

INDEX OF SHEETS

SHEET NO.	DESCRIPTION
1	TITLE SHEET
2	SUPPLEMENTAL INDEX OF SHEET

**STATE OF TEXAS
DEPARTMENT OF TRANSPORTATION**

**PLANS OF PROPOSED
STATE HIGHWAY IMPROVEMENT**

FEDERAL AID PROJECT BR 2023(449)

NET LENGTH OF ROADWAY= 300.00 FT.= 0.06 MI.
NET LENGTH OF BRIDGE = 70.00 FT.= 0.01 MI.
NET LENGTH OF PROJECT= 370.00 FT.= 0.07 MI.

**CSJ: 0910-12-139
VAN ZANDT COUNTY**

CR 1102 @ BUFFALO CREEK

PROJECT NO.			
BR 2023 (449)			
CONT	SECT	JOB	HIGHWAY
0910	12	139	CR 1102
DIST	COUNTY		SHEET NO.
TYLER	VAN ZANDT		1

DESIGN SPEED:
CR 1102 = MEET OR EXCEEDS
FUNCTIONAL CLASS: LOCAL ROAD

ADT:
CR 1102
EXIST: 76 (2020)
PROPOSED: 76 (2040)

FINAL PLANS

DATE CONTRACT LETTING: _____
DATE CONTRACTOR BEGAN WORK: _____
DATE WORK COMPLETED & ACCEPTED: _____
CONTRACTOR: _____
USED _____ OF _____ ALLOTTED DAYS _____
FINAL CONTRACT COST : \$ _____

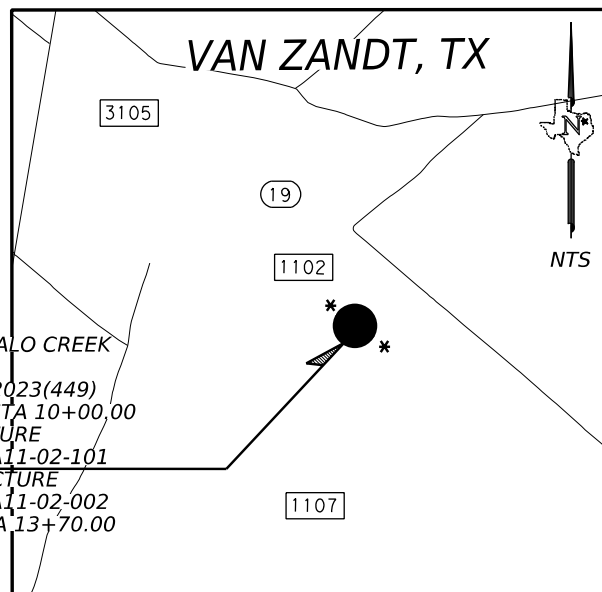
FINAL AS BUILT PLANS

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

DATE _____ AREA ENGINEER _____

FOR THE CONSTRUCTION OF THE REPLACEMENT
OF EXISTING BRIDGE FACILITY

CONSISTING OF REPLACING BRIDGE AND APPROACHES,
GRADING, ACP BASE & SURFACE, AND MBGF



CR 1102 AT BUFFALO CREEK
CSJ: 0910-12-139
PROJECT NO: BR 2023(449)
BEGIN PROJECT: STA 10+00.00
EXISTING STRUCTURE
NBI# 10-234-0-AA11-02-101
PROPOSED STRUCTURE
NBI# 10-234-0-AA11-02-002
END PROJECT: STA 13+70.00

EXCEPTIONS: NONE
EQUATIONS: N/A
RAILROAD: NONE

PREPARED BY: 5/17/2023

RICARDO A. PRIETO, P.E.
CONSOR ENGINEERS, LLC.
PROJECT MANAGER

* SIGN IN ACCORDANCE WITH THE
STANDARD BC SHEETS AND PART 6
OF THE TEXAS MANUAL ON UNIFORM
TRAFFIC CONTROL DEVICES.



F-12040

SPECIFICATIONS ADOPTED BY THE TEXAS DEPARTMENT OF TRANSPORTATION,
NOVEMBER 1, 2014 AND SPECIFICATION ITEMS LISTED AND DATED AS
FOLLOWS, SHALL GOVERN ON THIS PROJECT: REQUIRED CONTRACT PROVISIONS
FOR ALL FEDERAL-AID CONSTRUCTION CONTRACTS (FORM FHWA 1273, JULY 2022)

© 2023 by Texas Department of Transportation
ALL RIGHTS RESERVED



SUBMITTED 5/18/2023
FOR LETTING: _____

APPROVED 5/18/2023
FOR LETTING: _____

DocuSigned by:

ROLANDO MENDEZ
DISTRICT DESIGN ENGINEER

DocuSigned by:

RICARDO A. PRIETO
DISTRICT ENGINEER

CR
DW
CC
DW

INDEX OF SHEET

SHEET	DESCRIPTION	
	GENERAL	
1	TITLE SHEET	
2	SUPPLEMENTAL INDEX OF SHEET	
3	TYPICAL SECTIONS	
4, 4A-4F	GENERAL NOTES	
5-5A	ESTIMATE & QUANTITY SHEET	
6-8	QUANTITY SUMMARY SHEETS	
9	SUMMARY OF EARTHWORK	
	TRAFFIC CONTROL PLAN	
10	SEQUENCE OF CONSTRUCTION	
11	CR1102 TRAFFIC CONTROL PLAN	
	TRAFFIC CONTRL PLAN STANDARDS	
12-23	BC (1)-21 THRU BC (12)-21	
	ROADWAY	
24	SURVEY HORIZONTAL AND VERTICAL CONTROL	
25	CR 1102 SURVEY CONTROL LAYOUT	
26	CR 1102 AT BUFFALO CREEK ALIGNMENT DATA	
27	CR 1102 AT BUFFALO CREEK PLAN & PROFILE	
	ROADWAY STANDARDS	
28	BED-14	
29	GF (31)-19	
30-31	GF (31) RT TL3-20	
32	GF (31) MS-19	
33	TAU-11-R(N)-16	
34	QGUARD (M10)(N)-20	
35	QGELITE (M10)(N)-20	
36	CRASH CUSHION SUMMARY SHEET	
37	SGT (10S) 31-16	
38	SGT (11S) 31-18	
39	SGT (12S) 31-18	
40	SMTC (N)-16	
	RETAINING WALL	
41-42	CR 1102 RETAINING WALL LAYOUT	
43	SHEET PILE RETAINING WALL DETAILS	
44	SHEET PILING COPING DETAILS	
	RETAINING WALL STANDARDS	
45	SSPC	

DRAINAGE

46	VAN ZANDT COUNTY HYDRAULIC SUMMARY SHEET
47	CR 1102 OVERALL DRAINAGE AREA MAP
48	CR 1102 HYDROLOGIC DATA SHEET
49-50	CR 1102 HYDRAULIC CALCULATION DATA SHEET
51	CR 1102 SCOUR COMPUTATION SHEET

BRIDGE

52	CR 1102 BRIDGE LAYOUT
53	CR 1102 BORING LOGS
54	CR 1102 ESTIMATED QUANTITIES
55	CR 1102 FOUNDATION LAYOUT
56	CR 1102 BEARING SEAT ELEVATIONS
57-58	CR 1102 ABUTMENT NO.1

BRIDGE STANDARDS

59-61	AIG-24
62-63	CSAB
64-65	FD
66-67	IGSD-24
68-69	IGD
70-72	IGEB
73-74	IGMS
75	IGSK
76	IGTS
77-78	PCP (0)
79-80	PCP (0) - FAB
81-84	PCP
85	PCP - FAB
86	PSBEB
87-89	TYPE T223
90	SEJ-M
91-92	SIG-24
93-94	SRR

ENVIRONMENTAL

95	CR 1102 - ENVIRONMENTAL PERMITS, ISSUES AND COMMITMENTS
96-97	CR 1102 - STORMWATER POLLUTION PREVENTION PLAN (SW3P)
98	CR 1102 - SW3P LAYOUT

ENVIRONMENTAL STANDARDS

99	EC (1) - 16
100	EC (2) - 16

*THE STANDARD SHEETS SPECIFICALLY IDENTIFIED IN THIS SHEETS HAS BEEN ISSUED BY ME AND ARE APPLICABLE TO THIS PROJECT

NO.	DATE	REVISION	APPROV.

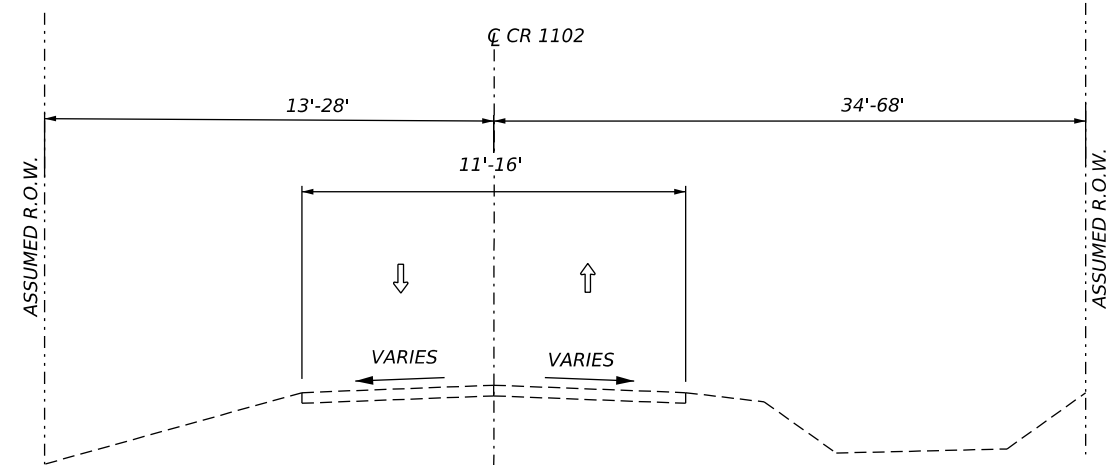
TYLER BRIDGE REPLACEMENTS

SUPPLEMENTAL INDEX OF SHEETS

SHEET 1 OF 1			
CONT	SECT	JOB	HIGHWAY
0910	12	139	CR 1102
DIST	COUNTY	SHEET NO.	
TYLER	VAN ZANDT	2	

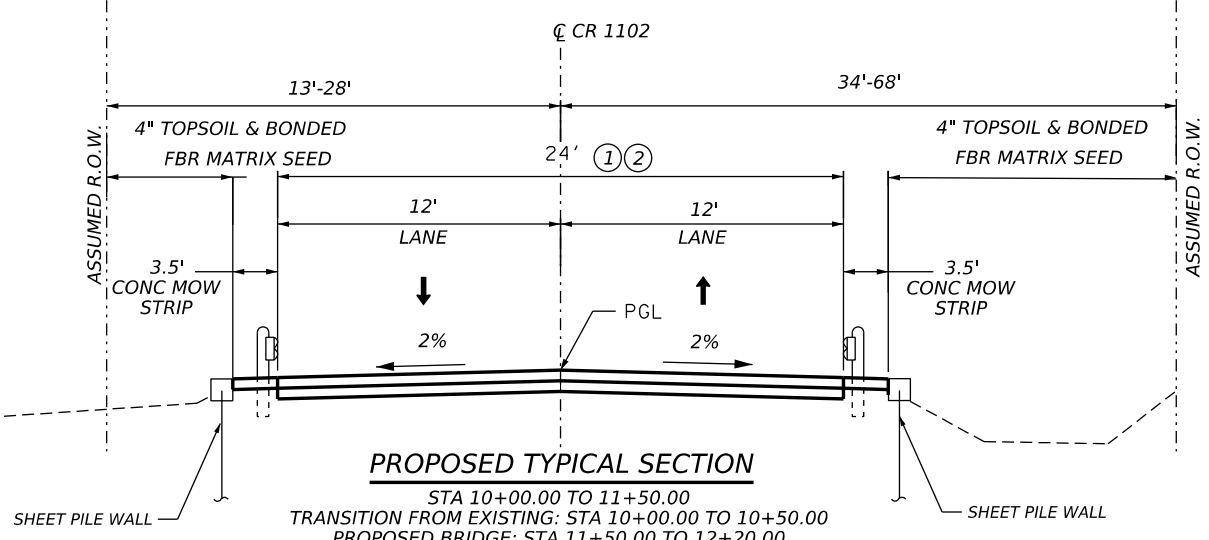
DATE: 5/16/2023 8:42:25 PM
FILE: c:\bms\pwe-useast-006\brian.martinez\dms671371c_139_s_gi001.dgn

CK:
DW:
CK:
DW:



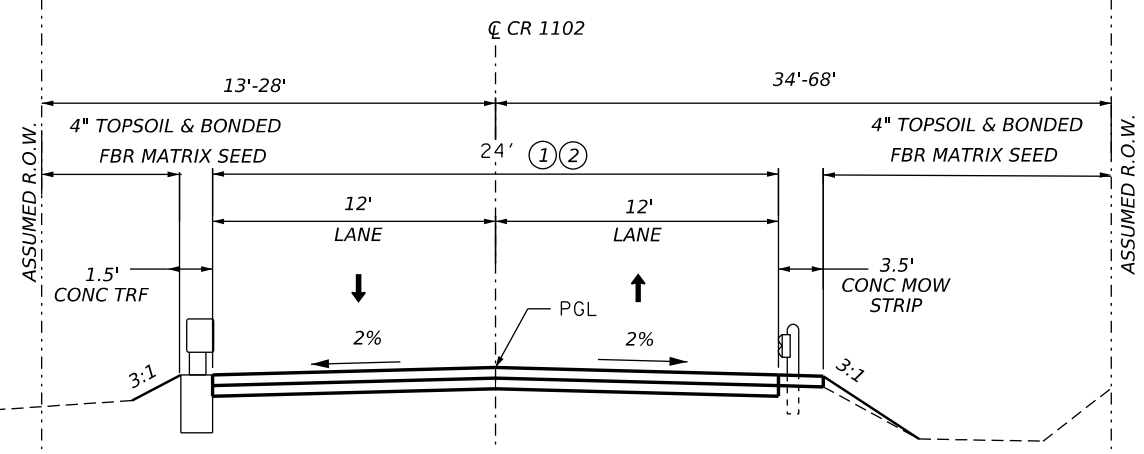
EXISTING TYPICAL SECTION

STA 10+00.00 TO 11+70.53
EXISTING BRIDGE: STA 11+70.53 TO 11+99.54
STA 11+99.54 TO 13+70.06



PROPOSED TYPICAL SECTION

STA 10+00.00 TO 11+50.00
TRANSITION FROM EXISTING: STA 10+00.00 TO 10+50.00
PROPOSED BRIDGE: STA 11+50.00 TO 12+20.00
* REFER TO CR 1102 PLAN & PROFILE FOR MBGF & RAIL LIMITS
* REFER TO RETAINING WALL LAYOUT FOR RETAINING WALL LIMITS



PROPOSED TYPICAL SECTION

PROPOSED BRIDGE: STA 11+50.00 TO 12+20.00
STA 12+20.00 TO 14+00.00
TRANSITION TO EXISTING: STA 13+50.00 TO 14+00.00
* REFER TO CR 1102 PLAN & PROFILE FOR MBGF & RAIL LIMITS
* REFER TO RETAINING WALL LAYOUT FOR RETAINING WALL LIMITS

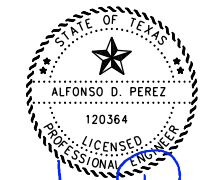
LEGEND

- ① 6" SUPERPAVE TY C
- ② 8" CEMENT TREAT EX. MATERIALS / EMBANKMENT
- ⇨ EXISTING TRAFFIC FLOW ARROW
- ⇨ PROPOSED TRAFFIC FLOW ARROW

NOTES:

1. SEE BRIDGE LAYOUT SHEET FOR EXACT BRIDGE TYPICAL SECTIONS.
2. SEE PLAN & PROFILE SHEET FOR TAPER LOCATIONS AND LIMITS OF GUARD FENCE.
3. STOCKPILE AND REUSE EXISTING TOPSOIL INSIDE RIGHT OF WAY.
4. AT GUARD FENCE LOCATIONS SEE STD. GF (31) MS-19.

SCALE = N.T.S.



Alfonso D. Perez 5/16/2023

NO.	DATE	REVISION	APPROV.



TYLER BRIDGE REPLACEMENTS

CR 1102
AT BUFFALO CREEK

TYPICAL SECTION

SHEET 1 OF 1

CONT	SECT	JOB	HIGHWAY
0910	12	139	CR 1102
DIST	COUNTY	SHEET NO.	
TYLER	VAN ZANDT	3	

DATE: 5/16/2023 8:42:41 PM
FILE: c:\bms\pwe-useast-006\brian.martinez\dms67143\C_139_S_RTS01_A.dgn

GENERAL NOTES:

GENERAL.

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

Lance Pomykal Lance.Pomykal@txdot.gov

Josh Fulton Josh.Fulton@txdot.gov

COMMISSIONER CONTACT INFORMATION:

PCT 1 Chad LaPrade claprade@vanzandtcounty.org

PCT 2 Virgil Melton, Jr. vmelton@vanzandtcounty.org

PCT 3 Keith Pearson kpearson@vanzandtcounty.org

PCT 4 Brandon Barton bbarton@vanzandtcounty.org

For Q&A on Proposals navigate to:

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

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

All relevant project documentation including CTDs and cross sections will still be posted to the districts FTP website.

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

Perform work as necessary off the right of way on temporary construction easements for driveway construction. All work performed in these areas will be paid for under the pertinent bid items of the Contract.

Do not haul with loaded scrapers on the surfaced areas of any highway except as approved.

Remove all vegetation from pavement edges, intersections, and driveways prior to planing operations, seal coat, or ACP operations. This work will not be paid for directly, but will be subsidiary to the bid items of the Contract.

ATTN: Provide a 20-ft. length per 1-in. depth temporary taper at all transverse joints in the travel lane before opening to traffic. This work will not be paid for directly, but will be subsidiary to the bid items of the Contract.

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

PROJECT MOWING

Mow the highway right of way in the project limits a maximum of 2 cycles per year, as directed. Mowing will not be measured or paid for directly, but will be subsidiary to pertinent Items.

Provide approved mowing equipment capable of mowing on slopes without unduly marring finished slope surfaces or damaging existing growth. The minimum cutting width should not be less than 5 ft. unless otherwise approved.

Mow all areas of existing vegetation and vegetation placed during the project, as directed. The mowing height should be 5 in. unless otherwise directed. Repair portions of sod or grass which are damaged during mowing operations in an acceptable manner.

Mow as close as possible to all fixed objects, exercising extreme care not to damage trees, plants, shrubs, signs, delineators or other appurtenances which are part of the facility. Hand trim around such objects, unless otherwise specified.

Use safety chains or other manufacturer’s safety devices to prevent injury to people or damage to property caused by flying debris propelled out from under rotary mowers. Chains should be a minimum size of 5/16 in. and links spaced side by side around the front, sides and rear of mower. When mowing at the specified cutting height, the chains should be long enough to drag the ground. If at any time it is determined that mowing or trimming equipment is defective to the point that it may affect the quality of work or create unsafe conditions, then immediately repair or replace the equipment.

LITTER PICKUP

Remove litter from the right of way in the project limits a maximum of 3 cycles per year as directed. Litter pickup will not be measured or paid for directly, but will be subsidiary to pertinent Items.

Equipment used for litter pickup must be approved.

Collect and properly dispose of all litter deposited by construction operations or the traveling public from within the right of way as directed. This includes cans, bottles, paper, plastic items, metal scraps, lumber, etc. Do not dump or stockpile collected litter on Department property.

ITEM 4. SCOPE OF WORK

Upon completion of the work and before final acceptance, remove all foreign material, stains, and marks from concrete surfaces. Sandblast clean concrete surfaces as directed. Clean existing concrete structures that are marked or stained by the Contractor's operations. This work will not be paid for directly, but will be subsidiary to the bid items of the Contract.

During final clean up, remove all foreign material that has accumulated at bridge abutments and bent caps as approved. All work and equipment involved in the removal of this material is subsidiary to the bid items of the Contract.

ITEM 5. CONTROL OF THE WORK

If utility lines need adjustments during construction operations, modify operations and continue the work in a manner that will allow others to make the utility adjustments. Additional working time may be allowed for delays caused by these utility adjustments.

Place and maintain construction hubs near the right of way line in accordance with Article 5.9., "Construction Surveying" on both sides of the roadway until the final item of work is complete.

Establish proposed centerlines throughout the project from control points and alignment data as shown on the plans.

Use "Method C" for construction surveying in accordance with Section 5.9.3.

Refer to the horizontal and vertical alignment data summaries for satellite-control point information.

Maintain and re-establish the centerline stations throughout each project as required for each phase of work.

Utility locations shown on the plans are approximate. Contact utilities in accordance with Article 5.6., "Cooperating With Utilities."

Verify survey control for accuracy before beginning construction.

Notify the Engineer if there are conflicts with survey control accuracy.

"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

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

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

The Buy America Material Classification Sheet is located at the link below:

<https://www.txdot.gov/business/resources/materials/buy-america-material-classification-sheet.html>

ITEM 7. LEGAL RELATIONS AND RESPONSIBILITIES

Do not initiate activities in a project specific location (PSL) associated with a U.S. Army Corps of Engineers (COE) permit area that has not been previously evaluated by the COE as part of the permit review of this project. Such activities include haul roads, equipment staging areas, borrow pits, and disposal sites. "Associated," defined here, means "materials are delivered to or from the PSL." The permit area includes all waters of the U.S. or associated wetlands affected by activities associated with this project. Special restrictions may be required for this work. The Contractor is responsible for all consultations with the COE regarding activities (including PSL) that have not been previously evaluated by the COE. Provide the Department with a copy of all consultations or approvals from the COE before initiating activities.

Proceed with activities in PSL that do not affect a COE permit area if Contractor determines that the PSL is non-jurisdictional or proper COE clearances have been obtained in jurisdictional areas or have been previously evaluated by the COE as part of the permit review of this project. The Contractor is responsible for documenting his determination that his activities do not affect a COE permit area. Maintain copies of determination for review by the Department or any regulatory agency.

Placement of any fill material within the channel is not allowed. A temporary crossing must clear span from channel bank to channel bank.

Project Number:

Sheet 4B

County: Van Zandt

Control: 0910-12-139

Highway: CR 1102

Maintain positive drainage for permanent and temporary work for the duration of the project. The Contractor will be responsible for any items associated with the temporary or interim drainage and all related maintenance. This work will be subsidiary to various bid items.

The total disturbed area for this project is 0.99 acres. The disturbed area in this project and the Contractor Project Specific Locations (PSL's) within 1 mile of the project limits for the Contract will further establish the authorization requirements for storm water discharges. The Department will obtain an authorization to discharge storm water from the Texas Commission on Environmental Quality (TCEQ) for the construction activities shown on the plans. Obtain any required authorization from the TCEQ for any Contractor PSL for construction support activities on or off the ROW. When the total area disturbed for all projects in the Contract and PSLs within 1 mile of the project limits exceed 5 acres, before disturbance, provide a copy of the Contractor NOI for PSLs on the ROW and within 1 mile of the project limits to the Engineer and to any local government that operates a Municipal Separate Storm Sewer System (MSSS).

In accordance with Article 7.9, provide and maintain adequate, neat and sanitary toilet accommodations within the project limits for employees, including State employees.

No significant traffic generator events identified.

ITEM 8. PROSECUTION AND PROGRESS

Prepare the progress schedule as a bar chart.

ITEM 9. MEASUREMENT & PAYMENT

In accordance with Article 9.1., "Measurement of Quantities," furnish the tare and maximum gross weights as well as the volume capacity of all vehicles, trucks, truck-tractors, trailers, semi-trailers, or combination of such vehicles used to deliver materials for this Contract. Also, furnish calculations supporting these weights and capacities. Provide all measurements required for pay a minimum of 2 days before the trucks are used.

ITEM 100. PREPARING RIGHT OF WAY

Perform work as necessary off the right of way on temporary or drainage easements and at those locations where improvements have been taken or partially taken by right of way acquisition. Review these locations with the Area Engineer. The cost of this work will be included in the unit price bid for this Item.

Burning will not be permitted within the right-of-way.

Project Number:

Sheet 4B

County: Van Zandt

Control: 0910-12-139

Highway: CR 1102

ITEMS 110 & 132. EXCAVATION & EMBANKMENT

Before Contract letting, prospective bidders may review the earthwork cross-sections at the Area Engineer's office. The computer data is for non-construction purposes only and is the prospective bidder's responsibility to validate the data with the accompanying plans, specifications, and estimates for this Contract.

Excavation and embankment for driveways, intersections, mailbox turnouts and crossovers will not be paid for directly, but will be subsidiary to the various bid items unless otherwise shown on the plans.

In a cut section, if the soil encountered in the subgrade is unsuitable for reasons other than excess moisture, this material will be declared "waste" and the Contractor will be required to undercut for a minimum depth of 1 ft. and a maximum depth as determined and replaced with a material having a plasticity index of 6 to 18. This required undercutting will be paid for under Item 110, "Excavation."

When excavation is required to adjust stream flow lines at culvert ends, flatten the side slopes of channels and the backslopes of parallel ditches to the maximum extent possible within the existing right of way and channel easements.

ITEM 132. EMBANKMENT

Furnish Type C embankment consisting of suitable earth material (rock, loam, clay, or other approved materials) that will form a stable embankment. The top 2 ft. of embankment material should have a plasticity index between 6 and 18.

Test borrow sources and furnish results to the Engineer for select embankment, the Engineer will then run confirmation testing.

ITEM 150. BLADING

Any required mowing and pulverizing before blading will not be paid for directly, but will be subsidiary to Item 150.

Use blading to finish slopes after placement of the ACP surface and use blading to reshape unimproved driveways as directed.

Compact blading material as directed.

ITEM 164. SEEDING FOR EROSION CONTROL

Mow tall vegetation prior to placement of erosion control measures in order to provide optimal growing conditions. This work will not be paid for directly, but will be subsidiary to the bid items of the Contract.

The season and seed mixture for “Broadcast Seeding (Temporary Erosion Control) (Cool Season)” and “Broadcast Seeding (Temporary Erosion Control) (Warm Season)” is specified below:

- Cool Season - September 1 thru November 30
- Warm Season - May 15 thru August 31

Permanent Planting Mixture	
Species and Rates	
(lb. PLS/ac.)	
(Season: February 1 to May 15)	
Green Sprangletop	0.5
Bermudagrass	5.0
Weeping Lovegrass (Ermelo)	0.5
Sand Lovegrass	0.5
Lance-Leaf Coreopsis	1.0
(Season: September 1 to February 1)	
Bermuda (unhulled)	12
Crimson Clover	10

Temporary Seeding for Erosion Control	
Warm Season	
(Season: May 15 to August 31)	
Bermudagrass	10
Foxtail Millet	30
Cool Season	
(Season: September 1 to November 30)	
Tall Fescue	4.5
Oats	24
Wheat	34

Place topsoil before temporary seeding unless otherwise directed.

Do not use Bahiagrass.

Use additional temporary seeding if permanent seeding is placed outside the optimum growing season shown for this Item as directed.

Provide a Bonded Fiber Matrix that meets the current requirements of the Approved Products List for Item 169, “Soil Retention Blanket, Class 1, Type D, Spray Type Blanket,” for both permanent and temporary seeding. Install according to manufacturer’s recommendations based on a slope steeper than 3:1 with sandy soils. This Item will be paid for under Item 164.

ITEM 166. FERTILIZER

Place fertilizer at the rate of 1 lb. per 9 sq. yd. on areas prepared for seeding.

Project Number:

Sheet 4D

County: Van Zandt

Control: 0910-12-139

Highway: CR 1102

ITEM 168. VEGETATIVE WATERING

Apply water to all newly placed sod or seeded areas the same day of installation. Maintain the sod or seeded areas in a sufficiently watered condition. Do not allow sod or seeded areas to dry out so that water stress is evident.

ITEM 204. SPRINKLING

Apply water for dust control as directed. When dust control is not being maintained, cease operations until proper resources have been utilized to adequately minimize dust during earthwork, base construction. This Item will not be paid directly, but will be subsidiary to pertinent Items.

ITEM 416. DRILLED SHAFT FOUNDATIONS

Collect all cuttings, spoils, and slurry resulting from drilled shaft operations and deposit material into a storage tank for disposal outside the limits of the project. Dispose of waste material in accordance with Section 416.3.7., "Additional Requirements for Slurry Displacement or Underwater Concrete Placement Methods."

ITEMS 420 & 427. CONCRETE SUBSTRUCTURES & SURFACE FINISHES FOR CONCRETE

Do not use membrane curing for structural elements.

Provide an ordinary surface finish to the following elements: Surface Area II.

ITEM 421. HYDRAULIC CEMENT CONCRETE

The Engineer will provide strength-testing equipment.

