

FEDERAL AID PROJECT NO.			
BR 2023(711)			
CONT	SECT	JOB	HIGHWAY
0923	10	021	3RD ST
DIST	COUNTY		SHEET NO.
BWD	LAMPASAS		1

DESIGN SPEED = 30 MPH
A.D.T. (2013)= 2900
A.D.T. (2033)= 3500

FINAL PLANS

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

REQUIRED SIGNS SHALL BE IN ACCORDANCE WITH BC (1)- 21 THRU BC (12)- 21 AND THE "TEXAS MANUAL ON UNIFORM TRAFFIC CONTROL DEVICES".

CONCURRENCE: 7-15-2024

MAYOR

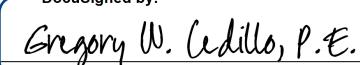


SUBMITTED FOR LETTING: 7/20/2024

CONSULTANT ENGINEER

RECOMMENDED FOR LETTING: 7/24/2024
DocuSigned by:

77D1477834648F
DISTRICT DIRECTOR OF TRANSPORTATION
PLANNING AND DEVELOPMENT

RECOMMENDED FOR LETTING: 7/24/2024
DocuSigned by:

58E2D01C26B3D45
DISTRICT ENGINEER

STATE OF TEXAS
DEPARTMENT OF TRANSPORTATION

PLANS OF PROPOSED
STATE HIGHWAY IMPROVEMENT

FEDERAL PROJECT: BR 2023(711)
CSJ: 0923-10-021

3RD STREET
LAMPASAS COUNTY

FOR THE CONSTRUCTION OF BRIDGE REPLACEMENT
CONSISTING OF REPLACING BRIDGE AND APPROACHES

LIMITS: AT BURLESON CREEK

NET LENGTH OF ROADWAY = 360.00 FT. = 0.068 MI.
NET LENGTH OF BRIDGE = 130.00 FT. = 0.024 MI.
NET LENGTH OF PROJECT = 490.00 FT. = 0.092 MI.

INDEX OF SHEETS

SEE SHEET 2 FOR INDEX OF SHEETS

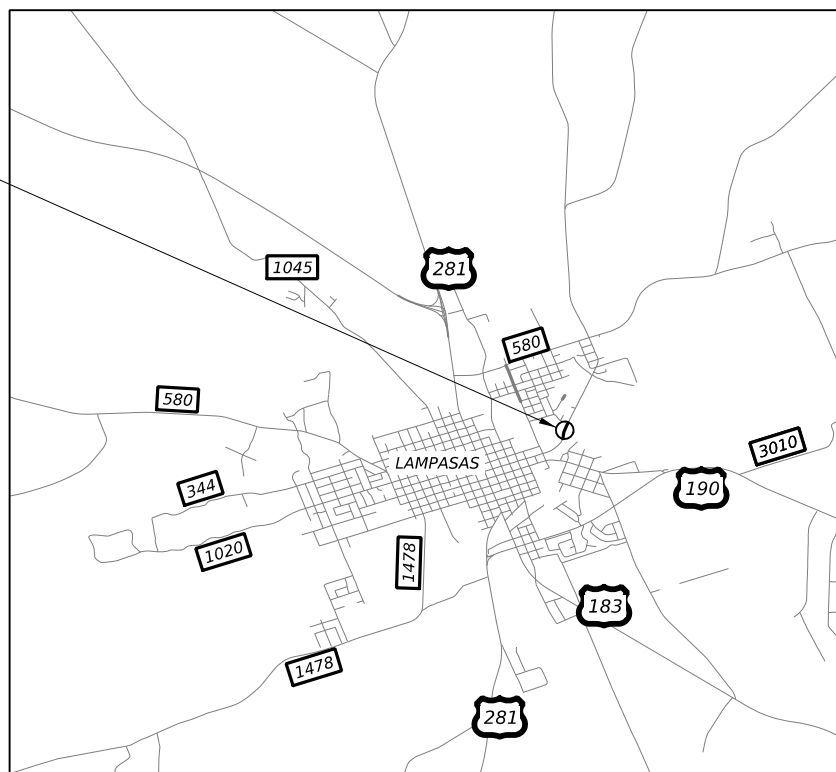
FINAL PLANS STATEMENT

THE CONSTRUCTION WORK WAS PERFORMED
IN ACCORDANCE WITH THE PLANS.

_____ P.E. _____
AREA ENGINEER DATE

TEXAS DEPARTMENT OF TRANSPORTATION

BEGIN PROJECT
CSJ 0923-10-021
STA 12+75.00
END PROJECT
CSJ 0923-10-021
STA 17+65.00



EXCEPTIONS: NONE
EQUATIONS: NONE
RAILROAD CROSSINGS: NONE

NOT TO SCALE



TBPE REG.
NO. F-2742

SPECIFICATIONS ADOPTED BY THE TEXAS DEPARTMENT OF TRANSPORTATION,
SEPTEMBER 1, 2024 AND SPECIFICATION ITEMS LISTED AND DATED AS FOLLOWS,
SHALL GOVERN ON THIS PROJECT: REQUIRED CONTRACT PROVISIONS FOR ALL
FEDERAL-AID CONSTRUCTION CONTRACTS (FORM FHWA 1273, OCTOBER 2023)

DATE: 7/19/2024 12:20:59 PM
FILE: R:\1005000-1005999\1005472.03\04_DOCUMENTS\DESIGN\Plan_Set1\General\3RD_GTS_01.dgn

DATE: 7/25/2024 9:24:29 AM
 FILE: R:\1005000-1005999\1005472.03\04_DOCUMENTS\DESIGN\Plan_Set1\General\3RD_GIX_01.dgn

CK: DW: CK: DW:


SHEET	GENERAL INFORMATION
1	TITLE SHEET
2	INDEX OF SHEETS
3	TYPICAL SECTIONS
4, 4A - 4D	GENERAL NOTES
5, 5A	ESTIMATE & QUANTITY SHEET
6	QUANTITY SUMMARIES
	TRAFFIC CONTROL
7	TRAFFIC CONTROL PLAN
	TRAFFIC CONTROL STANDARDS
8 - 19	# BC(1)-21 THRU (12)-21
	ROADWAY
20	SURVEY CONTROL INDEX
21	HORIZONTAL & VERTICAL CONTROL
22	HORIZONTAL ALIGNMENT DATA
23	ROADWAY PLAN & PROFILE
24	RIPRAP & GRADING LAYOUT
25	FENCE DETAILS
	ROADWAY STANDARDS
26	# D&OM(1)-20
27	# D&OM(2)-20
28	# D&OM(3)-20
29	# D&OM(5)-20
30	# D&OM(VIA)-20
31	# GF(31)-19
32	# GF(31)-TRTL2-19
33	# SGT(10S)31-16
34	# SGT(11S)31-18
35	# SGT(12)31-18
36	# WF(1)-10
37	# WF(2)-10
	DRAINAGE
38	DRAINAGE AREA MAP
39 - 40	HYDRAULIC DATA

SHEET	BRIDGE
41	BRIDGE LAYOUT
42 - 43	BORING LOGS
44	ESTIMATED QUANTITIES AND CAP ELEVATIONS
45	FOUNDATION LAYOUT
46 - 47	ABUTMENT DETAILS
48	BENT DETAILS
49	STEP ELEVATION DETAILS
50	FRAMING PLAN
51	130.000' PRESTR. CONC. SLAB BEAM UNIT
52	WATER PIPE UTILITY MOUNTING DETAILS
53	BRIDGE IDENTIFICATION NUMBER
	BRIDGE STANDARDS
54	# PSBND
55	# AJ
56 - 57	# CSAB
58 - 59	# FD
60 - 61	# PBC-RC
62 - 63	# SRR
64 - 67	# TYPE C223
68	# PSB-4SB15
69	# PSB-5SB15
70	# PSBEB
71	# PSBRA
	ENVIRONMENTAL
72	EPIC
73 - 74	SWP3
75	SWP3 LAYOUT
76	TEMPORARY CROSSING DETAIL
	ENVIRONMENTAL STANDARDS
77	# EC(1)-16
78	# EC(2)-16
79 - 81	# EC(9)-16

THE STANDARD SHEETS SPECIFICALLY IDENTIFIED ON THIS SHEET WITH A "*" OR "#" HAVE BEEN SELECTED BY ME OR UNDER MY RESPONSIBLE SUPERVISION AS BEING APPLICABLE TO THIS PROJECT.

Luis A. Gonzalez, PE 7/25/2024
 LUIS A. GONZALEZ DATE

Luis A. Gonzalez
 7/25/2024



NO.	DATE	REVISION	APPROV.

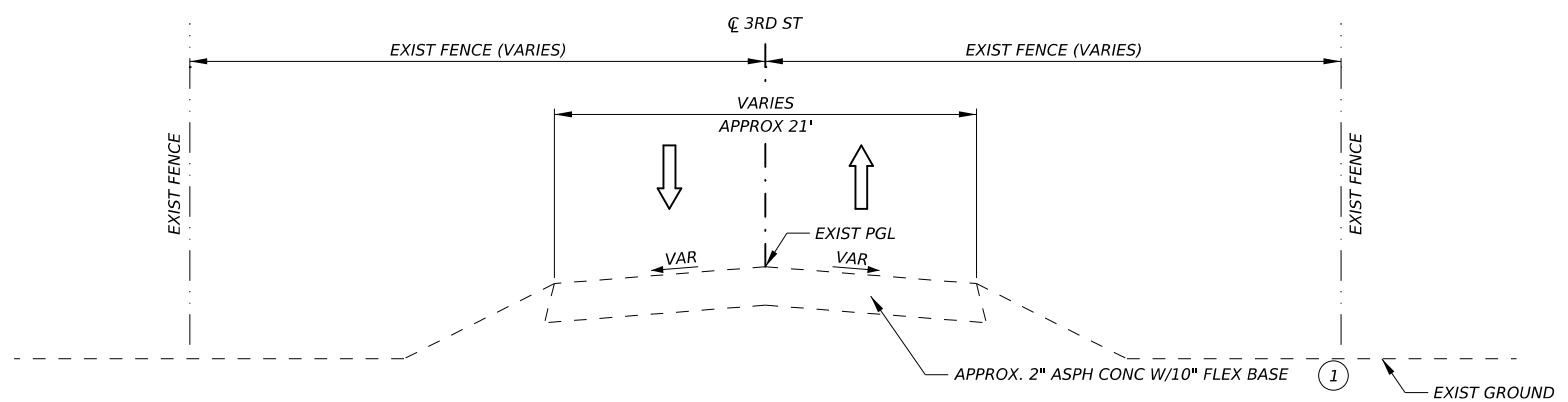
Texas Department of Transportation
 PG&AL TBPE REG. NO. F-2742
 3131 Briarpark Dr, Suite 200
 Houston, Texas 77042
 (713) 622-1444

3RD ST @ BURLESON CREEK

INDEX OF SHEETS

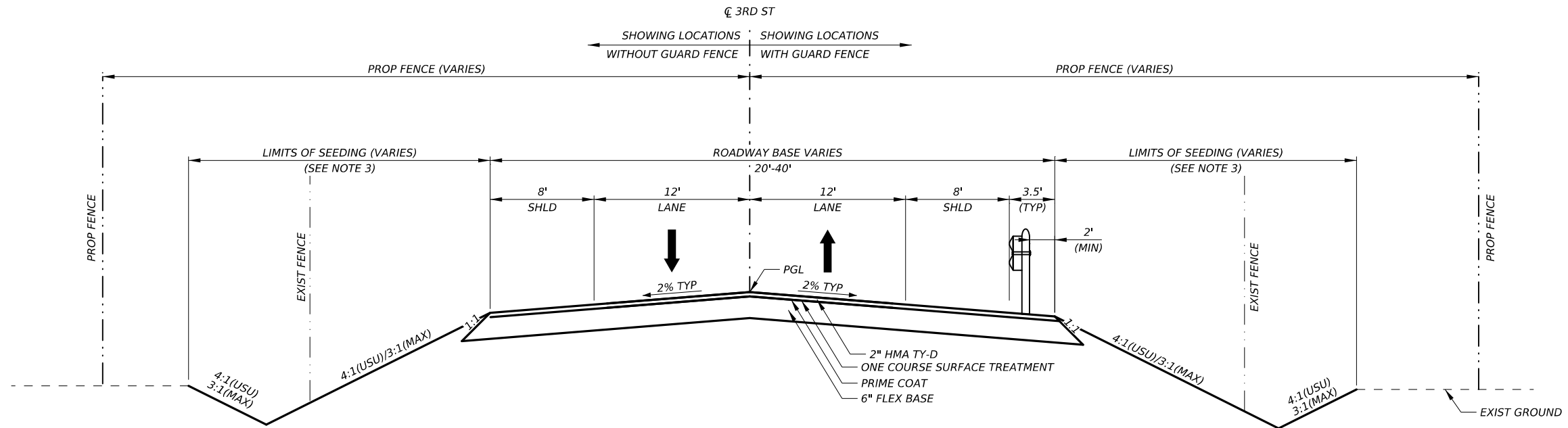
SHEET 1 OF 1			
CONT	SECT	JOB	HIGHWAY
0923	10	021	3RD ST
DIST	COUNTY	SHEET NO.	
BWD	LAMPASAS	2	

Ck:
Dw:
Ck:
Dw:



EXISTING 3RD ST APPROACH ROADWAY
STA 12+75.00 TO STA 17+65.00

① REMOVE EXISTING PAVEMENT ONLY TO DEPTH NECESSARY FOR CONSTRUCTION OF PROPOSED PAVEMENT. COMPACT EXISTING SUBGRADE OR FLEX BASE PRIOR TO PLACING PROPOSED PAVEMENT.



PROPOSED 3RD ST APPROACH ROADWAY
FROM STA 13+25.00 TO STA 14+08.00
FROM STA 15+38.00 TO STA 17+65.00

PROPOSED BRIDGE FROM STA 14+08.00 TO STA 15+38.00

TRANSITION FROM EXISTING WIDTH TO PROPOSED WIDTH
STA 12+75.00 TO STA 13+25.00 (SEE NOTE 1)
STA 17+05.00 TO STA 17+65.00 (SEE NOTE 2)

NOTES:

- 1.) TRANSITION FROM EXISTING CROSS-SLOPE AT STA 12+75.00 TO 2% REVERSE CROWN AT STA 13+25.00
- 2.) TRANSITION FROM 2% REVERSE CROWN AT STA 13+25.00 TO 2% CROSS-SLOPE AT STA 14+00.00
- 3.) TRANSITION FROM 2% CROSS-SLOPE AT STA 17+05.00 TO EXISTING CROSS-SLOPE AT STA 17+65.00
- 4.) SEE ROADWAY PLAN & PROFILE SHEETS FOR LOCATIONS OF DITCH SECTIONS

NOT TO SCALE

Professional Engineer Seal for Luis A. Gonzalez, State of Texas, License No. 104983, dated 7/23/2024.

NO.	DATE	REVISION	APPROV.

Texas Department of Transportation

PG&L
TBPE REG. NO. F-2742
3131 Briarpark Dr, Suite 200
Houston, Texas 77042
(713) 622-1444

3RD ST @ BURLESON CREEK

TYPICAL SECTIONS

SHEET 1 OF 1

CONT	SECT	JOB	HIGHWAY
0923	10	021	3RD ST
DIST	COUNTY	SHEET NO.	
BWD	LAMPASAS	3	

DATE: 7/23/2024 1:33:45 PM
FILE: R:\1005000-1005999\1005472.03\04_DOCUMENTS\DESIGN\Plan_Set\1_General\3RD_GTY_01.dgn

GENERAL NOTES

TEST TO BE IN ACCORDANCE WITH
TEXAS DEPARTMENT OF TRANSPORTATION
STANDARD TEST METHODS.

Item	Description	Soil Constants		
		Max LL.	Max. PI	Min. PI
132	Embankment (Final)(Ord Comp)(Ty C)	40	30	3
247	FL BS (CMP IN PLC)(TY A GR 4)(FNAL POS)			3

Job control samples for gradation and P.I. testing will be taken from the windrow after blade mixing.

Asphalt Surface Areas-SY

Item	Description	Course	Roadway
310	(MC-30)	Prime	1630
316	Asph (AC-20-5TR)	1 st	1630
316	Aggr (TY-PB GR-4)	1 st	1630
344	SP MIXES SP-C SAC-B PG76-22	Final	1630

Basis of Estimate

Item	Description	Course	Rate	SY	Quantity
310	MC-30	Prime	0.30 Gal/SY	1630	489 Gal
316	Asph (AC-20-5TR)	1 st	0.42 Gal/SY	1630	685 Gal
316	Aggr (TY-PB GR-4)	1 st	100 SY/CY	1630	17 CY
344	SP MIXES SP-C SAC-B PG76-22	Final	226 LBS/SY	1630	184 TON

TEXAS ONE CALL

Fiber optic cable systems, gas lines, underground power lines, water lines, sewer lines, and other various utilities may be buried within the project limits. Protection of these utility systems is of extreme importance since any break could disrupt service to users resulting in business interruption and loss of revenue and profits. The Contractor shall telephone Texas One Call at 1-800-344-8377 (a 24-hour number), to determine if utilities are buried anywhere on the project in accordance with all UNDERGROUND FACILITY DAMAGE PREVENTION AND SAFETY laws. This action, however, will in no way be interpreted as relief of responsibilities under the terms of the Contract as set out in the plans and specifications. Coordinate the repair of all damages caused by daily operations and have facilities restored to service in a timely manner as directed at no additional cost to TxDOT.

GENERAL

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

<u>Name</u>	<u>Email Address</u>
Chris Graf, P.E.	Chris.Graf@txdot.gov

Contractor questions will be accepted through email, phone, and in person by the above individual(s).

Questions may also be submitted via the Letting Pre-Bid Q&A web page. This webpage can be accessed from the Notice to Contractors dashboard located at the following Address:

<https://tableau.txdot.gov/views/ProjectInformationDashboard/NoticetoContractors>

All contractor questions will be reviewed by the Engineer. All questions and any corresponding responses that are generated will be posted through the same Letting Pre-Bid Q&A web page.

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

The term "Article" or "Section" referred to hereon is defined in the forward of the Standard Specifications for Construction and Maintenance of Highways, Streets, And Bridges adopted by the Texas Department of Transportation November 2014.

The total disturbed area is shown on the SW3P sheet(s).

The Contractor will establish drainage in ditches before seeding or as directed by the Engineer.

Watering for dust control will be required as Directed by the Engineer and will be considered subsidiary to the various bid items.

ITEM 5 CONTROL OF WORK

The responsibility for the construction surveying on this contract will be in accordance with Section 5.9.1. "Method A".

The contractor will be required to place and maintain Blue Tops with wooden hubs for new flexible base.

Prior to contract letting, bidders may obtain a free computer diskette or a computerized transfer of files (from the Engineer's office) that contains the earthwork information. If copies of the actual cross-sections in addition to, or instead of, the diskette are requested, they will be available at the Engineers office for borrowing by copying companies for the purpose of making copies for the bidder at the bidder's expense.

Precast Alternate Proposals:

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 6 CONTROL OF MATERIALS

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

The Department will not be obligated for the cost of paint testing and/or abatement materials, processes, personnel, incidentals, etc.

Lead Containing Paint (LCP):

The following structure components contain Lead-Containing Paint (LCP):

3rd Street Burlison Creek Bridge – guardrails (silver painted with red primer) and steel piers (silver paint with green primer – NBI # 231410B00645001

The LCP Inspection Report is part of the project PS&E. Item 6.10.1.2 in the TxDOT 2024 Standard Specifications shall be utilized for this project.

Demolition plan should limit disturbance where lead paint is located when possible.

The Contractor shall dismantle the structure components that contain LCP in a manner that will comply with OSHA and other applicable rules and regulations relating to lead. Different dismantling methods may be utilized for dismantling the structure components containing LCP such as machine shearing, strip abatement, long-handle torching, etc. provided the method is approved by TxDOT and follows all rules and regulations related to lead.

Lead Abatement Option:

The lead abatement work may be subcontracted to a firm or company with the appropriate certifications outlined in Item 6.10.1.2 of the TxDOT 2024 Texas Standard Specifications.

The Contractor shall abate sufficient LCP to facilitate the project work, per Item 6.10.1.2 or as outlined in the project plans. Where paint-stripping is utilized as a protective measure to facilitate torch cutting, submit paint-stripping locations to the TxDOT Project Manager for review and approval. The following default specifications shall be utilized when stripping LCP from steel structure components to facilitate torch cutting:

- The contractor shall abate a six-inch wide strip around the perimeter of the beam cross-section for each beam for every 40 feet of beam length.

- A four inch wide strip around the perimeter of the diaphragm member or members at each attachment location to the beams.
- A four inch wide strip around bearing attachments and at the anchor bolts.

ITEM 7 LEGAL RELATIONS AND RESPONSIBILITIES

No significant traffic generator events identified.

ITEM 8 PROSECUTION AND PROGRESS

Working days will be computed and charged in accordance with Section 8.3.1.4. "Standard Workweek". Work will not be performed without time being charged unless otherwise exempted by the Section as defined above.

Work on Sunday(s) will not be allowed.

Working day charges will be in accordance with **SP 008---005. This delay is for the manufacturing of bridge beams.**

PROJECT SCHEDULES

Critical Path Method (CPM) scheduling will be required to be submitted and maintained monthly by the Contractor unless otherwise directed by the Engineer. (8.5.2.)

ITEM 9 MEASUREMENT AND PAYMENT

Monthly estimates will be computed from the 26th of the previous month through the 25th of the current month unless otherwise approved in writing by the Engineer.

ITEM 100 PREPARING RIGHT OF WAY

Trees that are to be trimmed and brush that is to be trimmed or removed that are not over the roadway or bridge(s), will be trimmed or removed in accordance with the Roadside Vegetation Management Manual to a height of fourteen feet. Remove limbs at the trunk with less than twenty-one feet of clearance above the pavement or bridge(s). All trees and brush that are to be trimmed as directed by the Engineer, will not be paid for directly but will be considered subsidiary to Item 100 "Preparing Right Of Way".

See the "Environmental" section of the plans for additional information.

Perform "Preparing Right of Way" operations in the usual manner within the limits of the excavation and fill areas. Remove only such trees and brush as designated by the Engineer. Exercise care to avoid disturbing the native grasses unnecessarily during construction, removal of the existing bridge, and during the installation of the temporary fence.

Within the construction limits, blade and windrow the top 8 inches of vegetative material to just outside the construction limits. Once ditch slopes and drainage have been established and approved, blade the

windrow evenly over the disturbed area within the construction limits. This work is to be done as the job progresses and in conjunction with seeding. Work on the project may be suspended, if in the opinion of the Engineer, the Contractor does not make a good faith effort to stabilize loose material as the project progresses. Time will not be suspended. This work is subsidiary to Item 100.

The removal of existing and temporary fence will not be paid for directly but will be considered subsidiary to Item 100 "Preparing Right Of Way".

ITEM 164 SEEDING FOR EROSION CONTROL

The Contractor should anticipate two (2) separate mobilizations for seeding at each project location.

Blade and windrow outside construction limits, grass, weeds, and topsoil to grass roots depth.

TEM 166 FERTILIZER

Fertilize all areas of project to be seeded.

Furnish and apply fertilizer with analysis of 20-10-10 at a rate of 300 bulk pounds per acre.

ITEM 247 FLEXIBLE BASE

A grader (a road grader, a blade, a maintainer, or a motor grader) will be used to process base unless otherwise approved by the Engineer.

Do not add field sand to modify the finish material to meet requirements.

Place new flexible base in lifts of approximately equal depth not to exceed 6 inches unless otherwise directed.

Aggregate Material Requirements

Property	Test Method	Grade 4 ²			
Sampling	Tex-400-A				
Master gradation sieve size (cumulative % retained)					
2-1/2"	Tex-110-E	0			
1-3/4"		0-10			
7/8"		10-35			
3/8"		30-65			
#4		45-75			
#40		65-90			
Liquid Limit, % Max	Tex-104-E	40			
Plasticity Index, Max ¹	Tex-106-E	10			
Plasticity index, Min ¹		3			
Wet ball mill, % Max	Tex-116-E	40			
Wet ball mill, % Max increase passing the #40 sieve		20			
Min compressive strength, psi	Tex-117-E				
lateral pressure 0 psi		20			
lateral pressure 3 psi		-			
lateral pressure 15 psi		175			

- Determine plastic index in accordance with [Tex-107-E](#) (linear shrinkage) when liquid limit is unattainable as defined in [Tex-104-E](#).
- Grade 4 may be further designated as Grade 4A, Grade 4B, etc.

ITEM 310 PRIME COAT

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

Finished base must be dampened before the application of a cutback asphalt binder is placed. This work will not be paid for directly but will be considered subsidiary to Item 310.

ITEM 316 SURFACE TREATMENTS

All precoated aggregate will use PG 64-22 asphalt.

Furnish aggregate with a minimum B surface aggregate classification.

The asphalt rates shown hereon are for average conditions. The rate may be varied as determined by the Engineer to obtain proper embedment of aggregate.

Warm season asphalts are not to be placed between September 1st and April 30th unless otherwise directed/approved.

Protect all existing bridges, and other exposed concrete surfaces within the limits of this project(s), as much as practicable, from asphalt materials by any means approved by the Engineer at the contractor's expense.

Use a medium pneumatic roller meeting the requirements of Item 210 as directed by the Engineer. This work will be subsidiary to the various bid items.

ITEM 344 SUPERPAVE MIXTURES

Binder substitution is not allowed.

RAP and RAS will not be allowed.

Surge Volume and Remixing MTV will be required for this project.

During paving operations; proper adjustment of Surge Volume and Remixing MTV is required to ensure clean pickup of HMAC and to have residual HMAC not be in excess of 1/4" to 3/8" as approved by the Engineer. HMAC will not be dumped in a windrow that is determined by the Engineer to be an excessive distance from the paving operation.

Belly dumps will not be allowed if a spray paver is used.

See item 504 for additional structure requirements located at HMAC plant(s).

ITEM 416 DRILLED SHAFT FOUNDATIONS

Casing is anticipated for the installation of the drilled shafts. Refer to **Section 416.3.3** for requirements.

In accordance with Section 416.5.2 core holes will be paid at \$200 each. 4 core holes total will be paid for this project.

ITEM 420 CONCRETE SUBSTRUCTURES

All Class C Concrete has been measured for plan quantity payment.

ITEM 421 HYDRAULIC CEMENT CONCRETE

Furnish dome lids with 4" x 8" cylinder test molds.

Strength testing equipment is not required for Contract controlling test.

ITEM 427 SURFACE FINISHES FOR CONCRETE

Surface Area II will receive a rub finish.

ITEM 432 RIPRAP

Locations and quantities may be varied as directed by the Engineer to accommodate field conditions.

Due to field conditions changing during the removal of the existing bridge and the construction of the new structure, riprap will be verified by the Engineer before the Contractor installs the riprap. Riprap located under the bridge will be installed before the bridge beams are installed.

Limit excavation to within 1' of riprap. If excavation exceeds these limits without the Engineer's approval, riprap will be extended to the limits of the disturbance. No additional compensation will be allowed for this work.

All riprap stone protection shall have toe walls in accordance to standard SRR.

ITEM 496 REMOVING STRUCTURES

Handle materials when removing structures in accordance with Item 6.

Exercise care to avoid disturbing the native grasses unnecessarily during removal of the existing bridge.

Notify TxDOT at least 60 days prior to any bridge removal. The Texas Department of State Health Services (DSHS) requires TxDOT to notify the DSHS of the bridge removal even if no asbestos is present. The notification form to retain/notify the DSHS licensed asbestos consultant must be postmarked at least 10 working days prior to the scheduled abatement and/or demolition. If the work does not happen on the notified date, then another 10 Working-Day, Prior-To-Work Notification will be required.

Provide a detailed plan for the removal of the existing structure to include the schedule of removal and list of all equipment to be used.

The structure or structures to be removed may have surface coatings, which may contain hazardous materials. Provide for the safety and health of employees and abide by all OSHA Standards and Regulations as well as those set by Texas Department of State Health Services (DSHS).

ITEM 502 BARRICADES, SIGNS, AND TRAFFIC HANDLING

The Contractor will be required to keep all TCP devices clean. If notified by the Engineer to clean the TCP devices, the Contractor will have until the end of that daylight period to comply. Failure to comply will result in a suspension of all work until the TCP devices are clean. Time will not be suspended.

The Contractor Force Account "Safety Contingency" that has been established for this project is intended to be utilized for work zone enhancements, to improve the effectiveness of the Traffic Control Plan, that could

not be foreseen in the project planning and design stage. These enhancements will be mutually agreed upon by the Engineer and the Contractor's Responsible Person based on weekly or more frequent traffic management reviews on the project. The Engineer may choose to use existing bid items if it does not slow the implementation of enhancement.

All equipment operated by the Contractor on or within thirty feet (30') of the roadway will have a functioning flashing beacon mounted on it. Motor graders will have two standard orange warning flags mounted on them in addition to the flashing beacon.

The Contractor will be responsible for maintaining the edge of the roadway throughout the project in a traversable condition and/or as directed by the Engineer. Salvaged milling may be used as directed by the Engineer. This work will not be paid for directly and will be considered subsidiary to Item 502 "Barricades, Signs, and Traffic Handling".

All devices shown on the TCP Standards are required and considered subsidiary to Item 502 unless specifically outlined elsewhere in the plans.

All signs will be constructed in accordance with the details shown in the current Standard Highway Sign Designs for Texas manual.

ITEM 504 FIELD OFFICE AND LABORATORY

One Type D Structure (Asphalt Mix Control Laboratory) will be required for this project.

ITEM 506 TEMPORARY EROSION, SEDIMENTATION, AND ENVIRONMENTAL CONTROLS

The Contractor should anticipate multiple mobilizations for the installation of BMP's on this project.

BMP's will not be installed until authorized by the Engineer.

The Engineer will determine actual time and placement locations of BMP's and temporary measures once construction has begun.

Stockpile sites may be cleared of cover vegetation, but the vegetation root system will not be destroyed.

ITEM 540 METAL BEAM GUARD FENCE

Metal beam guard fence will not be installed until the embankment, flex base, one course and super pave is complete.

ITEM 552 WIRE FENCE

Wire fence quantities shown on the plans are approximate and may be adjusted in the field as approved by the Engineer.

Notify the Engineer three weeks prior to beginning any fence work.

All corner/pull posts, line posts, and braces, shall be steel pipe with a minimum of 2" Std. pipe (2.375" O.D., 0.154" wall thickness) with a 11#4" Std. pipe brace (1.660" O.D., 0.140" wall thickness), with a 2"x2"x1/4" angle, or other as approved by the Engineer.



Estimate & Quantity Sheet

CONTROLLING PROJECT ID 0923-10-021

DISTRICT Brownwood
HIGHWAY 3RD ST

COUNTY Lampasas

CONTROL SECTION JOB				0923-10-021		TOTAL EST.	TOTAL FINAL
PROJECT ID				A00135676			
COUNTY				Lampasas			
HIGHWAY				3RD ST			
ALT	BID CODE	DESCRIPTION	UNIT	EST.	FINAL		
	100-7002	PREPARING ROW	STA	3.600		3.600	
	110-7001	EXCAV (ROADWAY)	CY	295.000		295.000	
	110-7002	EXCAV (CHANNEL)	CY	1,277.000		1,277.000	
	132-7005	EMBANK (FNL)(OC)(TY C)	CY	423.000		423.000	
	164-7001	BROADCAST SEED (PERM_RURAL_SAND)	SY	1,100.000		1,100.000	
	164-7005	BROADCAST SEED (TEMP_WARM)	SY	550.000		550.000	
	164-7006	BROADCAST SEED (TEMP_COOL)	SY	550.000		550.000	
	168-7001	VEGETATIVE WATERING	TGL	18.000		18.000	
	169-7024	SOIL RET BLKT(SL_STEEP_SAND_LONG_SPRY)	SY	1,100.000		1,100.000	
	169-7033	SOIL RET BLKT(CHAN_PERM_6 PSF)	SY	699.000		699.000	
	247-7178	FL BS (CMP IN PLC)(TY A GR 4)(FNAL POS)	CY	276.000		276.000	
	310-7004	PRIME COAT (MC-30)	GAL	489.000		489.000	
	316-7007	ASPH (AC-20-5TR)	GAL	685.000		685.000	
	316-7256	AGGR (TY-PB, GR-4)	CY	17.000		17.000	
	344-7031	SP MIXES SP-C SAC-B PG76-22	TON	184.000		184.000	
	400-7010	CEM STABIL BKFL	CY	40.000		40.000	
	402-7001	TRENCH EXCAVATION PROTECTION	LF	70.000		70.000	
	416-7004	DRILL SHAFT (24 IN)	LF	568.000		568.000	
	420-7012	CL C CONC (ABUT)	CY	27.400		27.400	
	420-7022	CL C CONC (CAP)	CY	20.800		20.800	
	420-7038	CL C CONC (COLUMN)	CY	11.100		11.100	
	422-7007	REINF CONC SLAB (SLAB BEAM)	SF	5,482.000		5,482.000	
	425-7018	PRESTR CONC SLAB BEAM (4SB15)	LF	1,028.000		1,028.000	
	425-7019	PRESTR CONC SLAB BEAM (5SB15)	LF	257.000		257.000	
	432-7043	RIPRAP (STONE PROTECTION)(18 IN)	CY	1,007.000		1,007.000	
	442-7011	STR STEEL (RAILS/POSTS/PLATES)	LB	284.000		284.000	
	449-7001	ANCHOR BOLTS	EA	110.000		110.000	
	450-7034	RAIL (TY C223)	LF	284.000		284.000	
	454-7003	ARMOR JOINT (SEALED)	LF	78.000		78.000	
	496-7009	REMOV STR (BRIDGE 0 - 99 FT LENGTH)	EA	1.000		1.000	
	500-7001	MOBILIZATION	LS	1.000		1.000	
	502-7001	BARRICADES, SIGNS AND TRAFFIC HANDLING	MO	6.000		6.000	
	506-7002	ROCK FILTER DAMS (INSTALL) (TY 2)	LF	80.000		80.000	
	506-7011	ROCK FILTER DAMS (REMOVE)	LF	80.000		80.000	
	506-7039	TEMP SEDMT CONT FENCE (INSTALL)	LF	948.000		948.000	
	506-7041	TEMP SEDMT CONT FENCE (REMOVE)	LF	948.000		948.000	
	506-7045	BIODEG EROSN CONT LOGS (INSTL) (18")	LF	222.000		222.000	



DISTRICT	COUNTY	CCSJ	SHEET
Brownwood	Lampasas	0923-10-021	5



Estimate & Quantity Sheet

CONTROLLING PROJECT ID 0923-10-021

DISTRICT Brownwood

COUNTY Lampasas

HIGHWAY 3RD ST

CONTROL SECTION JOB				0923-10-021		TOTAL EST.	TOTAL FINAL
PROJECT ID				A00135676			
COUNTY				Lampasas			
HIGHWAY				3RD ST			
ALT	BID CODE	DESCRIPTION	UNIT	EST.	FINAL		
	506-7046	BIODEG EROSN CONT LOGS (REMOVE)	LF	222.000		222.000	
	540-7002	MTL W-BEAM GD FEN (STEEL POST)	LF	125.000		125.000	
	540-7006	MTL BEAM GD FEN TRANS (TL2)	EA	4.000		4.000	
	544-7001	GUARDRAIL END TREATMENT (INSTALL)	EA	4.000		4.000	
	552-7001	WIRE FENCE (TY A)	LF	400.000		400.000	
	552-7004	WIRE FENCE (TY D)	LF	440.000		440.000	
	552-7005	WIRE FENCE (SPECIAL)	LF	108.000		108.000	
	658-7013	INSTL DEL ASSM (D-SW)SZ 1(BRF)CTB (BI)	EA	6.000		6.000	
	658-7019	INSTL DEL ASSM (D-SW)SZ 1(BRF)GF2(BI)	EA	8.000		8.000	
	4003-7001	TIP TESTING(DRILL SHAFT)	EA	4.000		4.000	
	18	SAFETY CONTINGENCY: CONTRACTOR FORCE ACCOUNT WORK (PART)	LS	1.000		1.000	
		EROSION CONTROL MAINTENANCE: CONTRACTOR FORCE ACCOUNT WORK (PART)	LS	1.000		1.000	

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

DATE: 7/19/2024 12:21:03 PM
 FILE: R:\1005000-1005999\1005472.03\04_DOCUMENTS\DESIGN\Plan_Set\2. Traffic Control Standards\bc-21.dgn

BARRICADE AND CONSTRUCTION (BC) STANDARD SHEETS GENERAL NOTES:

- 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).
- The development and design of the Traffic Control Plan (TCP) is the responsibility of the Engineer.
- 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.
- 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.
- 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.
- 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.
- 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.
- 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.
- 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.
- 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.
- Traffic control devices should be in place only while work is actually in progress or a definite need exists.
- The Engineer has the final decision on the location of all traffic control devices.
- 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:


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

COMPLIANT WORKZONE TRAFFIC CONTROL DEVICES

- Only pre-qualified products shall be used. The "Compliant Work Zone Traffic Control Devices List" (CWZTCD) describes pre-qualified products and their sources.
- Work zone traffic control devices shall be compliant with the Manual for Assessing safety Hardware (MASH).

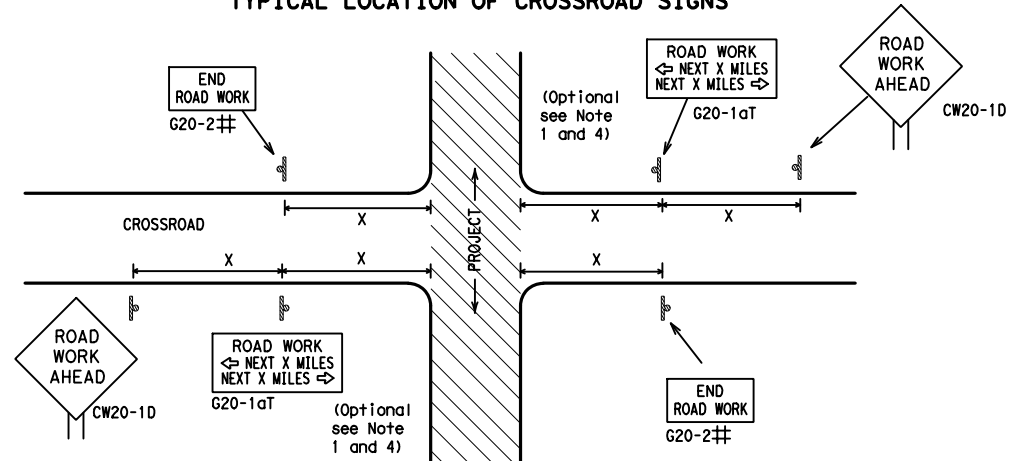
THE DOCUMENTS BELOW CAN BE FOUND ON-LINE AT http://www.txdot.gov
COMPLIANT WORK ZONE TRAFFIC CONTROL DEVICES LIST (CWZTCD)
DEPARTMENTAL MATERIAL SPECIFICATIONS (DMS)
MATERIAL PRODUCER LIST (MPL)
ROADWAY DESIGN MANUAL - SEE "MANUALS (ONLINE MANUALS) "
STANDARD HIGHWAY SIGN DESIGNS FOR TEXAS (SHSD)
TEXAS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

SHEET 1 OF 12

 Texas Department of Transportation		Traffic Safety Division Standard	
BARRICADE AND CONSTRUCTION GENERAL NOTES AND REQUIREMENTS			
BC(1)-21			
FILE: bc-21.dgn	DN: TxDOT	CR: TxDOT	DW: TxDOT
© TxDOT November 2002	CONT	SECT	JOB
	0923	10	021
4-03 7-13			3RD ST
9-07 8-14			
5-10 5-21	BWD	LAMPASAS	8

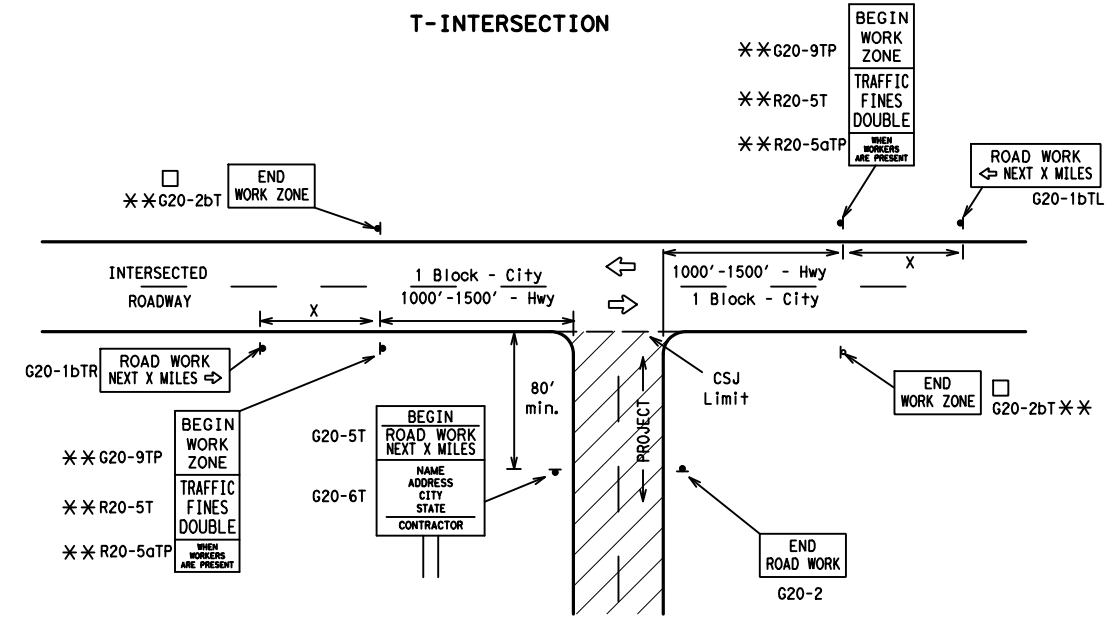
DATE: 7/19/2024 12:21:04 PM
 FILE: R:\1005000-1005999\1005472_03\04_DOCUMENTS\DESIGN\Plan_Set\2_Traffic Control Standard Signs-2.dgn
 The use of this standard is governed by the "Texas Engineering Practice Act". No warranty of any kind is made by TxDOT for any purpose whatsoever. TxDOT assumes no responsibility for the conversion of this standard to any other format 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

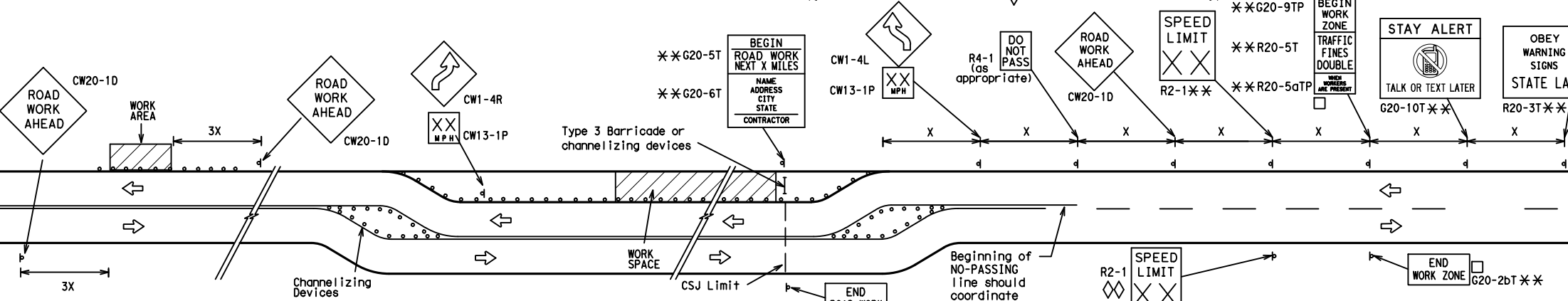
* For typical sign spacings on divided highways, expressways and freeways, see Part 6 of the "Texas Manual on Uniform Traffic Control Devices" (TMUTCD) typical application diagrams or TCP Standard Sheets.

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

GENERAL NOTES

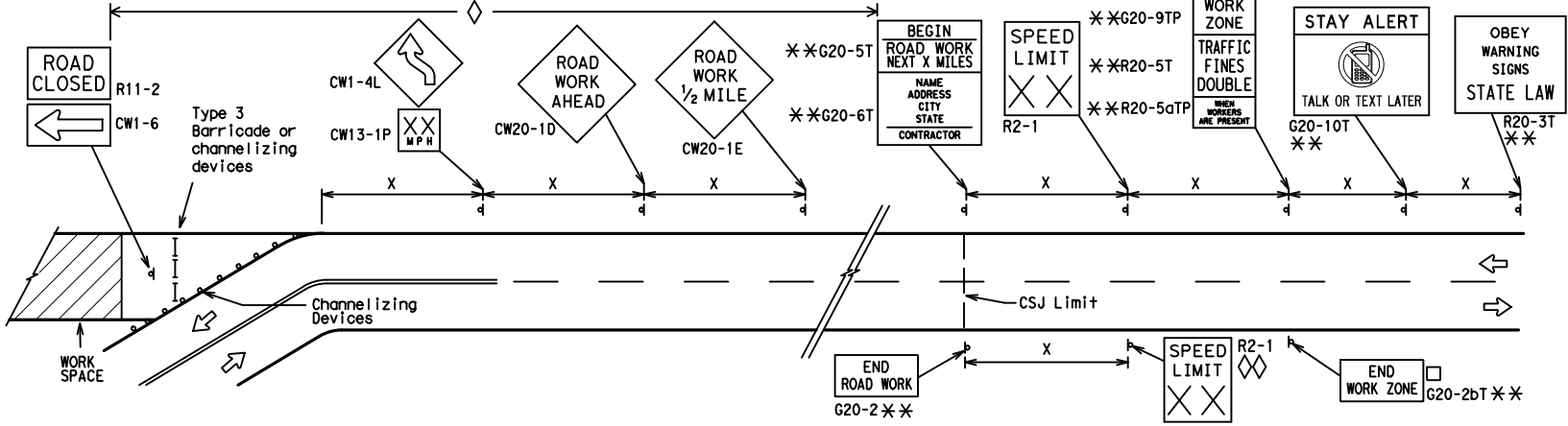
- Special or larger size signs may be used as necessary.
- Distance between signs should be increased as required to have 1500 feet advance warning.
- Distance between signs should be increased as required to have 1/2 mile or more advance warning.
- 36" x 36" "ROAD WORK AHEAD" (CW20-1D) signs may be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

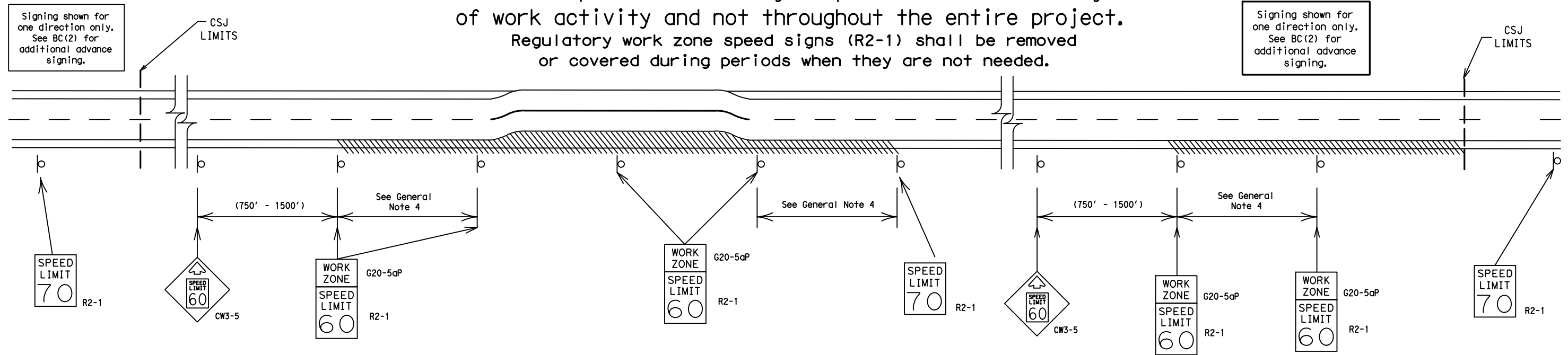
BC(2)-21

FILE: bc-21.dgn	DN: TxDOT	CK: TxDOT	DW: TxDOT	CK: TxDOT
© TxDOT November 2002	CONT	SECT	JOB	HIGHWAY
REVISIONS	0923	10	021	3RD ST
9-07 8-14	DIST	COUNTY	SHEET NO.	
7-13 5-21	BWD	LAMPASAS	9	

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 units or for incorrect results or damages resulting from its use.

DATE: 7/19/2024 12:21:04 PM
FILE: R:\1005000-1005999\1005472_03\04_DOCUMENTS\DESIGN\Plan_Set\2_Traffic Control Signs\BC-21.dgn

SHEET 3 OF 12



BARRICADE AND CONSTRUCTION WORK ZONE SPEED LIMIT

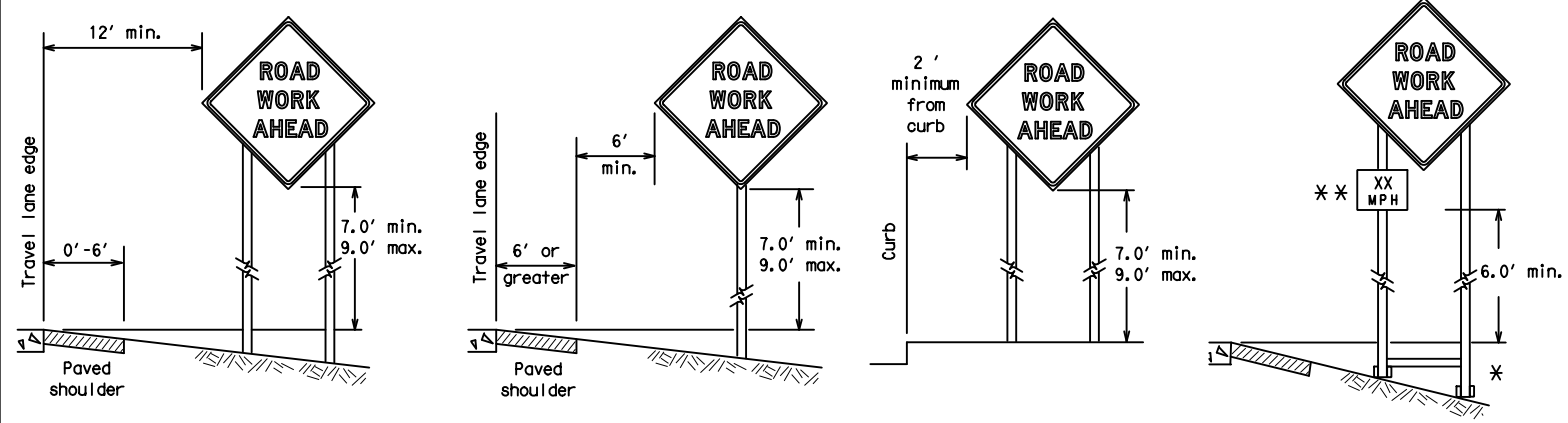
BC(3)-21

FILE:	bc-21.dgn	DW:	TxDOT	CK:	TxDOT	DW:	TxDOT	CK:	TxDOT
© TxDOT	November 2002	CONT	SECT	JOB	HIGHWAY				
REVISIONS		0923	10	021	3RD ST				
9-07	8-14	DIST	COUNTY	SHEET NO.					
7-13	5-21	BWD	LAMPASAS	10					

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: 7/19/2024 12:21:04 PM
 FILE: R:\1005000-1005999\1005472_03\04_DOCUMENTS\DESIGN\Plan_Set\2_Traffic Control\Standards\bc-21.dgn

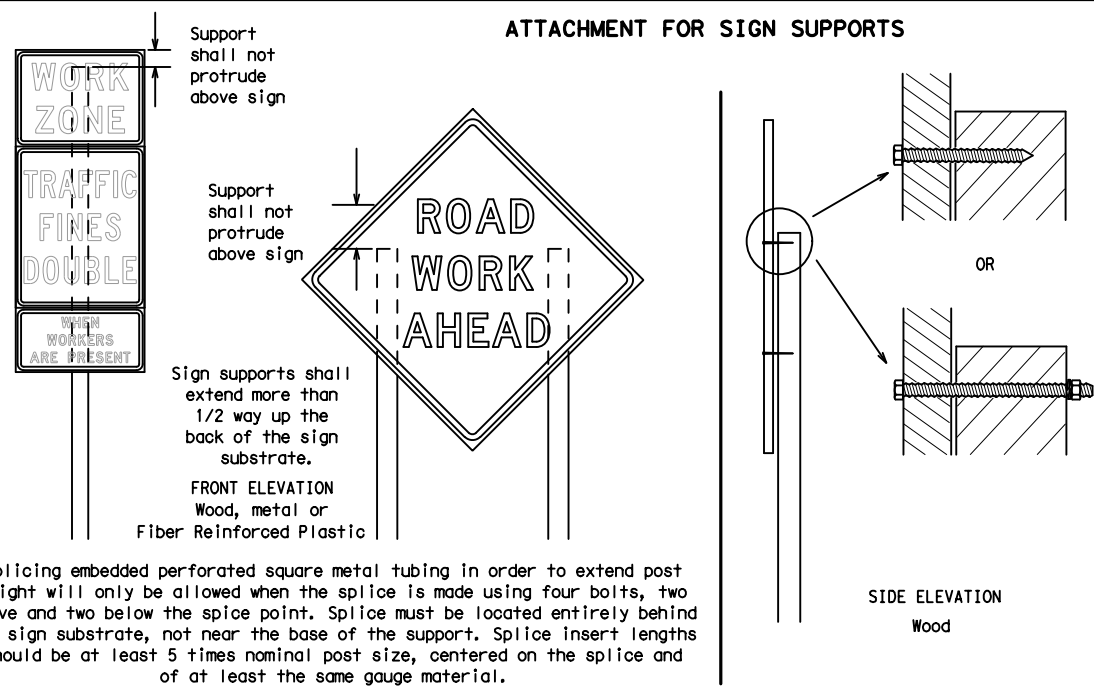
TYPICAL MINIMUM CLEARANCES FOR LONG TERM AND INTERMEDIATE TERM SIGNS



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

** When plaques are placed on dual-leg supports, they should be attached to the upright nearest the travel lane. Supplemental plaques (advisory or distance) should not cover the surface of the parent sign.

ATTACHMENT FOR SIGN SUPPORTS



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

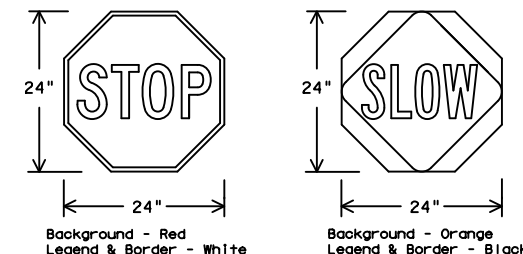
- Where sign supports require the use of weights to keep from turning over, the use of sandbags with dry, cohesionless sand should be used.
- The sandbags will be tied shut to keep the sand from spilling and to maintain a constant weight.
- Rock, concrete, iron, steel or other solid objects shall not 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.

Texas Department of Transportation
Traffic Safety Division Standard

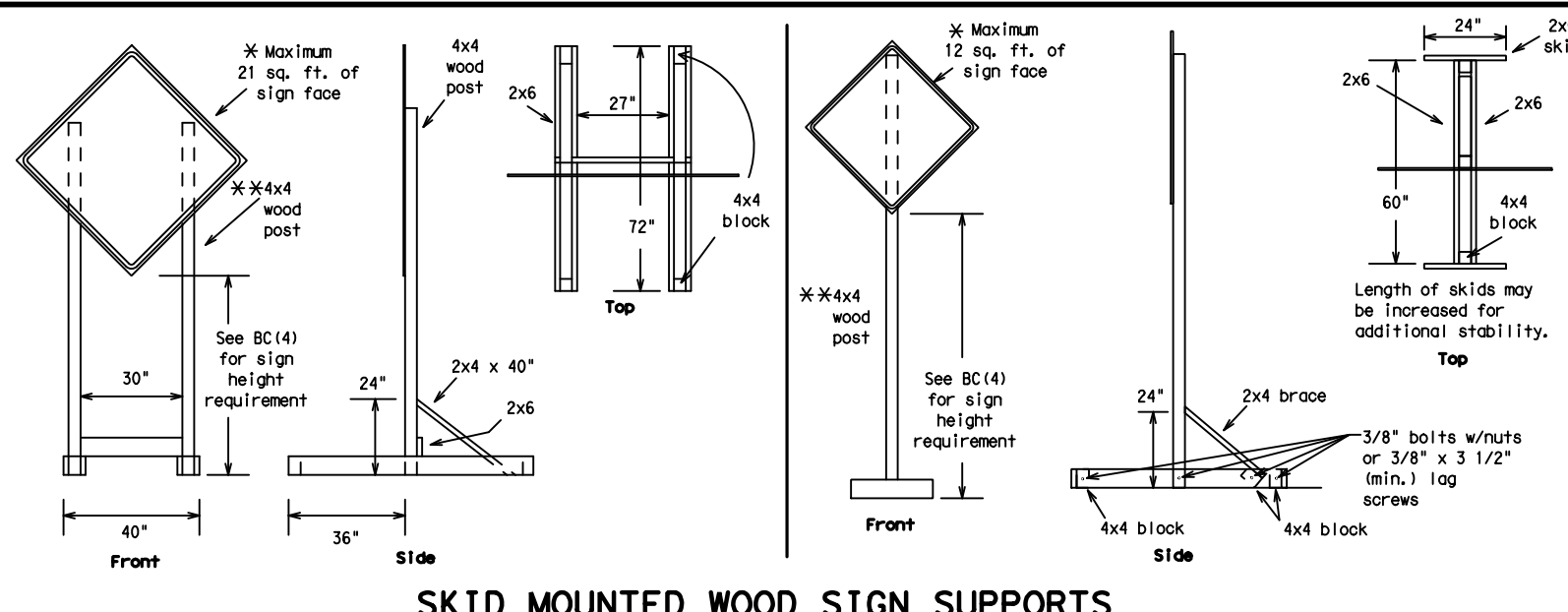
BARRICADE AND CONSTRUCTION
TEMPORARY SIGN NOTES

BC(4)-21

FILE: bc-21.dgn	DN: TxDOT	CR: TxDOT	OW: TxDOT	CK: TxDOT
© TxDOT November 2002	CONT	SECT	JOB	HIGHWAY
REVISIONS	0923	10	021	3RD ST
9-07 8-14	DIST	COUNTY	SHEET NO.	
7-13 5-21	BWD	LAMPASAS	11	

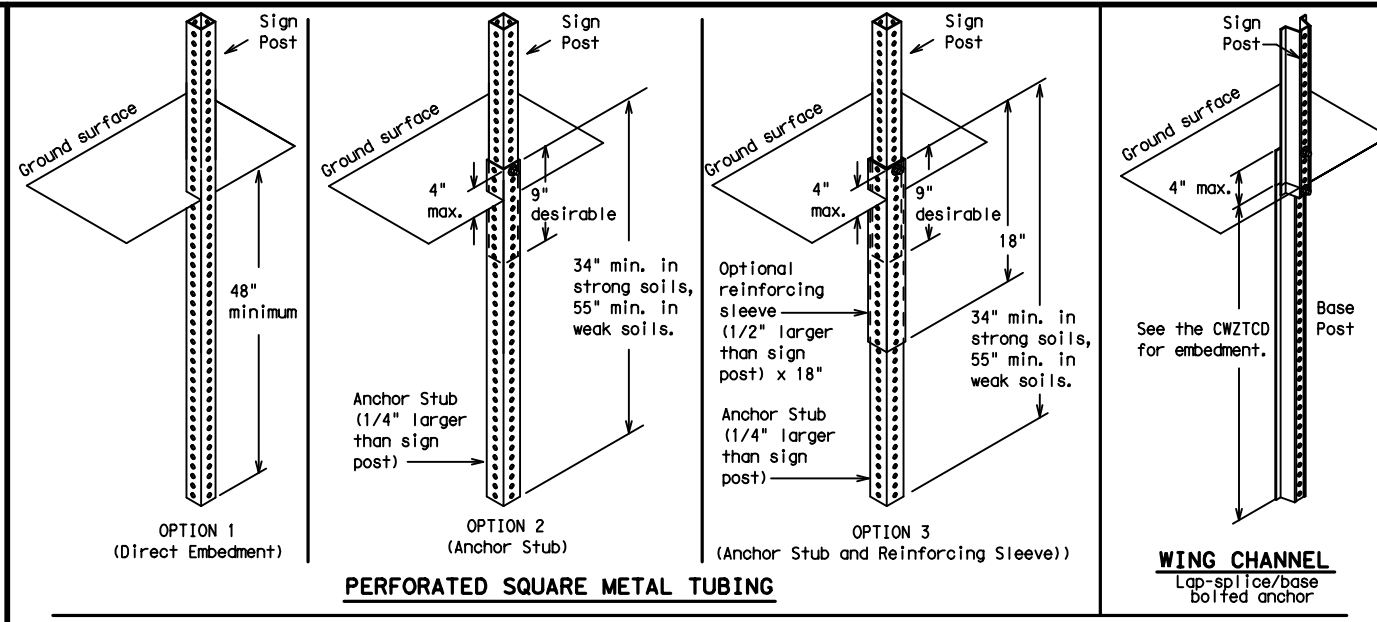
DISCLAIMER: The use of this standard is governed by the "Texas Engineering Practice Act". No warranty of any kind is made by TxDOT for any purpose whatsoever. TxDOT assumes no responsibility for the conversion of this standard to other formats or for incorrect results or damages resulting from its use.

DATE: 7/19/2024 12:21:05 PM
 FILE: R:\1005000-1005999\1005472.03\04_DOCUMENTS\DESIGN\Plan_Set\2. Traffic Control Standards\bc-21.dgn



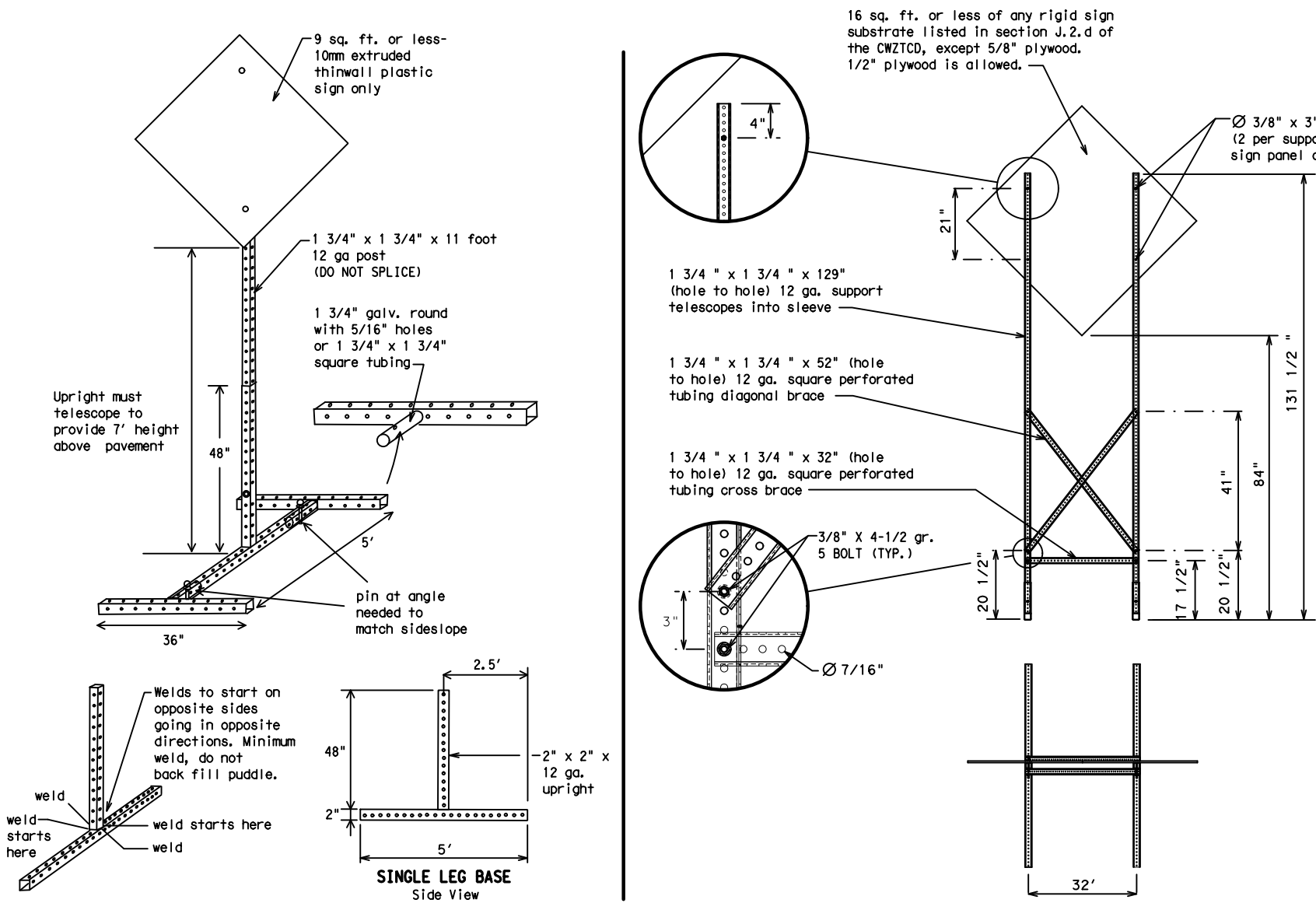
SKID MOUNTED WOOD SIGN SUPPORTS

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



GROUND MOUNTED SIGN SUPPORTS

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



SKID MOUNTED PERFORATED SQUARE STEEL TUBING SIGN SUPPORTS

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

WEDGE ANCHORS

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

OTHER DESIGNS

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

GENERAL NOTES

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

- * See BC(4) for definition of "Work Duration."
- ** Wood sign posts MUST be one piece. Splicing will NOT be allowed. Posts shall be painted white.
- See the CWZTCD for the type of sign substrate that can be used for each approved sign support.

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	0923	10	021	3RD ST					
9-07	8-14	DIST	COUNTY	SHEET NO.					
7-13	5-21	BWD	LAMPASAS	12					

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 message 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
Cannot	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
Hour(s)	HR, HRS	Time Minutes	TIME MIN
Information	INFO	Upper Level	UPR LEVEL
It Is	ITS	Vehicles (s)	VEH, VEHS
Junction	JCT	Warning	WARN
Left	LFT	Wednesday	WED
Left Lane	LFT LN	Weight Limit	WT LIMIT
Lane Closed	LN CLOSED	West	W
Lower Level	LWR LEVEL	Westbound	(route) W
Maintenance	MAINT	Wet Pavement	WET PVMT
		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	0923	10	021	3RD ST
9-07 8-14	DIST	COUNTY	SHEET NO.	
7-13 5-21	BWD	LAMPASAS	13	

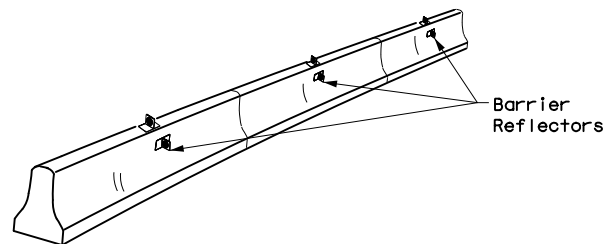
DATE: 7/19/2024 12:21:05 PM

FILE: R:\1005000-1005999\1005472_03\04_DOCUMENTS\DESIGN\Plan_Set\2_Traffic Control\Standards\bc-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 this standard to other formats or for incorrect results or damages resulting from its use.

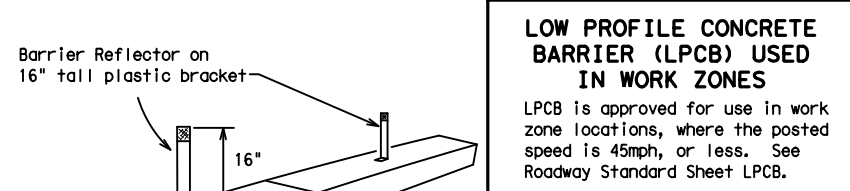
DATE: 7/19/2024 12:21:05 PM
 FILE: R:\1005000-1005999\1005472_03\04_DOCUMENTS\DESIGN\Plan_Set\2. Traffic Control\Standards\bc-21.dgn

- 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)

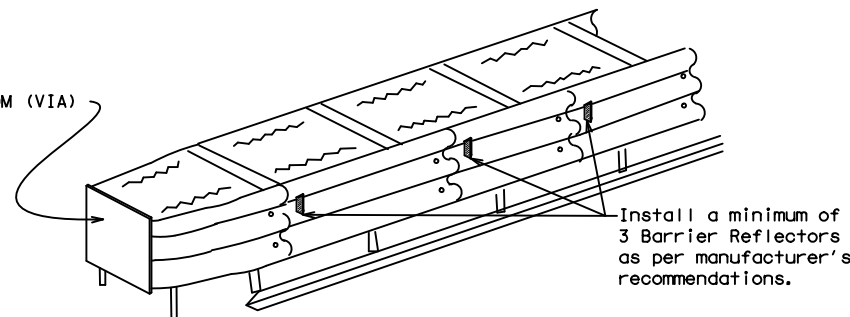
- Where traffic is on one side of the CTB, two (2) Barrier Reflectors shall be mounted in approximately the midsection of each section of CTB. An alternate mounting location is uniformly spaced at one end of each CTB. This will allow for attachment of a barrier grapple without damaging the reflector. 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.

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

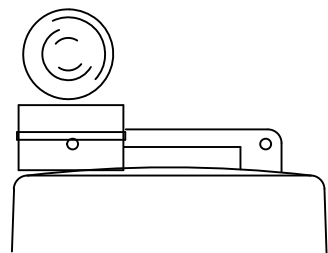
- Warning lights shall meet the requirements of the TMUTCD.
- Warning lights shall NOT be installed on barricades.
- Type A-Low Intensity Flashing Warning Lights are commonly used with drums. They are intended to warn of or mark a potentially hazardous area. Their use shall be as indicated on this sheet 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

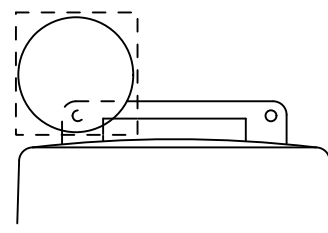
- Type A flashing warning lights are intended to warn drivers that they are approaching or are in a potentially hazardous area.
- Type A random flashing warning lights are not intended for delineation and shall not be used in a series.
- A series of sequential flashing warning lights placed on channelizing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



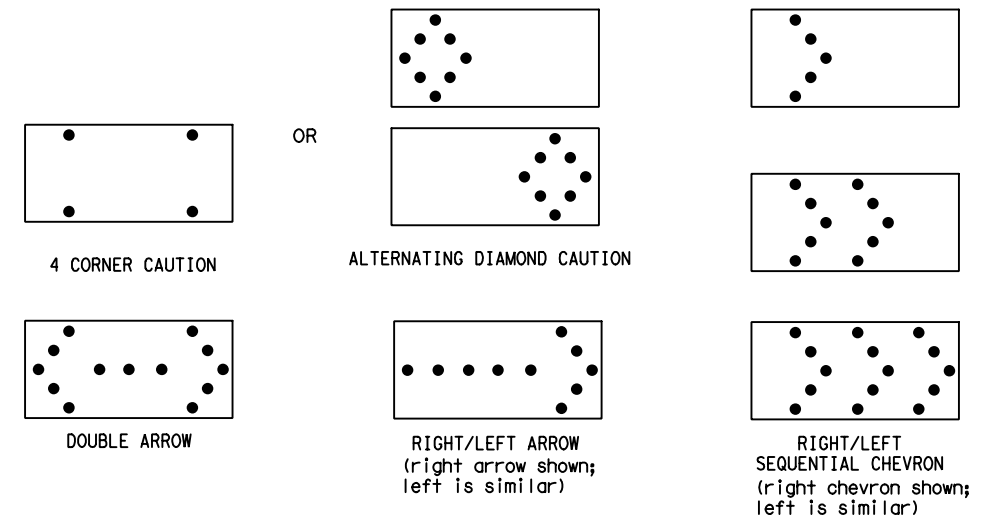
Type C Warning Light or approved substitute mounted on a drum adjacent to the travel way.



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

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		0923	10	021	3RD ST				
9-07	8-14	DIST	COUNTY	SHEET NO.					
7-13	5-21	BWD	LAMPASAS	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: 7/19/2024 12:21:06 PM
 FILE: R:\1005000-1005999\1005472_03\04_DOCUMENTS\DESIGN\Plan_Set\2_Traffic Control\Standards\bc-21.dgn

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

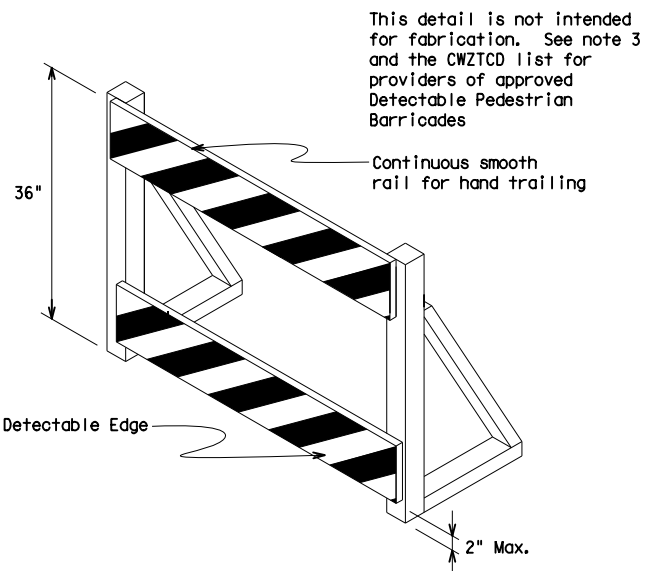
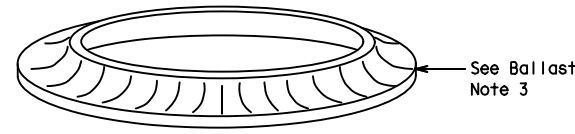
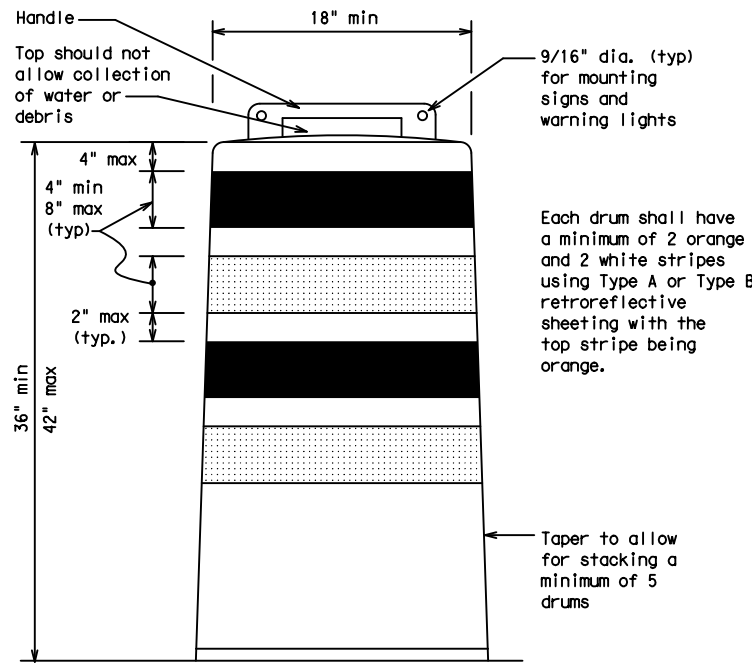
- Pre-qualified plastic drums shall meet the following requirements:
- Plastic drums shall be a two-piece design; the "body" of the drum shall be the top portion and the "base" shall be the bottom.
 - The body and base shall lock together in such a manner that the body separates from the base when impacted 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.

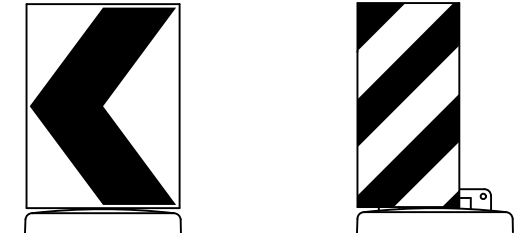
BALLAST

- 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



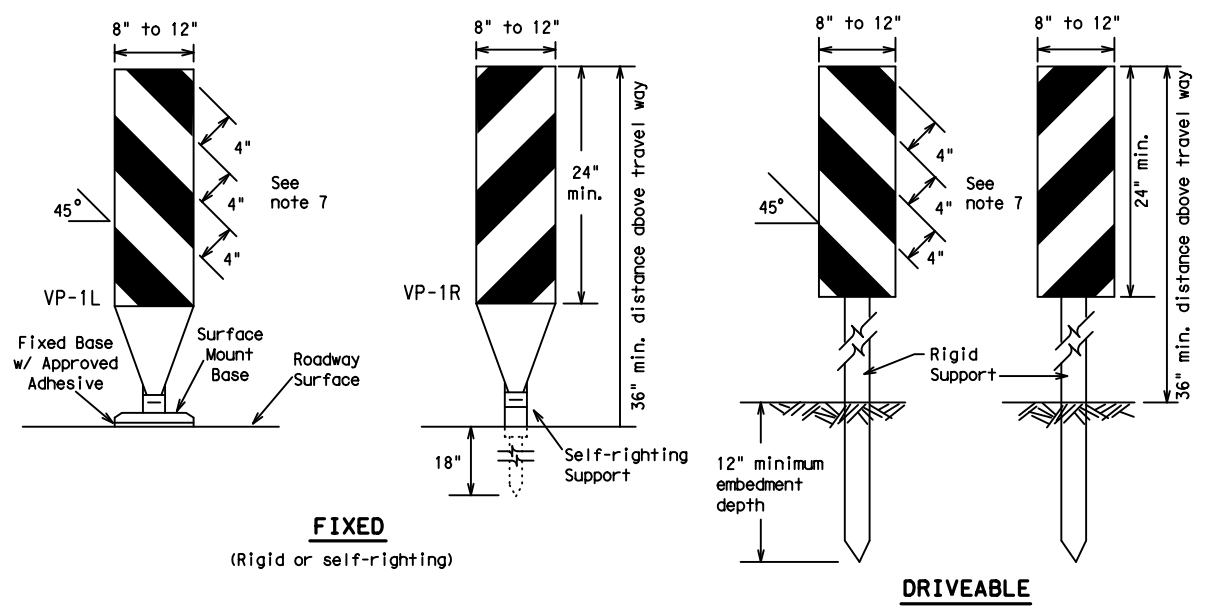
BARRICADE AND CONSTRUCTION CHANNELIZING DEVICES

BC(8)-21

FILE:	bc-21.dgn	DN:	TxDOT	CK:	TxDOT	DW:	TxDOT	CR:	TxDOT
© TxDOT	November 2002	CONT	SECT	JOB	HIGHWAY				
REVISIONS		0923	10	021	3RD ST				
4-03	8-14	DIST	COUNTY	SHEET NO.					
9-07	5-21	BWD	LAMPASAS	15					
7-13									

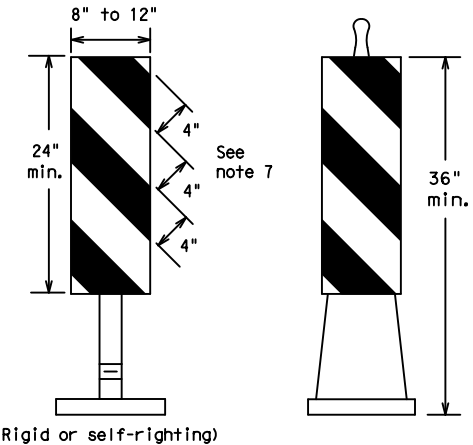
DISCLAIMER: The use of this standard is governed by the "Texas Engineering Practice Act". No warranty of any kind is made by TxDOT for any purpose whatsoever. TxDOT assumes no responsibility for the conversion of this standard to other formats or for incorrect results or damages resulting from its use.

DATE: 7/19/2024 12:21:06 PM
 FILE: R:\1005000-1005999\1005472_03\04_DOCUMENTS\DESIGN\Plan_Set\2_Traffic Control\Standards\bc-21.dgn



FIXED
(Rigid or self-righting)

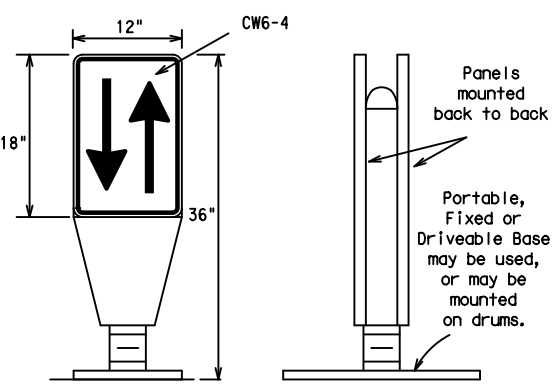
DRIVEABLE



PORTABLE

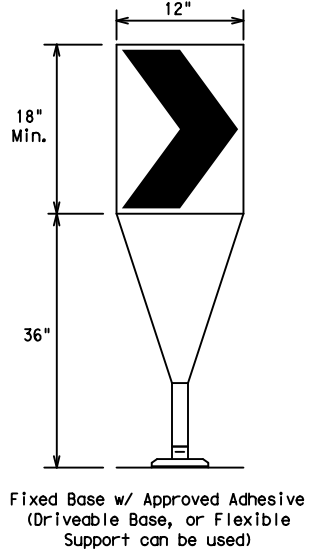
VERTICAL PANELS (VPs)

- 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.



