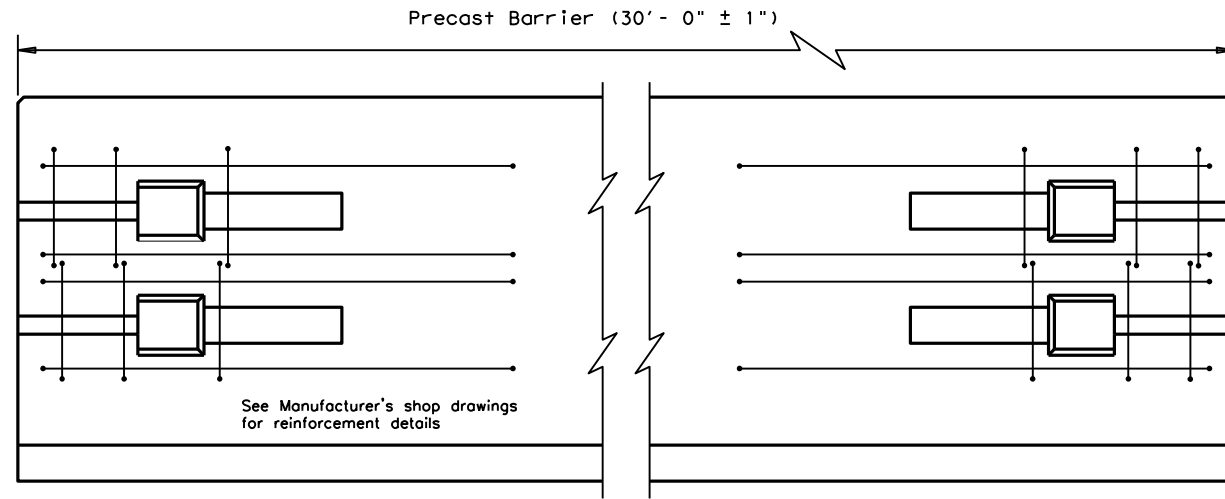
		Design Division Standard	
CONCRETE SAFETY BARRIER (F-SHAPE) PRECAST BARRIER (TYPE 1) CSB(1)-10			
FILE: csb110.dgn	DN: TxDOT	CK: AM	DW: BD
© TxDOT December 2010	CONT: 0122	SECT: 03	JOB: 033, ETC
REVISIONS	0122	03	US 287, ETC
	DIST: BRY	COUNTY: FREESTONE, ETC	SHEET NO: 78

DISCLAIMER: The use of this standard is governed by the "Texas Engineering Practice Act". No warranty of any kind is made by TxDOT for any purpose whatsoever. TxDOT assumes no responsibility for the conversion of this standard to other formats or for incorrect results or damages resulting from its use.

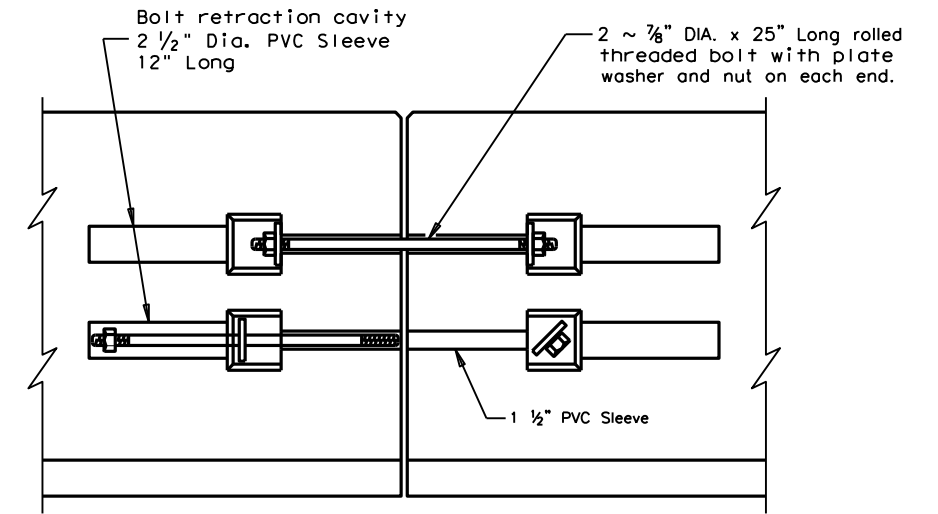
DATE: 5/26/2022 4:36:40 PM
 FILE: \\txdot.projectwiseonline.com:TXDOT14\Documents\17 - BRY\Design Projects\012203033\4 - Design\Plan Set\3. Roadway\3H. RoadwayStandards\csb110.dgn



END VIEW (CSB) QUICK-BOLT
 QUICK-BOLT POCKET LOCATIONS

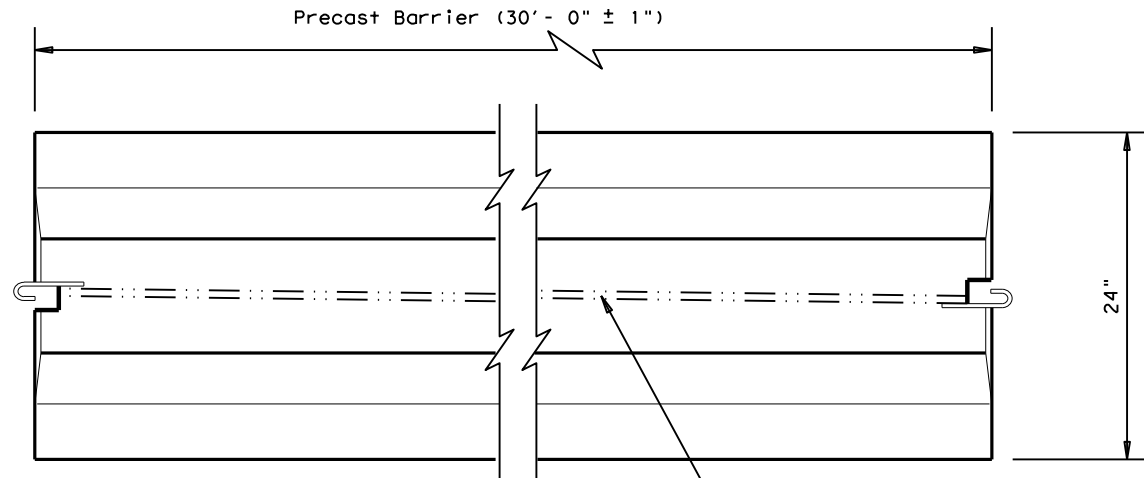


ELEVATION (CSB) QUICK-BOLT
 See Manufacturer's shop drawing for additional details

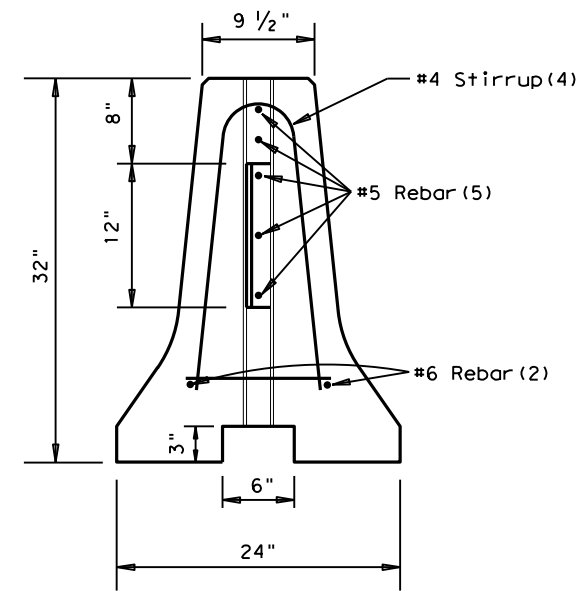


ELEVATION VIEW SHOWING JOINT CONNECTION
"QUICK-BOLT"

Joint Connection (Type Q)

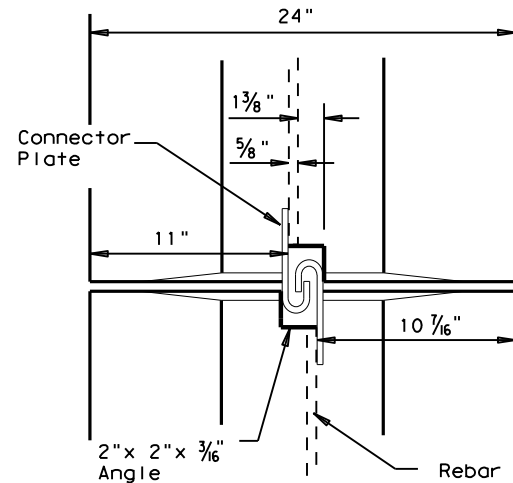


TOP VIEW
PRECAST (CSB) WITH J-J HOOKS
 See Manufacturer's shop drawing for additional details



END VIEW
J-J HOOK CONNECTION

Joint Connection (Type J)



VIEW FROM ABOVE
J-J HOOK CONNECTION

Proprietary Joint Connections (CSB)

Two proprietary joint connections are acceptable as alternates to the (Type X) connection shown, here on. These joint connections types are:

J-J Hooks by Easi-Set Industries, (800)547-4045
 Quick-Bolt by Bexar Concrete, (210)497-3773

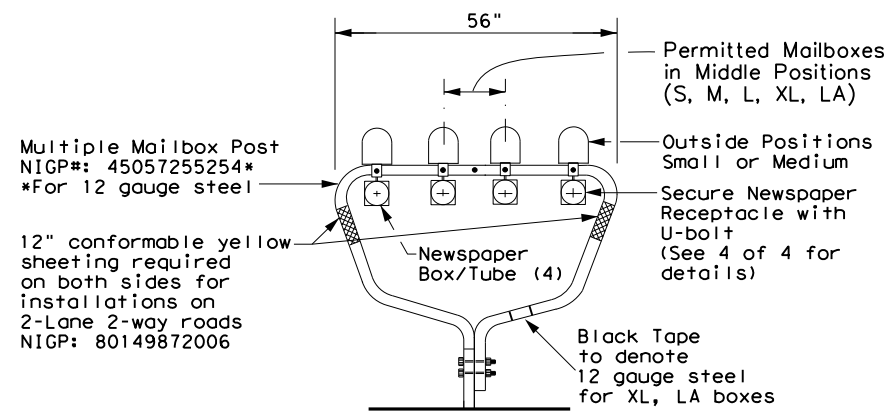
If one of these connection systems are exclusively specified in the plans, prior approval for sole source use must be obtained. Details of the connection components and barrier reinforcement for these systems, will be shown on the manufacturer's shop drawing(s) furnished to the Engineer.

SHEET 2 OF 2

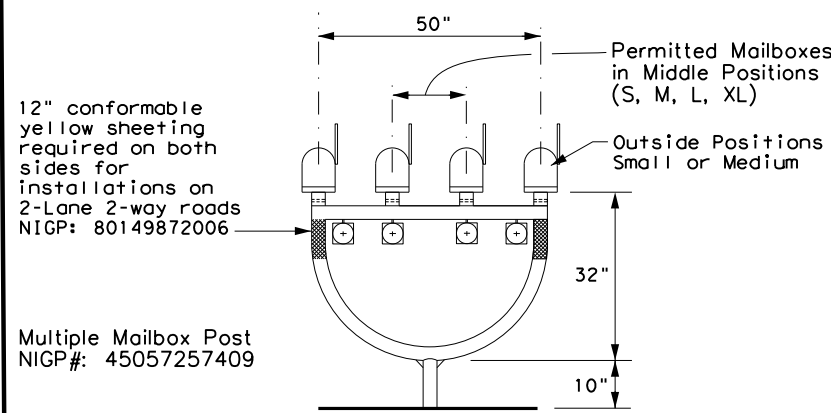
		<i>Design Division Standard</i>	
CONCRETE SAFETY BARRIER (F-SHAPE) PRECAST BARRIER (TYPE 1) CSB(1)-10			
FILE: csb110.dgn	DN: TxDOT	CK: AM	DW: BD
© TxDOT December 2010	CONT SECT	JOB	HIGHWAY
REVISIONS	0122 03	033, ETC	US 287, ETC
DIST	COUNTY	SHEET NO.	
BRY	FREESTONE, ETC	79	

DISCLAIMER: The use of this standard is governed by the "Texas Engineering Practice Act". No warranty of any kind is made by TxDOT for any purpose whatsoever. TxDOT assumes no responsibility for the conversion of this standard to other formats or for incorrect results or damages resulting from its use.

TYPE 1 - MULTIPLE



TYPE 4 - MULTIPLE



MAILBOX SIZES

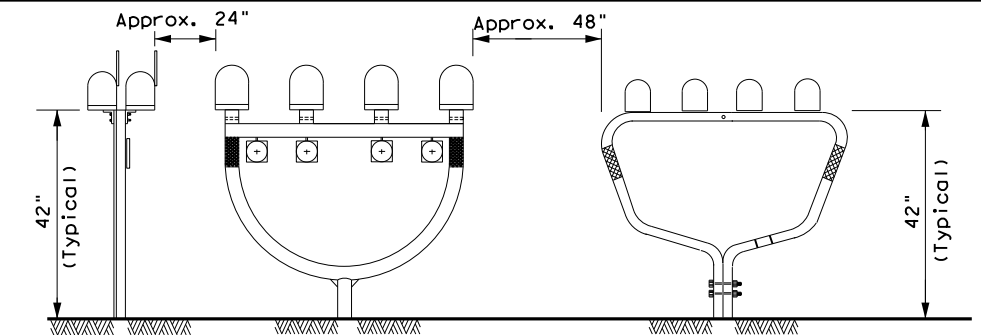
MAILBOX SIZE	TYPICAL DIMENSIONS			MAX **
	LENGTH	WIDTH	HEIGHT	WEIGHT
SMALL	19 1/2"	6"	7"	6 LBS
MEDIUM	22 1/2" *	8" *	11 1/2" *	8 LBS
LARGE	23 1/2"	11 1/2"	13 1/2"	11 LBS
EXTRA LARGE	18"	14"	12"	13 LBS
LOCKABLE	18"	11 1/2"	15"	23 LBS

GENERAL NOTES:

- Dimensions shown (length, width, and height) are typical, not maximums. However, anytime a medium size mailbox is mounted on a single/double mount or on the outside position on a multi mount, the dimensions shown are maximums.
- Mailboxes shall be made of light weight sheet metal or light weight plastic. Heavy steel, cast iron or decorative mailboxes shall not be used on the state highway system.

* See Note 1.
 ** Excluding Molded Plastic on 4 X 4 Post

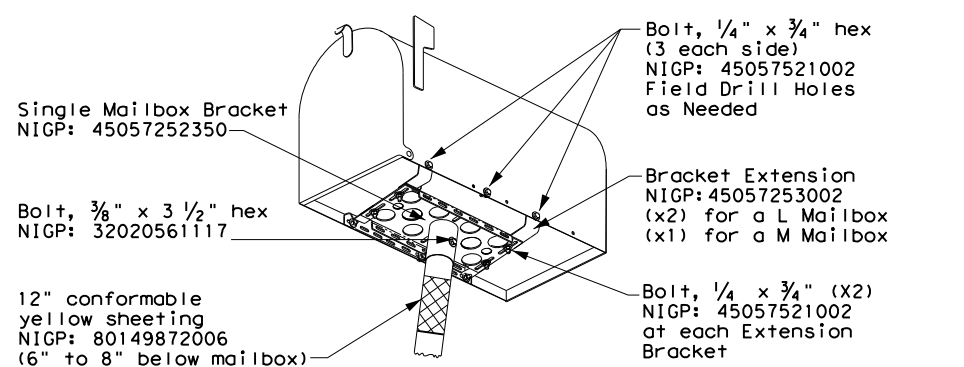
TYPICAL INSTALLATION MEASUREMENTS



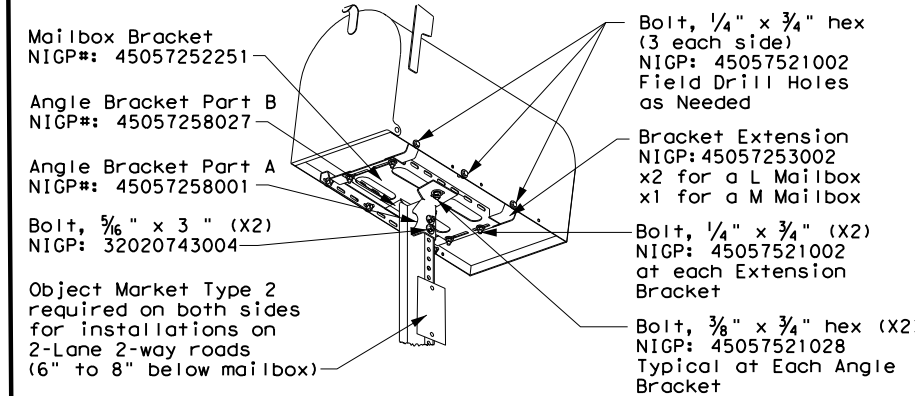
NOTE:

Mailbox installations in sidewalk areas shall be in accordance with the latest TxDOT Design Standard sheets PED-Pedestrian Facilities Curb Ramps.

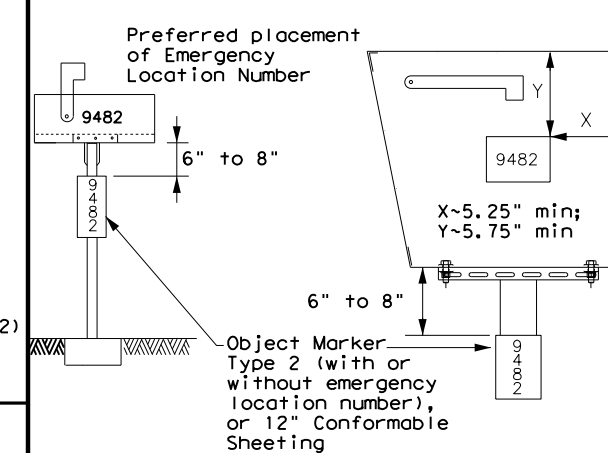
TYPE 2 and 4 - SINGLE/DOUBLE



TYPE 3 - SINGLE/DOUBLE



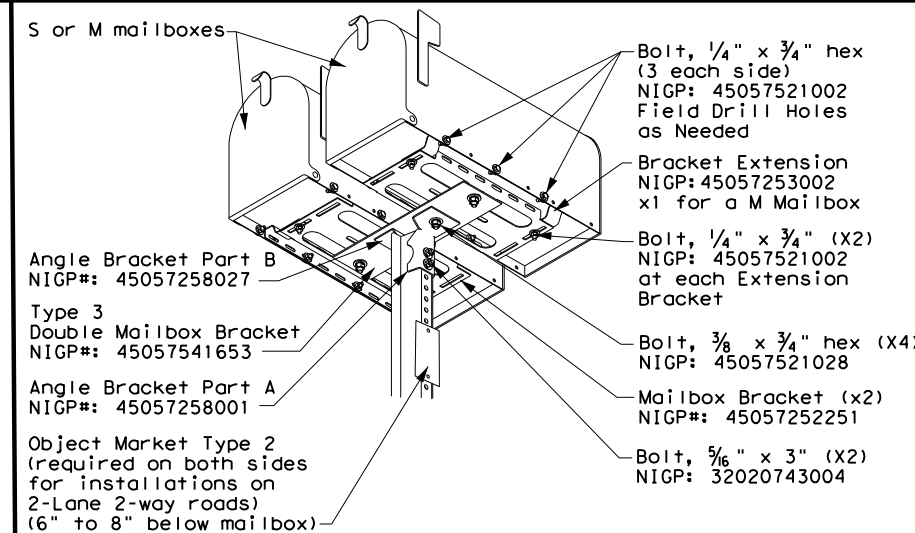
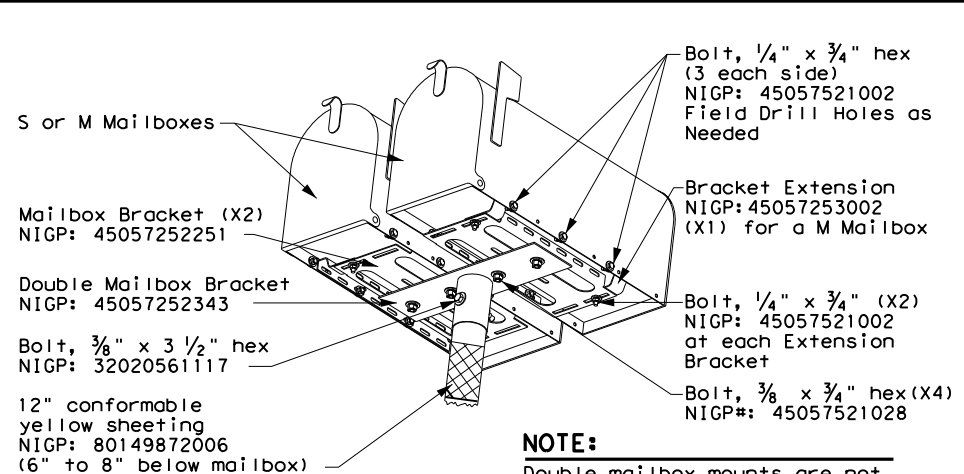
PLACEMENT OF EMERGENCY LOCATION NUMBER



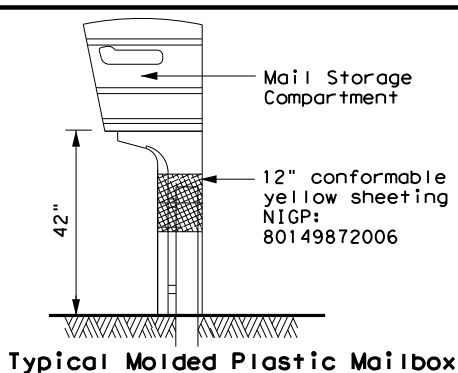
NOTES:

- Location numbers are provided by homeowner. Minimum size 1" height.
- Location number is typically placed on the mailbox in a contrasting color.
- Black numbers may be placed on the Type 2 object marker if the numbers cannot be placed on the mailbox.
- Alternatively, a green or blue plate with white numbers attached may be mounted below the object marker. Other contrasting color configuration, as approved, may be used.
- See 3 of 4 for Foundation details.
- See 4 of 4 for Hardware details.

SHEET 1 OF 4



TYPE 5



Texas Department of Transportation
 Maintenance Division Standard

MAILBOX MOUNTING AND ASSEMBLY

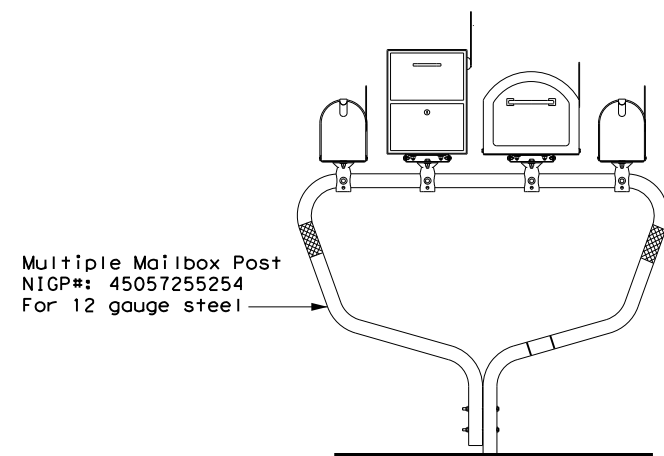
MB(1)-21

FILE: MB-21.dgn	DN: TxDOT	CK: TxDOT	DW: TxDOT	CK: TxDOT
© TxDOT March 2004	CONT	SECT	JOB	HIGHWAY
REVISIONS	0122	03	033,ETC.	US 287, ETC.
2/2005	11/2009	4/2015	DIST	COUNTY
6/2005	1/2011		BRY	FREESTONE, ETC.
11/2006	7/2014			SHEET NO. 80

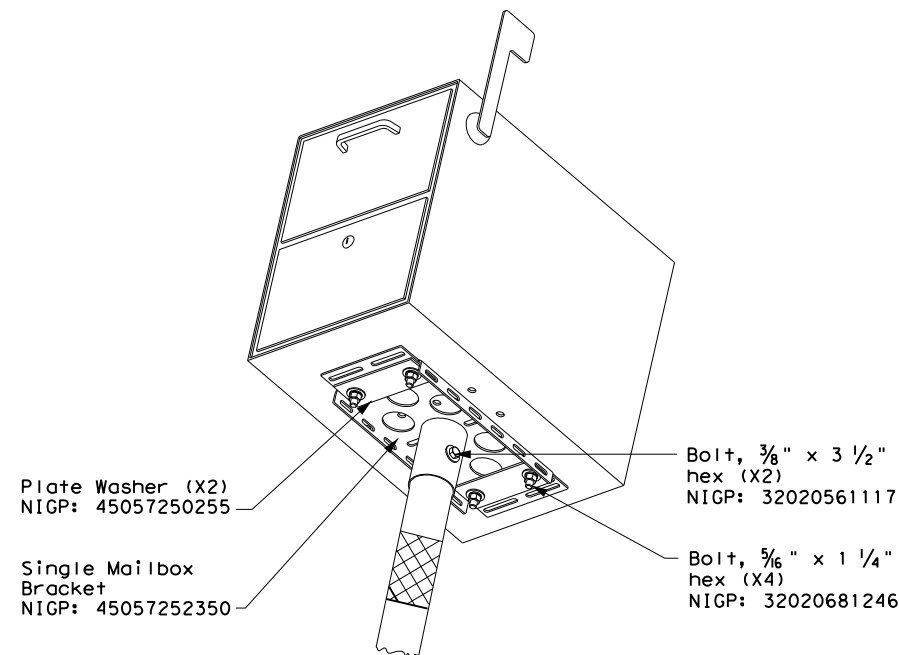
DATE: FILE:

DISCLAIMER: The use of this standard is governed by the "Texas Engineering Practice Act". No warranty of any kind is made by TxDOT for any purpose whatsoever. TxDOT assumes no responsibility for the conversion of this standard to other formats or for incorrect results or damages resulting from its use.

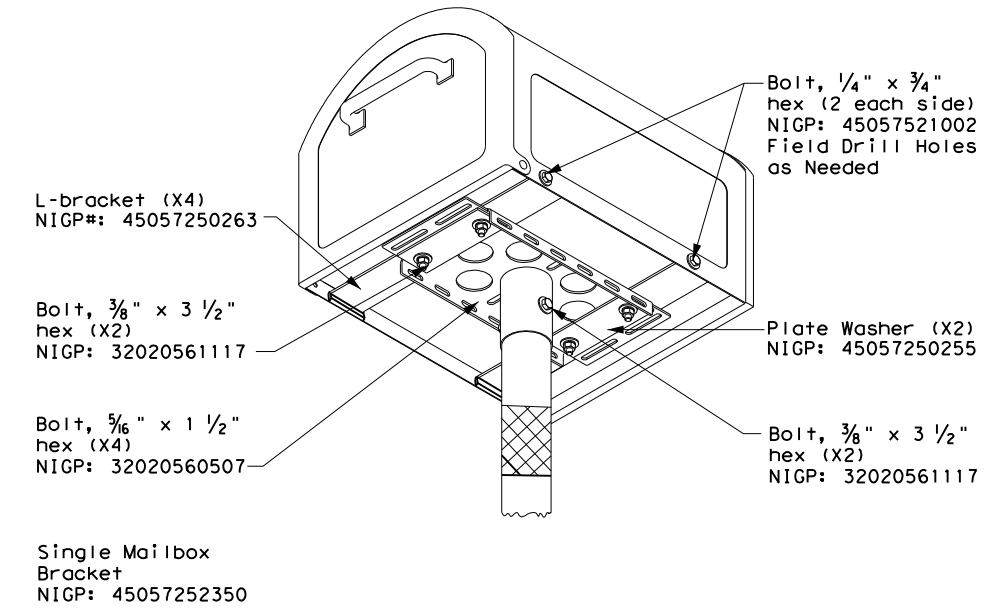
TYPE 1 - MULTI LOCKABLE AND XL MAILBOX



TYPE 2/4 - SINGLE LOCKABLE MAILBOX

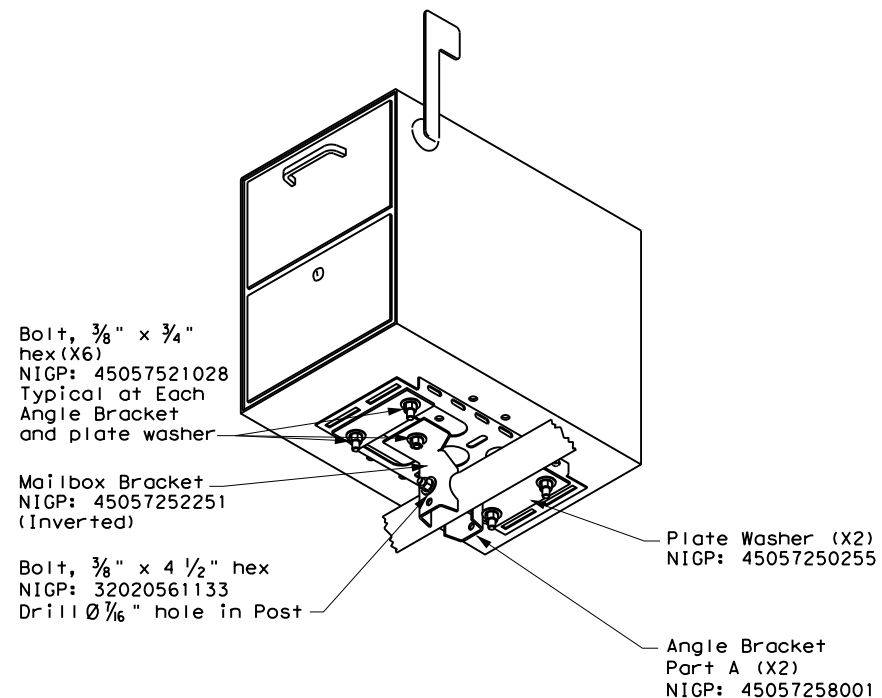


TYPE 2/4 - SINGLE XL MAILBOX

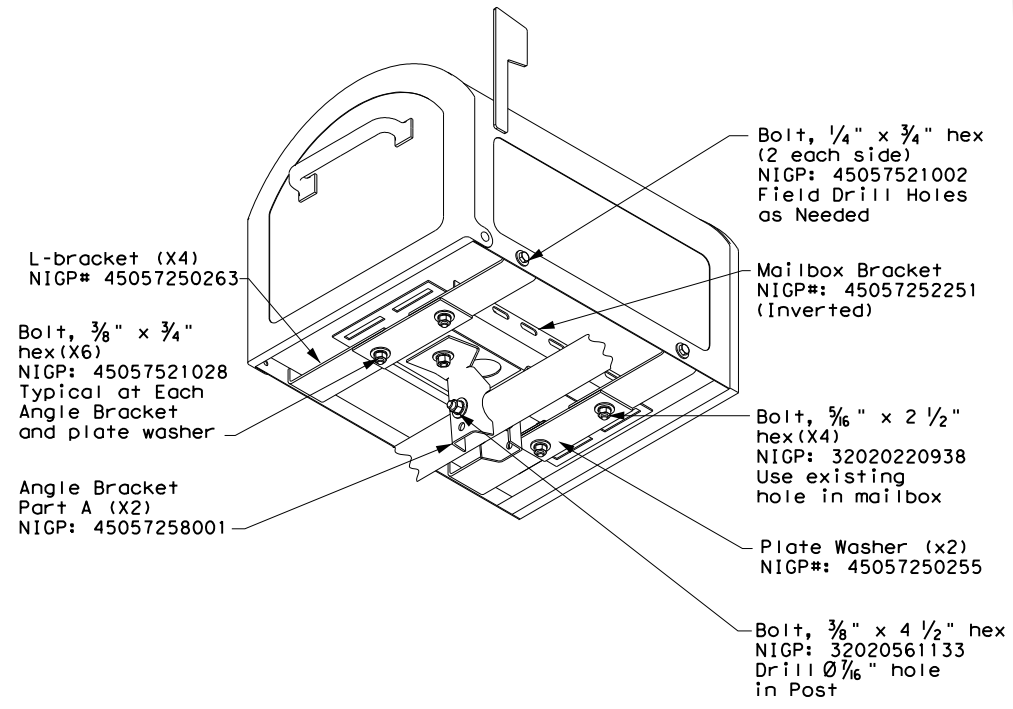


NOTE:
Follow same configuration when mounting an XL mailbox on a Type 4 multi post.

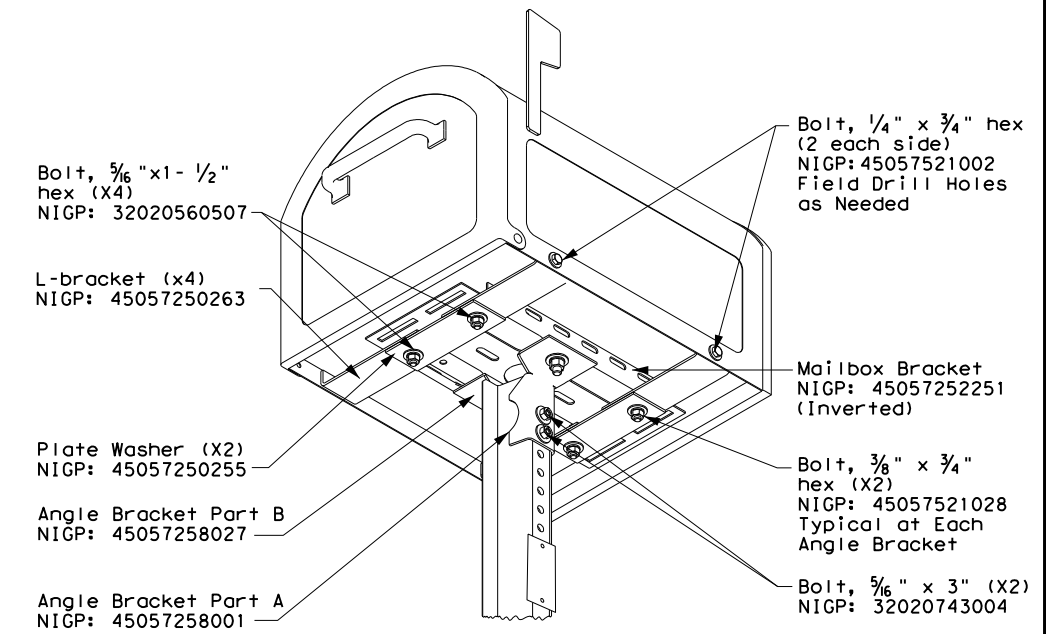
TYPE 1 MULTI - LOCKABLE ARCHITECTURAL (LA)



TYPE 1 MULTI - XL MAILBOX



TYPE 3 - XL MAILBOX MOUNTING



SHEET 2 OF 4

Texas Department of Transportation Maintenance Division Standard

XL AND LOCKABLE ARCHITECTURAL MAILBOX ASSEMBLY MB (2) - 21

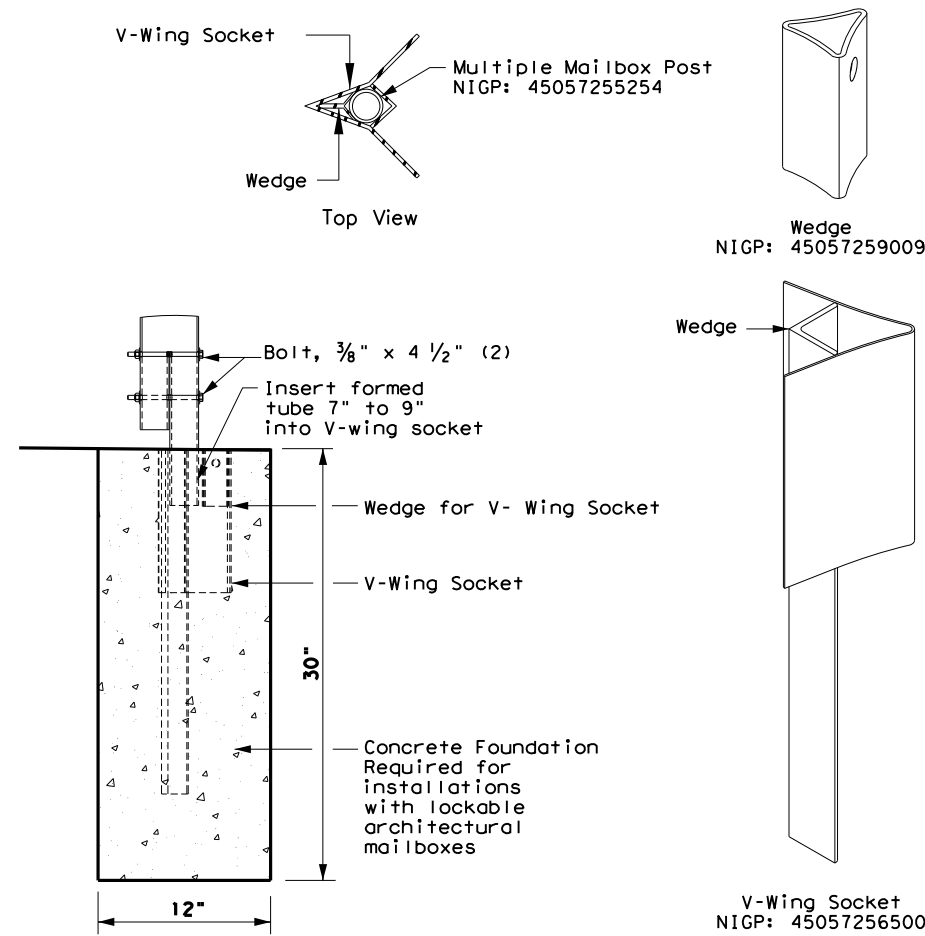
FILE: MB-21.dgn	DN: TxDOT	CK: TxDOT	DW: TxDOT	CR: TxDOT
© TxDOT March 2004	CONT	SECT	JOB	HIGHWAY
2/2005	REVISIONS	0122	03	033,ETC.
6/2005	11/2009	4/2015		US 287, ETC.
11/2006	1/2011			
	DIST	COUNTY	SHEET NO.	
	BRY	FREESTONE, ETC.	81	

DATE:
FILE:

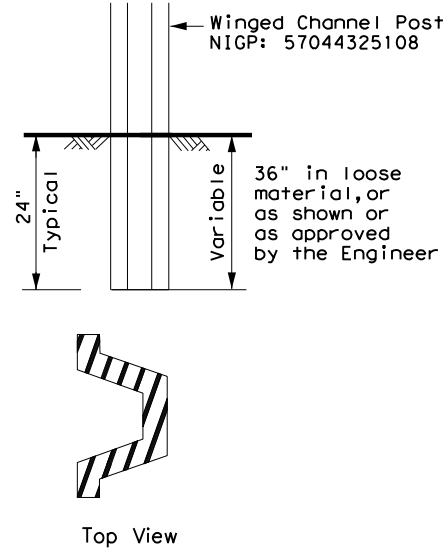
DISCLAIMER: The use of this standard is governed by the "Texas Engineering Practice Act". No warranty of any kind is made by TxDOT for any purpose whatsoever. TxDOT assumes no responsibility for the conversion of this standard to other formats or for incorrect results or damages resulting from its use.

TYPE 1 - SUPPORT/FOUNDATION

Thin Wall Tube w/ V-LOC Anchorage



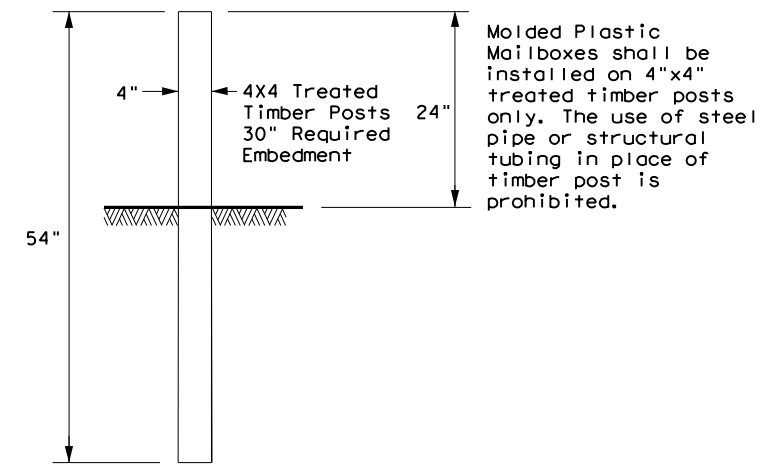
TYPE 3 - SUPPORT/FOUNDATION



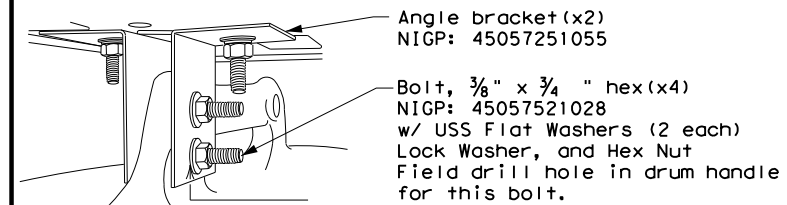
NOTES:

1. Attach Object Marker (OM) facing direction of traffic.
2. OM will also be required on opposite side if installed on a 2-Lane, 2-Way roadway.

TYPE 5 - SUPPORT/FOUNDATION



TYPE 6 - TEMPORARY MAILBOX SUPPORT



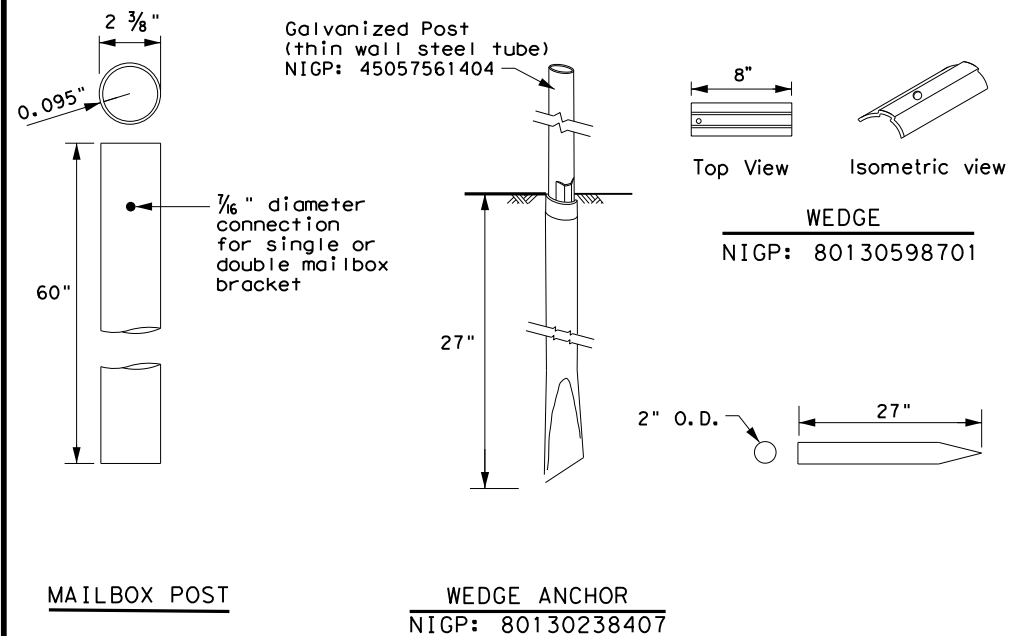
Plastic Drum NIGP: 55093383655
 Rubber Collar NIGP: 55093387102

NOTES:

1. Place on approved plastic drum as shown in the Compliant Work Zone Traffic Control Devices (CWZTCD).
2. Existing attachment hardware shall be used unless damaged. Damaged hardware shall be replaced.

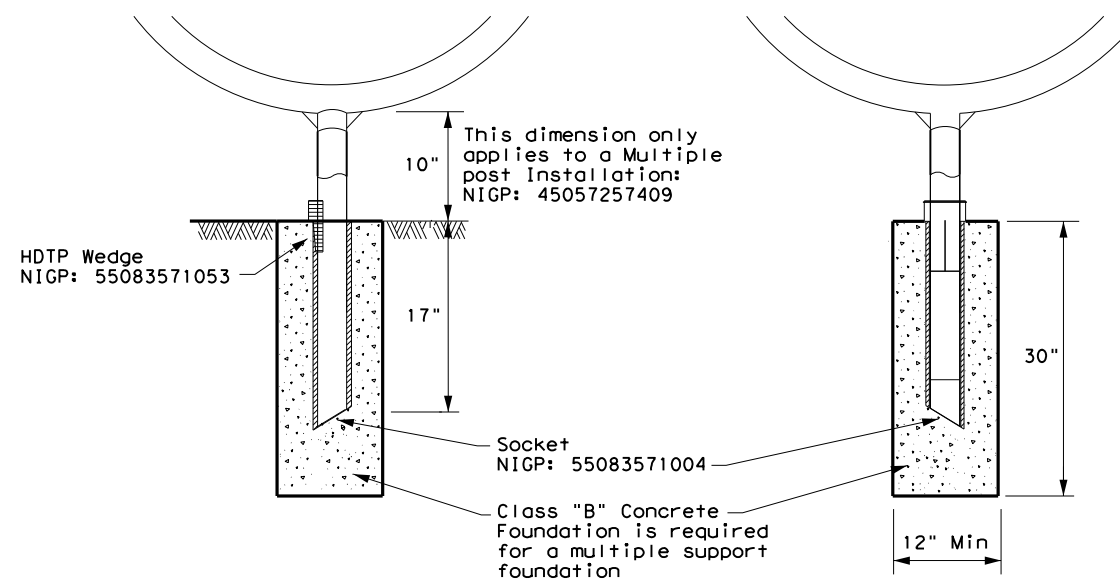
TYPE 2 - SUPPORT/FOUNDATION

Thin Wall Steel Tube w/Wedge Anchor System



TYPE 4 - SUPPORT/FOUNDATION

Whitecoated steel post NIGP: 45057561107
 Multiple post NIGP: 45057257409
 Recycled Rubber post (RR) NIGP: 45057561057



GENERAL NOTES:

1. Erect post plumb or vertical.
2. When galvanized part is required galvanize in accordance with Item 445.
3. Use a concrete footing as shown or when directed. Concrete footing will be required when soils do not hold the support/foundations in a stable condition, only on Type 1, Type 2, and Type 4

SHEET 3 OF 4



MAILBOX SUPPORT AND FOUNDATION

MB (3) - 21

FILE: MB-21.dgn	DN:	CK:	DW:	CK:
© TxDOT March 2004	CONT	SECT	JOB	HIGHWAY
REVISIONS	0122	03	033,ETC.	US 287, ETC.
2/2005	11/2009	4/2015	DIST	COUNTY
6/2005	1/2011		BRY	FREESTONE, ETC.
11/2006	7/2014			SHEET NO. 82

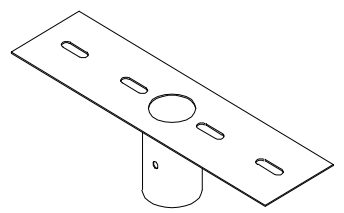
DATE:
FILE:

DISCLAIMER: The use of this standard is governed by the "Texas Engineering Practice Act". No warranty of any kind is made by TxDOT for any purpose whatsoever. TxDOT assumes no responsibility for the conversion of this standard to other formats or for incorrect results or damages resulting from its use.

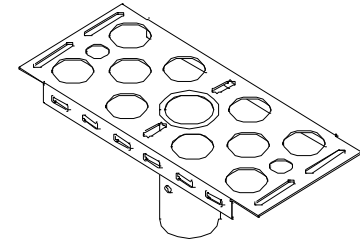
TYPE	TYPE 1	TYPE 2	TYPE 3	TYPE 4	TYPE 5	TYPE 6
Configuration	Multiple	Single or Double	Single or Double	Single	Double	Multiple
Mailbox Size NIGP #	Outside Position: S or M Inside Position: S, M, L, XL, or LA	Single: S, M, L, XL, or LA Double: SS, SM, MM	Single: S, M, L, or XL Double: SS, SM, MM	S, M, L, XL, or LA	SS, SM, or MM	Outside Position: S or M Inside Position: S, M, L, or XL
Mailbox Post NIGP #	45057255254 (Galvanized Multiple)	45057561404 (Thin Walled Govanize)	57044325108 (Wing Channel Post)	45057561107 (Thin walled white powder coated) 45057561057 (Recycled Rubber Post: S or M only)	45057561107 (Thin Walled White Powder Coated)	45057257409 (White Powder Coated Multiple)
Post and Mailbox Hardware NIGP #	45057259009 (Wedge) 45057256500 (V-Wing Socket) 45057253002 (Bracket Extension) 45057252251 (Mailbox Bracket) 45057258001 (Part A Angle Bracket x2) 45057250255 (Plate Washer for XL/LA x2) 45057250263 (L-Bracket for XL x4)	80130598701 (Wedge) 80130238407 (Wedge Anchor) 45057253002 (Bracket Extension) 45057252343 (Double MB Bracket) 45057252350 (S. Mailbox Bracket) 45057252251 (Mailbox Bracket) 45057250255 (Plate Washer for XL/LA x2) 45057250263 (L-Bracket for XL x4)	45057541653 (Type 3 Double Mailbox Bracket) 45057252251 (Mailbox Bracket) 45057253002 (Bracket Extension) 45057258001 (Part A Angle Bracket) 45057258027 (Part B Angle Bracket) 45057250255 (Plate Washer for XL x2) 45057250263 (L-Bracket for XL x4)	55083571053 (Wedge) 55083571004 (Socket) 45057252350 (Single Mailbox Bracket) 45057253002 (Bracket Extension) 45057250255 (Plate Washer for XL/LA x2) 45057250263 (L-Bracket for XL x4)	55083571053 (Wedge) 55083571004 (Socket) 45057253002 (Bracket Extension) 45057252343 (Double Mount Bracket) 45057252251 (Mailbox Bracket x2)	45057251055 Angle Bracket (x2)
Foundation Used	Class B Concrete (Required for LA Mailboxes)	Class B Concrete (Required for LA Mailboxes)	None	Class B Concrete (not used with recycled rubber post, required for LA Mailboxes)	Class B Concrete (not required)	Class B Concrete



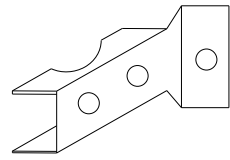
NIGP: 45057250263
L-Bracket x4 for XL sized mailboxes



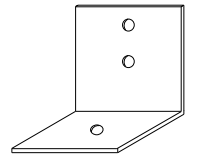
NIGP: 45057252343
Double Mailbox Bracket For Type 2 and Type 4 double mount



NIGP: 45057252350
Single Mailbox Bracket For Type 2 single and for Type 4 single and multi mount



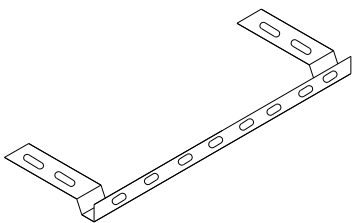
NIGP: 45057258001
Part "A" Angle Bracket For Type 1 multi (2 per mailbox) and Type 3 single and double



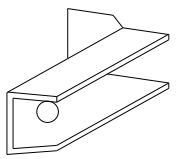
NIGP: 45057251055
Type 6 Angle Bracket (2 per mailbox)



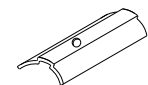
NIGP: 45057252251
Mailbox Bracket For Type 1 multi and any double mount (use 2)




NIGP: 45057253002
Bracket Extension Use 1 for a medium Mailbox Use 2 for a Large Mailbox



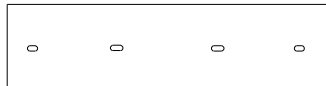
NIGP: 45057258027
Part "B" Angle Bracket For Type 3 single and double



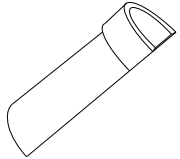
NIGP: 80130598701
Wedge for Type 2



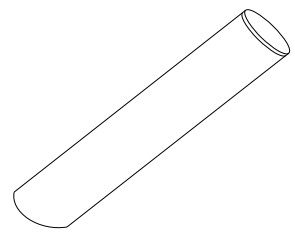
NIGP: 45057250255
Plate Washer for Architecural and XL Mailboxes




NIGP: 45057541653
Type 3 double mailbox bracket



NIGP: 55083571053
Type 4 Mailbox Wedge



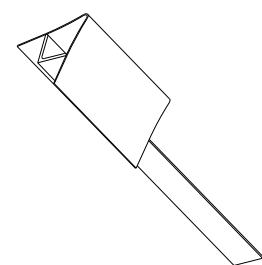
NIGP: 55083571004
Type 4 Mailbox Socket



NIGP: 80130238407
Type 2 Wedge Anchor



NIGP: 45057259009
Wedge for Type 1 V-wing Socket



NIGP: 45057256500
V-wing Socket for Type 1 Foundation

NIGP #	OBJECT MARKERS AND CONFORMABLE SHEETING
55008311759	Type 2 OM 4"x4" (3 Needed) for Type 3 Wing Channel Post
55008312906	Type 2 OM 6"x12" (1 needed) for Type 3 Wing Channel Post
80149872006	12" Conformable Reflective Yellow Sheeting for Flexible Posts

NOTES:

- Type 2 object marker in accordance with Traffic Engineering Standard Delineators & Object Markers.
- A light weight receptacle for newspaper delivery can be attached to mailbox posts if the receptacle does not touch the mailbox, present a hazard to traffic or delivery of the mail, extend beyond the front of the mailbox, or display advertising, except the publication title.

BID CODES FOR CONTRACTS

MB-(X) ASSM TY (XXX) (X)

Type of Mailbox _____

S = Single
D = Double
M = Multiple
MP = Molded Plastic


Type of Post _____

WC = Winged Channel Post
RR = Recycled Rubber
TWW = Thin Walled White Tubing
TWG = Thin Walled Galvanized Tubing
TIM = Timber

Type of Foundation _____

Ty 1 = V-Loc
Ty 2 = Wedge Anchor Steel System
Ty 3 = Winged Channel post
Ty 4 = Wedge Anchor Plastic System
Ty 5 = 4 X 4 Post

SHEET 4 OF 4


Maintenance Division Standard

NIGP PARTS LIST AND COMPATIBILITY

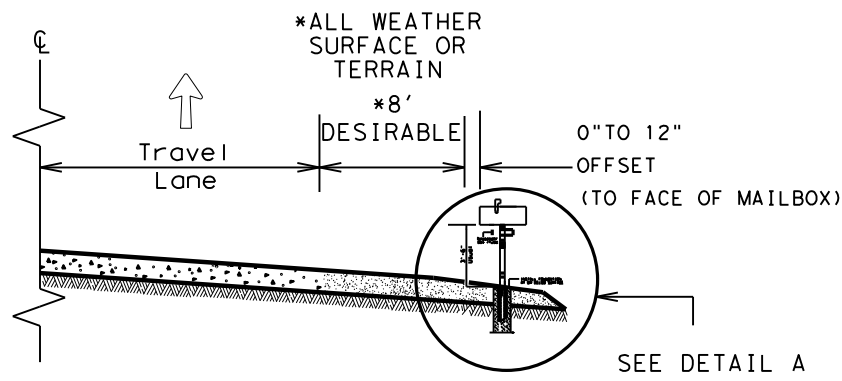
MB(4)-21

FILE: MB-21.dgn	DN: TxDOT	CK: TxDOT	DW: TxDOT	CR: TxDOT
©TxDOT March 2004	CONT	SECT	JOB	HIGHWAY
2/2005	0122	03	033,ETC.	US 287, ETC.
6/2005	DIST	COUNTY	SHEET NO.	
11/2006	BRY	FREESTONE, ETC.	83	

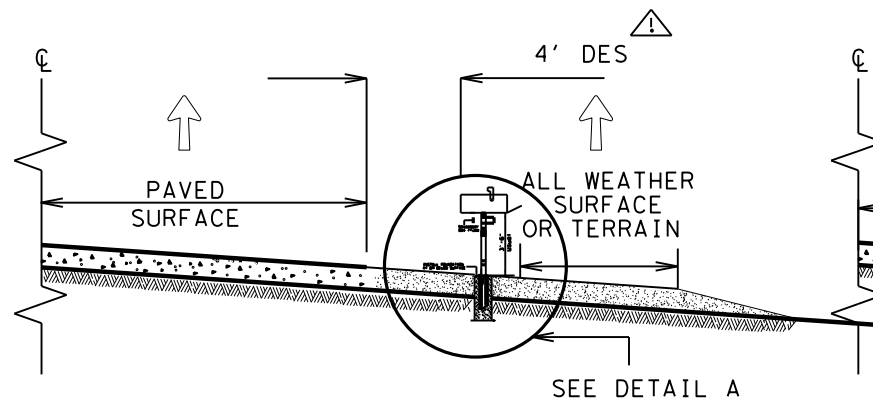
DATE: FILE:

DISCLAIMER: The use of this standard is governed by the "Texas Engineering Practice Act". No warranty of any kind is made by TxDOT for any purpose whatsoever. TxDOT assumes no responsibility for the conversion of units or for the accuracy of the information provided. TxDOT is not responsible for the use of this standard in any manner other than that intended by the Texas Department of Transportation.

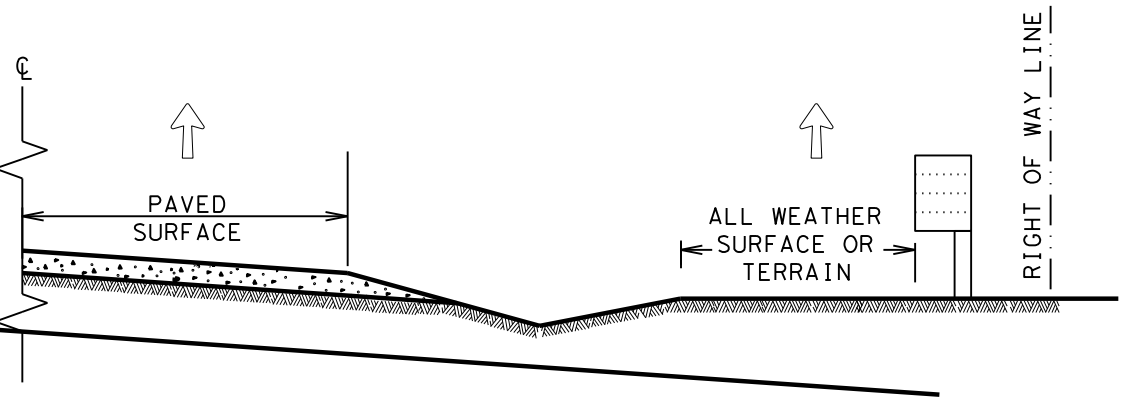
DATE: 5/26/2022 4:36:53 PM
 FILE: \\txdot\project\wisonline.com\TXDOT14\Documents\17 - BRY\Design Project\MB-14(2)\MB-14(2).dgn
 DW: \\txdot\project\wisonline.com\TXDOT14\Documents\17 - BRY\Design Project\MB-14(2)\MB-14(2).dgn



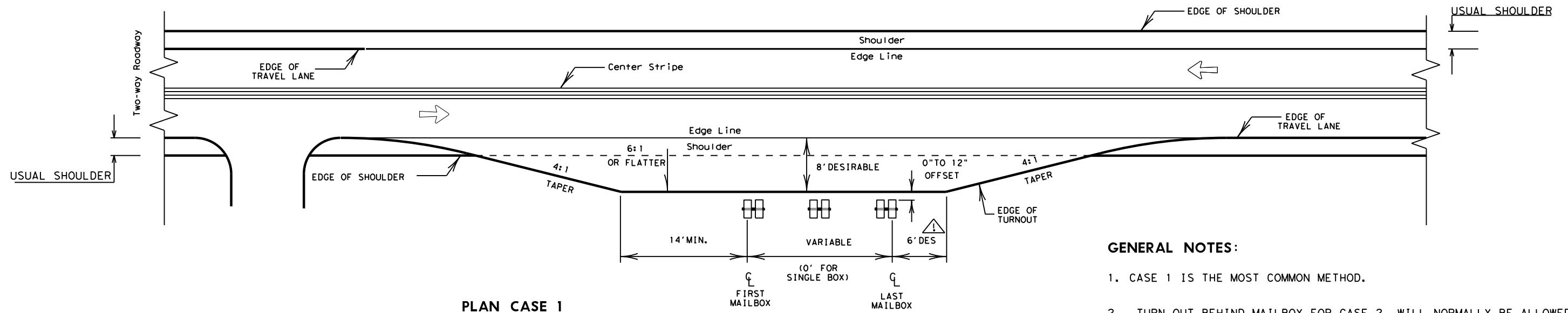
CASE 1. OFF TRAVEL WAY DELIVERY



CASE 2. BACK SIDE DELIVERY



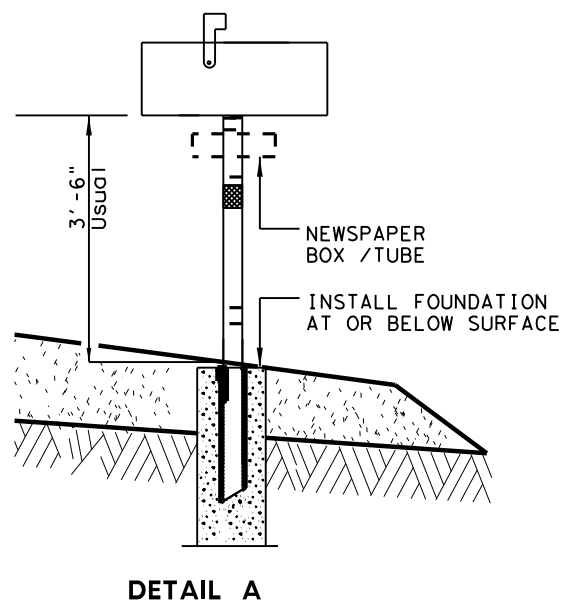
CASE 3. DELIVERY NEAR RIGHT OF WAY LINE



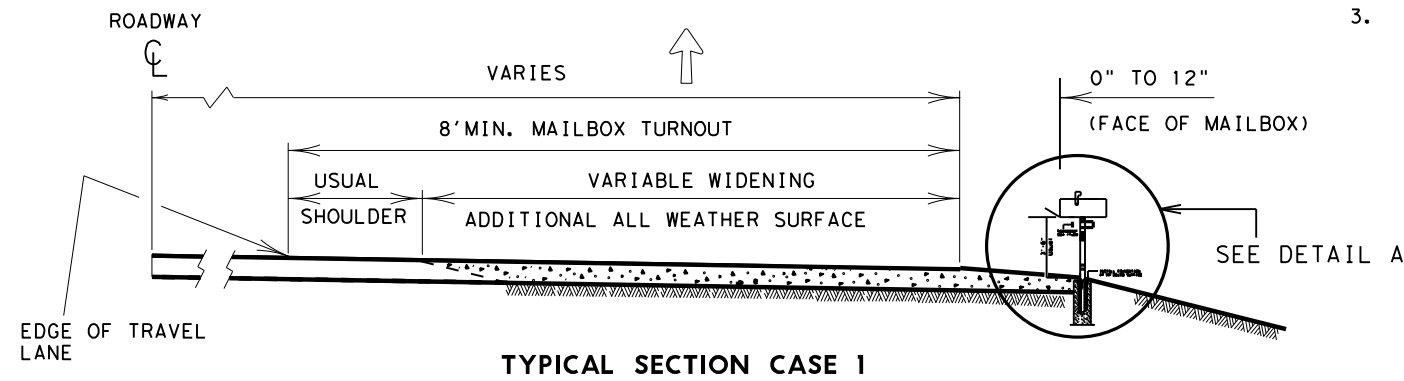
PLAN CASE 1

GENERAL NOTES:

1. CASE 1 IS THE MOST COMMON METHOD.
2. TURN OUT BEHIND MAILBOX FOR CASE 2 WILL NORMALLY BE ALLOWED FOR NATURAL TERRAIN THAT WILL SERVE AS AN ALL WEATHER SURFACE.
3. ALL WEATHER DRIVEWAYS FOR CASE 3 MAILBOXES LOCATED AT THE RIGHT OF WAY LINE SHOULD NORMALLY BE PLACED IN CONJUNCTION WITH COUNTY ROADS OR OTHER CONNECTING COMMUNITY ROADS OR STREETS. IF THE NUMBER OF MAILBOXES EXCEEDS FOUR, A COMMUNITY MAIL BOX SHOULD BE ENCOURAGED AT THESE LOCATIONS.



DETAIL A



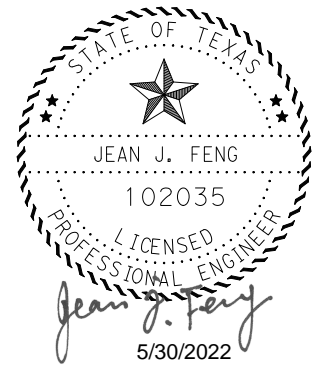
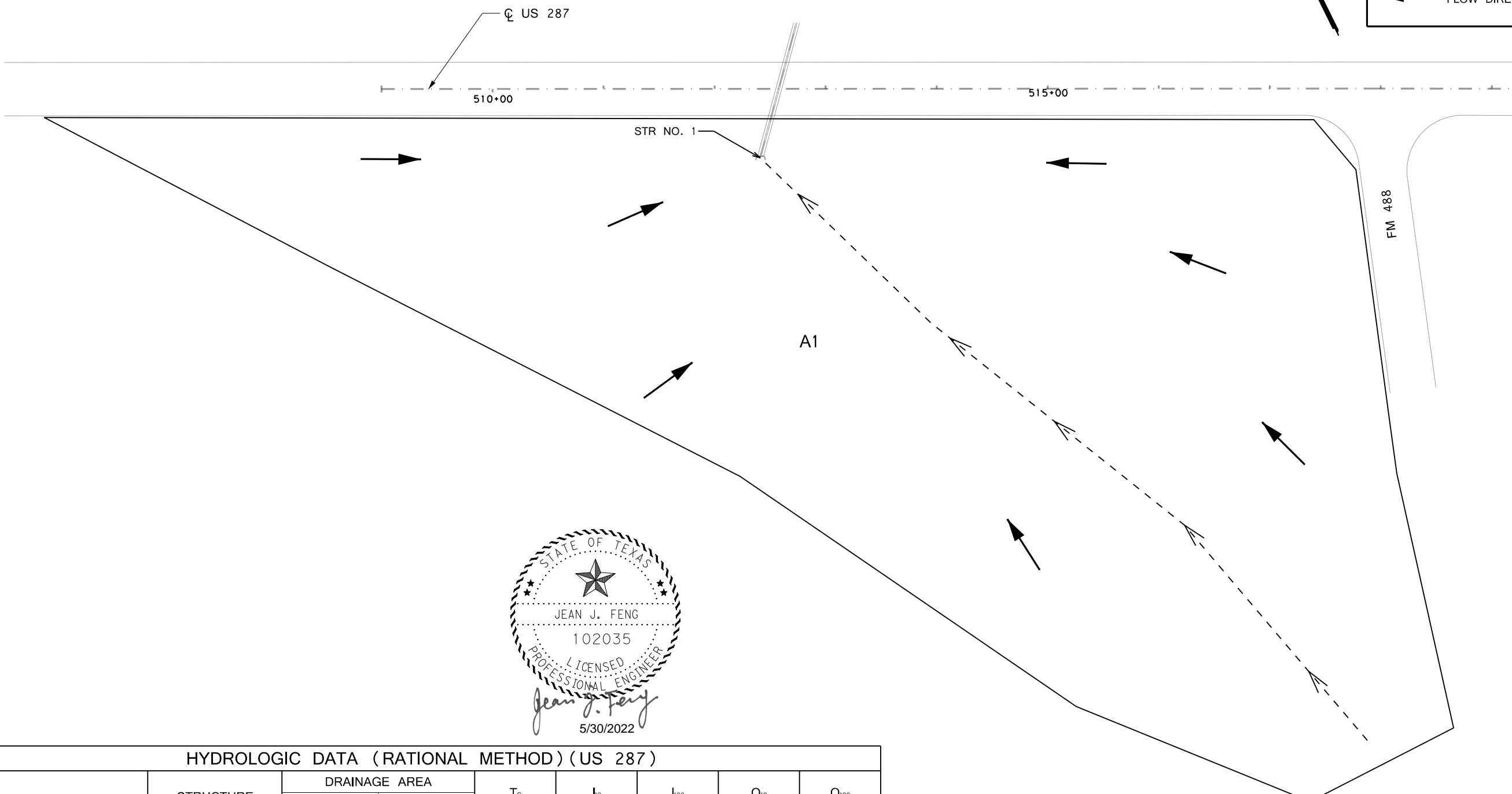
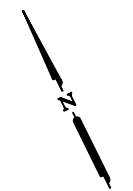
TYPICAL SECTION CASE 1

↑ MAIL DELIVERY VEHICLE TRAVEL DIRECTION

		Maintenance Division Standard	
<i>Guideline</i> MAILBOX SIDE ROAD PLACEMENT AND TURNOUTS MB-14(2)			
FILE: MB14(2).DGN	DN: JEO	CK:	DW: JEO
© TxDOT MAY 2014	CONT	SECT	JOB
REVISIONS	0122	03	033, ETC.
DECEMBER 2012-NEW TxDOT TITLE BLOCK	DIST	COUNTY	US 287, ETC.
	BRY	FREESTONE, ETC.	SHEET NO.
			84

LEGEND

- DRAINAGE AREA BOUNDRY
- - - LONGEST FLOW PATH
- FLOW DIRECTION



HYDROLOGIC DATA (RATIONAL METHOD) (US 287)

ID/ STR NO	STRUCTURE STATION	DRAINAGE AREA		T _c (MIN)	I ₀ (IN/HR)	I ₁₀₀ (IN/HR)	Q ₁₀ (CFS)	Q ₁₀₀ (CFS)
		SIZE (AC)	C					
A1 / STR 1	STA 512+58	9.1	0.57	16.91	6.82	9.18	31.63	49.52

HYDRAULIC DATA (HY-8) (US 287)

	STRUCTURE STATION	STRUCTURE DESCRIPTION	ALLOWABLE ELEV (FT)	LENGTH (FT)	CULV		D.S. CHANNEL		FREQ = 10 YR				FREQ = 100 YR			
					SLOPE (%)	MANNING "n"	SLOPE (%)	MANNING "n"	Q ₁₀ (CFS)	HW (FT)	TW (FT)	VEL OUTLET (FT/S)	Q ₁₀₀ (CFS)	HW (FT)	TW (FT)	VEL OUTLET (FT/S)
EXIST	STRUCTURE #1 STA 512+58	2-24" CMP	281.00	142	* 15.6 / 0.1	0.025	1.70	0.030	31.63	270.79	265.78	6.60	49.52	272.21	266.00	8.37
PROP		2-24" RCP		145	* 13.4 / 0.5	0.012	1.70	0.030		271.32	265.78	8.58		272.78	266.00	10.14

* BROKEN BACK

Drawings Not To Scale

PRINT DATE	REVISION DATE
5/26/2022	



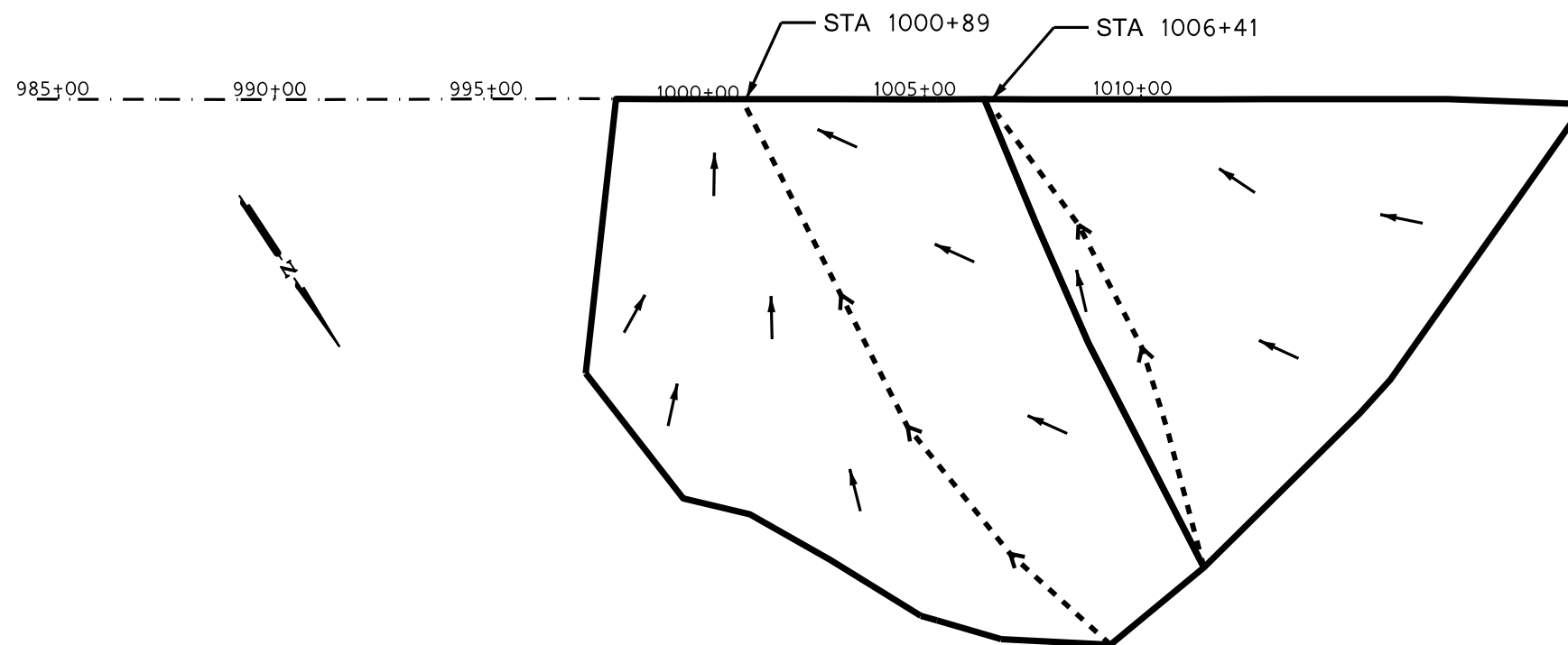
DRAINAGE AREA MAP WITH H & H DATA (US 287)

FED. RD. DIV. NO.	PROJECT NUMBER	HIGHWAY NUMBER	
6		US 287, ETC.	
STATE	DISTRICT	COUNTY	
TEXAS	BRYAN	FREESTONE, ETC.	
CONTROL	SECTION	JOB	SHEET NO.
0122	03	033,ETC.	85

REV DATE: 2-12-2015
 CSJ: 0122-03-033
 FILENAME: pw:\tdot\project\online.com\TXDOT\Documents\17 - BRY\Design Projects\012203033\4 - Design\Plan Set\5. Drainage\Map\Drainage Area\Map\Drainage Map.dgn

LEGEND

- DRAINAGE AREA BOUNDARY
- LONGEST FLOW PATH
- FLOW DIRECTION

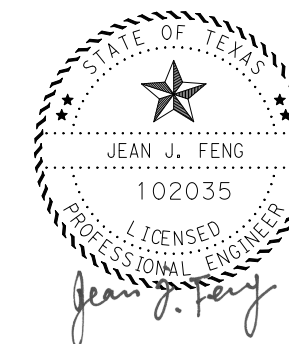


HYDROLOGIC DATA (RATIONAL METHOD) (SH 75)

STRUCTURE STATION	Drainage Area		t _c (min)	I ₁₀ (in/hr)	I ₁₀₀ (in/hr)	Q ₁₀ (cfs)	Q ₁₀₀ (cfs)
	A	C					
	(ac)						
STA 1000+89	27.9	0.37	26	4.73	7.19	49	74
STA 1006+41	18.5	0.37	23	5.09	7.76	35	53

HYDRAULIC DATA (HY-8) (SH 75)

	STRUCTURE STATION	STRUCTURE DESCRIPTION	ALLOWABLE ELEV	LENGTH (FT)	CULV		D.S. CHANNEL		FREQ = 10 YR				FREQ = 100 YR			
					SLOPE (%)	Manning "n"	SLOPE (%)	Manning "n"	Q ₁₀ (CFS)	HW (FT)	TW (FT)	VEL (FT/S)	Q ₁₀₀ (CFS)	HW (FT)	TW (FT)	VEL (FT/S)
EXIST	STA 1000+89	5' X 3' SBC	252.3	31	1.75	1.0	0.085	49	248.39	243.72	9.74	74	249.12	243.95	10.77	
PROP				61	0.63				248.58	243.72	16.51		249.31	243.95	17.55	
EXIST	STA 1006+41	3' X 2' SBC	253.8	31	1.97	1.3	0.045	35	252.48	248.20	10.16	53	253.85	248.30	11.08	
PROP				55	1.98				253.04	248.20	10.99		253.89	248.30	11.60	



05/30/2022

PRINT DATE	REVISION DATE
5/26/2022	

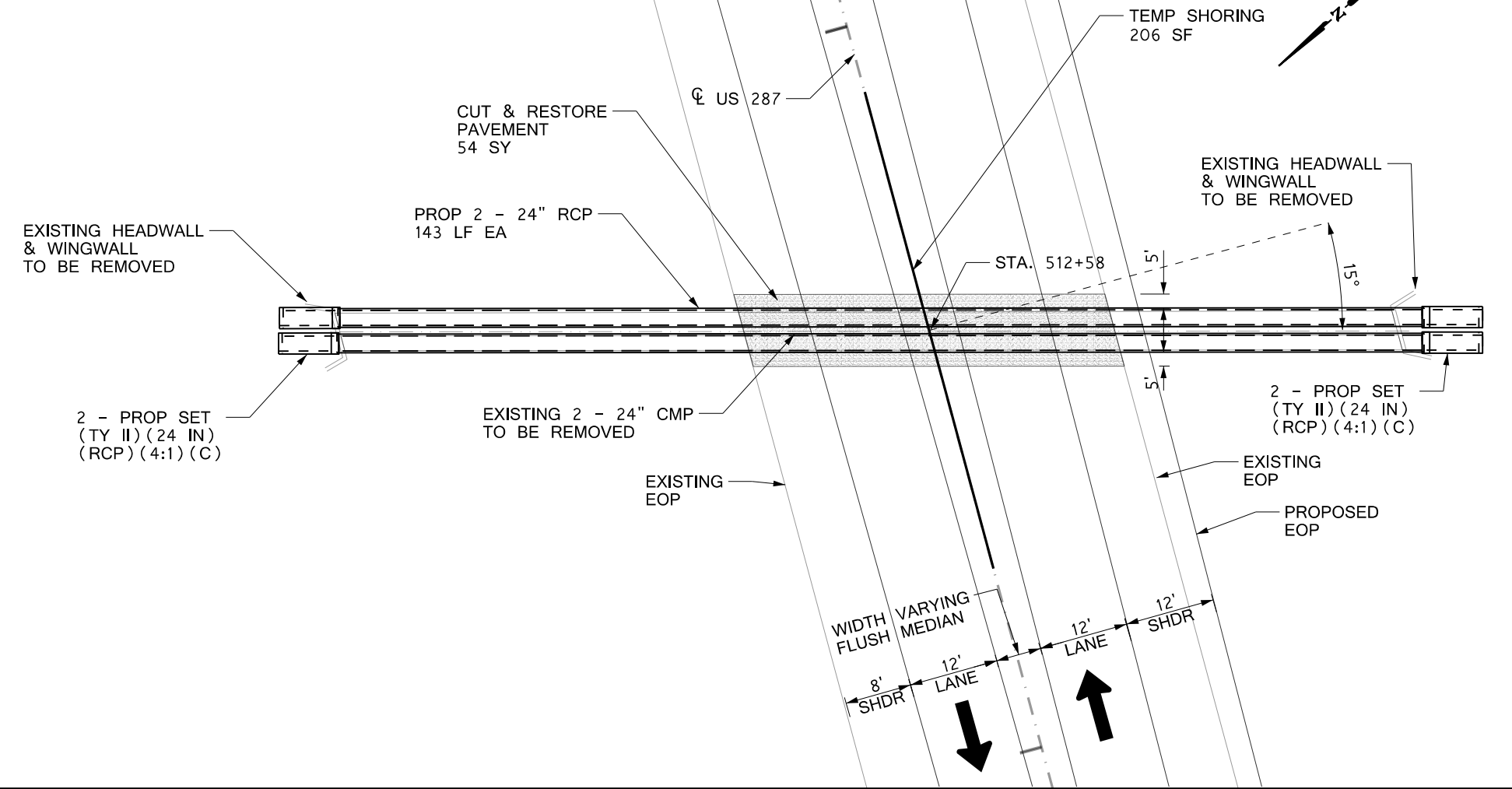
Texas Department of Transportation ©2022
Bryan District

DRAINAGE AREA MAP WITH H & H DATA (SH 75)

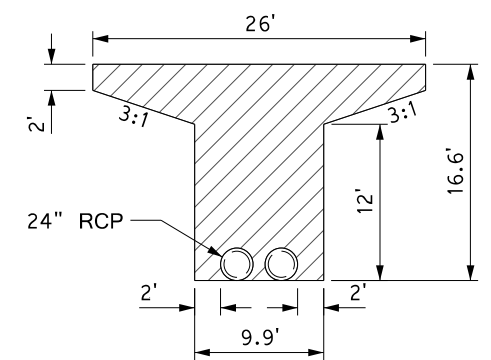
FED. RD. DIV. NO.	PROJECT NUMBER	HIGHWAY NUMBER
6		US 287, ETC.
STATE	DISTRICT	COUNTY
TEXAS	BRYAN	FREESTONE, ETC.
CONTROL	SECTION	JOB SHEET NO.
0122	03	033,ETC. 86

REV DATE: 2-12-2015
 CSJ: 0122-03-033
 FILENAME: pw:\ttdot\projectswisdomline.com\TDDOT4\Documents\17 - BRY\Design Projects\016607067\4 - Design Plan Set\5. Drainage\Map_Sheet_Drainage Area.dgn

REV DATE: 2-12-2015
 CS: 0122-03-033
 FILENAME: \\txdot\projectswisdom\com\TXDOT4\Documents\17 - BRY\Design Projects\012203033\4 - Design\Plan Set\5. Drainage\5D. CulvertLayout\Culvert Layout

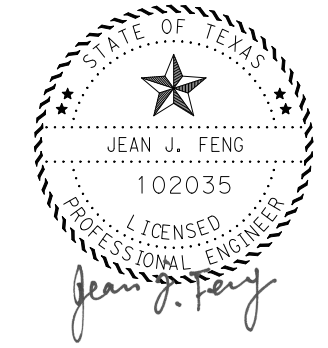


GENERAL NOTES:
 REFER TO "CUT AND RESTORE PAVEMENT
 DETAIL" SHEETS FOR MORE INFORMATION



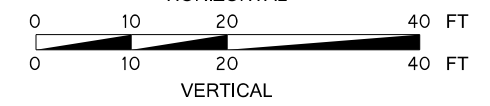
TEMPORARY SPECIAL SHORING DETAIL

APPROX. SURFACE AREA - 207 SF

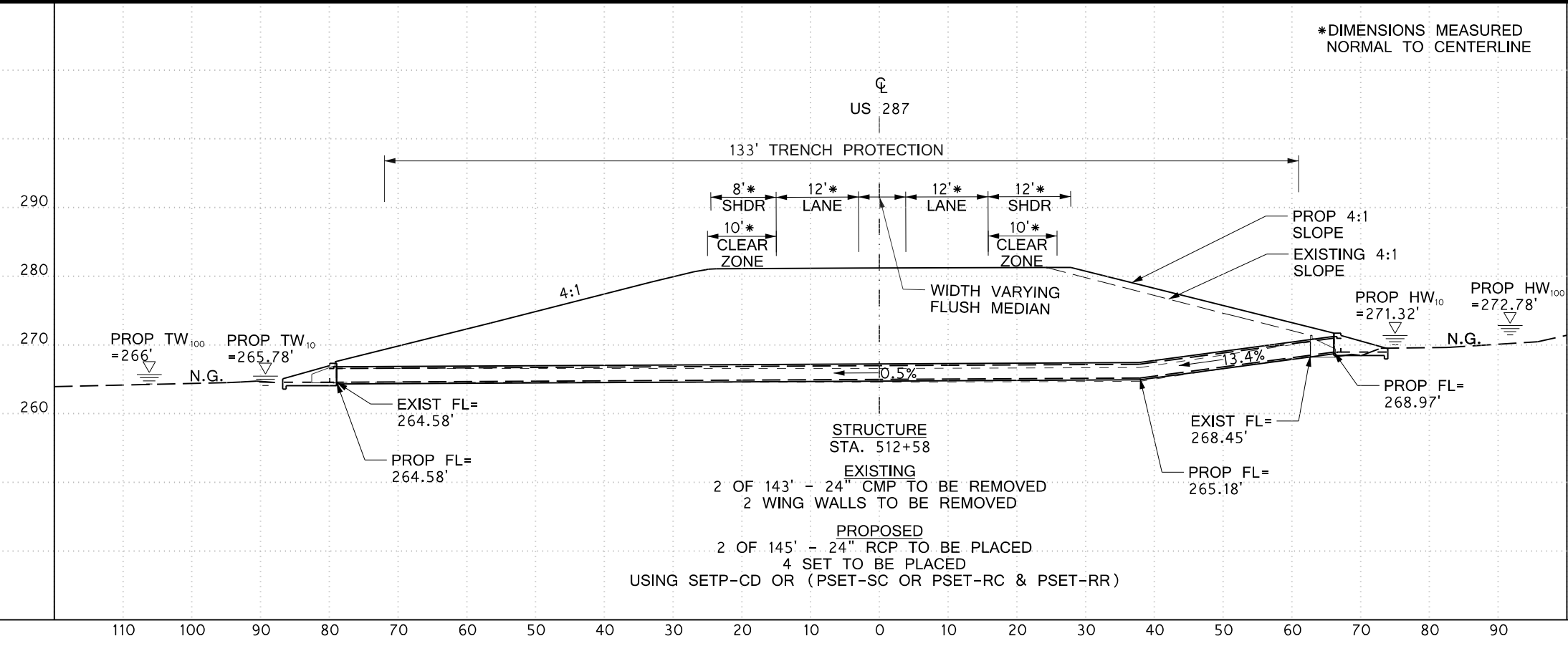


05/30/2022

HORIZONTAL

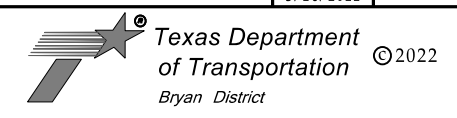


PRINT DATE	REVISION DATE
5/26/2022	



*DIMENSIONS MEASURED
 NORMAL TO CENTERLINE

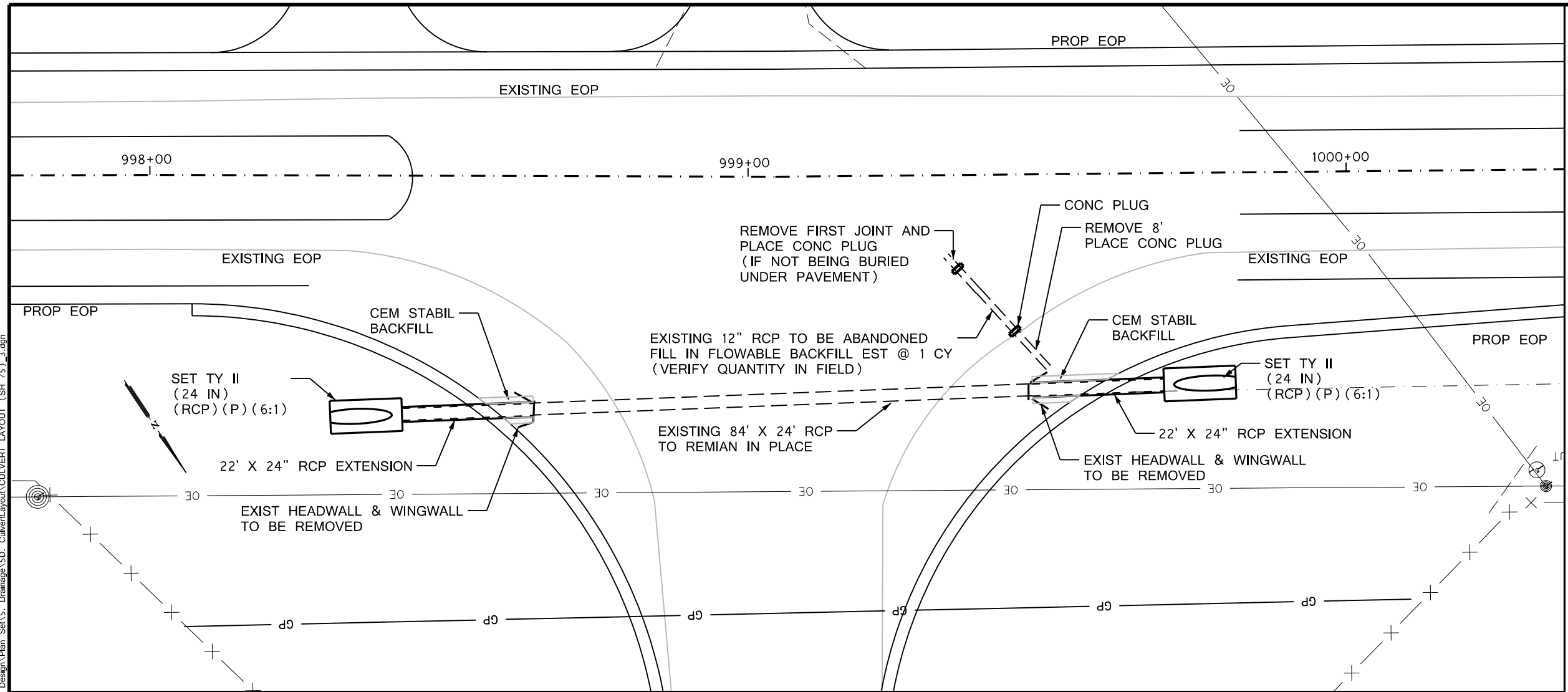
STRUCTURE STA. 512+58
 EXISTING
 2 OF 143' - 24" CMP TO BE REMOVED
 2 WING WALLS TO BE REMOVED
 PROPOSED
 2 OF 145' - 24" RCP TO BE PLACED
 4 SET TO BE PLACED
 USING SETP-CD OR (PSET-SC OR PSET-RC & PSET-RR)



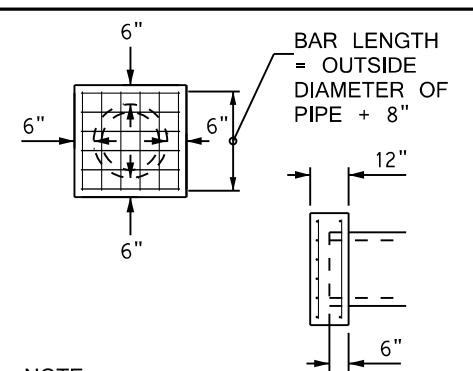
**STRUCTURE LAYOUT
 (US 287)
 (STA 512+58)**

FED. RD. DIV. NO.	PROJECT NUMBER	HIGHWAY NUMBER
6		US 287, ETC.
STATE	DISTRICT	COUNTY
TEXAS	BRYAN	FREESTONE, ETC.
CONTROL	SECTION	JOB SHEET NO.
0122	03	033, ETC. 87

REV DATE: 2-12-2015
 CS: 0122-03-033
 FILENAME: pw:\tdot\projectswisdomline.com\TXDOT4\Documents\17 - BRY\Design Projects\016607067\4 - Design\Plan Set\5. Drainage\SD. CulvertLayout\CULVERT_LAYOUT (SH 75)_3.dgn



GENERAL NOTES:

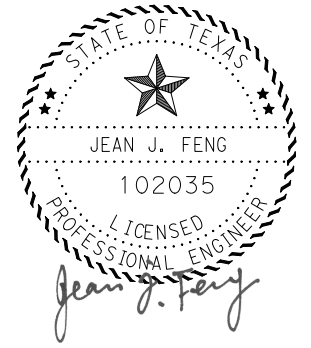


NOTE:
 ALL STEEL BARS ARE #4 SPACED AT 6". ALL CONCRETE SHALL BE CLASS A. STEEL SHALL BE A MINIMUM OF 1 1/2" CLEAR OF PIPE AND 2" CLEAR OF FORMS.