Provide the Engineer with a mixture design report using Department-provided software in accordance with Section 421.4.1., "Classification of Concrete Mix Designs," of the standard specifications. Include in the report the producer's plant, all materials sources, and a unique identification number for the design.

Air is not required on concrete cast-in-place elements on this project. If the Contractor proposes the use of an existing concrete design containing air, the Engineer must approve the design in writing before placement. If used, air testing will be performed in accordance with the specifications.

Project Number:

Sheet 4D

County: Van Zandt

Control: 0910-12-139

Highway: CR 1102

ITEM 422. CONCRETE SUPERSTRUCTURES

Once bridge beams/girders are in place, provide the Engineer in an acceptable electronic format, finished slab elevations, bottom of slab elevations with and without deflection, beam/girder field shot profiles, and the required calculated grading for the panels or PMD forms if used. Include elevations on each beam/girder across each span at 1/4, 1/2, and 3/4 points as well as at the beginning and ending of each span. Depending on conditions the Engineer may require each beam/girder edge to be included. Provide this information to the Engineer a minimum of 7 days prior to placing bridge slab concrete. Costs associated with this work will be subsidiary to pertinent Items.

ITEM 427. SURFACE FINISHES FOR CONCRETE

Provide a rub finish for Surface Area II.

ITEM 432. RIPRAP

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

ITEM 496. REMOVING STRUCTURES

All materials removed under this Item are the property of the Contractor.

Old timber becomes the property of the Contractor to dispose of off the right of way in a manner satisfactory to the Engineer. Furnish evidence of concurrence by the owner of the disposal site.

ITEM 502. BARRICADES, SIGNS, AND TRAFFIC HANDLING

The traffic control plan for this Contract consists of: the installation and maintenance of warning signs and other traffic control devices shown on the plans; specification data, which may be included in the general notes; applicable provisions of the Texas Manual on Uniform Traffic Control Devices (TMUTCD); traffic control plan sheets included on the plans; standard BC sheets; Compliant Work Zone Traffic Control Device List, and Item 502 of the standard specifications.

Use ground-mounted sign mounts with two posts for all temporary work zone signs unless otherwise directed.

Inspect and correct deficiencies each day throughout the duration of the Contract. In accordance with Article 502.4., "Payment," no payment will be made for the month if the Contractor fails to provide or properly maintain signs and devices in compliance with Contract requirements.

County: Van Zandt**Control:** 0910-12-139**Highway:** CR 1102

Temporary warning signs that are visible when conditions do not apply will be considered improper maintenance of signs.

Provide at least one employee on call nights and weekends (or any other time that work is not in progress) for maintenance of signs and traffic control devices. This employee must have an address and telephone number near the project, as approved. Notify the Engineer in writing of the name, address, and telephone number of this employee. The Engineer will furnish this information to local law enforcement officials.

In addition to providing a Contractor's Responsible Person and a phone number for emergency contact, have an employee available to respond on the project for emergencies and for taking corrective measures within 30 minutes.

Sign all roads intersecting the project in accordance with current BC standards.

Refer to the traffic control plan sheets for traffic handling through the work area. Contractor may vary the signing arrangement and spacing as necessary to fit field conditions; however, any proposed changes in the traffic control plan must be approved before implementation.

When the sequence of work is shown on the plans, the Contractor may submit an alternate proposal for approval. Submit in writing all proposed variations and revisions.

High-visibility safety apparel is required for workers in accordance with the General Notes on current BC standards.

Place and maintain signs, channelizing devices, and flaggers to direct and route traffic at any location and for any period of time as may be required or directed.

Unless otherwise approved, construction operations will not be allowed on Good Friday, Easter weekend, the Friday before Memorial Day thru Memorial Day, July 4th, the Friday before Labor Day thru Labor Day, the Wednesday before Thanksgiving Day thru Sunday, Christmas Eve, Christmas Day, New Year's Eve, New Year's Day, or on any other high traffic days or holidays as determined by the Engineer.

Maintain existing roadside signs within this project's limits during this Contract. In order to accommodate the grading or other operations, temporarily relocate these signs in accordance with the TMUTCD as directed. Use ground-mounted sign mounts with two posts for all relocated signs unless otherwise directed. This work will not be paid for directly, but will be subsidiary to Item 502.

Provide truck-mounted attenuators (TMA) as shown on the appropriate traffic control plan sheets. Provide a letter certifying that all TMA used on this project meet NCHRP 350 or AASHTO Manual for Assessing Safety Hardware (MASH) requirements.

County: Van Zandt**Control:** 0910-12-139**Highway:** CR 1102

Regulate all construction activities and equipment to minimize inconvenience to the traveling public. At points where it is necessary for trucks to stop, load, or unload, provide warning signs and flaggers to protect the traveling public.

The Contractor Force Account "Safety Contingency" is intended to be used for work zone enhancements that could not be foreseen in the project planning and design stage for the purpose of improving the effectiveness of the Traffic Control Plan. 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 work required by these general notes, except as provided for by Item 502, will not be paid for directly, but will be subsidiary to Item 502 unless otherwise shown on the plans.

ITEM 504. FIELD OFFICE AND LABORATORY

Provide a facility at the asphalt concrete pavement plant for use by the Engineer as a laboratory. This is an existing requirement of Item 6, Article 5, "Plant Inspection and Testing," of the Standard Specifications. Provide a facility meeting the requirements of Item 504. At a minimum meet the requirements of 504.2.2.4, "Ty D Structure (Asphalt Mix Control Laboratory)" and 504.2.2.4.1, "Asphalt Content by Ignition Method." In addition, provide the following: At least one exterior door opening with a 48-in. minimum width. If steps are required to gain access to the facility's 48-in. door, provide a landing dock with minimum dimensions of 60 in. wide by 60 in. deep. The strong floor and landing of the facility should support the weight of all equipment and personnel providing a stable, essentially zero deflection during testing operations, acceptable to the Engineer. This facility will be required of all projects with plant produced asphalt concrete pavement.

No direct payment will be made for Engineer field labs. All construction, maintenance, utilities, custodial services, security, and permits necessary to establish and maintain readiness of this facility is the responsibility of the Contractor. This building/facility is required by the standard specifications and is considered a standard part of any asphalt concrete pavement plant producing materials for Department projects.

Furnish a Superpave Gyratory Compactor calibrated in accordance with Tex-241-F for molding production samples. The Superpave Gyratory Compactor will not be paid for directly, but will be subsidiary to the asphalt concrete pavement Items of work.

Project Number:

Sheet 4F

County: Van Zandt

Control: 0910-12-139

Highway: CR 1102

ITEM 506. TEMPORARY EROSION, SEDIMENTATION, AND ENVIRONMENTAL CONTROLS

Remove dirt, silt, rocks, debris, and other foreign matter that accumulates in all structures due to project erosion and Contractor's operations. Keep stream channels open at all times. This work will not be paid for directly, but will be subsidiary to this Item.

The total disturbed area for this project is 0.99 acres. The disturbed area in this project, all project locations in the Contract, and Contractor project specific locations (PSLs) within 1 mile of the project limits for the Contract, will further establish the authorization requirements for storm water discharges. The Department will obtain an authorization to discharge storm water from the Texas Commission on Environmental Quality (TCEQ) for the construction activities shown on the plans. Obtain any required authorization from the TCEQ for any Contractor PSLs for the construction support activities on or off right of way. When the total area disturbed for all projects in the Contract and PSLs within 1 mile of the project limits exceeds 5 acres, before disturbance, provide a copy of the Contractor NOI for PSLs on the right of way to the Engineer (to the appropriate MS4 operator when on an off-State system route).

The Engineer will provide copies of documents to meet TxDOT's posting requirements. Laminate, post, and maintain these documents at the project limits and at major roadways intersecting the project as directed. Post required Contractor documents in the same manner and location. This work will be subsidiary to Item 506.

ITEM 540. METAL BEAM GUARD FENCE

All work involved in placement of timber posts in soil cement riprap must be included in the price bid for Item 540.

Do not paint treated timber posts.

Use round wood posts on all metal beam guard fence except where steel posts are required in accordance with "Low Fill Culvert Post Mounting" details shown on standard sheet MBGF.

ITEM 545. CRASH CUSHION ATTENUATORS

Provide crash cushion attenuators meeting TL-3 requirements.

ITEM 585. RIDE QUALITY FOR PAVEMENT SURFACES

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

Project Number:

Sheet 4F

County: Van Zandt

Control: 0910-12-139

Highway: CR 1102

ITEM 658. DELINEATOR AND OBJECT MARKER ASSEMBLIES

Accept ownership of unsalvageable delineator and object marker assemblies and remove from the right of way.

For materials paid for by the ton, provide a summary spreadsheet in accordance with Article 520.2., "Equipment."

All RAP used on this project must be fractionated. If an existing mix design is submitted for use as Warm Mix Asphalt (WMA), then a new trial batch with passing Hamburg Wheel test results is required.

ITEM 3076. DENSE-GRADED HOT-MIX ASPHALT

Target laboratory molded density is 97%.

Provide coarse aggregate for the final surface course from the same source or blended sources unless otherwise directed.

Give the TxDOT inspector at the spreading and finishing machine one weight ticket for each load of material. When directed, weigh asphaltic concrete loads on public scales to ensure the proper weight of material.

Apply a tack coat with a rate of 0.10 gal/sy of residual asphalt between each layer of ACP pavement unless otherwise directed.

ITEM 6001. PORTABLE CHANGEABLE MESSAGE SIGN

Provide a non-erodible, stable surface to place the Portable Changeable Message Sign (PCMS) units adjacent to the roadway as directed. Payment for this surface is incidental to Item 6001.



Estimate & Quantity Sheet

CONTROLLING PROJECT ID 0910-12-139

DISTRICT Tyler
HIGHWAY CR 1102

COUNTY Van Zandt

CONTROL SECTION JOB				0910-12-139		TOTAL EST.	TOTAL FINAL
PROJECT ID				A00140528			
COUNTY				Van Zandt			
HIGHWAY				CR 1102			
ALT	BID CODE	DESCRIPTION	UNIT	EST.	FINAL		
	100-6002	PREPARING ROW	STA	5.000		5.000	
	110-6001	EXCAVATION (ROADWAY)	CY	27.000		27.000	
	110-6002	EXCAVATION (CHANNEL)	CY	813.000		813.000	
	132-6005	EMBANKMENT (FINAL)(ORD COMP)(TY C)	CY	211.000		211.000	
	150-6001	BLADING	STA	0.500		0.500	
	160-6003	FURNISHING AND PLACING TOPSOIL (4")	SY	821.000		821.000	
	164-6054	BOND FBR MTRX SEED (PERM)(RURAL)(SAND)	SY	821.000		821.000	
	164-6055	BONDED FBR MTRX SEED (TEMP)(WARM)	SY	411.000		411.000	
	164-6056	BONDED FBR MTRX SEED (TEMP)(COOL)	SY	411.000		411.000	
	168-6001	VEGETATIVE WATERING	MG	18.000		18.000	
	251-6034	REWORK BS MTL (TY C) (8") (ORD COMP)	SY	822.000		822.000	
	275-6001	CEMENT	TON	17.000		17.000	
	275-6011	CEMENT TREAT(EXIST MATL)(8")	SY	822.000		822.000	
	400-6005	CEM STABIL BKFL	CY	98.000		98.000	
	407-6019	SHEET PILING (PZC - 18)	SF	6,777.000		6,777.000	
	416-6001	DRILL SHAFT (18 IN)	LF	70.000		70.000	
	416-6004	DRILL SHAFT (36 IN)	LF	300.000		300.000	
	420-6013	CL C CONC (ABUT)	CY	55.300		55.300	
	420-6066	CL C CONC (RAIL FOUNDATION)	CY	18.000		18.000	
	420-6159	CL C CONC(COPING)(HPC)	LF	265.000		265.000	
	422-6001	REINF CONC SLAB	SF	1,820.000		1,820.000	
	425-6035	PRESTR CONC GIRDER (TX28)	LF	278.000		278.000	
	432-6034	RIPRAP (STONE PROTECTION)(21 IN)	CY	280.000		280.000	
	432-6045	RIPRAP (MOW STRIP)(4 IN)	CY	25.000		25.000	
	450-6006	RAIL (TY T223)	LF	291.000		291.000	
	454-6018	SEALED EXPANSION JOINT (4 IN) (SEJ - M)	LF	52.000		52.000	
	496-6009	REMOV STR (BRIDGE 0 - 99 FT LENGTH)	EA	1.000		1.000	
	500-6001	MOBILIZATION	LS	1.000		1.000	
	502-6001	BARRICADES, SIGNS AND TRAFFIC HANDLING	MO	7.000		7.000	
	506-6002	ROCK FILTER DAMS (INSTALL) (TY 2)	LF	113.000		113.000	
	506-6011	ROCK FILTER DAMS (REMOVE)	LF	113.000		113.000	
	506-6038	TEMP SEDMT CONT FENCE (INSTALL)	LF	740.000		740.000	
	506-6039	TEMP SEDMT CONT FENCE (REMOVE)	LF	740.000		740.000	
	540-6001	MTL W-BEAM GD FEN (TIM POST)	LF	225.000		225.000	
	540-6006	MTL BEAM GD FEN TRANS (THRIE-BEAM)	EA	3.000		3.000	
	544-6001	GUARDRAIL END TREATMENT (INSTALL)	EA	3.000		3.000	
	545-6007	CRASH CUSH ATTEN (INSTL)(L)(N)(TL3)	EA	1.000		1.000	



DISTRICT	COUNTY	CCSJ	SHEET
Tyler	Van Zandt	0910-12-139	5



Estimate & Quantity Sheet

CONTROLLING PROJECT ID 0910-12-139

DISTRICT Tyler
HIGHWAY CR 1102

COUNTY Van Zandt

CONTROL SECTION JOB				0910-12-139		TOTAL EST.	TOTAL FINAL
PROJECT ID				A00140528			
COUNTY				Van Zandt			
HIGHWAY				CR 1102			
ALT	BID CODE	DESCRIPTION	UNIT	EST.	FINAL		
	644-6076	REMOVE SM RD SN SUP&AM	EA	2.000		2.000	
	658-6061	INSTL DEL ASSM (D-SW)SZ 1(BRF)GF2	EA	12.000		12.000	
	3077-6011	SP MIXESSP-CPG64-22	TON	271.000		271.000	
	3077-6075	TACK COAT	GAL	123.000		123.000	
	6001-6001	PORTABLE CHANGEABLE MESSAGE SIGN	DAY	14.000		14.000	
	18	EROSION CONTROL MAINTENANCE: CONTRACTOR FORCE ACCOUNT WORK (PART)	LS	1.000		1.000	
		SAFETY CONTINGENCY: CONTRACTOR FORCE ACCOUNT WORK (PARTICIPATING)	LS	1.000		1.000	



DW:
 CK:
 DW:
 CK:

ROADWAY SUMMARY															
LOCATION	ITEM 100	ITEM 110		ITEM 132	ITEM 150	ITEM 251	ITEM 275	ITEM 275	ITEM 407	ITEM 420	ITEM 420	ITEM 450	ITEM 545	3077	ITEM 6001
	PREPARING ROW	EXCAVATION (ROADWAY)	EXCAVATION (CHANNEL)	EMBANKMENT (FINAL) (ORD COMP) (TY C)	BLADING	REWORK BS MTL (TY C) (8") (ORD COMP)	CEMENT	CEMENT TREAT (EXIST MATL) (8")	SHEET PILING (PZC-18)	CL C CONC (COPING) (HPC)	CL C CONC (RAIL FOUNDATION)	RAIL (TY T223)	CRASH CUSH ATTEN (INSTL) (L)(N)(TL3)	SP MIXES SP-C PG64-22	PORTABLE CHANGEABLE MESSAGE SIGN
STA	CY	CY	CY	CY	STA	SY	TON	SY	SF	LF	CY	LF	EA	TON	DAY
CR 1102	5	27	813	211	0.5	822	17	822	6777	265	18	105	1	271	14
PROJECT TOTAL	5	27	813	211	0.5	822	17	822	6777	265	18	105	1	271	14

BASIS OF ESTIMATE						
ITEM	DESCRIPTION	RATE	CSJ 0910-12-139 AMOUNT	UNIT	PROJECT TOTAL	PAY UNIT
166	* FERTILIZER	1 LB/9 SY	821	SY	0.05	TON
168	VEGETATIVE WATERING	11 GAL/SY	1642	SY	18	MG
275	CEMENT (5%)(120 LB/CF)	41.4 LB/SY	822	SY	17	TON
3077	SP MIXES SP-C PG64-22	660 LB/SY	822	SY	271	TON
3077	TACK COAT	0.15 GAL/SY	822	SY	123	GAL
500	MOBILIZATION		1.0	LS	1	LS
502	BARRICADES, SIGNS AND TRAFFIC HANDLING		7	MO	7	MO

* FERTILIZER QUANTITY FOR CONTRACTOR'S INFO ONLY



DATE: 5/16/2023 8:43:01 PM
 FILE: c:\bms\pwe-useast-006\brian.martinez\dms67137c_139_s_s0001.dgn

NO.	DATE	REVISION	APPROV.
 F-12040			
 ©2023			
TYLER BRIDGE REPLACEMENTS			
<h2>QUANTITY SUMMARY SHEETS</h2>			
SHEET 1 OF 3			
CONT	SECT	JOB	HIGHWAY
0910	12	139	CR 1102
DIST	COUNTY		SHEET NO.
TYLER	VAN ZANDT		6

DW: CK: DW: CK: DW: CK:

BRIDGE SUMMARY										
LOCATION	ITEM 400	ITEM 416		ITEM 420	ITEM 422	ITEM 425	ITEM 432	ITEM 450	ITEM 454	ITEM 496
	CEM STABIL BKFL	DRILL SHAFT (18 IN)	DRILL SHAFT (36 IN)	CL C CONC (ABUT)	REINF CONC SLAB	PRESTR CONC GIRDER (TX28)	RIPRAP (STONE PROTECTION (21 IN)	RAIL (TY T223)	SEALED EXPANSION JOINT (4 IN) (SEJ-M)	REMOV STR (BRIDGE 0-99 FT LENGTH)
	CY	LF	LF	CY	SF	LF	CY	LF	LF	EA
CR 1102	98	70	300	55.3	1820	278	280	186	52	1
CSJ 0910-12-139 SUBTOTAL	98	70	300	55.3	1820	278	280	186	52	1
PROJECT TOTAL	98	70	300	55.3	1820	278	280	186	52	1

DATE: 5/16/2023 2:41:28 PM
 FILE: c:\bms\pwe-useast-006\rubyarely.gonzalez\dms67137c_139_s_s0002.dgn

NO.	DATE	REVISION	APPROV.
 F-12040			
 ©2023			
TYLER BRIDGE REPLACEMENTS			
QUANTITY SUMMARY SHEETS			
SHEET 2 OF 3			
CONT	SECT	JOB	HIGHWAY
0910	12	139	CR 1102
DIST	COUNTY		SHEET NO.
TYLER	VAN ZANDT		7

DW: CK: DW: CK: DW: CK:



METAL BEAM GUARD FENCE SUMMARY							
LOCATION	FROM STA	TO STA	ITEM 432	ITEM 540	ITEM 540	ITEM 544	ITEM 658
			RIPRAP (MOW STRIP) (4*)	MTL W-BEAM GD FEN (TIM POST)	MTL BEAM GD FEN TRANS (THRIE-BEAM)	GUARDRAIL END TREATMENT (INSTALL)	INSTL DEL ASSM (D-SW) SZ 1 (BRF) GF2
			CY	LF	EA	EA	EA
	CR 1102		25	225	3	3	12
PROJECT TOTAL			25	225	3	3	12

SMALL SIGN TABULATION	
LOCATION	ITEM 644
	REMOVE SM RD SN SUP & AM
	EA
CR 1102	2
PROJECT TOTAL	2

NOTE: MULTIPLE MOVE-INS MAY BE REQUIRED FOR PLACEMENT OF PERMANENT SIGNS

EROSION CONTROL SUMMARY										
LOCATION	ITEM 160	ITEM 164			ITEM 168		ITEM 506			
	FURNISHING AND PLACING TOPSOIL (4")	BOND FBR MTRX SEED (PERM)(RURAL) (SAND)	BOND FBR MTRX SEED (TEMP)(WARM)	BOND FBR MTRX SEED (TEMP)(COOL)	VEGETATIVE WATERING (PERM)	VEGETATIVE WATERING (TEMP)	ROCK FILTER DAMS (INSTALL)(TY 2)	ROCK FILTER DAMS (REMOVE)	TEMP SEDMT CONT FENCE (INSTALL)	TEMP SEDMT CONT FENCE (REMOVE)
	SY	SY	SY	SY	MG	MG	LF	LF	LF	LF
CR 1102	821	821	411	411	9	9	113	113	740	740
PROJECT TOTAL	821	821	411	411	9	9	113	113	740	740



DATE: 5/16/2023 8:43:34 PM
 FILE: c:\bms\pwe-useast-006\brian.martinez\dms67137c_139_s_s0003.dgn

NO.	DATE	REVISION	APPROV.
 			
TYLER BRIDGE REPLACEMENTS			
QUANTITY SUMMARY SHEETS			
SHEET 3 OF 3			
CONT	SECT	JOB	HIGHWAY
0910	12	139	CR 1102
DIST		COUNTY	SHEET NO.
TYLER		VAN ZANDT	8

CK: DW: CK: DW:

SUMMARY OF EARTHWORK QUANTITIES					
CR 1102 CSJ 0910-12-139 STATION TO STATION		ITEM 110	ITEM 132		
		EXCAVATION (ROADWAY)	EMBANKMENT (FINAL) (ORD COMP) (TY C)	MASS ORDINATE	
		CY	CY	CY	
10+00.00	-	10+20.00	0.00	0.00	0.00
10+20.00	-	10+40.00	0.93	5.32	-4.39
10+40.00	-	10+60.00	0.42	11.59	-15.56
10+60.00	-	10+80.00	0.19	18.50	-33.87
10+80.00	-	11+00.00	0.05	21.93	-55.75
11+00.00	-	11+20.00	0.01	23.56	-79.31
11+20.00	-	11+40.00	0.00	26.62	-105.93
11+40.00	-	11+60.00	0.00	30.03	-135.97
11+60.00	-	11+80.00	0.00	16.01	-151.98
11+80.00	-	12+00.00	0.00	0.00	-151.98
12+00.00	-	12+20.00	0.00	0.00	-151.98
12+20.00	-	12+40.00	0.01	2.53	-154.5
12+40.00	-	12+60.00	1.60	8.11	-161.02
12+60.00	-	12+80.00	3.45	9.55	-167.12
12+80.00	-	13+00.00	3.94	7.24	-170.41
13+00.00	-	13+20.00	4.20	6.25	-172.46
13+20.00	-	13+40.00	4.56	5.19	-173.09
13+40.00	-	13+60.00	3.54	4.25	-173.80
13+60.00	-	13+80.00	2.11	3.49	-175.18
13+80.00	-	14+00.00	1.57	2.41	-176.03
14+00.00	-	14+00.35	0.57	0.97	-176.43
14+00.35	-		0.00	7.45	-176.43
TOTAL			27.00	211.00	

DATE: 5/16/2023 8:43:52 PM
 FILE: c:\bms\pwe-useast-006\brian.martinez\dms67137c_139_s_soe01.dgn

NO.	DATE	REVISION	APPROV.
 			
TYLER BRIDGE REPLACEMENTS SUMMARY OF EARTHWORK			
SHEET 1 OF 1			
CONT	SECT	JOB	HIGHWAY
0910	12	139	CR 1102
DIST	COUNTY		SHEET NO.
TYLER	VAN ZANDT		9

CK: DW: CK: DW:


CONSTRUCTION SEQUENCE

CONSTRUCTION TO BEGIN AFTER JAN 1ST, 2024.

CR 1102 - 0910- 12- 139


1. INSTALL PROJECT SIGNS FOR CR 2905 ROAD CLOSURE.
2. REMOVE EXIST BRIDGE AND ABUTMENT RETAINING WALLS.
3. CONSTRUCT PROPOSED BRIDGE.
4. PLACE SHEET PILE WALL.
5. REMOVE STABLE BASE & ASPHALT PAVEMENT AND PLACE EMBANKMENT TY C FOR ROADWAY WIDENING. THEN, REWORK BASE MATERIAL, CEMENT TREAT, AND PLACE HMA TY-D.
6. INSTALL MBGF AND CONCRETE MOW STRIP.
7. OPEN NEW BRIDGE TO THRU TRAFFIC.
8. PLACE TOPSOIL AND ESTABLISH PERMANENR VEGETATION.
9. PERFORM FINAL CLEANUP AND REMOVE PROJECT SIGNS.

DATE: 4/28/2023 3:56:51 PM
FILE: c:\bms\pwe-useast-006\tony.treid\dms67141\TCP_SOC01.dgn




4/28/2023

NO.	DATE	REVISION	APPROV.



F-12040



©2023

TYLER BRIDGE REPLACEMENTS

SEQUENCE OF CONSTRUCTION

SHEET 1 OF 1

CONT	SECT	JOB	HIGHWAY
0910	12	139	CR 1102
DIST		COUNTY	SHEET NO.
TYLER		SMITH	10

CC: DW: CC: DW:

ROAD CLOSED TO THRU TRAFFIC

R11-4
60"X30"
DOUBLE SIGN

①

ROAD CLOSED 1500 FT

CW20-3A
48"x48"
SINGLE SIGN

②

ROAD CLOSED 1000 FT

CW20-3B
48"x48"
SINGLE SIGN

③

ROAD CLOSED 500 FT

CW20-3C
48"x48"
SINGLE SIGN

④

NAME ADDRESS CITY STATE CONTRACTOR

G20-6
48"X30"
SINGLE SIGN

⑤

ROAD CLOSED

R11-2
48"X30"
DOUBLE SIGN

⑥

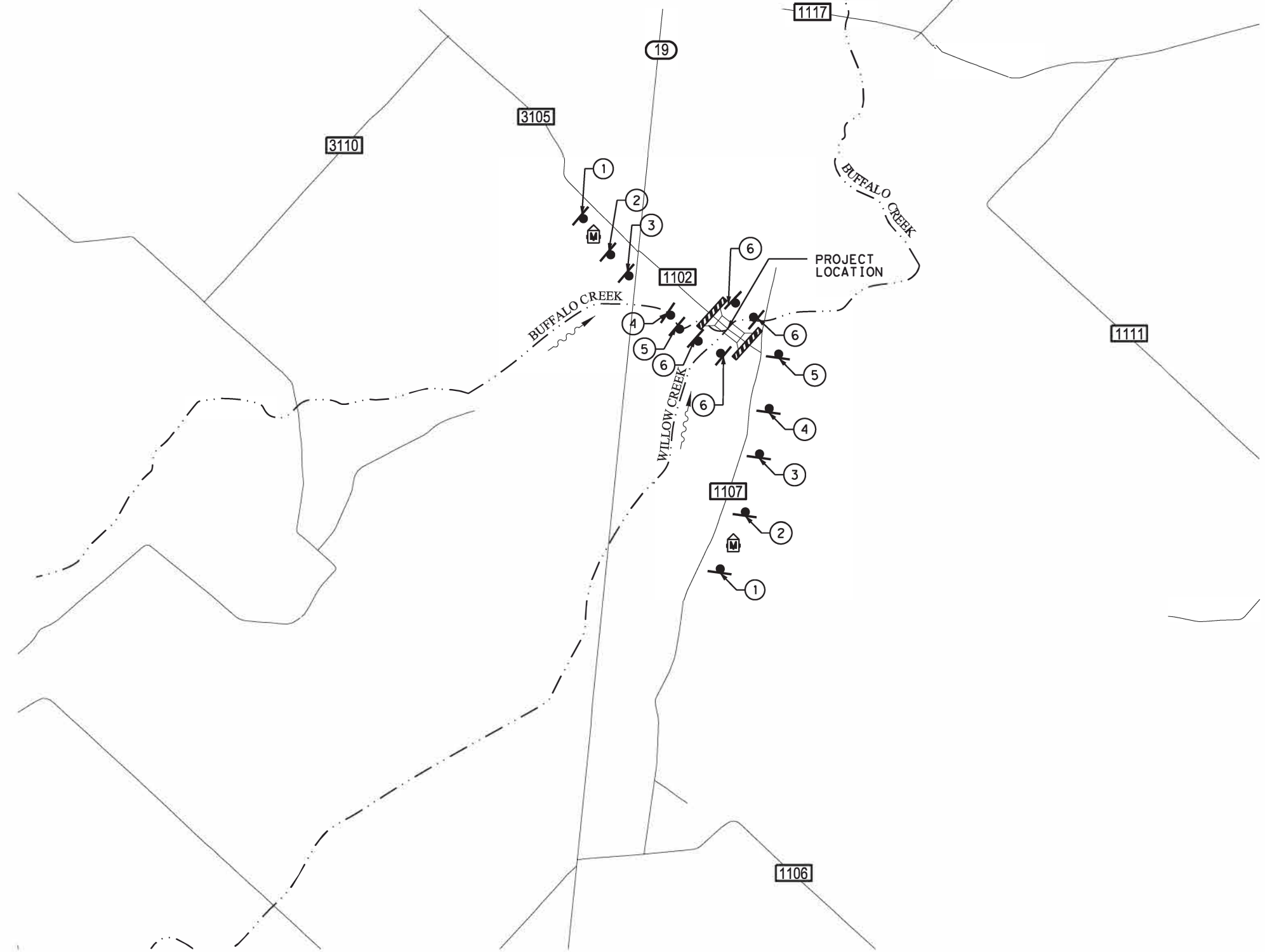


LEGEND

- PORTABLE CHANGEABLE MESSAGE SIGN (PCMS)
- SIGN
- TY 3 BARRICADE

NOTES

1. CONTRACTOR SHALL ADHERE AT ALL TIMES TO THE TMUTCD AND TXDOT BC STANDARDS DRAWINGS FOR SIGN DETAILS, DIMENSIONS AND PLACEMENT.
2. ALLOW EGRESS AND INGRESS FOR LOCAL PROPERTY OWNERS AT ALL TIMES.