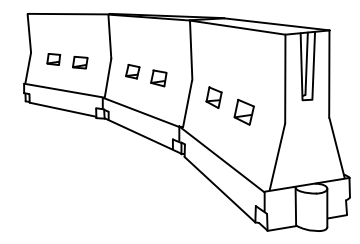
OPPOSING TRAFFIC LANE DIVIDERS (OTLD)

- 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

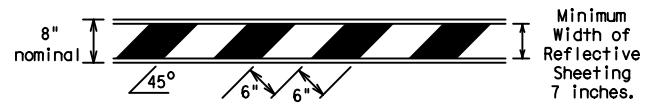
FILE: bc-21.dgn	DN: TxDOT	CK: TxDOT	DW: TxDOT	CR: TxDOT
© TxDOT November 2002	CONT	SECT	JOB	HIGHWAY
REVISIONS	0923	10	021	3RD ST
9-07 8-14	DIST	COUNTY	SHEET NO.	
7-13 5-21	BWD	LAMPASAS	16	

DATE: 7/19/2024 12:21:06 PM
 FILE: R:\1005000-1005999\1005472_03\04_DOCUMENTS\DESIGN\Plan_Set\2. Traffic Control\Standards\bc-21.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 this standard to other formats or for incorrect results or damages resulting from its use.

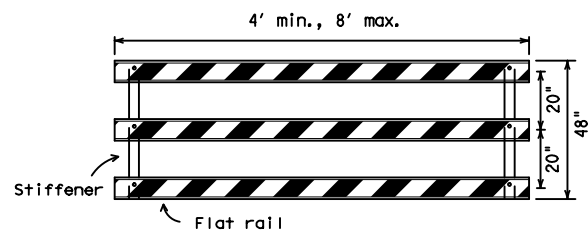
TYPE 3 BARRICADES

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.

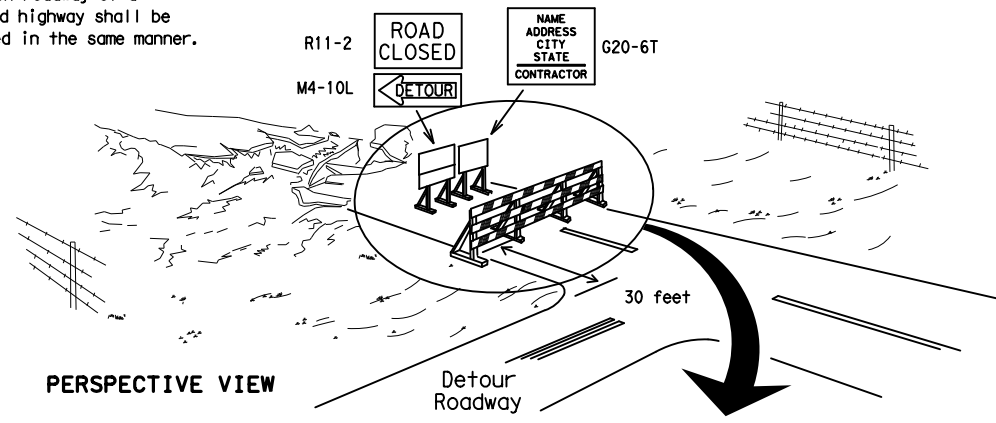


TYPICAL STRIPING DETAIL FOR BARRICADE RAIL



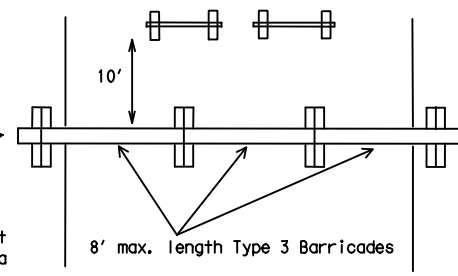
TYPICAL PANEL DETAIL FOR SKID OR POST TYPE BARRICADES

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



PERSPECTIVE VIEW

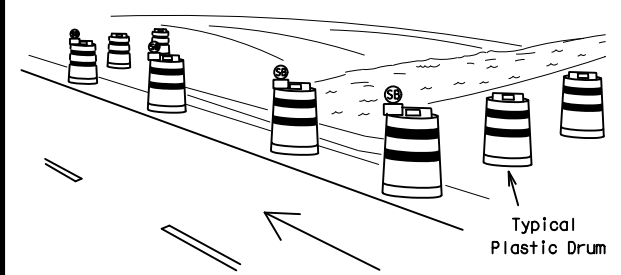
The three rails on Type 3 barricades shall be reflectorized orange and reflective white stripes on one side facing one-way traffic and both sides for two-way traffic. Barricade striping should slant downward in the direction of detour.



PLAN VIEW

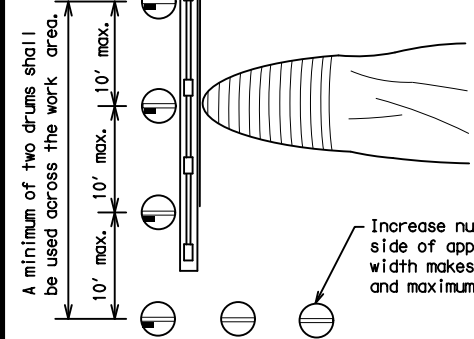
1. Signs should be mounted on independent supports at a 7 foot mounting height in center of roadway. The signs should be a minimum of 10 feet behind Type 3 Barricades.
2. Advance signing shall be as specified elsewhere in the plans.

TYPE 3 BARRICADE (POST AND SKID) TYPICAL APPLICATION



PERSPECTIVE VIEW

These drums are not required on one-way roadway



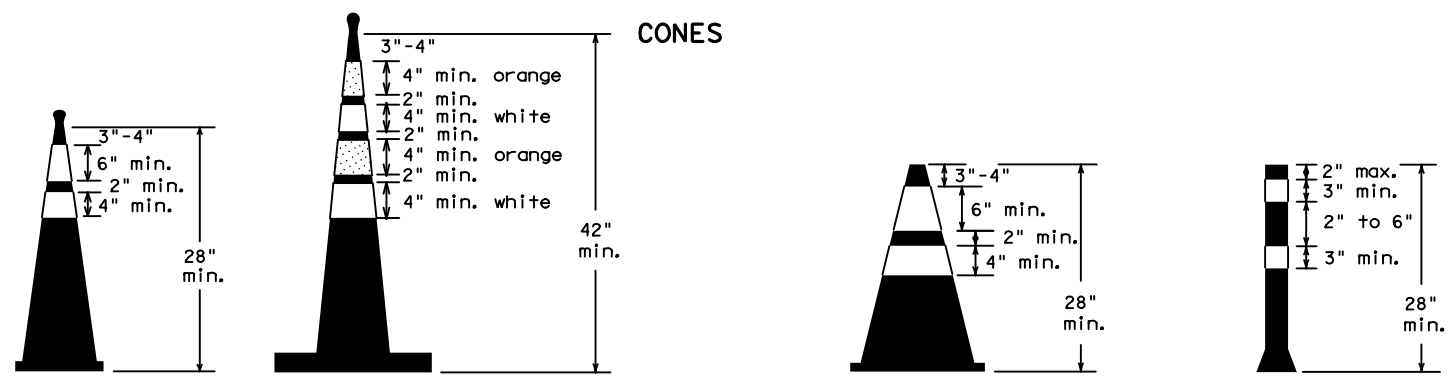
PLAN VIEW

Increase number of plastic drums on the side of approaching traffic if the crown width makes it necessary. (minimum of 2 and maximum of 4 drums)

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

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.

CULVERT WIDENING OR OTHER ISOLATED WORK WITHIN THE PROJECT LIMITS



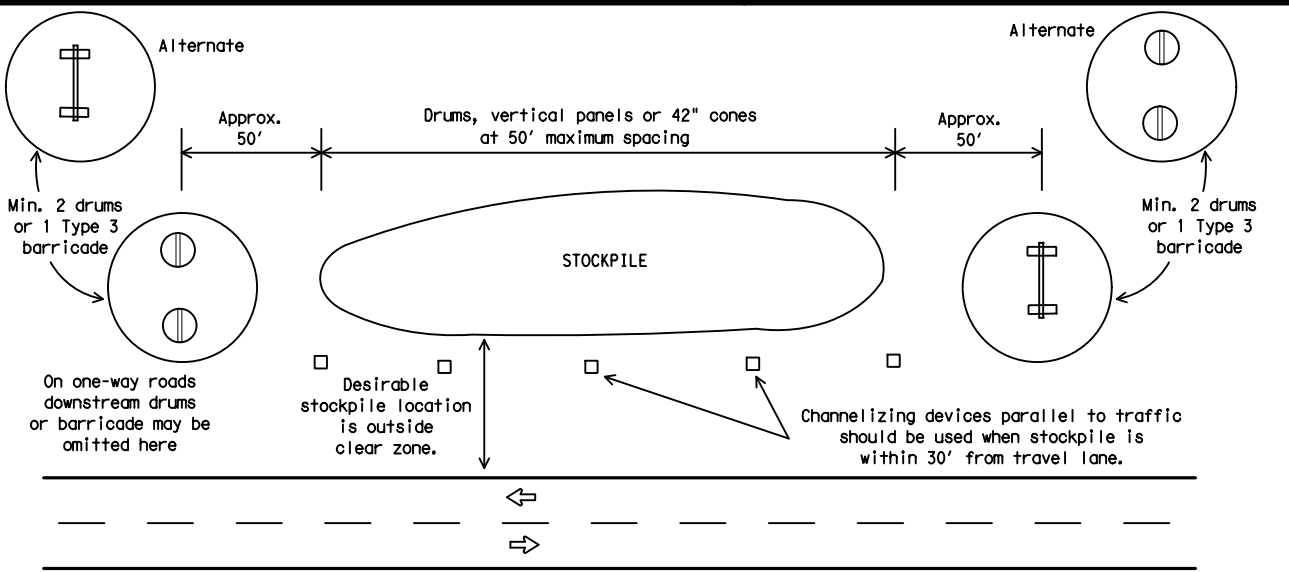
Two-Piece cones

One-Piece cones

Tubular Marker

28" Cones shall have a minimum weight of 9 1/2 lbs.
 42" 2-piece cones shall have a minimum weight of 30 lbs. including base.

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



TRAFFIC CONTROL FOR MATERIAL STOCKPILES



BARRICADE AND CONSTRUCTION CHANNELIZING DEVICES

BC(10)-21

FILE: bc-21.dgn	DN: TxDOT	CK: TxDOT	DW: TxDOT	CR: TxDOT
© TxDOT November 2002	CONT	SECT	JOB	HIGHWAY
REVISIONS	0923	10	021	3RD ST
9-07 8-14	DIST	COUNTY	SHEET NO.	
7-13 5-21	BWD	LAMPASAS	17	

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.

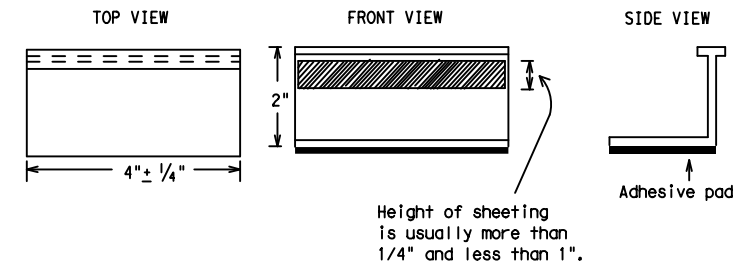
MAINTAINING WORK ZONE PAVEMENT MARKINGS

- 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	0923	10	021	3RD ST
2-98 9-07 5-21	DIST	COUNTY	SHEET NO.	
1-02 7-13	BWD	LAMPASAS	18	
11-02 8-14				

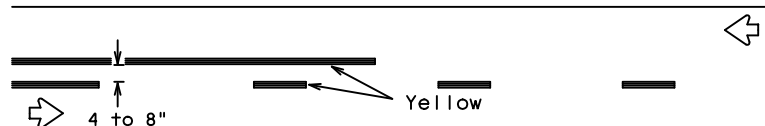
DISCLAIMER: The use of this standard is governed by the "Texas Engineering Practice Act." No warranty of any kind is made by TxDOT for any purpose whatsoever. TxDOT assumes no responsibility for the conversion of this standard to other formats or for incorrect results or damages resulting from its use.

DATE: 7/19/2024 12:21:07 PM
FILE: R:\1005000-1005999\1005472.03\04_DOCUMENTS\DESIGN\Plan_Set\2_Traffic Control\Standards\bc-21.dgn

PAVEMENT MARKING PATTERNS

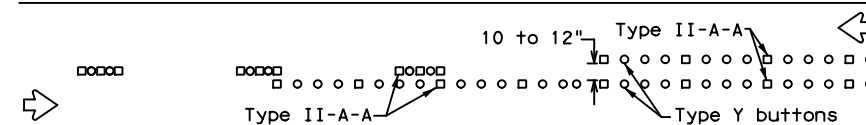


REFLECTORIZED PAVEMENT MARKINGS - PATTERN A

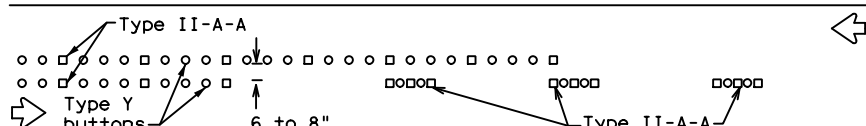


REFLECTORIZED PAVEMENT MARKINGS - PATTERN B

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



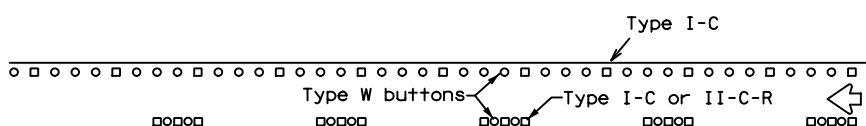
RAISED PAVEMENT MARKERS - PATTERN B

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.



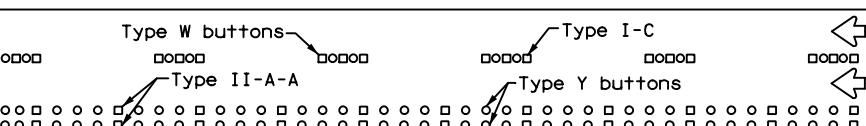
RAISED PAVEMENT MARKERS

EDGE & LANE LINES FOR DIVIDED HIGHWAY



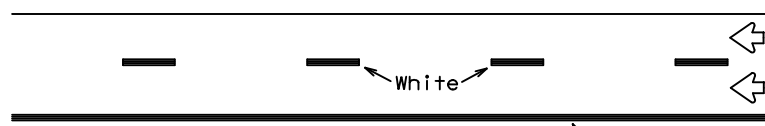
REFLECTORIZED PAVEMENT MARKINGS

Prefabricated markings may be substituted for reflectORIZED pavement markings.



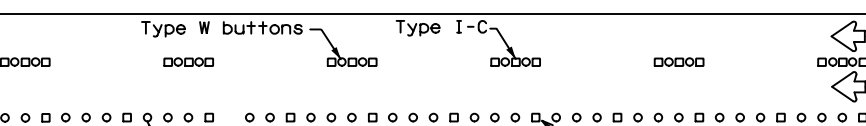
RAISED PAVEMENT MARKERS

LANE & CENTER LINES FOR MULTILANE UNDIVIDED HIGHWAYS



REFLECTORIZED PAVEMENT MARKINGS

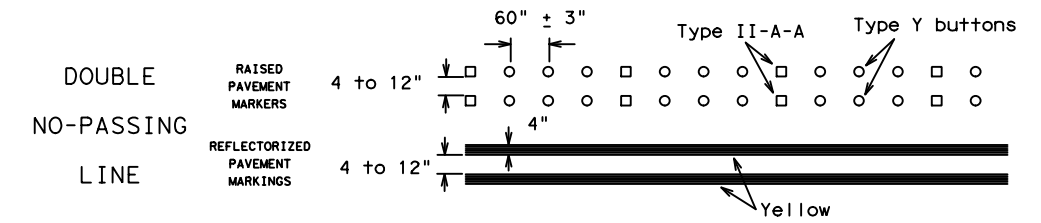
Prefabricated markings may be substituted for reflectORIZED pavement markings.



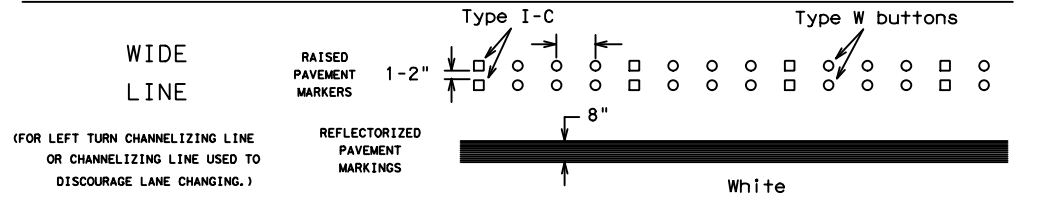
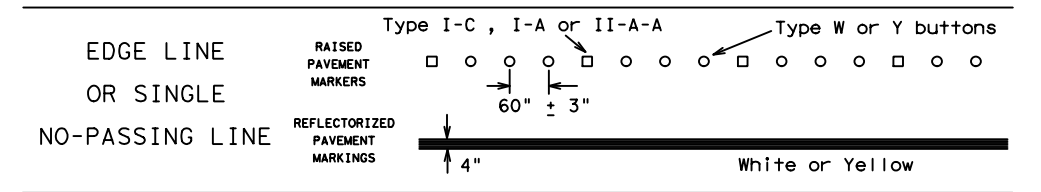
RAISED PAVEMENT MARKERS

TWO-WAY LEFT TURN LANE

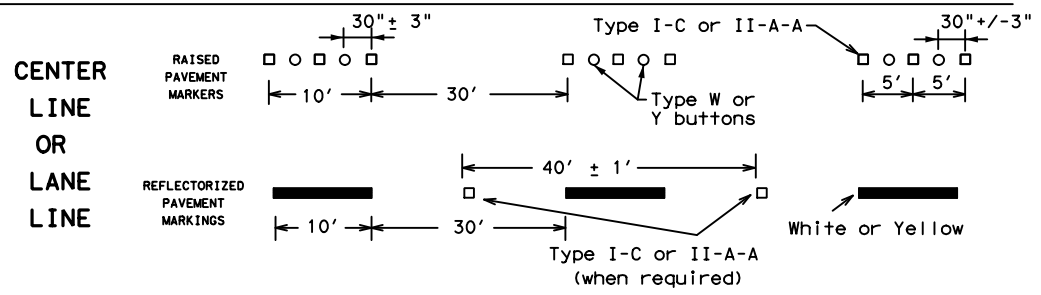
STANDARD WORK ZONE PAVEMENT MARKINGS DETAILS



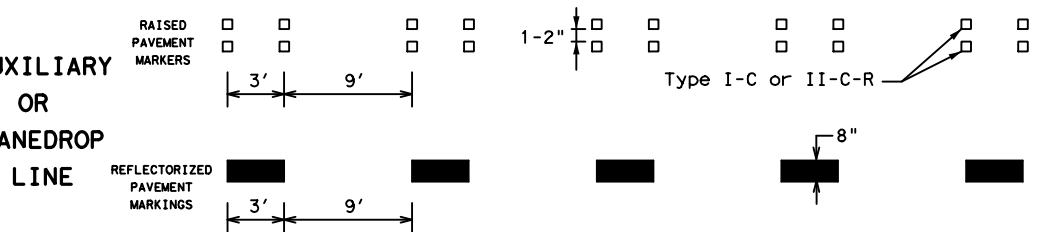
SOLID LINES



BROKEN LINES

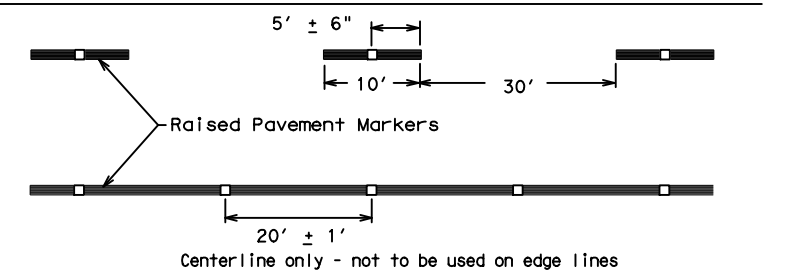


AUXILIARY OR LANEDROP LINE



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

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

FILE: bc-21.dgn	DN: TxDOT	CK: TxDOT	DW: TxDOT	CK: TxDOT
©TxDOT February 1998	CONT	SECT	JOB	HIGHWAY
REVISIONS	0923	10	021	3RD ST
1-97 9-07 5-21	DIST	COUNTY	SHEET NO.	
2-98 7-13	BWD	LAMPASAS	19	
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: 7/19/2024 12:21:07 PM
 FILE: R:\1005000-1005999\1005472_03\04_DOCUMENTS\DESIGN\Plan_Set\2_Traffic Control\Standards\bc-21.dgn

CDC
DWC
CDC
DWC

DATE: 6/13/2024 10:26:08 AM
FILE: S:\2023\2320055-BWD BRIDGES PGALCADD\3RD STREET SAN SABA TX\MRF0923_10_021_3rd St @ Burleson Creek_SCM.dgn

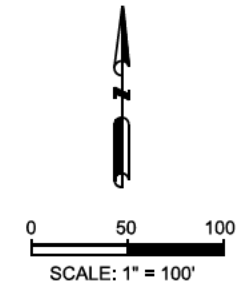
CONTROL MONUMENTATION TABLE						
POINT	STATION	OFFSET	NORTHING (N)	EASTING (E)	ELEV.	DESCRIPTION
CP-1	11+36.22	28.00'	10,359,959.87	2,973,200.27	1,014.11'	FND 5/8" IRwTxDOT CAP
CP-2	13+52.41	-23.80'	10,360,176.43	2,973,244.05	1,011.89'	FND 5/8" IRwTxDOT CAP
CP-3	N/A	N/A	10,360,714.51	2,973,373.06	1,010.09'	FND 5/8" IRwTxDOT CAP
CP-4	N/A	N/A	10,360,693.38	2,973,416.42	1,009.29'	SET 5/8" IRwTxDOT CAP
CP-6	14+32.79	1.09'	10,360,250.03	2,973,279.65	1,012.34'	SET 5/8" IRwTxDOT CAP
CP-5	16+54.19	-14.72'	10,360,473.07	2,973,292.97	1,009.77'	SET 5/8" IRwTxDOT CAP

CONTROL MONUMENT INVERSE			
FROM	TO	BEARING	DISTANCE
CP-1	*CP-2	N 11° 25' 40" E	220.94'
CP-2	CP-6	N 25° 48' 49" E	81.76'
CP-6	CP-5	N 03° 25' 09" E	223.04'
CP-5	CP-4	N 29° 15' 50" E	252.53'
CP-4	CP-3	N 64° 01' 03" W	48.24'

LINE DATA		
LINE	BEARING	LENGTH
L1	N 44° 36' 20" E	11.34'
L2	N 24° 58' 48" E	71.86'
L3	N 05° 39' 04" E	161.82'
L4	N 22° 03' 43" E	93.42'

- NOTES:
- ALL BEARINGS AND COORDINATES ARE BASED ON THE TEXAS COORDINATE SYSTEM, CENTRAL ZONE (4203), NORTH AMERICAN DATUM OF 1983 (NAD 83), (2011), EPOCH 2010.00, ALL DISTANCES AND COORDINATES SHOWN HEREON ARE SURFACE VALUES AND MAY BE CONVERTED TO GRID BY DIVIDING BY THE SURFACE ADJUSTMENT FACTOR OF 1.00012 FOR LAMPASAS COUNTY, TEXAS.
 - HORIZONTAL CONTROL WAS DERIVED FROM MULTIPLE GPS OBSERVATIONS UTILIZING TxDOT RTN (VRS). HORIZONTAL SURVEY METHOD: TxDOT RTN
 - ALL ELEVATIONS HEREON ARE REFERENCED TO THE NORTH AMERICAN VERTICAL DATUM OF 1988 (NAVD 88).
 - THE ELEVATION OF THE EXISTING PROVIDED TxDOT CONTROL MONUMENT NO. 2 WAS MELD FOR VERTICAL CONTROL (NAVD88). VERTICAL SURVEY METHOD: DIGITAL LEVELING
 - FIELD SURVEYS WERE PERFORMED BETWEEN JUNE, 2023 AND AUGUST, 2023.
 - THIS SURVEY CONTROL INFORMATION HAS BEEN ACCEPTED AND INCORPORATED INTO THIS PS&E.
 - UNIT OF MEASURE IS U.S. SURVEY FEET.

THE CONTROL POINTS SHOWN HEREIN WERE DETERMINED BY A SURVEY MADE ON THE GROUND UNDER MY SUPERVISION AND REPRESENTS AN UPDATE TO SURVEY CONTROL PREVIOUSLY ESTABLISHED AND PROVIDED BY TxDOT.
SURVEY DATE: AUGUST, 2023



C3
PI STATION = 16+49.40
DELTA = 16° 24' 38.59" (RT)
DEGREE OF CURVE = 09° 32' 57.47"
TANGENT = 86.52
LENGTH = 171.85
RADIUS = 600.00
PC STATION = 15+62.88
PT STATION = 17+34.73

C2
PI STATION = 13+45.43
DELTA = 19° 19' 43.68" (LT)
DEGREE OF CURVE = 17° 12' 21.38"
TANGENT = 56.71
LENGTH = 112.34
RADIUS = 333.00
PC STATION = 12+88.72
PT STATION = 14+01.06

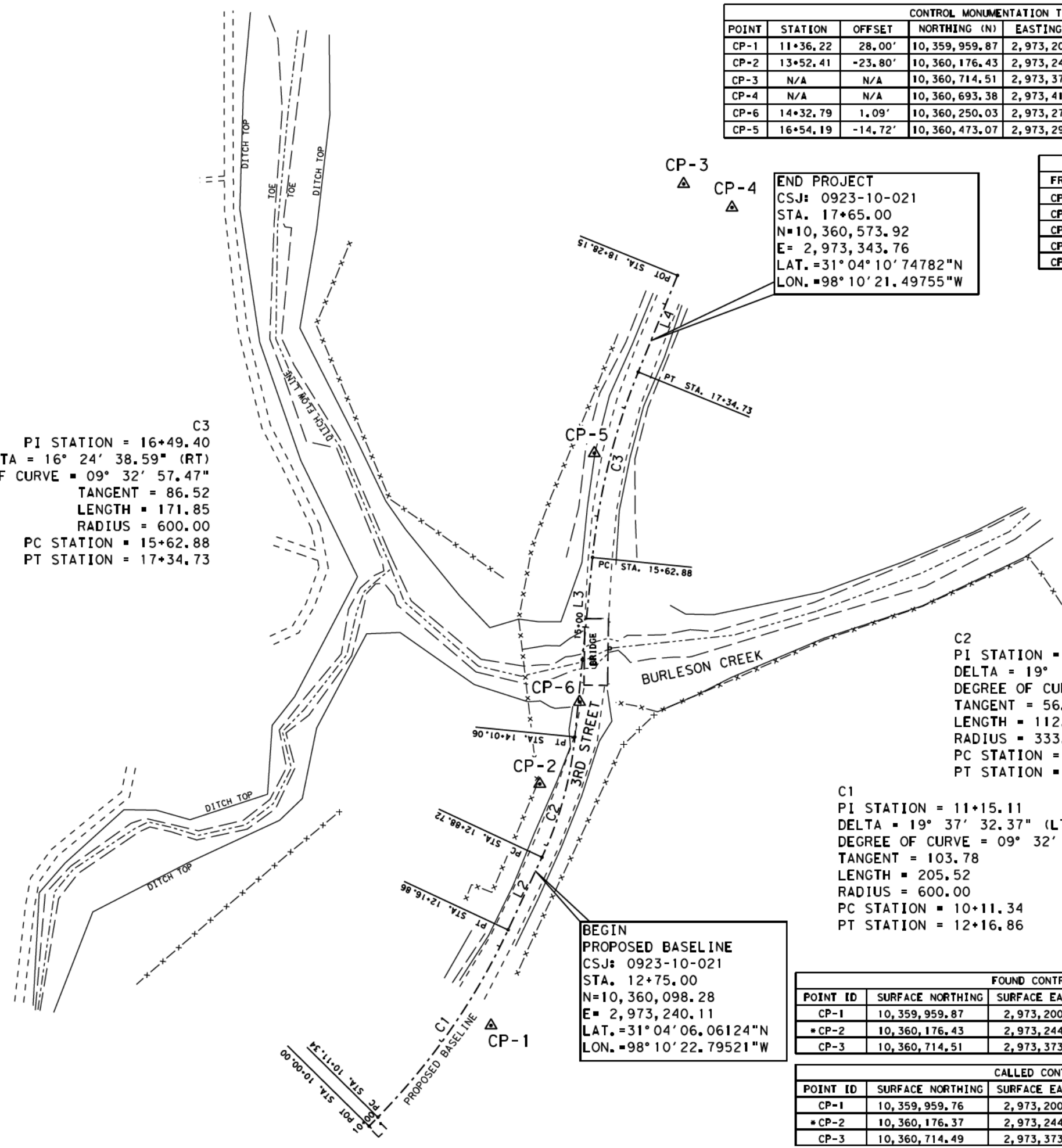
C1
PI STATION = 11+15.11
DELTA = 19° 37' 32.37" (LT)
DEGREE OF CURVE = 09° 32' 57.47"
TANGENT = 103.78
LENGTH = 205.52
RADIUS = 600.00
PC STATION = 10+11.34
PT STATION = 12+16.86

BEGIN
PROPOSED BASELINE
CSJ: 0923-10-021
STA. 12+75.00
N=10,360,098.28
E= 2,973,240.11
LAT.=31° 04' 06.06124"N
LON.=98° 10' 22.79521"W

FOUND CONTROL				
POINT ID	SURFACE NORTHING	SURFACE EASTING	ELEVATION	DESCRIPTION
CP-1	10,359,959.87	2,973,200.27	1,014.11'	FND 5/8" IRwTxDOT CAP
*CP-2	10,360,176.43	2,973,244.05	1,011.89'	FND 5/8" IRwTxDOT CAP
CP-3	10,360,714.51	2,973,373.06	1,010.09'	FND 5/8" IRwTxDOT CAP

CALLED CONTROL				
POINT ID	SURFACE NORTHING	SURFACE EASTING	ELEVATION	DESCRIPTION
CP-1	10,359,959.76	2,973,200.33	1,014.09'	FND 5/8" IRwTxDOT CAP
*CP-2	10,360,176.37	2,973,244.03	1,011.89'	FND 5/8" IRwTxDOT CAP
CP-3	10,360,714.49	2,973,373.01	1,010.12'	FND 5/8" IRwTxDOT CAP

* INDICATES HOLDING CALLED ELEVATION OF CP-2 FOR VERTICAL CONTROL



THIS SURVEY WAS PERFORMED UNDER MY SUPERVISION.

Jacob J. Luper
06/12/2024
REGISTERED PROFESSIONAL LAND SURVEYOR
TEXAS REGISTRATION NO. 6606

NO.	DATE	REVISION	APPROV.

Texas Department of Transportation

LANDTECH
2525 North Loop West, Suite 300,
Houston, Texas 77008
T: 713-861-7068 F: 713-861-4331
TSPS Registration No. F-1364; TSPS Registration No. 10019100

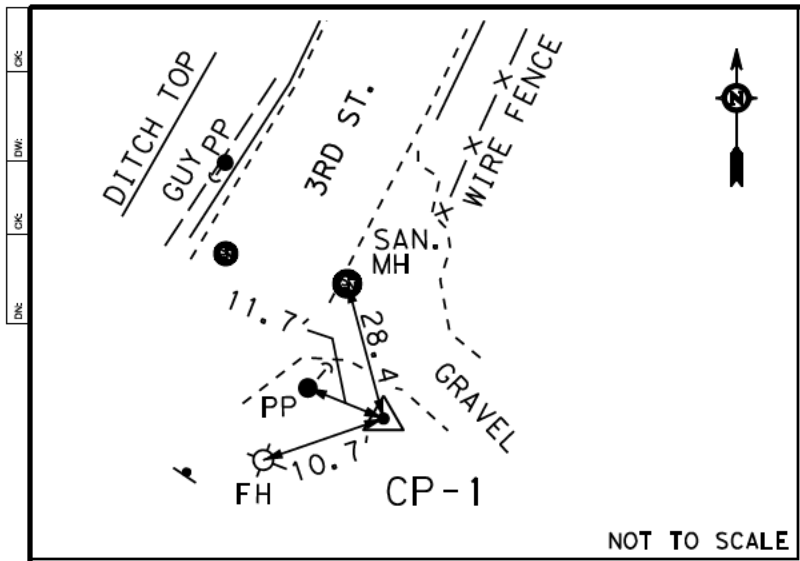
3RD ST @ BURLESON CREEK

SURVEY CONTROL INDEX

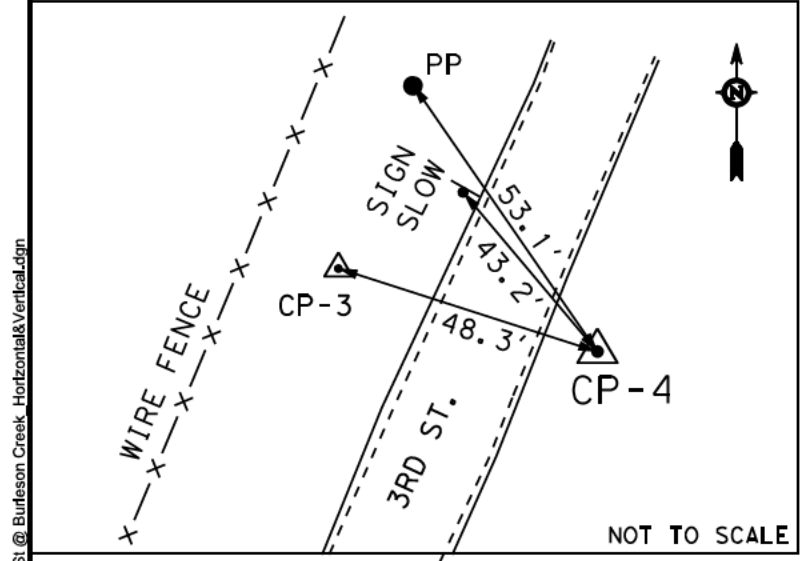
SHEET 1 OF 1

CONT	SECT	JOB	HIGHWAY
0923	10	021	3RD ST
DIST	COUNTY	SHEET NO.	
BWD	LAMPASAS	20	

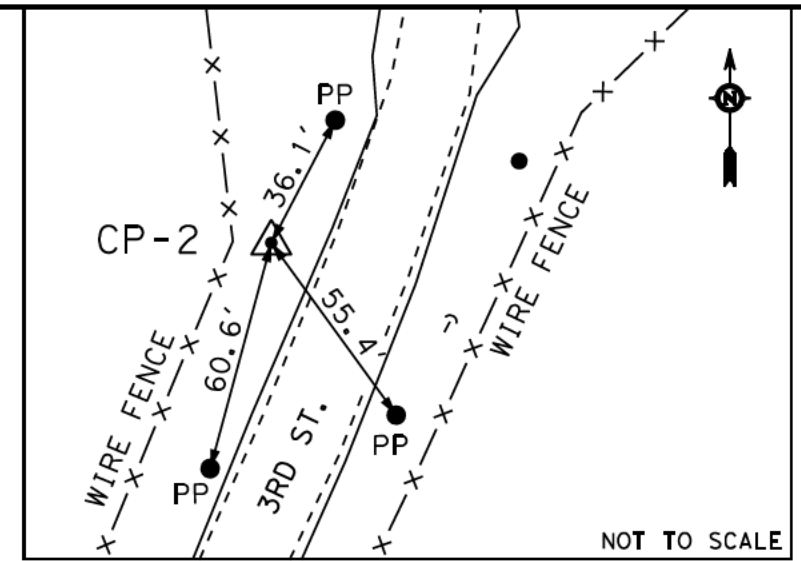
DATE: 6/13/2024 10:30:50 AM
 FILE: S:\2023\2320055-BWD BRIDGES PGALCADD\3RD STREET SAN SABA TX\MRF0923_10_021_3rd St @ Burleson Creek_Horizontal&Vertical.dgn



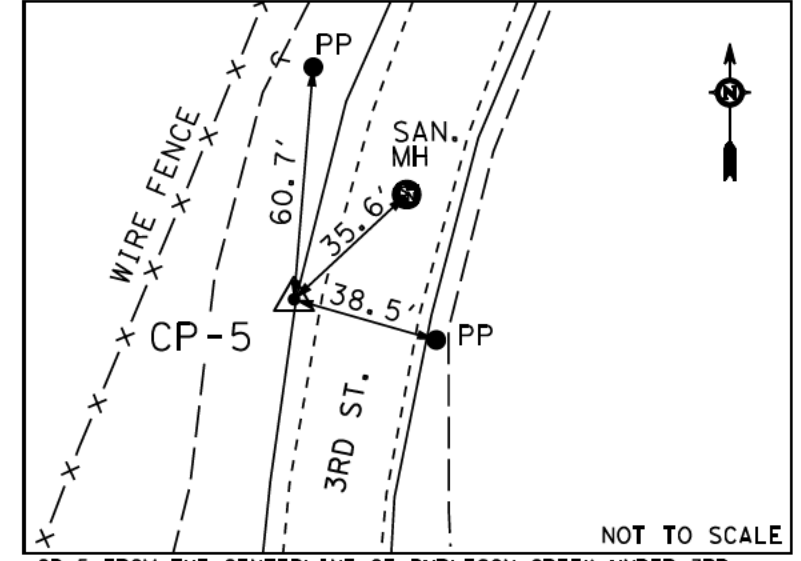
CP-1 FROM THE CENTERLINE OF BURLESON CREEK UNDER 3RD STREET BRIDGE, TRAVEL SOUTH ALONG 3RD ST. APPROXIMATELY 358 FEET. POINT 1 IS ON THE EAST SIDE OF THE ROAD +/- 16 FT. EASTERLY FROM THE EDGE OF GRAVEL ROAD.



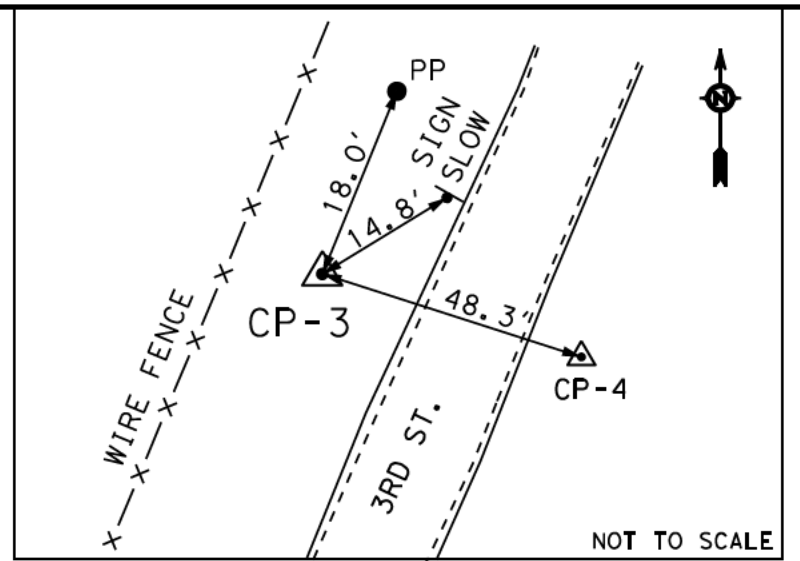
CP-4 FROM THE CENTERLINE OF BURLESON CREEK UNDER 3RD STREET BRIDGE, TRAVEL NORTH ALONG 3RD ST. APPROXIMATELY 411 FEET. POINT 4 IS ON THE EAST SIDE OF THE ROAD



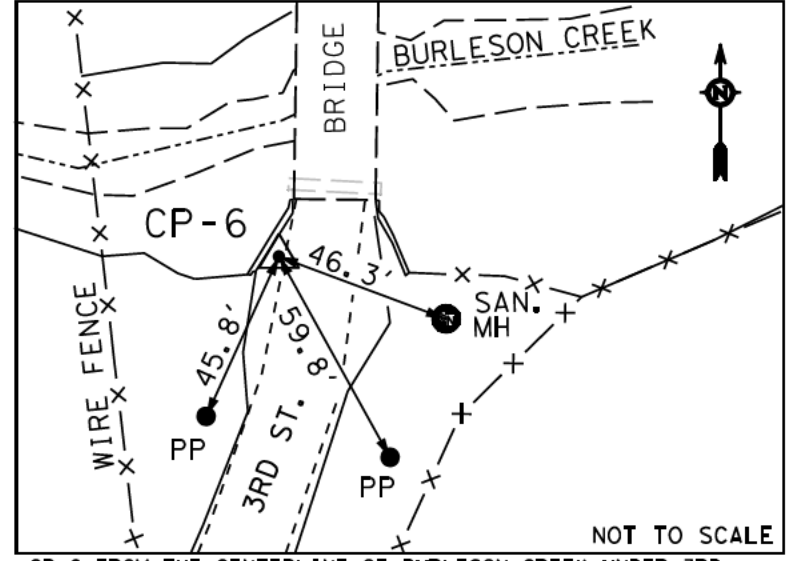
CP-2 FROM THE CENTERLINE OF BURLESON CREEK UNDER 3RD STREET BRIDGE, TRAVEL SOUTH ALONG 3RD ST. APPROXIMATELY 143 FEET. POINT 2 IS ON THE WEST SIDE OF THE ROAD +/- 15 FT. WESTERLY FROM THE EDGE OF GRAVEL ROAD.



CP-5 FROM THE CENTERLINE OF BURLESON CREEK UNDER 3RD STREET BRIDGE, TRAVEL NORTH ALONG 3RD ST. APPROXIMATELY 166 FEET. POINT 5 IS ON THE WEST SIDE OF THE ROAD +/- 7 FT. WESTERLY FROM THE EDGE OF GRAVEL ROAD.



CP-3 FROM THE CENTERLINE OF BURLESON CREEK UNDER 3RD STREET BRIDGE, TRAVEL NORTH ALONG 3RD ST. APPROXIMATELY 421 FEET. POINT 3 IS ON THE WEST SIDE OF THE ROAD



CP-6 FROM THE CENTERLINE OF BURLESON CREEK UNDER 3RD STREET BRIDGE, TRAVEL SOUTH ALONG 3RD ST. APPROXIMATELY 58 FEET. POINT 6 IS ON THE WEST SIDE OF THE ROAD +/- 1.7 FT. WESTERLY FROM THE EDGE OF GRAVEL ROAD.

- NOTES:
1. ALL BEARINGS AND COORDINATES ARE BASED ON THE TEXAS COORDINATE SYSTEM, CENTRAL ZONE (4203), NORTH AMERICAN DATUM OF 1983 (NAD 83), (2011), EPOCH 2010.00. ALL DISTANCES AND COORDINATES SHOWN HEREON ARE SURFACE VALUES AND MAY BE CONVERTED TO GRID BY DIVIDING BY THE SURFACE ADJUSTMENT FACTOR OF 1.00012 FOR LAMPASAS COUNTY, TEXAS.
 2. HORIZONTAL CONTROL WAS DERIVED FROM MULTIPLE GPS OBSERVATIONS UTILIZING I+DOT RTN (VRS). HORIZONTAL SURVEY METHOD: I+DOT RTN
 3. ALL ELEVATIONS HEREON ARE REFERENCED TO THE NORTH AMERICAN VERTICAL DATUM OF 1988 (NAVD 88).
 4. THE ELEVATION OF THE EXISTING PROVIDED I+DOT CONTROL MONUMENT NO. 2 WAS HELD FOR VERTICAL CONTROL (NAVD88). VERTICAL SURVEY METHOD: DIGITAL LEVELING
 5. FIELD SURVEYS WERE PERFORMED BETWEEN JUNE, 2023 AND AUGUST, 2023.
 6. THIS SURVEY CONTROL INFORMATION HAS BEEN ACCEPTED AND INCORPORATED INTO THIS PS&E.
 7. UNIT OF MEASURE IS U.S. SURVEY FEET.
- THE CONTROL POINTS SHOWN HEREIN WERE DETERMINED BY A SURVEY MADE ON THE GROUND UNDER MY SUPERVISION AND REPRESENTS AN UPDATE TO SURVEY CONTROL PREVIOUSLY ESTABLISHED AND PROVIDED BY I+DOT.
 SURVEY DATE: AUGUST, 2023

NOT TO SCALE

THIS SURVEY WAS PERFORMED UNDER MY SUPERVISION.

Jacob J. Luper
 REGISTERED PROFESSIONAL LAND SURVEYOR
 TEXAS REGISTRATION NO. 6606

06 / 12 / 2024

NO.	DATE	REVISION	APPROV.

Texas Department of Transportation

LANDTECH
 2525 North Loop West, Suite 300,
 Houston, Texas 77008
 T: 713-861-7068 F: 713-861-4331
 TBPE Registration No. F-1384; TBPS Registration No. 10019100

3RD ST @ BURLESON CREEK

HORIZONTAL AND VERTICAL CONTROL

SHEET 1 OF 1

CONT	SECT	JOB	HIGHWAY
0923	10	021	3RD ST
DBT	COUNTY	SHEET NO.	
BWD	LAMPASAS	21	

DATE: 7/19/2024 12:21:08 PM
 FILE: R:\1005000-1005999\1005472.03\04_DOCUMENTS\DESIGN\Plan_Set\3_Roadway\3RD_HAD_01.dgn

HORIZONTAL ALIGNMENT REPORT

Alignment name: 3RD ST
 Alignment description:
 Report Created: Friday, January 19, 2024
 Time: 9:29:04 AM

	STATION	X	Y
POT	10+00.000 R1	2973090.898	10359869.55
PC	10+11.336 R1	2973098.859	10359877.62
Tangential Direction: N44°36'20.250"E			
Tangential Length: 11.336			
PC	10+11.336 R1	2973098.859	10359877.62
PI	11+15.112 R1	2973171.733	10359951.51
CC		2972671.685	10360298.96
PT	12+16.855 R1	2973215.558	10360045.57
Radius: 600			
Delta: 19°37'32.367" Left			
Degree of Curvature(Arc): 09°32'57.468"			
Length: 205.519			
Tangent: 103.776			
Chord: 204.516			
Middle Ordinate: 8.778			
External: 8.908			
Tangent Back Direction: N44°36'20.250"E			
Radial Direction: S45°23'39.750"E			
Chord Direction: N34°47'34.066"E			
Radial Direction: S65°01'12.117"E			
Tangent Ahead Direction: N24°58'47.883"E			
PT	12+16.855 R1	2973215.558	10360045.57
PC	12+88.720 R1	2973245.906	10360110.72
Tangential Direction: N24°58'47.883"E			
Tangential Length: 71.864			
PC	12+88.720 R1	2973245.906	10360110.72
PI	13+45.428 R1	2973269.854	10360162.12
CC		2972944.057	10360251.34
PT	14+01.058 R1	2973275.438	10360218.55
Radius: 333			
Delta: 19°19'43.679" Left			
Degree of Curvature(Arc): 17°12'21.383"			
Length: 112.338			
Tangent: 56.708			
Chord: 111.806			
Middle Ordinate: 4.726			
External: 4.794			
Tangent Back Direction: N24°58'47.883"E			
Radial Direction: S65°01'12.117"E			
Chord Direction: N15°18'56.043"E			
Radial Direction: S84°20'55.796"E			
Tangent Ahead Direction: N05°39'04.204"E			
PT	14+01.058 R1	2973275.438	10360218.55
PC	15+62.880 R1	2973291.373	10360379.59
Tangential Direction: N05°39'04.204"E			
Tangential Length: 161.822			

PC	15+62.880 R1	2973291.373	10360379.59
PI	16+49.398 R1	2973299.893	10360465.69
CC		2973888.457	10360320.5
PT	17+34.733 R1	2973332.39	10360545.87
Radius: 600			
Delta: 16°24'38.594" Right			
Degree of Curvature(Arc): 09°32'57.468"			
Length: 171.853			
Tangent: 86.519			
Chord: 171.266			
Middle Ordinate: 6.142			
External: 6.206			
Tangent Back Direction: N05°39'04.204"E			
Radial Direction: S84°20'55.796"E			
Chord Direction: N13°51'23.501"E			
Radial Direction: S67°56'17.202"E			
Tangent Ahead Direction: N22°03'42.798"E			
PT	17+34.733 R1	2973332.39	10360545.87
POT	18+28.148 R1	2973367.478	10360632.44
Tangential Direction: N22°03'42.798"E			
Tangential Length: 93.416			

NOT TO SCALE



Luis A. Gonzalez 7/20/2024

NO.	DATE	REVISION	APPROV.



PGAL 3131 Briarpark Dr, Suite 200
 Houston, Texas 77042
 TBPE REG. NO. F-2742 (713) 622-1444

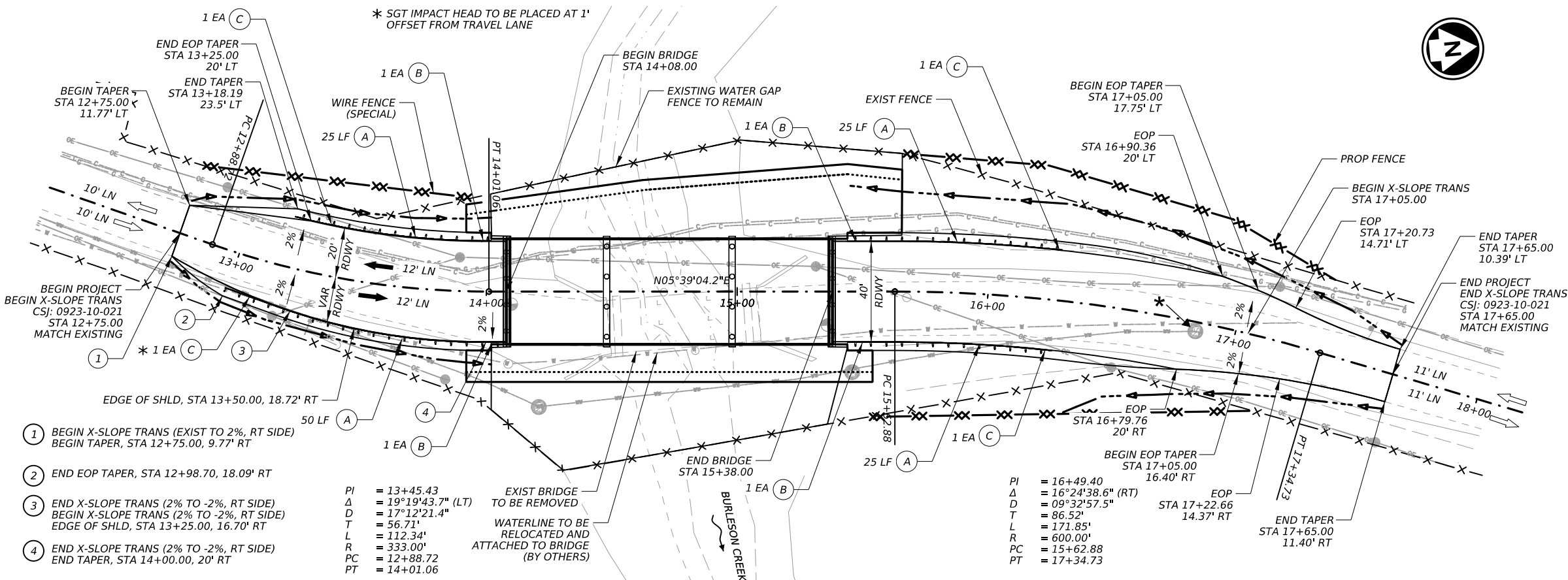
3RD ST @ BURLESON CREEK

HORIZONTAL ALIGNMENT DATA

SHEET 1 OF 1

CONT	SECT	JOB	HIGHWAY
0923	10	021	3RD ST
DIST	COUNTY	SHEET NO.	
BWD	LAMPASAS	22	

CK: DW: CK: DW:



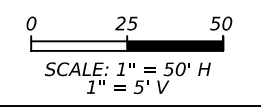
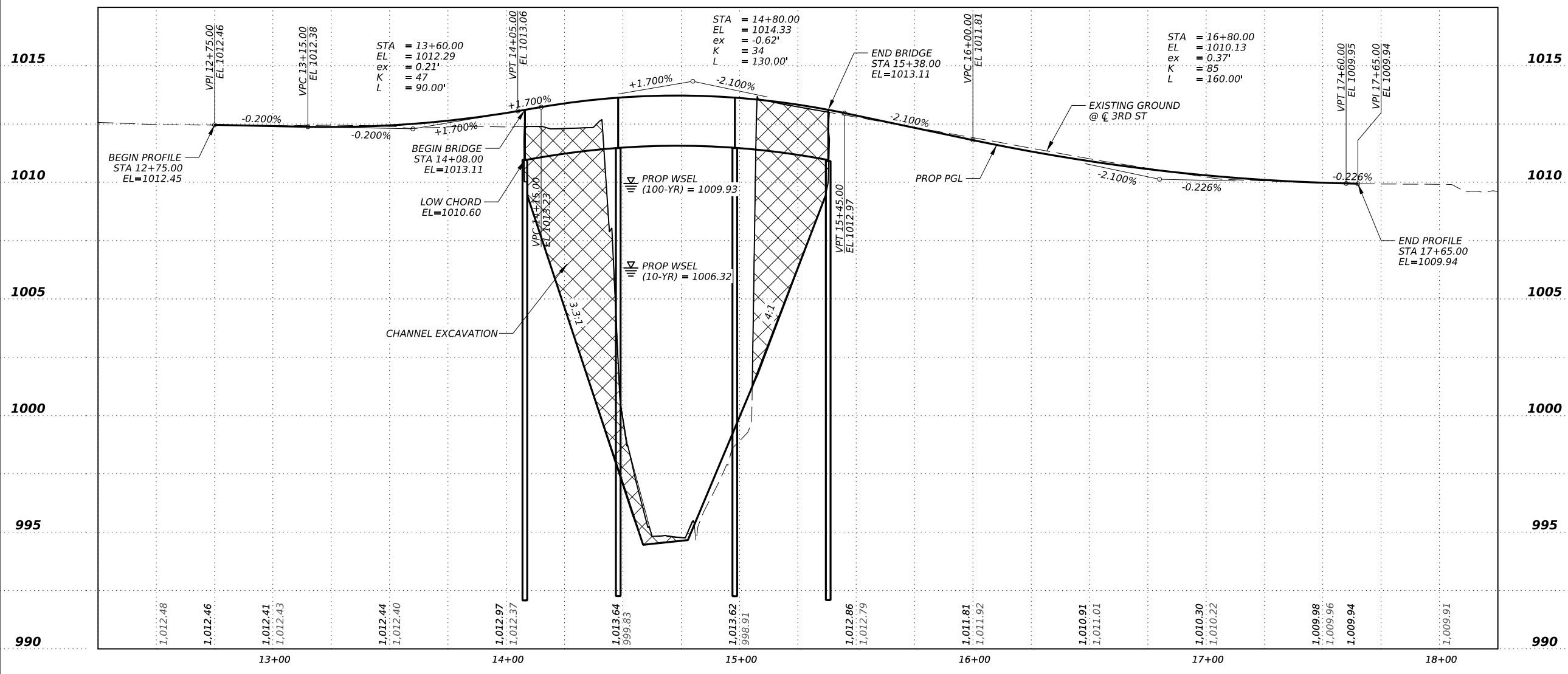
LEGEND

- PROPOSED TRAFFIC FLOW DIRECTION
- EXISTING TRAFFIC FLOW DIRECTION
- MBGF
- MBGF TRANS (TL-2)
- SGT
- DITCH FLOW DIRECTION
- STONE RIPRAP

* EXIST. MH EL = 1010.13
 PROP. MH RIM EL = 1010.38
 WORK IS TO BE DONE BY THE CITY OF LAMPASAS DURING CONSTRUCTION

NOTES

1. CONTRACTOR SHALL LOCATE AND FIELD VERIFY ALL UTILITIES PRIOR TO CONSTRUCTION. UTILITY RELOCATIONS AND ADJUSTMENTS BY OTHERS.



1015
1010
1005
1000
995
990

13+00 14+00 15+00 16+00 17+00 18+00

1,012.48 1,012.46 1,012.41 1,012.43 1,012.44 1,012.40 1,012.97 1,012.37 1,013.64 998.83 1,013.62 998.91 1,012.86 1,012.79 1,011.81 1,011.92 1,010.91 1,010.01 1,010.30 1,010.22 1,009.98 1,009.96 1,009.94 1,009.91

STA = 13+60.00
 EL = 1012.29
 ex = 0.21'
 K = 47
 L = 90.00'

STA = 14+80.00
 EL = 1014.33
 ex = -0.62'
 K = 34
 L = 130.00'

STA = 16+80.00
 EL = 1010.13
 ex = 0.37'
 K = 85
 L = 160.00'

BEGIN PROFILE STA 12+75.00 EL=1012.45

BEGIN BRIDGE STA 14+08.00 EL=1013.11

LOW CHORD EL=1010.60

CHANNEL EXCAVATION

PROP WSEL (100-YR) = 1009.93

PROP WSEL (10-YR) = 1006.32

EXISTING GROUND @ 3RD ST

PROP PGL

END BRIDGE STA 15+38.00 EL=1013.11

END PROFILE STA 17+65.00 EL=1009.94

0 25 50

SCALE: 1" = 50' H
 1" = 5' V

Jos A. Gonzalez 7/20/2024

NO.	DATE	REVISION	APPROV.

Texas Department of Transportation

PG&L 3131 Briarpark Dr, Suite 200
 Houston, Texas 77042
 (713) 622-1444

3RD ST @ BURLESON CREEK

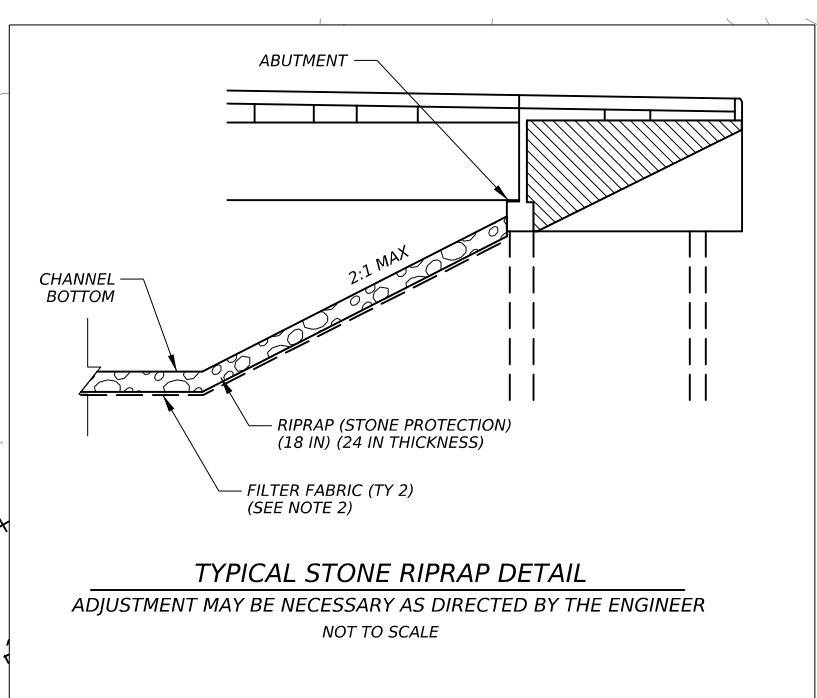
ROADWAY PLAN & PROFILE

SHEET 1 OF 1

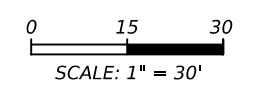
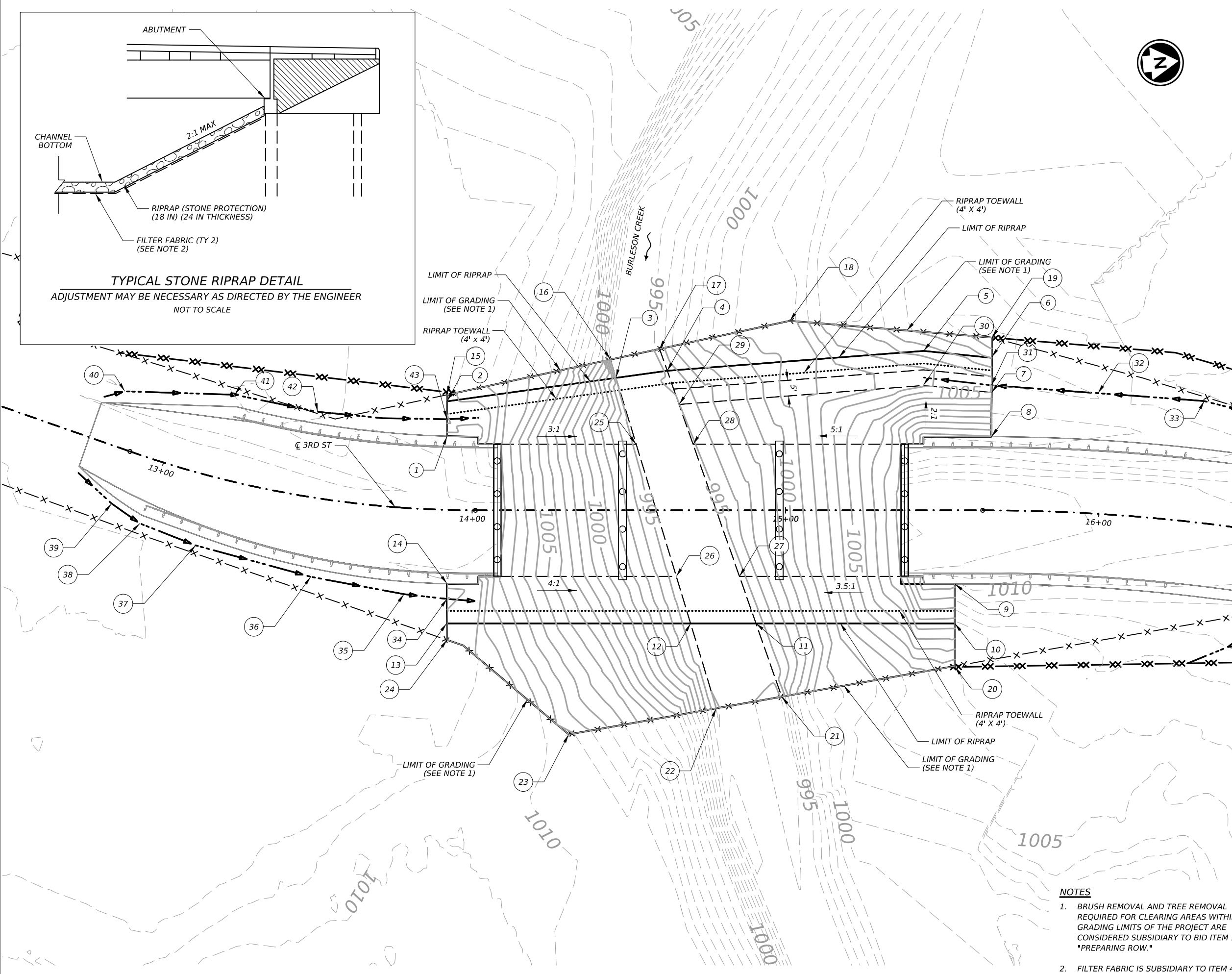
CONT	SECT	JOB	HIGHWAY
0923	10	021	3RD ST
DIST	COUNTY	SHEET NO.	
BWD	LAMPASAS	23	

DATE: 7/19/2024 12:21:18 PM
 FILE: R:\1005000-1005999\1005472.03\04_DOCUMENTS\DESIGN\Plan_Set\3_Roadway\3RD_RPP_01.dgn

DATE: 7/19/2024 12:21:22 PM
 FILE: R:\1005000-1005999\1005472.03\04_DOCUMENTS\DESIGN\Plan_Set\3_Roadway\3RD_GRA_01.dgn



POINT TABLE				
POINT	DESCRIPTION	STATION	OFFSET	ELEV
1	LIMIT OF RIPRAP	13+92.00	23.50' LT	1012.38
2	LIMIT OF RIPRAP	13+90.95	34.59' LT	1011.30
3	LIMIT OF RIPRAP	14+45.92	42.23' LT	994.84
4	LIMIT OF RIPRAP	14+62.26	44.51' LT	995.07
5	LIMIT OF RIPRAP	15+44.07	50.83' LT	1005.49
6	LIMIT OF RIPRAP	15+65.61	48.63' LT	1006.97
7	LIMIT OF RIPRAP	15+65.61	37.57' LT	1005.01
8	LIMIT OF RIPRAP	15+65.60	23.50' LT	1012.06
9	LIMIT OF RIPRAP	15+54.00	23.50' RT	1012.31
10	LIMIT OF RIPRAP	15+54.00	36.08' RT	1008.63
11	LIMIT OF RIPRAP	14+90.56	36.08' RT	994.32
12	LIMIT OF RIPRAP	14+69.71	36.08' RT	994.18
13	LIMIT OF RIPRAP	13+92.89	36.19' RT	1012.40
14	LIMIT OF RIPRAP	13+92.00	23.50' RT	1012.38
15	LIMIT OF GRADING	13+90.88	36.70' LT	1011.25
16	LIMIT OF GRADING	14+44.13	48.12' LT	994.89
17	LIMIT OF GRADING	14+59.81	51.50' LT	995.14
18	LIMIT OF GRADING	15+01.35	60.44' LT	1001.52
19	LIMIT OF GRADING	15+65.61	55.11' LT	1008.37
20	LIMIT OF GRADING	15+54.00	49.97' RT	1004.34
21	LIMIT OF GRADING	14+98.78	59.47' RT	994.11
22	LIMIT OF GRADING	14+77.94	63.16' RT	993.95
23	LIMIT OF GRADING	14+30.80	71.49' RT	1008.82
24	LIMIT OF GRADING	13+93.00	41.46' RT	1012.48
25	LIMIT OF GRADING	14+52.34	21.08' LT	994.66
26	LIMIT OF GRADING	14+65.15	21.08' RT	994.31
27	LIMIT OF GRADING	14+85.30	21.08' RT	994.46
28	LIMIT OF GRADING	14+70.49	21.08' LT	994.85
29	LIMIT OF GRADING	14+66.04	33.64' LT	994.97
30	LIMIT OF GRADING	15+43.94	39.79' LT	1003.83
31	DITCH FL	15+65.54	37.52' LT	1005.01
32	DITCH FL	15+97.48	38.41' LT	1006.08
33	DITCH FL	16+29.42	38.77' LT	1010.82
34	DITCH FL	13+92.72	28.33' RT	1010.87
35	DITCH FL	13+80.00	27.49' RT	1011.13
36	DITCH FL	13+52.03	25.12' RT	1011.66
37	DITCH FL	13+16.57	22.56' RT	1011.89
38	DITCH FL	12+98.70	20.76' RT	1011.95
39	DITCH FL	12+88.72	17.64' RT	1011.98
40	DITCH FL	12+80.82	17.55' LT	1010.94
41	DITCH FL	13+16.57	27.07' LT	1010.82
42	DITCH FL	13+45.98	27.25' LT	1010.72
43	DITCH FL	13+91.14	28.92' LT	1010.56



Jos A. Gonzalez 7/20/2024

NO.	DATE	REVISION	APPROV.

Texas Department of Transportation
 PG&L
 TBPE REG. NO. F-2742
 3131 Briarpark Dr, Suite 200
 Houston, Texas 77042
 (713) 622-1444

3RD ST @ BURLESON CREEK

RIPRAP & GRADING LAYOUT

SHEET 1 OF 1

CONT	SECT	JOB	HIGHWAY
0923	10	021	3RD ST
DIST	COUNTY	SHEET NO.	
BWD	LAMPASAS	24	

- NOTES**
- BRUSH REMOVAL AND TREE REMOVAL REQUIRED FOR CLEARING AREAS WITHIN THE GRADING LIMITS OF THE PROJECT ARE CONSIDERED SUBSIDIARY TO BID ITEM 100 *PREPARING ROW.*
 - FILTER FABRIC IS SUBSIDIARY TO ITEM 432.

GENERAL NOTES

WIRE FENCE (SPECIAL) TO BE INSTALLED AS DIRECTED BY THE ENGINEER AND IS ESTIMATED AT 108 LF.

FIELD VERIFY WIRE AND POST TYPE PRIOR TO CONSTRUCTING.

LINE, CORNER AND PULL POSTS SHALL BE DRIVEN 5 FT INTO EXISTING GROUND.

ALL LINE POSTS, CORNER AND PULL POSTS, AND BRACES, SHALL BE STEEL PIPE WITH A MINIMUM OF 2" STD. PIPE (2.375" O.D., 0.154" WALL THICKNESS) WITH A 11#4" STD. PIPE BRACE (1.660" O.D., 0.140" WALL THICKNESS), WITH A 2"X2"X1/4" ANGLE, OR OTHER AS APPROVED BY THE ENGINEER.



TYPICAL LINE POST



TYPICAL LINE POST



TYPICAL T-POST



TYPICAL T-POST



TYPICAL CORNER/PULL POST



07/24/2024

THIRD ST.
FENCE
DETAILS



CONT	SECT	JOB	HIGHWAY
0923	10	021	THIRD ST.
DIST	COUNTY		SHEET NO.
BWD	LAMPASAS		25

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: 7/19/2024 12:21:23 PM
 FILE: R:\1005000-1005999\1005472.03\04_DOCUMENTS\DESIGN\Plan_Set\3. Roadway\Standards\dom1-20.dgn

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 BRFL = 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				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	INSTL OM ASSM (OM-XX) (XXXX)XXX(XX) TYPE OF OBJECT MARKER 1, 2, 3, or 4 NUMBER OF REFLECTORS OR DIRECTION X = 3-Size 2 reflector units (Type 2 only) Y = 1-Size 3 reflector unit (Type 2 only) Z = 3-Size 1 or 1-Size 4 reflector unit(s) (Type 2 only) L = Left Side (Type 3 Object Marker only) R = Right Side (Type 3 Object Marker only) C = Center (Type 3 Object Marker only) TYPE OF POST WC = Wing Channel Post WFLX = White Flexible Post TWT = Thin Walled Tubing TYPE OF MOUNT GND = Embedded (drivable) SRF = Surface Mount WAS = Wedge Anchor Steel WAP = Wedge Anchor Plastic DIRECTION If Required BI = Bi-Directional
					MOUNT TYPE	GND	GND, SRF	GND	GND, SRF	

OBJECT MARKERS								
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
SHEETING	Yellow-Type B _{FL} or C _{FL} Sheeting	Yellow - Type B or C Sheeting			Alternating acrylic black and retroreflective yellow - Type B _{FL} or C _{FL} Sheeting			Red -Type B _{FL} or C _{FL} Sheeting
POST TYPE	TWT	WC	WC	WFLX	TWT			TWT
MOUNT TYPE	WAS, WAP	GND	GND	GND, SRF	WAS, WAP			WAS, WAP

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

BARRIER REFLECTORS (BRF)			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			
									1. Barrier reflectors shall meet the requirements of DMS 8600. 2. Approved Barrier Reflectors are listed on the "Barrier Reflectors" Material Producer List at: www.txdot.gov.		
SHEETING	Yellow, White, Red			SIZE (W x L)	18" x 24" (Conventional)	24" x 30" (Conventional Oversize)	30" x 36" (Expressway)	36" x 48" (Freeway)		SIZE (W x L)	48" x 24" (Conventional)
NOTE	1. Reflective sheeting shall have a minimum dimension of 3 inches and minimum surface area of 9 square inches.			MOUNTING HEIGHT	4'-0" or 7'-0"		7'-0" Only		MOUNTING HEIGHT	7'-0"	
				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).						

Texas Department of Transportation
Traffic Safety Division Standard

DELINEATOR & OBJECT MARKER MATERIAL DESCRIPTION

D & OM(1)-20

FILE: dom1-20.dgn	DN: TxDOT	CK: TxDOT	DW: TxDOT	CR: TxDOT
© TxDOT August 2004	CONT	SECT	JOB	HIGHWAY
REVISIONS	0923	10	021	3RD ST
10-09 3-15	DIST	COUNTY	SHEET NO.	
4-10 7-20	BWD	LAMPASAS	26	

20A

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: 7/19/2024 12:21:23 PM
 FILE: R:\1005000-1005999\1005472_03\04_DOCUMENTS\DESIGN\Plan_Sets\3. Roadway\Standards\dom2-20.dgn

POST TYPE AND SUPPORT FOUNDATION DETAILS				TYPE OF BARRIER MOUNTS	
WING CHANNEL (WC)	FLEXIBLE POSTS (YFLX, WFLX)		WEDGE ANCHOR SYSTEMS		GUARD FENCE ATTACHMENT
GND	GND	SRF	WAS	WAP	GF1
	<p>EMBEDDED</p> <p>NOTES</p> <ol style="list-style-type: none"> 1. Embedded Wing Channel (WC) post option may be used for Type 2 Object Markers and Delineators only. 2. 1.12 lbs/ft steel per ASTM A 1011 SS Gr. 50, or ASTM A499. 		<p>STEEL</p> <p>NOTE</p> <ol style="list-style-type: none"> 1. Install per manufacturer's recommendations. 		<p>GF2</p>
CONCRETE TRAFFIC BARRIER (CTB)					
<p>GENERAL NOTES</p> <ol style="list-style-type: none"> 1. Place delineators on a section of roadway at a consistent distance from the edge of pavement. 2. Where a restriction prevents consistent placement from the pavement edge, place the affected object markers in line with the innermost edge of the obstruction. 3. When Type 2 object markers and delineators are more than 8'-0" from the edge of the pavement, it may not be possible to maintain a height of approximately 4'-0". If this is the case, place the object marker or delineator as close to the desired height as possible. 4. Install all delineators, object markers and barrier reflectors in accordance with the manufacturer's recommendation. 5. Barrier reflectors should be installed a minimum of 18 inches above the edge of the pavement surface. 6. Diagonal stripes on Type 3 object markers shall slope down toward the intended travel lane. 					

TYPES 1, 3, AND 4 OBJECT MARKERS AND CHEVRONS

NOTE
 Mounting at 4 feet to the bottom of the chevron is permitted for chevrons that will not exceed a height of 6'-6" to the top of the chevron (sizes 24" x 30" and smaller)

CHEVRONS AND ONE DIRECTION LARGE ARROW SIGN

NOTE
 Chevrons 30" x 36" and larger shall be mounted at a height of 7' to the bottom of the chevron. Chevron sign and ONE DIRECTION LARGE ARROW sign (W1-9T) shall be installed per SMD standard sheets and paid under item 644.

DELINEATORS AND TYPE 2 OBJECT MARKERS

See general notes 1, 2 and 3.

Traffic Safety Division Standard

DELINATOR & OBJECT MARKER INSTALLATION

D & OM(2)-20

FILE: dom2-20.dgn	DN: TxDOT	CK: TxDOT	DW: TxDOT	CR: TxDOT
© TxDOT August 2004	CONT	SECT	JOB	HIGHWAY
REVISIONS	0923	10	021	3RD ST
10-09 3-15	DIST	COUNTY	SHEET NO.	
4-10 7-20	BWD	LAMPASAS	27	

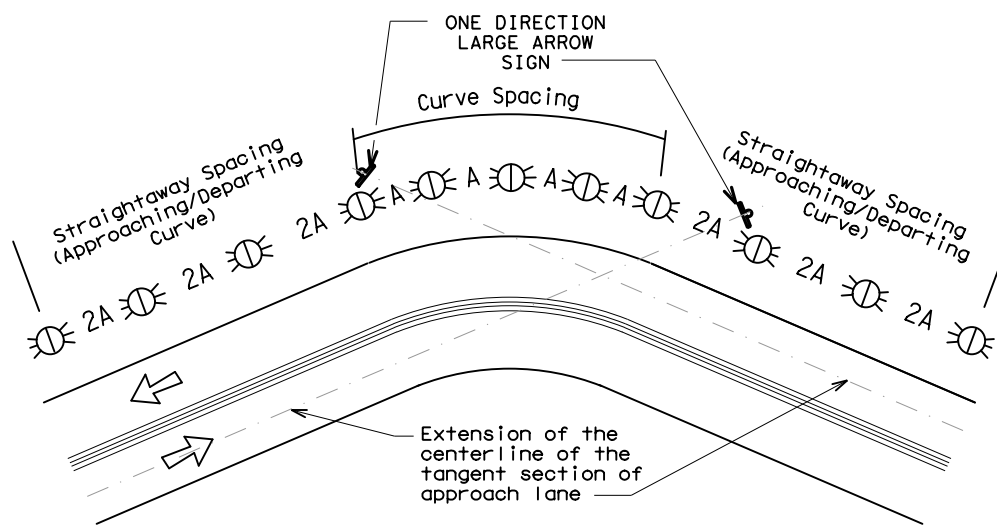
DISCLAIMER: The use of this standard is governed by the "Texas Engineering Practice Act". No warranty of any kind is made by TxDOT for any purpose whatsoever. TxDOT assumes no responsibility for the conversion of this standard to other formats or for incorrect results or damages resulting from its use.

DATE: 7/19/2024 12:21:24 PM
 FILE: R:\1005000-1005999\1005472_03\04_DOCUMENTS\DESIGN\Plan_Set\3_RoadwayStandards\dom3-20.dgn

MINIMUM WARNING DEVICES AT CURVES WITH ADVISORY SPEEDS

Amount by which Advisory Speed is less than Posted Speed	Curve Advisory Speed	
	Turn (30 MPH or less)	Curve (35 MPH or more)
5 MPH & 10 MPH	• RPMs	• RPMs
15 MPH & 20 MPH	• RPMs and One Direction Large Arrow sign	• RPMs and Chevrons; or • RPMs and One Direction Large Arrow sign where geometric conditions or roadside obstacles prevent the installation of chevrons.
25 MPH & more	• RPMs and Chevrons; or • RPMs and One Direction Large Arrow sign where geometric conditions or roadside obstacles prevent the installation of chevrons	• RPMs and Chevrons

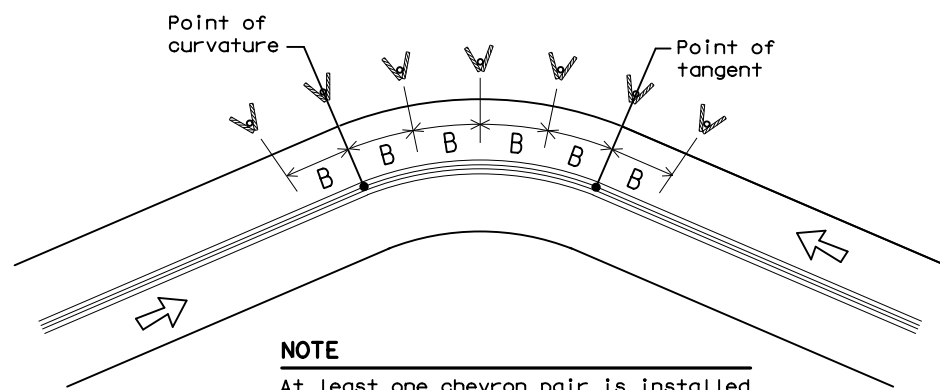
SUGGESTED SPACING FOR DELINEATORS ON HORIZONTAL CURVES



NOTE

ONE DIRECTION LARGE ARROW (W1-6) sign should be located at approximately and perpendicular to the extension of the centerline of the tangent section of approach lane.

SUGGESTED SPACING FOR CHEVRONS ON HORIZONTAL CURVES



NOTE

At least one chevron pair is installed beyond the point of tangent in tangent section.

DELINEATOR AND CHEVRON SPACING

WHEN DEGREE OF CURVE OR RADIUS IS KNOWN				
Degree of Curve	FEET			
	Radius of Curve	Spacing in Curve	Spacing in Straightaway	Chevron Spacing in Curve
		A	2A	B
1	5730	225	450	—
2	2865	160	320	—
3	1910	130	260	200
4	1433	110	220	160
5	1146	100	200	160
6	955	90	180	160
7	819	85	170	160
8	716	75	150	160
9	637	75	150	120
10	573	70	140	120
11	521	65	130	120
12	478	60	120	120
13	441	60	120	120
14	409	55	110	80
15	382	55	110	80
16	358	55	110	80
19	302	50	100	80
23	249	40	80	80
29	198	35	70	40
38	151	30	60	40
57	101	20	40	40

Curve delineator approach and departure spacing should include 3 delineators spaced at 2A. This spacing should be used during design preparation or when the degree of curve is known.

DELINEATOR AND CHEVRON SPACING

WHEN DEGREE OF CURVE OR RADIUS IS NOT KNOWN			
Advisory Speed (MPH)	Spacing in Curve	Spacing in Straightaway	Chevron Spacing in Curve
	A	2xA	B
65	130	260	200
60	110	220	160
55	100	200	160
50	85	170	160
45	75	150	120
40	70	140	120
35	60	120	120
30	55	110	80
25	50	100	80
20	40	80	80
15	35	70	40

If the degree of curve is not known, delineator spacing may be determined based on the Advisory Speed of the curve. Use the delineator curve spacing for each Advisory Speed (MPH).