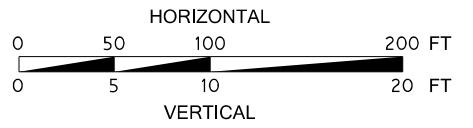
ESTIMATED QUANTITIES PER PLUG*		
PIPE SIZE	CLASS A CONCRETE	REINFORCING STEEL
24"	0.33 CY	32 LBS

*FOR CONTRACTORS INFORMATION ONLY

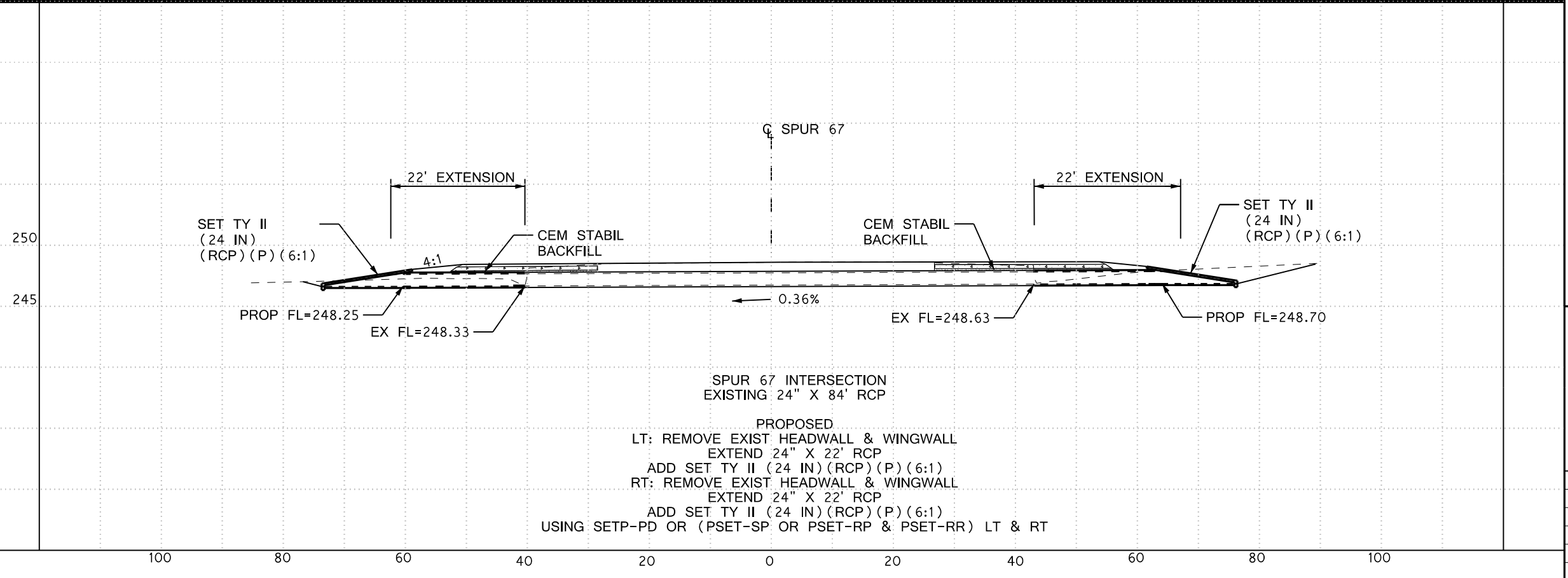
PIPE PLUG DETAIL



05/30/2022



PRINT DATE	REVISION DATE
5/26/2022	



SPUR 67 INTERSECTION
 EXISTING 24" X 84' RCP

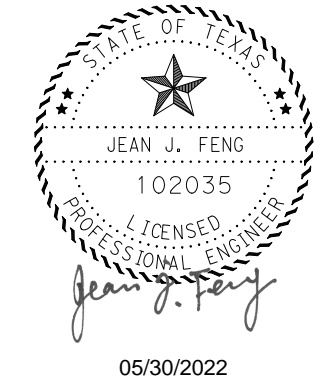
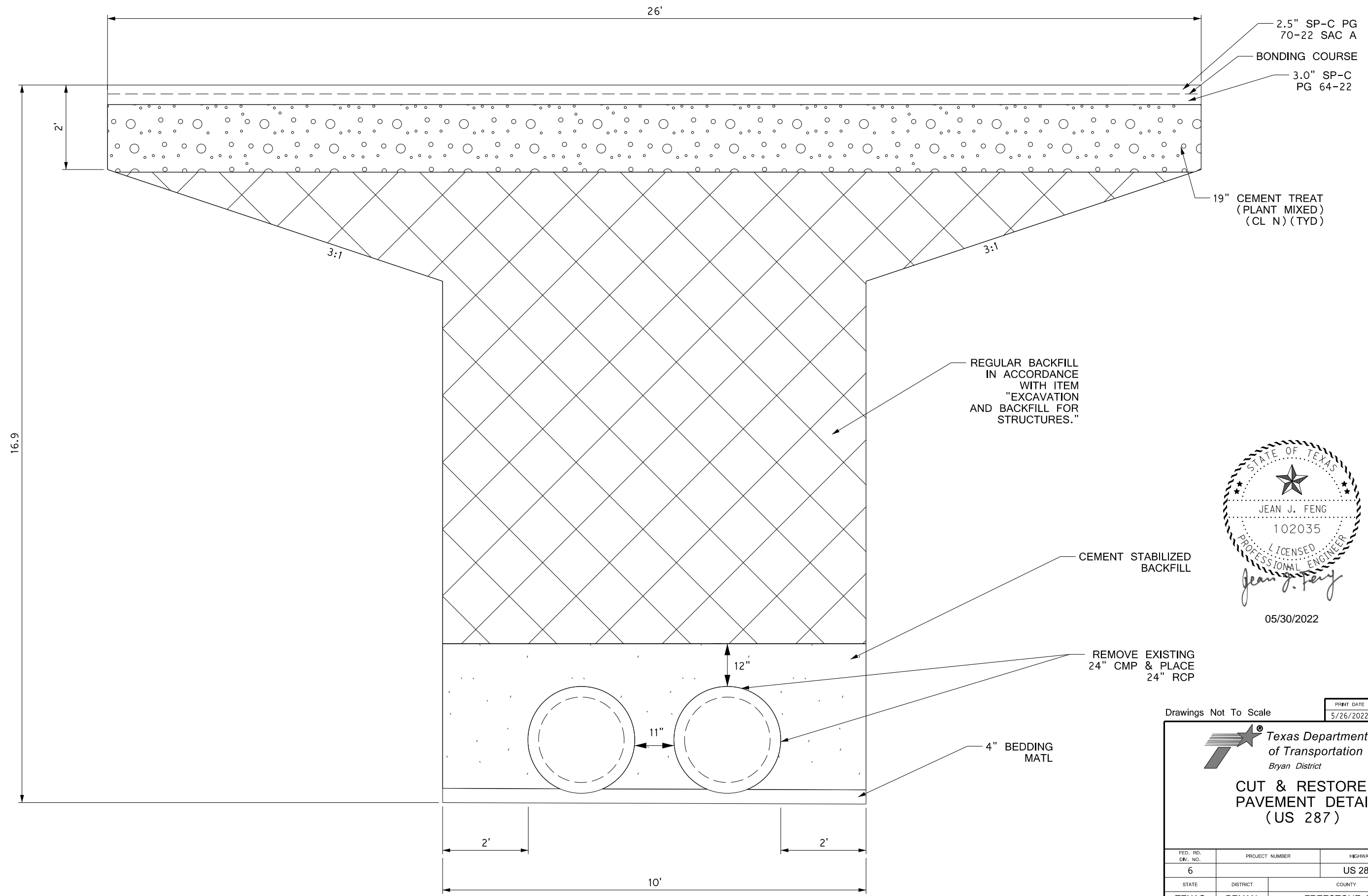
PROPOSED
 LT: REMOVE EXIST HEADWALL & WINGWALL
 EXTEND 24" X 22' RCP
 ADD SET TY II (24 IN)(RCP)(P)(6:1)
 RT: REMOVE EXIST HEADWALL & WINGWALL
 EXTEND 24" X 22' RCP
 ADD SET TY II (24 IN)(RCP)(P)(6:1)
 USING SETP-PD OR (PSET-SP OR PSET-RP & PSET-RR) LT & RT



**STRUCTURE LAYOUT
 (SH 75)
 (SPUR 67 INTERSECTION)
 SHEET 3 OF 3 SHEETS**

FED. RD. DIV. NO.	PROJECT NUMBER	HIGHWAY NUMBER
6		US 287, ETC.
STATE	DISTRICT	COUNTY
TEXAS	BRYAN	FREESTONE, ETC.
CONTROL	SECTION	JOB SHEET NO.
0122	03	033,ETC. 90

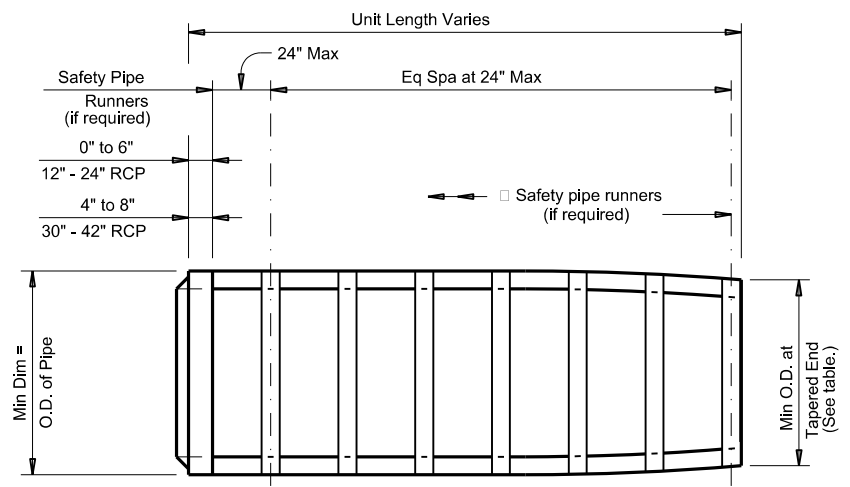
REV DATE: 2-12-2015
 CS: 0122-03-033
 FILENAME: \\txdotprojectsonline.com\TXDOT4\Documents\17 - BRY\Design Projects\012203033\4 - Design Plan Set\5. Drainage\5D. CulvertLayout\Cut and Restore Pavement Detail.dgn



Drawings Not To Scale
 PRINT DATE: 5/26/2022
 REVISION DATE:

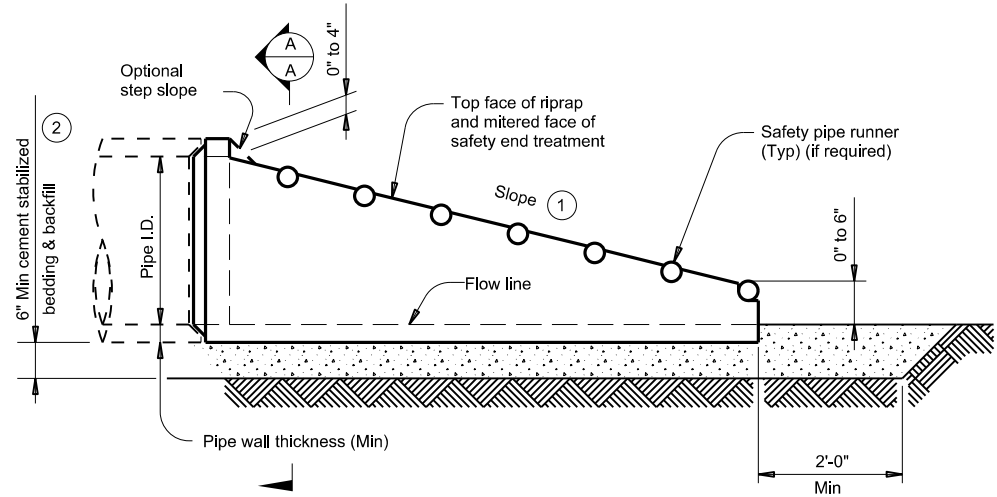
Texas Department of Transportation ©2022 Bryan District		
CUT & RESTORE PAVEMENT DETAIL (US 287)		
FED. RD. DIV. NO. 6	PROJECT NUMBER	HIGHWAY NUMBER US 287, ETC.
STATE TEXAS	DISTRICT BRYAN	COUNTY FREESTONE, ETC.
CONTROL 0122	SECTION 03	JOB 033, ETC.
		SHEET NO. 91

DATE: 5/26/2022 4:38:35 PM
 FILE: \\txdot\project\wiseonline.com\TXDOT14\Documents\17 - BRY\Design\Projects\1703000000\1703000000.dwg
 Project: 1703000000 - Drainage Standards\SET-PP.dgn
 Project: 1703000000 - Drainage Standards\SET-PP.dgn



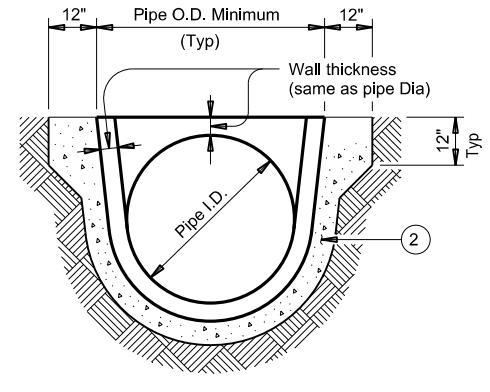
PLAN VIEW - 12" THRU 24"

(Showing spigot end connection.)

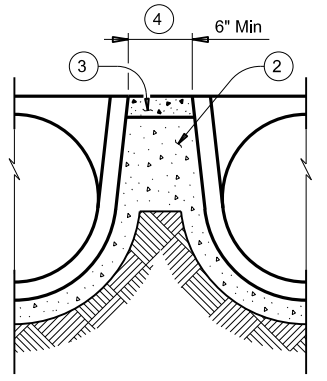


LONGITUDINAL ELEVATION - 12" THRU 24"

(Showing spigot end connection.)

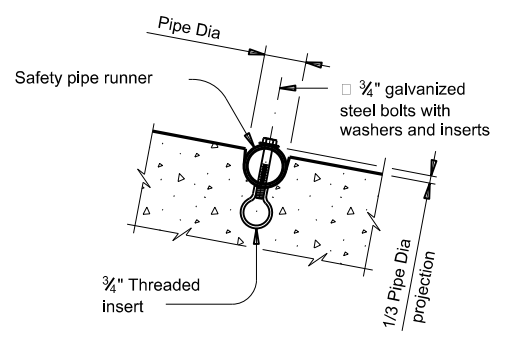


SECTION A-A



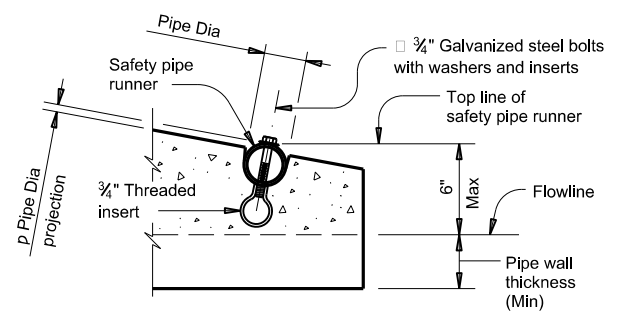
MULTIPLE PIPE INSTALLATION

- ① Slope as shown elsewhere in the plans. Slope of 6:1 or flatter is required for vehicle safety.
- ② Provide cement stabilized bedding and backfill in accordance with the Item, "Excavation and Backfill for Structures". Bedding and backfill is considered subsidiary to the Item 467, "Safety End Treatment". When concrete riprap is specified around the safety end treatment, backfill as directed by Engineer.
- ③ Fill the top 4" of void between precast end treatments with concrete riprap. Concrete riprap is considered subsidiary to the Item 467, "Safety End Treatment".
- ④ Adjust clear distance between pipes to provide for the minimum distance between safety end treatments.
- ⑤ Safety pipe runners are required for multiple pipe culverts with more than two pipes.

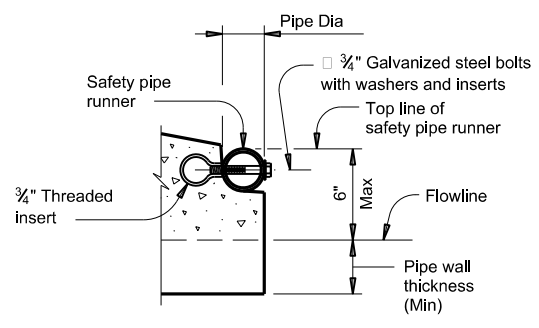


INSTALLATION DETAIL FOR SAFETY PIPE RUNNERS

(If required)



OPTION A



OPTION B

END DETAILS FOR INSTALLATION OF SAFETY PIPE RUNNERS

(If required)

REQUIREMENTS FOR CULVERT PIPES AND SAFETY PIPE RUNNERS

Pipe I.D.	Min Wall Thickness	Min O.D.	Min O.D. at Tapered End	Min Reinf Requirements (sq. in. per ft. of Pipe)	Max Slope	Min Length of Unit	Pipe Runner Requirements		Required Pipe Runner Sizes		
							Single Pipe	Multiple Pipe	Nominal Dia	O.D.	I.D.
12"	2"	16"	16"	0.07 Circ.	6:1	4' - 0"	No	⑤	3" STD	3.500"	3.068"
15"	2 1/4"	19 1/2"	19"	0.07 Circ.	6:1	5' - 8"	No	⑤	3" STD	3.500"	3.068"
18"	2 1/2"	23"	21 1/2"	0.07 Circ.	6:1	7' - 3"	No	⑤	3" STD	3.500"	3.068"
24"	3"	30"	27"	0.07 Circ.	6:1	10' - 6"	No	⑤	3" STD	3.500"	3.068"
30"	3 1/2"	37"	31"	0.18 Circ.	6:1	12' - 1"	No	Yes	4" STD	4.500"	4.026"
36"	4"	44"	36"	0.19 Ellip.	6:1	15' - 4"	Yes	Yes	4" STD	4.500"	4.026"
42"	4 1/2"	51"	41 1/2"	0.23 Ellip.	6:1	18' - 7"	Yes	Yes	4" STD	4.500"	4.026"

MATERIAL NOTES:

Synthetic fibers listed on the "Fibers for Concrete" Material Producer List (MPL) may be used in lieu of steel reinforcing in riprap concrete unless noted otherwise.
 Provide pipe runners meeting the requirements of ASTM A53 (Type E or S, Gr B), ASTM A500 Gr B, or API 5LX52.
 Galvanize steel components except reinforcing steel after fabrication. Repair galvanizing damaged during transport or construction in accordance with the specifications.

GENERAL NOTES:

Precast safety end treatment for reinforced concrete pipe (RCP) may be used for TYPE II end treatment as specified in Item 467, "Safety End Treatment".
 When precast safety end treatment is used as a Contractor's alternate to mitered RCP, riprap will not be required unless noted otherwise on the plans.
 Manufacture precast concrete end sections in accordance with Item 464, "Reinforced Concrete Pipe" and in accordance with ASTM Specification C-76, Class III, Wall B for circular pipe.
 Provide precast concrete end sections with a spigot or bell end for compatibility to upstream or downstream end conditions with sufficient annular space to allow for grout, mortar, cold applied asphalt joint compound or pre-formed plastic gasket material.
 Methods of lifting shall be provided by the manufacturer for ease of loading, unloading and installation.
 Pipe runners are designed for a traversing load of 10,000 Lbs at yield as recommended by Research Report 280-2F, "Safety Treatment of Roadside Parallel-Drainage Structures", Texas Transportation Institute, March 1981.

Texas Department of Transportation
Bridge Division Standard

PRECAST SAFETY END TREATMENT
 TYPE II ~ PARALLEL DRAINAGE

PSET-RP

FILE: psetrps-20.dgn	DN: RLW	CK: KLR	DW: JTR	CK: GAF
©TXDOT February 2020	CONT: 0122	SECT: 03	JOB: 033,ETC.	HIGHWAY: US 287, ETC.
REVISIONS	DIST: BRY	COUNTY: FREESTONE, ETC.	SHEET NO. 94	

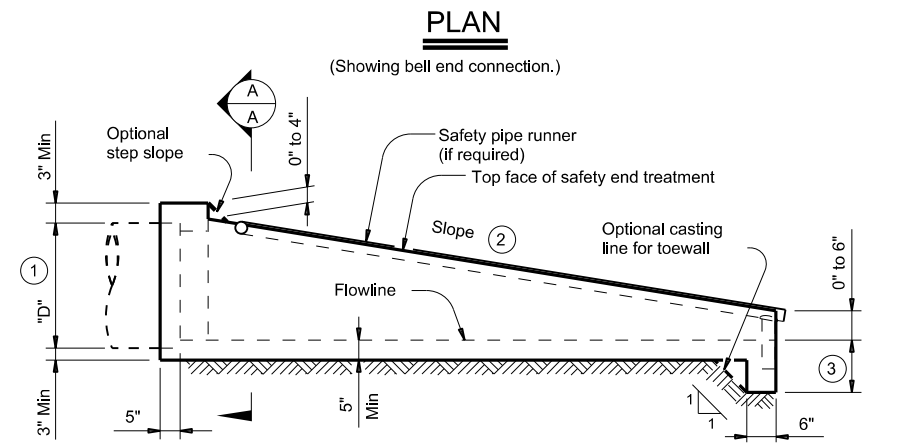
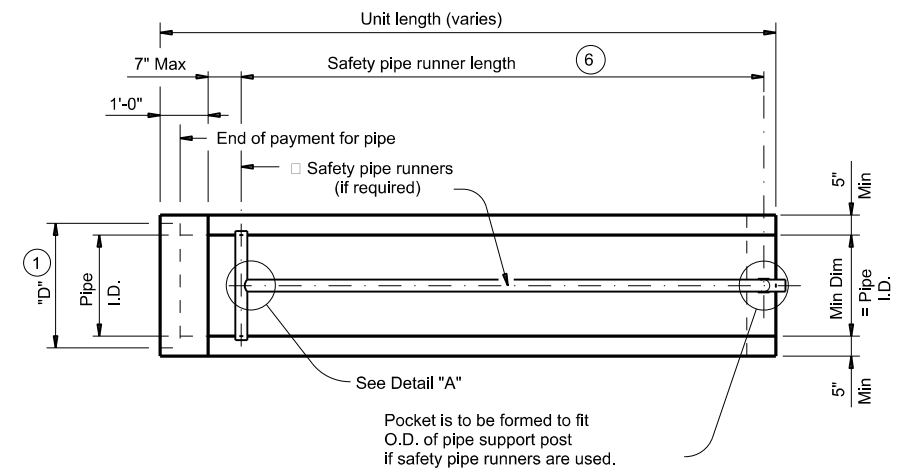
DATE: 5/26/2022 4:38:46 PM
 FILE: \\txdot\project\w\seon\line.com\TXDOT14\Documents\17 - BRY\Design\Project\w\seon\line.com\TXDOT14\Documents\PSET-SC.dgn
 DISCLAIMER: The use of this standard is governed by the "Texas Engineering Practice Act". No warranty of any kind is made by TxDOT for any purpose whatsoever. TxDOT assumes no responsibility for the conversion of units or for the accuracy of the information provided herein.

REQUIREMENTS FOR CULVERT PIPES AND SAFETY PIPE RUNNERS

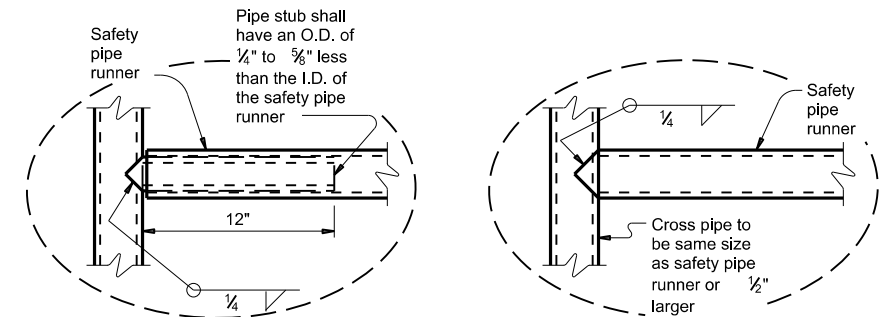
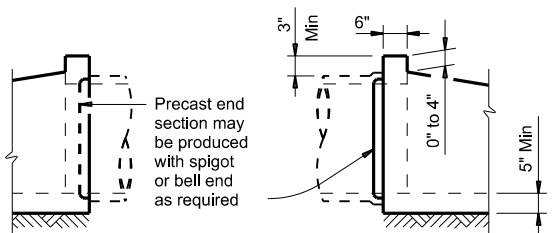
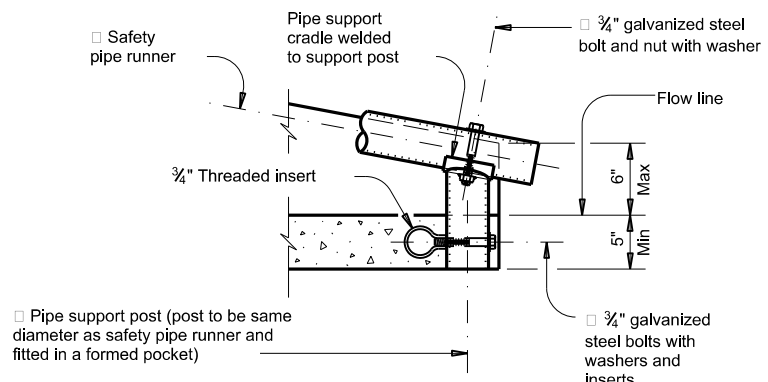
Pipe I.D.	RCP Wall "B" Thickness	TP Wall Thickness (8)	"D" (1)	Slope	Min Length of Unit	Single Pipe		Multiple Pipes	
						Skew	Pipe Runners Required	Skew	Pipe Runners Required
12"	2"	1.15"	17.00"	3:1	2' - 11"	≤ 45°	No	≤ 45°	No
				4:1	3' - 6"				
				6:1	4' - 9"				
15"	2 1/4"	1.30"	20.50"	3:1	3' - 8"	≤ 45°	No	≤ 45°	No
				4:1	4' - 7"				
				6:1	6' - 5"				
18"	2 1/2"	1.60"	24.00"	3:1	4' - 6"	≤ 45°	No	≤ 45°	No
				4:1	5' - 8"				
				6:1	8' - 0"				
24"	3"	1.95"	31.00"	3:1	6' - 2"	≤ 45°	No	= 30°	No
				4:1	7' - 10"				
				6:1	11' - 3"				
30"	3 1/2"	2.65"	38.50"	3:1	7' - 10"	= 15°	No	= 15°	No
				4:1	10' - 1"				
				6:1	14' - 8"				
36"	4"	2.75"	45.50"	3:1	9' - 5"	= 0°	No	≥ 0°	Yes
				4:1	12' - 3"				
				6:1	17' - 11"				
42"	4 1/2"	N/A	52.50"	3:1	11' - 1"	≥ 0°	Yes	≥ 0°	Yes
				4:1	14' - 5"				
				6:1	21' - 2"				

SAFETY PIPE RUNNER DIMENSIONS

Max Safety Pipe Runner Length	Required Pipe Runner Size		
	Pipe Size	Pipe O.D.	Pipe I.D.
11' - 2"	3" STD	3.500"	3.068"
15' - 6"	3 1/2" STD	4.000"	3.548"
20' - 10"	4" STD	4.500"	4.026"
35' - 4"	5" STD	5.563"	5.047"



- 1 Dimension "D" is based on reinforced concrete pipe (RCP) meeting the requirements of ASTM C-76, Class III, (RCP Wall "B" thickness). Adjust "D" for any other wall thickness used. For thermoplastic pipe (TP) take into account the annular space requirements for grouted connections.
- 2 Slope as shown elsewhere in plans. Slope of 3:1 or flatter is required for vehicle safety.
- 3 Toewall to be used only when dimension is shown elsewhere in the plans.
- 4 Fill the top 4" of void between precast end treatments with concrete riprap. Concrete riprap is considered subsidiary to the Item 467, "Safety End Treatment".
- 5 Adjust clear distance between pipes to provide for the minimum distance between safety end treatments.
- 6 Measured along slope.
- 7 Provide cement stabilized bedding and backfill in accordance with the Item 400, "Excavation and Backfill for Structures". Bedding and backfill is considered subsidiary to the Item 467, "Safety End Treatment". When concrete riprap is specified around the safety end treatment, backfill as directed by Engineer.
- 8 Thermoplastic pipe wall thickness may vary. Adjust accordingly. Thermoplastic pipe requires the safety end treatments to have a bell end for grouted connections.



GENERAL NOTES:

Precast safety end treatment for reinforced concrete pipe (RCP), and thermoplastic pipe (TP) may be used for TYPE II end treatment as specified in Item "Safety End Treatment".

When precast safety end treatment is used as a Contractor's alternate to mitered RCP, riprap will not be required unless noted otherwise on the plans.

Synthetic fibers listed on the "Fibers for Concrete" Material Producer List (MPL) may be used in lieu of steel reinforcing in riprap concrete unless noted otherwise.

Manufacture this product in accordance with Item 467, "Safety End Treatment" except as noted below:

A. Provide minimum reinforcing of #4 at 6" (Grade 40) or #4 at 9" (Grade 60) each way or 6"x6" - D12 x D12 or 5"x5" - D10 x D10 welded wire reinforcement (WWR).

B. For precast (steel formed) sections, provide Class "C" concrete (f_c = 3,600 psi).

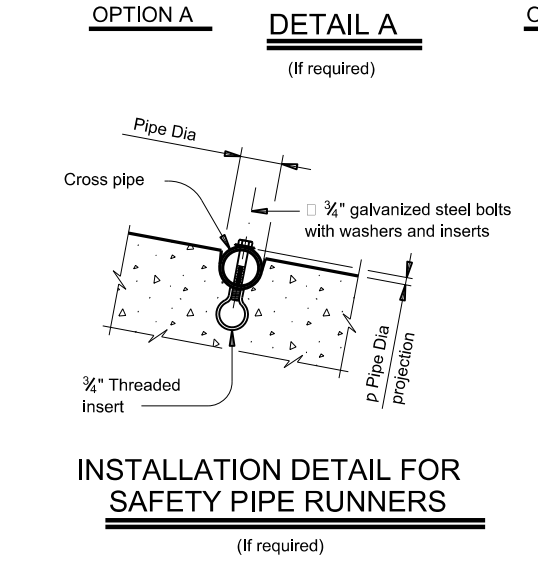
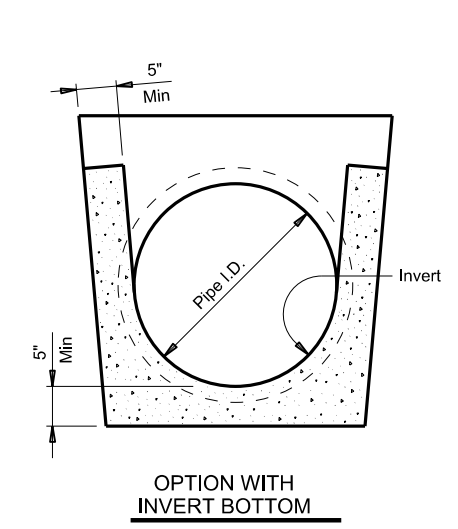
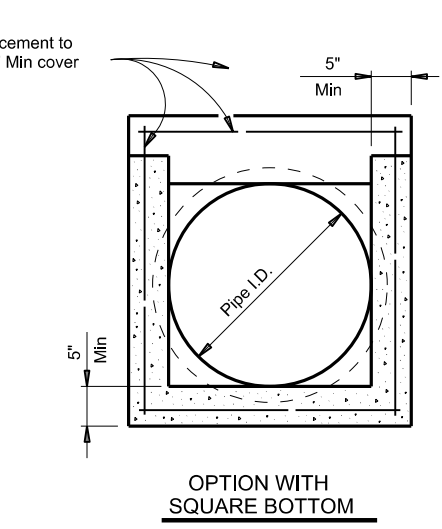
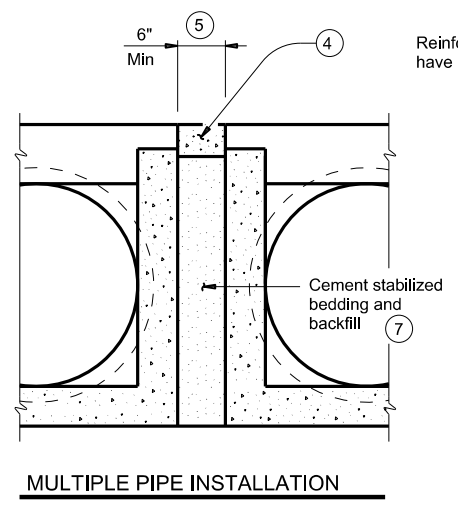
At the option and expense of the Contractor, the next larger size of safety end treatment may be furnished as long as the "D" dimension cast is that of the required size of pipe.

Pipe runners are designed for a traversing load of 1,800 Lbs at yield as recommended by Research Report 280-1, "Safety Treatment of Roadside Cross-Drainage Structures", Texas Transportation Institute, March 1981.

Provide safety pipe runners, cross pipes, pipe support posts, and pipe stubs meeting the requirements of ASTM A53 (Type E or S, Grade B), ASTM A500 (Grade B), or API 5LX52.

Galvanize all steel components except reinforcing steel after fabrication. Repair galvanizing damaged during transport or construction in accordance with the specifications.

Connect RCP using the Optional Joint for RCP detail shown or in accordance with Item 464 "Reinforced Concrete Pipe". Connect TP by grouting. See PBGC standard for grouted connections with TP and precast safety end treatment.



Bridge Division Standard

Texas Department of Transportation

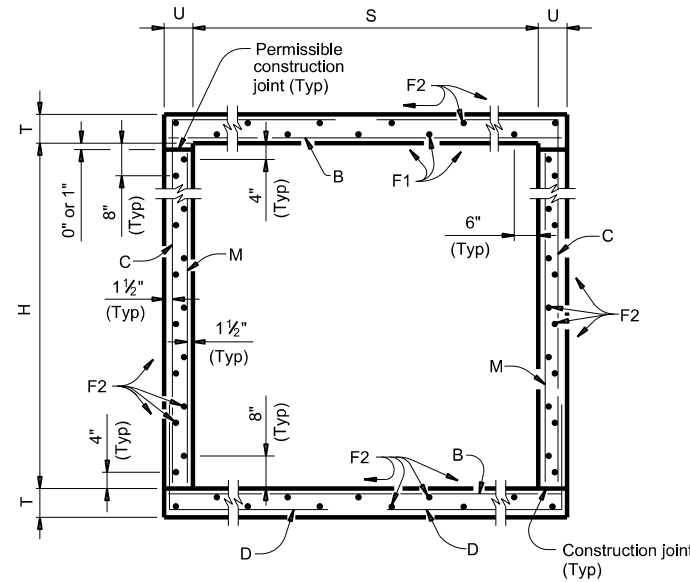
PRECAST SAFETY END TREATMENT

TYPE II ~ CROSS DRAINAGE

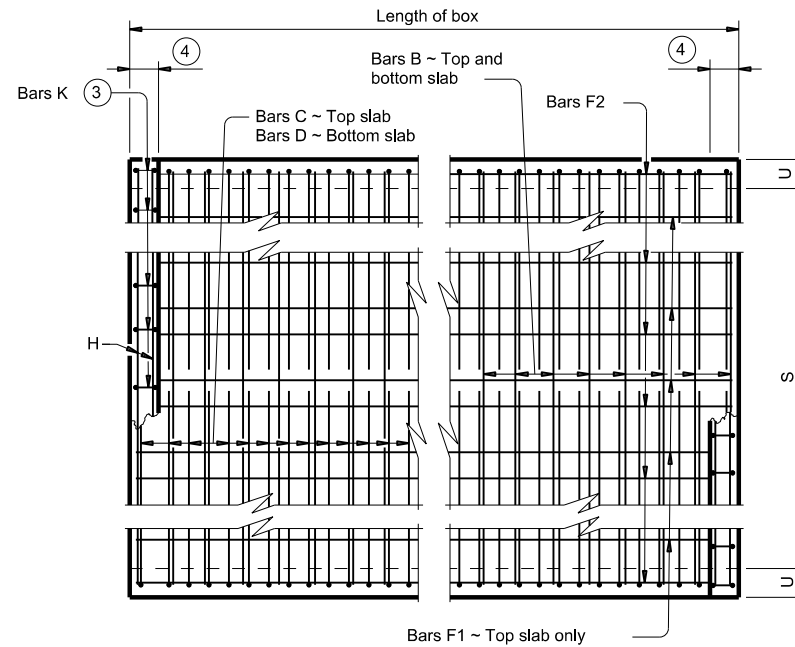
PSET-SC

FILE: psetscs-20.dgn	DN: RLW	CK: KLR	DW: JTR	CK: GAF
©TxDOT February 2020	CONT	SECT	JOB	HIGHWAY
REVISIONS	0122	03	033,ETC.	US 287, ETC.
	DIST	COUNTY	SHEET NO.	
	BRY	FREESTONE, ETC.	96	

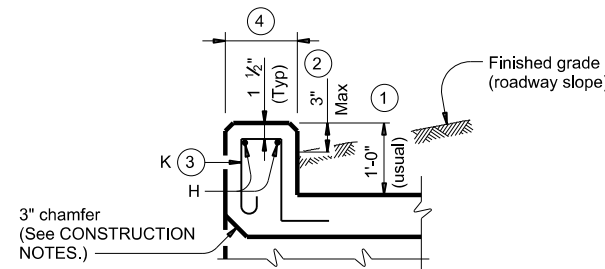
DATE: 5/26/2022 4:39:02 PM
 FILE: \\txdot.projectwiseonline.com:TXDOT14\Documents\17 - BRY\Design Project\wiseonline\17 - DrainageStandards\scc34ste-21.dgn
 DISCLAIMER: The use of this standard is governed by the "Texas Engineering Practice Act". No warranty of any kind is made by TxDOT for any purpose whatsoever. TxDOT assumes no responsibility for the conversion of units or for the accuracy of the information provided.



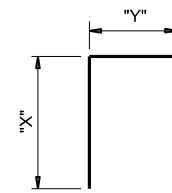
TYPICAL SECTION



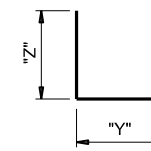
PLAN OF REINF STEEL



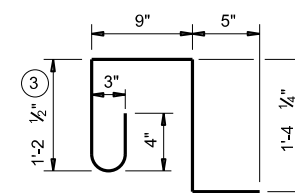
SECTION THRU CURB



BARS C



BARS D



BARS K (#4)
(Spa = 1'-0" Max)
(Length = 4'-2")

- ① 0" Min to 5'-0" Max. Estimated curb heights are shown elsewhere in the plans. For structures with pedestrian rail or curbs taller than 1'-0", refer to the Extended Curb Details (ECD) standard sheet. For structures with T631 or T631LS bridge rail, refer to the Mounting Details for T631 & T631LS Rails (T631-CM) standard sheet. Refer to the Rail Anchorage Curb (RAC) standard sheet for structures with bridge rail other than T631 or T631LS.
- ② For vehicle safety, the following requirements must be met:
 - For structures without bridge rail, construct curbs no more than 3" above finished grade.
 - For structures with bridge rail, construct curbs flush with finished grade.
 Reduce curb heights, if necessary, to meet the above requirements. No changes will be made in quantities and no additional compensation will be allowed for this work.
- ③ For curbs less than 1'-0" high, tilt Bars K or reduce bar height as necessary to maintain cover. For curbs less than 3" high, Bars K may be omitted.
- ④ 1'-0" typical. 2'-3" when the Rail Anchorage Curb (RAC) standard sheet is referred to elsewhere in the plans.

The Contractor may replace Bars B, C, D, E, F1, F2, M, Y, and/or Z with deformed welded wire reinforcement (WWR) meeting the requirements of ASTM A1064. The area of required reinforcement may be reduced by the ratio of 60 ksi / 70 ksi. Spacing of WWR is limited to 4" Min and 18" Max. When required, provide lap splices in the WWR of the same length required for the equivalent bar size, rounded up for wire sizes between conventional bar sizes. The lap length required for WWR is never less than the lap length required for uncoated #4 bars.

Example conversion: Replacing No. 6 Gr 60 at 6" Spacing with WWR.
 Required WWR = (0.44 sq. in. per 0.5 ft.) x (60 ksi / 70 ksi) = 0.755 sq. in. per ft.
 If D30.6 wire is used to meet the 0.755 sq. in. per ft. requirement in this example, the required spacing = (0.306 sq. in.) / (0.755 sq. in. per ft.) x (12 in. per ft.) = 4.86" Max spacing. Required lap length for the provided D30.6 wire is 2'-1" (the same minimum lap length required for uncoated #5 bars, as listed under MATERIAL NOTES).

CONSTRUCTION NOTES:

- Do not use permanent forms.
- Chamfer the bottom edge of the top slab 3" at the entrance.
- Optionally, raise construction joints shown at the flow line by a maximum of 6". If this option is taken, Bars M may be cut off or raised, Bars C and D may be reversed.

MATERIAL NOTES:

- Provide Grade 60 reinforcing steel.
- Provide galvanized reinforcing steel if required elsewhere in the plans.
- Provide Class C concrete (f_c = 3,600 psi) for culvert barrel and curb, with the following exceptions: provide Class S concrete (f_c = 4,000 psi) for top slabs of:
 - culverts with overlay,
 - culverts with 1-to-2 course surface treatment, or
 - culverts with the top slab as the final riding surface.
- Provide bar laps, where required, as follows:
 - Uncoated or galvanized ~ #4 = 1'-8" Min
 - Uncoated or galvanized ~ #5 = 2'-1" Min

GENERAL NOTES:

- Designed according to AASHTO LRFD Bridge Design Specifications for the range of fill heights shown.
- See the Single Box Culverts Cast-In-Place Miscellaneous Detail (SCC-MD) standard sheet for details pertaining to skewed ends, angle sections, and lengthening.

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

HL93 LOADING

SHEET 1 OF 2

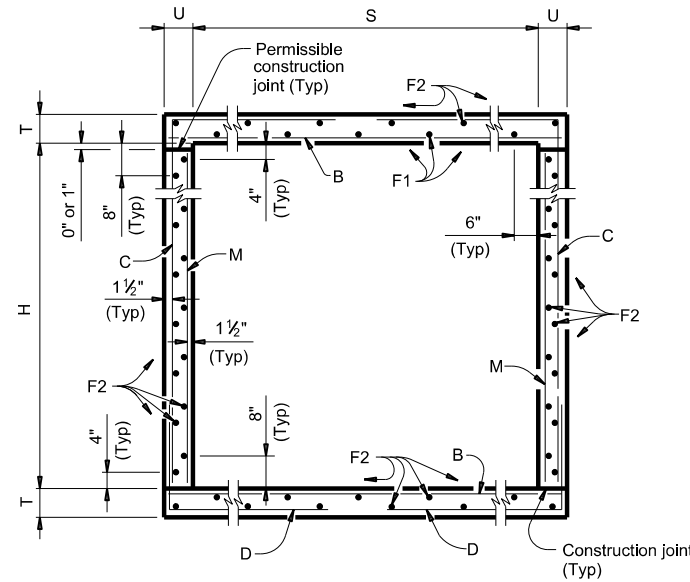


**SINGLE BOX CULVERTS
 CAST-IN-PLACE
 0' TO 30' FILL**

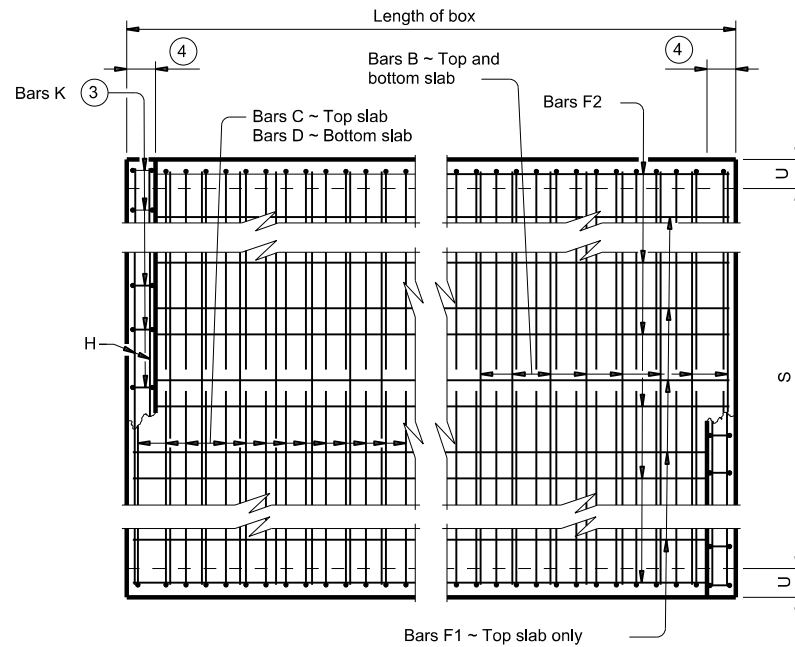
SCC-3 & 4

FILE: scc34ste-21.dgn	DN: TBE	CK: BMP	DW: TXDOT	CK: TXDOT
©TxDOT February 2020	CONT	SECT	JOB	HIGHWAY
REVISIONS	0122	03	033, ETC	US 287, ETC
04/2021 Updated X values.	DIST	COUNTY	SHEET NO.	
BRY	FREESTONE, ETC	99		

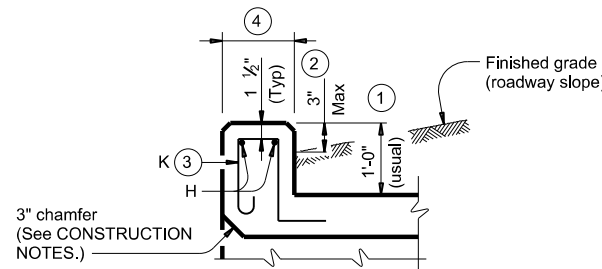
DATE: 5/26/2022 4:39:09 PM
 FILE: \\txdot.projectwiseonline.com:TXDOT14\Documents\17 - BRY\Design\Projects\1705050505\SCC-5 & 6.dgn
 PROJECT: 1705050505 - BRY\Design\Projects\1705050505\SCC-5 & 6.dgn
 DRAWING: SCC-5 & 6.dgn
 TITLE: SINGLE BOX CULVERTS CAST-IN-PLACE
 DISCLAIMER: The use of this standard is governed by the "Texas Engineering Practice Act". No warranty of any kind is made by TxDOT for any purpose whatsoever. TxDOT assumes no responsibility for the conversion of units.



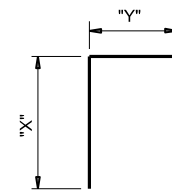
TYPICAL SECTION



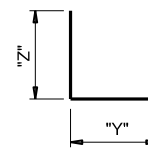
PLAN OF REINF STEEL



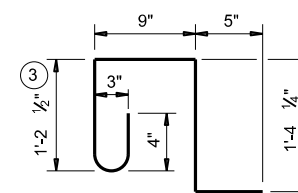
SECTION THRU CURB



BARS C



BARS D



BARS K (#4)
(Spa = 1'-0" Max)
(Length = 4'-2")

- ① 0" Min to 5'-0" Max. Estimated curb heights are shown elsewhere in the plans. For structures with pedestrian rail or curbs taller than 1'-0", refer to the Extended Curb Details (ECD) standard sheet. For structures with T631 or T631LS bridge rail, refer to the Mounting Details for T631 & T631LS Rails (T631-CM) standard sheet. Refer to the Rail Anchorage Curb (RAC) standard sheet for structures with bridge rail other than T631 or T631LS.
- ② For vehicle safety, the following requirements must be met:
 - For structures without bridge rail, construct curbs no more than 3" above finished grade.
 - For structures with bridge rail, construct curbs flush with finished grade. Reduce curb heights, if necessary, to meet the above requirements. No changes will be made in quantities and no additional compensation will be allowed for this work.
- ③ For curbs less than 1'-0" high, tilt Bars K or reduce bar height as necessary to maintain cover. For curbs less than 3" high, Bars K may be omitted.
- ④ 1'-0" typical. 2'-3" when the Rail Anchorage Curb (RAC) standard sheet is referred to elsewhere in the plans.

The Contractor may replace Bars B, C, D, E, F1, F2, M, Y, and/or Z with deformed welded wire reinforcement (WWR) meeting the requirements of ASTM A1064. The area of required reinforcement may be reduced by the ratio of 60 ksi / 70 ksi. Spacing of WWR is limited to 4" Min and 18" Max. When required, provide lap splices in the WWR of the same length required for the equivalent bar size, rounded up for wire sizes between conventional bar sizes. The lap length required for WWR is never less than the lap length required for uncoated #4 bars.

Example conversion: Replacing No. 6 Gr 60 at 6" Spacing with WWR.
 Required WWR = (0.44 sq. in. per 0.5 ft.) x (60 ksi / 70 ksi) = 0.755 sq. in. per ft.
 If D30.6 wire is used to meet the 0.755 sq. in. per ft. requirement in this example, the required spacing = (0.306 sq. in.) / (0.755 sq. in. per ft.) x (12 in. per ft.) = 4.86" Max spacing. Required lap length for the provided D30.6 wire is 2'-1" (the same minimum lap length required for uncoated #5 bars, as listed under MATERIAL NOTES).

CONSTRUCTION NOTES:

- Do not use permanent forms.
- Chamfer the bottom edge of the top slab 3" at the entrance.
- Optionally, raise construction joints shown at the flow line by a maximum of 6". If this option is taken, Bars M may be cut off or raised, Bars C and D may be reversed.

MATERIAL NOTES:

- Provide Grade 60 reinforcing steel.
- Provide galvanized reinforcing steel if required elsewhere in the plans.
- Provide Class C concrete (f'c = 3,600 psi) for culvert barrel and curb, with the following exceptions: provide Class S concrete (f'c = 4,000 psi) for top slabs of:
 - culverts with overlay,
 - culverts with 1-to-2 course surface treatment, or
 - culverts with the top slab as the final riding surface.
- Provide bar laps, where required, as follows:
 - Uncoated or galvanized ~ #4 = 1'-8" Min
 - Uncoated or galvanized ~ #5 = 2'-1" Min
 - Uncoated or galvanized ~ #6 = 2'-6" Min

GENERAL NOTES:

- Designed according to AASHTO LRFD Bridge Design Specifications for the range of fill heights shown.
- See the Single Box Culverts Cast-In-Place Miscellaneous Detail (SCC-MD) standard sheet for details pertaining to skewed ends, angle sections, and lengthening.

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

HL93 LOADING

SHEET 1 OF 2

		Bridge Division Standard	
SINGLE BOX CULVERTS CAST-IN-PLACE 0' TO 30' FILL			
SCC-5 & 6			
FILE: scc56ste-21.dgn	DN: TBE	CK: BMP	DW: TxDOT
©TxDOT February 2020	CONT	SECT	JOB
REVISIONS	0122	03	033, ETC
04/2021 Updated X values.	DIST	COUNTY	SHEET NO.
BRY	FREESTONE, ETC		101

DISCLAIMER: The use of this standard is governed by the "Texas Engineering Practice Act". No warranty of any kind is made by TxDOT for any purpose whatsoever. TxDOT assumes no responsibility for the conversion of units or for the accuracy of the information presented herein. **Drainage Standards - scc56ste-21.dgn**
 DATE: 5/26/2022 4:39:10 PM
 FILE: \\txdot\project\wison\line.com:TXDOT14\Documents\17 - BRY\Design Project\170303\170303.dgn

SECTION DIMENSIONS				FILL HEIGHT	BILLS OF REINFORCING STEEL (For Box Length = 40 feet)																								QUANTITIES														
					Bars B						Bars C						Bars D						Bars M ~ #4				Bars F1 ~ #4 at 18" Spa				Bars F2 ~ #4 at 18" Spa		Bars H 4 ~ #4		Bars K		Per Foot of Barrel		Curb		Total		
					S	H	T	U	No.	Size	Spa	Length	Weight	No.	Size	Spa	Length	Weight	" X "	" Y "	No.	Size	Spa	Length	Weight	" Y "	" Z "	No.	Spa	Length	Weight	No.	Length	Wt	No.	Length	Weight	Length	Wt	No.	Wt	Conc (CY)	Reinf (Lb)
5' - 0"	2' - 0"	8"	7"	26'	108	#6	9"	5' - 11"	960	108	#5	9"	6' - 3"	704	2' - 6"	3' - 9"	108	#5	9"	6' - 5"	723	3' - 9"	2' - 8"	108	9"	2' - 0"	144	4	39' - 9"	106	22	39' - 9"	584	5' - 11"	16	14	39	0.391	80.5	0.5	55	16.1	3,276
5' - 0"	2' - 0"	9"	7"	30'	108	#6	9"	5' - 11"	960	108	#5	9"	6' - 4"	713	2' - 7"	3' - 9"	108	#5	9"	6' - 6"	732	3' - 9"	2' - 9"	108	9"	2' - 0"	144	4	39' - 9"	106	22	39' - 9"	584	5' - 11"	16	14	39	0.429	81.0	0.5	55	17.6	3,294
5' - 0"	3' - 0"	8"	7"	26'	108	#6	9"	5' - 11"	960	108	#5	9"	7' - 3"	817	3' - 6"	3' - 9"	108	#5	9"	6' - 5"	723	3' - 9"	2' - 8"	108	9"	3' - 0"	216	4	39' - 9"	106	26	39' - 9"	690	5' - 11"	16	14	39	0.434	87.8	0.5	55	17.8	3,567
5' - 0"	3' - 0"	9"	7"	30'	108	#6	9"	5' - 11"	960	108	#5	9"	7' - 4"	826	3' - 7"	3' - 9"	108	#5	9"	6' - 6"	732	3' - 9"	2' - 9"	108	9"	3' - 0"	216	4	39' - 9"	106	26	39' - 9"	690	5' - 11"	16	14	39	0.472	88.3	0.5	55	19.3	3,585
5' - 0"	4' - 0"	8"	7"	26'	108	#6	9"	5' - 11"	960	108	#5	9"	8' - 3"	929	4' - 6"	3' - 9"	108	#5	9"	6' - 5"	723	3' - 9"	2' - 8"	108	9"	4' - 0"	289	4	39' - 9"	106	26	39' - 9"	690	5' - 11"	16	14	39	0.477	92.4	0.5	55	19.5	3,752
5' - 0"	4' - 0"	9"	7"	30'	108	#6	9"	5' - 11"	960	108	#5	9"	8' - 4"	939	4' - 7"	3' - 9"	108	#5	9"	6' - 5"	732	3' - 9"	2' - 9"	108	9"	4' - 0"	289	4	39' - 9"	106	26	39' - 9"	690	5' - 11"	16	14	39	0.515	92.9	0.5	55	21.1	3,771
5' - 0"	5' - 0"	8"	7"	26'	108	#6	9"	5' - 11"	960	108	#5	9"	9' - 3"	1,042	5' - 6"	3' - 9"	108	#5	9"	6' - 5"	723	3' - 9"	2' - 8"	108	9"	5' - 0"	361	4	39' - 9"	106	30	39' - 9"	797	5' - 11"	16	14	39	0.521	99.7	0.5	55	21.3	4,044
5' - 0"	5' - 0"	9"	7"	30'	108	#6	9"	5' - 11"	960	108	#5	9"	9' - 4"	1,051	5' - 7"	3' - 9"	108	#5	9"	6' - 6"	732	3' - 9"	2' - 9"	108	9"	5' - 0"	361	4	39' - 9"	106	30	39' - 9"	797	5' - 11"	16	14	39	0.559	100.2	0.5	55	22.8	4,062
6' - 0"	2' - 0"	8"	7"	20'	108	#6	9"	6' - 11"	1,122	108	#5	9"	6' - 7"	742	2' - 6"	4' - 1"	108	#5	9"	6' - 9"	760	4' - 1"	2' - 8"	108	9"	2' - 0"	144	5	39' - 9"	133	25	39' - 9"	664	6' - 11"	18	16	45	0.440	89.1	0.5	63	18.1	3,628
6' - 0"	2' - 0"	9"	7"	26'	108	#6	9"	6' - 11"	1,122	162	#5	6"	6' - 8"	1,126	2' - 7"	4' - 1"	162	#5	6"	6' - 10"	1,155	4' - 1"	2' - 9"	108	9"	2' - 0"	144	5	39' - 9"	133	25	39' - 9"	664	6' - 11"	18	16	45	0.485	108.6	0.5	63	19.9	4,407
6' - 0"	2' - 0"	10"	8"	30'	108	#6	9"	7' - 1"	1,149	162	#5	6"	6' - 10"	1,155	2' - 8"	4' - 2"	162	#5	6"	7' - 0"	1,183	4' - 2"	2' - 10"	82	12"	2' - 0"	110	5	39' - 9"	133	25	39' - 9"	664	7' - 1"	19	18	50	0.551	109.9	0.5	69	22.6	4,463
6' - 0"	3' - 0"	8"	7"	20'	108	#6	9"	6' - 11"	1,122	108	#5	9"	7' - 7"	854	3' - 6"	4' - 1"	108	#5	9"	6' - 9"	760	4' - 1"	2' - 8"	108	9"	3' - 0"	216	5	39' - 9"	133	29	39' - 9"	770	6' - 11"	18	16	45	0.484	96.4	0.5	63	19.9	3,918
6' - 0"	3' - 0"	9"	7"	26'	108	#6	9"	6' - 11"	1,122	162	#5	6"	7' - 8"	1,295	3' - 7"	4' - 1"	162	#5	6"	6' - 10"	1,155	4' - 1"	2' - 9"	108	9"	3' - 0"	216	5	39' - 9"	133	29	39' - 9"	770	6' - 11"	18	16	45	0.528	117.3	0.5	63	21.6	4,754
6' - 0"	3' - 0"	10"	8"	30'	108	#6	9"	7' - 1"	1,149	162	#5	6"	7' - 10"	1,324	3' - 8"	4' - 2"	162	#5	6"	7' - 0"	1,183	4' - 2"	2' - 10"	82	12"	3' - 0"	164	5	39' - 9"	133	29	39' - 9"	770	7' - 1"	19	18	50	0.601	118.1	0.5	69	24.6	4,792
6' - 0"	4' - 0"	8"	7"	20'	108	#6	9"	6' - 11"	1,122	108	#5	9"	8' - 7"	967	4' - 6"	4' - 1"	108	#5	9"	6' - 9"	760	4' - 1"	2' - 8"	108	9"	4' - 0"	289	5	39' - 9"	133	29	39' - 9"	770	6' - 11"	18	16	45	0.527	101.0	0.5	63	21.6	4,104
6' - 0"	4' - 0"	9"	7"	26'	108	#6	9"	6' - 11"	1,122	162	#5	6"	8' - 8"	1,464	4' - 7"	4' - 1"	162	#5	6"	6' - 10"	1,155	4' - 1"	2' - 9"	108	9"	4' - 0"	289	5	39' - 9"	133	29	39' - 9"	770	6' - 11"	18	16	45	0.571	123.3	0.5	63	23.4	4,996
6' - 0"	4' - 0"	10"	8"	30'	108	#6	9"	7' - 1"	1,149	162	#5	6"	8' - 10"	1,493	4' - 8"	4' - 2"	162	#5	6"	7' - 0"	1,183	4' - 2"	2' - 10"	82	12"	4' - 0"	219	5	39' - 9"	133	29	39' - 9"	770	7' - 1"	19	18	50	0.650	123.7	0.5	69	26.5	5,016
6' - 0"	5' - 0"	8"	7"	20'	108	#6	9"	6' - 11"	1,122	108	#5	9"	9' - 7"	1,080	5' - 6"	4' - 1"	108	#5	9"	6' - 9"	760	4' - 1"	2' - 8"	108	9"	5' - 0"	361	5	39' - 9"	133	33	39' - 9"	876	6' - 11"	18	16	45	0.570	108.3	0.5	63	23.3	4,395
6' - 0"	5' - 0"	9"	7"	26'	108	#6	9"	6' - 11"	1,122	162	#5	6"	9' - 8"	1,633	5' - 7"	4' - 1"	162	#5	6"	6' - 10"	1,155	4' - 1"	2' - 9"	108	9"	5' - 0"	361	5	39' - 9"	133	33	39' - 9"	876	6' - 11"	18	16	45	0.614	132.0	0.5	63	25.1	5,343
6' - 0"	5' - 0"	10"	8"	30'	108	#6	9"	7' - 1"	1,149	162	#5	6"	9' - 10"	1,661	5' - 8"	4' - 2"	162	#5	6"	7' - 0"	1,183	4' - 2"	2' - 10"	82	12"	5' - 0"	274	5	39' - 9"	133	33	39' - 9"	876	7' - 1"	19	18	50	0.700	131.9	0.5	69	28.5	5,345
6' - 0"	6' - 0"	8"	7"	20'	108	#6	9"	6' - 11"	1,122	108	#5	9"	10' - 7"	1,192	6' - 6"	4' - 1"	108	#5	9"	6' - 9"	760	4' - 1"	2' - 8"	108	9"	6' - 0"	433	5	39' - 9"	133	37	39' - 9"	982	6' - 11"	18	16	45	0.613	115.6	0.5	63	25.0	4,685
6' - 0"	6' - 0"	9"	7"	26'	108	#6	9"	6' - 11"	1,122	162	#5	6"	10' - 8"	1,802	6' - 7"	4' - 1"	162	#5	6"	6' - 10"	1,155	4' - 1"	2' - 9"	108	9"	6' - 0"	433	5	39' - 9"	133	37	39' - 9"	982	6' - 11"	18	16	45	0.657	140.7	0.5	63	26.8	5,690
6' - 0"	6' - 0"	10"	8"	30'	108	#6	9"	7' - 1"	1,149	162	#5	6"	10' - 10"	1,830	6' - 8"	4' - 2"	162	#5	6"	7' - 0"	1,183	4' - 2"	2' - 10"	82	12"	6' - 0"	329	5	39' - 9"	133	37	39' - 9"	982	7' - 1"	19	18	50	0.749	140.2	0.5	69	30.5	5,675

5 For direct traffic culverts (fill height ≤ 2 ft.), identify the required box size and select the option with the minimum fill height.

HL93 LOADING SHEET 2 OF 2

Bridge Division Standard

SINGLE BOX CULVERTS
CAST-IN-PLACE
0' TO 30' FILL

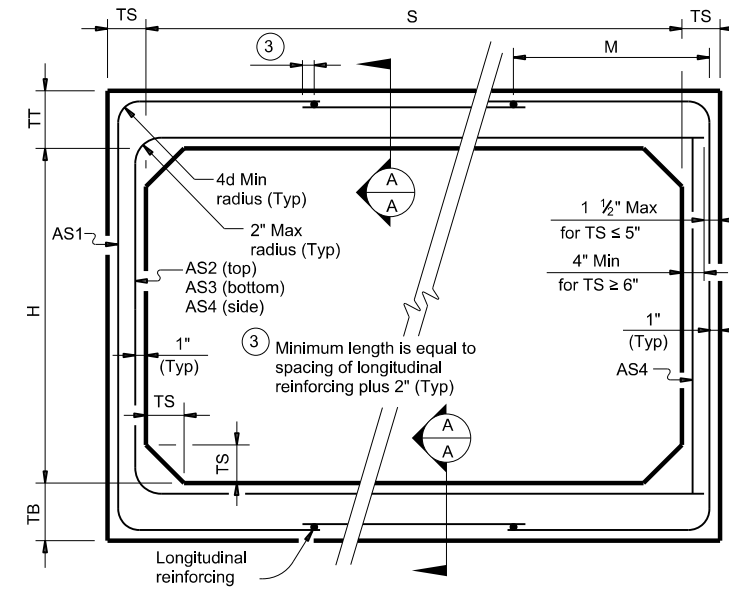
SCC-5 & 6

FILE: scc56ste-21.dgn	DN: TBE	CK: BMP	DW: TxDOT	CK: TxDOT
©TxDOT February 2020	CONT	SECT	JOB	HIGHWAY
REVISIONS	0122	03	033, ETC	US 287, ETC
04/2021 Updated X values.	DIST	COUNTY	SHEET NO.	
	BRY	FREESTONE, ETC	102	

DATE: 5/26/2022 4:39:20 PM
 FILE: \\txdot\project\w\seon\line.com:TXDOT14\Documents\17 - BRY\Design\Projects\17030303\scp03sts-20.dgn
 PROJECT: 17030303 - BRY\Design\Projects\17030303\scp03sts-20.dgn
 DRAWING: 17030303 - BRY\Design\Projects\17030303\scp03sts-20.dgn
 TITLE: Drainage Standards - scp03sts-20.dgn
 No warranty of any kind is made by TxDOT for any purpose whatsoever. TxDOT assumes no responsibility for the conversion of this standard to any other format.

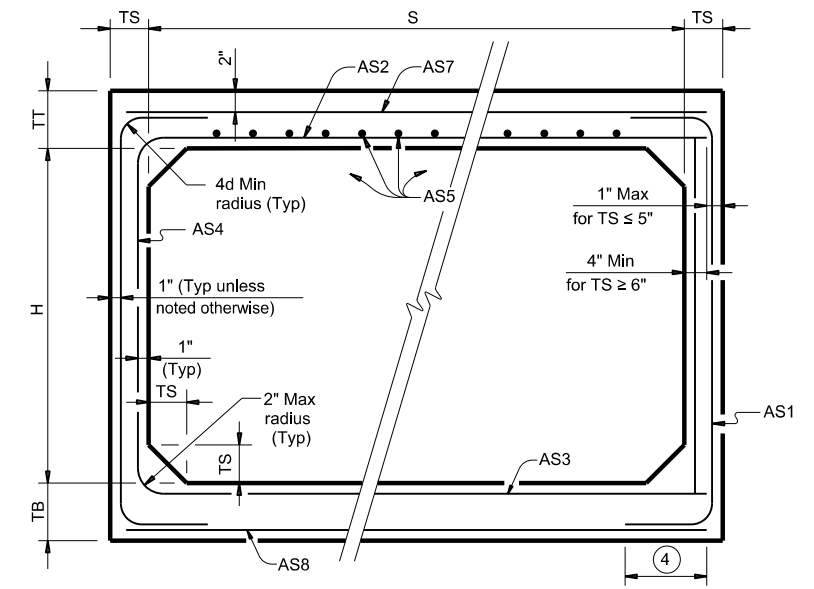
BOX DATA

SECTION DIMENSIONS					Fill Height (ft.)	M (Min) (in.)	REINFORCING (sq. in. / ft.) ^②								① Lift Weight (tons)
S (ft.)	H (ft.)	TT (in.)	TB (in.)	TS (in.)			AS1	AS2	AS3	AS4	AS5	AS7	AS8		
3	2	7	6	4	< 2	-	0.17	0.25	0.16	0.10	0.17	0.17	0.14	3.3	
3	2	4	4	4	2 < 3	31	0.13	0.19	0.18	0.10	-	-	-	2.4	
3	2	4	4	4	3 - 5	31	0.10	0.11	0.12	0.10	-	-	-	2.4	
3	2	4	4	4	10	31	0.10	0.10	0.10	0.10	-	-	-	2.4	
3	2	4	4	4	15	31	0.10	0.13	0.13	0.10	-	-	-	2.4	
3	2	4	4	4	20	31	0.11	0.17	0.17	0.10	-	-	-	2.4	
3	2	4	4	4	25	31	0.14	0.21	0.21	0.10	-	-	-	2.4	
3	2	4	4	4	30	31	0.17	0.25	0.25	0.10	-	-	-	2.4	
3	2	4	4	4	35	31	0.20	0.29	0.30	0.10	-	-	-	2.4	
3	3	7	6	4	< 2	-	0.17	0.27	0.17	0.10	0.17	0.17	0.14	3.7	
3	3	4	4	4	2 < 3	31	0.10	0.22	0.21	0.10	-	-	-	2.8	
3	3	4	4	4	3 - 5	31	0.10	0.14	0.14	0.10	-	-	-	2.8	
3	3	4	4	4	10	31	0.10	0.11	0.11	0.10	-	-	-	2.8	
3	3	4	4	4	15	31	0.10	0.14	0.15	0.10	-	-	-	2.8	
3	3	4	4	4	20	31	0.10	0.18	0.19	0.10	-	-	-	2.8	
3	3	4	4	4	25	31	0.10	0.23	0.23	0.10	-	-	-	2.8	
3	3	4	4	4	30	31	0.12	0.27	0.28	0.10	-	-	-	2.8	
3	3	4	4	4	35	31	0.14	0.32	0.32	0.10	-	-	-	2.8	



CORNER OPTION "A" CORNER OPTION "B"

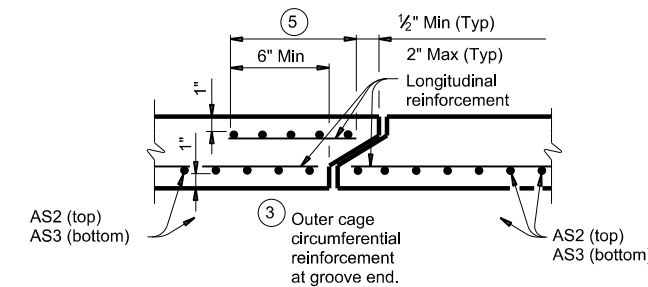
FILL HEIGHT 2 FT AND GREATER



CORNER OPTION "A" CORNER OPTION "B"

FILL HEIGHT LESS THAN 2 FT

④ Length is equal to spacing of longitudinal reinforcing plus 2". (10" Min) (Typ)



SECTION A-A

(Showing top and bottom slab joint reinforcement.)

MATERIAL NOTES:

Provide 0.03 sq. in./ft. minimum longitudinal reinforcement at each face in slabs and walls. This minimum requirement may be met by the transverse wires when wire mesh reinforcement is used.
Provide Class H concrete (f'c = 5,000 psi).

GENERAL NOTES:

Designs shown conform to ASTM C1577. Refer to ASTM C1577 for information or details not shown.
See Box Culverts Precast Miscellaneous Details (SCP-MD) standard sheet for details and notes not shown.
In lieu of furnishing the designs shown on this sheet, the contractor may furnish an alternate design that is equal to or exceeds the box design for the design fill height in the table. Submit shop plans for alternate designs in accordance with Item "Precast Concrete Structural Members (Fabrication)".

HL93 LOADING

		Bridge Division Standard	
SINGLE BOX CULVERTS PRECAST 3'-0" SPAN			
SCP-3			
FILE: scp03sts-20.dgn	DN: TxDOT	CR: TxDOT	DW: TxDOT
©TxDOT February 2020	CONT	SECT	JOB
REVISIONS	0122	03	033, ETC
DIST	COUNTY		SHEET NO.
BRY	FREESTONE, ETC		104

① For box length = 8'-0"

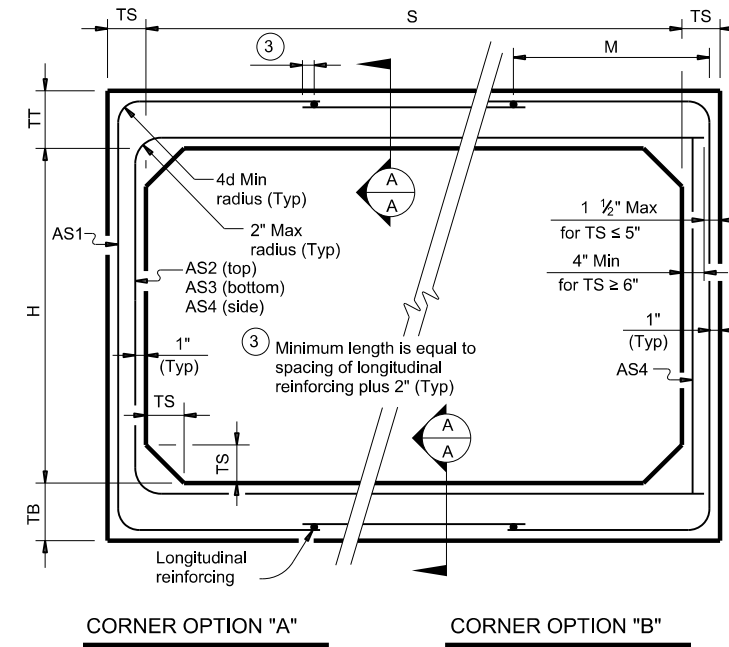
② AS1 thru AS4, AS7 and AS8 are minimum required areas of reinforcement per linear foot of box length. AS5 is minimum required area of reinforcement per linear foot of box width.

DATE: 5/26/2022 4:39:25 PM
 FILE: \\txdot\project\wiseon\ine.com:TXDOT14\Documents\17 - BRY\Design\Projects\2020\05\scp05sts-20.dgn
 PROJECT: 17 - BRY\Design\Projects\2020\05\scp05sts-20.dgn
 DRAWING: 17 - BRY\Design\Projects\2020\05\scp05sts-20.dgn
 TITLE: Drainage Standards - scp05sts-20.dgn

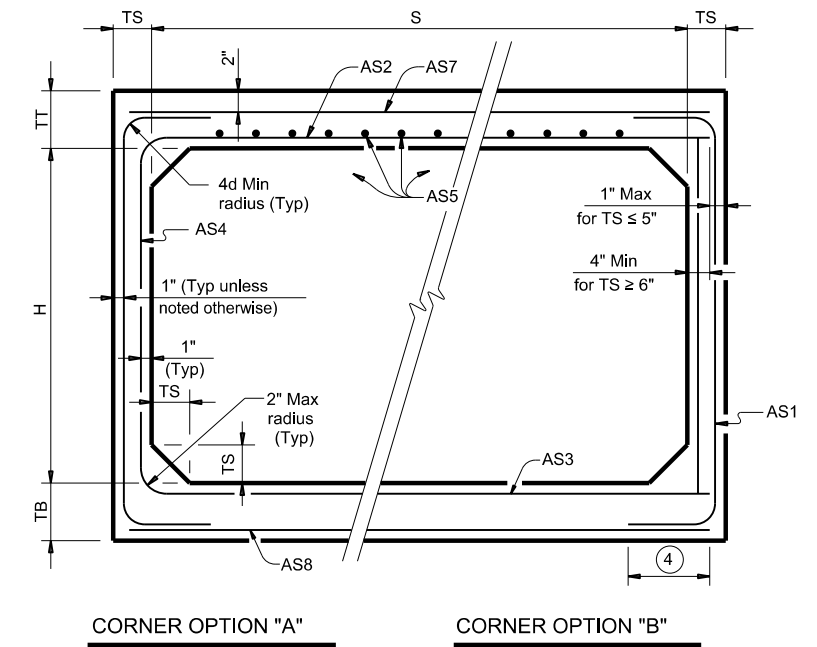
DISCLAIMER: The use of this standard is governed by the "Texas Engineering Practice Act". No warranty of any kind is made by TxDOT for any purpose whatsoever. TxDOT assumes no responsibility for the conversion of units.

BOX DATA

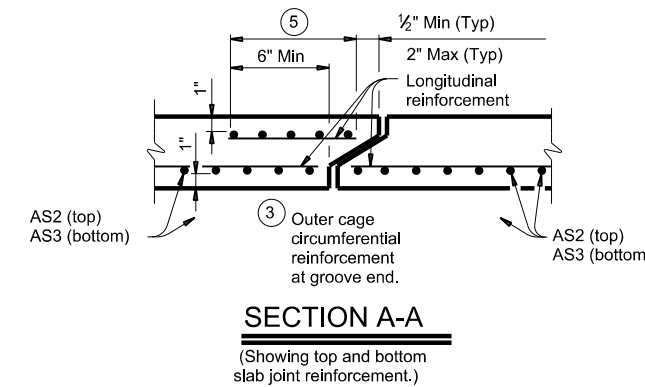
SECTION DIMENSIONS					Fill Height (ft.)	M (Min) (in.)	REINFORCING (sq. in. / ft.) ^②								① Lift Weight (tons)
S (ft.)	H (ft.)	TT (in.)	TB (in.)	TS (in.)			AS1	AS2	AS3	AS4	AS5	AS7	AS8		
5	2	8	7	6	< 2	-	0.19	0.27	0.18	0.14	0.19	0.19	0.17	6.0	
5	2	6	6	6	2 < 3	44	0.22	0.20	0.16	0.14	-	-	-	5.1	
5	2	6	6	6	3 - 5	44	0.16	0.14	0.14	0.14	-	-	-	5.1	
5	2	6	6	6	10	36	0.15	0.14	0.14	0.14	-	-	-	5.1	
5	2	6	6	6	15	36	0.20	0.18	0.18	0.14	-	-	-	5.1	
5	2	6	6	6	20	36	0.26	0.23	0.24	0.14	-	-	-	5.1	
5	2	6	6	6	25	36	0.33	0.29	0.29	0.14	-	-	-	5.1	
5	2	6	6	6	30	36	0.39	0.34	0.35	0.14	-	-	-	5.1	
5	3	8	7	6	< 2	-	0.19	0.31	0.21	0.14	0.19	0.19	0.17	6.6	
5	3	6	6	6	2 < 3	45	0.18	0.24	0.19	0.14	-	-	-	5.7	
5	3	6	6	6	3 - 5	36	0.14	0.17	0.16	0.14	-	-	-	5.7	
5	3	6	6	6	10	36	0.14	0.16	0.17	0.14	-	-	-	5.7	
5	3	6	6	6	15	35	0.16	0.21	0.22	0.14	-	-	-	5.7	
5	3	6	6	6	20	35	0.21	0.27	0.28	0.14	-	-	-	5.7	
5	3	6	6	6	25	35	0.26	0.34	0.34	0.14	-	-	-	5.7	
5	3	6	6	6	30	35	0.31	0.41	0.41	0.14	-	-	-	5.7	
5	4	8	7	6	< 2	-	0.19	0.33	0.24	0.14	0.19	0.19	0.17	7.2	
5	4	6	6	6	2 < 3	45	0.16	0.27	0.22	0.14	-	-	-	6.3	
5	4	6	6	6	3 - 5	45	0.14	0.19	0.18	0.14	-	-	-	6.3	
5	4	6	6	6	10	36	0.14	0.18	0.18	0.14	-	-	-	6.3	
5	4	6	6	6	15	35	0.14	0.23	0.24	0.14	-	-	-	6.3	
5	4	6	6	6	20	35	0.17	0.30	0.31	0.14	-	-	-	6.3	
5	4	6	6	6	25	35	0.21	0.37	0.38	0.14	-	-	-	6.3	
5	4	6	6	6	30	35	0.25	0.44	0.45	0.14	-	-	-	6.3	
5	5	8	7	6	< 2	-	0.19	0.35	0.26	0.14	0.19	0.19	0.17	7.8	
5	5	6	6	6	2 < 3	45	0.14	0.29	0.24	0.14	-	-	-	6.9	
5	5	6	6	6	3 - 5	45	0.14	0.21	0.20	0.14	-	-	-	6.9	
5	5	6	6	6	10	45	0.14	0.19	0.20	0.14	-	-	-	6.9	
5	5	6	6	6	15	36	0.14	0.24	0.25	0.14	-	-	-	6.9	
5	5	6	6	6	20	35	0.15	0.31	0.32	0.14	-	-	-	6.9	
5	5	6	6	6	25	35	0.18	0.38	0.39	0.14	-	-	-	6.9	
5	5	6	6	6	30	35	0.21	0.46	0.47	0.14	-	-	-	6.9	



FILL HEIGHT 2 FT AND GREATER



FILL HEIGHT LESS THAN 2 FT



MATERIAL NOTES:
 Provide 0.03 sq. in./ft. minimum longitudinal reinforcement at each face in slabs and walls. This minimum requirement may be met by the transverse wires when wire mesh reinforcement is used.
 Provide Class H concrete (f'c = 5,000 psi).

GENERAL NOTES:
 Designs shown conform to ASTM C1577. Refer to ASTM C1577 for information or details not shown.
 See Box Culverts Precast Miscellaneous Details (SCP-MD) standard sheet for details and notes not shown.
 In lieu of furnishing the designs shown on this sheet, the contractor may furnish an alternate design that is equal to or exceeds the box design for the design fill height in the table. Submit shop plans for alternate designs in accordance with Item "Precast Concrete Structural Members (Fabrication)".

HL93 LOADING

		<i>Bridge Division Standard</i>	
SINGLE BOX CULVERTS PRECAST 5'-0" SPAN			
SCP-5			
FILE: scp05sts-20.dgn	DN: TxDOT	CR: TxDOT	DW: TxDOT
©TxDOT February 2020	CONT	SECT	JOB
REVISIONS	0122	03	033, ETC
DIST	COUNTY		SHEET NO.
BRY	FREESTONE, ETC		105

① For box length = 8'-0"
 ② AS1 thru AS4, AS7 and AS8 are minimum required areas of reinforcement per linear foot of box length. AS5 is minimum required area of reinforcement per linear foot of box width.

DATE: 5/26/2022 4:39:30 PM
 FILE: \\txdot\project\wiseonline.com\TXDOT4\Documents\17 - BRY\Design Project\wiseonline.com\SETB-FW-0.dgn
 Dr. Inge Standards\SETB-FW-0.dgn
 DISCLAIMER: The use of this standard is governed by the "Texas Engineering Practice Act". No warranty of any kind is made by TxDOT for any purpose whatsoever. TxDOT assumes no responsibility for the conversion of units or for the accuracy of the information contained herein.

TABLE OF DIMENSIONS AND REINFORCING STEEL
(Wings for One Structure End)

Maximum Wingwall Height Hw (9)	Dimensions				Variable Reinforcing				Estimated Quantities per ft of wing length (Two-Wings) (3)	
	W	X	Y	Z	Bars J1		Bars J2		Reinf (Lb/Ft)	Conc (CY/Ft)
2'-6"	2'-5"	1'-0"	9"	7" #4	1'-0"	#4	1'-0"	#4	33.73	0.248
3'-0"	2'-9"	1'-0"	9"	7" #4	1'-0"	#4	1'-0"	#4	37.07	0.261
3'-6"	2'-9"	1'-0"	9"	7" #4	1'-0"	#4	1'-0"	#4	37.74	0.273
4'-0"	2'-9"	1'-0"	9"	7" #4	1'-0"	#4	1'-0"	#4	38.41	0.285
4'-6"	3'-2"	1'-6"	1'-0"	7" #4	1'-0"	#4	1'-0"	#4	41.75	0.330
5'-0"	3'-2"	1'-6"	1'-0"	7" #4	1'-0"	#4	1'-0"	#4	45.09	0.343
5'-6"	3'-2"	1'-6"	1'-0"	7" #4	1'-0"	#4	1'-0"	#4	45.75	0.355
6'-0"	3'-2"	1'-6"	1'-0"	7" #4	1'-0"	#4	1'-0"	#4	46.42	0.367
7'-0"	3'-8"	1'-9"	1'-3"	7" #4	1'-0"	#4	1'-0"	#4	52.77	0.414
8'-0"	4'-2"	2'-0"	1'-5"	8" #5	1'-0"	#4	1'-0"	#4	60.19	0.486
9'-0"	4'-8"	2'-3"	1'-9"	8" #4	6" #4	6"			81.49	0.535
10'-0"	5'-0"	2'-6"	2'-0"	8" #5	6" #4	6"			97.25	0.584
11'-0"	5'-8"	2'-9"	2'-3"	8" #6	6" #5	6"			133.65	0.634
12'-0"	6'-2"	3'-0"	2'-6"	9" #7	6" #5	6"			162.29	0.721

TABLE OF WING WALL REINFORCING
(Two-Wings)

Bar	Size	No.	Spa
D #5	~ 1'-0"		
E #5	~ 1'-0"		
F #4	~ 1'-0"		
G #6	4 ~		
M #4	4 ~		
P #4	~ 1'-0"		
R #5	6 ~		
V #4	~ 1'-0"		

TABLE OF ESTIMATED CULVERT TOEWALL QUANTITIES

Bar	Size	No.	Spa
L #4	~ 1'-5"		
Q #4	1 ~		
Reinf (Lb/Ft)		2.45	
Conc (CY/Ft)		0.037	

TABLE OF ESTIMATED ANCHOR TOEWALL QUANTITIES

Bar	Size	No.	Spa
K #4	~ 1'-0"		
N #5	6 ~		
OL #4	6 ~		
Reinf (Lb/Ft)		9.82	
Conc (CY/Ft)		0.074	

- Extend Bars P 3'-0" Min into bottom slab of box culvert.
- Adjust to fit as necessary to maintain 1 #2" clear cover and 4" Min between bars.
- Quantities shown are based on an average wing height for two wings (one structure end). To determine total quantities for two wings multiply the tabulated values by Lw.
- Recommended values of slope are: 3:1, 4:1, and 6:1. Provide 3:1 or flatter slope.
- When shown elsewhere on the plans, construct 5" deep concrete riprap. Payment for riprap is as required by Item 432, "Riprap". Unless otherwise shown on the plans or directed by the Engineer, extend construction joints or grooved joints, oriented in the direction of flow, across the full distance of the riprap, at intervals of approximately 20'. When such riprap is provided, the culvert toewall shown in SECTION B-B is not required.
- At Contractor's option, end the culvert toewall flush with wingwall toewall. Adjust reinforcing as needed.
- 3" Min to 5'-0" Max. Estimated curb heights are shown elsewhere in the plans. For structures without railing and curbs taller than 1'-0", refer to the Extend Curb Details (ECD) standard sheet.
- For vehicle safety, reduce curb heights, if necessary, to provide a maximum 3" projection above finished grade. No changes will be made in quantities and no additional compensation will be allowed for this work.
- See Table of Maximum Wing Heights for various slopes. Height is limited based on a 33'-6" maximum safety pipe runner length.