4/28/2023

NO.	DATE	REVISION	APPROV.

F-12040

©2023

TYLER BRIDGE REPLACEMENTS

CR 1102
AT BUFFALO CREEK

TRAFFIC CONTROL PLAN LAYOUTS

SHEET 1 OF 1

CONT	SECT	JOB	HIGHWAY
0910	12	139	CR 1102
DIST	COUNTY	SHEET NO.	
TYLER	VAN ZANDT	11	

DATE: 4/28/2023 3:57:13 PM
FILE: c:\bms\pwe-useast-006\tony.tre\oldms67141\CR 1102 TCP 01.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: 4/28/2023 3:57:25 PM
 FILE: c:\bms\pwe-useast-006\tony.tre\oams59706\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).

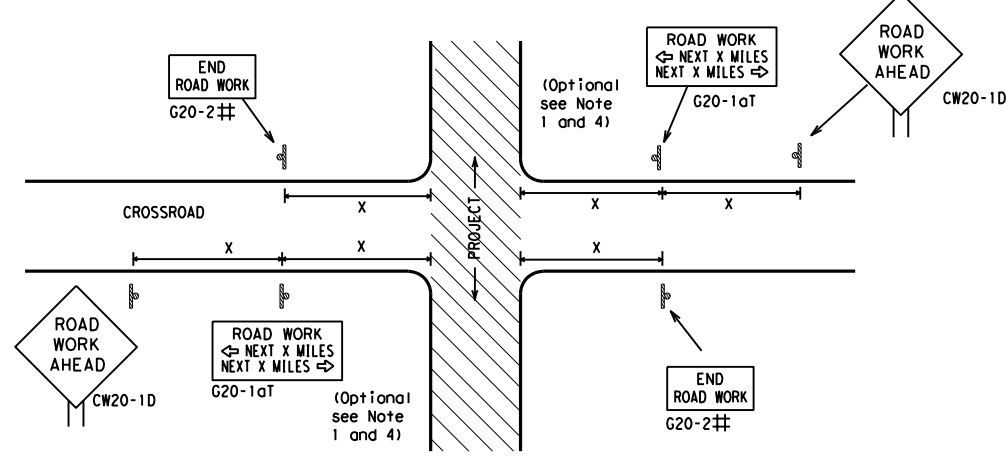
THE DOCUMENTS BELOW CAN BE FOUND ON-LINE AT http://www.txdot.gov
COMPLIANT WORK ZONE TRAFFIC CONTROL DEVICES LIST (CWZTCD)
DEPARTMENTAL MATERIAL SPECIFICATIONS (DMS)
MATERIAL PRODUCER LIST (MPL)
ROADWAY DESIGN MANUAL - SEE "MANUALS (ONLINE MANUALS) "
STANDARD HIGHWAY SIGN DESIGNS FOR TEXAS (SHSD)
TEXAS 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	CK: TxDOT
© TxDOT November 2002	CONT	SECT
	JOB	HIGHWAY
	0910 12	139 CR 1102
4-03 7-13	REVISIONS	
9-07 8-14	DIST	COUNTY
5-10 5-21	TYLER	VAN ZANDT
		SHEET NO. 12

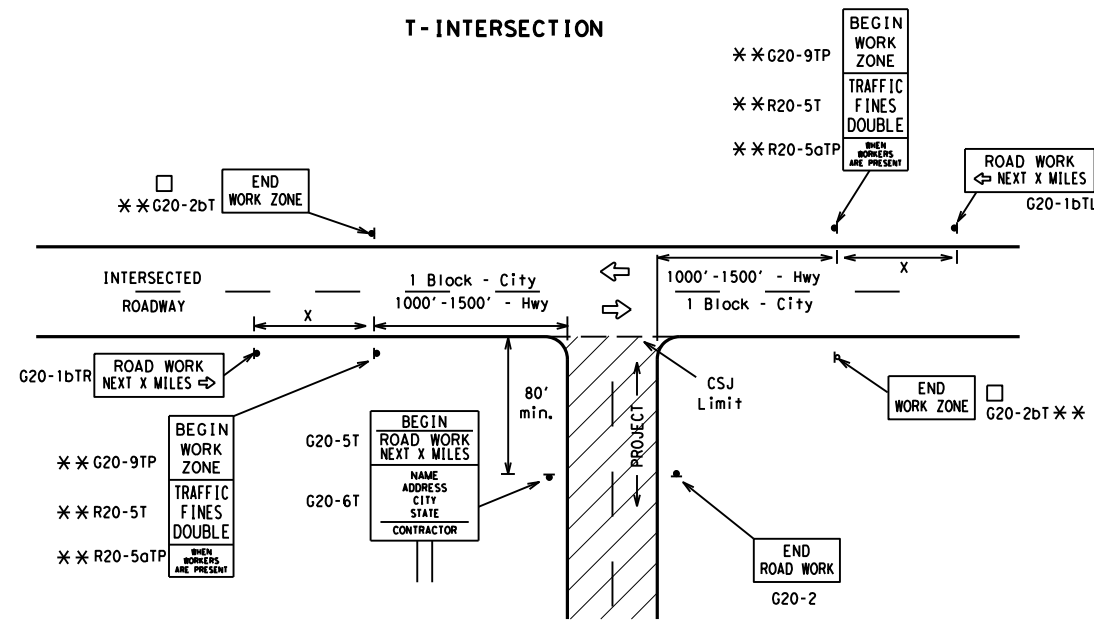
DISCLAIMER: The use of this standard is governed by the "Texas Engineering Practice Act". No warranty of any kind is made by TxDOT for any purpose whatsoever. TxDOT assumes no responsibility for the conversion of this standard to other formats or for incorrect results or damages resulting from its use.

TYPICAL LOCATION OF CROSSROAD SIGNS



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

T-INTERSECTION



CSJ LIMITS AT T-INTERSECTION

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

TYPICAL CONSTRUCTION WARNING SIGN SIZE AND SPACING^{1,5,6}

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

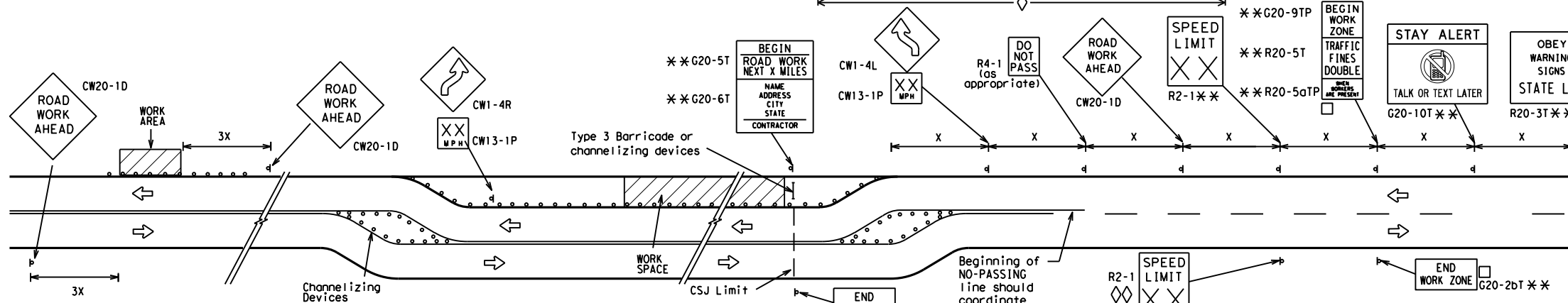
* For typical sign spacings on divided highways, expressways and freeways, see Part 6 of the "Texas Manual on Uniform Traffic Control Devices" (TMUTCD) typical application diagrams or TCP Standard Sheets.

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

GENERAL NOTES

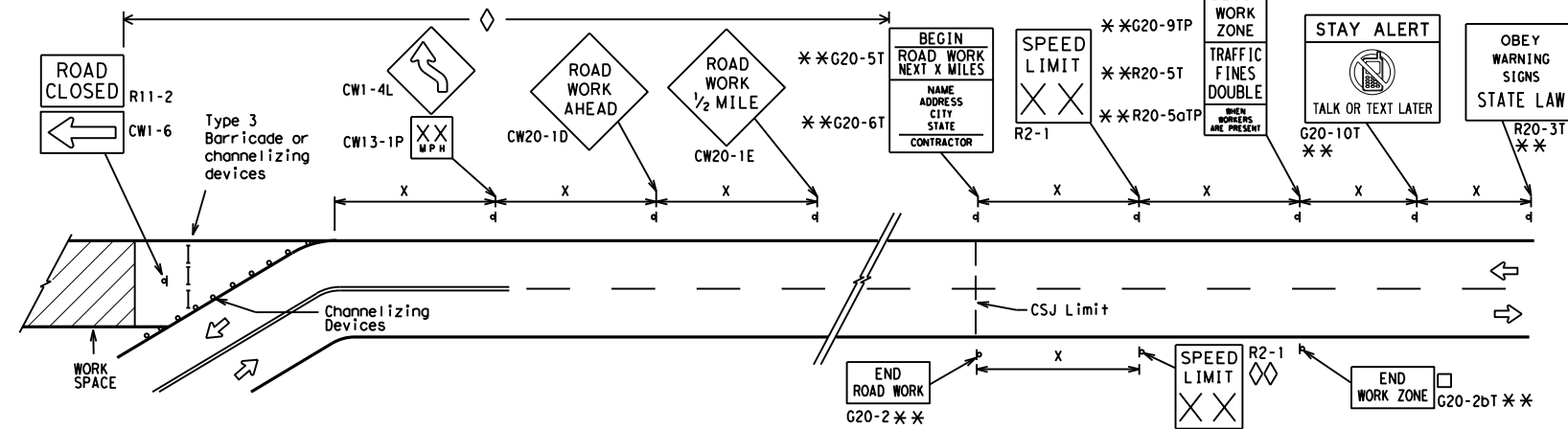
- Special or larger size signs may be used as necessary.
- Distance between signs should be increased as required to have 1500 feet advance warning.
- Distance between signs should be increased as required to have 1/2 mile or more advance warning.
- 36" x 36" "ROAD WORK AHEAD" (CW20-1D) signs may be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

WORK AREAS IN MULTIPLE LOCATIONS WITHIN CSJ LIMITS



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

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



NOTES

- The Contractor shall determine the appropriate distance to be placed on the G20-1 series signs and "BEGIN ROAD WORK NEXT X MILES" (G20-5T) sign for each specific project. This distance shall replace the "x" and shall be rounded to the nearest whole mile with the approval of the Engineer. No decimals shall be used.
- The "BEGIN WORK ZONE" (G20-9TP) and "END WORK ZONE" (G20-2bT) shall be used as shown on the sample layout when advance signs are required outside the CSJ Limits. They inform the motorist of entering or leaving a part of the work zone lying outside the CSJ Limits where traffic fines may double if workers are present.
 - CSJ limit signing is required for highway construction and maintenance work, with the exception of mobile operations.
 - Area for placement of "ROAD WORK AHEAD" (CW20-1D) sign and other signs or devices as called for on the Traffic Control Plan.
 - Contractor will install a regulatory speed limit sign at the end of the work zone.

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

SHEET 2 OF 12



BARRICADE AND CONSTRUCTION PROJECT LIMIT

BC (2) - 21

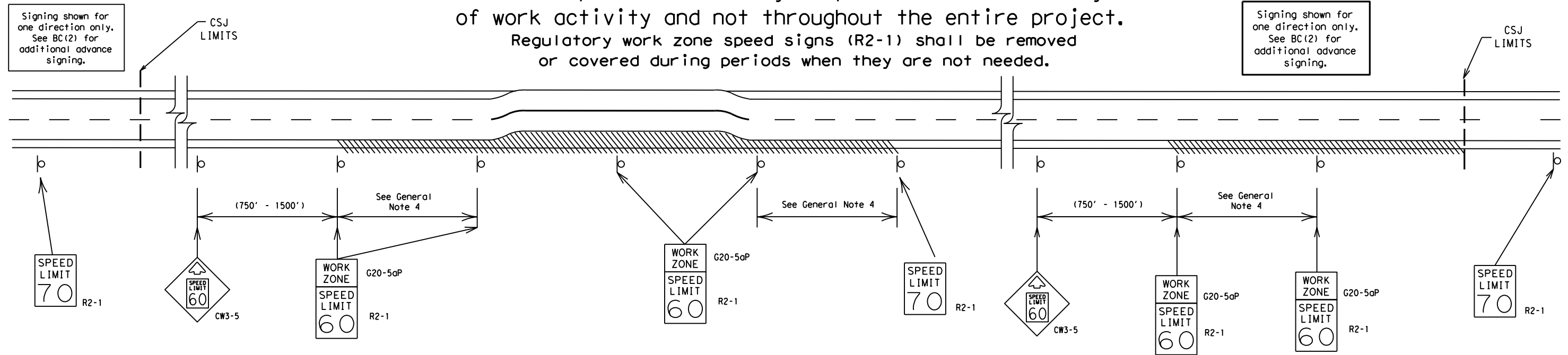
FILE: bc-21.dgn	DN: TxDOT	CK: TxDOT	DW: TxDOT	CR: TxDOT
© TxDOT November 2002	CONT	SECT	JOB	HIGHWAY
REVISIONS	091016	139	CR	1102
9-07 8-14	DIST	COUNTY	SHEET NO.	
7-13 5-21	TYLER	VAN ZANDT	13	

DATE: 4/28/2023 3:57:28 PM
 FILE: c:\bms\pwe-useast-006\tony.trejo\dms59706\bc-21.dgn

TYPICAL APPLICATION OF WORK ZONE SPEED LIMIT SIGNS

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

Reduced speeds should only be posted in the vicinity of work activity and not throughout the entire project. Regulatory work zone speed signs (R2-1) shall be removed or covered during periods when they are not needed.



GUIDANCE FOR USE:

LONG/INTERMEDIATE TERM WORK ZONE SPEED LIMITS

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

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

- rough road or damaged pavement surface
- substantial alteration of roadway geometrics (diversions)
- construction detours
- grade
- width
- other conditions readily apparent to the driver

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

SHORT TERM WORK ZONE SPEED LIMITS

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

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

GENERAL NOTES

- Regulatory work zone speed limits should be used only for sections of construction projects where speed control is of major importance.
- Regulatory work zone speed limit signs shall be placed on supports at a 7 foot minimum mounting height.
- Speed zone signs are illustrated for one direction of travel and are normally posted for each direction of travel.
- Frequency of work zone speed limit signs should be:

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

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

DATE: 4/28/2023 3:57:31 PM
FILE: c:\bms\pwe-useast-006\tony.trejo\ams59706\bc-21.dgn

SHEET 3 OF 12



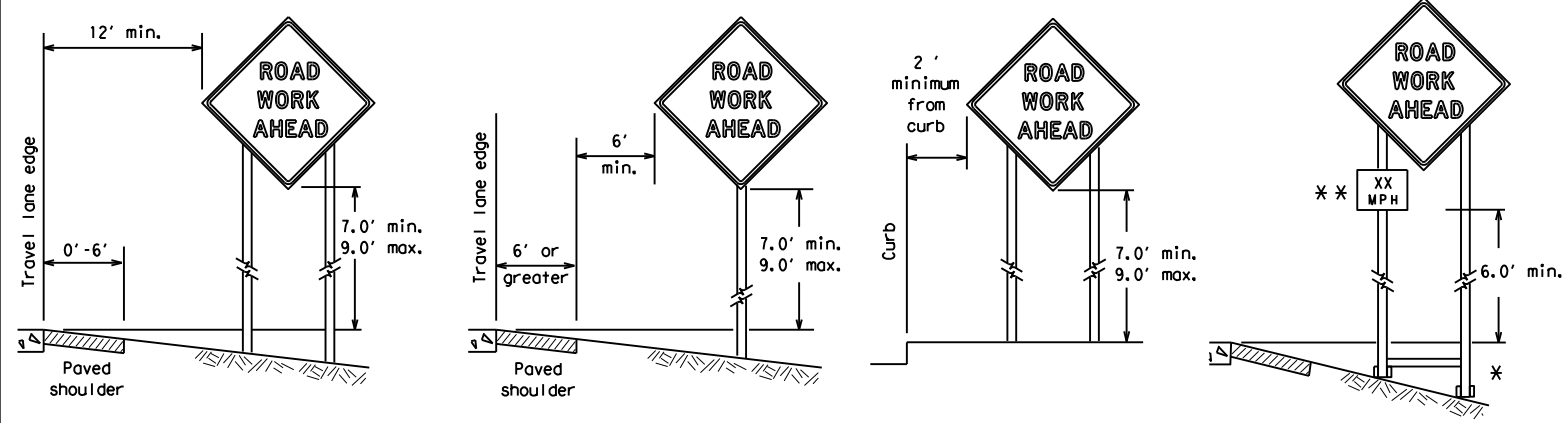
BARRICADE AND CONSTRUCTION WORK ZONE SPEED LIMIT

BC (3) -21

FILE:	bc-21.dgn	DW:	TxDOT	CK:	TxDOT	DW:	TxDOT	CK:	TxDOT
© TxDOT	November 2002	CONT	SECT	JOB	HIGHWAY				
REVISIONS		0910	16	139	CR 1102				
9-07	8-14								
7-13	5-21	DIST	COUNTY		SHEET NO.				
		TYLER	VAN ZANDT		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.

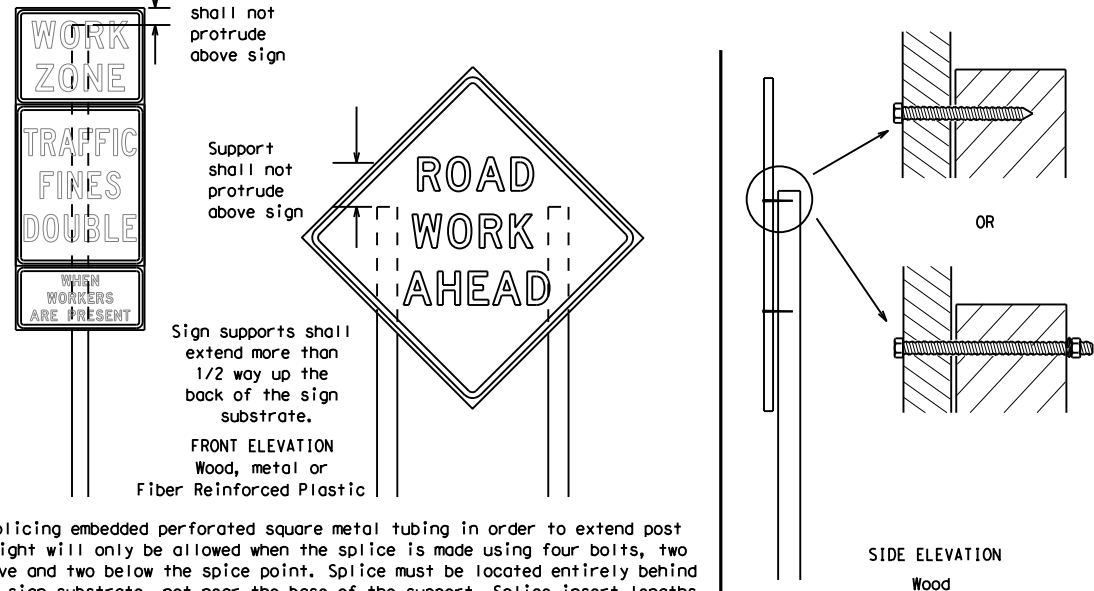
TYPICAL MINIMUM CLEARANCES FOR LONG TERM AND INTERMEDIATE TERM SIGNS



* 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

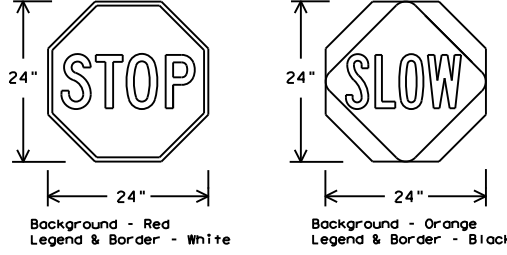
- Where sign supports require the use of weights to keep from turning over, the use of sandbags with dry, cohesionless sand should be used.
- The sandbags will be tied shut to keep the sand from spilling and to maintain a constant weight.
- Rock, concrete, iron, steel or other solid objects shall not 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 retroreflectORIZED when used at night.
- STOP/SLOW paddles may be attached to a staff with a minimum length of 6' to the bottom of the sign.
- Any lights incorporated into the STOP or SLOW paddle faces shall only be as specifically described in Section 6E.03 Hand Signaling Devices in the TMUTCD.



SHEETING REQUIREMENTS (WHEN USED AT NIGHT)		
USAGE	COLOR	SIGN FACE MATERIAL
BACKGROUND	RED	TYPE B OR C SHEETING
BACKGROUND	ORANGE	TYPE B _{FL} OR C _{FL} SHEETING
LEGEND & BORDER	WHITE	TYPE B OR C SHEETING
LEGEND & BORDER	BLACK	ACRYLIC NON-REFLECTIVE FILM

CONTRACTOR REQUIREMENTS FOR MAINTAINING PERMANENT SIGNS WITHIN THE PROJECT LIMITS

- Permanent signs are used to give notice of traffic laws or regulations, call attention to conditions that are potentially hazardous to traffic operations, show route designations, destinations, directions, distances, services, points of interest, and other geographical, recreational, specific service (LOGO), or cultural information. Drivers proceeding through a work zone need the same, if not better route guidance as normally installed on a roadway without construction.
- When permanent regulatory or warning signs conflict with work zone conditions, remove or cover the permanent signs until the permanent sign message matches the roadway condition. For details for covering large guide signs see the TS-CD standard.
- When existing permanent signs are moved and relocated due to construction purposes, they shall be visible to motorists at all times.
- If existing signs are to be relocated on their original supports, they shall be installed on crashworthy bases as shown on the SMD Standard sheets. The signs shall meet the required mounting heights shown on the BC Sheets or the SMD Standards. This work should be paid for under the appropriate pay item for relocating existing signs.
- If permanent signs are to be removed and relocated using temporary supports, the Contractor shall use crashworthy supports as shown on the BC standard sheets, TLRS standard sheets or the CWZTCD list. The signs shall meet the required mounting heights shown on the BC, or the SMD standard sheets during construction. This work should be paid for under the appropriate pay item for relocating existing signs.
- Any sign or traffic control device that is struck or damaged by the Contractor or his/her construction equipment shall be replaced as soon as possible by the Contractor to ensure proper guidance for the motorists. This will be subsidiary to Item 502.



BARRICADE AND CONSTRUCTION TEMPORARY SIGN NOTES

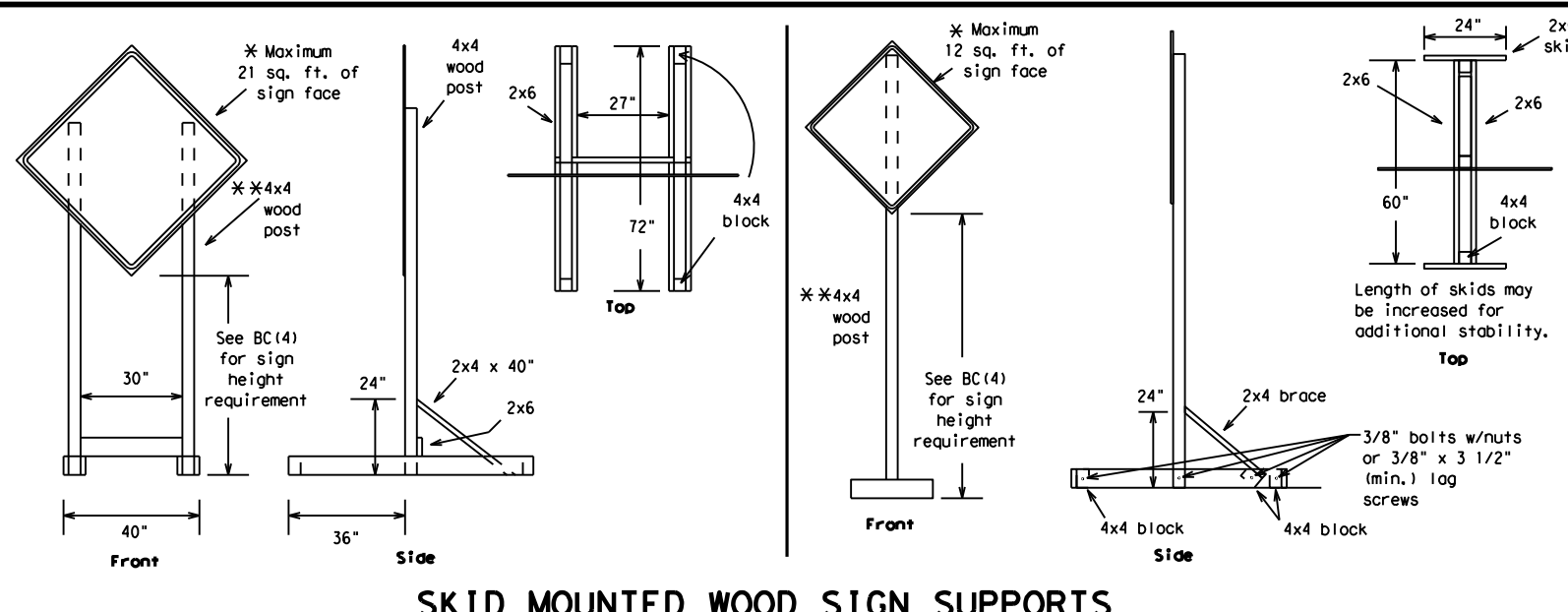
BC (4) - 21

FILE: bc-21.dgn	DN: TxDOT	CR: TxDOT	OW: TxDOT	CK: TxDOT
© TxDOT November 2002	CONT	SECT	JOB	HIGHWAY
REVISIONS	091016	139	CR 1102	
9-07 8-14	DIST	COUNTY	SHEET NO.	
7-13 5-21	TYLER	VAN ZANDT	15	

DATE: 4/28/2023 3:57:33 PM
FILE: c:\bms\pwe-useast-006\tony.trejo\ams59706\bc-21.dgn

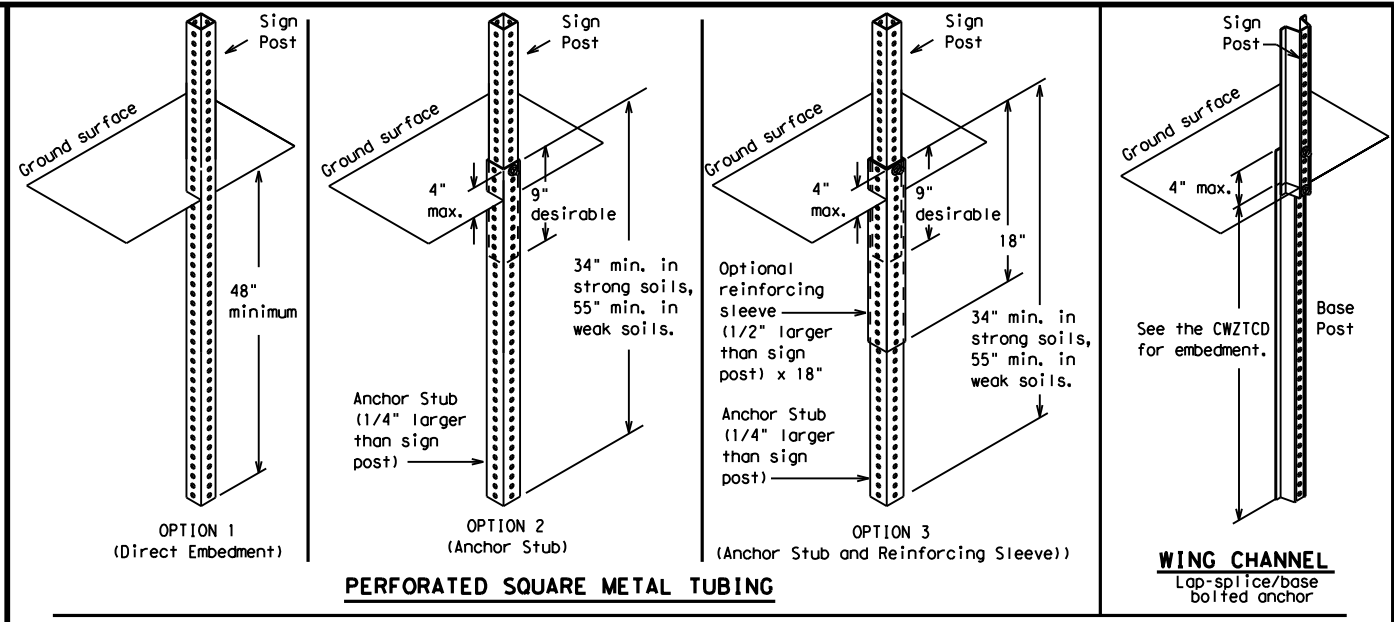
DISCLAIMER: The use of this standard is governed by the "Texas Engineering Practice Act". No warranty of any kind is made by TxDOT for any purpose whatsoever. TxDOT assumes no responsibility for the conversion of this standard to other formats or for incorrect results or damages resulting from its use.