DELINEATOR AND OBJECT MARKER APPLICATION AND SPACING

CONDITION	REQUIRED TREATMENT	MINIMUM SPACING
Frwy./Exp. Tangent	RPMs	See PM-series and FPM-series standard sheets
Frwy./Exp. Curve	Single delineators on right side	See delineator spacing table
Frwy/Exp. Ramp	Single delineators on at least one side of ramp (should be on outside of curves) (see Detail 3 on D&OM(4))	100 feet on ramp tangents Use delineator spacing table for ramp curves ("straightway spacing" does not apply to ramp curves)
Acceleration/Deceleration Lane	Double delineators (see Detail 3 on D&OM(4))	100 feet (See Detail 3 on D & OM (4))
Truck Escape Ramp	Single red delineators on both sides	50 feet
Bridge Rail (steel or concrete) and Metal Beam Guard Fence	Bi-Directional Delineators when undivided with one lane each direction Single Delineators when multiple lanes each direction	Equal spacing (100' max) but not less than 3 delineators
Concrete Traffic Barrier (CTB) or Steel Traffic Barrier	Barrier reflectors matching the color of the edge line	Equal spacing 100' max
Cable Barrier	Reflectors matching the color of the edge line	Every 5th cable barrier post (up to 100' max)
Guard Rail Terminus/Impact Head	Divided highway - Object marker on approach end Undivided 2-lane highways - Object marker on approach and departure end	Requires reflective sheeting provided by manufacturer per D & OM (VIA) or a Type 3 Object Marker (OM-3) in front of the terminal end See D & OM (5) and D & OM (6)
Bridges with no Approach Rail	Type 3 Object Marker (OM-3) at end of rail and 3 single delineators approaching rail	See D & OM(5)
Reduced Width Approaches to Bridge Rail	Type 2 and Type 3 Object Markers (OM-3) and 3 single delineators approaching bridge	Requires reflective sheeting provided by manufacturer per D & OM (VIA) or a Type 3 Object Marker (OM-3) in front of the terminal end See D & OM (5)
Culverts without MBGF	Type 2 Object Markers	See Detail 2 on D & OM(4)
Crossovers	Double yellow delineators and RPMs	See Detail 1 on D & OM (4)
Pavement Narrowing (lane merge) on Freeways/Expressway	Single delineators adjacent to affected lane for full length of transition	100 feet

NOTES

- Unless indicated otherwise, the delineator or barrier reflector color shall conform to the color of the pavement edge line on the side of the road where the delineators or barrier reflectors are placed.
- Barrier reflectors may be used to replace required delineators.
- Single red delineators may be mounted on the back side of delineator posts for wrong way driver applications

LEGEND	
	Bi-directional Delineator
	Delineator
	Sign

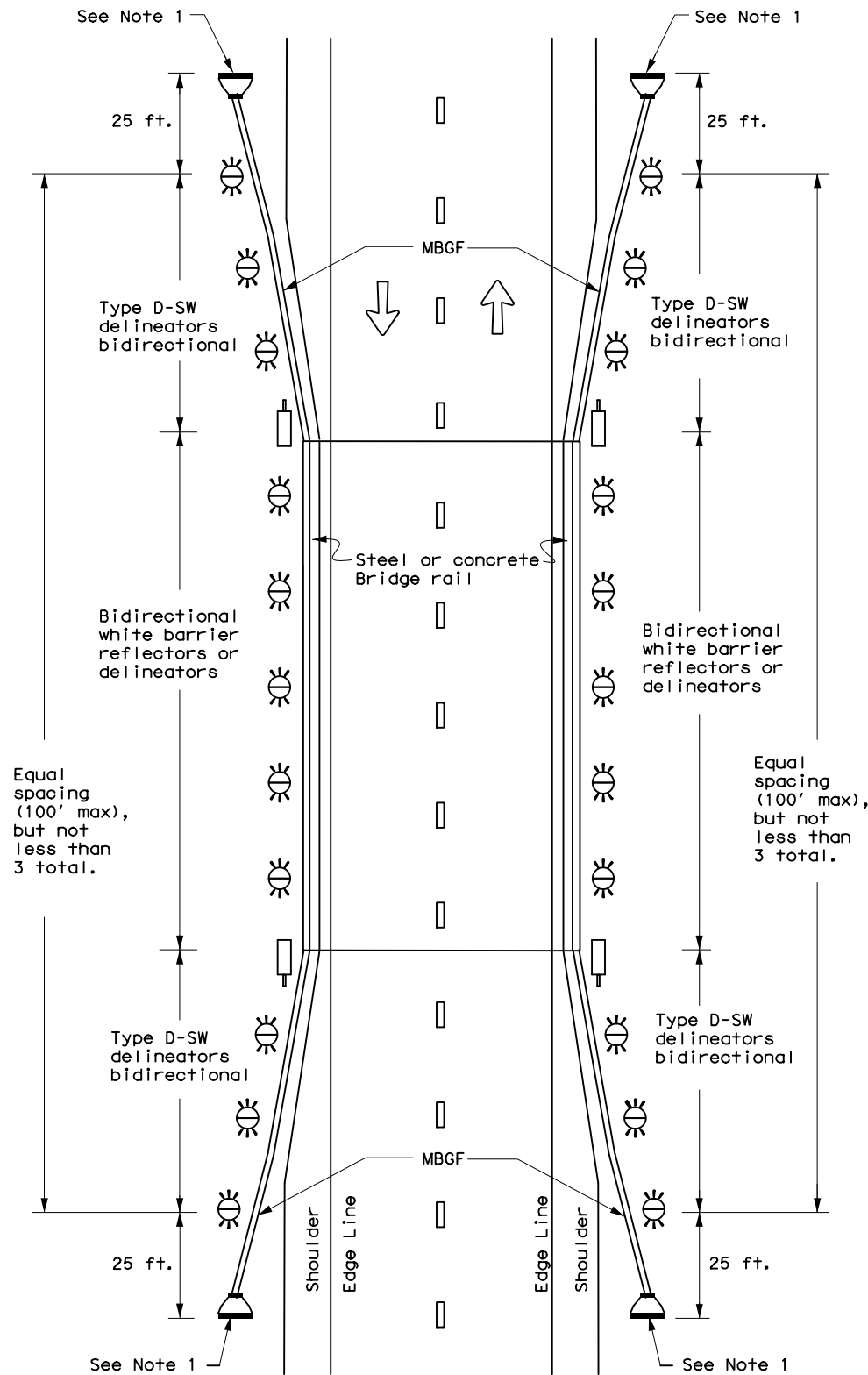
Traffic Safety Division Standard

DELINEATOR & OBJECT MARKER PLACEMENT DETAILS

D & OM(3)-20

FILE: dom3-20.dgn	DW: TxDOT	CK: TxDOT	OW: TxDOT	CR: TxDOT
© TxDOT August 2004	CONT	SECT	JOB	HIGHWAY
REVISIONS		0923 10	021	3RD ST
3-15 8-15	DIST	COUNTY	SHEET NO.	
8-15 7-20	BWD	LAMPASAS	28	

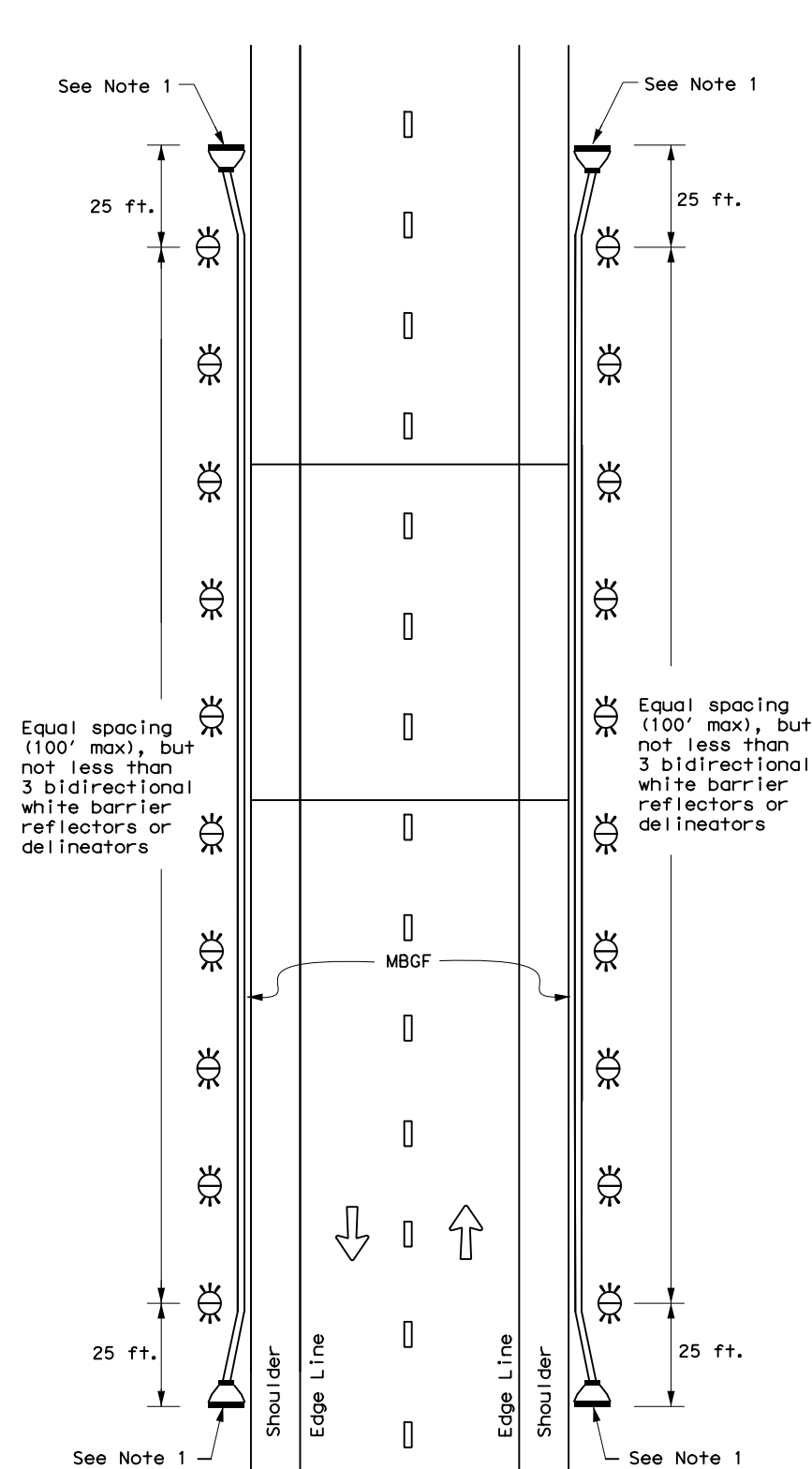
**TWO-WAY, TWO LANE ROADWAY
WITH REDUCED WIDTH APPROACH RAIL**



NOTE:

1. Terminal ends require reflective sheeting provided by manufacturer per D & OM (VIA) or a Type 3 Object Marker (OM-3) in front of the terminal end.

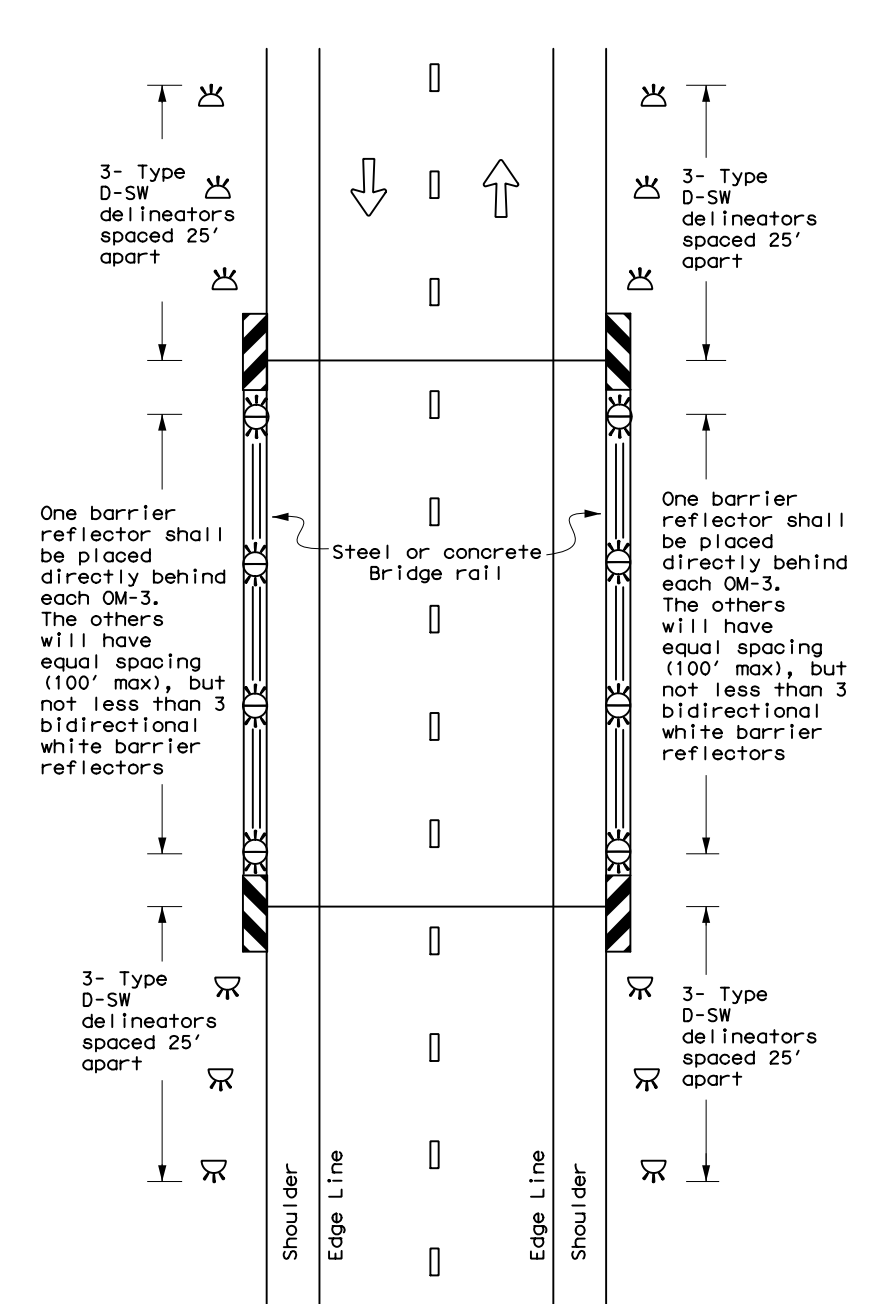
**TWO-WAY, TWO LANE ROADWAY
WITH METAL BEAM GUARD FENCE (MBGF)**



NOTE:

1. Terminal ends require reflective sheeting provided by manufacturer per D & OM (VIA) or a Type 3 Object Marker (OM-3) in front of the terminal end.

**TWO-WAY, TWO LANE ROADWAY
BRIDGE WITH NO APPROACH RAIL**



LEGEND

	Bidirectional Delineator
	Delineator
	OM-3
	OM-2
	Terminal End
	Traffic Flow



**DELINEATOR &
OBJECT MARKER
PLACEMENT DETAILS**

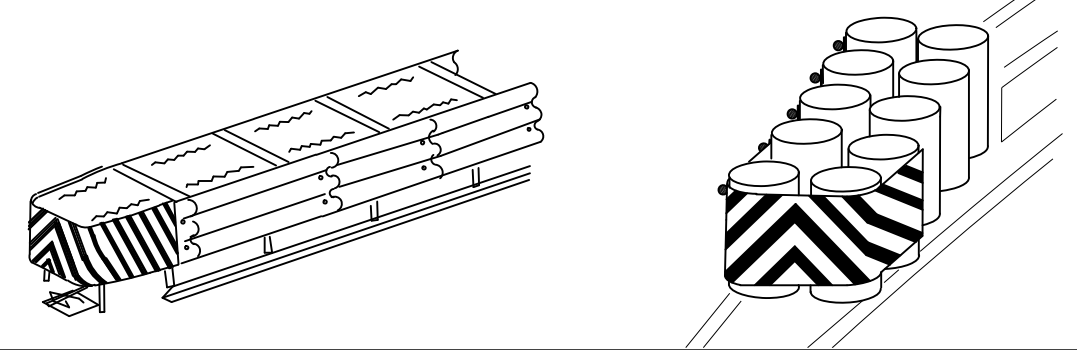
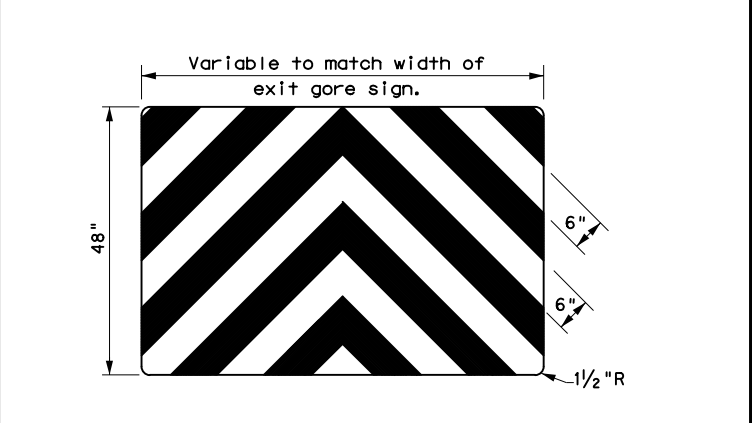
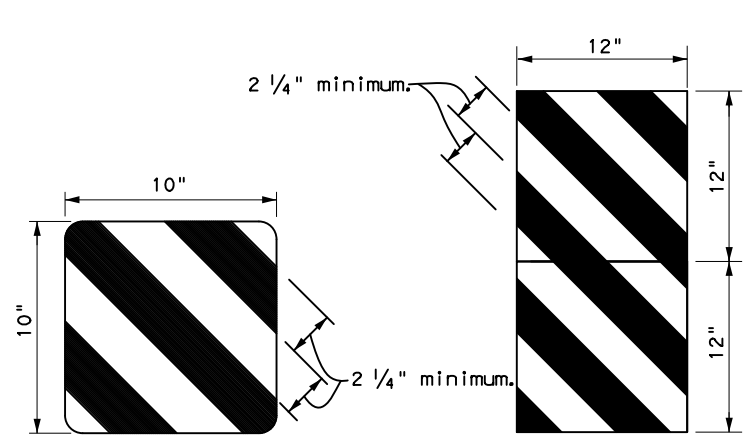
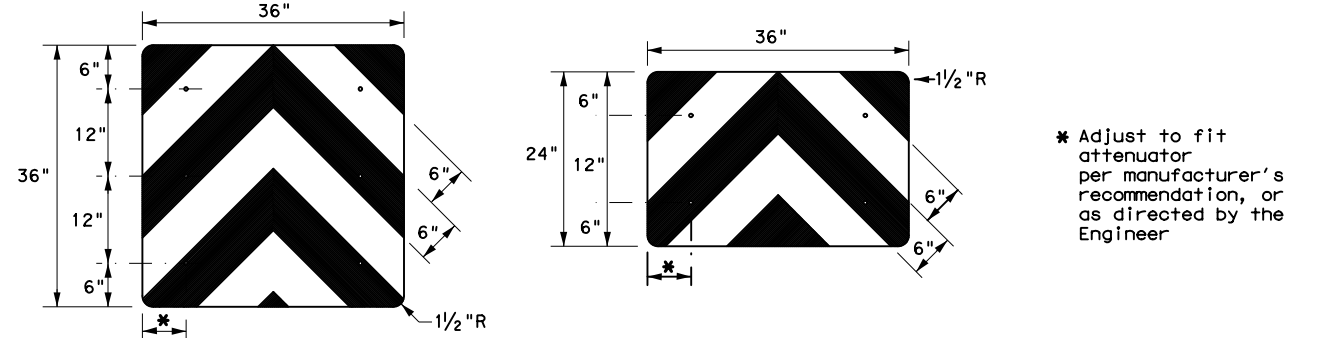
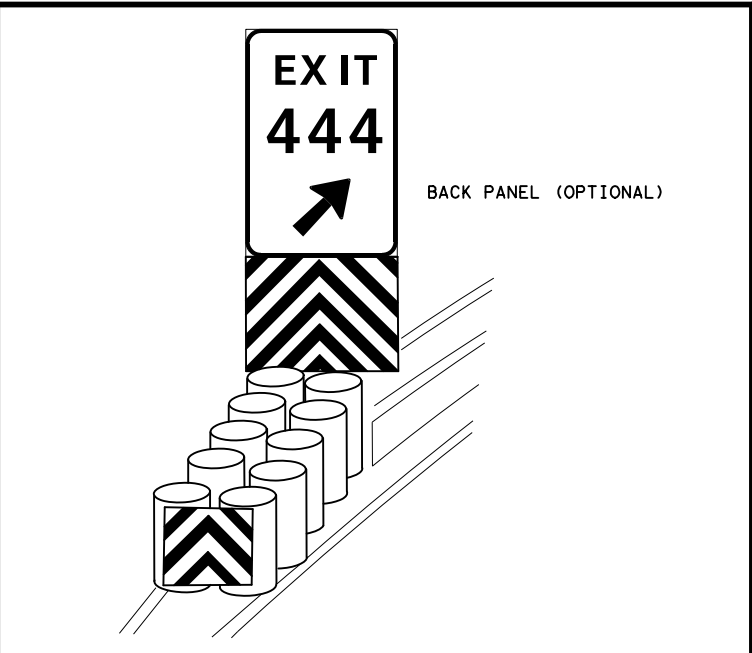
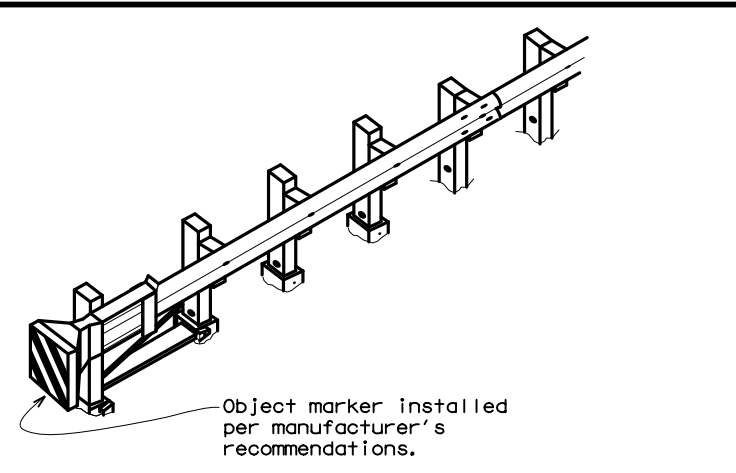
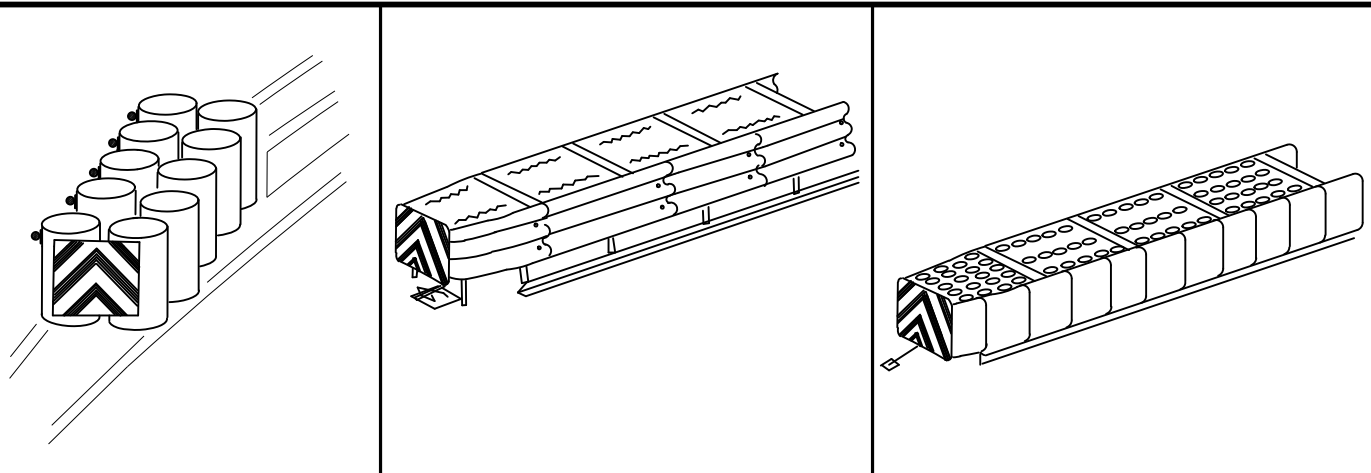
D & OM(5)-20

FILE: dom5-20.dgn	DN: TxDOT	CK: TxDOT	DW: TxDOT	CR: TxDOT
© TxDOT August 2015	CONT	SECT	JOB	HIGHWAY
7-20	0923	10	021	3RD ST
	DIST	COUNTY	SHEET NO.	
	BWD	LAMPASAS	29	

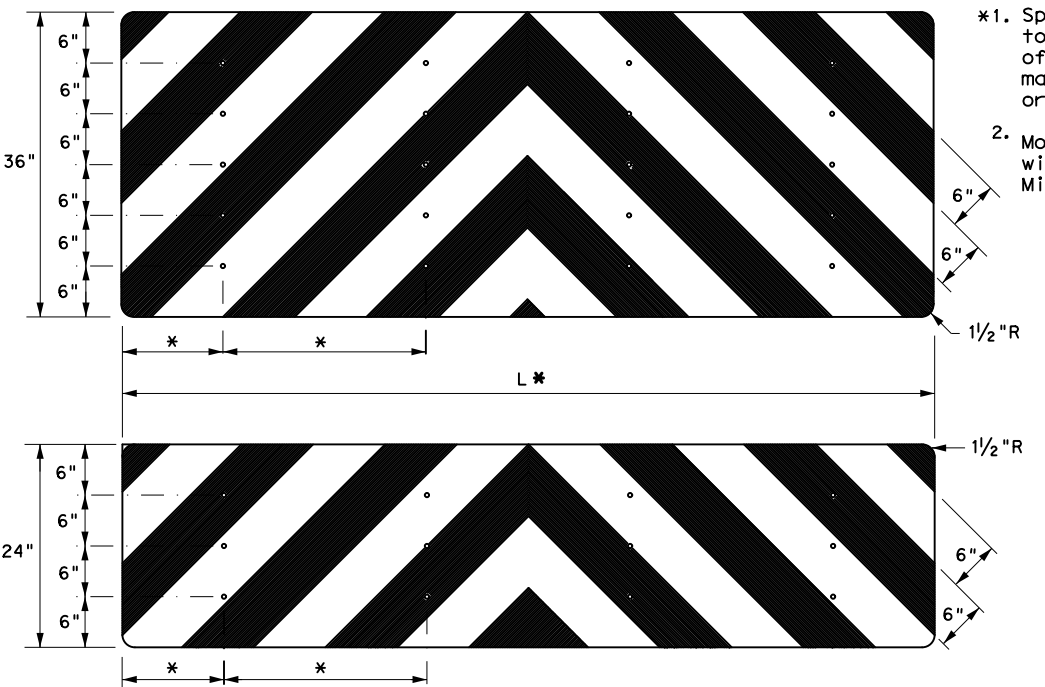
DISCLAIMER: The use of this standard is governed by the "Texas Engineering Practice Act". No warranty of any kind is made by TxDOT for any purpose whatsoever. TxDOT assumes no responsibility for the conversion of this standard to other formats or for incorrect results or damages resulting from its use.
 DATE: 7/19/2024 12:21:24 PM
 FILE: R:\1005000-1005999\1005472_03\04_DOCUMENTS\DESIGN\Plan_Set\3_RoadwayStandards\dom5-20.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 this standard to other formats or for incorrect results or damages resulting from its use.

DATE: 7/19/2024 12:21:25 PM
 FILE: R:\1005000-1005999\1005472_03\04_DOCUMENTS\DESIGN\Plan_Set\3. Roadway\Standards\domvia-20.dgn



OBJECT MARKERS SMALLER THAN 3 FT²



- NOTES**
- *1. Spacing should be adjusted to attach through centerline of drum, per attenuator manufacturer's recommendation, or as directed by the Engineer.
 - *2. Mounting should be flush with top of attenuator. Minimum size 96" x 24".

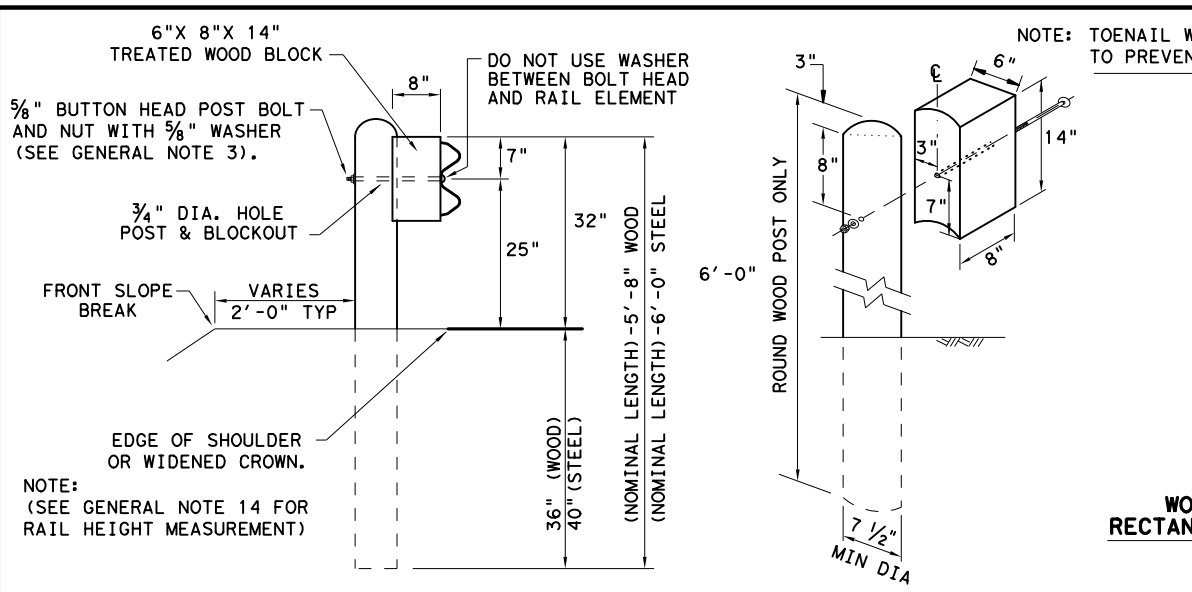
NOTES

- 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.

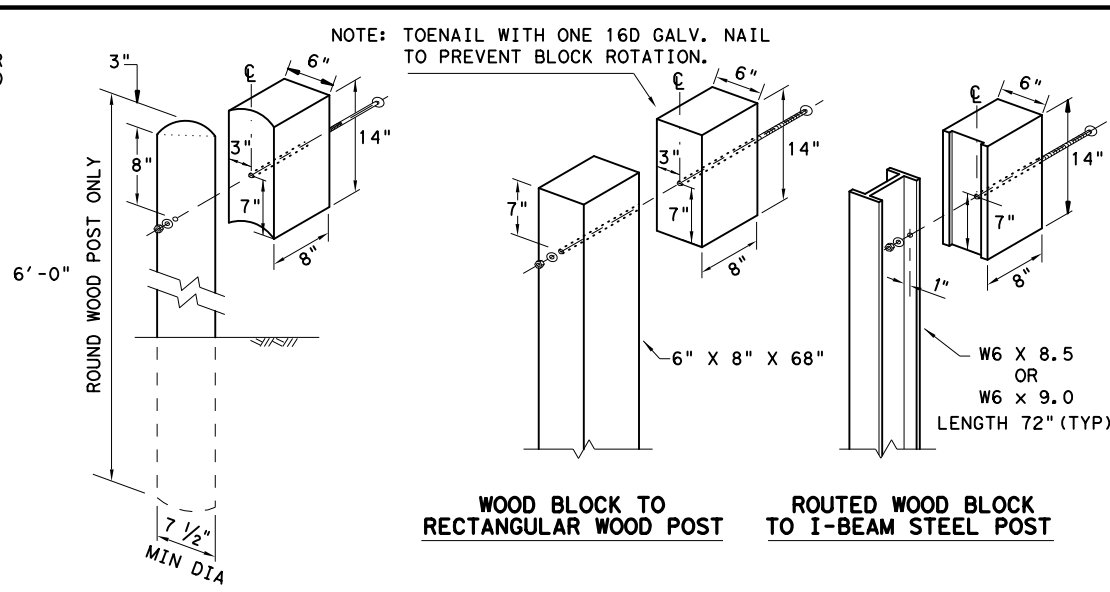
DELINEATOR & OBJECT MARKER FOR VEHICLE IMPACT ATTENUATORS D & OM(VIA)-20			
FILE: domvia20.dgn	DN: TXDOT	CK: TXDOT	DW: TXDOT
© TXDOT December 1989	CONT	SECT	JOB
REVISIONS		0923 10	021 3RD ST
4-92 8-04	DIST	COUNTY	SHEET NO.
8-95 3-15	BWD	LAMPASAS	30
4-98 7-20			
206			

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: 7/19/2024
 FILE: R:\1005000-1005472.03\04_DOCUMENTS\DESIGN\Plan_Set\3_RoadwayStandards\gf3119.dgn

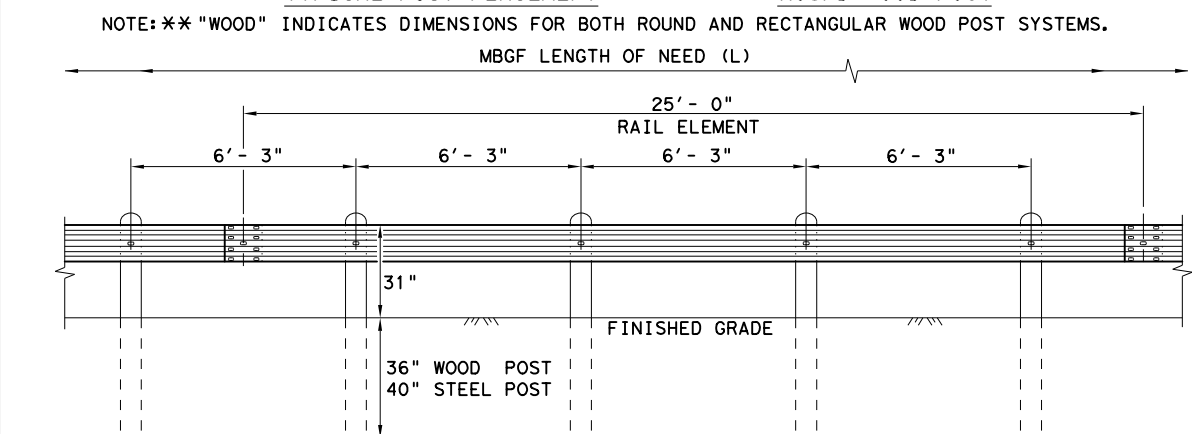


TYPICAL POST PLACEMENT



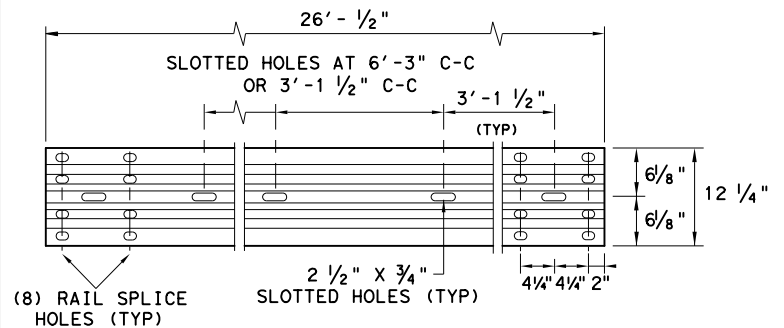
WOOD BLOCK TO ROUND WOOD POST **ROUTED WOOD BLOCK TO I-BEAM STEEL POST**

- 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.



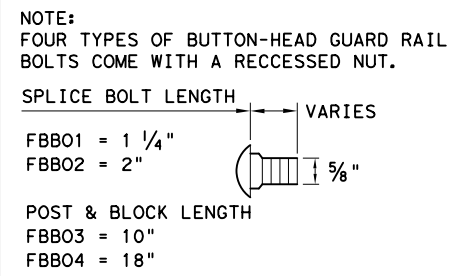
ELEVATION MID-SPAN RAIL SPLICE

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



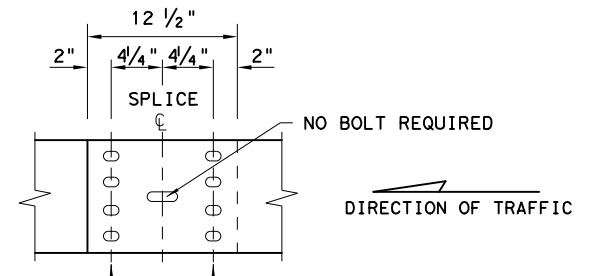
ELEVATION 25'-0" (NOM.) W-BEAM SECTION

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.



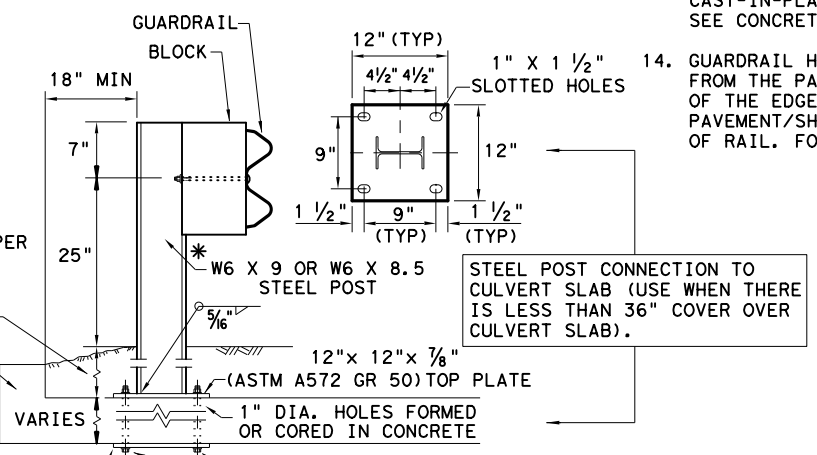
MID-SPAN RAIL SPLICE DETAIL

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.

12" X 12" X 1/4" (ASTM A36) STEEL BOTTOM PLATE WITH 1" DIA. HOLES REQUIRED WITH BOLT-THROUGH INSTALLATION.

LOW FILL CULVERT POST



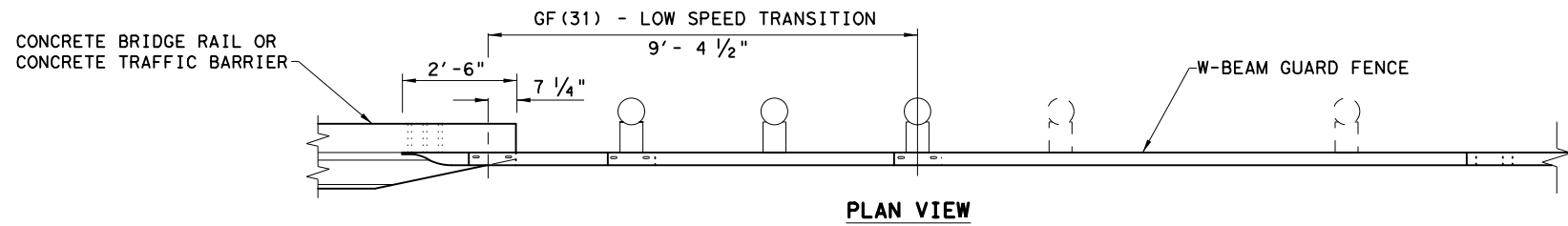
1. **BOLT-THROUGH OPTION:** REQUIRES A 6" MIN. SLAB THICKNESS. 7/8" DIA (ASTM A449) HEAVY HEX BOLTS WITH TWO HARDENED WASHER EACH AND HEAVY HEX NUTS. NOTE: BOLT LENGTH = SLAB PLUS 2 1/4" MIN.
2. **EPOXY ANCHOR OPTION:** THIS OPTION MAY ONLY BE USED IF THE CULVERT SLAB IS 9" MIN. THICK. THREADED ANCHOR RODS MUST BE 7/8" 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	0923	10	021
DIST	COUNTY	SHEET NO.	
BWD	LAMPASAS	31	

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.

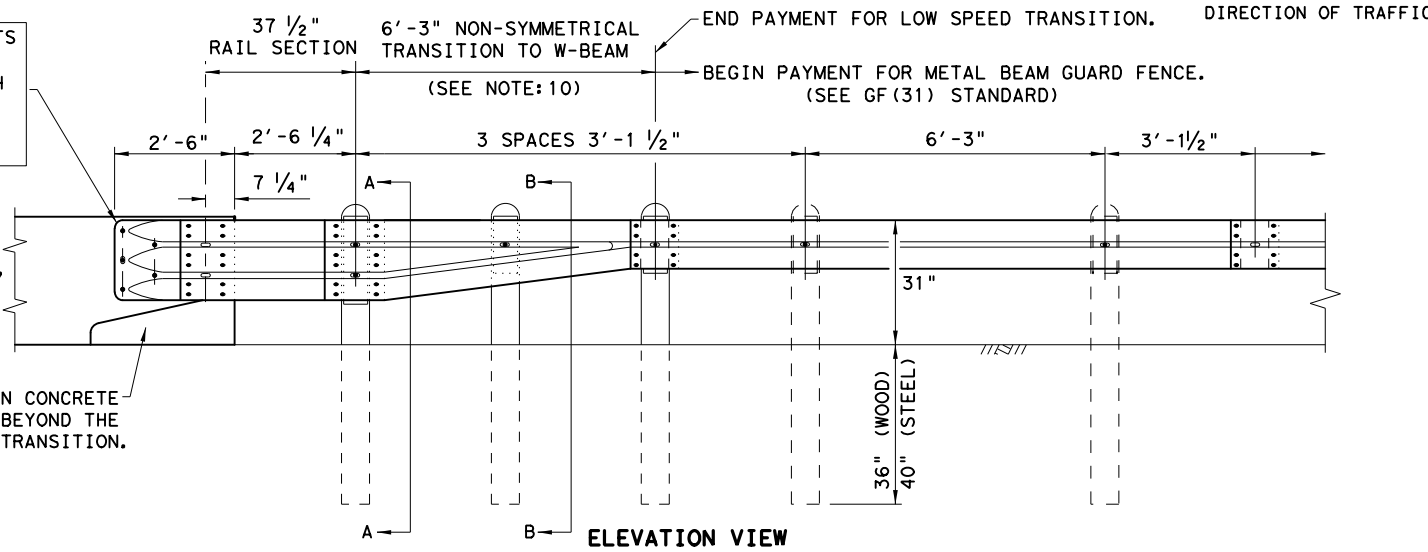
DATE: 7/19/2024 12:21:26 PM
 FILE: R:\1005000-1005999\1005472.03\04_DOCUMENTS\DESIGN\Plan_Set\3. Roadway\Standards\gf31tr+1219.dgn



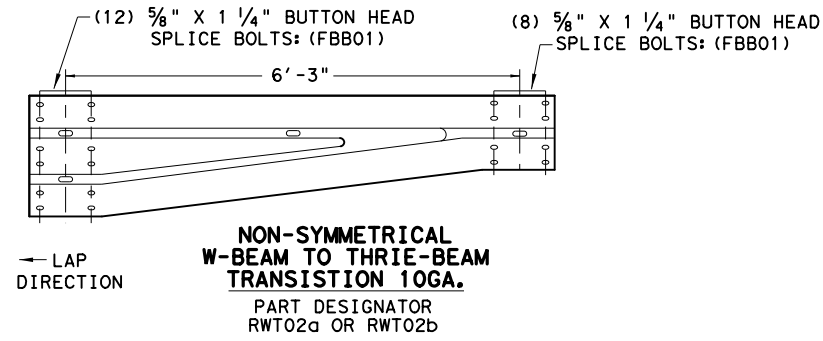
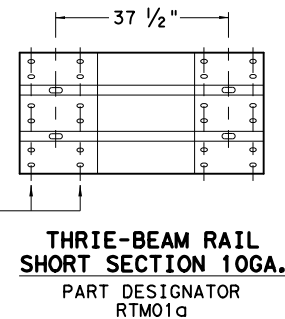
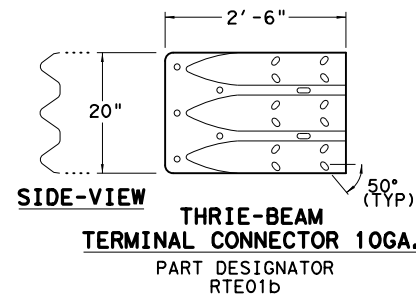
- (5) 7/8" DIA. HEAVY HEX HEAD BOLTS (ASTM A325 OR A449)
 - (10) 1 3/4" O.D. WASHER UNDER EACH HEX BOLT HEAD AND NUT.
 - (5) 7/8" DIA. HEAVY HEX NUTS (ASTM A194 OR A563)
- THRIE-BEAM CONNECTOR TO CONCRETE RAIL

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: CHAMFER REQUIRED ON CONCRETE RAILS THAT EXTEND BEYOND THE FACE OF GUARDRAIL TRANSITION.



- ### GENERAL NOTES
- THE TYPE OF POST (ROUND WOOD POST, RECTANGULAR WOOD POST, OR STEEL POST) WILL BE AS SHOWN IN THE PLANS. THE EXACT POSITION OF TRANSITIONS SHALL BE AS SHOWN IN THE PLANS OR AS DIRECTED BY THE ENGINEER. REFER TO GF(31) STANDARD SHEET.
 - RAIL ELEMENT SHALL MEET THE REQUIREMENTS OF ITEM 540, "METAL BEAM GUARD FENCE" EXCEPT AS MODIFIED IN THE PLANS.
 - FITTINGS (BOLTS, NUTS, AND WASHERS) SHALL BE GALVANIZED IN ACCORDANCE WITH ITEM 445, "GALVANIZING." FITTINGS SHALL BE SUBSIDIARY TO THE BID ITEM REQUIRING CONSTRUCTION OF THE TRANSITION.
 - BUTTON HEAD "POST BOLTS & NUTS" SHALL MEET THE REQUIREMENTS OF (ASTM A307), AND SHALL BE OF SUFFICIENT LENGTH TO EXTEND THROUGH THE FULL THICKNESS OF THE NUT AND 5/8" WASHER (FWC16a) AND NOT MORE THAN 1" BEYOND IT. TRIM BOLT LENGTH TO MEET REQUIRED LENGTH.
 - POSTS SHALL NOT BE SET IN CONCRETE, OF ANY DEPTH.
 - CROWN SHALL BE WIDENED TO ACCOMMODATE TRANSITIONS.
 - WHERE SOLID ROCK IS ENCOUNTERED, CONTACT THE DESIGN DIVISION FOR ADDITIONAL GUIDANCE. (512) 416-2678
 - 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 CAN FURNISH COMPOSITE MATERIAL BLOCKS.
 - REFER TO GF(31) STANDARD SHEET & BRIDGE RAILING DETAILS FOR ADDITIONAL DETAILS.
 - FOR ROUND WOOD POSTS SYSTEMS, ALL ROUND WOOD POSTS SHALL BE 7 1/2" DIA. MINIMUM THROUGHOUT THE TRANSITION.

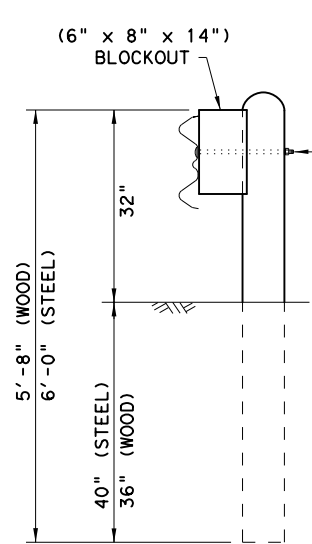
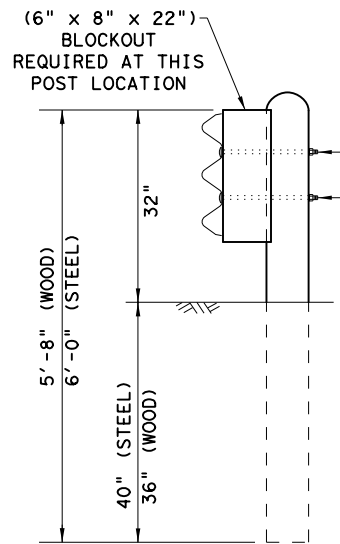


- (2) 5/8" BUTTON HEAD POST BOLTS & NUTS: (FBB04)
- (1) 5/8" FLAT WASHER: (FWC14a) UNDER EACH NUT

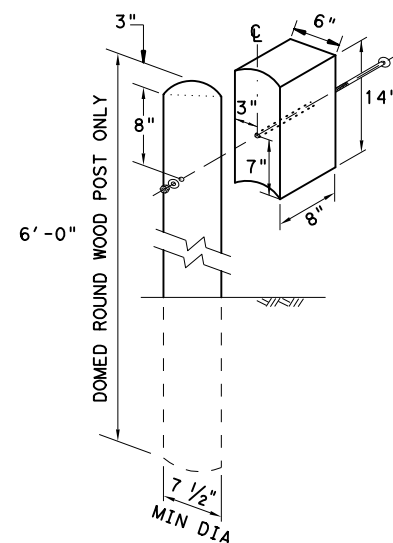
- (1) 5/8" BUTTON HEAD POST BOLT & NUT: (FBB04)
- (1) 5/8" FLAT WASHER: (FWC14a) UNDER EACH NUT

PLATE WASHER INSTRUCTIONS

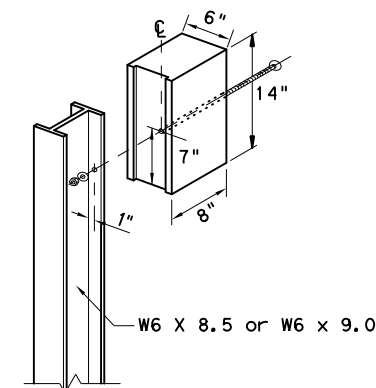
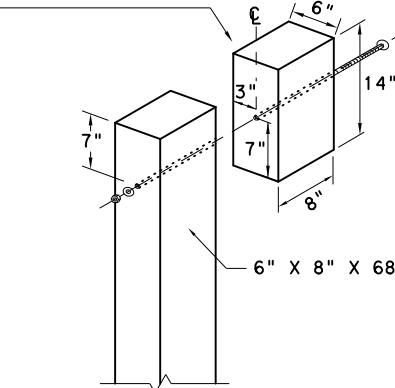
BRIDGE APPROACH - UPSTREAM: THE SHORT RAIL LAPS OVER THE TERMINAL CONNECTOR. PLATE WASHERS ARE INSTALLED UNDER THE SPLICE NUTS AGAINST INSIDE OF CONNECTOR.
 BRIDGE EXIT - DOWNSTREAM: THE TERMINAL CONNECTOR LAPS OVER THE NESTED RAIL. PLATE WASHERS ARE INSTALLED UNDER THE BOLT HEAD AGAINST OUTSIDE OF CONNECTOR.



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



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

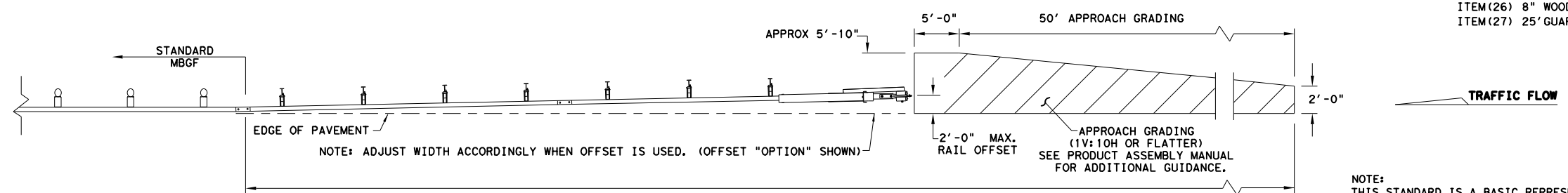
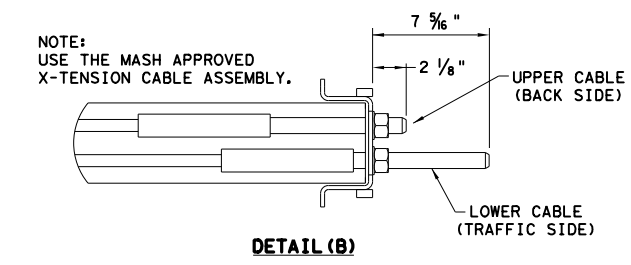
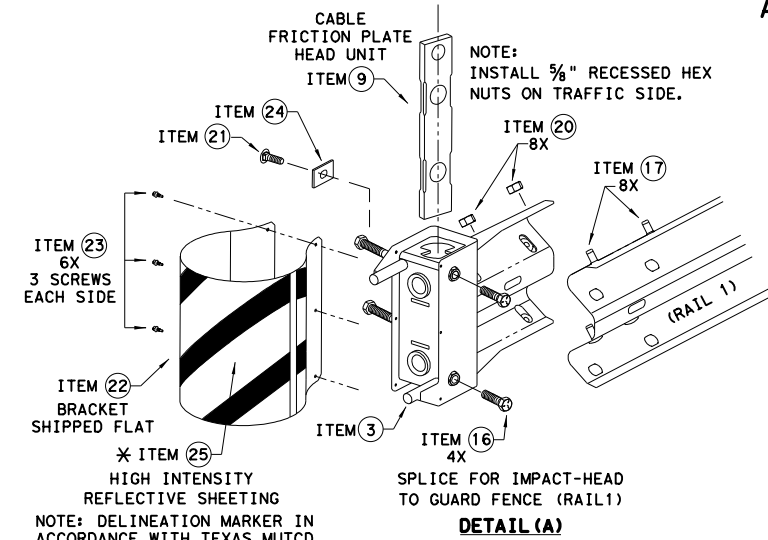
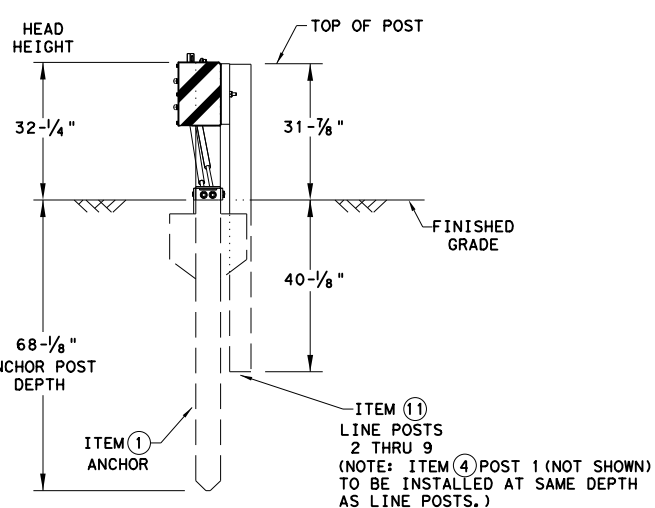
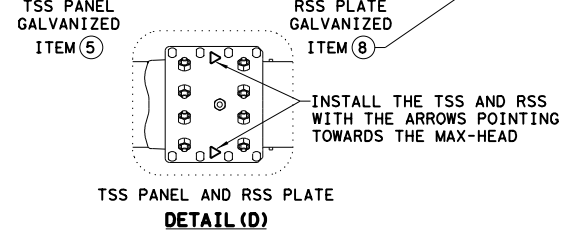
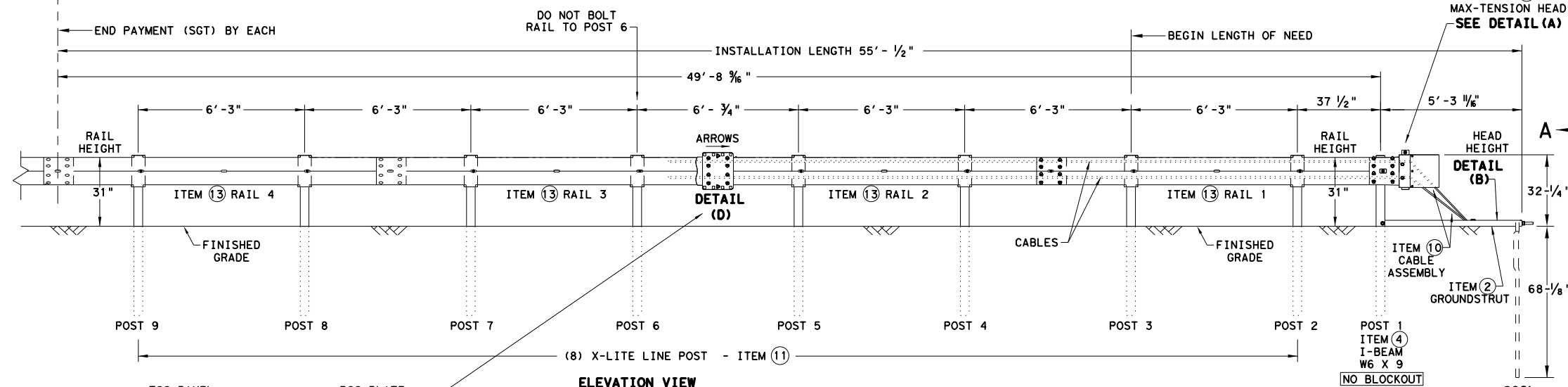
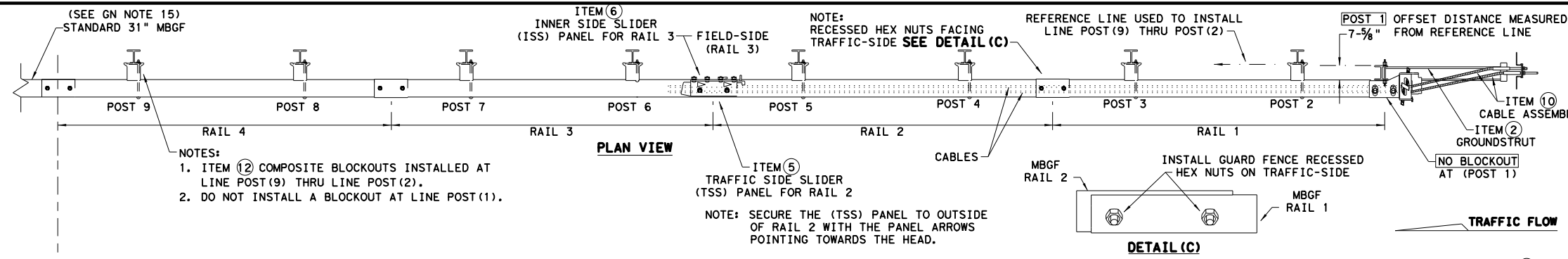


LOW-SPEED TRANSITION

		Design Division Standard	
METAL BEAM GUARD FENCE THRIE-BEAM TRANSITION TL-2 MASH COMPLIANT GF(31) TR TL2-19			
FILE: gf31tr+1219.dgn	DN: TXDOT	CK: KM	DW: VP
© TXDOT: NOVEMBER 2019	CONT SECT	JOB	HIGHWAY
REVISIONS	0923 10	021	3RD ST
DIST	COUNTY	SHEET NO.	
BWD	LAMPASAS	32	

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: 7/19/2024
 FILE: R:\1005000-1005999\1005472.03\04_DOCUMENTS\DESIGN\Plan_Set\3_RoadwayStandards\sgt11s3118.dgn



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

* 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

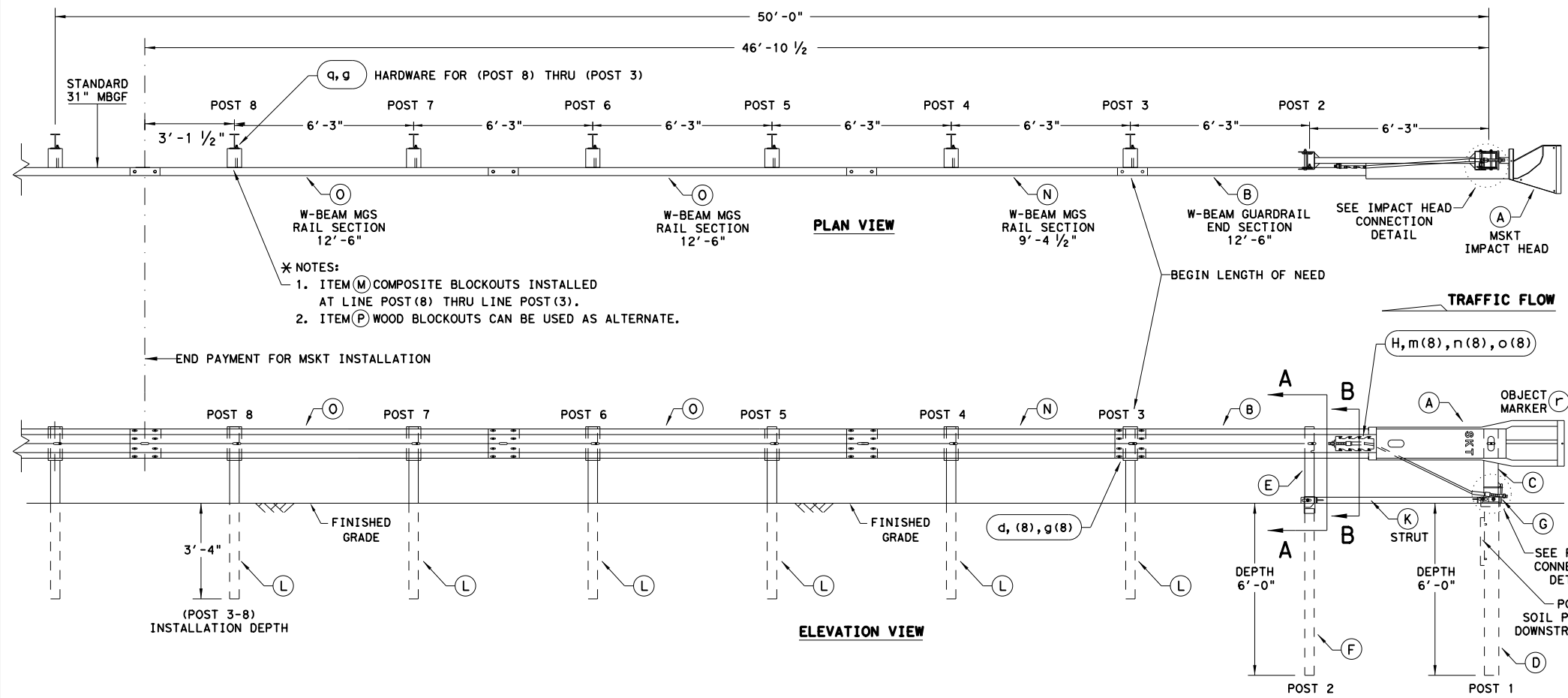
**MAX-TENSION END TERMINAL
 MASH - TL-3
 SGT (11S) 31-18**

FILE: sgt11s3118.dgn	DN: TxDOT	CK: KM	DW: TxDOT	CK: CL
© TxDOT: FEBRUARY 2018	CONT	SECT	JOB	HIGHWAY
REVISIONS	0923	10	021	3RD ST
DIST	COUNTY		SHEET NO.	
BWD	LAMPASAS		34	

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

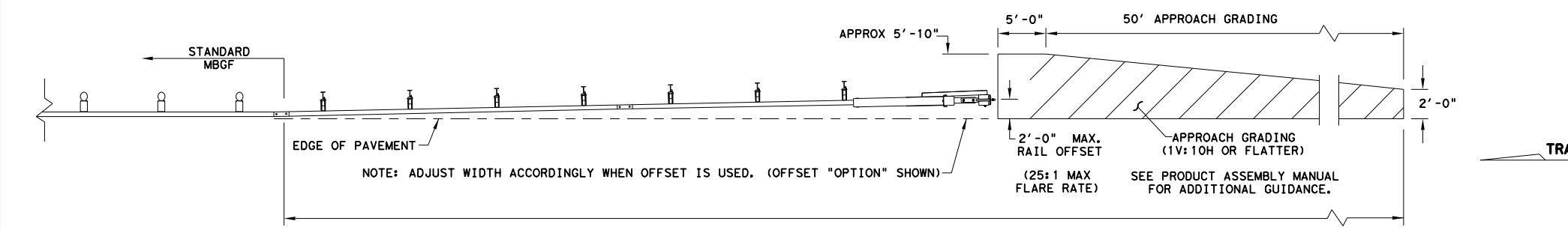
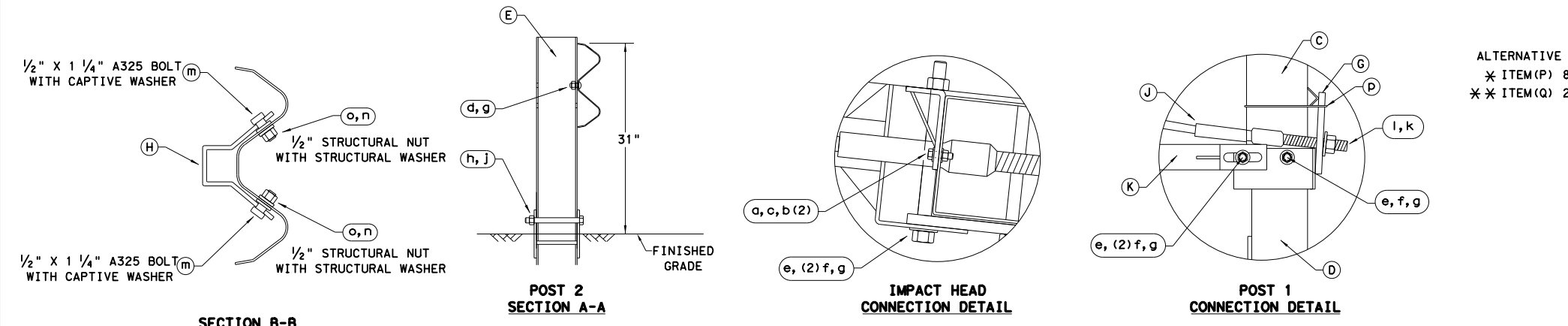
DISCLAIMER: THIS STANDARD IS GOVERNED BY THE "TEXAS ENGINEERING PRACTICE ACT". NO WARRANTY OF ANY KIND IS MADE BY TXDOT FOR ANY PURPOSE WHATSOEVER. TXDOT ASSUMES NO RESPONSIBILITY FOR THE CONVERSION OF THIS STANDARD TO OTHER FORMATS OR FOR INCORRECT RESULTS OR DAMAGES RESULTING FROM ITS USE.

DATE: 7/19/2024
 FILE: R:\1005000-1005999\1005472_03\04_DOCUMENTS\DESIGN\Plan_Seg13_3_RoadwayStandards\sgt12s3118.dgn



- 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 Ga.	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	5/8" x 1" HEX BOLT (GRD 5)	B5160104A
b	4	5/8" WASHER	W0516
c	2	5/8" HEX NUT	N0516
d	25	5/8" Dia. x 1 1/4" SPLICE BOLT (POST 2)	B580122
e	2	5/8" Dia. x 9" HEX BOLT (GRD A449)	B580904A
f	3	5/8" WASHER	W050
g	33	5/8" 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	5/8" 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

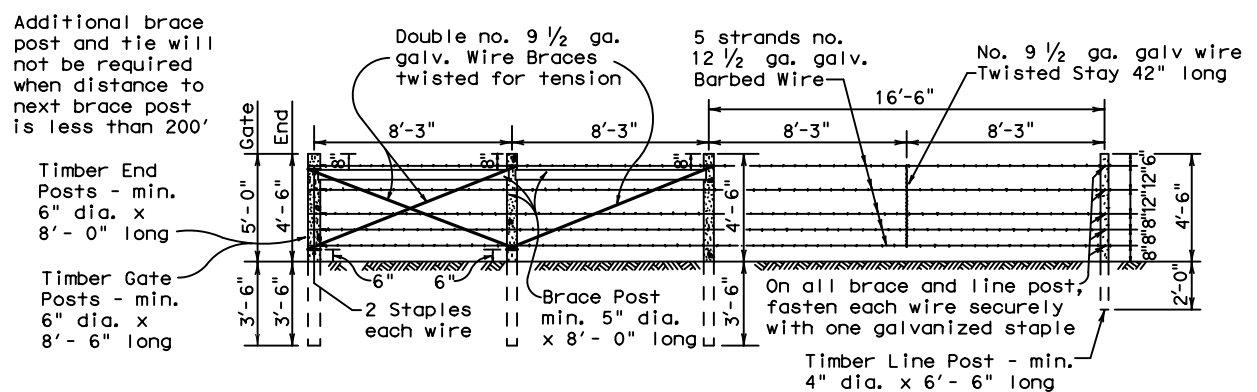
MSKT-MASH-TL-3

SGT (12S) 31-18

FILE: sgt12s3118.dgn	DN: TXDOT	CK: KM	DW: VP	CK: CL
© TXDOT: APRIL 2018	CONT	SECT	JOB	HIGHWAY
REVISIONS	0923	10	021	3RD ST
	DIST	COUNTY	SHEET NO.	
	BWD	LAMPASAS	35	

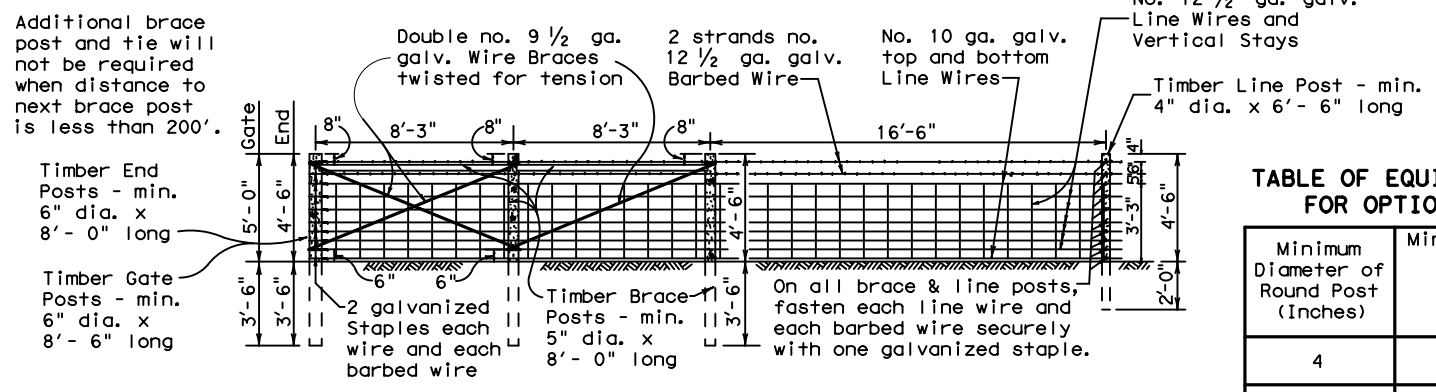
DISCLAIMER: The use of this standard is governed by the "Texas Engineering Practice Act". No warranty of any kind is made by TxDOT for any purpose whatsoever. TxDOT assumes no responsibility for the conversion of this standard to other formats or for incorrect results or damages resulting from its use.

DATE: 7/19/2024
 FILE: R:\1005000-1005999\1005472.03\04_DOCUMENTS\DESIGN\Plan_Set\3_Roadway\Standards\wf110.dgn



SECTION GALVANIZED BARBED WIRE FENCE WITH WOOD POSTS
 Bracing Detail Used at Ends and Gates

TYPE "A" FENCE
 (See General Note 6)



SECTION GALVANIZED WOVEN WIRE FENCE WITH WOOD POSTS
 Bracing Detail Used at Ends and Gates

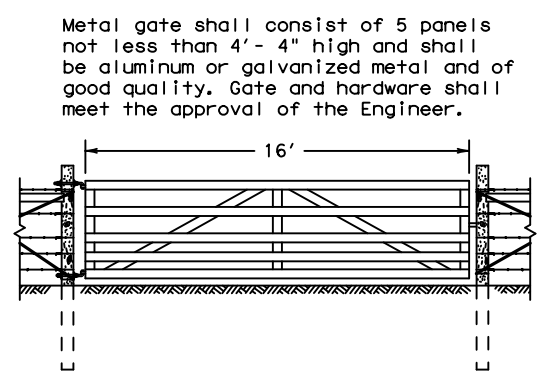
TYPE "B" FENCE
 (See General Note 6)

TABLE OF EQUIVALENT SIZES FOR OPTIONAL SHAPE

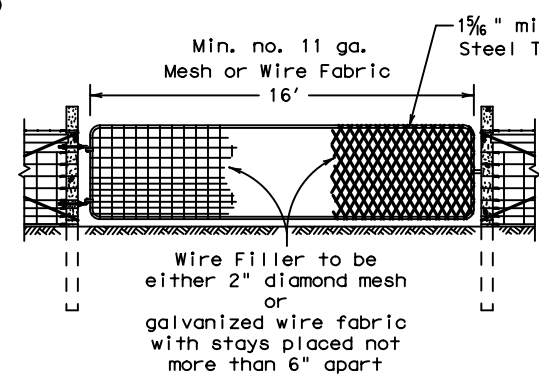
Minimum Diameter of Round Post (Inches)	Minimum Equivalent Dimension for Each Side of Square Post (Inches)
4	3 1/2
5	4 1/2
6	5 1/4

GENERAL NOTES

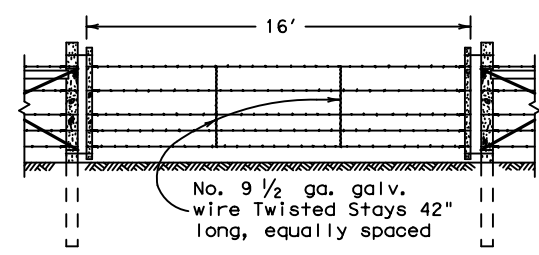
- Any high point which interferes with the placing of wire mesh shall be excavated to provide 2" clearance.
 - Latches for Type 1 and Type 2 gates shall be good commercial quality and design latches of the spring, fork or chain type. All latches shall be suitable for the gate and shall be approved by the Engineer.
 - Hinges for Type 2 gates shall be commercial design approved by the Engineer suitable for post and gate.
 - Concrete shall be of the design and consistency approved by the Engineer and shall contain not less than 4 sacks of cement per cubic yard. Concrete footings are to be crowned at the top to shed water.
 - If rock is encountered at a depth less than the embedded depth required, a 15" or larger diameter hole shall be drilled for the post and the post shall be set in concrete. If rock is encountered at a depth of 1'-6" or more below the ground surface, the hole shall be drilled to the required depth. If rock is encountered at a depth less than 1'-6" below the ground surface, the holes shall be drilled a minimum of 2'-0" into the rock or to the depth whichever is the lesser depth.
 - Barbed wire shall be in accordance with ASTM A 121 (Class 1) Design designation 12-2-4-1 4R or 12-2-5-1 4R, or as approved by the Engineer.
- Woven Wire Fence (Type B) shall be in accordance with ASTM A 116 (Class 1) No. 12-1/2 Grade 60 (See Table 1 ASTM A 116) to the height and design shown on the plans, or as approved by the Engineer.
- The location of gates and corner posts will be as indicated elsewhere on these plans.
 - Square wood posts may be used in lieu of round posts provided minimum equivalent size requirements, as shown are met. All wood posts shall be in accordance with Item 552, "Wire Fence."



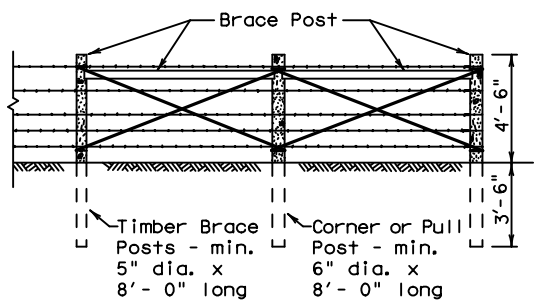
DETAIL TYPE 1 GATE



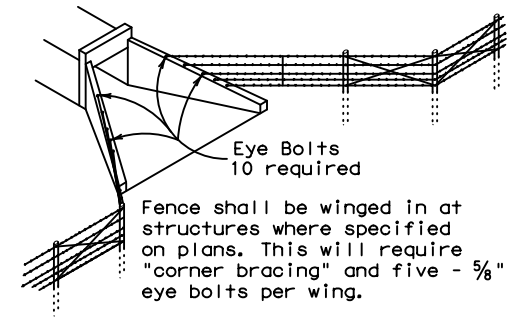
DETAIL TYPE 2 GATE



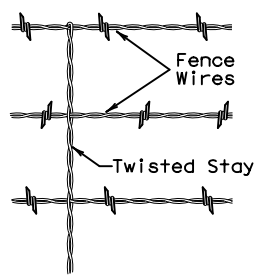
DETAIL TYPE 3 GATE



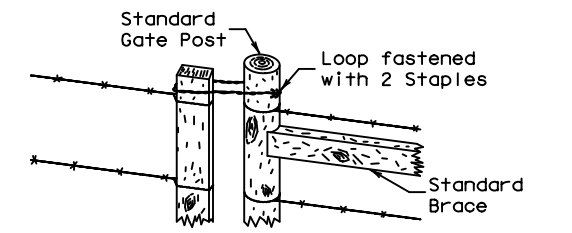
CORNER OR PULL POST ASSEMBLY



DETAIL OF FENCE TREATMENT AT STRUCTURES

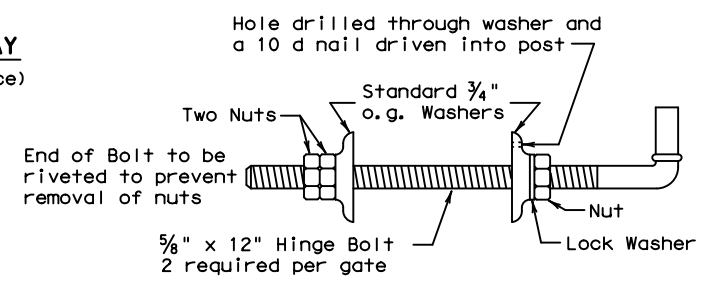


DETAIL OF STAY
 (Barbed wire fence)

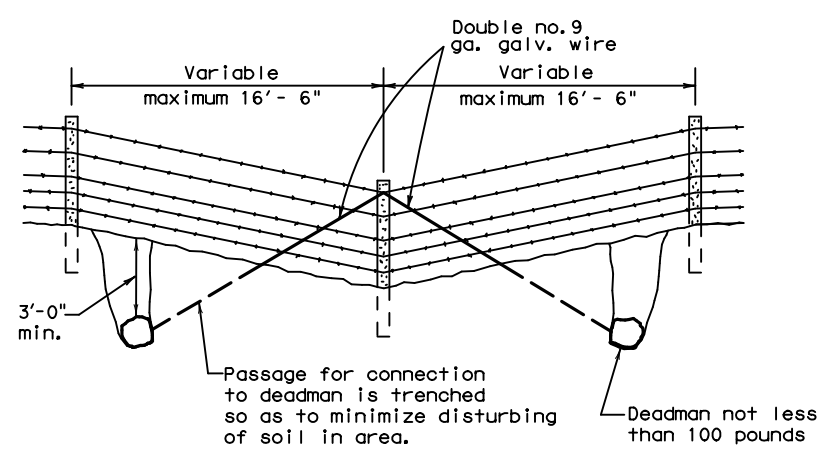


Loop to be made from two strands twisted no. 9 1/2 ga. galv. smooth wire, and to be securely fastened to gate post with two galv. staples.

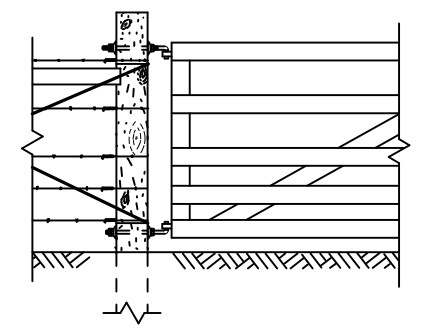
DETAIL FASTENER TYPE 3 GATE



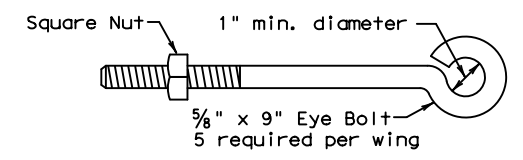
DETAIL OF GATE HINGE BOLT ASSEMBLY



DETAIL OF FENCE SAG
 (Single Line Connection)



DETAIL SHOWING INSTALLATION OF HINGES OF TYPE 1 & 2 GATE



DETAIL OF EYE BOLT

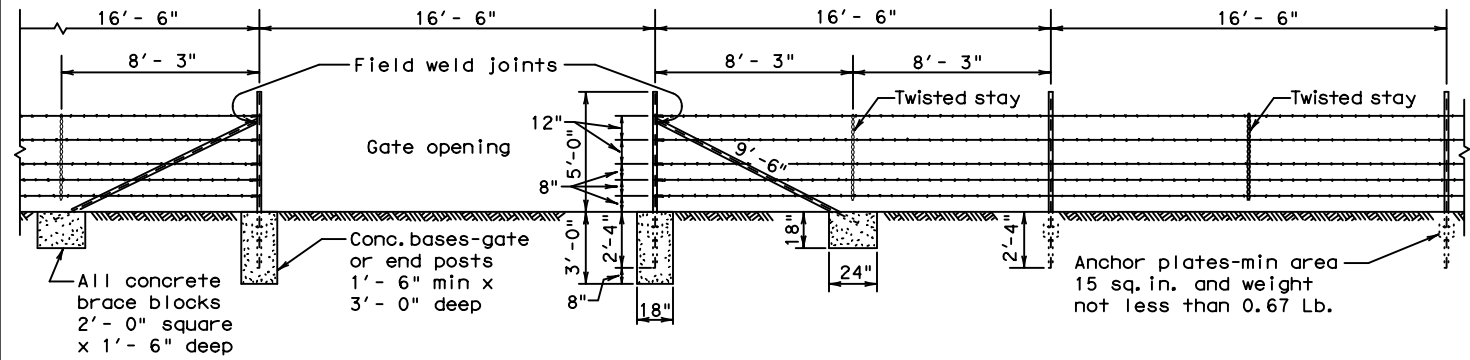
Texas Department of Transportation
 Design Division Standard

BARBED WIRE AND WOVEN WIRE FENCE (WOOD POSTS) WF (1)-10

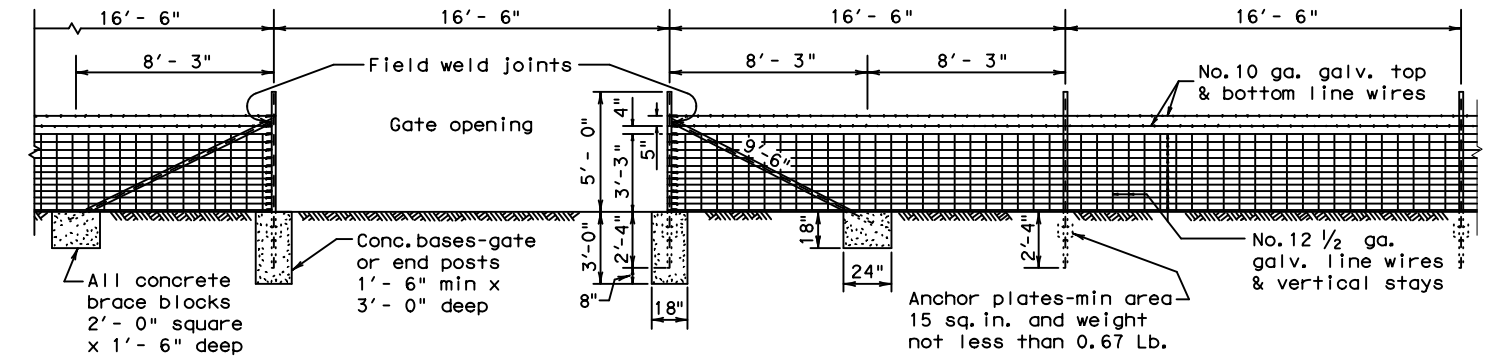
FILE: wf110.dgn	DN: TxDOT	CK: AM	DW: VP	CK:
© TxDOT 1994	CONT	SECT	JOB	HIGHWAY
REVISIONS	0923	10	021	3RD ST
	DIST	COUNTY		SHEET NO.
	BWD	LAMPASAS		36

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.