TABLE OF MAXIMUM WING HEIGHTS (9)

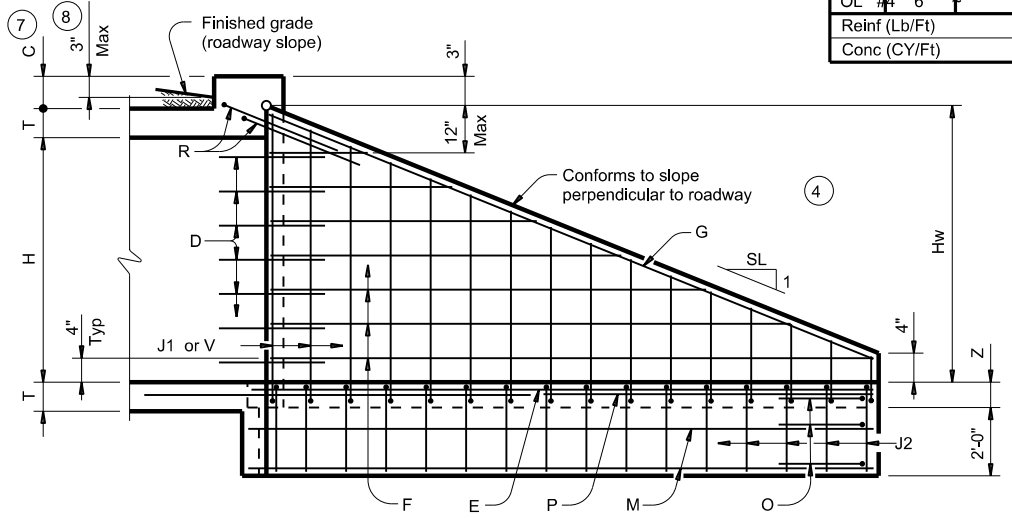
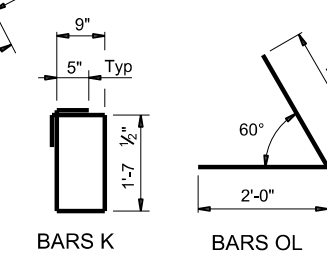
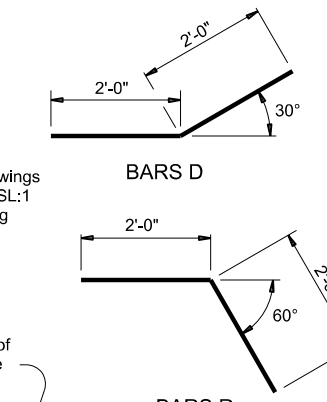
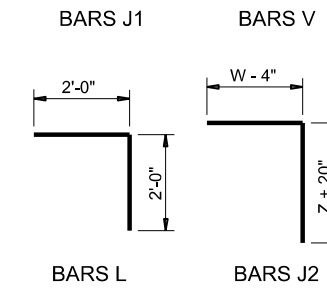
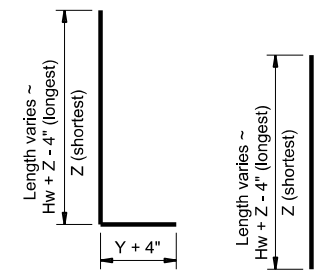
Side Slope	Hw Max
3:1	11'-5"
4:1	8'-10"
6:1	6'-1"

WING DIMENSION CALCULATIONS:

$$\begin{aligned}
 Hw &= H + T + C - 0.250' \quad (9) \\
 A &= (Hw - 0.333') (SL) \\
 B &= (A) (\tan 30^\circ) \\
 Lw &= (A) + \cos 30^\circ) \\
 \text{For cast-in-place culverts:} \\
 Ltw &= (N) (S) + (N + 1) (U) \\
 \text{For precast culverts:} \\
 Ltw &= (N) (2U + S) + (N - 1) (0.500') \\
 Lc &= (Ltw) - (2U) \\
 Atw &= (Lc) + (2B) \\
 \text{Total Wingwall Area (two wings ~ SF)} \\
 &= (Hw + 0.333') (Lw)
 \end{aligned}$$

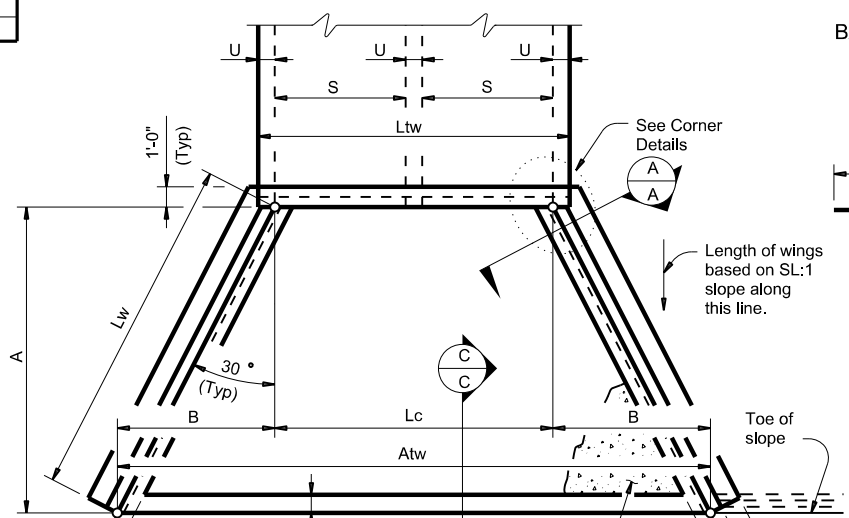
Hw = Height of wingwall (feet)
 Atw = Anchor toewall length (feet)
 Lw = Length of wingwall (feet)
 N = Number of culvert barrels
 SL:1 = Side slope ratio (horizontal : 1 vertical)
 Ltw = Culvert toewall length (feet)
 Lc = Culvert curb between wings (feet)

See applicable box culvert standard for H, S, T, and U values. See Table of Maximum Wall Heights for limits on Hw.



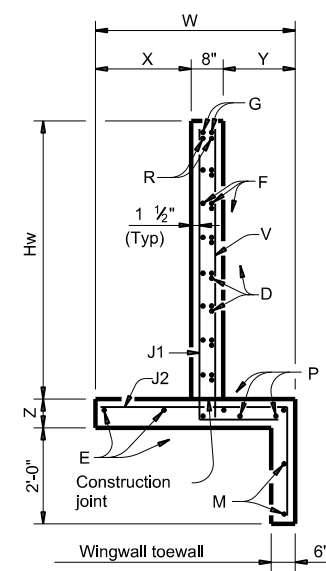
INSIDE ELEVATION OF WINGWALL

(Showing reinforcing. Culvert and culvert toewall reinforcing not shown for clarity.)

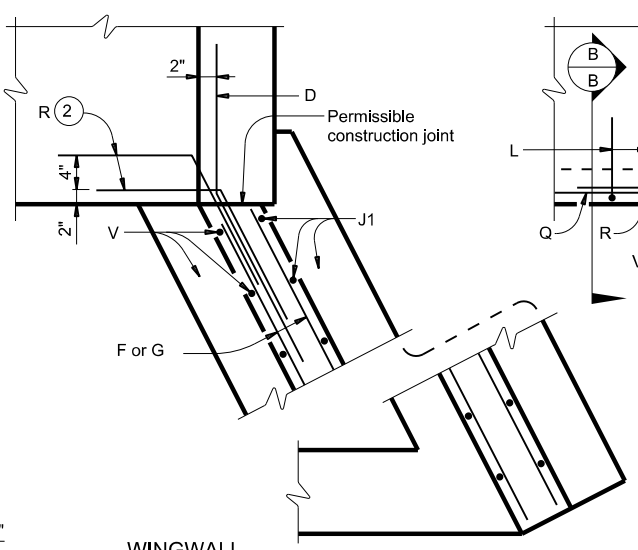


STRUCTURAL PLAN

(Showing dimensions.)



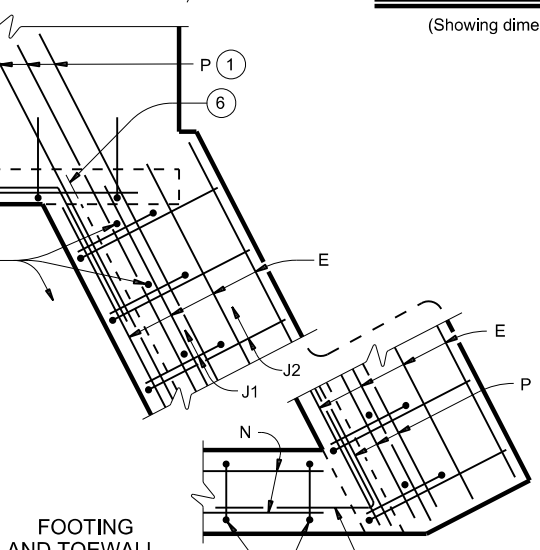
SECTION A-A



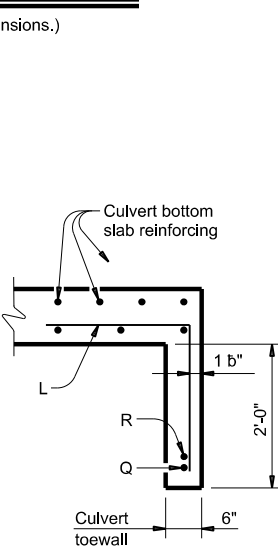
WINGWALL

CORNER DETAILS

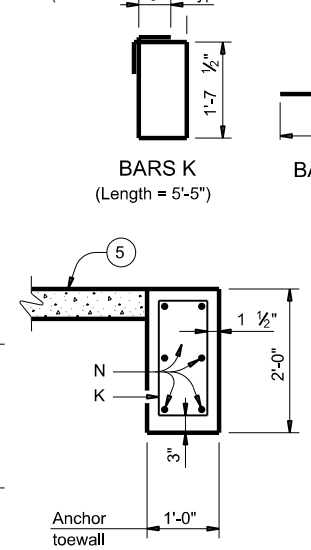
(Culvert and culvert toewall reinforcing not shown for clarity.)



FOOTING AND TOEWALL



SECTION B-B (5)



SECTION C-C

MATERIAL NOTES:

- Provide Grade 60 reinforcing steel.
- Provide galvanized reinforcing steel if required elsewhere in the plans. Synthetic fibers listed on the "Fibers for Concrete" Material Producer List (MPL) may be used in lieu of steel reinforcing in riprap concrete unless noted otherwise.
- Provide Class "C" concrete (f'c = 3,600 psi).
- Adjust reinforcing as necessary to provide a minimum clear cover of 1 1/2".
- Provide pipe runners and anchor pipes meeting the requirements of ASTM A53 (Type E or S, Gr B), ASTM A500 Gr B, or API 5LX52.
- Provide ASTM A307 bolts and nuts.
- Provide ASTM A36 steel plates.
- Galvanize all steel components, except reinforcing unless required elsewhere in the plans, after fabrication.
- Repair galvanizing damaged during transport or construction in accordance with the Item 445, "Galvanizing".
- For optional adhesive anchors, install adhesive anchorages in accordance with the manufacturer's instructions including hole size, drilling equipment and method, hole cleaning equipment and method, mixing and dispensing adhesive, and anchor insertion. Do not alter the manufacturer's mixing nozzle or dispenser. Provide anchorage rods that are clean and free of grease, oil, or any other foreign material. Demonstrate hole cleaning method to the Engineer for approval and continue the approved process for all anchorage locations. Test adhesive anchors in accordance with Item 450.3.3, "Tests." Test 3 anchors per 100 anchors installed.

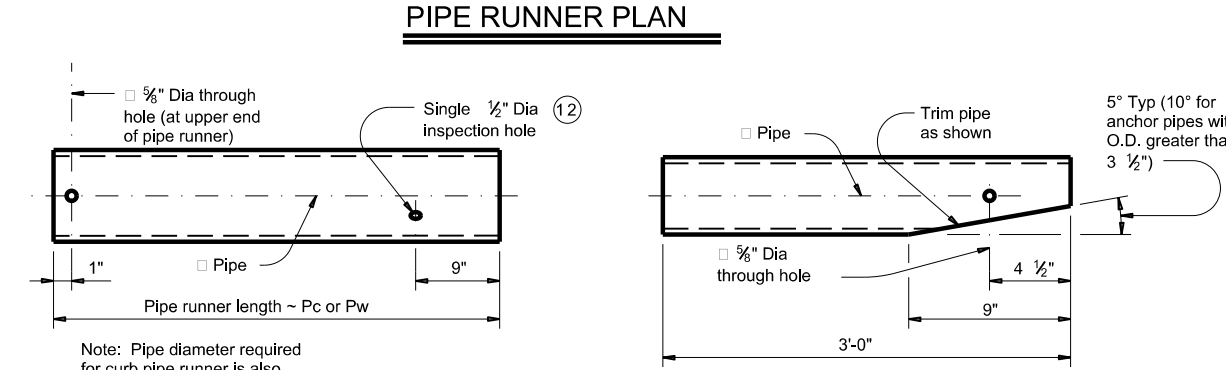
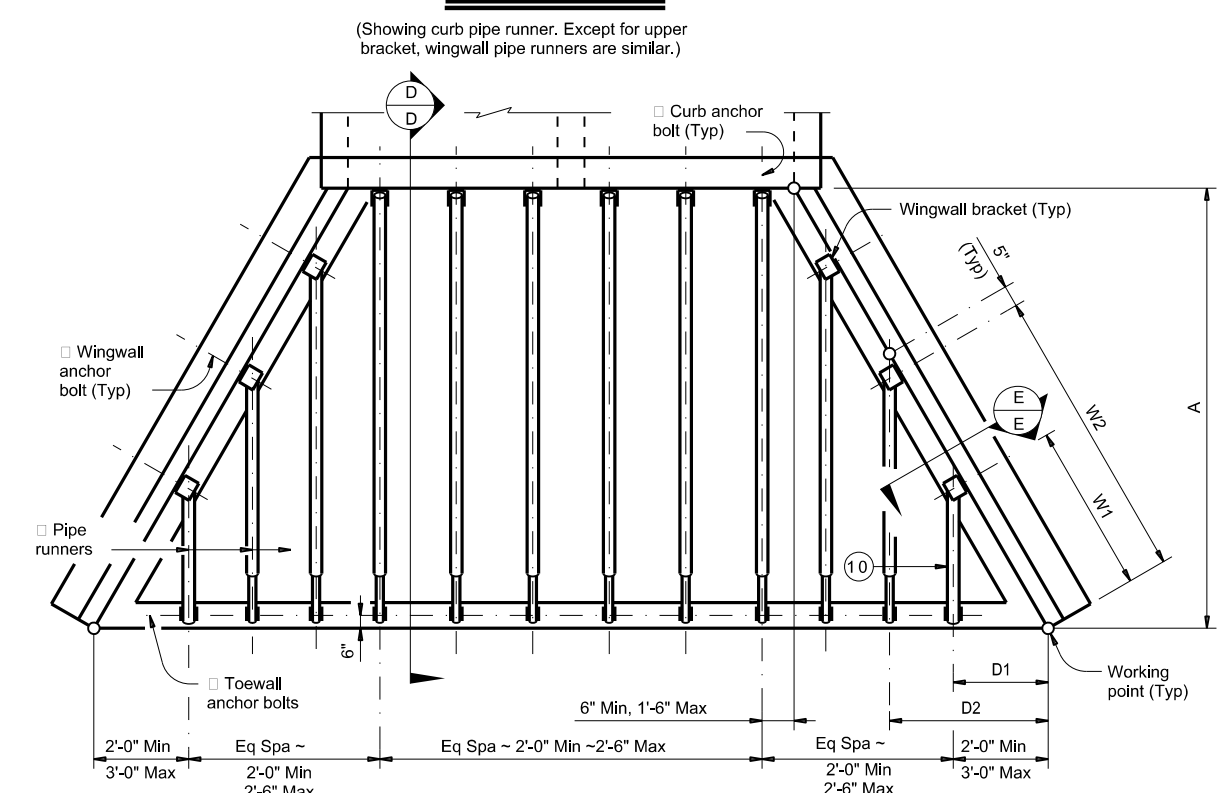
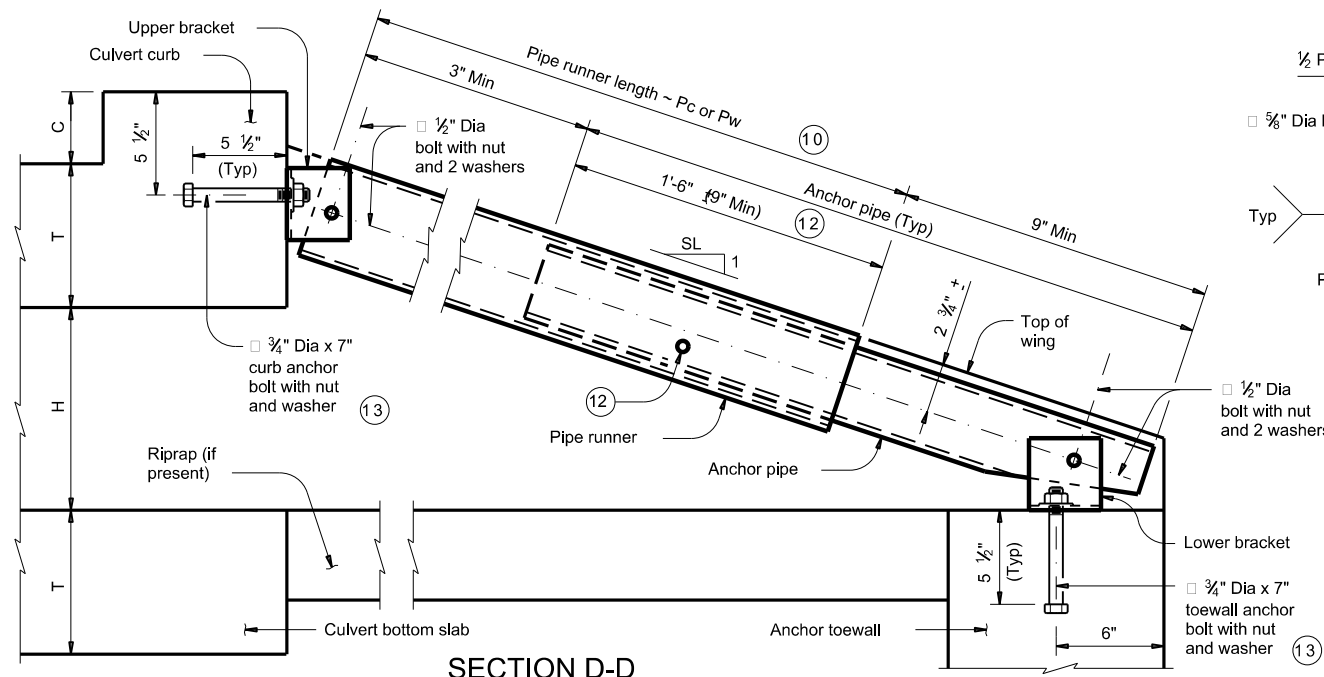
GENERAL NOTES:

- Designed according to AASHTO LRFD Bridge Design Specifications.
- The safety end treatments shown herein are intended for use in those installations where out of control vehicles are likely to traverse the openings approximately perpendicular to the pipe runners.
- Pipe runners are designed for a traversing load of 1,800 pounds at yield as recommended by Research Report 280-1, "Safety Treatment of Roadside Cross-Drainage Structures", Texas Transportation Institute, March 1981.
- When structure is founded on solid rock, depth of toewalls for culverts and wingwalls may be reduced or eliminated as directed by the Engineer.
- All bolts, nuts, washers, brackets, angles, and pipe runners are considered parts of the safety end treatment for payment.
- The quantities for pipe runners, reinforcing steel, and concrete, resulting from the formulas given herein are for Contractor's information only.
- See the Box Culvert Supplement (BCS) standard sheet for additional dimensions and information.

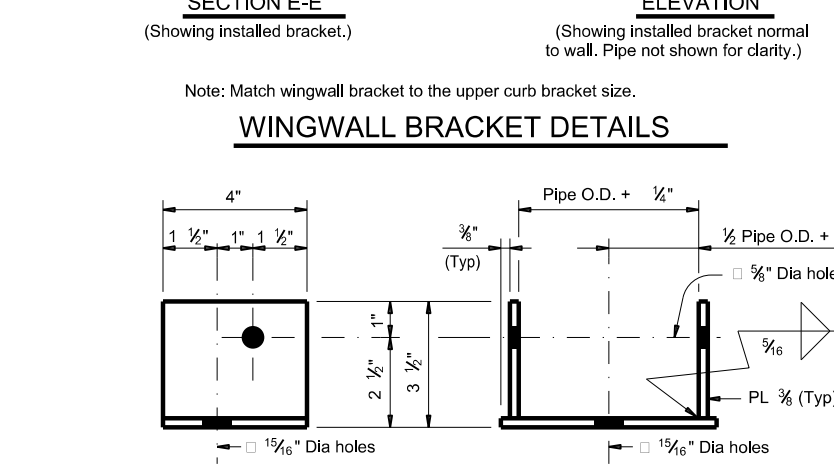
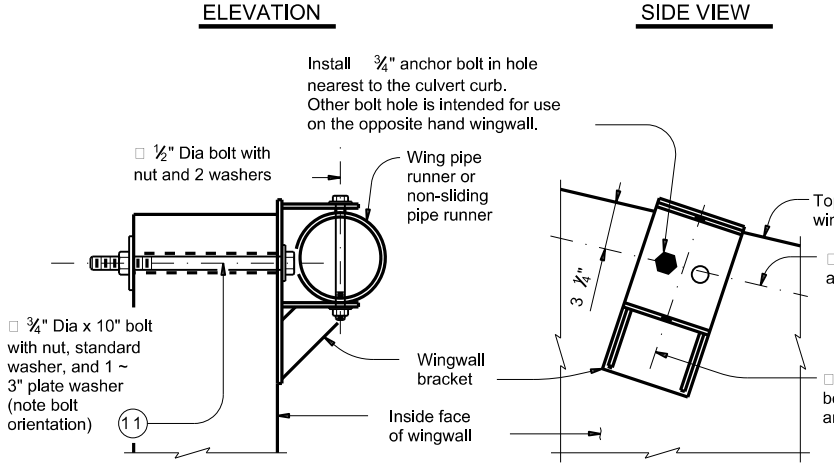
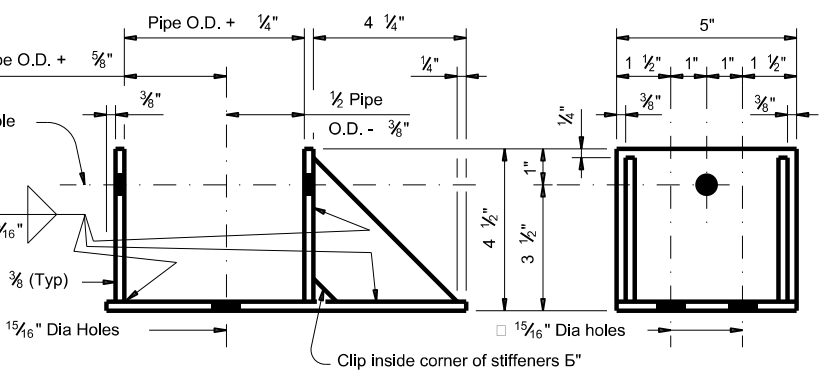
Cover dimensions are clear dimensions, unless noted otherwise. Reinforcing dimensions are out-to-out of bars.

		Bridge Division Standard	
SAFETY END TREATMENT WITH FLARED WINGS FOR 0° SKEW BOX CULVERTS TYPE I ~ CROSS DRAINAGE			
SETB-FW-0			
FILE: setb0se-20.dgn	DN: GAF	CK: CAT	DW: TxDOT
©TxDOT February 2020	CONT	SECT	JOB
REVISIONS	0122	03	033, ETC
DIST	COUNTY	SHEET NO.	
BRY	FREESTONE, ETC	106	

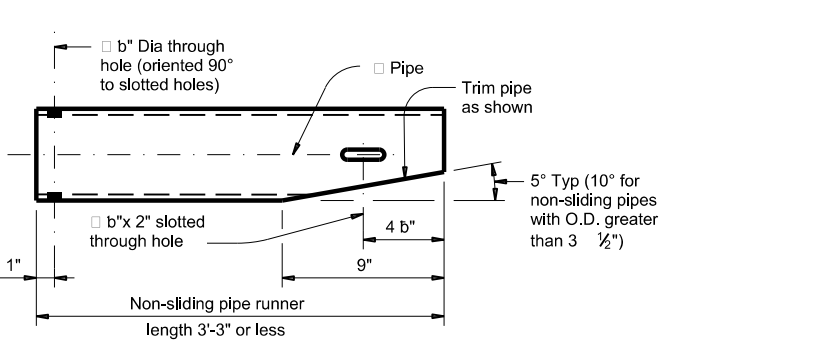
DATE: 5/26/2022 4:39:31 PM
 FILE: \\txdot\project\wiseon\line.com\TXDOT4\Documents\17 - BRY\Design Project\wiseon\SETB-FW-0.dgn
 PROJECT: 012203033,ETC
 DRAWING: SETB-FW-0.dgn
 DISCLAIMER: The use of this standard is governed by the "Texas Engineering Practice Act". No warranty of any kind is made by TxDOT for any purpose whatsoever. TxDOT assumes no responsibility for the conversion of units or for the accuracy of the information contained herein.



PIPE RUNNER PLAN
PIPE RUNNER DETAILS
ANCHOR PIPE DETAILS



WINGWALL BRACKET DETAILS
UPPER AND LOWER BRACKET DETAILS



NON-SLIDING PIPE RUNNER DETAILS

MAXIMUM PIPE RUNNER LENGTHS AND REQUIRED PIPE RUNNER SIZES

Maximum Pipe Runner Length (Pc or Pw)	Required Pipe Runner Size			Required Anchor Pipe Size		
	Pipe Size	Pipe O.D.	Pipe I.D.	Pipe Size	Pipe O.D.	Pipe I.D.
9'-4"	3" STD	3.500"	3.068"	2" STD	2.375"	2.067"
19'-0"	4" STD	4.500"	4.026"	3" STD	3.500"	3.068"
33'-6"	5" STD	5.563"	5.047"	4" STD	4.500"	4.026"

- 10 If pipe runner length (Pw) is 1'-9" or less replace the normal pipe runner and anchor pipe with a single non-sliding pipe runner. See Non-Sliding Pipe Runner Details for additional information.
- 11 At Contractor's option, 7/8" diameter hole may be formed or cored drilled. Percussion drilling is not permitted. Adjust placement of reinforcing steel as necessary to avoid bolt holes.
- 12 After installation of pipe runner, use the b" inspection hole to ensure that the lap of the anchor pipe with the pipe runner is adequate.
- 13 At Contractor's option, an adhesive anchor may be used. Provide 3/4" Dia adhesive anchors that meet the requirements of ASTM A307 Gr A fully threaded rods. Embed threaded rods into curb, wingwalls, and toewall using a Type III, Class C, D, E, or F anchor adhesive. Minimum embedment depth is 5 b". Provide anchor adhesive able to achieve a basic bond strength in tension, Nba, of 20 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.

PIPE RUNNER DIMENSION CALCULATIONS:

Wn	= (2.000) (Dn) - (0.416')
Pwn	= (Dn) (K2) - (2.063')
Pw1 Non-Sliding Pipe Runner (If required)	= (D1) (K2) - (0.563')
Pc	= (A) (K1) - (1.688')

- Wn = Distance from working point to centerline anchor bolt measured along bottom inside face of wing (feet)
 - Dn = Distance from working point to centerline pipe runner measured along outside face of anchor toewall (feet)
 - Pw = Wingwall pipe runner length (feet)
 - Pc = Curb pipe runner length (feet)
 - K = Constant values for use in formulas
- | Slope SL:1 | K1 | K2 |
|------------|---------|---------|
| 3:1 | ~ 1.054 | ~ 1.826 |
| 4:1 | ~ 1.031 | ~ 1.785 |
| 6:1 | ~ 1.014 | ~ 1.756 |
- n = Wing pipe runner number

SHEET 2 OF 3

Texas Department of Transportation
Bridge Division Standard

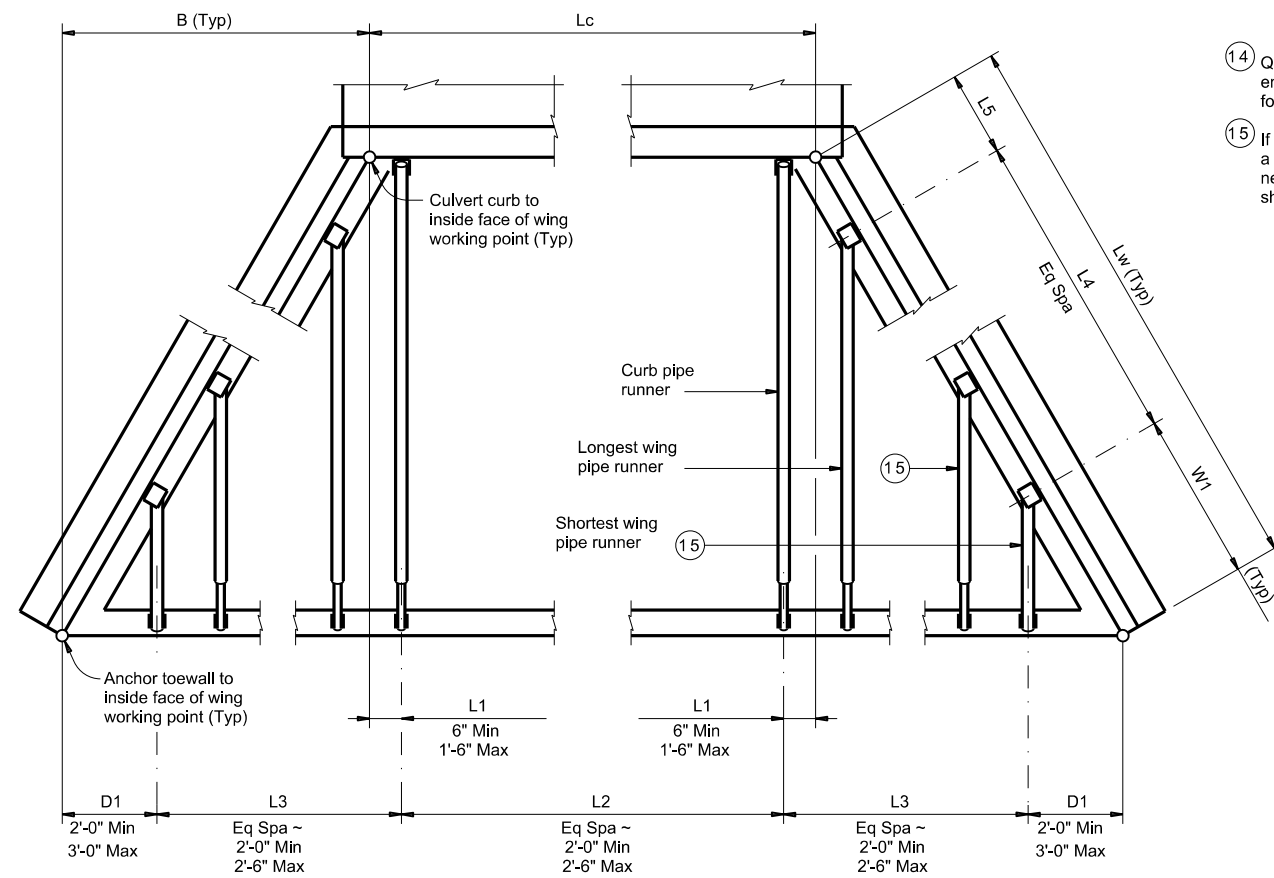
SAFETY END TREATMENT WITH FLARED WINGS
FOR 0° SKEW BOX CULVERTS
TYPE I ~ CROSS DRAINAGE

SETB-FW-0

FILE: setb0se-20.dgn	DN: GAF	CK: CAT	DW: TXDOT	CK: TXDOT
©TxDOT February 2020	CONT	SECT	JOB	HIGHWAY
REVISIONS	0122	03	033,ETC	US 287,ETC
DIST	COUNTY	SHEET NO.		
BRY	FREESTONE,ETC	107		

DATE: 5/26/2022 4:39:33 PM
 FILE: \\txdot.projectwiseonline.com\TXDOT14\Documents\17 - BRY\Design Project\030303\SETB-FW-0.dgn
 PROJECT: 030303 - BRY\Design Project\030303\SETB-FW-0.dgn
 DRAWING: 030303 - BRY\Design Project\030303\SETB-FW-0.dgn
 DISCLAIMER: The use of this standard is governed by the "Texas Engineering Practice Act". No warranty of any kind is made by TxDOT for any purpose whatsoever. TxDOT assumes no responsibility for the conversion of units or the accuracy of the information provided.

Culvert Station and/or Creek name followed by applicable end (Lt, Rt or Both) (14)	Lc (Ft)	L1 (Ft)	L2			D1 (Ft)	L3			W1 (Ft)	L4			L5 (Ft)	Curb Pipe Runner (Pc)		Longest Wing Pipe Runner (Pw) (Ft)	Shortest Wing Pipe Runner (Pw) (Ft)	Non-Sliding Wing Pipe Runner (if applicable) (Ft)	Curb, Wing, and/or Non-Sliding Pipe Runners		3'-0" Anchor Pipe	
			No. Spa	Spa at (Ft)	Overall Length (Ft)		No. Spa	Spa at (Ft)	Overall Length (Ft)		No. Spa	Spa at (Ft)	Overall Length (Ft)		No.	Length (Ft)				Size (3", 4" or 5")	Total Length (Ft) (14)	Size (2", 3" or 4")	Total Length (Ft) (14)
Sta 1000+89 (SH 75) (Rt)	5'	0.5'	2	2'	4'	2'	2	2.353'	4.707'	3.583'	1	4.707'	4.707'	4.123'	3	9.646'	5.896'	N/A	3.083"	4"	46.8963'	3"	15'
Sta 1000+89 (SH 75) (Rt)	5'	0.5'	2	2'	4'	2'	2	2.209'	4.418'	3.583'	1	4.418'	4.418'	3.836'	3	9.125'	5.265'	N/A	3.083"	3"	44.792'	2"	15'
Sta 1006+41 (SH 75) (Rt)	3'	1.5'	0	0	0	2'	2	2.444'	4.889'	3.583'	1	4.889'	4.889'	2.305'	1	7.938'	5.875'	N/A	3"	3"	25.688'	2"	9'
Sta 1006+41 (SH 75) (Rt)	3'	1.5'	0	0	0	2'	2	2.348'	4.696'	3.583'	1	4.696'	4.696'	2.113'	1	7.583'	5.708'	N/A	3"	3"	25'	2"	9'



- (14) Quantities shown are for one structure end if Lt or Rt. Quantities shown are for two structure ends if Both.
- (15) If the outermost wing pipe runner is a non-sliding pipe runner, consider the next outermost wing pipe runner as the shortest.

SPECIAL NOTE:

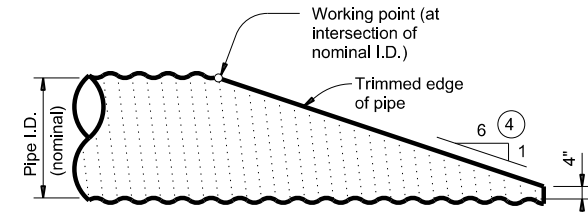
This tabular sheet is to be filled out by the culvert specifier and provides information for the construction details and quantities of pipe runners.

An Excel 2010 spreadsheet to assist in completing this table can be downloaded from the Bridge Standards (English) web page on the TxDOT web site. The completed sheet must be signed, sealed, and dated by a licensed Professional Engineer.

Note that the tabular quantities are given for estimating purposes only. It is likely that these quantities will change due to field conditions. Therefore, all dimensions must be verified by the Contractor in the field prior to fabrication of the safety end treatment components.

SAFETY END TREATMENT WITH FLARED WINGS FOR 0° SKEW BOX CULVERTS TYPE I ~ CROSS DRAINAGE			
SETB-FW-0			
FILE: setb0se-20.dgn	DN: TxDOT	CK: TxDOT	DW: TxDOT
©TxDOT February 2020	CONT: 0122	SECT: 03	JOB: 033, ETC
REVISIONS	US 287, ETC		HIGHWAY
DIST: BRY	COUNTY: FREESTONE, ETC	SHEET NO. 108	

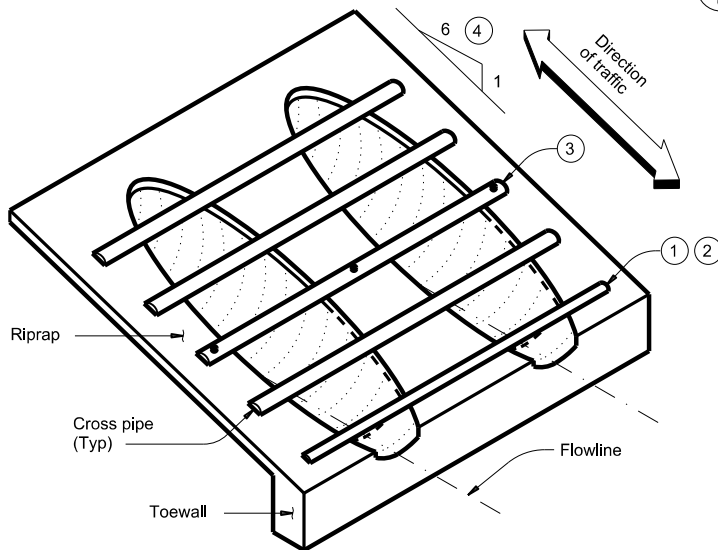
DATE: 5/26/2022 4:39:44 PM
 FILE: \\txdot\project\w\seon\line.com\TXDOT14\Documents\17 - BRY\Design Project\SETP-PD.dgn
 PROJECT: BRY\Design Project\SETP-PD.dgn
 DRAWING: SETP-PD.dgn
 DRAWING TITLE: SAFETY END TREATMENT FOR PIPE CULVERTS
 DRAWING NUMBER: 0122-03-033.ETC.
 COUNTY: FREESTONE, ETC.
 SHEET NO.: 111



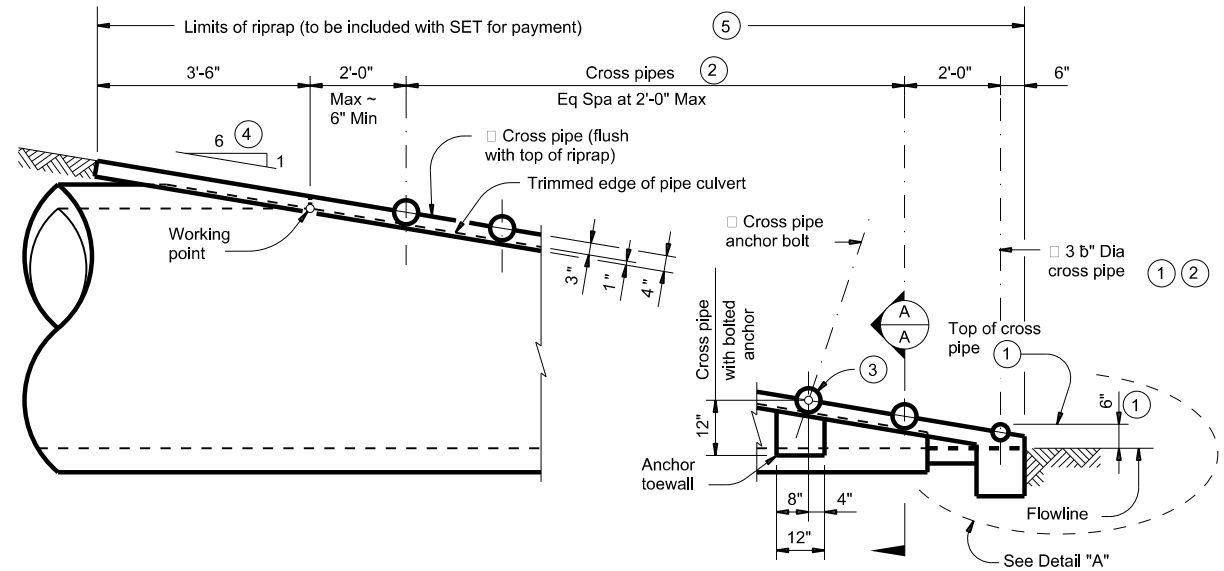
NOTE: All cross pipes, calculations, and dimensions are based on the pipe culverts mitered as shown in this detail. Alternate styles of mitered ends will require that appropriate adjustments be made to the values presented on this standard.

SIDE ELEVATION OF TYPICAL PIPE CULVERT MITER

(Showing corrugated metal pipe (CMP) culvert. Details at reinforced concrete pipe (RCP) culvert are similar.)

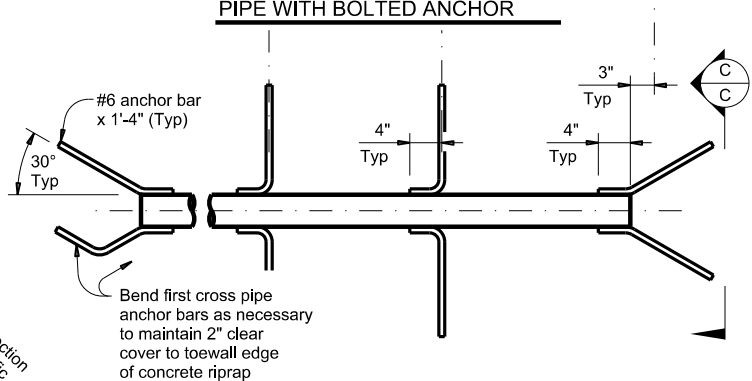
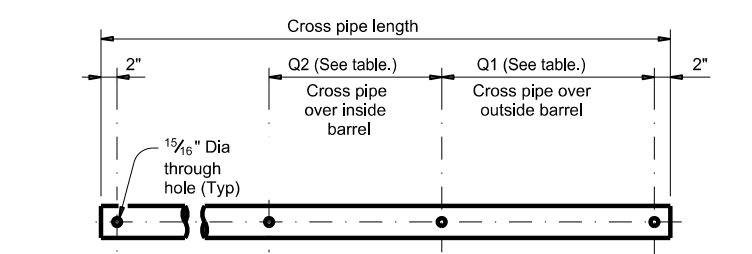


ISOMETRIC VIEW OF TYPICAL INSTALLATION

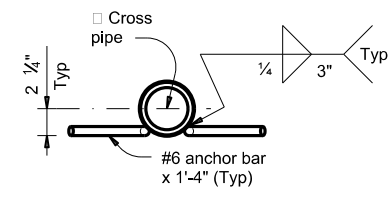


SIDE ELEVATION OF CAST-IN-PLACE CONCRETE

(Showing reinforced concrete pipe (RCP) culvert. Details at corrugated metal pipe (CMP) culvert are similar.)

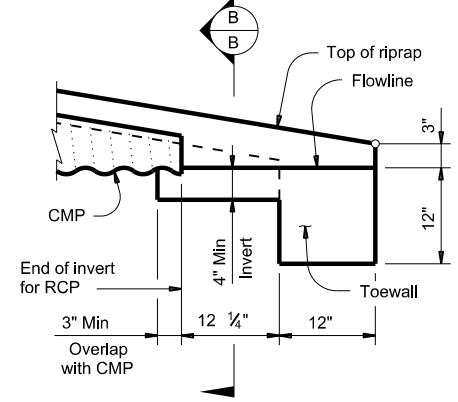


PIPE WITH ANCHOR BARS



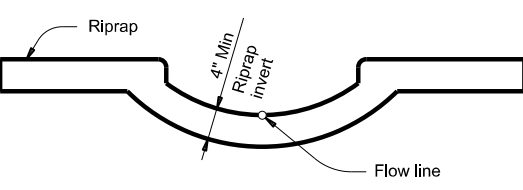
SECTION C-C

CROSS PIPE DETAILS



DETAIL "A"

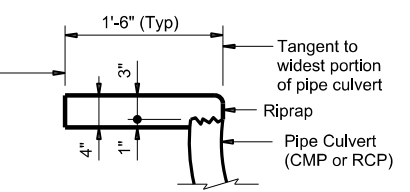
(Showing invert with corrugated metal pipe (CMP) culvert. Reinforced concrete pipe (RCP) culvert details are similar. Cross pipes not shown for clarity.)



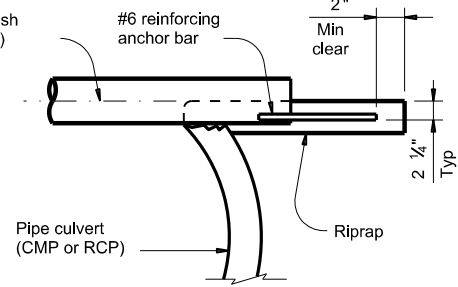
SECTION B-B

(Cross pipes not shown for clarity.)

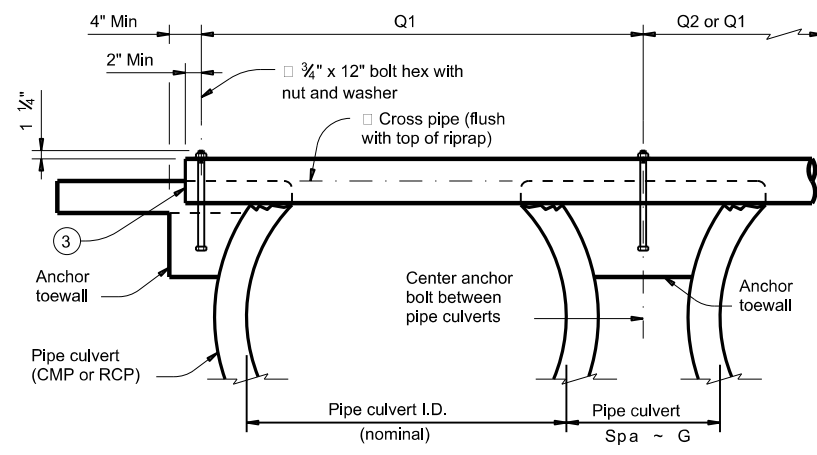
Limits of riprap (to be included with SET for payment) 5



SHOWING TYPICAL PIPE CULVERT AND RIPRAP



SHOWING CROSS PIPE WITH ANCHOR BAR



SECTION A-A

SHOWING CROSS PIPE WITH BOLTED ANCHOR

CROSS PIPE LENGTHS, REQUIRED PIPE SIZES, AND RIPRAP QUANTITIES

Nominal Culvert I.D.	Conc Riprap (CY) (6)	Pipe Culvert Spa ~ G	Single Barrel ~ Q1	Multi-Barrel ~ Q1	Q2	Conditions for Use of Cross Pipes	Cross Pipe Sizes
12"	0.6	0' - 9"	N/A	2' - 1"	1' - 9"	3 or more pipe culverts	3" Std (3.500" O.D.)
15"	0.7	0' - 11"	N/A	2' - 5"	2' - 2"		
18"	0.8	1' - 2"	N/A	2' - 10"	2' - 8"		
21"	0.9	1' - 4"	N/A	3' - 2"	3' - 1"	3 or more pipe culverts	3 1/2" Std (4.000" O.D.)
24"	0.9	1' - 7"	N/A	3' - 6"	3' - 7"		
27"	1.0	1' - 8"	N/A	3' - 10"	3' - 11"	2 or more pipe culverts	3 1/2" Std (4.000" O.D.)
30"	1.1	1' - 10"	N/A	4' - 2"	4' - 4"	All pipe culverts	
33"	1.2	1' - 11"	4' - 2"	4' - 5"	4' - 8"	All pipe culverts	4" Std (4.500" O.D.)
36"	1.3	2' - 1"	4' - 5"	4' - 9"	5' - 1"		
42"	1.5	2' - 4"	4' - 11"	5' - 5"	5' - 10"	All pipe culverts	5" Std (5.563" O.D.)
48"	1.7	2' - 7"	5' - 5"	6' - 0"	6' - 7"		
54"	2.0	3' - 0"	5' - 11"	6' - 9"	7' - 6"	All pipe culverts	5" Std (5.563" O.D.)
60"	2.2	3' - 3"	6' - 5"	7' - 4"	8' - 3"		
66"	2.4	3' - 3"	6' - 11"	7' - 10"	8' - 9"		
72"	2.7	3' - 4"	7' - 5"	8' - 5"	9' - 4"		

- The proper installation of the first cross pipe is critical for vehicle safety. Place the top of the first cross pipe no more than 6" above the flow line.
- Provide cross pipes, except the first bottom pipe, of the size shown in the table. Provide a 3 1/2" standard pipe (4" O.D.) for the first bottom pipe.
- Install the third cross pipe from the bottom of the culvert using a bolted connection. Ensure that riprap concrete does not flow into the cross pipe so as to permit disassembly of the bolted connection to allow cleanout access. At the Contractor's option, install all other cross pipes using the bolted connection details.
- Match cross slope as shown elsewhere in the plans. Cross slope of 6:1 or flatter is required for vehicle safety.
- Riprap placed beyond the limits shown will be paid for as concrete riprap in accordance with Item 432, "Riprap".
- Quantities shown are for one end of one reinforced concrete pipe (RCP) culvert. For multiple pipe culverts or for corrugated metal pipe (CMP) culverts, quantities will need to be adjusted. Riprap quantities are for contractor's information only.

MATERIAL NOTES:

Synthetic fibers listed on the "Fibers for Concrete" Material Producer List (MPL) may be used in lieu of steel reinforcing in riprap concrete unless noted otherwise. Provide cross pipes that meet the requirements of ASTM A53 (Type E or S, Gr B), ASTM A500 (Gr B), or API 5LX52. Provide ASTM A307 bolts and nuts. Galvanize all steel components, except concrete reinforcing, after fabrication. Repair galvanizing damaged during transport or construction in accordance with the specifications.

GENERAL NOTES:

Cross pipes are designed for a traversing load of 10,000 pounds at yield as recommended by Research Report 280-2F, "Safety Treatment of Roadside Parallel-Drainage Structures", Texas Transportation Institute, March 1981. Safety end treatments (SET) shown herein are intended for use in those installations where out of control vehicles are likely to traverse the openings approximately perpendicular to the cross pipes. Construct concrete riprap and all necessary inverts in accordance with the requirements of Item 432, "Riprap". Payment for riprap and toewall is included in the Price Bid for each Safety End Treatment.

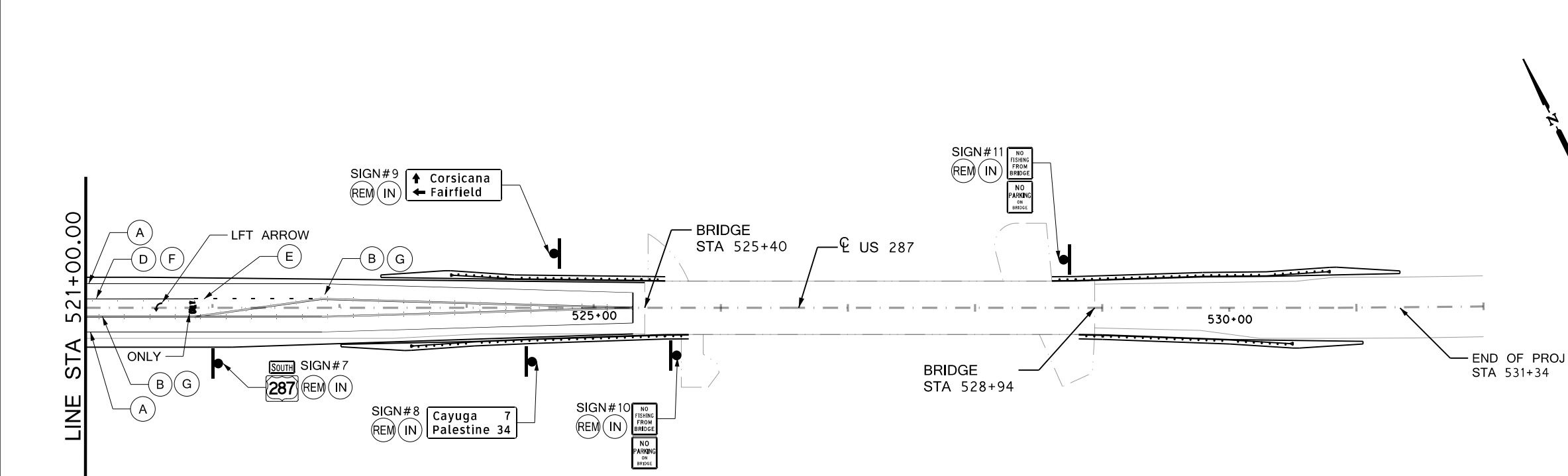
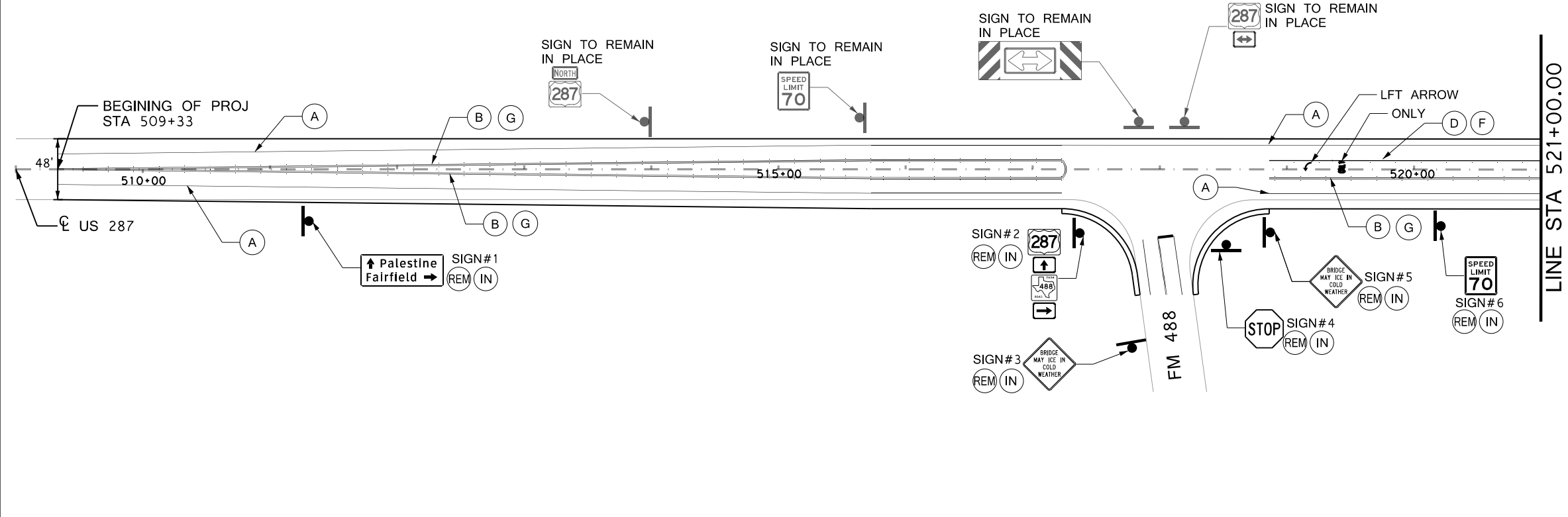
Bridge Division Standard

SAFETY END TREATMENT
FOR 12" DIA TO 72" DIA
PIPE CULVERTS
TYPE II ~ PARALLEL DRAINAGE

SETP-PD

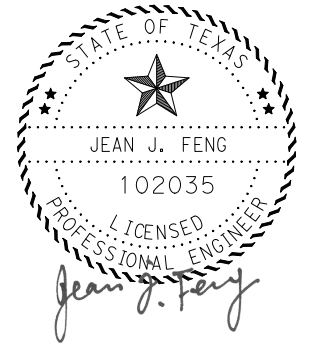
FILE: setppdse-20.dgn	DN: GAF	CK: CAT	DW: JRP	CK: GAF
©TXDOT	REVISIONS	CONT	SECT	JOB
	0122	03	033.ETC.	US 287, ETC.
	DIST	COUNTY	SHEET NO.	
	BRY	FREESTONE, ETC.	111	

REV DATE: 2-12-2015
 CS: 0122-03-033
 FILENAME: pw:\tdot\projectswisconsin.com\TXDOT4\Documents\17 - BRY\Design Projects\012203033\4 - Design Plan Set & Traffic RD. Signing\Layout\Signing and Striping Layout.dgn



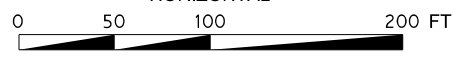
LEGEND	
(A)	(W) (4") (SLD)
(B)	(Y) (4") (SLD)
(C)	(Y) (4") (BRK)
(D)	(W) (8") (SLD)
(E)	(W)(8")(DOT)
(F)	REFL PAV MRK TYI-C
(G)	REFL PAV MRK TYII-A-A
(H)	SIGN
(I)	REMOVE EXISTING SIGN
(J)	INSTALL NEW SIGN
(K)	DOUBLE WHITE DELINEATOR (D-DY)
(L)	DOUBLE YELLOW DELINEATOR (D-DW)
(M)	SINGLE WHITE DELINEATOR (D-SW)
(N)	SINGLE YELLOW DELINEATOR (D-SY)
(O)	OBJECT MARKER (OM-2)
(P)	OBJECT MARKER (OM-3)

GENERAL NOTES:



05/30/2022

HORIZONTAL



PRINT DATE	REVISION DATE
5/26/2022	



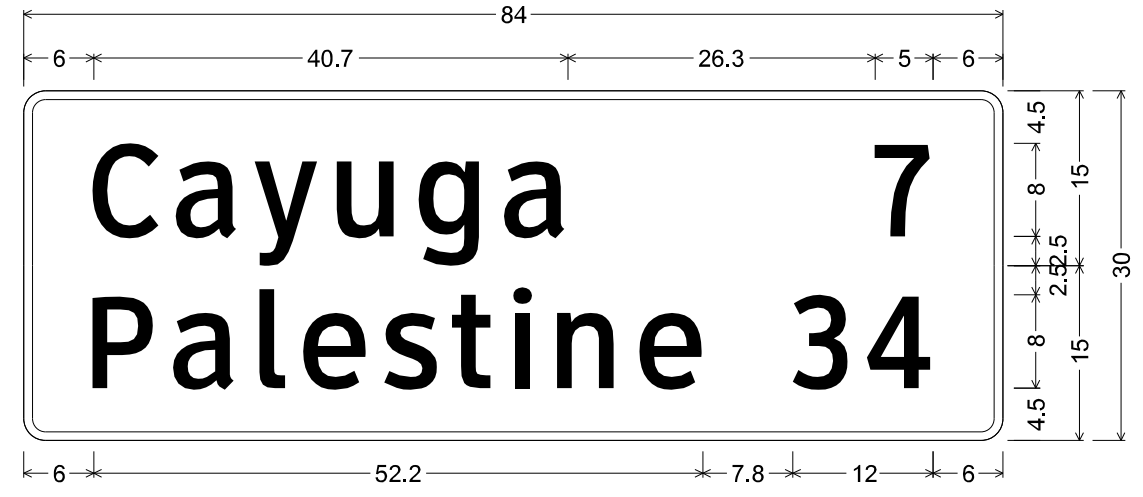
SIGNING & STRIPING LAYOUT (US 287)

FED. RD. DIV. NO.	PROJECT NUMBER	HIGHWAY NUMBER	
6		US 287, ETC.	
STATE	DISTRICT	COUNTY	
TEXAS	BRYAN	FREESTONE, ETC.	
CONTROL	SECTION	JOB	SHEET NO.
0122	03	033,ETC.	112

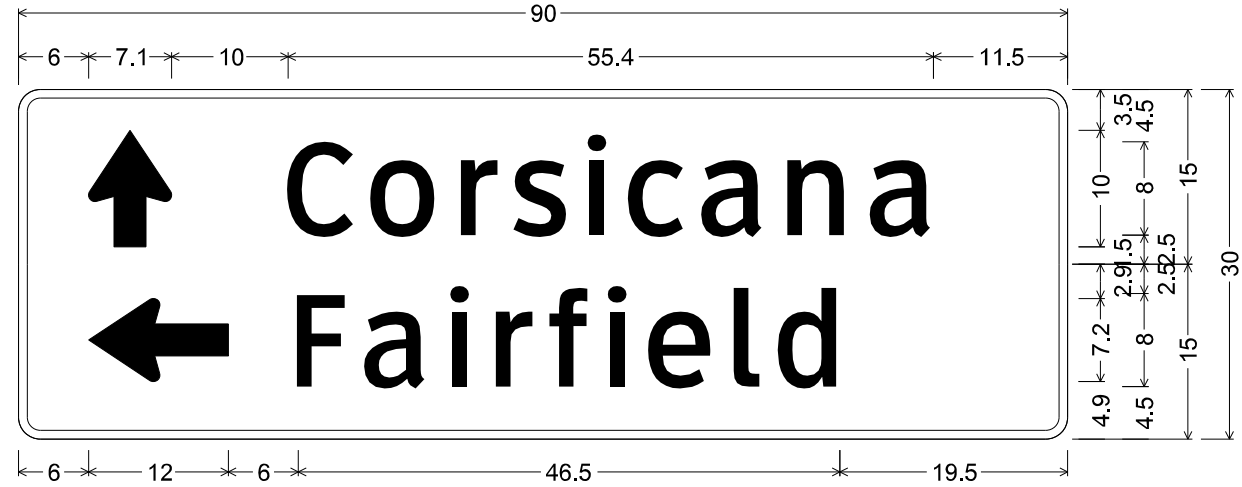
REV DATE: 2-12-2015
 CSJ: 0122-03-033
 FILENAME: pw:\tdot\projectswiseline.com\TXDOT4\Documents\17 - BRY\Design Projects\01203033\4 - Design Plan Set\8. Traffic\8E_GuideSignDetails\Small Sign Details.dgn



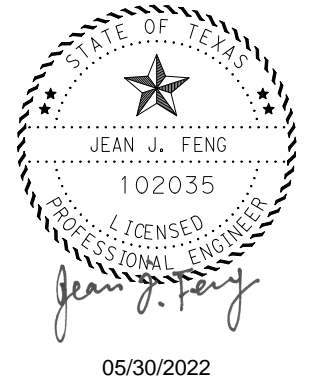
D1-2 8in UP-RT;
 1.9" Radius, 0.8" Border, White on, Green;
 Standard Arrow Custom 10.0" X 7.1" 90"; "Palestine", ClearviewHwy-3-W;
 1.9" Radius, 0.8" Border, White on, Green;
 "Fairfield", ClearviewHwy-3-W; Standard Arrow Custom 12.0" X 7.1" 0";



D2-2 8in;
 1.9" Radius, 0.8" Border, White on, Green;
 "Cayuga", ClearviewHwy-3-W; "7", ClearviewHwy-3-W;
 1.9" Radius, 0.8" Border, White on, Green;
 "Palestine", ClearviewHwy-3-W; "34", ClearviewHwy-3-W;



D1-2 8in UP-LT;
 1.9" Radius, 0.8" Border, White on, Green;
 Standard Arrow Custom 10.0" X 7.1" 90"; "Corsicana", ClearviewHwy-3-W;
 1.9" Radius, 0.8" Border, White on, Green;
 Standard Arrow Custom 12.0" X 7.1" 180"; "Fairfield", ClearviewHwy-3-W;



Drawings Not To Scale
 PRINT DATE: 5/26/2022
 REVISION DATE:

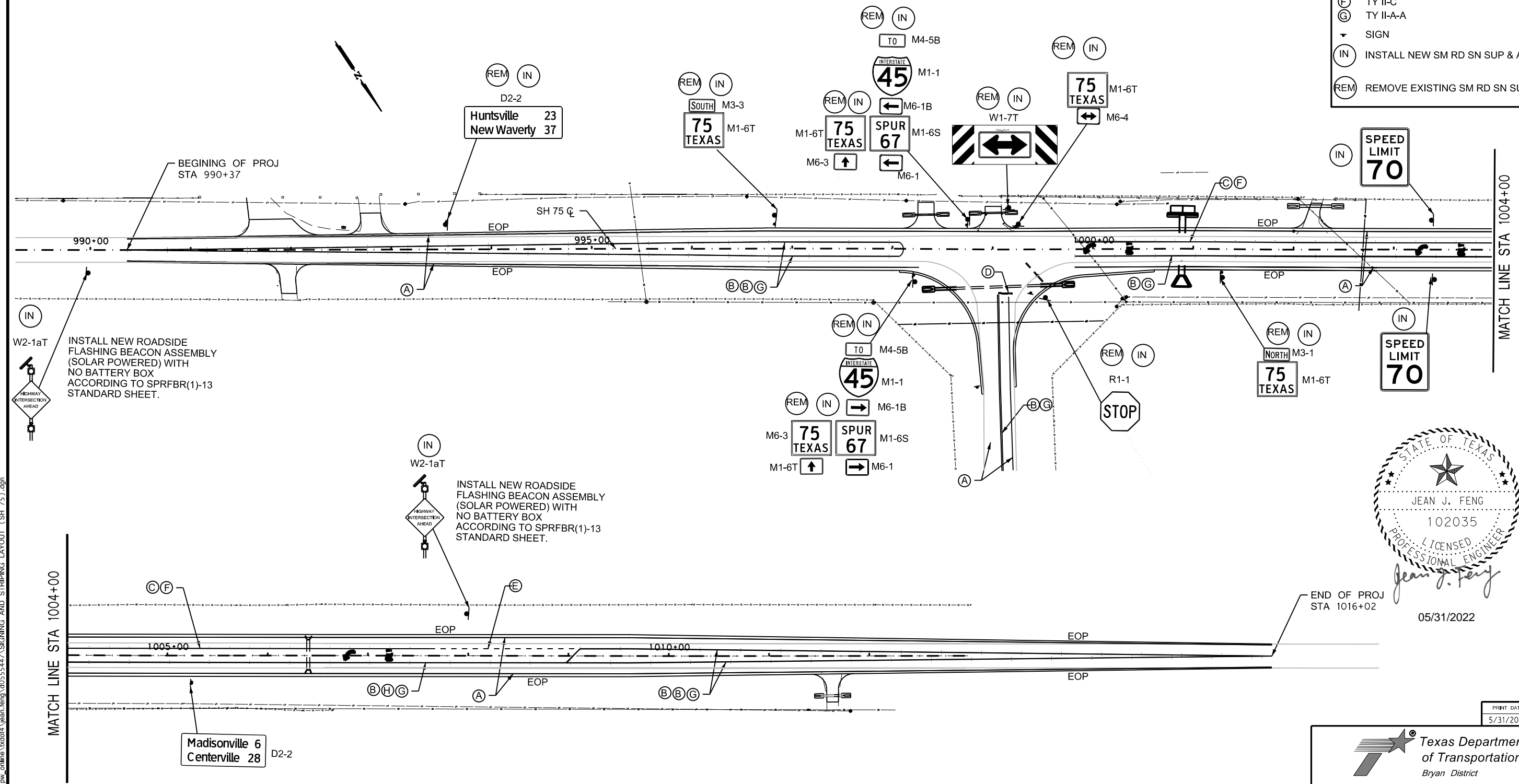
Texas Department of Transportation ©2022
 Bryan District

SMALL SIGN DETAILS (US 287)

FED. RD. DIV. NO.	PROJECT NUMBER	HIGHWAY NUMBER	
6		US 287, ETC.	
STATE	DISTRICT	COUNTY	
TEXAS	BRYAN	FREESTONE, ETC.	
CONTROL	SECTION	JOB	SHEET NO.
0122	03	033,ETC.	114

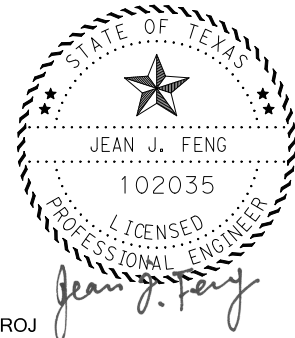
LEGEND

- (A) (W) (4") (SLD)
- (B) (Y) (4") (SLD)
- (C) (W) (8") (SLD)
- (D) (W) (24") (SLD)
- (E) (W) (8") (DOT)
- (F) TY II-C
- (G) TY II-A-A
- ▼ SIGN
- (IN) INSTALL NEW SM RD SN SUP & AM
- (REM) REMOVE EXISTING SM RD SN SUP & AM



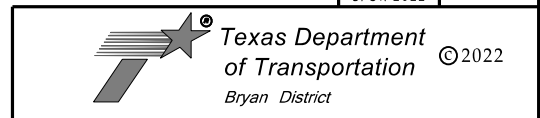
W2-1aT
INSTALL NEW ROADSIDE FLASHING BEACON ASSEMBLY (SOLAR POWERED) WITH NO BATTERY BOX ACCORDING TO SPRFBR(1)-13 STANDARD SHEET.

W2-1aT
INSTALL NEW ROADSIDE FLASHING BEACON ASSEMBLY (SOLAR POWERED) WITH NO BATTERY BOX ACCORDING TO SPRFBR(1)-13 STANDARD SHEET.



END OF PROJ STA 1016+02
05/31/2022

PRINT DATE	REVISION DATE
5/31/2022	





















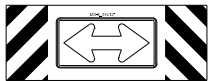
SIGNING AND STRIPING LAYOUT (SH 75)

FED. RD. DIV. NO.	PROJECT NUMBER	HIGHWAY NUMBER	
6		US 287, ETC.	
STATE	DISTRICT	COUNTY	
TEXAS	BRYAN	FREESTONE, ETC.	
CONTROL	SECTION	JOB	SHEET NO.
0122	03	033, ETC.	115

REV DATE: 2-12-2015
CSJ: 0122-03-033
FILENAME: c:\pwork\online\tdot\jean.feng\102035\447_SIGNING AND STRIPING LAYOUT (SH 75).dgn

SUMMARY OF SMALL SIGNS

DATE: 5/27/2022 11:24:05 AM
 FILE: c:\txdot\pw_online\txdot4\jean.feng\40555389\Summary of Small Signs.dwg

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		
										PREFABRICATED		1EXT or 2EXT = # of Ext BM = Extruded Wind Beam WC = 1.12 #/ft Wing Channel EXAL= Extruded Alum Sign Panels
	1	W2-1aT		48 X 48	✓		10BWG	1	SA	P		
	2	D2-2		84 X 30	✓		Sch 80	1	SA	T		
	3	M3-3		24 X 12	✓		10BWG	1	SA	P		
		M1-6T		24 X 24								
	4	M4-5B		24 X 12	✓		10BWG	1	SA	U	1EXT	
		M1-1		24 X 24								
		M6-1B		24 X 12								
		M1-6S M1-6T	 	24 X 24								
		M6-3 M6-1	 	24 X 12								
	5	M4-5B		24 X 12	✓		10BWG	1	SA	U	1EXT	
		M1-1		24 X 24								
		M6-1B		24 X 12								
		M1-6T M1-6S	 	24 X 24								
		M6-3 M6-1	 	24 X 12								
	6	W1-7T		96 X 36	✓		Sch 80	2	SA	T		

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

The Standard Highway Sign Designs for Texas (SHSD) can be found at the following website.
<http://www.txdot.gov/>

- NOTE:**
- 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.
 - For installation of bridge mount clearance signs, see Bridge Mounted Clearance Sign Assembly (BMCS) Standard Sheet.
 - 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 (SH 75)

SHEET 1 OF 2

FILE: slums16.dgn	DN: TxDOT	CK: TxDOT	DW: TxDOT	CR: TxDOT
© TxDOT May 1987	CONT	SECT	JOB	HIGHWAY
REVISIONS				
4-16	DIST	COUNTY	SHEET NO.	
8-16			116	

SUMMARY OF SMALL SIGNS

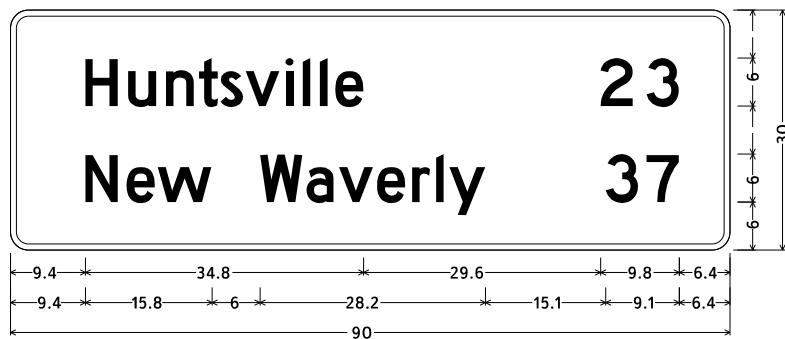
DISCLAIMER: The use of this standard is governed by the "Texas Engineering Practice Act". No warranty of any kind is made by TxDOT for any purpose whatsoever. TxDOT assumes no responsibility for the conversion of any information to other formats or for incorrect results or damages resulting from its use.

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		
										PREFABRICATED		1EXT or 2EXT = # of Ext
	7	M1-6T M6-4		24 X 24 12 X 15	✓		10BWG	1	SA	P		
	8	R1-1		36 X 36	✓		10BWG	1	SA	P		
	9	M3-1 M1-6T	 	24 X 12 24 X 24	✓		10BWG	1	SA	P		
	10-11	R2-1		30 X 36	✓		10BWG	1	SA	P		
	12	D2-2		96 X 30	✓		Sch 80	1	SA	T		
	13	W2-1aT		48 X 48	✓		10BWG	1	SA	P		

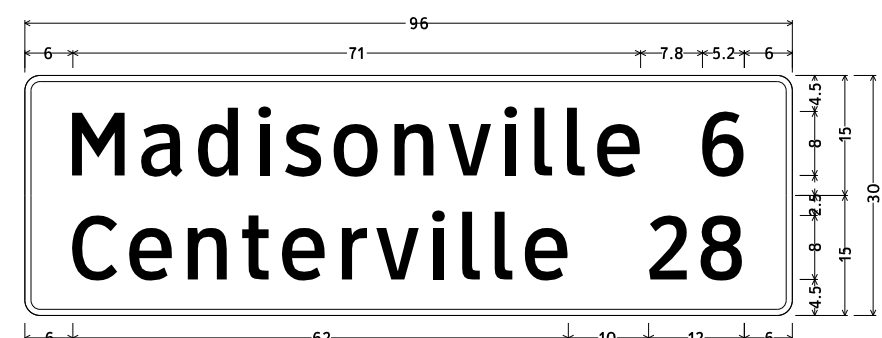
ALUMINUM SIGN BLANKS THICKNESS	
Square Feet	Minimum Thickness
Less than 7.5	0.080"
7.5 to 15	0.100"
Greater than 15	0.125"

The Standard Highway Sign Designs for Texas (SHSD) can be found at the following website:
<http://www.txdot.gov/>

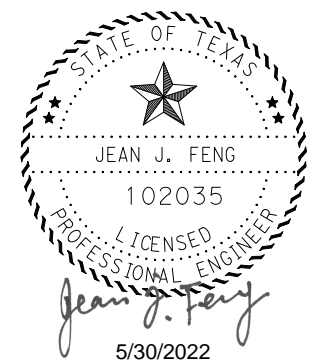
- NOTE:**
- Sign supports shall be located as shown on the plans, except that the Engineer may shift the sign supports, within design guidelines, where necessary to secure a more desirable location or to avoid conflict with utilities. Unless otherwise shown on the plans, the Contractor shall stake and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



D2-2_VARX30;
 2.3" Radius, 0.8" Border, White on Green;
 "Huntsville", D 2K; "23", D 2K; "New Waverly", D 2K; "37", D 2K;



D2-2 8in;
 1.9" Radius, 0.8" Border, White on Green;
 "Madisonville", ClearviewHwy-3-W; "6", ClearviewHwy-3-W;
 "Centerville", ClearviewHwy-3-W; "28", ClearviewHwy-3-W;



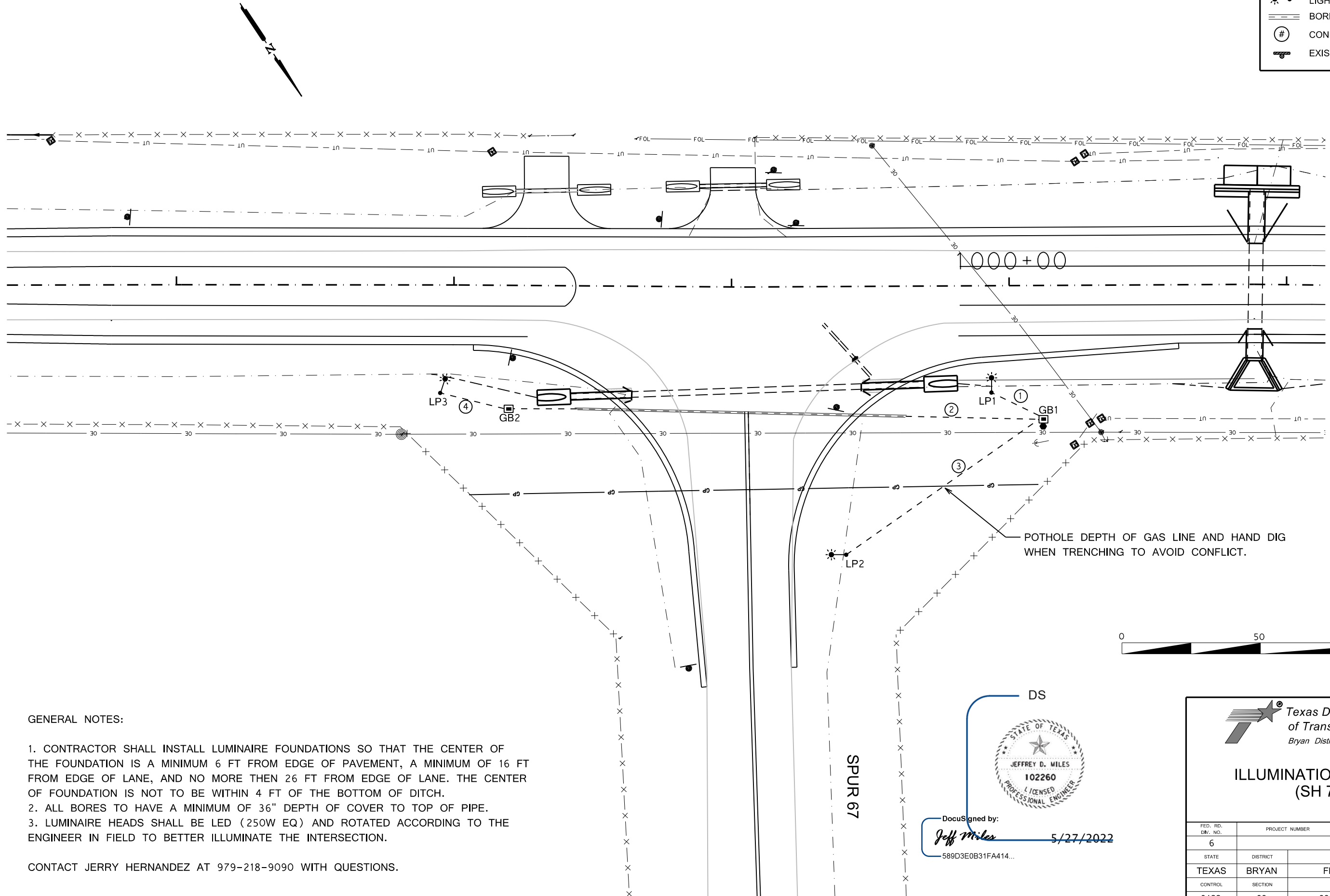
SUMMARY OF SMALL SIGNS (SH 75)

SHEET 2 OF 2

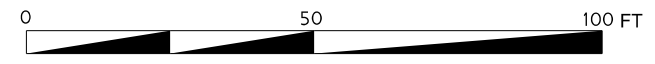
FILE: slums16.dgn	DN: TxDOT	CK: TxDOT	DW: TxDOT	CK: TxDOT
© TxDOT May 1987	CONT	SECT	JOB	HIGHWAY
REVISIONS				
4-16	DIST	COUNTY		SHEET NO.
8-16				117

DATE: 5/28/2022 12:43:54 AM
 FILE: c:\txdot\p_w_online\txdot4\jean.feng\40555389\Summary of Small Signs

LEGEND	
	SERVICE POLE
	CONDUIT
	GROUND BOX
	LIGHT POLE
	BORE CONDUIT
	CONDUIT LABEL NUMBER
	EXISTING SIGN



POTHOLE DEPTH OF GAS LINE AND HAND DIG WHEN TRENCHING TO AVOID CONFLICT.



GENERAL NOTES:

1. CONTRACTOR SHALL INSTALL LUMINAIRE FOUNDATIONS SO THAT THE CENTER OF THE FOUNDATION IS A MINIMUM 6 FT FROM EDGE OF PAVEMENT, A MINIMUM OF 16 FT FROM EDGE OF LANE, AND NO MORE THEN 26 FT FROM EDGE OF LANE. THE CENTER OF FOUNDATION IS NOT TO BE WITHIN 4 FT OF THE BOTTOM OF DITCH.
2. ALL BORES TO HAVE A MINIMUM OF 36" DEPTH OF COVER TO TOP OF PIPE.
3. LUMINAIRE HEADS SHALL BE LED (250W EQ) AND ROTATED ACCORDING TO THE ENGINEER IN FIELD TO BETTER ILLUMINATE THE INTERSECTION.

CONTACT JERRY HERNANDEZ AT 979-218-9090 WITH QUESTIONS.

DocuSigned by:

 Jeff Miles 5/27/2022
 589D3E0B31FA414...

PRINT DATE 5/26/2022		REVISION DATE	
Texas Department of Transportation ©2022 Bryan District			
ILLUMINATION LAYOUT (SH 75)			
FED. RD. DIV. NO. 6	PROJECT NUMBER	HIGHWAY NUMBER US 287, ETC.	
STATE TEXAS	DISTRICT BRYAN	COUNTY FREESTONE, ETC.	
CONTROL 0122	SECTION 03	JOB 033, ETC.	SHEET NO. 118

REV DATE: 2-12-2015
 CSJ: 0122-03-033
 FILENAME: c:\vdot\p_w_online\txdot4\jean.feng\40555446\ILLUMINATIONLAYOUT1.dgn

DATE: 5/26/2022 4:41:12 PM
 FILE: \\txdot.projectwiseonline.com:TXDOT4\Documents\17 - BRY\Design Projects\170933\170933.dwg
 The use of this standard is governed by the "Texas Engineering Practice Act". No warranty of any kind is made by TxDOT for any purpose whatsoever. TxDOT assumes no responsibility for the conversion of units or the use of the information contained herein for any purpose other than that for which it was prepared.

REFLECTOR UNIT SIZES FOR DELINEATORS AND OBJECT MARKERS				DELINEATORS				D & OM DESCRIPTIVE CODES	
DEVICE	SIZE 1	SIZE 2	SIZE 3	SIZE 4	SINGLE		DOUBLE		
									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
SHEETING: Yellow, White or Red Type B or C reflective sheeting				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 (fix). 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.				POST TYPE: WC, YFLX, WFLX, WC, YFLX, WFLX				MOUNT TYPE: GND, GND, SRF, GND, SRF	

OBJECT MARKERS								D & OM DESCRIPTIVE CODES	
DEVICE	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	
								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 unit (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	
SHEETING: Yellow-Type B _{FL} or C _{FL} Sheeting		SHEETING: Yellow - Type B or C Sheeting			SHEETING: Alternating acrylic black and retroreflective yellow - Type B _{FL} or C _{FL} Sheeting			SHEETING: Red -Type B _{FL} or C _{FL} Sheeting	
POST TYPE: TWT		POST TYPE: WC		POST TYPE: WFLX	POST TYPE: TWT			POST TYPE: TWT	
MOUNT TYPE: WAS, WAP		MOUNT TYPE: GND		MOUNT TYPE: GND, SRF	MOUNT TYPE: WAS, WAP			MOUNT TYPE: WAS, WAP	

DEPARTMENTAL MATERIAL SPECIFICATIONS	
FLEXIBLE DELINEATOR & OBJECT MARKER POSTS (EMBEDDED & SURFACE MOUNT TYPES)	DMS-4400
SIGN FACE MATERIALS	DMS-8300
DELINEATORS, OBJECT MARKERS AND BARRIER REFLECTORS	DMS-8600

BARRIER REFLECTORS (BRF)			CHEVRONS				ONE DIRECTION LARGE ARROW		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.
DEVICE	GF1	GF2	CTB	W1-8				W1-6	
SHEETING: Yellow, White, Red			SHEETING: Yellow, White, Red				SHEETING: Yellow, White, Red		
NOTE: 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.			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).				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).		
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"				MOUNTING HEIGHT: 7'-0"		

Texas Department of Transportation
 Traffic Safety Division Standard

DELINEATOR & OBJECT MARKER MATERIAL DESCRIPTION

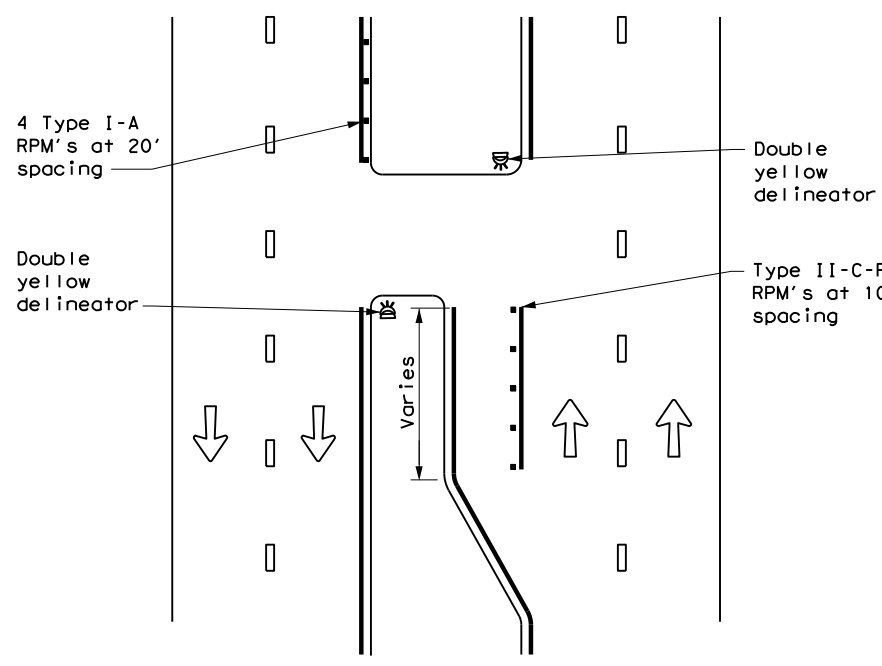
D & OM(1)-20

FILE: dom1-20.dgn	DN: TXDOT	CK: TXDOT	OW: TXDOT	CR: TXDOT
© TXDOT August 2004	CONT	SECT	JOB	HIGHWAY
REVISIONS	0122	03	033, ETC	US 287, ETC
10-09 3-15	DIST	COUNTY	SHEET NO.	
4-10 7-20	BRY	FREESTONE, ETC	119	

DISCLAIMER: The use of this standard is governed by the "Texas Engineering Practice Act". No warranty of any kind is made by TxDOT for any purpose whatsoever. TxDOT assumes no responsibility for the conversion of units or the use of this standard in any other manner than that intended by the original author.