DATE: 4/28/2023 3:57:36 PM
 FILE: c:\bms\pwe-useast-006\tony.tre\o\dms59706\bc-21.dgn



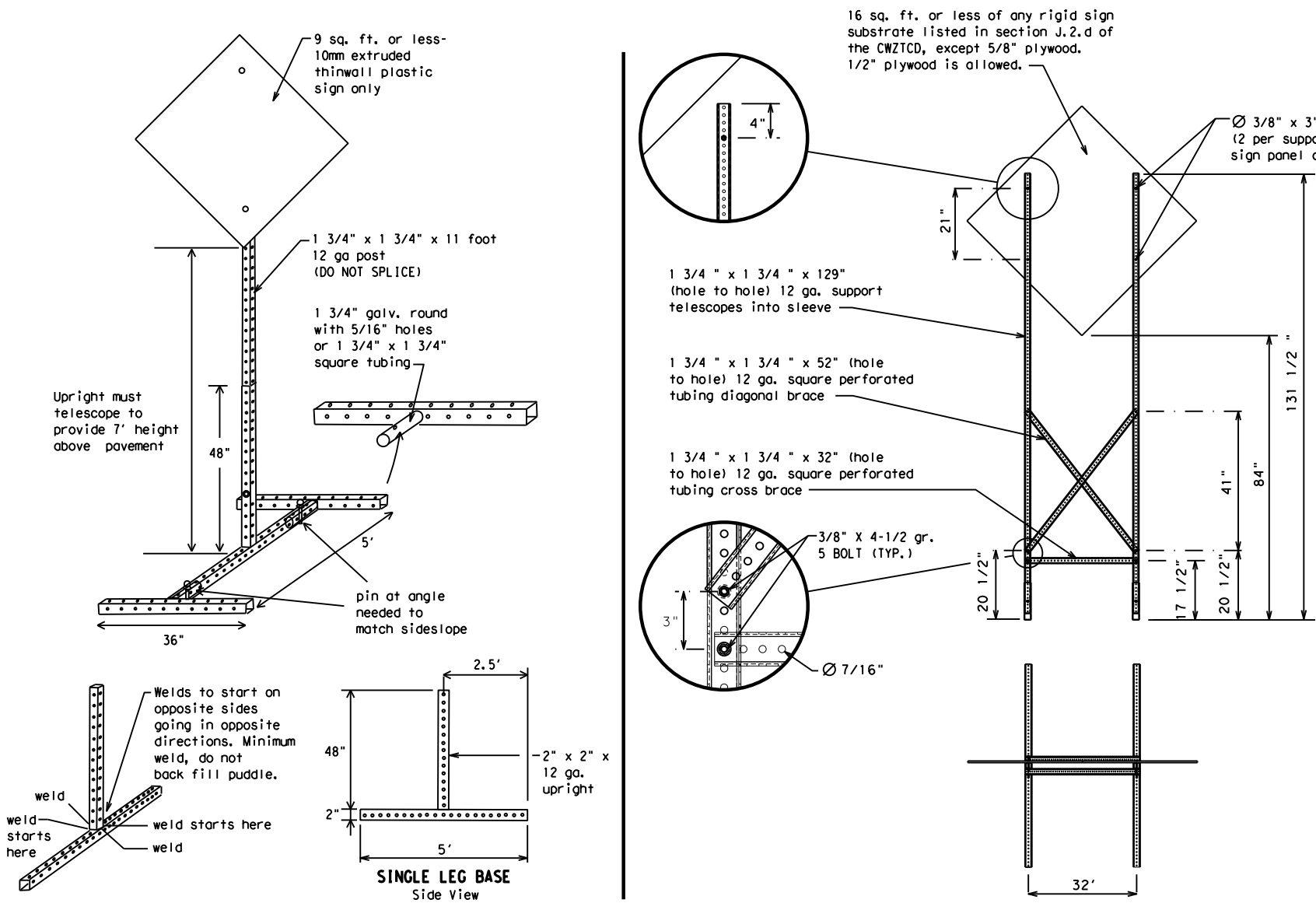
SKID MOUNTED WOOD SIGN SUPPORTS

* 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	0910	16	139	CR 1102
9-07 8-14	DIST	COUNTY	SHEET NO.	
7-13 5-21	TYLER	VAN ZANDT	16	

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.

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 XXXXXX
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.

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.

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: 4/28/2023 3:57:39 PM
FILE: c:\bms\pwe-useast-006\tony.trejo\dms59706\bc-21.dgn

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

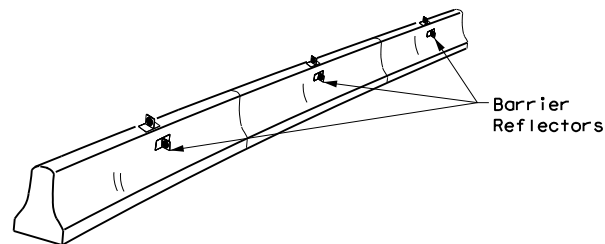
Roadway designation # IH-number, US-number, SH-number, FM-number

<h3>BARRICADE AND CONSTRUCTION PORTABLE CHANGEABLE MESSAGE SIGN (PCMS)</h3>			
<h2>BC (6) - 21</h2>			
FILE:	bc-21.dgn	DN:	TxDOT
© TxDOT	November 2002	CR:	TxDOT
REVISIONS	0910 16	OW:	TxDOT
9-07	8-14	CR:	1102
7-13	5-21	DIST:	TYLER
		COUNTY:	VAN ZANDT
		SHEET NO.:	17

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.

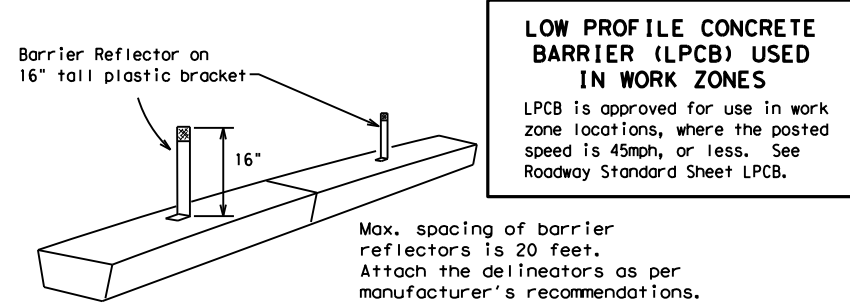
DATE: 4/28/2023 3:57:42 PM
 FILE: c:\bms\pwe-useast-006\tony.trejo\dms59706\bc-21.dgn

- 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.



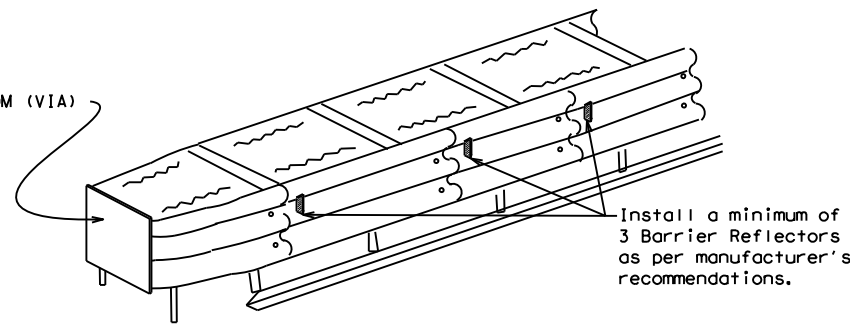
CONCRETE TRAFFIC BARRIER (CTB)

- 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

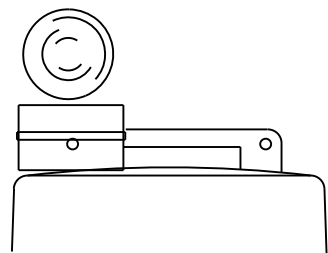
- Warning lights shall meet the requirements of the TMUTCD.
- Warning lights shall NOT be installed on barricades.
- Type A-Low Intensity Flashing Warning Lights are commonly used with drums. They are intended to warn of or mark a potentially hazardous area. Their use shall be as indicated on this sheet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

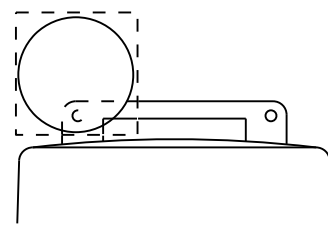
- Type A flashing warning lights are intended to warn drivers that they are approaching or are in a potentially hazardous area.
- Type A random flashing warning lights are not intended for delineation and shall not be used in a series.
- A series of sequential flashing warning lights placed on channelizing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



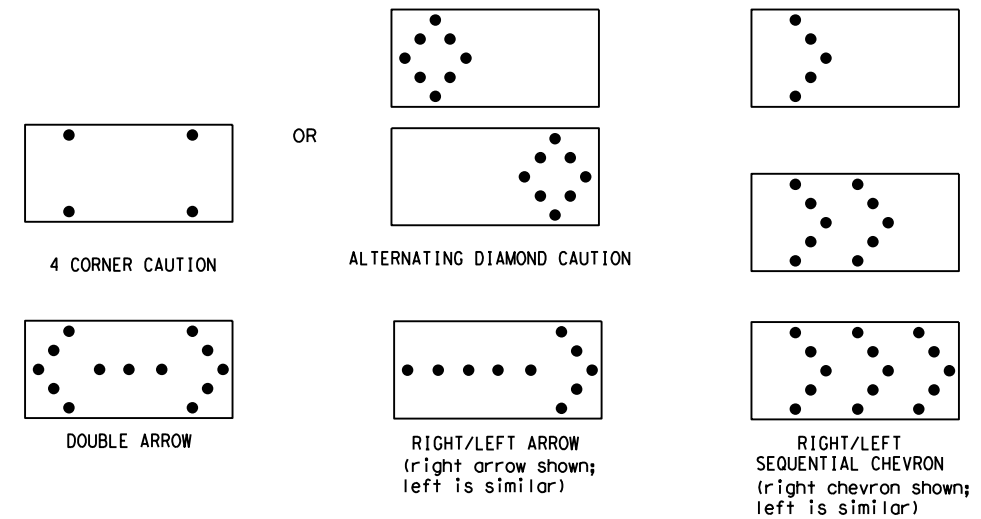
Type C Warning Light or approved substitute mounted on a drum adjacent to the travel way.



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	DW: TxDOT	CK: TxDOT
© TxDOT November 2002	CONT	SECT	JOB	HIGHWAY
REVISIONS	0910	16	139	CR 1102
9-07 8-14	DIST	COUNTY	SHEET NO.	
7-13 5-21	TYLER	VAN ZANDT	18	

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

DATE: 4/28/2023 3:57:44 PM
 FILE: c:\bms\pwe-useast-006\tony.tre\o\dms59706\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:

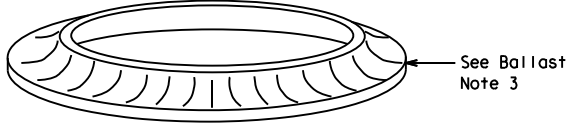
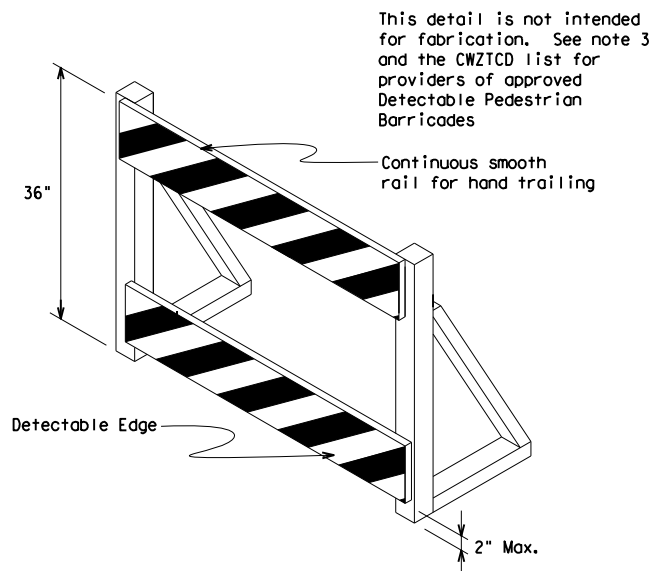
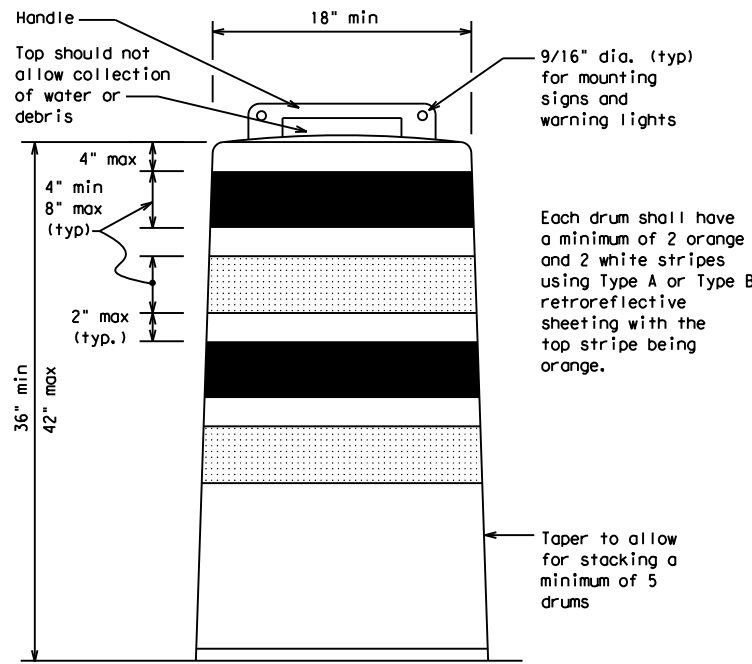
- Plastic drums shall be a two-piece design; the "body" of the drum shall be the top portion and the "base" shall be the bottom.
- The body and base shall lock together in such a manner that the body separates from the base when impacted by a vehicle traveling at a speed of 20 MPH or greater but prevents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

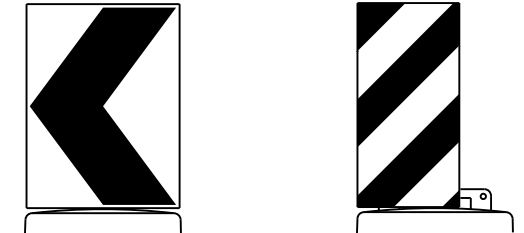
BALLAST

- 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

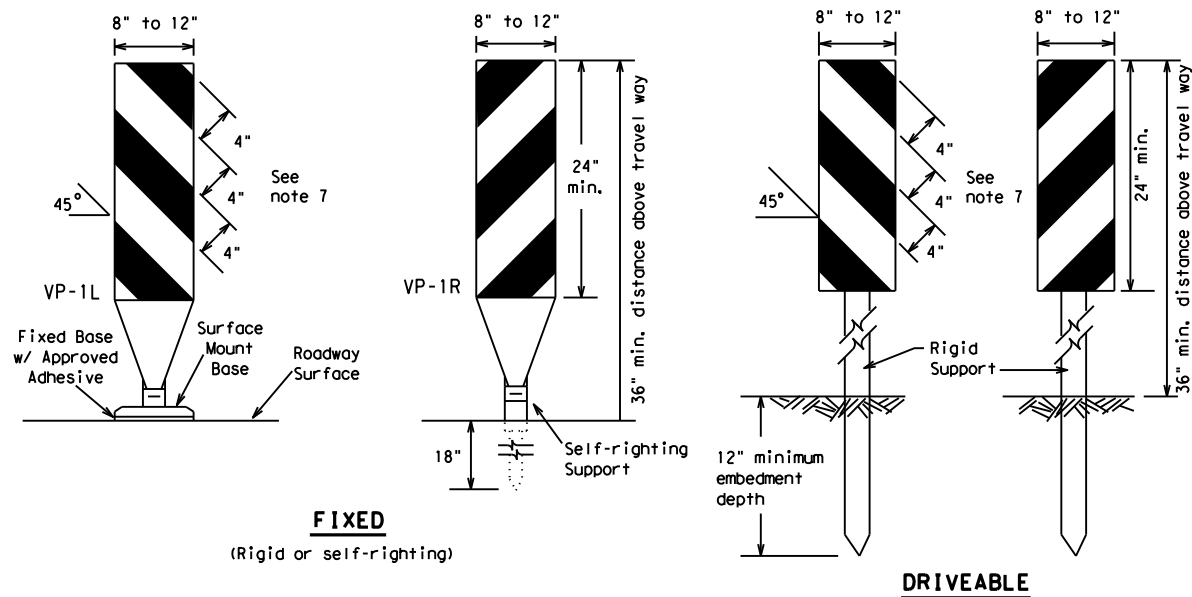


BARRICADE AND CONSTRUCTION CHANNELIZING DEVICES

BC (8) - 21

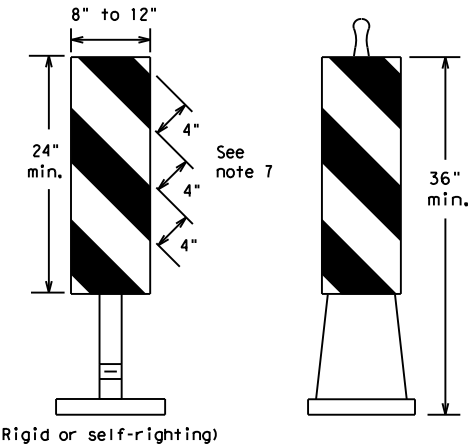
FILE: bc-21.dgn	DW: TxDOT	CR: TxDOT	DW: TxDOT	CR: TxDOT
© TxDOT November 2002	CONT	SECT	JOB	HIGHWAY
REVISIONS	0910	16	139	CR 1102
4-03 8-14	DIST	COUNTY	SHEET NO.	
9-07 5-21	TYLER	VAN ZANDT	19	
7-13				

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.



FIXED
(Rigid or self-righting)

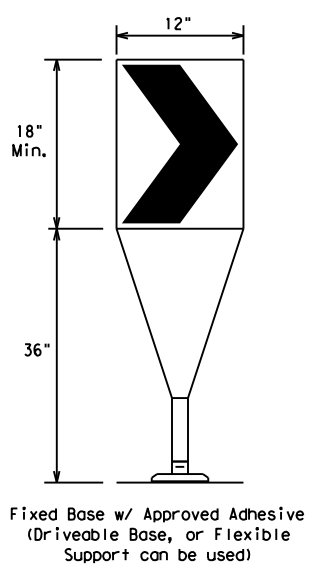
DRIVEABLE



PORTABLE

VERTICAL PANELS (VPs)

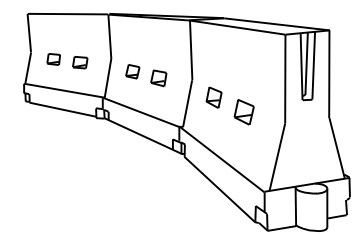
- Vertical Panels (VP's) are normally used to channelize traffic or divide opposing lanes of traffic.
- VP's may be used in daytime or nighttime situations. They may be used at the edge of shoulder drop-offs and other areas such as lane transitions where positive daytime and nighttime delineation is 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.



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

- 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)

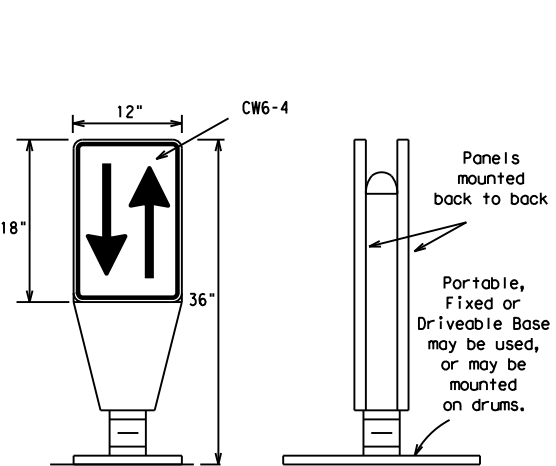
- LCDs are crashworthy, lightweight, deformable devices that are highly visible, have good target value and can be connected together. They are not designed to contain or redirect a vehicle on impact.
- LCDs may be used instead of a line of cones or drums.
- LCDs shall be placed in accordance to application 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



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.

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	091016	139	CR	1102
9-07 8-14	DIST	COUNTY	SHEET NO.	
7-13 5-21	TYLER	VAN ZANDT	20	

DATE: 4/28/2023 3:57:47 PM
FILE: c:\bms\pwe-useast-006\tony.trejo\dms59706\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.

TYPE 3 BARRICADES

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

Barricades shall NOT be used as a sign support.

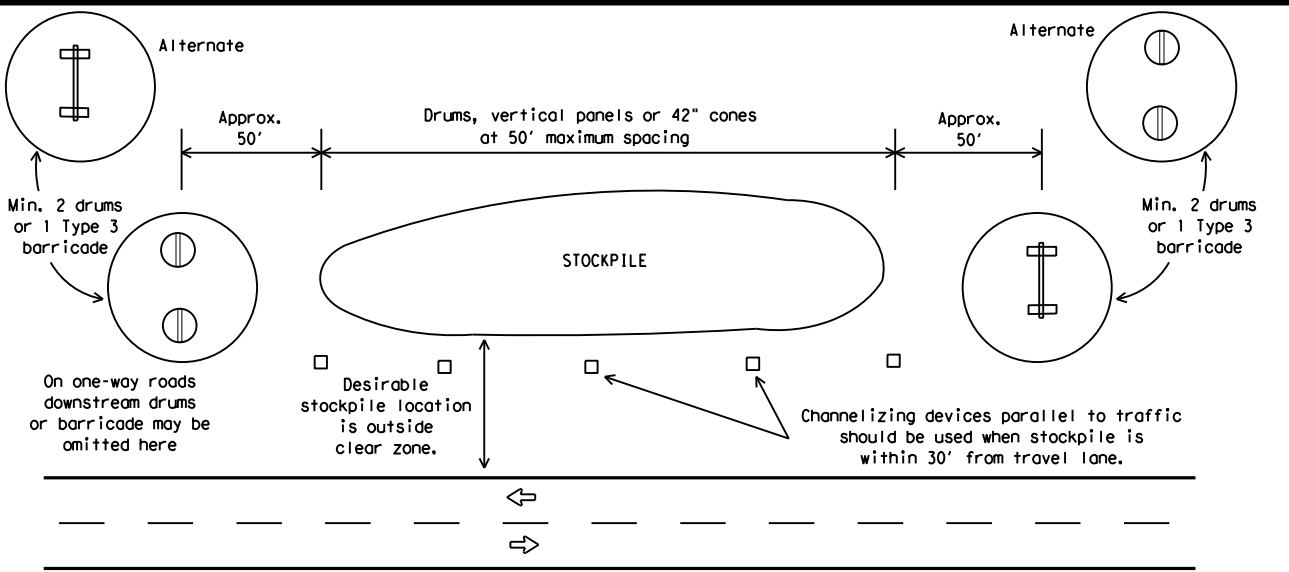


TYPICAL STRIPING DETAIL FOR BARRICADE RAIL



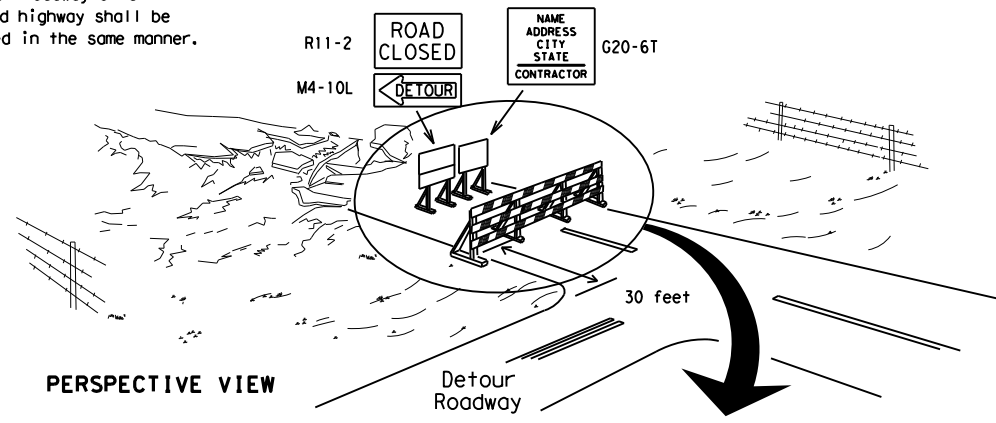
Stiffener may be inside or outside of support, but no more than 2 stiffeners shall be allowed on one barricade.

TYPICAL PANEL DETAIL FOR SKID OR POST TYPE BARRICADES



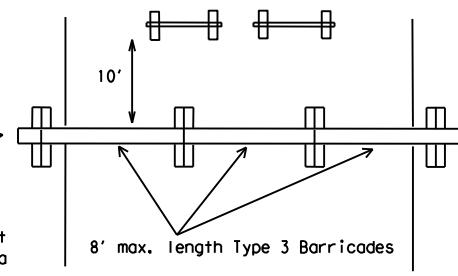
TRAFFIC CONTROL FOR MATERIAL STOCKPILES

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



PERSPECTIVE VIEW

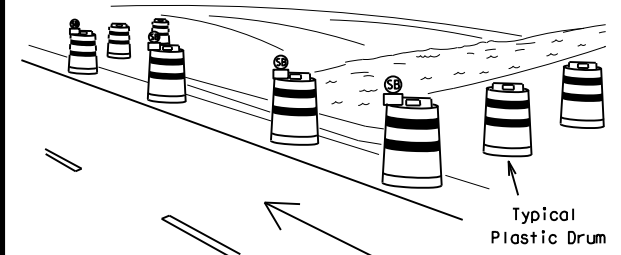
The three rails on Type 3 barricades shall be reflectorized orange and reflective white stripes on one side facing one-way traffic and both sides for two-way traffic. Barricade striping should slant downward in the direction of detour.