DATE: 7/19/2024
 FILE: R:\1005000-1005999\1005472_03\04_DOCUMENTS\DESIGN\Plan_Set\3. Roadway\Standards\wf210.dgn



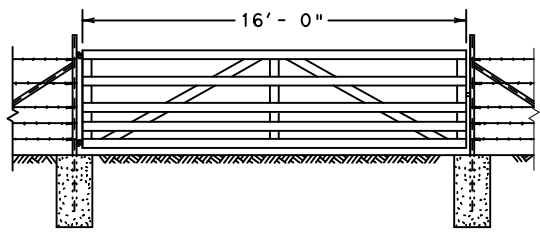
SECTION GALVANIZED BARBED WIRE FENCE WITH METAL POSTS
 BRACING DETAIL USED AT ENDS AND GATES
TYPE "C" FENCE
 (See General Note 8)



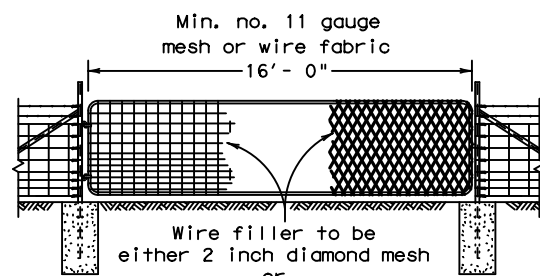
SECTION GALVANIZED WOVEN WIRE FENCE WITH METAL POSTS
 BRACING DETAIL USED AT ENDS AND GATES
TYPE "D" FENCE
 (See General Note 8)

Note:
 For Steel pipe and T-Post requirements.
 (See General Notes 6 & 7)

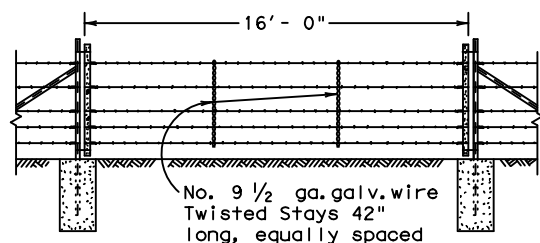
Metal gate shall consist of 5 panels not less than 4'-4" high and shall be aluminum or galvanized metal and of good quality. Gate and hardware shall meet the approval of the engineer.



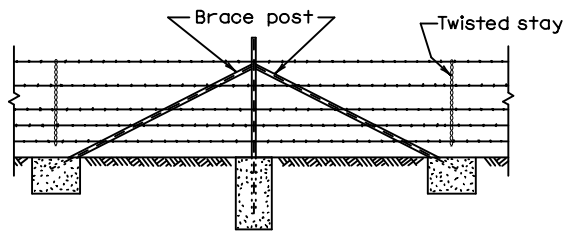
DETAIL TYPE 1 GATE



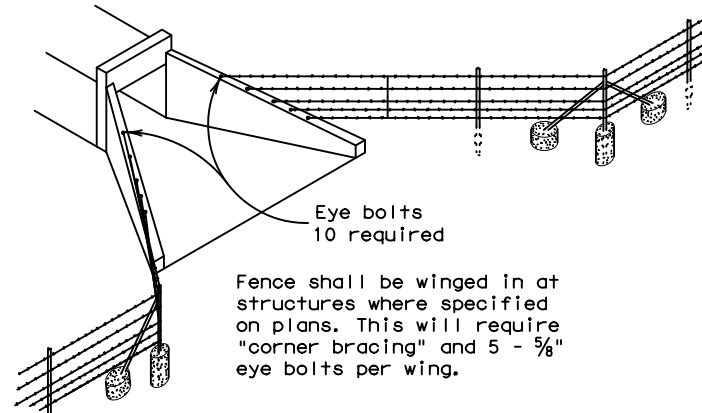
DETAIL TYPE 2 GATE



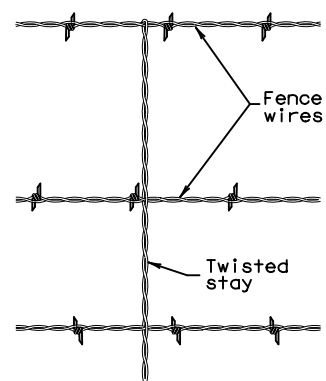
DETAIL TYPE 3 GATE



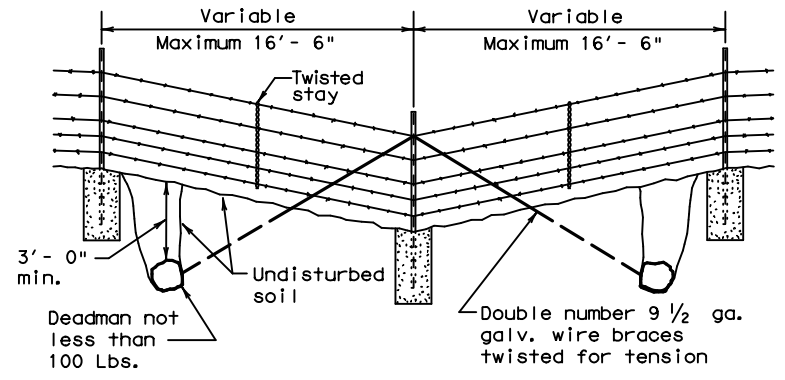
CORNER OR PULL POST ASSEMBLY



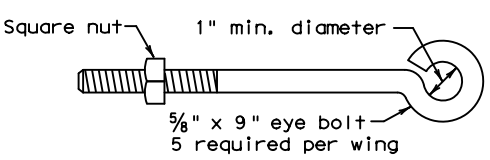
DETAIL OF FENCE TREATMENT AT STRUCTURES



DETAIL OF STAY (Barbed Wire Fence)



DETAIL OF FENCE SAG



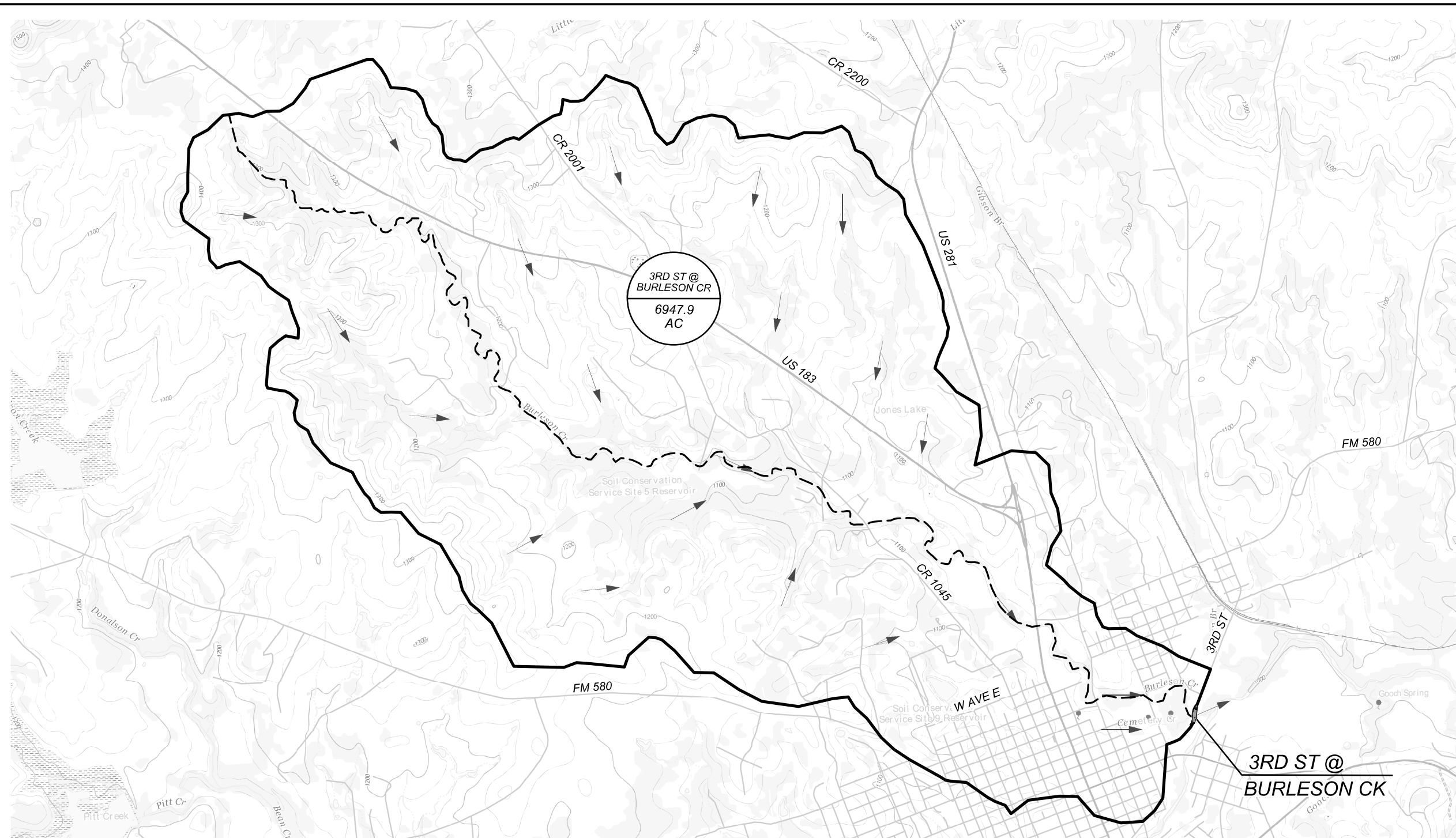
DETAIL OF EYE BOLT

GENERAL NOTES

- Any high point which interferes with the placing of wire mesh shall be excavated to provide a 2 inch clearance.
 - Latches for Type 1 and Type 2 gates shall be good commercial quality and design latch of the spring, fork or chain type. All latches shall be suitable to the gate and shall be approved by the Engineer.
 - Hinges for Type 2 gates shall be a commercial design approved by the Engineer suitable for post and gate.
 - Concrete shall be of the design and consistency approved by the Engineer and shall contain not less than 4 sacks of cement per cubic yard. Concrete footings are to be crowned at the top to shed water.
 - Steel anchor plates shall be of a design and thickness sufficient to prevent turning of the post in firm soil.
 - Steel pipe end posts, corner and pull posts shall be a minimum of 2" Std. pipe (2.375" O.D., 0.154" wall thickness) with a 1/4" Std. pipe brace (1.660" O.D., 0.140" wall thickness), with a 2"x2"x1/4" angle, or other as approved by the Engineer. Fasteners for securing barbed wire or woven wire fence to metal posts shall be a minimum of 11 gauge galvanized steel wire. Tubular posts shall be fitted with water malleable iron caps.
 - If Steel pipe is used for posts and braces, use standard pipe in accordance with ASTM A 53, Class B or A 501. For T-Posts use steel that meets ASTM A 702. Metal line posts shall be not less than 6'-6" in length and shall weigh not less than (1.33 lbs./lin.ft.). These items shall be in accordance with Item 552, "Wire Fence."
 - Barbed Wire shall be in accordance with ASTM A 121, Class 1 Design designation 12-2-4-1 4R or 12-2-5-1 4R, or as approved by the Engineer.
- Woven Wire Fence (Type D) shall be in accordance with ASTM A 116, Class 1 No. 12-1/2 Grade 60 (See Table 1 ASTM A 116) to the height and design shown on the plans, or as approved by the Engineer.
- The location of gates and corner posts will be as indicated elsewhere in these plans.

		Design Division Standard	
BARBED WIRE AND WOVEN WIRE FENCE (STEEL POSTS) WF (2) - 10			
FILE: wf210.dgn	DN: TxDOT	CK: AM	DW: VP
© TxDOT 1996	CONT SECT	JOB	HIGHWAY
REVISIONS	0923 10	021	3RD ST
DIST	COUNTY	SHEET NO.	
BWD	LAMPASAS	37	

DATE: 6/22/2024 10:04:21 PM
FILE: Z:\02 Engineering Projects\PCAL-7 Bridges\Brownwood, TX\Work\3rd St\03 DRAWINGS\3rd Street Drainage Area Map Sheet.dgn

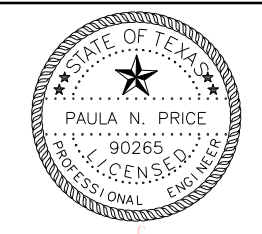
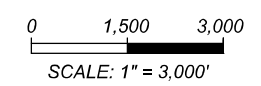


LEGEND

- DRAINAGE AREA ID
- AREA (AC)
- DRAINAGE FLOW DIRECTION
- DRAINAGE DIVIDE
- LONGEST FLOW PATH



- NOTES:**
1. TOPOGRAPHIC CONTOUR FROM USGS 1-METER DEM (2014 BANDERA AND LAMPASAS COUNTIES LIDAR) AND USGS QUADRANGLE MAPS: LAMPASAS, TX, 2022 NIX, TX, 2022
 2. HYDROLOGIC CALCULATIONS CALIBRATED TO FEMA FLOOD INSURANCE STUDY OF CITY OF LAMPASAS COUNTY, DATED DECEMBER 15, 1981, FOR BURLESON CREEK AT THE CONFLUENCE WITH SULPHUR CREEK. DEFAULT PEAK RATING FACTOR OF 484 WAS USED.
 3. HYDROLOGIC SOIL GROUPS MEASURED FROM DATA OBTAINED THROUGH NRCS WEB SOIL SURVEY.
 4. NRCS COMPOSITE CURVE NUMBER BASED ON COMBINATION OF LAND USE TYPES CONSISTING OF RESIDENTIAL - 38% IMPERVIOUS, AND BRUSH-WEED-GRASS MIXTURE IN GOOD CONDITION.
 5. KERBY-KIRPICH METHOD USED FOR ESTIMATING TIME OF CONCENTRATION.
 6. RAINFALL DEPTHS FROM NOAA ATLAS 14, VOL. 11, VER 2. DEPTHS ADJUSTED TO LAT 31.0689°, LONG -98.1729°.
 7. PEAK FLOW RATES CALCULATED WITH HEC-HMS MODEL VERSION 4.11.
 8. ALL CALCULATIONS IN ACCORDANCE WITH TxDOT HYDRAULIC DESIGN MANUAL, SEPT 2019.
 9. PROJECT SUBMITTED TO FLOODPLAIN ADMINISTRATOR ON JUNE 20, 2024.



Paula N. Price
Digitally signed by Paula N. Price, P.E., CEM
DN: cn=Paula N. Price, o=P&D Professional Services,
ou=Houston, email=pp@pandps.com, c=US
Date: 2024.06.22 12:45:08-0500



P&D PROFESSIONAL SERVICES, INC.
617 CAROLINE STREET, SUITE 11
HOUSTON, TEXAS 77002
281-743-4475
TEXAS FIRM NO. F-141117

3RD ST @ BURLESON CREEK

DRAINAGE AREA MAP

CONTRACT	SECTION	JOB	HIGHWAY
0923	10	021	3RD ST
DISTRICT	COUNTY	SHEET NO.	
BWD	LAMPASAS	38	

NOAA ATLAS 14, VOLUME 11, VERSION 2
LAMPASAS, TEXAS, LATITUDE: 31.0689°, LONGITUDE: -98.1729°

DURATION	FREQUENCY / RAINFALL DEPTH					
	2-YR	5-YR	10-YR	25-YR	50-YR	100-YR
5-MIN	0.483	0.611	0.717	0.864	0.976	1.09
10-MIN	0.775	0.981	1.15	1.39	1.57	1.76
15-MIN	0.97	1.22	1.43	1.71	1.93	2.16
30-MIN	1.33	1.68	1.96	2.35	2.64	2.94
60-MIN	1.71	2.16	2.54	3.06	3.45	3.87
2-HR	2.08	2.66	3.16	3.89	4.46	5.09
3-HR	2.3	2.96	3.55	4.41	5.12	5.9
6-HR	2.69	3.48	4.21	5.3	6.21	7.23
12-HR	3.12	4.03	4.87	6.13	7.18	8.36
24-HR	3.58	4.62	5.56	6.96	8.13	9.43

HYDROLOGIC SUMMARY TABLE

DRAINAGE AREA ID	AREA (AC)	AREA (SQ MI)	METHOD USED	PEAK RATING FACTOR	COMP CURVE NUMBER	T _c (MIN)	T Lag (MIN)	PEAK FLOW RATE (CFS)					
								2-YR	5-YR	10-YR	25-YR	50-YR	100-YR
3rd St	6947.9	10.86	HEC-HMS	484	70.8	209.36	125.6	1,588.1	2,727.0	3,850.3	5,607.4	7,105.9	8,793.1

NRCS COMPOSITE CURVE NUMBER

LAND COVER		DRAINAGE AREA (AC)	HYDROLOGIC SOIL GROUP				COMPOSITE CURVE NUMBER
GROUP	DESCRIPTION		A	B	C	D	
Urban Areas	Residential - 38% Imp	653.1	61	75	83	87	80.2
Other Agricultural Lands	Brush-Weed-Grass Mixture Good Condition	6294.8	0.0	361.3	29.7	262.1	69.8
			38.7	642.7	291.6	5321.8	
Composite Curve Number		6947.9					70.8

TIME OF CONCENTRATION - KERBY-KIRPICH METHOD

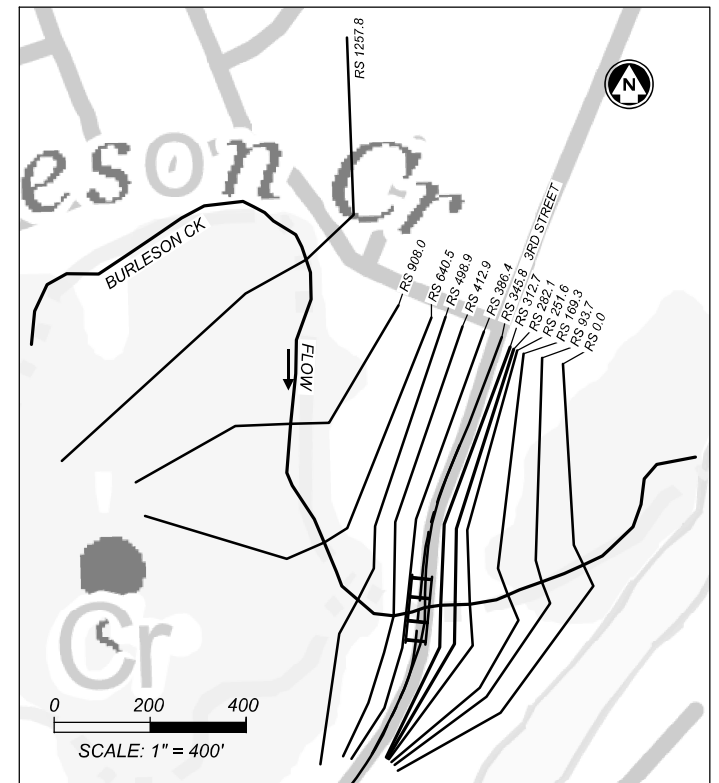
DRAINAGE AREA ID	T _c (HR)	T _c (MIN)	OVERLAND FLOW					CHANNEL FLOW									
			T _{ov} (MIN)	K _{ov}	L _{ov} (FT)	N	S (FT/FT)	Adj S (FT/FT)	ELEV START	ELEV END	T _{ch} (MIN)	K _{ch}	L _{ch} (FT)	S (FT/FT)	Adj S (FT/FT)	ELEV START	ELEV END
3rd St	3.49	209.36	28.28	0.828	1042	0.4	0.0480	0.0480	1370.0	1320.0	181.08	0.0078	41428	0.0079	0.0079	1320.0	994.75

DATE: 6/22/2024 10:12:29 PM
 FILE: Z:\02 Engineering Projects\PCAL-7 Bridges Brownwood, TX\Work\3rd St\03 DRAWINGS\3rd Street Hydraulic Data Sheets.dgn

PLAN: PROP 5A BURLERSON CK 3rd ST RS: 345.8 PROFILE: 10-YR				
E.G. US. (FT)	1006.59	ELEMENT	Inside BR US	Inside BR DS
W.S. US. (FT)	1006.32	E.G. ELEV (FT)	1006.51	1006.43
Q TOTAL (CFS)	3850.3	W.S. ELEV (FT)	1006	1005.96
Q BRIDGE (CFS)	3850.3	CRIT W.S. (FT)	1001.71	1001.28
Q WEIR (CFS)		MAX CHL DEPTH (FT)	11.49	11.91
WEIR STA LFT (FT)		VEL TOTAL (FT/S)	5.73	5.47
WEIR STA RGT (FT)		FLOW AREA (SQ FT)	672.28	704.21
WEIR SUBMERG		FROUDE # CHL	0.39	0.36
WEIR MAX DEPTH (FT)		SPECIF FORCE (CU FT)	3683.34	3904.66
MIN EL WEIR FLOW (FT)	1009.92	HYDR DEPTH (FT)	6.79	7.02
MIN EL PRS (FT)	1011.54	W.P. TOTAL (FT)	131.42	134.14
DELTA EG (FT)	0.21	CONV. TOTAL (CFS)	98858	105357.9
DELTA WS (FT)	0.46	TOP WIDTH (FT)	99.01	100.26
BR OPEN AREA (SQ FT)	1293.96	FRCTN LOSS (FT)	0.06	0.03
BR OPEN VEL (FT/S)	5.73	C & E LOSS (FT)	0.02	0.02
BR SLUICE COEF		SHEAR TOTAL (LB/SQ FT)	0.48	0.44
BR SEL METHOD	ENERGY ONLY	POWER TOTAL (LB/FT S)	2.77	2.39

PLAN: PROP 5A BURLERSON CK 3rd ST RS: 345.8 PROFILE: 100-YR				
E.G. US. (FT)	1010.51	ELEMENT	Inside BR US	Inside BR DS
W.S. US. (FT)	1009.93	E.G. ELEV (FT)	1010.33	1010.19
Q TOTAL (CFS)	8793.1	W.S. ELEV (FT)	1009.19	1009.12
Q BRIDGE (CFS)	8793.1	CRIT W.S. (FT)	1005.36	1004.95
Q WEIR (CFS)		MAX CHL DEPTH (FT)	14.68	15.07
WEIR STA LFT (FT)		VEL TOTAL (FT/S)	8.57	8.33
WEIR STA RGT (FT)		FLOW AREA (SQ FT)	1025.61	1055.84
WEIR SUBMERG		FROUDE # CHL	0.52	0.5
WEIR MAX DEPTH (FT)		SPECIF FORCE (CU FT)	8031.71	8282.47
MIN EL WEIR FLOW (FT)	1009.92	HYDR DEPTH (FT)	8.38	8.6
MIN EL PRS (FT)	1011.54	W.P. TOTAL (FT)	168.37	170.13
DELTA EG (FT)	0.47	CONV. TOTAL (CFS)	169435.5	176627.9
DELTA WS (FT)	1.28	TOP WIDTH (FT)	122.32	122.76
BR OPEN AREA (SQ FT)	1293.96	FRCTN LOSS (FT)	0.11	0.05
BR OPEN VEL (FT/S)	8.57	C & E LOSS (FT)	0.03	0.09
BR SLUICE COEF		SHEAR TOTAL (LB/SQ FT)	1.02	0.96
BR SEL METHOD	ENERGY ONLY	POWER TOTAL (LB/FT S)	8.78	8

REACH	RIVER STA	PROFILE	PLAN	HEC-RAS RIVER: BURLERSON CK				REACH: 3RD ST					
				Q TOTAL (CFS)	MIN CH EL (FT)	W.S. ELEV (FT)	CRIT W.S. (FT)	E.G. ELEV (FT)	E.G. SLOPE (FT/FT)	VEL CHNL (FT/S)	FLOW AREA (SQ FT)	TOP WIDTH (FT)	FROUDE # CHL
3rd St	1257.8	10-yr	Exist	3850.3	999.53	1010.42		1011	0.00375	6.1	630.69	115.65	0.46
3rd St	1257.8	10-yr	Prop 5	3850.3	999.53	1010.33		1010.93	0.003886	6.21	619.7	113.61	0.47
3rd St	1257.8	100-yr	Exist	8793.1	999.53	1014.14		1014.74	0.002584	6.68	2291.5	1070.53	0.41
3rd St	1257.8	100-yr	Prop 5	8793.1	999.53	1014.15		1014.75	0.002556	6.65	2308.21	1076.17	0.41
3rd St	908	10-yr	Exist	3850.3	996.45	1008.93		1009.74	0.003941	7.29	577.06	133.55	0.48
3rd St	908	10-yr	Prop 5	3850.3	996.45	1008.7		1009.57	0.004345	7.54	548.43	122.26	0.51
3rd St	908	100-yr	Exist	8793.1	996.45	1012.45		1013.68	0.004082	9.6	1422.11	373.16	0.53
3rd St	908	100-yr	Prop 5	8793.1	996.45	1012.45		1013.69	0.004076	9.6	1423.29	373.38	0.52
3rd St	640.5	10-yr	Exist	3850.3	996.5	1007.58		1008.59	0.004642	8.08	487.8	98.45	0.52
3rd St	640.5	10-yr	Prop 5	3850.3	996.5	1007.05		1008.23	0.005482	8.68	443.49	60.73	0.56
3rd St	640.5	100-yr	Exist	8793.1	996.5	1011.33	1009.26	1012.6	0.004182	10.02	1661.2	621.31	0.52
3rd St	640.5	100-yr	Prop 5	8793.1	996.5	1011.34	1009.26	1012.6	0.004168	10.01	1664.76	621.52	0.52
3rd St	498.6	10-yr	Exist	3850.3	995.44	1007.17	1003.94	1007.92	0.003211	7.03	629.09	159.52	0.45
3rd St	498.6	10-yr	Prop 5	3850.3	995.44	1006.32	1003.93	1007.31	0.004887	8.03	512.39	113.16	0.54
3rd St	498.6	100-yr	Exist	8793.1	995.44	1011.29	1007.87	1011.98	0.002227	7.79	2318.77	683.65	0.4
3rd St	498.6	100-yr	Prop 5	8793.1	995.44	1009.72	1007.87	1011.33	0.005225	10.86	1360.31	537.05	0.6
3rd St	412.9	10-yr	Exist	3850.3	995.35	1006.97	1003.79	1007.57	0.003965	6.24	616.69	113.08	0.47
3rd St	412.9	10-yr	Prop 5	3850.3	995.35	1005.9	1003.79	1006.81	0.006443	7.63	504.58	98.04	0.59
3rd St	412.9	100-yr	Exist	8793.1	995.35	1011.23	1007.28	1011.75	0.002294	6.24	2148.57	614.49	0.39
3rd St	412.9	100-yr	Prop 5	8793.1	995.35	1009.54	1007.33	1010.74	0.005926	8.94	1207.32	478.63	0.6
3rd St	386.4	10-yr	Exist	3850.3	995.31	1006.94	1003.5	1007.46	0.002542	5.81	662.37	155.19	0.39
3rd St	386.4	10-yr	Prop 5	3850.3	994.51	1006.32	1000.44	1006.59	0.00485	4.15	928.93	130.09	0.26
3rd St	386.4	100-yr	Exist	8793.1	995.31	1011.05	1006.5	1011.67	0.002029	6.69	2067.89	652.66	0.38
3rd St	386.4	100-yr	Prop 5	8793.1	994.51	1009.93	1003.71	1010.51	0.000684	6.2	1805.51	527.7	0.33
3rd St	345.8			Bridge									
3rd St	312.7	10-yr	Exist	3850.3	994.74	1005.5	1003.06	1006.51	0.004944	8.06	480.89	106.13	0.55
3rd St	312.7	10-yr	Prop 5	3850.3	994.05	1005.86	1001.3	1006.38	0.000948	5.82	697.29	116.22	0.37
3rd St	312.7	100-yr	Exist	8793.1	994.74	1008.34	1006.66	1010.57	0.007303	12.26	879.2	191.81	0.7
3rd St	312.7	100-yr	Prop 5	8793.1	994.05	1008.65	1005.02	1010.04	0.001734	9.57	1111.88	211.47	0.52
3rd St	282.1	10-yr	Exist	3850.3	994.78	1005.46	1002.77	1006.24	0.005295	7.11	541.83	102.67	0.55
3rd St	282.1	10-yr	Prop 5	3850.3	994.78	1005.46	1002.76	1006.24	0.005295	7.11	541.83	102.67	0.55
3rd St	282.1	100-yr	Exist	8793.1	994.78	1008.59	1006.42	1009.92	0.005932	9.44	1161.27	362.75	0.61
3rd St	282.1	100-yr	Prop 5	8793.1	994.78	1008.59	1006.48	1009.92	0.005932	9.44	1161.25	362.74	0.61
3rd St	251.6	10-yr	Exist	3850.3	994.68	1004.98	1003.05	1006.02	0.007606	8.22	468.57	100.49	0.65
3rd St	251.6	10-yr	Prop 5	3850.3	994.68	1004.98	1003.04	1006.02	0.007605	8.22	469.07	100.5	0.65
3rd St	251.6	100-yr	Exist	8793.1	994.68	1008.05	1006.86	1009.69	0.007343	10.62	1082.44	323.93	0.68
3rd St	251.6	100-yr	Prop 5	8793.1	994.68	1008.05	1006.85	1009.69	0.007343	10.62	1082.46	323.94	0.68
3rd St	169.3	10-yr	Exist	3850.3	994.82	1004.78		1005.45	0.004517	7.99	909.09	210.02	0.51
3rd St	169.3	10-yr	Prop 5	3850.3	994.82	1004.78		1005.45	0.004517	7.99	909.09	210.02	0.51
3rd St	169.3	100-yr	Exist	8793.1	994.82	1007.94		1008.99	0.005878	10.8	1764.58	346.29	0.6
3rd St	169.3	100-yr	Prop 5	8793.1	994.82	1007.94		1008.99	0.005879	10.8	1764.56	346.29	0.6
3rd St	93.7	10-yr	Exist	3850.3	994.94	1004.79		1005.1	0.002355	5.76	1305.5	279.67	0.37
3rd St	93.7	10-yr	Prop 5	3850.3	994.94	1004.79		1005.1	0.002355	5.76	1305.5	279.67	0.37
3rd St	93.7	100-yr	Exist	8793.1	994.94	1008.04		1008.52	0.002769	7.59	2272.86	321.95	0.42
3rd St	93.7	100-yr	Prop 5	8793.1	994.94	1008.04		1008.52	0.002769	7.59	2272.84	321.95	0.42
3rd St	0	10-yr	Exist	3850.3	994.98	1004.13	1002.34	1004.78	0.004304	7.27	883.74	242.67	0.5
3rd St	0	10-yr	Prop 5	3850.3	994.98	1004.13	1002.34	1004.78	0.004304	7.27	883.74	242.67	0.5
3rd St	0	100-yr	Exist	8793.1	994.98	1007.32	1005.03	1008.17	0.004302	9.04	1715.87	276.74	0.53
3rd St	0	100-yr	Prop 5	8793.1	994.98	1007.32	1005.03	1008.17	0.004302	9.04	1715.87	276.74	0.53



CROSS SECTION LAYOUT

NOTES:

- PROPOSED BRIDGE IS LOCATED AT HEC-RAS RS 345.8. UPSTREAM CROSS SECTION IS AT HEC-RAS RS 386.4 AND DOWNSTREAM CROSS SECTION IS AT HEC-RAS RS 312.7.
- PROPOSED BRIDGE ABUTMENTS AND BENTS ARE NON-SKEWED.
- PROPOSED OVERALL BRIDGE WIDTH IS 42.17 FT. OVERALL BRIDGE LENGTH IS 130.0 FT.
- BURLERSON CREEK AT 3RD STREET IS FOUND ON LAMPASAS COUNTY, TEXAS EFFECTIVE FEMA FIRM PANEL 480430 0005 B, DATED JUNE 15, 1982. SPECIAL FLOOD HAZARD AREA ZONE A5 FLOODPLAIN AT 3RD STREET.
- FLOODPLAIN ADMINISTRATOR NOTIFIED OF PROPOSED PROJECT ON JUNE 20, 2024.

HYDRAULIC METHOD:

- WATER SURFACE ELEVATIONS COMPUTED USING HEC-RAS (V 6.4.1) MODEL CREATED FOR BURLERSON CREEK AT 3RD ST. FILENAME: 3rdSt.prj
EXIST COND PLAN: "EXISTING"
PROP COND PLAN: "PROPOSED 5A"
- HEC-RAS CROSS SECTIONS FROM FIELD SURVEY, USGS 1 M DEM DATA, AND PROPOSED BRIDGE LAYOUT.
- HEC-RAS BOUNDARY CONDITION BASED ON NORMAL DEPTH WITH A SLOPE OF 0.0043 FT/FT.
- MANNING'S ROUGHNESS COEFFICIENTS SET AT 0.045 FOR THE CHANNEL AND 0.08 TO 0.10 FOR THE OVERBANKS. PROPOSED STONE RIPRAP UNDER BRIDGE SET TO 0.030.
- ALL CALCULATIONS PERFORMED IN ACCORDANCE WITH TxDOT HYDRAULIC DESIGN MANUAL, DATED SEPTEMBER 2019.

Richard A. Kraus
Professional Engineer
57390

Digitally signed by Richard A. Kraus, PE, CFM
DN: cn=Richard A. Kraus, PE, CFM, ou=P&D Professional Services, Inc., ou, email=kraus@pdproservices.com, c=US
Date: 2024.06.22 22:17:21 -0600

Texas Department of Transportation

617 CAROLINE STREET, SUITE 11
HOUSTON, TEXAS 77005
281-743-4475
TEXAS FIRM NO. F-141117

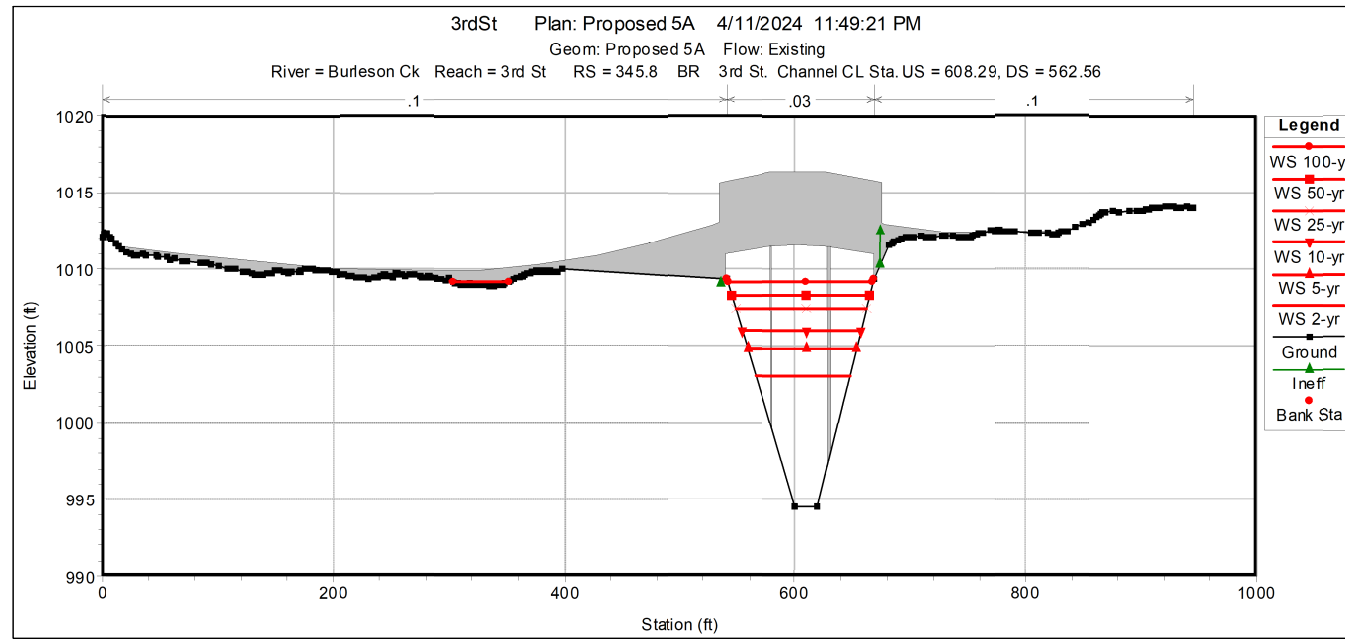
3RD ST @ BURLERSON CREEK

HYDRAULIC DATA

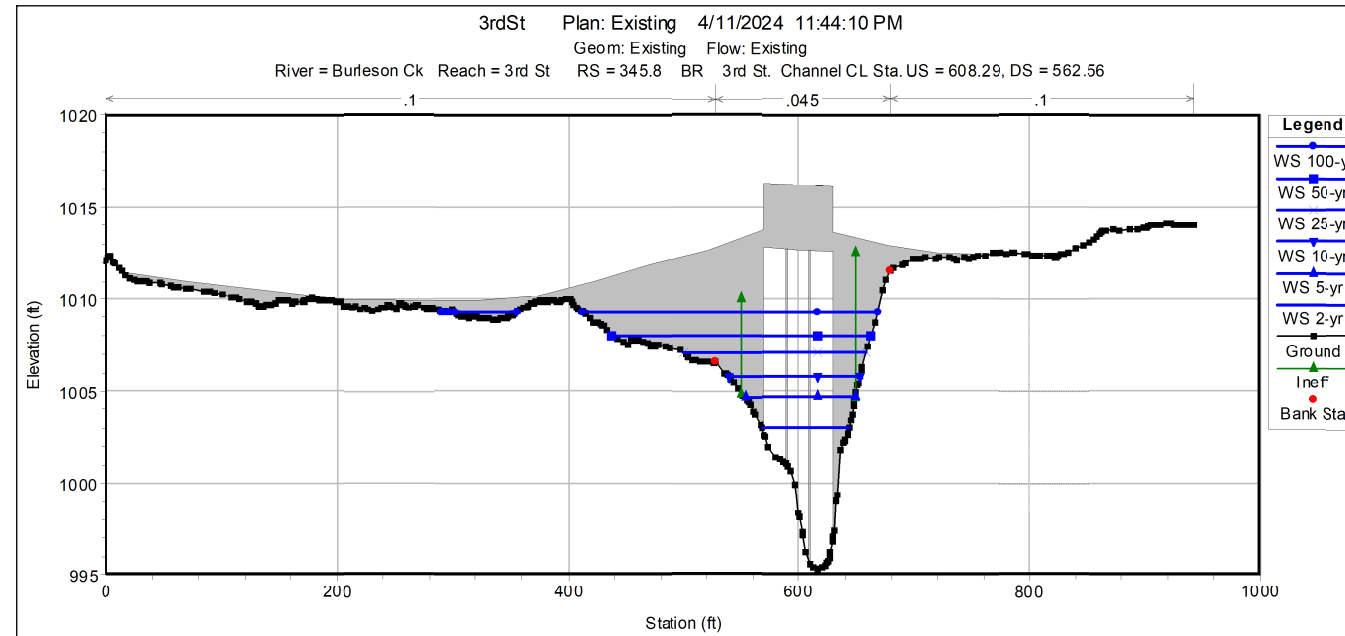
SHEET 1 OF 2

CONT	SECT	JOB	HIGHWAY
0923	10	021	3RD ST
DIST	COUNTY	SHEET NO.	
BWD	LAMPASAS	39	

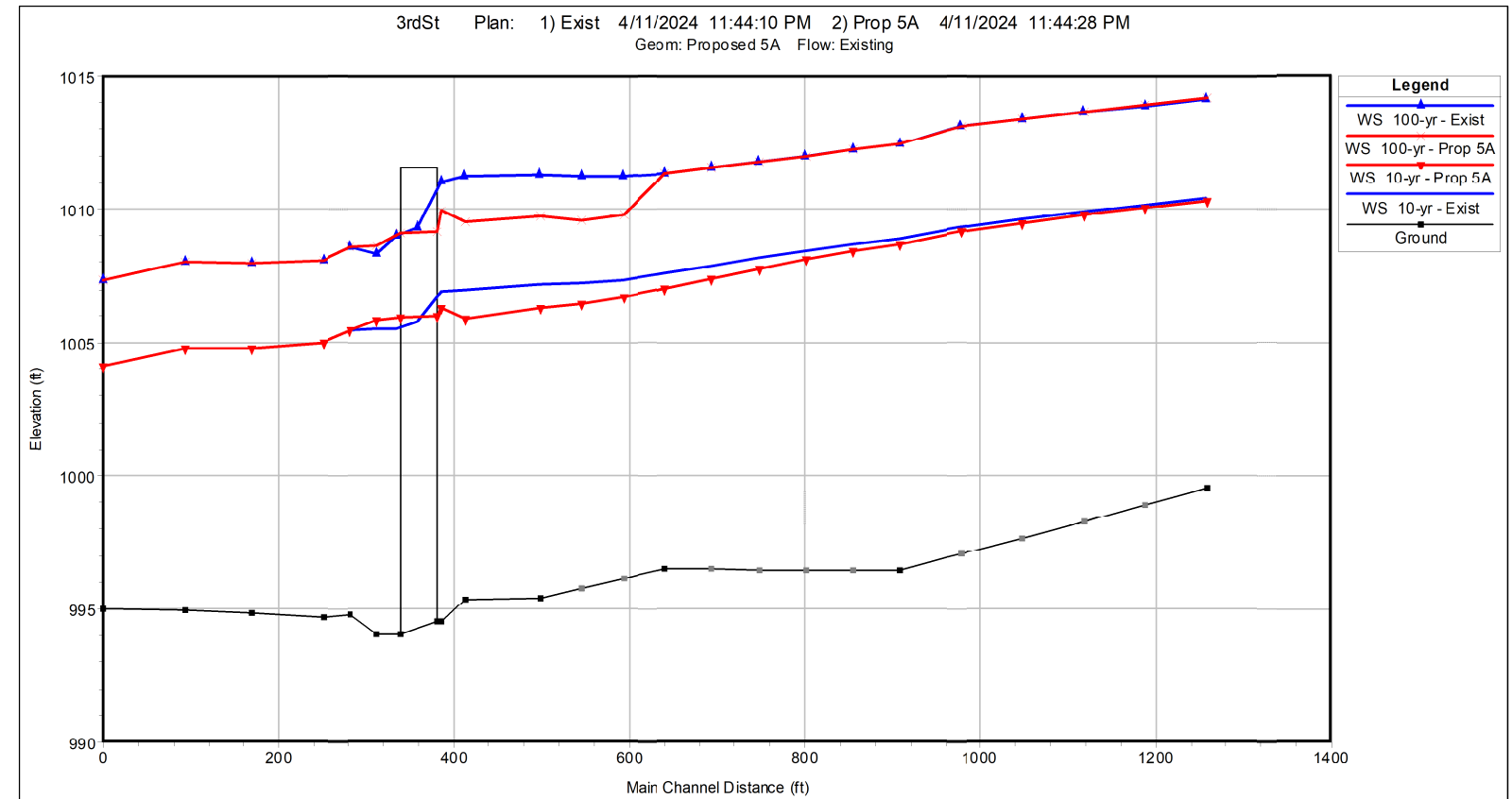
DATE: 6/22/2024 10:13:06 PM
 FILE: Z:\02 Engineering Projects\PCAL-7 Bridges Brownwood, TX\Work\3rd St\03 DRAWINGS\3rd Street Hydraulic Data Sheets.dgn



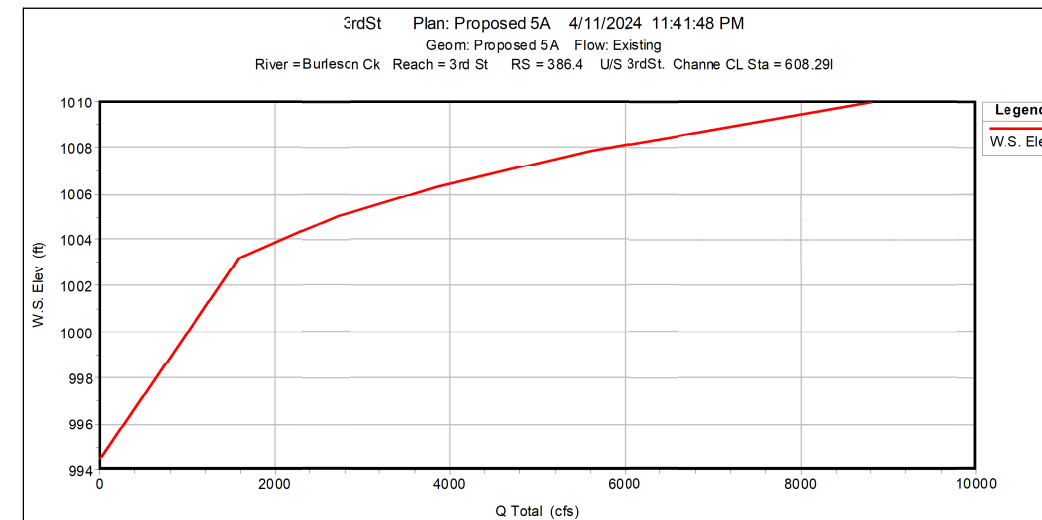
HEC-RAS CROSS SECTION OUTPUT - PROPOSED CONDITION



HEC-RAS CROSS SECTION OUTPUT - EXISTING CONDITION



HEC-RAS PROFILE OUTPUT



HEC-RAS PROPOSED CONDITION RATING CURVE

Digitally signed by Richard A. Kraus, PE, CFM
 DN: cn=Richard A. Kraus, PE, CFM, o=P&D Professional Services, Inc., ou=, email=rkraus@pdproservices.com, c=US
 Date: 2024.06.22 22:19:12 -0600



617 CAROLINE STREET, SUITE 11
 HOUSTON, TEXAS 77002
 281-743-4475
 TEXAS FIRM NO. F-141117

3RD ST @ BURLESON CREEK

HYDRAULIC DATA

SHEET 2 OF 2

CONT	SECT	JOB	HIGHWAY
0923	10	021	3RD ST
DIST	COUNTY	SHEET NO.	
BWD	LAMPASAS	40	

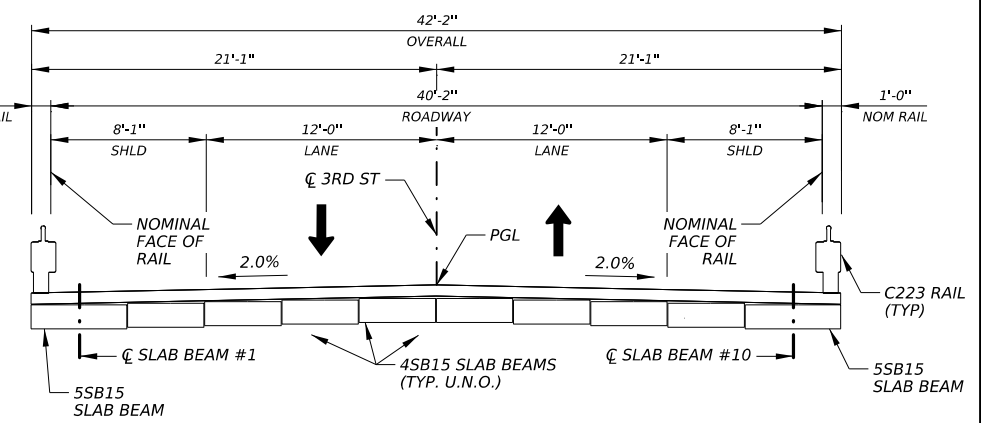
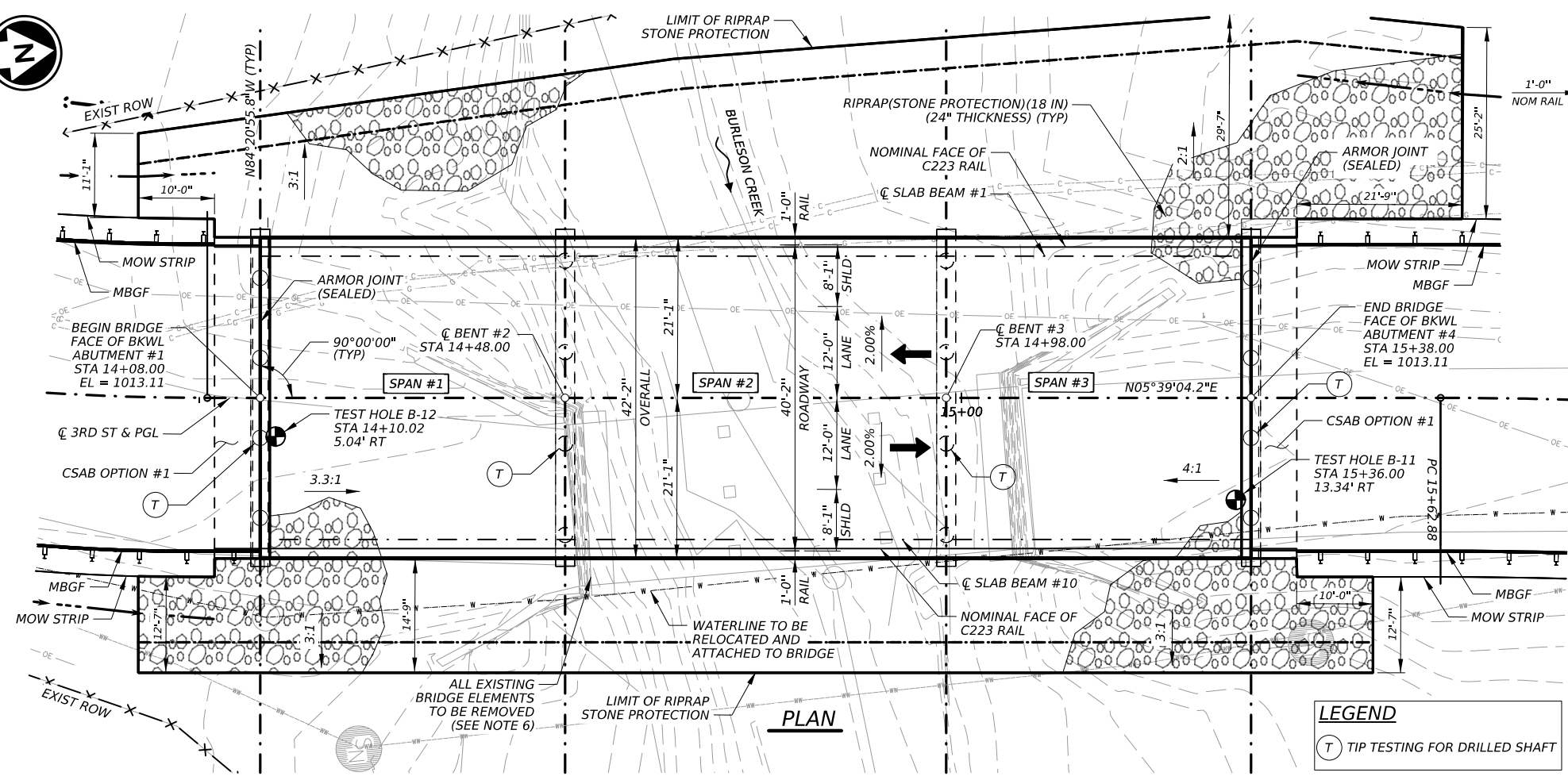
NOTES:

- PROPOSED BRIDGE IS LOCATED AT HEC-RAS RS 345.8. UPSTREAM CROSS SECTION IS AT HEC-RAS RS 386.4 AND DOWNSTREAM CROSS SECTION IS AT HEC-RAS RS 312.7.
- PROPOSED BRIDGE ABUTMENTS AND BENTS ARE NON-SKEWED.
- PROPOSED OVERALL BRIDGE WIDTH IS 42.17 FT. OVERALL BRIDGE LENGTH IS 130.0 FT.
- BURLESON CREEK AT 3RD STREET IS FOUND ON LAMPASAS COUNTY, TEXAS EFFECTIVE FEMA FIRM PANEL 480430 0005 B, DATED JUNE 15, 1982. SPECIAL FLOOD HAZARD AREA ZONE A5 FLOODPLAIN AT 3RD STREET.
- FLOODPLAIN ADMINISTRATOR NOTIFIED OF PROPOSED PROJECT ON JUNE 20, 2024.

HYDRAULIC METHOD:

- WATER SURFACE ELEVATIONS COMPUTED USING HEC-RAS (V 6.4.1) MODEL CREATED FOR BURLESON CREEK AT 3RD ST. FILENAME: 3rdSt.prj
EXIST COND PLAN: "EXISTING"
PROP COND PLAN: "PROPOSED 5A"
- HEC-RAS CROSS SECTIONS FROM FIELD SURVEY, USGS 1 M DEM DATA, AND PROPOSED BRIDGE LAYOUT.
- HEC-RAS BOUNDARY CONDITION BASED ON NORMAL DEPTH WITH A SLOPE OF 0.0043 FT/FT.
- MANNING'S ROUGHNESS COEFFICIENTS SET AT 0.045 FOR THE CHANNEL AND 0.08 TO 0.10 FOR THE OVBANKS. PROPOSED STONE RIPRAP UNDER BRIDGE SET TO 0.030.
- ALL CALCULATIONS PERFORMED IN ACCORDANCE WITH TxDOT HYDRAULIC DESIGN MANUAL, DATED SEPTEMBER 2019.

DATE: 7/22/2024 8:46:58 AM
 FILE: \\pgal.com\data\drive\1005000-1005999\1005472.03104 DOCUMENTS\DESIGN\Plan_Sett7_Bridge\3RD BRG BL 01.dgn



- GENERAL NOTES:**
- DESIGNED ACCORDING TO AASHTO LRFD BRIDGE DESIGN SPECIFICATIONS, 9TH EDITION (2020), CURRENT INTERIMS AND TxDOT BRIDGE DESIGN MANUAL (JAN 2023).
 - ⊕ DENOTES SOIL BORING LOCATION. SEE "BORING LOG" SHEETS FOR BORING LOG INFORMATION.
 - UTILITIES SHOWN ARE IN APPROXIMATE LOCATIONS. CONTRACTOR SHALL VERIFY LOCATION PRIOR TO CONSTRUCTION AND INFORM ENGINEER OF ANY CONFLICTS PRIOR TO BEGINNING CONSTRUCTION.
 - ELEVATIONS SHOWN ARE AT PROFILE GRADE LINE UNLESS OTHERWISE NOTED.
 - NO FUTURE WEARING SURFACE ALLOWANCE CONSIDERED IN DESIGN.
 - EXISTING MASONRY ABUTMENTS, WINGWALLS AND CONCRETE FOOTINGS SHALL BE COMPLETELY REMOVED. EXISTING CONCRETE FOUNDATIONS AND STEEL PILING SHALL BE REMOVED 2'-0" BELOW FINISHED GROUND. ALL EXCAVATED AREAS TO BE BACKFILLED WITH NON-STRUCTURAL CONCRETE.
 - CONTRACTOR'S ATTENTION IS DIRECTED TO THE PRESENCE OF GROUNDWATER, CLAY LAYERS AND GRANULAR SOILS AS SHOWN IN THE BORING LOGS. PROVIDE PROPER INSTALLATION METHOD FOR THE DRILLED SHAFT FOUNDATIONS, SUCH AS TEMPORARY STEEL CASING (A MINIMUM OF 10-FT LONG) AND BENTONITE SLURRY. IT IS CONTRACTOR'S SOLE RESPONSIBILITY TO MAINTAIN THE STABILITY OF DRILLED SHAFT HOLES.
 - "H" VALUES SHOWN ARE ESTIMATED AVERAGE COLUMN HEIGHTS. CONTRACTOR IS RESPONSIBLE FOR CALCULATING ACTUAL COLUMN HEIGHTS BASED ON FIELD CONDITIONS.
 - FOUND DRILLED SHAFTS AT THE LENGTHS SHOWN OR LONGER TO OBTAIN A MINIMUM PENETRATION INTO HARD ROCK AS FOLLOWS: 1.5 DRILLED SHAFT DIAMETER FOR ABUTMENTS AND 2 DRILLED SHAFT DIAMETER FOR BENTS.
 - CORE HOLES SHALL BE TAKEN TO CONFIRM CONDITION OF ROCK AT EACH DRILLED SHAFT LOCATION IN ACCORDANCE WITH ITEM 416 OF THE STANDARD SPECIFICATIONS.

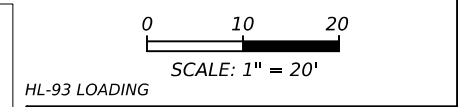
EXISTING BRIDGE:
 OVERALL 24'-0" WIDE X 60'-0" LONG, CONSISTING OF THREE 20'-0" LONG CONCRETE SLAB SPANS, SUPPORTED ON PILE BENTS AND MASONRY ABUTMENTS, INCLUDING CONCRETE CAST-IN-PLACE DECK. ABUTMENTS CONSIST OF APPROX 3'(W) X 24'(L) X 25'(H) MASONRY, WITH CONCRETE FOOTINGS. WINGWALLS CONSIST OF APPROX 2'(W) X 23'(L) X 25'(H) MASONRY.

1020
 DESIGN SPEED: 30 MPH
 ADT (2013): 2900
 ADT (2033): 3500
 FUNCTIONAL CLASSIFICATION: MAJOR COLLECTOR
 EXISTING NBI NUMBER: 23-141-0-B006-45-001
 PROPOSED NBI NUMBER: 23-141-0-B006-45-003

1000
 HL-93 LOADING:
 SUPERSTRUCTURE INV/OPR = 1.14/2.17

980
 HYDRAULIC DATA (EXIST):
 Q (10YR) = 3850 CFS Q (100YR) = 8793 CFS
 V (10YR) = 5.81 FPS V (100YR) = 6.69 FPS
 WSEL (10YR) = 1006.94 WSEL (100YR) = 1011.05
 BRIDGE OPEN AREA = 822.33 SF

960
 HYDRAULIC DATA (PROP):
 Q (10YR) = 3850 CFS Q (100YR) = 8793 CFS
 V (10YR) = 4.15 FPS V (100YR) = 6.20 FPS
 WSEL (10YR) = 1006.32 WSEL (100YR) = 1009.93
 BRIDGE OPEN AREA = 1293.96 SF



HL-93 LOADING

NO.	DATE	REVISION	APPROV.

Texas Department of Transportation

PG&L
 TBPE REG. NO. F-2742

3131 Briarpark Dr, Suite 200
 Houston, Texas 77042
 (713) 622-1444

3RD ST @ BURLESON CREEK

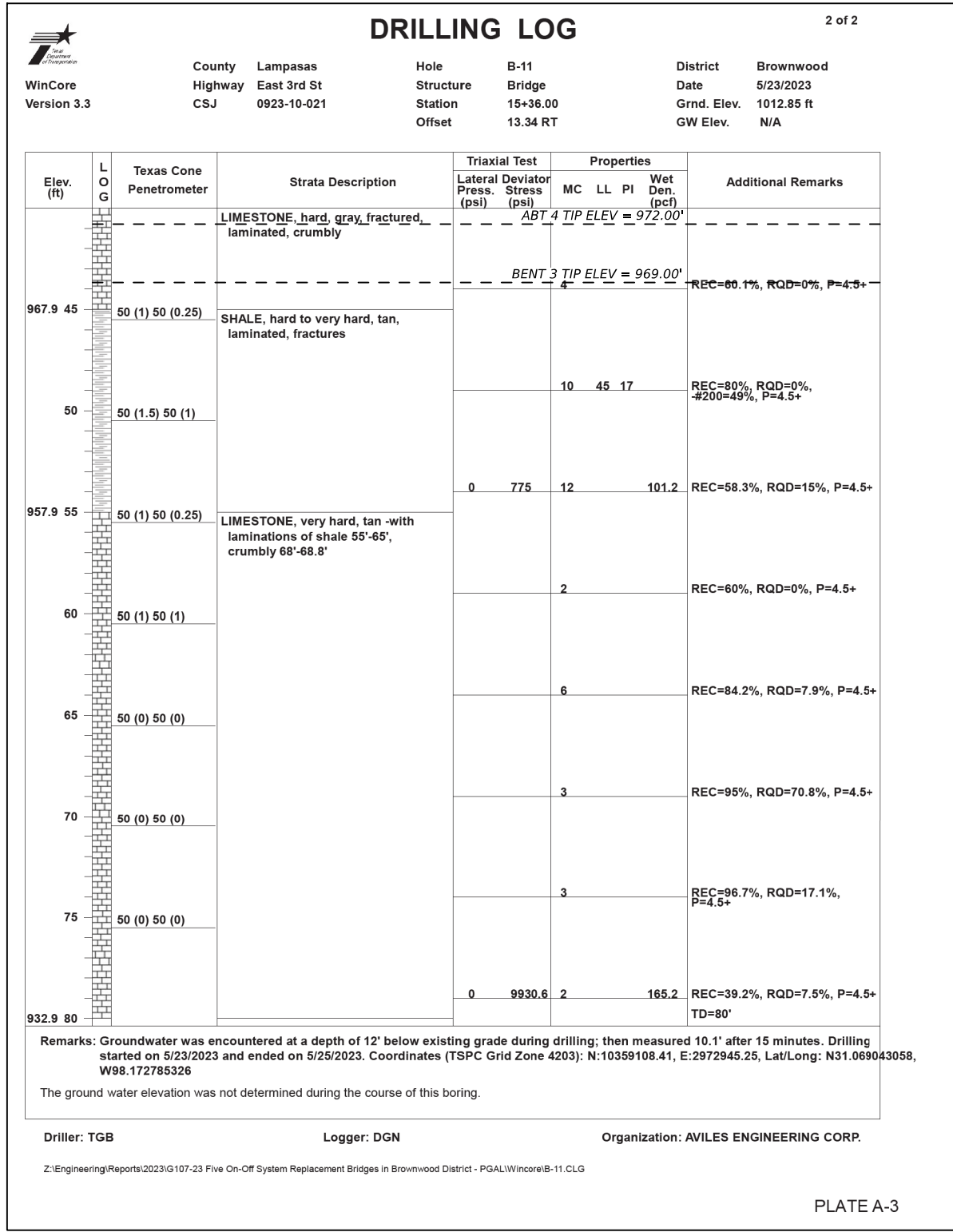
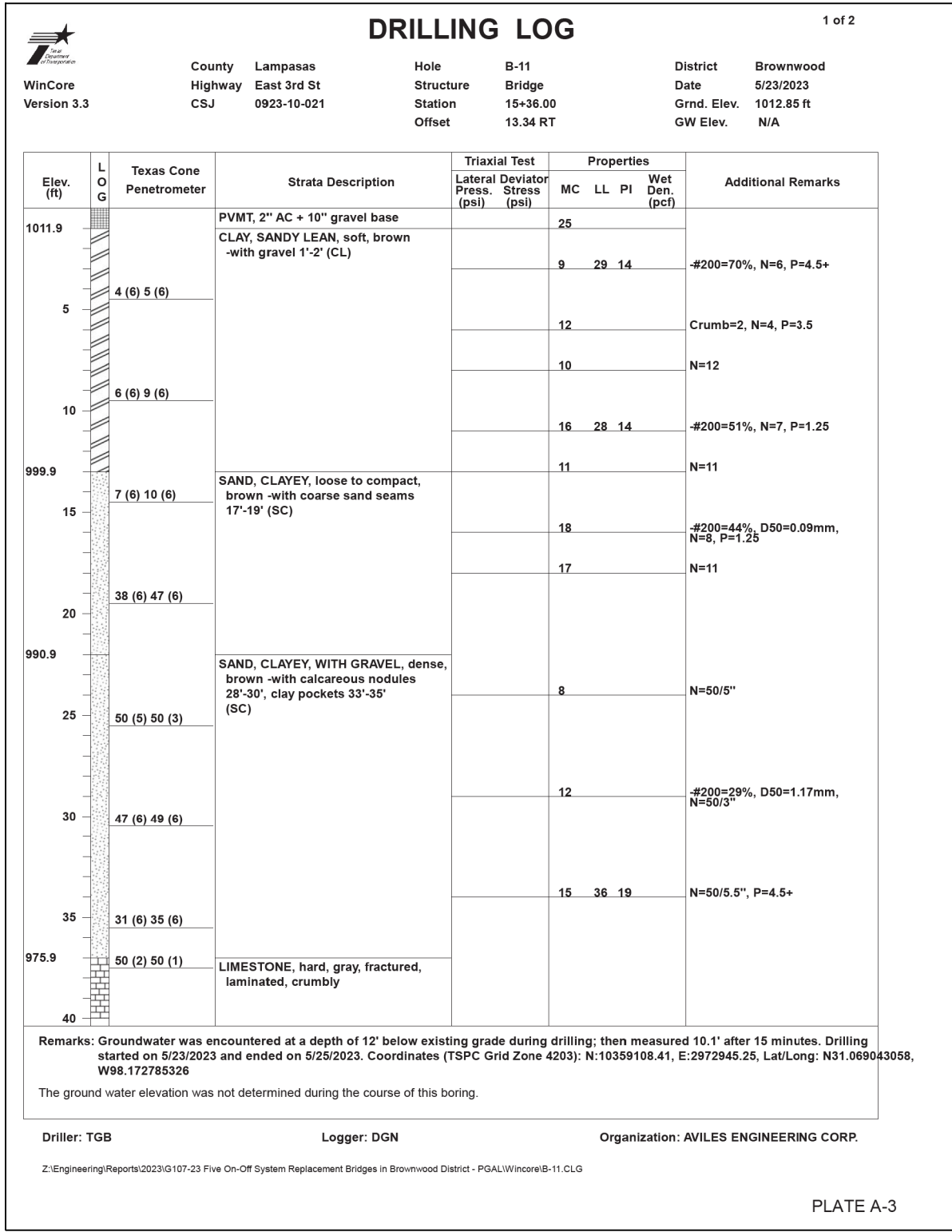
BRIDGE LAYOUT
 3RD ST OVER BURLESON CREEK

SHEET 1 OF 1

CONT	SECT	JOB	HIGHWAY
0923	10	021	3RD ST
DIST	COUNTY	SHEET NO.	
BWD	LAMPASAS	41	

DW: VS
 CK: JL
 DW: MW
 CK: OH

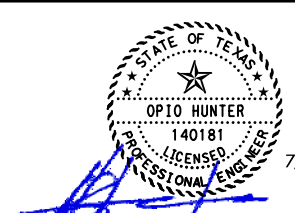
DATE: 7/19/2024 5:07:48 PM
 FILE: R:\1005000-1005999\1005472.03\04_DOCUMENTS\DESIGN\Plan_Set\7_Bridge\3RD_BORE_01.dgn



NOTES

1. BORING LOGS SHOWN ON THIS SHEET ARE WITHOUT MODIFICATION AS PRODUCED IN GEOTECHNICAL STUDY "REPORT NO. G107-23D", DATED FEBRUARY 2024, PREPARED BY AVILES ENGINEERING CORPORATION FOR TXDOT ON CONTRACT NO. 36-01DP5091, WA#3.

NOT TO SCALE



7/19/2024

NO.	DATE	REVISION	APPROV.

Texas Department of Transportation

PGAL 3131 Briarpark Dr, Suite 200
Houston, Texas 77042
(713) 622-1444

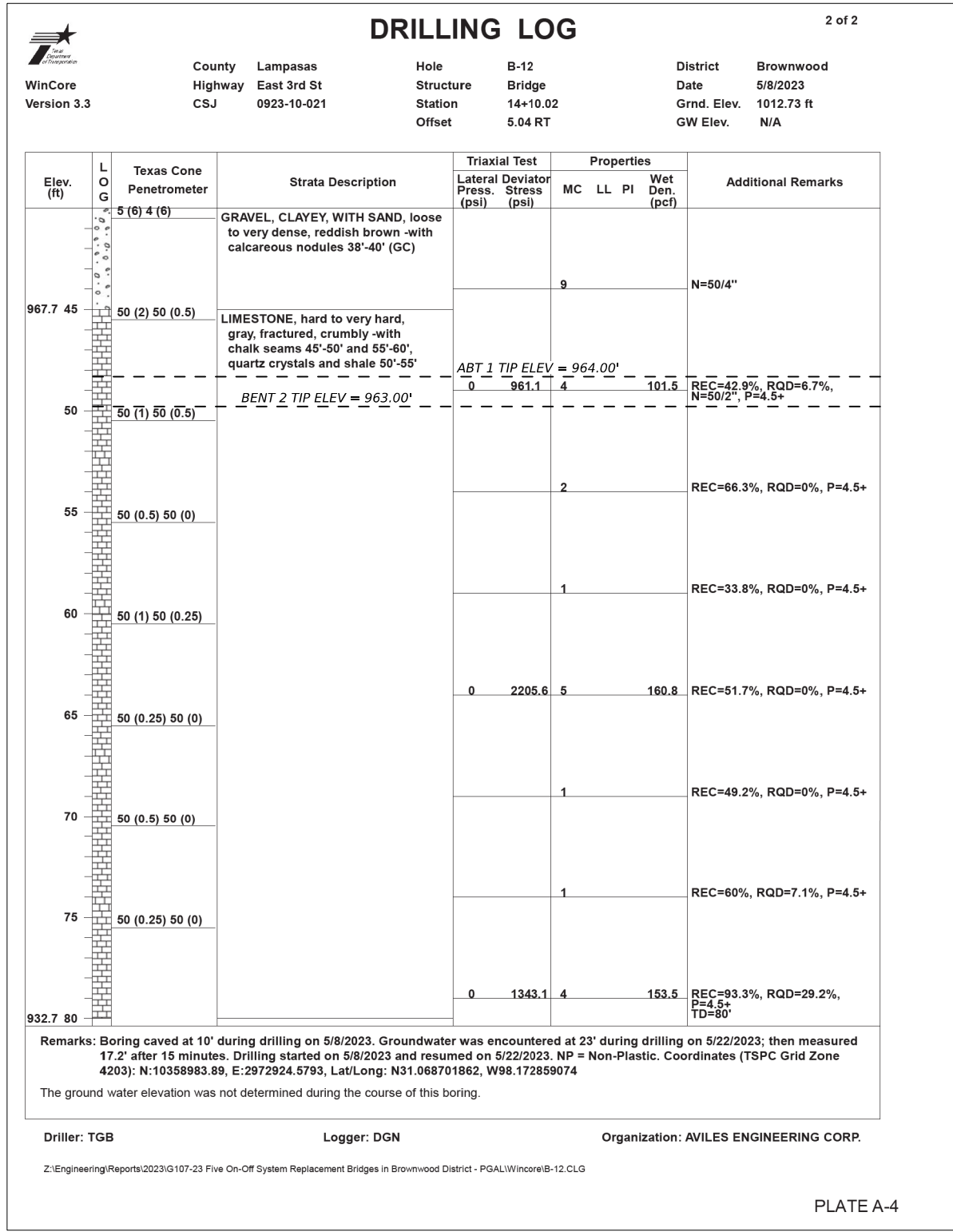
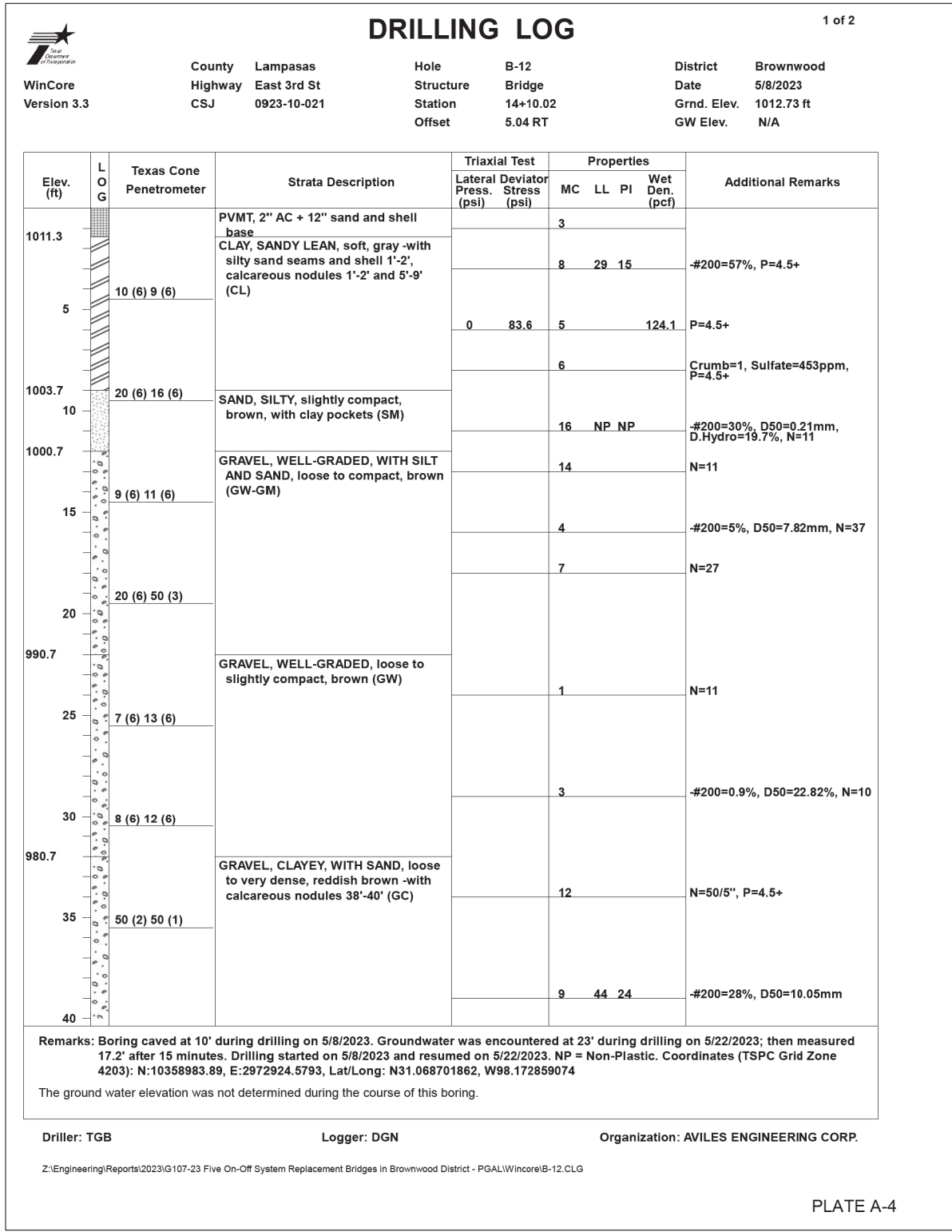
TBPE REG. NO. F-2742

3RD ST @ BURLESON CREEK

BORING LOGS

SHEET 1 OF 2

CONT	SECT	JOB	HIGHWAY
0923	10	021	3RD ST
DIST	COUNTY	SHEET NO.	
BWD	LAMPASAS	42	



NOTES

1. BORING LOGS SHOWN ON THIS SHEET ARE WITHOUT MODIFICATION AS PRODUCED IN GEOTECHNICAL STUDY "REPORT NO. G107-23D", DATED FEBRUARY 2024, PREPARED BY AVILES ENGINEERING CORPORATION FOR TXDOT ON CONTRACT NO. 36-0IDP5091, WA#3.

NOT TO SCALE

7/19/2024

NO.	DATE	REVISION	APPROV.

Texas Department of Transportation

PGAL 3131 Briarpark Dr, Suite 200
 Houston, Texas 77042
 (713) 622-1444

TBPE REG. NO. F-2742

3RD ST @ BURLESON CREEK

BORING LOGS

SHEET 2 OF 2


CONT	SECT	JOB	HIGHWAY
0923	10	021	3RD ST
DIST	COUNTY	SHEET NO.	
BWD	LAMPASAS	43	

SUMMARY OF ESTIMATED BRIDGE QUANTITIES													
ITEM	400-7010	402-7001	416-7004	420-7012	420-7022	420-7038	422-7007	425-7018	425-7019	432-7043	450-7034	454-7003	4003-7001
DESCRIPTION	CEM STABIL BKFL	TRENCH EXCAVATION PROTECTION	DRILL SHAFT (24 IN)	CL C CONC (ABUT)	CL C CONC (CAP)	CL C CONC (COLUMN)	REINF CONC SLAB (SLAB BEAM)	PRESTR CONC SLAB BEAM (4SB15)	PRESTR CONC SLAB BEAM (5SB15)	* RIPRAP (STONE PROTECTION) (18 IN)	RAIL (TY C223)	ARMOR JOINT (SEALED)	** TIP TESTING(DRILL SHAFT)
UNIT	CY	LF	LF	CY	CY	CY	SF	LF	LF	CY	LF	LF	CY
ABUTMENT 1	20	35	176	13.7						456.9	12	39	1
ABUTMENT 4	20	35	144	13.7						550.1	12	39	1
BENT 2			132		10.4	6.0							1
BENT 3			116		10.4	5.1							1
130.00 PRSTR CONC SLAB BEAM UNIT 1							5,482	1,028.0	257.00		260.0		
OVERALL TOTAL	40	70	568	27.4	20.8	11.1	5,482	1,028.0	257.00	1,007.0	284.0	78	4

* FILTER FABRIC (TY 2) REQUIRED UNDERNEATH SRR, THIS IS SUBSIDIARY TO ITEM 432.
 ** DRILLED SHAFT TESTING NOTES:
 THERMAL INTEGRITY PROFILER (TIP) TESTING OF DRILLED SHAFT (SS 4021-6004) PERFORM THE NONDESTRUCTIVE TESTING (NDT) METHOD TERMED TIP TESTING TO CHECK THE INTEGRITY OF DESIGNATED PRODUCTION DRILLED SHAFTS AS SHOWN ON PLANS. COORDINATE TESTING WITH THE ENGINEER A MINIMUM OF ONE WEEK PRIOR TO THE DESIRED TESTING DATE.


CAP ELEVATIONS

			BEAM 1	BEAM 2	BEAM 3	BEAM 4	BEAM 5	BEAM 6	BEAM 7	BEAM 8	BEAM 9	BEAM 10
BENT 1	(FWD)		1010.75	1010.84	1010.92	1011.00	1011.08	1011.08	1011.00	1010.92	1010.84	1010.75
BENT 2	(BK)		1011.25	1011.34	1011.42	1011.50	1011.58	1011.58	1011.50	1011.42	1011.34	1011.25
	(FWD)		1011.26	1011.35	1011.43	1011.51	1011.60	1011.60	1011.51	1011.43	1011.35	1011.26
BENT 3	(BK)		1011.27	1011.36	1011.44	1011.52	1011.60	1011.60	1011.52	1011.44	1011.36	1011.27
	(FWD)		1011.26	1011.35	1011.43	1011.51	1011.59	1011.59	1011.51	1011.43	1011.35	1011.26
BENT 4	(BK)		1010.75	1010.84	1010.92	1011.00	1011.08	1011.08	1011.00	1010.92	1010.84	1010.75



7/25/2024

NO.	DATE	REVISION	APPROV.