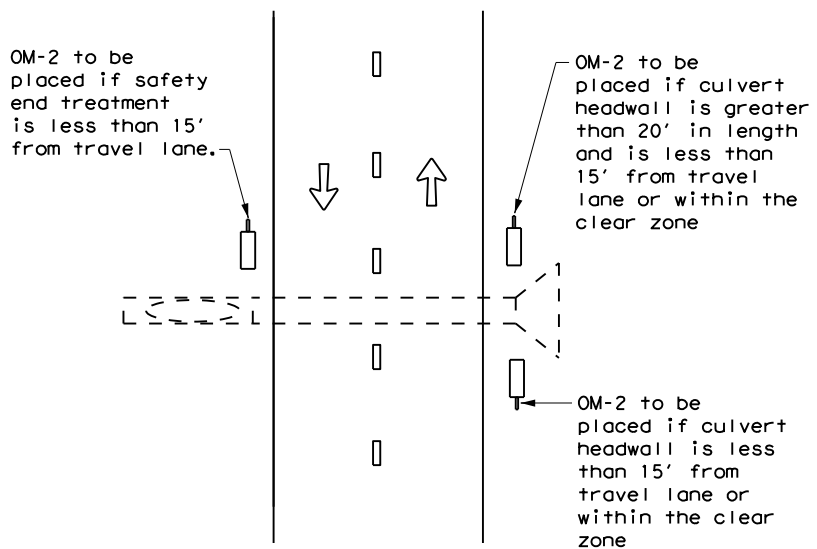
DATE: 5/26/2022 4:41:21 PM
 FILE: \\txdot.projectwiseonline.com:TXDOT14\Documents\17 - BRY\Design Projects\17-00000000000000000000000000000000.dgn

CROSSOVERS



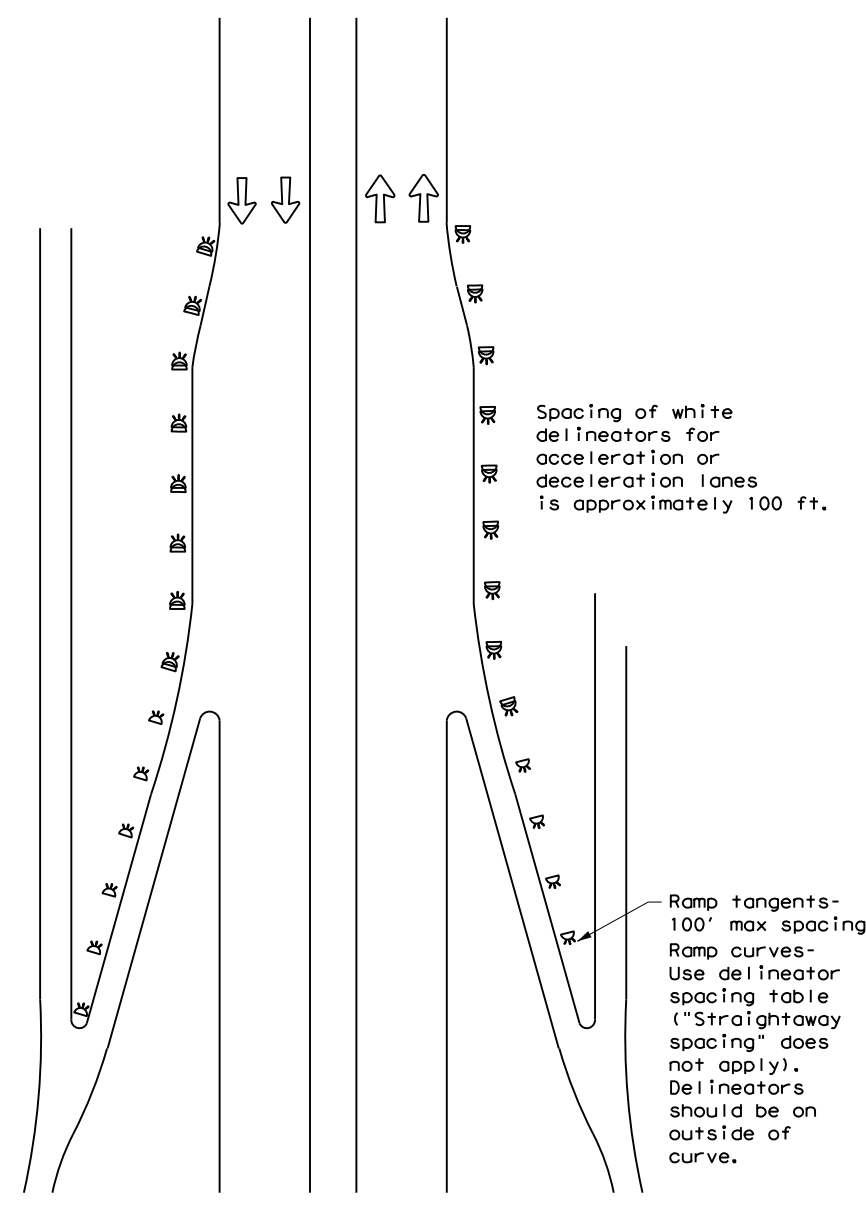
DETAIL 1

FOR CULVERTS WITHOUT MBGF



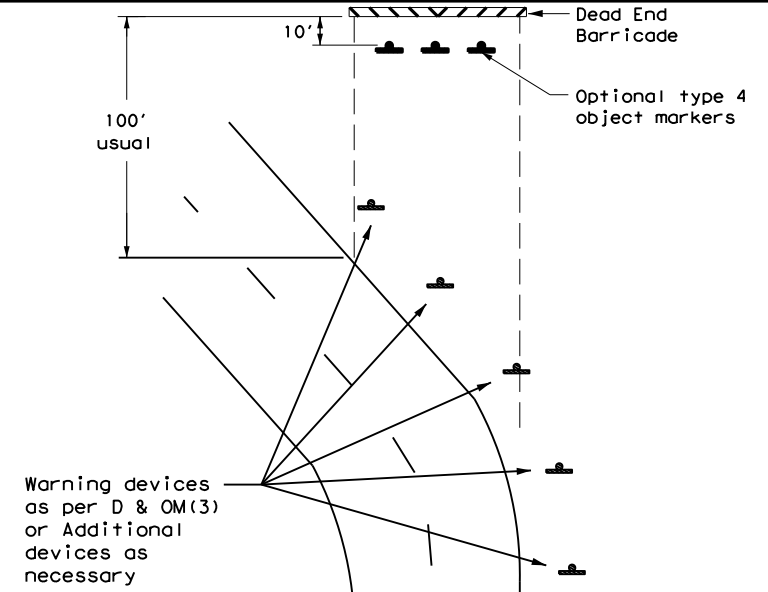
DETAIL 2

FREEWAY DELINEATION FOR RAMPS AND ACCELERATION/DECELERATION LANES



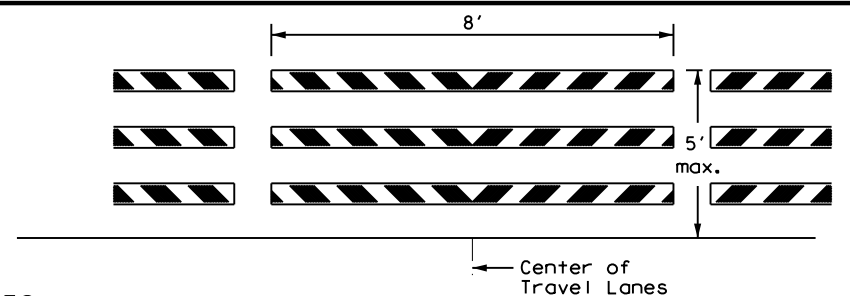
DETAIL 3

TYPICAL APPLICATION OF DEAD END BARRICADE



DETAIL 4

TYPICAL DEAD END BARRICADE INSTALLATION



NOTES

- Barricade striping shall be red and white reflective sheeting for all permanent road closures.
- Barricade striping is red and white sloping toward the center of the roadway.
- 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



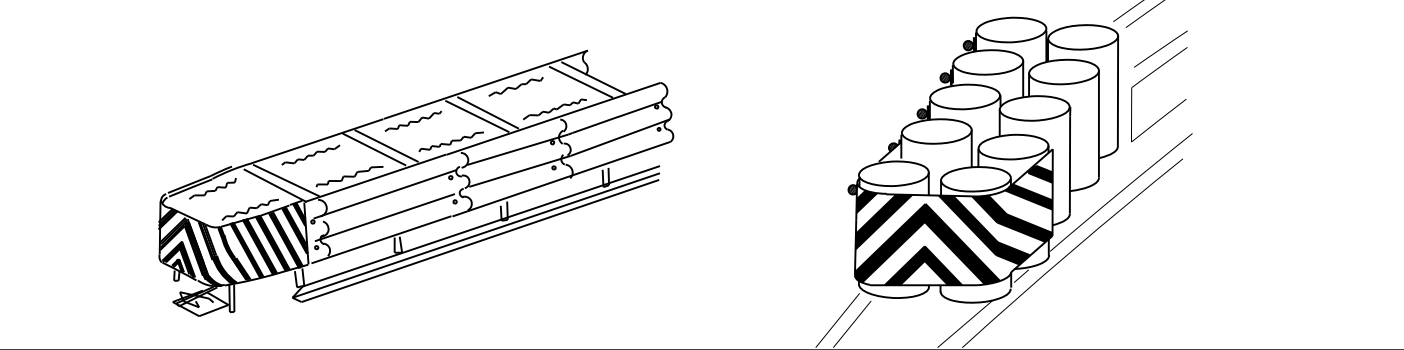
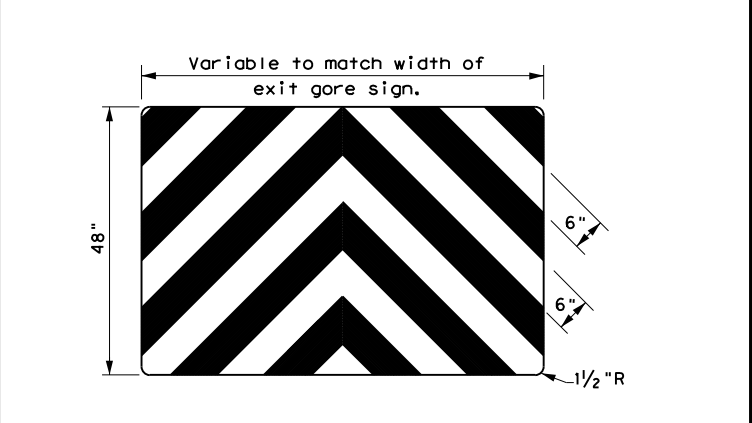
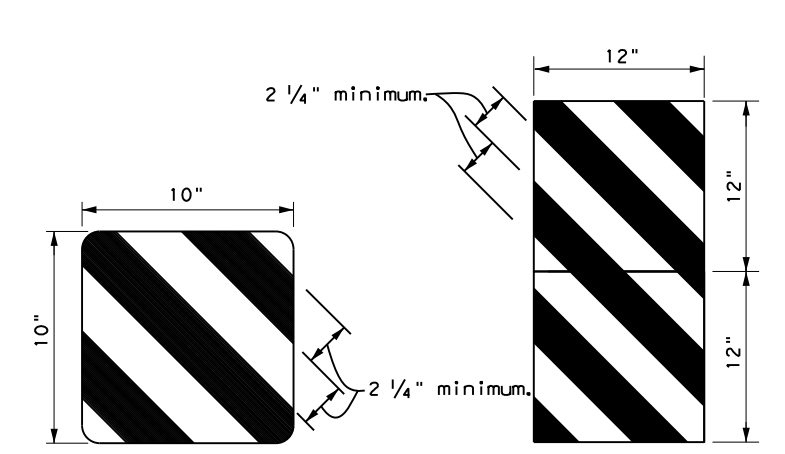
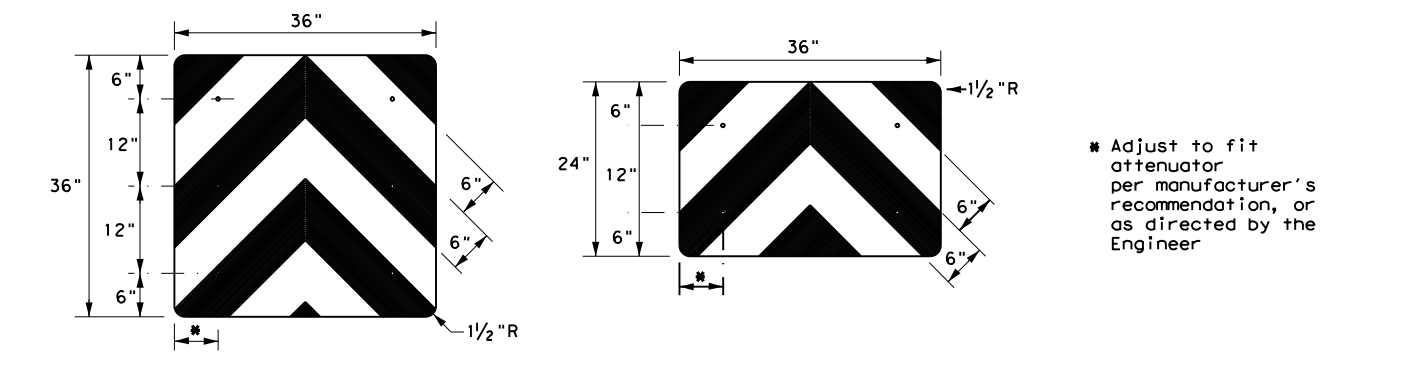
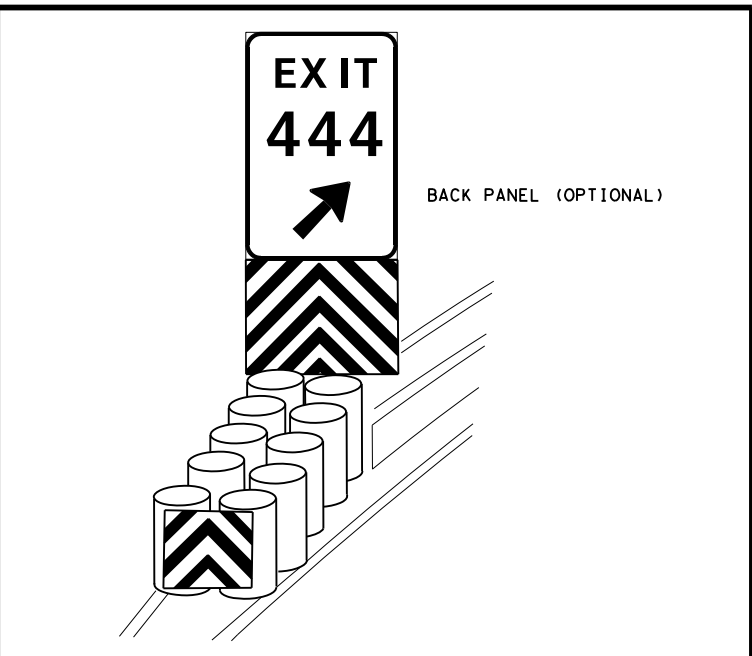
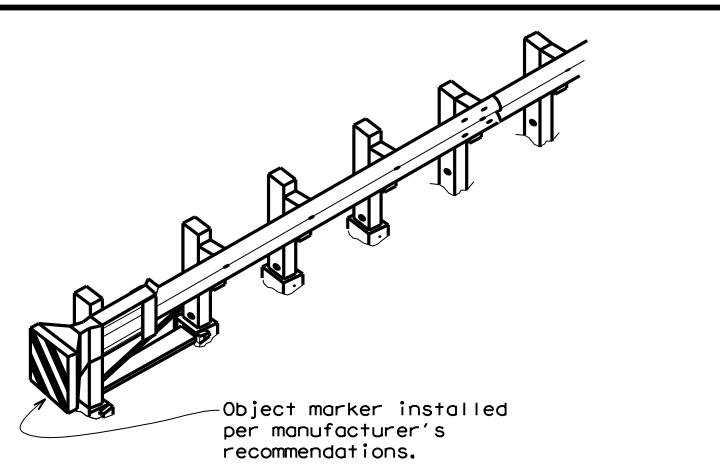
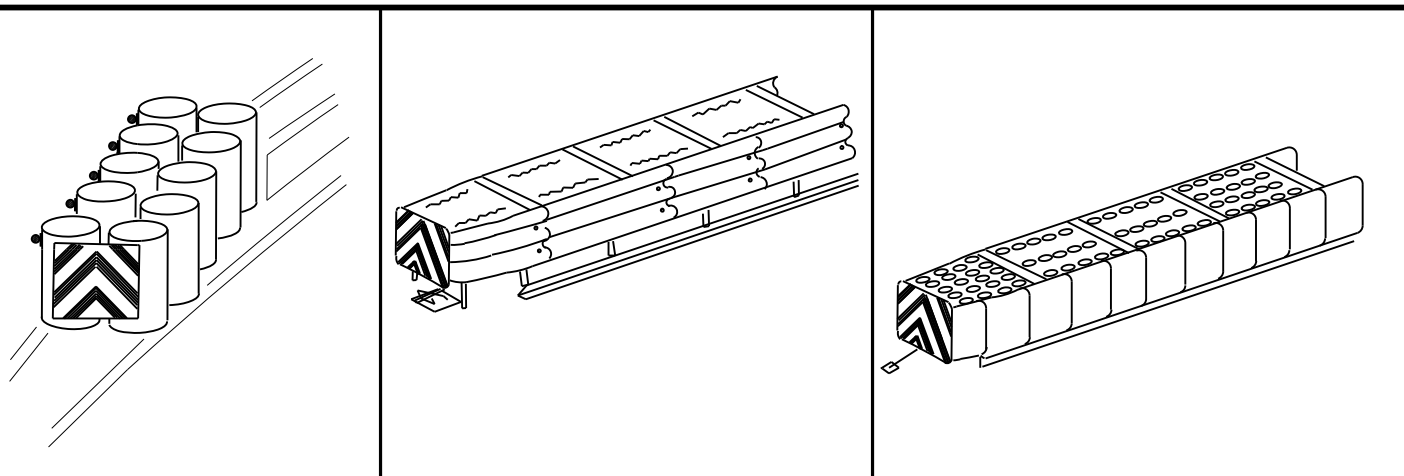
DELINEATOR & OBJECT MARKER PLACEMENT DETAILS

D & OM(4) -20

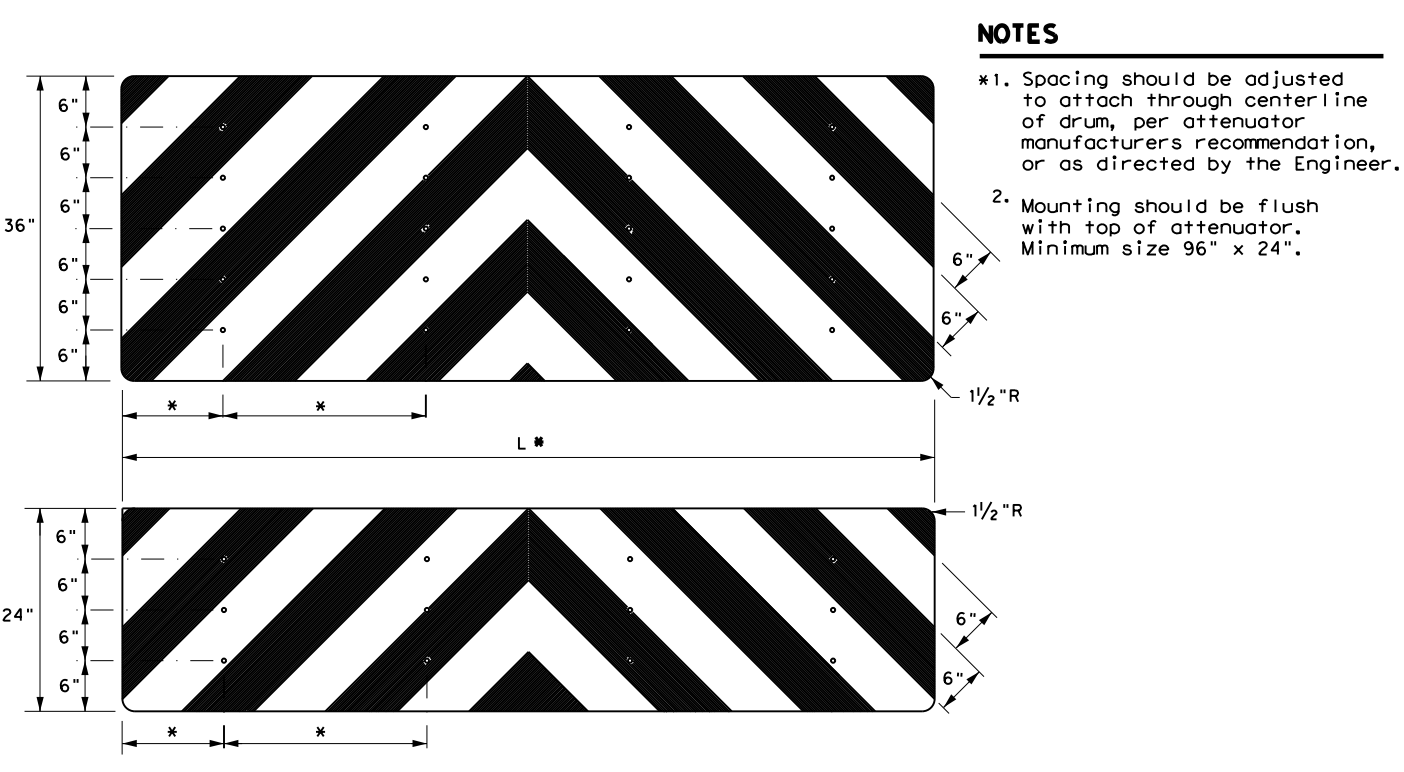
FILE: dom4-20.dgn	DN: TXDOT	CK: TXDOT	OW: TXDOT	CR: TXDOT
© TXDOT August 2004	CONT	SECT	JOB	HIGHWAY
REVISIONS	0122	03	033, ETC	US 287, ETC
3-15	DIST	COUNTY	SHEET NO.	
7-20	BRY	FREESTONE, ETC	121	

DISCLAIMER: The use of this standard is governed by the "Texas Engineering Practice Act". No warranty of any kind is made by TxDOT for any purpose whatsoever. TxDOT assumes no responsibility for the conversion of units or for the accuracy of the information contained herein. The user of this standard is advised to consult the Texas Engineering Practice Act for further information.

DATE: 5/26/2022 4:41:31 PM
 FILE: \\txdot\project\wiseon\line.com:TXDOT14\Documents\17 - BRY\Design Project\170909\170909.dgn



OBJECT MARKERS SMALLER THAN 3 FT²



NOTES

- Object Markers shall conform to the Texas MUTCD and meet the color and reflectivity requirement of Department Material Specification DMS 8300. Background shall be yellow reflective sheeting (Type B or C) and Chevron shall be black.
- Object Markers may be fabricated from adhesive backed reflective sheeting applied directly to guardrail end treatment, or applied directly to an "end cap" as per the manufacturer's recommendation. Direct applied sheeting shall provide a smooth surface and have no wrinkles, air bubbles, cuts or tears. A radius at the corners is not required for direct applied sheeting.
- Object Marker size may be reduced to fit smaller devices. Width of alternating black and yellow stripes are typically 6". Object Markers smaller than 3ft may have reduced width stripes of a minimum of 2 1/4".
- Pop rivets, screws, or nuts and bolts may be used to attach object markers and reflectors. Holes, slots or other openings may be cut or drilled through object markers to allow cable or other attachments.
- Object Marker at nose of attenuator is subsidiary to the attenuator.
- See D & OM (1-4) for required barrier reflectors.

		Traffic Safety Division Standard	
DELINEATOR & OBJECT MARKER FOR VEHICLE IMPACT ATTENUATORS D & OM(VIA) -20			
FILE: domvia20.dgn	DN: TXDOT	CK: TXDOT	OW: TXDOT
© TXDOT December 1989	CONT: 0122	SECT: 03	JOB: 033,ETC. US 287, ETC.
REVISIONS		DIST: COUNTY	SHEET NO.
4-92 8-04		BRY	FREESTONE, ETC.
8-95 3-15			123
4-98 7-20			
20G			

GENERAL NOTES FOR ALL ELECTRICAL WORK

1. The location of all conduits, junction boxes, ground boxes, and electrical services is diagrammatic and may be shifted to accommodate field conditions.
2. Provide new and unused materials. Ensure that all materials and installations comply with the applicable articles of the National Electrical Code (NEC), TxDOT standards and specifications, National Electrical Manufacturers Association (NEMA), and are listed by Underwriters Laboratories (UL) or a Nationally Recognized Testing Lab (NRTL). NRTLs such as Canadian Standard Association (CSA), Intertek Testing Services NA Inc., or FM Approvals LLC can be considered equivalent to UL. Where reference is made to NEMA listed devices, International Electrotechnical Commission (IEC) listed devices will not be considered an acceptable equal to a NEMA listed device. Acceptable devices may have both a NEMA and IEC listing. Faulty fabrication or poor workmanship in any material, equipment, or installation is justification for rejection. Replace or reinstall rejected material or equipment at no additional cost to the Department.
3. Miscellaneous nuts, bolts and hardware, except for high strength bolts, may be stainless steel when plans specify galvanized, provided the bolt size is 1/2 in. or less in diameter.
4. Provide the following test equipment as required by the Engineer to confirm compliance with the contract and the NEC: voltmeter, ammeter, megohm meter (1000 volt DC), ground resistance tester, torque wrenches, and torque screwdrivers. Ensure all equipment has been properly calibrated within the last year. Provide calibration certification to the Engineer upon request. Operate test equipment during inspection as requested by the Engineer.
5. Install grounding as shown on the plans and in accordance with the NEC. Ensure all metallic conduits; metal poles; luminaires; and metal enclosures are bonded to the equipment grounding conductor. Provide stranded bare copper or green insulated grounding conductors. Ground rods, connectors, and bonding jumpers are subsidiary to the various bid items.
6. When required by the Engineer, notify the Department in writing of materials from the Material Producers List (MPL) intended for use on each project. Prequalified materials are listed on the MPL on TxDOT's website under "Roadway Illumination and Electrical Supplies." No substitutions will be allowed for materials on this list.

CONDUIT

A. MATERIALS

1. Provide conduit, junction boxes, fittings, and hardware as per TxDOT Departmental Material Specification (DMS) 11030 "Conduit" and Item 618 "Conduit" of TxDOT's "Standard Specifications For Construction And Maintenance Of Highways, Streets, And Bridges," latest edition. Provide conduits listed under Item 618 on the MPL under "Roadway Illumination and Electrical Supplies." Provide conduit types according to the descriptive code or as shown on the plans. Do not substitute other types of conduits for those shown. Provide liquidtight flexible metal conduit (LFMC) when flexible conduit is called for on galvanized steel rigid metallic conduit (RMC) systems. Provide liquidtight flexible nonmetallic conduit (LFNC) when flexible conduit is called for on polyvinyl chloride (PVC) systems.
2. Provide galvanized steel RMC for all exposed conduits, unless otherwise shown on the plans. Properly bond all metal conduits.
3. Unless otherwise shown on the plans, provide junction boxes with a minimum size as shown in the following table, which applies to the greatest number of conductors entering the box through one conduit with no more than four conduits per box. When a mixture of conductor sizes is present, count the conductors as if all are of the larger size. For situations not applicable to the table, size junction boxes in accordance with NEC.

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

4. Junction boxes with an internal volume of less than 100 cu. in. and supported by entering raceways must have threaded entries or hubs identified for the intended purpose and supported by connection of two or more rigid metal conduits. Secure conduit within 3 ft. of the enclosure or within 18 in. of the enclosure if all conduit entries are on the same side. Mechanically secure all junction boxes with an internal volume greater than 100 cu. inches.
5. Provide hot dipped galvanized cast iron or sand cast aluminum outlet boxes for junction boxes containing only 10 AWG or 12 AWG conductors. Do not use die cast aluminum boxes. Size outlet boxes according to the NEC.
6. Do not use intermediate metal conduit (IMC) or electrical metallic tubing (EMT) unless specifically required by the plan sheets. When EMT is called for, provide junction boxes made from galvanized steel sheeting, listed and approved for outdoor use, unless otherwise noted on the plans. Size all galvanized steel junction boxes in accordance with the NEC. Provide junction boxes for IMC conduit systems that meet the same requirements for junction boxes used with RMC systems.
7. Provide PVC junction boxes intended for outdoor use on PVC conduit systems, unless otherwise noted on the plans.

8. Provide PVC elbows in PVC conduit systems, unless otherwise shown on the plans. Use only a flat, high tensile strength polyester fiber pull tape for pulling conductors through the PVC conduit system. When galvanized steel RMC elbows are specifically called for in the plans and any portion of the RMC elbow is buried less than 18 in., ground the RMC elbow by means of a grounding bushing on a rigid metal extension. Grounding of the rigid metal elbow is not required if the entire RMC elbow is encased in a minimum of 2 in. of concrete. PVC extensions are allowed on these concrete encased rigid metal elbows. RMC or PVC elbows are subsidiary to various bid items.
9. When required, provide High-Density Polyethylene (HDPE) conduit with factory installed internal conductors according to Item 622 "Duct Cable." At the Contractor's request and with approval by the Engineer, substitute HDPE conduit with no conductors for bored schedule 40 or schedule 80 PVC conduit bid under Item 618. Ensure bored HDPE substituted for PVC is schedule 40 and of the same size PVC called for in the plans. Ensure the substituted HDPE meets the requirements of Item 622, except that the conduit is supplied without factory-installed conductors. Make the transition of the HDPE conduit to PVC (or RMC elbow when required) at the bore pit. Provide conduit of the size and schedule as shown on the plans. Do not extend substituted conduit into ground boxes or foundations. Provide PVC or galvanized steel RMC elbows as called for at all ground boxes and foundations.
10. Use two-hole straps when supporting 2 in. and larger conduits. On electrical service poles, properly sized stainless steel or hot dipped galvanized one-hole standoff straps are allowed on the service riser conduit.

B. CONSTRUCTION METHODS

1. Provide and install expansion joint conduit fittings on all structure-mounted conduits at the structure's expansion joints to allow for movement of the conduit. In addition, provide and install expansion joint fittings on all continuous runs of galvanized steel RMC conduit externally exposed on structures such as bridges at maximum intervals of 150 ft. When requested by the project Engineer, supply manufacturer's specification sheet for expansion joint conduit fittings. Repair or replace expansion joint fittings that do not allow for movement at no additional cost to the Department. Provide the method of determining the amount of expansion to the Engineer upon request. Do not use LFMC or LFNC as a substitute for the required expansion conduit fittings.
2. Space all conduit supports at maximum intervals of 5 ft. Install conduit spacers when attaching metal conduit to surface of concrete structures. See "Conduit Mounting Options" on ED(2). Install conduit support within 3 ft. of all enclosures and conduit terminations.
3. Do not attach conduit supports directly to pre-stressed concrete beams except as shown specifically in the plans or as approved by the Engineer.
4. Unless otherwise shown on the plans, jack or bore conduit placed beneath existing roadways, driveways, sidewalks, or after the base or surfacing operation has begun. Backfill and compact the bore pits below the conduit per Item 476 "Jacking, Boring, or Tunneling Pipe or Box" prior to installing conduit or duct cable to prevent bending of the connections.
5. When placing conduit in the sub-grade of new roadways, backfill all trenches with excavated material unless otherwise noted on the plans. When placing conduit in the sub-base of new roadways, backfill all trenches with cement-stabilized base as per requirements of Items 110 "Excavation", 400 "Excavation and Backfill for Structures", 401 "Flowable Backfill", 402 "Trench Excavation Protection", and 403 "Temporary Special Shoring."
6. Provide and place warning tape approximately 10 in. above all trenched conduit as per Item 618.
7. During construction, temporarily cap or plug open ends of all conduit and raceways immediately after installation to prevent entry of dirt, debris and animals. Temporary caps constructed of durable duct tape are allowed. Tightly fix the tape to the conduit opening. Clean out the conduit and prove it clear in accordance with Item 618 prior to installing any conductors.
8. Ensure conduit entry into the top of any enclosure is waterproof by installing conduit sealing hubs or using boxes with threaded bosses. This includes surface mounted safety switches, meter cans, service enclosures, auxiliary enclosures and junction boxes. Grounding bushings on water tight sealing hubs are not required.
9. Fit the ends of all PVC conduit terminations with bushings or bell end fittings. Provide and install a grounding type bushing on all metal conduit terminations.
10. Install a bonding jumper from each grounding bushing to the nearest ground rod, grounding lug, or equipment grounding conductor. Ensure all bonding jumpers are the same size as the equipment grounding conductor. Bonding of conduit used as a casing under roadways for duct cable is not required, if the duct extends the full length through the casing.
11. At all electrical services, install a 6 AWG solid copper grounding electrode conductor.
12. Place conduits entering ground boxes so that the conduit openings are between 3 in. and 6 in. from the bottom of the box. See the ground box detail on sheet ED(4).
13. Seal ends of all conduits with duct seal, expandable foam, or by other methods approved by the Engineer. Seal conduit immediately after completion of conductor installation and pull tests. Do not use duct tape as a permanent conduit sealant. Do not use silicone caulk as a conduit sealant.
14. File smooth the cut ends of all mounting strut and conduit. Before installing, paint the field cut ends of all mounting strut and RMC (threaded or non-threaded) with zinc rich paint (94% or more zinc content) to alleviate overspray. Use zinc rich paint to touch up galvanized material as allowed under Item 445 "Galvanizing." Do not paint non-galvanized material with a zinc rich paint as an alternative for materials required to be galvanized.

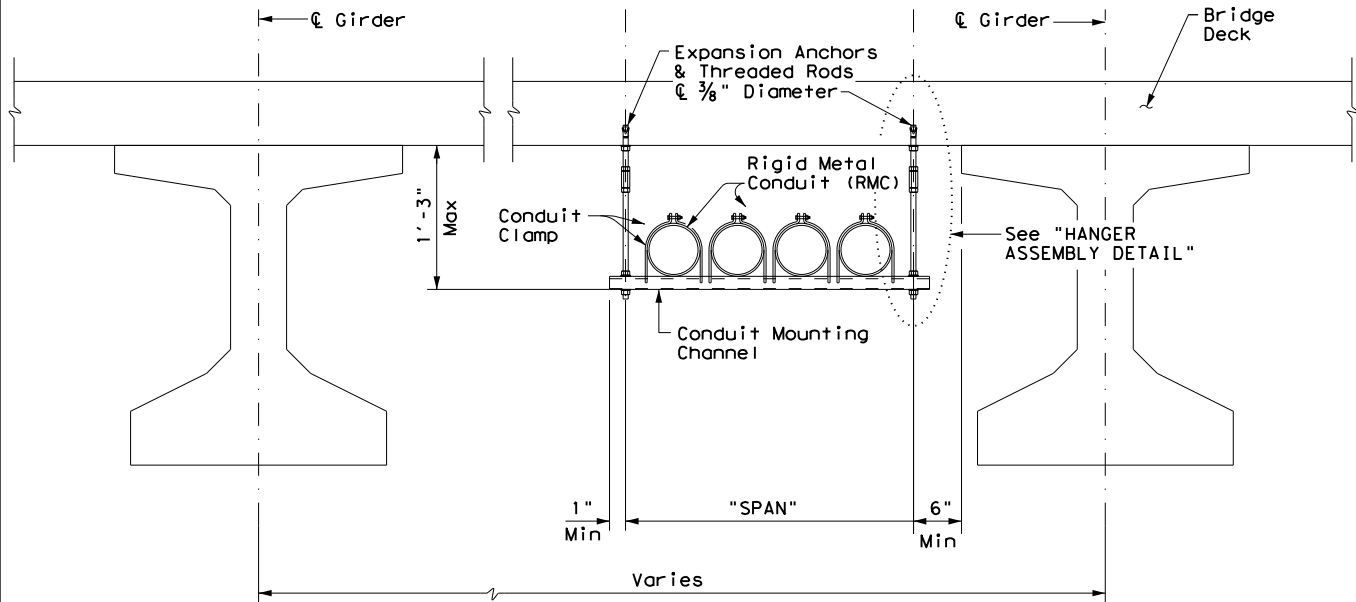
DISCLAIMER: The use of this standard is governed by the "Texas Engineering Practice Act". No warranty of any kind is made by TxDOT for any purpose whatsoever. TxDOT assumes no responsibility for the conversion of units or for the use of this standard for any purpose other than that for which it was intended.

DATE: 5/26/2022 4:41:35 PM
 FILE: \\txdot.projectwiseonline.com:TXDOT14\Documents\17 - BRY\Design Projects\170303\170303.dwg

		Traffic Operations Division Standard	
<h1>ELECTRICAL DETAILS CONDUITS & NOTES</h1>			
<h2>ED(1) - 14</h2>			
FILE:	ed1-14.dgn	DW:	CK:
© TxDOT	October 2014	CONT	SECT
REVISIONS		0122	03
		033, ETC	
		US 287, ETC	
		DIST	COUNTY
		BRY	FREESTONE, ETC
		SHEET NO.	
		124	

DISCLAIMER: The use of this standard is governed by the "Texas Engineering Practice Act". No warranty of any kind is made by TxDOT for any purpose whatsoever. TxDOT assumes no responsibility for the conversion of units or for the use of this standard for any purpose other than that for which it was intended.

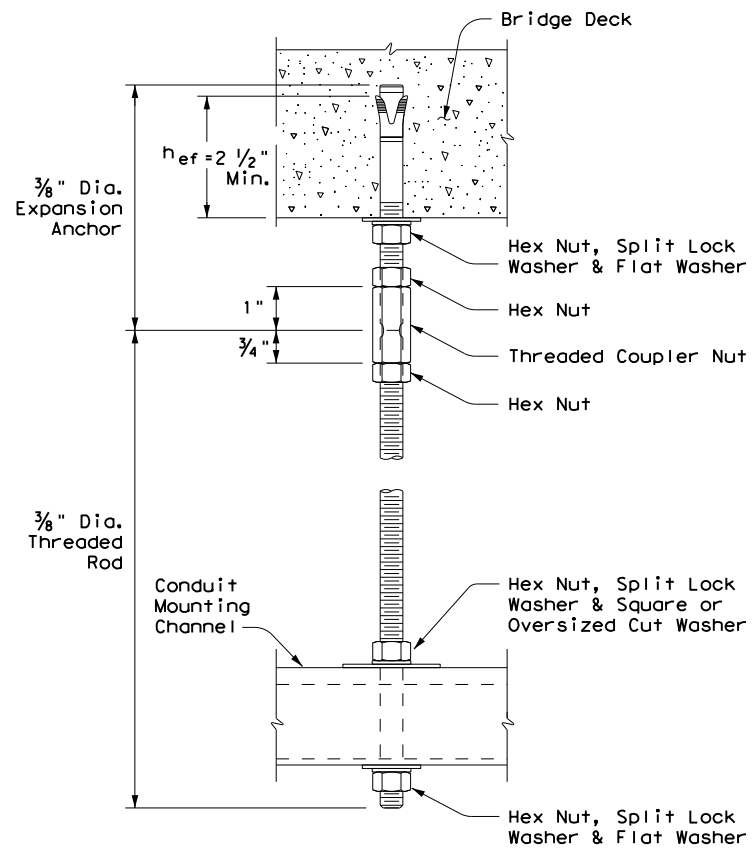
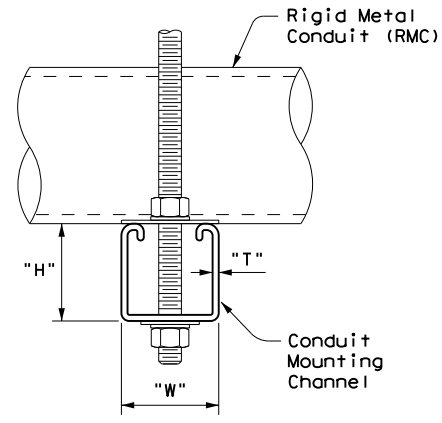
DATE: 5/26/2022 4:41:40 PM
 FILE: \\txdot\project\wiseonline.com\TXDOT14\Documents\17 - BRY\Design\Projects\17-0333\ED(2)-14.dgn



CONDUIT HANGING DETAIL

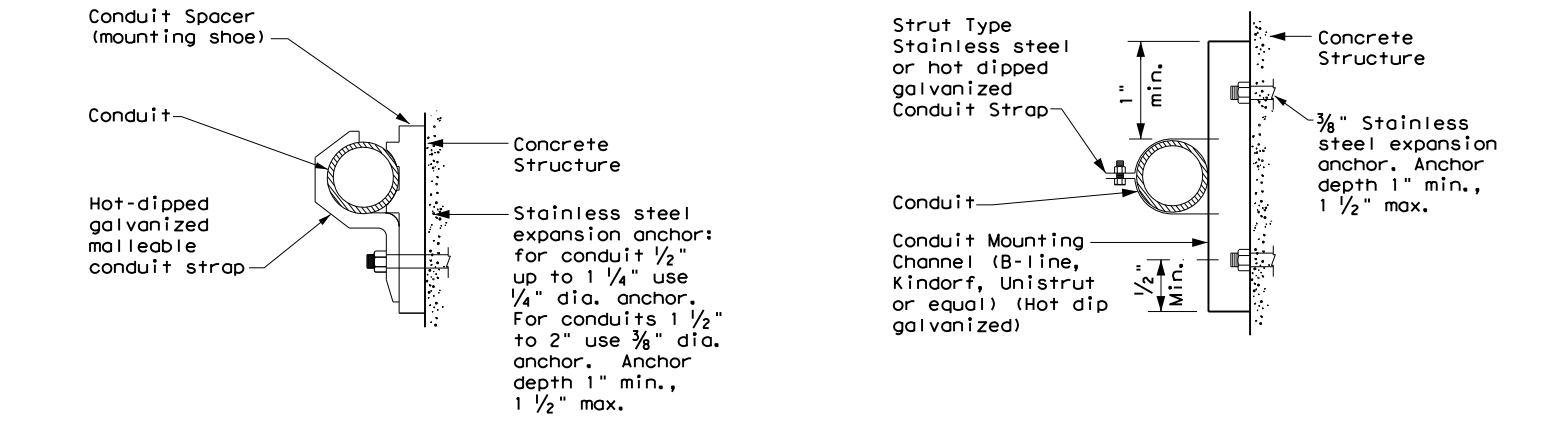
CONDUIT MOUNTING CHANNEL		
"SPAN"	"W" x "H"	"T"
less than 2'	1 5/8" x 1 3/8"	12 Ga.
2'-0" to 2'-6"	1 5/8" x 1 5/8"	12 Ga.
>2'-6" to 3'-0"	1 5/8" x 2 1/16"	12 Ga.

Channels with round or short slotted hole patterns are allowed, if the load carrying capacity is not reduced by more than 15%.



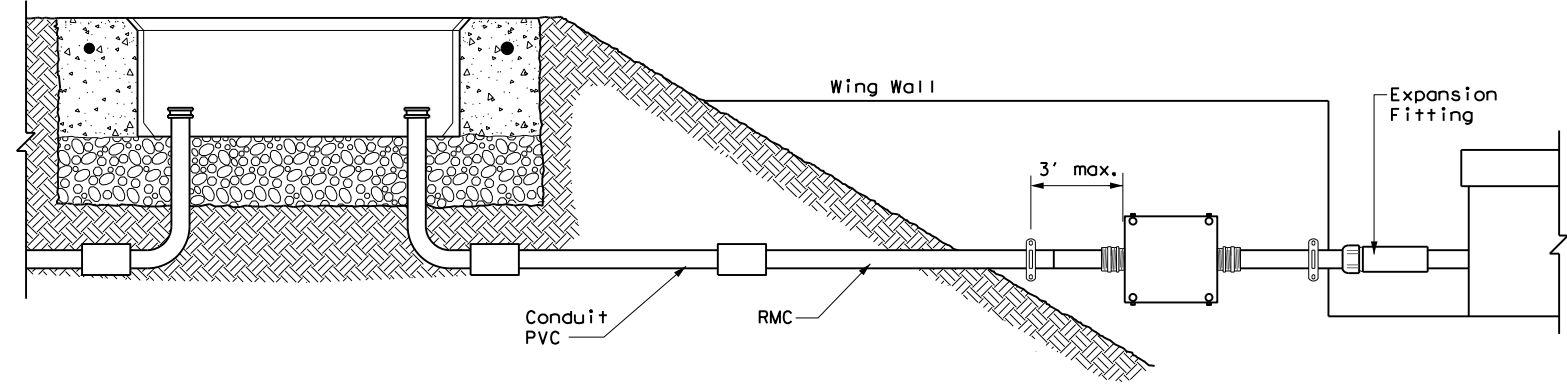
HANGER ASSEMBLY DETAIL

ELECTRIC CONDUIT TO BRIDGE DECK ATTACHMENT



CONDUIT MOUNTING OPTIONS

Attachment to concrete surfaces
 See ED(1)B.2



TYPICAL CONDUIT ENTRY TO BRIDGE STRUCTURE DETAIL

EXPANSION ANCHOR NOTES FOR BRIDGE DECK ATTACHMENT

1. Use torque controlled mechanical expansion anchors that are approved for use in cracked concrete by the International Code Council, Evaluation Service (ICC-ES). The chosen anchor product shall have a designated ICC-ES Evaluation Report number, and its approval status shall be maintained on the ICC-ES website under Division 031600 for Concrete Anchors.
2. Unless otherwise approved by the Engineer: do not use adhesive anchors; do not use expansion anchors that are not included in the ICC-ES approval list; and do not use expansion anchors that are only approved for use in uncracked concrete.
3. Use anchors manufactured with stainless steel expansion wedges. Anchors manufactured with carbon steel expansion wedges are not allowed. Anchor bodies can be either zinc-plated carbon steel or stainless steel. For application in marine environment, both the anchor body and expansion wedge shall be stainless steel.
4. Install anchors as shown on the plans and in accordance with the anchor manufacturer's published installation instructions. Arrange a field demonstration test to evaluate the procedures and tools. The test shall be witnessed and approved by the Engineer prior to furnishing anchors on the structure.
5. Prior to hole drilling, use rebar locator to ensure clearing of existing deck strands or reinforcement. Install anchors to ensure a minimum effective embedment depth, (h_{ef}), as shown. Increase (h_{ef}) as needed to ensure sufficient thread length for proper torquing and tightening of anchors.
6. Use anchors of minimum 1600 Lbs tensile capacity (minimum of steel, concrete breakout, and concrete pullout strengths as determined by ACI 318 Appendix D) at the required minimum embedment depth (h_{ef}). No lateral loads shall be introduced after conduit installation.

		Traffic Operations Division Standard	
<h2>ELECTRICAL DETAILS CONDUIT SUPPORTS</h2>			
<h3>ED(2) - 14</h3>			
FILE: ed2-14.dgn	DN: TxDOT	CK: TxDOT	DW: TxDOT
© TxDOT October 2014	CONT: 0122	SECT: 03	HIGHWAY
REVISIONS	0122	03	033, ETC
DIST: BRY	COUNTY: FREESTONE, ETC	US 287, ETC	SHEET NO. 125

ELECTRICAL CONDUCTORS

A. MATERIAL INFORMATION

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

B. CONSTRUCTION METHODS

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

12. Provide and install a separate stranded equipment grounding conductor (EGC) in all conduits that contain circuit wiring of 50 volts or more. Unless shown elsewhere, size the EGC to be the same size as the largest current carrying conductor contained in the conduit. Ensure all EGCs are bonded together at every accessible location. For traffic signal installations, provide a minimum size 8 AWG EGC. The EGC is paid for under Item 620.

C. TEMPORARY WIRING

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

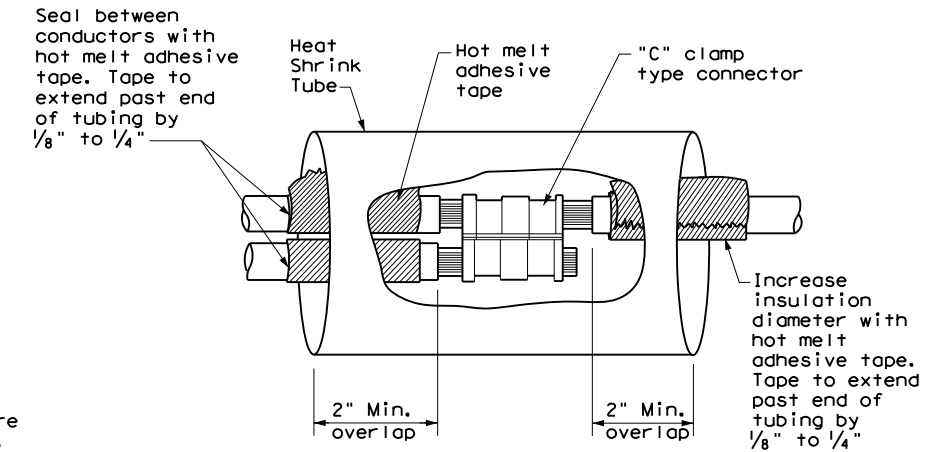
GROUND RODS & GROUNDING ELECTRODES

A. MATERIAL INFORMATION

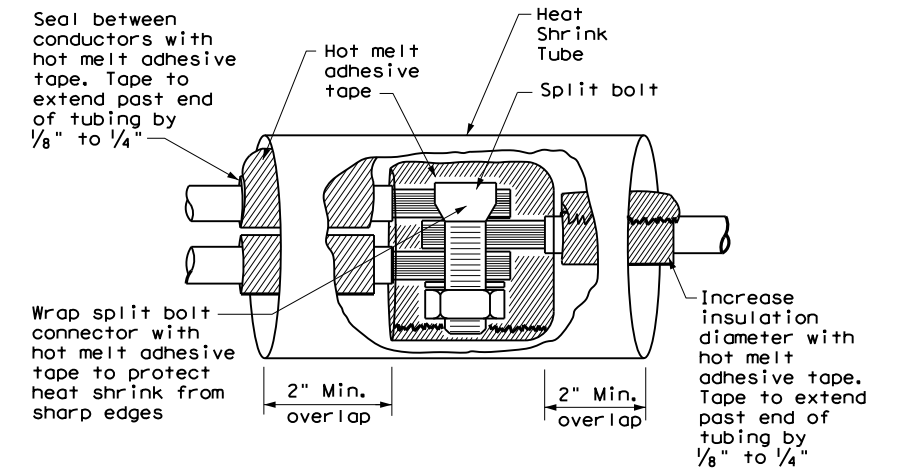
1. Provide and install a grounding electrode at electrical services. Provide ground rods according to DMS 11040 and the plans. Larger diameter or longer length rods may be called for in some specific locations, see the individual plans sheets. Concrete encased grounding electrodes may be called for in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

B. CONSTRUCTION METHODS

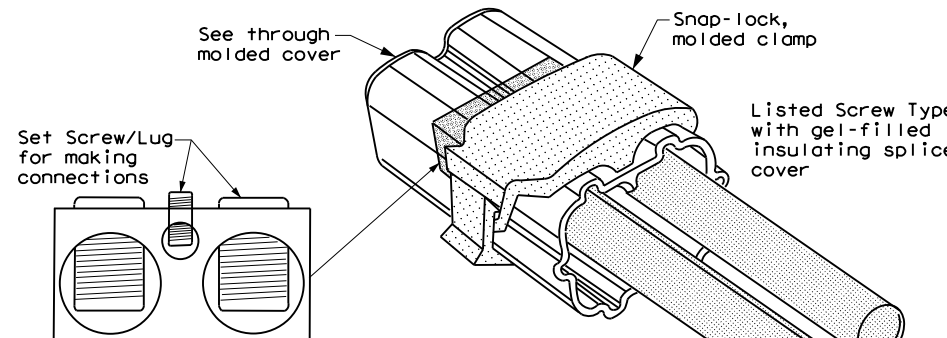
1. Furnish auxiliary ground rods for lightning protection and install in soil, concrete, or both, as called for in the plans. For ground rods installed in concrete, ensure the connection of the conductor to the ground rod is readily accessible for inspection or repairs. For ground rods installed in soil,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



**SPLICE OPTION 1
Compression Type**



**SPLICE OPTION 2
Split Bolt Type**

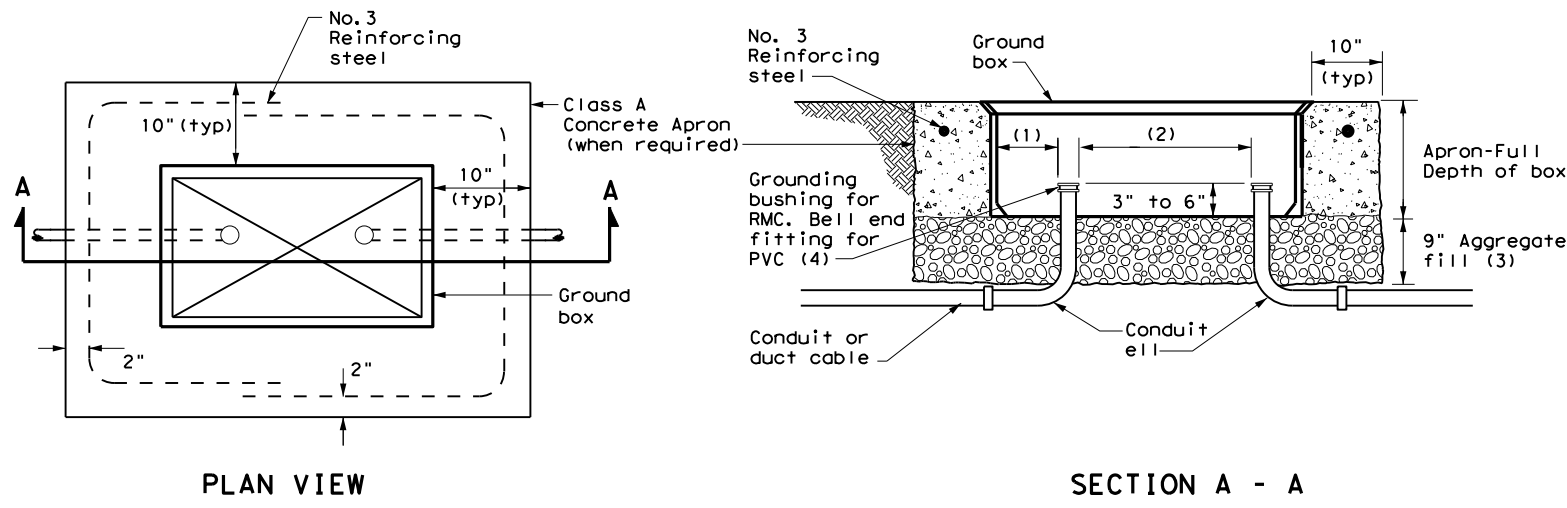


**SPLICE OPTION 3
Listed Screw Type**

DISCLAIMER: The use of this standard is governed by the "Texas Engineering Practice Act". No warranty of any kind is made by TxDOT for any purpose whatsoever. TxDOT assumes no responsibility for the conversion of units or for the use of this standard in any project. BRY Design Project: 5/26/2022 4:41:45 PM
 DATE: 5/26/2022 4:41:45 PM
 FILE: \\txdot\project\wiseonline.com:TXDOT4\Documents\17 - BRY\Design Project\5/26/2022 4:41:45 PM

		Traffic Operations Division Standard	
<h2>ELECTRICAL DETAILS CONDUCTORS</h2>			
<h3>ED(3) - 14</h3>			
FILE: ed3-14.dgn	DN: TxDOT	CK: TxDOT	DW: TxDOT
© TxDOT October 2014	CONT	SECT	JOB
REVISIONS	0122	03	033, ETC
	DIST	COUNTY	SHEET NO.
	BRY	FREESTONE, ETC	126

DATE: 5/26/2022 4:41:50 PM
 FILE: \\txdot\project\wiseon\line.com:TXDOT4\Documents\17 - BRY\Design Project\170303\170303.dwg
 DISCLAIMER: The use of this standard is governed by the "Texas Engineering Practice Act". No warranty of any kind is made by TxDOT for any purpose whatsoever. TxDOT assumes no responsibility for the conversion of units or for the use of the information contained herein for any purpose other than that for which it was prepared.

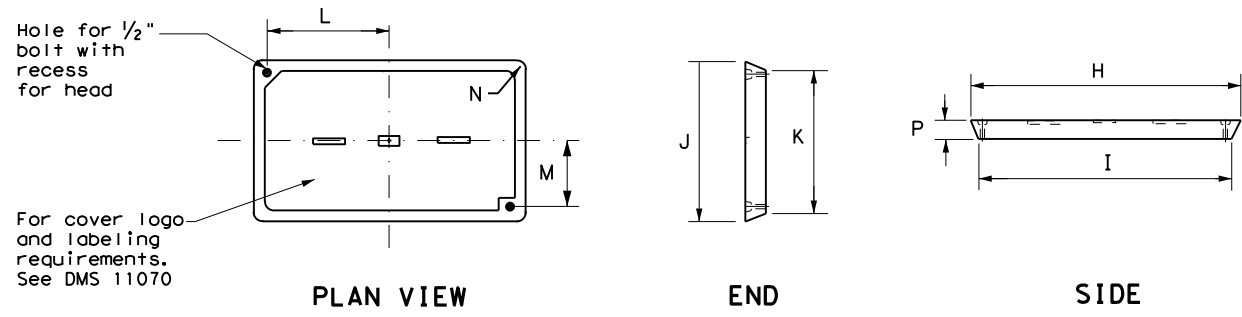


APRON FOR GROUND BOX

- (1) Uniformly space ends of conduits within the ground box. Position ends of conduits so that ground box walls do not interfere with the installation of grounding bushings or bell end fittings.
- (2) Maintain sufficient space between conduits to allow for proper installation of bushing.
- (3) Place aggregate under the box, not in the box. Aggregate should not encroach on the interior volume of the box.
- (4) Install a grounding bushing on the upper end of all RMC terminating in a ground box. Ground RMC elbows when any part of the elbow is less than 18 in. below the bottom of the ground box. Install a PVC bushing or bell end fitting on the upper end of all PVC conduits terminating in a ground box.

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

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



GROUND BOX COVER

GROUND BOXES

A. MATERIALS

1. Provide polymer concrete ground boxes measuring 16x30x24 in. (WxLxD) or smaller in accordance with Departmental Material Specification (DMS) 11070 "Ground Boxes" and Item 624 "Ground Boxes."
2. Provide Type A, B, C, D, and E ground boxes as shown in the plans, and as listed on the Material Producers List (MPL) on the Department web site under "Roadway Illumination and Electrical Supplies," Item 624.
3. Ensure ground box cover is correctly labeled in accordance with DMS 11070.
4. Provide larger ground boxes in accordance with Item 624 and as shown in the plans.

B. CONSTRUCTION METHODS

1. Remove all gravel and dirt from conduit. Cap all conduits prior to placing aggregate and setting ground box. Provide Grade 3 or 4 coarse aggregate as shown on Table 2 of Item 302 "Aggregates for Surface Treatments." Ensure aggregate bed is in place and at least 9 inches deep, prior to setting the ground box. Install ground box on top of aggregate.
2. Cast ground box aprons in place. Reinforcing steel may be field bent. Ensure the depth of concrete for the apron extends from finished grade to the top of the aggregate bed under the box. Ground box aprons, including concrete and reinforcing steel, are subsidiary to ground boxes when called for by descriptive code.
3. Keep bolt holes in the box clear of dirt. Bolt covers down when not working in ground boxes.
4. Install all conduits and ells in a neat and workmanlike manner. Uniformly space conduits so grounding bushings and bell end fittings can easily be installed.
5. Temporarily seal all conduits in the ground box until conductors are installed.
6. Permanently seal conduits immediately after the completion of conductor installation and pull tests. Permanently seal the ends of all conduits with duct seal, expandable foam, or other method as approved. Do not use duct tape as a permanent conduit sealant. Do not use silicone caulk as a sealant.
7. When a ground rod is present in a ground box, bond all equipment grounding conductors together and to the ground rod with listed connectors.
8. When a type B or D ground box is stacked to meet volume requirements, it is allowable to cut an appropriately sized hole for conduit entry in the side wall at least 18 inches below grade.
9. If an existing ground box in the contract has a metal cover, bond the cover to the equipment grounding conductor with a 3 ft. long stranded bonding jumper the same size as the grounding conductor. The bonding jumper is subsidiary to various bid items. Verify existing ground boxes with metal covers are shown on the plans, with notes fully describing the work required.
10. If other ground boxes with metal covers are within the project limits but are not part of the contract, the Engineer may direct the Contractor to bond the metal covers, identifying the specific boxes in writing. This work will be paid for separately.
11. Bond metal ground box covers to the grounding conductor with a tank ground type lug.

				Traffic Operations Division Standard	
<h2>ELECTRICAL DETAILS</h2> <h3>GROUND BOXES</h3> <h4>ED(4) - 14</h4>					
FILE:	ed4-14.dgn	DN:	TxDOT	CK:	TxDOT
© TxDOT	October 2014	CONT:	0122	SECT:	03
REVISIONS		JOB:	033, ETC		
		US:	287, ETC		
		DIST:	COUNTY:		SHEET NO.
		BRY:	FREESTONE, ETC		127

ELECTRICAL SERVICES NOTES

1. Provide new materials. Ensure installation and materials comply with the applicable provisions of the National Electrical Code (NEC) and National Electrical Manufacturers Association (NEMA) standards. Ensure material is Underwriters Laboratories (UL) listed. Provide and install electrical service conduits, conductors, disconnects, contactors, circuit breaker panels, and branch circuit breakers as shown on the Electrical Service Data chart in the plans. Faulty fabrication or poor workmanship in material, equipment, or installation is justification for rejection. Where manufacturers provide warranties and guarantees as a customary trade practice, furnish these to the State.
2. Provide electrical services in accordance with Electrical Details standard sheets, Departmental Material Specification (DMS) 11080 "Electrical Services," DMS 11081 "Electrical Services-Type A," DMS 11082 "Electrical Services-Type C," DMS 11083 "Electrical Services-Type D," DMS 11084 "Electrical Services-Type T," DMS 11085 "Electrical Services-Pedestal (PS)", and Item 628 "Electrical Services" of the Standard Specifications. Provide electrical service types A, C, and D, as listed on the Material Producers List (MPL) on the Department web site under "Roadway Illumination and Electrical Supplies," Item 628. Provide other service types as detailed on the plans.
3. Provide all work, materials, services, and any incidentals needed to install a complete electrical service as specified in the plans.
4. Coordinate with the Engineer and the utility provider for metering and compliance with utility requirements. Primary line extensions, connection charges, meter charges, and other charges by the utility company to provide power to the location are paid for in accordance with Item 628. Get approval for the costs associated with these charges prior to engaging the utility company to do the work. Consult with the utility provider to determine costs and requirements, and coordinate the work as approved.
5. The enclosure manufacturer will provide Master Lock Type 2 with brass tumblers keyed #2195 for all custom electrical enclosures. Installing Contractor is to provide Master Lock #2195 Type 2 with brass tumblers for "off the shelf" enclosures. Master Lock #2195 keys and locks become property of the State. Unless otherwise approved, do not energize electrical service equipment until locks are installed.
6. Enclosures with external disconnects that de-energize all equipment inside the enclosure do not need a dead front trim. Protect incoming line terminations from incidental contact as required by the NEC.
7. When galvanized is specified for nuts, screws, bolts or miscellaneous hardware, stainless steel may be used.
8. Provide wiring and electrical components rated for 75°C. Provide red, black, and white colored XHHW service entrance conductors of minimum size 6 American Wire Gauge (AWG). Identify size 6 AWG conductors by continuous color jacket. Identify electrical conductors sized 4 AWG and larger by continuous color jacket or by colored tape. Mark at least 6 inches of the conductor's insulation with half laps of colored tape, when identifying conductors. Ensure each service entrance conductor exits through a separately bushed non-metallic opening in the weatherhead. The lengths of the conductors outside the weatherhead are to be 12 inches minimum, 18 inches maximum, or as required by utility.
9. All electrical service conduit and conductors attached to the electrical service including the riser or the elbow below ground are subsidiary to the electrical service. For an underground utility feed, all service conduit and conductors after the elbow, including service conduit and conductors for the utility pole riser when furnished by the Contractor, will be paid for separately.
10. Provide rigid metal conduit (RMC) for all conduits on service, except for the 1/2 in. PVC conduit containing the electrical service grounding electrode conductor. Size the service entrance conduit as shown in the plans. Ensure conduit for branch circuit entry to enclosure is the same size as that shown on the layout sheets for branch circuit conduit. Extend all rigid metal conduits a minimum of 6 inches underground and then couple to the type and schedule of the conduit shown on the layout for that particular branch circuit. Install a grounding bushing on the RMC where it terminates in the service enclosure.
11. Use of liquidtight flexible metal conduit (LFMC) is allowed between the meter and service enclosure when they are mounted 90 to 180 degrees to each other. Size the LFMC the same size as service entrance conduit. LFMC must not exceed 3 feet in length. Strap LFMC within 1 foot of each end. LFMC less than 12 inches in length need not be strapped. Each end of LFMC must have a grounding bushing or be terminated with a grounding fitting. The LFMC must contain a grounded (neutral) conductor. Ensure any bend in LFMC never exceeds 180 degrees. A pull test is required on all installed conductors, with at least six inches of free conductor movement demonstrated to the satisfaction of the Engineer.
12. Ensure all mounting hardware and installation details of services conform to utility company specifications.
13. For all electrical service enclosures listed under Item 628 on the MPL, the UL 508 enclosure manufacturers will prepare and submit a schematic drawing unique to each service. Before shipment to the job site, place the applicable laminated schematic drawings and the laminated plan sheet showing the electrical service data chart used to build the enclosure in the enclosure's data pocket. The installing contractor will copy and laminate the actual project plan sheets detailing all equipment and branch circuits supplied by that service. The laminated plan sheets are to be placed in the service enclosure's document pocket. Reduce 11 in. x 17 in. plan sheets to 8 1/2 in. x 11 in. before laminating. If the installation differs from the plan sheets, the installing contractor is to redline plan sheets before laminating.
14. When providing an "Off The Shelf" Type D or Type T service, provide laminated plan sheets detailing equipment and branch circuits supplied by that service. Reduce 11 in. x 17 in. plan sheets to 8 1/2 in. x 11 in. before laminating. Deliver these drawings before completion of the work to the Engineer, instead of placing in enclosure that has no door pocket.
15. Do not install conduit in the back wall of a service enclosure where it would penetrate the equipment mounting panel inside the enclosure. Provide grounding bushings on all metal conduits, and terminate bonding jumpers to grounding bus. Grounding bushings are not required when the end of the metal conduit is fitted with a conduit sealing hub or threaded boss, such as a meter base hub.

SERVICE ASSEMBLY ENCLOSURE

1. Provide threaded hub for all conduit entries into the top of enclosure.
2. Type galvanized steel (GS) enclosures may be used for Type C panelboards and for Type D and T services that do not use an enclosure mounted photocell or lighting contactor. Provide GS enclosures in accordance with DMS 11080, 11082, 11083, and 11084.
3. Provide aluminum (AL) and stainless steel (SS) enclosures for Types A, C, and D in accordance with DMS 11080, 11081, 11082, 11083, and 11084. Do not paint stainless steel.
4. Provide pedestal service (PS) enclosures in accordance with ED(9) and DMS 11080 and 11085. Do not provide GS pedestal services. If GS is shown in the PS descriptive code, provide an AL enclosure.

MAIN DISCONNECT & BRANCH CIRCUIT BREAKERS

1. Field drill flange-mounted remote operator handle if needed, to ensure handle is lockable in both the "On" and "Off" positions.
2. When the utility company provides a transformer larger than 50 KVA, verify that the available fault current is less than the circuit breaker's ampere interrupting capacity (AIC) rating and provide documentation from the electric utility provider to the Engineer.

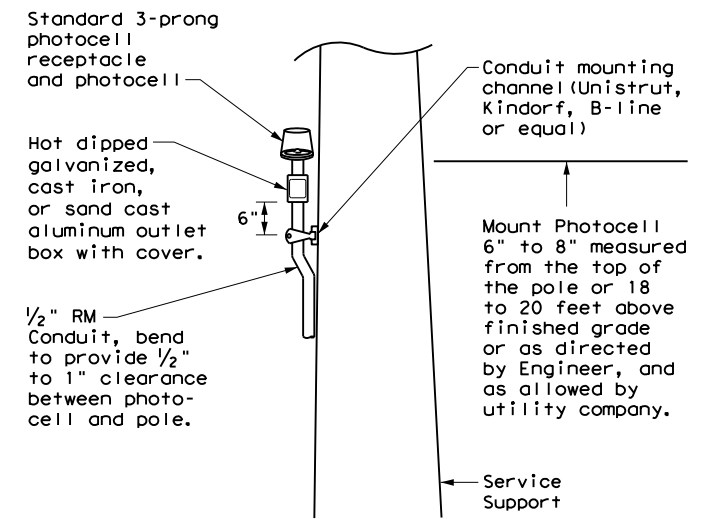
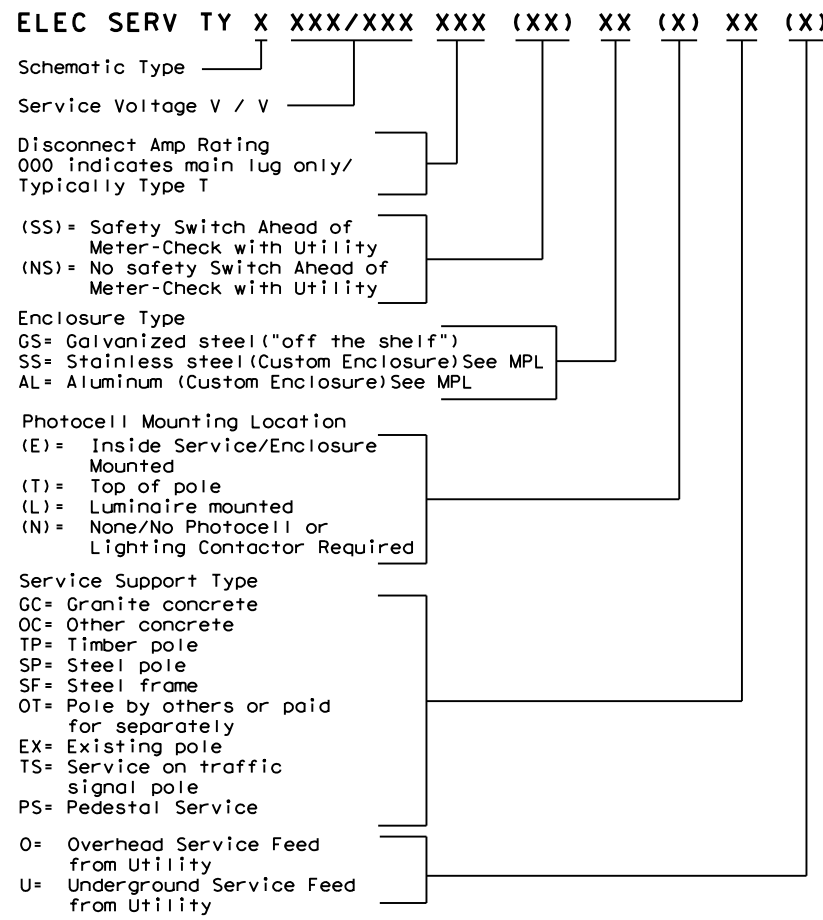
PHOTOELECTRIC CONTROL

1. Provide photocell as listed on the MPL. Move, adjust, or shield the photocell from stray or ambient night time light to ensure proper operation. Mount photocell facing north when practical. Mount top of pole photocells as shown on Top Mounted Photocell Detail.

* ELECTRICAL SERVICE DATA												
Elec. Service ID	Plan Sheet Number	Electrical Service Description	Service Conduit *xSize	Service Conductors No./Size	Safety Switch Amps	Main Ckt. Bkr. Pole/Amps	Two-Pole Contractor Amps	Panelbd/ Loadcenter Amp Rating	Branch Circuit ID	Branch Ckt. Bkr. Pole/Amps	Branch Circuit Amps	KVA Load
SB 183	289	ELC SRV TY A 240/480 100(SS)AL(E)SF(U)	2"	3/#2	100	2P/100	100	N/A	Lighting NB	2P/40	26	28.1
									Lighting SB	2P/40	25	
									Underpass	1P/20	15	
NB Access	30	ELC SRV TY D 120/240 060(NS)SS(E)TS(O)	1 1/4"	3/#6	N/A	2P/60		100	Sig. Controller	1P/30	23	5.3
								30	Luminaires	2P/20	9	
									CCTV	1P/20	3	
2nd & Main	58	ELC SRV TY T 120/240 000(NS)GS(N)SP(O)	1 1/4"	3/#6	N/A	N/A	N/A	70	Flashing Beacon 1	1P/20	4	1.0
									Flashing Beacon 2	1P/20	4	

* Example only, not for construction. All new electrical services must have electrical service data chart specific to that service as shown in the plans.
 ** Verify service conduit size with utility. Size may change due to utility meter requirements. Ensure conduit size meets the National Electrical Code.

EXPLANATION OF ELECTRICAL SERVICE DESCRIPTIVE CODE



TOP MOUNTED PHOTOCELL

Install conduit strap maximum 3 feet from box. 5 foot maximum spacing between straps supporting conduit.

Texas Department of Transportation
 Traffic Operations Division Standard

ELECTRICAL DETAILS SERVICE NOTES & DATA

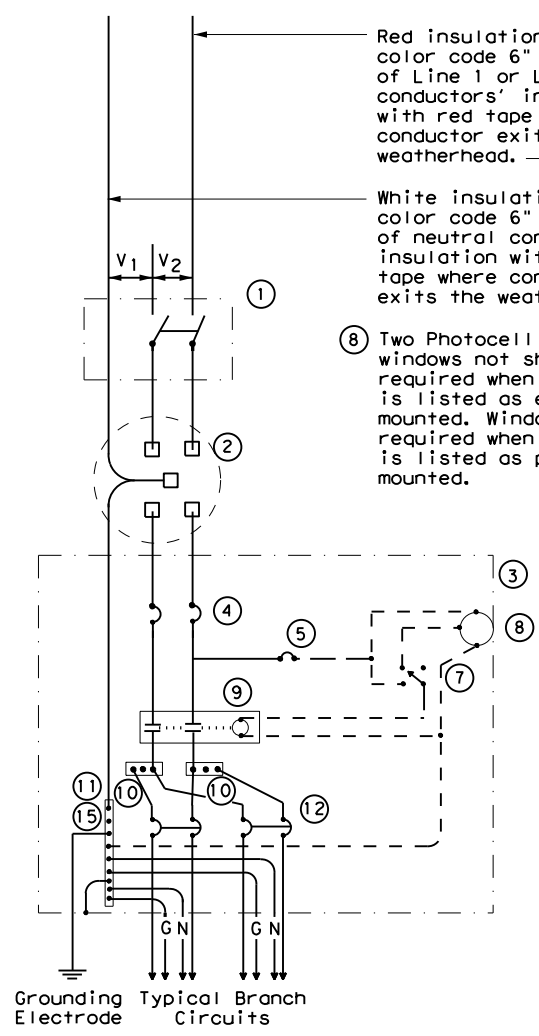
ED(5) - 14

FILE: ed5-14.dgn	DN: TxDOT	CK: TxDOT	DW: TxDOT	CR: TxDOT
© TxDOT October 2014	CONT	SECT	JOB	HIGHWAY
REVISIONS	0122	03	033, ETC	US 287, ETC
	DIST	COUNTY	SHEET NO.	
BRY	FREESTONE, ETC		128	

DISCLAIMER: The use of this standard is governed by the "Texas Engineering Practice Act". No warranty of any kind is made by TxDOT for any purpose whatsoever. TxDOT assumes no responsibility for the conversion of units or for any errors or omissions. BRY Design Project: w:\txdot\project\wiseonline.com\52626\2022_4:41:55 PM DATE: 5/26/2022 4:41:55 PM FILE: w:\txdot\project\wiseonline.com\52626\2022_4:41:55 PM

DISCLAIMER: The use of this standard is governed by the "Texas Engineering Practice Act". No warranty of any kind is made by TxDOT for any purpose whatsoever. TxDOT assumes no responsibility for the conversion of this standard to metric units. This standard is not to be used for any purpose other than that for which it was developed.

DATE: 5/26/2022 4:42:00 PM
 FILE: \\txdot\project\wiseonline.com\TXDOT4\Documents\17 - BRY\Design Project\ED(6)-14.dwg

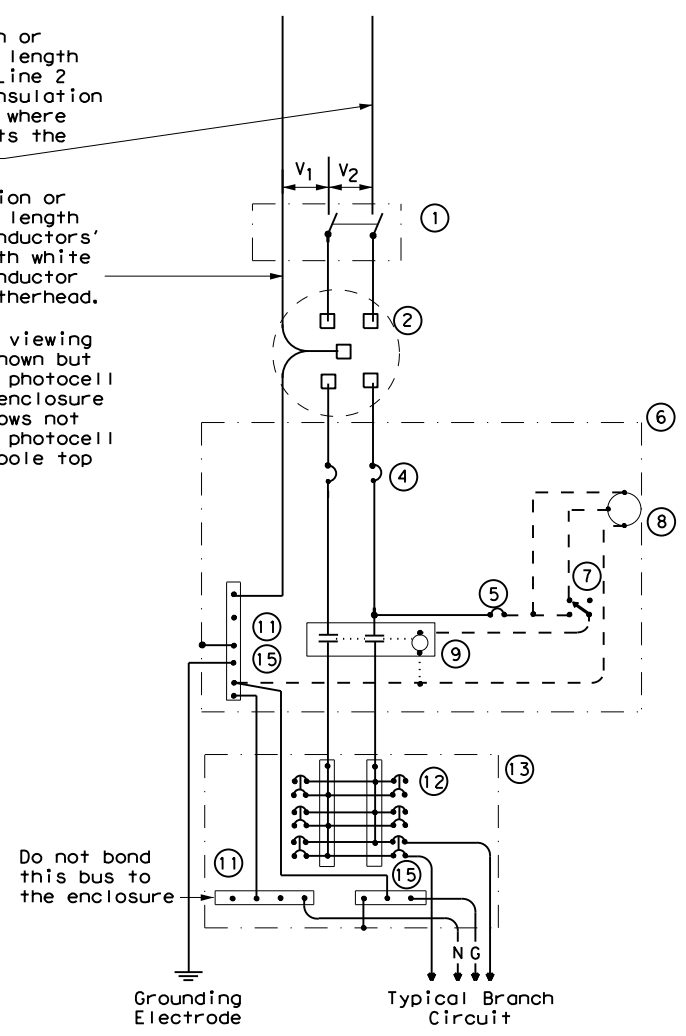


**SCHEMATIC TYPE A
THREE WIRE**

Red insulation or color code 6" length of Line 1 or Line 2 conductors' insulation with red tape where conductor exits the weatherhead.

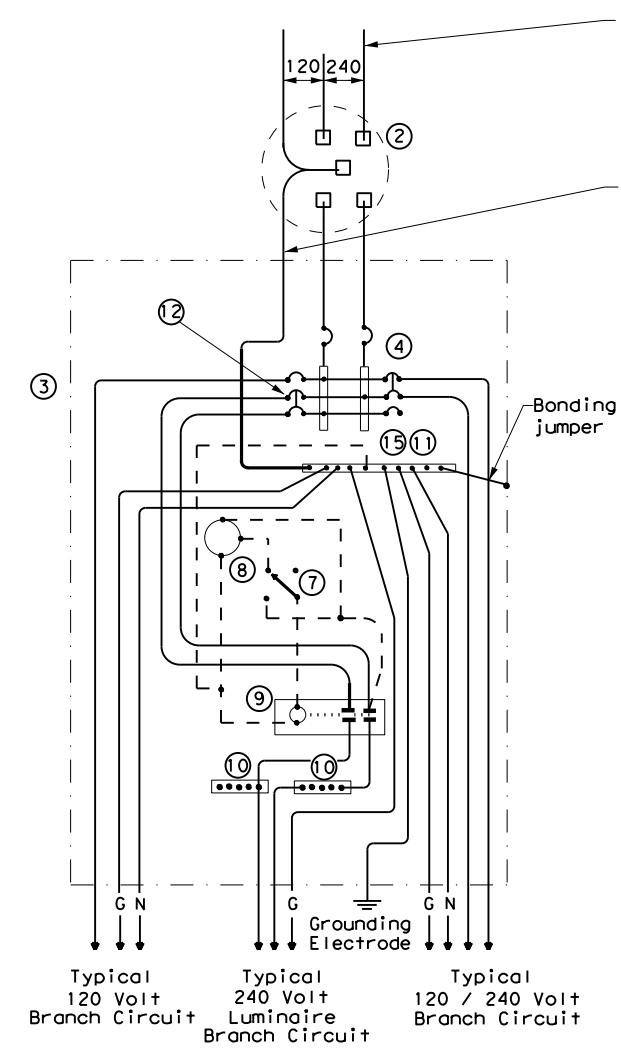
White insulation or color code 6" length of neutral conductors' insulation with white tape where conductor exits the weatherhead.

⑧ Two Photocell viewing windows not shown but required when photocell is listed as enclosure mounted. Windows not required when photocell is listed as pole top mounted.



**SCHEMATIC TYPE C
THREE WIRE**

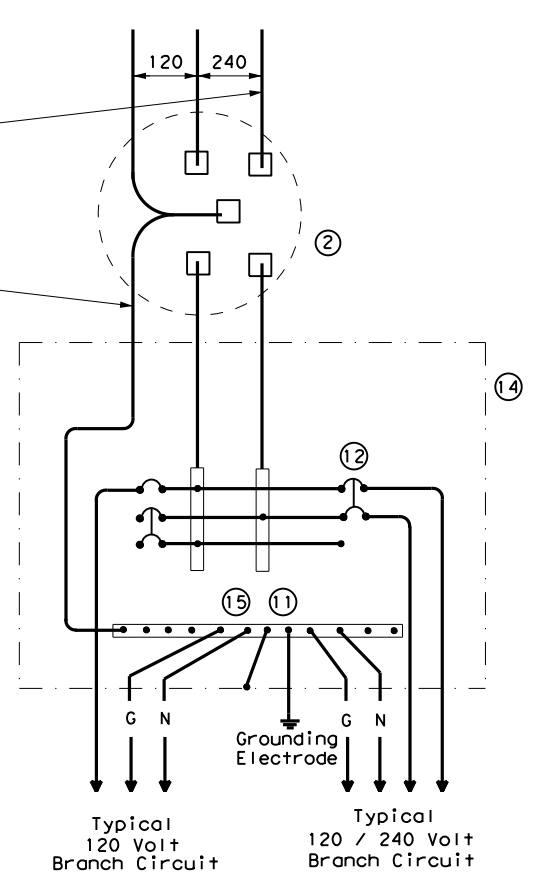
WIRING LEGEND	
————	Power Wiring
- - - -	Control Wiring
—N—	Neutral Conductor
—G—	Equipment grounding conductor-always required



**SCHEMATIC TYPE D - CUSTOM
120/240 VOLTS - THREE WIRE**

Red insulation or color code 6" length of Line 1 or Line 2 conductors' insulation with red tape where conductor exits the weatherhead.

White insulation or color code 6" length of neutral conductors' insulation with white tape where conductor exits the weatherhead.



**SCHEMATIC TYPE T
120/240 VOLTS - THREE WIRE**
 Galvanized steel-"Buy Off The Shelf" only. When required install photocell top of the pole or on luminaire only, no lighting contractor will be installed.

SCHEMATIC LEGEND	
1	Safety Switch (when required)
2	Meter (when required-verify with electric utility provider)
3	Service Assembly Enclosure
4	Main Disconnect Breaker (See Electrical Service Data)
5	Circuit Breaker, 15 Amp (Control Circuit)
6	Auxiliary Enclosure
7	Control Station ("H-O-A" Switch)
8	Photo Electric Control (enclosure-mounted shown)
9	Lighting Contactor
10	Power Distribution Terminal Blocks
11	Neutral Bus
12	Branch Circuit Breaker (See Electrical Service Data)
13	Separate Circuit Breaker Panelboard
14	Load Center
15	Ground Bus

		Traffic Operations Division Standard	
ELECTRICAL DETAILS SERVICE ENCLOSURE AND NOTES			
ED(6) - 14			
FILE: ed6-14.dgn	DN: TxDOT	CK: TxDOT	DW: TxDOT
© TxDOT October 2014	CONT: 0122	SECT: 03	JOB: 033, ETC
REVISIONS	DIST: BRY	COUNTY: FREESTONE, ETC	US 287, ETC
			SHEET NO. 129

DATE: 5/26/2022 4:42:05 PM
 FILE: \\txdot.projectwiseonline.com:TXDOT4\Documents\17 - BRY\Design Projects\17-033-Freestone\17-033-Freestone.dwg
 The use of this standard is governed by the "Texas Engineering Practice Act". No warranty of any kind is made by TxDOT for any purpose whatsoever. TxDOT assumes no responsibility for the conversion of units or for the use of the drawings for any purpose other than that for which they were prepared.

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

1. Provide steel pole and steel frame supports as per TxDOT Departmental Material Specification (DMS)11080 "Electrical Services." Mount all equipment and conduit on 12 gauge galvanized steel or stainless steel channel strut, 1 1/2 in. or 1 3/8 in. wide by 1 in. up to 3 3/4 in. deep Unistrut, Kindorf, B-line or equal. Bolt or weld all channel and hardware to vertical members as approved. Do not stack channel. File smooth and paint field cut ends of all channel with zinc-rich paint before installing.
2. Provide poles for overhead service with an eyebolt or similar fitting for attachment of the service drop to the pole in conformance with the electric utility provider's specifications.
3. Provide and install galvanized 3/4 in. x 18 in. x 4 in. (dia. x length x hook length) anchor bolts for underground service supports. Provide and install galvanized 3/4 in. x 56 in. x 4 in. anchor bolts for overhead service supports. Ensure anchor bolts have 3 in. of thread, with 3 1/4 in. to 3 1/2 in. of the exposed anchor bolt projecting above finished foundation. Provide and install leveling nuts for all anchor bolts.
4. Bond one of the anchor bolts to the rebar cage with 6 AWG bare stranded copper conductor. Use listed mechanical connectors rated for embedment in concrete. See Inset B.
5. Furnish and install rigid metallic ellis in all steel pole and steel frame foundations for all conduits entering the service from underground.
6. Use class C concrete for foundations. Ensure reinforcing steel is Grade 60 with 3" of unobstructed concrete cover.
7. Drill and tap steel poles and frames for 1/2 in. X 13 UNC tank ground fitting. For steel pole service supports, provide and install tank ground fitting 4 in. to 6 in. below electrical service enclosure. Provide properly sized hole through the bottom of the enclosure for the service grounding electrode conductor. Ensure electrical service grounding electrode conductor is as short and straight as possible from the enclosure to the tank ground fitting. For steel frame service supports, provide and install tank ground fitting on steel frame post. Install service grounding electrode conductor in a non-metallic conduit or tubing from the enclosure to the steel frame post. Connect electrical service grounding electrode conductor to the tank ground fitting. See steel frame and steel pole details and Inset A for more information. Size service entrance conduit and branch circuit conduit as shown in the plans. For underground conduit runs from the electrical service, extend RMC from the service enclosure to an RMC elbow, and then connect the schedule type and size of conduit shown in the plans. Provide and install grounding bushings where RMC terminates in the enclosure. Grounding bushings are not required when RMC is fitted into a sealing hub or threaded boss.
8. If Steel pole or frame is painted, bond each separate painted piece with a bonding jumper attached to a tapped hole.
9. Provide 1/4" - 20 machine screws for bonding. Do not use sheet metal screws. Remove all non-conductive material at contact points. Terminate bonding jumpers with listed devices. Install minimum size 6 AWG stranded copper bonding jumpers. Make up all threaded bonding connections wrench tight.
10. Avoid contact of the service drop and service entrance conductors with the metal pole to prevent abrasion of the insulated conductors.
11. Shop drawings are not required for service support structure unless specifically stated elsewhere or directed by the Engineer.

White insulation or color code 6" of neutral conductor's insulation with white tape where conductor exits weatherhead.

Red insulation or color code 6" length of Line 1 or Line 2 conductor's insulation with red tape where conductor exits the weatherhead. Conductor slack length, 12" min., 18" max.

2" to 6" 4" (typ.)

RMC

Service Enclosure

Inset A

Channel bracket or other arrangement approved by the Engineer. (Kindorf, Unistrut, B-line or equal.)

Inset A

Inset B

60" TYP.

2"

18" Min.

Class "C" concrete

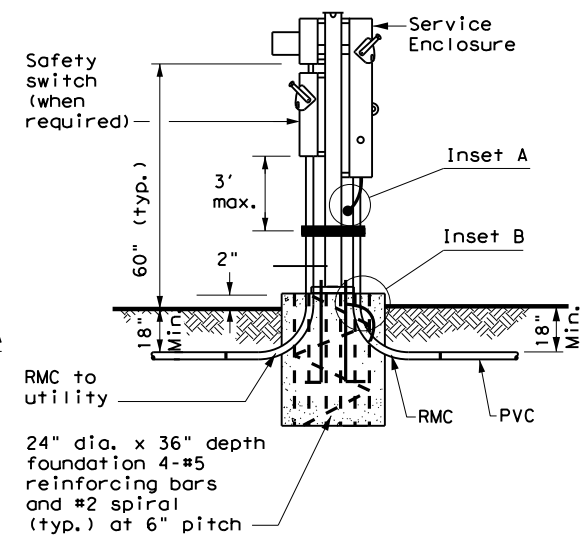
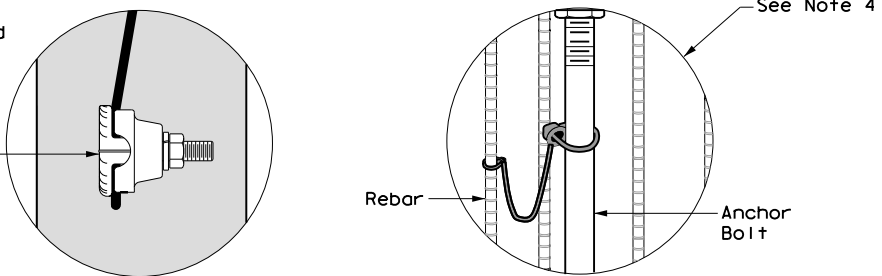
RMC

PVC

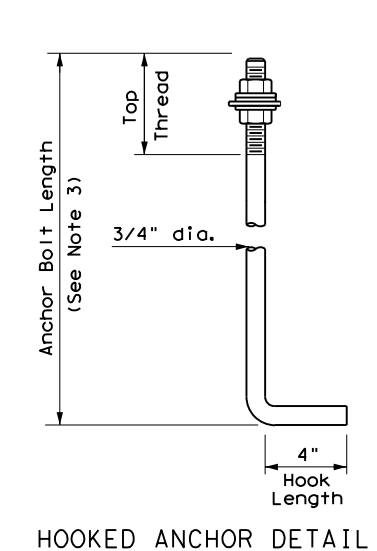
24 Dia. x 60" depth foundation 4-#5 reinforcing bars and #2 spiral (typ.) at 6" pitch

WITH SAFETY SWITCH
WITHOUT SAFETY SWITCH
SERVICE SUPPORT TYPE SP (O) - OVERHEAD SERVICE

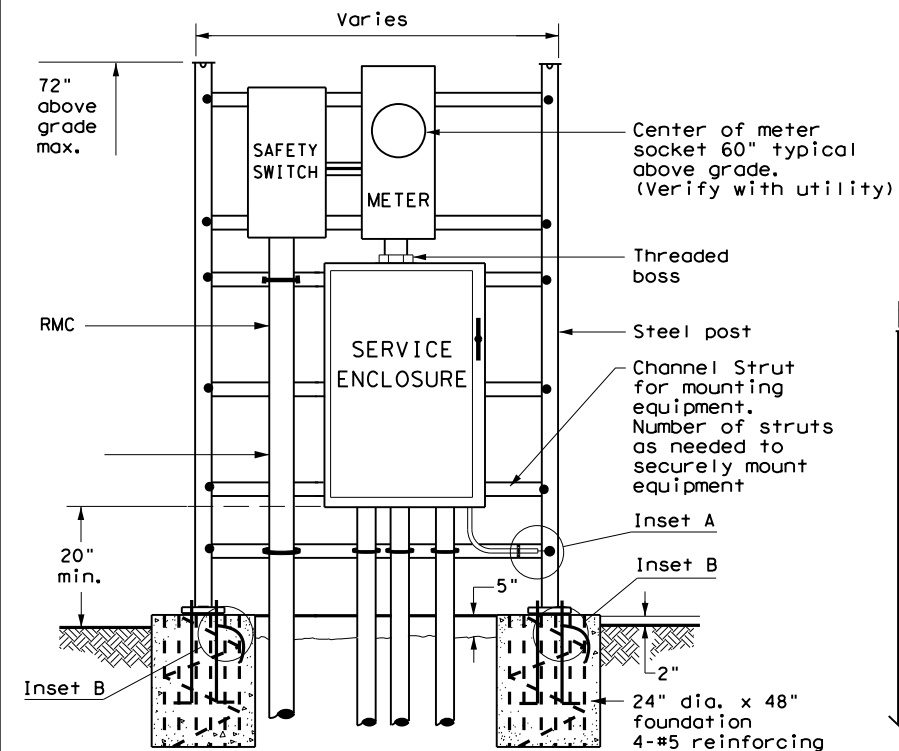
Drill, tap, and thread 1/2" X 13 UNC. Install tank ground fitting, connect electrical service grounding electrode conductor. See Note 7.