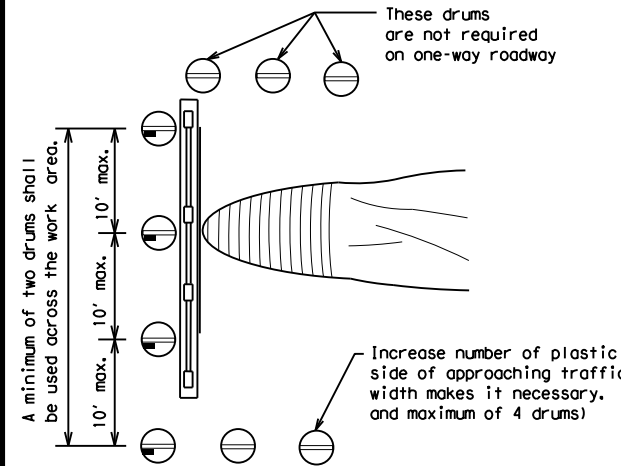
PLAN VIEW

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

TYPE 3 BARRICADE (POST AND SKID) TYPICAL APPLICATION



PERSPECTIVE VIEW



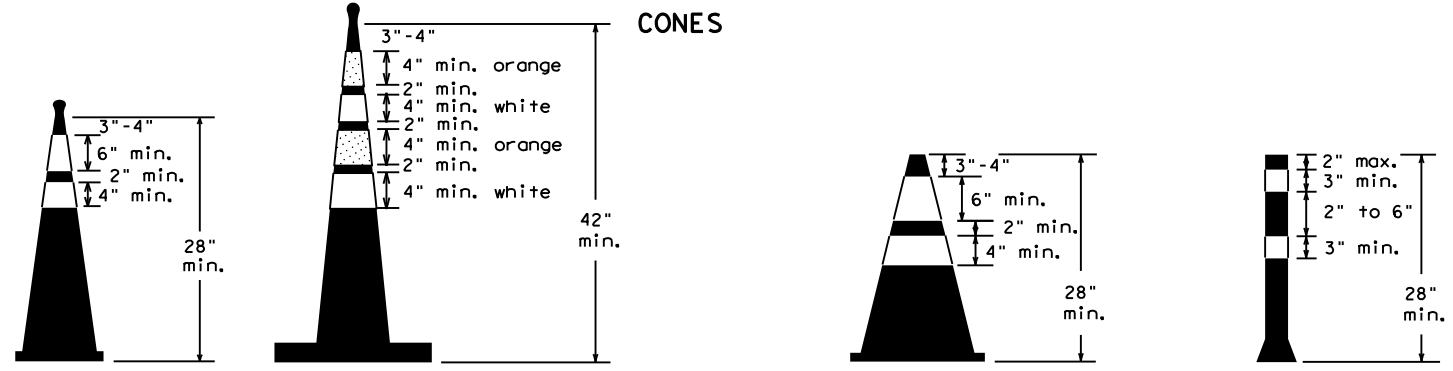
PLAN VIEW

CULVERT WIDENING OR OTHER ISOLATED WORK WITHIN THE PROJECT LIMITS

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

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

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)



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.



BARRICADE AND CONSTRUCTION CHANNELIZING DEVICES

BC (10) - 21

FILE: bc-21.dgn	DN: TxDOT	CK: TxDOT	OW: TxDOT	CR: TxDOT
© TxDOT November 2002	CONT	SECT	JOB	HIGHWAY
REVISIONS	0910	16	139	CR 1102
9-07 8-14	DIST	COUNTY	SHEET NO.	
7-13 5-21	TYLER	VAN ZANDT	21	

DATE: 4/28/2023 3:57:50 PM
 FILE: c:\bms\pwe-useast-006\tony.trejo\dms59706\bc-21.dgn

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.

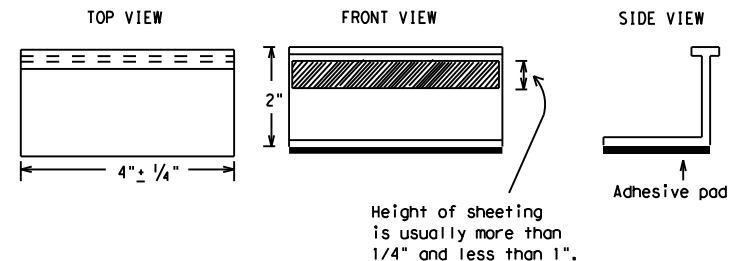
MAINTAINING WORK ZONE PAVEMENT MARKINGS

- 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	CR: TxDOT	DW: TxDOT	CK: TxDOT
© TxDOT February 1998	CONT	SECT	JOB	HIGHWAY
REVISIONS	0910	16	139	CR 1102
2-98 9-07 5-21	DIST	COUNTY	SHEET NO.	
1-02 7-13	TYLER	VAN ZANDT	22	
11-02 8-14				

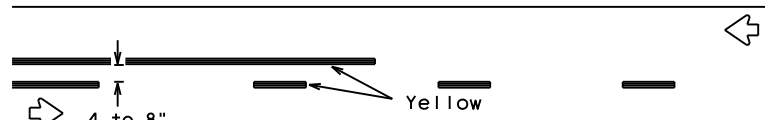
DISCLAIMER: The use of this standard is governed by the "Texas Engineering Practice Act". No warranty of any kind is made by TxDOT for any purpose whatsoever. TxDOT assumes no responsibility for the conversion of this standard to other formats or for incorrect results or damages resulting from its use.

DATE: 4/28/2023 3:57:52 PM
FILE: c:\bms\pwe-useast-006\tony.trejo\dms59706\bc-21.dgn

PAVEMENT MARKING PATTERNS

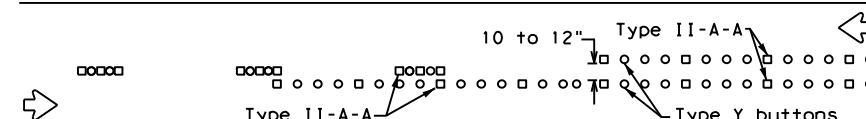


REFLECTORIZED PAVEMENT MARKINGS - PATTERN A

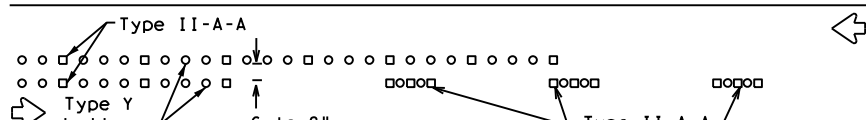


REFLECTORIZED PAVEMENT MARKINGS - PATTERN B

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



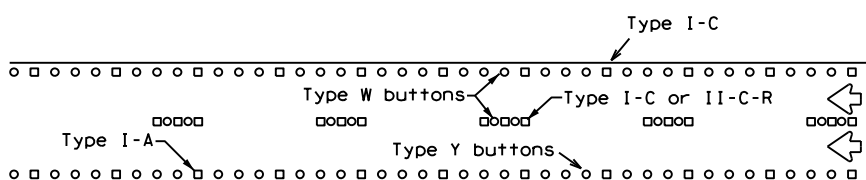
RAISED PAVEMENT MARKERS - PATTERN B

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.



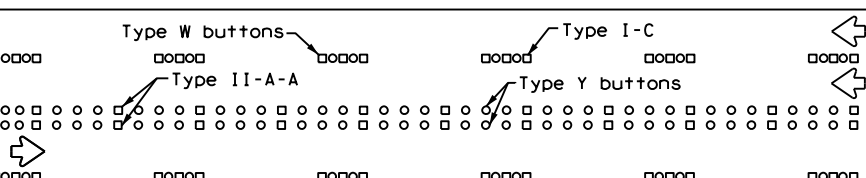
RAISED PAVEMENT MARKERS

EDGE & LANE LINES FOR DIVIDED HIGHWAY



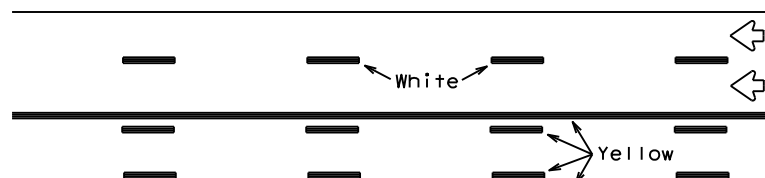
REFLECTORIZED PAVEMENT MARKINGS

Prefabricated markings may be substituted for reflectORIZED pavement markings.



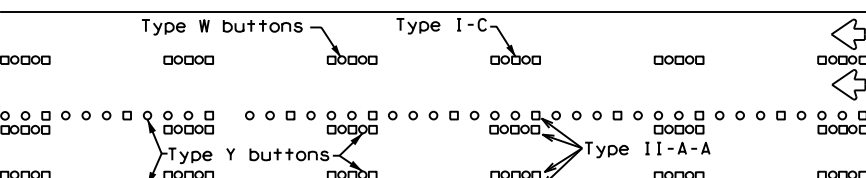
RAISED PAVEMENT MARKERS

LANE & CENTER LINES FOR MULTILANE UNDIVIDED HIGHWAYS



REFLECTORIZED PAVEMENT MARKINGS

Prefabricated markings may be substituted for reflectORIZED pavement markings.



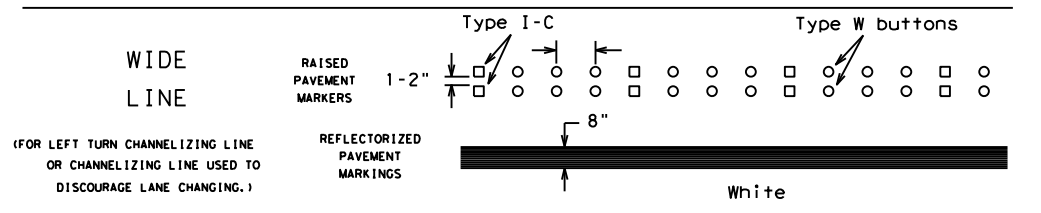
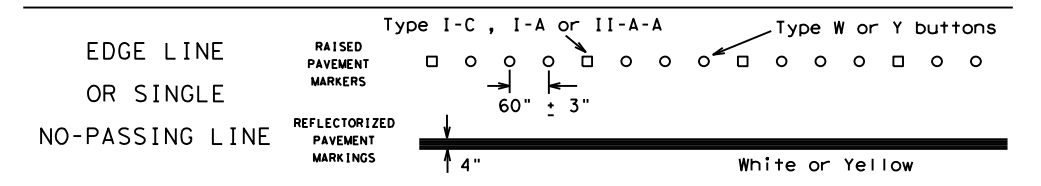
RAISED PAVEMENT MARKERS

TWO-WAY LEFT TURN LANE

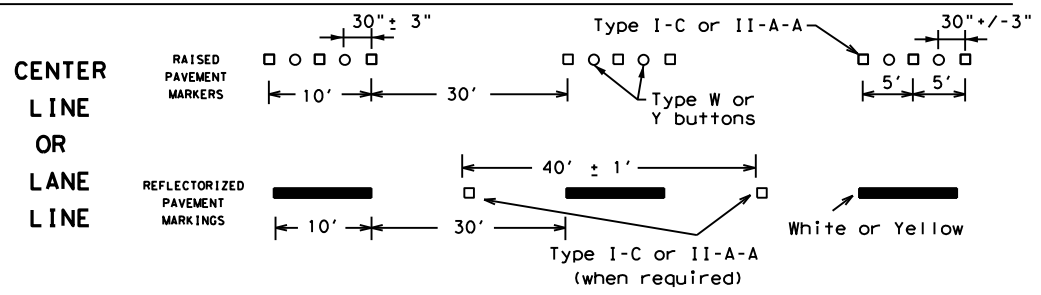
STANDARD WORK ZONE PAVEMENT MARKINGS DETAILS



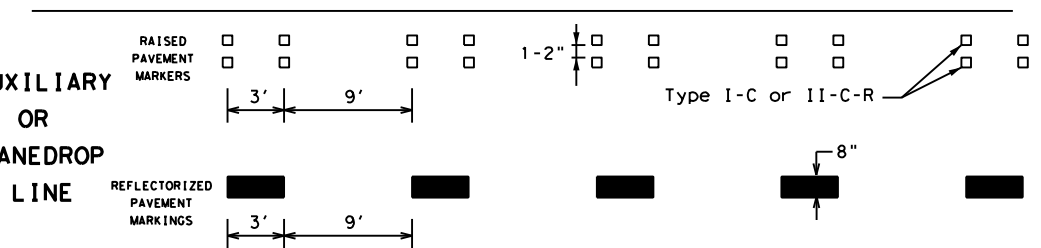
SOLID LINES



BROKEN LINES

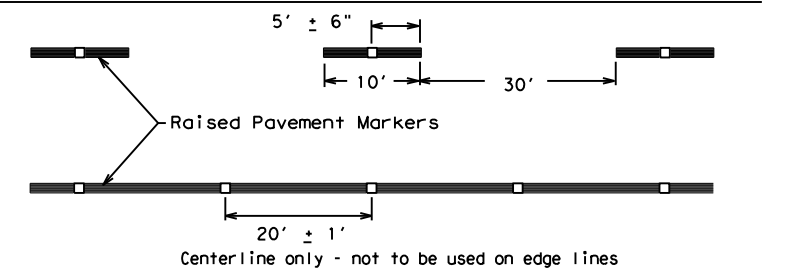


AUXILIARY OR LANEDROP LINE



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

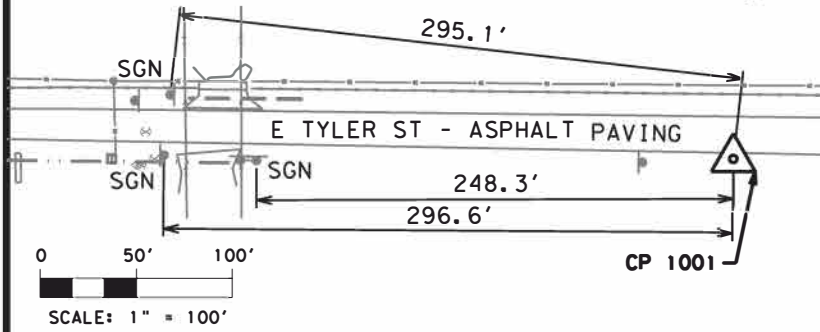
FILE: bc-21.dgn	DN: TxDOT	CK: TxDOT	DW: TxDOT	CR: TxDOT
©TxDOT February 1998	CONT	SECT	JOB	HIGHWAY
REVISIONS	0910	16	139	CR 1102
1-97 9-07 5-21				
2-98 7-13				
11-02 8-14	DIST	COUNTY	SHEET NO.	
	TYLER	VAN ZANDT	23	

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."

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.

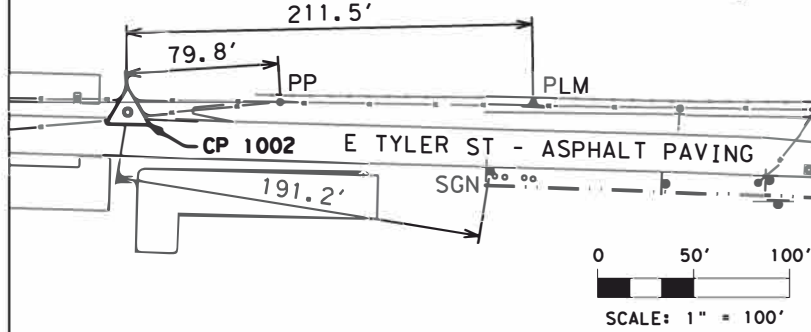
DATE: 4/28/2023 3:57:55 PM
FILE: c:\bms\pwe-useast-006\tony.trejo\dms59706\bc-21.dgn

CP 1001
 STA: OFF CHAIN
 OFF: OFF CHAIN
 N=6,895,535.59
 E=2,783,342.42
 ELEV=462.86'
 5/8" IRON ROD
 W/PLASTIC CAP
 "CONTROL POINT"



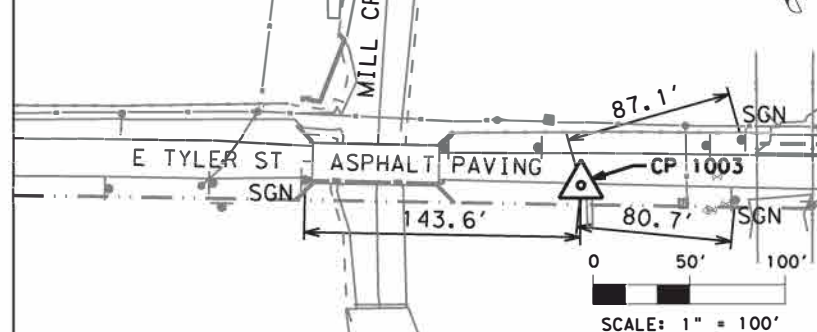
SITUATED ON THE SOUTH SIDE OF E TYLER STREET
 APPROXIMATELY 1,100 FEET WEST OF E DALLAS STREET

CP 1002
 STA: OFF CHAIN
 OFF: OFF CHAIN
 N=6,895,956.59
 E=2,782,541.82
 ELEV=460.81'
 5/8" IRON ROD
 W/PLASTIC CAP
 "CONTROL POINT"



SITUATED ON THE NORTH SIDE OF E TYLER STREET
 APPROXIMATELY 2,010 FEET WEST OF E DALLAS STREET

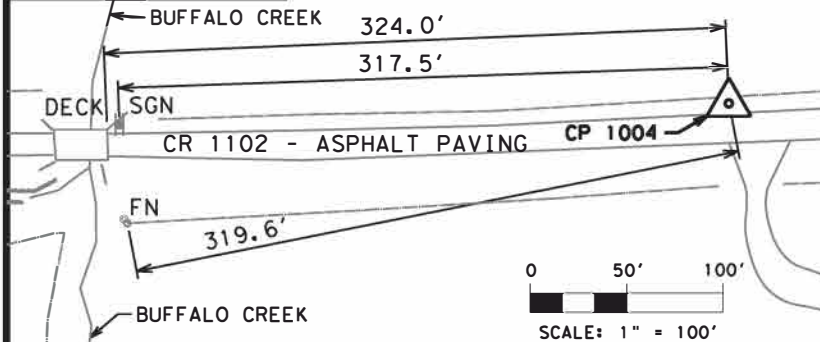
CP 1003
 STA: 13+07.20
 OFF: 8.92' RT
 N=6,895,705.79
 E=2,783,005.94
 ELEV=461.31'
 5/8" IRON ROD
 W/PLASTIC CAP
 "CONTROL POINT"



SITUATED ON THE SOUTH SIDE OF E TYLER STREET
 APPROXIMATELY 1,490 FEET WEST OF E DALLAS STREET

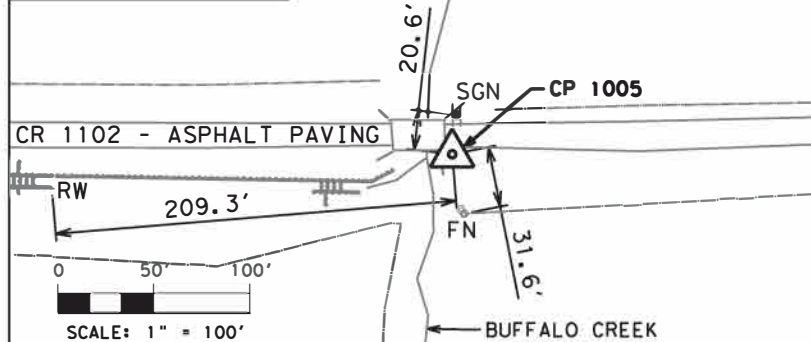
- NOTES:
1. ALL BEARINGS AND COORDINATES ARE REFERENCED TO THE TEXAS COORDINATE SYSTEM OF 1983 TEXAS NORTH CENTRAL ZONE (4204), NAD 83 (2011 ADJ.), EPOCH 2010.00) GEOID 12B, AND NAVD 88. ALL DISTANCES AND COORDINATES ARE SURFACE VALUES AND MAY BE CONVERTED TO GRID BY DIVIDING BY A SURFACE ADJUSTMENT FACTOR OF 1.000120.
 2. ALL HORIZONTAL VALUES WERE DERIVED FROM GPS (RTK) OBSERVATION.
 3. ALL ELEVATIONS ARE BASED ON THE NORTH AMERICAN VERTICAL DATUM OF 1988 (NAVD88), 2001 ADJUSTMENT UTILIZING GEOID 12B.
 4. ALL HORIZONTAL AND VERTICAL CONTROL FOR THIS PROJECT WAS VERIFIED BY GPS (RTK) OBSERVATION MEANS.
 5. THE CONTROL POINTS SHOWN HEREIN WAS DETERMINED BY SURVEY MADE ON THE GROUND UNDER MY SUPERVISION.
 6. ALL MEASUREMENTS ARE U.S. SURVEY FEET.

P 1004
 STA: OFF CHAIN
 OFF: OFF CHAIN
 N=6,929,911.08
 E=2,788,411.22
 ELEV=416.64'
 5/8" IRON ROD
 W/PLASTIC CAP
 "CONTROL POINT"



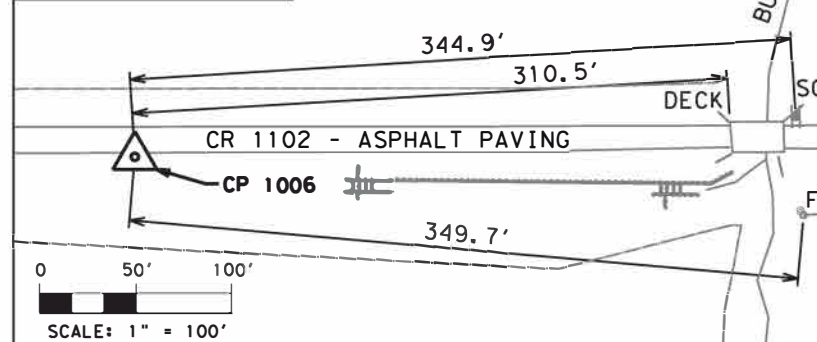
SITUATED ON THE NORTHEAST SIDE OF CR 1102
 APPROXIMATELY 300 FEET WEST OF CR 1107

CP 1005
 STA: 12+02.89
 OFF: 8.70' RT
 N=6,930,106.73
 E=2,788,156.51
 ELEV=415.51'
 5/8" IRON ROD
 W/PLASTIC CAP
 "CONTROL POINT"

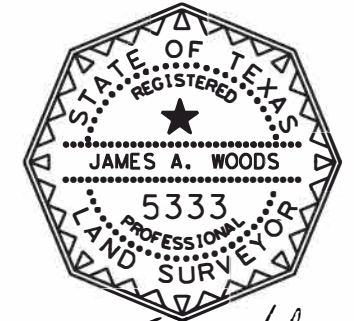


SITUATED ON THE SOUTHWEST SIDE OF CR 1102
 APPROXIMATELY 620 FEET WEST OF CR 1107

CP 1006
 STA: OFF CHAIN
 OFF: OFF CHAIN
 N=6,930,341.34
 E=2,787,907.62
 ELEV=415.60'
 5/8" IRON ROD
 W/PLASTIC CAP
 "CONTROL POINT"



SITUATED ON THE SOUTHWEST SIDE OF CR 1102
 APPROXIMATELY 960 FEET WEST OF CR 1107



SIGNED: *James A. Woods*
 JAMES A. WOODS
 REGISTERED PROFESSIONAL
 LAND SURVEYOR TEXAS No. 5333



THE SURVEY CONTROL INFORMATION HAS BEEN
 ACCEPTED AND INCORPORATED INTO THIS PS&E.

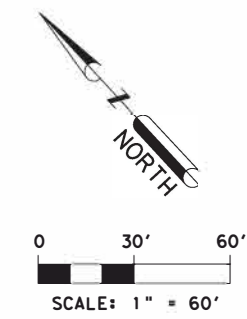
Civil Corp
 ENGINEERS - SURVEYORS
 801 LIPAN STREET, CORPUS CHRISTI, TEXAS 78401
 TEL: (361) 371-5380 TBPLS #10194156 TBPE #10283

©2023
 Texas Department of Transportation

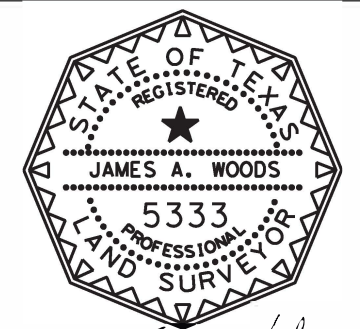
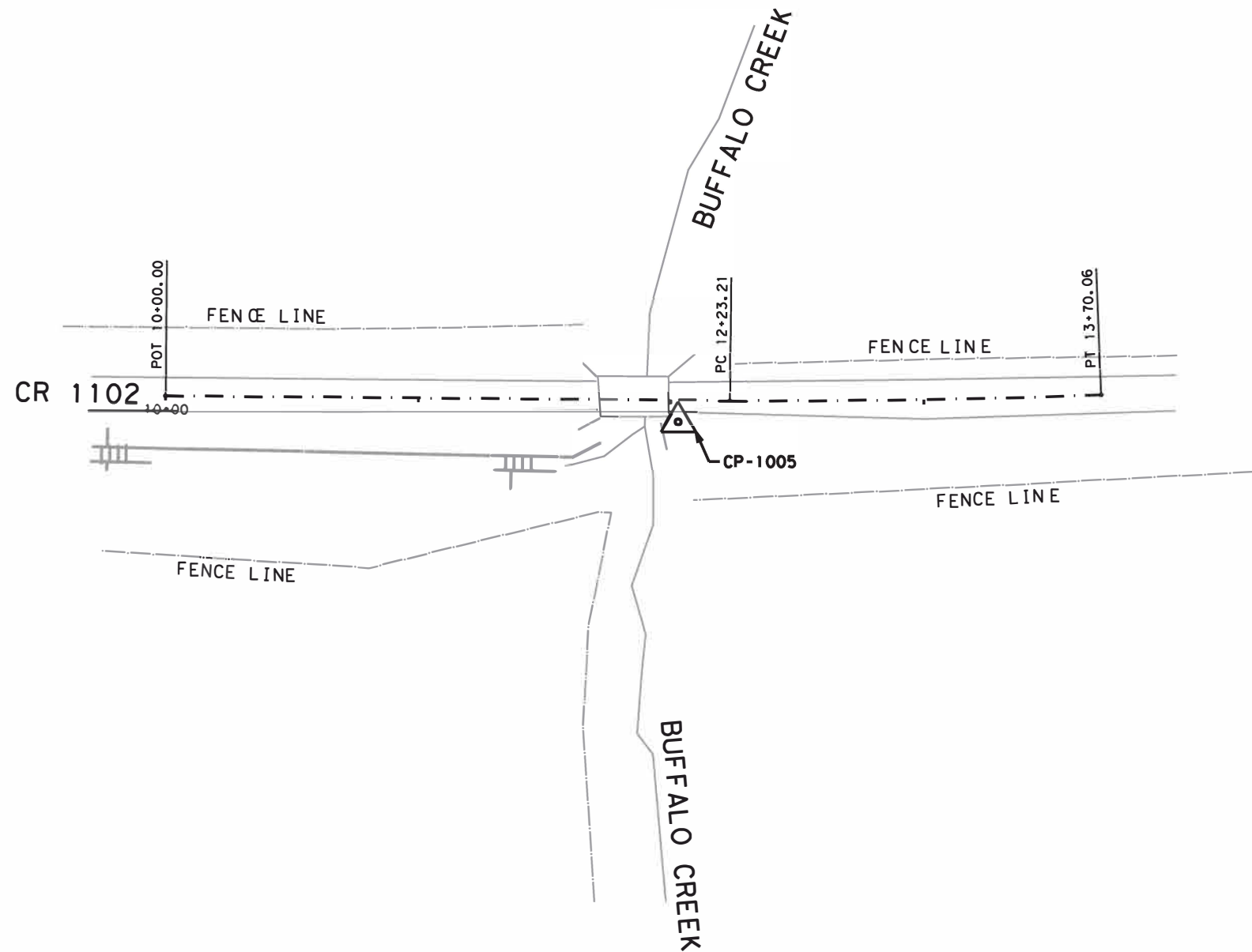
CR 1102 • BUFFALO CREEK

**SURVEY
 HORIZONTAL AND VERTICAL
 CONTROL**

FED RD DIV NO.	FEDERAL AID PROJECT	SHEET NO.
6	SEE TITLE SHEET	24
STATE	DISTRICT	COUNTY
TEXAS	TYL	VAN ZANDT
CONTROL	SECTION	JOB
0910	12	139
		HIGHWAY
		CR 1102



- NOTES:
1. ALL BEARINGS AND COORDINATES ARE REFERENCED TO THE TEXAS COORDINATE SYSTEM OF 1983 TEXAS NORTH CENTRAL ZONE (4204), NAD 83 (2011 ADJ.), EPOCH 2010.00) GEOID 12B, AND NAVD 88. ALL DISTANCES AND COORDINATES ARE SURFACE VALUES AND MAY BE CONVERTED TO GRID BY DIVIDING BY A SURFACE ADJUSTMENT FACTOR OF 1.000120.
 2. ALL HORIZONTAL VALUES WERE DERIVED FROM GPS (RTK) OBSERVATION.
 3. ALL ELEVATIONS ARE BASED ON THE NORTH AMERICAN VERTICAL DATUM OF 1988 (NAVD88), 2001 ADJUSTMENT UTILIZING GEOID 12B.
 4. ALL HORIZONTAL AND VERTICAL CONTROL FOR THIS PROJECT WAS VERIFIED BY GPS (RTK) OBSERVATION MEANS.
 5. THE CONTROL POINTS SHOWN HEREIN WAS DETERMINED BY SURVEY MADE ON THE GROUND UNDER MY SUPERVISION.
 6. ALL MEASUREMENTS ARE U.S. SURVEY FEET.



SIGNED: *James A. Woods*
 JAMES A. WOODS
 REGISTERED PROFESSIONAL
 LAND SURVEYOR TEXAS No. 5333



THE SURVEY CONTROL INFORMATION HAS BEEN ACCEPTED AND INCORPORATED INTO THIS PS&E.