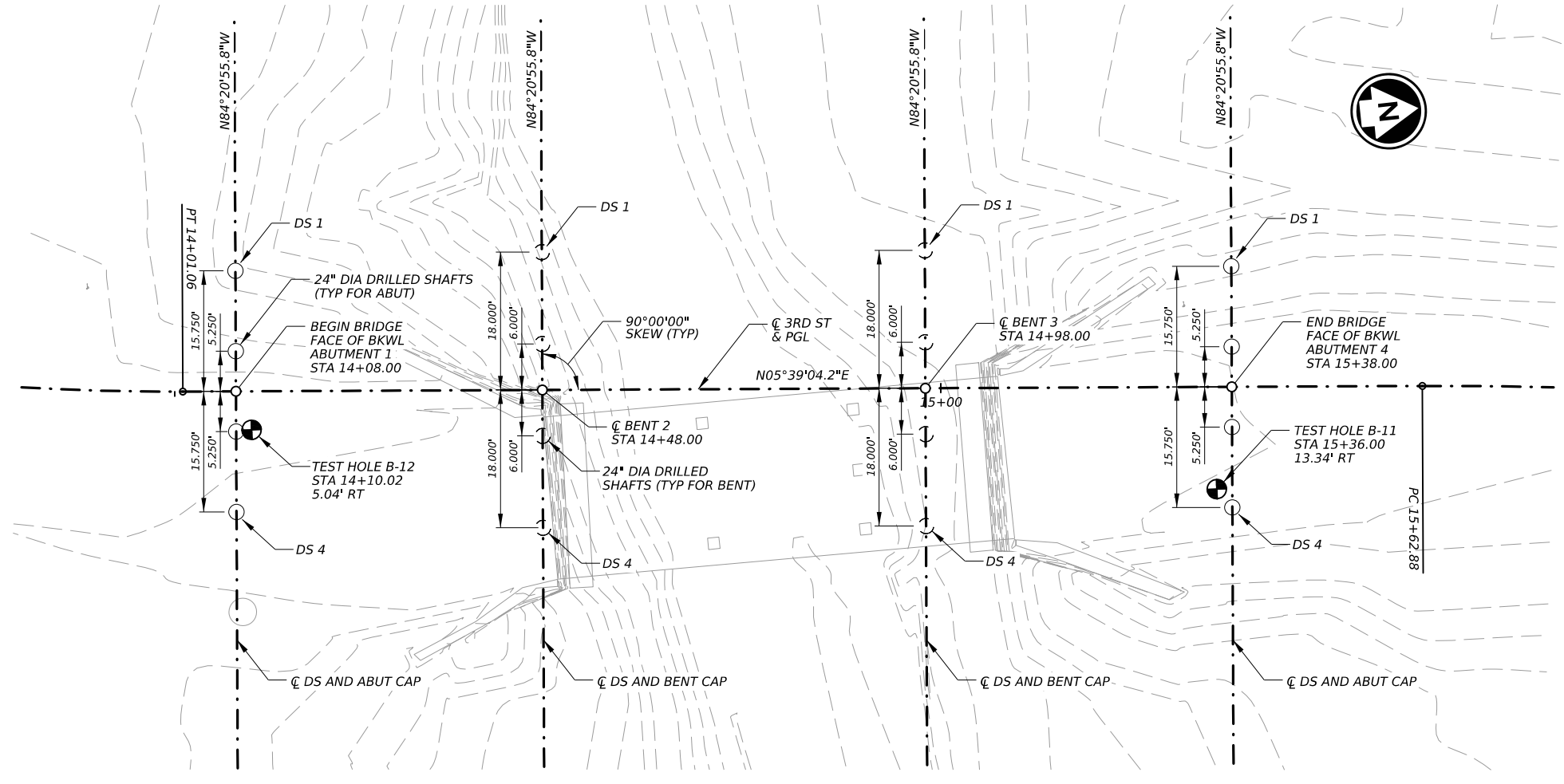
3131 Briarpark Dr, Suite 200
 Houston, Texas 77042
 (713) 622-1444

3RD ST @ BURLESON CREEK

ESTIMATED QUANTITIES AND CAP ELEVATIONS

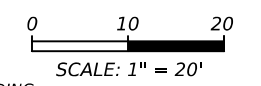
SHEET 1 OF 1

CONT	SECT	JOB	HIGHWAY
0923	10	021	3RD ST
DIST	COUNTY		SHEET NO.
BWD	LAMPASAS		44



FOUNDATION LAYOUT

- GENERAL NOTES:**
- DESIGNED ACCORDING TO AASHTO LRFD BRIDGE DESIGN SPECIFICATIONS, 9TH EDITION (2020), CURRENT INTERIMS AND TxDOT BRIDGE DESIGN MANUAL (JAN 2023).
 - DENOTES SOIL BORING LOCATION. SEE "BORING LOG" SHEETS FOR BORING LOG INFORMATION.
 - SEE "BRIDGE LAYOUT" SHEETS FOR DRILLED SHAFTS LENGTHS.
 - SEE "BRIDGE LAYOUT" SHEETS FOR HORIZONTAL CURVE INFORMATION.
 - FOR DRILLED SHAFT LOADS AND DETAILS SEE ABUTMENT AND BENTS DETAILS SHEETS.
 - SEE "COMMON FOUNDATION DETAILS" (FD) TxDOT STANDARD SHEET FOR ALL ABUTMENT/BENT DETAILS AND NOTES NOT SHOWN.
 - CONTRACTOR SHALL VERIFY LOCATION OF ALL EXISTING UTILITIES BEFORE PROCEEDING WITH ANY FOUNDATION WORK.
 - EXISTING COLUMNS/DRILLED SHAFTS LOCATED ACCORDING TO SURVEY OF EXISTING BRIDGE. CONTRACTOR TO VERIFY PRIOR TO COMMENCING WORK.
 - EXISTING CONCRETE DRILLED SHAFT FOUNDATIONS SHALL BE REMOVED 2'-0" BELOW FINISHED GROUND.
 - EXISTING MASONRY ABUTMENTS, WINGWALLS AND CONCRETE FOOTINGS SHALL BE COMPLETELY REMOVED. EXISTING CONCRETE FOUNDATIONS AND STEEL PILING SHALL BE REMOVED 2'-0" BELOW FINISHED GROUND. ALL EXCAVATED AREAS TO BE BACKFILLED WITH NON-STRUCTURAL CONCRETE.



HL-93 LOADING

	XXX		
NO.	DATE	REVISION	APPROV.

3131 Briarpark Dr, Suite 200
 Houston, Texas 77042
 (713) 622-1444

FOUNDATION LAYOUT

SHEET 1 OF 1

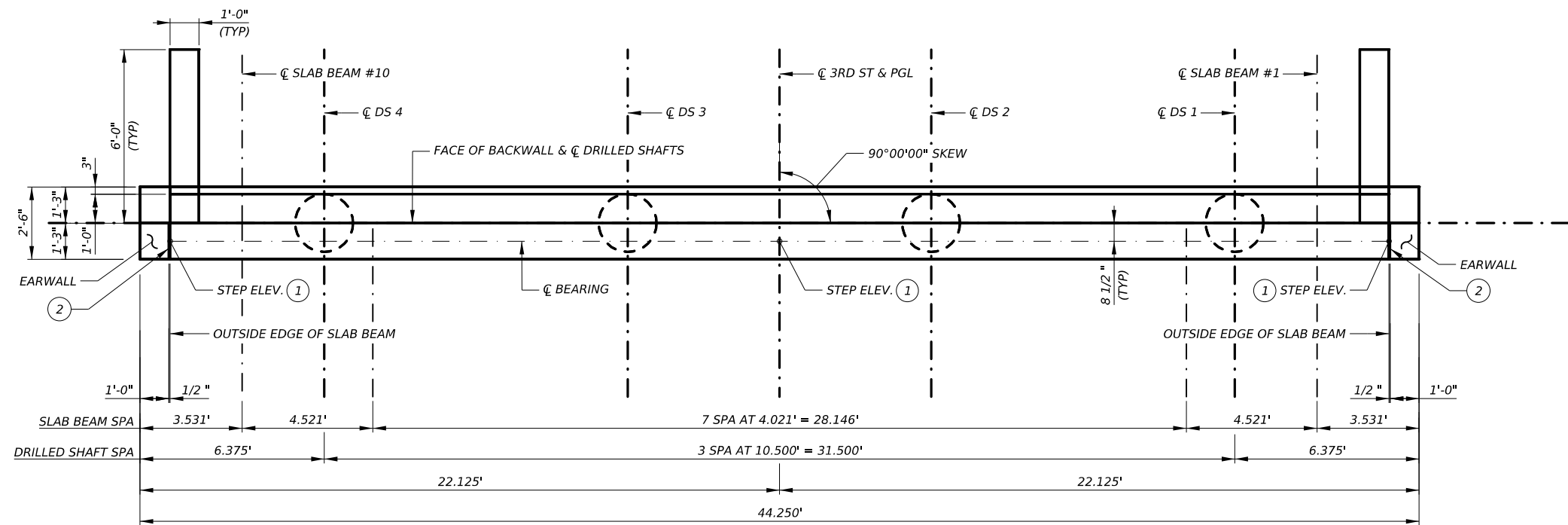
CONT	SECT	JOB	HIGHWAY
0923	10	021	3RD ST
DIST	COUNTY	SHEET NO.	
BWD	LAMPASAS	45	

DW: MW
 CC: JL
 DN: VS

- ① SEE "STEP ELEVATION DETAILS" SHEET FOR WORKING POINT ELEVATION AND FURTHER DETAILS.
- ② ½" PREFORMED BITUMINOUS FIBER MATERIAL BETWEEN SLAB BEAM AND EARWALL. BOND TO EARWALL WITH AN APPROVED ADHESIVE. INSIDE FACE OF EARWALL TO BE CAST PERPENDICULAR TO CAP.

WORK POINT ELEVATIONS				
TOP OF DRILLED SHAFTS (FT)				
ABUTMENT #	1	2	3	4
1	1008.308	1008.518	1008.518	1008.308
4	1008.307	1008.516	1008.516	1008.307

TABLE OF ESTIMATED QUANTITIES (QTY FOR ONE ABUT)				
BAR	NO.	SIZE	LENGTH	WEIGHT
A	6	#11	43'-3"	1,379
E	4	#4	2'-2"	6
F	10	#4	6'-4"	42
H	2	#5	41'-10"	87
L	6	#6	4'-0"	36
S	64	#4	9'-4"	399
U	4	#6	7'-1"	43
V	41	#5	7'-10"	335
wH1	8	#6	5'-8"	68
wH2	8	#6	6'-11"	83
wU	12	#4	1'-8"	13
wV	28	#5	4'-2"	122
REINFORCING STEEL			LBS	2,613
CL *C* CONC (ABUT)			CY	13.7



PLAN

(SHOWING ABUTMENT #1; ABUTMENT #4 SYMMETRICAL BY OPPOSITE HAND.)

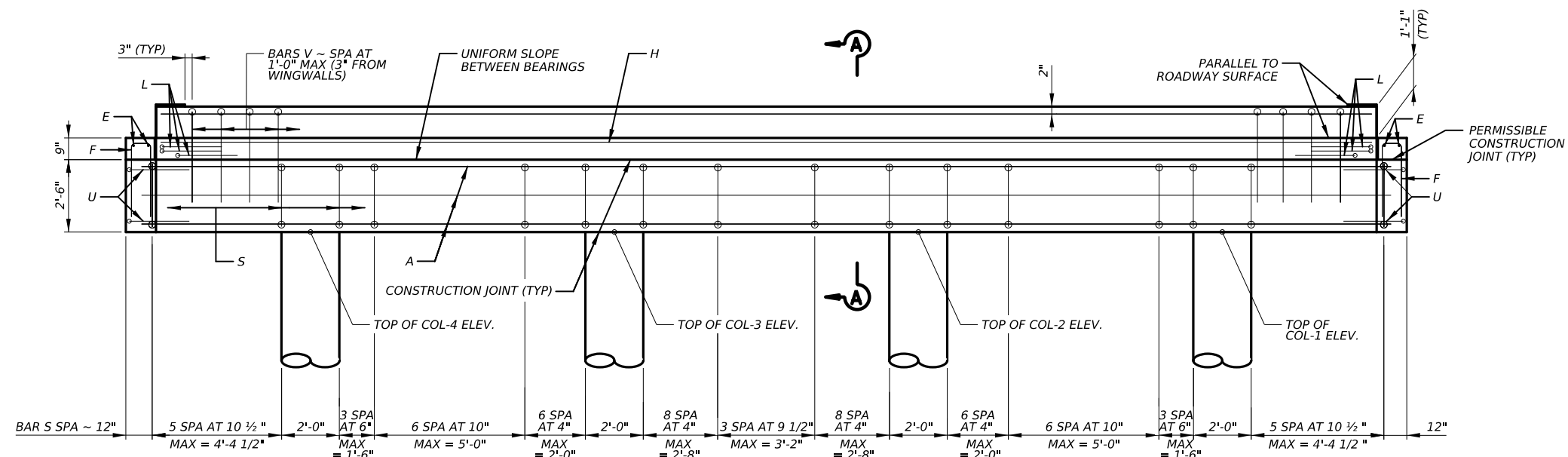
GENERAL NOTES:

1. DESIGNED ACCORDING TO AASHTO LRFD BRIDGE DESIGN SPECIFICATIONS, 9TH EDITION (2020), CURRENT INTERIMS AND TxDOT BRIDGE MANUAL (JAN 2023).
2. SEE BRIDGE LAYOUT SHEETS FOR HEADER SLOPE AND FOUNDATION TYPE, SIZE AND LENGTH.
3. SEE COMMON FOUNDATION DETAIL (FD) STANDARD SHEET FOR ALL FOUNDATION DETAILS AND NOTES.
4. SEE STONE RIPRAP (SRR) STANDARD SHEET FOR RIPRAP ATTACHEMENT DETAILS.
5. SEE APPLICABLE RAIL STANDARD FOR RAIL ANCHORAGE IN WINGWALLS.
6. CALCULATED FOUNDATION LOAD:
65 TONS FOR 24" DIA D.S.

COVER DIMENSIONS ARE CLEAR DIMENSIONS, UNLESS NOTED OTHERWISE. REINFORCING BAR DIMENSIONS SHOWN ARE OUT-TO-OUT OF BAR.

MATERIAL NOTES:

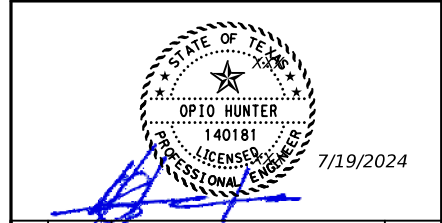
1. PROVIDE CLASS C CONCRETE (f'c = 3,600 PSI).
2. PROVIDE GRADE 60 REINFORCING STEEL



ELEVATION

(SHOWING ABUTMENT #1; ABUTMENT #4 SYMMETRICAL BY OPPOSITE HAND.)

HL-93 LOADING NOT TO SCALE



NO.	DATE	REVISION	APPROV.



PG&L
 TBPE REG. NO. F-2742
 3131 Briarpark Dr, Suite 200
 Houston, Texas 77042
 (713) 622-1444

3RD ST @ BURLESON CREEK

**ABUTMENT
DETAILS**

SHEET 1 OF 2			
CONT	SECT	JOB	HIGHWAY
0923	10	021	3RD ST
DIST	COUNTY	SHEET NO.	
BWD	LAMPASAS	46	

DATE: 7/19/2024 5:07:55 PM
 FILE: R:\1005000-1005999\1005472.03104_DOCUMENTS\DESIGN\Plan_Set\7_Bridge\3RD BRG_BGA_01.dgn

CK: OH
 DW: MW
 CK: JL
 DW: VS

- ① SEE "STEP ELEVATION DETAILS" SHEET FOR WORKING POINT ELEVATION AND FURTHER DETAILS.
- ② 1/2" PREFORMED BITUMINOUS FIBER MATERIAL BETWEEN SLAB BEAM AND EARWALL. BOND TO EARWALL WITH AN APPROVED ADHESIVE. INSIDE FACE OF EARWALL TO BE CAST PERPENDICULAR TO CAP.

WORK POINT ELEVATIONS				
TOP OF COLUMN (FT)				
BENT #	1	2	3	4
2	1008.765	1009.004	1009.004	1008.765
3	1008.766	1009.004	1009.004	1008.766

TABLE OF CAP QUANTITIES (QTY FOR ONE BENT)				
BAR	NO.	SIZE	LENGTH	WEIGHT
A	8	#11	43'-11"	1,867
E	4	#4	2'-2"	6
F	14	#4	6'-6"	61
S	99	#5	9'-8"	998
T	4	#5	43'-11"	183
REINFORCING STEEL			LBS	3,115
CL "C" CONC (CAP)			CY	10.4

TABLE OF VARIABLE COLUMN QUANTITIES							
BENT	"H"	CLASS "C" CONC (COL)	BARS V 32 - #7		BARS Z 4 - #3 SPIRALS		REINF STEEL
			LENGTH	WEIGHT	LENGTH	WEIGHT	
2	13.00	6.0	15'-3"	998	136'-8"	206	1,204
3	11.00	5.1	13'-3"	867	117'-10"	177	1,044

FOR EACH LINEAR FOOT OF VARIATION IN "H" VALUE, MAKE THE FOLLOWING ADJUSTMENTS:

BARS V LENGTH 1 FT
 BARS Z LENGTH 9.425 FT
 REINFORCING STEEL 80 LB
 CLASS C CONC 0.465 CY

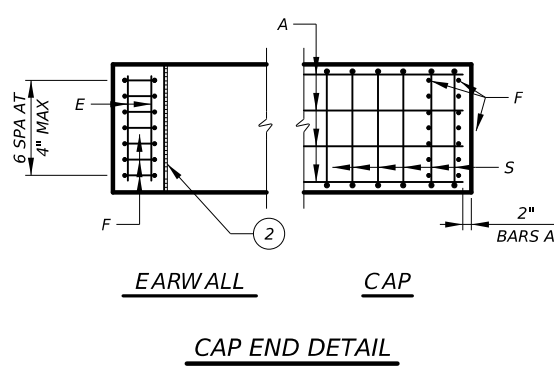
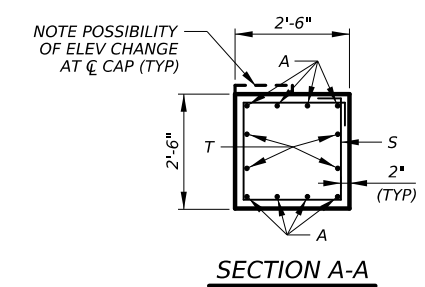
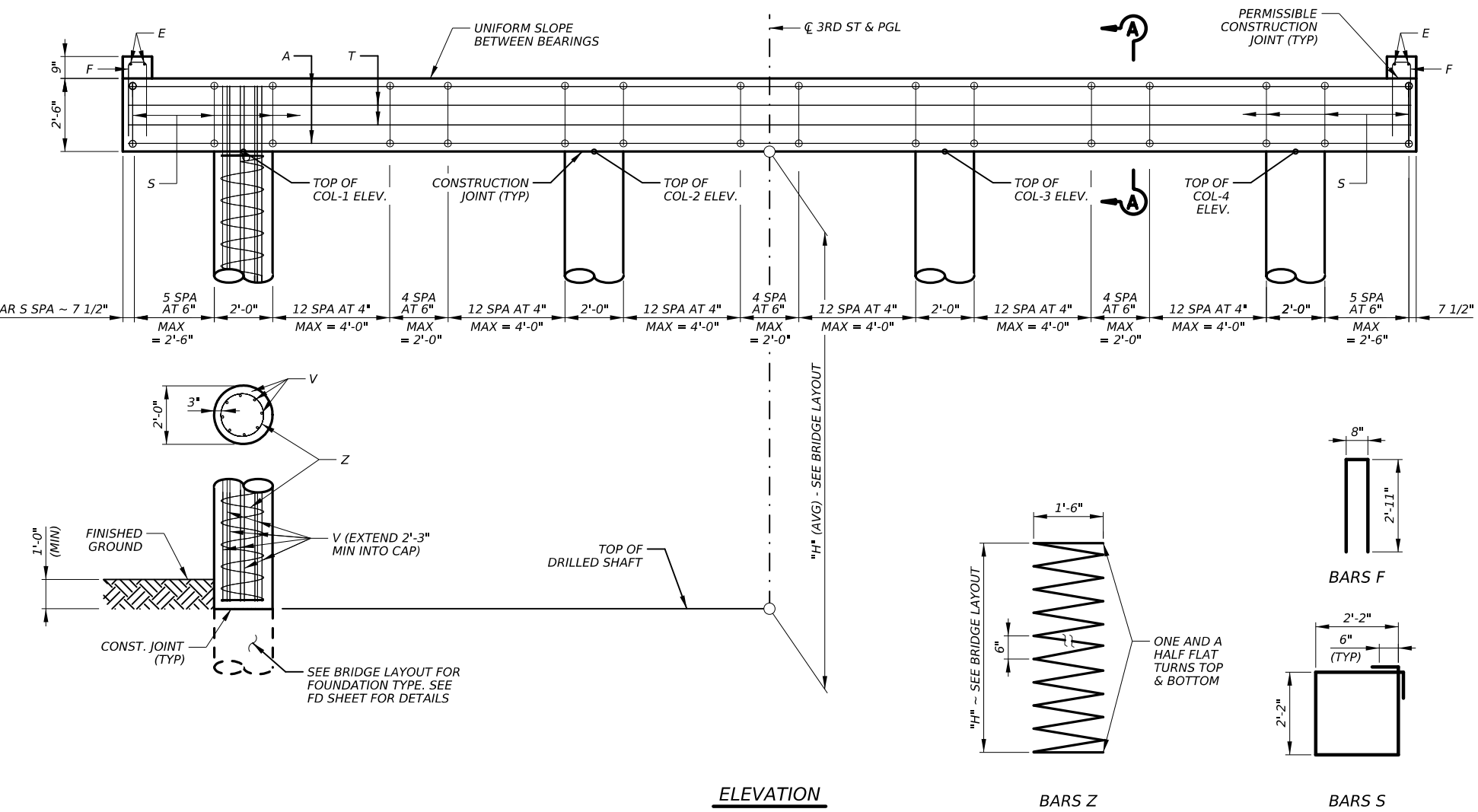
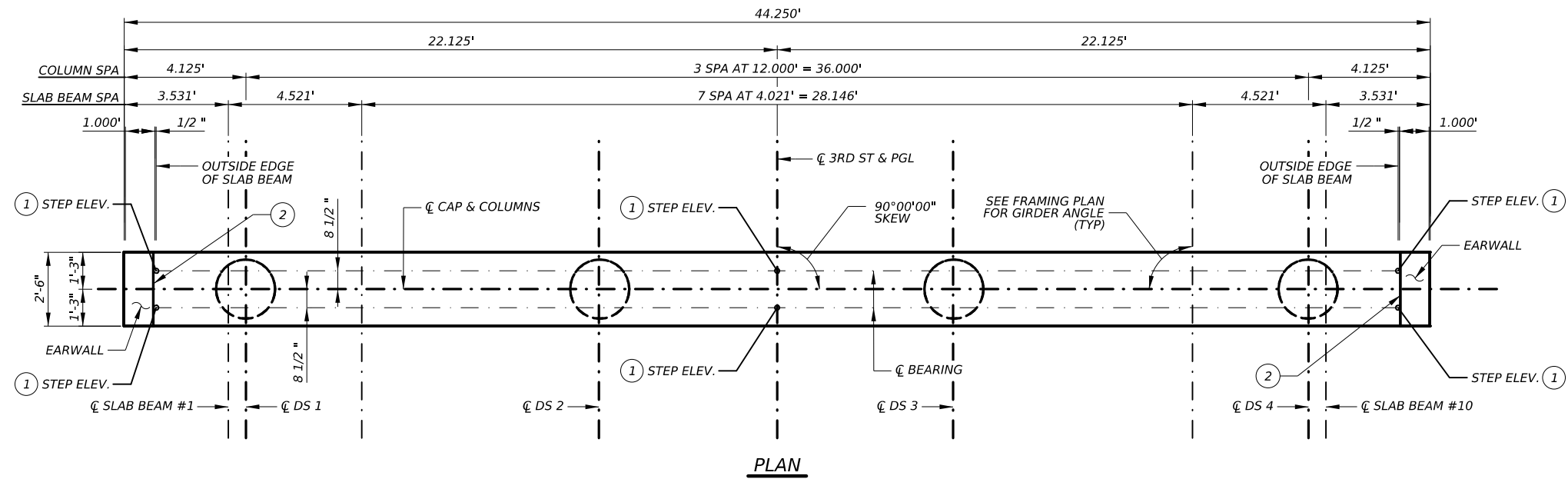
GENERAL NOTES:

1. DESIGNED ACCORDING TO AASHTO LRFD BRIDGE DESIGN SPECIFICATIONS, 9TH EDITION (2020), CURRENT INTERIMS AND TxDOT BRIDGE MANUAL (JAN 2023).
2. SEE BRIDGE LAYOUT SHEETS FOR FOUNDATION TYPE, SIZE AND LENGTH.
3. SEE COMMON FOUNDATION DETAIL (FD) STANDARD SHEET FOR ALL FOUNDATION DETAILS AND NOTES.
4. CALCULATED FOUNDATION LOAD = 117 TONS/D.S.

COVER DIMENSIONS ARE CLEAR DIMENSIONS, UNLESS NOTED OTHERWISE. REINFORCING BAR DIMENSIONS SHOWN ARE OUT-TO-OUT OF BAR.

MATERIAL NOTES:

1. PROVIDE CLASS C CONCRETE ($f_c = 3,600$ PSI).
2. PROVIDE GRADE 60 REINFORCING STEEL



DATE: 7/19/2024 5:07:57 PM
 FILE: R:\1005000-1005999\1005472.03104_DOCUMENTS\DESIGN\Plan_Set17_Bridge3RD BRG_BGB_01.dgn

HL-93 LOADING NOT TO SCALE

STATE OF TEXAS
 OPIO HUNTER
 140181
 LICENSED PROFESSIONAL ENGINEER

7/19/2024

NO.	DATE	REVISION	APPROV.

Texas Department of Transportation

PGAL 3131 Briarpark Dr, Suite 200
 Houston, Texas 77042
 (713) 622-1444
 TBPE REG. NO. F-2742

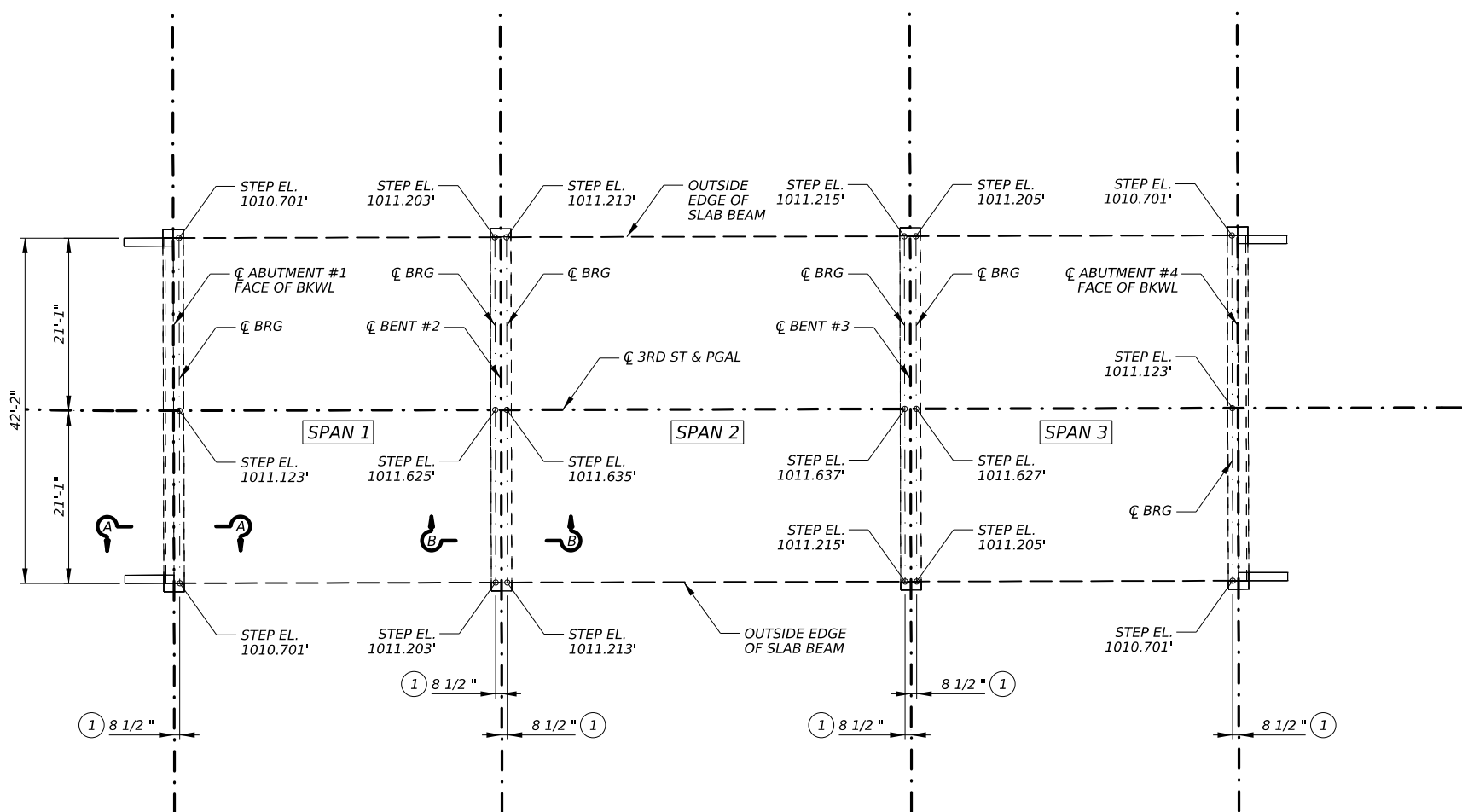
3RD ST @ BURLESON CREEK

BENT DETAILS

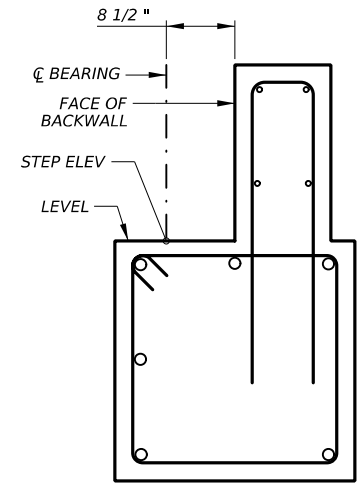
SHEET 1 OF 1

COUNT	SECT	JOB	HIGHWAY
0923	10	021	3RD ST
DIST	COUNTY		SHEET NO.
BWD	LAMPASAS		48

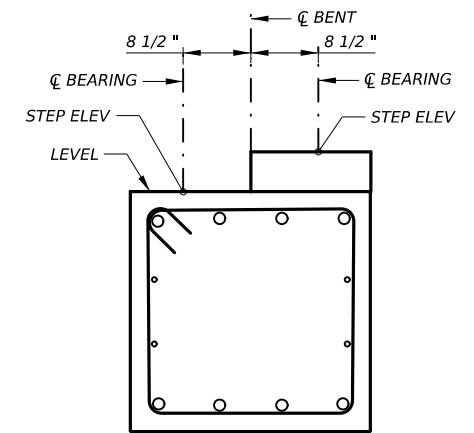
DW: VS
 CK: JL
 DW: MW
 CK: OH



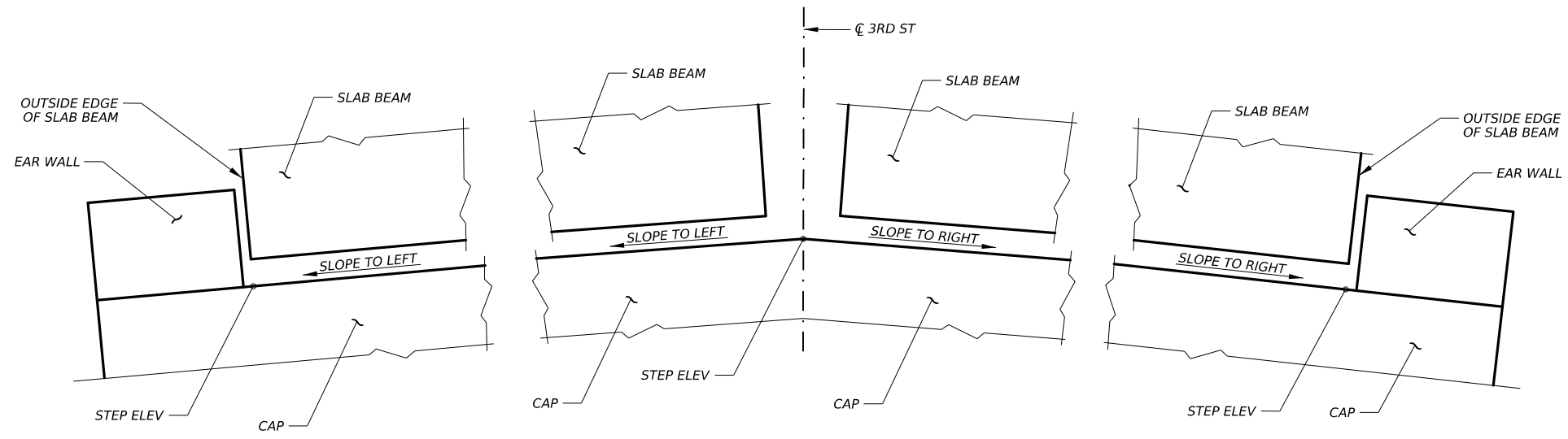
PLAN OF STEP LOCATIONS



SECTION A-A



SECTION B-B

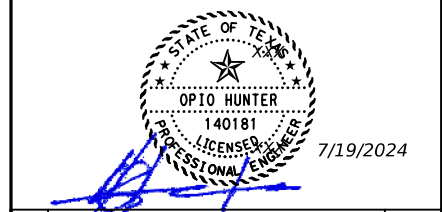


COMMON TRANSVERSE SECTIONS AT STEP ELEVATIONS

NOTES: STEPS ARE LOCATED AT THE OUTSIDE EDGE OF EXTERIOR SLAB BEAMS, AND AT CENTERLINE OF BRIDGE. UNIFORMLY SLOPE THE CAP IN THE TRANSVERSE DIRECTION, BETWEEN THE ADJACENT STEPS SHOWN ABOVE.

(1) SEE SLAB BEAM ELASTOMERIC BEARING DETAILS (PSBEB) STANDARD SHEET FOR ORIENTATION OF DIMENSION.

HL-93 LOADING NOT TO SCALE



NO.	DATE	REVISION	APPROV.
			XXX



PGAL
 TBPE REG. NO. F-2742
 3131 Briarpark Dr, Suite 200
 Houston, Texas 77042
 (713) 622-1444

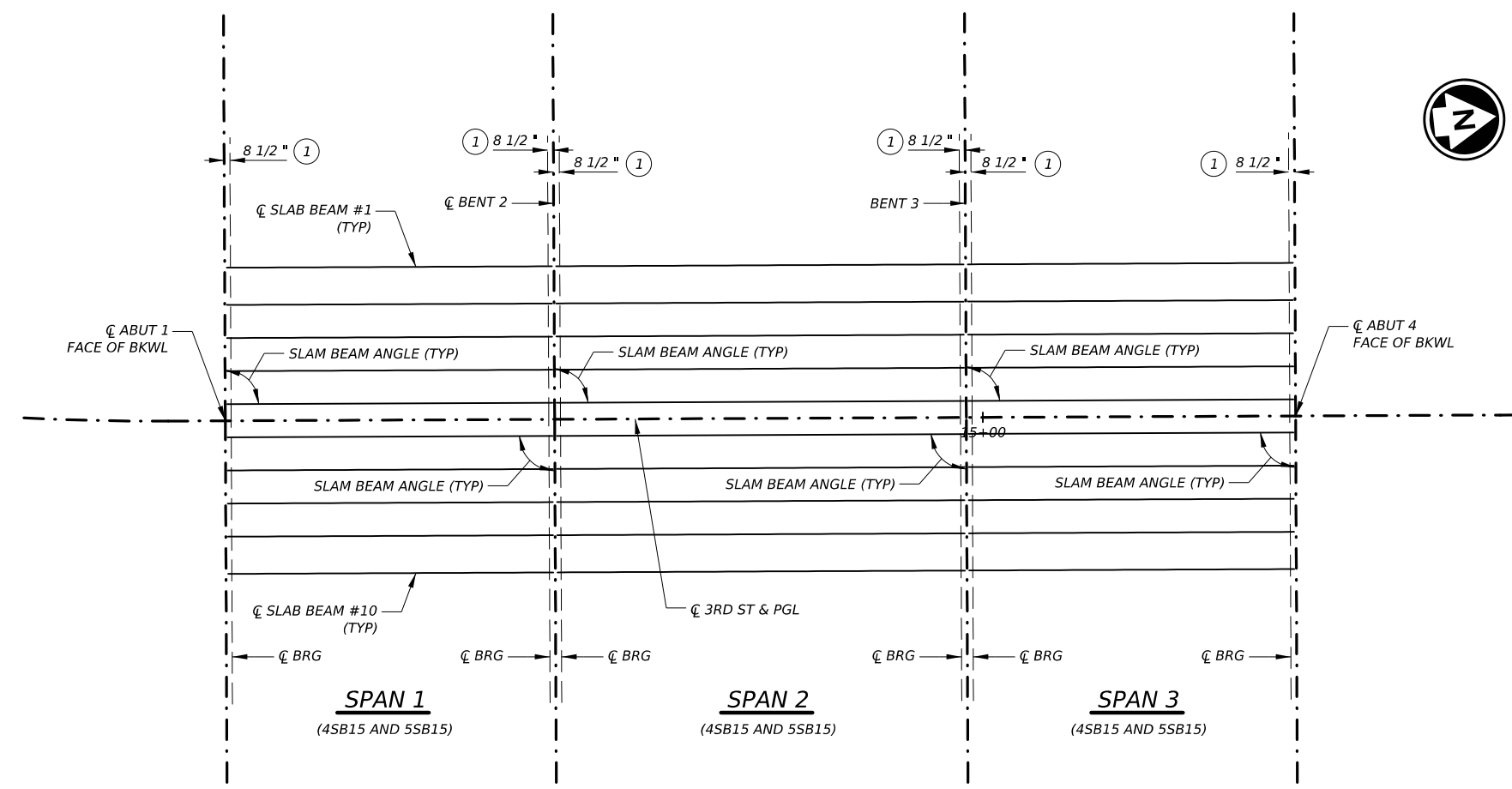
3RD ST @ BURLESON CREEK

STEP ELEVATION DETAILS

SHEET 1 OF 1			
CONT	SECT	JOB	HIGHWAY
0923	10	021	3RD ST
DIST	COUNTY	SHEET NO.	
BWD	LAMPASAS	49	

DATE: 7/19/2024 5:07:58 PM
 FILE: R:\1005000-1005999\1005472.03\04_DOCUMENTS\DESIGN\Plan_Set\7_Bridge\3RD BRG_STEP ELEV_01.dgn

DW: VS
 CK: JL
 DW: WW
 CK: OH



- ① SEE SLAB BEAM ELASTOMERIC BEARING DETAILS (PSBEB) STANDARD SHEET FOR ORIENTATION OF DIMENSION.
- ② GIRDER LENGTHS SHOWN ARE BOTTOM BEAM LENGTHS WITH ADJUSTMENTS MADE FOR BEAM SLOPE.

FRAMING PLAN

BENT REPORT

BENT NO. 1 (N 84 20 55.80 W)
DISTANCE BETWEEN STATION LINE AND BEAM 1, 18.594 L

SPAN	BEAM	BEAM SPAC.		BEAM ANGLE		
		(C.L. BENT)	D M S	D	M	S
SPAN 1	BEAM 1	0.000	90 0 0			
	BEAM 2	4.521	90 0 0			
	BEAM 3	4.021	90 0 0			
	BEAM 4	4.021	90 0 0			
	BEAM 5	4.021	90 0 0			
	BEAM 6	4.021	90 0 0			
	BEAM 7	4.021	90 0 0			
	BEAM 8	4.021	90 0 0			
	BEAM 9	4.021	90 0 0			
	BEAM 10	4.521	90 0 0			
	TOTAL	37.187				

BENT REPORT (CONTINUED)

BENT NO. 3 (N 84 20 55.80 W)
DISTANCE BETWEEN STATION LINE AND BEAM 1, 18.594 L

SPAN	BEAM	BEAM SPAC.		BEAM ANGLE		
		(C.L. BENT)	D M S	D	M	S
SPAN 2	BEAM 1	0.000	90 0 0			
	BEAM 2	4.521	90 0 0			
	BEAM 3	4.021	90 0 0			
	BEAM 4	4.021	90 0 0			
	BEAM 5	4.021	90 0 0			
	BEAM 6	4.021	90 0 0			
	BEAM 7	4.021	90 0 0			
	BEAM 8	4.021	90 0 0			
	BEAM 9	4.021	90 0 0			
	BEAM 10	4.521	90 0 0			
	TOTAL	37.187				

BEAM REPORT

BEAM REPORT, SPAN 1 ②

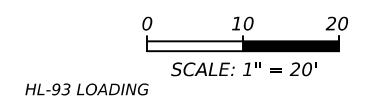
C-C BENT	HORIZONTAL DISTANCE	TRUE DISTANCE		BEAM SLOPE
		C-C BRG.	BOT. BM. FLG.	
BEAM 1	40.000	38.583	39.50	0.0130
BEAM 2	40.000	38.583	39.50	0.0130
BEAM 3	40.000	38.583	39.50	0.0130
BEAM 4	40.000	38.583	39.50	0.0130
BEAM 5	40.000	38.583	39.50	0.0130
BEAM 6	40.000	38.583	39.50	0.0130
BEAM 7	40.000	38.583	39.50	0.0130
BEAM 8	40.000	38.583	39.50	0.0130
BEAM 9	40.000	38.583	39.50	0.0130
BEAM 10	40.000	38.583	39.50	0.0130

BEAM REPORT, SPAN 2 ②

C-C BENT	HORIZONTAL DISTANCE	TRUE DISTANCE		BEAM SLOPE
		C-C BRG.	BOT. BM. FLG.	
BEAM 1	50.000	48.583	49.50	0.0000
BEAM 2	50.000	48.583	49.50	0.0000
BEAM 3	50.000	48.583	49.50	0.0000
BEAM 4	50.000	48.583	49.50	0.0000
BEAM 5	50.000	48.583	49.50	0.0000
BEAM 6	50.000	48.583	49.50	0.0000
BEAM 7	50.000	48.583	49.50	0.0000
BEAM 8	50.000	48.583	49.50	0.0000
BEAM 9	50.000	48.583	49.50	0.0000
BEAM 10	50.000	48.583	49.50	0.0000

BEAM REPORT, SPAN 3 ②

C-C BENT	HORIZONTAL DISTANCE	TRUE DISTANCE		BEAM SLOPE
		C-C BRG.	BOT. BM. FLG.	
BEAM 1	40.000	38.583	39.50	-0.0131
BEAM 2	40.000	38.583	39.50	-0.0131
BEAM 3	40.000	38.583	39.50	-0.0131
BEAM 4	40.000	38.583	39.50	-0.0131
BEAM 5	40.000	38.583	39.50	-0.0131
BEAM 6	40.000	38.583	39.50	-0.0131
BEAM 7	40.000	38.583	39.50	-0.0131
BEAM 8	40.000	38.583	39.50	-0.0131
BEAM 9	40.000	38.583	39.50	-0.0131
BEAM 10	40.000	38.583	39.50	-0.0131



HL-93 LOADING

NO.	DATE	REVISION	APPROV.

Texas Department of Transportation

3131 Briarpark Dr, Suite 200
 Houston, Texas 77042
 (713) 622-1444
 TBPE REG. NO. F-2742

3RD ST @ BURLESON CREEK

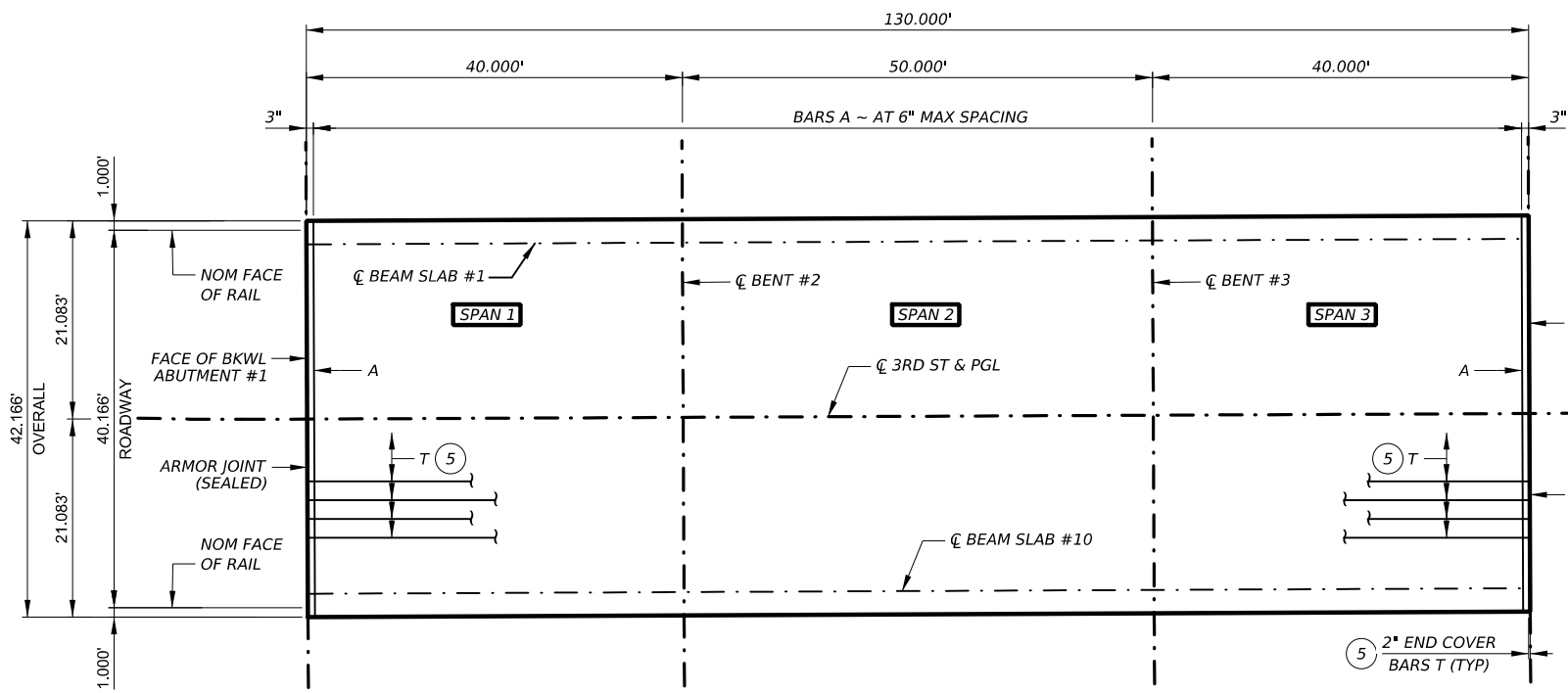
FRAMING PLAN

SHEET 1 OF 1

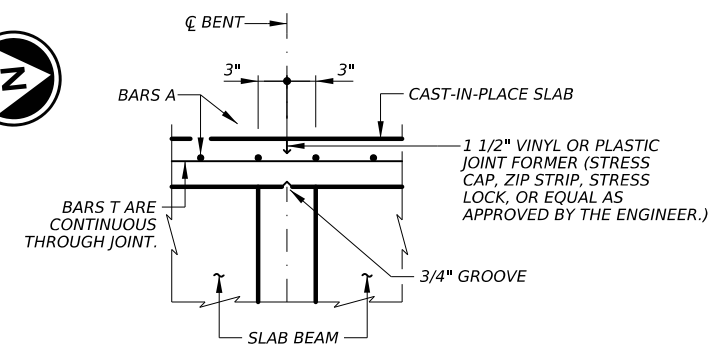
CONT	SECT	JOB	HIGHWAY
0923	10	021	3RD ST
DIST	COUNTY	SHEET NO.	
BWD	LAMPASAS	50	

DATE: 7/19/2024 5:07:59 PM
 FILE: R:\1005000-1005999\1005472.03104_DOCUMENTS\DESIGN\Plan_Set17_Bridge\3RD BRG_BGF_01.dgn

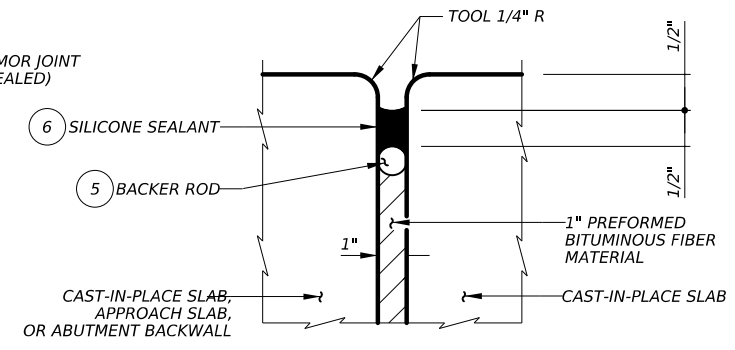
CK: OH
DW: MW
CK: JL
DN: VS



PLAN

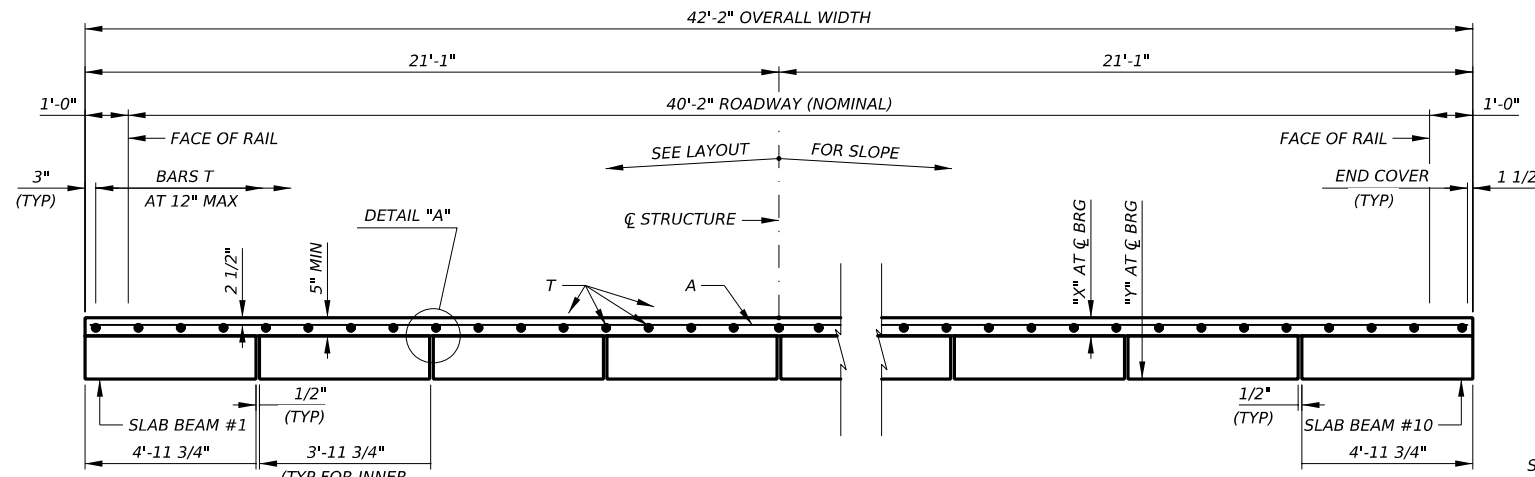


CONTINUOUS SLAB DETAIL

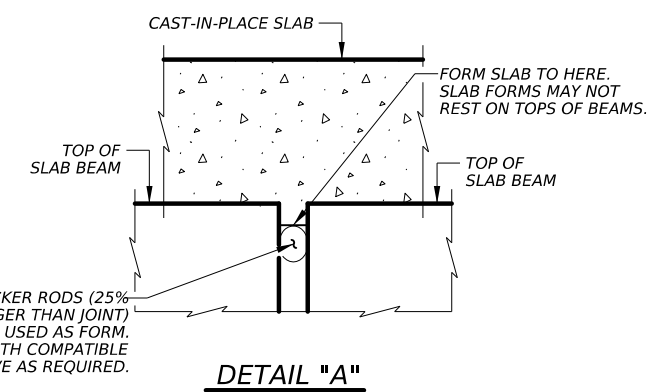


TYPE A JOINT DETAIL

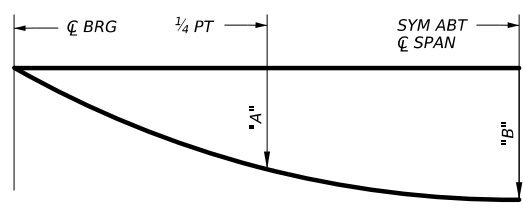
- GENERAL NOTES:**
- DESIGNED ACCORDING TO AASHTO LRFD BRIDGE DESIGN SPECIFICATIONS, 9TH EDITION (2020), CURRENT INTERIMS AND TxDOT BRIDGE MANUAL (JAN 2023).
 - SEE STANDARDS AJ FOR ARMOR JOINT DETAILS.
 - SEE APPLICABLE RAIL DETAILS FOR RAIL ANCHORAGE IN SLAB.
- MATERIAL NOTES:**
- PROVIDE CLASS S CONCRETE ($f_c = 4000$ PSI).
 - PROVIDE GRADE 60 REINFORCING STEEL.
 - PROVIDE BAR LAPS, WHERE REQUIRED, AS FOLLOWS:
UNCOATED ~ #5 = 2'-0"
 - DEFORMED WELDED WIRE REINFORCEMENT (WWR) (ASTM A1064) OF EQUAL SIZE AND SPACING MAY BE SUBSTITUTED FOR BARS A OR T UNLESS NOTED OTHERWISE. PROVIDE THE SAME LAPS AS REQUIRED FOR REINFORCING BARS.
- COVER DIMENSIONS ARE CLEAR DIMENSIONS, UNLESS NOTED OTHERWISE. REINFORCING BAR DIMENSIONS SHOWN ARE OUT-TO-OUT OF BAR.
- REINFORCING STEEL WEIGHT IS CALCULATED USING APPROXIMATE FACTOR OF 2.8 LBS/SF
 - LENGTHS SHOWN ARE BOTTOM BEAM LENGTHS WITH ADJUSTMENTS MADE FOR BEAM SLOPE.
 - FABRICATOR WILL ADJUST BEAM LENGTHS FOR BEAM SLOPES AS REQUIRED.
 - WHERE SLAB IS CONTINUOUS OVER INTERIOR BENTS, BARS T ARE CONTINUOUS THROUGH JOINT. SEE "CONTINUOUS SLAB DETAIL".
 - 1 1/4" BACKER ROD MUST BE COMPATIBLE WITH JOINT SEALANT. USE OF MULTIPLE PIECES TO CREATE A BACKER ROD CROSS SECTION IS NOT PERMITTED. TOP OF BACKER ROD MUST BE CONVEX AS SHOWN.
 - CLASS 7 SILICONE SEALANT THAT CONFORMS TO DMS-6310. INSTALL WHEN AMBIENT TEMPERATURE IS BETWEEN 55°F AND 85°F AND RISING. ENGINEER TO DETERMINE ALLOWABLE HOURS FOR SEALANT APPLICATION.
 - SEE BRIDGE LAYOUT FOR EXPANSION JOINT LOCATIONS. IF USING TYPE A EXPANSION JOINTS, THE MAXIMUM DISTANCE BETWEEN JOINTS IS 100 FEET. TYPE A JOINTS ARE SUBSIDIARY TO ITEM 422, "CONCRETE SUBSTRUCTURES".



TYPICAL TRANSVERSE SECTION



DETAIL "A"



DEAD LOAD DEFLECTION DIAGRAM

NOTE: DEFLECTIONS SHOWN ARE DUE TO CONCRETE SLAB ONLY ($E_c = 5,000$ ksi). CALCULATED DEFLECTIONS SHOWN ARE THEORETICAL AND ACTUAL DIMENSIONS MAY VARY. ADJUST BASED ON FIELD VERIFICATION.

TABLE OF DEAD LOAD DEFLECTIONS (FT)

SPAN	BEAM	"A"	"B"
1	1 & 10	0.016	0.024
	2 - 9	0.016	0.024
2	1 & 10	0.041	0.059
	2 - 9	0.041	0.059
3	1 & 10	0.016	0.024
	2 - 9	0.016	0.024

TABLE OF SECTION DEPTHS

SPAN	BEAM	"X" AT CL BRG	"Y" AT CL BRG
1	ALL	7"	1'-10"
2	ALL	7"	1'-10"
3	ALL	7"	1'-10"

TABLE OF ESTIMATED QUANTITIES

SPAN	REINF CONCRETE SLAB	PRESTR CONC SLAB BEAM		REINFORCING STEEL
		(4SB15) ③	(5SB15) ③	
NO	SF	LF	LF	LB
1	1,687	316.00	79.00	4,724
2	2,108	396.00	99.00	5,902
3	1,687	316.00	79.00	4,724
TOTAL	5,482	1,028.00	257.00	15,350

BAR TABLE

BAR	SIZE
A	#5
T	#4

HL-93 LOADING NOT TO SCALE

XXX

NO.	DATE	REVISION	APPROV.

Texas Department of Transportation

PG&L 3131 Briarpark Dr, Suite 200
Houston, Texas 77042
(713) 622-1444

TBPE REG. NO. F-2742

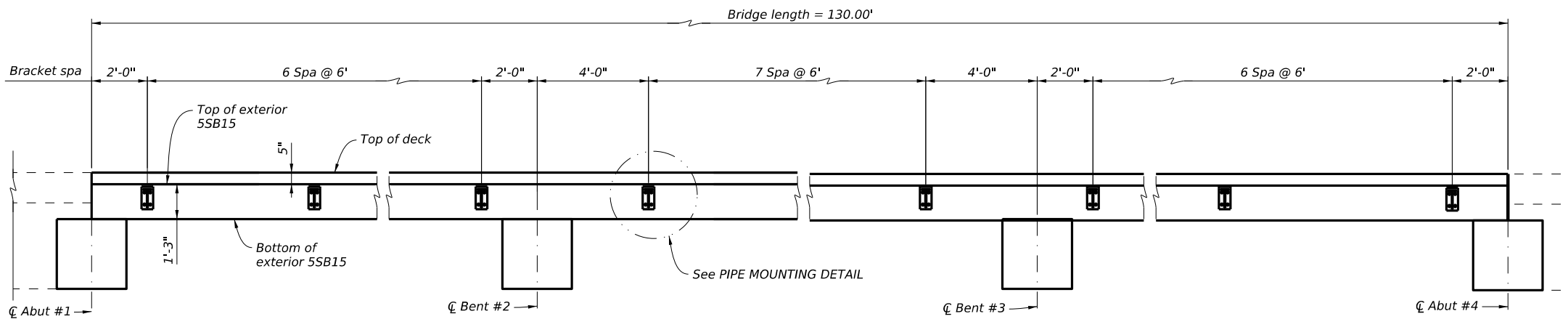
3RD ST @ BURLESON CREEK

130.000' PRESTR. CONC. SLAB BEAM UNIT

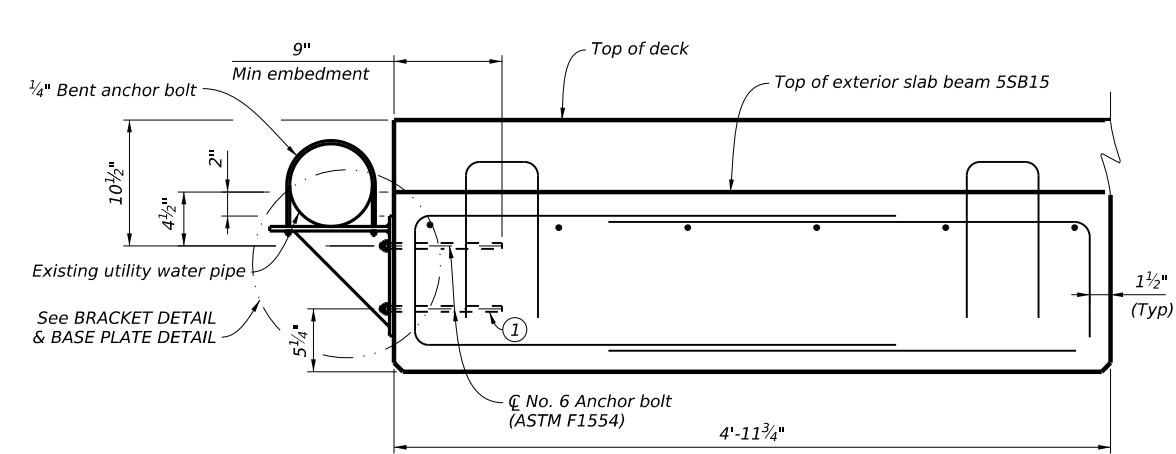
SHEET 1 OF 1

CONT	SECT	JOB	HIGHWAY
0923	10	021	3RD ST
DIST	COUNTY	SHEET NO.	
BWD	LAMPASAS	51	

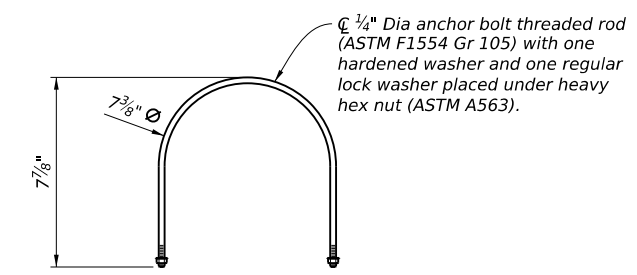
DATE: 7/19/2024 5:08:05 PM
FILE: R:\1005000-1005999\1005472.03\04_DOCUMENTS\DESIGN\Plan_Set\7_Bridge\3RD BRG_BGS_01.dgn



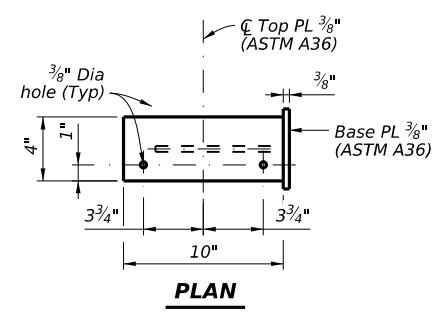
PIPE SUPPORT LOCATION DETAIL



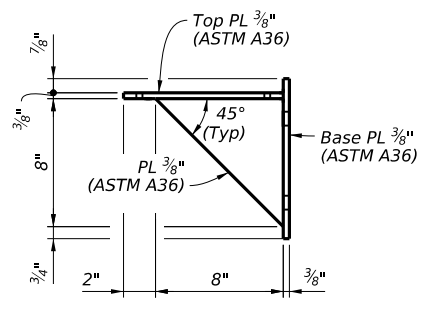
PIPE MOUNTING DETAIL



BENT ANCHOR BOLT

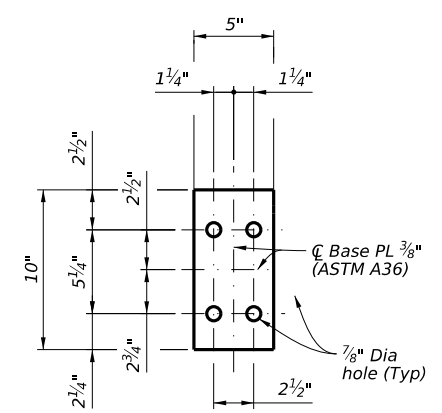


PLAN

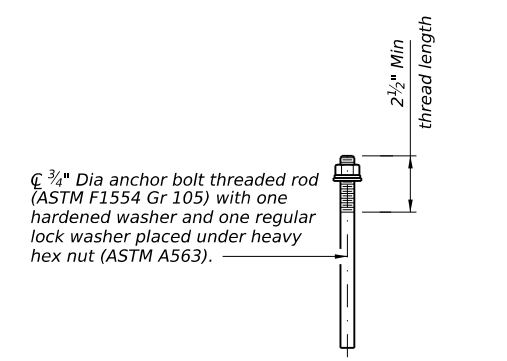


ELEVATION

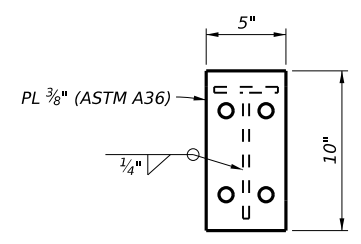
BRACKET DETAIL



BASE PLATE DETAIL



ANCHOR BOLT



BRACKET TO BASE PLATE CONNECTION DETAIL

TABLE OF ESTIMATED QUANTITIES		
Bid Code	Item Description	Quantity
0449 7001	ANCHOR BOLTS	110 EA (2)
0442 7011	STR STEEL (PLATES)	284 LB

- ① Embed (#6) anchor bolt threaded rod with a Type III, Class C, D, E, or F anchor adhesive. Minimum adhesive anchor embedment depth is 9". Anchor adhesive chosen must be 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 ability to develop this load to the Engineer for approval prior to use.
- ② Quantity includes U bent anchor bolts.

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

MATERIAL NOTES:
 Provide anchor bolts conforming to ASTM F1554 Grade 105. Provide nuts conforming to ASTM A563 Grade DH, heavy hex or A194 Grade 2D, heavy hex. Provide washer conforming to ASTM F436. Hot dip galvanize rod, nut, and washer as per Item 445, "Galvanizing". Sizing, drilling, and cleaning rod holes must follow the epoxy Manufacturer's directions. Use a Type III (Class C) epoxy meeting the requirements of DMS-6100, "Epoxyes and Adhesives". Mix and dispense adhesive with the Manufacturer's static mixing nozzle/dual cartridge system. Provide base plates and brackets conforming to ASTM A36.

GENERAL NOTES:
 Material for brackets will be measured and paid for in accordance with Item 442, "Metal for Structures". Galvanize all steel components unless otherwise noted.



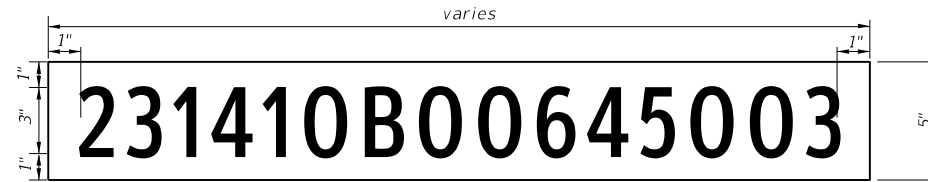
08/06/2024

		Bridge Division	
WATER PIPE UTILITY MOUNTING DETAILS			
NBI# 23-141-0-B006-45-003			
FILE: SP998m101.dgn	DN: JLL	CK: XC	DW: LH
©TXDOT AUGUST 2024	CONT SECT	JOB	HIGHWAY
REVISIONS	0923 10	021	3rd Street
DIST	COUNTY	SHEET NO.	
BWD	Lampasas	52	

DATE: FILE:

KEYED NOTES

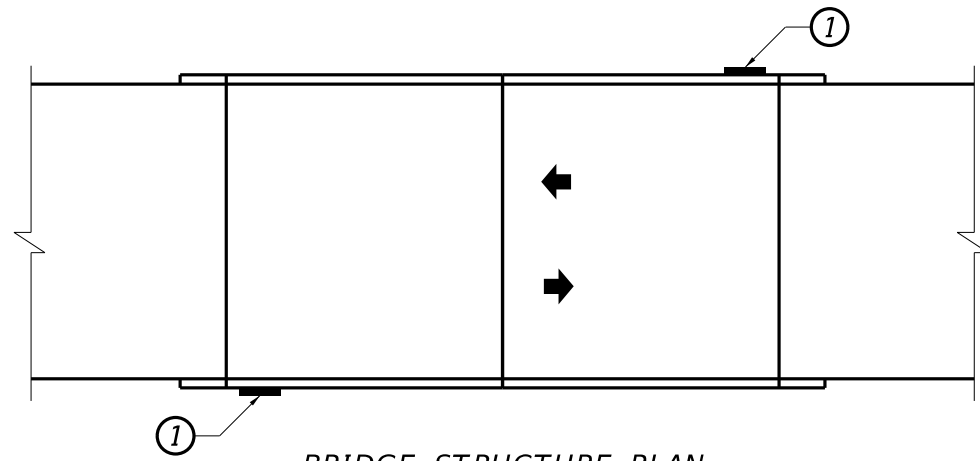
- ① Proposed painted bridge identification number.



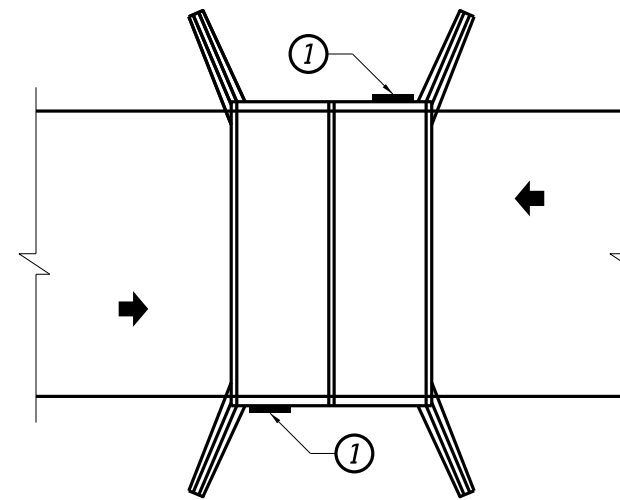
BRIDGE IDENTIFICATION NUMBER DETAILS

GENERAL NOTES

1. Obtain approval of proposed materials and work methods before commencing work.
2. Paints shall be waterproof, weather resistant, and quick drying when used on concrete without smearing, smudging or rippling.
3. Metal stencil set shall have 3 in. interlocking characters, shall include numbers, letters and dashes, and shall have font as approved. C H Hanson stencil set model 10153 or equal.
4. Painted bridge identification numbers shall have white background with black letters. Borders shall be 1 in. minimum. Mask to prevent overspray.
5. For bridge structures, apply painted bridge identification numbers on both sides of structure, except for parallel structures which are only separated by an expansion joint. Apply to each outside edge of concrete deck close to abutment on the upstream traffic side unless otherwise approved.
6. For culvert structures, apply painted bridge identification numbers on both sides of structure. Apply to each headwall adjacent to wingwall on the upstream traffic side unless otherwise approved.
7. The Engineer will provide guidance in cases where painted bridge identification numbers cannot be installed in standard locations.
8. Unless identified in the contract as bid items, painted bridge identification numbers will not be measured and paid for directly, but will be considered as subsidiary to the various bid items of the contract. Submit digital photographs of each new painted bridge identification number to the bridge inspection coordinator. Include the following information visible within the digital photographs: date, latitude, longitude, and direction.



BRIDGE STRUCTURE PLAN



CULVERT STRUCTURE PLAN



J.H. Scantling, P.E.

07/24/2024

THIRD ST.
BRIDGE
IDENTIFICATION
NUMBER



CONT	SECT	JOB	HIGHWAY
0923	10	021	THIRD ST.
DIST	COUNTY		SHEET NO.
BWD	LAMPASAS		53

DATE: 7/24/2024 11:02:33 AM
FILE: ... \BRIDGE IDENTIFICATION NUMBER DETAILS.dgn

DATE: 7/19/2024 5:08:05 PM
 FILE: R:\1005000-1005999\1005472.03\04_DOCUMENTS\DESIGN\Icon_Set\7. BridgeStandards\SLAB_BEAM_STANDARDS\PSB-PSBND-22.dgn
 VS JL MW GH

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.

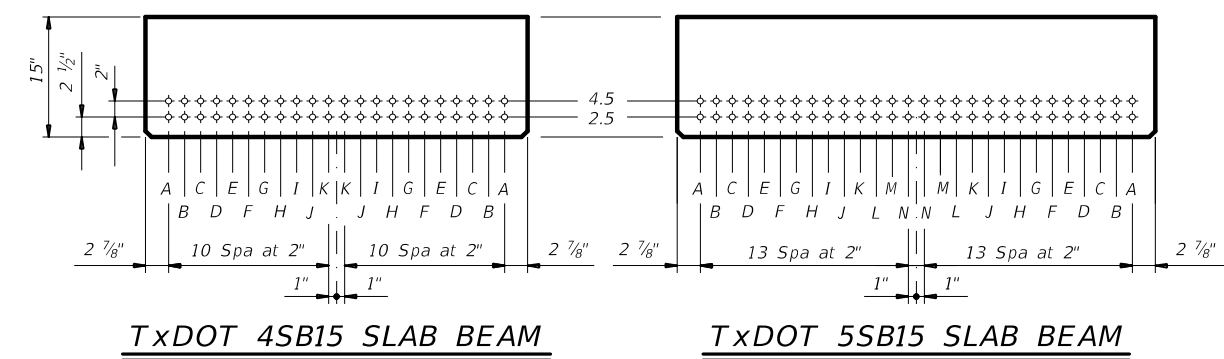
STRUCTURE	DESIGNED BEAMS (STRAIGHT STRANDS)																	OPTIONAL DESIGN					LOAD RATING FACTORS			NON-STANDARD STRAND PATTERNS					
	SPAN NO.	BEAM NO.	BEAM TYPE	PRESTRESSING STRANDS							DEBONDED STRANDS PER ROW							CONCRETE	DESIGN LOAD COMP STRESS (TOP $\bar{\epsilon}$) (SERVICE I)	DESIGN LOAD TENSILE STRESS (BOT $\bar{\epsilon}$) (SERVICE III)	REQUIRED MINIMUM ULTIMATE MOMENT CAPACITY (STRENGTH I)	LIVE LOAD DISTRIBUTION FACTOR		STRENGTH I			SERVICE III				
				NON-STD STRAND PATTERN	TOTAL NO.	SIZE (in)	STRGTH (ksi)	"e" $\bar{\epsilon}$ (in)	"e" END (in)	TOT NO. DEB	DIST FROM BOTTOM (in)	NO. OF STRANDS		NUMBER OF STRANDS DEBONDED TO (ft from end)								RELEASE STRGTH $\bar{\epsilon}$ (ksi)	MINIMUM 28 DAY COMP STRGTH $\bar{\epsilon}$ (ksi)	LIVE LOAD DISTRIBUTION FACTOR		STRENGTH I			SERVICE III		
												TOTAL	DE-BONDED	3	6	9	12							15	Moment	Shear	Inv	Opr	Inv		
3RD ST BRIDGE	1 & 3	1 & 10	5SB15		14	0.6	270	5.0	5.0	0	2.5	14	0	0	0	0	0	4.0	5.0	1.116	-0.219	851	0.40	0.38	1.67	2.17	1.37				
	1 & 3	2-9	4SB15		12	0.6	270	5.0	5.0	0	2.5	12	0	0	0	0	0	4.0	5.0	1.032	-0.052	661	0.31	0.31	1.92	2.49	1.69				
	2	1 & 10	5SB15		22	0.6	270	5.0	5.0	6	2.5	22	6	4	2	0	0	4.0	5.0	1.740	-0.318	1233	0.38	0.37	1.73	2.24	1.14				
	2	2-9	4SB15		18	0.6	270	5.0	5.0	4	2.5	18	4	2	2	0	0	4.0	5.0	1.656	-0.195	959	0.29	0.29	1.87	2.42	1.32				

PATTERN	STRAND ARRANGEMENT AT $\bar{\epsilon}$ OF BEAM		
	Inv	Opr	Inv

- ① Based on the following allowable stresses (ksi):
 Compression = $0.65 f'_{ci}$
 Tension = $0.24 \sqrt{f'_{ci}}$
 Optional designs must likewise conform.
- ② Portion of full HL93.

DESIGN NOTES:
 Designed according to AASHTO LRFD Bridge Design Specifications.
 Load rated using Load and Resistance Factor Rating according to AASHTO Manual for Bridge Evaluation.
 Prestress losses for the designed beams have been calculated for a relative humidity of 75 percent. Optional designs must likewise conform.

FABRICATION NOTES:
 Provide Class H concrete.
 Provide Grade 60 reinforcing steel.
 Use low relaxation strands, each pretensioned to 75 percent of fpu.
 Full-length debonded strands are not permitted in positions "A" and "B".
 Strand debonding must comply with Item 424.4.2.2.4.
 When shown on this sheet, the Fabricator has the option of furnishing either the designed beam or an approved optional beam design. All optional design submittals and shop drawings must be signed, sealed and dated by a Professional Engineer registered in the State of Texas.
 Locate strands for the designed beam as low as possible on the 2" grid system unless a non-standard strand pattern is indicated. Fill row "2.5", then row "4.5". Place strands within a row as follows:
 1) Locate a strand in each "A" position.
 2) Place strand symmetrically about vertical centerline of beam.
 3) Space strands as equally as possible across the entire width.
 Do not debond strands in position "A". Distribute debonded strands symmetrically about the vertical centerline. Increase debonded lengths working outward, with debonding staggered in each row.



TxDOT 4SB15 SLAB BEAM

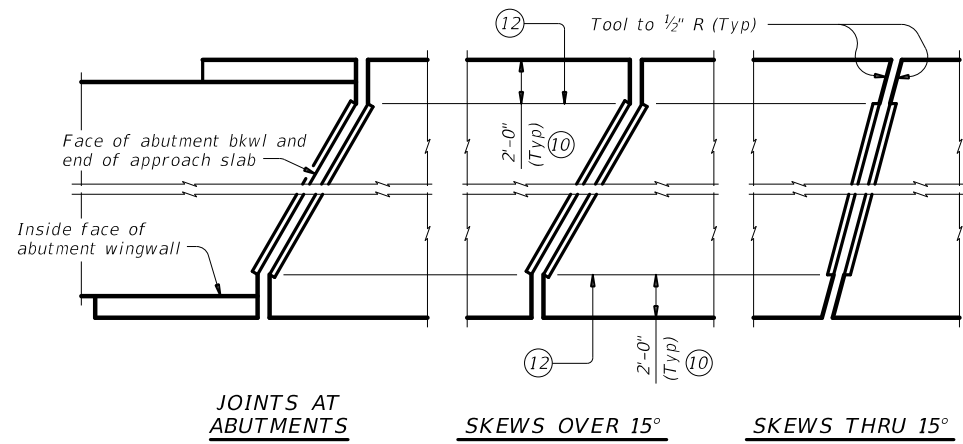
TxDOT 5SB15 SLAB BEAM

HL93 LOADING

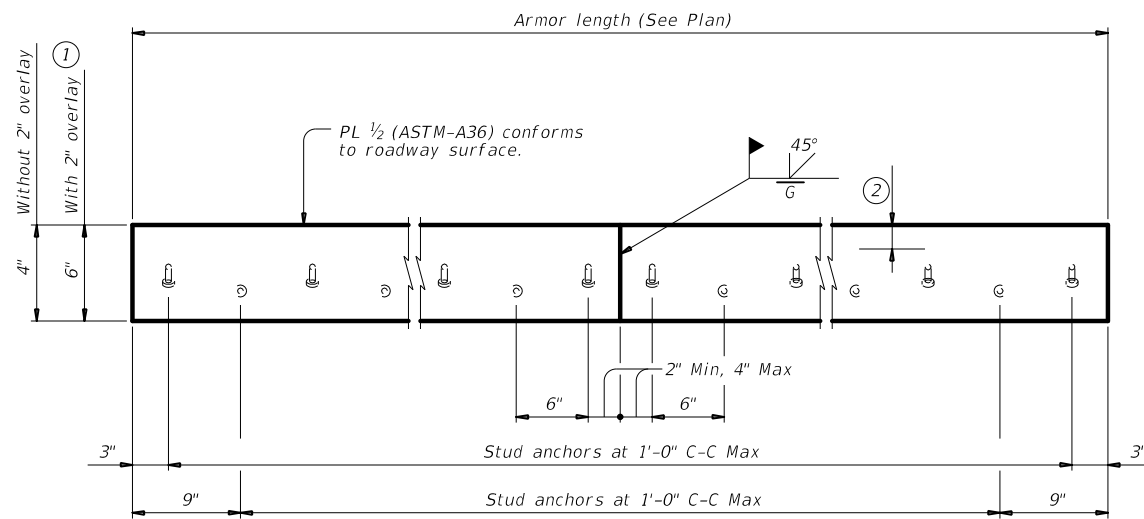
		Bridge Division Standard	
PRESTRESSED CONCRETE SLAB BEAM DESIGNS (NON-STANDARD SPANS)			
PSBND			
FILE: PSB-PSBND-22.dgn	DN: TxDOT	CK: TxDOT	DW: TxDOT
©TxDOT January 2017	CONT	SECT	JOB
REVISIONS	0923	10	021
3-22: Added Load Rating.	DIST	COUNTY	SHEET NO.
	BWD	LAMPASAS	54

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: 7/19/2024 12:21:58 PM
 FILE: R:\1005000-1005999\1005472\03\04 DOCUMENTS\DESIGN\Plan Set\7_Bridge_Standards\AJ-19.dgn

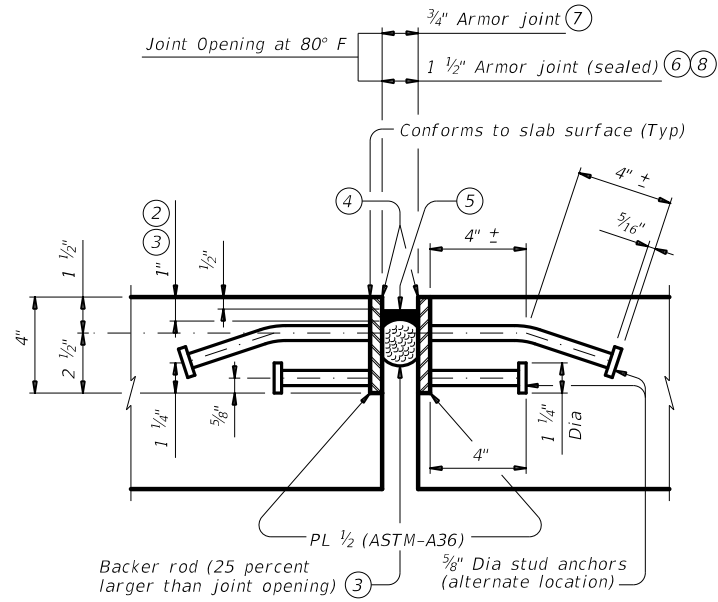


JOINTS AT ABUTMENTS
SKEWS OVER 15°
SKEWS THRU 15°
PLANS OF ARMOR PLATES

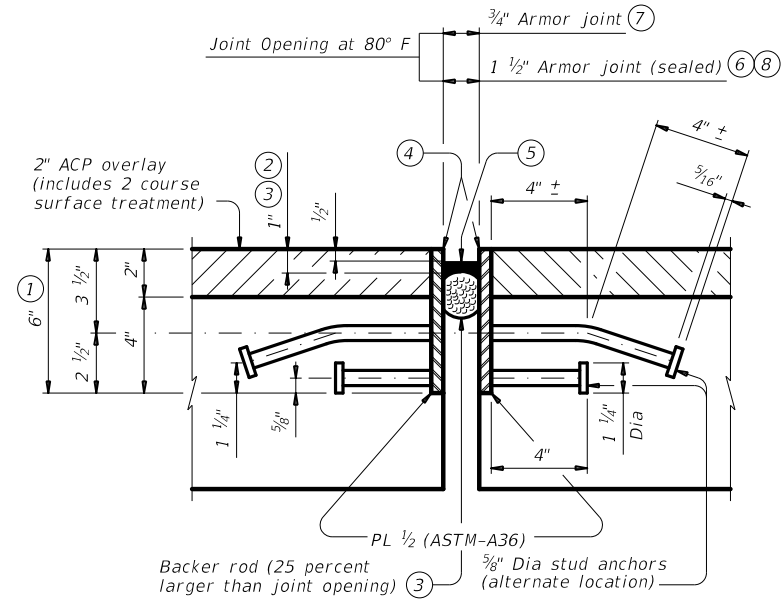


ELEVATION OF BASIC ARMOR PLATE

- ① Adjust 6" plate height for overlay thicknesses other than the 2" shown. Adjust weight by 1.70 plf for each 1/2" variation in thickness.
- ② Do not paint top 1/2" of plate if using sealed armor joint.
- ③ Set top of backer rod 1" below top of armor plate. Backer rod must be compatible with joint sealant. Use of multiple pieces to create a backer rod cross section is not permitted. Top of backer rod must be convex as shown.
- ④ Blast clean entire contact area between sealant and plate (SSPC-SP10) before installing sealant. Light brush blast and thoroughly clean all dust and debris from concrete surfaces in contact with joint sealant before application of silicone seal.
- ⑤ Use Class 7 joint sealant that conforms to DMS-6310.
- ⑥ Place sealant while ambient temperature is between 55°F and 80°F and is rising.
- ⑦ Armor joint does not include joint sealant or backer rod.
- ⑧ Armor joint (sealed) includes Class 7 joint sealant and backer rod.
- ⑨ Form vertical leg of seal as per the Manufacturer's recommendations. Use Class 4 joint sealant if Class 7 cannot be installed correctly. Install according to Manufacturer's recommendations.
- ⑩ Unless shown otherwise, terminate armor plate at slab break point if break is more than 2'-0" from slab edge.
- ⑪ See "Plans of Armor Plates".
- ⑫ At Fabricator's option, armor plate may extend up to 6" beyond this point for skews through 15°.
- ⑬ Align shipping angle perpendicular to joint.