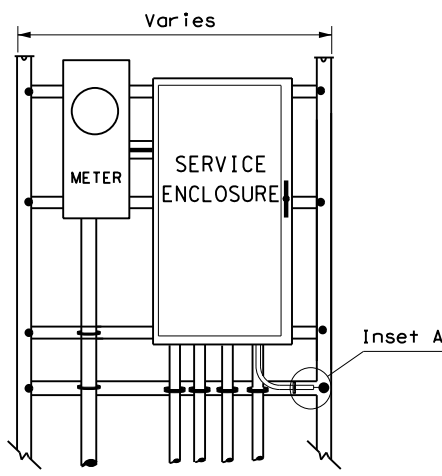
SERVICE SUPPORT TYPE SP(U) - UNDERGROUND SERVICE



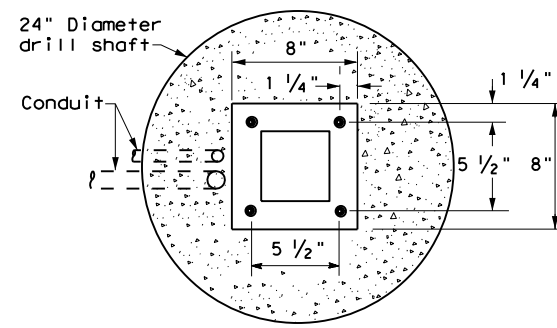
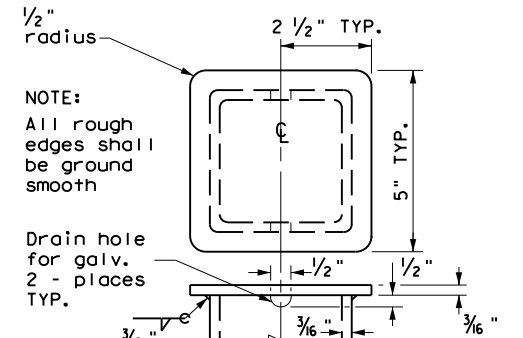
HOOKED ANCHOR DETAIL



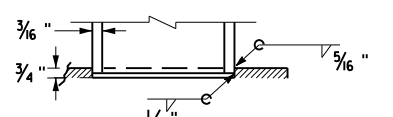
SERVICE SUPPORT TYPE SF(U) - UNDERGROUND SERVICE



WITHOUT SAFETY SWITCH

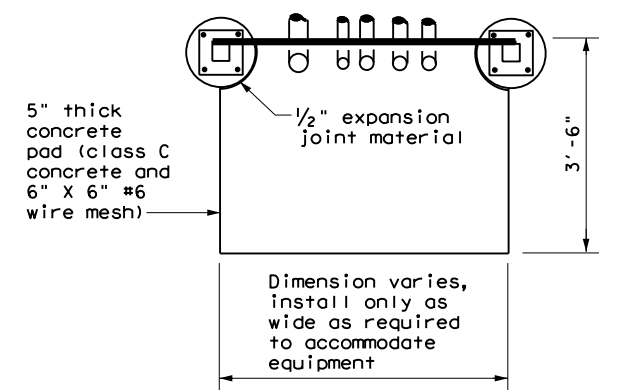


BASE PLATE DETAIL



BOTTOM OF POLE

SERVICE SUPPORT TYPE SF & SP



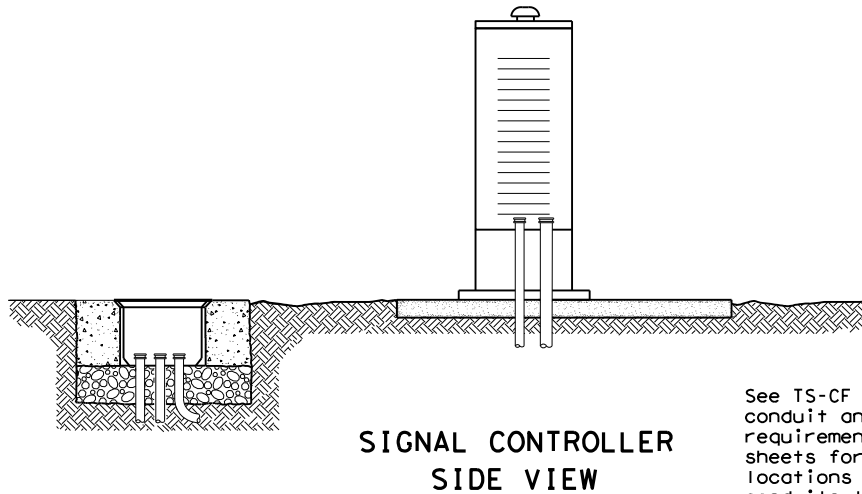
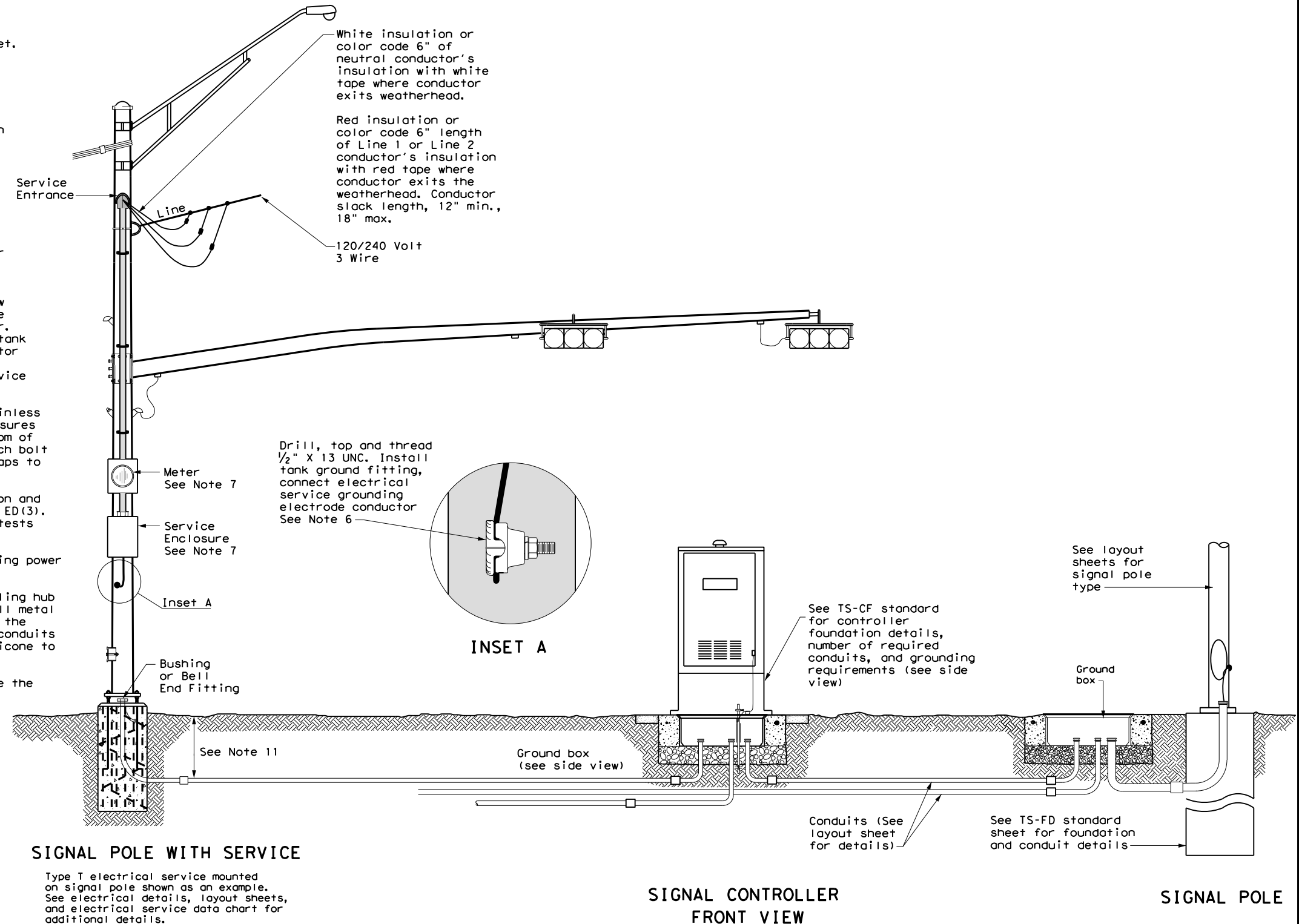
SERVICE SUPPORT TYPE SF (O) & SF (U)

		Traffic Operations Division Standard	
ELECTRICAL DETAILS SERVICE SUPPORT TYPES SF & SP ED(7)-14			
FILE: ed7-14.dgn	DWG: TXDOT	CHK: TXDOT	DWG: TXDOT
© TXDOT October 2014	CONT: 0122	SECT: 03	JOB: 033, ETC
REVISIONS			US 287, ETC
	DIST: BRY	COUNTY: FREESTONE, ETC	SHEET NO. 130

DISCLAIMER: The use of this standard is governed by the "Texas Engineering Practice Act". No warranty of any kind is made by TxDOT for any purpose whatsoever. TxDOT assumes no responsibility for the conversion of units of measurements for the conversion of units of measurements. DATE: 5/26/2022 4:42:10 PM FILE: \\txdotprojectwiseonline.com:TXDOT14\Documents\17 - BRY\Design Projects\17-033-Freestone\17-033-Freestone.dwg

TRAFFIC SIGNAL NOTES

1. Do not pass luminaire conductors through the signal controller cabinet.
2. Include an equipment grounding conductor in all conduits throughout the electrical system. Bond all exposed metal parts to the grounding conductor.
3. Provide roadway luminaires, when required, in accordance with the material and construction sections of Item 610, "Roadway Illumination Assemblies," except for performance testing of luminaires. Test installed roadway luminaires for proper operation as a part of the associated traffic signal system test.
4. If internally illuminated street name signs are approved for use, ground the fixture to the pole with a 12 AWG green XHHW conductor.
5. Bond anchor bolts to rebar cage in two locations using #3 bars or 6 AWG stranded copper conductors. Use listed mechanical connectors rated for embedment in concrete. See TxDOT standard TS-FD for further details.
6. Drill and tap signal poles for 1/2 in. X 13 UNC tank ground fitting. Provide and install tank ground fitting 4 in. to 6 in. directly below electrical service enclosure. Provide properly sized hole through the bottom of the enclosure for the service grounding electrode conductor. Connect the electrical service grounding electrode conductor to the tank ground fitting. Ensure electrical service grounding electrode conductor is as short and straight as possible from the enclosure to the tank ground fitting. See Inset A detail for further information. Size service entrance conduit and branch circuit conduit as shown in the plans.
7. Mount electrical service enclosure and meter to signal pole with stainless steel bands. Ensure bands are a minimum width of 3/4 in. Secure enclosures to bands using two-bolt brackets. Install brackets near top and bottom of each enclosure. Install properly sized stainless steel washers on each bolt in the enclosure. Band or drill and tap properly sized stand-off straps to signal pole for attaching conduit.
8. Conduct pull tests and insulation resistance tests on all illumination and power conductors as required in Item 620 "Electrical Conductors" and ED(3). To prevent electronics damage, do not conduct insulation resistance tests on traffic signal cables after termination.
9. Lock all enclosures and bolt down all ground box covers before applying power to the signal installation.
10. Terminate conduits entering the top of enclosures with a conduit-sealing hub or threaded boss such as meter hub. Install a grounding bushing on all metal conduits not connected to conduit-sealing hub or threaded boss. Bond the grounding bushing to the ground bus with a bonding jumper. Seal all conduits entering enclosures with duct seal or expanding foam. Do not use silicone to seal conduit ends.
11. For all conduits, ensure the burial depth is a minimum of 18". Ensure the minimum burial depth for conduit placed under a roadway is 24".



SIGNAL CONTROLLER SIDE VIEW

See TS-CF standard for conduit and grounding requirements. See layout sheets for ground box locations and any additional conduits that are required.

SIGNAL POLE WITH SERVICE

Type T electrical service mounted on signal pole shown as an example. See electrical details, layout sheets, and electrical service data chart for additional details.

SIGNAL CONTROLLER FRONT VIEW

SIGNAL POLE

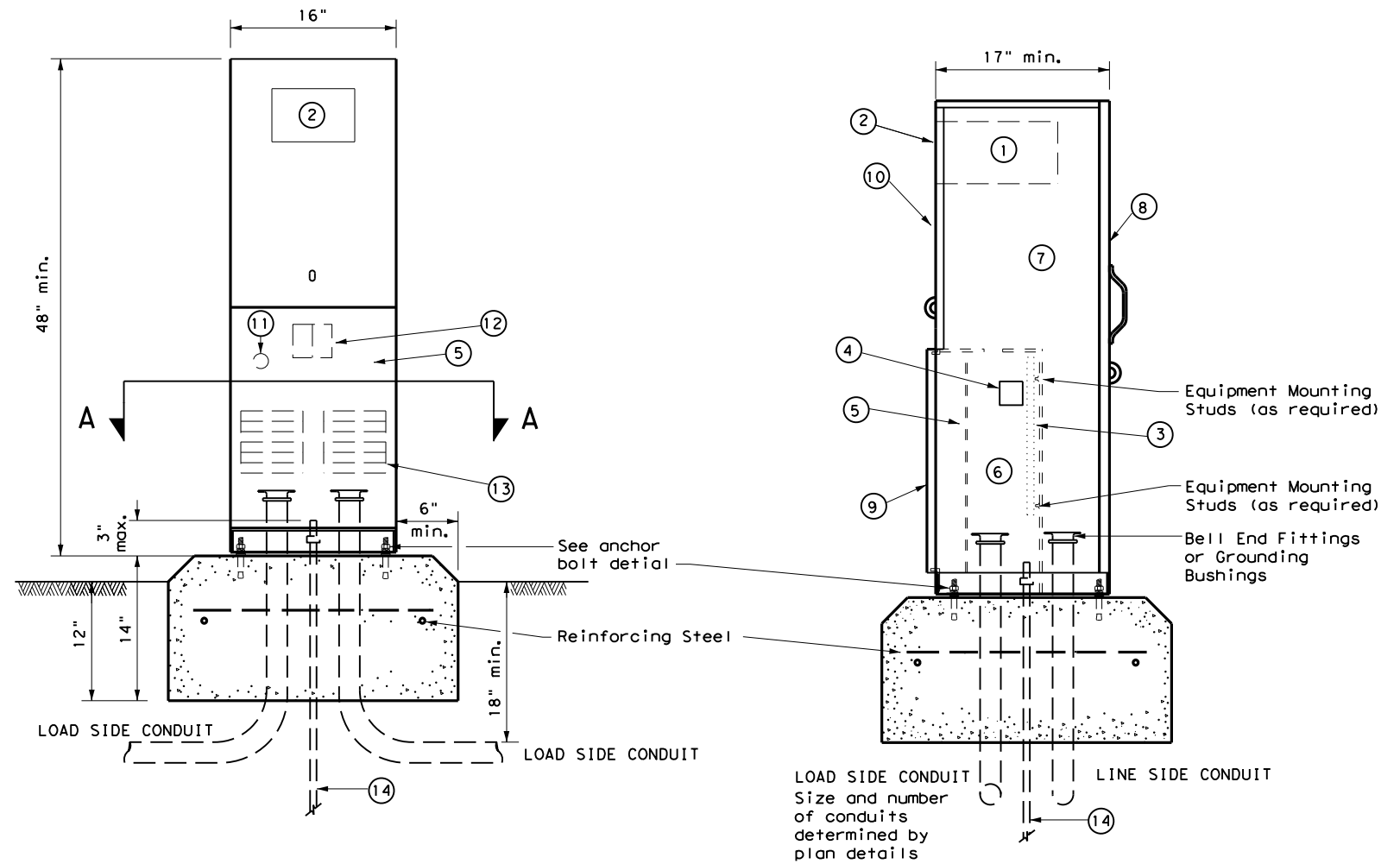
		Texas Department of Transportation				Traffic Operations Division Standard	
<h2 style="margin: 0;">ELECTRICAL DETAILS TYPICAL TRAFFIC SIGNAL SYSTEM DETAILS</h2>							
<h3 style="margin: 0;">ED(8) - 14</h3>							
FILE:	ed8-14.dgn	DW:	TxDOT	CK:	TxDOT	DW:	TxDOT
©TxDOT	October 2014	CONT:	0122	SECT:	03	JOB:	033, ETC
				US		287, ETC	
REVISIONS				DIST:		COUNTY	
				BRY		FREESTONE, ETC	
						SHEET NO. 131	

DISCLAIMER: The use of this standard is governed by the "Texas Engineering Practice Act". No warranty of any kind is made by TxDOT for any purpose whatsoever. TxDOT assumes no responsibility for the conversion of units or for the use of this standard for any purpose other than that for which it was originally intended.

DATE: 5/26/2022 4:42:16 PM
 FILE: \\txdot\project\wiseonline.com\TXDOT14\Documents\17 - BRY\Design Projects\ED(9)-14\ED(9)-14.dgn

PEDESTAL SERVICE NOTES

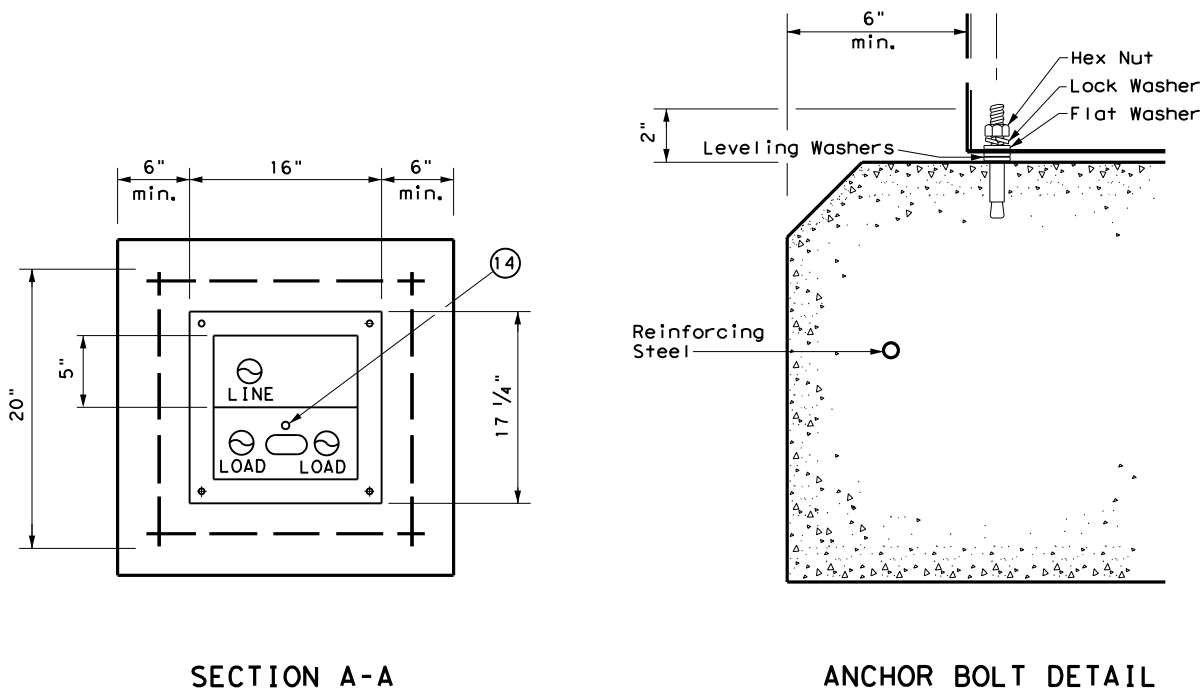
1. Manufacture pedestal electrical services in accordance with Departmental Material Specifications (DMS) 11080 "Electrical Services", 11085 "Electrical Services-Pedestal (PS)" and Item 628 "Electrical Services." Provide pedestal electrical services as listed on the Material Producers List (MPL) on the Department's web site under "Roadway Illumination and Electrical Supplies," Item 628. Ensure all mounting hardware and installation details of services meet utility company specifications. Contact the local utility company for approval of pedestal details prior to installing the electrical pedestal service. Submit any changes required by the utility company prior to manufacturing the pedestal enclosure.
2. When a meter socket is required, provide a socket with a minimum 100 amp rating that complies with local utility requirements.
3. Provide Class A or C concrete for pedestal service foundations in accordance with Item 420, "Concrete Substructures," except that concrete will not be paid for directly but is considered subsidiary to Item 628.
4. Provide #4 reinforcing steel for foundations in accordance with Item 440, "Reinforcement for Concrete."
5. Install 1/2 in. X 2 1/16 in. minimum length concrete single expansion type anchors for mounting pedestal enclosure to foundation. Anchor location to match mounting holes in each corner of enclosure. Secure each of the four corners of the pedestal enclosure to the anchors in the foundation with a 1/2 in. galvanized or stainless steel machine thread bolt, a properly sized locknut and a flat washer.
6. Finish top of concrete foundation in a neat and workmanlike manner. If leveling washers are used, ensure no more than 1/8 in. gap at any corner. Do not exceed a maximum dip or rise in the foundation of 1/8 in. per foot. When properly installed, ensure the top of the service enclosure is level front to back and side to side within 1/4 in. Repair rocking or movement of the service enclosure at no additional cost to the department.
7. Do not use liquidtight flexible metal conduit (LFMC) on pedestal type services.
8. Ensure all elbows in the foundation are sized as per utility provider's conduit requirements for underground conduit and feeders. PVC extensions may be installed provided the ends of the rigid metal conduits are more than 2 in. below the top of the concrete foundation. Where extension conduits are metal, grounding bushings must be installed with a bonding jumper properly terminated.



FRONT VIEW

SIDE VIEW

TYPE C shown, TYPE A similar except that TYPE A shall have individual circuit breakers (CB) mounted on an equipment mounting panel. CB Handles shall protrude through hinged deadfront trim.



SECTION A-A

ANCHOR BOLT DETAIL

LEGEND

1	Meter Socket, (when required)
2	Meter Socket Window, (when required)
3	Equipment Mounting Panel
4	Photo Electric Control Window, (When required)
5	Hinged Deadfront Trim
6	Load Side Conduit Trim
7	Line Side Conduit Area
8	Utility Access Door, with handle
9	Pedestal Door
10	Hinged Meter Access
11	Control Station (H-O-A Switch)
12	Main Disconnect
13	Branch Circuit Breakers
14	Copper Clad Ground Rod - 5/8" X 10'

		Traffic Operations Division Standard	
<h2>ELECTRICAL DETAILS</h2> <h2>ELECTRICAL SERVICE SUPPORT</h2> <h2>PEDESTAL SERVICE TYPE PS</h2> <h3>ED(9) - 14</h3>			
FILE: ed9-14.dgn	DN: TxDOT	CK: TxDOT	DW: TxDOT
© TxDOT October 2014	CONT: 0122	SECT: 03	JOB: 033, ETC
REVISIONS	DIST: BRY	COUNTY: FREESTONE, ETC	US 287, ETC
		SHEET NO.	132

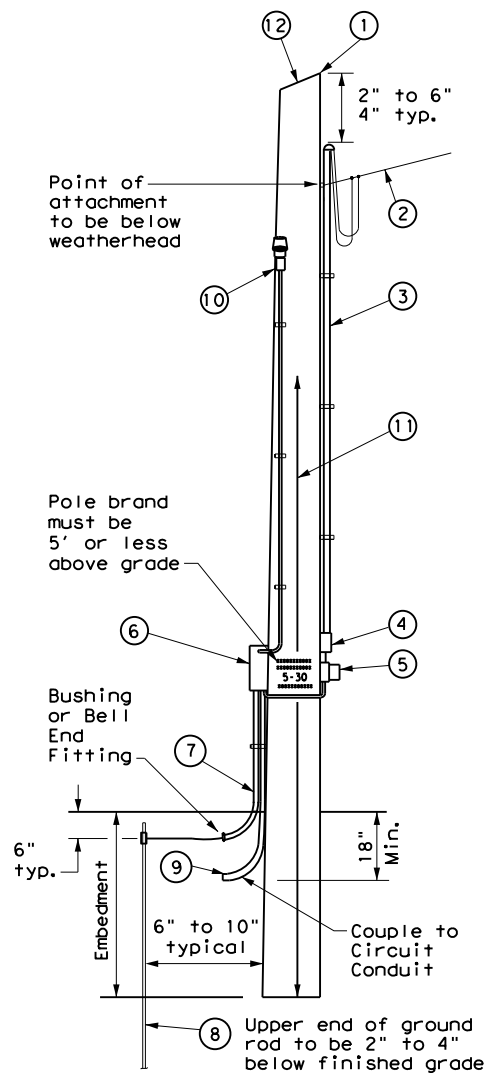
DISCLAIMER: The use of this standard is governed by the "Texas Engineering Practice Act". No warranty of any kind is made by TxDOT for any purpose whatsoever. TxDOT assumes no responsibility for the conversion of units or for the use of the standard for any purpose other than that for which it was intended.

DATE: 5/26/2022 4:42:21 PM
 FILE: \\txdot\project\wiseonline.com\TXDOT14\Documents\17 - BRY\Design Projects\ED10-14.dgn

TIMBER POLE (TP) SERVICE SUPPORT NOTES

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

- 1 Class 5 pole, height as required
- 2 Service drop from utility company (attached below weatherhead)
- 3 Service conduit (RMC) and service entrance conductors - One Red, One Black, One White (See Electrical Service Data)
- 4 Safety switch (when required)
- 5 Meter (when required)
- 6 Service enclosure
- 7 6 AWG bare grounding electrode conductor in 1/2 in. PVC to ground rod - extend 1/2 in. PVC 6 in. underground.
- 8 5/8 in. x 8 ft. Copper clad ground rod - drive ground rod to a depth of 2 in. to 4 in. below grade.
- 9 RMC same size as branch circuit conduit.
- 10 See pole-top mounted photocell detail on ED(5).
- 11 When required by the serving utility provide bare 6 AWG copper conductor. Run wire from pole top to butt wrap or copper butt plate. Protect conductor with non-conductive material to a height of 8 ft. above finished grade.
- 12 When required by utility, cut top of pole at an angle to enhance rain run off.

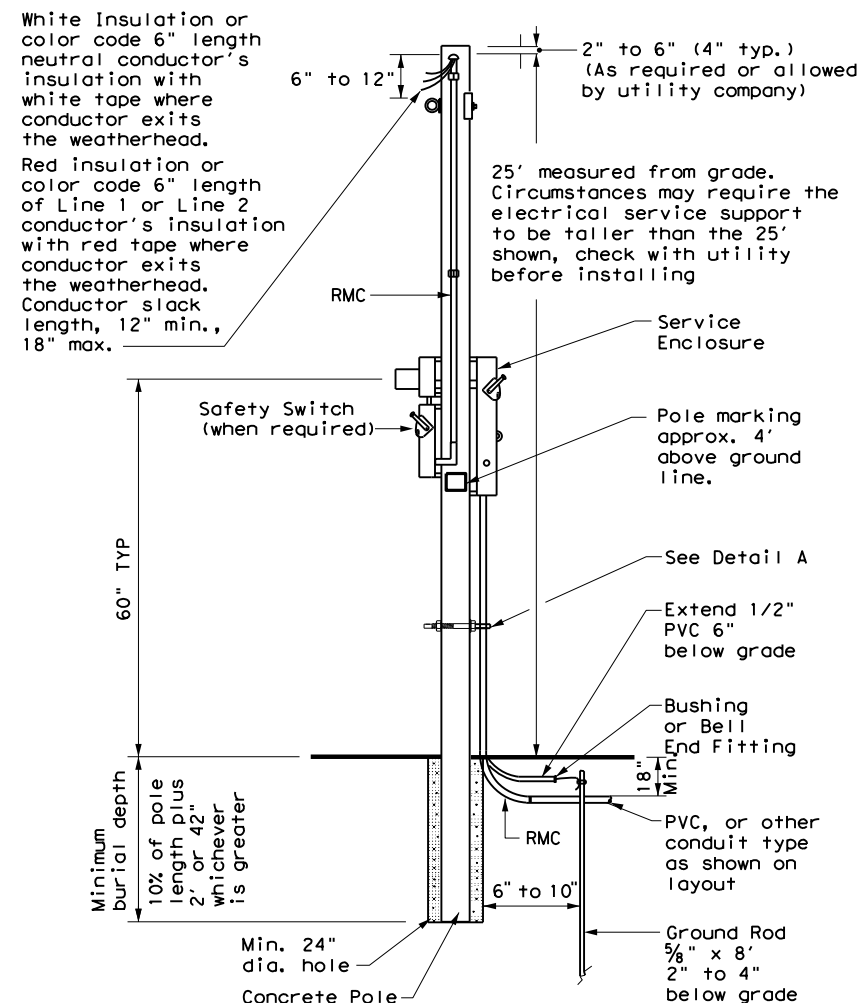


SERVICE SUPPORT TYPE TP (O)

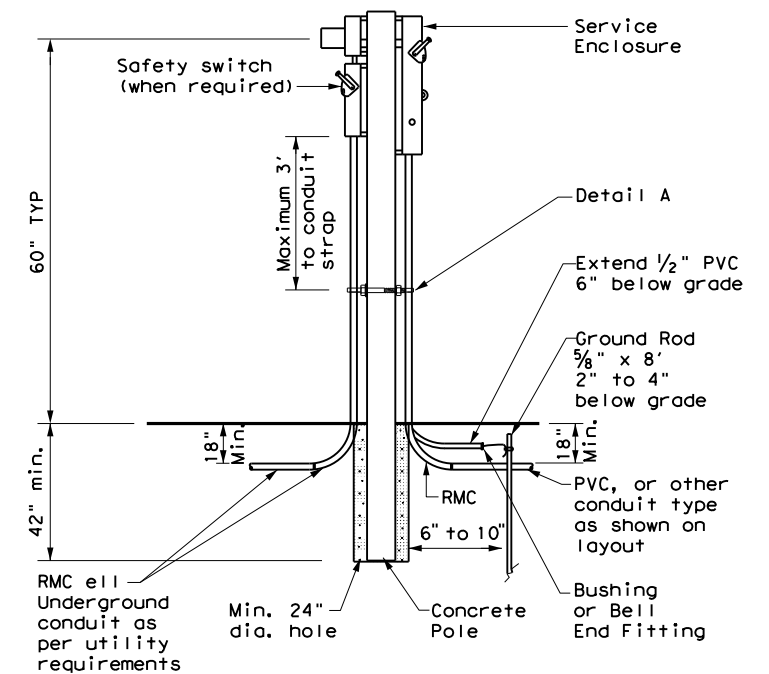
GRANITE CONCRETE (GC) & OTHER CONCRETE (OC) NOTES

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

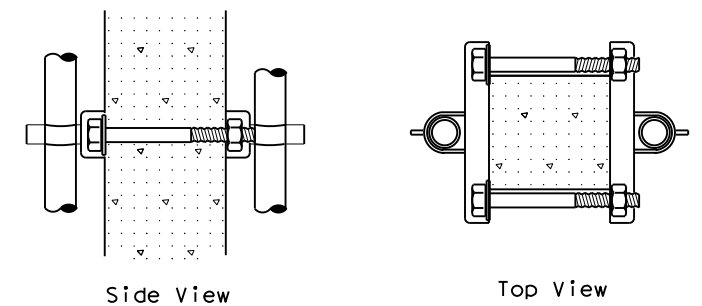
1. Provide GC and OC poles that meet the requirements of DMS 11080 "Electrical Services."
2. Provide prestressed concrete poles suitable for direct embedment into the ground without special foundations.
3. Verify poles are marked as required on DMS 11080. Location of marking should be approximately 4'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



CONCRETE SERVICE SUPPORT Overhead (O)



CONCRETE SERVICE SUPPORT Underground (U)



DETAIL A

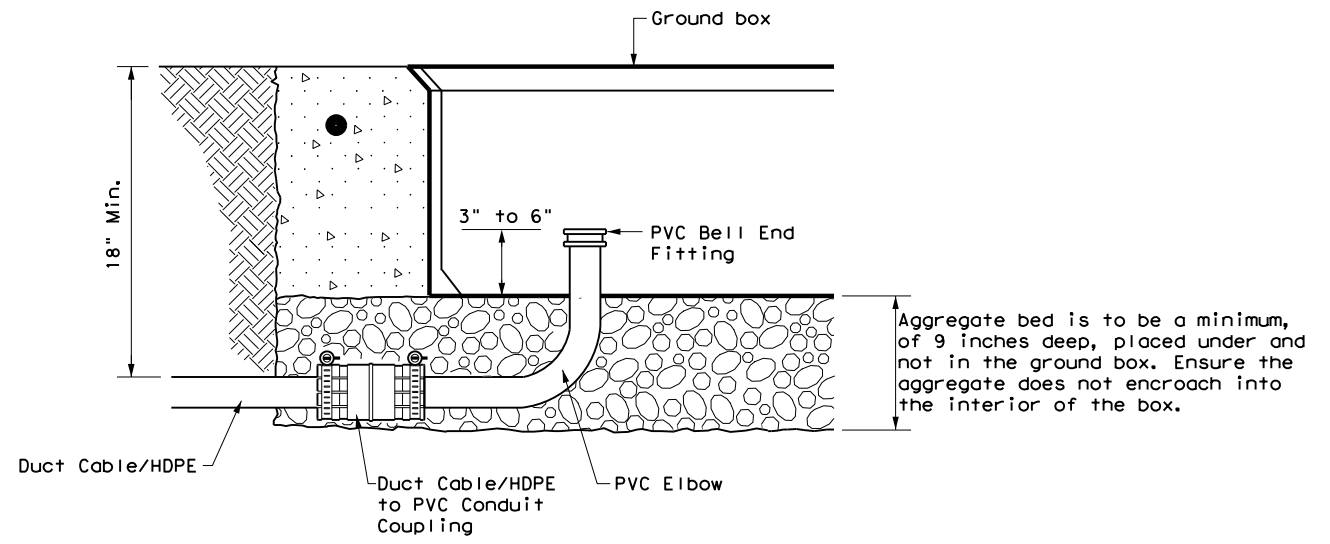
See Note 7. Before installing channel that has been cut, file sharp edges and paint with zinc-rich paint. Ensure there is no paint splatter on the pole.

		Traffic Operations Division Standard	
ELECTRICAL DETAILS SERVICE SUPPORT TYPES GC, OC, & TP			
ED(10)-14			
FILE: ed10-14.dgn	DN: TxDOT	CK: TxDOT	DW: TxDOT
© TxDOT October 2014	CONT: 0122	SECT: 03	JOB: 033, ETC
REVISIONS	US	287, ETC	
DIST: BRY	COUNTY: FREESTONE, ETC	SHEET NO. 133	

DATE: 5/26/2022 4:42:27 PM
 FILE: \\txdot.projectwiseonline.com:TXDOT4\Documents\17 - BRY\Design Projects\17090903\17090903.dwg
 The use of this standard is governed by the "Texas Engineering Practice Act". No warranty of any kind is made by TxDOT for any purpose whatsoever. TxDOT assumes no responsibility for the conversion of any information from one format to another.

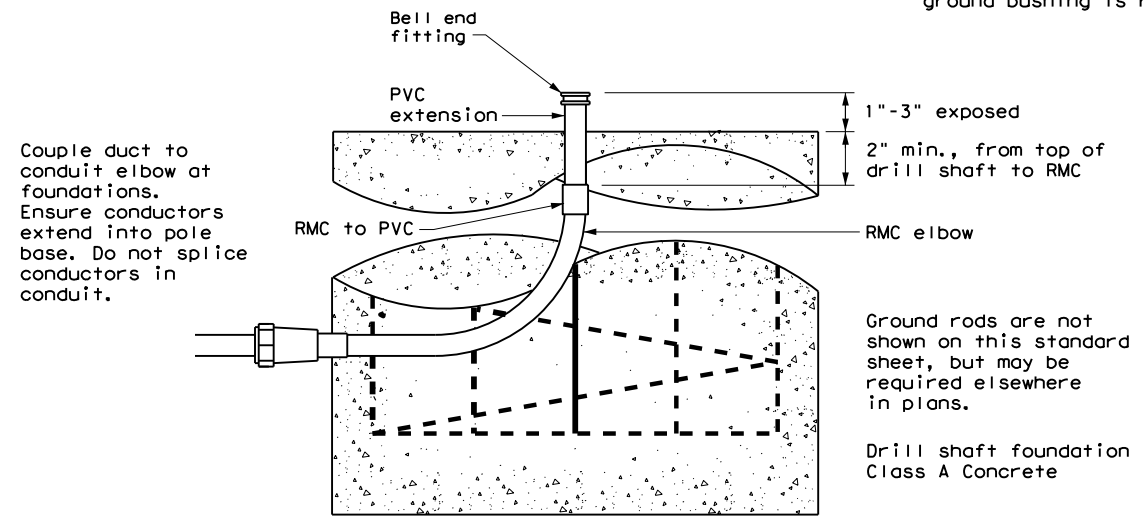
DUCT CABLE & HDPE CONDUIT NOTES

1. Provide duct cable in accordance with Departmental Material Specification (DMS) 11060 "Duct Cable" and Item 622 "Duct Cable." Provide duct cable as listed on the Material Producer List (MPL) on the Department web site under "Roadway Illumination and Electrical Supplies" Item 622.
2. Provide High-Density Polyethylene (HDPE) conduit in accordance with DMS 11060 and Item 618, "Conduit." Provide HDPE as listed on the MPL on the Department web site under "Roadway Illumination and Electrical Supplies," Item 618.
3. Supply duct cable with a minimum 2 in. diameter, unless otherwise shown in the plans. Provide duct cable and HDPE conduit as shown by descriptive code or on the plans. Bend duct cable and HDPE conduit as recommended by the manufacturer, with a minimum bending radius of 26 in. for 2 in. duct. Follow manufacturers' recommendations when handling duct cable and HDPE conduit reels and during installation of duct cable and HDPE conduit.
4. Do not splice conductors within duct cable or HDPE conduit. Couple duct cable and HDPE entering a ground box or foundation to a PVC elbow. When galvanized steel RMC elbows are called for in the plans and any portion of the RMC elbow is buried less than 18" from possible contact, ground the RMC elbow.
5. Furnish and install duct cable with factory installed conductors, sized as shown in the plans and as required by the National Electrical Code (NEC). The NEC contains specific requirements for duct cable in Article, "Nonmetallic Underground Conduit with Conductors: Type NUCC."
6. When conduit casing is called for in the plans, extend duct cable or HDPE conduit through the conduit casing in one continuous length without connection to the casing.
7. Seal the ends of duct cable or HDPE conduit with duct seal, expandable foam, or other approved method after completing the pull tests required by Item 622.
8. Provide minimum cover of 24 in. under roadways, 18 in. in other locations, or as shown on the plans.
9. Furnish and install listed fittings to couple duct cable or HDPE conduit to other types of conduit. Duct cable and HDPE conduit may be field-threaded and spliced with PVC or RMC threaded couplings; connected with listed tie-wrap fittings; connected using listed coupling made of HDPE with stainless steel external banding clamps and locking rings; connected with approved electrofusion conduit couplings; or connected using an approved chemical fusion method using an epoxy or adhesive specifically designed for HDPE couplings and connectors all installed in accordance with their manufacturer's instructions. Do not use PVC glue on HDPE. Do not use water pipe fittings, or connect conduit with heat shrink tubing.

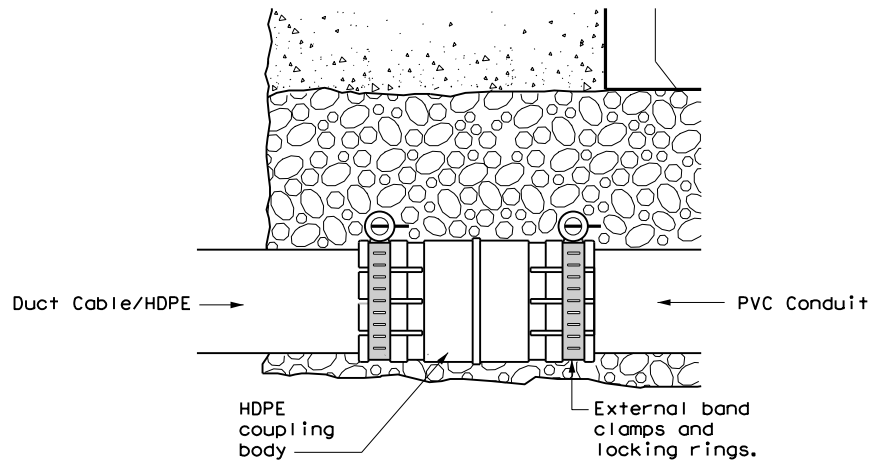


DUCT CABLE/HDPE AT GROUND BOX

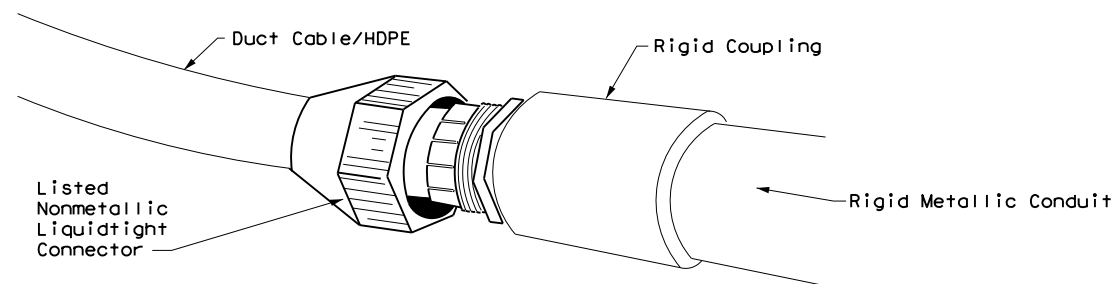
When the upper end of an RMC Ell does not enter the ground box, it may be extended with a SCH-40 PVC conduit nipple and bell end, provided there is a minimum of 18" of cover over all parts of the elbow. If not, a rigid extension and ground bushing is required.



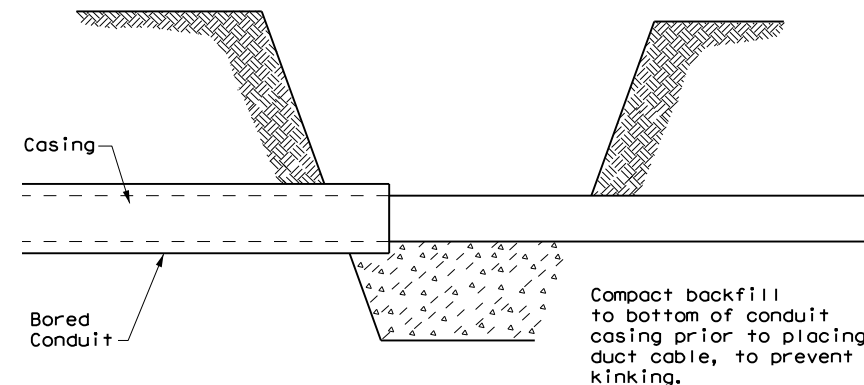
DUCT CABLE / HDPE AT FOUNDATION



DUCT CABLE/HDPE TO PVC



DUCT CABLE/HDPE TO RMC



BORE PIT DETAIL

		Traffic Operations Division Standard	
ELECTRICAL DETAILS DUCT CABLE / HDPE CONDUIT ED(11)-14			
FILE: ed11-14.dgn	DN: TxDOT	CK: TxDOT	DW: TxDOT
© TxDOT October 2014	CONT: 0122	SECT: 03	JOB: 033, ETC
REVISIONS			US 287, ETC
	DIST: BRY	COUNTY: FREESTONE, ETC	SHEET NO. 134

DISCLAIMER: The use of this standard is governed by the "Texas Engineering Practice Act". No warranty of any kind is made by TxDOT for any purpose whatsoever. TxDOT assumes no responsibility for the conversion of units or for the use of this standard in any project.

DATE: 5/26/2022 4:42:32 PM
 FILE: \\txdot\project\wiseonline.com\TXDOT14\Documents\17 - BRY\Design Project\ED(12)-14.dwg

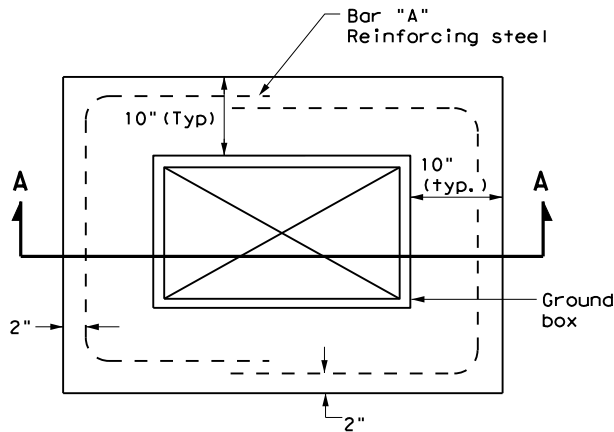
BATTERY BOX GROUND BOXES NOTES

A. MATERIALS

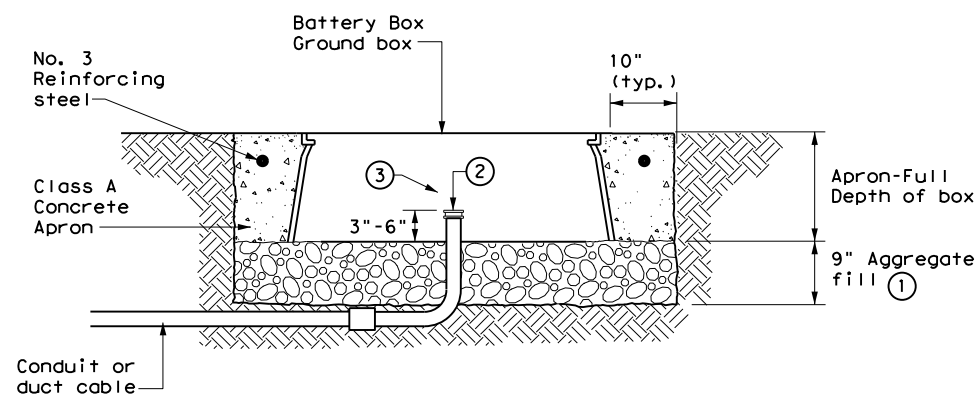
1. Provide polymer concrete or fiberglass reinforced plastic (FRP) battery box ground box and cover in accordance with Departmental Material Specification (DMS) 11071 "Battery Box Ground Boxes." Battery box will accommodate up to 4 batteries, each measuring 8 in. x 13.5 in. x 10 in. (W x L x D). Label battery box ground box cover in accordance with DMS 11071.
2. Supply a marine grade batteries with covers. Secure the marine grade batteries with covers to the stainless steel rack in the bottom of the ground box with tie down straps.

B. CONSTRUCTION METHODS

1. Ensure conduit entry will not interfere with placement of the batteries in the battery box ground box.
2. Remove all gravel and dirt from conduit. Cap all conduits prior to placing aggregate and setting battery box ground box. Provide Grade 3 or 4 coarse aggregate as shown on Table 2 of Item 302 "Aggregates for Surface Treatments." Ensure the aggregate bed is in place and is a minimum of 9 in. deep prior to setting the box. Install battery box ground box on top of aggregate.
3. Cast battery box aprons in place. Reinforcing steel may be field bent. Ensure the depth of concrete for the apron extends from finished grade to the top of the aggregate bed under the box. Battery box ground box aprons, including concrete and reinforcing steel, are subsidiary to battery box ground boxes when called for by descriptive code.
4. Bolt covers down when not working in battery box ground boxes. Keep bolt holes in the box clear of dirt.



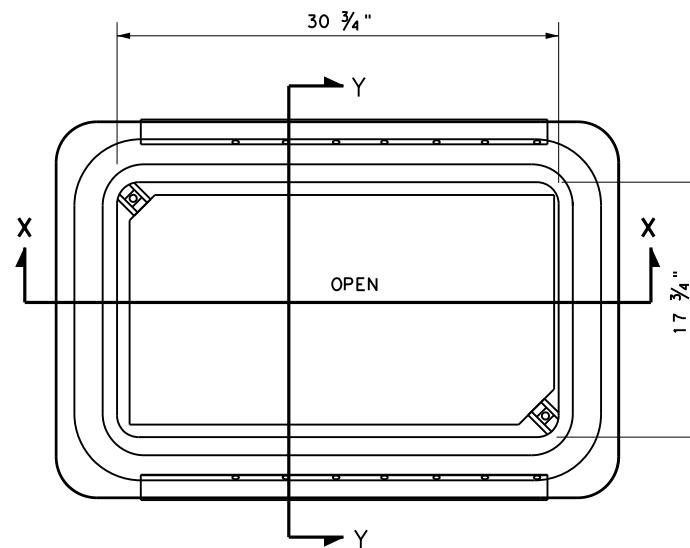
PLAN VIEW



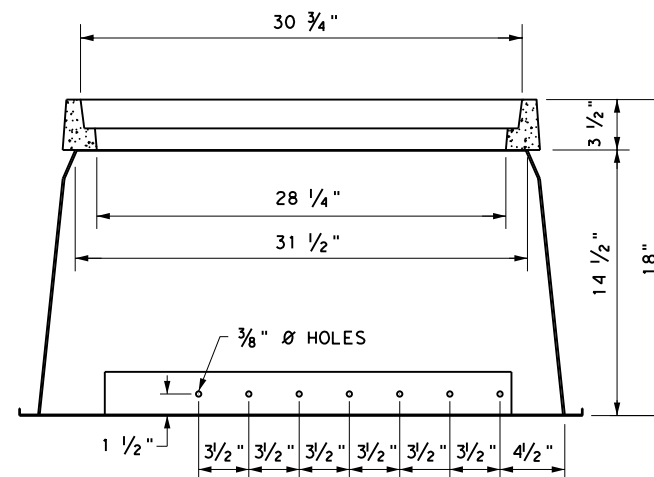
SECTION A - A

APRON FOR BATTERY BOX GROUND BOXES

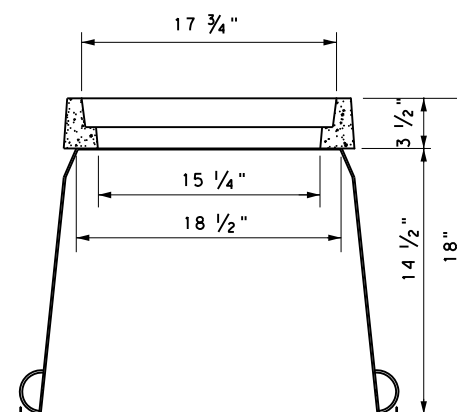
- ① Place aggregate under the box and not in the box. Aggregate should not encroach on the interior volume of the box.
- ② Install bushing or bell end fitting on the upper end of all ellis.
- ③ Install all conduits in a neat and workmanlike manner.



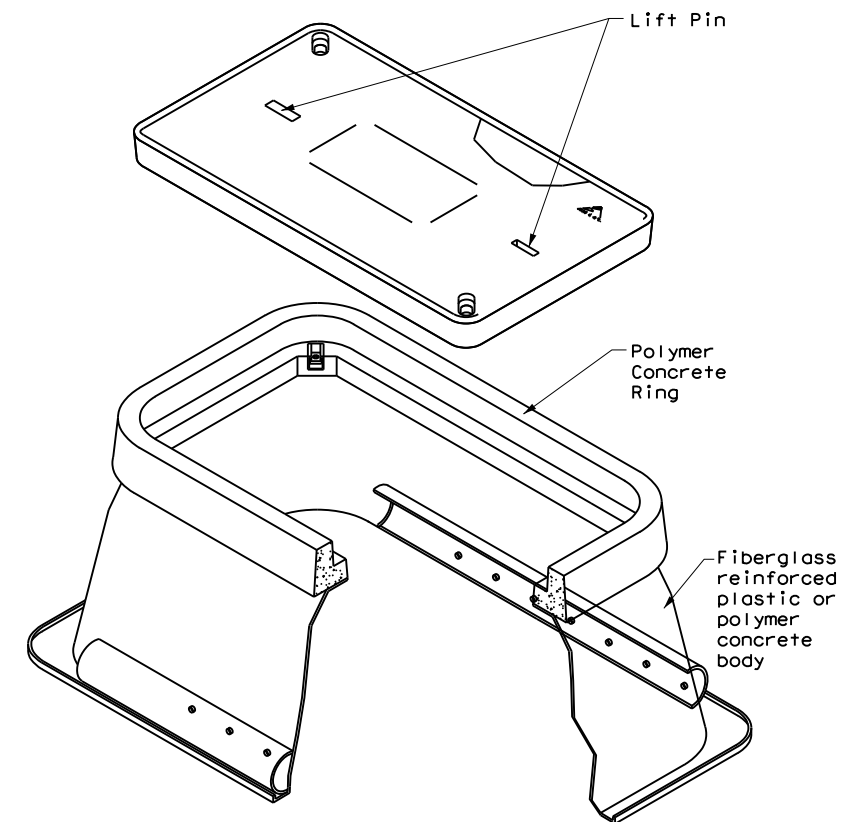
BATTERY BOX TOP VIEW



SECTION X-X

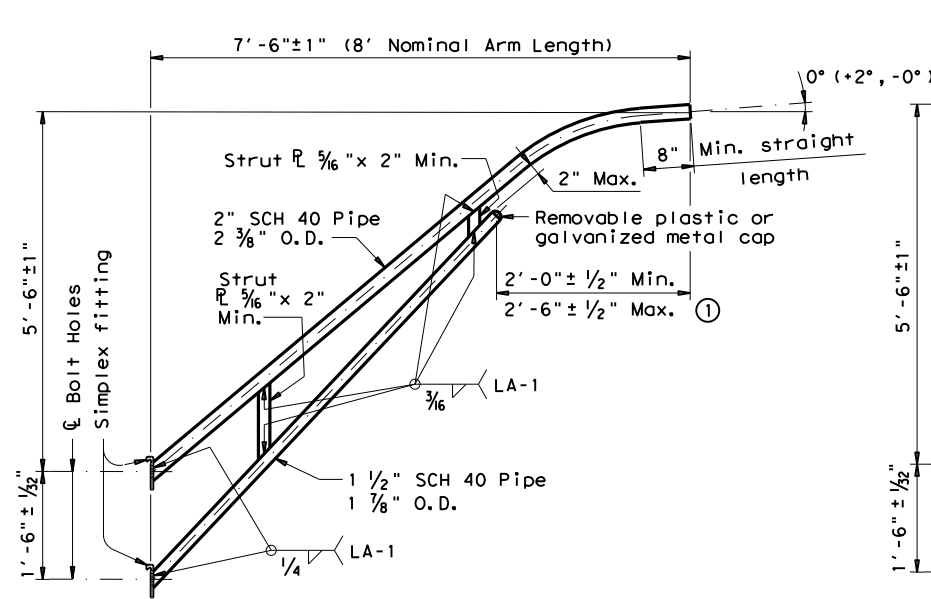


SECTION Y-Y

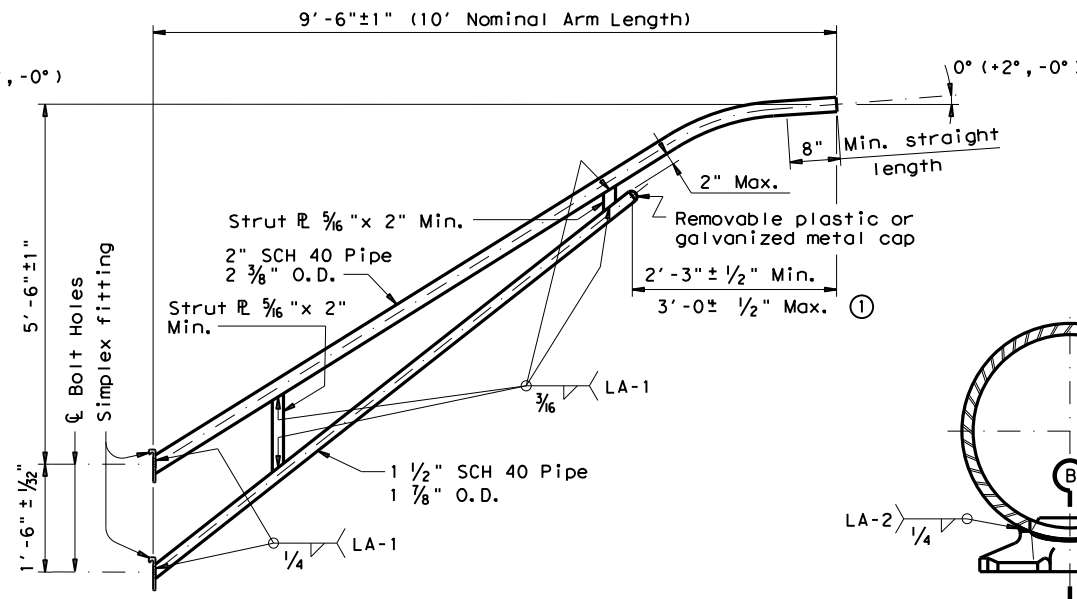


		Traffic Operations Division Standard	
<h2>ELECTRICAL DETAILS BATTERY BOX GROUND BOXES</h2>			
<h3>ED(12)-14</h3>			
FILE: ed12-14.dgn	DN: TxDOT	CK: TxDOT	DW: TxDOT
©TxDOT October 2014	CONT: 0122	SECT: 03	JOB: 033, ETC
REVISIONS		US	287, ETC
DIST: BRY	COUNTY: FREESTONE, ETC	SHEET NO. 135	

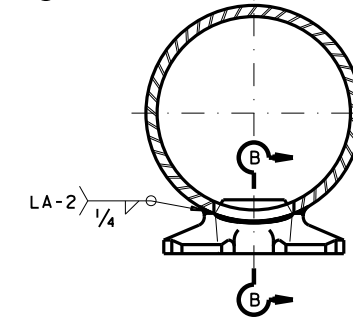
DATE: 5/26/2022 4:42:37 PM
 FILE: \\txdot.projectwiseonline.com:TXDOT14\Documents\17 - BRY\Design Projects\01220333\4 - Design\Plan Set\8. Traffic\Plan Set\8. Traffic\8H. TrafficStandards\LUM-A-12.dgn
 DISCLAIMER: The use of this standard is governed by the "Texas Engineering Practice Act". No warranty of any kind is made by TxDOT for any purpose whatsoever. TxDOT assumes no responsibility for the conversion of this standard to other formats or for incorrect results or damages resulting from its use.



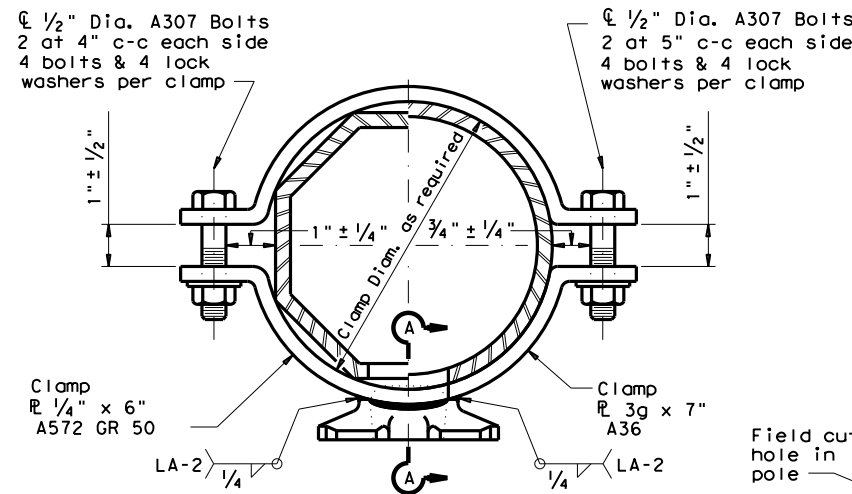
8-FOOT LUMINAIRE ARM



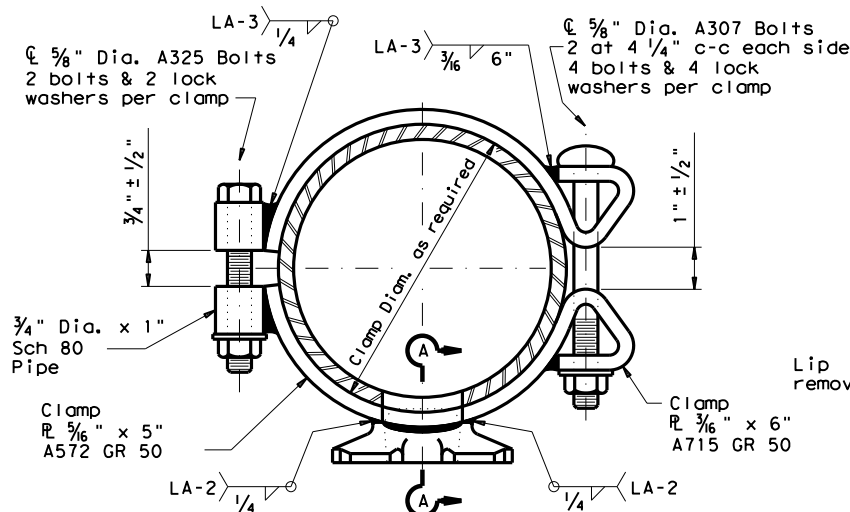
10-FOOT LUMINAIRE ARM



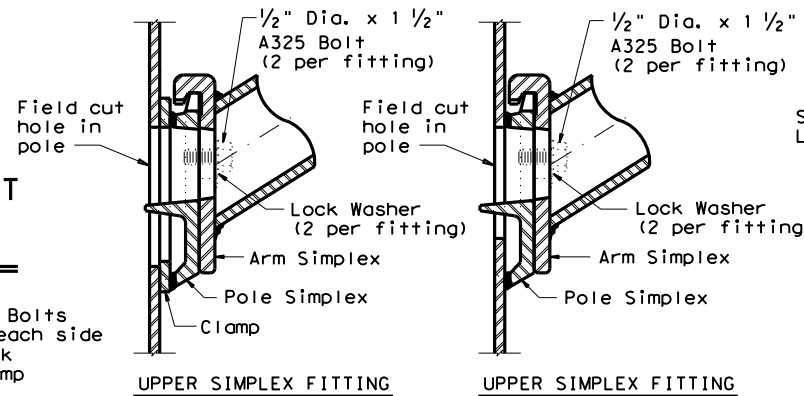
DIRECT ATTACHMENT DETAIL



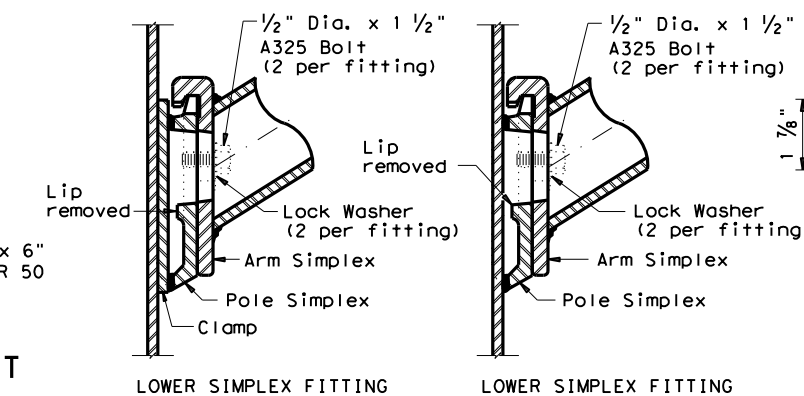
CLAMP ATTACHMENT DETAIL NO. 1 (HALF SECTION)
CLAMP ATTACHMENT DETAIL NO. 2 (HALF SECTION)



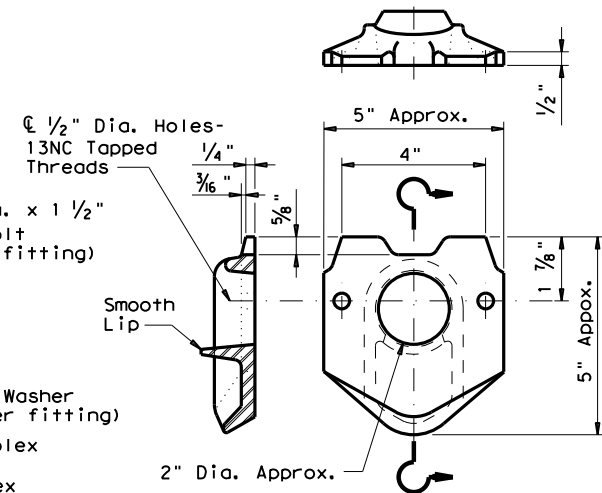
CLAMP ATTACHMENT DETAIL NO. 3 (HALF SECTION)
CLAMP ATTACHMENT DETAIL NO. 4 (HALF SECTION)



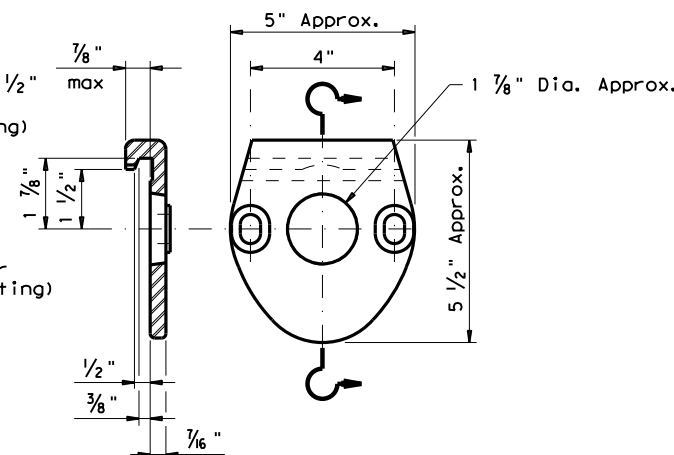
UPPER SIMPLEX FITTING



LOWER SIMPLEX FITTING



POLE SIMPLEX DETAIL



ARM SIMPLEX DETAIL

SECTION A-A

SECTION B-B

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

- Dimensional limits are given to show acceptable variation in design. All of a Fabricator's production of a particular arm length shall have the same dimensions within specified tolerances.
- Any of the materials listed for plates may be used where the drawings do not specify a particular ASTM designation.
- A576 must be suitable for forging and also meet minimum tensile strength of 65 ksi, minimum yield of 35 ksi, and elongation in 2 inches of 22 percent.
- ASTM A572, A1008 HSLAS-F, and A1011 HSLAS-F may have higher yield strengths but shall not have less elongation than the grade indicated.

GENERAL NOTES:

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

Materials and fabrication shall be in accordance with Item 686, "Traffic Signal Pole Assemblies (Steel)" and with the details, dimensions, and weld procedures shown herein. Weld references call for preapproved weld procedures which the Fabricator must obtain prior to fabrication. In the absence of specified Fabricator tolerances, dimensions shall be within the tolerances generally obtainable in normal fabrication practice.

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

Deviation from the details and dimensions shown herein require submission of shop drawings in accordance with Item 441, "Steel Structures". Alternate designs are not acceptable.

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

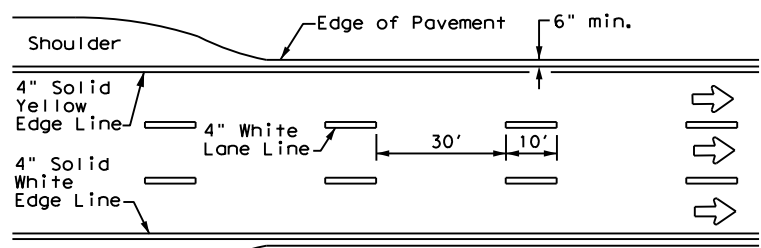
If clamp assemblies are ordered without poles, the Fabricator shall ship one upper and one lower clamp assembly together in a single package, including all nuts and washers required for the clamps and simplex fittings.

Texas Department of Transportation
 Traffic Operations Division
STANDARD ASSEMBLY DRAWINGS FOR LUMINAIRE SUPPORT STRUCTURES
ARM DETAILS
LUM-A-12

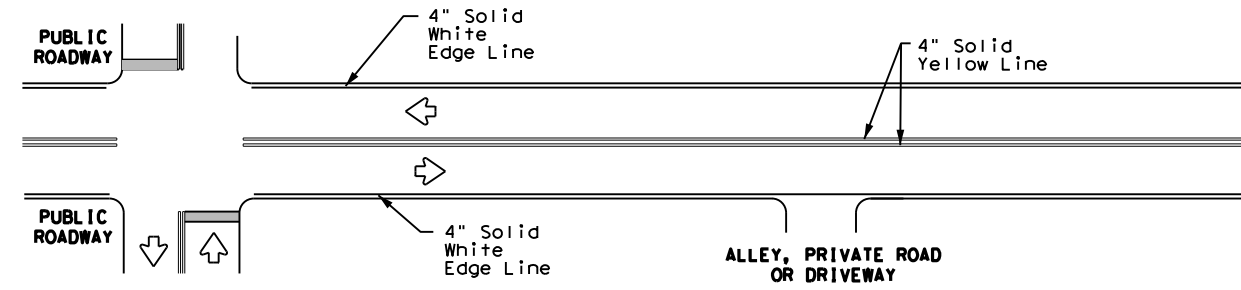
© TxDOT August 1995		DN: LEH	CK: JSY	DW: LTT	CK: TEB
REVISIONS		CONT	SECT	JOB	HIGHWAY
5-96	1-99	0122	03	033, ETC	US 287, ETC
1-12		DIST	COUNTY		SHEET NO.
		BRY	FREESTONE, ETC		136

DISCLAIMER: The use of this standard is governed by the "Texas Engineering Practice Act". No warranty of any kind is made by TxDOT for any purpose whatsoever. TxDOT assumes no responsibility for the conversion of units or for the use of this standard in any project.

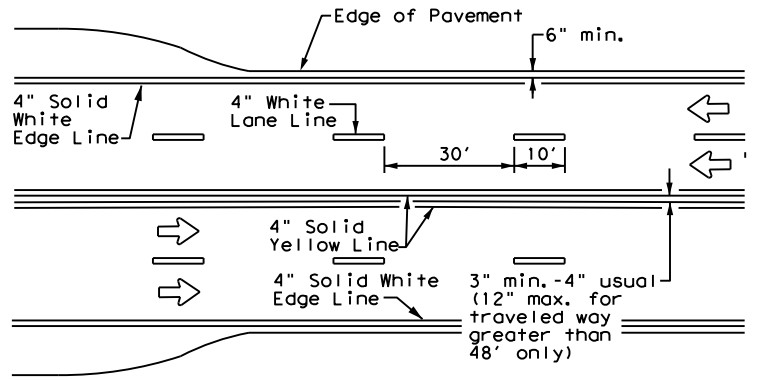
DATE: 5/26/2022 4:42:43 PM
 FILE: \\txdot\project\wiseon\line.com\TXDOT4\Documents\17 - BRY\Design Project\170903\170903.dwg



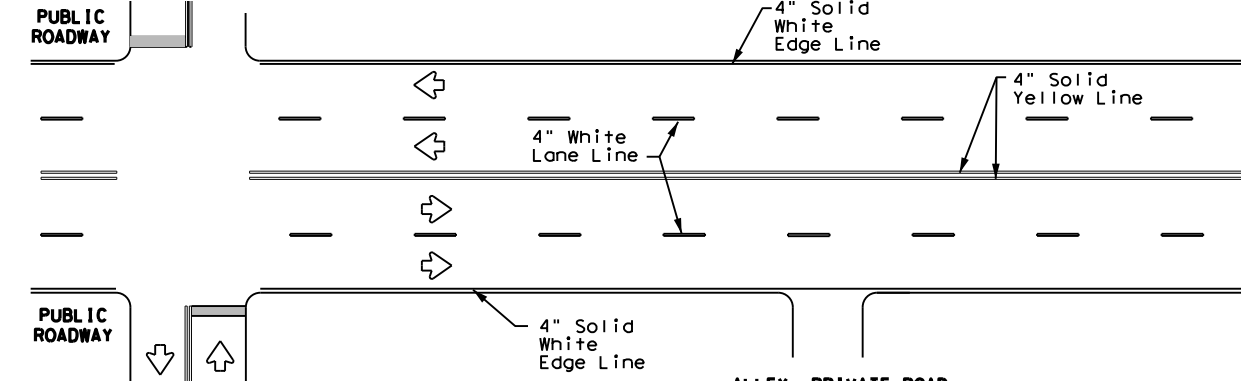
**EDGE LINE AND LANE LINES
ONE-WAY ROADWAY
WITH OR WITHOUT SHOULDERS**



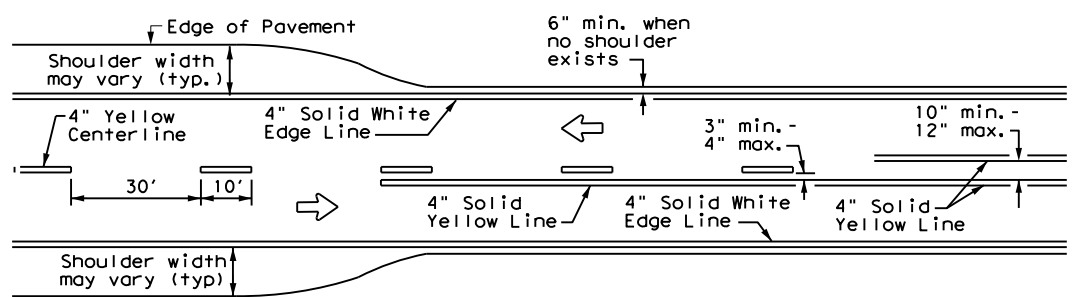
**TYPICAL TWO-LANE, TWO-WAY PAVEMENT
MARKINGS THROUGH INTERSECTIONS**



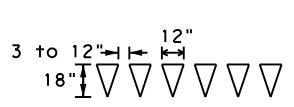
**CENTERLINE AND LANE LINES
FOUR LANE TWO-WAY ROADWAY
WITH OR WITHOUT SHOULDERS**



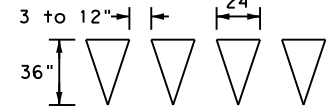
**TYPICAL MULTI-LANE, TWO-WAY PAVEMENT
MARKINGS THROUGH INTERSECTIONS**



**TWO LANE TWO-WAY ROADWAY
WITH OR WITHOUT SHOULDERS**

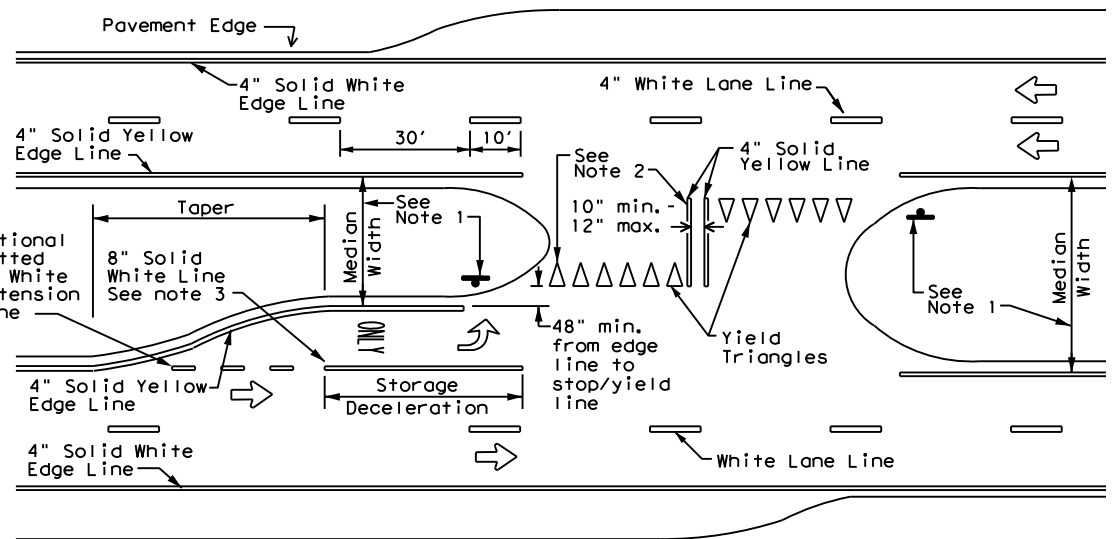


For posted speed on road being marked equal to or less than 40 MPH.



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

YIELD LINES



FOUR LANE DIVIDED ROADWAY CROSSOVERS

NOTES

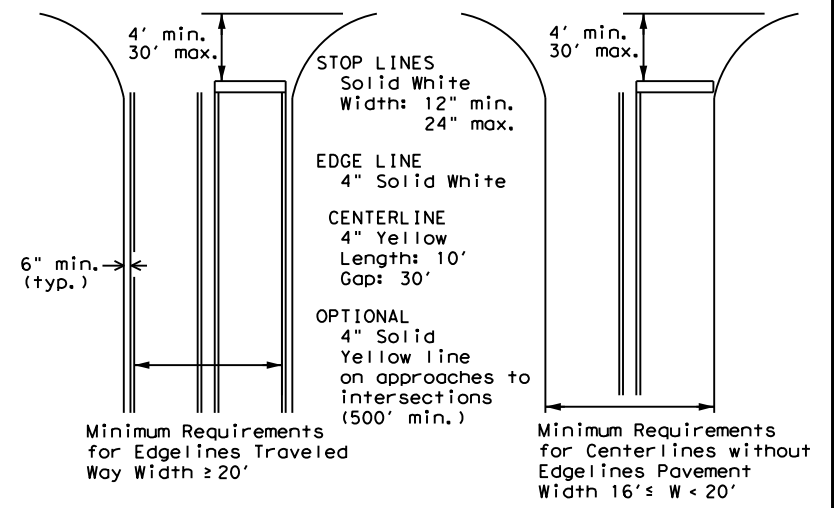
- Where divided highways are separated by median widths at the median opening itself of 30 feet or more, median openings shall be signed as two separate intersections. Each median opening has two width measurements, with one measurement for each approach. The narrow median width will be the controlling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

- Edgeline striping shall be as shown in the plans or as directed by the Engineer. The edgeline should not be placed less than 6 inches from the edge of pavement. This distance may vary due to pavement raveling or other conditions. Edgelines are not required in curb and gutter sections of roadways.
- 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 inside of edgeline to the inside of edgeline 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.



**GUIDE FOR PLACEMENT OF STOP LINES,
EDGE LINE & CENTERLINE**

Based on Traveled Way and Pavement Widths for Undivided Highways



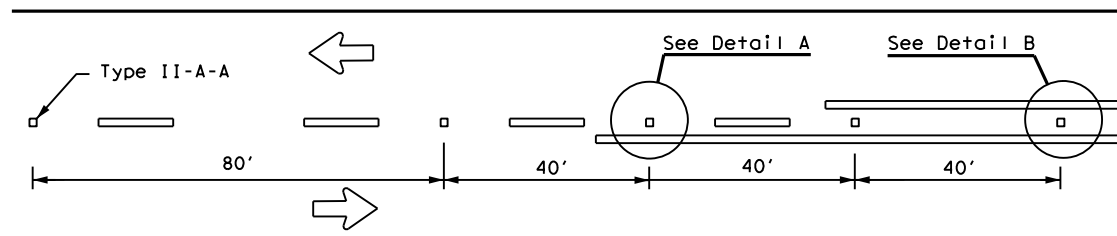
**TYPICAL STANDARD
PAVEMENT MARKINGS**

PM(1) - 20

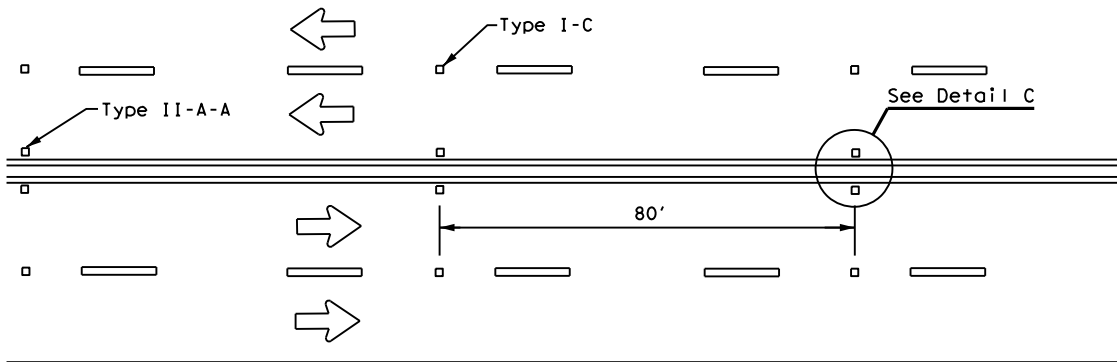
FILE: pm1-20.dgn	DN:	CK:	DW:	CK:
© TxDOT November 1978	CONT	SECT	JOB	HIGHWAY
8-95 3-03 REVISIONS	0122	03	033, ETC	US 287, ETC
5-00 2-12	DIST	COUNTY	SHEET NO.	
8-00 6-20	BRY	FREESTONE, ETC	137	

REFLECTIVE RAISED PAVEMENT MARKERS FOR VEHICLE POSITIONING GUIDANCE

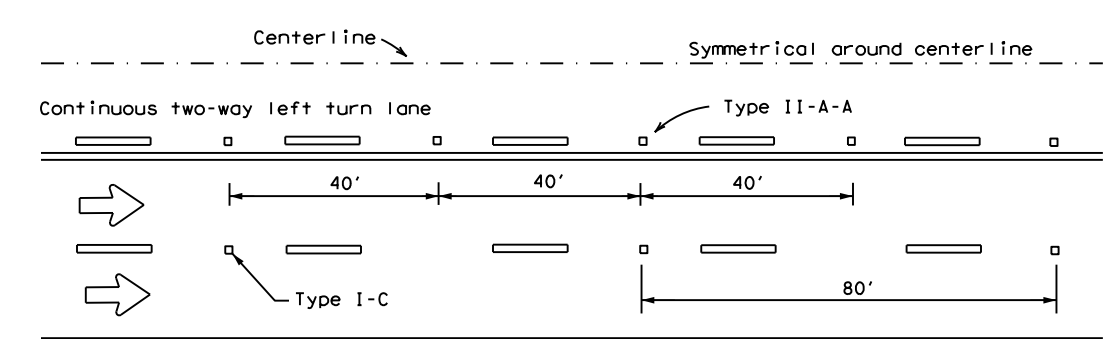
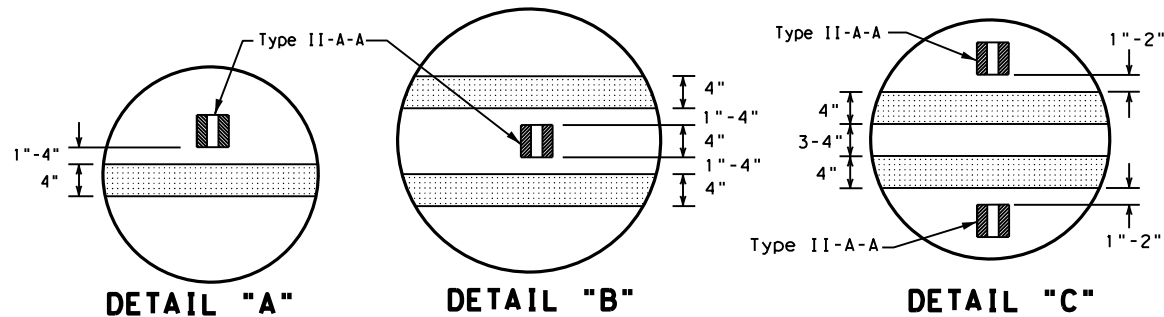
DISCLAIMER: The use of this standard is governed by the "Texas Engineering Practice Act". No warranty of any kind is made by TxDOT for any purpose whatsoever. TxDOT assumes no responsibility for the conversion of units or for the use of this standard for any purpose other than that for which it was intended.



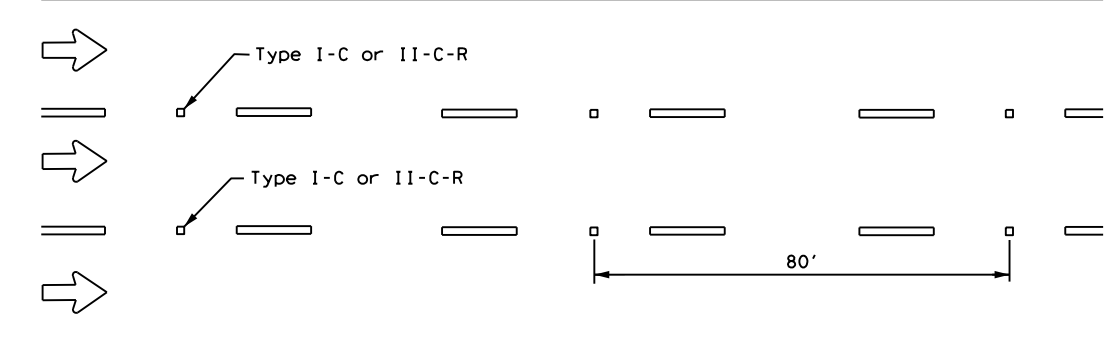
CENTERLINE FOR ALL TWO LANE ROADWAYS



**CENTERLINE & LANE LINES
FOR FOUR LANE TWO-WAY HIGHWAYS**

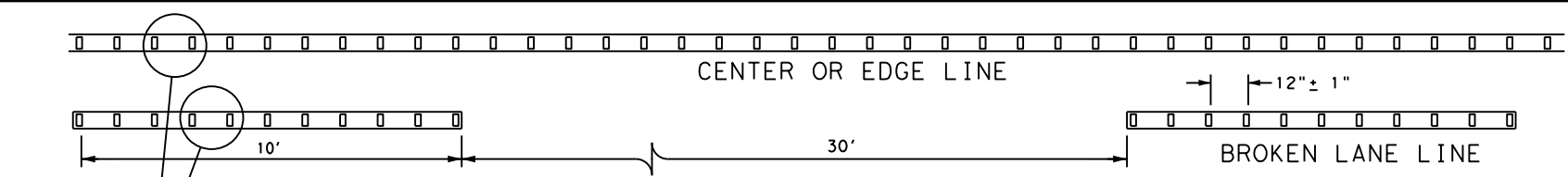


CENTERLINE AND LANE LINES FOR TWO-WAY LEFT TURN LANE

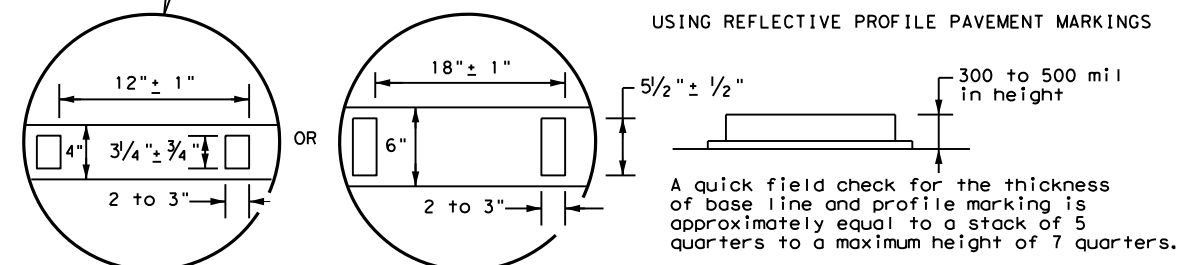


LANE LINES FOR ONE-WAY ROADWAY (NON-FREEWAY FACILITIES)

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



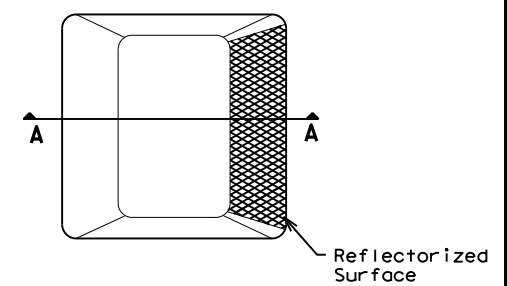
**REFLECTORIZED PROFILE
PATTERN DETAIL**
USING REFLECTIVE PROFILE PAVEMENT MARKINGS



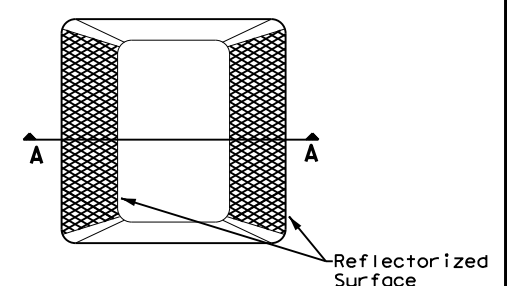
NOTE
Profile markings shall not be placed on roadways with a posted speed limit of 45 MPH or less.