Civil Corp
 ENGINEERS • SURVEYORS
 801 LIPAN STREET, CORPUS CHRISTI, TEXAS 78401
 TEL: (361) 371-5380 TBPLS #10194156 TBPE #10283

©2023
 Texas Department of Transportation

CR 1102 • BUFFALO CREEK

SURVEY CONTROL LAYOUT

FROM	TO	DIRECTION	DISTANCE
CP 1006	CP 1005	S 46° 41' 29" E	342.04'
CP 1005	CP 1004	S 52° 28' 14" E	321.18'

Point	North	East	Elevation	Station	Offset	Description
CP 1004	6,929,911.08	2,788,411.22	416.64'	Off Chain	Off Chain	5/8" IRON ROD W/PLASTIC CAP "CONTROL POINT"
CP 1005	6,930,106.73	2,788,156.51	415.51'	12+02.89	8.70'	5/8" IRON ROD W/PLASTIC CAP "CONTROL POINT"
CP 1006	6,930,341.34	2,787,907.62	415.60'	Off Chain	Off Chain	5/8" IRON ROD W/PLASTIC CAP "CONTROL POINT"

FED RD DIV NO.	FEDERAL AID PROJECT	SHEET NO.	
6	SEE TITLE SHEET	25	
STATE	DISTRICT	COUNTY	
TEXAS	TYL	VAN ZANDT	
CONTROL	SECTION	JOB	HIGHWAY
0910	12	139	CR 1102

CR 1102 HORIZONTAL ALIGNMENT

* BENTLEY HORIZONTAL ALIGNMENT REVIEW




*
 * Alignment name: CR1102
 * Alignment description:
 * Alignment style: Alignment\Baseline
 *

	STATION	NORTHING	EASTING
Element: Linear			
POT()	1000.000 R1	6930252.008	2788014.615
PC()	1223.214 R1	6930099.154	2788177.281
Tangential Direction:	S46.781?E		
Tangential Length:	223.214		

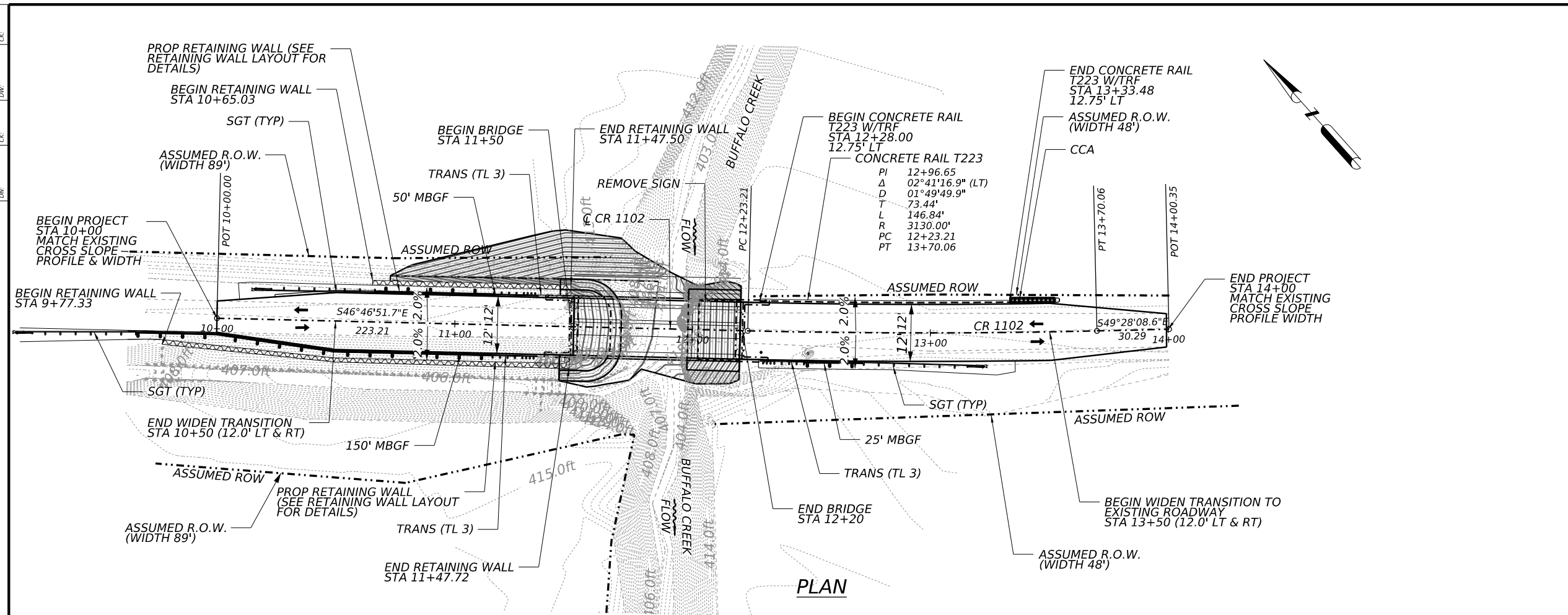
Element: Circular			
PC()	1223.214 R1	6930099.154	2788177.281
PI()	1296.649 R1	6930048.866	2788230.796
CC()	6932380.116	2790320.668	
PT()	1370.058 R1	6930001.143	2788286.611
Radius:	3130.000		
Delta:	2.688? Left		
Degree of Curvature(Arc):	1.831?		
Length:	146.844		
Tangent:	73.435		
Chord:	146.830		
Middle Ordinate:	0.861		
External:	0.861		
Tangent Direction:	S46.781?E		
Radial Direction:	S43.219?W		
Chord Direction:	S48.125?E		
Radial Direction:	S40.531?W		
Tangent Direction:	S49.469?E		

Element: Linear			
PT()	1370.058 R1	6930001.143	2788286.611
POT()	1400.351 R1	6929981.457	2788309.636
Tangential Direction:	S49.469?E		
Tangential Length:	30.294		

DATE: 4/28/2023 3:58:22 PM
 FILE: c:\bms\pwe-useast-006\tony.tre\oldms67143\C_139_S_RHD01.dgn

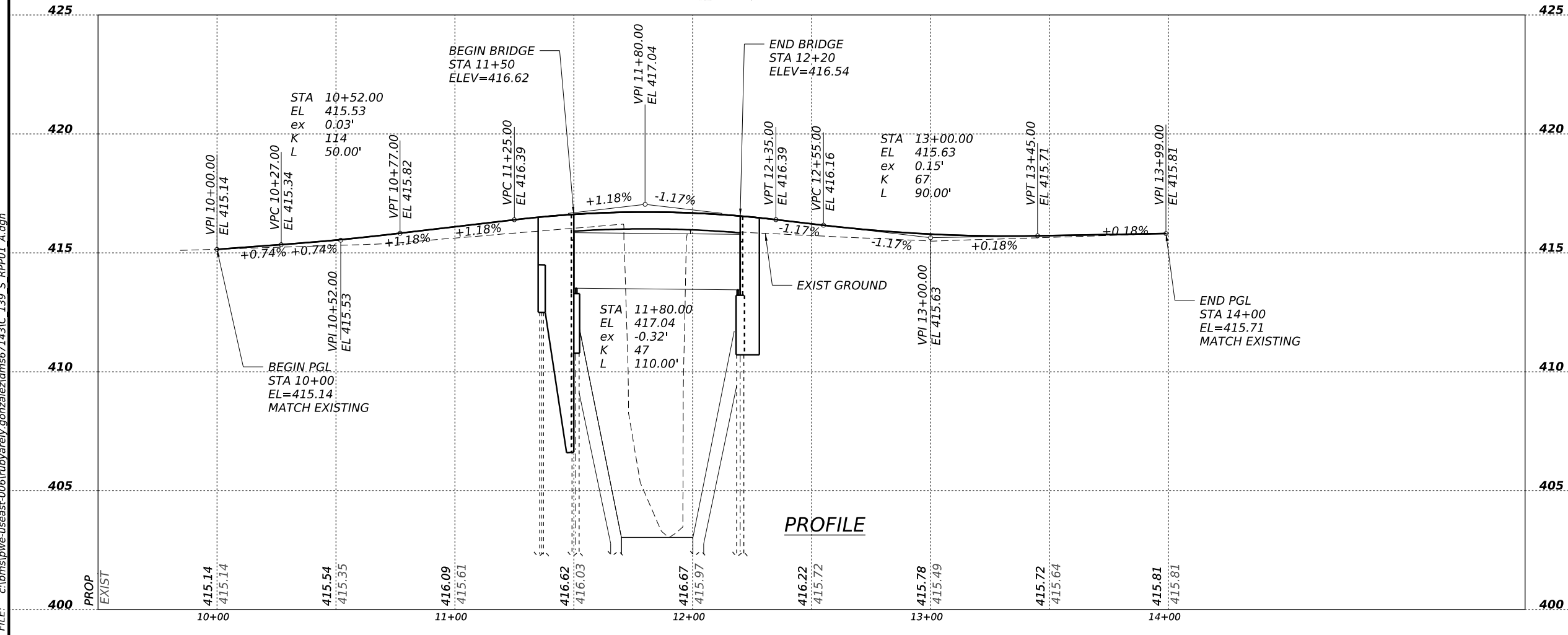
 4/28/2023		
NO.	DATE	REVISION
 F-12040		
 ©2023		
TYLER BRIDGE REPLACEMENTS CR 1102 AT BUFFALO CREEK ALIGNMENT DATA SHEET 1 OF 1		
CONT	SECT	JOB
0910	12	139
		HIGHWAY
		CR 1102
DIST	COUNTY	SHEET NO.
TYLER	VAN ZANDT	26

CK:
DW:
CK:
DW:

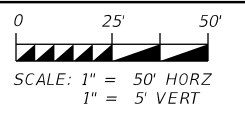


NOTE:
PENDING SERVICE
INFRASTRUCTURE, UTILITY
OWNER SHALL RELOCATE
WHEN CONFLICTS WITH
PROJECT.

PLAN



PROFILE



[Signature] 5/17/2023

NO.	DATE	REVISION	APPROV.



TYLER BRIDGE REPLACEMENTS

CR 1102
AT BUFFALO CREEK

PLAN & PROFILE

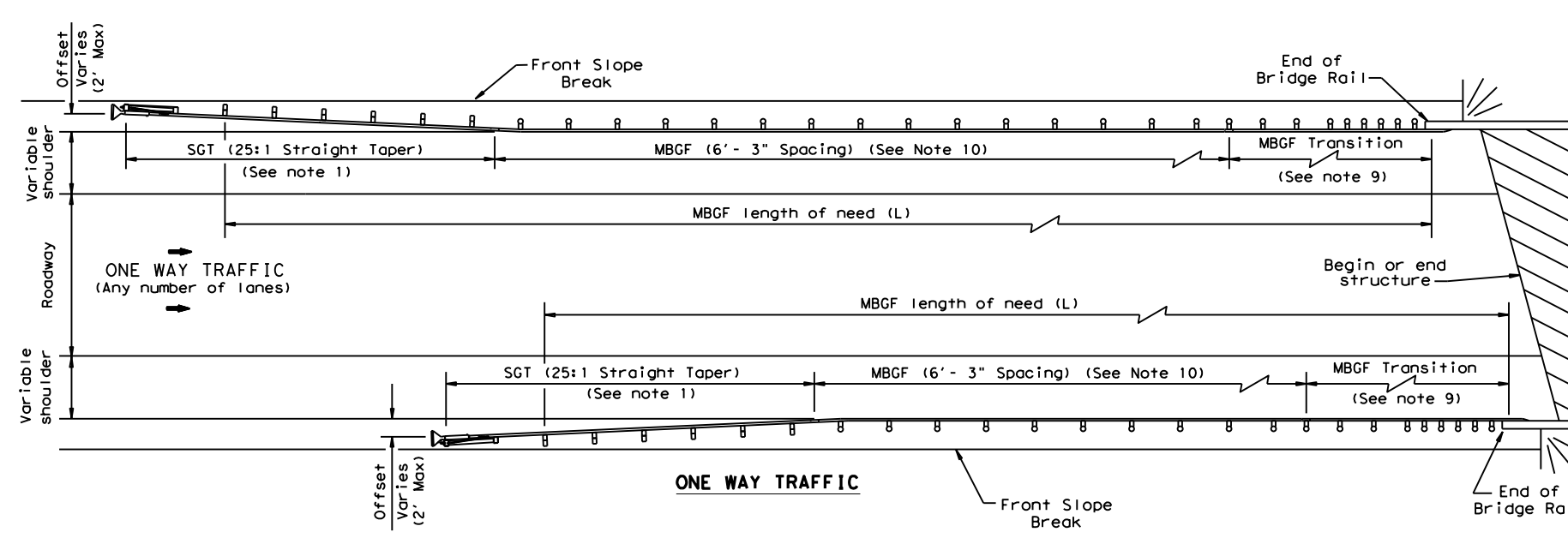
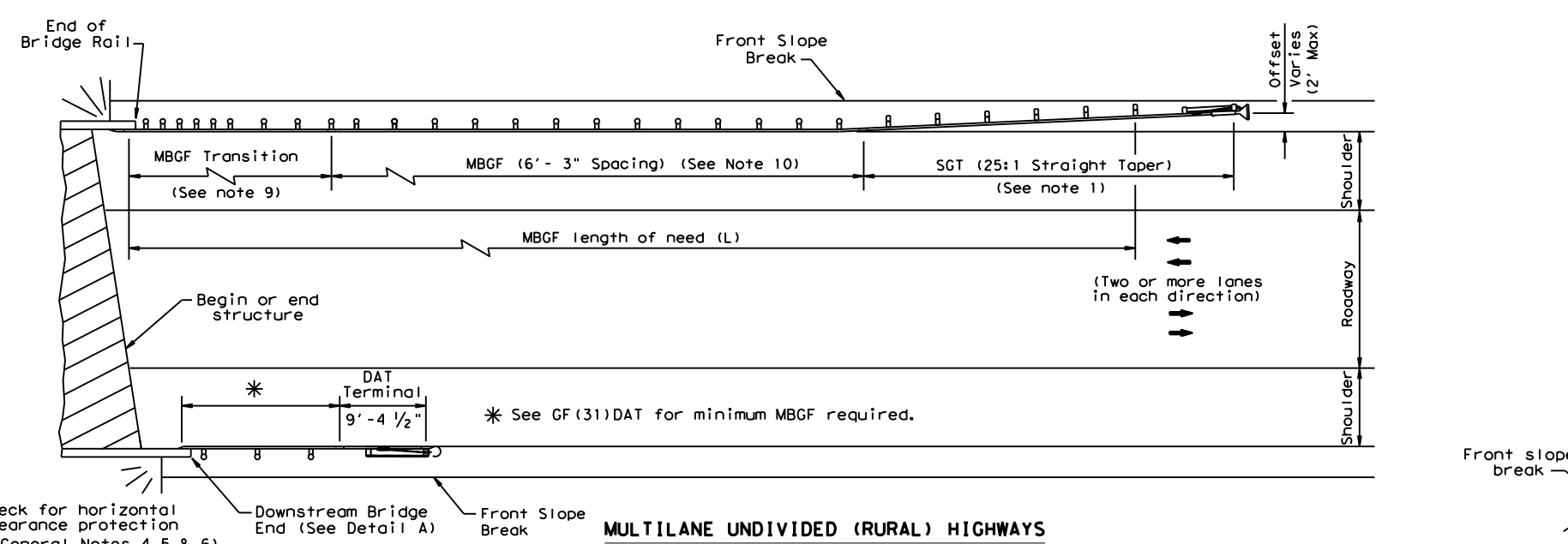
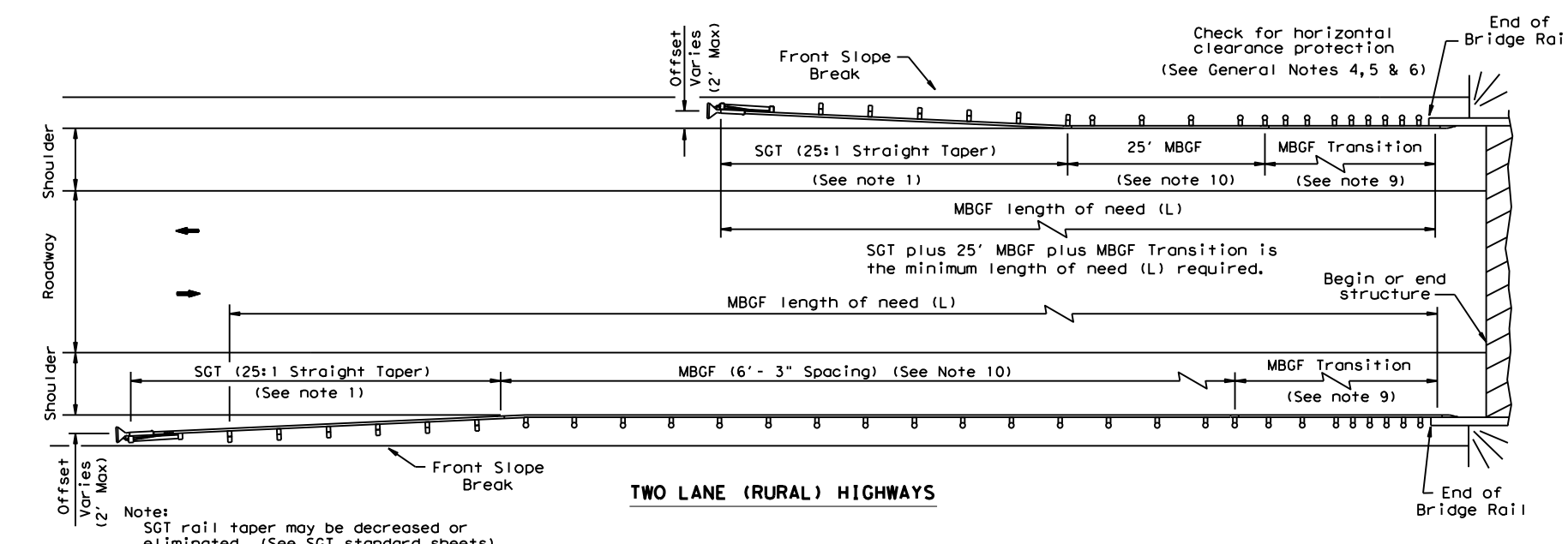
SHEET 1 OF 1

CONT	SECT	JOB	HIGHWAY
0910	12	139	CR 1102
DIST	COUNTY	SHEET NO.	
TYLER	VAN ZANDT	27	

DATE: 5/17/2023 2:15:01 PM
FILE: c:\bms\pwe-useast-006\rbvarely.gonzalez\dms671431c_139_s_rpp01_a.dgn

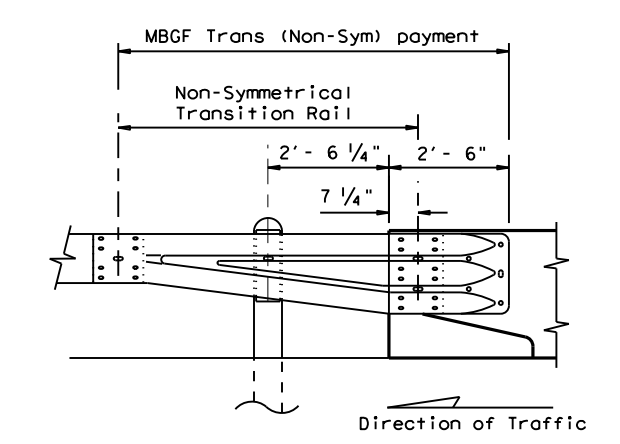
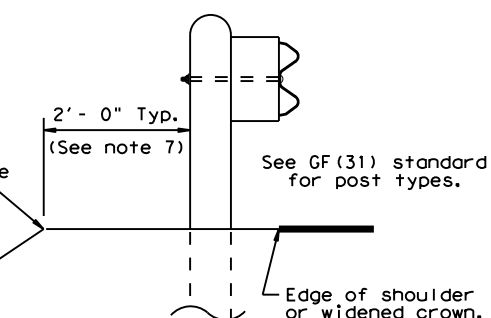
DISCLAIMER: The use of this standard is governed by the "Texas Engineering Practice Act". No warranty of any kind is made by TxDOT for any purpose whatsoever. TxDOT assumes no responsibility for the conversion of this standard to other formats or for incorrect results or damages resulting from its use.

DATE: 4/28/2023 3:58:56 PM
 FILE: c:\bms\pwe-useast-006\tony.trejo\dms59526\bed14.dgn



GENERAL NOTES

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



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

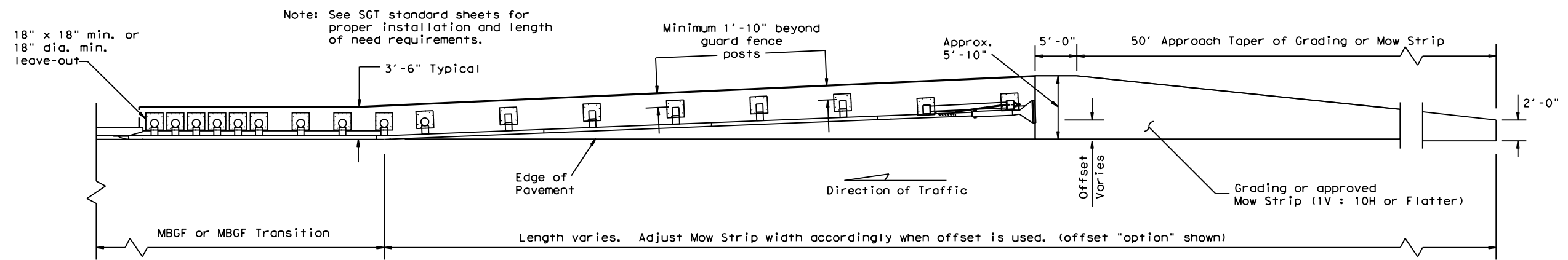
Texas Department of Transportation
 Design Division Standard

BRIDGE END DETAILS
 (METAL BEAM GUARD FENCE APPLICATIONS TO RIGID RAILS)
BED-14

FILE: bed14.dgn	DN: TxDOT	CK: AM	DW: BD/VP	CK: CGL
© TxDOT: December 2011	CONT	SECT	JOB	HIGHWAY
REVISIONS	091016	139	CR 1102	
REVISED APRIL 2014 SEE (MEMO 0414)	DIST	COUNTY	SHEET NO.	
	TYLER	VAN ZANDT	28	

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.

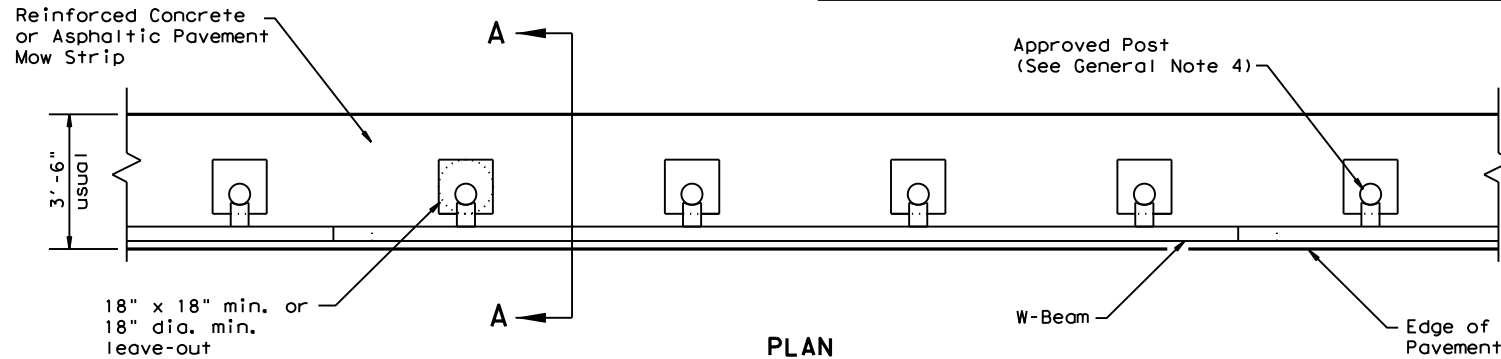
DATE: 4/28/2023
 FILE: c:\bms\pwe-useast-006\tony.trejo\dms59526\gf31ms19.dgn



Note: See SGT standard sheets for proper installation and length of need requirements.

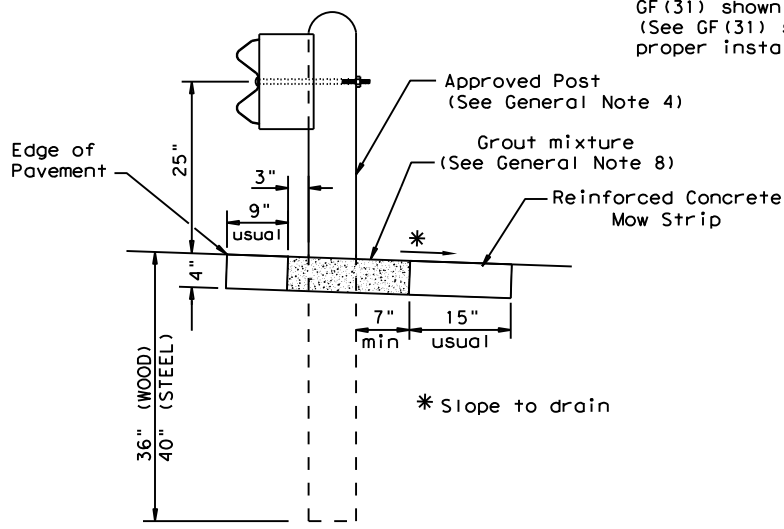
GRADING AND MOW STRIP AT GUARDRAIL END TREATMENTS

Note: Site Condition(s)
 Site conditions may exist where grading is required for the proper installation of metal guard fence and end treatments.
 Approach grading or mow strip may be decreased or eliminated, as directed by the Engineer.



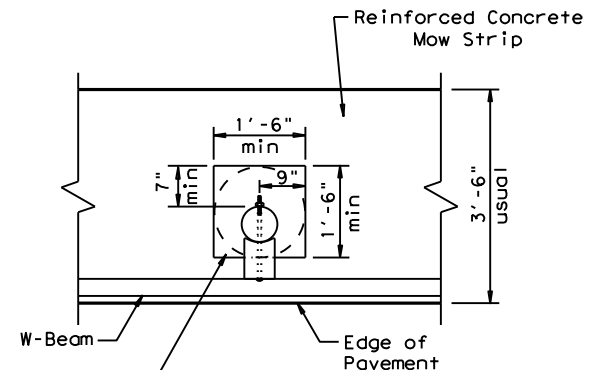
PLAN

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



SECTION A-A

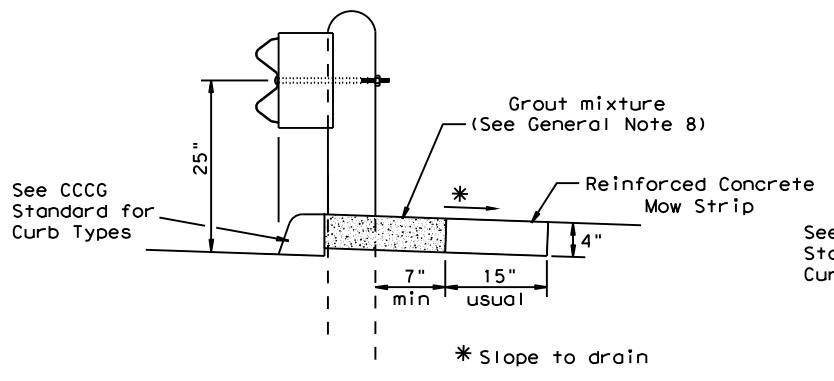
Typical



MOW STRIP DETAIL

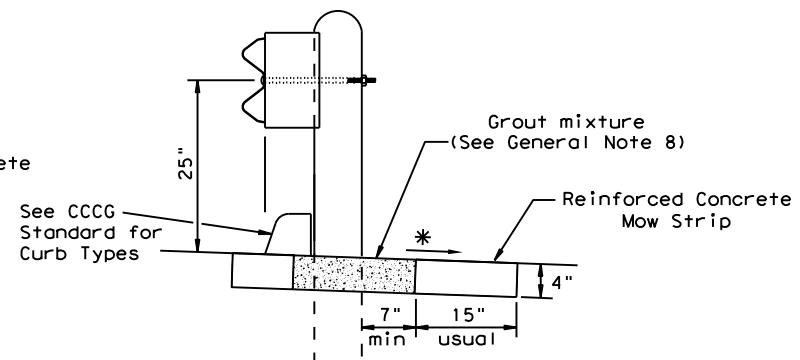
Reinforced Concrete Mow Strip with 18" x 18" Square or 18" Dia. minimum leave-out.