SHOWN WITHOUT 2" OVERLAY AT JOINT LOCATION



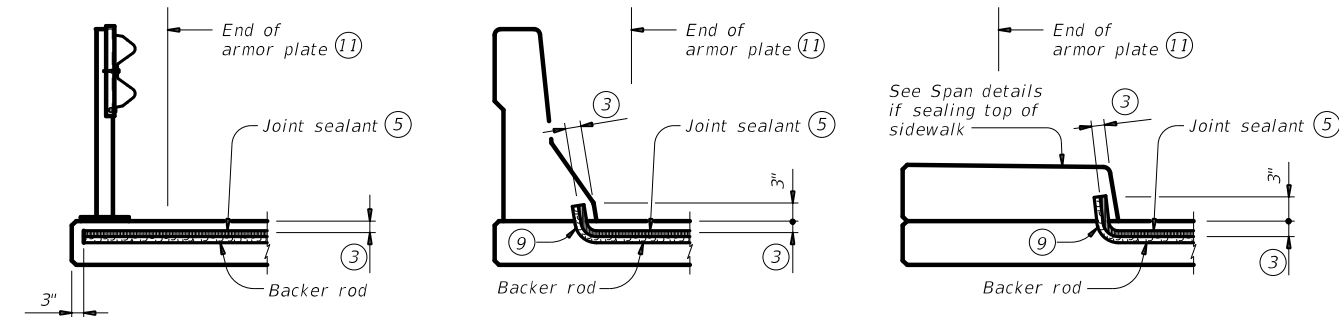
SHOWN WITH 2" OVERLAY AT JOINT LOCATION

ARMOR JOINT SECTIONS
 Showing Armor Joint (Sealed)

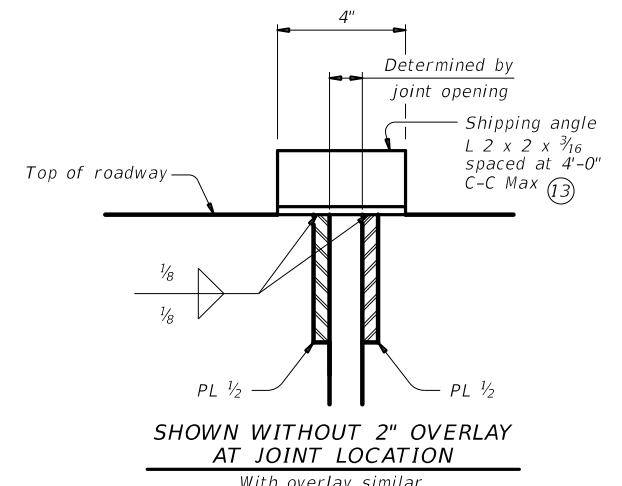
FABRICATION NOTES:
 Match mark corresponding plate sections and secure together for shipment with shipping angle. Do not use erection bolts. Ship armor joints in convenient lengths of 10'-0" Min and 24'-0" Max unless necessary for stage construction or widenings. One shop splice is permitted in each shipping length provided no piece is less than 2'-0" long and sufficient studs are added to limit the stud to shop splice distance to 2" Min and 4" Max. Weld studs in accordance with AWS D1.1. Use groove welds for all shop and field butt splices. Grind smooth areas in contact with seal. Make all necessary field splice joint preparations in the shop. Paint the entire steel section, except as stated in Note 2, with System II or IV primer in accordance with Item 446 "Field Cleaning and Painting Steel." Provide paints in accordance with Item 446.2. Prepare steel and apply paint in accordance with Items 446.4.7.3 and 446.4.7.4. Shop drawings for the fabrication of armor joints will not require the Engineer's approval if fabrication is in accordance with the details shown on this standard.

CONSTRUCTION NOTES:
 Secure armor joints in position and place to proper grade and alignment by welding braces to adjacent reinforcing steel, to prestressed beam stirrups, or to anchors cast in concrete diaphragms. Include cost of temporary bracing in the price bid for Armor Joint. Remove shipping angle immediately after each joint half is secured in place. Grind smooth, and touch up with organic zinc-rich paint.

GENERAL NOTES:
 Provide armor joints at locations shown on the plans. Provide the seal when "Armor Joint (Sealed)" is noted on the plans. These joint details accommodate a joint movement range of 1 3/8" (3/4" opening movement and 5/8" closure movement). Payment for armor joint, with or without seal, is based on length of armor plate.



JOINT SEALANT TERMINATION DETAILS
 Armor joint (sealed) only. Armor plate is not shown for clarity.



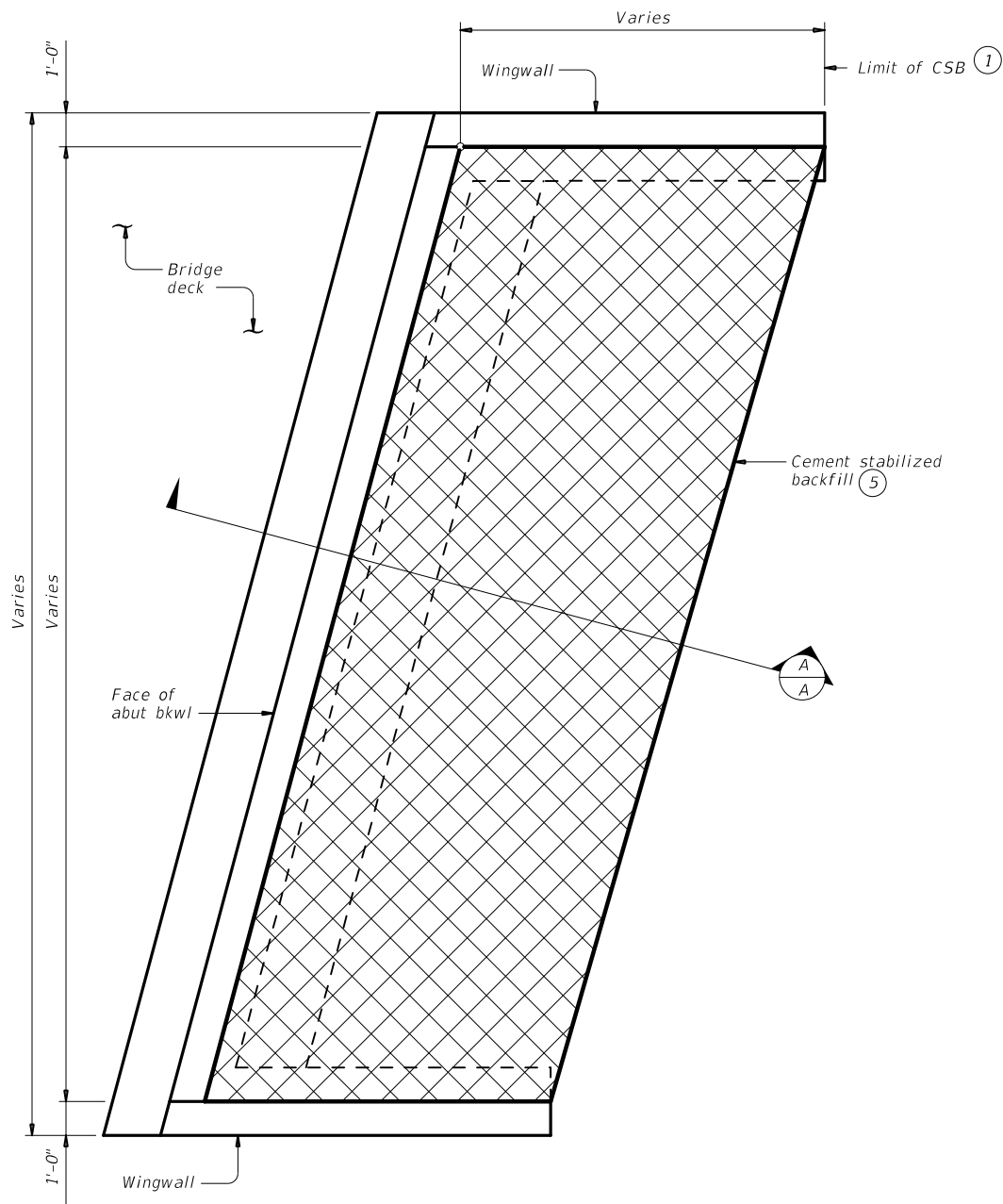
SHIPPING ANGLE
 An alternate method of securing joint sections may be used if approved by the Bridge Division. Erection bolts are not allowed.

WEIGHTS FOR ONE ARMOR JOINT (2 PLATES)	
WITHOUT OVERLAY	16.10 plf
WITH 2" OVERLAY ①	22.90 plf

				Bridge Division Standard	
<h2>ARMOR JOINT DETAILS</h2>					
<h3>AJ</h3>					
FILE:	DN: TxDOT	CK: TxDOT	DW: TxDOT	CK: TxDOT	
©TxDOT	April 2019	CONTRACT	SECTION	JOB	HIGHWAY
	REVISIONS	0923	10	021	3RD ST
		DIST	COUNTY	SHEET NO.	
		BWD	LAMPASAS	55	

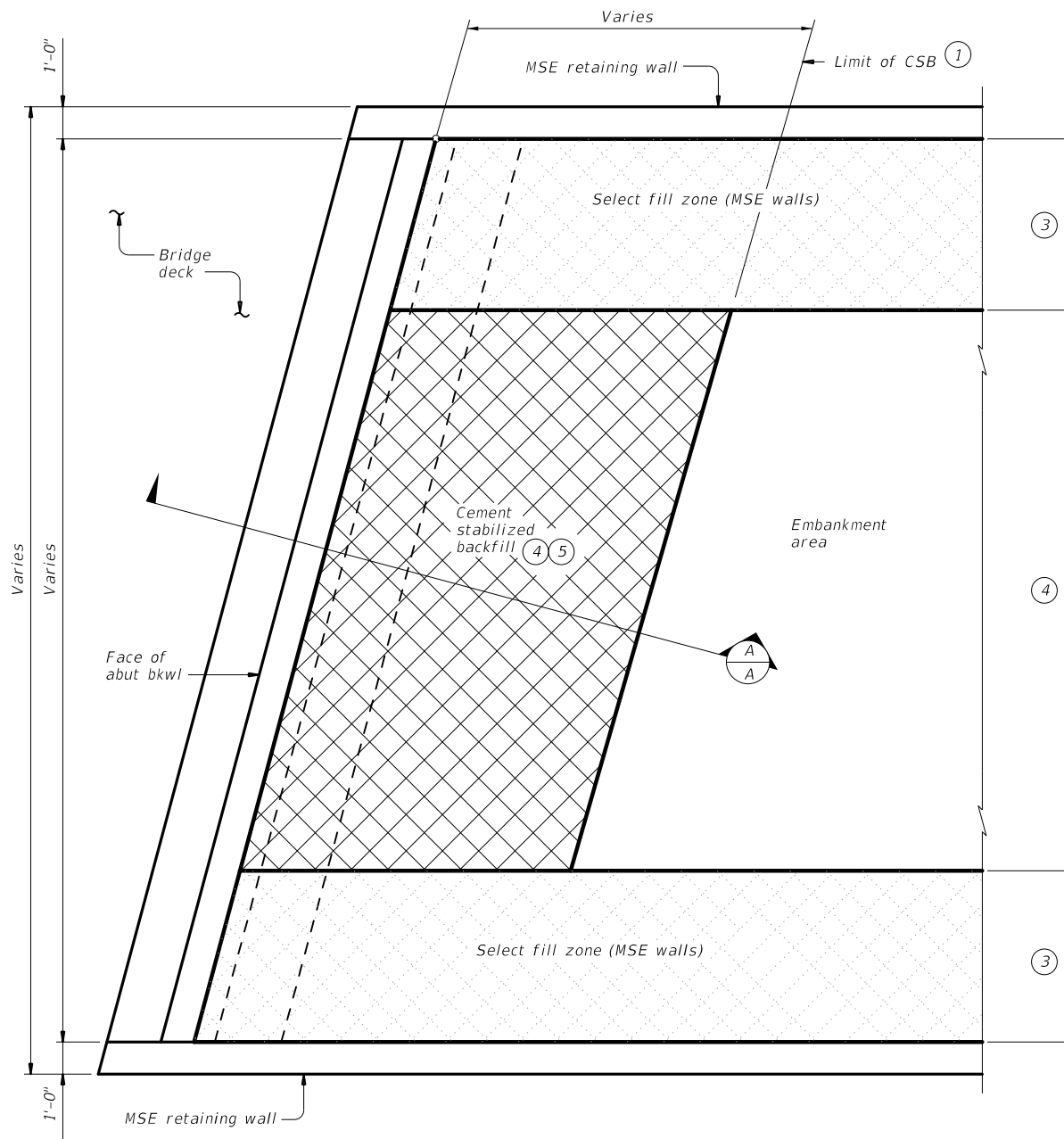
DISCLAIMER: This standard is governed by the "Texas Engineering Practice Act". No warranty of any kind is made by TxDOT for any purpose whatsoever. TxDOT assumes no responsibility for the conversion of this standard to other formats or for incorrect results or damages resulting from its use.

7/19/2024 12:21:58 PM
 DATE: R:\1005000-1005999\1005472_03\04_DOCUMENTS\DESIGN\Plan_Sets\7. Bridge Standards\I_GIRDER_STANDARDS\MS-CSAB-23.dgn
 FILE:



OPTION 1 ~ PLAN WITH WINGWALLS

Cast-in-place retaining walls similar.



OPTION 1 ~ PLAN WITH MSE RETAINING WALLS

- ① Usual limit of Cement Stabilized Backfill is at end of wingwall. Extend CSB limits as required to maintain a slope no steeper than 1:1 at bottom of backfill.
- ② Bench backfill as shown with 12" (approximate) bench depths.
- ③ Where MSE retaining walls are present, adjust CSB limits to accommodate the select fill zone. See retaining wall details for additional information.
- ④ When distance between select fill zones is less than 5'-0", MSE select fill may be substituted for cement stabilized backfill with approval from the Engineer.
- ⑤ If shown in the plans, flowable backfill can be used as a substitute for cement stabilized backfill with the following constraints:
 - a) If flowable backfill is to be placed over MSE backfill, then a filter fabric will be placed over the MSE backfill prior to placement of the flowable fill; and
 - b) Place flowable fill in lifts not exceeding 2 feet in height. Place each successive lift when the previous lift has stiffened/hardened (i.e. has lost its flowability).

GENERAL NOTES:

See the Bridge Layout for selected Option. Option 1 is intended for construction only requiring plasticity index (PI) controlled embankment fill or excavation in competent soils/rocks in order to construct the abutment. Option 2 is intended for new construction requiring high plasticity embankment fill with a PI greater than 30 or pavement built in poor native soil. Poor soils are defined as high plasticity clays or expansive clays.

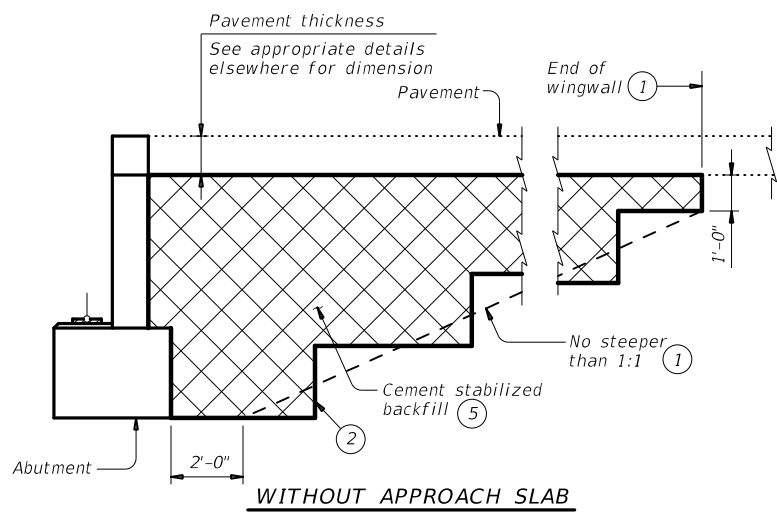
Construct abutment backfill in accordance with Item 400, "Excavation and Backfill for Structures".

Provide Cement Stabilized Backfill (CSB) meeting the requirements of Item 400, "Excavation and Backfill for Structures", to the limits shown at bridge abutments.

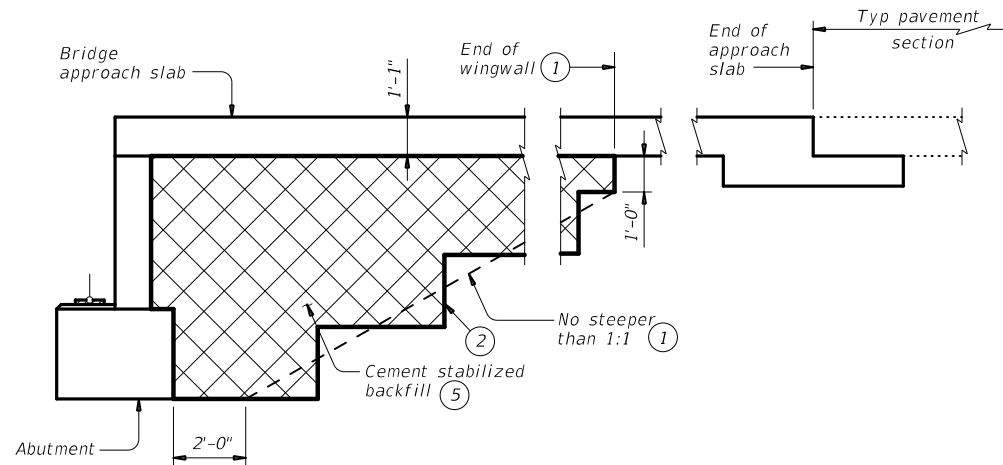
If required elsewhere in the plans, provide Flowable Backfill meeting the requirements of Item 401, "Flowable Backfill", to the limits shown at bridge abutments.

Details are drawn showing left forward skew. See Bridge Layout for actual skew direction.

These details do not apply when Concrete Block retaining walls are used in lieu of wingwalls.



WITHOUT APPROACH SLAB



WITH APPROACH SLAB
 (Showing BAS-C, BAS-A similar.)

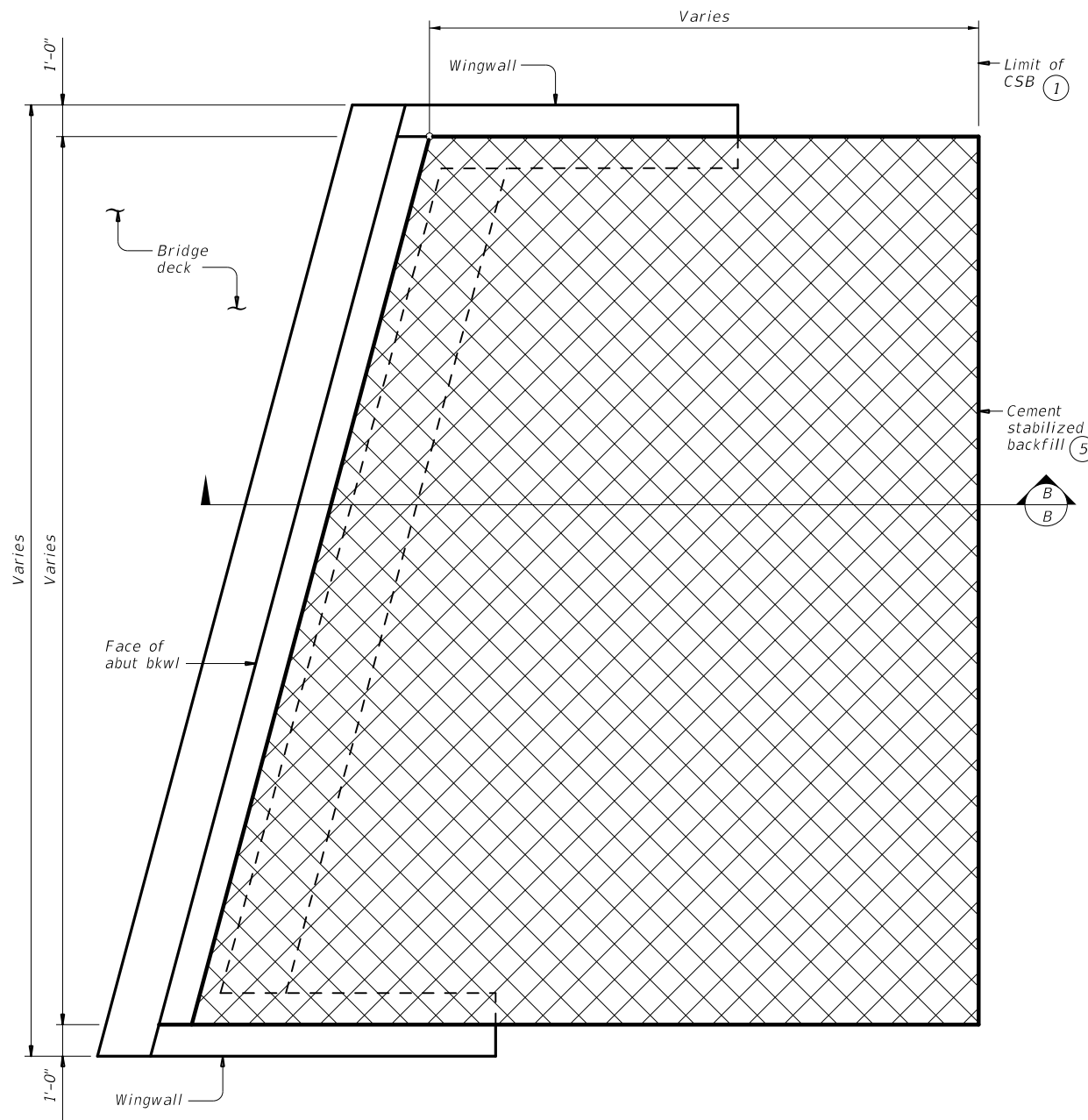
SECTION A-A

SHEET 1 OF 2

		Bridge Division Standard	
CEMENT STABILIZED ABUTMENT BACKFILL BRIDGE ABUTMENT			
CSAB			
FILE: MS-CSAB-23.dgn	DN: TxDOT	CK: TxDOT	DW: TxDOT
©TxDOT	April 2019	CONTRACT	SECT
0923	10	021	3RD ST
02-20: Added Option 2.	DIST	COUNTY	SHEET NO.
03-23: Updated General Notes.	BWD	LAMPASAS	56

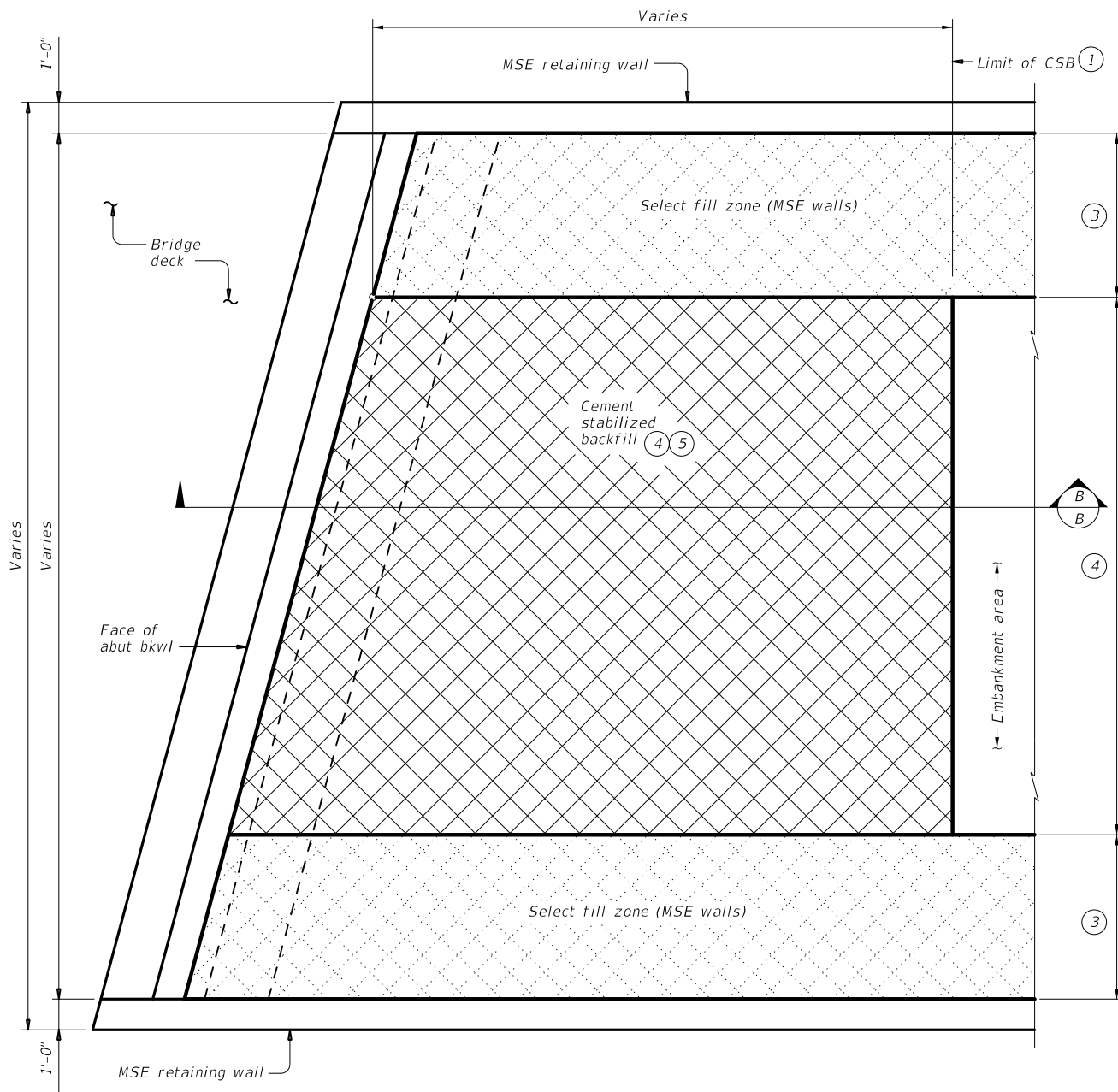
DISCLAIMER: This standard is governed by the "Texas Engineering Practice Act". No warranty of any kind is made by TxDOT for any purpose whatsoever. TxDOT assumes no responsibility for the conversion of this standard to other formats or for incorrect results or damages resulting from its use.

7/19/2024 12:21:59 PM
 FILE: R:\1005000-1005999\1005472_03\04_DOCUMENTS\DESIGN\Plan_Sets\7. Bridge Standards\I_GIRDER_STANDARDS\MS-CSAB-23.dgn



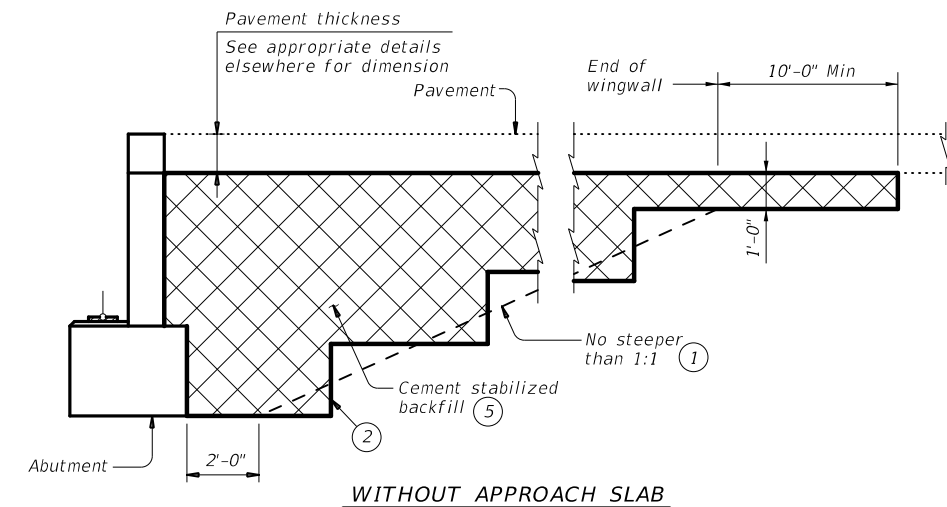
OPTION 2 ~ PLAN WITH WINGWALLS

Cast-in-place retaining walls similar.

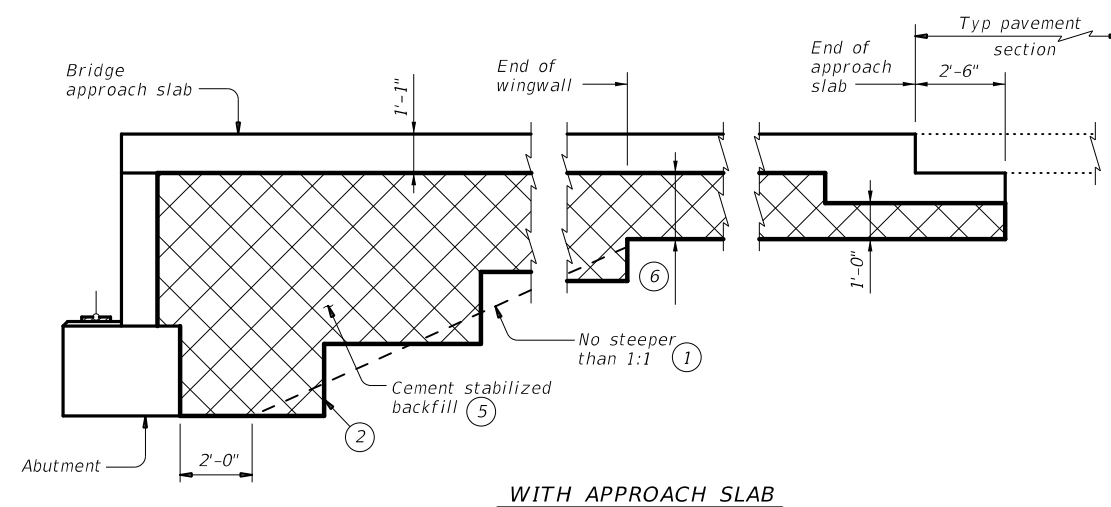


OPTION 2 ~ PLAN WITH MSE RETAINING WALLS

- ① Usual limit of Cement Stabilized Backfill is at end of wingwall. Extend CSB limits as required to maintain a slope no steeper than 1:1 at bottom of backfill.
- ② Bench backfill as shown with 12" (approximate) bench depths.
- ③ Where MSE retaining walls are present, adjust CSB limits to accommodate the select fill zone. See retaining wall details for additional information.
- ④ When distance between select fill zones is less than 5'-0", MSE select fill may be substituted for cement stabilized backfill with approval from the Engineer.
- ⑤ If shown in the plans, flowable backfill can be used as a substitute for cement stabilized backfill with the following constraints:
 - a). If flowable backfill is to be placed over MSE backfill, then a filter fabric will be placed over the MSE backfill prior to placement of the flowable fill; and
 - b). Place flowable fill in lifts not exceeding 2 feet in height. Place each successive lift when the previous lift has stiffened/hardened (i.e. has lost its flowability).
- ⑥ 1'-0" for BAS-A
1'-10" for BAS-C



WITHOUT APPROACH SLAB



SECTION B-B

WITH APPROACH SLAB
(Showing BAS-C, BAS-A similar.)

SHEET 2 OF 2

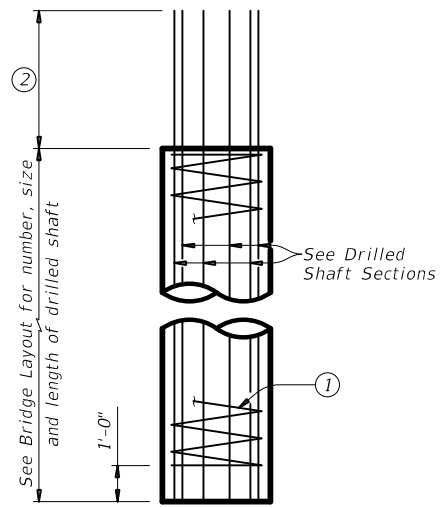


**CEMENT STABILIZED
 ABUTMENT BACKFILL
 BRIDGE ABUTMENT**

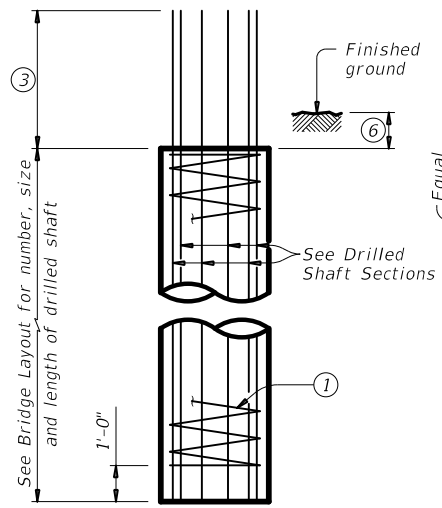
CSAB

FILE: MS-CSAB-23.dgn	DN: TxDOT	CK: TxDOT	DW: TxDOT	CK: TxDOT
©TxDOT April 2019	CONT	SECT	JOB	HIGHWAY
REVISIONS	0923	10	021	3RD ST
02-20: Added Option 2. 03-23: Updated General Notes.	DIST	COUNTY	SHEET NO.	
	BWD	LAMPASAS	57	

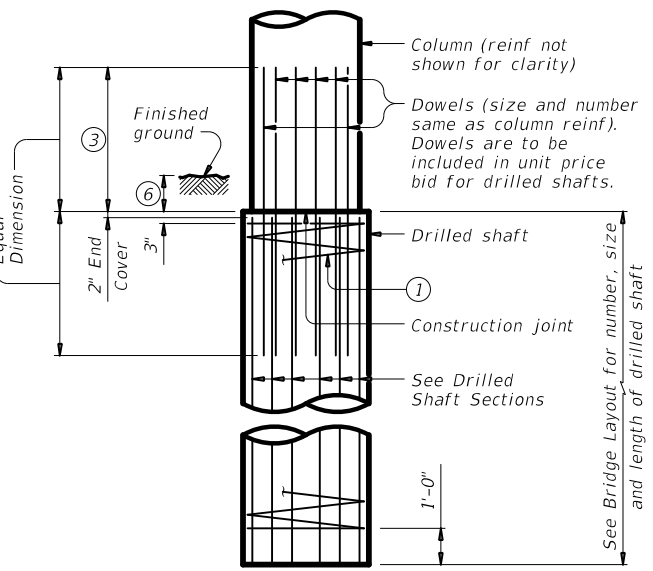
7/19/2024 12:21:59 PM
 DATE: R:\1005000-1005999\1005472_03\04_DOCUMENTS\DESIGN\Plan_Sets\7. Bridge Standards\I_GIRDER_STANDARDS\MS-FD-20.dgn
 FILE:



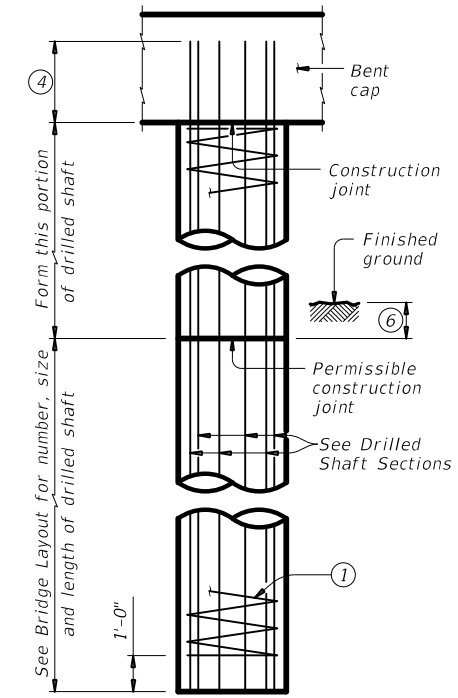
ABUTMENTS, WINGWALLS AND MULTI-DRILLED SHAFT FOOTINGS



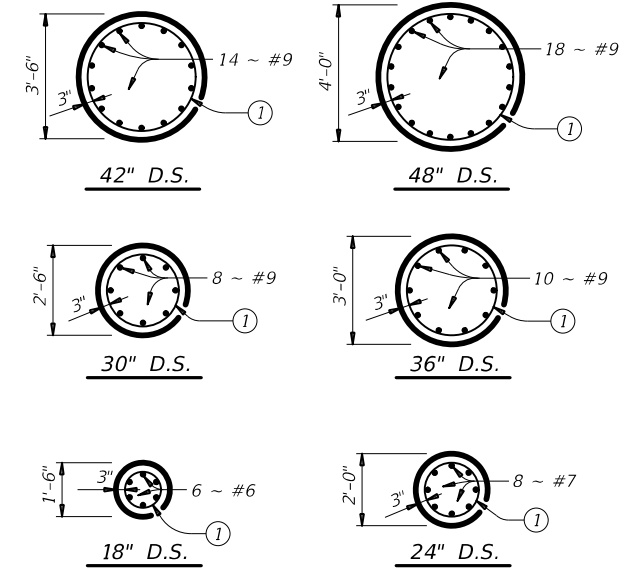
INTERIOR BENTS DRILLED SHAFT DIA EQUAL TO COLUMN DIA



INTERIOR BENTS DRILLED SHAFT DIA GREATER THAN COLUMN DIA



OPTIONAL INTERIOR BENT DRILLED SHAFT DETAIL

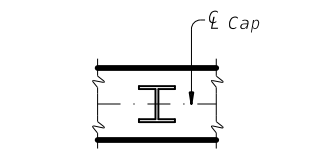


DRILLED SHAFT SECTIONS

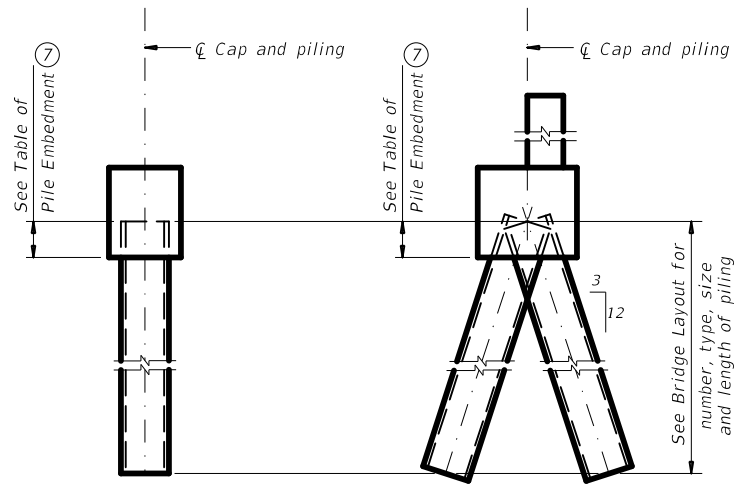
DRILLED SHAFT DETAILS

TABLE OF PILE EMBEDMENT	
Pile Type	Embedment Depth (Ft)
16" Sq Concrete 18" Sq Concrete HP14 Steel HP16 Steel	1'-0"
20" Sq Concrete 24" Sq Concrete HP18 Steel	1'-6"

See Prestressed Concrete Piling (CP) standard for additional details on concrete pile embedment.

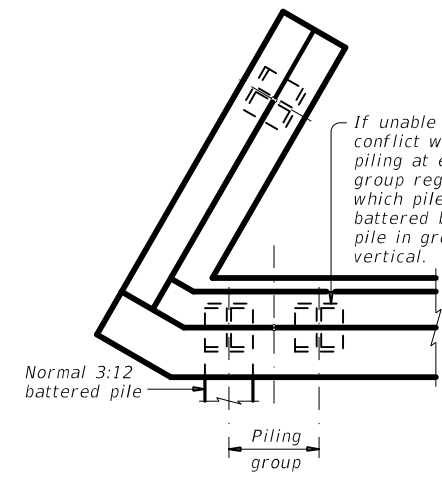


ORIENTATION OF STEEL H-PILING



VERTICAL PILE BATTERED PILE

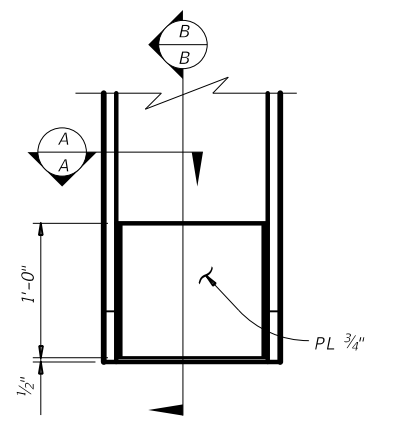
PILING DETAILS
(Concrete or steel H)



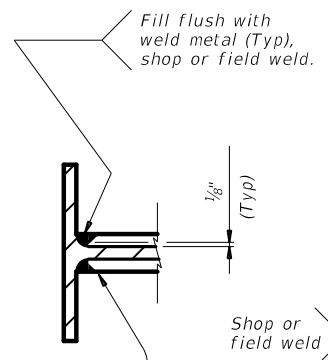
DETAIL "A"

(Showing plan view of a 30° skewed abutment)

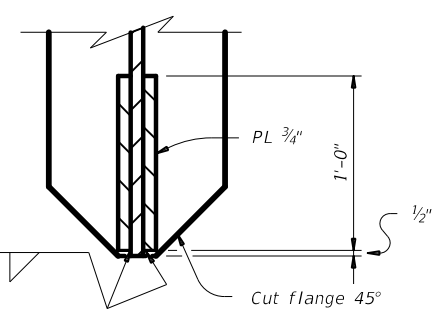
- ① #3 spiral at 6" pitch (one and a half flat turns top and bottom).
- ② Min extension into supported element:
#6 Bars = 1'-11"
#7 Bars = 2'-0"
#9 Bars = 2'-3"
- ③ Min lap with column reinf:
#7 Bars = 2'-11"
#9 Bars = 3'-9"
#11 Bars = 4'-8"
- ④ Min extension into supported element:
#6 Bars = 1'-11"
#7 Bars = 2'-3"
#9 Bars = 2'-9"
- ⑤ Drilled shafts may extend to the bottom of bent caps for "H" heights of 6 ft and less (as shown on the Bridge Layout), if approved. This option can only be used when the drilled shaft diameter equals the column diameter. Obtain approval of the forming method above the ground line prior to construction. No adjustments in payment will be made if this option is used.
- ⑥ 1'-0" Min, unless shown otherwise on plans.
- ⑦ Or as shown on plans.



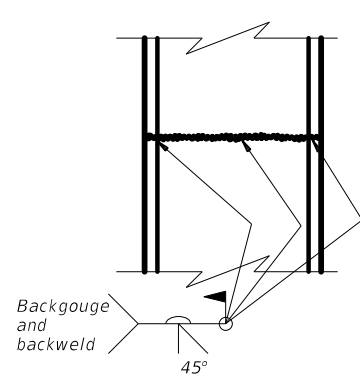
ELEVATION



SECTION A-A

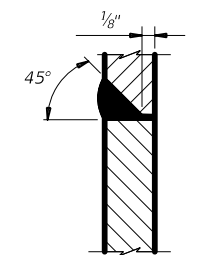


SECTION B-B



STEEL H-PILE SPLICE DETAIL

Use when required.



SECTION THRU FLANGE OR WEB

STEEL H-PILE TIP REINFORCEMENT

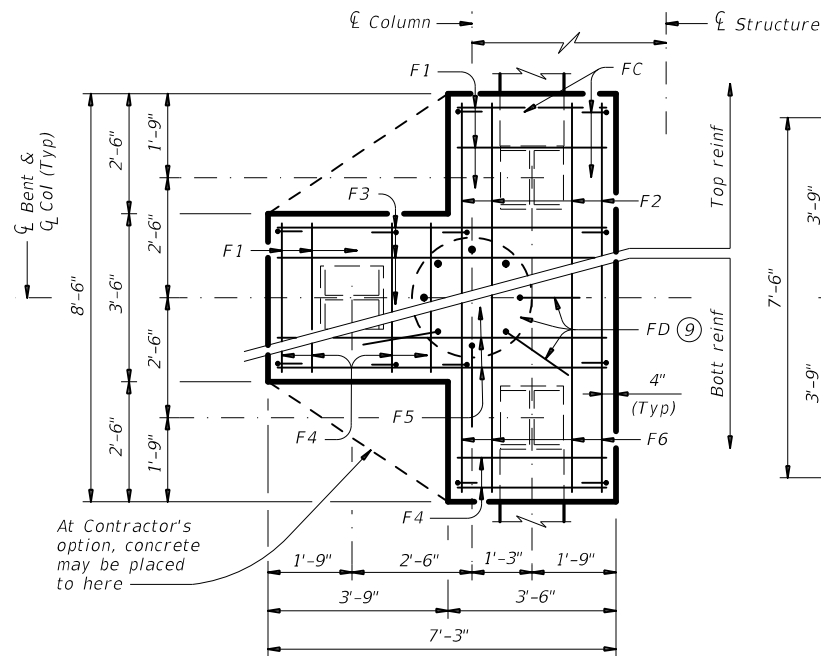
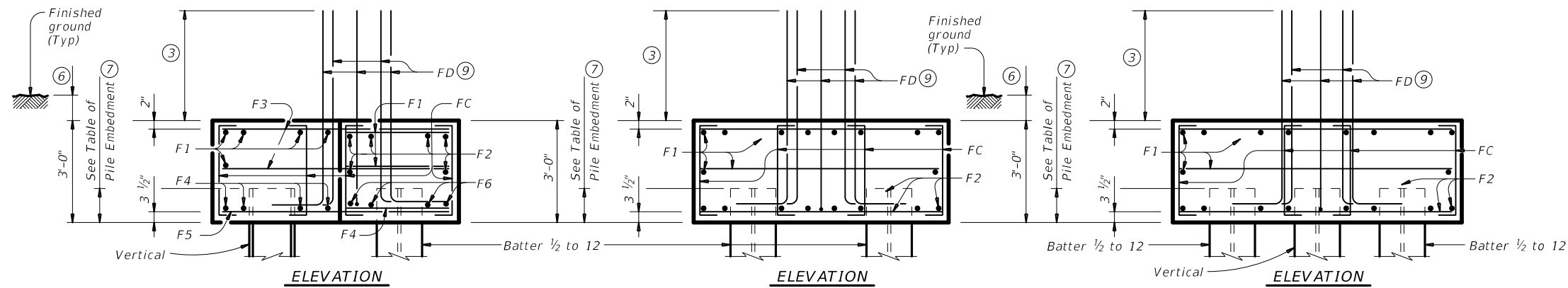
See Item 407 "Steel Piling" to determine when tip reinforcement is required and for options to the details shown.

SHEET 1 OF 2

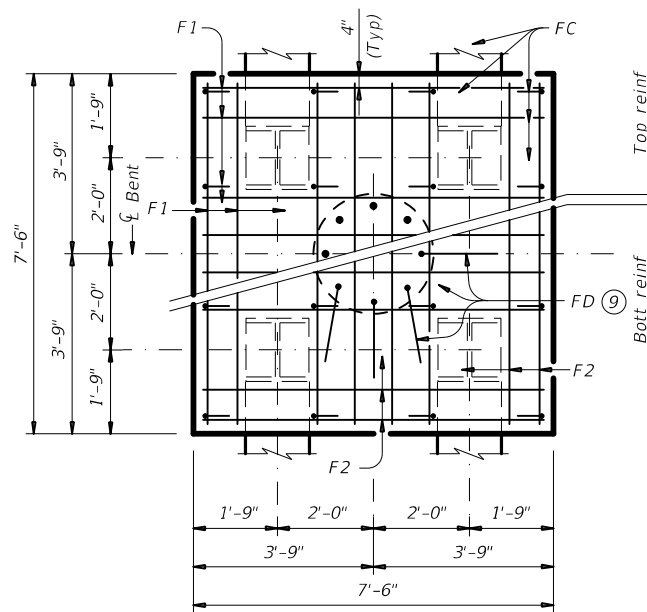
		Bridge Division Standard	
COMMON FOUNDATION DETAILS			
FD			
FILE: MS-FD-20.dgn	DN: TxDOT	CK: TxDOT	DW: TxDOT
©TxDOT April 2019	CON: 0923	SECT: 10	JOB: 021
REVISIONS	DIST: BWO		COUNTY: LAMPASAS
01-20: Added #11 bars to the FD bars.	SHEET NO.		58

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.

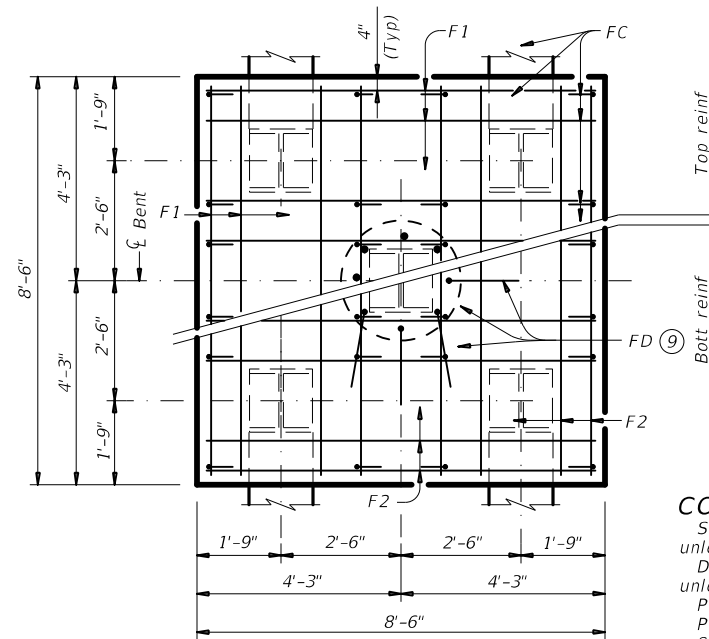
DATE: 7/19/2024 12:22:00 PM
 FILE: R:\1005000-1005999\1005472_03\04_DOCUMENTS\DESIGN\Plan_Set\7. Bridge Standards\I_GIRDER_STANDARDS\MS-FD-20.dgn



THREE PILE FOOTING^⑧
 For 36" Dia and smaller columns.

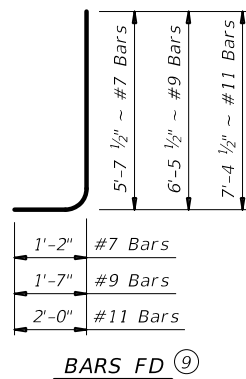
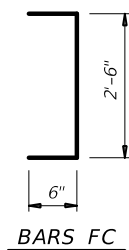


FOUR PILE FOOTING^⑧
 For 42" Dia and smaller columns.



FIVE PILE FOOTING^⑧
 For 42" Dia and smaller columns.

At Contractor's option, concrete may be placed to here



- ③ Min lap with column reinforcing:
 #7 Bars = 2'-11"
 #9 Bars = 3'-9"
 #11 Bars = 4'-8"
- ⑥ 1'-0" Min, unless shown otherwise on plans.
- ⑦ Or as shown on plans.
- ⑧ See Bridge Layout for type, size and length of piling.
- ⑨ Number and size of FD bars must match column reinforcing. Tie FD bars to the top of the bottom reinforcing mat.
- ⑩ Adjust FD quantity, size and weight as needed to match column reinforcing.

TABLE OF FOOTING QUANTITIES FOR 30" COLUMNS

ONE 3 PILE FOOTING					
Bar	No.	Size	Length	Weight	
F1	11	#4	3'- 2"	23	
F2	6	#4	8'- 2"	33	
F3	6	#4	6'- 11"	28	
F4	8	#9	3'- 2"	86	
F5	4	#9	6'- 11"	94	
F6	4	#9	8'- 2"	111	
FC	12	#4	3'- 6"	28	
FD ^⑩	8	#9	8'- 1"	220	
Reinforcing Steel				Lb	623
Class "C" Concrete				CY	4.8
ONE 4 PILE FOOTING					
Bar	No.	Size	Length	Weight	
F1	20	#4	7'- 2"	96	
F2	16	#8	7'- 2"	306	
FC	16	#4	3'- 6"	37	
FD ^⑩	8	#9	8'- 1"	220	
Reinforcing Steel				Lb	659
Class "C" Concrete				CY	6.3
ONE 5 PILE FOOTING					
Bar	No.	Size	Length	Weight	
F1	20	#4	8'- 2"	109	
F2	16	#9	8'- 2"	444	
FC	24	#4	3'- 6"	56	
FD ^⑩	8	#9	8'- 1"	220	
Reinforcing Steel				Lb	829
Class "C" Concrete				CY	8.0

CONSTRUCTION NOTES:

See Bridge Layout for foundation type required. Use these foundation details unless shown otherwise.
 Drive piling under abutment wingwalls to a minimum resistance of 10 Tons/Pile unless shown otherwise.
 Provide Class C Concrete ($f'_c = 3,600$ psi), unless shown otherwise.
 Provide Grade 60 reinforcing steel.
 Galvanize reinforcing if shown elsewhere in the plans.
 Provide bar laps for drilled shaft reinforcing, where required, as follows:
 Uncoated or galvanized (#6) ~ 2'-6"
 Uncoated or galvanized (#7) ~ 2'-11"
 Uncoated or galvanized (#9) ~ 3'-9"

GENERAL NOTES:

Designed according to AASHTO LRFD Bridge Design Specifications.

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

DESIGNER NOTES:

Do not use the drilled shaft details shown on this standard for retaining wall, noise wall, barrier, or sign foundations without structural evaluation.
 Do not use the footings shown on this standard in direct contact with salt water or exposed to salt water spray.
 Maximum allowable pile loads for the footings shown are:
 72 Tons/Pile with 24" Dia Columns
 80 Tons/Pile with 30" Dia Columns
 100 Tons/Pile with 36" Dia Columns
 120 Tons/Pile with 42" Dia Columns

SHEET 2 OF 2



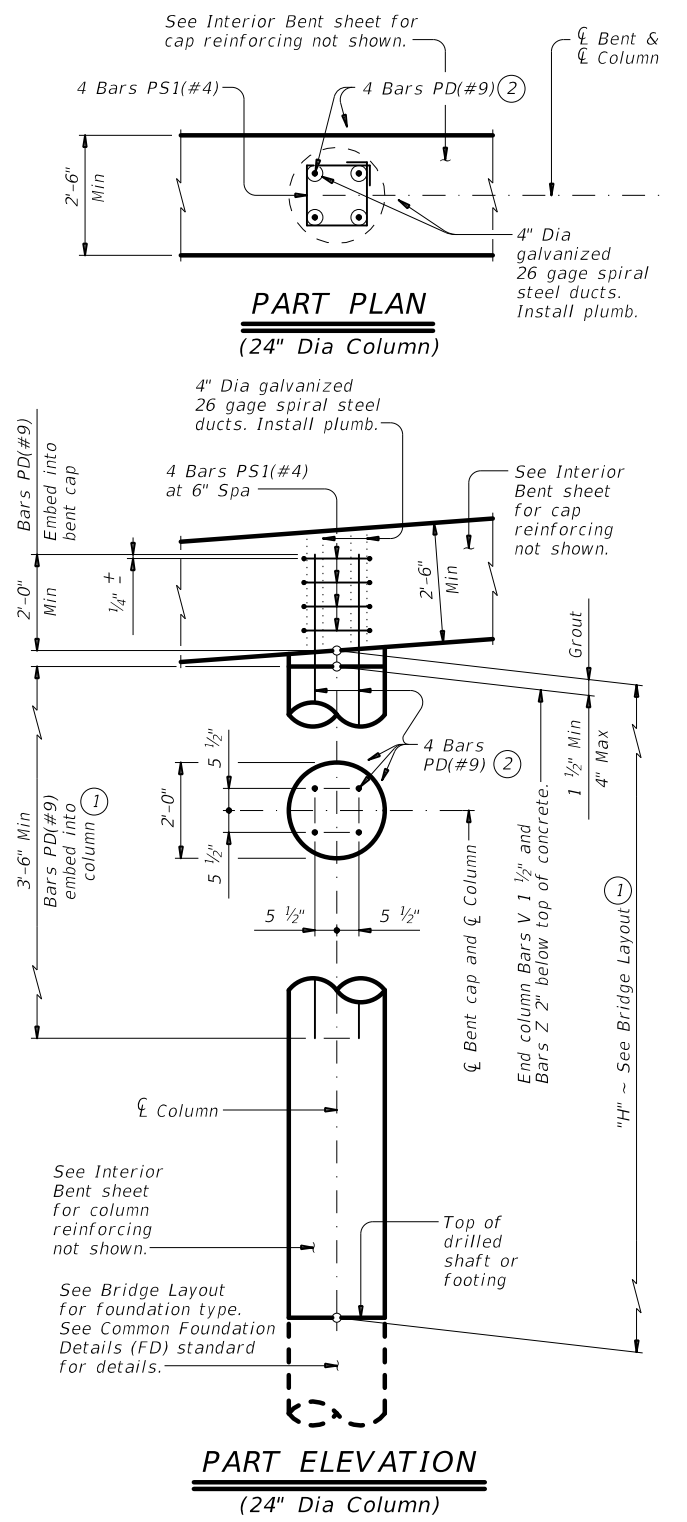
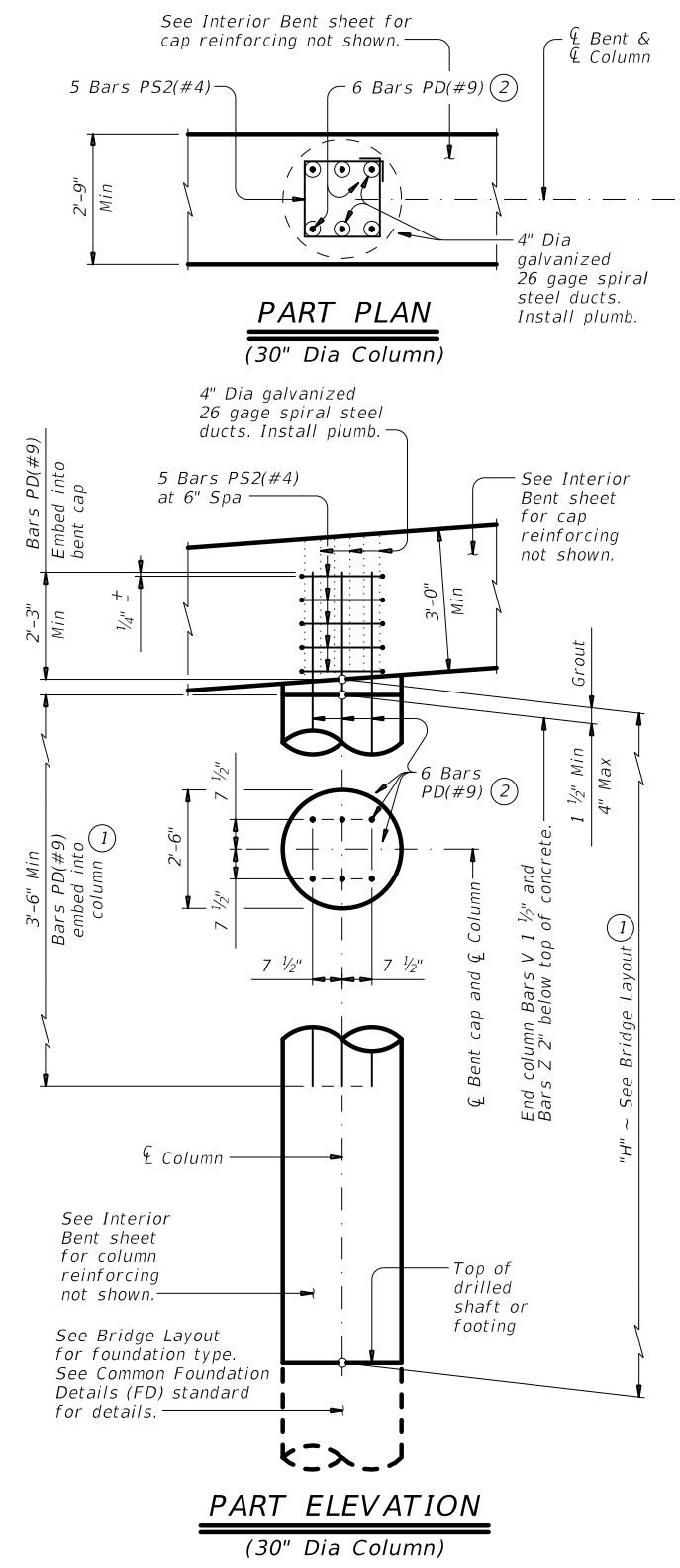
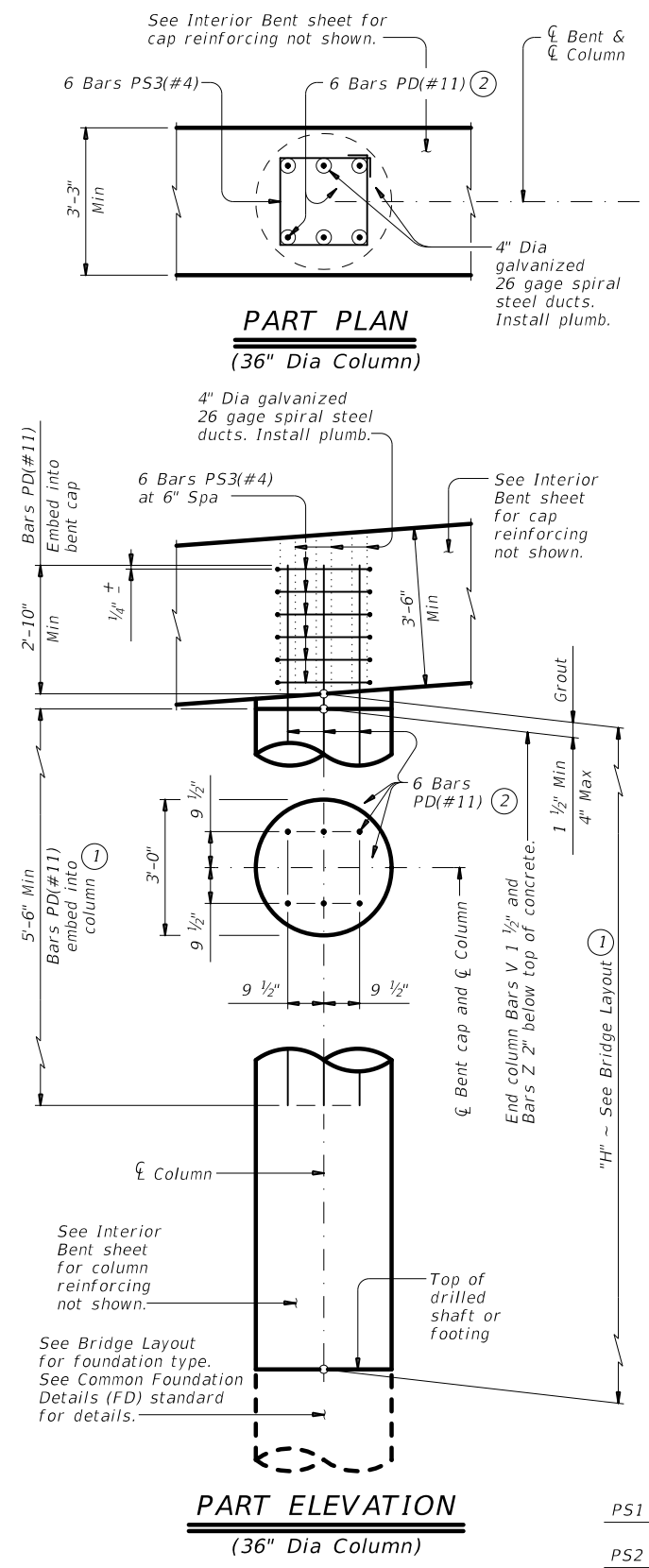
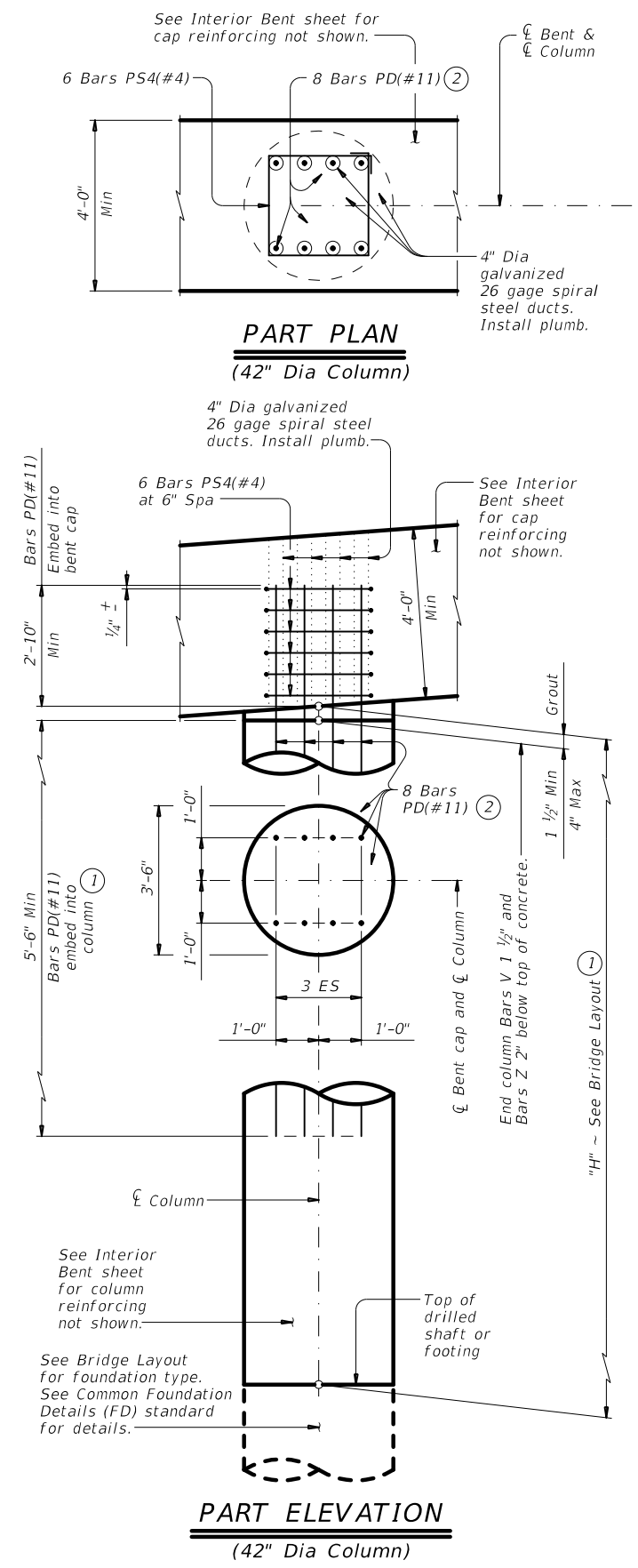
COMMON FOUNDATION DETAILS

FD

FILE: MS-FD-20.dgn	DN: TxDOT	CK: TxDOT	DW: TxDOT	CK: TxDOT
©TxDOT April 2019	CONT	SECT	JOB	HIGHWAY
REVISIONS	0923	10	021	3RD ST
01-20: Added #11 bars to the FD bars.	DIST	COUNTY	SHEET NO.	
	BWD	LAMPASAS	59	

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: 7/19/2024 12:22:00 PM
 FILE: R:\1005000-1005999\1005472_03\04_DOCUMENTS\DESIGN\Plan_Set\1. Bridge Standards\1_GIRDER_STANDARDS\MS-PBC-RC-21_01.dgn



BARS PS (#4)

PS1	1'-4 1/4"
PS2	1'-8 1/4"
PS3	2'-0 1/4"
PS4	2'-5 1/4"

PS1	1'-4 1/4"
PS2	1'-8 1/4"
PS3	2'-0 1/4"
PS4	2'-5 1/4"

- ① Bars PD may need to be embedded in footing or drilled shaft for short columns.
- ② Location tolerance of dowels in columns/drilled shafts is 1/4" from plan location, transversely and longitudinally.

HL93 LOADING SHEET 1 OF 2

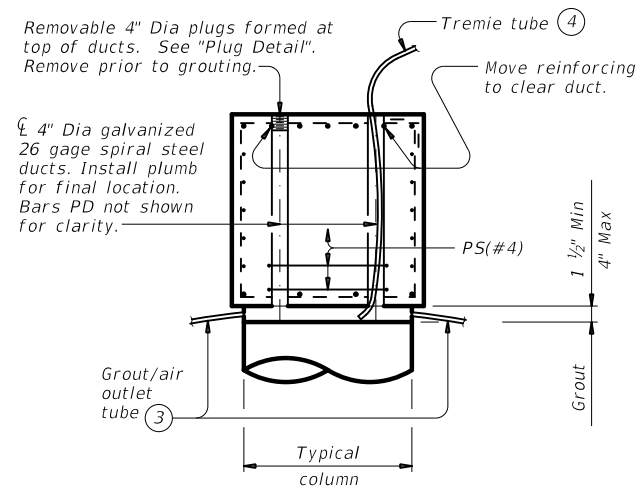
Texas Department of Transportation Bridge Division Standard

PRECAST CONCRETE BENT CAP OPTION FOR ROUND COLUMNS

PBC-RC

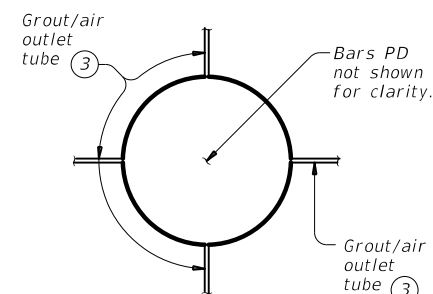
FILE:	DN: TxDOT	CK: JMH	DW: JTR	CK: TxDOT
©TxDOT	April 2019	CONT	SECT	HIGHWAY
REVISIONS	0923	10	021	3RD ST
12-21: General Notes	DIST	COUNTY	SHEET NO.	
	BWD	LAMPASAS	60	

7/19/2024 12:22:01 PM
 DATE: 7/19/2024 12:22:01 PM
 FILE: R:\1005000-1005999\1005472_03\04_DOCUMENTS\DESIGN\Plan_Series_V1_BridgeStandards_V1_GIRDER_STANDARDS\MS-PBC-RC-21_02.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.

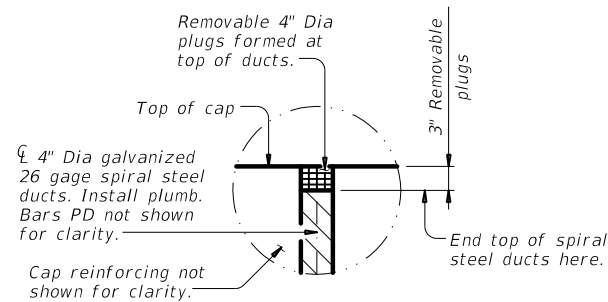


TYPICAL SECTION THRU CAP

(Showing example of ducts and cap reinforcing.)



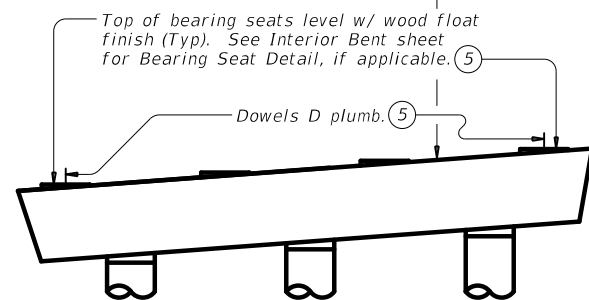
SECTION A-A



PLUG DETAIL

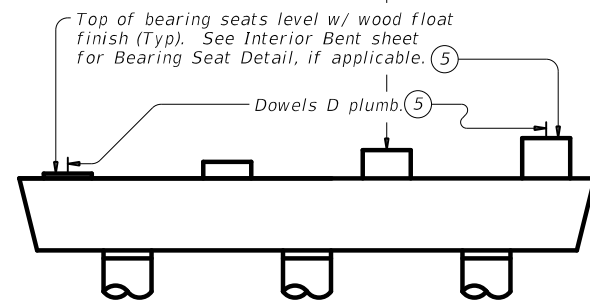
(Plug is used to keep concrete out of ducts during concrete placement. Remove prior to grouting)

Slope top of cap between bearing seats in accordance with Item 420.4.9 "Treatment and Finishing of Horizontal Surfaces", unless directed otherwise by the Engineer.



CAP SET AT SLOPE

Reinforce bearing seats over 3" tall and slope top of cap between bearing seats in accordance with Item 420.4.9 "Treatment and Finishing of Horizontal Surfaces", unless directed otherwise by the Engineer.



CAP SET LEVEL

EXAMPLES OF PRECAST BENTS WITH DOWELS D

- (3) Provide at least 4 grout/air outlet tubes equally spaced around the perimeter of the column. Install at bottom of cap to avoid air entrapment. Seal off tubes sequentially when a steady flow of grout without air occurs. Secondary tubes to help drain water, located at top of column, may also be installed.
- (4) Continuous gravity-flow grouting through a tremie tube is recommended. With this method, lower a flexible tremie tube through one of the vertical ducts to the bottom of the bedding layer and fill the connection from the bottom upward with a continuous flow of grout. This method requires a sufficient amount of grout to be mixed prior to grouting and that the funnel connected to the tremie tube have adequate volume capacity (4 quarts Min is recommended). A valve may be used to stop the flow during grouting to allow refilling the funnel or to tamp the grout. The tube should remain within the grout and gradually withdrawn as the level of the grout rises in the ducts. It is critical to ensure a continuous flow of grout to avoid air entrapment. Alternative methods, including pressure grouting with low pressure pumps, may be used provided they are proved effective in providing void-free connections during the mock-up phase.
- (5) Unless otherwise shown.

CONSTRUCTION NOTES:

Cap Fabrication:

Construct and cure cap in accordance with Item 420, "Concrete Substructures". If fabricated at an offsite location, construct and cure cap in accordance with Item 424, "Precast Concrete Structural Members (Fabrication)". Secure ducts to prevent their movement during concrete placement. Location tolerance of ducts is 1/4" from plan location, transversely and longitudinally. Seal ducts to prevent intrusion of concrete.

Bearing seats may be precast with the cap. Bearing seats over 3" in height must be reinforced as per Item 420.4.9. Do not locate lift points at bearing seats if bearing seats are precast.

Cap concrete must achieve a compressive strength of 2,500 psi prior to lifting. Limit flexural stress in cap to 250 psi during handling and storage. Store and handle caps in accordance with Item 424, "Precast Concrete Structural Members (Fabrication)". Do not stack caps. Caps that become cracked or otherwise damaged may be rejected.

Cap-to-Column Connection:

Make a trial batch of grout using the same material, equipment and personnel to be used for actual grouting operations and grout a mock-up of the connection at least one week before grouting and in the presence of the Engineer. This mock-up test must demonstrate the reliability of the Contractor's grouting procedures to provide a connection free of voids. Field test the trial batch grout to the same level required for the actual grouting.

Caps may be placed on columns/drilled shafts after column/drilled shaft concrete has achieved a flexural stress of 355 psi (or 2,500 psi compressive strength). Use plastic shims or friction collars to support the cap at the proper elevation prior to grouting. Total area of plastic shims used on top of each column may not exceed 6 percent of the column area. Column/drilled shaft curing may be interrupted a maximum of 2 hours for placement of plastic shims or friction collars and cap placement.

Surfaces in contact with grout must be clean and in a saturated, surface-dry condition, immediately prior to grouting. Provide water tight forms. Fill the forms with water and drain just prior to grouting. Ponding or free-standing water is not permitted. Use compressed air to blow out excess water.

Mix grout in accordance with the manufacturer's directions. Evidence of frothing, foaming, or segregation is cause for rejection. Transport grout from mixer to final location by wheel barrow, bucket or pumping.

Perform sampling and testing of grout by trained personnel at the Contractor's expense and while witnessed by the Engineer. Grouted connections must be free of voids.

Trowel finish top surface of cap anchorage ducts flush with top of cap. Wet mat cure these locations for at least 48 hours. Recess lifting loops 1-inch minimum using exothermic cutting rods. Do not overheat or damage the surrounding concrete. Abrade the concrete surfaces of excavation and end of the lifting loop to remove all slag with a needle gun, steel brush, or other suitable means. Coat the inside of the recessed area, including the lifting loops, with 10 mils (minimum) of neat, Type VIII epoxy and patch the recess with epoxy mortar.

Friction collars may be removed, if used, and beams placed on the cap after the grout obtains a compressive strength of 2,500 psi. Subsequent loading can occur when the grout reaches its final required 28 day compressive strength.

MATERIAL NOTES:

Provide a pre-qualified grout from TxDOT's Material Producer List "Cementitious Grouts and Mortars for Miscellaneous Applications", conforming to DMS-4675.

Provide semi-rigid spirally crimped, corrugated duct of galvanized, cold rolled steel conforming to ASTM A653. Corrugations must have a minimum amplitude of 0.094".

Grout tubes and forms must be approved prior to grouting.

Provide Grade 60 reinforcing steel. Epoxy coat or galvanize all reinforcement if column reinforcement is epoxy coated or galvanized.

GENERAL NOTES:

Designed in accordance with AASHTO LRFD Bridge Design Specifications.

The Contractor has the option to provide precast bent caps in accordance with the details shown. No additional payment will be made if the Contractor uses precast caps.

Submit shop drawings of precast caps for approval prior to construction. Indicate lifting attachments and locations on the shop drawings.

Precast Concrete Bent Cap Option shown on this standard may require modification for select structure types. See appropriate details elsewhere in plans for these modifications.

See Interior Bent sheet for details and notes not shown.

Reinforcing bar dimensions shown are out-to-out of bar.



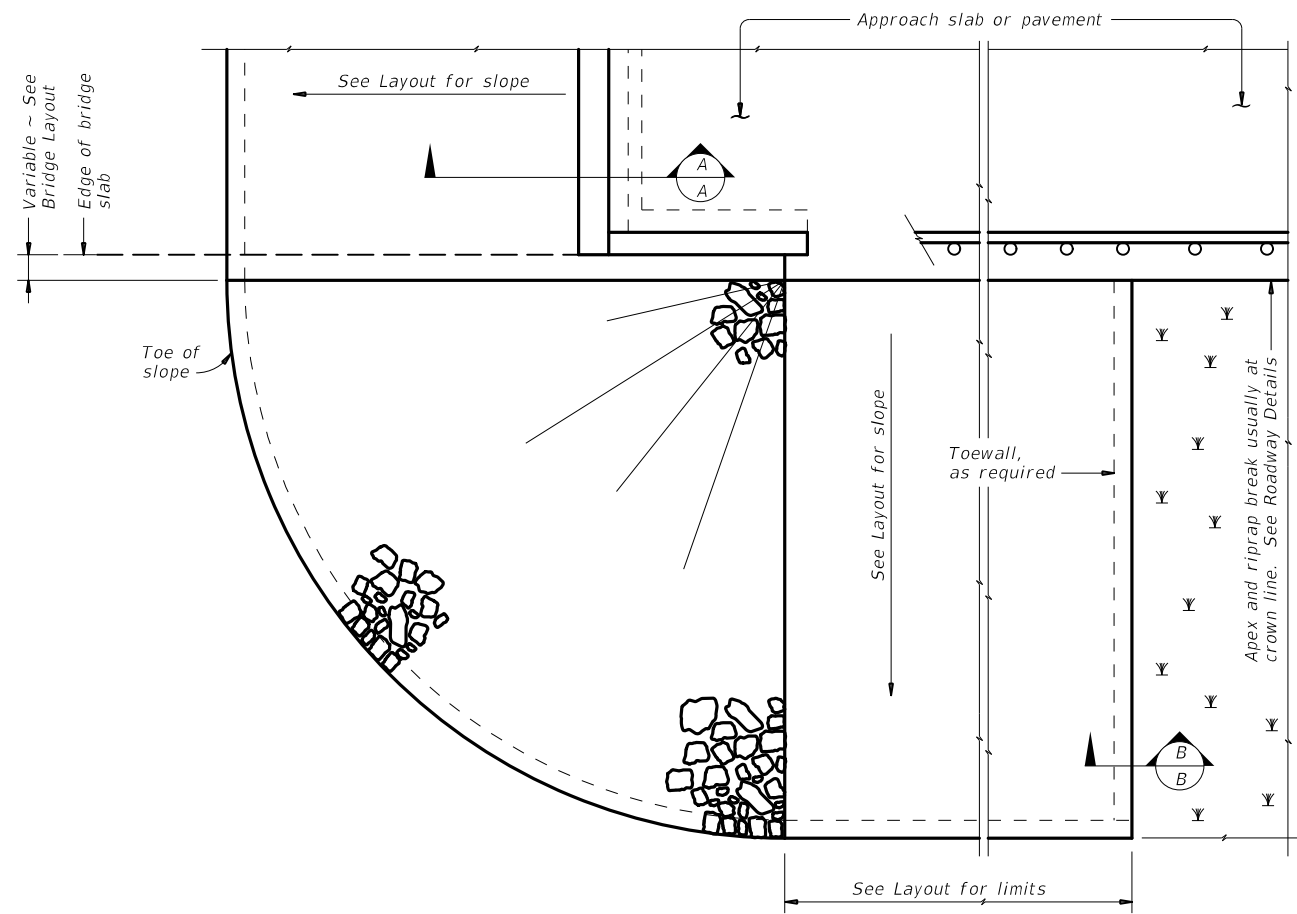
PRECAST CONCRETE BENT CAP OPTION FOR ROUND COLUMNS

PBC-RC

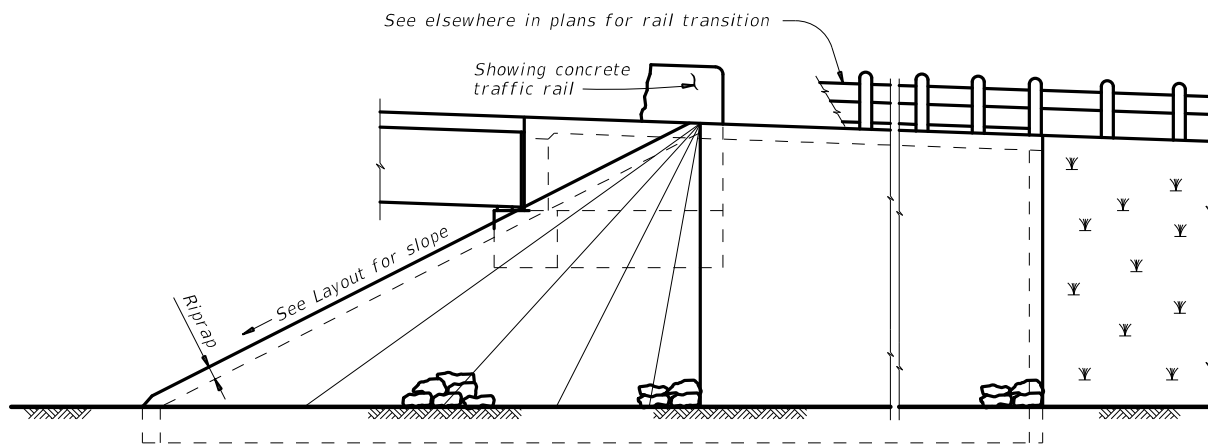
FILE:	DN: TxDOT	CK: JMH	DW: JTR	CK: TxDOT
©TxDOT	April 2019	CONT	SECT	JOB
REVISIONS	0923	10	021	3RD ST
12-21: General Notes	DIST	COUNTY	SHEET NO.	
	BWD	LAMPASAS	61	

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.