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

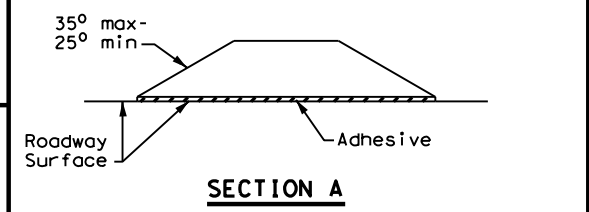
All pavement marking materials shall meet the required Departmental Material Specifications as specified by the plans.



Type I (Top View)



Type II (Top View)



RAISED PAVEMENT MARKERS

GENERAL NOTES

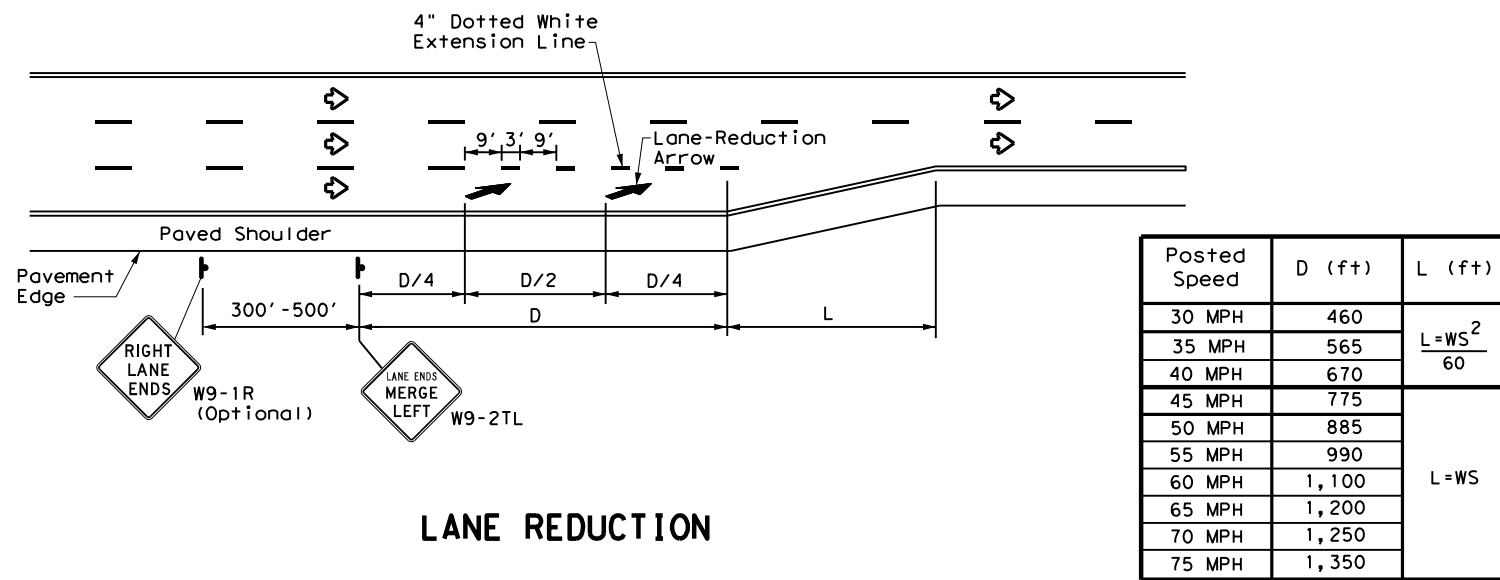
- All raised pavement markers placed in broken lines shall be placed in line with and midway between the stripes.
- On concrete pavements the raised pavement markers should be placed to one side of the longitudinal joints.



POSITION GUIDANCE USING RAISED MARKERS REFLECTORIZED PROFILE MARKINGS PM(2) - 20

FILE: pm2-20.dgn	DN:	CK:	DW:	CK:
© TxDOT April 1977	CONT	SECT	JOB	HIGHWAY
4-92 2-10 REVISIONS	0122	03	033, ETC	US 287, ETC
5-00 2-12	DIST	COUNTY	SHEET NO.	
8-00 6-20	BRY	FREESTONE, ETC	138	

DISCLAIMER: The use of this standard is governed by the "Texas Engineering Practice Act". No warranty of any kind is made by TxDOT for any purpose whatsoever. TxDOT assumes no responsibility for the conversion of units or for the use of this standard in any project. TxDOT is not responsible for any errors or omissions in this standard. DATE: 5/26/2022 4:42:52 PM FILE: \\txdot\project\wiseonline.com:TXDOT14\Documents\17 - BRY\Design Projects\170303\170303.dwg



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

LANE REDUCTION

NOTES

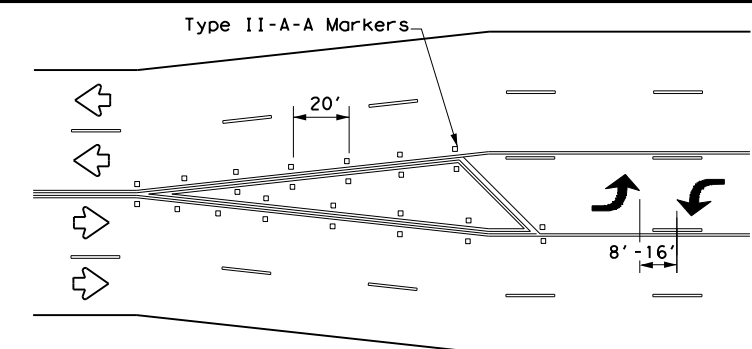
- Lane reduction pavement markings are used where the number of through lanes is reduced because of narrowing of the roadway or because of a section of on-street parking in what would otherwise be a through lane. For Texas Super 2 Passing Lanes, see TS2(PL) standard sheets.
- On divided highways, an additional W9-1R "RIGHT LANE ENDS" sign may be installed in the median aligned with the W9-1R sign on the right side of the highway.
- 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.
- For lane reductions on Freeways and Expressways, signing shall conform to the TxDOT Freeway Signing Handbook.

GENERAL NOTES

- 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.
- 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.
- 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.
- Length of turn bays, including taper, deceleration, and storage lengths shall be as shown on the plans or as directed by the Engineer.

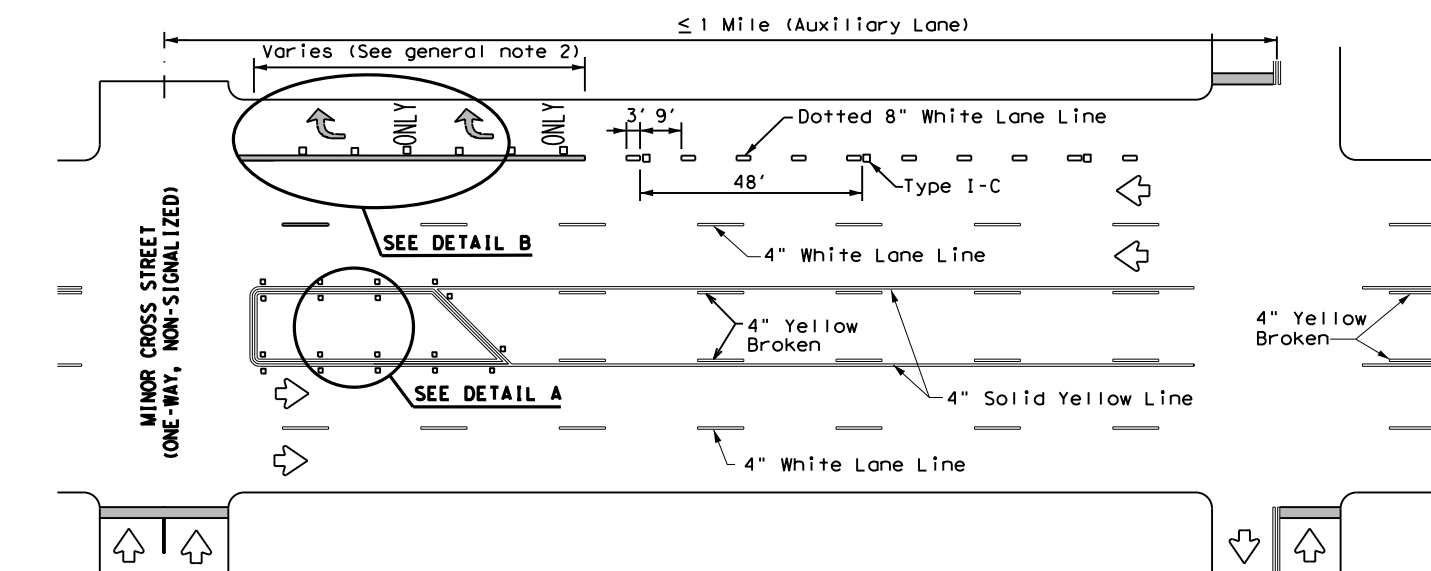
MATERIAL SPECIFICATIONS	
PAVEMENT MARKERS (REFLECTORIZED)	DMS-4200
EPOXY AND ADHESIVES	DMS-6100
BITUMINOUS ADHESIVE FOR PAVEMENT MARKERS	DMS-6130
TRAFFIC PAINT	DMS-8200
HOT APPLIED THERMOPLASTIC	DMS-8220
PERMANENT PREFABRICATED PAVEMENT MARKINGS	DMS-8240

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

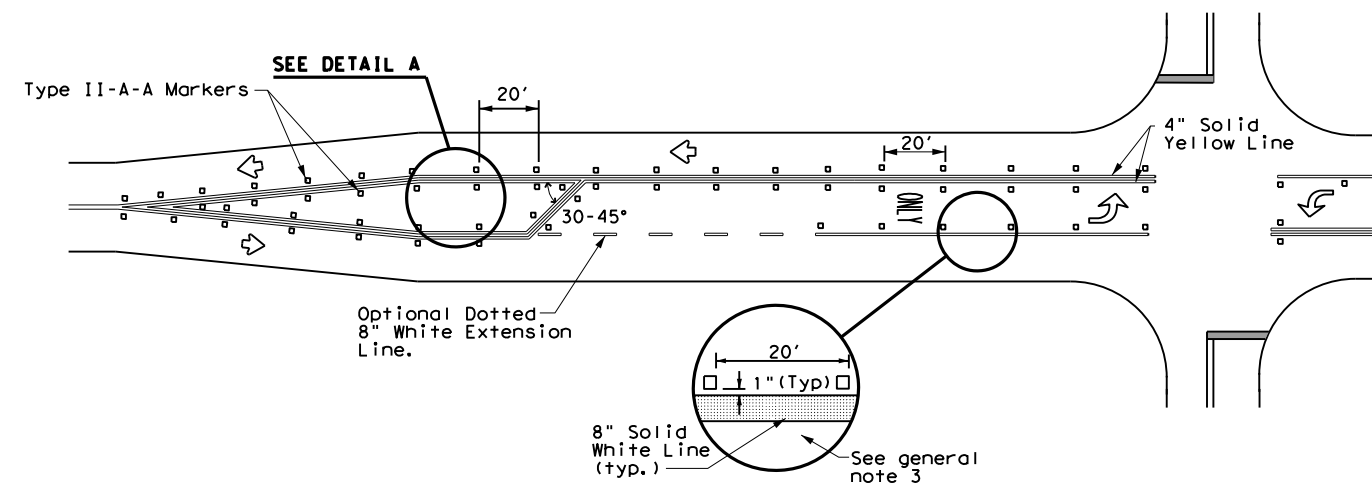


A two-way left-turn (TWLTL) lane-use arrow pavement marking should be used at or just downstream from the beginning of a two-way left-turn lane within a corridor. Repeating the marking after each intersection or dedicated turn bay is not required unless stated elsewhere in the plans.

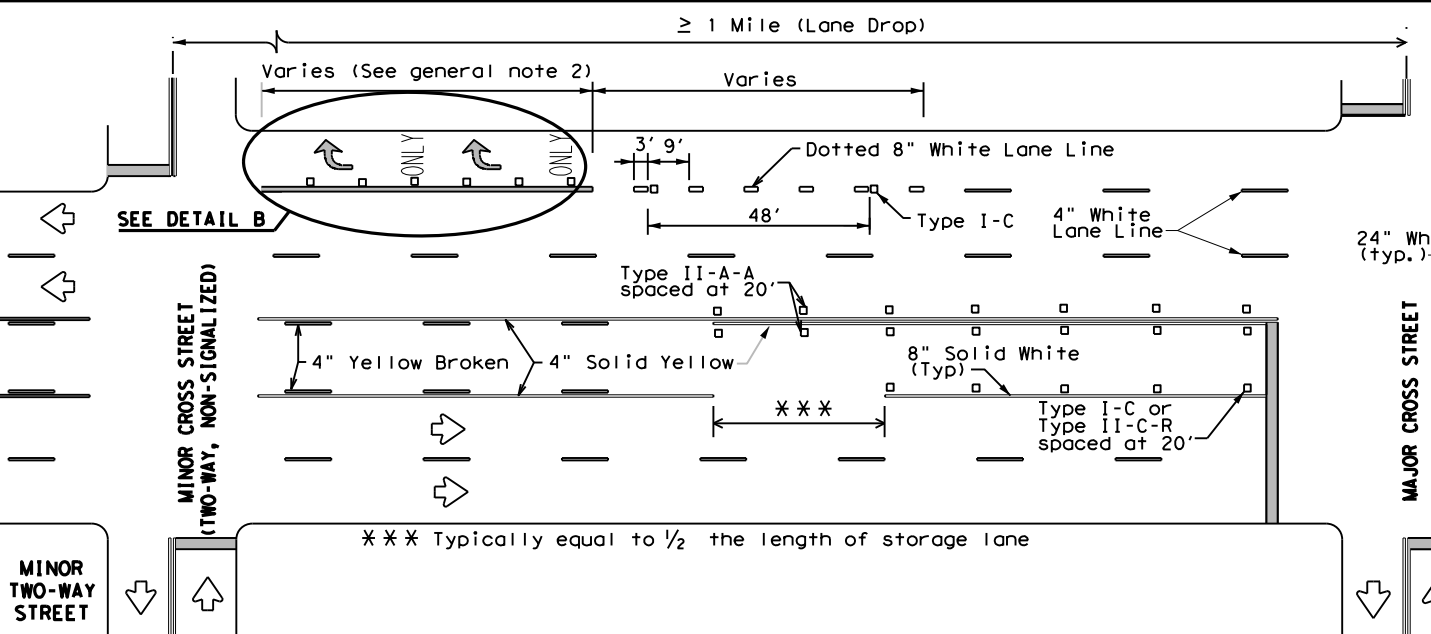
TYPICAL TRANSITION FOR TWLTL AND DIVIDED HIGHWAY



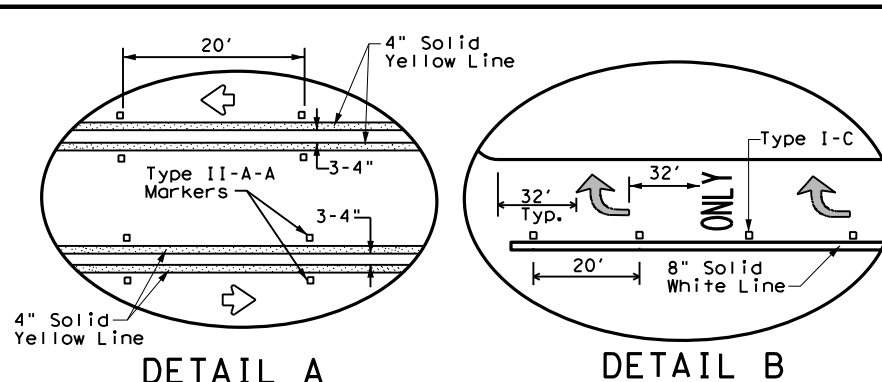
TYPICAL TWLTL AT ONE-WAY STREET AND RIGHT TURN AUXILIARY LANE



TYPICAL TWO-LANE HIGHWAY INTERSECTION WITH LEFT TURN BAYS



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



DETAIL A

DETAIL B

Texas Department of Transportation
Traffic Safety Division Standard

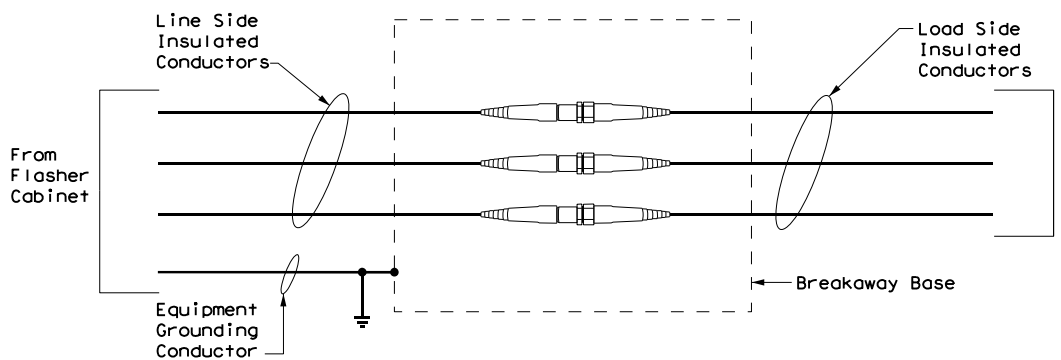
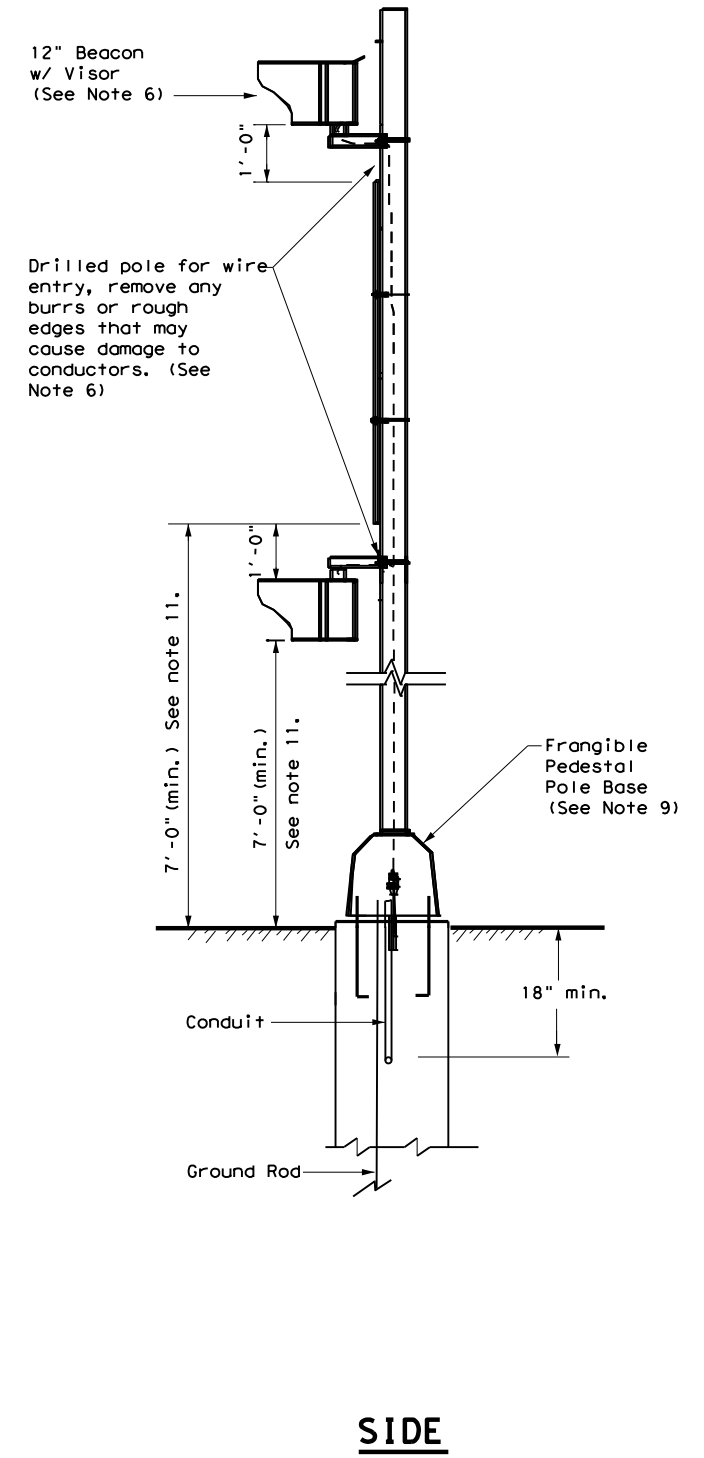
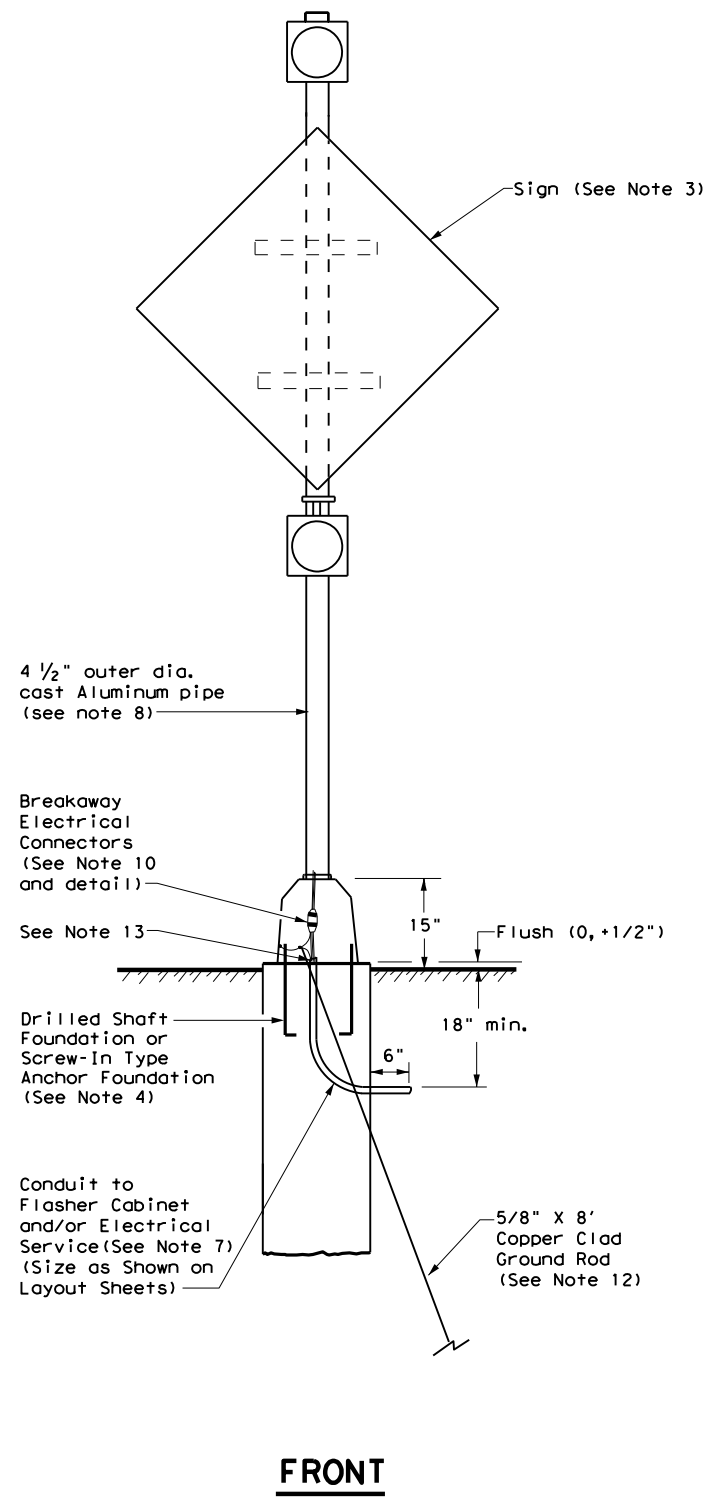
TWO-WAY LEFT TURN LANES, RURAL LEFT TURN BAYS, AND LANE REDUCTION PAVEMENT MARKINGS PM(3) -20

FILE: pm3-20.dgn	DN:	CK:	DW:	CK:
© TxDOT April 1998	CONT	SECT	JOB	HIGHWAY
REVISIONS	0122	03	033, ETC	US 287, ETC
5-00 2-10	DIST	COUNTY	SHEET NO.	
8-00 2-12	BRY	FREESTONE, ETC	139	
3-03 6-20				

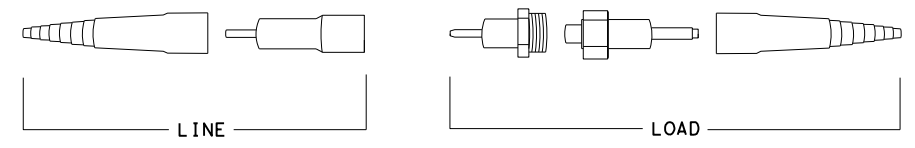
DISCLAIMER: The use of this standard is governed by the "Texas Engineering Practice Act". No warranty of any kind is made by TxDOT for any purpose whatsoever. TxDOT assumes no responsibility for the conversion of units or the use of this standard in any project. TxDOT assumes no responsibility for the conversion of units or the use of this standard in any project.

GENERAL NOTES:

1. Details show a typical warning sign with two flashing beacon heads, other arrangements are possible. When only one beacon is required, install the upper beacon.
2. See Item 685, "Roadside Flashing Beacon Assemblies" for further requirements.
3. See SMD standard sheets for lateral and vertical clearances and sign mounting details. Install signs as shown on the sign layout sheets.
4. Use either a Screw-In Type Anchor Foundation or a Drilled Shaft Foundation as shown elsewhere in the plans. When plans require a Drilled Shaft Foundation, see standard sheet TS-FD. Install the Screw-In Type Anchor Foundation as per manufacturer's recommendations. On a slope, install one edge at ground level. Screw-In/Drilled Shaft Foundation is subsidiary to Item 685. Installation of a ground rod is not required for solar powered flashing beacon assemblies.
5. When used, provide Screw-In Type Anchor Foundations as shown on TxDOT's Material Producer List (MPL) in the file "Highway Traffic Signals".
6. Install beacon heads as shown here, as shown elsewhere on the plans, or as directed. Use hardware specifically designed for mounting beacon heads on poles.
7. Conduit in foundation and within 6 in. of foundation is subsidiary to the Item 685, "Roadside Flashing Beacon Assemblies."
8. Unless otherwise shown on the plans, pole shaft shall be one piece, Schedule 40 Aluminum pipe, ASTM B429 or B221 (Alloy 6061-T6 only). Aluminum conduit will not develop the necessary strength and will not be allowed.
9. Per manufacturer's recommendations, engage all threads on the pedestal pole base and pipe unless the pipe is fully seated into base. In high winds, use a pole and base collar assembly to add strength and prevent loosening of connection.
10. Provide single pole non-fused watertight breakaway electrical connectors for frangible pedestal pole bases, as shown on TxDOT's MPL in the file "Roadway Illumination and Electrical Supplies." Approved models are listed under Item 685. For ungrounded (hot) conductors, install a breakaway connector with a dummy fuse slug. For grounded (neutral) conductors, install a breakaway connector with a white colored marking and a permanently installed dummy fuse (slug).
11. Provide clearance as shown above the sidewalk or pavement grade at the edge of the road. When a bottom beacon is not used, mount the bottom of the sign at least 7 ft. above the sidewalk or pavement grade at the edge of the road.
12. Make connections to ground rods according to NEC. Ground rod clamps shall be listed for their intended purpose.
13. Ensure height of conduit and ground rod is below top of anchor bolts.



NON-FUSED BREAKAWAY ELECTRICAL CONNECTORS



**NON-FUSED BREAKAWAY ELECTRICAL CONNECTORS
EXPLODED VIEW**

**ROADSIDE FLASHING
BEACON ASSEMBLY**

RFBA-13

FILE: rfb-13.dgn	DN: TxDOT	CK: TxDOT	DW: TxDOT	CR: TxDOT
© TxDOT January 1992	CONT	SECT	JOB	HIGHWAY
REVISIONS				
5-93 12-04	0122	03	033, ETC	US 287, ETC
10-93 3-13	DIST	COUNTY	SHEET NO.	
4-98	BRY	FREESTONE, ETC	140	

ROADWAY ILLUMINATION ASSEMBLY NOTES

1. Details apply to roadway lighting installations bid or referenced under Item 610, "Roadway Illumination Assemblies." Provide, furnish, and install all other materials not shown on the plans which may be necessary for complete and proper construction. Where manufacturers provide warranties or guarantees as a customary trade practice, furnish to the State such warranties or guarantees.
2. The locations of poles and fixtures may be shifted by the Engineer to accommodate local conditions. Install or remove poles and luminaires located near overhead electrical lines using established industry and utility safety practices and in accordance with laws governing such work. Consult with the appropriate utility company prior to beginning such work.
3. Provide new and unused materials. Ensure that all materials and installations comply with the applicable articles of the National Electrical Code (NEC), TxDOT standards and specifications, National Electrical Manufacturers Association (NEMA), and are listed by Underwriters Laboratories (UL) or a Nationally Recognized Testing Lab (NRTL). NRTLs such as Canadian Standard Association, Intertek Testing Services NA Inc., or FM Approvals LLC can be considered equivalent to UL. Faulty fabrication or poor workmanship in any material, equipment, or installation is justification for rejection.
4. Provide Roadway Illumination Light Fixtures as per TxDOT Departmental Material Specification (DMS) 11010, Item 610, and as shown on the Material Producers List (MPL) for Roadway Illumination and Electrical Supplies.
5. Fabricate steel roadway illumination poles in accordance with Roadway Illumination Poles (RIP) standards and Item 610. Poles fabricated according to RIP standards do not require shop drawing submittals.
 - a. Alternate designs to RIP standards or the use of aluminum to fabricate poles will require the submission of shop drawings electronically. For instructions on submitting shop drawings electronically see "Guide to Electronic Shop Drawing Submittal" on the TxDOT web site.
 - b. Limitations on use of the RIP standard: The RIP standard details were developed for installations in locations where the 3-second gust basic maximum wind speed is 110 mph, and where the elevation of the base of the pole is less than (i.e. not more than) 25' above the elevation of the surrounding terrain, in accordance with the "AASHTO Standard Specifications for Structural Supports for Highway Signs, Luminaires and Traffic Signals," 6th Edition (2013) of the AASHTO Design Specifications. For poles to be installed in regions where the maximum basic wind speed exceeds 110 mph or to be mounted more than 25' above the surrounding terrain, provide poles meeting the following requirements:
 - i. Submittals. Following the electronic shop drawing submittal process (see Guide to Electronic Shop Drawing Submittal on the TxDOT web site), submit to the Engineer for approval fabrication drawings and calculations for the poles, sealed by a Texas licensed professional engineer (P.E.).
 - ii. Luminaire Structural Support Requirements. Provide light poles, arms, and anchor bolt assemblies with a 25 year design life to safely resist dead loads, ice loads and the required basic wind speeds at the location of installation in accordance with the 6th edition (2013) of the AASHTO Design Specifications. For transformer base poles, include transformer base and connecting hardware in calculations and shop drawing submittals. Structurally test all transformer bases to resist the theoretical plastic moment capacity of the pole. Submit certification of the plastic moment load test and FHWA breakaway requirement test of the model of base being furnished with the shop drawings. Show breakaway base model number, manufacturer's name, and logo on shop drawings. Include on manufacturer's shop drawings the ASTM designations for all materials to be used.
6. For both transformer and shoe-base type illumination poles, provide and install double-pole breakaway fuse holders as specified by DMS-11040. Breakaway fuse holders are listed on the MPL for Roadway Illumination and Electrical Supplies under Items 610 & 620. Provide 10 amp time delay fuses for breakaway connectors in light poles, or inside the light fixture for underpass luminaires. In each pole, connect luminaires to the breakaway connector with continuous stranded 12 AWG copper conductors as listed on the MPL. Bond all equipment grounding conductors together and to the ground lug in the transformer base or hand hole.
7. Tighten anchor bolts for shoe base, concrete traffic barrier base, and bridge mount roadway illumination poles, in accordance with Item 449.
8. Install T-Base with following procedure:
 - a. Anchor Bolt Tightening.
 - i. Coat the threads of the anchor bolts with electrically conductive lubricant.
 - ii. Place the T-base over the anchor bolts. Foundation must be level and flat. The maximum permissible gap under any one corner of the t-base is 1/8" before nuts are tightened.
 - iii. Coat the bearing surfaces of the nuts and washers with electrically conductive lubricant. Install (1) 1/2" hold down washer, (1) lock washer, and (1) nut on each anchor bolt. Turn the nuts onto the bolts so that each is hand-tight against the washer.
 - iv. Using a torque wrench, tighten each nut to 150 ft-lb. Uniform contact is required between the foundation and the T-base in the corner regions of the T-base, and all corner gaps must be closed after applying torque. If a gap still exists after torquing to 150 ft-lbs, continue torquing each bolt incrementally until gap is closed or maximum allowable torque of 250 ft. pound is reached, whichever comes first. If 250 ft-lbs is not enough to close the gap the foundation must be leveled. Gaps along the straight sides of the T-bases and the foundation are permissible. Ensure that no high point of contact occurs between the straight sides of the T-base and the foundation.
 - v. Check top of T-base for level. If not level then foundation must be leveled.
 - b. Top Bolt Procedure
 - i. Erect pole over T-base with crane. Coat bolts, nuts, washers, and lock washers with electrically conductive lubricant.

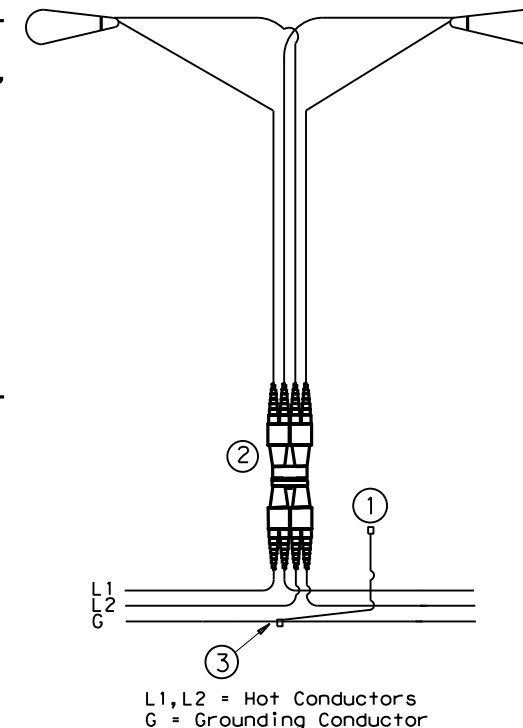
- ii. Install bolts and 1/2" connecting washers from the inside of the T-base, thread up through the pole base. Install flat washers, lock washers and nuts snug tight according to Item 447, "Structural Bolting."
 - iii. Tighten each nut to 150 ft-lb. using a torque wrench.
- c. Level and Plumb
- i. Ensure pole is plumb and mast arm is perpendicular to the roadway according to plans to within 5 degrees.
9. Construct luminaire pole foundations in accordance with Item 416, "Drilled Shaft Foundations," and TxDOT standard sheet RID(2).
 10. Provide and install underpass luminaires in accordance with Item 610, DMS-11010, and TxDOT standard sheet RID(3). Typical luminaire size for underpass luminaires is 150W HPS or 150W EQ LED.
 11. Mount luminaires on arms level as shown by the luminaire level indicator.
 12. Orient luminaires perpendicular to the roadway intended to be lit unless otherwise shown on the plans.

Wiring Diagram Notes:

- ① Use 1/2 in. -13 UNC threaded, copper or tin-plated copper, pole bonding connector, sized appropriately for conductors, bonded to T-base, or use ground lug in handhole as available.
- ② Use pre-qualified two-pole breakaway connectors for all luminaire pole installations. For luminaires fed by a circuit with a neutral conductor, use double pole breakaway connectors with the neutral side unfused and marked white.
- ③ Split Bolt or other connector.

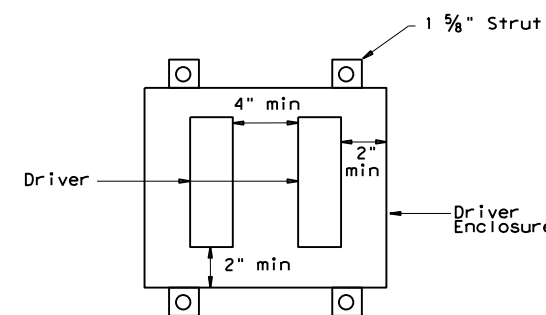
Decorative LED Lighting Notes:

1. LED Drivers in Remote Outdoor enclosures (for drivers that do not include an enclosure as part of a factory assembly):
 - a. Provide NEMA 3R outdoor enclosure or as approved.
 - b. Install enclosure at least 12" above ground or other horizontal surface. Mount vertically or on ceiling, and avoid direct sun where possible.
 - c. Install drivers with at least 2 inches of space from enclosure walls.
 - d. For multiple drivers in an enclosure, provide at least 4 inches side to side and 1 inch end to end from other drivers or electronic equipment
 - e. For drivers mounted on back wall of enclosure, mount enclosure on 1 5/8" strut or other standoff to dissipate heat, or mount driver to side of the enclosure or to the metal cover.
 - f. Provide remote drivers with a maximum of 100 watts
 - g. Provide drivers with documentation of 100,000 hr lifetime at Tcase of 65C or higher.



TYPICAL WIRING DIAGRAM

LUMINAIRES SERVED AT 480V ON 240/480 VOLT SERVICE OR LUMINAIRES SERVED AT 240V FOR 120/240 VOLT SERVICE.



Driver Spacing In Remote Enclosure

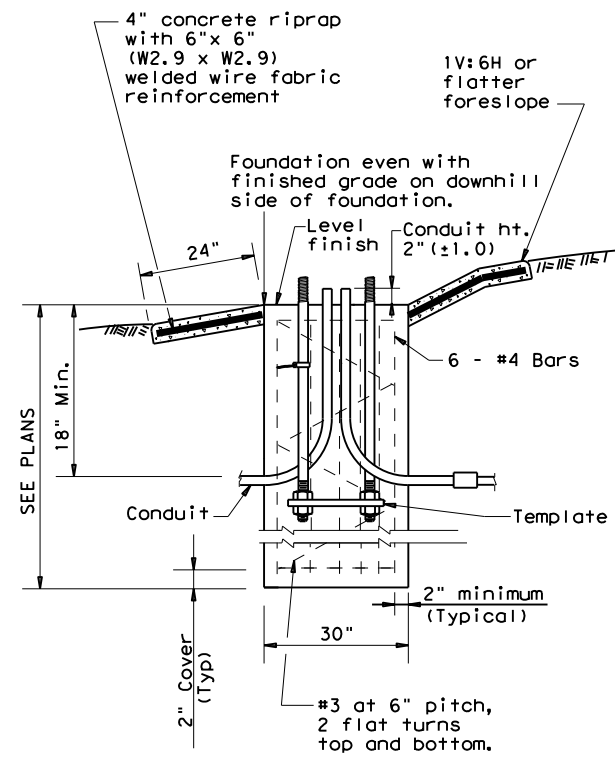
DISCLAIMER: The use of this standard is governed by the "Texas Engineering Practice Act". No warranty of any kind is made by TxDOT for any purpose whatsoever. TxDOT assumes no responsibility for the conversion of units or for the use of the standard in any other manner than that intended.

DATE: 5/26/2022 4:43:11 PM
 FILE: \\txdot\project\wiseonline.com:TXDOT14\Documents\17 - BRY\Design Project\17-03-2022\17-03-2022.dgn

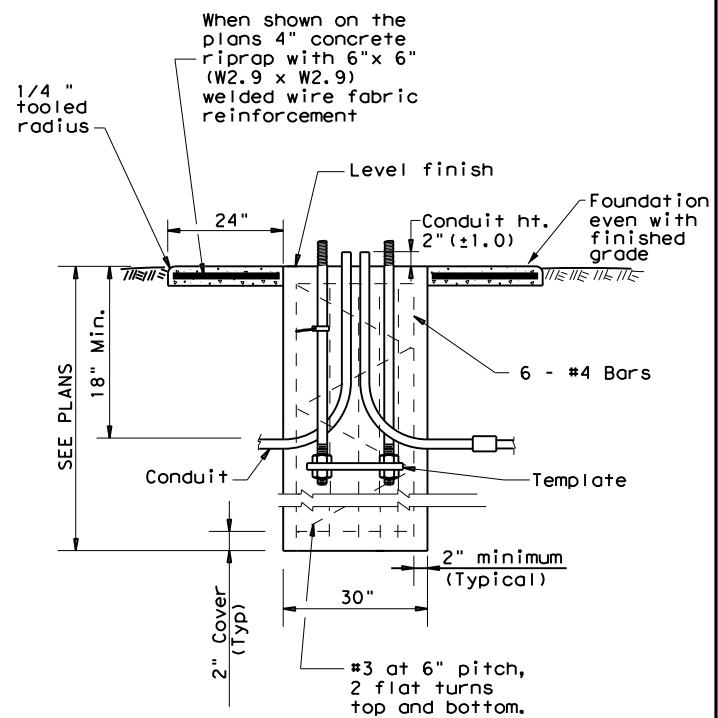
				Traffic Safety Division Standard	
<h1>ROADWAY ILLUMINATION DETAILS</h1> <h2>RID(1)-20</h2>					
FILE:	rid1-20.dgn	DN:	CK:	DW:	CK:
© TxDOT January 2007		CONT:	SECT:	JOB:	HIGHWAY:
REVISIONS		0122	03	033, ETC	US 287, ETC
7-17		DIST:	COUNTY:	SHEET NO.	
12-20		BRY	FREESTONE, ETC	141	

DISCLAIMER: The use of this standard is governed by the "Texas Engineering Practice Act". No warranty of any kind is made by TxDOT for any purpose whatsoever. TxDOT assumes no responsibility for the conversion of units or for the use of this standard in any project. See the project specifications for further details.

DATE: 5/26/2022 4:43:16 PM
 FILE: \\txdot\project\wiseon\line.com\TXDOT4\Documents\17 - BRY\Design Projects\17-00000000000000000000.dwg



SECTION A-A
SHOWING SLOPED GRADE



SECTION A-A
SHOWING CONSTANT GRADE

TABLE 1
ANCHOR BOLTS

POLE MOUNTING HEIGHT	BOLT CIRCLE		ANCHOR BOLT SIZE
	Shoe Base	T-Base	
<40 ft.	13 in.	14 in.	1 in. x 30 in.
40-50 ft.	15 in.	17 1/4 in.	1 1/4 in. x 30 in.

TABLE 2
RECOMMENDED FOUNDATION LENGTHS
(See note 1)

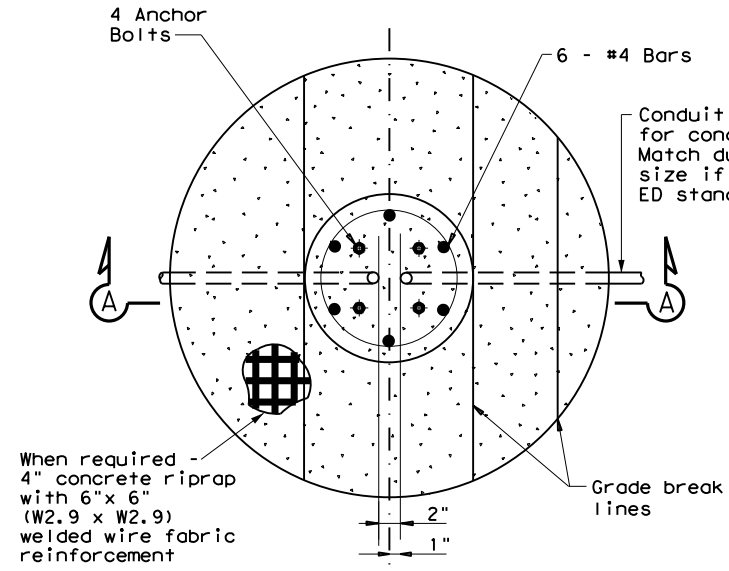
MOUNTING HEIGHT	TEXAS CONE PENETROMETER N Blows/ft		
	10	15	40
<20 ft.	6'	6'	6'
>20 ft. to 30 ft.	8'	6'	6'
>30 ft. to 40 ft.	8'	8'	6'
>40 ft. to 50 ft.	10'	8'	6'

TABLE 3
PAY QUANTITY OF RIPRAP PER FOUNDATION
(Install only when shown on the plans)

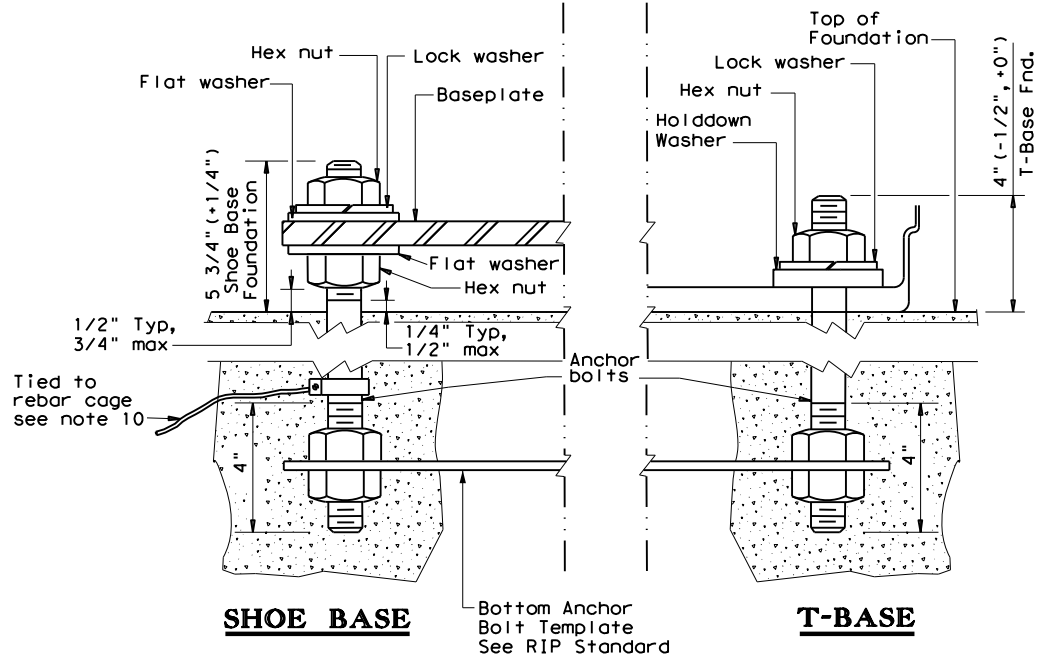
Foundation Diameter	RIPRAP DIAMETER	RIPRAP (CONC) (CL B)
30 in.	78 in.	0.35 CY

GENERAL NOTES:

- "Recommended Foundation Lengths" table is for information purposes only. Foundation lengths shall be as shown on the plans, or as directed by the Engineer. Foundations will be paid for under Item 416, "Drilled Shaft Foundations," unless otherwise shown on the plans.
- Erect roadway illumination assembly poles plumb and true. Form and level the top 6" of the foundation so the pole will be plumb. Use leveling nuts to plumb shoe base poles. Do not use shims or leveling nuts under transformer bases. Do not grout between baseplate and the foundation.
- Ensure Class 2A and 2B fit for anchor bolts and nuts. Tap and chase nuts after galvanizing. Anchor bolt body with rolled threads need not be full size.
- Use appropriate class of concrete as specified in Items 416 and 432. Concrete for riprap may be upgraded to Class C at no extra cost to the Department.
- Place riprap around the foundation when called for elsewhere in the plans. Riprap will be paid for under Item 432.
- Locate breakaway roadway illumination assemblies as shown in the placement table, unless otherwise dimensioned on the plans. Protect non-breakaway illumination assemblies from vehicular impact (i.e. 2.5 ft. behind guard rail or mounted on traffic barrier), or located outside the clear zone, except that 2.5 ft. from curb face is minimum desired for light poles on city streets, 45 mph or less. See Roadway Design Manual for further information.
- Use 4 hold down and 4 connecting washers on transformer base poles as recommended by the manufacturer and supplied with base.
- Install a minimum of 2 conduits in each foundation. See lighting layout sheets for locations of foundations with more than 2 conduits. Cap unused conduits in foundations on both ends.
- Conduit location in foundations is critical for breakaway devices. Place conduits 2 in. apart on centerline as shown.
- Bond anchor bolt to rebar cage with #6 bare stranded copper conductor. Use listed mechanical connectors rated for embedment in concrete. The bonded steel in the foundation creates a concrete encased grounding electrode which replaces the ground rod.
- Grade earthwork around T-base foundations even with the finished grade as shown in Section A-A to ensure proper function of the breakaway device. Use riprap on T-base foundations that are located on sloped grades, and as shown on the plans for level grades.



FOUNDATION DETAIL



ANCHOR BOLT DETAIL

TABLE 4
BREAKAWAY POLE PLACEMENT (See note 6)

ROADWAY FUNCTIONAL CLASSIFICATION	** POLE OFFSET (DISTANCE TO FACE OF TRANSFORMER BASE)
Freeway Mainlanes (roadway with full control of access)	15 ft. (minimum and typical) from lane edge
All curbed, 45 mph or less design speed	2.5 ft. minimum (15 ft. desirable) from curb face
All others	10 ft. minimum*(15 ft. desirable) from lane edge

* or as close to ROW line as is practical
 ** provide 2/5 of the luminaire mounting height behind the pole for "falling area" to prevent encroachment on the other travel lanes. See design guidelines.

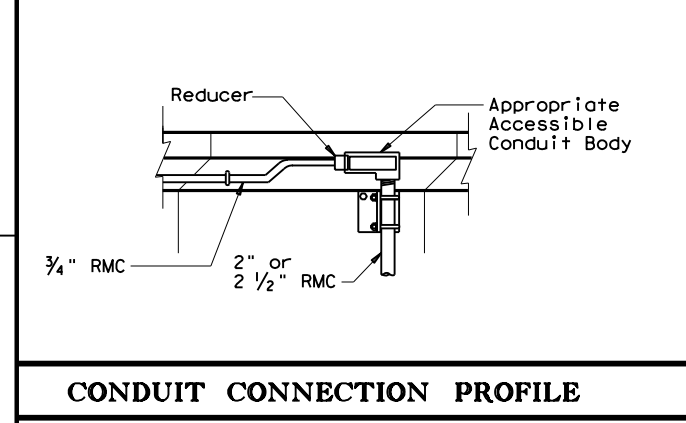
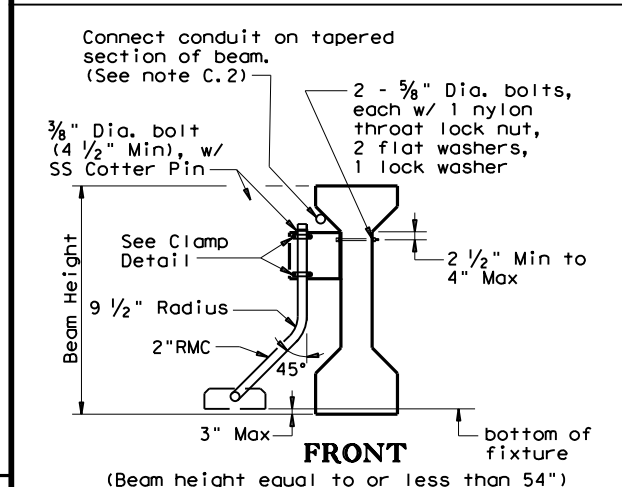
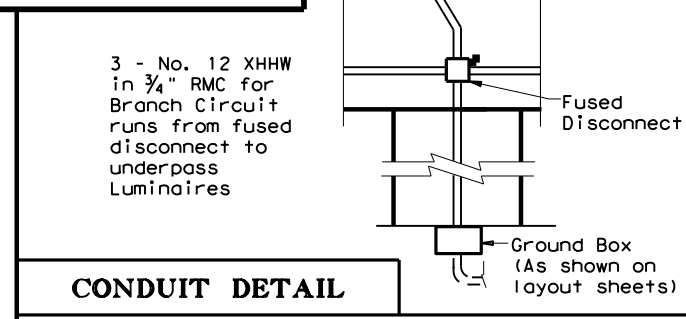
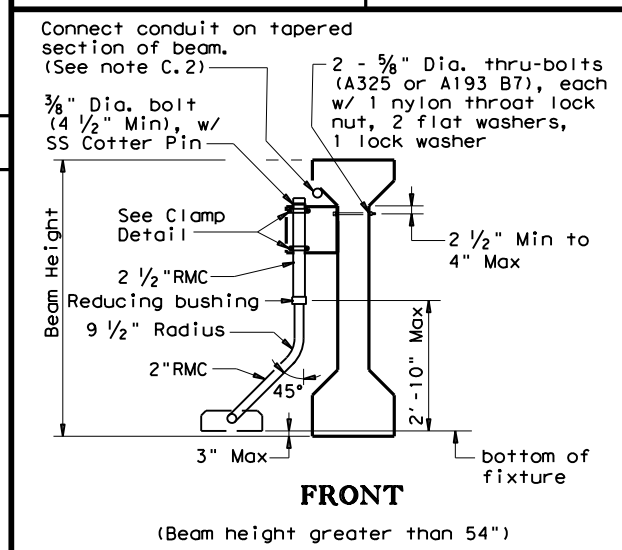
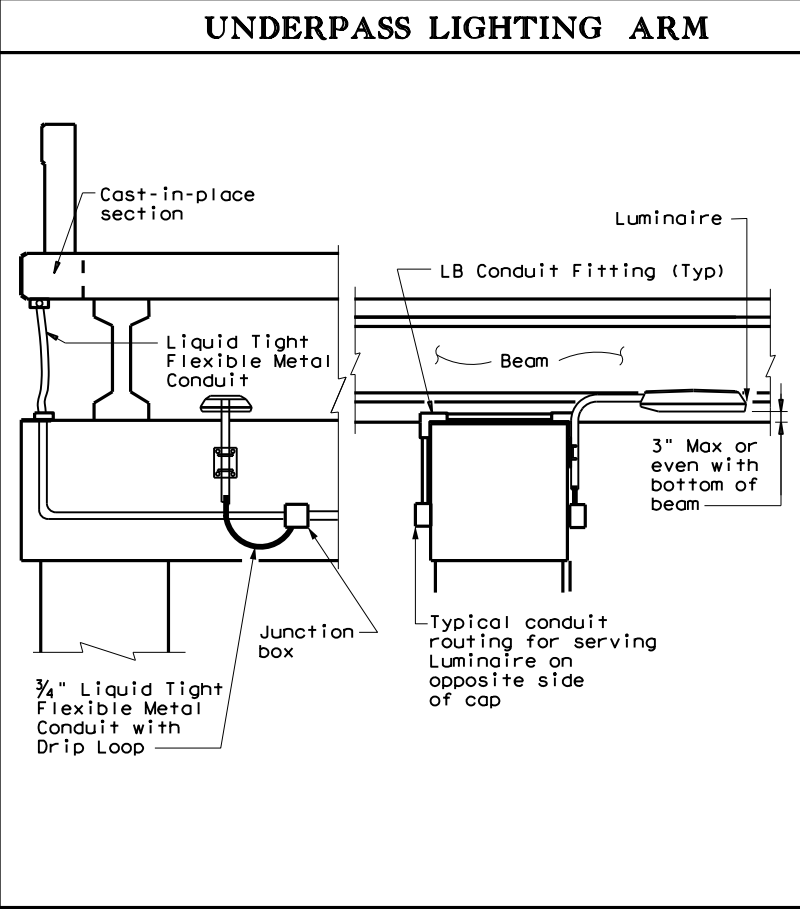
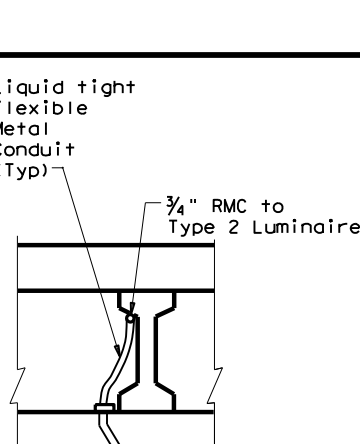
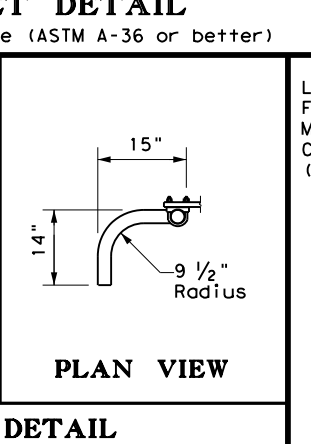
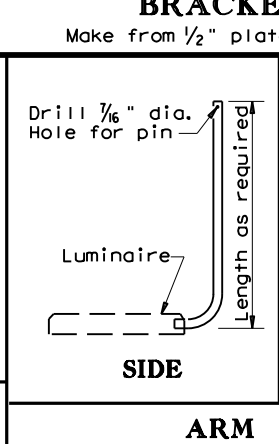
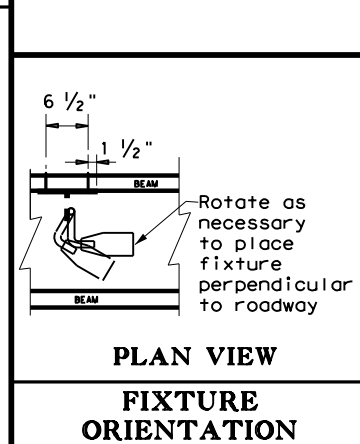
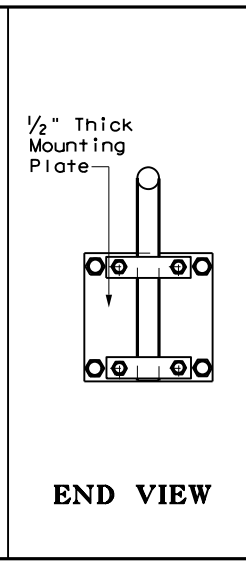
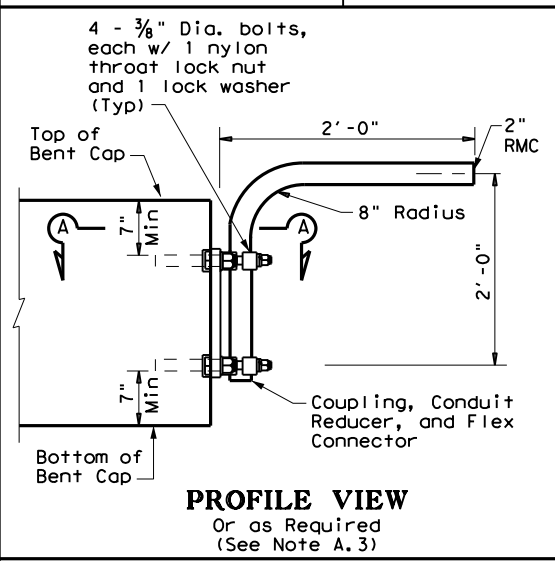
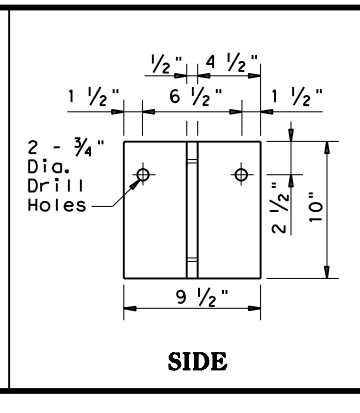
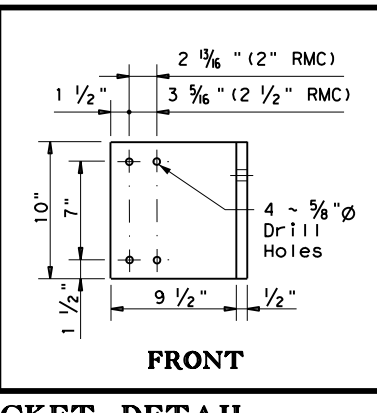
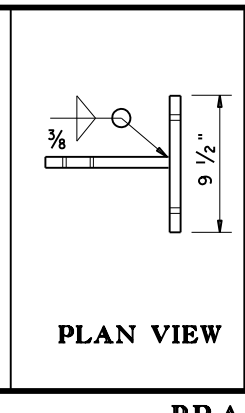
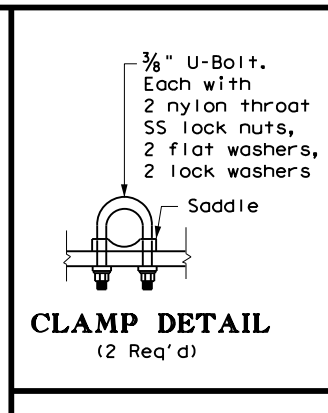
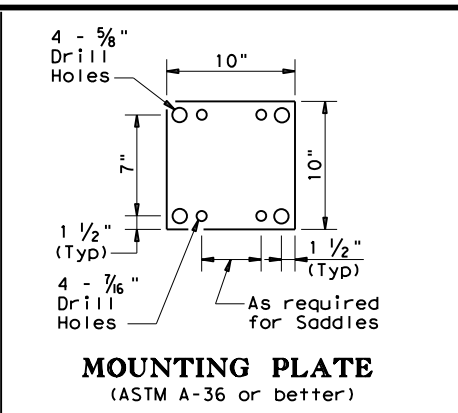
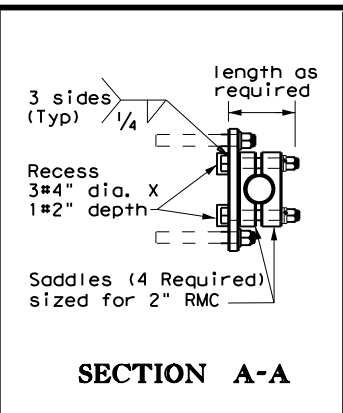
Texas Department of Transportation
 Traffic Safety Division Standard

ROADWAY ILLUMINATION DETAILS (RDWY ILLUM FOUNDATIONS)
RID(2)-20

FILE: rid2-20.dgn	DN:	CK:	DW:	CK:
© TxDOT January 2007	CONT	SECT	JOB	HIGHWAY
REVISIONS	0122	03	033, ETC	US 287, ETC
1-11	DIST	COUNTY	SHEET NO.	
7-17	BRY	FREESTONE, ETC	142	
12-20				

DISCLAIMER: The use of this standard is governed by the "Texas Engineering Practice Act". No warranty of any kind is made by TxDOT for any purpose whatsoever. TxDOT assumes no responsibility for the conversion of units or for the use of the drawings for any purpose other than that intended. See the project manual for more information.

DATE: 5/26/2022 4:43:20 PM
 FILE: \\txdot\project\wiseonline.com\TXDOT4\Documents\17 - BRY\Design\Projects\17-0333\17-0333-01\17-0333-01.dwg



IN RD IL AM (U/P) (TY 1)
 If bridge has pre-cast panels under deck, run circuit under deck edge.

UNDERPASS LIGHTING TYPE 1

IN RD IL AM (U/P) (TY 2)

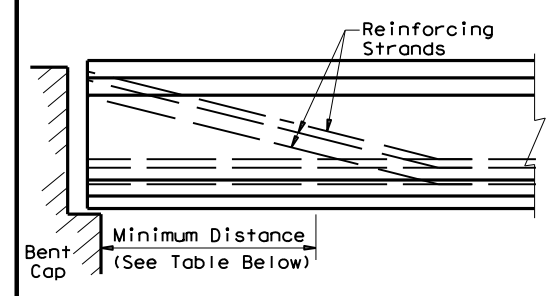


TABLE 5 LOCATION OF UNDERPASS LIGHT MOUNTING BRACKET TABLE	
SPAN LENGTH	MINIMUM DISTANCE
≤ 50'	10'-0"
50' - 70'	15'-0"
70' - 90'	20'-0"
> 90'	25'-0"

LOCATION OF UNDERPASS LIGHT MOUNTING BRACKET

UNDERPASS LIGHTING TYPE 2

GENERAL NOTES:

- A. ALL 150 watt HPS and 150 watt equivalent LED Luminaires**
- Luminaire locations, conduit and conductor sizes and routing are typical and diagrammatic only. See project layout sheets for specific details.
 - Conduit will be paid for under Item 618, "Conduit" and conductors will be paid for under Item 620, "Electrical Conductors," unless otherwise shown on the plans.
 - Adjust conduit in saddles to place fixture height and orientation as required. See fixture orientation detail and plans. Where practicable, place luminaires so the bottom of luminaire is above the bottom of the beam, maximum of 3 in. (See detail UNDERPASS LIGHTING ARM TYPE 2)
 - Except as noted, galvanize all structural steel and exposed bolts, nuts, and washers in accordance with Item 445 "Galvanizing".
 - Fabrication of brackets and support arms will not be paid for directly but is subsidiary to Item 610, "Roadway Illumination Assemblies."
 - Install a heavy duty NEMA 3R fused disconnect or breaker enclosure rated at 30 amps and 480 volts to switch underpass luminaires as shown on plans, with at least one per bridge circuit. Install 20 amp time-delay fuses or inverse-time circuit breakers. Mount disconnect or breaker enclosure 10 ft. (min) above grade on columns or bent caps as approved by the Department. Modify disconnect to allow padlocking in the "ON" and "OFF" positions. Padlocks and disconnect switches or circuit breakers for underpass fixtures will not be paid for directly but are subsidiary to the various bid items of the contract.
 - Conduit on columns, caps, and slab is shown surface mounted. For new columns and caps, embed PVC conduit in concrete. Bond and ground metal junction boxes and conduit.
- B. TYPE 1**
- Provide 2 in. rigid metal conduit (2.375" O.D., 0.146" wall) for Type 1 arm shaft.
 - Use 3/8 in. stainless steel bolt or stud non-epoxy type expansion anchors for concrete for Type 1 mounting. Except as noted, provide an allowable 2650 lbs minimum pull-out force (after consideration of adjustment factors for edge distance and bolt spacing) for each anchor. Install each anchor to the embedment depth recommended by the manufacturer.
 - Attach conduit to plate with 4 saddles, four - 3/8 in. diameter bolts, nylon throat lock nuts, and lock washers.
- C. TYPE 2**
- Provide 2 in. rigid metal conduit (2.375" O.D., 0.146" wall) or provide a combination of 2 1/2 in. (2.875" O.D., 0.193" wall) and 2 in. (2.375" O.D., 0.146" wall) rigid metal conduits with a reducing bushing as beam height stipulated for Type 2 arm shaft. Field cutting and threading will be permitted. Paint cut and threaded areas with zinc rich paint after conduit is connected to adjacent fitting.
 - Connecting conduit may be strapped to tapered section only of precast beams as shown. Anchor as approved by the Engineer. Maximum anchor depth is 1 in.
 - Indiscriminate drilling into precast concrete beams may result in reduced beam strength. Use drilling location and method as directed by the Engineer. See Location of Underpass Lighting Mounting Bracket detail. The locations shown in the table are such that reinforcing strands will not be damaged.

Texas Department of Transportation
 Traffic Safety Division Standard

ROADWAY ILLUMINATION DETAILS
(UNDERPASS LIGHT FIXTURES)
RID(3)-20

FILE: rid3-20.dgn	DN: TxDOT	CK: TxDOT	DW: TxDOT	CR: TxDOT
© TxDOT May 2013	CONT: 0122	SECT: 03	JOB: 033, ETC	HIGHWAY: US 287, ETC
REVISIONS	DIST: BRY	COUNTY: FREESTONE, ETC	SHEET NO. 143	

2-14
 7-17
 12-20
 172C

SHIPPING PARTS LIST - POLES AND LUMINAIRE ARMS

Table with columns for Nominal Mounting Ht. (ft), Shoe Base, T-Base, and CSB/SSCB Mounted. Each section includes Designation, Pole, A1, A2, Luminaire, and Quantity.

Table titled 'OTHER' with columns for Designation, Pole, A1, A2, Luminaire, and Quantity.

GENERAL NOTES:

- 1. All work, materials and services not shown on the plans... shall be performed, furnished and installed by the Contractor.
2. The location of poles and fixtures are diagrammatic only...
3. Standard Steel Pole Designs. Steel poles fabricated in accordance with the details and dimensions shown herein...
4. Optional Steel Pole Designs. Multi-sided steel poles may be allowed as optional designs...
5. Aluminum Pole Designs. Aluminum pole designs may be allowed, if aluminum poles are permitted or required...
6. Special Designs. Poles with architectural treatments shall meet the requirements shown elsewhere in the plans.
7. Luminaire Mounting Height. Actual luminaire mounting height shall be the nominal mounting height given on RIP(2) for all pole-arm combinations...

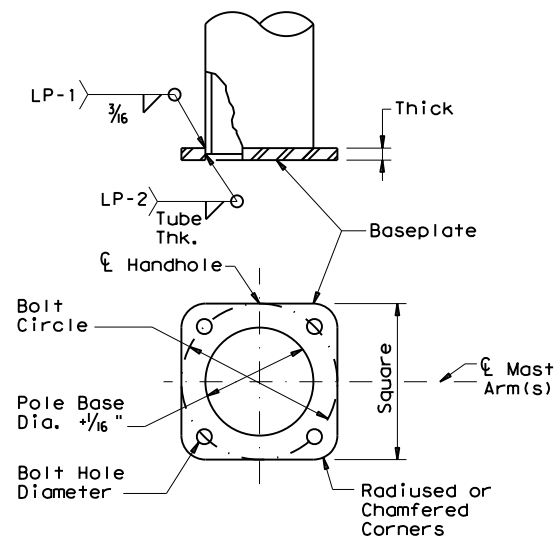
EXPLANATION OF ROADWAY ILLUMINATION ASSEMBLY DESIGNATIONS

(TYPE SA 50 T - X - X) (400W EQ) LED
SA: Pole and mast arm may be steel or aluminum.
ST: Pole and mast arm must be steel.
AL: Pole and mast arm must be aluminum.
SP: Special (ovalized) steel or aluminum pole for installing on CSB or SSCB. See standard sheet CSB (4), or SSCB (4).
Two numerical digits denote nominal mounting height in feet.
Next letter denotes type of base, (S-Shoe Base, T-Transformer Base, or B-Bridge/Ret.Wall Mount)
First number denotes length of mast arm in feet.
Use of second mast arm is indicated by second dashed number which denotes length in feet.
Luminaire rating in watts (i.e. 400W). Equivalent wattage LED fixtures will include EQ (i.e. 400W EQ)
Last letters indicate light source (S - High Pressure Sodium; LED - LED luminaire)

Texas Department of Transportation Traffic Safety Division Standard
ROADWAY ILLUMINATION POLES
RIP(1) - 19
FILE: rip-19.dgn
© TxDOT January 2007
REVISIONS: 0122 03 033, ETC US 287, ETC
7-17 12-19
DIST COUNTY SHEET NO. BRY FREESTONE, ETC 144

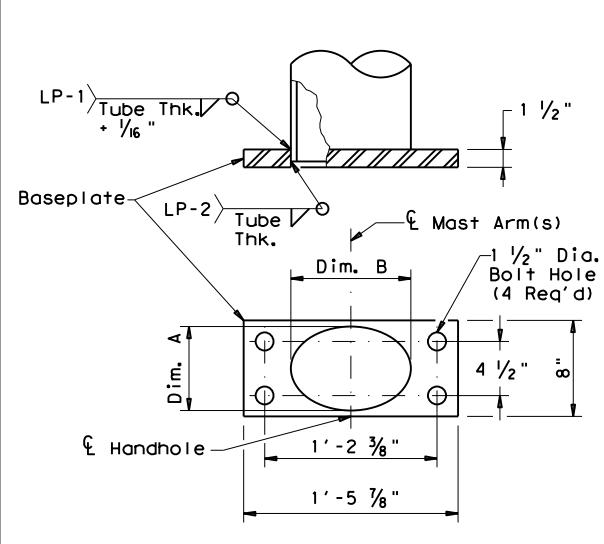
DISCLAIMER: The use of this standard is governed by the "Texas Engineering Practice Act". No warranty of any kind is made by TxDOT for any purpose whatsoever. TxDOT assumes no responsibility for the conversion of units or the accuracy of the data shown on these drawings. This drawing is the property of TxDOT and is loaned to the user for the project shown hereon only. It is not to be used for any other project without the written approval of TxDOT. DATE: 5/26/2022 4:43:25 PM FILE: p:\txdot\project\wiseonline.com\TXDOT14\Documents\17 - BRY\Design Project\17-033\17-033.dwg

DATE: 5/26/2022 4:43:29 PM
 FILE: \\txdot.projectwiseonline.com:TXDOT4\Documents\17 - BRY\Design Projects\17-033\17-033-01\17-033-01.dgn
 The use of this standard is governed by the "Texas Engineering Practice Act". No warranty of any kind is made by TxDOT for any purpose whatsoever. TxDOT assumes no responsibility for the conversion of units or the accuracy of the information contained herein.



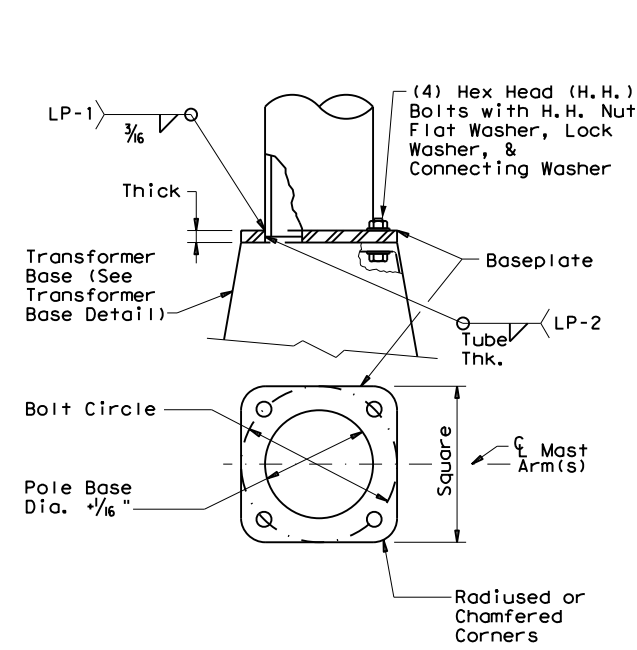
SHOE BASE BASEPLATE

SHOE BASE BASEPLATE TABLE				
MOUNTING HEIGHTS (nominal)	BOLT CIRCLE	SQUARE	THICK	BOLT HOLE DIAMETER
20' - 39'	13"	13"	1 1/4"	1 1/4"
40'	15"	15"	1 1/4"	1 1/2"
50'	15"	15"	1 1/2"	1 1/2"



CONCRETE TRAFFIC BARRIER BASE BASEPLATE

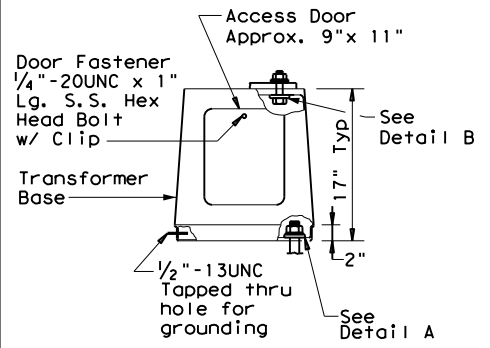
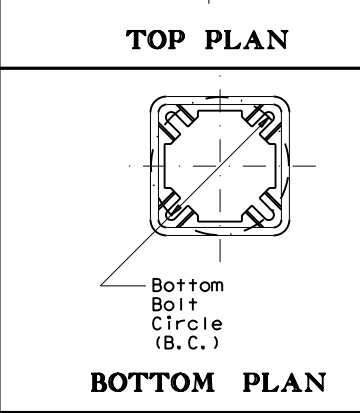
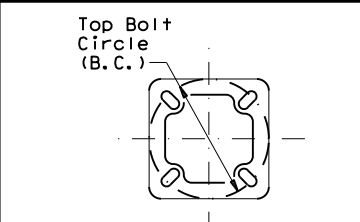
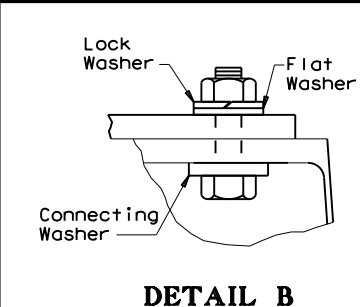
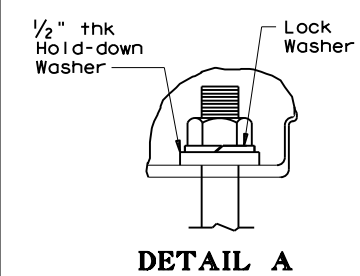
CONCRETE TRAFFIC BARRIER BASE BASEPLATE TABLE			
MOUNTING HEIGHTS (nominal)	POLE DIA. (12)	DIM. A	DIM. B
28' - 38'	9"	7" ± 1/4"	10" ± 1/4"
48'	10 1/2"	7" ± 1/4"	13" ± 1/4"



TRANSFORMER BASE BASEPLATE

TRANSFORMER BASE BASEPLATE TABLE						
MOUNTING HEIGHTS (nominal)	BOLT CIRCLE	SQUARE	THICK	CONNECTING BOLT DIA.	BOLT HOLE DIAMETER	TRANSFORMER BASE TYPE
20' - 39'	13"	13"	1 1/4"	1"	1 1/4"	A
40'	15"	15"	1 1/4"	1 1/4"	1 1/2"	B
50'	15"	15"	1 1/2"	1 1/4"	1 1/2"	B

TRANSFORMER BASE TABLE		
TYPE	TOP B.C.	BTM. B.C.
A	13"	14"
B	15"	17 1/4"



TRANSFORMER BASE DETAILS

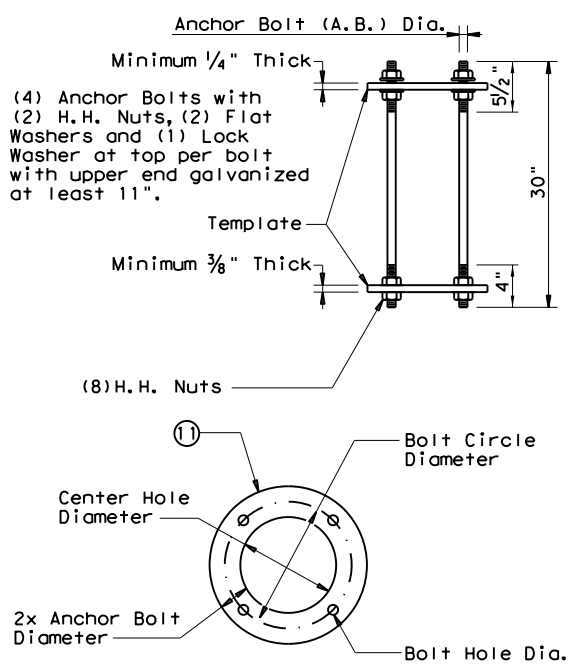
GENERAL NOTES:

- For mounting heights between those shown in the table, use the values in the table for the larger mounting height.
- All breakaway bases shall meet the breakaway requirements of the AASHTO Standard Specifications for Structural Supports for Highway Signs, Luminaires and Traffic Signals, 6th Edition (2013) and Interim Revisions thereto, and shall have been tested by FHWA-approved methods. All bases shall have been structurally tested to resist 150% of the design moment.
- Transformer bases shall be cast from aluminum, ASTM B108 or B26 Alloy 356.0-T6, or other material approved by the Engineer. Four Hex Head (H.H.) bolts with four H.H. nuts, four lock washers, four flat washers, and connecting and hold-down washers as recommended by the manufacturer, galvanized to ASTM A153 Class C or D, or B695 Class 50, shall be provided with each transformer base for connecting the pole. Bolts shall be ASTM A325 or approved equal. Nuts shall be ASTM A563 grade DH galvanized.
- Bases shall be stamped, incised or by other approved permanent means, marked to show fabricator's name or logo, and model number. Such information shall be placed in a readily seen location, inside or outside the base, but shall not be placed on the door.
- Doors for transformer bases shall be made of plastic, fiberglass or other non-metallic material approved by the Engineer and shall be attached with stainless steel screws or bolts. Transformer bases shall be cleaned by grit blast cleaning after heat treatment. Certification by the manufacturer of heat treatment shall be furnished with transformer bases. The certification shall show the metal alloy and temper and that the base meets those requirements, chemical and physical. The certification shall also show the material ASTM specification. Transformer bases shall be cast with a removable tab bar for material testing. Some bars may have been removed by the manufacturer for testing.

NOTES:

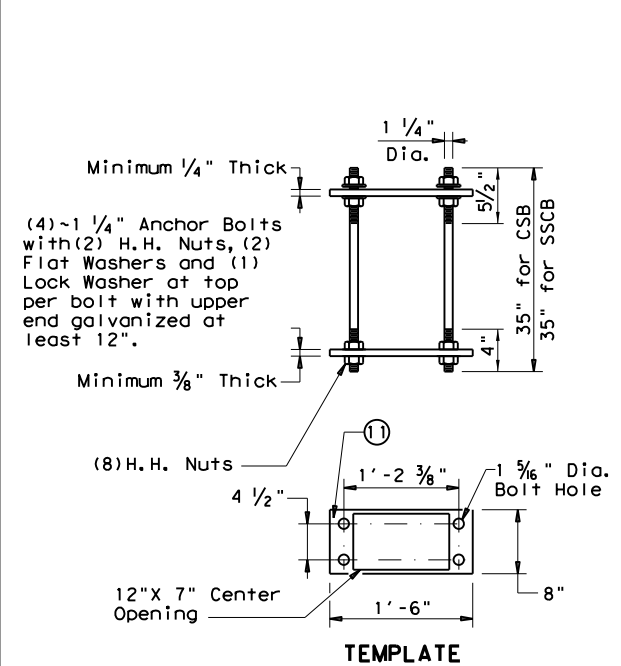
- Anchor Bolt Templates do not need to be galvanized.
- Pole diameter before ovalized.

ANCHOR BOLT FABRICATION TOLERANCES TABLE	
DIMENSION	TOLERANCE
Length	± 1/2"
Threaded length	± 1/2"
Galvanized length (if required)	- 1/4"



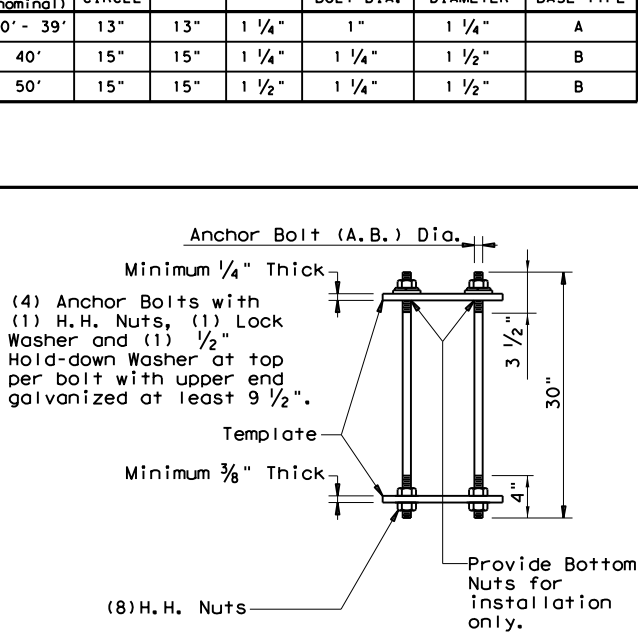
SHOE BASE ANCHOR BOLT ASSEMBLY

SHOE BASE ANCHOR BOLT ASSEMBLY TABLE				
MOUNTING HEIGHTS (nominal)	A.B. Dia.	BOLT CIRCLE DIAMETER	CTR. HOLE DIAMETER	BOLT HOLE DIAMETER
20' - 39'	1"	13"	11"	1 1/16"
40' - 50'	1 1/4"	15"	12 1/2"	1 5/16"



CONCRETE TRAFFIC BARRIER BASE ANCHOR BOLT ASSEMBLY

CONCRETE TRAFFIC BARRIER BASE ANCHOR BOLT ASSEMBLY TABLE				
MOUNTING HEIGHTS (nominal)	A.B. Dia.	BOLT CIRCLE DIAMETER	CTR. HOLE DIAMETER	BOLT HOLE DIAMETER
20' - 39'	1"	14"	12"	1 1/16"
40' - 50'	1 1/4"	17 1/4"	14 3/4"	1 5/16"



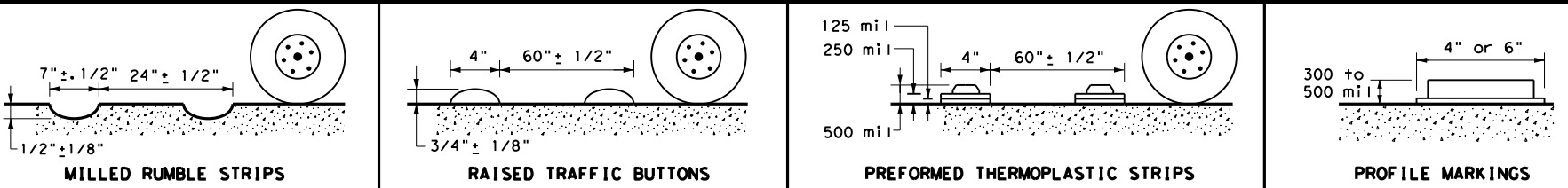
TRANSFORMER BASE ANCHOR BOLT ASSEMBLY

**ROADWAY ILLUMINATION POLES
RIP(4) - 19**

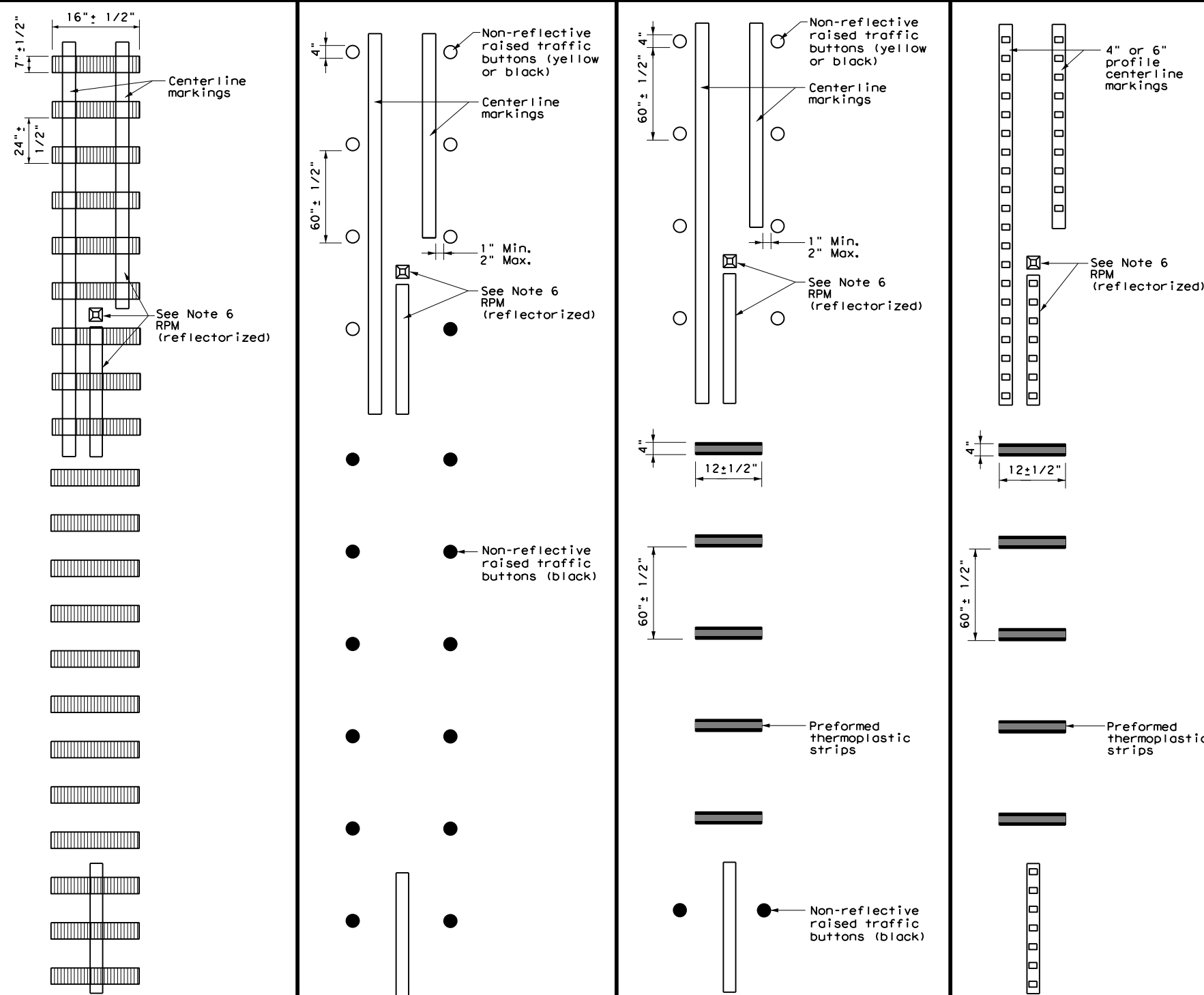
FILE: rip-19.dgn	DN:	CK:	DW:	CK:
©TxDOT January 2007	CONT	SECT	JOB	HIGHWAY
REVISIONS	0122	03	033, ETC	US 287, ETC
7-17	DIST	COUNTY	SHEET NO.	
12-19	BRY	FREESTONE, ETC	147	

DISCLAIMER: The use of this standard is governed by the "Texas Engineering Practice Act". No warranty of any kind is made by TxDOT for any purpose whatsoever. TxDOT assumes no responsibility for the conversion of units or for the use of this standard in any project. The use of this standard is governed by the "Texas Engineering Practice Act". No warranty of any kind is made by TxDOT for any purpose whatsoever. TxDOT assumes no responsibility for the conversion of units or for the use of this standard in any project.