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



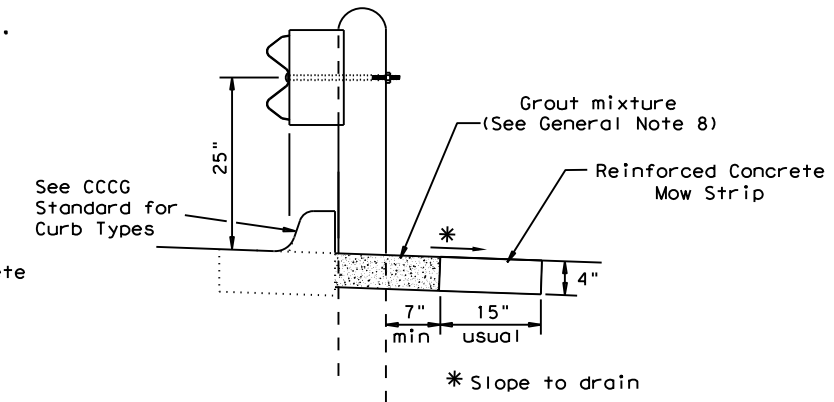
CURB OPTION (1)

This option will increase the post embedment throughout the system.



CURB OPTION (2)

Curb shown on top of mow strip



CURB OPTION (3)

Texas Department of Transportation
 Design Division Standard

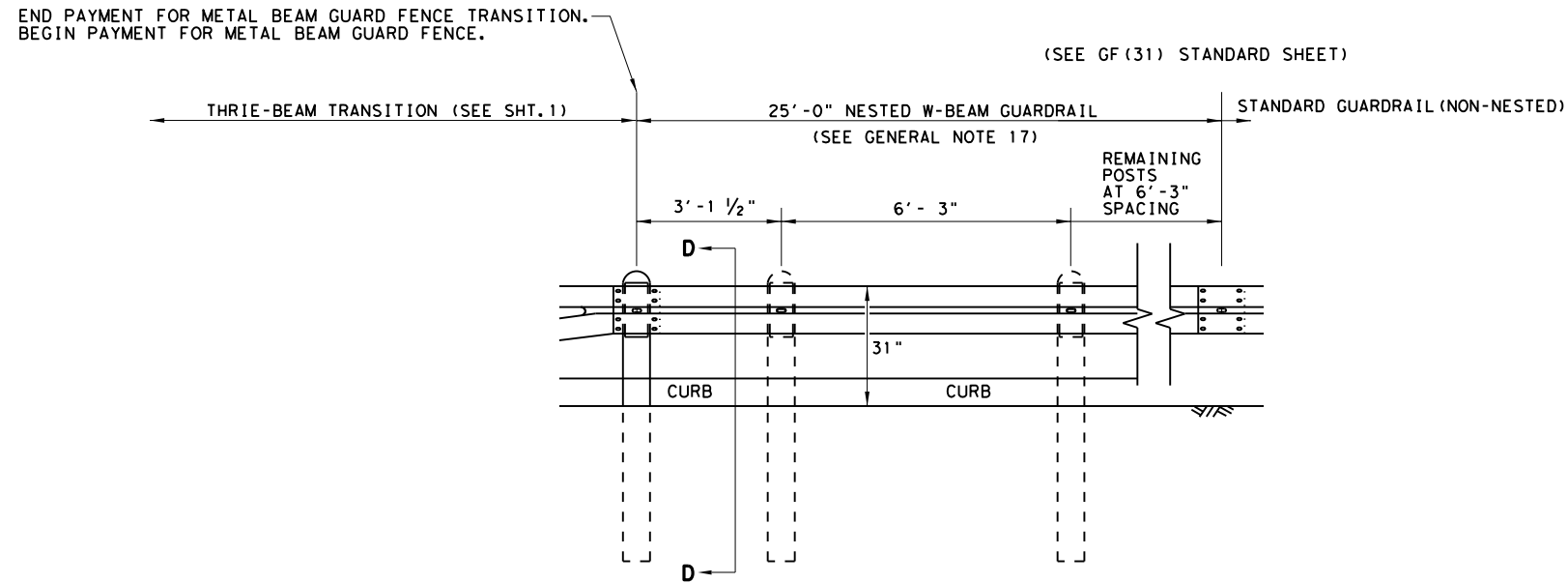
METAL BEAM GUARD FENCE (MOW STRIP)
TL-3 MASH COMPLIANT
GF(31)MS-19

FILE: gf31ms19.dgn	DN:TxDOT	CK:KM	DW:VP	CK:CGL/AG
©TXDOT: NOVEMBER 2019	CONT	SECT	JOB	HIGHWAY
REVISIONS	0910	16	139	CR 1102
DIST	COUNTY	SHEET NO.		
TYLER	VAN ZANDT			29

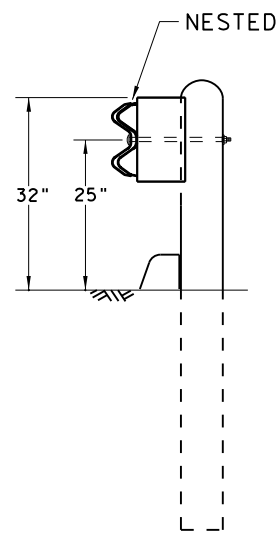
DISCLAIMER:
 THE USE OF THIS STANDARD IS GOVERNED BY THE "TEXAS ENGINEERING PRACTICE ACT". NO WARRANTY OF ANY KIND IS MADE BY TXDOT FOR ANY PURPOSE WHATSOEVER.
 TXDOT ASSUMES NO RESPONSIBILITY FOR THE CONVERSION OF THIS STANDARD TO OTHER FORMATS OR FOR INCORRECT RESULTS OR DAMAGES RESULTING FROM ITS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

DATE: 4/28/2023
 FILE: c:\bms\pwe-useast-006\tony.trejo\dms59526\gf31tr+1320.dgn

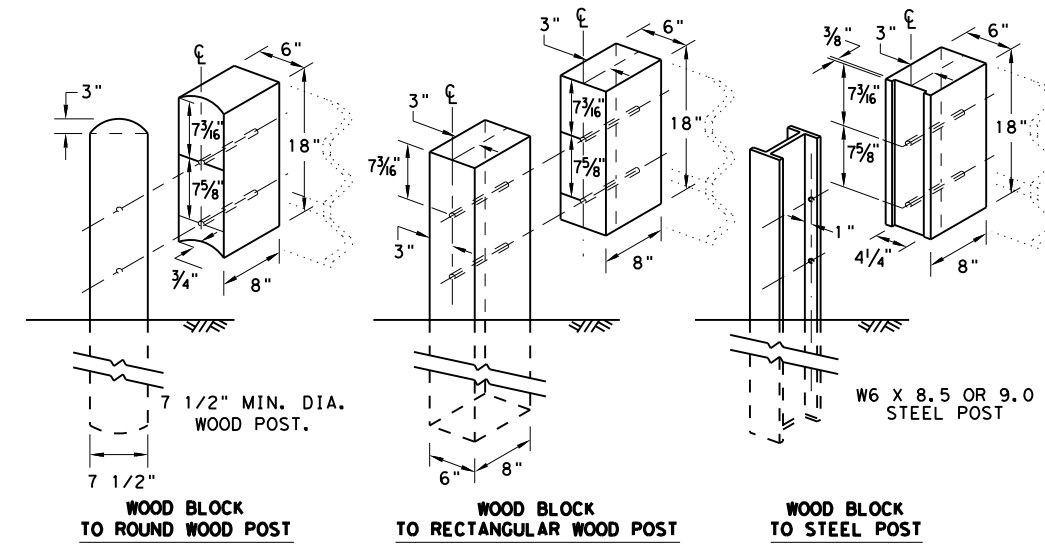
REQUIRED ALTERNATIVE FOR CONTINUOUS CURB EXTENDING PAST POST 7 (SEE SHT. 1 GENERAL NOTE 17)



ELEVATION VIEW



SECTION D-D



THREE BEAM TRANSITION BLOCKOUT DETAILS

HIGH-SPEED TRANSITION

SHEET 2 OF 2



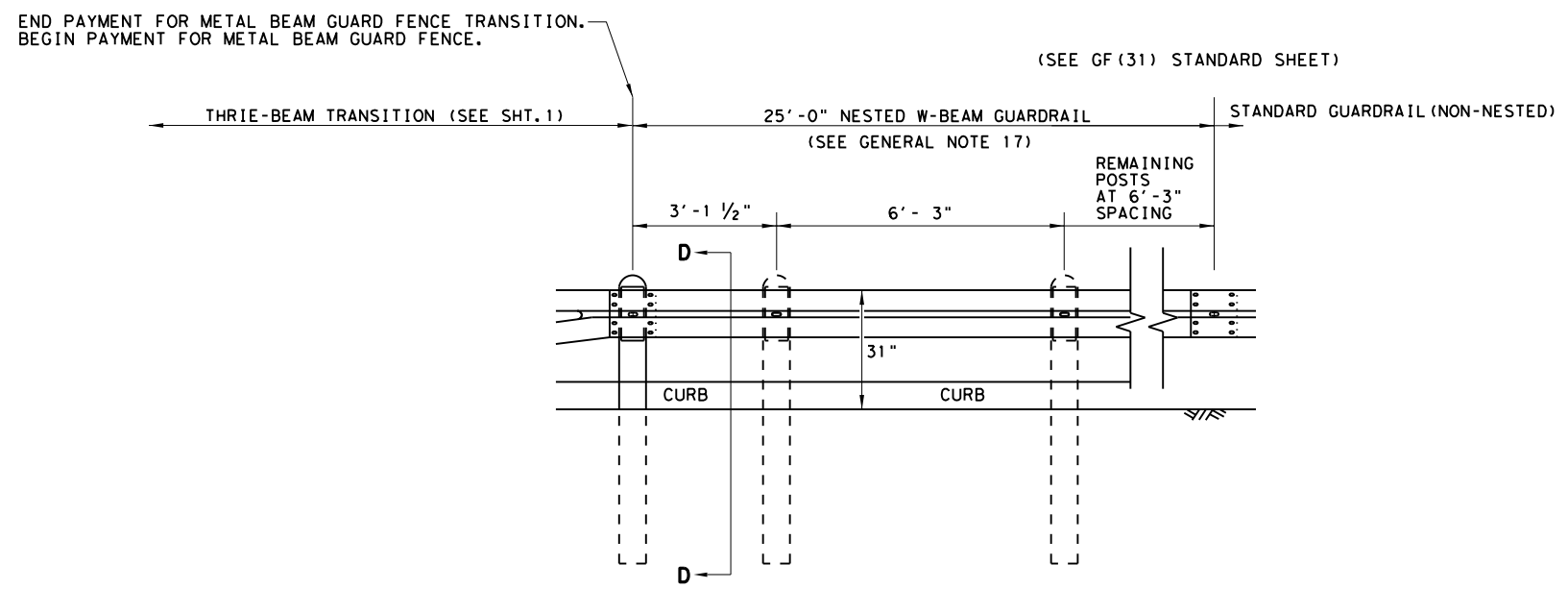
METAL BEAM GUARD FENCE
 THREE-BEAM TRANSITION
 TL-3 MASH COMPLIANT
 GF (31) TR TL3-20

FILE: gf31tr+1320.dgn	DN: TXDOT	CK: KM	DW: KM	CK: CGL/AG
©TXDOT: NOVEMBER 2020	CONT	SECT	JOB	HIGHWAY
REVISIONS	0910	16	139	CR 1102
	DIST	COUNTY	SHEET NO.	
	TYLER	VAN ZANDT	30	

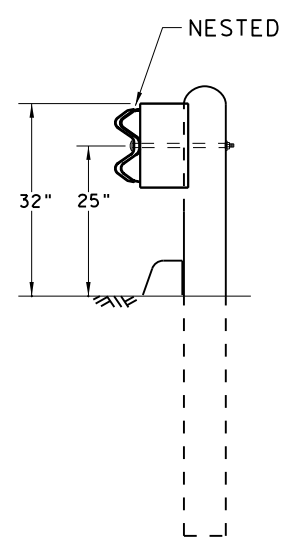
DISCLAIMER: THE USE OF THIS STANDARD IS GOVERNED BY THE "TEXAS ENGINEERING PRACTICE ACT". NO WARRANTY OF ANY KIND IS MADE BY TXDOT FOR ANY PURPOSE WHATSOEVER. TXDOT ASSUMES NO RESPONSIBILITY FOR THE CONVERSION OF THIS STANDARD TO OTHER FORMATS OR FOR INCORRECT RESULTS OR DAMAGES RESULTING FROM ITS USE.

DATE: 4/28/2023
 FILE: c:\bms\pwe-useast-006\tony.trejo\dms59526\gf31trt1320.dgn

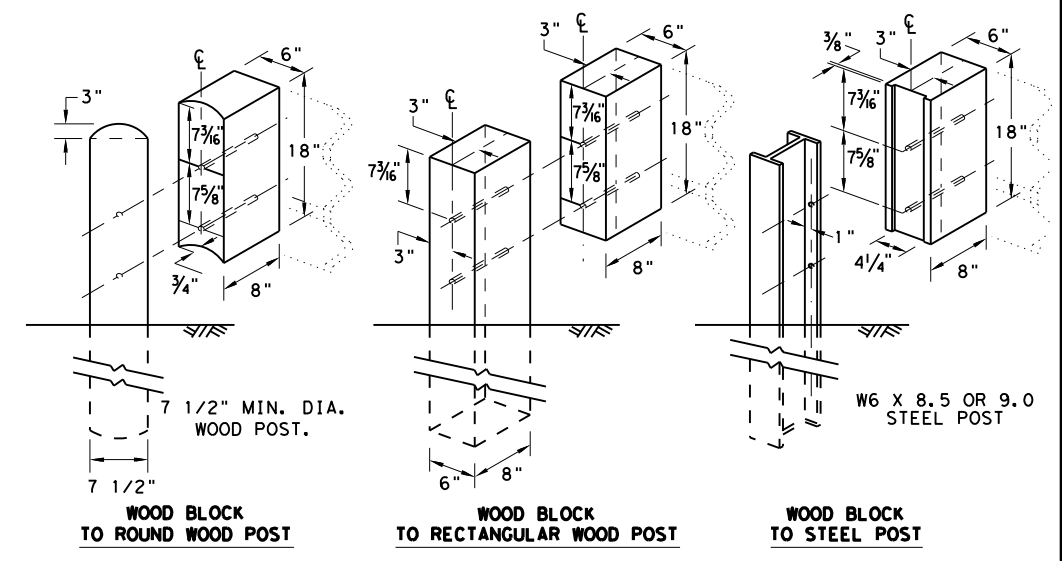
REQUIRED ALTERNATIVE FOR CONTINUOUS CURB EXTENDING PAST POST 7 (SEE SHT. 1 GENERAL NOTE 17)



ELEVATION VIEW



SECTION D-D



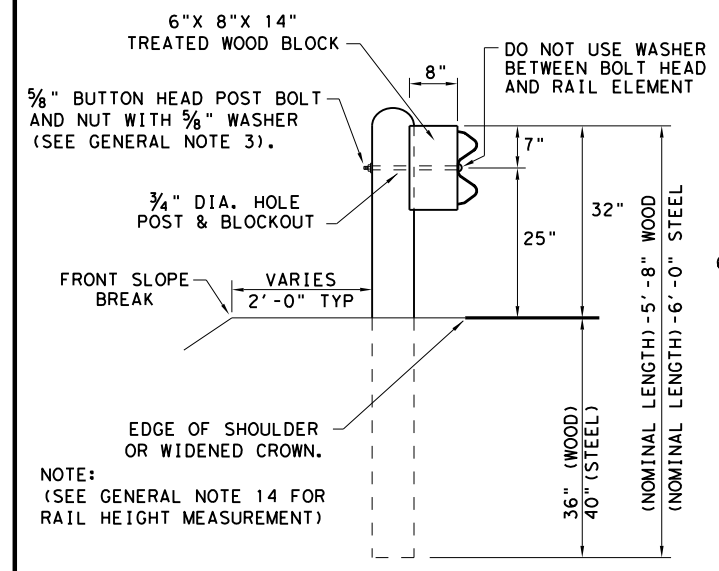
THREE BEAM TRANSITION BLOCKOUT DETAILS

HIGH-SPEED TRANSITION

SHEET 2 OF 2

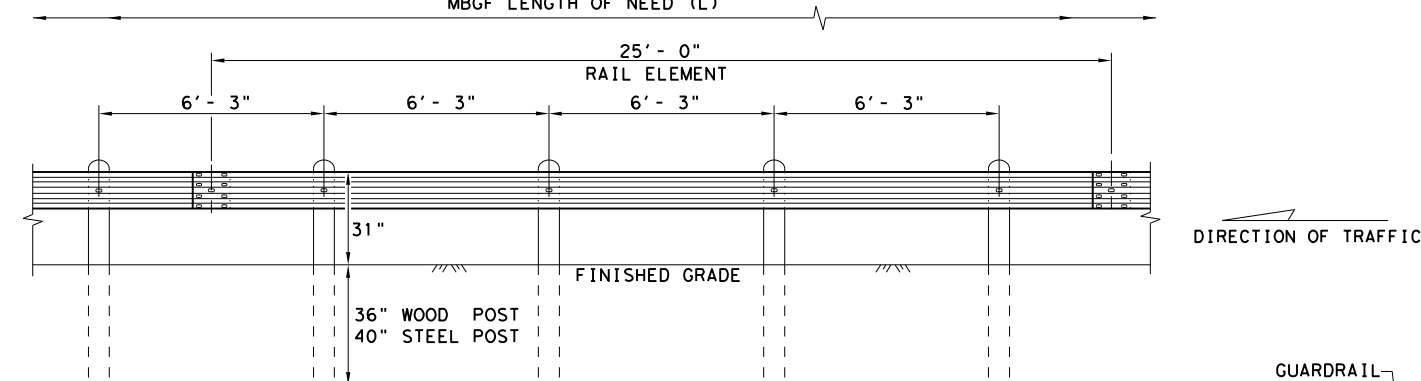
		Design Division Standard	
METAL BEAM GUARD FENCE THREE-BEAM TRANSITION TL-3 MASH COMPLIANT GF (31) TR TL3-20			
FILE: gf31trt1320.dgn	DN: TXDOT	CK: KM	DW: KM
©TXDOT: NOVEMBER 2020	CONT	SECT	JOB
REVISIONS		0910 16	139 CR 1102
DIST	COUNTY	SHEET NO.	
TYLER	VAN ZANDT	31	

DATE: 4/28/2023
 FILE: c:\bms\pwe-useast-006\tony.trejo\dms59526\of3119.dgn
 DISCLAIMER: THE USE OF THIS STANDARD IS GOVERNED BY THE "TEXAS ENGINEERING PRACTICE ACT". NO WARRANTY OF ANY KIND IS MADE BY TXDOT FOR ANY PURPOSE WHATSOEVER. TXDOT ASSUMES NO RESPONSIBILITY FOR THE CONVERSION OF THIS STANDARD TO OTHER FORMATS OR FOR INCORRECT RESULTS OR DAMAGES RESULTING FROM ITS USE.



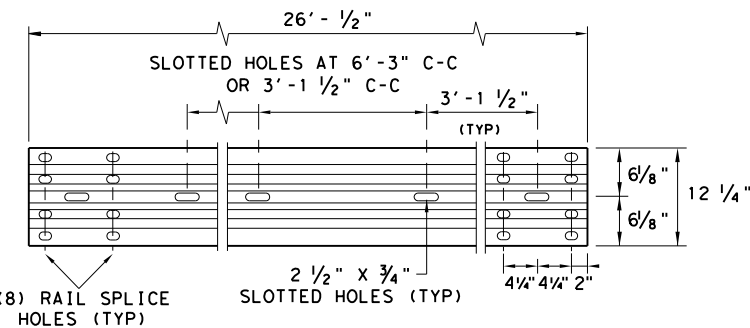
TYPICAL POST PLACEMENT

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



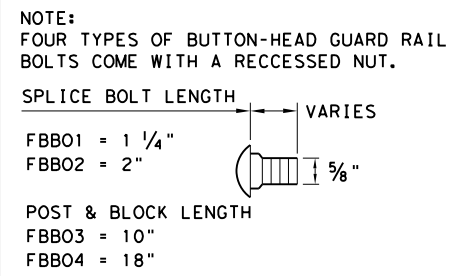
ELEVATION MID-SPAN RAIL SPLICE

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



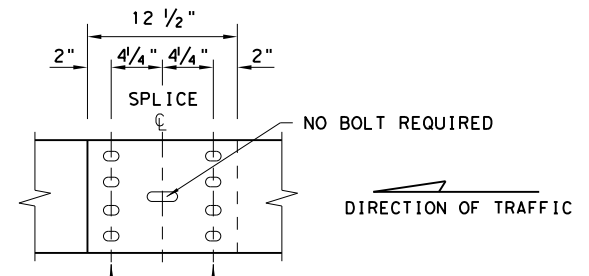
ELEVATION 25' - 0" (NOM.) W-BEAM SECTION

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



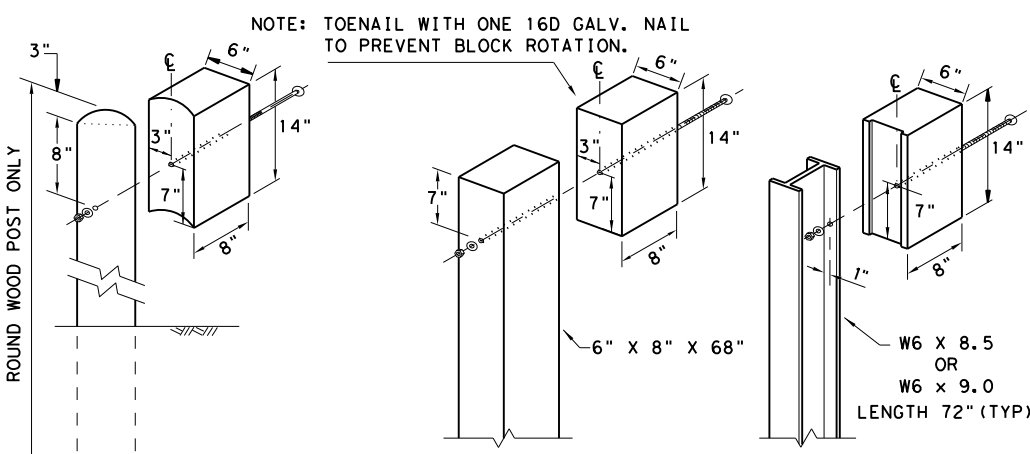
BUTTON HEAD BOLT

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



MID-SPAN RAIL SPLICE DETAIL

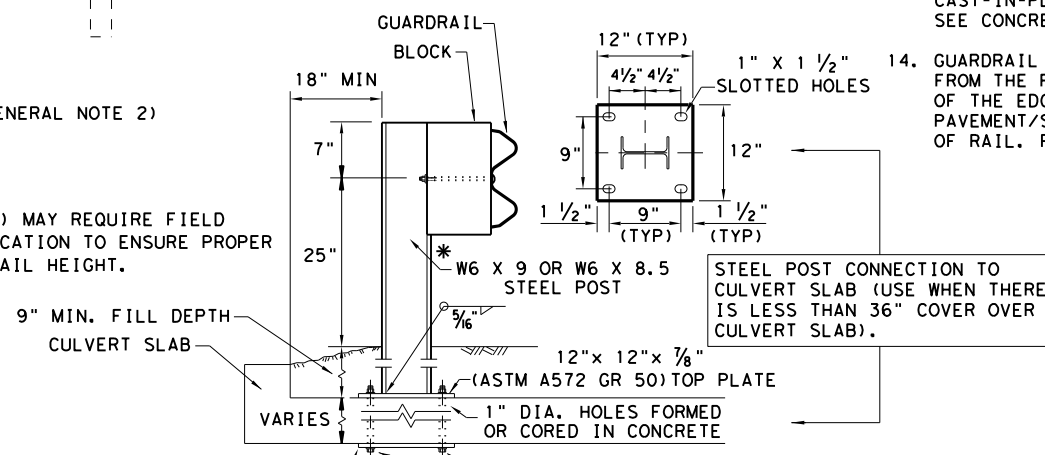
NOTE: GF(31), MID-SPAN RAIL SPLICES ARE REQUIRED WITH 6'-3" POST SPACINGS.



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

- GENERAL NOTES**
1. THE TYPE OF POST (ROUND WOOD POST, RECTANGULAR WOOD POST, OR STEEL POST) WILL BE AS SHOWN IN THE PLANS. THE EXACT POSITION OF MBGF SHALL BE SHOWN IN THE PLANS OR AS DIRECTED BY THE ENGINEER. STEEL POSTS TO BE GALVANIZED IN ACCORDANCE WITH ITEM 445, "GALVANIZING."
 2. RAIL ELEMENTS SHALL MEET THE REQUIREMENTS OF ITEM 540, "METAL BEAM GUARD FENCE" EXCEPT AS MODIFIED IN THE PLANS. THE CONTRACTOR MAY FURNISH RAIL ELEMENTS OF 25' - 0", OR 12' - 6" (NOM.) LENGTHS. RAIL ELEMENTS MAY HAVE SLOTTED HOLES AT 3'-1 1/2" C-C OR 6'-3" C-C. A SPECIAL LENGTH OF RAIL MAY BE MANUFACTURED TO ACCOMMODATE THE DOWNSTREAM ANCHOR TERMINAL (DAT) AND THE TRANSITION SECTIONS OF GUARDRAIL.
 3. BUTTON HEAD "POST BOLTS & NUTS" SHALL MEET THE REQUIREMENTS OF (ASTM A307), AND SHALL BE OF SUFFICIENT LENGTH TO EXTEND THROUGH THE FULL THICKNESS OF THE NUT AND 5/8" WASHER (FWC16G) AND NOT MORE THAN 1" BEYOND IT. TRIM REMAINING BOLT LENGTH TO MEET REQUIRED LENGTH.
 4. FITTINGS (BOLTS, NUTS, AND WASHERS) SHALL BE GALVANIZED IN ACCORDANCE WITH ITEM 445, "GALVANIZING." FITTINGS SHALL BE SUBSIDIARY TO THE BID ITEM.
 5. CROWN SHALL BE WIDENED TO ACCOMMODATE THE METAL BEAM GUARD FENCE.
 6. THE LATERAL APPROACH TO THE GUARD FENCE, SHALL HAVE A MAXIMUM SLOPE OF 1V:10H.
 7. IF SHOWN ELSEWHERE IN THE PLANS OR AS DIRECTED BY THE ENGINEER, THE GUARD FENCE MAY BE FLARED AT A RATE OF 25:1 OR FLATTER.
 8. UNLESS OTHERWISE SHOWN IN THE PLANS, GUARD FENCE PLACED IN THE VICINITY OF CURBS SHALL BE POSITIONED SO THAT THE FACE OF CURB IS LOCATED DIRECTLY BELOW OR BEHIND THE FACE OF THE RAIL. RAIL PLACED OVER CURBS SHALL BE INSTALLED SO THAT THE POST BOLT IS LOCATED APPROXIMATELY 25 INCHES ABOVE THE GUTTER PAN OR EDGE OF SHOULDER.
 9. APPLICATIONS IN SOLID ROCK ARE ONLY ALLOWED WITH STEEL POSTS. IF SOLID ROCK IS ENCOUNTERED WITHIN 0 TO 18" OF THE FINISHED GRADE, DRILL A 24" DIA. HOLE, 24" INTO THE ROCK. IF SOLID ROCK IS ENCOUNTERED BELOW 18", DRILL A 12" DIA. HOLE, 12" INTO THE ROCK OR TO THE STANDARD EMBEDMENT DEPTH, WHICHEVER MAYBE LESS. ANY EXCESS POST LENGTH, AFTER MEETING THESE DEPTHS, MAY BE FIELD CUT TO ENSURE PROPER GUARDRAIL MOUNTING HEIGHT. BACKFILL WITH COARSE AGGREGATE MATERIAL.
 10. POSTS SHALL NOT BE SET IN CONCRETE, OF ANY DEPTH.
 11. SPECIAL FABRICATION WILL BE REQUIRED AT INSTALLATION LOCATIONS HAVING A CURVATURE OF LESS THAN 150 FT. RADIUS.
 12. UNLESS OTHERWISE SHOWN IN THE PLANS, A COMPOSITE MATERIAL BLOCK THAT MEETS THE REQUIREMENTS OF DMS-7210, "COMPOSITE MATERIAL POSTS AND BLOCKS FOR METAL BEAM GUARD FENCE" MAY BE SUBSTITUTED FOR BLOCKS OF SIMILAR DIMENSIONS. THE CONSTRUCTION DIVISION, TXDOT MAINTAINS A MATERIAL PRODUCER LIST (MPL) FOR PRODUCERS OF MATERIALS CONFORMING TO DMS-7210 ONLY PRODUCERS ON THE MPL MAY FURNISH COMPOSITE MATERIAL BLOCKS.
 13. FOR THE LOW FILL CULVERT OPTION, POSTS LOCATED PARTIALLY OR WHOLLY BETWEEN PRECAST BOX CULVERT UNITS, THE USE OF A CAST-IN-PLACE CONCRETE CLOSURE BETWEEN BOXES IS REQUIRED. THE LENGTH OF THE CAST-IN-PLACE CONCRETE CLOSURE SHALL ACCOMMODATE THE PLACEMENT OF THE LOW FILL CULVERT OPTION. SEE CONCRETE CLOSURE DETAILS ON BRIDGE STANDARD SCP-MD.
 14. GUARDRAIL HEIGHT MEASUREMENT: WHEN THE GUARDRAIL IS LOCATED ABOVE PAVEMENT, MEASURE THE HEIGHT FROM THE PAVEMENT TO THE TOP OF THE W-BEAM RAIL. WHEN THE GUARDRAIL IS LOCATED UP TO 2 FT. OFF OF THE EDGE OF PAVEMENT OR FOR A PAVEMENT OVERLAY, USE A 10-FOOT STRAIGHTEDGE TO EXTEND THE PAVEMENT/SHOULDER SLOPE TO THE BACK OF RAIL, MEASURE FROM THE BOTTOM OF STRAIGHTEDGE TO THE TOP OF RAIL. FOR GUARDRAIL LOCATED DOWN A 10:1 SLOPE, MEASURE FROM THE NOMINAL TERRAIN.