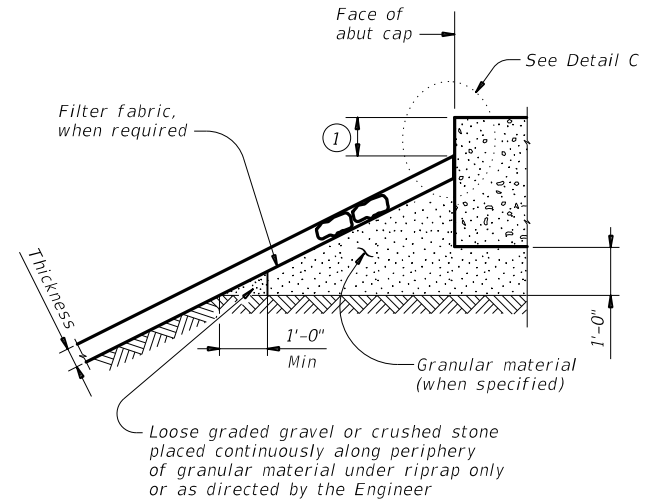
DATE: 7/19/2024 12:22:02 PM
 FILE: R:\1005000-1005999\1005472_03\04_DOCUMENTS\DESIGN\Plan_Set\7. Bridge Standards\SLAB_BEAM_STANDARDS\MS-SRR-19.dgn



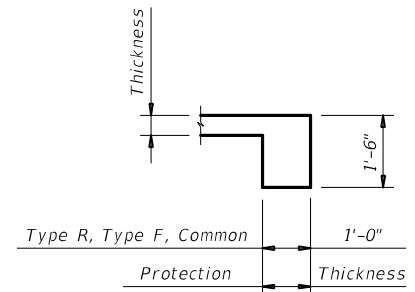
PLAN



ELEVATION

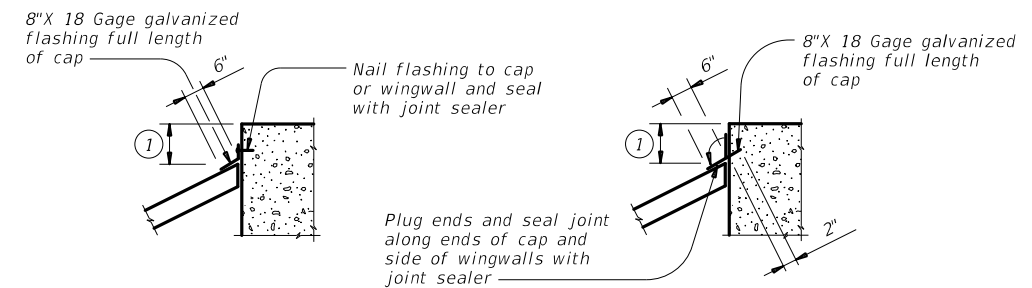


SECTION A-A AT CAP



SECTION B-B

Provide toewall when shoulder drain is located adjacent to limits of stone riprap. Omit toewall when thickness of protection riprap is greater than 18".



CAP OPTION A

CAP OPTION B

DETAIL C

① Top of cap to top of riprap dimension varies as directed by the Engineer. Provide 9" Min for beam/slab type bridges and 1'-6" for slab span, box beam, or slab beam bridges.

GENERAL NOTES:

Refer to Item 432, "Riprap" for stone size and gradation, and construction details. See Layout for limits and thickness of riprap specified.
 See elsewhere in plans for locations and details of shoulder drains.

SHEET 1 OF 2

		Bridge Division Standard	
<h2>STONE RIPRAP</h2>			
<h3>SRR</h3>			
FILE: MS-SRR-19.dgn	DN: AES	CK: JGD	DW: BWH
©TxDOT April 2019	CONT SECT	JOB	HIGHWAY
REVISIONS	0923 10	021	3RD ST
DIST	COUNTY	SHEET NO.	
BWD	LAMPASAS	62	

7/19/2024 12:22:02 PM
 DATE: 7/19/2024 12:22:02 PM
 FILE: R:\1005000-1005999\1005472.03\04_DOCUMENTS\DESIGN\Plan_Sett\7_Bridge_Standards\SLAB_BEAM_STANDARDS_MS-SRR-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.

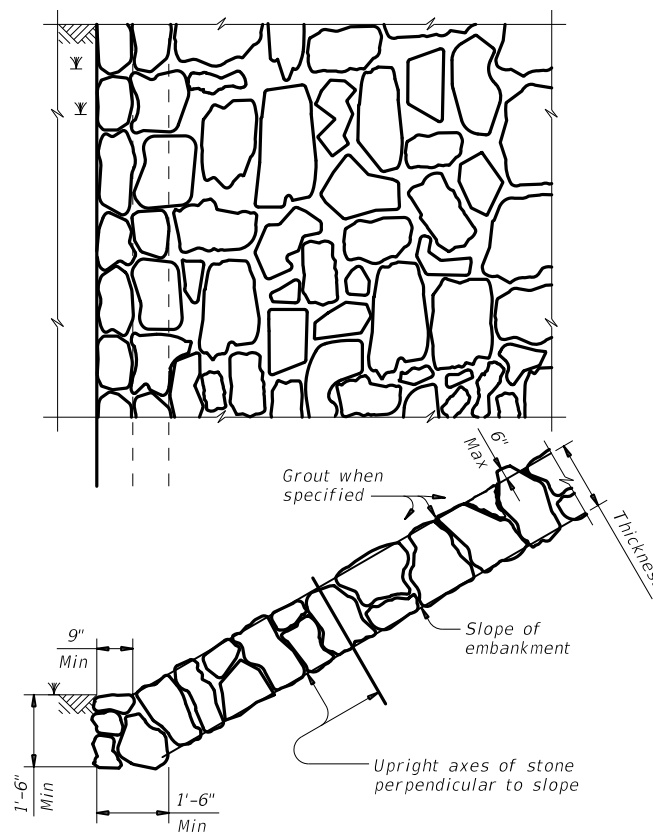


FIGURE 1 ~ TYPE R STONE RIPRAP
dry or grouted

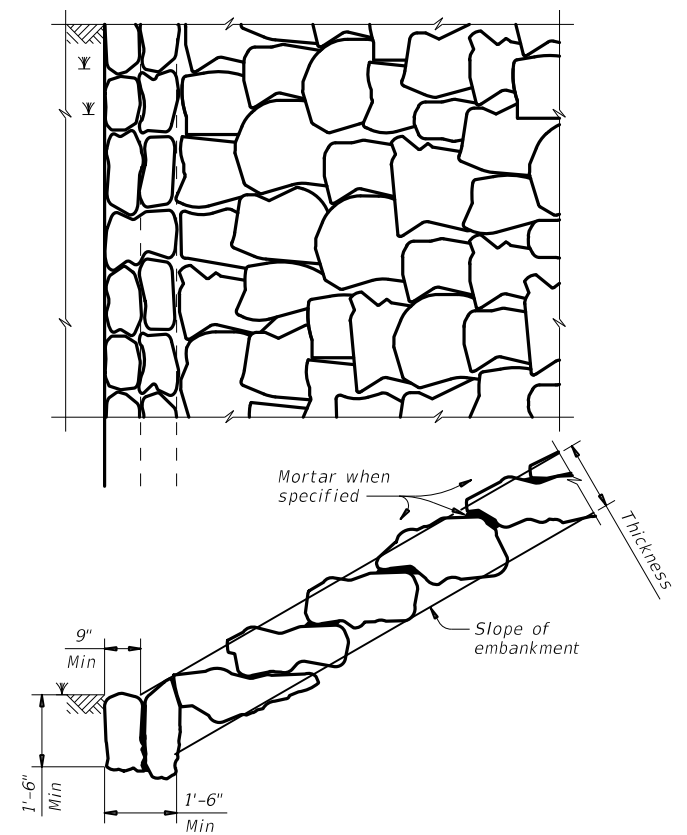


FIGURE 2 ~ TYPE F STONE RIPRAP
dry or mortared

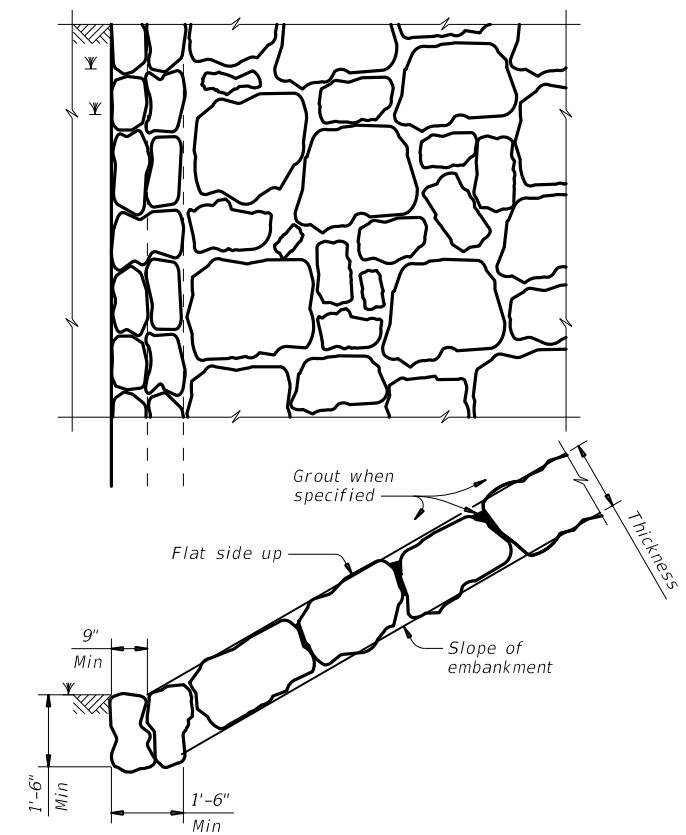


FIGURE 3 ~ TYPE F STONE RIPRAP
grouted

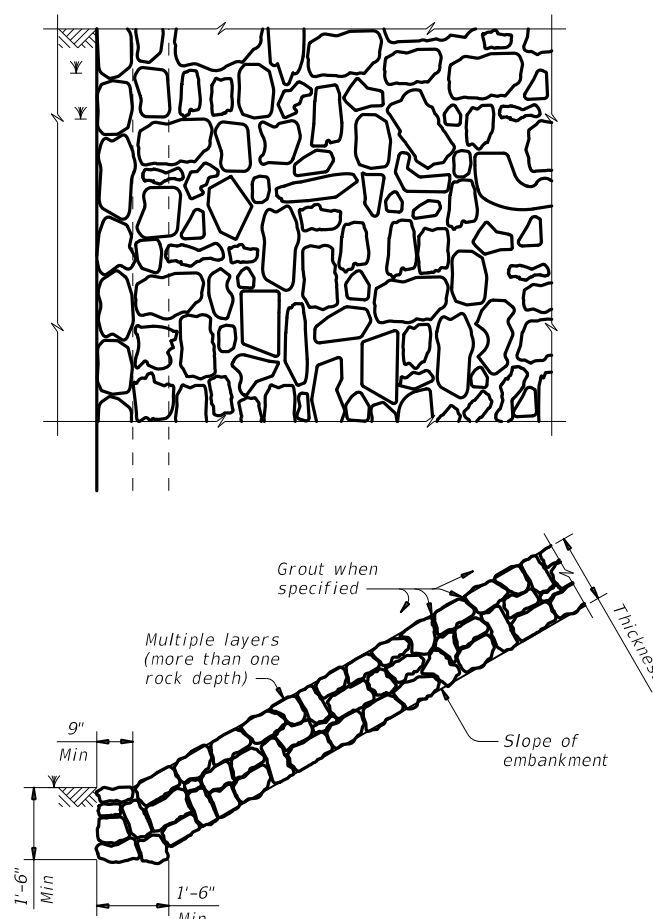


FIGURE 4 ~ COMMON STONE RIPRAP
dry or grouted

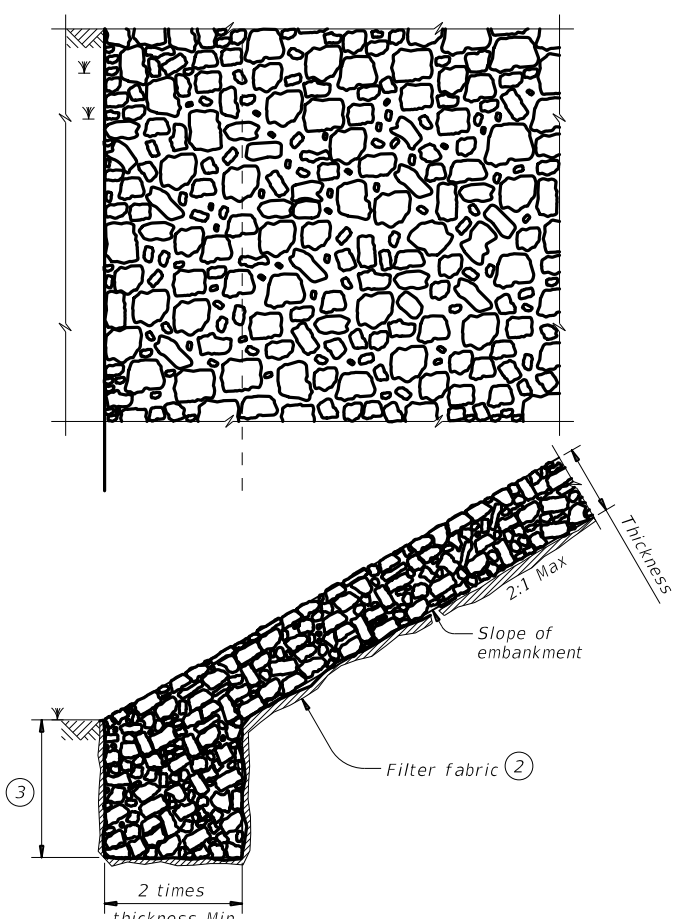
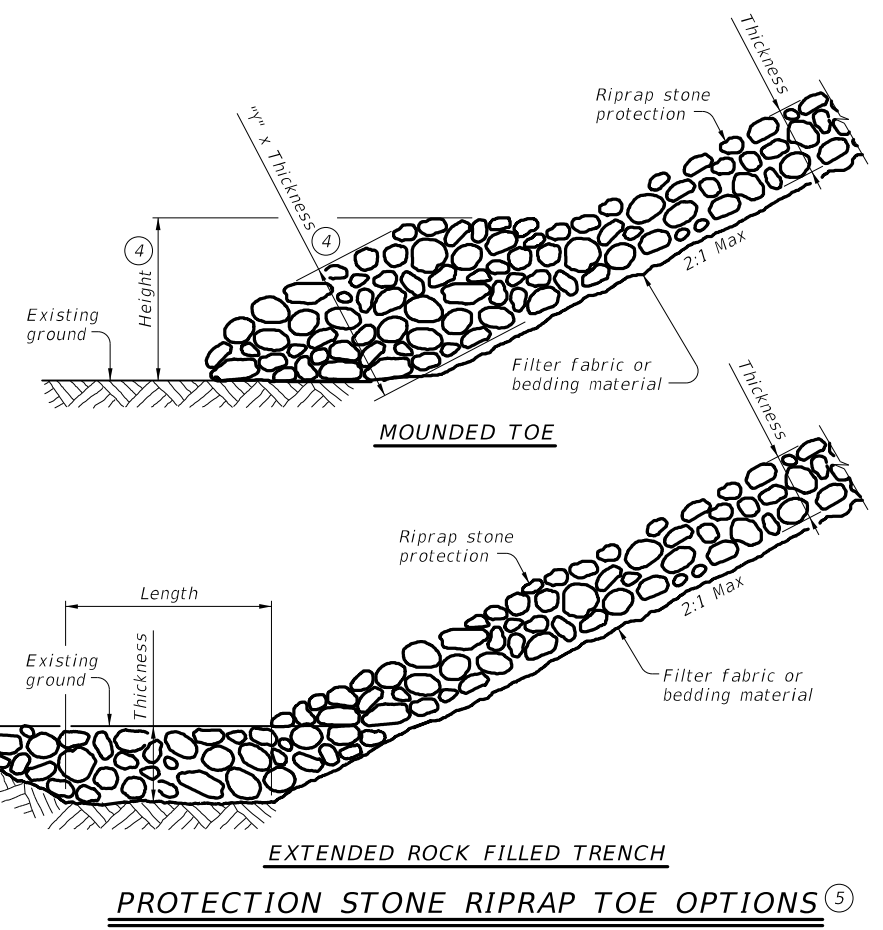


FIGURE 5 ~ PROTECTION STONE RIPRAP

- ② Provide bedding material instead of filter fabric if shown elsewhere in plans. See Layout for thickness of bedding material.
- ③ Minimum toe depth is the larger of the maximum scour depth or 2 times the riprap thickness.
- ④ "y" and Height need to be defined. See layout or detail sheet for values if this option is used.
- ⑤ List Stone Protection as size (XX inch) and thickness (YY inch) on the layout.
Example: Riprap (Stone Protection) XX inch, Thickness = YY inch.



PROTECTION STONE RIPRAP TOE OPTIONS

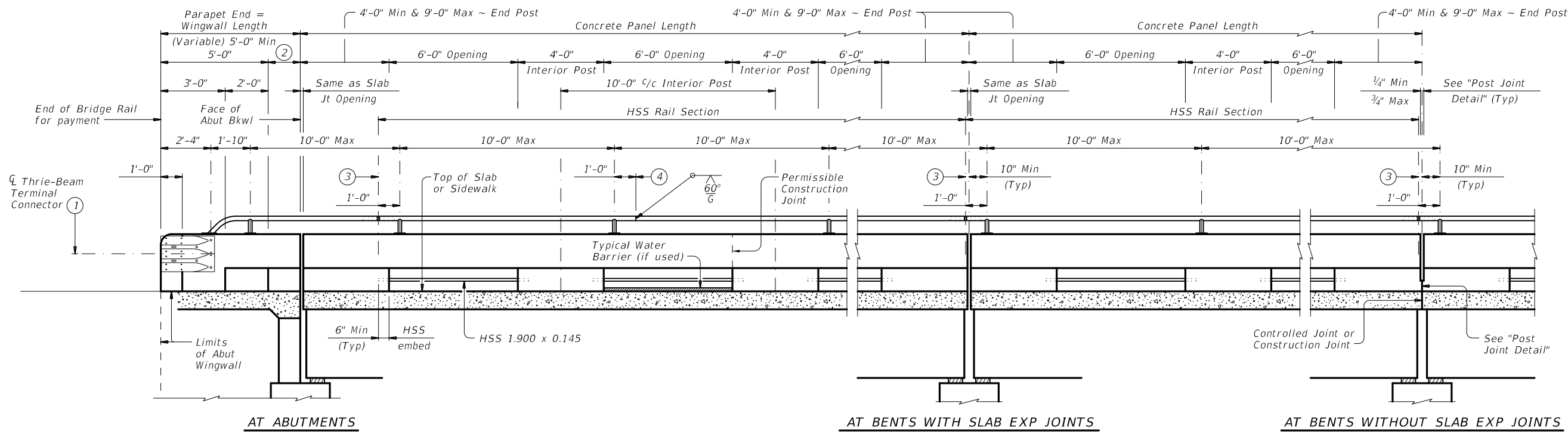
SHEET 2 OF 2

		Bridge Division Standard	
<h2>STONE RIPRAP</h2>			
<h3>SRR</h3>			
FILE: MS-SRR-19.dgn	DN: AES	CK: JGD	DW: BWH
©TxDOT April 2019	CONT SECT	JOB	HIGHWAY
REVISIONS	0923 10	021	3RD ST
	DIST	COUNTY	SHEET NO.
	BWD	LAMPASAS	63

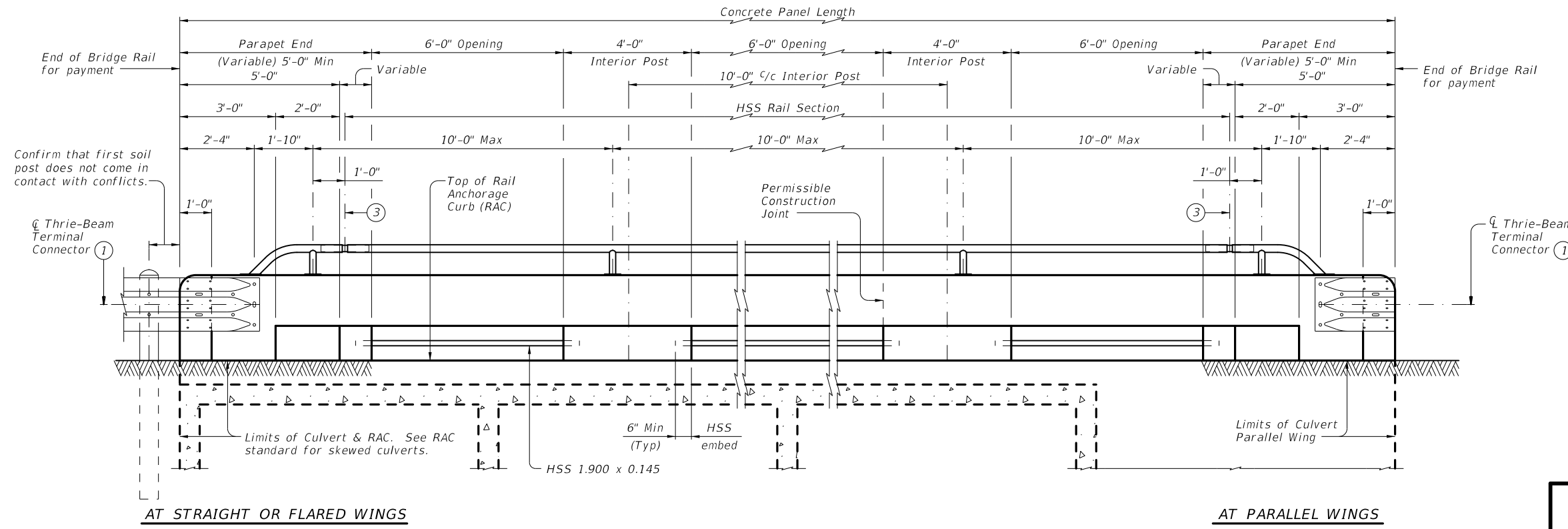
DISCLAIMER: This standard is governed by the "Texas Engineering Practice Act." No warranty of any kind is made by TxDOT for any purpose whatsoever. TxDOT assumes no responsibility for the conversion of this standard to other formats or for incorrect results or damages resulting from its use.

FILE: R:\1005000-1005999\1005472.03\04_DOCUMENTS\DESIGN\Plan_Set\T. Bridge Standards\SLAB_BEAM_STANDARDS_RL-C223-19.dgn

DATE: 7/19/2024 12:22:03 PM
 FILE: R:\1005000-1005999\1005472.03\04_DOCUMENTS\DESIGN\Plan_Set\T. Bridge Standards\SLAB_BEAM_STANDARDS_RL-C223-19.dgn



ROADWAY ELEVATION OF RAIL ON BRIDGE
 (Showing without raised sidewalk)



ROADWAY ELEVATION OF RAIL ON BOX CULVERTS

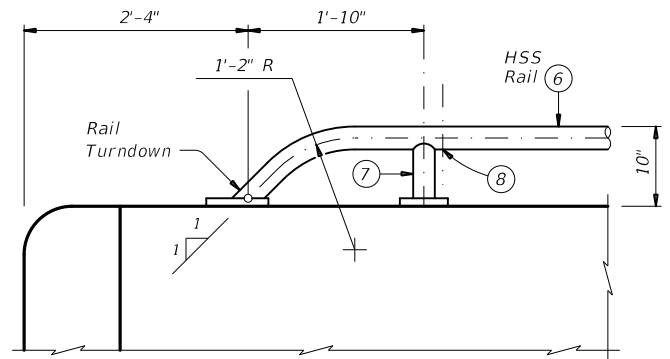
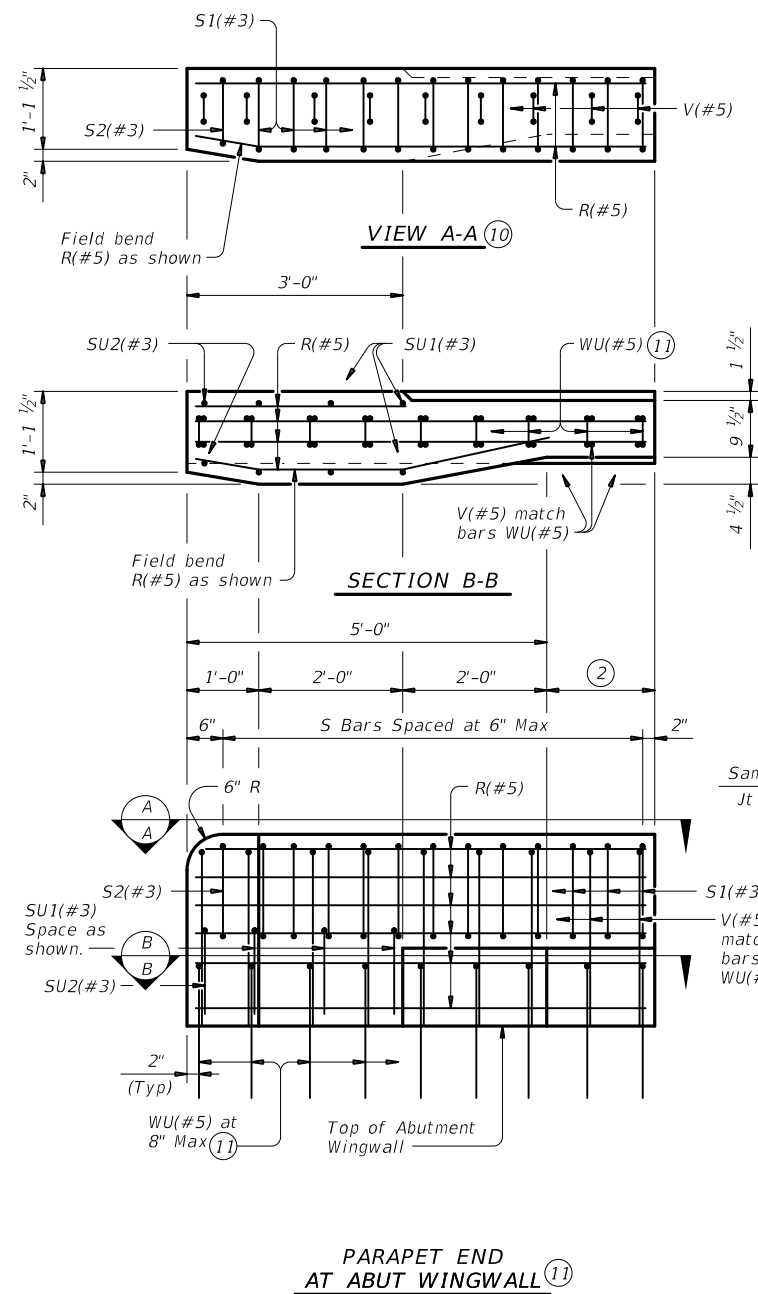
Showing 0° skew culvert. Skewed culverts similar. See RAC standard for details not shown. Vertical joints in concrete rail are not required, unless shown elsewhere.

- ① Terminal Connectors and associated hardware are to be paid for under the Item "Metal Beam Guard Fence." Attach Metal Beam Guard Fence Transitions to the bridge rail and extend along the embankment unless otherwise shown in the plans.
- ② Wingwall Length minus 5'-0" (Varies)
- ③ ζ Splice joint or expansion joint
- ④ One shop splice per HSS rail section is permitted with minimum 85 percent penetration. The weld may be square groove or single V groove. Grind smooth.

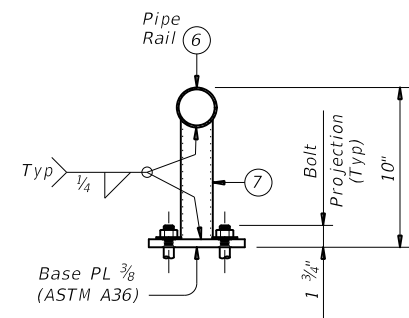
SHEET 1 OF 4

		Bridge Division Standard	
<h2>COMBINATION RAIL</h2>			
<h3>TYPE C223</h3>			
FILE: RL-C223-19.dgn	DN: TxDOT	CK: TxDOT	DW: JTR
©TxDOT September 2019	CONT: 0923	SECT: 10	JOB: 021
REVISIONS	DIST: BWD		COUNTY: LAMPASAS
	HIGHWAY: 3RD ST		SHEET NO.: 64

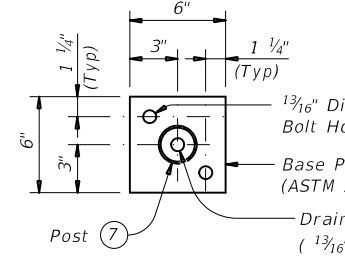
7/19/2024 12:22:03 PM
 DATE: 7/19/2024 12:22:03 PM
 FILE: R:\1005000-1005999\1005472_03\04_DOCUMENTS\DESIGN\Plan_Sets\T. Bridge Standards\SLAB_BEAM_STANDARDS_RL-C223-19.dgn
 DISCLAIMER: This standard is governed by the "Texas Engineering Practice Act." No warranty of any kind is made by TxDOT for any 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.



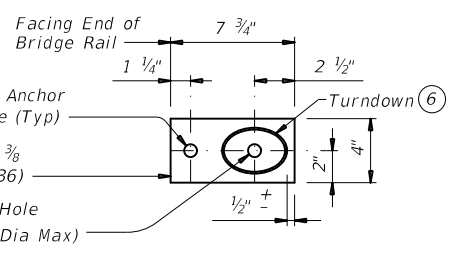
HSS RAIL TERMINAL DETAIL



TRANSVERSE SECTION

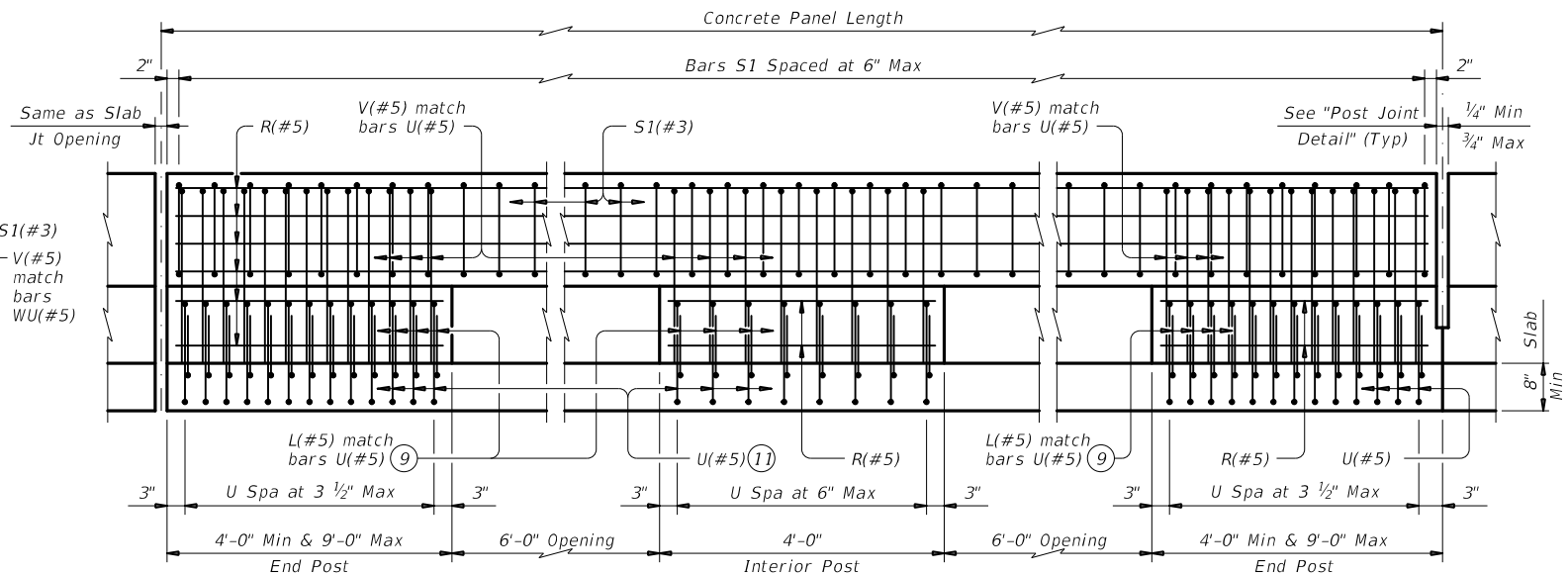


POST BASE PLATE PLAN



RAIL TURNDOWN BASE PLATE PLAN

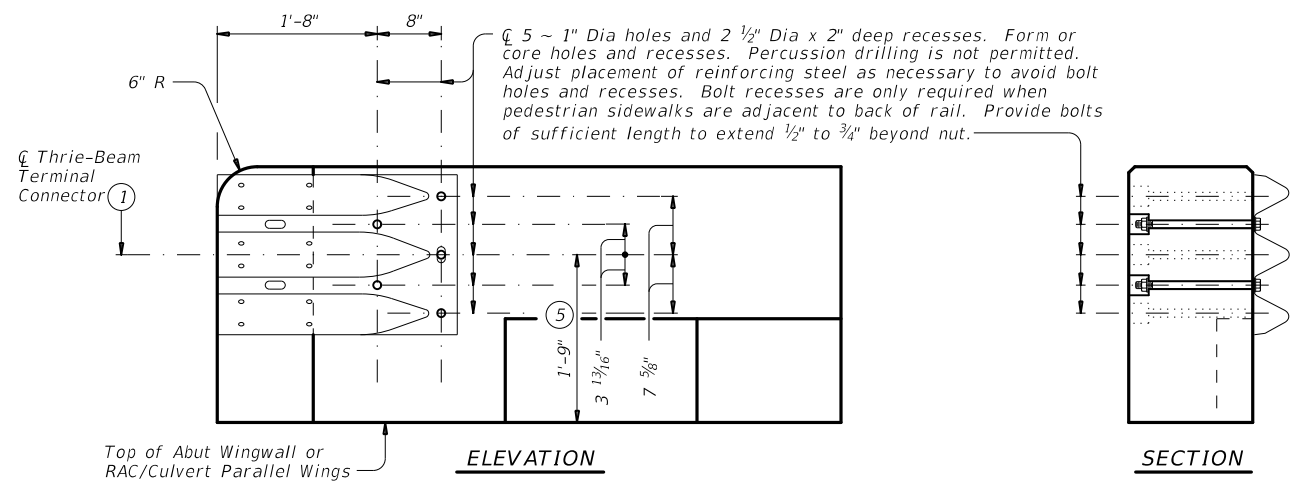
HSS RAIL DETAILS



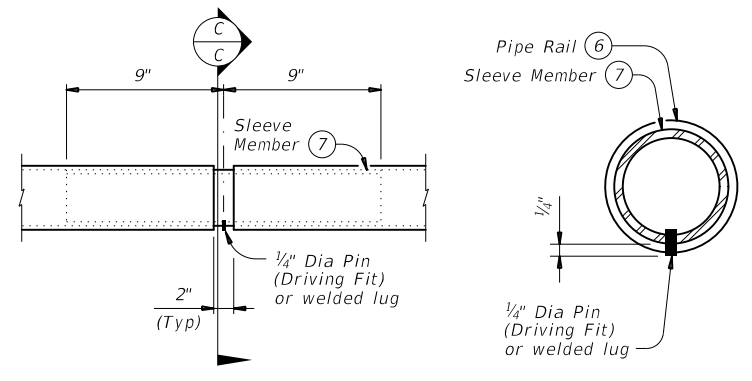
ELEVATION SHOWING TYPICAL REINFORCING PLACEMENT

Showing rail on slab and without raised sidewalk. Rail on box culvert similar. HSS not shown for clarity.

- ① Terminal Connectors and associated hardware are to be paid for under the Item "Metal Beam Guard Fence." Attach Metal Beam Guard Fence Transitions to the bridge rail and extend along the embankment unless otherwise shown in the plans.
- ② Wingwall Length minus 5'-0" (Varies)
- ③ Increase 2" for structures with overlay.
- ④ HSS 2.875 x 0.203
- ⑤ HSS 2.375 x 0.154
- ⑥ 3/8" Dia Hole in bottom of HSS rail (Minimum 1 hole between posts ~ Typ)
- ⑦ Bars L(#5) are part of rail reinforcing and are included in unit price bid for railing. Space with Bars U. Bars L match slab bar cover. Bars L may be bundled with top slab reinforcing if spacing is equivalent.
- ⑧ Bars SU1(#3), SU2(#3) and WU(#5) not shown for clarity.
- ⑨ Substitute Bars U(#5) for Bars WU(#5) when parapet end is located on anchorage curb over culvert top slab. Use Bars WU(#5) in culvert parallel wings.



TERMINAL CONNECTION DETAILS



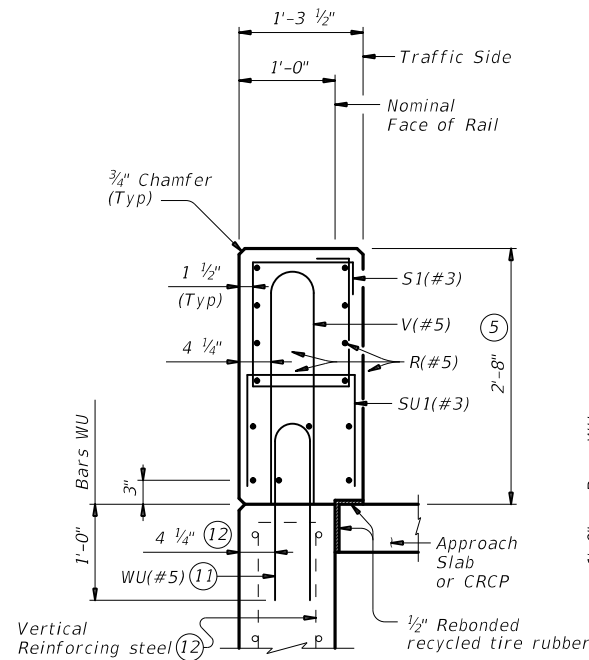
PIPE SPLICE DETAILS

SHEET 2 OF 4

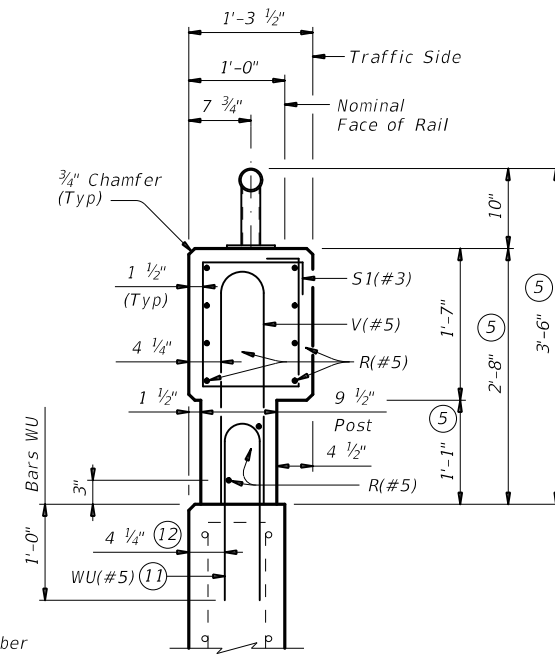
		Bridge Division Standard	
<h2>COMBINATION RAIL</h2>			
<h3>TYPE C223</h3>			
FILE: RL-C223-19.dgn	DN: TxDOT	CK: TxDOT	DW: JTR
©TxDOT September 2019	CONTRACT: 0923 10	SECTION: 021	HIGHWAY: 3RD ST
DIST: BWD	COUNTY: LAMPASAS	SHEET NO. 65	

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.

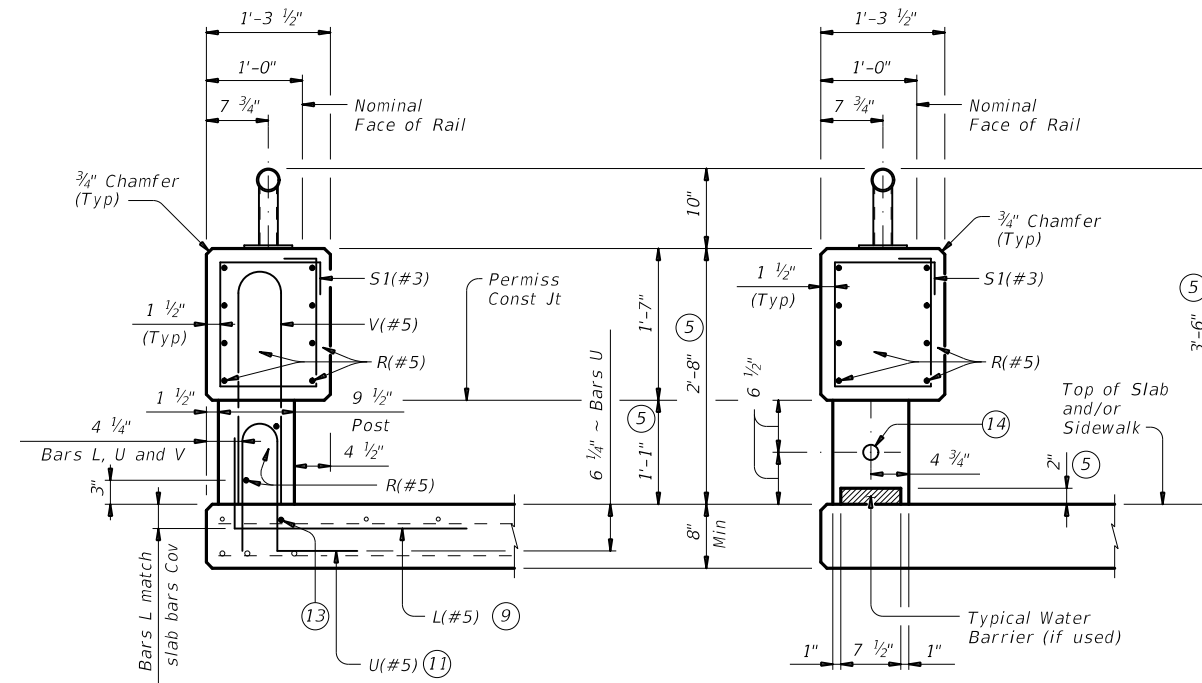
DATE: 7/19/2024 12:22:04 PM
 FILE: R:\1005000-1005999\1005472.03\04_DOCUMENTS\DESIGN\Plan_Sets\1. Bridge Standards\SLAB_BEAM_STANDARDS\RL-C223-19.dgn



**SECTION D-D
ON ABUTMENT WINGWALLS
OR CIP RETAINING WALLS**

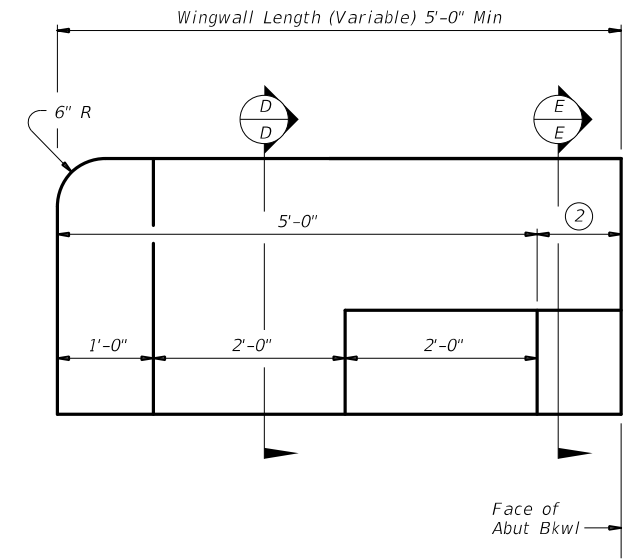


**SECTION E-E
ON ABUTMENT WINGWALLS
OR CIP RETAINING WALLS**



**AT POST
ON BRIDGE SLAB**

**AT OPENING
ON BRIDGE SLAB**

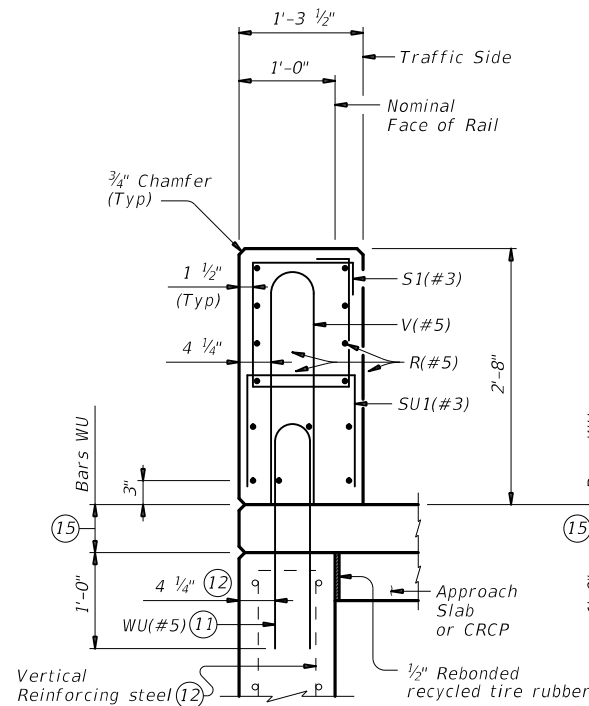


**ELEVATION AT
ABUTMENT WINGWALL**

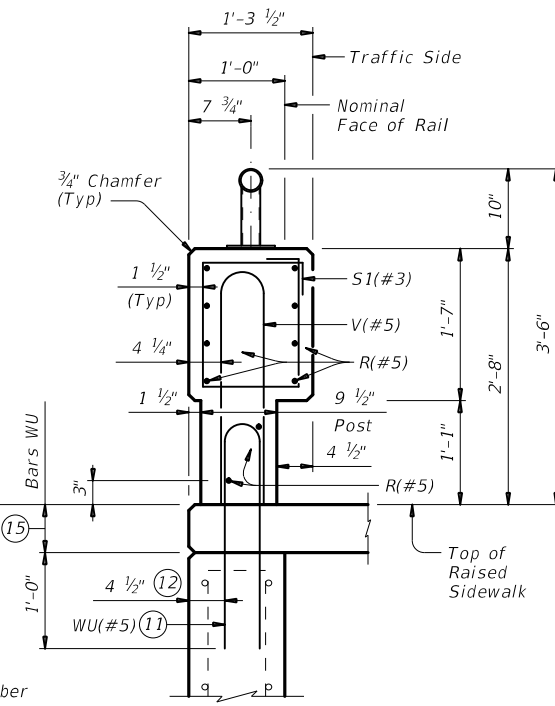
Box culvert parallel wings or rail anchorage curb similar. HSS rail not shown for clarity.

SECTIONS THRU RAIL WITHOUT RAISED SIDEWALK

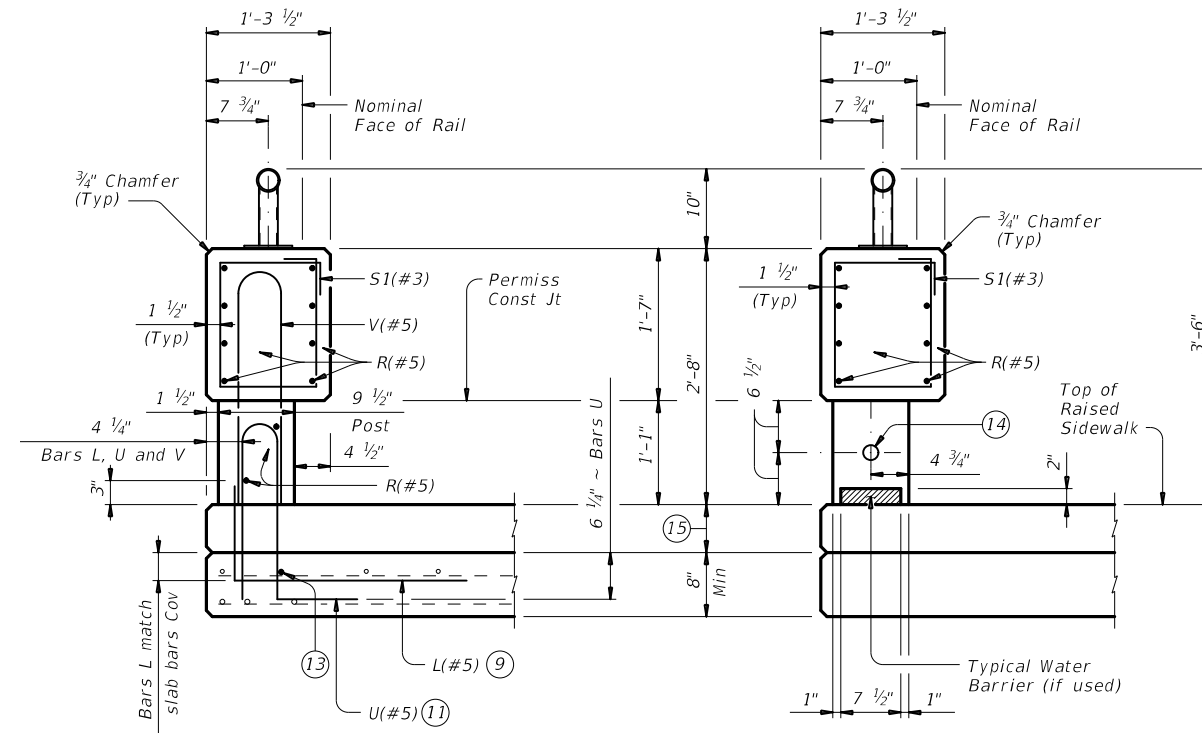
Sections on box culvert similar.



**SECTION D-D
ON ABUTMENT WINGWALLS
OR CIP RETAINING WALLS**



**SECTION E-E
ON ABUTMENT WINGWALLS
OR CIP RETAINING WALLS**

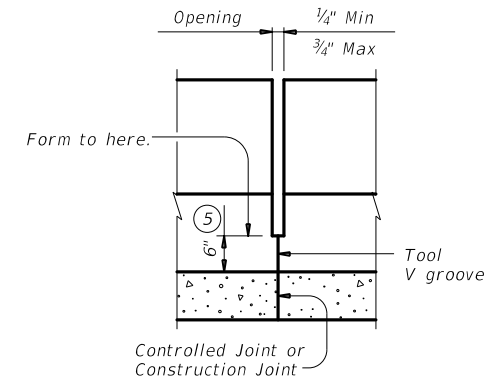


**AT POST
ON BRIDGE SLAB**

**AT OPENING
ON BRIDGE SLAB**

SECTIONS THRU RAIL WITH RAISED SIDEWALK

Sections on box culvert similar.



POST JOINT DETAIL

(Showing without raised sidewalk) Provide at all interior bents without slab expansion joints.

- ② Wingwall Length minus 5'-0" (Varies)
- ⑤ Increase 2" for structures with overlay.
- ⑨ Bars L(#5) are part of rail reinforcing and are included in unit price bid for railing. Space with Bars U. Bars L match slab bar cover. Bars L may be bundled with top slab reinforcing if spacing is equivalent.
- ⑪ Substitute Bars U(#5) for Bars WU(#5) when parapet end is located on anchorage curb over culvert top slab. Use Bars WU(#5) in culvert parallel wings.
- ⑫ When vertical reinforcing has closer clear cover over horizontal reinforcing in abutment wingwalls on traffic side of wall, move the horizontal wingwall/retaining wall reinforcing to the inside of Bars WU where bars conflict.
- ⑬ Top longitudinal slab bar may be adjusted laterally 3" plus or minus to tie reinforcing.
- ⑭ HSS 1.900 x 0.145
- ⑮ Raised Sidewalk.

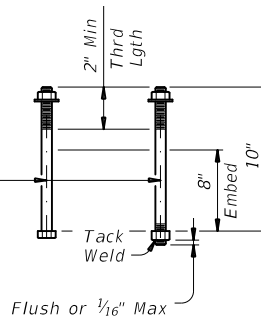
SHEET 3 OF 4

		Bridge Division Standard	
<h2>COMBINATION RAIL</h2>			
<h3>TYPE C223</h3>			
FILE: RL-C223-19.dgn	DN: TxDOT	CK: TxDOT	DW: JTR
©TxDOT September 2019	CONV: 0923	SECT: 10	JOB: 021
REVISIONS			HIGHWAY: 3RD ST
DIST: BWD	COUNTY: LAMPASAS	SHEET NO: 66	

RAIL DATA FOR HORIZONTAL CURVES

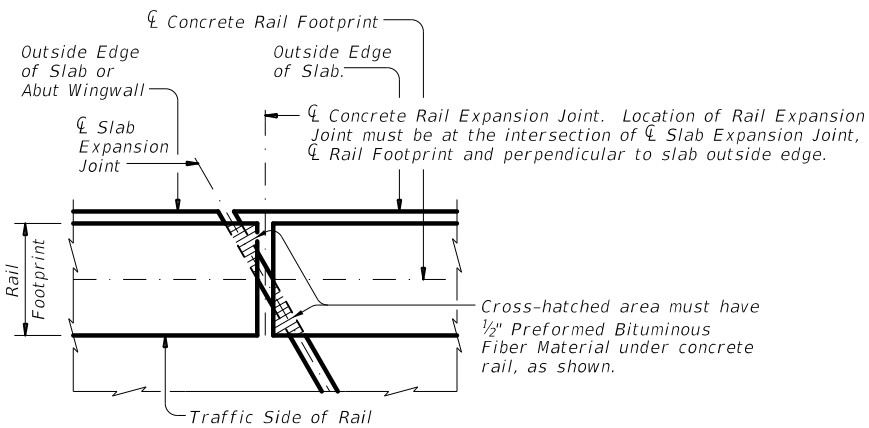
	RADIUS TO FACE OF RAIL	MAX CHORD LENGTH	CONSTRUCT OR FABRICATE
HSS Rail	Over 2800'	29'-0"	Straight rail sections
	Over 1400' thru 2800'	14'-6"	To required radius or to chords shown
	Over 700' thru 1400'	7'-3"	
	Thru 700'	Zero	To required radius

5/8" Dia hex head anchor bolt or threaded rod (ASTM A307 Gr A) with one hardened steel washer (ASTM F436) placed under each hex nut (ASTM A563). One additional hex nut must be furnished and tack welded for each threaded rod.



CAST-IN-PLACE ANCHOR BOLT OPTIONS 16

- 5 Increase 2" for structures with overlay.
- 16 See "Material Notes" for anchor bolt information.
- 17 For raised sidewalks, add sidewalk height to total bar height. Use sidewalk height at rail's location.
- 18 At the Contractor's option, Bars V may be replaced by extending Bars U to 2'-5 1/4" above the roadway/sidewalk surface without overlay.



PLAN OF RAIL AT EXPANSION JOINTS

Example showing Slab Expansion Joints without breakbacks.

CONSTRUCTION NOTES:

Face of rail, posts and parapet must be vertical transversely unless otherwise approved by the Engineer. HSS rail posts and opening end faces must be perpendicular to top of adjacent concrete parapet grade. Use epoxy mortar under HSS rail post base plates if gaps larger than 1/16" exist.

Provide water barriers at openings draining onto undercrossing roadways and sidewalks. They may be cast-in-place or precast in convenient lengths and bonded to the bridge deck with an approved epoxy cement.

HSS rail sections must not include less than two posts, and no more than four (except at Abutments).

Round or chamfer exposed edges of HSS rail and HSS rail posts to approximately 1/16" by grinding.

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

At the Contractor's option anchor bolts may be cast with the parapet. See "Material Notes." Chamfer all exposed corners.

MATERIAL NOTES:

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

Provide Grade 60 reinforcing steel.

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

Provide ASTM A1085, A500 Gr B or A53 Gr B for all HSS.

Galvanize all metal components of steel rail system. Apply additional coatings when shown elsewhere on the plans. When plans require paint over galvanizing, follow the requirements for painting galvanized steel in Item 445, "Galvanizing" and when field painting, Item 446, "Field Cleaning and Painting Steel." Sleeve members and anchor bolts must receive galvanization prior to installation and only field paint after installation unless directed otherwise by Engineer.

Deformed Welded Wire Reinforcing (WWR) (ASTM A1064) of equal size and spacing may be substituted for Bars U, V, and WU unless noted otherwise.

Anchor bolts must be 5/8" Dia ASTM A307 Gr A fully threaded rods with one hex nut and one hardened steel washer (ASTM F436) each. Nuts must conform to ASTM A563 requirements. Embed fully threaded rods into parapet wall with a Type III, Class C, D, E, or F anchor adhesive. Minimum adhesive anchor embedment depth is 3". Anchor adhesive chosen must be able to achieve a nominal bond strength in tension of a single anchor, Na, of 5 kips (edge distance must be accounted for). Submit signed and sealed calculations or the manufacturer's published literature showing the proposed anchor adhesive's ability to develop this load to the Engineer for approval prior to use. Anchor installation, including hole size, drilling, and clean out, must be in accordance with Item 450, "Railing".

Optional cast-in-place anchor bolts must be 5/8" Dia ASTM A307 Gr A bolts (or threaded rods with one tack welded hex nut each) with one hex nut and one hardened steel washer (ASTM F436) at each bolt. Nuts must conform to ASTM A563 requirements.

Provide bar laps, where required, as follows:

Uncoated or galvanized ~ #5 = 2'-0"
Epoxy coated ~ #5 = 3'-0"

GENERAL NOTES:

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

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

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

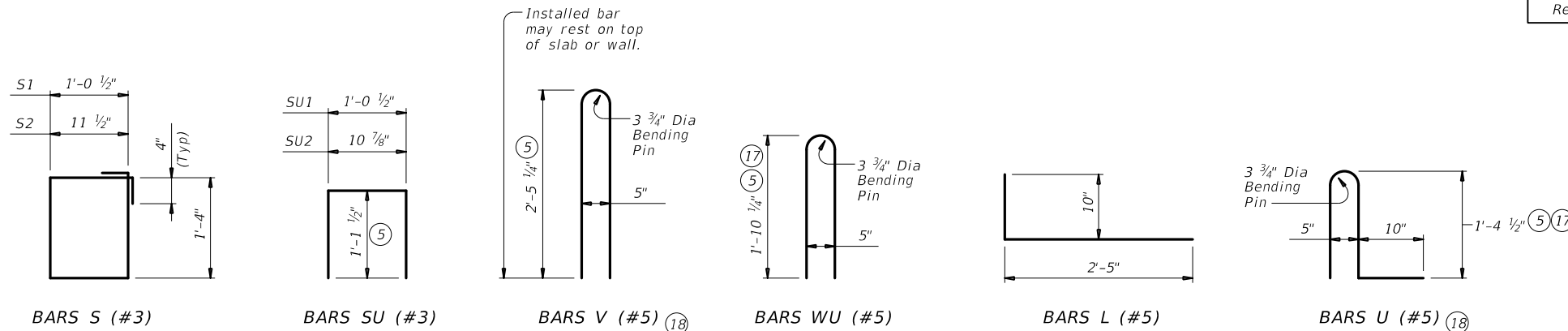
See appropriate details elsewhere in plans for these modifications.

Submit erection drawings showing panel lengths, HSS rail post spacing, and anchor bolt setting to the Engineer for approval.

Average weight of railing with no overlay:

370 plf total
358 plf (Conc)
12 plf (Steel)

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

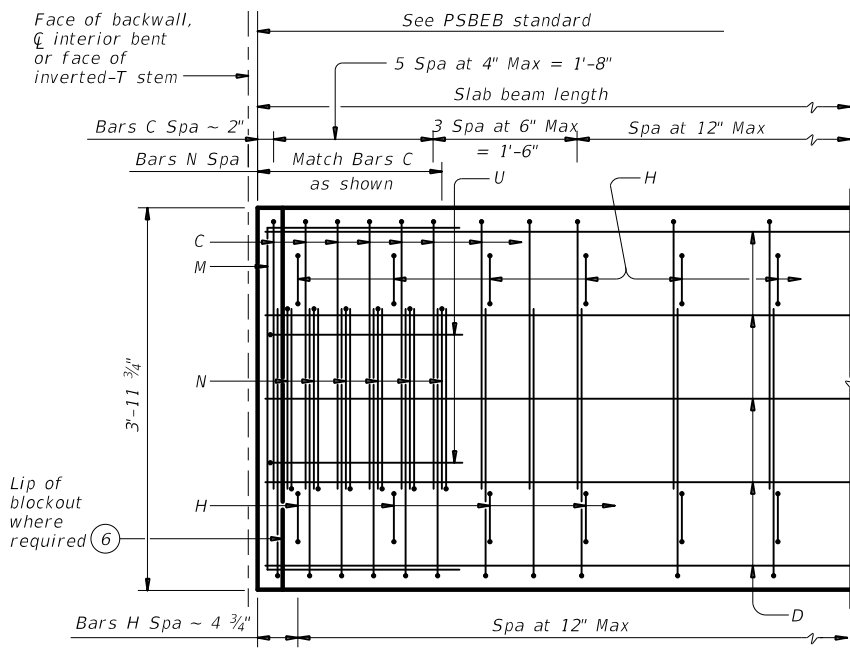


SHEET 4 OF 4

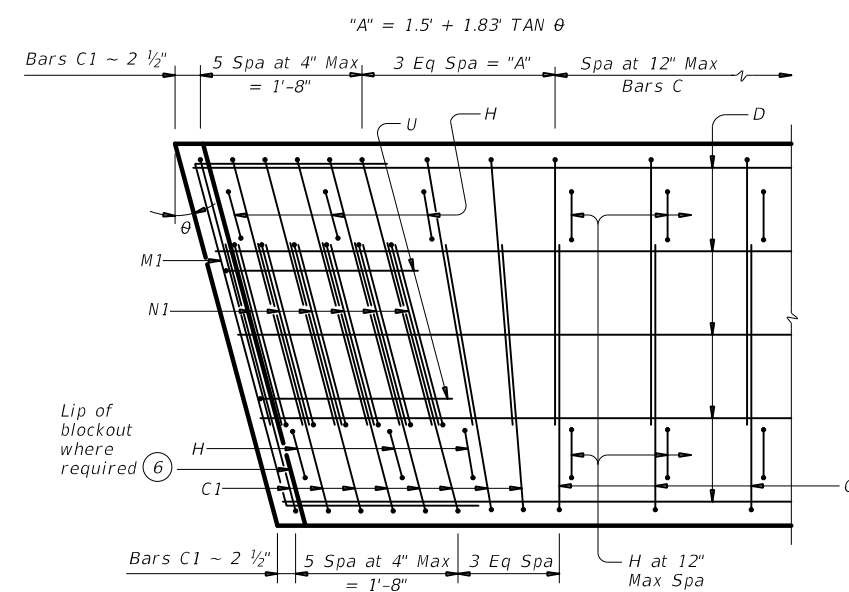
		Bridge Division Standard	
<h2>COMBINATION RAIL</h2>			
<h3>TYPE C223</h3>			
FILE: RL-C223-19.dgn	DN: TxDOT	CK: TxDOT	DW: JTR
CK: AES			
©TxDOT	0923	10	021
REVISIONS	3RD ST		HIGHWAY
DIST	COUNTY	SHEET NO.	
BWD	LAMPASAS	67	

DATE: 7/19/2024 12:22:04 PM
 FILE: R:\1005000-1005999-1005472-03\04_DOCUMENTS\DESIGN\Plan_Set\7. Bridge Standards\SLAB_BEAM_STANDARDS_RL-C223-19.dgn
 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.

7/19/2024 12:22:05 PM
 DATE: 7/19/2024 12:22:05 PM
 FILE: R:\1005000-1005999\1005472_03\04_DOCUMENTS\DESIGN\Plan_Set\7. Brldge_Standards\SLAB_BEAM_STANDARDS\PSB-4SB15-17.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.

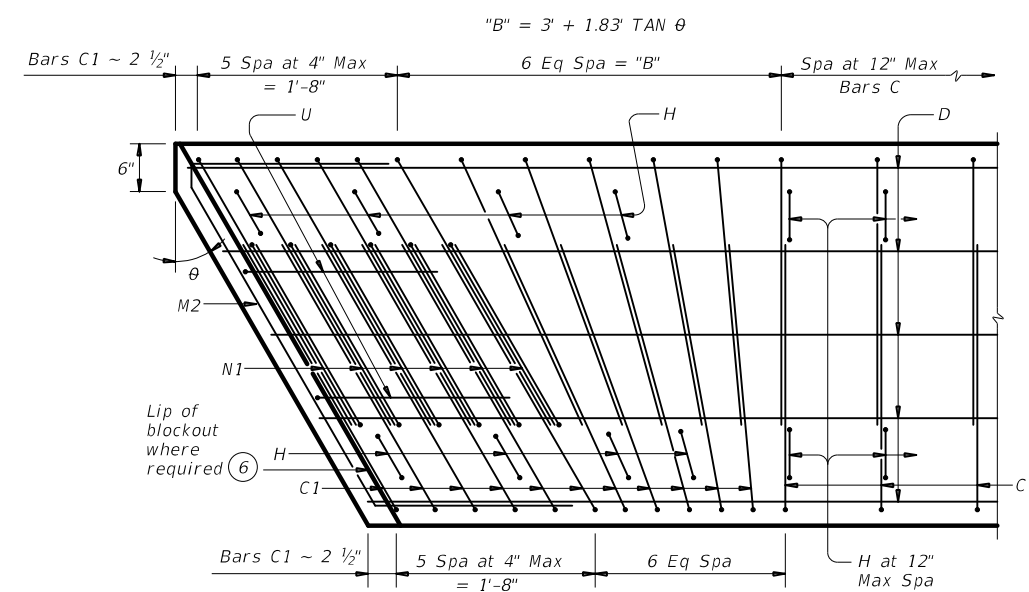


PART PLAN



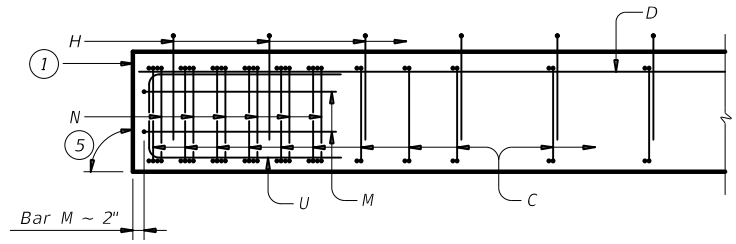
PART SKEW PLAN

(Showing θ over 0° to 15° Skew)

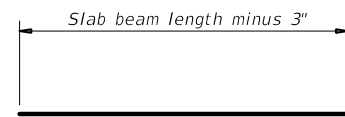


PART SKEW PLAN

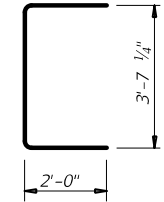
(Showing θ over 15° to 30° Skew)



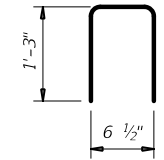
ELEVATION



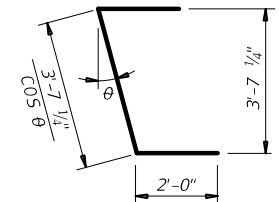
BARS D(#6)



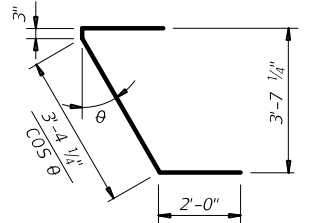
BARS M(#4)



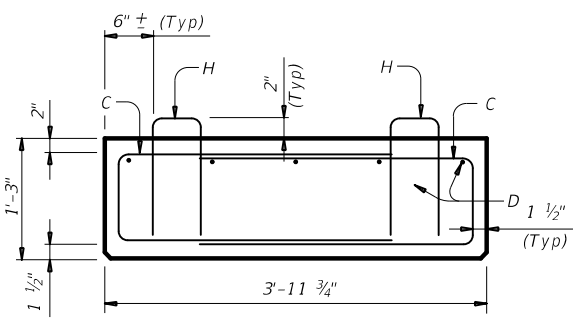
BARS H(#4)



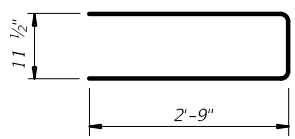
BARS M1(#4)



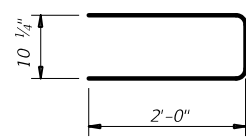
BARS M2(#4)



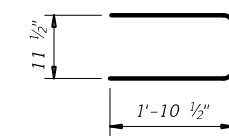
SECTION



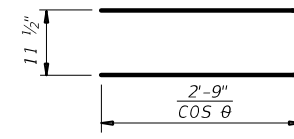
BARS C(#4)



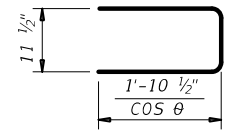
BARS U(#5)



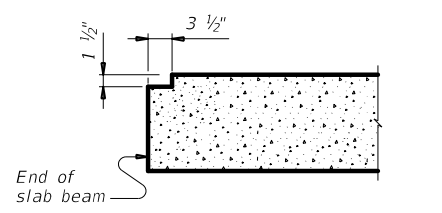
BARS N(#4)



BARS C1(#4)

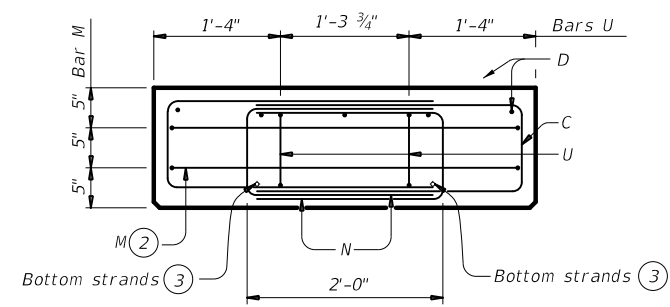


BARS N1(#4)



ELEVATION OF BLOCKOUT (6)

BEAM PROPERTIES		
Area	in ²	716.2
Y top	in	7.50
Y bott	in	7.50
I	in ⁴	13,429
Weight (4)	lb/ft	746



END MAT REINFORCING

Bars H not shown for clarity.

GENERAL NOTES:
 Designed according to AASHTO LRFD Bridge Design Specifications.
 Provide Class H concrete. Provide Class H (HPC) if shown elsewhere in the plans.
 Provide Grade 60 reinforcing steel.
 An equal area of welded wire reinforcement (WWR) (ASTM 1064) may be substituted for bars C and D if approved by the Engineer.
 These details can be used for any skew angle up to a maximum of 30 degrees.
 Chamfer all exposed corners 3/4" or round to a 3/4" radius.
 Details are drawn showing right forward skew. See Bridge Layout for actual direction.

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

HL93 LOADING

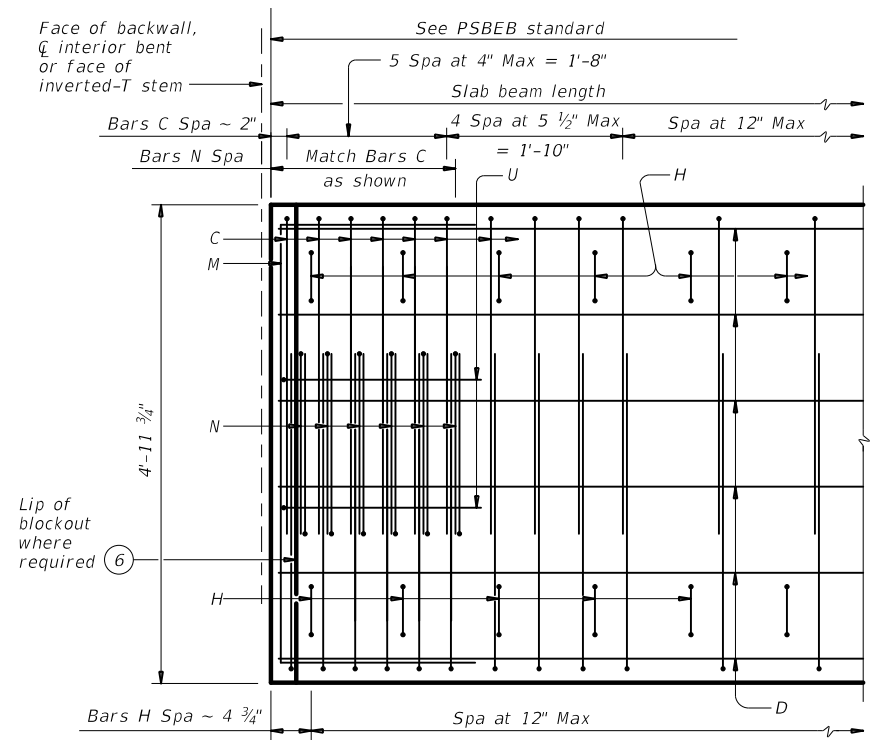
Texas Department of Transportation
 Bridge Division Standard

PRESTRESSED CONCRETE SLAB BEAM DETAILS (TYPE 4SB15)

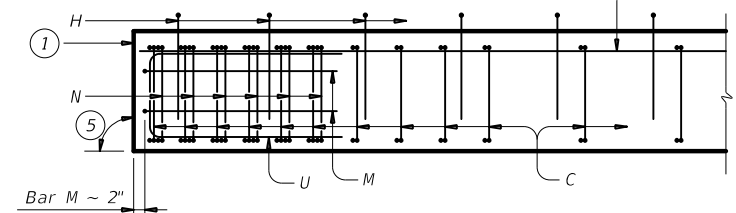
PSB-4SB15

FILE: PSB-4SB15-17.dgn	DN: TxDOT	CK: TxDOT	DW: TxDOT	CK: TxDOT
©TxDOT January 2017	CONT	SECT	JOB	HIGHWAY
REVISIONS	0923	10	021	3RD ST
DIST	COUNTY		SHEET NO.	
BWD	LAMPASAS		68	

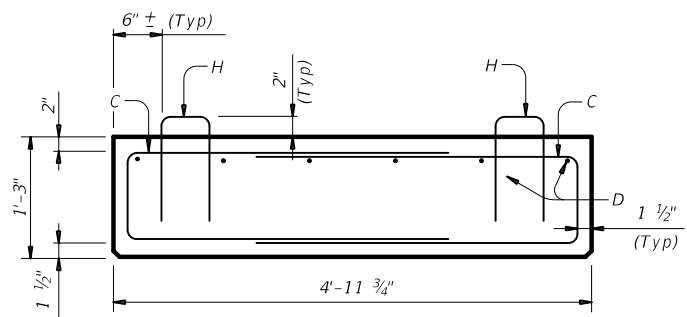
7/19/2024 12:22:05 PM
 DATE: 7/19/2024 12:22:05 PM
 FILE: R:\1005000-1005999\1005472_03\04_DOCUMENTS\DESIGN\Plan_Set\7. Bridge Standards\SLAB_BEAM_STANDARDS\PSB-5SB15-17.dgn
 DISCLAIMER: The use of this standard is governed by the "Texas Engineering Practice Act". No warranty of any kind is made by TxDOT 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.



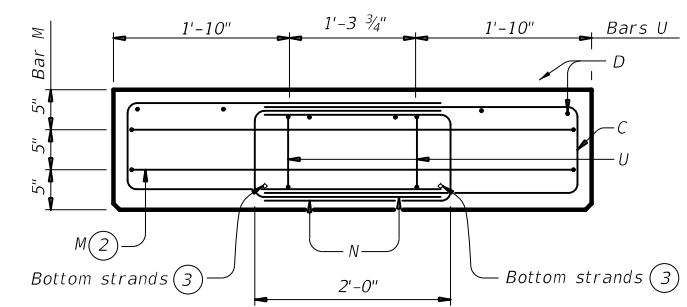
PART PLAN



ELEVATION

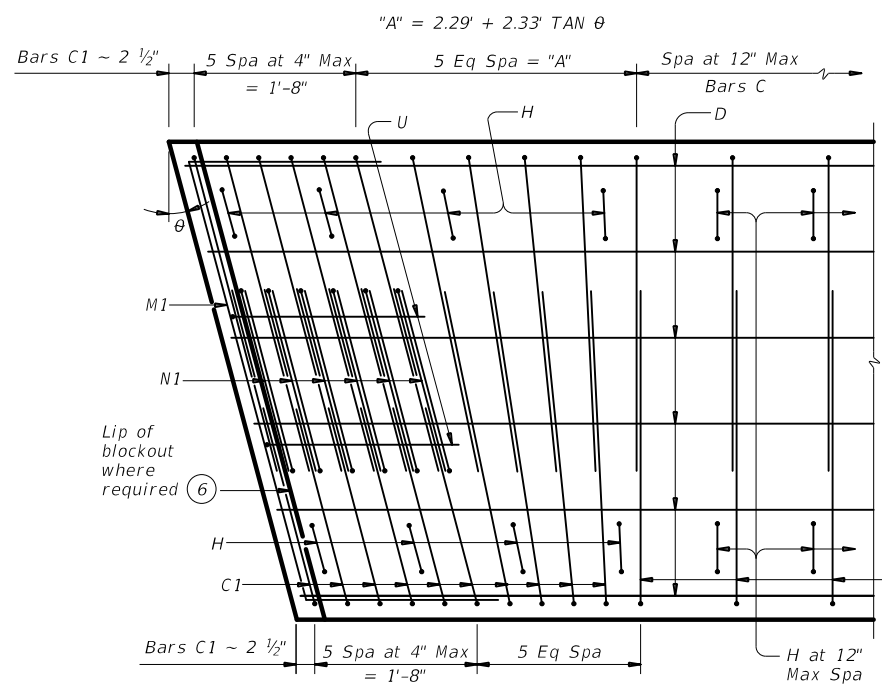


SECTION



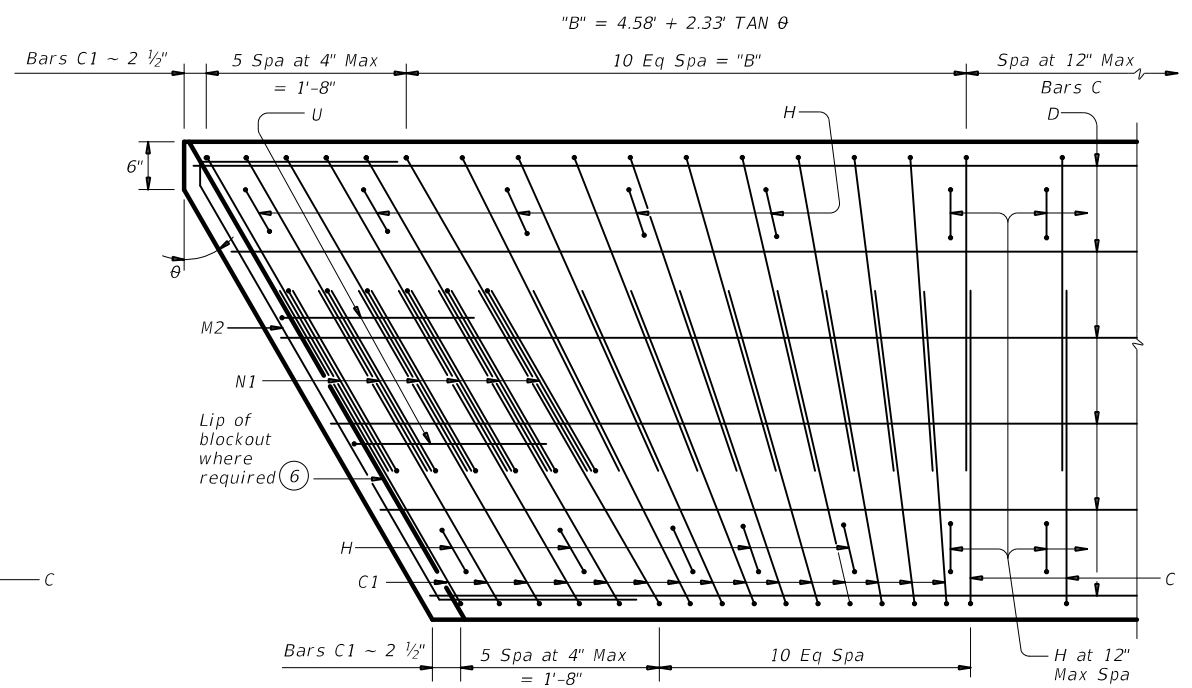
END MAT REINFORCING

Bars H not shown for clarity.