CENTERLINE RUMBLE STRIPS



PROFILE VIEW



PLAN VIEW
OPTION 1

PLAN VIEW
OPTION 2

PLAN VIEW
OPTION 3

PLAN VIEW
OPTION 4

GENERAL NOTES

- This standard sheet provides guidelines for installing centerline rumble strips on two-lane highways with or without shoulders.
 - Centerline and edgeline rumble strips or profile markings shall not be placed on roadways with a posted speed limit of 45 MPH or less.
 - 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.
 - See dimensions for milled rumble strips. Other shapes and dimensions may be used if approved by the Traffic Operations Division.
 - 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 and driveways with high usage of large trucks.
 - Use Standard Sheet PM(2) for positioning, dimensioning, and spacing of all reflective raised pavement markers, and dimensions pavement markings and profile markings.
 - Consideration should be given to noise levels when centerline rumble strips are installed near residential areas, schools, churches, etc. A minimum of 3/8 inch depth of milled rumble strip may be considered in these areas.
 - Pavement markings must be applied over milled centerline rumble strips.
- WHEN INSTALLING CENTERLINE RUMBLE STRIPS:**
- 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.
 - 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.
 - 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.
- WHEN INSTALLING EDGELINE RUMBLE STRIPS WITH OR WITHOUT CENTERLINE RUMBLE STRIPS ON UNDIVIDED HIGHWAYS:**
- See standard sheet RS(4).

Shoulder

TWO LANE TWO-WAY ROADWAYS

MILLED CENTERLINE RUMBLE STRIPS

RAISED CENTERLINE RUMBLE STRIPS

RAISED CENTERLINE RUMBLE STRIPS AND PREFORMED THERMOPLASTIC STRIPS

PROFILE CENTERLINE MARKINGS AND PREFORMED THERMOPLASTIC STRIPS

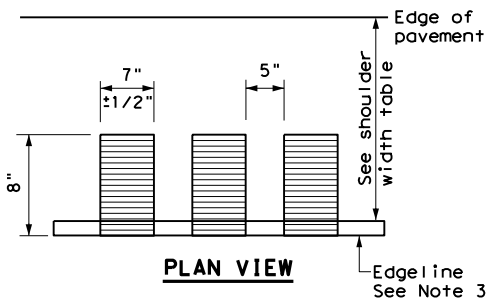
Texas Department of Transportation
Traffic Operations Division Standard

CENTERLINE RUMBLE STRIPS ON TWO LANE TWO-WAY HIGHWAYS

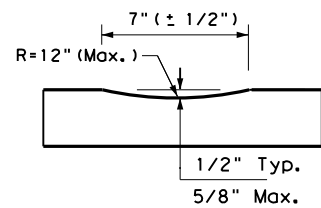
RS(3) - 13

FILE: r's(3) - 13.dgn	DW: TxDOT	CK: TxDOT	DW: TxDOT	CK: TxDOT
© TxDOT October 2013	CONT	SECT	JOB	HIGHWAY
REVISIONS	0122	03	033, ETC	US 287, ETC
	DIST	COUNTY	SHEET NO.	
	BRY	FREESTONE, ETC	148	

DATE: 5/26/2022 4:43:50 PM
 FILE: \\txdot\project\wiseonline.com\TXDOT4\Documents\17 - BRY\Design Project\17090903\17090903.dwg
 DISCLAIMER: The use of this standard is governed by the "Texas Engineering Practice Act". No warranty of any kind is made by TxDOT for any purpose whatsoever. TxDOT assumes no responsibility for the conversion of units or for the accuracy of the information provided.

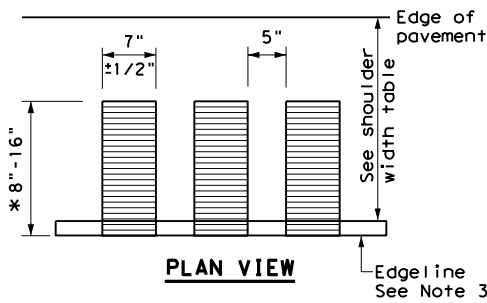


PLAN VIEW

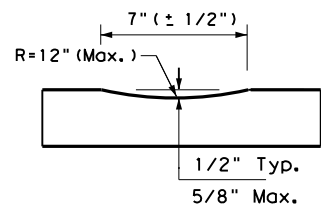


PROFILE VIEW
OPTION 1

CONTINUOUS MILLED DEPRESSIONS (Rumble Strips)

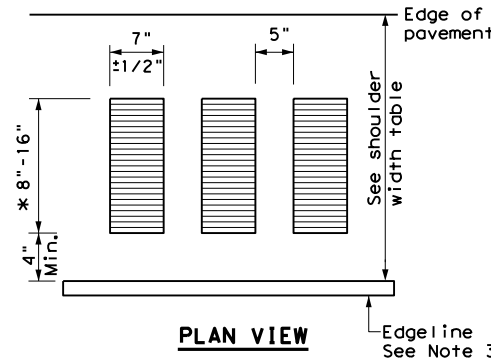


PLAN VIEW



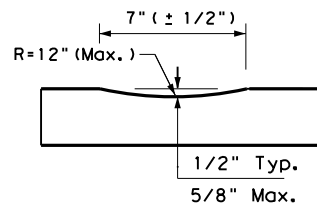
PROFILE VIEW
OPTION 2

CONTINUOUS MILLED DEPRESSIONS (Rumble Strips)



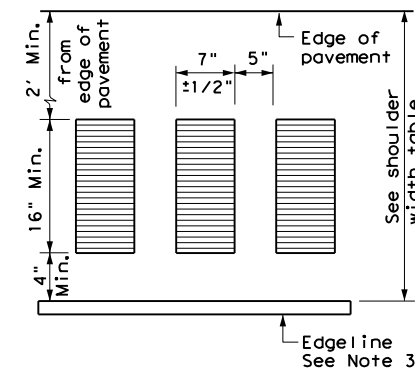
PLAN VIEW

* This distance may vary based on width of shoulder

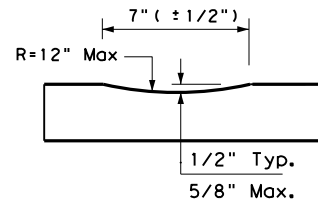


PROFILE VIEW
OPTION 3

CONTINUOUS MILLED DEPRESSIONS (Rumble Strips)



PLAN VIEW



PROFILE VIEW
OPTION 4

CONTINUOUS MILLED DEPRESSIONS (Rumble Strips)

GENERAL NOTES

- Rumble strips and profile markings shall not be placed on roadways with a posted speed limit of 45 MPH or less.
- 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.
- Use Standard Sheet PM(2) for positioning, dimensioning, and spacing of all reflective raised pavement markers, pavement markings, and profile markings.
- See the table below for determining what options may be used for edgeline rumble strips.

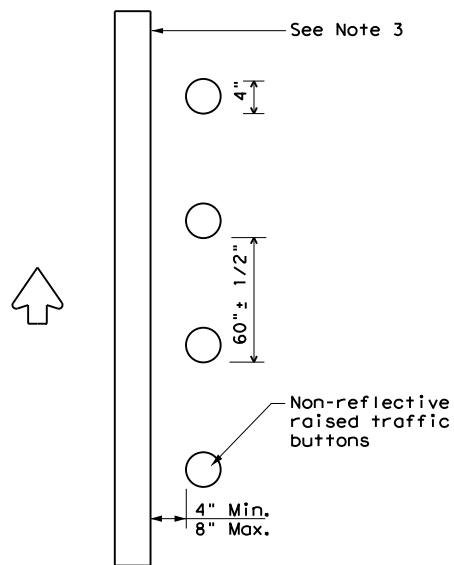
WHEN INSTALLING MILLED DEPRESSION EDGELINE RUMBLE STRIPS:

- See dimensions for milled rumble strips. Other shapes and dimensions may be used if approved by the Traffic Operations Division.
- Pavement markings can be applied over milled shoulder rumble strips to create an edgeline rumble stripe.
- Breaks in edgeline rumble strips shall occur at least 50 feet and no more than 150 feet in advance of bridges, railroad crossings, intersections and driveways with high usage of large trucks when installed on conventional highways.
- Rumble strips shall not be placed across exit or entrance ramps, acceleration and deceleration lanes, crossovers, gore areas or intersections with other roadways.
- Consideration should be given to noise levels when edgeline rumble strips are installed near residential areas, schools, churches, etc. A minimum of 3/8 inches depth of milled rumble strip may be considered in these areas.
- On roadways with high bicycle activity, consideration should be given before the installation of edgeline rumble strips. Things to consider include size of rumble strips, rumble strip material and location of rumble strips on the shoulder. If the designer determines that gaps are needed in the rumble strips due to bicycle use of the road, then follow the requirement shown in FHWA Technical Advisory T5040.39, or latest version. A detail of the spacing shall be included in the plans.

WHEN INSTALLING RAISED OR PROFILE EDGELINE RUMBLE STRIPS:

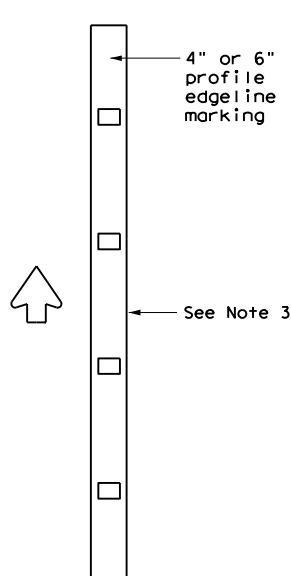
- Raised rumble strips consisting of non-reflective raised traffic buttons may be used. Non-reflective raised traffic buttons can be affixed to asphalt or concrete with bitumen or adhesives, as per the manufacturer's recommendations.
- Non-reflective traffic buttons shall be placed adjacent to the pavement marking delineating the edgeline when used as a rumble strip. The color of the button should match the color of the adjacent edgeline marking (white or yellow). The buttons will be paid for under Item 672, "Raised Pavement Markers." Non-reflective traffic buttons must meet the requirements of DMS-4300.
- Non-reflective traffic buttons shall not be placed across exit or entrance ramps, acceleration and deceleration lanes, crossovers, gore areas or intersections with other roadways.
- Breaks in edgeline rumble strips using raised traffic buttons shall occur at least 50 feet and no more than 150 feet in advance of bridges, railroad crossing, intersections and driveways with high usage of large trucks when installed on conventional highways.
- The minimum distance between the edgeline and the buttons should be used if the shoulder is less than 8 feet in width.
- Raised profile thermoplastic markings used as edgelines may substitute for buttons.

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



PLAN VIEW
OPTION 5

RAISED EDGELINE RUMBLE STRIPS



PLAN VIEW
OPTION 6

PROFILE EDGELINE MARKINGS

Traffic Operations Division Standard

EDGELINE RUMBLE STRIPS ON UNDIVIDED OR TWO LANE HIGHWAYS RS(4)-13

FILE: rs(4)-13.dgn	DN: TxDOT	CK: TxDOT	DW: TxDOT	CK: TxDOT
© TxDOT October 2013	CONT	SECT	JOB	HIGHWAY
REVISIONS	0122	03	033, ETC	US 287, ETC
	DIST	COUNTY	SHEET NO.	
	BRY	FREESTONE, ETC	149	

DISCLAIMER: The use of this standard is governed by the "Texas Engineering Practice Act". No warranty of any kind is made by TxDOT for any purpose whatsoever. TxDOT assumes no responsibility for the conversion of this standard to other formats or for incorrect results or damages resulting from its use.

DATE: 5/26/2022 4:43:55 PM
 FILE: \\txdot.projectwiseonline.com:TXDOT14\Documents\17 - BRY\Design Projects\012203033\4 - Design\Plan Set\8 - Traffic\Signs\dgn

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)

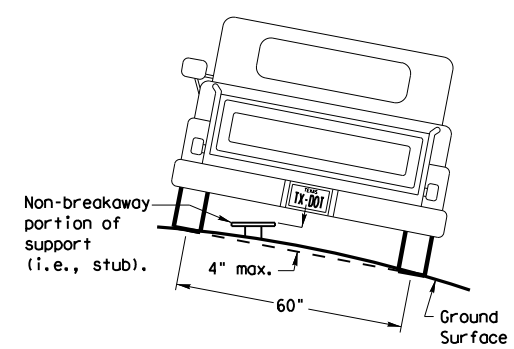
Anchor Type

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

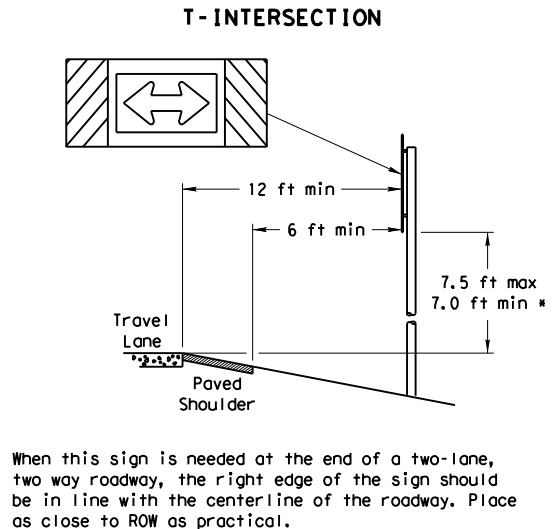
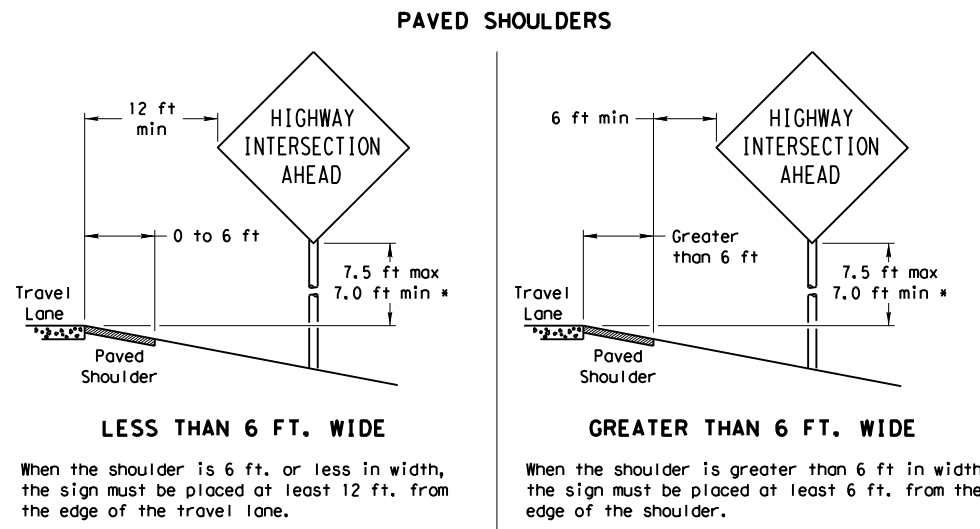
P = Prefab. "Plain" (see SMD(SLIP-1) to (SLIP-3), (TWT), (FRP))
 T = Prefab. "T" (see SMD(SLIP-1) to (SLIP-3), (TWT))
 U = Prefab. "U" (see SMD(SLIP-1) to (SLIP-3))
 IF REQUIRED
 1EXT or 2EXT = Number of Extensions (see SMD(SLIP-1) to (SLIP-3), (TWT))
 BM = Extruded Wind Beam (see SMD(SLIP-1) to (SLIP-3))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

REQUIRED CLEARANCE FOR BREAKAWAY SUPPORT

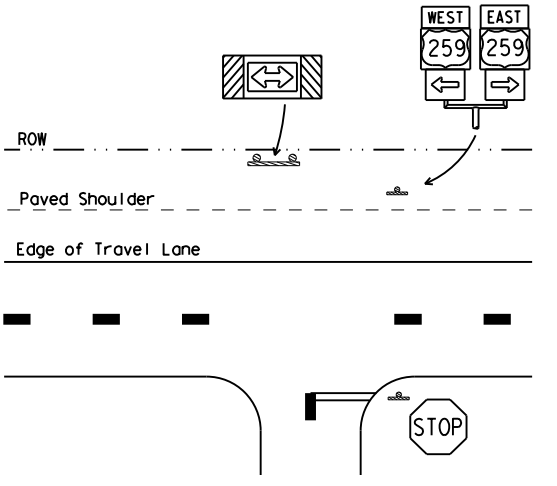
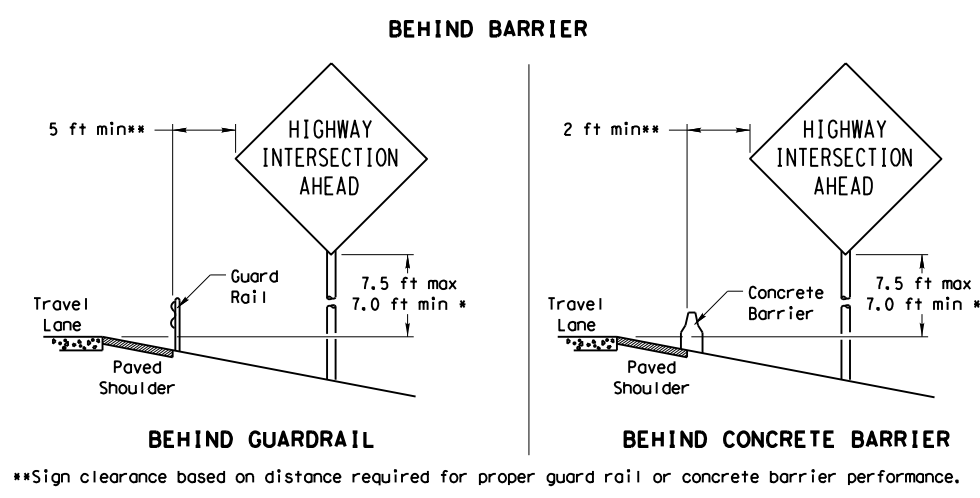
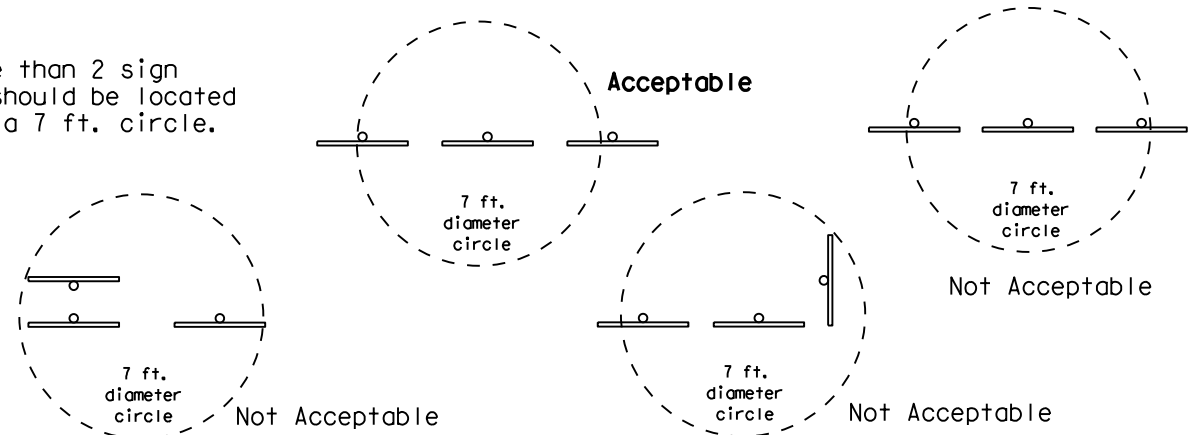


To avoid vehicle undercarriage snagging, any substantial remains of a breakaway support, when it is broken away, should not project more than 4 inches above a 60-inch chord (i.e., typical space between wheel paths).

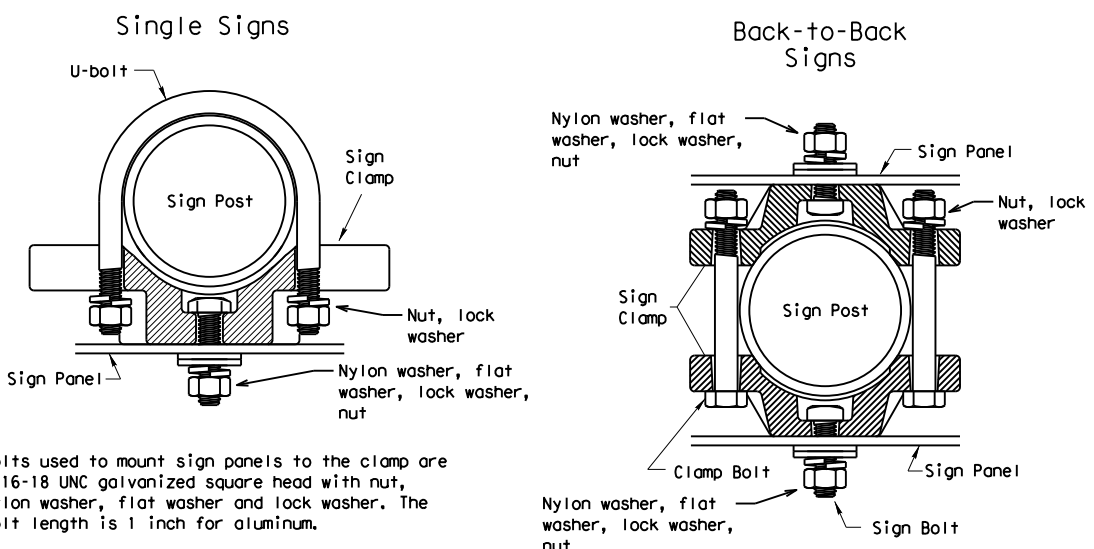
SIGN LOCATION



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



TYPICAL SIGN ATTACHMENT DETAIL



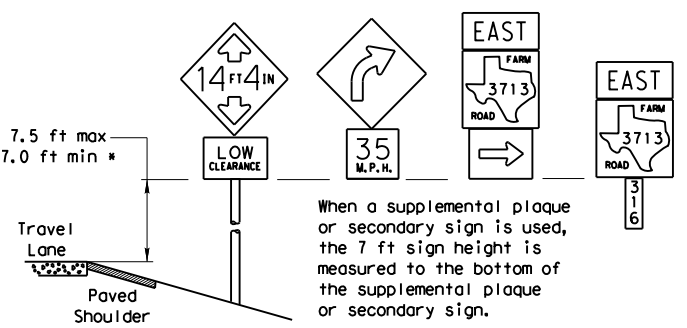
Bolts used to mount sign panels to the clamp are 5/16-18 UNC galvanized square head with nut, nylon washer, flat washer and lock washer. The bolt length is 1 inch for aluminum.

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

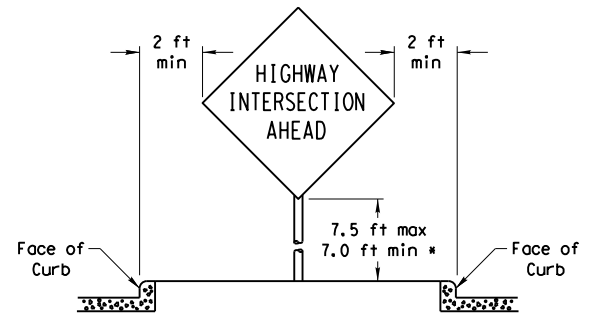
Sign clamps may be either the specific size clamp or the universal clamp.

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

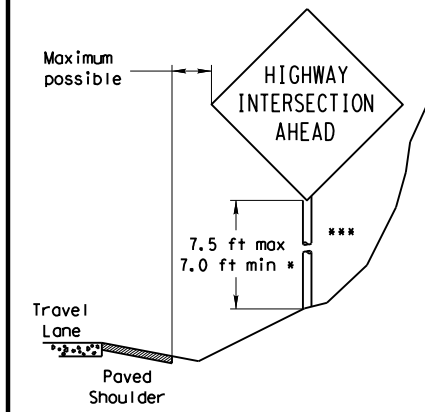
SIGNS WITH PLAQUES



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.

* 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>



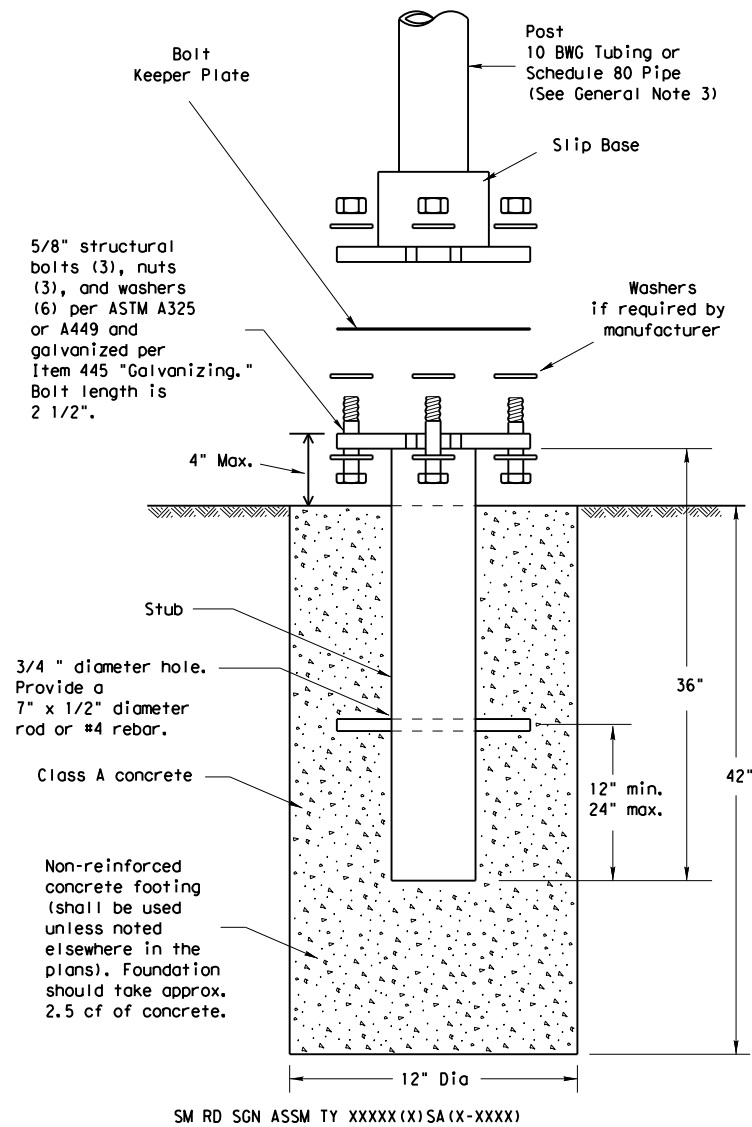
SIGN MOUNTING DETAILS SMALL ROADSIDE SIGNS GENERAL NOTES & DETAILS

SMD(GEN) - 08

© TxDOT July 2002		DN: TXDOT	CK: TXDOT	DW: TXDOT	CK: TXDOT
9-08	REVISIONS	CONT	SECT	JOB	HIGHWAY
		0122	03	033, ETC	US 287, ETC
		DIST	COUNTY		SHEET NO.
		BRY	FREESTONE, ETC		150

DISCLAIMER: The use of this standard is governed by the "Texas Engineering Practice Act". No warranty of any kind is made by TxDOT for any purpose whatsoever. TxDOT assumes no responsibility for the conversion of this standard to other formats or for incorrect results or damages resulting from its use.
 DATE: 5/26/2022 4:44:02 PM
 FILE: \\txdot.projectwiseonline.com:TXDOT14\Documents\17 - BRY\Design Projects\012203033\4 - Design\Plan Set\8 - Traffic\Plan Set\8 - Traffic\8H - TrafficStandards\smdsl.dgn

TRIANGULAR SLIPBASE INSTALLATION GENERAL REQUIREMENTS



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:

- 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.
- 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
- 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>
- Sign supports shall not be spliced except where shown. Sign support posts shall not be spliced.

ASSEMBLY PROCEDURE

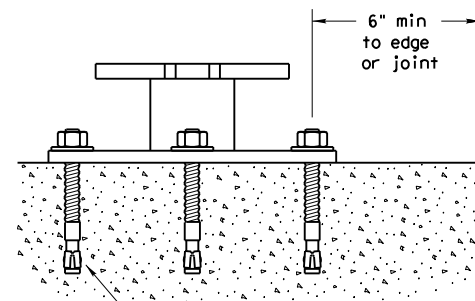
Foundation

- 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.
- 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.
- 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.
- Plumb the stub. Allow a minimum of 4 days to set, unless otherwise directed by the Engineer.
- The triangular slipbase system is multidirectional and is designed to release when struck from any direction.

Support

- 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.
- 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



5/8" diameter Concrete Anchor -
 8 places (embed a minimum of
 5 1/2" and torque to min. of
 50 ft-lbs). Anchor may be
 expansion or adhesive type.

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, "Epoxyes 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.



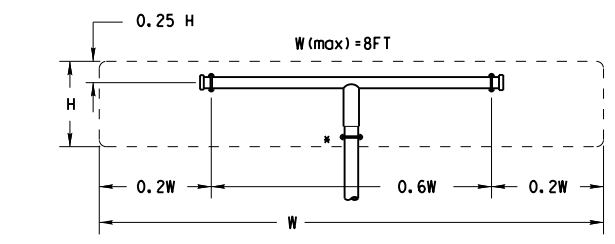
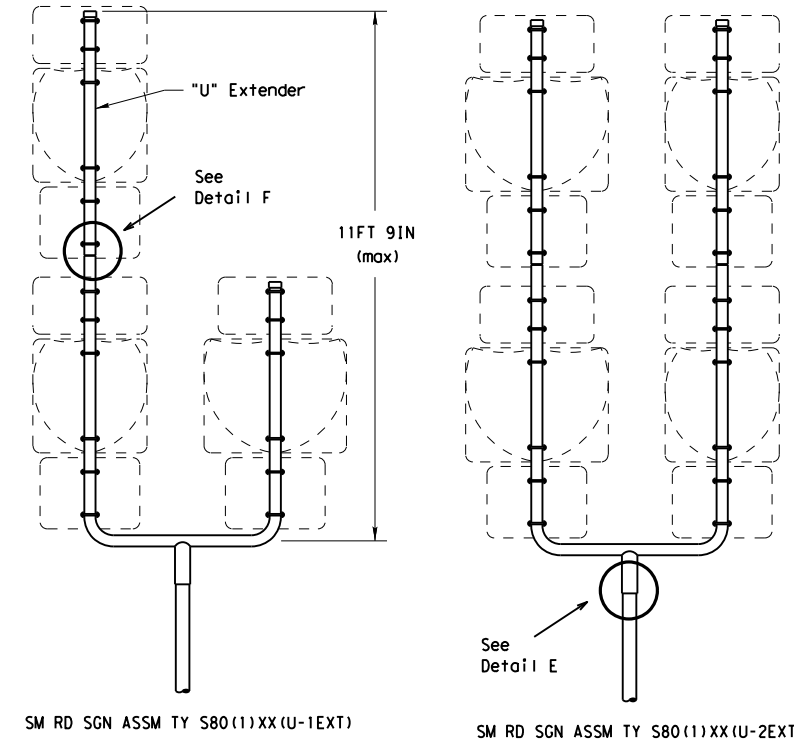
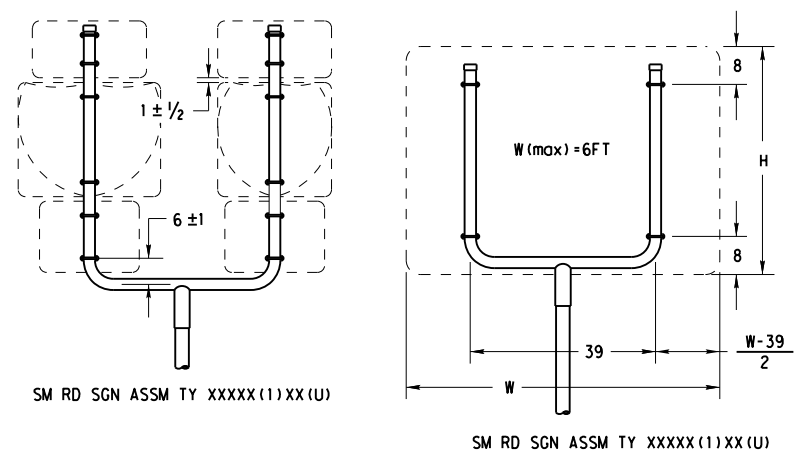
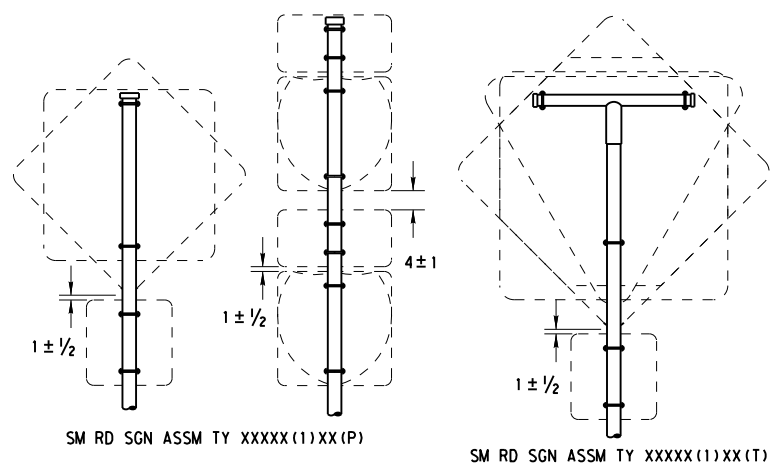
SIGN MOUNTING DETAILS SMALL ROADSIDE SIGNS TRIANGULAR SLIPBASE SYSTEM

SMD(SLIP-1)-08

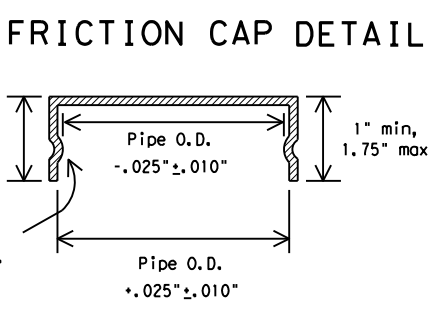
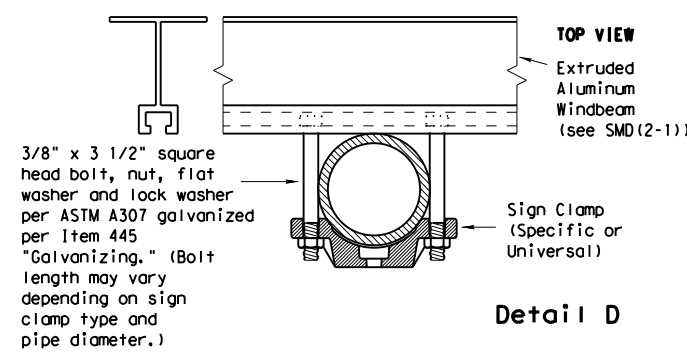
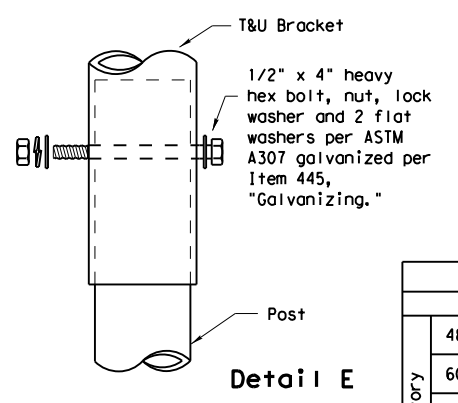
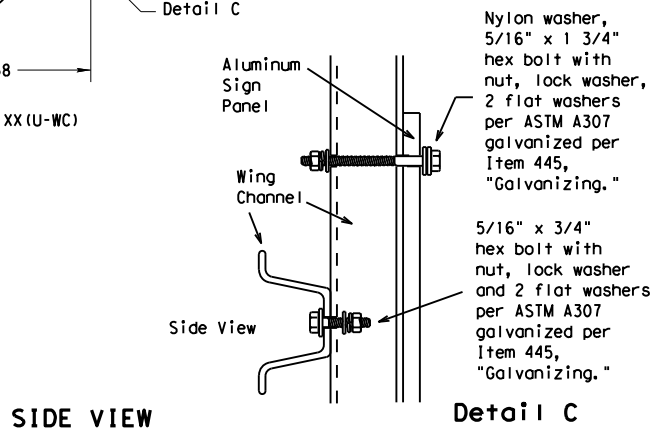
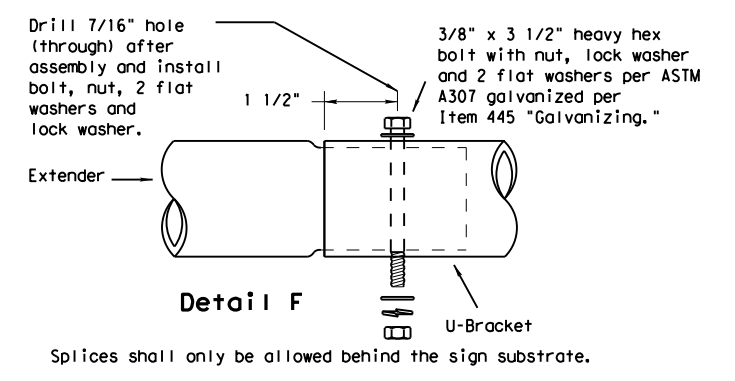
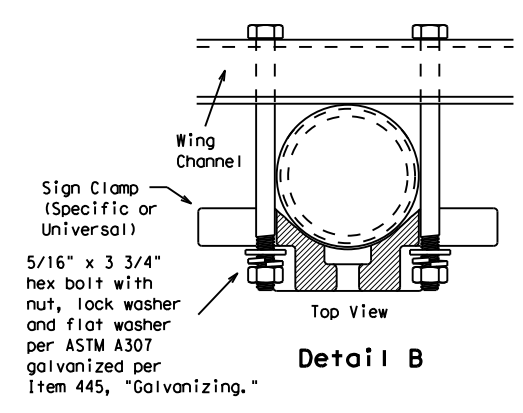
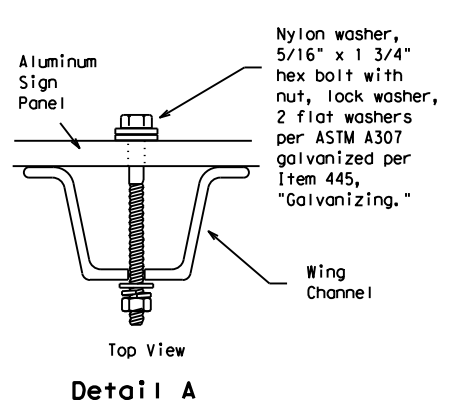
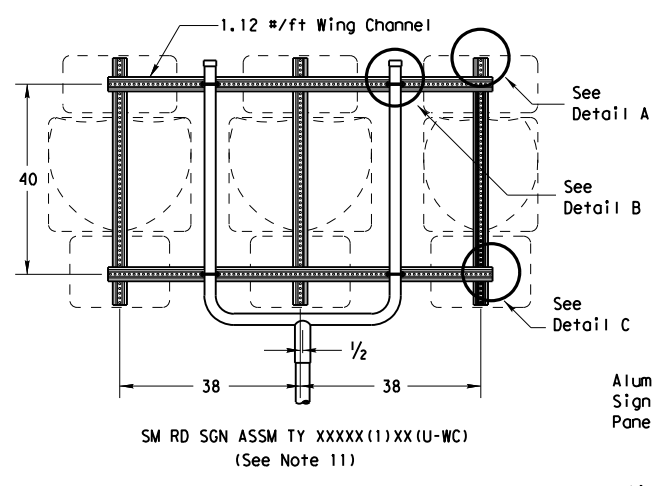
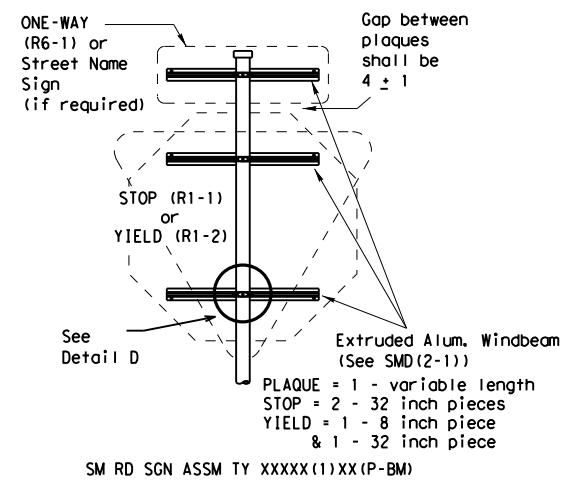
© TxDOT July 2002		DN: TxDOT	CK: TxDOT	DW: TxDOT	CR: TxDOT	
9-08	REVISIONS		CONT	SECT	JOB	HIGHWAY
			0122	03	033, ETC	US 287, ETC
			DIST	COUNTY	SHEET NO.	
		BRY	FREESTONE, ETC	151		

DISCLAIMER: The use of this standard is governed by the "Texas Engineering Practice Act". No warranty of any kind is made by TxDOT for any purpose whatsoever. TxDOT assumes no responsibility for the conversion of this standard to other formats or for incorrect results or damages resulting from its use.

DATE: 5/26/2022 4:44:07 PM
 FILE: \\txdot.projectwiseonline.com:TXDOT14\Documents\17 - BRY\Design Projects\012203033\4 - Design\Plan Set\8 - Traffic\Signs\TrafficStandards\smds2.dgn



All dimensions are in english unless detailed otherwise.



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:

- 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
- 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.
- Sign supports shall not be spliced except where shown. Sign support posts shall not be spliced.
- 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.
- Signs that require specific supports due to reasons in addition to windloading are indicated on the "REQUIRED SUPPORT" table on this sheet.
- 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.
- 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.
- Wing channel shall meet ASTM A 1011 SS Gr 50 and be galvanized per ASTM A 123.
- 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."
- Additional route markers may be added vertically, provided the total sign area does not exceed the maximum allowable amount per Note 1.
- 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.
- Post open ends shall be fitted with Friction Caps.
- 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)
Warning	36x48, 48x36, and 48x48-inch signs	TY 10BWG(1)XX(T)
	48x60-inch signs	TY S80(1)XX(T)
	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)	

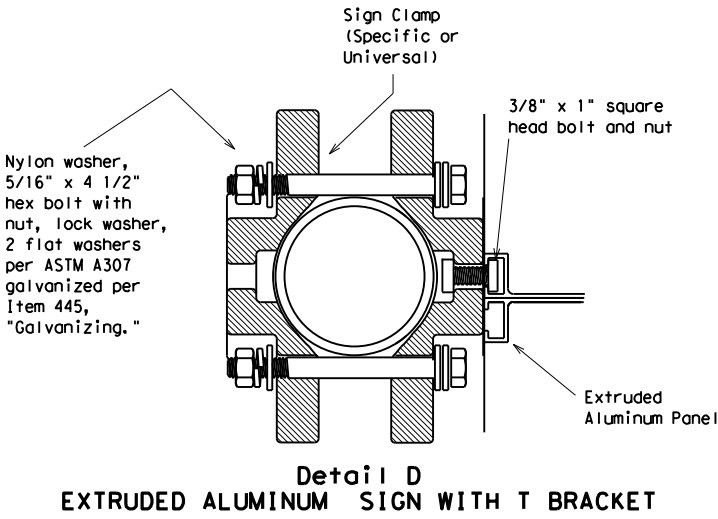
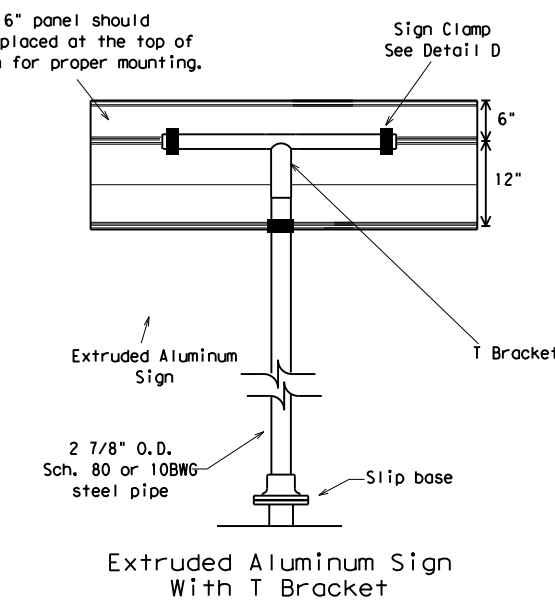
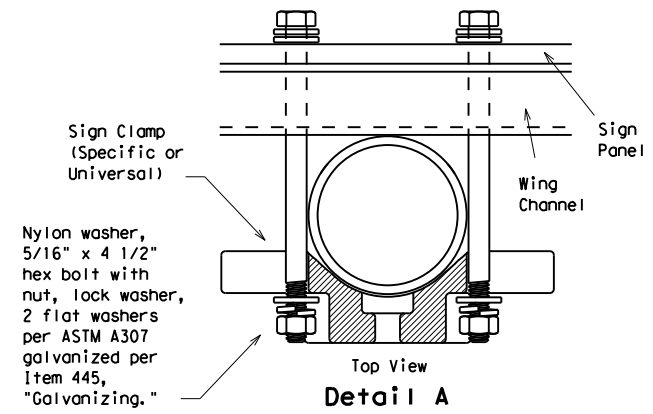
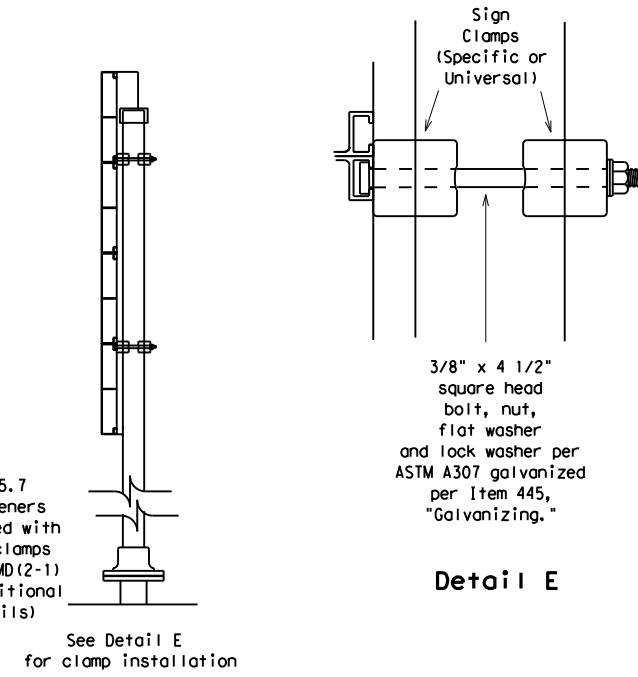
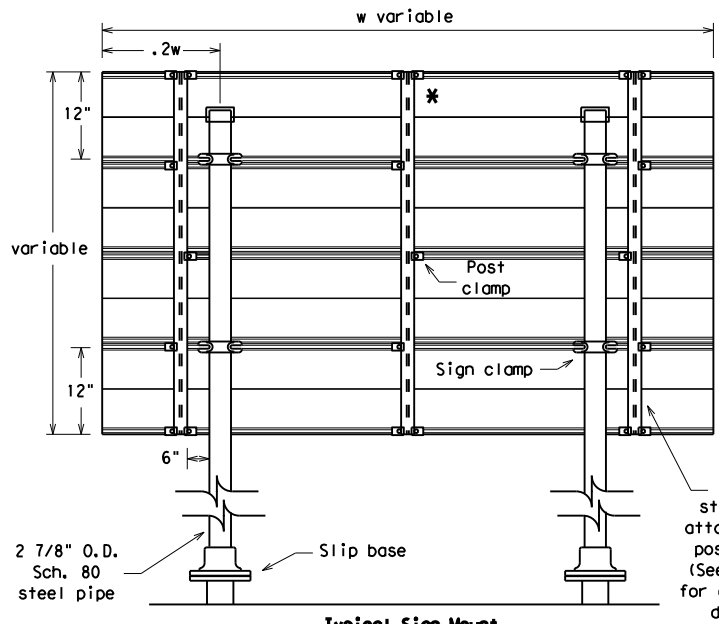
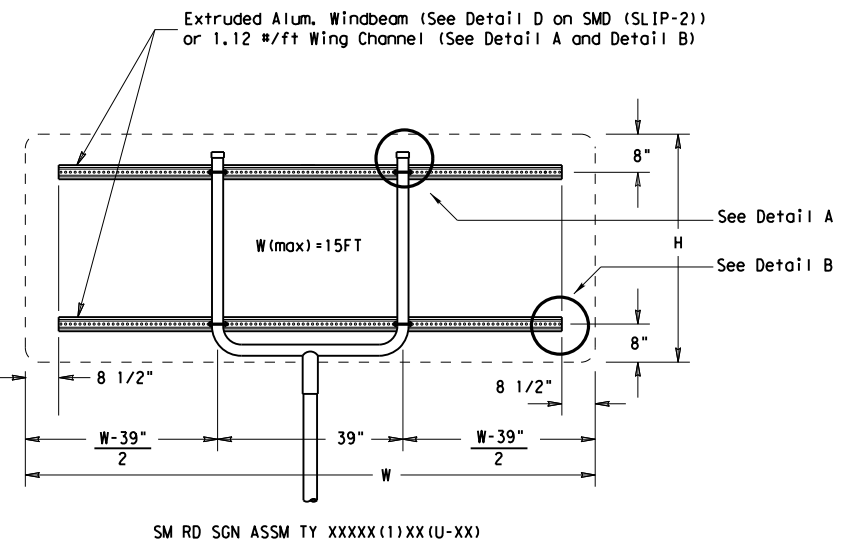
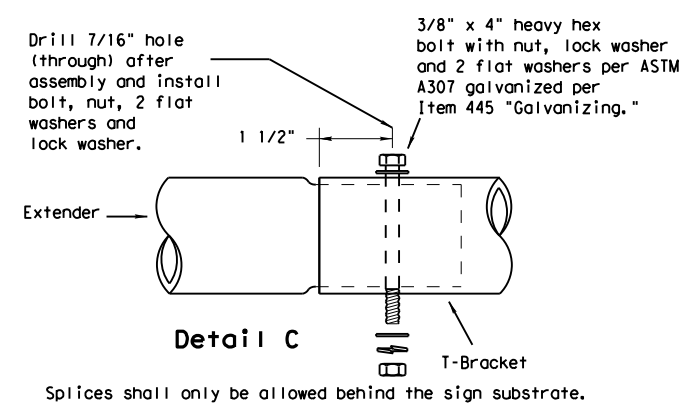
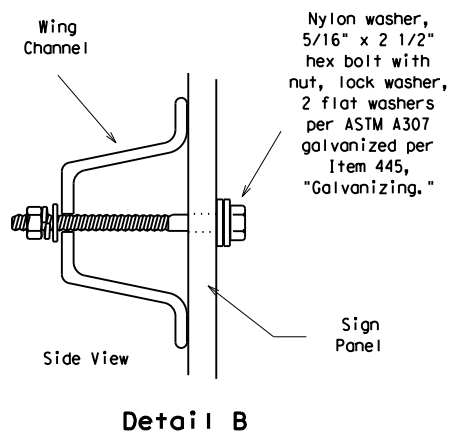
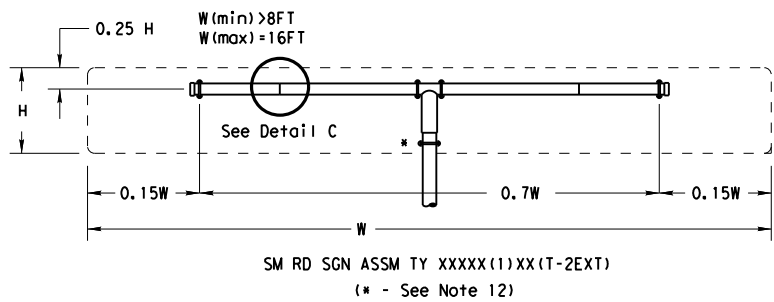


SIGN MOUNTING DETAILS
 SMALL ROADSIDE SIGNS
 TRIANGULAR SLIPBASE SYSTEM
 SMD(SLIP-2)-08

© TxDOT July 2002		DN: TXDOT	CK: TXDOT	DW: TXDOT	CK: TXDOT
9-08	REVISIONS	CON: 0122	SECT: 03	JOB: 033, ETC	HIGHWAY: US 287, ETC
		DIST: BRY	COUNTY: FREESTONE, ETC	SHEET NO. 152	

DISCLAIMER: The use of this standard is governed by the "Texas Engineering Practice Act". No warranty of any kind is made by TxDOT for any purpose whatsoever. TxDOT assumes no responsibility for the conversion of this standard to other formats or for incorrect results or damages resulting from its use.

DATE: 5/26/2022 4:44:12 PM
 FILE: \\txdot.projectwiseonline.com:TXDOT14\Documents\17 - BRY\Design Projects\012203033\4 - Design\Plan Set\8. Traffic\8H. TrafficStandards\smds3.dgn



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 |
- 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.
- Sign supports shall not be spliced except where shown. Sign support posts shall not be spliced.
- 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.
- Signs that require specific supports due to reasons in addition to windloading are indicated on the "REQUIRED SUPPORT" table on this sheet.
- 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.
- 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.
- Wing channel shall meet ASTM A 1011 SS Gr 50 and be galvanized per ASTM A 123.
- 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."
- Sign blanks shall be the sizes and shapes shown on the plans.
- 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.
- Post open ends shall be fitted with Friction Caps.

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



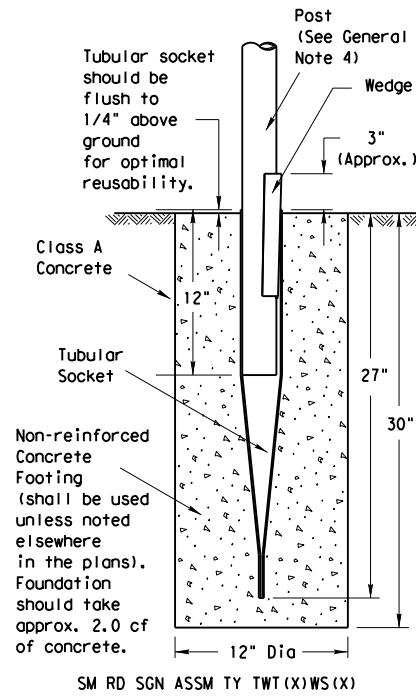
**SIGN MOUNTING DETAILS
 SMALL ROADSIDE SIGNS
 TRIANGULAR SLIPBASE SYSTEM
 SMD(SLIP-3)-08**

© TxDOT July 2002		DN: TxDOT	CK: TxDOT	DW: TxDOT	CK: TxDOT
9-08	REVISIONS	CONT	SECT	JOB	HIGHWAY
		0122	03	033, ETC	US 287, ETC
		DIST	COUNTY		SHEET NO.
		BRY	FREESTONE, ETC		153

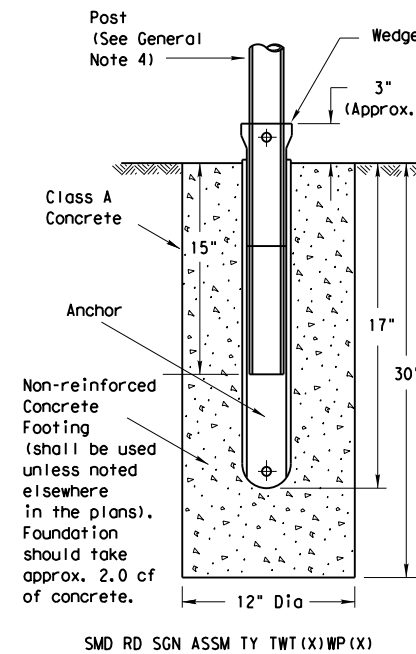
DISCLAIMER: The use of this standard is governed by the "Texas Engineering Practice Act". No warranty of any kind is made by TxDOT for any purpose whatsoever. TxDOT assumes no responsibility for the conversion of this standard to other formats or for incorrect results or damages resulting from its use.

DATE: 5/26/2022 4:44:22 PM
 FILE: \\txdot.projectwiseonline.com\TXDOT14\Documents\17 - BRY\Design Projects\01220333\4 - Design\Plan Set\8 - Traffic\8H - TrafficStandards.smdwt.dgn

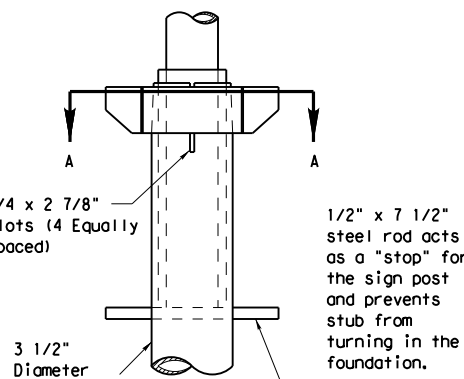
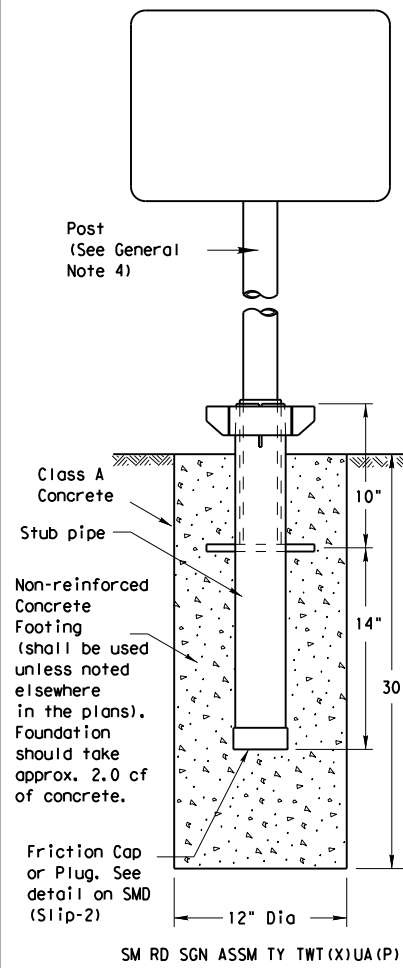
Wedge Anchor Steel System



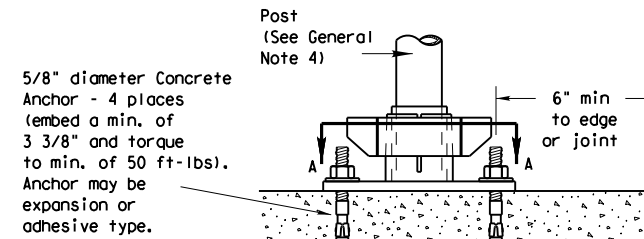
Wedge Anchor High Density Polyethylene (HDPE) System



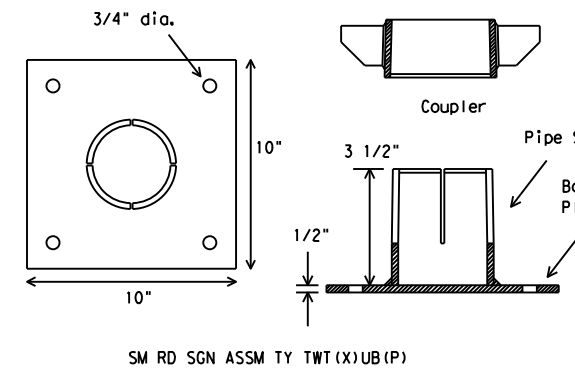
Universal Anchor System with Thin-Walled Tubing Post



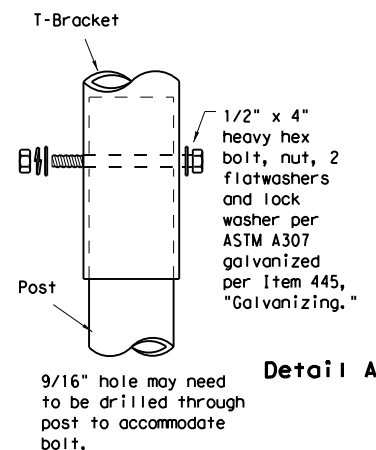
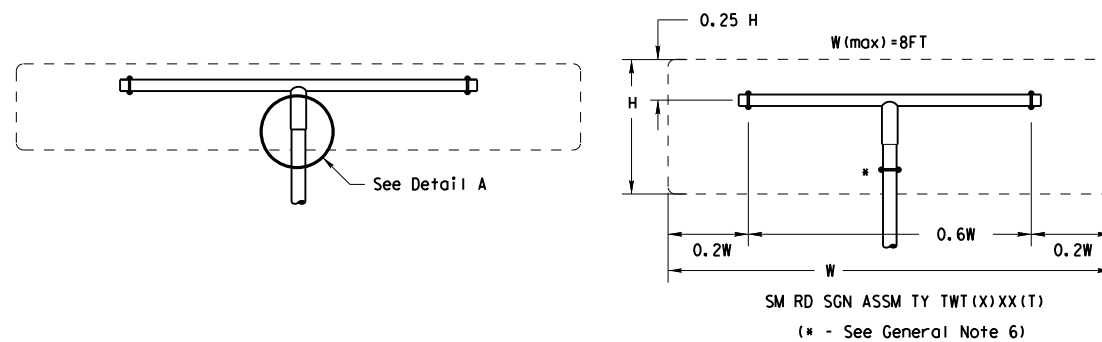
Plastic insert must be used when using the TWT with either the Universal Anchor System or the Bolt Down Universal Anchor System. The insert should be approx. 10" long and cover the tubing from just above the top of the stub pipe to the bottom of the sign post when using the Universal Anchor System. The insert should be cut to approx. 4 1/2" when used with the Bolt Down Universal Anchor System.



Concrete anchor consists of 5/8" diameter stud bolt with UNC series bolt threads on the upper end. A heavy hex nut per ASTM A563 and hardened washer per ASTM F436. The stud bolt shall have minimum yield and ultimate tensile strengths of 50 and 75 ksi, respectively. Nuts, bolts and washers shall be galvanized per Item 445, "Galvanizing." Top of bolt shall extend at least flush with top of nut when installed. The anchor, when installed in 4000 psi normal-weight concrete with a 3 3/8" minimum embedment, shall have a minimum allowable tension and shear of 2450 and 1525 psi, respectively. Adhesive type anchors shall have stud bolts installed with Type III epoxy per DMS-6100, "Epoxyes and Adhesives." Adhesive anchors may be loaded after adequate epoxy cure time per the manufacturer's recommendations.



Sign Installation Using a Prefabricated T-Bracket for Thin-Wall Tubing Post



NOTE

The devices shall be installed per manufacturer's recommendations. Installation procedures shall be provided to the Engineer by Contractor.

GENERAL NOTES:

- The Wedge Anchor System and the Universal Anchor System with thin wall tubing post may be used to support up to 10 square feet of sign area.
- The tubular socket, wedge and prefabricated T-bracket shall be permanently marked to indicate manufacturer. Method, design, and location of marking are subject to the approval of the TxDOT Traffic Standards Engineer.
- Except for posts (13 BWG Tubing), clamps, nuts and bolts, all components shall be prequalified. A list of prequalified vendors may be obtained from the Material Producer List web page. The website address is: http://www.txdot.gov/business/producer_list.htm
- Material used as post with this system shall conform to the following specifications:
 - 13 BWG Tubing (2.375" outside diameter) (TWT)
 - 0.095" nominal wall thickness
 - Seamless or electric-resistance welded steel tubing
 - Steel shall be HSLA 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
 - 18% minimum elongation in 2"
 - Wall thickness (uncoated) shall be within the range of .083" to .099"
 - Outside diameter (uncoated) shall be within the range of 2.369" to 2.381"
 - Galvanization per ASTM 123 or ASTM A653 G210. For precoated steel tubing (ASTM A653), recoat tube outside diameter weld seam by metallizing with zinc wire per ASTM B833.
 - Sign blanks shall be the sizes and shapes shown on the plans.
 - Additional sign clamp required on the "T-bracket" post for 24" high signs. Place clamp at least 3" above bottom of sign when possible.
 - Sign supports shall not be spliced except where shown. Sign support posts shall not be spliced.
 - See the Traffic Operations Division website for detailed drawings of sign clamps and Wedge Anchor System components. The website address is: <http://www.txdot.gov/publications/traffic.htm>

WEDGE ANCHOR SYSTEM INSTALLATION PROCEDURE

- Dig foundation hole. Where solid rock is encountered at ground level, the foundation shall be a minimum depth of 18". When solid rock is encountered below ground level, the foundation shall extend in the solid rock a minimum depth of 18" or provide a minimum foundation depth of 30". If solid rock is encountered, the socket/stub may be reduced in length as required to a minimum length of 18". Any material removed from the socket/stub shall be from the bottom and the clearance requirements given on SMD(GEN) must be followed. The inner surfaces of the socket/stub must remain free of concrete or other debris.
- 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. Place concrete into hole until it is approximately flush with the ground. Concrete shall be Class A.
- Insert tubular socket into concrete until top of socket is approximately 1/4" above the concrete footing.
- Plumb the socket. Allow a minimum 4 days for concrete to set, unless otherwise directed by Engineer.
- Attach the sign to the sign post.
- Insert the sign post into socket and align sign face with roadway.
- Drive the wedge into the socket to secure post. This will leave approximately 3 inches of the wedge exposed.

UNIVERSAL ANCHOR SYSTEM INSTALLATION PROCEDURE

- Dig foundation hole. Where solid rock is encountered at ground level, the foundation shall be a minimum depth of 18". When solid rock is encountered below ground level, the foundation shall extend in the solid rock a minimum depth of 18" or provide a minimum foundation depth of 30". If solid rock is encountered, the socket/stub may be reduced in length as required to a minimum length of 18". Any material removed from the socket/stub shall be from the bottom and the clearance requirements given on SMD(GEN) must be followed. The inner surfaces of the socket/stub must remain free of concrete or other debris.
- Insert base post in hole to depths shown and backfill hole with concrete.
- Level and plumb the base post using a torpedo level and allow concrete adequate time to set. The bottom of the slots provided in the stub pipe shall remain above the top of the concrete foundation.
- Attach the sign to the sign post.
- Install plastic insert around bottom of post.
- Insert sign post into base post. Lower until the post comes to rest on steel rod.
- Seat compression ring using a hammer. Typically, the top of compression ring will be approximately level with top of stub post when optimally installed.
- Check sign post by hand to ensure it is unable to turn. If loose, increase the tightening of the compression ring.



SIGN MOUNTING DETAILS SMALL ROADSIDE SIGNS WEDGE & UNIVERSAL ANCHOR WITH THIN WALL TUBING POST SMD (TWT) -08

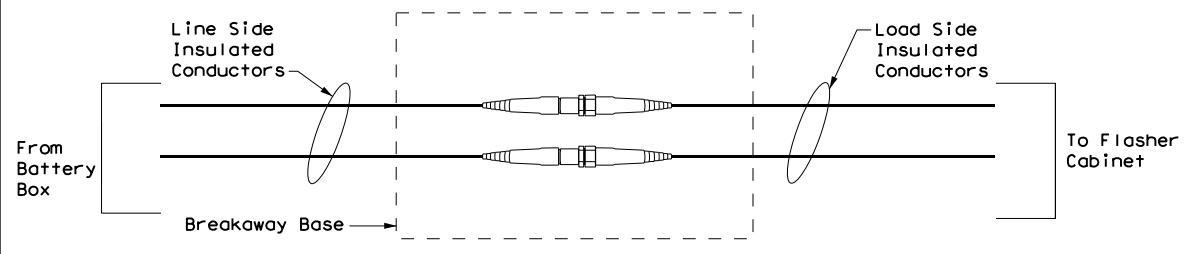
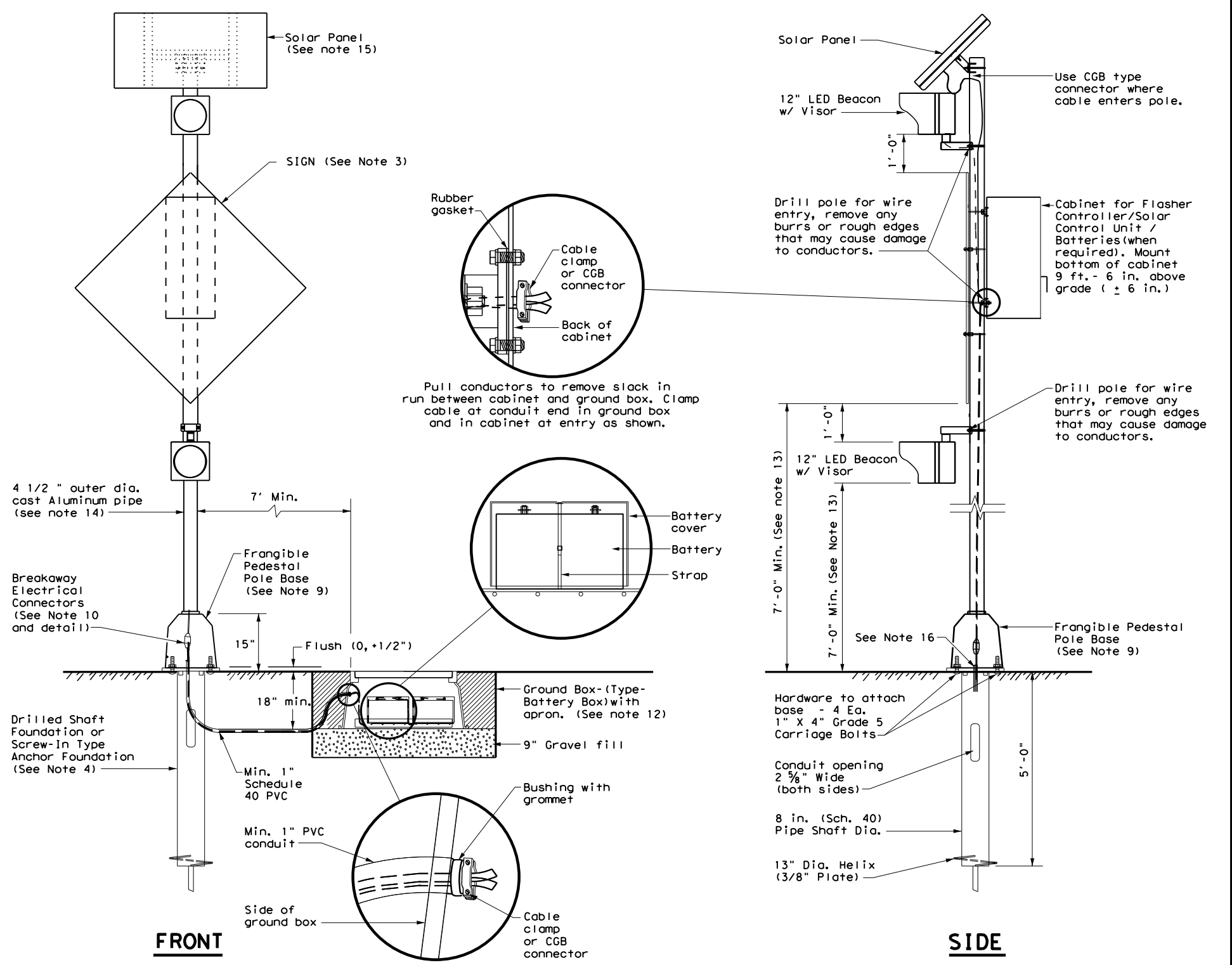
© TxDOT July 2002	DN: TxDOT	CK: TxDOT	DW: TxDOT	CK: TxDOT	
9-08	REVISIONS	CONT	SECT	JOB	HIGHWAY
	0122	03	033, ETC	US 287, ETC	
	DIST	COUNTY	SHEET NO.		
	BRY	FREESTONE, ETC	155		

DISCLAIMER: The use of this standard is governed by the "Texas Engineering Practice Act". No warranty of any kind is made by TxDOT for any purpose whatsoever. TxDOT assumes no responsibility for the conversion of units or for the use of this standard in any other project.

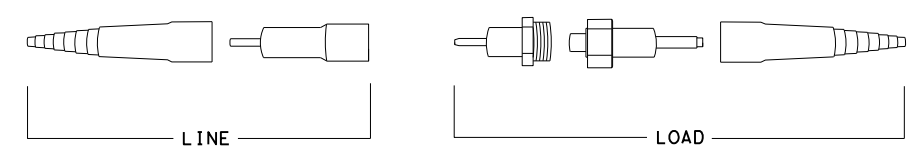
DATE: 5/26/2022 4:44:35 PM
 FILE: \\txdot\project\wiseonline.com\TXDOT4\Documents\17 - BRY\Design Projects\SPRFBA (1) - 13.dgn

GENERAL NOTES:

- Details show a typical warning sign with two flashing beacon heads, other arrangements are possible. When only one beacon is required, install the upper beacon.
- See Item 685, "Roadside Flashing Beacon Assemblies" for further requirements.
- See SMD standard sheets for lateral and vertical clearances and sign mounting details. Install signs as shown on the sign layout sheets.
- Use either a Screw-In Type Anchor Foundation or a Drilled Shaft Foundation as shown elsewhere in the plans. When plans require a Drilled Shaft Foundation, see standard sheet TS-FD. Install the Screw-In Type Anchor Foundation as per manufacturer's recommendations. On a slope, install one edge at ground level. Screw-In/Drilled Shaft Foundation is subsidiary to Item 685. Installation of a ground rod is not required for solar powered flashing beacon assemblies.
- When used, provide Screw-In Type Anchor Foundations as shown on TxDOT's Material Producer List (MPL) in the file "Highway Traffic Signals".
- Use materials specifically designed for attaching cabinets, beacon heads, solar panels, etc., to poles.
- Install beacon heads as shown here, as shown elsewhere on the plans, or as directed. Use hardware specifically designed for mounting beacon heads on poles.
- Conduit in foundation and within 6 in. of foundation is subsidiary to the Item 685, "Roadside Flashing Beacon Assemblies."
- Per manufacturer's recommendations, engage all threads on the pedestal pole base and pipe unless the pipe is fully seated into base. In high winds, use a pole and base collar assembly to add strength and prevent loosening on connection.
- Provide single pole non-fused watertight breakaway electrical connectors for frangible pedestal pole bases, as shown on TxDOT's MPL in the file "Roadway Illumination and Electrical Supplies." Approved models are listed under Item 685. For ungrounded (hot) conductors, install a breakaway connector with a dummy fuse slug. For grounded (neutral) conductors, install a breakaway connector with a white colored marking and a permanently installed dummy fuse (slug).
- Install the batteries in a battery box. Place the batteries on a 3/16" thick plastic sheet and connect together. Place a plastic cover (battery bell jar) over the top of each battery and secure the battery bell jar to the battery with a strap. The batteries, bell jars, straps and 3/16" plastic sheet are subsidiary to the Item 685, "Roadside Flashing Beacon Assemblies." When required, install batteries in the flasher cabinet. Wire batteries according to manufacturer's recommendations. Provide the number of batteries as required by the manufacturer.
- See standard sheet Electrical Details (ED) for additional requirements regarding the installation of ground boxes/battery boxes, conduit, and cabinets.
- Provide clearance as shown above the sidewalk or pavement grade at the edge of the road. When a bottom beacon is not used, mount the bottom of the sign at least 7 ft. above the sidewalk or pavement grade at the edge of the road.
- Unless otherwise shown on the plans, pole shaft shall be one piece, Schedule 40 Aluminum pipe, ASTM B429 or B221 (Alloy 6061-T6 only). Aluminum conduit will not develop the necessary strength and will not be allowed.
- Orient solar panel for optimum exposure to sunlight (face to the south). Prior to installation, check the location to ensure there is no overhead obstruction that would block the solar panel from receiving full sunlight. Unless specified elsewhere, mount a minimum of 14' above grade.
- Ensure height of conduit is below top of anchor bolts.



NON-FUSED BREAKAWAY ELECTRICAL CONNECTORS



**NON-FUSED BREAKAWAY ELECTRICAL CONNECTORS
EXPLODED VIEW**

SOLAR POWERED ROADSIDE FLASHING BEACON ASSEMBLY DETAILS
SPRFBA (1) - 13

FILE: spb1-13.dgn	DW: TxDOT	CK: TxDOT	DW: TxDOT	CK: TxDOT
© TxDOT May 2003	CONT	SECT	JOB	HIGHWAY
REVISIONS	0122	03	033, ETC	US 287, ETC
12-04	DIST	COUNTY	SHEET NO.	
3-13	BRY	FREESTONE, ETC	156	

DISCLAIMER: The use of this standard is governed by the "Texas Engineering Practice Act". No warranty of any kind is made by TxDOT for any purpose whatsoever. TxDOT assumes no responsibility for the conversion of this standard to other formats or for incorrect results or damages resulting from its use. FILE: pw:\txdot.projectwiseonline.com:TXDOT4\Documents\17 - BRY\Design Projects\0122030334 - Design\Plan Set\8 - Traffic\8H - TrafficStandards\TS-FD-12.dgn

FOUNDATION DESIGN TABLE

FDN TYPE	DRILLED SHAFT DIA	REINFORCING STEEL		EMBEDDED DRILLED SHAFT LENGTH-ft (4), (5), (6)			ANCHOR BOLT DESIGN (1)			FOUNDATION DESIGN LOAD (2)		TYPICAL APPLICATION	
		VERT BARS	SPIRAL & PITCH	TEXAS CONE PENETROMETER N Blows/ft			ANCHOR BOLT DIA	F _y (ksi)	BOLT CIR DIA	ANCHOR TYPE	MOMENT K-ft		SHEAR Kips
				10	15	40							
24-A	24"	4- #5	#2 at 12"	5.7	5.3	4.5	¾"	36	12 ¾"	1	10	1	Pedestal pole, pedestal mounted controller.
30-A	30"	8- #9	#3 at 6"	11.3	10.3	8.0	1 ½"	55	17"	2	87	3	Mast arm assembly. (see Selection Table)
36-A	36"	10- #9	#3 at 6"	13.2	12.0	9.4	1 ¾"	55	19"	2	131	5	Mast arm assembly. (see Selection Table) 30' strain pole with or without luminaire.
36-B	36"	12- #9	#3 at 6"	15.2	13.6	10.4	2"	55	21"	2	190	7	Mast arm assembly. (see Selection Table) Strain pole taller than 30' & strain pole with mast arm.
42-A	42"	14- #9	#3 at 6"	17.4	15.6	11.9	2 ¼"	55	23"	2	271	9	Mast arm assembly. (see Selection Table)

NOTES:

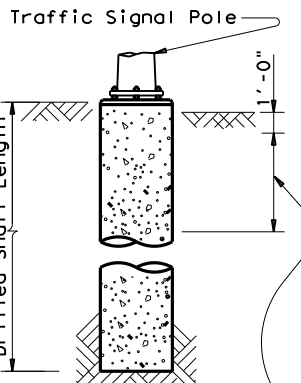
- Anchor bolt design develops the foundation capacity given under Foundation Design Loads.
- Foundation Design Loads are the allowable moments and shears at the base of the structure.
- Foundations may be listed separately or grouped according to similarity of location and type. Quantities are for the Contractor's information only.
- Field Penetrometer readings at a depth of approximately 3 to 5 feet may be used to adjust shaft lengths.
- If rock is encountered, the Drilled Shaft shall extend a minimum of two diameters into solid rock.
- Decimal lengths in Design Table are to allow interpolation for other penetrometer values. Round to nearest foot for entry into Summary Table.

FOUNDATION SUMMARY TABLE (3)

LOCATION IDENTIFICATION	AVG. N BLOW /ft.	FDN TYPE	NO. EA	DRILLED SHAFT LENGTH (6) (FEET)				
				24-A	30-A	36-A	36-B	42-A
TOTAL DRILLED SHAFT LENGTHS								

FOUNDATION SELECTION TABLE FOR STANDARD MAST ARM PLUS ILSN SUPPORT ASSEMBLIES (ft)

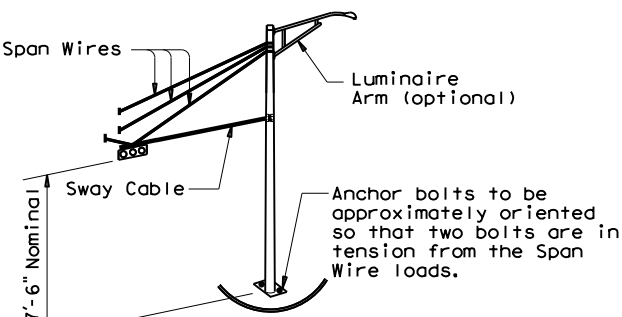
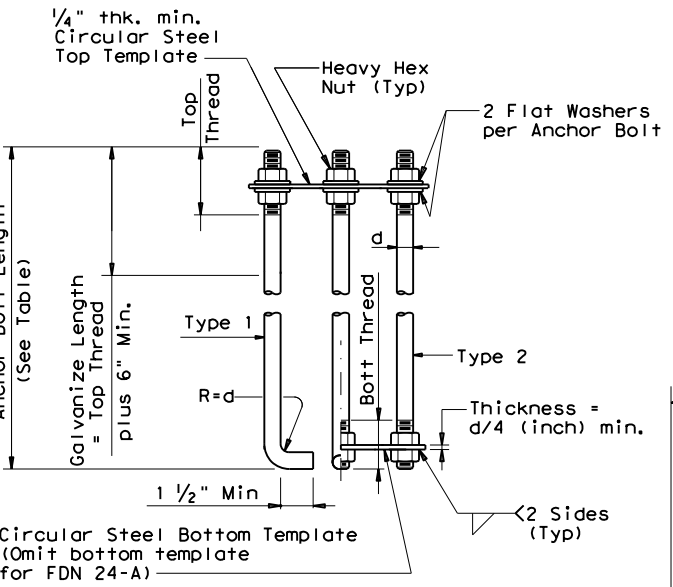
WIND SPEED		FDN 30-A	FDN 36-A	FDN 36-B	FDN 42-A	
80 MPH DESIGN	MAX SINGLE ARM LENGTH	32'	48'			
	MAXIMUM DOUBLE ARM LENGTH COMBINATIONS	24' X 24'				
		28' X 28'				
		32' X 28'				
100 MPH DESIGN	MAX SINGLE ARM LENGTH		36'	44'		
	MAXIMUM DOUBLE ARM LENGTH COMBINATIONS					



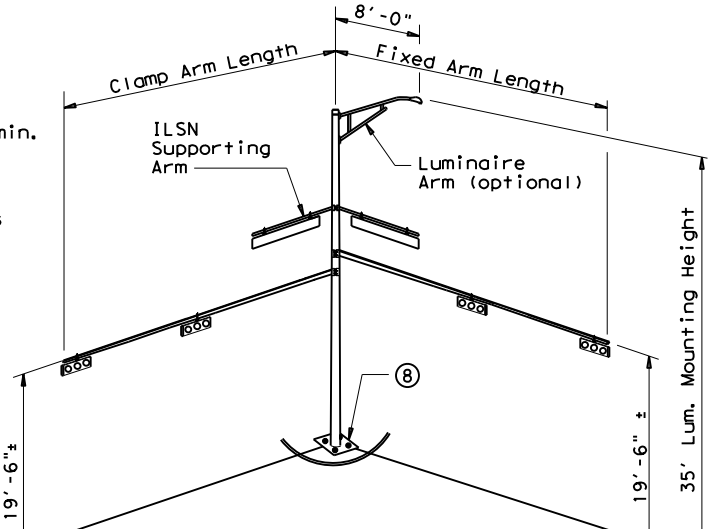
BOLT DIA IN.	7 BOLT LENGTH	TOP THREAD	BOTTOM THREAD	BOLT CIRCLE	R ₂	R ₁
¾"	1'-6"	3"	---	12 ¾"	7 ⅝"	5 ⅝"
1 ½"	3'-4"	6"	4"	17"	10"	7"
1 ¾"	3'-10"	7"	4 ½"	19"	11 ¼"	7 ¾"
2"	4'-3"	8"	5"	21"	12 ½"	8 ½"
2 ¼"	4'-9"	9"	5 ½"	23"	13 ¾"	9 ¼"

(7) Min dimensions given, longer bolts are acceptable.

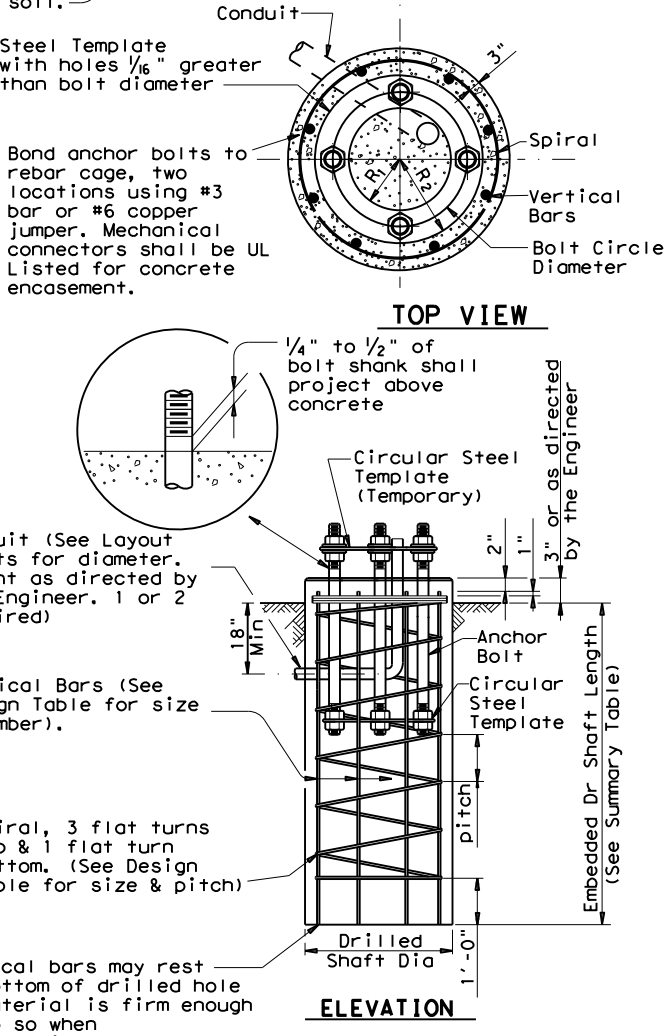
- EXAMPLE:
- For 80mph design wind speed, foundation 30-A can support up to a 32' arm with another arm up to 28'
 - For 100mph design wind speed, foundation 36-A can support a single 36' mast arm.



TYPICAL STRAIN POLE ASSEMBLY



TYPICAL MAST ARM ASSEMBLY



FOUNDATION DETAILS

GENERAL NOTES:

- Design conforms to 1994 AASHTO Standard Specifications for Structural Supports for Highway Signs, Luminaires and Traffic Signals and interim revisions thereto.
- Reinforcing steel shall conform to Item 440, "Reinforcing Steel".
- Concrete shall be Class "C".
- Threads for anchor bolts and nuts shall be rolled or cut threads of 8UN series up to 2" in diameter or UNC series for all sizes. Bolts and nuts shall have Class 2A and 2B fit tolerances. Galvanized nuts shall be tapped after galvanizing.
- Anchor bolts that are larger than 1" in diameter shall conform to "alloy steel" or "medium-strength mild steel" per Item 449, "Anchor Bolts". Anchor bolts that are 1" in diameter or less shall conform to ASTM A36. Galvanize a minimum of the top end thread length plus 6" for all anchor bolts unless otherwise noted. Exposed washers and exposed nuts shall be galvanized. All galvanizing shall be in accordance with Item 445, "Galvanizing".
- Templates and embedded nuts need not be galvanized. Lubricate and tighten anchor bolts when erecting the structure in accordance with Item 449, "Anchor Bolts".



TRAFFIC SIGNAL POLE FOUNDATION

TS-FD-12

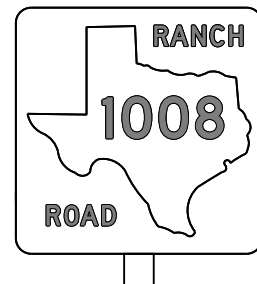
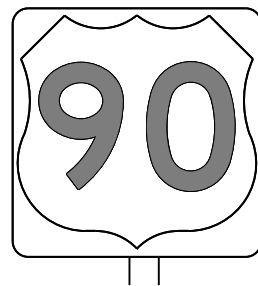
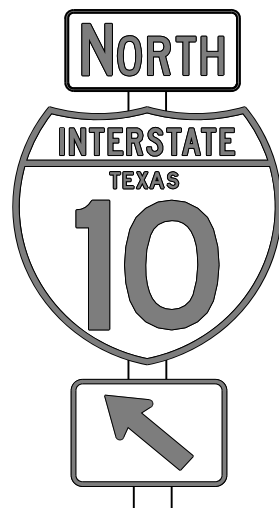
© TxDOT August 1995		DN: MS	CK: JSY	DW: MAQ/MMF	CK: JSY/TEB
REVISIONS	CONT	SECT	JOB	HIGHWAY	
0122	03	033, ETC	US 287, ETC		
DIST	COUNTY	SHEET NO.			
BRY	FREESTONE, ETC	157			

DISCLAIMER: The use of this standard is governed by the "Texas Engineering Practice Act". No warranty of any kind is made by TxDOT for any purpose whatsoever. TxDOT assumes no responsibility for the conversion of units or for the use of this standard in any other manner than that intended by the original author.

DATE: 5/26/2022 4:44:52 PM
 FILE: \\txdot.projectwiseonline.com:TXDOT4\Documents\17 - BRY\Design Projects\17-033\17-033.dgn

REQUIREMENTS FOR INDEPENDENT MOUNTED ROUTE SIGNS

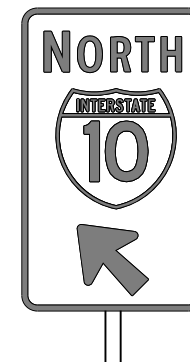
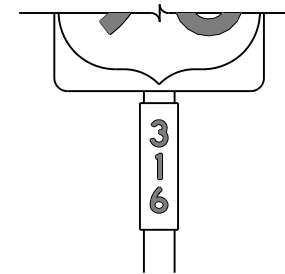
SHEETING REQUIREMENTS		
USAGE	COLOR	SIGN FACE MATERIAL
BACKGROUND	WHITE	TYPE A SHEETING
BACKGROUND	ALL OTHERS	TYPE B OR C SHEETING
LEGEND & BORDERS	WHITE	TYPE A SHEETING
LEGEND & BORDERS	BLACK	ACRYLIC NON-REFLECTIVE FILM
LEGEND & BORDERS	ALL OTHERS	TYPE B or C SHEETING



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

- 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).
- 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

- 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).
- 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.
- 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.
- 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.
- Sign substrate shall be any material that meets the Departmental Material Specification requirements of DMS-7110 or approved alternative.
- 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.

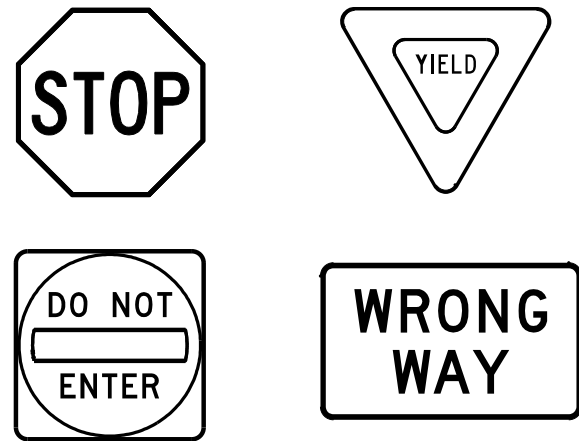
<http://www.txdot.gov/>

		Traffic Operations Division Standard	
<h3>TYPICAL SIGN REQUIREMENTS</h3>			
<h3>TSR(3) - 13</h3>			
FILE:	tsr3-13.dgn	DN:	TxDOT
© TxDOT	October 2003	CONT:	SECT:
REVISIONS		JOB:	HIGHWAY:
12-03	7-13	0122 03	033, ETC US 287, ETC
9-08		DIST:	COUNTY:
		BRY	FREESTONE, ETC
			SHEET NO. 158

DATE: 5/26/2022 4:44:57 PM
 FILE: \\txdot\project\wiseon\line.com:TXDOT4\Documents\17 - BRY\Design Projects\170909\170909.dgn
 DISCLAIMER: The use of this standard is governed by the "Texas Engineering Practice Act". No warranty of any kind is made by TxDOT for any purpose whatsoever. TxDOT assumes no responsibility for the conversion of any information from one format to another.

REQUIREMENTS FOR RED BACKGROUND REGULATORY SIGNS

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



REQUIREMENTS FOR FOUR SPECIFIC SIGNS ONLY

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

REQUIREMENTS FOR WHITE BACKGROUND REGULATORY SIGNS

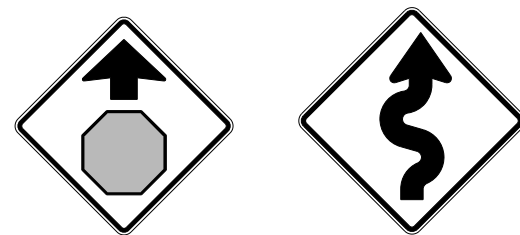
(EXCLUDING STOP, YIELD, DO NOT ENTER AND WRONG WAY SIGNS)



TYPICAL EXAMPLES

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

REQUIREMENTS FOR WARNING SIGNS



TYPICAL EXAMPLES

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

REQUIREMENTS FOR SCHOOL SIGNS



TYPICAL EXAMPLES

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

GENERAL NOTES

- 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).
- Sign legend shall use the Federal Highway Administration (FHWA) Standard Highway Alphabets (B, C, D, E, Emod or F).
- 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.
- Black legend and borders shall be applied by screening process or cut-out acrylic non-reflective black film to background sheeting, or combination thereof.
- White legend and borders shall be applied by screening process with transparent colored ink, transparent colored overlay film to white background sheeting or cut-out white sheeting to colored background sheeting, or combination thereof.
- Colored legend shall be applied by screening process with transparent colored ink, transparent colored overlay film or colored sheeting to background sheeting, or combination thereof.
- Sign substrate shall be any material that meets the Departmental Material Specification requirements of DMS-7110 or approved alternative.
- Mounting details for roadside mounted signs are shown in the "SMD series" Standard Plan Sheets.

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

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

The Standard Highway Sign Designs for Texas (SHSD) can be found at the following website:
<http://www.txdot.gov/>

		<i>Traffic Operations Division Standard</i>	
<h2>TYPICAL SIGN REQUIREMENTS</h2>			
<h3>TSR(4) - 13</h3>			
FILE:	tsr4-13.dgn	DN:	TxDOT
© TxDOT	October 2003	CK:	TxDOT
REVISIONS		DW:	TxDOT
12-03	7-13	CONT	SECT
9-08		0122	03
		JOB	HIGHWAY
		033, ETC	US 287, ETC
		DIST	COUNTY
		BRY	FREESTONE, ETC
		SHEET NO.	159

SITE DESCRIPTION

PROJECT LIMITS:

CSJ 0122-03-033 - From: 0.1 Mi W of FM 488 To: 0.1 Mi E of FM 488
 Begin Latitude 31.9722251, Longitude -96.0919071
 CSJ 0166-07-067 - From: 0.25 Mi N of Spur 67 To: 0.25 Mi S of Spur 67
 Begin Latitude 30.9197490, Longitude -95.8153546

PROJECT DESCRIPTION:

CSJ : 0122-03-033, Add Left Turn Lane
 CSJ : 0166-07-067, Installing Overhead Intersection Flashing Beacon, Safety Lighting at intersection, Add Left Turn Lane.

SEQUENCE OF MAJOR SOIL DISTURBING ACTIVITIES:

1. Replace/ extend structures
2. Windrow existing sod outside work area, creating a temporary topsoil berm
3. Add embankment, widen, cement treat subgrade, and place flex base
4. Smooth out windrow and place topsoil

TOTAL PROJECT AREA: CSJ: 0122-03-033, 8.8 AC
 CSJ: 0166-07-067, 5.9 AC

TOTAL AREA TO BE DISTURBED: CSJ: 0122-03-033, 2.5 AC - 28%
 CSJ: 0166-07-067, 4.6 AC - 78%

EXISTING CONDITION OF SOIL & VEGETATIVE COVER AND % OF EXISTING VEGETATIVE COVER:

CSJ: 0122-03-033, Existing soil is undisturbed; about 90% of the surface has vegetation that is in fair to good condition.
 CSJ: 0166-07-067, Existing soil is undisturbed; about 90% of the surface has vegetation that is in fair to good condition.

NAME OF RECEIVING WATERS:

CSJ: 0122-03-033, From STA 509+00 to STA 518+00 cross drainage structures collect into Alligator Creek which flows approximately .75 miles into Richland creek which flows approximately 2.0 miles into the Trinity River (Richland-Chambers Reservoir segment 0835).
 CSJ: 0166-07-067, From STA 990+37 to STA 1016+02 cross drainage structures collect into Nison Branch, which flows approximately 0.8 miles into Collard Creek, which flows approximately 1.0 miles into the Bedias Creek (Trinity River Basin Segment 0803).

ANTICIPATED EFFECT OF STORM WATER ON THREATENED AND ENDANGERED SPECIES AND WILDLIFE HABITAT:

See Environmental Permits, Issues and Commitments (EPIC) sheet.

EROSION AND SEDIMENT CONTROLS AND TCEQ 401 CERTIFICATION

I. SOIL STABILIZATION PRACTICES AND EROSION CONTROL:

- TEMPORARY SEEDING
- PERMANENT PLANTING, SODDING, OR SEEDING
- MULCHING
- SOIL RETENTION BLANKET
- BUFFER ZONES
- PRESERVATION OF NATURAL RESOURCES
- SUBSURFACE DRAINS

OTHER:

II. STRUCTURAL PRACTICES AND SEDIMENTATION CONTROL: (T/P) *

- SEDIMENT CONTROL FENCES
- HAY BALES
- ROCK BERMS
- STORM SEWERS
- CURBS AND GUTTERS
- VELOCITY CONTROL DEVICES
- PIPE SLOPE DRAINS
- PAVED FLUMES
- SAND BAG BERM
- GRAVEL BAG BERM
- BRUSH BERMS
- TRIANGULAR FILTER DIKE
- STONE OUTLET SEDIMENT TRAPS
- ROCK BEDDING AT CONSTRUCTION EXIT
- TIMBER MATTING AT CONSTRUCTION EXIT
- DIVERSION, INTERCEPTOR, OR PERIMETER DIKES
- DIVERSION, INTERCEPTOR, OR PERIMETER SWALES
- DIVERSION DIKE AND SWALE COMBINATIONS
- ROCK FILTER DAMS
- CHANNEL LINERS
- SEDIMENT TRAPS
- SEDIMENT BASINS
- STORM INLET SEDIMENT TRAP
- STONE OUTLET STRUCTURES

* T means Temporary - P means Permanent

OTHER:

III. POST CONSTRUCTION: (IF COE PERMIT IS ISSUED)

- RETENTION/IRRIGATION
- EXTENDED DETENTION BASINS
- VEGETATION FILTER STRIPS
- CONSTRUCTION WETLANDS
- WET BASINS
- VEGETATION LINED DRAINAGE DITCHES
- GRASSY SWALES
- SAND FILTER SYSTEMS

OTHER:

T - Topsoil Berm

NARRATIVE - SEQUENCE OF CONSTRUCTION (STORM WATER MANAGEMENT) ACTIVITIES:

- All work to be performed by the Contractor.
 The order of activities will be as follows:
1. Install SW3P items according to the plans and as directed
 2. Salvage existing vegetation and topsoil into a berm
 3. Cut/fill sideslopes to grade and perform widening
 4. Stabilize sideslopes with existing topsoil and establish vegetation
 5. Finish final surface
 6. Backfill pavement edges
 7. after stabilization and approval, remove temporary controls and seed/sod as needed

STORM WATER MANAGEMENT:

Surface drainage will be provided by grass ditches which carry drainage within the ROW to channels where cross drained occurs

OTHER EROSION AND SEDIMENT CONTROLS:

MAINTENANCE:

All erosion and sediment controls will be maintained in good working order. If a repair is necessary, it will be done at the earliest date possible, but no later than 7 calendar days after the surrounding exposed ground has dried sufficiently to prevent further damage from heavy equipment. The areas adjacent to creeks and drainageways shall have priority. Sediment must be removed from sediment traps or sedimentation ponds when design capacity has been reduced by 50%.

INSPECTION:

A TxDOT inspector will perform an inspection every 7 days.

DESCRIPTION OF CONSTRUCTION MATERIALS TO BE STORED ON-SITE AND CONTROLS TO PREVENT THESE FROM ENTERING STORM WATER:

Store all construction materials (wood, flex base, aggregate, etc.) in locations where they will not enter storm water runoff. Structural controls may be required for flex base, aggregate and earth stockpiles.

WASTE MATERIALS:

A TxDOT inspector will perform an inspection every 7 days.

HAZARDOUS WASTE (INCLUDING SPILL REPORTING):

At a minimum, any products in the following categories are considered to be hazardous: paints, acids for cleaning masonry surfaces, cleaning solvents, asphalt products, chemical additives for soil stabilization or concrete curing compounds and additives. In the event of a spill which may be hazardous, the Engineer should be contacted immediately.

SANITARY WASTE:

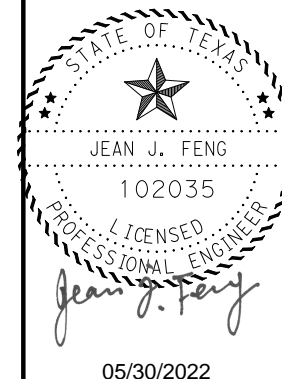
All sanitary waste will be collected from the portable units as necessary or as required by local regulation by a licensed sanitary waste management director.

OFFSITE VEHICLE TRACKING:

- HAUL ROADS DAMPENED FOR DUST CONTROL
- LOADED HAUL TRUCKS TO BE COVERED WITH TARPAULIN
- EXCESS DIRT ON ROAD REMOVED DAILY
- STABILIZED CONSTRUCTION ENTRANCE

REMARKS:

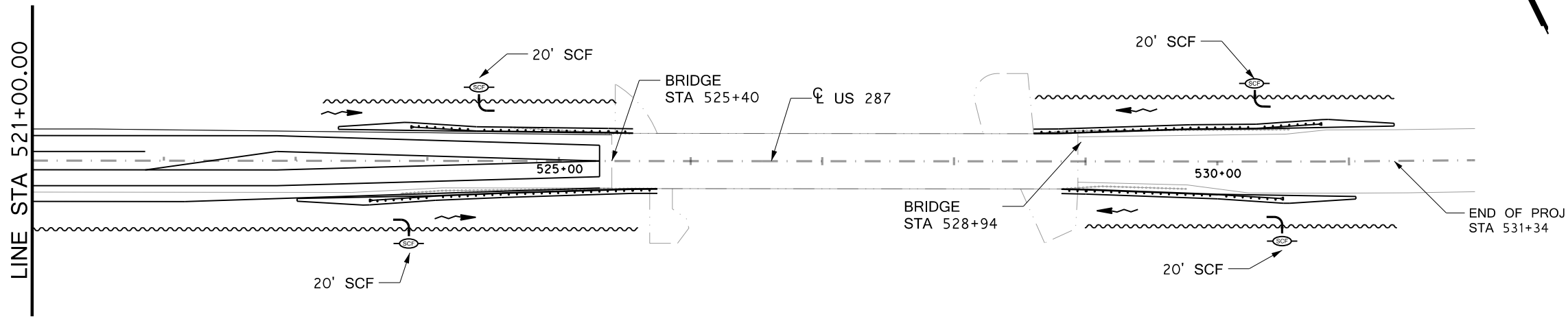
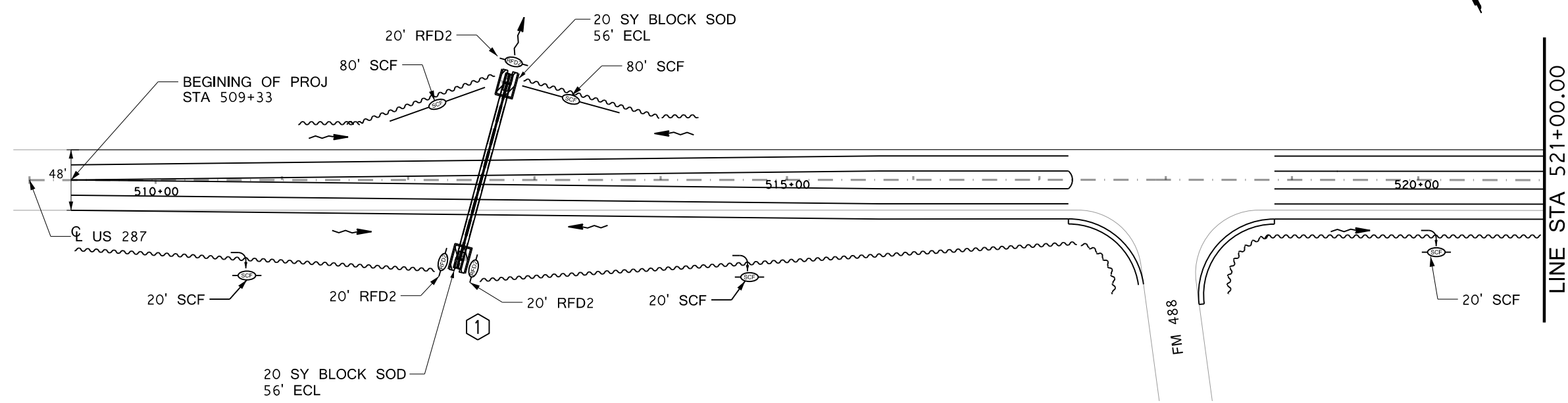
REV DATE: 2-12-2015
 CSJ: 8122-03-033
 FILENAME: pw:\tdot\projectswiseline.com\TXDOT\Documents\17 - BRY\Design Projects\012203033\4 - Design\Plan Set\10 - Environmental\10A - SW3P\SW3PPlan.dgn



Texas Department of Transportation ©2022 Bryan District TxDOT STORM WATER POLLUTION PREVENTION PLAN (SW3P)			
FED. RD. DIV. NO.	PROJECT NUMBER	HIGHWAY NUMBER	
6		US 287, ETC.	
STATE	DISTRICT	COUNTY	
TEXAS	BRYAN	FREESTONE, ETC.	
CONTROL	SECTION	JOB	SHEET NO.
0122	03	033,ETC.	160

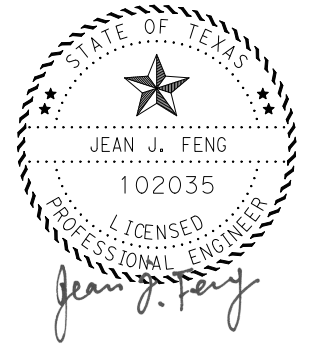
PRINT DATE	REVISION DATE
5/26/2022	

REV DATE: 2-12-2015
 CSJ: 0122-03-033
 FILENAME: pw:\hxdot\projectswiseline.com\TXDOT4\Documents\17 - BRY\Design Projects\012203033\4 - Design Plan Set\10 - Environmental\10A - SW3P\SW3P Layout.dgn

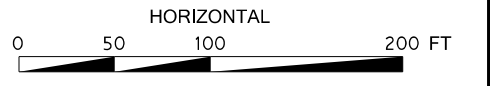


LEGEND	
	STRUCTURE NUMBER
	DIRECTION OF FLOW
	TOPSOIL BERM
	BERM BREAK
	BLOCK SOD - 4' WIDE (BOXES, HEADWALL & WINGWALLS) 2' WIDE (SETS)
	SEDIMENT CONTROL FENCE
	ROCK FILTER DAM (TY 2)
	BIODEG EROSN CONT LOGS
(WOTUS) WATERS OF THE US	

GENERAL NOTES:
 SEDIMENT CONTROL FENCE ESTIMATED AT 20' EACH, UNLESS OTHERWISE NOTED.
 TY 1 AND TY 2 ROCK FILTER DAM ESTIMATED AT 20' EACH, UNLESS OTHERWISE NOTED.



05/30/2022



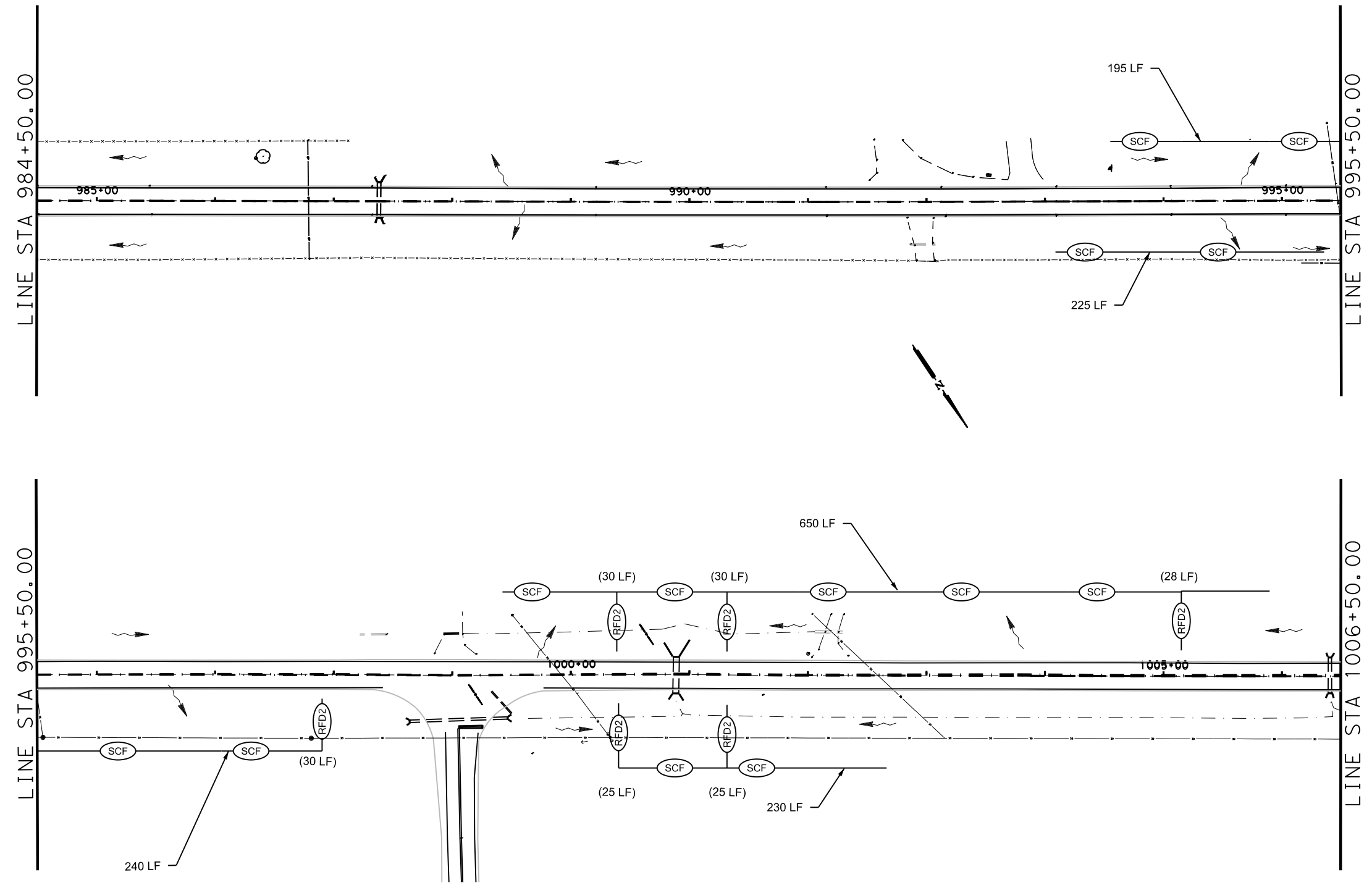
PRINT DATE	REVISION DATE
5/26/2022	



SW3P LAYOUT
 (US 287)

FED. RD. DIV. NO.	PROJECT NUMBER	HIGHWAY NUMBER	
6		US 287, ETC.	
STATE	DISTRICT	COUNTY	
TEXAS	BRYAN	FREESTONE, ETC.	
CONTROL	SECTION	JOB	SHEET NO.
0122	03	033, ETC.	161

REV DATE: 2-12-2015
 CSJ: 0122-03-033
 FILENAME: pw:\tdot\projectswisconsin.com\TXDOT4\Documents\17 - BRY\Design Projects\016607067\4 - Design Plan Set\10 - Environmental\10A - SW3P\SW3P_LAYOUT.dgn



LEGEND

- SCF SEDIMENT CONTROL FENCE
- RFD2 ROCK FILTER DAM (TY 2)
- CULVERT FLOW DIRECTION

GENERAL NOTES:

SEDIMENT CONTROL FENCE ESTIMATED AT 20' EACH, UNLESS OTHERWISE NOTED.
 TY 1 AND TY 2 ROCK FILTER DAM ESTIMATED AT 20' EACH, UNLESS OTHERWISE NOTED.

PRINT DATE	REVISION DATE
5/26/2022	

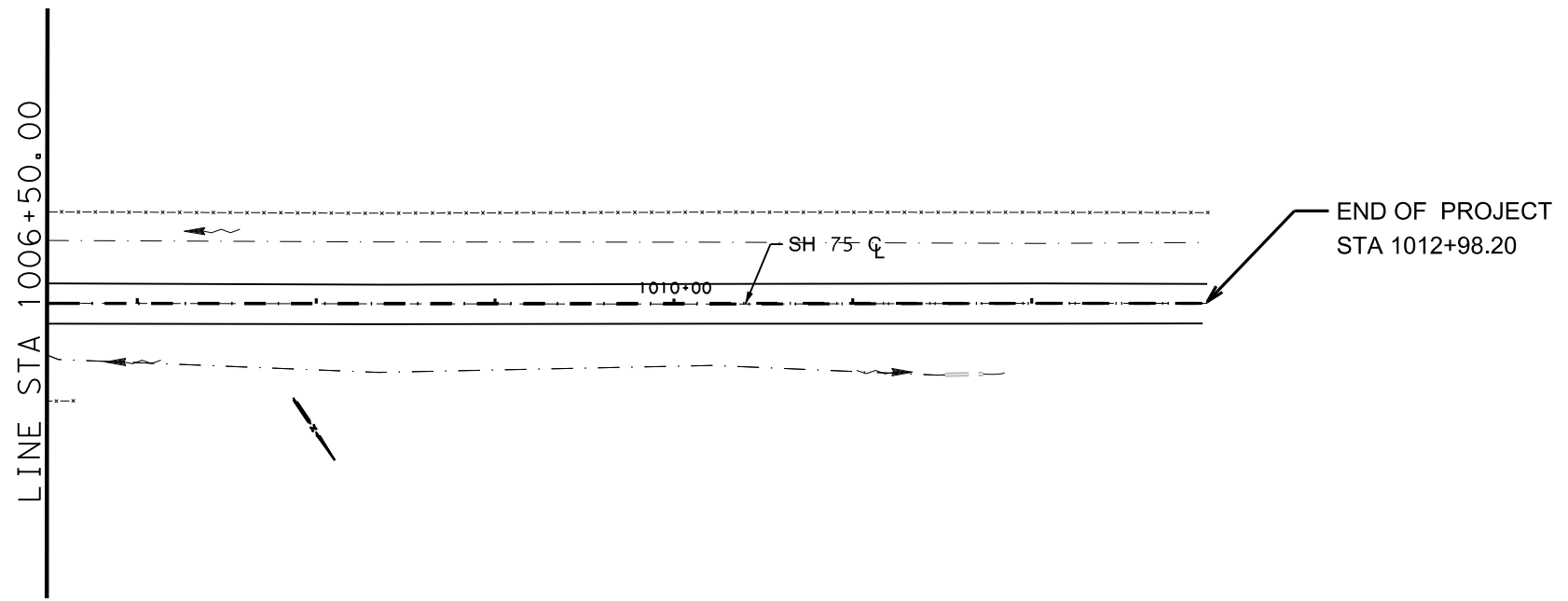


**SW3P LAYOUT
(SH 75)**

SHEET 1 OF 2 SHEETS

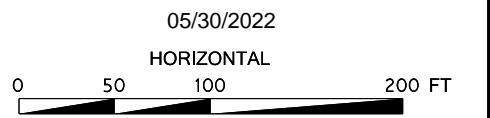
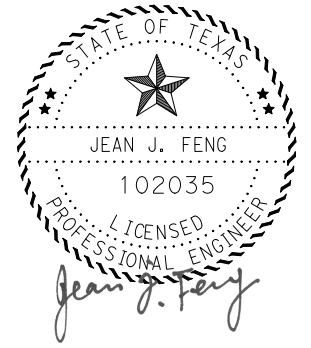
FED. RD. DIV. NO.	PROJECT NUMBER	HIGHWAY NUMBER	
6		US 287, ETC.	
STATE	DISTRICT	COUNTY	
TEXAS	BRYAN	FREESTONE, ETC.	
CONTROL	SECTION	JOB	SHEET NO.
0122	03	033, ETC.	162

REV DATE: 2-12-2015
 CSJ: 0122-03-033
 FILENAME: pw:\ttdot\project\wisconsin.com\TXDOT4\Documents\17 - BRY\Design Projects\016607067\4 - Design Plan Set\10 - Environmental\10A - SW3P\SW3P_LAYOUT2.dgn

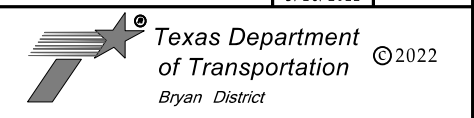


LEGEND	
	SEDIMENT CONTROL FENCE (1)
	ROCK FILTER DAM (TY 2) (1)
	CULVERT FLOW DIRECTION

GENERAL NOTES:
 SEDIMENT CONTROL FENCE ESTIMATED AT 20' EACH, UNLESS OTHERWISE NOTED.
 TY 1 AND TY 2 ROCK FILTER DAM ESTIMATED AT 20' EACH, UNLESS OTHERWISE NOTED.



PRINT DATE	REVISION DATE
5/26/2022	

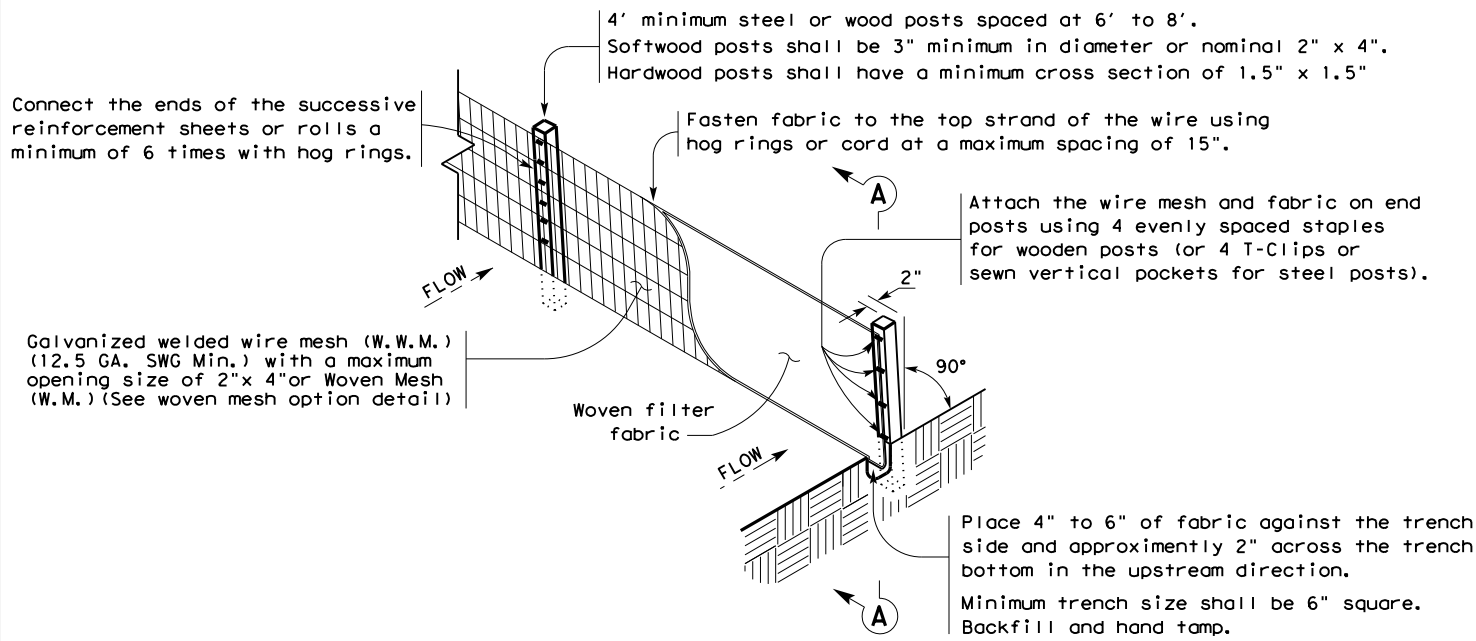


**SW3P LAYOUT
 (SH 75)**

SHEET 2 OF 2 SHEETS

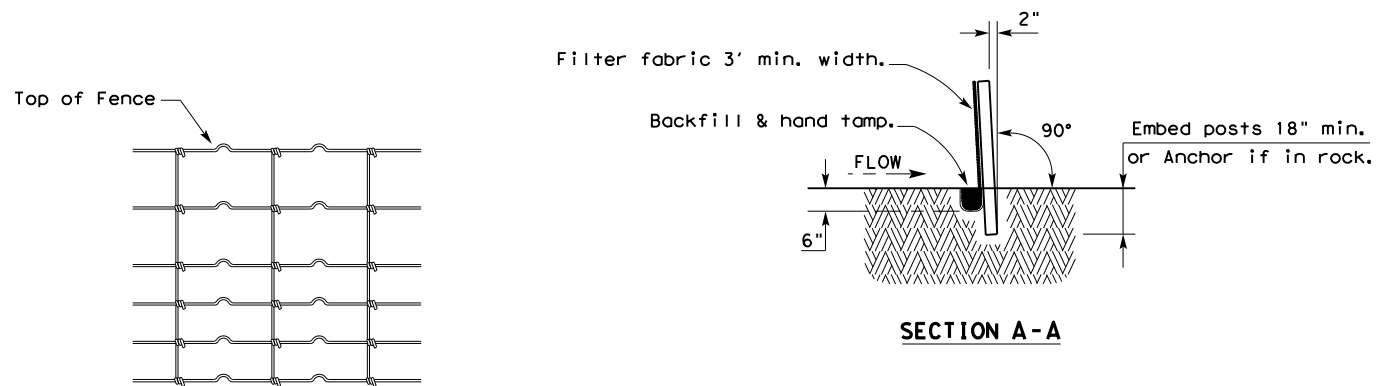
FED. RD. DIV. NO.	PROJECT NUMBER	HIGHWAY NUMBER	
6		US 287, ETC.	
STATE	DISTRICT	COUNTY	
TEXAS	BRYAN	FREESTONE, ETC.	
CONTROL	SECTION	JOB	SHEET NO.
0122	03	033,ETC.	163

508852022
 D:\US\txdot\projectwiseonline.com\TXDOT4\Documents\17 - BR\Design Projects\012203033\4 - Design\Plan Set\10. Environmental\Standards\ec116.dgn
 DISCLAIMER: The use of this standard is governed by the "Texas Engineering Practice Act". No warranty of any kind is made by TxDOT for any purpose whatsoever. TxDOT assumes no responsibility for the conversion of this standard to other formats or for incorrect results or damages resulting from its use.



TEMPORARY SEDIMENT CONTROL FENCE

SCF



HINGE JOINT KNOT WOVEN MESH (OPTION) DETAIL

Galvanized hinge joint knot woven mesh (12.5 GA. SWG Min.) requires a minimum of five horizontal wires spaced at a maximum of 12 inches apart and all vertical wires spaced at a maximum of 12 inches apart.

SEDIMENT CONTROL FENCE USAGE GUIDELINES

A sediment control fence may be constructed near the downstream perimeter of a disturbed area along a contour to intercept sediment from overland runoff. A 2 year storm frequency may be used to calculate the flow rate to be filtered.

Sediment control fence should be sized to filter a maximum flow through rate of 100 GPM/FT². Sediment control fence is not recommended to control erosion from a drainage area larger than 2 acres.

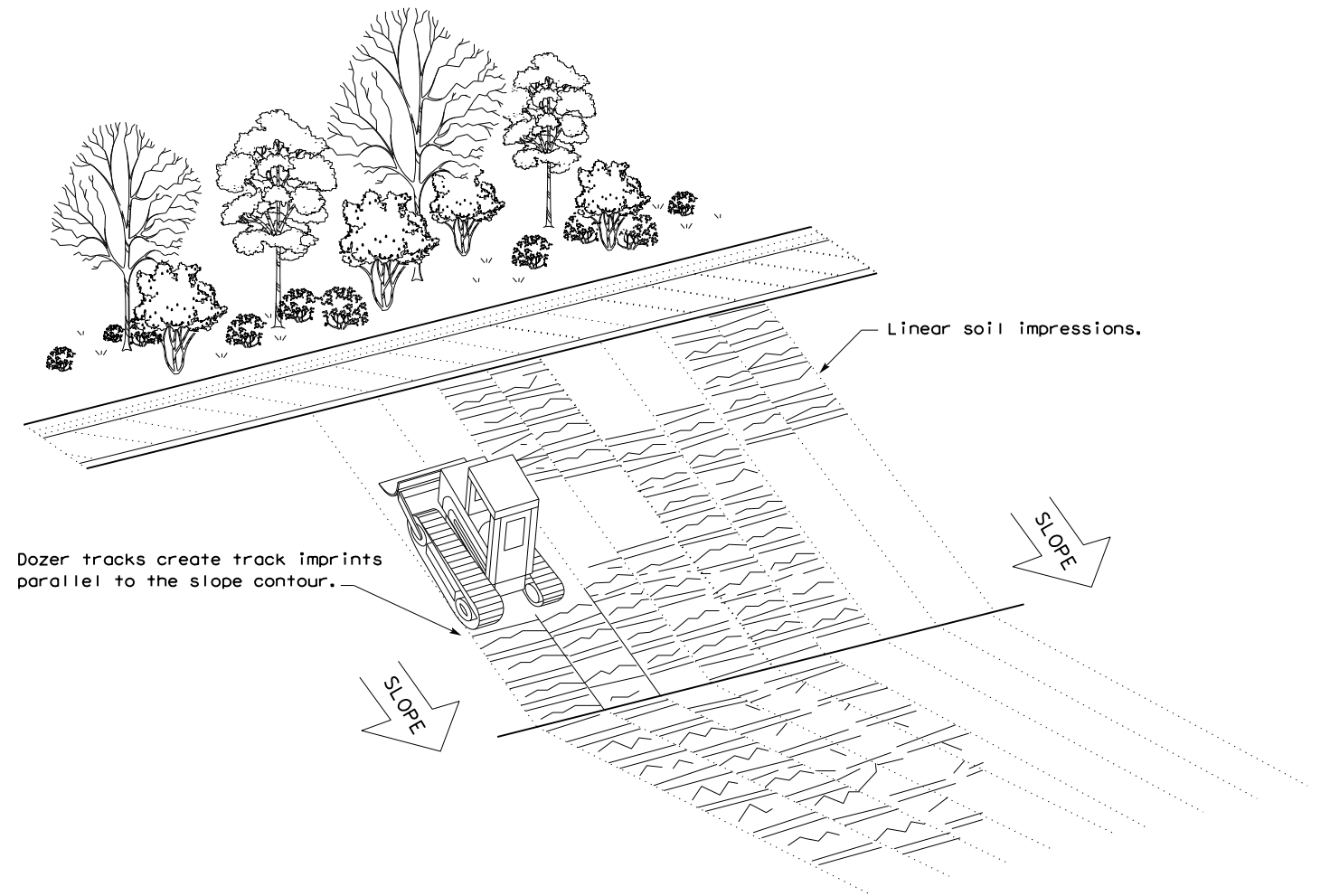
LEGEND

Sediment Control Fence

SCF

GENERAL NOTES

1. Vertical tracking is required on projects where soil distributing activities have occurred unless otherwise approved.
2. Perform vertical tracking on slopes to temporarily stabilize soil.
3. Provide equipment with a track undercarriage capable of producing linear soil impressions measuring a minimum of 12" in length by 2" to 4" in width by 1/2" to 2" in depth.
4. Do not exceed 12" between track impressions.
5. Install continuous linear track impressions where the minimum 12" length impressions are perpendicular to the slope or direction of water flow.

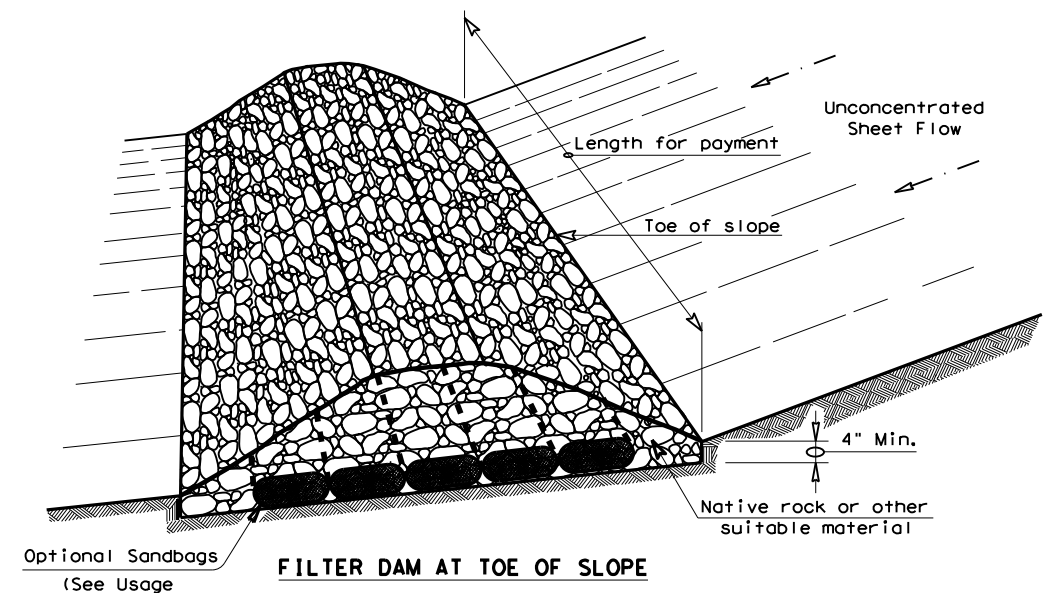


VERTICAL TRACKING

				Design Division Standard	
TEMPORARY EROSION, SEDIMENT AND WATER POLLUTION CONTROL MEASURES FENCE & VERTICAL TRACKING EC(1) - 16					
FILE: ec116	DN: TxDOT	CK: KM	DW: VP	DN/CK: LS	
© TxDOT: JULY 2016	CONT	SECT	JOB	HIGHWAY	
REVISIONS	0122	03	033, ETC	US 287, ETC	
	DIST	COUNTY		SHEET NO.	
	BRY	FREESTONE, ETC		164	

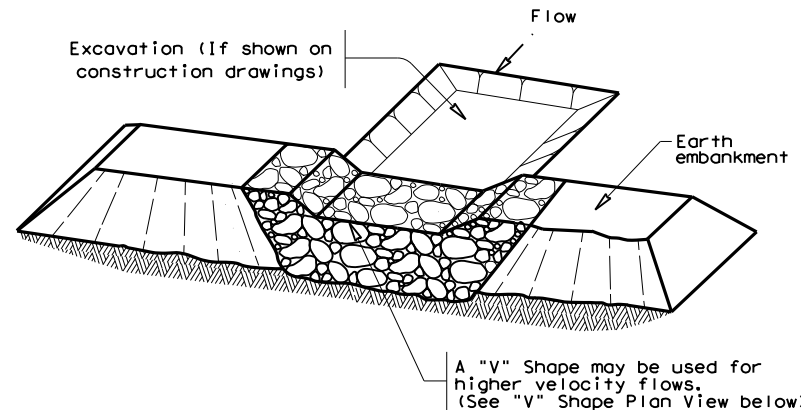
DATE: 5/26/2022
 FILE: p:\txdot\projectwiseonline.com\TXDOT4\Documents\17 - BRY\Design Projects\0122030334 - Design\Plan Set\10. EnvironmentalStandards\ec216.dgn

DISCLAIMER:
 The use of this standard is governed by the "Texas Engineering Practice Act". No warranty of any kind is made by TxDOT for any purpose whatsoever. TxDOT assumes no responsibility for the conversion of this standard to other formats or for incorrect results or damages resulting from its use.



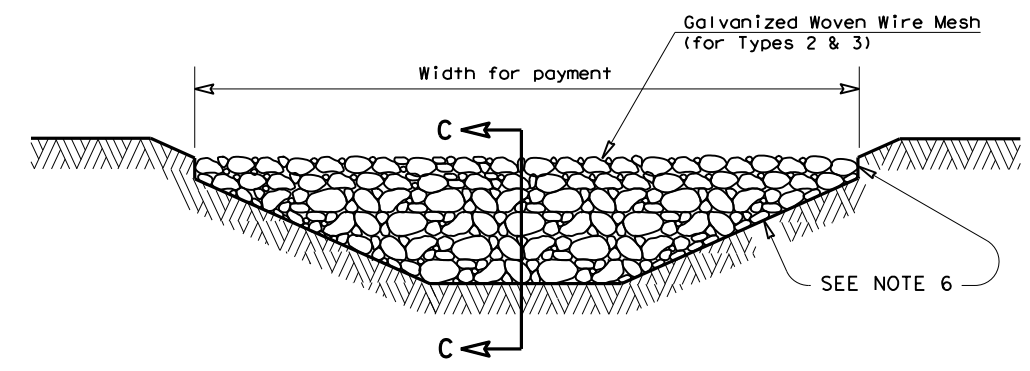
FILTER DAM AT TOE OF SLOPE

(RFD1)



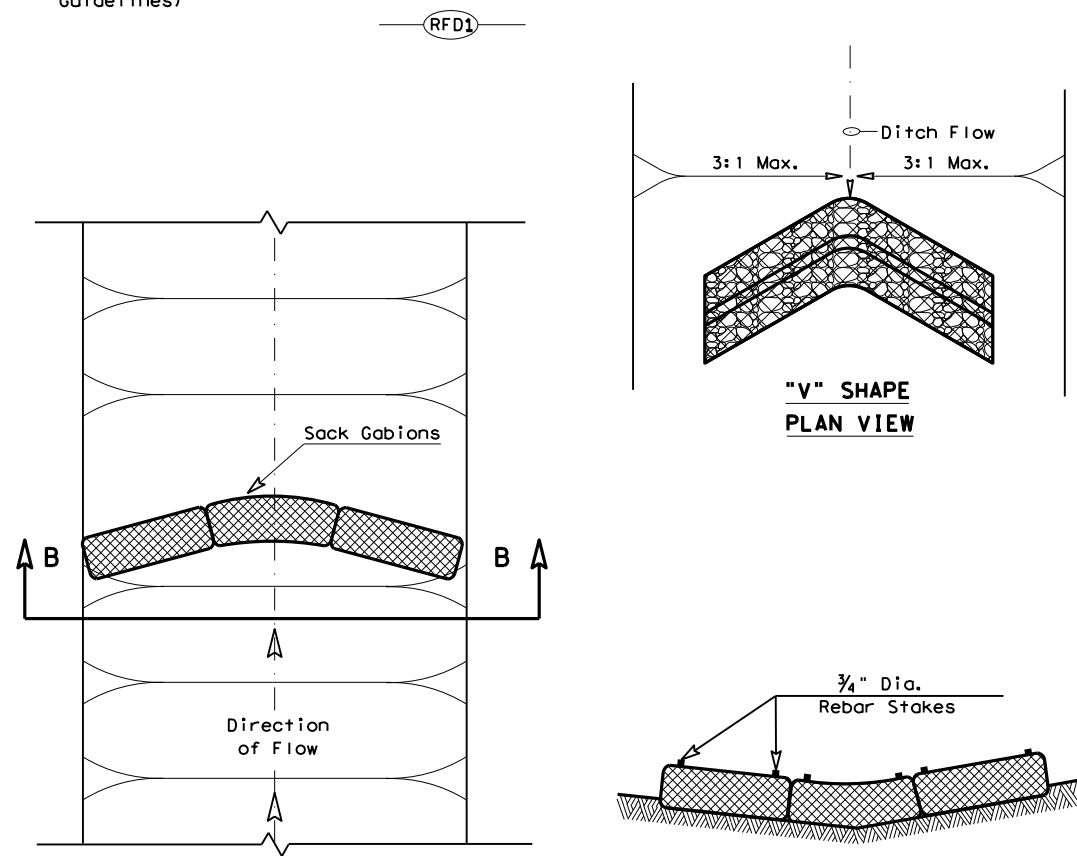
FILTER DAM AT SEDIMENT TRAP

(RFD1) OR (RFD2)

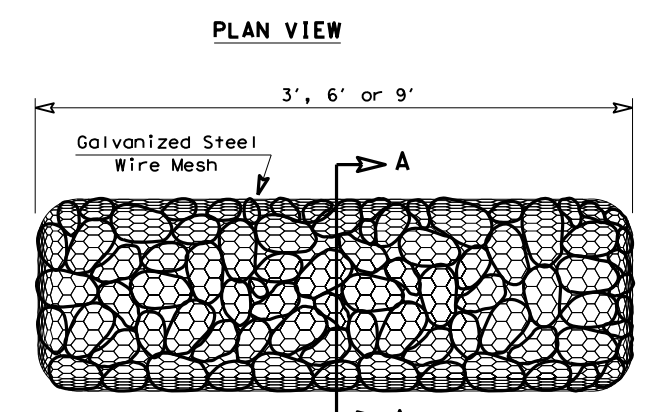


FILTER DAM AT CHANNEL SECTIONS

(RFD1) OR (RFD2) OR (RFD3)



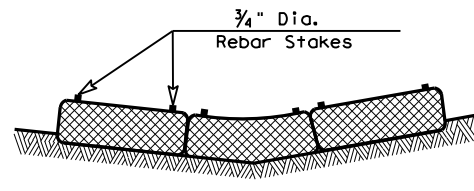
"V" SHAPE PLAN VIEW



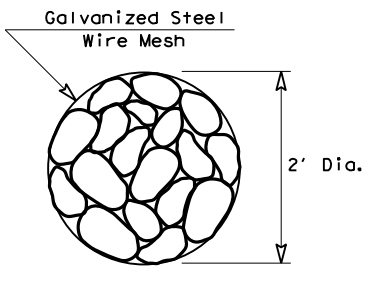
PLAN VIEW

TYPE 4 (SACK GABIONS)

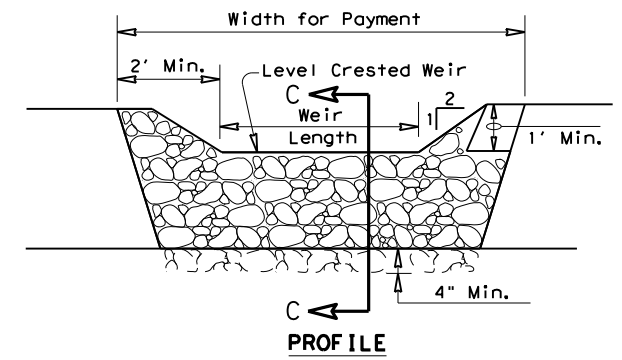
(RFD4)



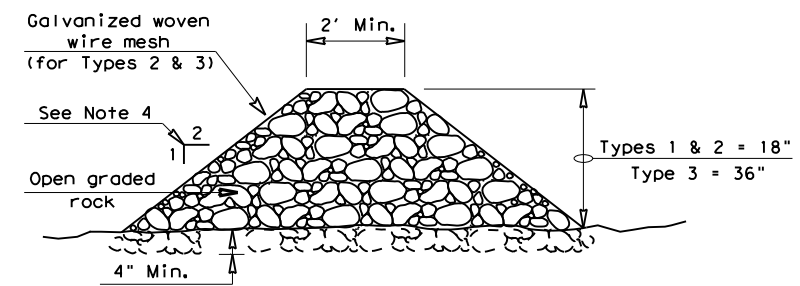
SECTION B-B



SECTION A-A



PROFILE



SECTION C-C

ROCK FILTER DAM USAGE GUIDELINES

Rock Filter Dams should be constructed downstream from disturbed areas to intercept sediment from overland runoff and/or concentrated flow. The dams should be sized to filter a maximum flow through rate of 60 GPM/FT² of cross sectional area. A 2 year storm frequency may be used to calculate the flow rate.

Type 1 (18" high with no wire mesh) (3" to 6" aggregate): Type 1 may be used at the toe of slopes, around inlets, in small ditches, and at dike or swale outlets. This type of dam is recommended to control erosion from a drainage area of 5 acres or less. Type 1 may not be used in concentrated high velocity flows (approximately 8 Ft/Sec or more) in which aggregate wash out may occur. Sandbags may be used at the embedded foundation (4" deep min.) for better filtering efficiency of low flows if called for on the plans or directed by the Engineer.

Type 2 (18" high with wire mesh) (3" to 6" aggregate): Type 2 may be used in ditches and at dike or swale outlets.

Type 3 (36" high with wire mesh) (4" to 8" aggregate): Type 3 may be used in stream flow and should be secured to the stream bed.

Type 4 (Sack gabions) (3" to 6" aggregate): Type 4 May be used in ditches and smaller channels to form an erosion control dam.

Type 5: Provide rock filter dams as shown on plans.

GENERAL NOTES

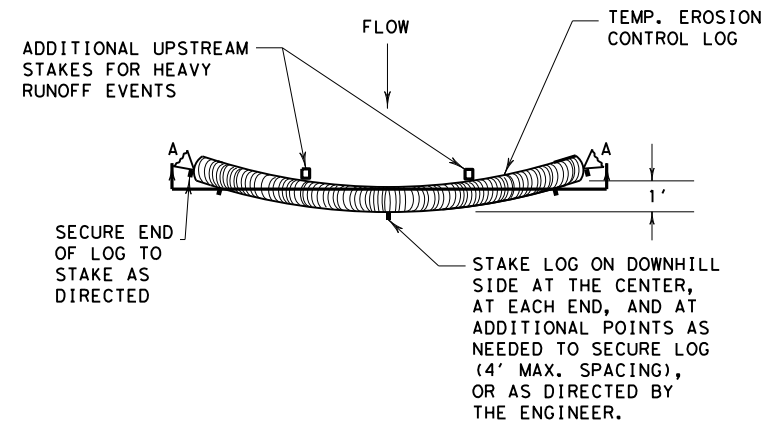
1. If shown on the plans or directed by the Engineer, filter dams should be placed near the toe of slopes where erosion is anticipated, upstream and/or downstream at drainage structures, and in roadway ditches and channels to collect sediment.
2. Materials (aggregate, wire mesh, sandbags, etc.) shall be as indicated by the specification for "Rock Filter Dams for Erosion and Sedimentation Control".
3. The rock filter dam dimensions shall be as indicated on the SW3P plans.
4. Side slopes should be 2:1 or flatter. Dams within the safety zone shall have sideslopes of 6:1 or flatter.
5. Maintain a minimum of 1' between top of rock filter dam weir and top of embankment for filter dams at sediment traps.
6. Filter dams should be embedded a minimum of 4" into existing ground.
7. The sediment trap for ponding of sediment laden runoff shall be of the dimensions shown on the plans.
8. Rock filter dam types 2 & 3 shall be secured with 20 gauge galvanized woven wire mesh with 1" diameter hexagonal openings. The aggregate shall be placed on the mesh to the height & slopes specified. The mesh shall be folded at the upstream side over the aggregate and tightly secured to itself on the downstream side using wire ties or hog rings. For in stream use, the mesh should be secured or staked to the stream bed prior to aggregate placement.
9. Sack Gabions should be staked down with 3/4" dia. rebar stakes, and have a double-twisted hexagonal weave with a nominal mesh opening of 2 1/2" x 3 1/4".
10. Flow outlet should be onto a stabilized area (vegetation, rock, etc.).
11. The guidelines shown hereon are suggestions only and may be modified by the Engineer.

PLAN SHEET LEGEND

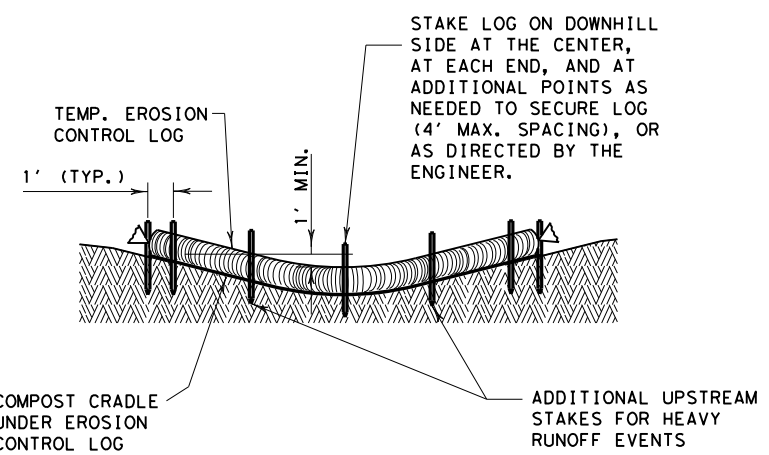
- Type 1 Rock Filter Dam (RFD1)
- Type 2 Rock Filter Dam (RFD2)
- Type 3 Rock Filter Dam (RFD3)
- Type 4 Rock Filter Dam (RFD4)

		Design Division Standard	
TEMPORARY EROSION, SEDIMENT AND WATER POLLUTION CONTROL MEASURES ROCK FILTER DAMS EC(2) - 16			
FILE: ec216	DN: TxDOT	CK: KM	DW: VP
© TxDOT: JULY 2016	CONT	SECT	JOB
REVISIONS	0122	03	033, ETC
	DIST	COUNTY	SHEET NO.
	BRY	FREESTONE, ETC	165

DATE: 5/26/2022
 FILE: p:\txdot\projectwiseonline.com\TXDOT4\Documents\17 - BRY\Design Projects\01220333\4 - Design\Plan Set\10. EnvironmentalStandards\ec916.dgn
 DISCLAIMER: The use of this standard is governed by the "Texas Engineering Practice Act". No warranty of any kind is made by TxDOT for any purpose whatsoever. TxDOT assumes no responsibility for the conversion of this standard to other formats or for incorrect results or damages resulting from its use.



PLAN VIEW

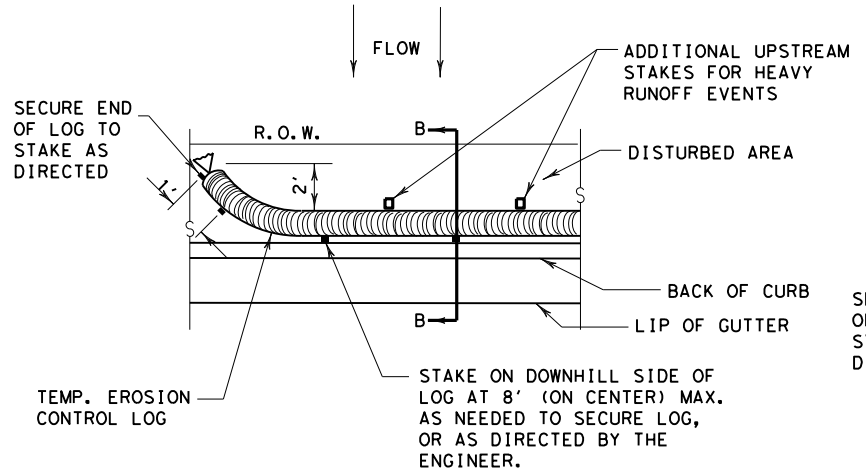


SECTION A-A
EROSION CONTROL LOG DAM

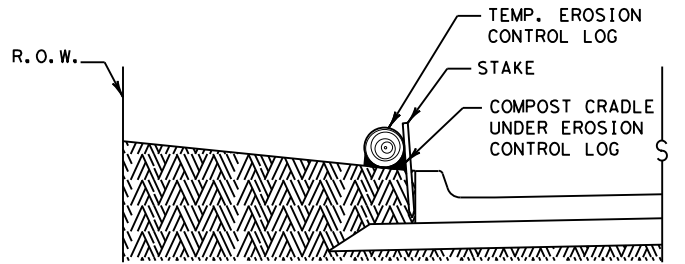
CL-D

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



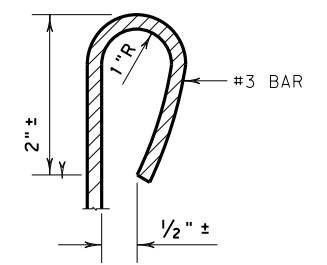
PLAN VIEW



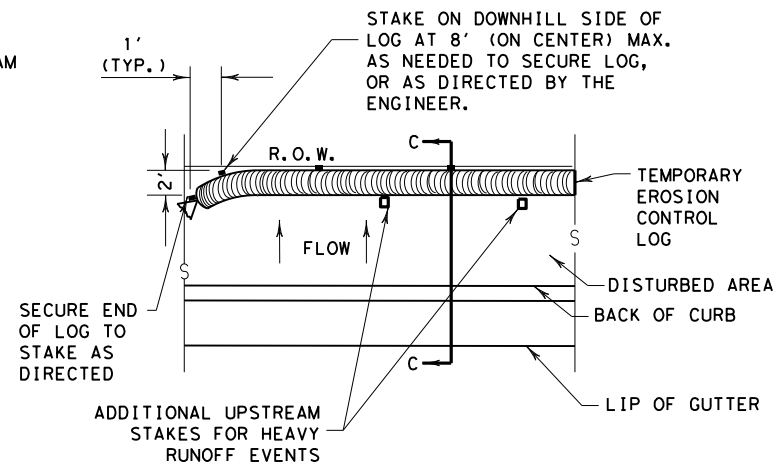
SECTION B-B

EROSION CONTROL LOG AT BACK OF CURB

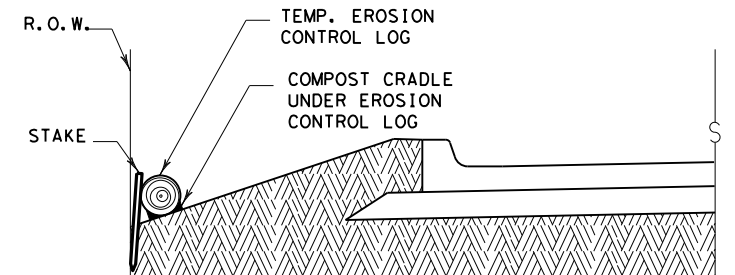
CL-BOC



REBAR STAKE DETAIL



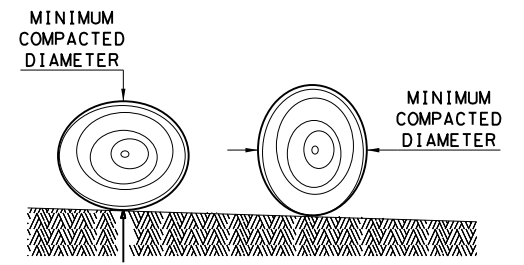
PLAN VIEW



SECTION C-C

EROSION CONTROL LOG AT EDGE OF RIGHT-OF-WAY

CL-ROW



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.

GENERAL NOTES:

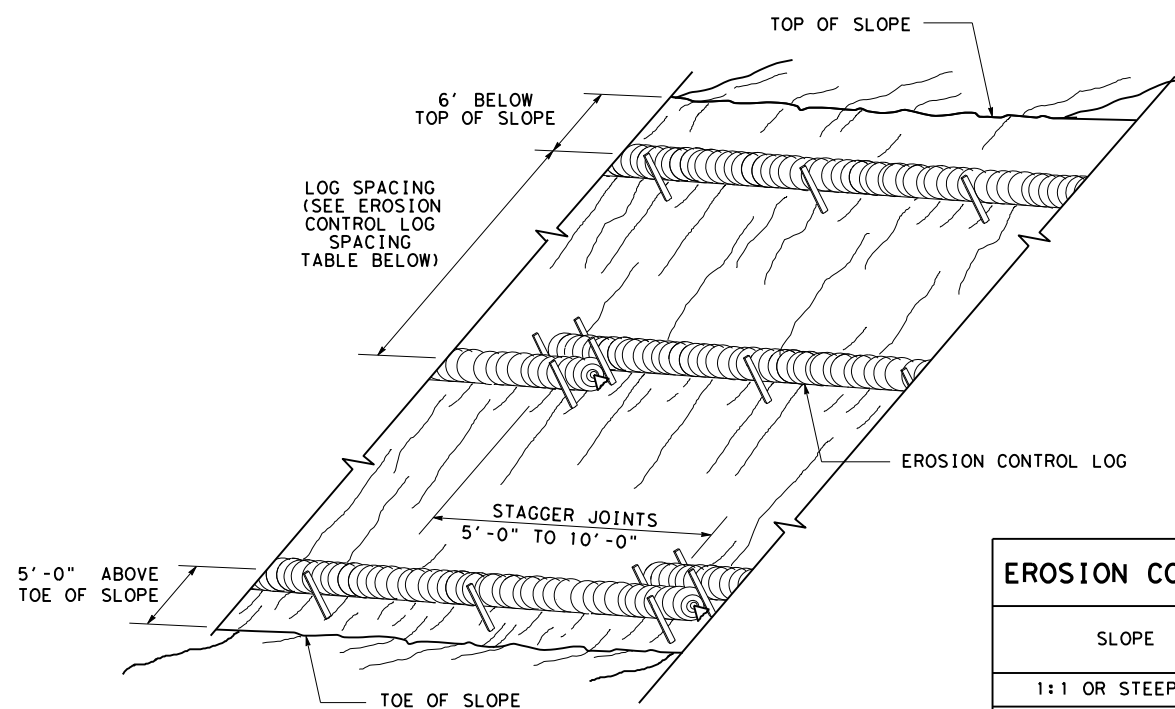
1. EROSION CONTROL LOGS SHALL BE INSTALLED IN ACCORDANCE WITH MANUFACTURER'S RECOMMENDATIONS, OR AS DIRECTED BY THE ENGINEER.
2. LENGTHS OF EROSION CONTROL LOGS SHALL BE IN ACCORDANCE WITH MANUFACTURER'S RECOMMENDATIONS AND AS REQUIRED FOR THE PURPOSE INTENDED.
3. UNLESS OTHERWISE DIRECTED, USE BIODEGRADABLE 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.

SHEET 1 OF 3

		<i>Design Division Standard</i>		
<p>TEMPORARY EROSION, SEDIMENT AND WATER POLLUTION CONTROL MEASURES</p> <p>EROSION CONTROL LOG</p> <p>EC (9) - 16</p>				
FILE: ec916	DN: TxDOT	CK: KM	DW: LS/PT	CK: LS
© TxDOT: JULY 2016	CONT	SECT	JOB	HIGHWAY
REVISIONS	0122	03	033, ETC	US 287, ETC
	DIST	COUNTY	SHEET NO.	
	BRY	FREESTONE, ETC	166	

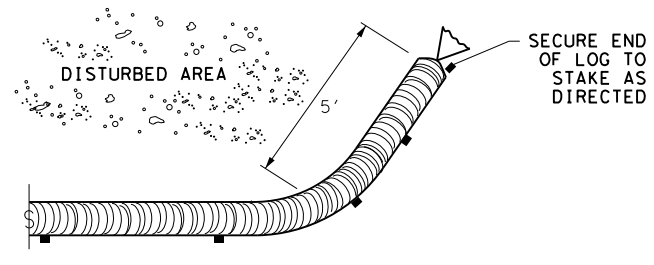
DISCLAIMER: The use of this standard is governed by the "Texas Engineering Practice Act". No warranty of any kind is made by TxDOT for any purpose whatsoever. TxDOT assumes no responsibility for the conversion of this standard to other formats or for incorrect results or damages resulting from its use.

DATE: 5/26/2022
 FILE: \\txdot\projectwise\online.com\TXDOT4\Documents\17 - BRY\Design Projects\012203033\4 - Design\Plan Set\10. EnvironmentalStandards\ec916.dgn



**EROSION CONTROL LOGS ON SLOPES
 STAKE AND TRENCHING ANCHORING**

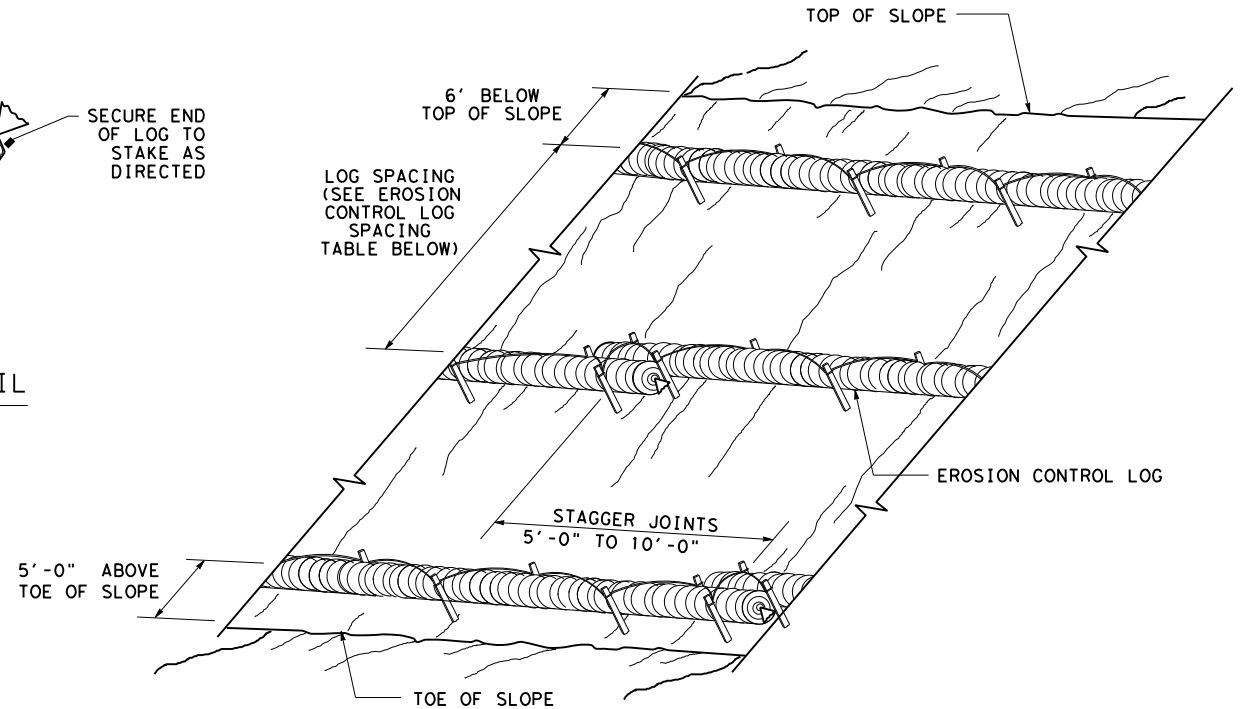
CL-SST



END SECTION RAP DETAIL

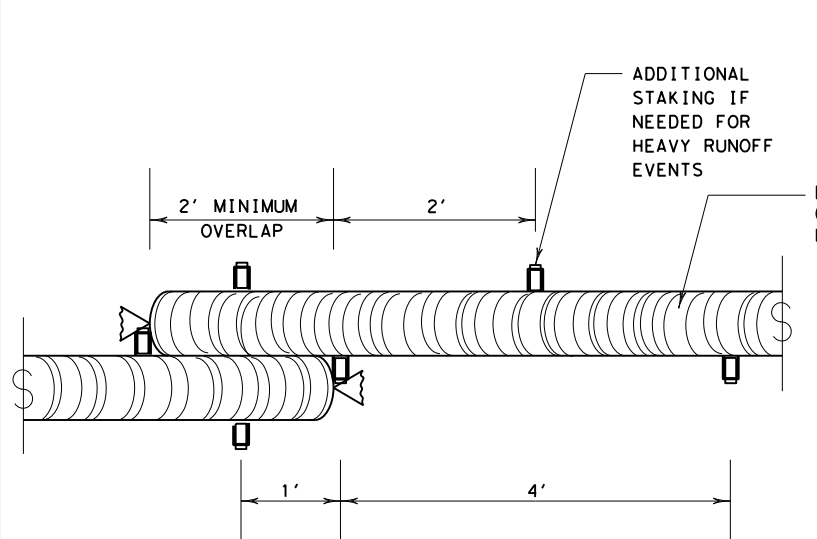
SLOPE	LOG DIAMETER			
	6"	8"	12"	18"
1:1 OR STEEPER	5'	10'	15'	20'
2:1	10'	20'	30'	40'
3:1	15'	30'	45'	60'
4:1 OR FLATTER	20'	40'	60'	80'

* ADJUSTMENTS CAN BE MADE FOR SOIL TYPE:
 SOFT, LOAMY SOILS-ADJUST ROWS CLOSER TOGETHER;
 HARD, ROCKY SOILS- ADJUST ROWS FARTHER APART



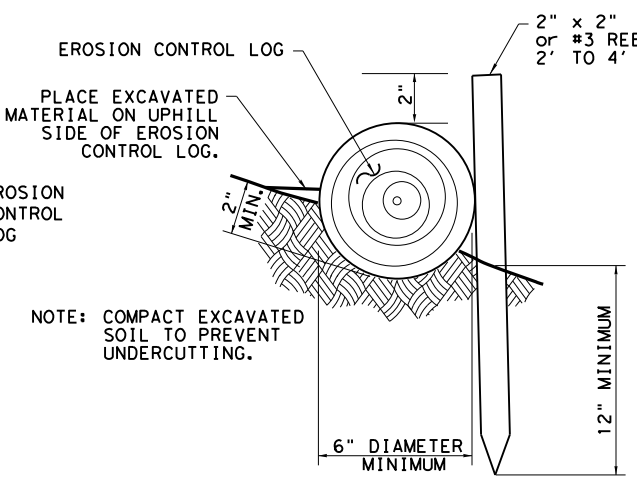
**EROSION CONTROL LOGS ON SLOPES
 STAKE AND LASHING ANCHORING**

CL-SSL



STAKE AND TRENCHING ANCHORING DETAIL

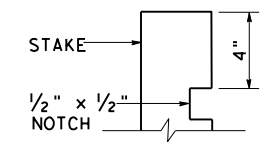
CL-SST



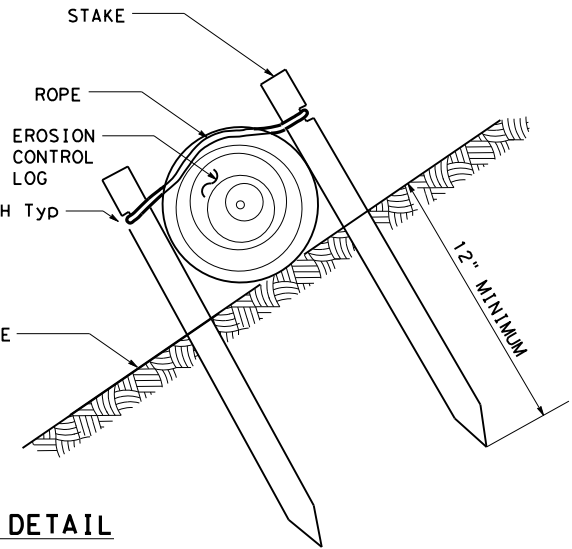
STAKE AND LASHING ANCHORING DETAIL

CL-SSL

LOG DIAMETER	DEPTH
6"	2"
8"	3"
12"	4"
18"	5"



STAKE NOTCH DETAIL



SHEET 2 OF 3

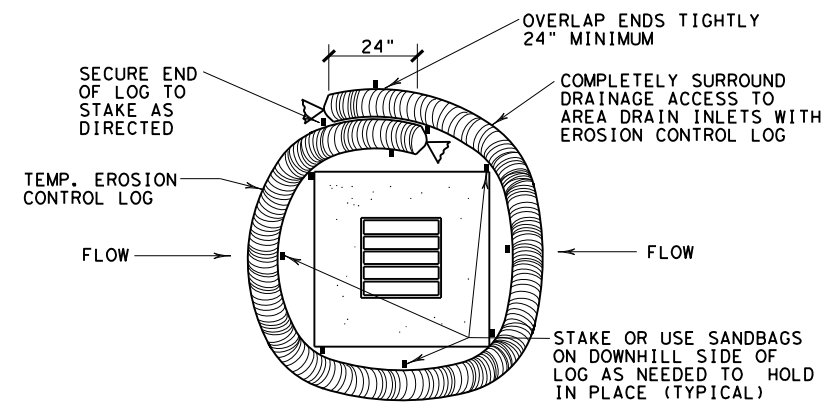
Design Division Standard

**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	0122	03	033, ETC	US 287, ETC
	DIST	COUNTY	SHEET NO.	
	BRY	FREESTONE, ETC	167	

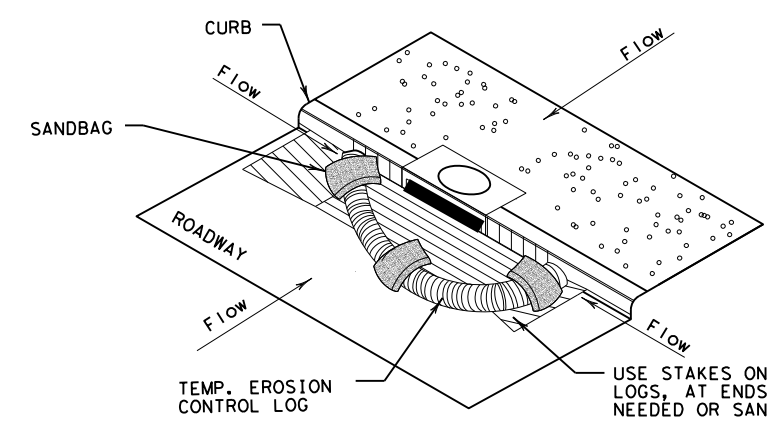
DATE: 5/26/2022
 FILE: p:\txdot\projectwise\line.com:TXDOT4\Documents\17 - BRY\Design Projects\012203033\4 - Design\Plan Set\10. EnvironmentalStandards\ec916.dgn

DISCLAIMER:
 The use of this standard is governed by the "Texas Engineering Practice Act". No warranty of any kind is made by TxDOT for any purpose whatsoever. TxDOT assumes no responsibility for the conversion of this standard to other formats or for incorrect results or damages resulting from its use.



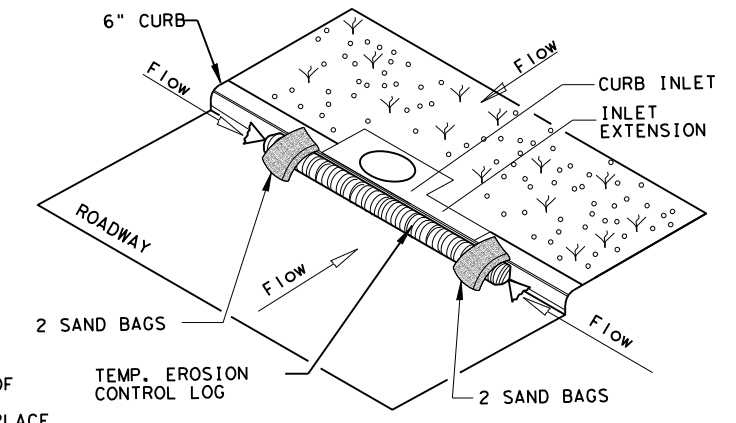
EROSION CONTROL LOG AT DROP INLET

CL-DI



EROSION CONTROL LOG AT CURB INLET

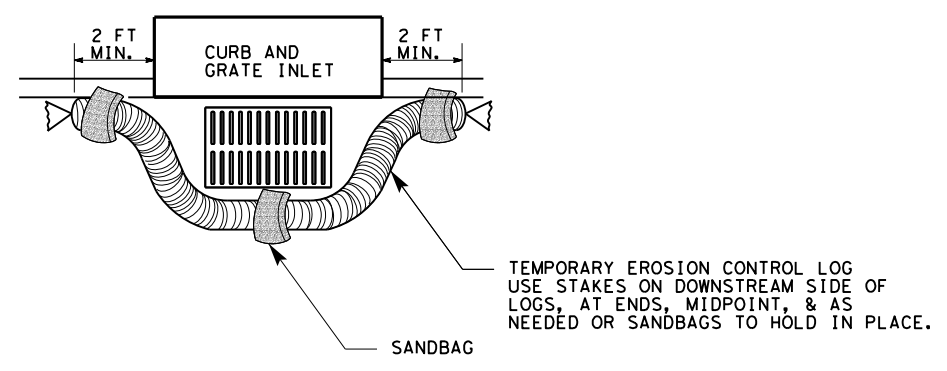
CL-CI



EROSION CONTROL LOG AT CURB INLET

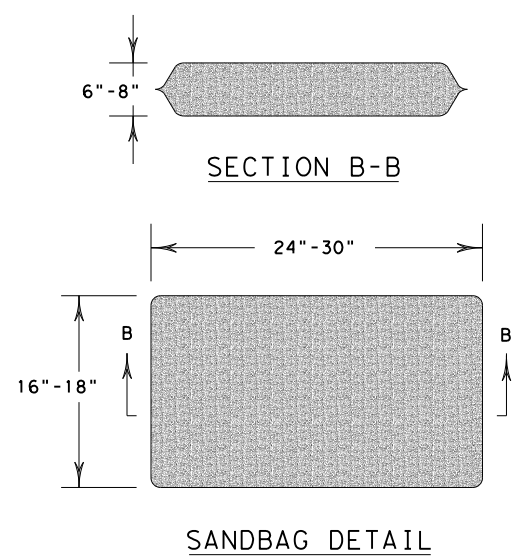
CL-CI

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



SHEET 3 OF 3

		<i>Design Division Standard</i>	
TEMPORARY EROSION, SEDIMENT AND WATER POLLUTION CONTROL MEASURES EROSION CONTROL LOG EC (9) - 16			
FILE: ec916	DN: TxDOT	CK: KM	DW: LS/PT
© TxDOT: JULY 2016	CONT	SECT	JOB
REVISIONS	0122	03	033, ETC
	DIST	COUNTY	SHEET NO.
	BRY	FREESTONE, ETC	168

REV DATE: 2-12-2015
CSJ: 0122-03-033
FILENAME: pw:\txdot\projectswisconsin.com\TXDOT14\Documents\17 - BRY\Design Projects\01203033\4 - Design Plan Set\10 - Environmental\10B - EPIC\US 287 etc EPIC.DGN

During the planning phase of project development the following environmental permits, issues and commitments have been developed during coordination with resource agencies, local governmental entities and the general public. Any change orders and/or deviations from the final design must be reported to the Engineer prior to the commencement of construction activities. As additional environmental clearances may be required.

I. 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.

Required Action No Action Required

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.

Refer to 2014 TxDOT Standard Specification Items:

- 7.7.2 Texas Pollutant Discharge Elimination System (TPDES) Permits and Storm Water Pollution Prevention Plans (SWP3)
- 506 Temporary Erosion, Sedimentation and Environmental Controls
- 734 Litter Removal
- 735 Debris Removal
- 738 Cleaning and Sweeping Highways

II. WORK IN OR NEAR STREAMS, WATER BODIES 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 locations of waters of the US.

- 1. SH 75 at STA 1006+41

Information regarding the USACE Nationwide Permit Program can be found at: <http://www.swf.usace.army.mil/Missions/Regulatory/Permitting/GeneralPermits.aspx>

- Refer to 2014 TxDOT Standard Specification Items:
- 7.7.3 Work in Waters of the United States
- 7.7.6 Project Specific Locations
- 496 Removing Structures
- 506 Temporary Erosion, Sedimentation and Environmental Controls
- 506.4.3.4 Restricted Activities and Required Precautions

III. CULTURAL RESOURCES

Refer to 2014 TxDOT Standard Specification Item 7.7.1 Cultural Resources, in the event historical issues or archeological artifacts are found during construction. Upon discovery of archeological artifacts (bones, burnt rock, flint, pottery, etc.) immediately cease work in the vicinity and contact the Engineer.

Required Action No Action Required

IV. VEGETATION RESOURCES

Preserve native vegetation to the extent practical.

Required Action No Action Required

Action No.

- 1. Tree removal to be done in accordance with the Migratory Bird Treaty Act (see Section V)

Refer to 2014 TxDOT Standard Specification Items:

- 160 Topsoil
- 161 Compost
- 162 Sodding for Erosion Control
- 164 Seeding for Erosion Control
- 166 Fertilizer
- 168 Vegetative Watering
- 169 Soil Retention Blankets
- 170 Irrigation System
- 180 Wildflower Seeding
- 192 Landscape Planting
- 193 Landscape Establishment
- 506 Temporary Erosion, Sedimentation, and Environmental Controls
- 730 Roadside Mowing
- 751 Landscape Maintenance
- 752 Tree and Brush Removal

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

Required Action No Action Required

Action No.

- 1. Do not kill snakes or other animals!
- 2. Do not destroy nests on structures within the project limits.

Temporarily prevent the building of nests on any structures that require work within the project limits during the construction timeframe.

This can be accomplished by application of bird repellent gel, netting, or removal by hand every 3-4 days.

The nesting/breeding season for migratory birds is March 1 - September 1.

Under the Migratory Bird Treaty Act (MBTA), it is unlawful by any means or manner, to pursue, hunt, take, capture, [or] kill any migratory birds except as permitted by regulation (16 U.S.C. 703-704). Neither the statute nor its implementing regulations (Title 50, Code of Federal Regulations, Parts 10, 13, 21) exempt unintentional take of migratory birds. The unauthorized take (e.g. killing, capturing, or collecting) of migratory birds is a strict liability criminal offense that does not require knowledge or specific intent on the part of the offender. Even when engaged in an otherwise lawful activity for which the intent is not the killing of migratory birds, a violation may be committed.

- 3. If caves or sinkholes are discovered, cease work in the immediate area to verify the presence or absence of wildlife.

The Bryan District Environmental Section can be contacted at (979) 778-9766 to assist with the removal of wildlife that will not leave on their own with gentle persuasion.

- Refer to 2014 TxDOT Standard Specification Item:
- 7.7.6 Project Specific Locations

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 Engineer 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 discoverd on site. Hazardous Materials or Contamination Issues Specific to this Project:

Required Action No Action Required

Action No.

- 1. The Clean Water Act, in part, requires that any spill of oil that could enter a waterway, as defined by the Act, and that violates applicable water quality standards or causes a film or sheen on water require reporting to the TCEQ and local authorities. Contact the Bryan District Environmental Section at 979-778-9766.

If potentially hazardous material and/or contaminated media (i.e. soil, groundwater, surface water, sediment, building materials) are unexpectedly encountered during construction, immediately cease work in the vicinity and contact the Engineer.

- Refer to 2014 TxDOT Standard Specification Items:
- 6.10 Hazardous Materials
- 7.12 Responsibility for Hazardous Materials

VII. OTHER ENVIRONMENTAL ISSUES

Required Action No Action Required

Action No.

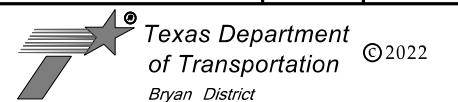
- 1.

- Refer to 2014 TxDOT Standard Specification Items:
- 7.7.6 Project Specific Locations
- 751 Landscape Maintenance

Contacts:

Mr. John D. Moravec
Environmental Coordinator
Texas Department of Transportation
Bryan District
2591 N. Earl Rudder Freeway
Bryan, TX 77803
Phone: (979) 778-9766
Fax: (979) 778-9702
e-mail: John.Moravec@txdot.gov

PRINT DATE	REVISION DATE
5/26/2022	



ENVIRONMENTAL PERMITS, ISSUES AND COMMITMENTS (EPIC)

FED. RD. DIV. NO.	PROJECT NUMBER	HIGHWAY NUMBER	
6		US 287, ETC.	
STATE	DISTRICT	COUNTY	
TEXAS	BRYAN	FREESTONE, ETC.	
CONTROL	SECTION	JOB	SHEET NO.
0122	03	033,ETC.	169