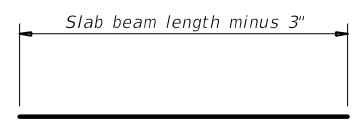
PART SKEW PLAN

(Showing θ over 0° to 15° skew)

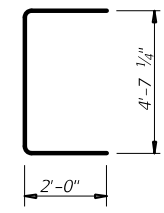


PART SKEW PLAN

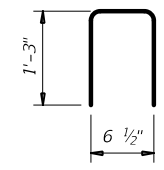
(Showing θ over 15° to 30° skew)



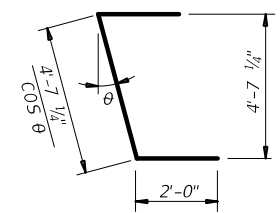
BARS D(#6)



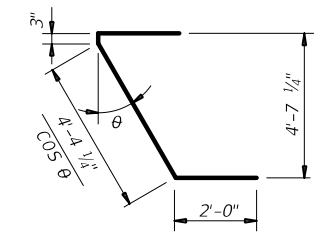
BARS M(#4)



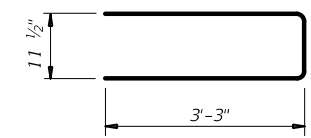
BARS H(#4)



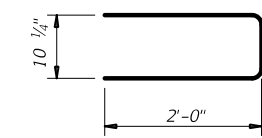
BARS M1(#4)



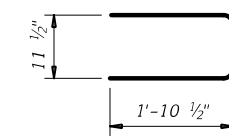
BARS M2(#4)



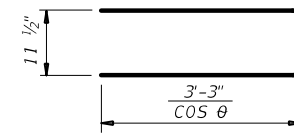
BARS C(#4)



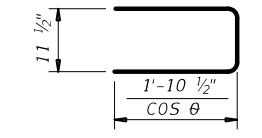
BARS U(#5)



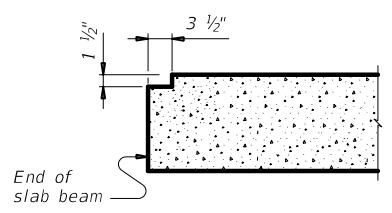
BARS N(#4)



BARS C1(#4)



BARS N1(#4)



ELEVATION OF BLOCKOUT (6)

BEAM PROPERTIES		
Area	in ²	896.2
Y top	in	7.50
Y bott	in	7.50
I	in ⁴	16,805
Weight (4)	lb/ft	934

GENERAL NOTES:
 Designed according to AASHTO LRFD Bridge Design Specifications.
 Provide Class H concrete. Provide Class H (HPC) if shown elsewhere in the plans.
 Provide Grade 60 reinforcing steel.
 An equal area of welded wire reinforcement (WWR) (ASTM 1064) may be substituted for bars C and D if approved by the Engineer.
 These details can be used for any skew angle up to a maximum of 30 degrees.
 Chamfer all exposed corners 3/4" or round to a 3/4" radius.
 Details are drawn showing right forward skew. See Bridge Layout for actual direction.

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

- (1) See End Mat Reinforcing detail.
- (2) Adjust bars M vertically to avoid strands.
- (3) See sheet PSBND or PSBSD for strand locations.
- (4) Assumes 150 pcf weight density of concrete.
- (5) 90° at conventional interior bents. End of beam must be vertical at abutment backwall and inverted-T stem.
- (6) Blockout required at armor joint (AJ) and sealed expansion joint (SEJ) locations to accommodate joint anchorage.

HL93 LOADING

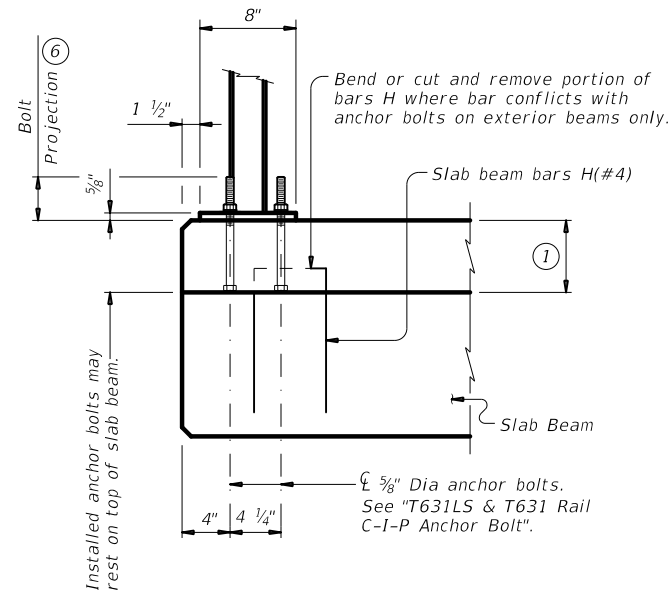
Texas Department of Transportation
 Bridge Division Standard

PRESTRESSED CONCRETE SLAB BEAM DETAILS (TYPE 5SB15)

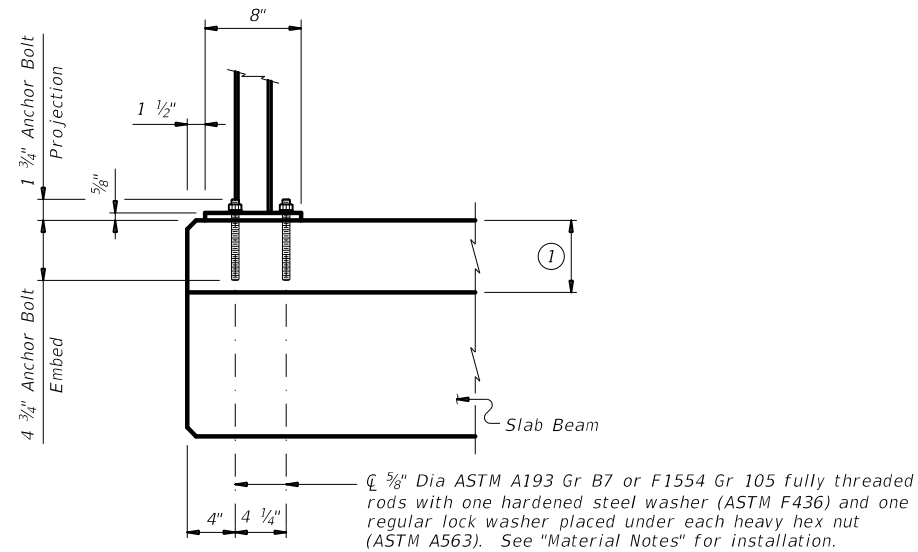
PSB-5SB15

FILE: PSB-5SB15-17.dgn	DN: TxDOT	CK: TxDOT	DW: TxDOT	CK: TxDOT
©TxDOT January 2017	CONT	SECT	JOB	HIGHWAY
REVISIONS	0923	10	021	3RD ST
DIST	COUNTY	SHEET NO.		
BWD	LAMPASAS			69

7/19/2024 12:22:06 PM
 DATE: 7/19/2024 12:22:06 PM
 FILE: R:\1005000-1005999\1005472_03\04_DOCUMENTS\DESIGN\Plan_Series7. Br\Tdx\Standards\SLAB_BEAM_STANDARDS\PSB-PSBRA-18.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.

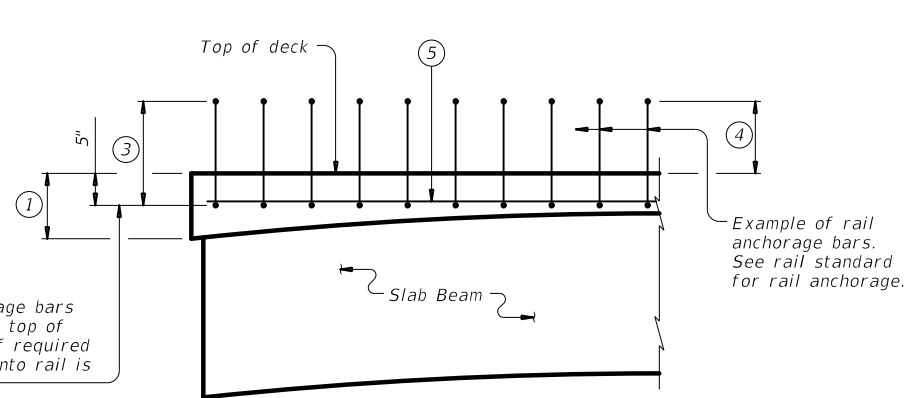


CAST-IN-PLACE ANCHORAGE OPTION

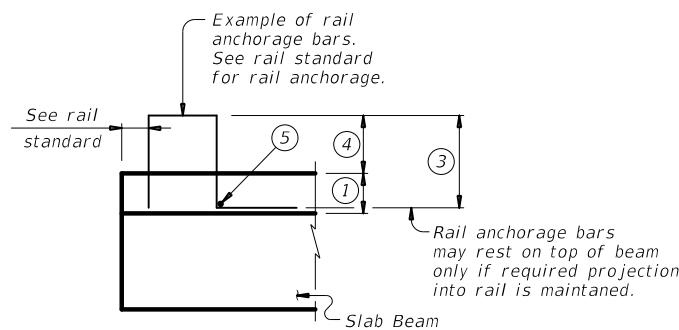


ADHESIVE ANCHORAGE OPTION

T631LS & T631 RAIL ANCHORAGE PLACEMENT (2) (7)



PART SPAN ELEVATION

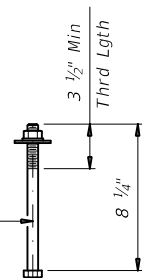


SECTION

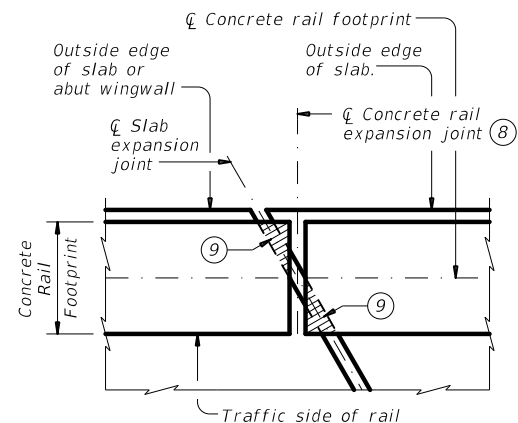
TYPICAL CONCRETE RAIL ANCHORAGE

(Showing typical concrete rail anchorage)

5/8" Dia heavy hex head anchor bolt (ASTM F3125 Gr A325 or A449) with one hardened steel washer (ASTM F436) and one regular lock washer placed under heavy hex nut (ASTM A563).



T631LS & T631 RAIL C-I-P ANCHOR BOLT



PLAN OF CONCRETE RAILS AT EXPANSION JOINTS

- ① Cast-in-place slab thickness varies due to beam camber (5" minimum).
- ② Replace cast-in-place anchor bolts shown on T631LS and T631 Rail standard with an adhesive anchor system or cast-in-place anchor bolts shown on this sheet.
- ③ Bar length shown on rail standard, minus 1 1/4". Adjust bar length for a raised sidewalk.
- ④ See rail standard for projection from finished grade or top of sidewalk.
- ⑤ Place additional (#5) longitudinal bar.
- ⑥ Excess bolt length has been provided to accommodate a variable slab thickness due to beam camber. If slab thickness on span details exceed 7", bolt length must be increased accordingly. After posts have been set and bolts tightened, bolt projection above nuts of more than 1/2" must be cut off and painted with two coats of zinc-rich paint conforming to the Item 445 "Galvanizing".
- ⑦ Distance from end of top outside edge of slab to center of first bolt group can not be less than 9", except: 15° Skew: 1'-0" (acute corner only) 30° Skew: 1'-3" (acute corner only)
- ⑧ Location of rail expansion joint must be at the intersection of centerline of slab expansion joint, centerline of rail footprint and perpendicular to slab outside edge.
- ⑨ Cross-hatched area must have 1/2" preformed bituminous fiber material under concrete rail, as shown.

CONSTRUCTION NOTES:

Rail anchorage bars may be field bent as required to clear rail reinforcing or provide minimum cover shown on standard rail detail sheets. Test adhesive anchors in accordance with Item 450.3.3, "Tests". Test 3 anchors per 100 anchors installed. Perform corrective measures to provide adequate capacity if any of the tests do not meet the required test load. Repair damage from testing as directed.

MATERIAL NOTES:

Galvanize all steel components of steel rail system. Provide Grade 60 reinforcing steel. Cast-in-place anchorage system for T631LS and T631 Rail must be 5/8" Dia heavy hex head anchor bolts (ASTM F3125 Gr 325 or A449) with one hardened steel washer (ASTM F436) and one regular lock washer placed under heavy hex nut. Nuts must conform to ASTM A563 requirements. Embed anchor bolts 4 1/2" minimum. Adhesive anchors for T631LS and T631 Rail must be 5/8" Dia ASTM A193 Gr B7 or F1554 Gr 105 fully threaded rods with one hardened steel washer (ASTM F436) and one regular lock washer placed under each heavy hex nut. Nuts must conform to ASTM A563 requirements. Embed fully threaded rod into slab and/or abutment wingwall using a Type III, Class C, D, E, or F anchor adhesive. Minimum adhesive anchor embedment depth is 4 3/4". Anchor adhesive chosen must be able to achieve a nominal bond strength in tension of a single anchor, Na, of 8 kips (edge distance must be accounted for). Submit signed and sealed calculations or the manufacturer's published literature showing the proposed anchor adhesive's ability to develop this load to the Engineer for approval prior to use. Anchor installation, including hole size, drilling, and clean out, must be in accordance with Item 450, "Railing." Epoxy coat or galvanize reinforcing steel shown on this standard if rail reinforcement is epoxy coated or galvanized.

GENERAL NOTES:

Designed in accordance with AASHTO LRFD Bridge Design Specifications. This standard is for use with structures with a 5" minimum cast-in-place concrete slab. This standard may require modification for interior rails. This standard does not apply to median barriers. This standard does not provide details for Type T221P, T224, T80HT, T80SS, C412, PR11, PR22 and PR3 rails on slab beam bridges. See rail standards for approved speed restrictions, notes and details not shown.

Cover dimensions are clear dimensions, unless noted otherwise.

		Bridge Division Standard	
RAIL ANCHORAGE DETAILS PRESTR CONCRETE SLAB BEAMS			
PSBRA			
FILE: PSB-PSBRA-18.dgn	DN: TxDOT	CK: TxDOT	DW: JTR
©TxDOT January 2017	CONT	SECT	JOB
REVISIONS	0923	10	021
03-18: Updated adhesive anchor notes.	DIST	COUNTY	SHEET NO.
	BWD	LAMPASAS	71

Prepared by *****
 DATE: 7/24/2024 11:14:35 AM
 FILE: I:\BWDSDTEAM\Design Projects\Compass\0923-10-021 Third St. at Burleson Creek - BRIDGE REPLACEMENT\6. Environmental\EPIC_3r\dst_092310021.dwg DATED 6/22/2017

During the planning phase of project development the following environmental permits, issues, and commitments have been developed during coordination with resource agencies, local governmental entities, and the general public. Any change orders and/or deviations from the final design must be reported to the Engineer prior to the commencement of construction activities, as additional environmental clearances may be required.

I. Clean Water Act, Sec. 402 Texas Pollutant Discharge Elimination System

(Addresses CGP and MS4 Storm Water requirements for the project.)
 (In the event that the Contractor implements a PSL on or within one mile of the project, a Site Notice and/or a NOI will apply.)

No Action Required Required Action

Action No. 1 Commitment No. 1
 The project disturbs less than one acre of surface area. The contractor is responsible for the PSL as defined in the Standard Specifications for Construction and Maintenance of Highways, Street, and Bridges (2014 Edition, Item 7 (7.6) Page 42). The total disturbed acreage is the combined acreage to be disturbed on the project and the contractor's PSL.

This EPIC must be updated if the disturbed area increases to one or more acres during the course of construction. It may become necessary to post a site notice/or NOI for the project and/or PSL.

II. Clean Water Act, Section 401 and 404 Compliance

(Addresses Nationwide Permits, Individual Permits, and Wetlands.)
 (Filling, dredging, or excavating in any water bodies, rivers, creeks, streams, wetlands, or wet area is prohibited unless specified in the USACE permit and approved by the Engineer.)
 (When temporary fills implemented, only stated TxDOT standards will be used unless written authorization for an alternative is obtained from the Engineer. No equipment is allowed in any stream channel below the Ordinary High Water Mark except on temporary stream crossings or drill pads.)

No Action Required 404 Permit and 401 Certification Required

Permit	Required Action	Waters of the US	App. Plan Sheet(s)
NWP 14	Adher to permit conditions	Sulphur Creek	Bridge Sheets

Best Management Practices for applicable 401 General Conditions:

General Condition 12 - Categories I and II BMPs required

Category I (Erosion Control)

- Temporary Vegetation
- Mulch
- Interceptor Swale
- Erosion Control Compost
- Compost Filter Berms and Socks
- Blankets, Matting
- Sod
- Diversion Dike
- Mulch Filter Berms and Socks
- Compost Blankets

Category II (Sedimentation Control)

- Sand Bag Berm
- Silt Fence
- Triangular Filter Dike
- Stone Outlet Sediment Traps
- Erosion Control Compost
- Compost Filter Berms and Socks
- Rock Berm
- Hay Bale Dike
- Brush Berms
- Sediment Basins
- Mulch Filter Berms and Socks

General Condition 25 - Category III BMPs required

Category III (Post-Construction TSS Control)

- Retention/Irrigation
- Extended Detention Basin
- Vegetative Filter Strips
- Grassy Swales
- Erosion Control Compost
- Compost Filter Berms and Socks
- Constructed Wetlands
- Wet Basins
- Vegetation-Lined Ditches
- Sand Filter Systems
- Mulch filter Berms and Socks
- Sedimentation Chambers

III. Cultural Resources

(Addresses any special circumstances associated with cultural resources, such as archeological or historic sites.)
 (Upon discovery of archeological artifacts (bones, burnt rock, flint, pottery, etc.) cease work in the immediate area and contact the Engineer immediately.)

No Action Required Required Action

Action No. Station (Rt/Lt) Commitment

IV. Vegetation Resources

(Addresses any special circumstances associated with vegetation, such as large trees to be avoided, or mitigation that will occur as part of the project.)

No Action Required Required Action

Action No. Station (Rt/Lt) Commitment

1. All Avoid non-mow locations for stockpiles and equipment parking/storage.
2. Project Limits Preserve native vegetation to the extent practical. Contractor must adhere to Construction Specification Requirements Specs 162, 164, 192, 506, 730, 751, 752 in order to comply with requirements for invasive species, beneficial landscaping, and tree/brush removal commitments.

V. Federal Listed, Proposed, Threatened, Endangered Species, Critical Habitat, State Listed Species, Candidate Species, and Migratory Bird Treaty Act (MBTA)

(Addresses any special habitat that may need to be avoided, lists any threatened or endangered species whose habitat was observed and might be impacted within the project area, and lists any precautions such as nesting seasons for migratory birds.)

No Action Required Required Action

Species Potentially within Project Area & Description Habitat Description

 Contractor is to be aware that various species may be present in the project area and should not harm or harass them. If a species is identified or other issues arise; contact the Brownwood District Environmental Coordinator, Andrew Chisholm at 325-643-0442.

The Migratory Bird Treaty Act of 1918 states that it is unlawful to kill, capture, collect, possess, buy, sell, trade, or transport any migratory bird, nest, young, feather, or egg in part or in whole, without a federal permit issued in accordance within the Act's policies and regulations. Migration patterns would not be affected by the proposed project. The contractor will remove all old migratory bird nests from any structure where work would be done from September 1 through the end of February. In addition, the contractor will be prepared to prevent migratory birds from building nests between March 1 and August 31, per the Environmental Permits, Issues, and Commitments (EPIC) plans. In the event that migratory birds are encountered on-site during project construction, adverse impacts on protected birds, active nests, eggs, and/or young shall be avoided.

VI. Hazardous Material or Contamination Issues

(Addresses any previously identified high risk sites associated with hazardous materials that may be encountered during construction.)

Comply with the Hazard Communication Act (the Act) for personnel who will be working with hazardous materials by conducting safety meetings prior to beginning construction and making workers aware of potential hazards in the workplace. Ensure that all workers are provided with personal protective equipment appropriate for any hazardous materials used. Obtain and keep on-site Material Safety Data Sheets (MSDS) for all hazardous products used on the project, which may include, but are not limited to the following categories: Paints, acids, solvents, asphalt products, chemical additives, fuels and concrete curing compounds or additives. Provide protected storage, off bare ground and covered, for products which may be hazardous. Maintain product labelling as required by the Act. Maintain an adequate supply of on-site spill response materials, as indicated in the MSDS. In the event of a spill, take actions to mitigate the spill as indicated in the MSDS, in accordance with safe work practices, and contact the District Spill Coordinator immediately. The Contractor shall be responsible for the proper containment and cleanup of all product spills.

Contractor will follow all applicable storage and management requirements for liquid oil products, liquid petroleum products, and other chemical liquids as per 40 CFR 112 (a.k.a. SPCC) and/or TCEQ Construction General Permit for storm water management.

Contact the Engineer if any of the following are detected:
 Dead or distressed vegetation (not identified as normal)
 Trash piles, drums, canisters, barrels, etc.
 Undesirable smells/odors
 Underground storage tanks
 Evidence of leaching or seepage of substances
 Any other evidence indicating possible hazardous materials or contamination discovered on-site

Does the project involve any bridge class structure rehabilitation or replacements (bridge class structure not including box culverts)?

Yes No

If "No", then no further action is required.
 If "Yes", then TxDOT is responsible for completing an asbestos assessment/inspection. Are the results of the asbestos inspection positive (is asbestos present)?

Yes No

If "Yes", then TxDOT must retain a Texas Department of State Health Services (DSHS) licensed asbestos consultant to assist with the notification, develop abatement/mitigation procedures, and perform management activities as necessary. The notification form to DSHS must be postmarked at least 10 working days prior to scheduled abatement and/or demolition.
 If "No", then TxDOT is still required to notify DSHS 10 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.

Bridges on this project may contain Lead-Containing Paint (LCP) or other items that contain lead. The location of (LCP) is identified in the General Notes. Item 6.10.1.2 in the 2014 TxDOT Standard Specifications shall be utilized for this project.

VII. Other Environmental Issues

(Addresses any other environmental issues that may not have been covered in other sections.)

No Action Required Required Action

Action No. Station (Rt/Lt) Commitment
 1. --- ---

LIST OF ABBREVIATIONS

- BMP: Best Management Practice
- CGP: Construction General Permit
- DSHS: Texas Department of State Health Services
- FEMA: Federal Emergency Management Agency
- FHWA: Federal Highway Administration
- MOA: Memorandum of Agreement
- MOU: Memorandum of Understanding
- MS4: Municipal Separate Stormwater Sewer System
- MBTA: Migratory Bird Treaty Act
- NOI: Notice of Intent
- NOT: Notice of Termination
- NWP: Nationwide Permit
- SPCC: Spill Prevention Control and Countermeasure
- SW3P: Storm Water Pollution Prevention Plan
- PCN: Pre-Construction Notification
- PSL: Project Specific Location
- TCEQ: Texas Commission on Environmental Quality
- TPDES: Texas Pollutant Discharge Elimination System
- TPWD: Texas Parks and Wildlife Department
- TxDOT: Texas Department of Transportation
- T&E: Threatened and Endangered Species
- USACE: U.S. Army Corp of Engineers
- USFWS: U.S. Fish and Wildlife Service

ENVIRONMENTAL PERMITS, ISSUES, AND COMMITMENTS (EPIC)

©2024 Texas Department of Transportation BROWNWOOD DISTRICT			
CONT	SECT	JOB	HIGHWAY
0923	10	021	THIRD ST.
DIST	COUNTY		SHEET NO.
BWD	LAMPASAS		72

DATE: 7/19/2024 12:22:07 PM
FILE: R:\1005000-1005999\1005472.03\04_DOCUMENTS\DESIGN\Plan_Set\10_Environmental\3RD_SWP3A_01.dgn

STORMWATER POLLUTION PREVENTION PLAN (SWP3):

This SWP3 has been developed in accordance with TxDOT policy for projects disturbing less than 1 acre of soil, and not part of a larger common plan of development.

For projects with less than one acre of soil disturbing activity and that have Environmental, Permits, Issues, and Commitments (EPICs) dependent on stormwater controls and water quality measures TxDOT will maintain a SWP3 with all pertinent records, correspondence, environmental documents, etc. at the project field office, Area Office, or electronically.

This SWP3 is consistent with requirements specified in applicable stormwater plans, and the project's environmental permits, issues, and commitments (EPICs).

1.0 SITE/PROJECT DESCRIPTION

1.1 PROJECT CONTROL SECTION JOB (CSJ):

CSJ: 0923-10-021, 3RD ST

1.2 PROJECT LIMITS:

AT BURLESON CREEK

1.3 PROJECT COORDINATES:

BEGIN: (Lat) 31°04'06.1"N, (Long) 98°10'22.7"W

END: (Lat) 31°04'10.7"N, (Long) 98°10'21.5"W

1.4 TOTAL PROJECT AREA (Acres): 1.00

1.5 TOTAL AREA TO BE DISTURBED (Acres): 0.79

1.6 NATURE OF CONSTRUCTION ACTIVITY:

FOR THE CONSTRUCTION OF BRIDGE REPLACEMENT AND APPROACHES

1.7 MAJOR SOIL TYPES:

Soil Type	Description
Oakalla silty clay loam, 0% to 1% slopes	90% Oakalla and similar soils, well drained, negligible rate of runoff

1.8 PROJECT SPECIFIC LOCATIONS (PSLs):

PSLs must be depicted on the Environmental Layout Sheets in Attachment 1.2 of this SWP3. PSLs may be identified during preconstruction meetings or during the construction process. Please choose from the options below:

- PSLs determined during preconstruction meeting
- PSLs determined during construction
- No PSLs planned for construction

Type	Sheet #s

All off-ROW PSLs required by the Contractor are the Contractor's responsibility. The Contractor shall secure all permits required by local, state, federal laws for off-ROW PSLs. The contractor shall provide diagrams, areas of disturbance, acreage, and BMPs for all off-ROW PSLs within one mile of the project.

1.9 CONSTRUCTION ACTIVITIES:

(Use the following list as a starting point when developing the Construction Activity Schedule and Ceasing Record in Attachment 2.3.)

- Mobilization
- Install sediment and erosion controls
- Blade existing topsoil into windrows, prep ROW, clear and grub
- Remove existing pavement
- Grading operations, excavation, and embankment
- Excavate and prepare subgrade for proposed pavement widening
- Remove existing culverts, safety end treatments (SETs)
- Remove existing metal beam guard fence (MBGF), bridge rail
- Install proposed pavement per plans
- Install culverts, culvert extensions, SETs
- Install mow strip, MBGF, bridge rail
- Place flex base
- Rework slopes, grade ditches
- Blade windrowed material back across slopes
- Revegetation of unpaved areas
- Achieve site stabilization and remove sediment and erosion control measures

- Other: _____
- Other: _____
- Other: _____

1.10 POTENTIAL POLLUTANTS AND SOURCES:

- Sediment laden stormwater from stormwater conveyance over disturbed area
- Fuels, oils, and lubricants from construction vehicles, equipment, and storage
- Solvents, paints, adhesives, etc. from various construction activities
- Transported soils from offsite vehicle tracking
- Construction debris and waste from various construction activities
- Contaminated water from excavation or dewatering pump-out water
- Sanitary waste from onsite restroom facilities
- Trash from various construction activities/receptacles
- Long-term stockpiles of material and waste

- Other: _____
- Other: _____
- Other: _____

1.11 RECEIVING WATERS:

Receiving waters must be depicted on the Environmental Layout Sheets in Attachment 1.2 of this SWP3. Include Segment # for receiving waters.

Tributaries	Classified Waterbody
Tributaries To Sulphur Creek (Burleson Creek)	1217 Lampasas River Above Stillhouse Hollow Lake
No TMDLs or I-Plans were identified.	

* Add (*) for impaired waterbodies with pollutant in ().

1.12 ROLES AND RESPONSIBILITIES: TxDOT

- Development of plans and specifications
- Perform SWP3 inspections
- Maintain SWP3 records and update to reflect daily operations
- Other: _____
- Other: _____

1.13 ROLES AND RESPONSIBILITIES: CONTRACTOR

- Day To Day Operational Control
- Maintain schedule of major construction activities
- Install, maintain and modify BMPs
- Other: _____
- Other: _____

STORMWATER POLLUTION PREVENTION PLAN (SWP3) (Less Than 1 Acre)

FED. RD. DIV. NO.	PROJECT NO.			SHEET NO.
				73
STATE	STATE DIST.	COUNTY		
TEXAS	BWD	LAMPASAS		
CONT.	SECT.	JOB	HIGHWAY NO.	
0923	10	021	3RD ST	

STORMWATER POLLUTION PREVENTION PLAN (SWP3):

2.0 BEST MANAGEMENT PRACTICES (BMPs) AND CONTROLS, INSPECTION, AND MAINTENANCE

The Contractor shall be the responsible party for implementing the BMPs described herein and for complying with the SWP3 for control of erosion and sedimentation during day-to-day operations. The Contractor shall implement changes to this SWP3 approved by TxDOT within the times specified in this SWP3 or the CGP.

2.1 EROSION CONTROL AND SOIL STABILIZATION BMPs:

T / P

- Protection of Existing Vegetation
- Vegetated Buffer Zones
- Soil Retention Blankets
- Geotextiles
- Mulching/ Hydromulching
- Soil Surface Treatments
- Temporary Seeding
- Permanent Planting, Sodding or Seeding
- Biodegradable Erosion Control Logs
- Rock Filter Dams/ Rock Check Dams
- Vertical Tracking
- Interceptor Swale
- Riprap
- Diversion Dike
- Temporary Pipe Slope Drain
- Embankment for Erosion Control
- Paved Flumes
- Other: _____
- Other: _____
- Other: _____
- Other: _____

2.2 SEDIMENT CONTROL BMPs:

T / P

- Biodegradable Erosion Control Logs
- Dewatering Controls
- Inlet Protection
- Rock Filter Dams/ Rock Check Dams
- Sandbag Berms
- Sediment Control Fence
- Stabilized Construction Exit
- Floating Turbidity Barrier
- Vegetated Buffer Zones
- Vegetated Filter Strips
- Other: _____
- Other: _____
- Other: _____
- Other: _____

Refer to the Environmental Layout Sheets/ SWP3 Layout Sheets located in Attachment 1.2 of this SWP3

2.3 PERMANENT CONTROLS:

(Coordinate post-construction BMPs with appropriate TxDOT maintenance sections.)

BMPs To Be Left In Place Post Construction:

Type	Stationing	
	From	To
No permanent controls are planned.		

Refer to the Environmental Layout Sheets/ SWP3 Layout Sheets located in Attachment 1.2 of this SWP3

2.4 OFFSITE VEHICLE TRACKING CONTROLS:

- Excess dirt/mud on road removed daily
- Haul roads dampened for dust control
- Loaded haul trucks to be covered with tarpaulin
- Stabilized construction exit
- Daily street sweeping
- Other: Dirt/mud will be removed from roadway as necessary.

Other: _____

Other: _____

Other: _____

2.5 POLLUTION PREVENTION MEASURES:

- Chemical Management
- Concrete and Materials Waste Management
- Debris and Trash Management
- Dust Control
- Sanitary Facilities
- Other: _____
- Other: _____
- Other: _____
- Other: _____

2.6 VEGETATED BUFFER ZONES:

Natural vegetated buffers shall be maintained as feasible to protect adjacent surface waters. If vegetated natural buffer zones are not feasible due to site geometry, the appropriate additional sediment control measures have been incorporated into this SWP3.

Type	Stationing	
	From	To
Infeasible, insufficient space between toe of slope and fence line.		
SCF & ECL	12+75.00	17+65.00

Refer to the Environmental Layout Sheets/ SWP3 Layout Sheets located in Attachment 1.2 of this SWP3

2.7 ALLOWABLE NON-STORMWATER DISCHARGES:

- Fire hydrant flushings
- Irrigation drainage
- Pavement washwater (where spills or leaks have not occurred, and detergents are not used)
- Potable water sources
- Springs
- Uncontaminated groundwater
- Water used to wash vehicles or control dust
- Other allowable non-stormwater discharges as allowed by TPDES GP TXR150000.

2.8 DEWATERING:

Dewatering discharges of accumulated stormwater, groundwater, and surface water including discharges from dewatering of trenches, excavations, foundations, vaults, and other points of accumulation are prohibited unless managed by appropriate controls to prevent and minimize the offsite discharge of sediment and other pollutants.

2.9 INSPECTIONS:

All disturbed areas and erosion and sediment control devices shall be inspected at least once every seven (7) days. Inspections shall be performed by TxDOT as indicated on the Field Inspection and Maintenance Report Form 2118 and retained in Attachment 2.3 of this SWP3 .

2.10 MAINTENANCE:

Control measures shall be properly installed according to specifications. If it is determined that a BMP or control measure is not operating effectively, maintenance must be accomplished as soon as possible and before the next anticipated rain event, but in no case later than 7 calendar days after being able to access the site. Maintenance shall be performed by the Contractor as indicated on the Field Inspection and Maintenance Report Form 2118 and retained in Attachment 2.3 of this SWP3.

STORMWATER POLLUTION PREVENTION PLAN (SWP3) (Less Than 1 Acre)

FED. RD. DIV. NO.	PROJECT NO.			SHEET NO.
				74
STATE	STATE DIST.	COUNTY		
TEXAS	BWD	LAMPASAS		
CONT.	SECT.	JOB	HIGHWAY NO.	
0923	10	021	3RD ST	

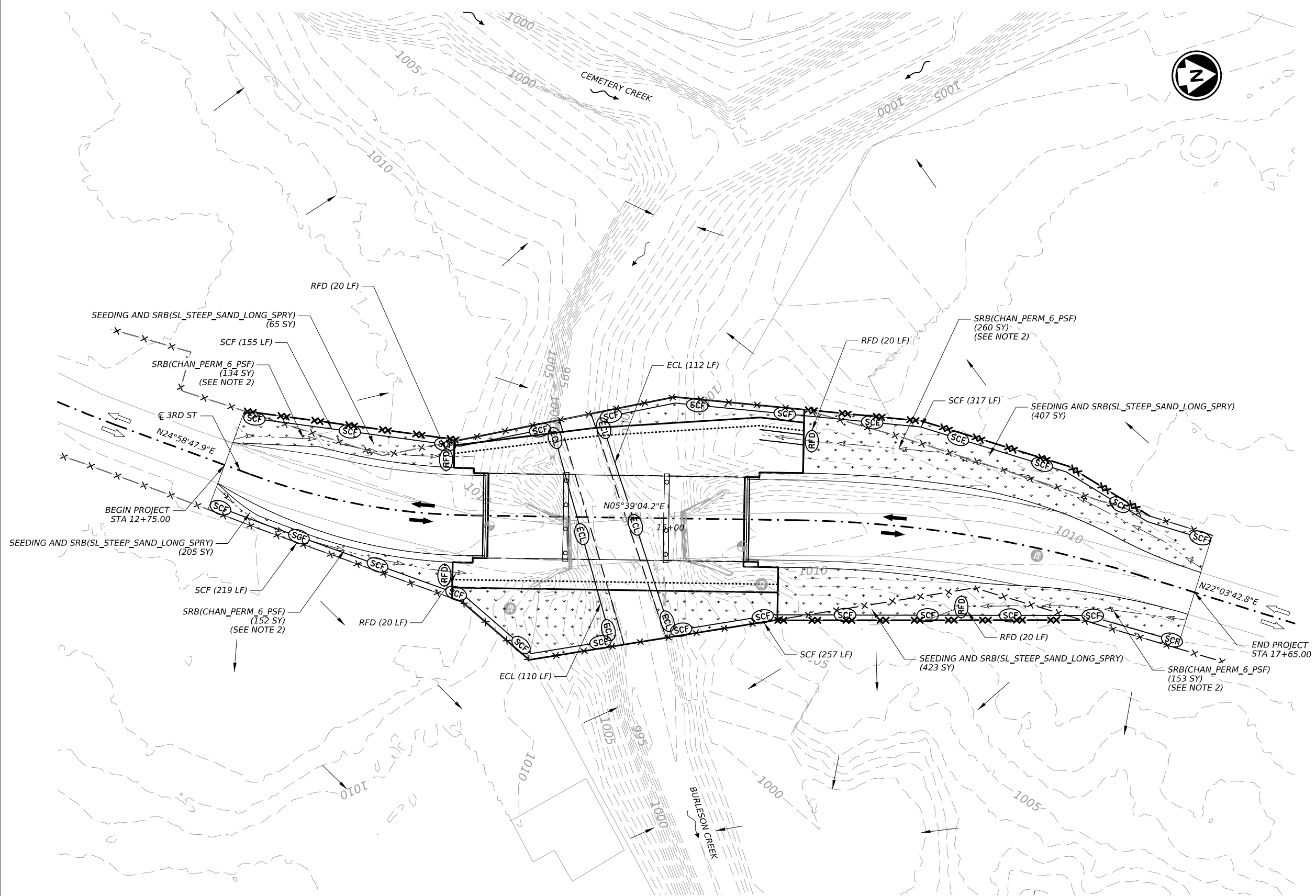
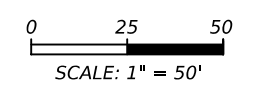
CK:
DW:
CK:
DW:

LEGEND

- ➔ TRAFFIC FLOW DIRECTION
- ➔ DRAINAGE FLOW DIRECTION
- ➔ CHANNEL FLOW DIRECTION
- ⊙ RFD ROCK FILTER DAM
- ⊙ SCF TEMP SEDIMENT CONTROL FENCE
- ⊙ ECL EROSION CONTROL LOG
- ☒ SEEDING AND SOIL RETENTION BLANKET

NOTES

1. FINAL LOCATIONS OF EROSION CONTROL DEVICES SHALL BE APPROVED BY THE ENGINEER.
2. SRB(CHAN_PERM_6 PSF) TO BE APPLIED IN A 10-FT WIDE STRIP CENTERED ALONG THE DITCH FLOWLINE.



DATE: 7/23/2024 1:33:48 PM
 FILE: R:\1005000-1005999\1005472.03\04_DOCUMENTS\DESIGN\Plan_Set\10_Environmental\BRD_SWP3_01.dgn

Luis A. Gonzalez
 7/23/2024

NO.	DATE	REVISION	APPROV.



3131 Briarpark Dr, Suite 200
 Houston, Texas 77042
 TBPE REG. NO. F-2742 (713) 622-1444

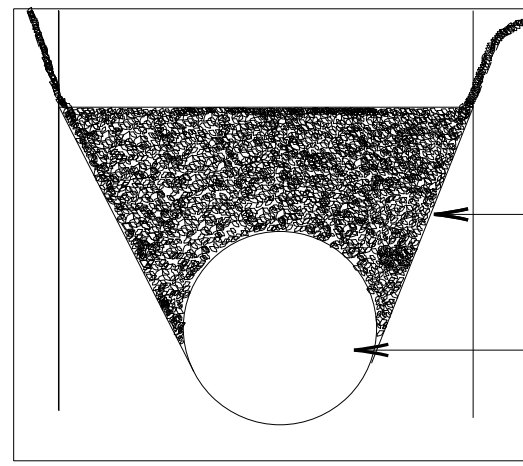
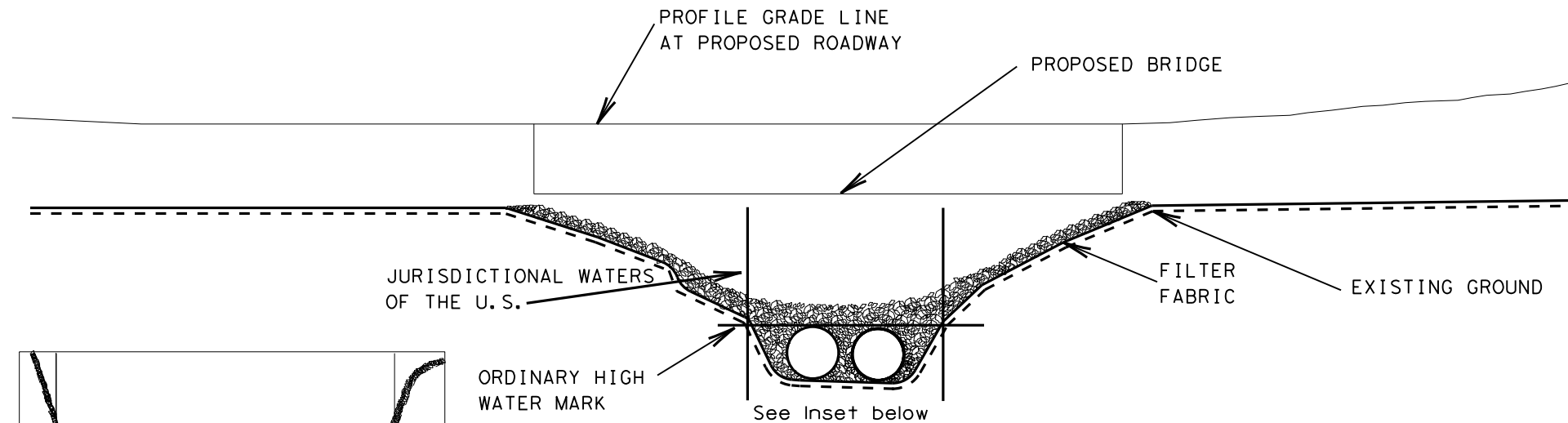
3RD ST @ BURLESON CREEK

SWP3 LAYOUT

SHEET 1 OF 1

CONT	SECT	JOB	HIGHWAY
0923	10	021	3RD ST
DIST	COUNTY	SHEET NO.	
BWD	LAMPASAS	75	

TEMPORARY CROSSING



Inset

NON-ERODIBLE MATERIAL (4" to 6" rock)

TEMPORARY CULVERT(S)

CAPACITY OF CULVERT(S) SHALL BE ADEQUATE TO CONVEY THE LOW FLOW OF WATER

Note: Temporary crossing will not be paid for directly but will be considered subsidiary to pertinent items.

DRAWING NOT TO SCALE



JH Scantling, P.E.

07/24/2024

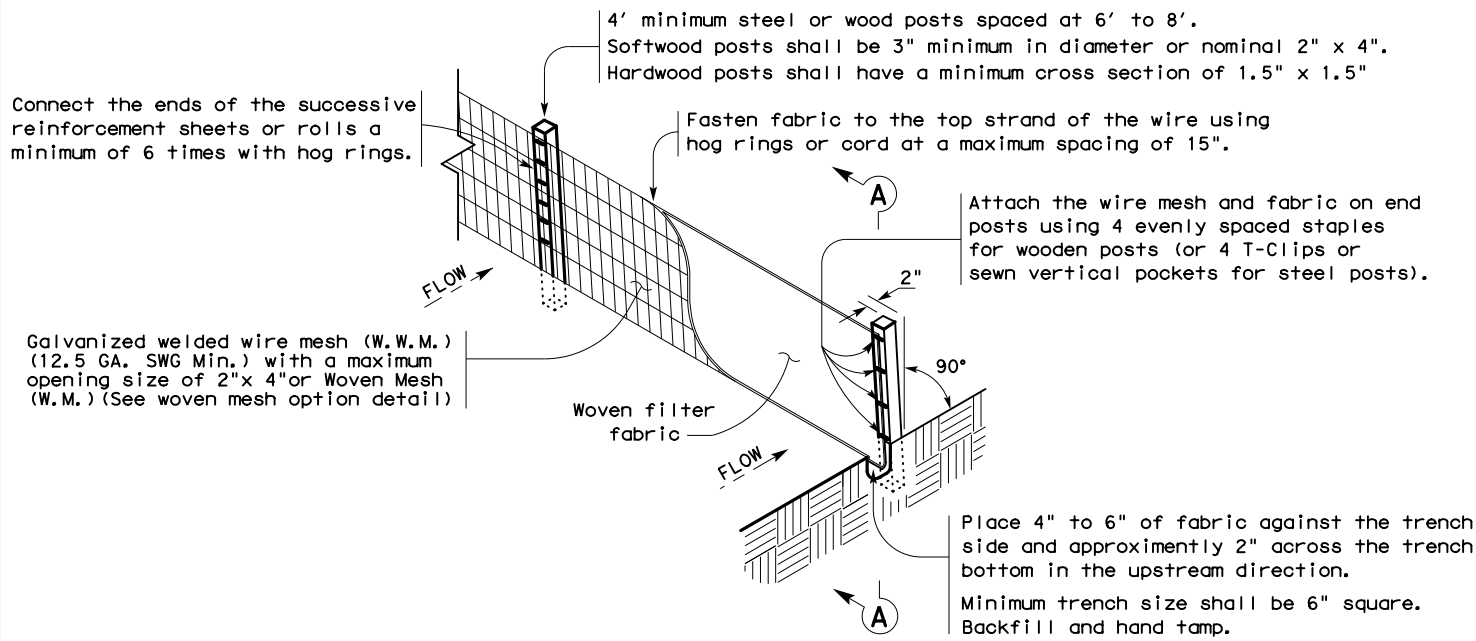
**THIRD ST.
TEMP CROSSING
DETAIL
0923-17-092**



CONT	SECT	JOB	HIGHWAY
0923	10	021	THIRD ST.
DIST	COUNTY		SHEET NO.
BWD	LAMPASAS		76

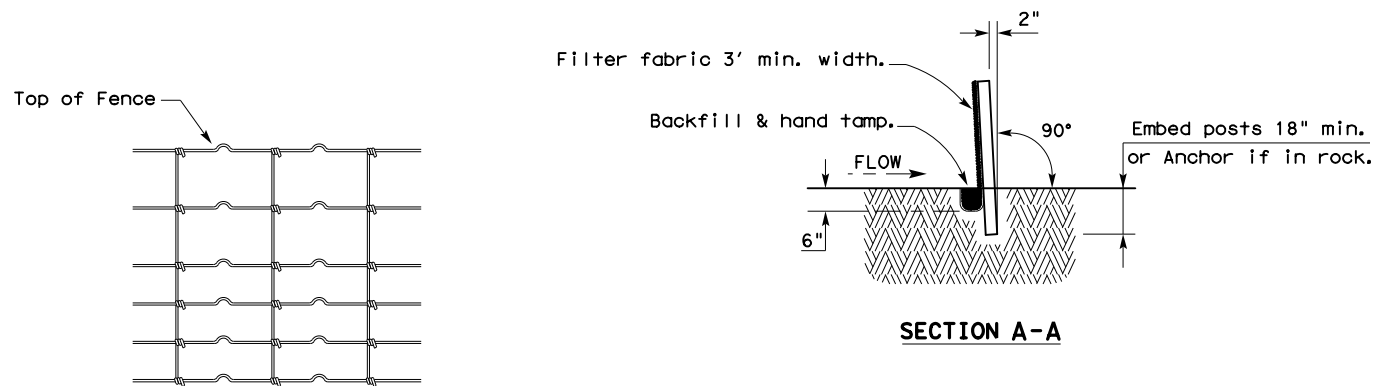
DATE: 7/24/2024 11:08:02 AM
FILE: ... \cr146\TEMP CROSSING DETAIL.dgn

7/18/2024
 FILE: 1005999\1005472_03\04_DOCUMENTS\DESIGN\Plan_Series10_EnvironmentalStandards.ec16.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. 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.

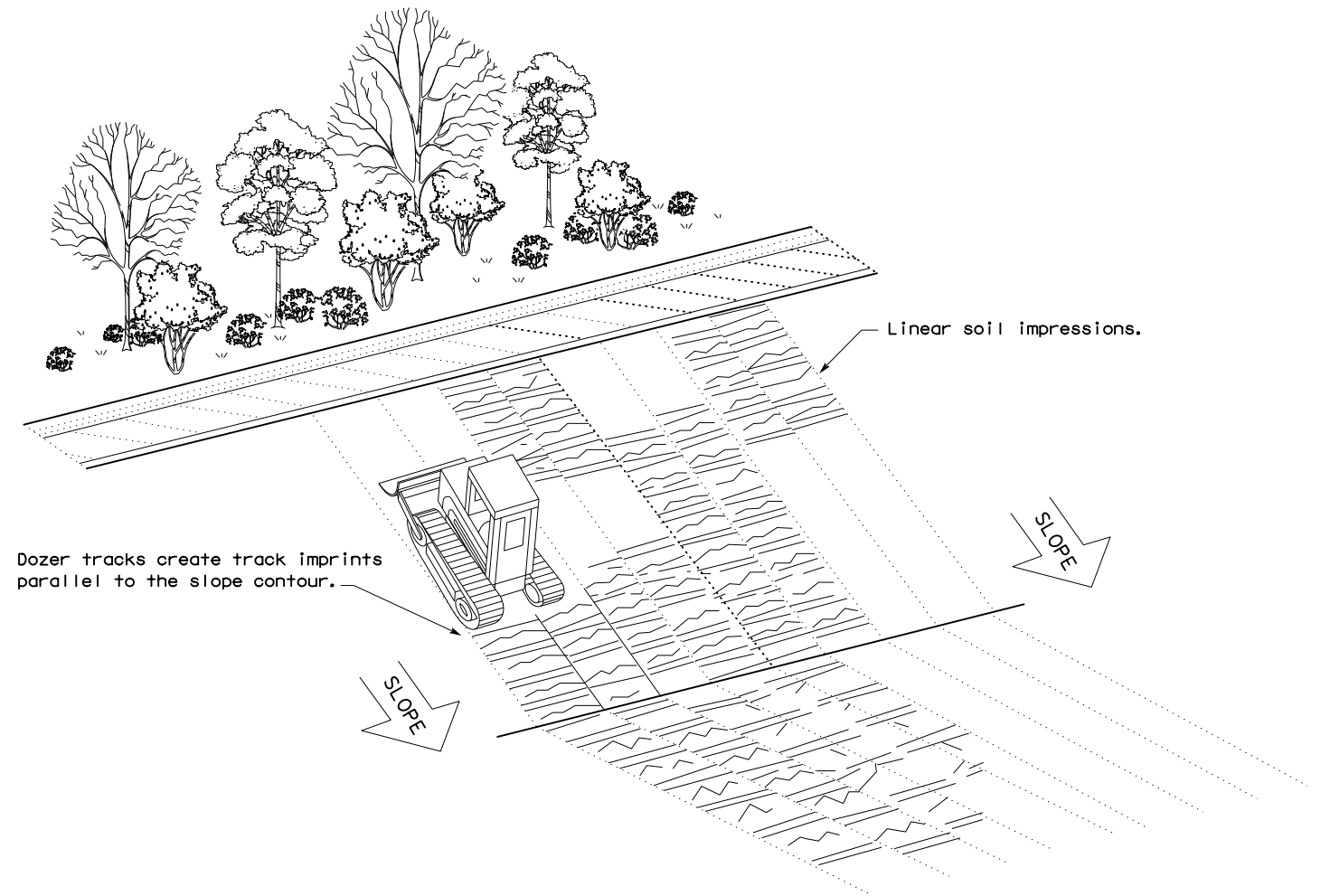
LEGEND

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.

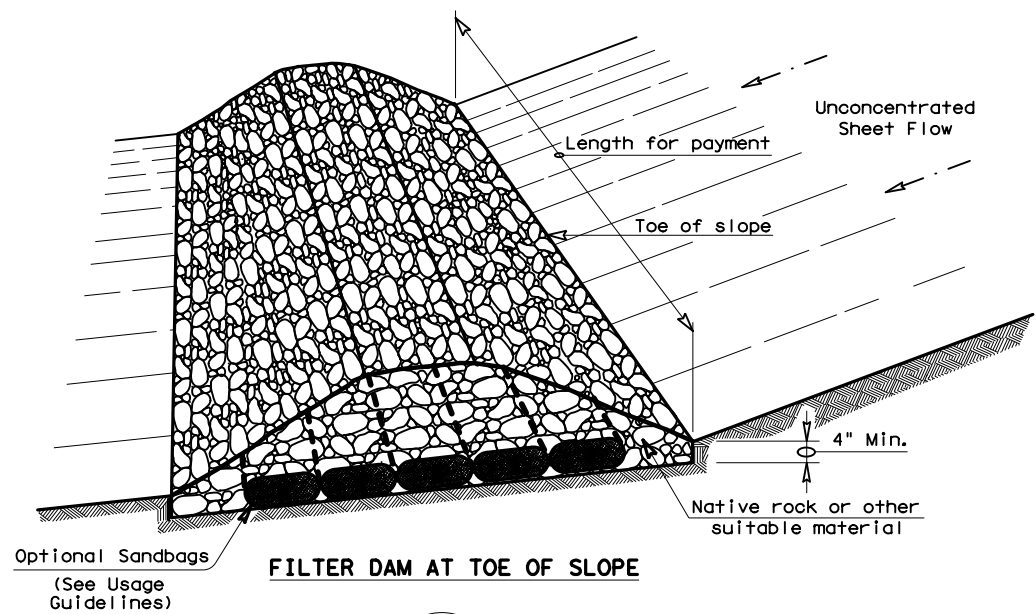


VERTICAL TRACKING

				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	0923	10	021	3RD ST	
	DIST	COUNTY		SHEET NO.	
	BWD	LAMPASAS		77	

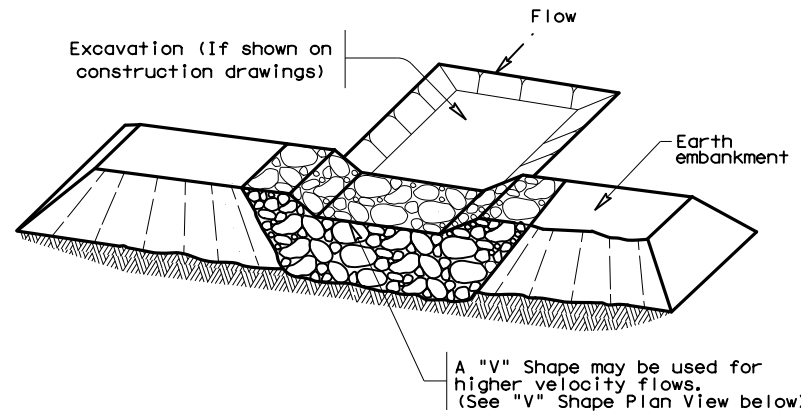
DISCLAIMER: The use of this standard is governed by the "Texas Engineering Practice Act". No warranty of any kind is made by TxDOT for any purpose whatsoever. TxDOT assumes no responsibility for the conversion of this standard to other formats or for incorrect results or damages resulting from its use.

DATE: 7/19/2024
 FILE: R:\1005000-1005999\1005472\03\04_DOCUMENTS\DESIGN\Plan_Set\10_Environmental\Standards\ec216.dgn



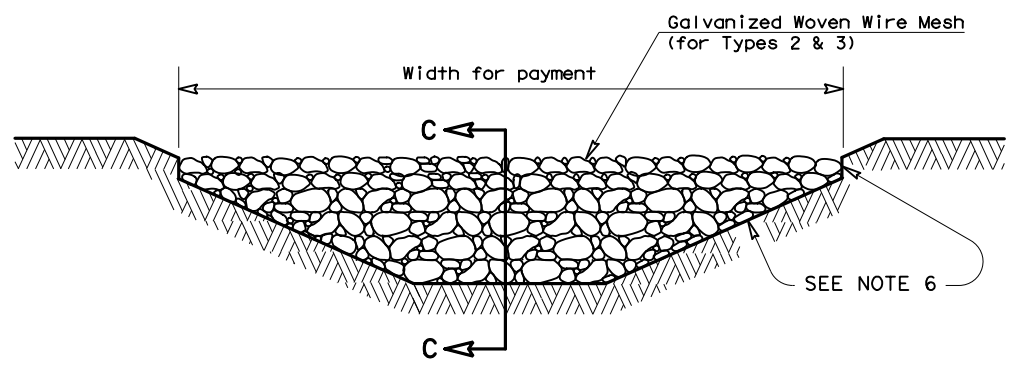
FILTER DAM AT TOE OF SLOPE

(RFD1)



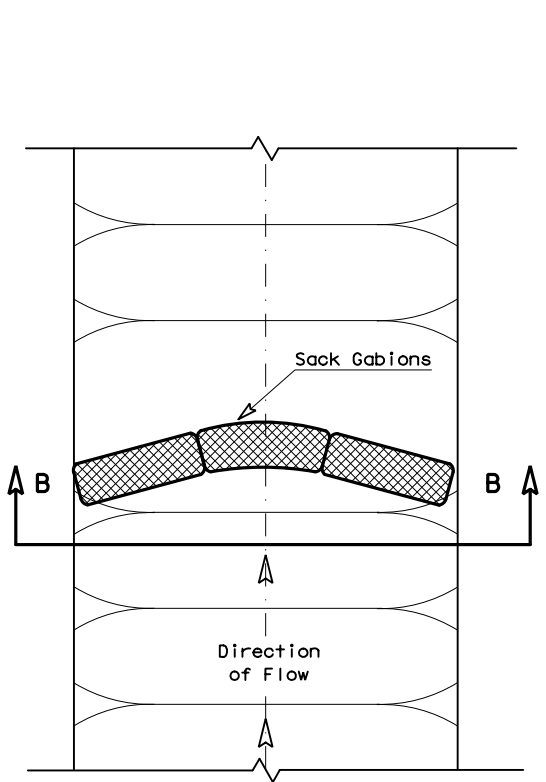
FILTER DAM AT SEDIMENT TRAP

(RFD1) OR (RFD2)

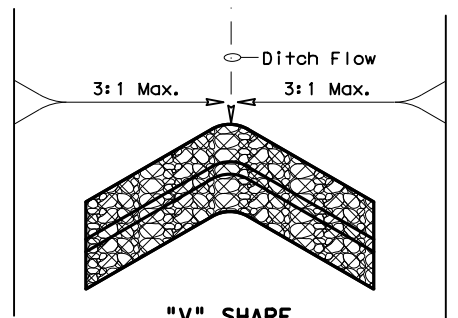


FILTER DAM AT CHANNEL SECTIONS

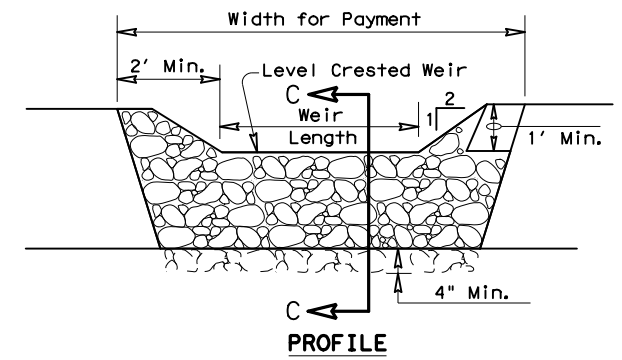
(RFD1) OR (RFD2) OR (RFD3)



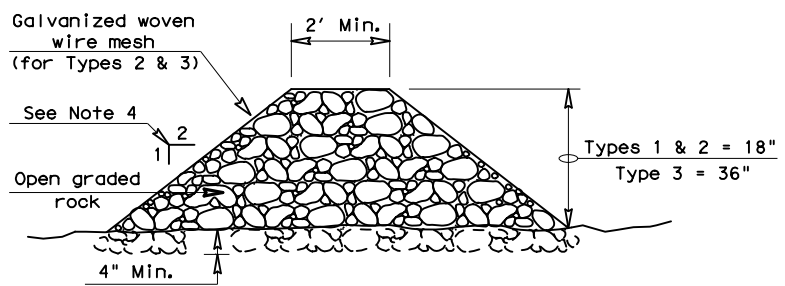
PLAN VIEW



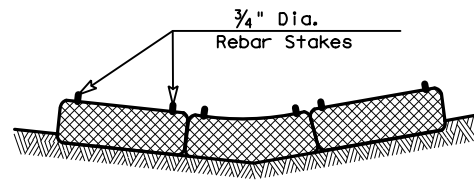
"V" SHAPE PLAN VIEW



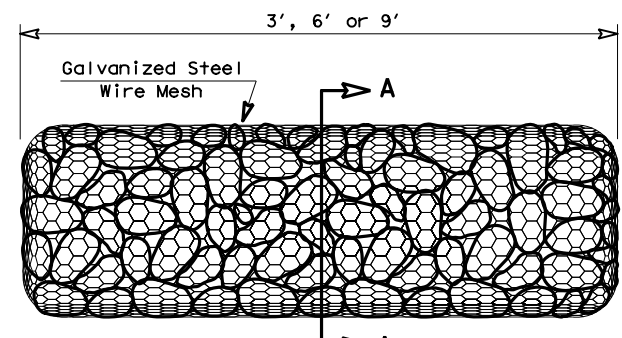
PROFILE



SECTION C-C

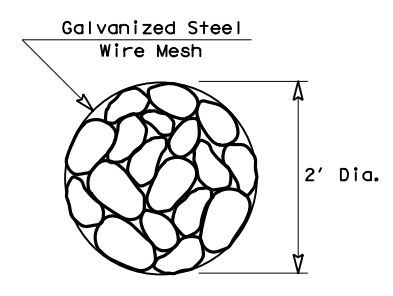


SECTION B-B



TYPE 4 (SACK GABIONS)

(RFD4)



SECTION A-A

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.

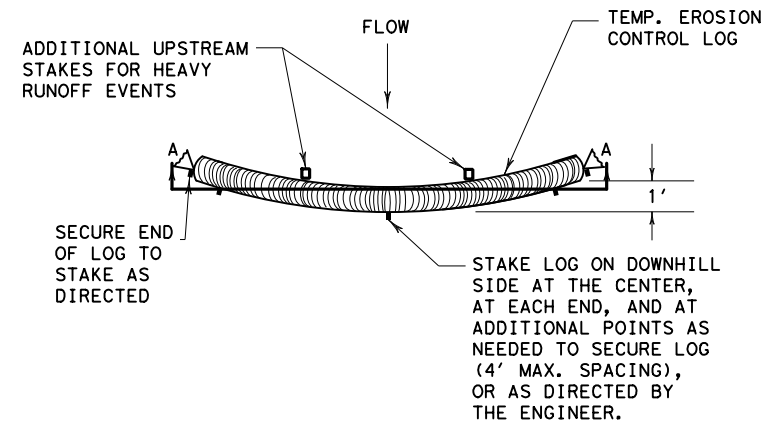
PLAN SHEET LEGEND

- Type 1 Rock Filter Dam (RFD1)
- Type 2 Rock Filter Dam (RFD2)
- Type 3 Rock Filter Dam (RFD3)
- Type 4 Rock Filter Dam (RFD4)

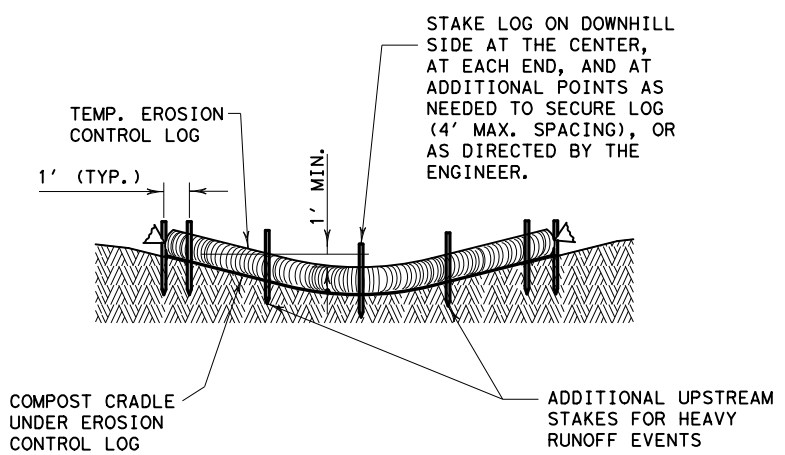
		Design Division Standard	
TEMPORARY EROSION, SEDIMENT AND WATER POLLUTION CONTROL MEASURES ROCK FILTER DAMS EC (2) - 16			
FILE: ec216	DN: TxDOT	CK: KM	DW: VP
© TxDOT: JULY 2016	CONT: 0923	SECT: 10	JOB: 021
REVISIONS	BWD	COUNTY: LAMPASAS	SHEET NO.: 78

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: 7/19/2024
 FILE: R:\1005000-1005999\1005472-03\04_DOCUMENTS\DESIGN\Plan_Set\10_Environmental\Standards\ec916.dgn

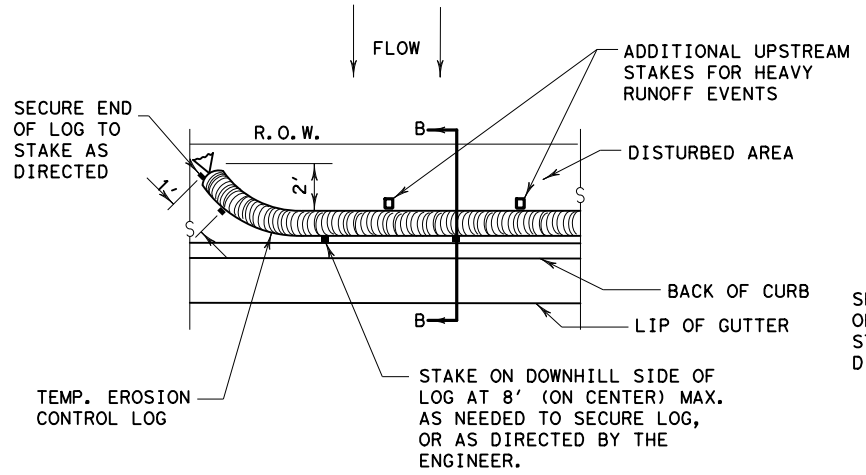


PLAN VIEW

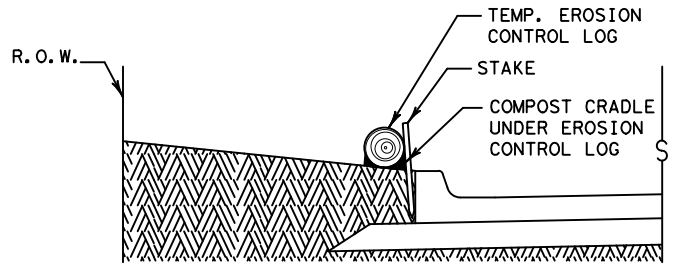


SECTION A-A
EROSION CONTROL LOG DAM

CL-D

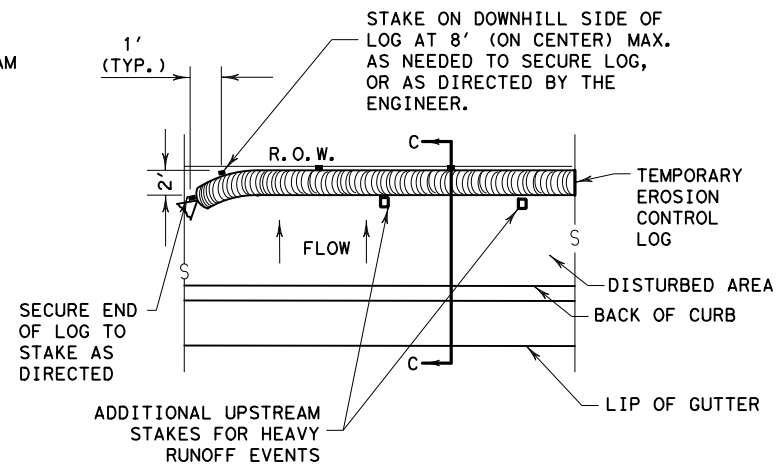


PLAN VIEW

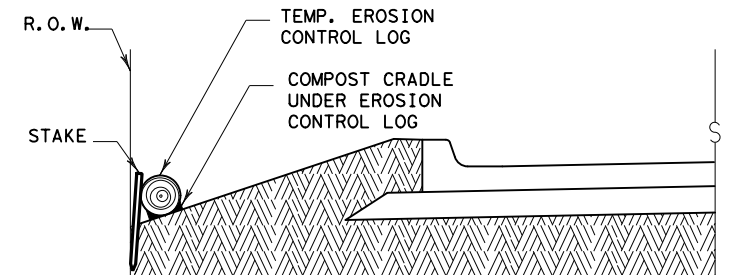


SECTION B-B
EROSION CONTROL LOG AT BACK OF CURB

CL-BOC



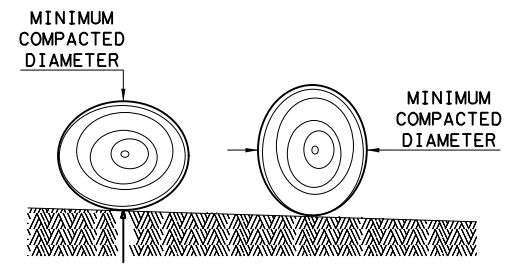
PLAN VIEW



SECTION C-C

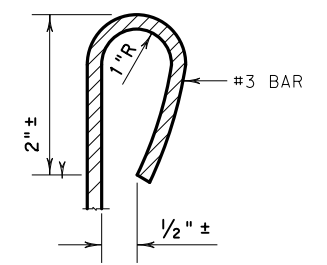
EROSION CONTROL LOG AT EDGE OF RIGHT-OF-WAY

CL-ROW



DIAMETER MEASUREMENTS OF EROSION CONTROL LOGS SPECIFIED IN PLANS

- LEGEND**
- CL-D EROSION CONTROL LOG DAM
 - CL-BOC EROSION CONTROL LOG AT BACK OF CURB
 - CL-ROW EROSION CONTROL LOG AT EDGE OF RIGHT-OF-WAY
 - CL-SST EROSION CONTROL LOGS ON SLOPES STAKE AND TRENCHING ANCHORING
 - CL-SSL EROSION CONTROL LOGS ON SLOPES STAKE AND LASHING ANCHORING
 - CL-DI EROSION CONTROL LOG AT DROP INLET
 - CL-CI EROSION CONTROL LOG AT CURB INLET
 - CL-GI EROSION CONTROL LOG AT CURB & GRATE INLET



REBAR STAKE DETAIL

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:

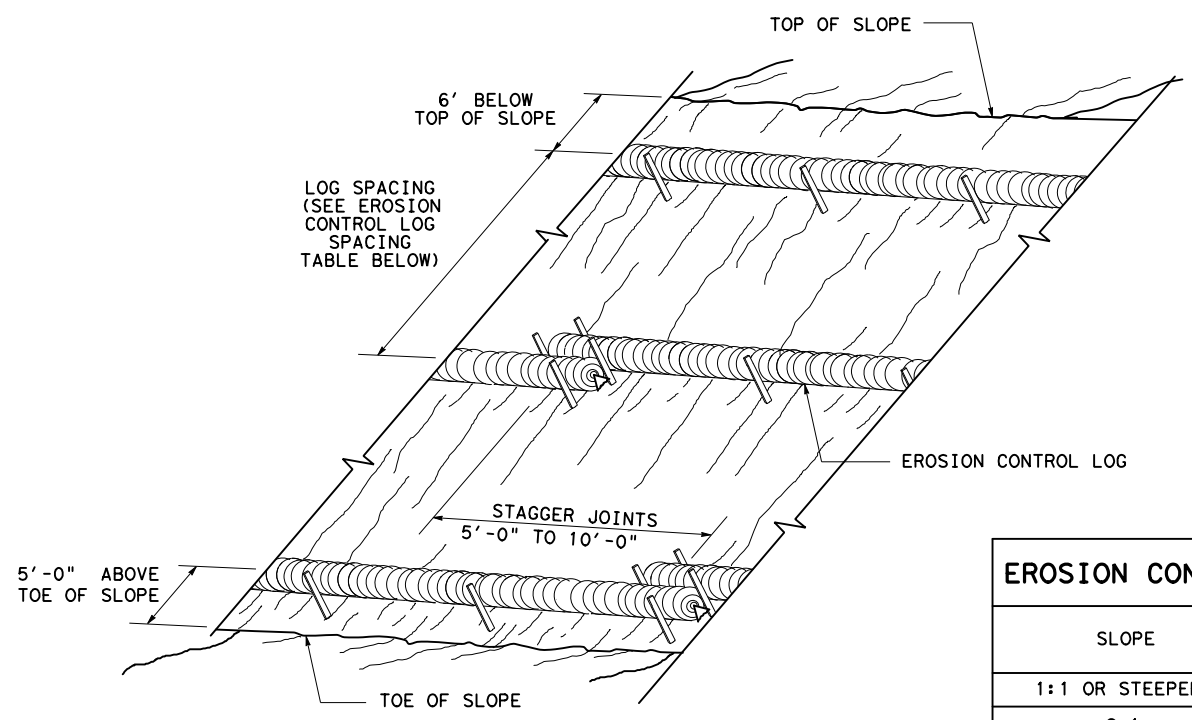
1. EROSION CONTROL LOGS SHALL BE INSTALLED IN ACCORDANCE WITH MANUFACTURER'S RECOMMENDATIONS, OR AS DIRECTED BY THE ENGINEER.
2. LENGTHS OF EROSION CONTROL LOGS SHALL BE IN ACCORDANCE WITH MANUFACTURER'S RECOMMENDATIONS AND AS REQUIRED FOR THE PURPOSE INTENDED.
3. UNLESS OTHERWISE DIRECTED, USE BIODEGRADABLE 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>	
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	0923	10	021
	DIST	COUNTY	SHEET NO.
	BWD	LAMPASAS	79

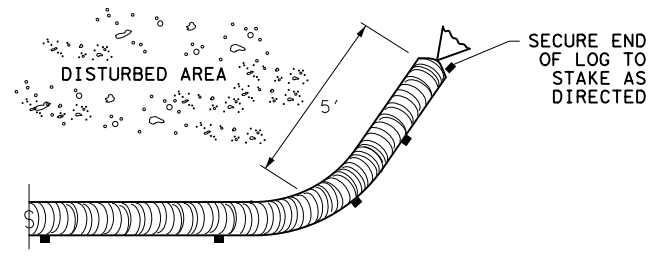
DISCLAIMER: The use of this standard is governed by the "Texas Engineering Practice Act". No warranty of any kind is made by TxDOT for any purpose whatsoever. TxDOT assumes no responsibility for the conversion of this standard to other formats or for incorrect results or damages resulting from its use.

DATE: 7/19/2024
 FILE: R:\1005000-1005999\1005472-03\04_DOCUMENTS\DESIGN\Plan_Set\10_Environmental\Standards\ec916.dgn



**EROSION CONTROL LOGS ON SLOPES
STAKE AND TRENCHING ANCHORING**

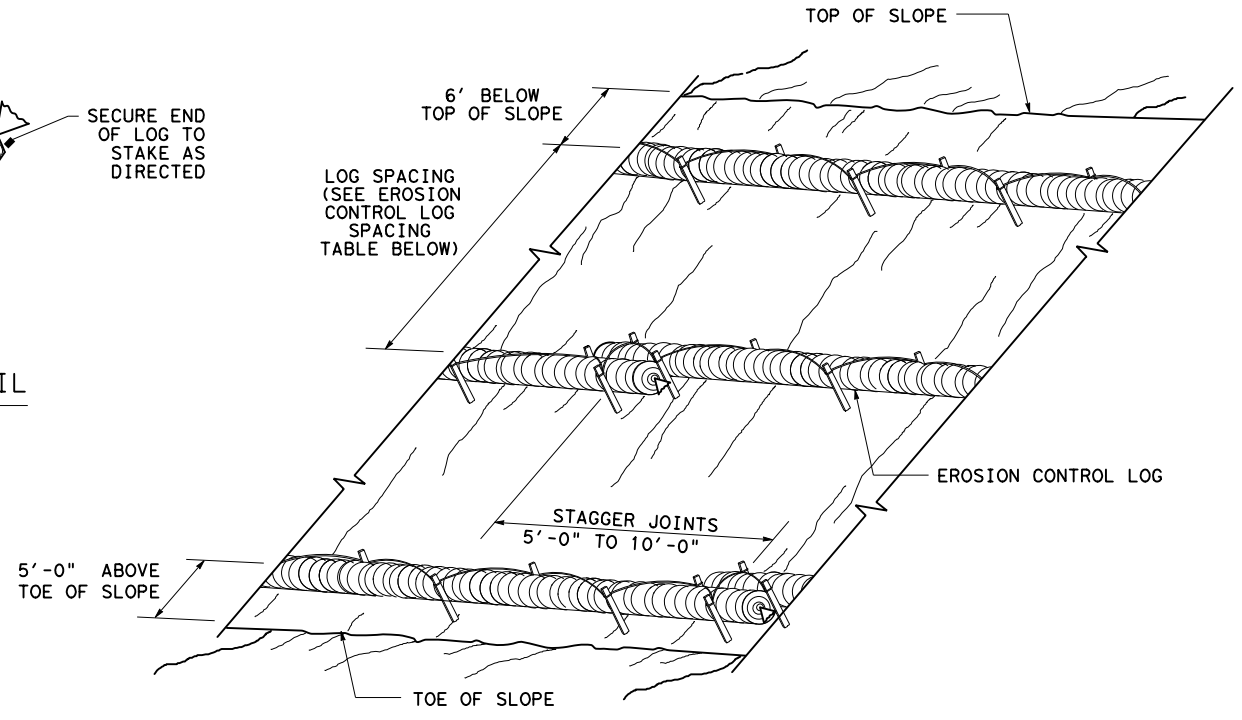
CL-SST



END SECTION RAP DETAIL

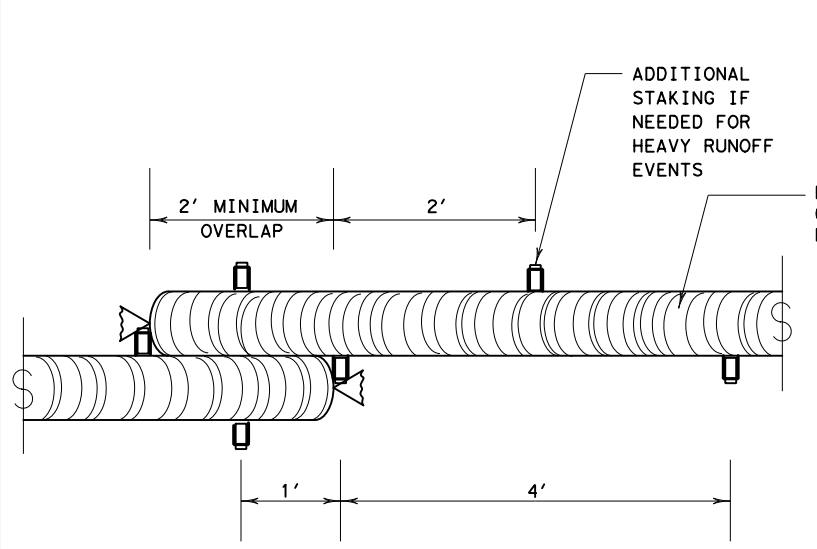
SLOPE	LOG DIAMETER			
	6"	8"	12"	18"
1:1 OR STEEPER	5'	10'	15'	20'
2:1	10'	20'	30'	40'
3:1	15'	30'	45'	60'
4:1 OR FLATTER	20'	40'	60'	80'

* ADJUSTMENTS CAN BE MADE FOR SOIL TYPE:
 SOFT, LOAMY SOILS-ADJUST ROWS CLOSER TOGETHER;
 HARD, ROCKY SOILS- ADJUST ROWS FARTHER APART



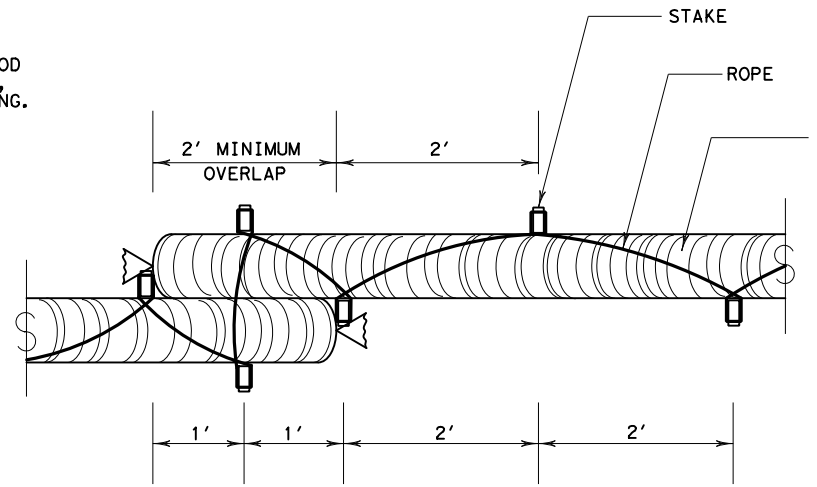
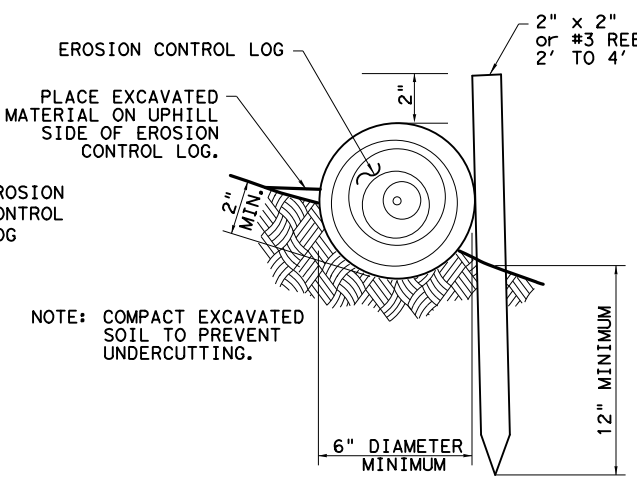
**EROSION CONTROL LOGS ON SLOPES
STAKE AND LASHING ANCHORING**

CL-SSL



STAKE AND TRENCHING ANCHORING DETAIL

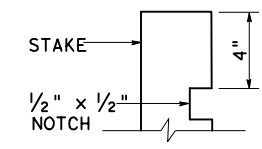
CL-SST



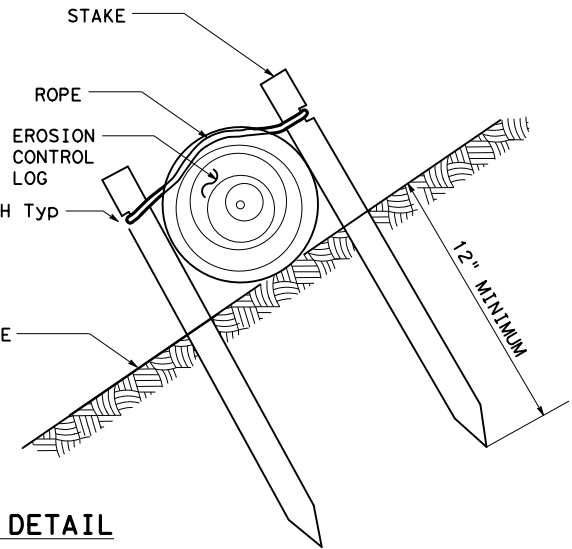
STAKE AND LASHING ANCHORING DETAIL

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	0923	10	021	3RD ST
DIST	COUNTY		SHEET NO.	
BWD	LAMPASAS		80	