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



LOW FILL CULVERT POST

- NOTE: TWO INSTALLATION OPTIONS.
1. **BOLT-THROUGH OPTION:** REQUIRES A 6" MIN. SLAB THICKNESS. 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.

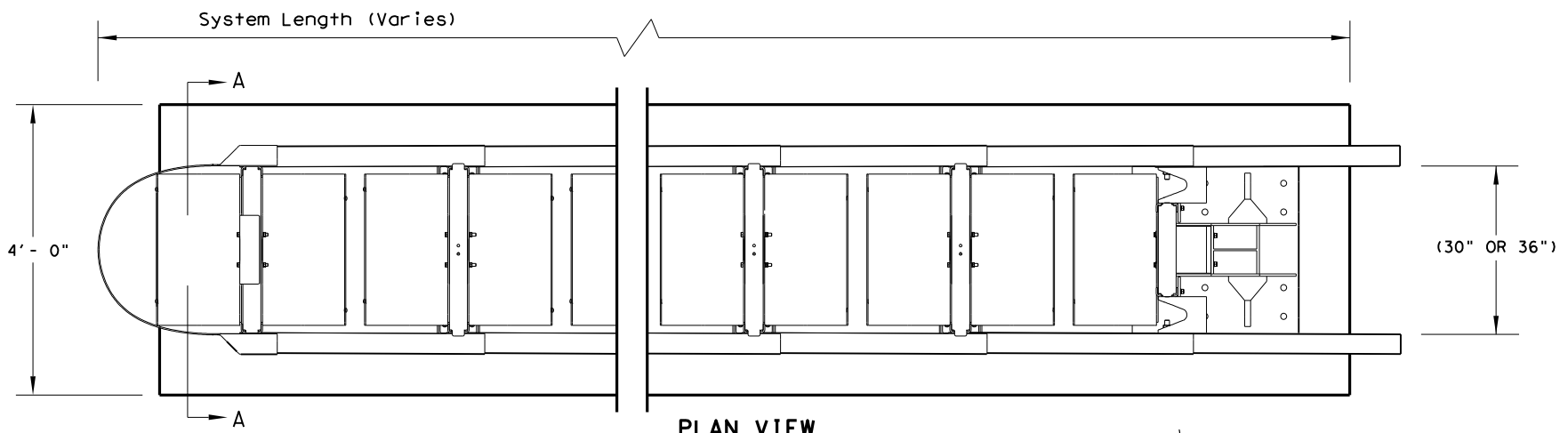
NOTE: CULVERTS OF 25 FT. OR LESS, SEE GF(31)LS STANDARD FOR "LONG SPAN" OPTION.

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

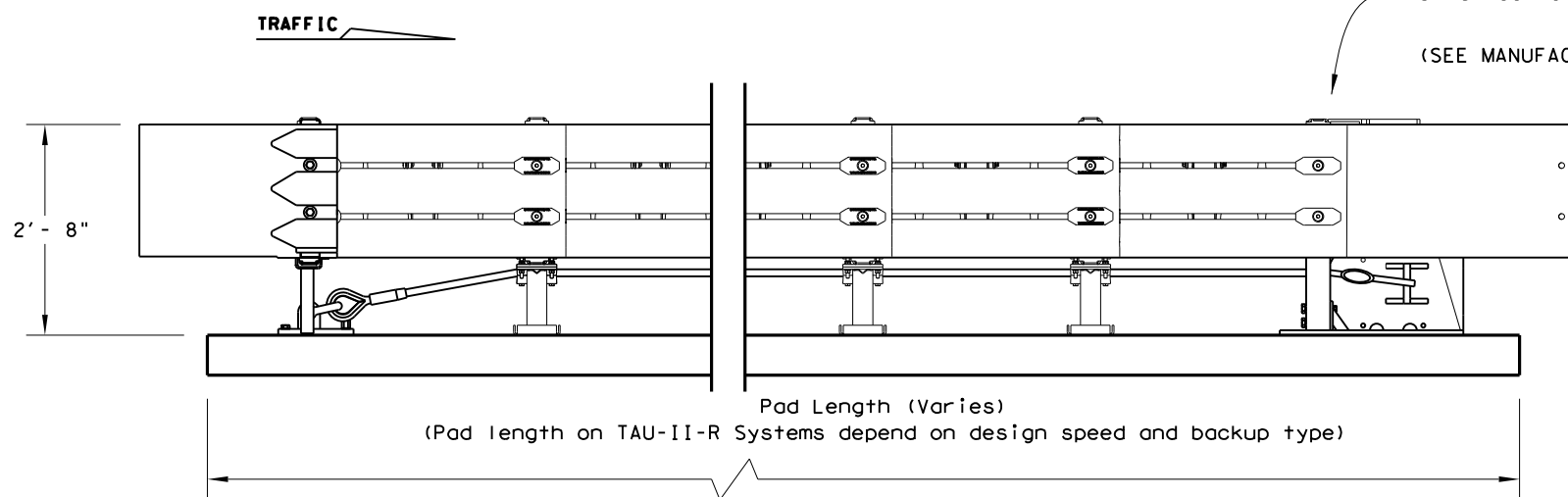
				Design Division Standard
METAL BEAM GUARD FENCE TL-3 MASH COMPLIANT GF(31)-19				
FILE: gf3119.dgn	DN: TXDOT	CK: KM	DW: VP	CK: CGL/AG
© TXDOT: NOVEMBER 2019	CONT	SECT	JOB	HIGHWAY
REVISIONS	091016	139	CR	1102
DIST	COUNTY	SHEET NO.		
TYLER	VAN ZANDT			32

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.

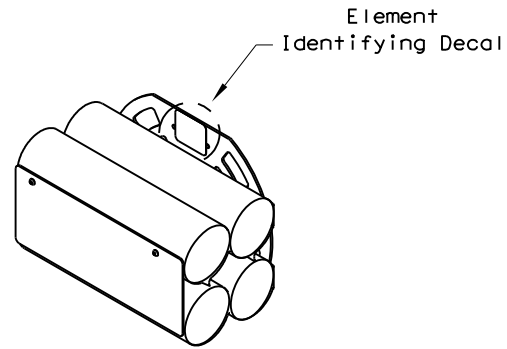
DATE: 4/28/2023
 FILE: c:\bms\pwe-useast-006\tony.trejo\dms59526\tauu1rn16.dgn



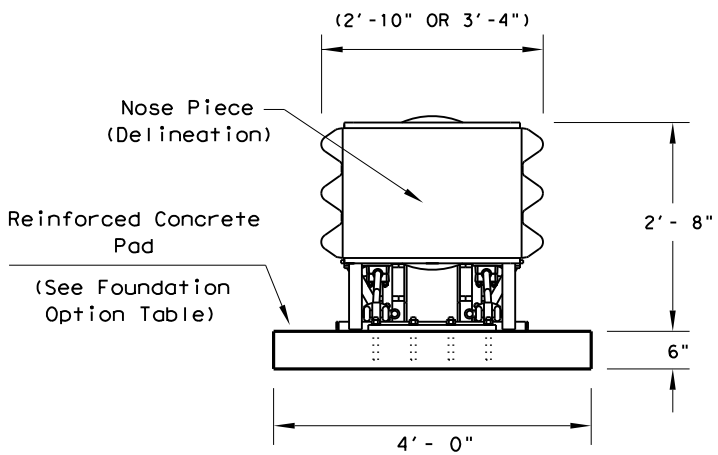
PLAN VIEW



ELEVATION VIEW



ENERGY ABSORBING ELEMENTS (EAE)



SECTION A-A

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

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

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

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

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

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

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

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

Note: System lengths are ± 2"

GENERAL NOTES

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

BILL OF MATERIAL

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

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

(See manufacturer's product manual for details)



**LTS-BARRIER SYSTEMS
 CRASH CUSHION
 (R-NARROW)**

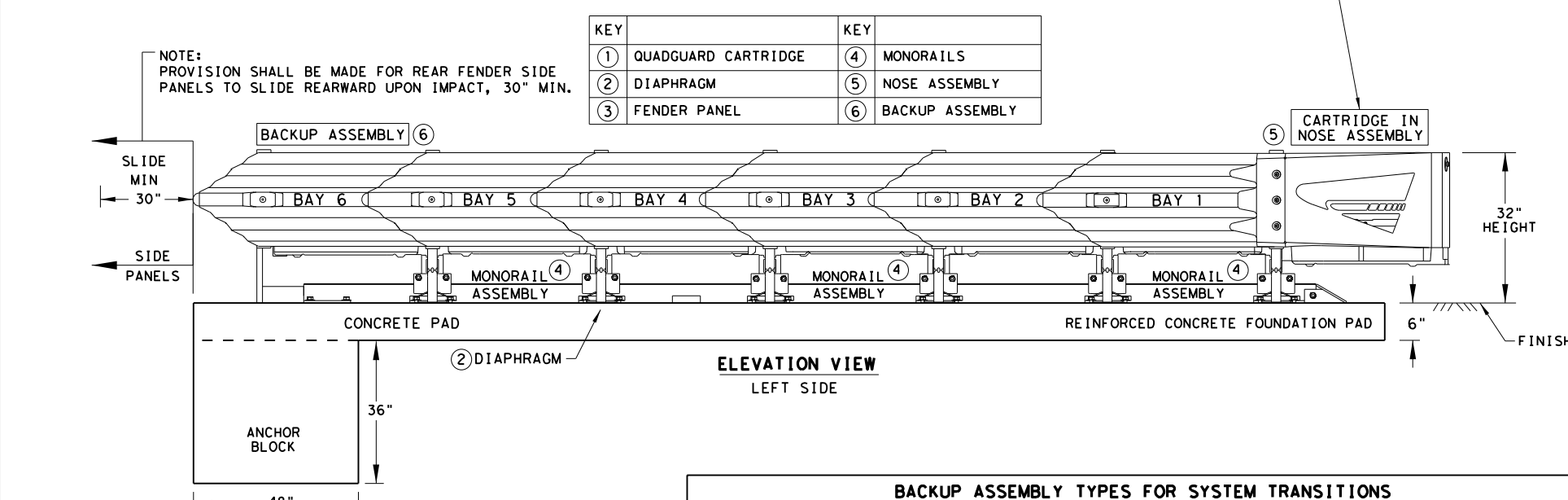
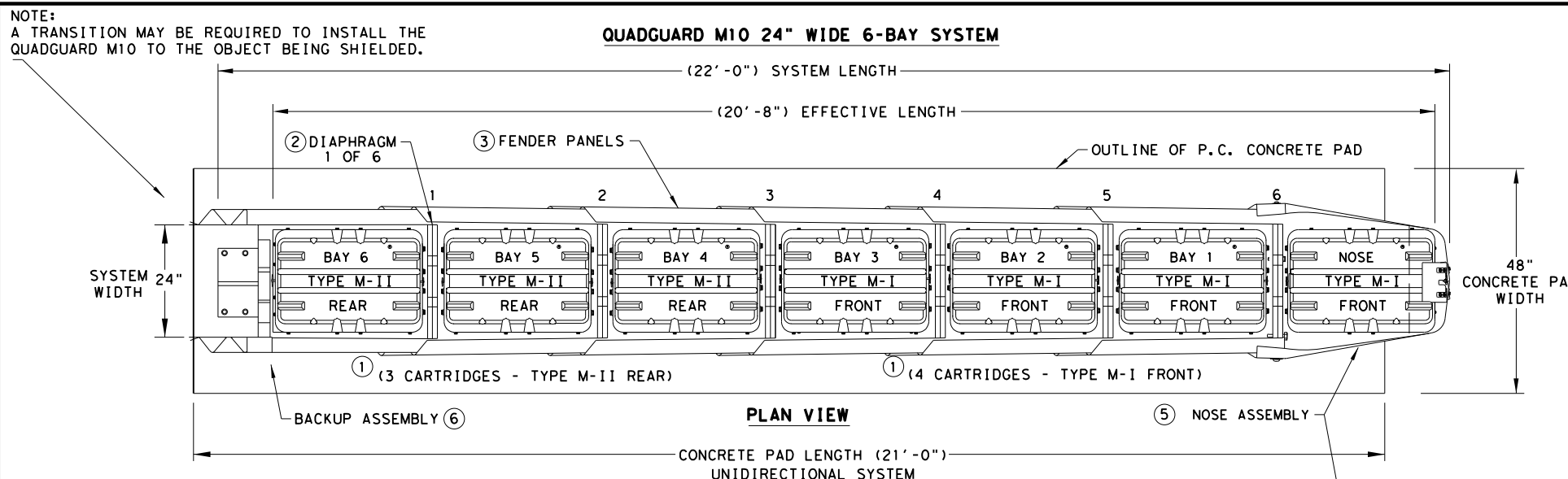
TAU-II-R(N)-16

LOW MAINTENANCE

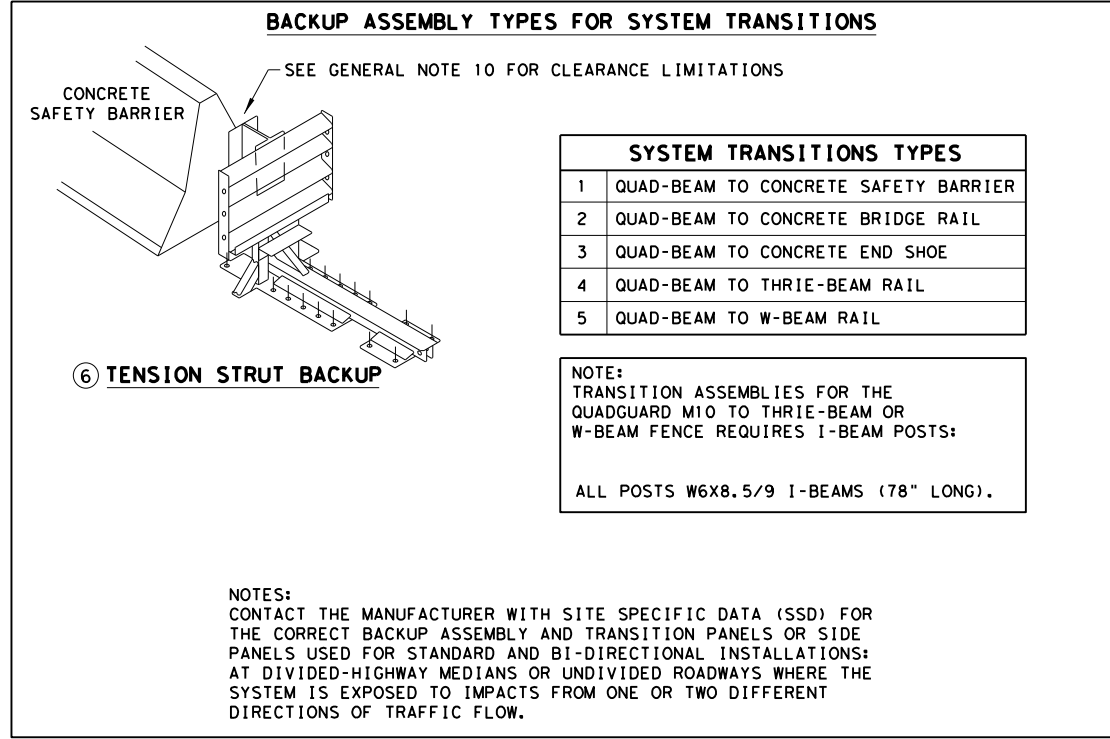
FILE: tau1rn16.dgn	DW: TxDOT	CK: KM	DW: VP	CK: CGL
©TxDOT: January 2013	CONT	SECT	JOB	HIGHWAY
REVISIONS	0910	16	139	CR 1102
REVISED 06, 2013 (VP)	DIST	COUNTY	SHEET NO.	
REVISED 03, 2016 (VP)	TYLER	VAN ZANDT	33	

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: 4/28/2023
 FILE: c:\bms\pwe-useast-006\tony.trejo\dms59526\quar\dm1on20.dgn



KEY		KEY	
①	QUADGUARD CARTRIDGE	④	MONORAILS
②	DIAPHRAGM	⑤	NOSE ASSEMBLY
③	FENDER PANEL	⑥	BACKUP ASSEMBLY



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

NOTE:
 TRANSITION ASSEMBLIES FOR THE QUADGUARD M10 TO THRIE-BEAM OR W-BEAM FENCE REQUIRES I-BEAM POSTS:
 ALL POSTS W6x8.5/9 I-BEAMS (78" LONG).

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

GENERAL NOTES

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

FOUNDATION & ANCHORING REQUIREMENTS	
FOUNDATION TYPES: A, B, C, & D	
FOUNDATION TYPE: A	REINFORCED CONCRETE PAD OR ROADWAY
FOUNDATION:	6" MINIMUM DEPTH (P.C.C.)
ANCHORAGE:	7" STUDS EMBEDDED 5 1/2" - APPROVED ADHESIVE
FOUNDATION TYPE: B	ASPHALT OVER P.C.C.
FOUNDATION:	3" MIN. (A.C.) OVER 3" MIN. (P.C.C.)
ANCHORAGE:	18" THREADED ROD EMBEDDED 16 1/2" - APPROVED ADHESIVE
FOUNDATION TYPE: C	ASPHALT OVER SUBBASE
FOUNDATION:	6" MIN. (A.C.) OVER 6" MIN. (C.S.)
ANCHORAGE:	18" THREADED ROD EMBEDDED 16 1/2" - APPROVED ADHESIVE
FOUNDATION TYPE: D	ASPHALT ONLY
FOUNDATION:	8" MIN. (A.C.)
ANCHORAGE:	18" THREADED ROD EMBEDDED 16 1/2" - APPROVED ADHESIVE

KEY:
 ASPHALT CONCRETE (A.C.)
 COMPACTED SUBBASE (C.S.)
 PORTLAND CEMENT CONCRETE (P.C.C.)
 NOTE: SEE TRINITY'S PRODUCT DESCRIPTION ASSEMBLY MANUAL FOR THE APPROVED ADHESIVE.
 IF THE UNIT IS ANCHORED TO ASPHALTIC CONCRETE, IT SHOULD BE RELOCATED TO FRESH, UNDISTURBED ASPHALT AND RE-ANCHORED AFTER EACH IMPACT TO ENSURE ADEQUATE FUTURE PERFORMANCE.

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

NOTES:
 CONTACT THE MANUFACTURER WITH SITE SPECIFIC DATA (SSD) FOR CONCRETE PAD AND ANCHOR BLOCK INSTALLATION REQUIREMENTS.
 A MANUFACTURER'S DRAWING PACKAGE UNIQUE AND SPECIFIC FOR THE QUADGUARD M10 (N) INSTALLATION AND DETAILED INFORMATION REGARDING THE TYPE OF BACKUP ASSEMBLY FOR THE REQUIRED TRANSITION WILL BE PROVIDED TO THE ENGINEER AND INSTALLER.

6" REINFORCED CONCRETE PAD REQUIRES THE INSTALLATION OF AN ANCHOR BLOCK AS SHOWN ON THE MANUFACTURER'S DRAWING PACKAGE.
 8" NON-REINFORCED CONCRETE PAD MAY NOT REQUIRE AN ANCHOR BLOCK, IF THE PAD IS INSTALLED AGAINST AN IMMOVABLE CONCRETE BACKUP.
 CONCRETE PAD AND ANCHOR BLOCK COMBINATIONS SHALL BE CONFIRMED WITH THE MANUFACTURER BASED UPON SITE SPECIFIC DATA (SSD).

NOTE:
 THE QUADGUARD M10 24" WIDE 6-BAY - NARROW SYSTEM HAS BEEN TESTED TO MASH TEST LEVEL 3.

TL-3 MODEL #	QM10024	CARTRIDGE TYPES IN BAYS		
BAYS	6	TYPE-MII	TYPE-MI	TYPE-MI
DIAPHRAGMS	6	3	3	1
WIDTH	24"	REAR	FRONT	NOSE

TL-2 MODEL #	QM7024	CARTRIDGE TYPES IN BAYS		
BAYS	3	TYPE-MII	TYPE-MI	TYPE-MI
DIAPHRAGMS	3	1	2	1
WIDTH	24"	REAR	FRONT	NOSE

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

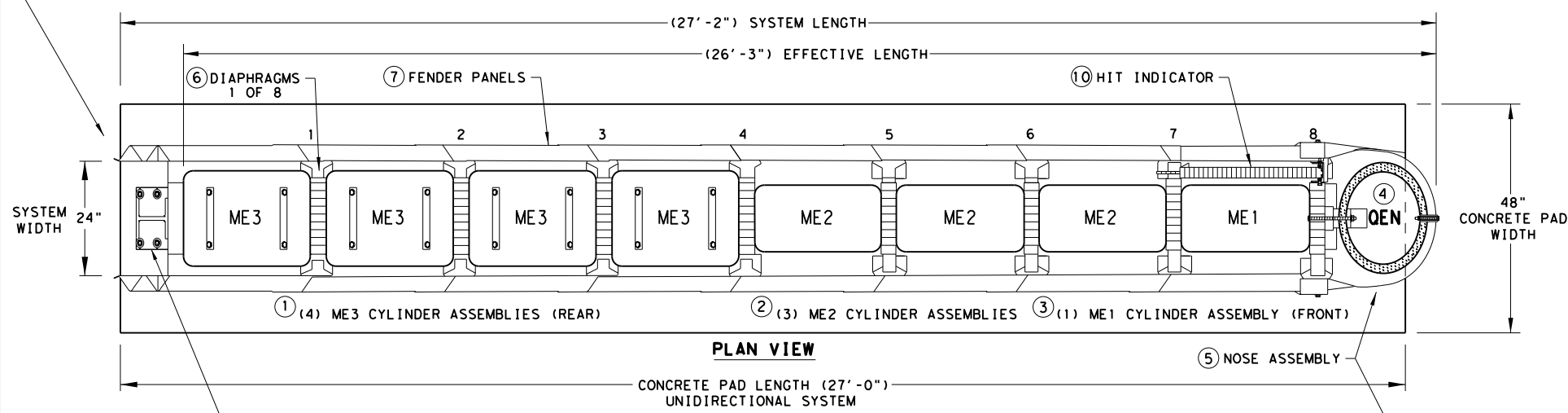
REUSABLE

		<i>Design Division Standard</i>	
TRINITY HIGHWAY ENERGY ABSORPTION QUADGUARD M10 (MASH TL-3 & TL-2 NARROW-24" ONLY) QUADGUARD (M10) (N) - 20			
FILE: quardm1on20.dgn	DN: TXDOT	CK: KM	DW: VP
© TXDOT: NOVEMBER 2020	CONT SECT	JOB	HIGHWAY
REVISIONS	091016	139	CR 1102
	DIST	COUNTY	SHEET NO.
	TYLER	VAN ZANDT	34

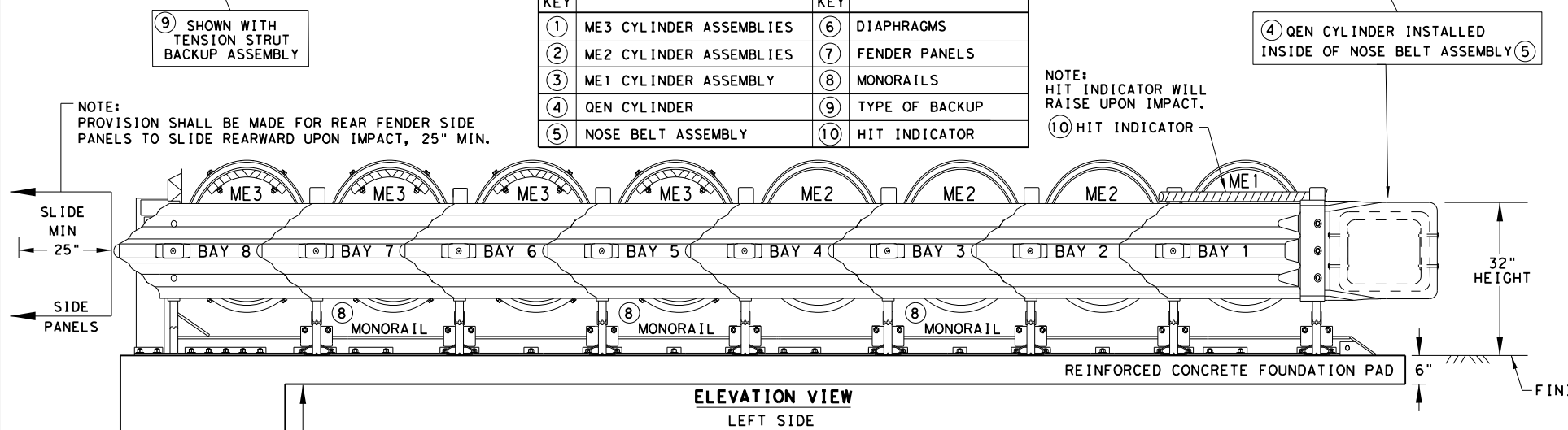
DATE: 4/28/2023
 FILE: c:\bms\pwe-useast-006\tony.trejo\dms59526\qelitem10n20.dgn
 DISCLAIMER: THIS STANDARD IS GOVERNED BY THE "TEXAS ENGINEERING PRACTICE ACT". NO WARRANTY OF ANY KIND IS MADE BY TXDOT FOR ANY PURPOSE WHATSOEVER. TXDOT ASSUMES NO RESPONSIBILITY FOR THE CONVERSION OF THIS STANDARD TO OTHER FORMATS OR FOR INCORRECT RESULTS OR DAMAGES RESULTING FROM ITS USE.

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

QUADGUARD ELITE M10 24" WIDE (8 BAY) SYSTEM



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



BACKUP ASSEMBLY TYPES FOR SYSTEM TRANSITIONS

SEE GENERAL NOTE 10 FOR CLEARANCE LIMITATIONS

⑨ TENSION STRUT BACKUP

⑨ CONCRETE BACKUP

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

NOTE:
TRANSITION ASSEMBLIES FOR THE QUADGUARD ELITE M10 TO THRIE-BEAM OR W-BEAM FENCE REQUIRES I-BEAM POSTS:
ALL POSTS W6X8.5/9 I-BEAMS (78" LONG).

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

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

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

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

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

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

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

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

GENERAL NOTES

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

FOUNDATION & ANCHORING REQUIREMENTS	
FOUNDATION TYPES: A, B, C, & D	
FOUNDATION TYPE: A	REINFORCED CONCRETE PAD OR ROADWAY
FOUNDATION:	6" MINIMUM DEPTH (P.C.C.)
ANCHORAGE:	7" STUDS EMBEDDED 5 1/2" - APPROVED ADHESIVE
FOUNDATION TYPE: B	ASPHALT OVER P.C.C.
FOUNDATION:	3" MIN. (A.C.) OVER 3" MIN. (P.C.C.)
ANCHORAGE:	18" THREADED ROD EMBEDDED 16 1/2" - APPROVED ADHESIVE
FOUNDATION TYPE: C	ASPHALT OVER SUBBASE
FOUNDATION:	6" MIN. (A.C.) OVER 6" MIN. (C.S.)
ANCHORAGE:	18" THREADED ROD EMBEDDED 16 1/2" - APPROVED ADHESIVE
FOUNDATION TYPE: D	ASPHALT ONLY
FOUNDATION:	8" MIN. (A.C.)
ANCHORAGE:	18" THREADED ROD EMBEDDED 16 1/2" - APPROVED ADHESIVE

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

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

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

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

Texas Department of Transportation
Design Division Standard

**TRINITY HIGHWAY
ENERGY ABSORPTION
QUADGUARD ELITE M10
(MASH TL-3)
QGUARD ELITE (M10) (N) -20**

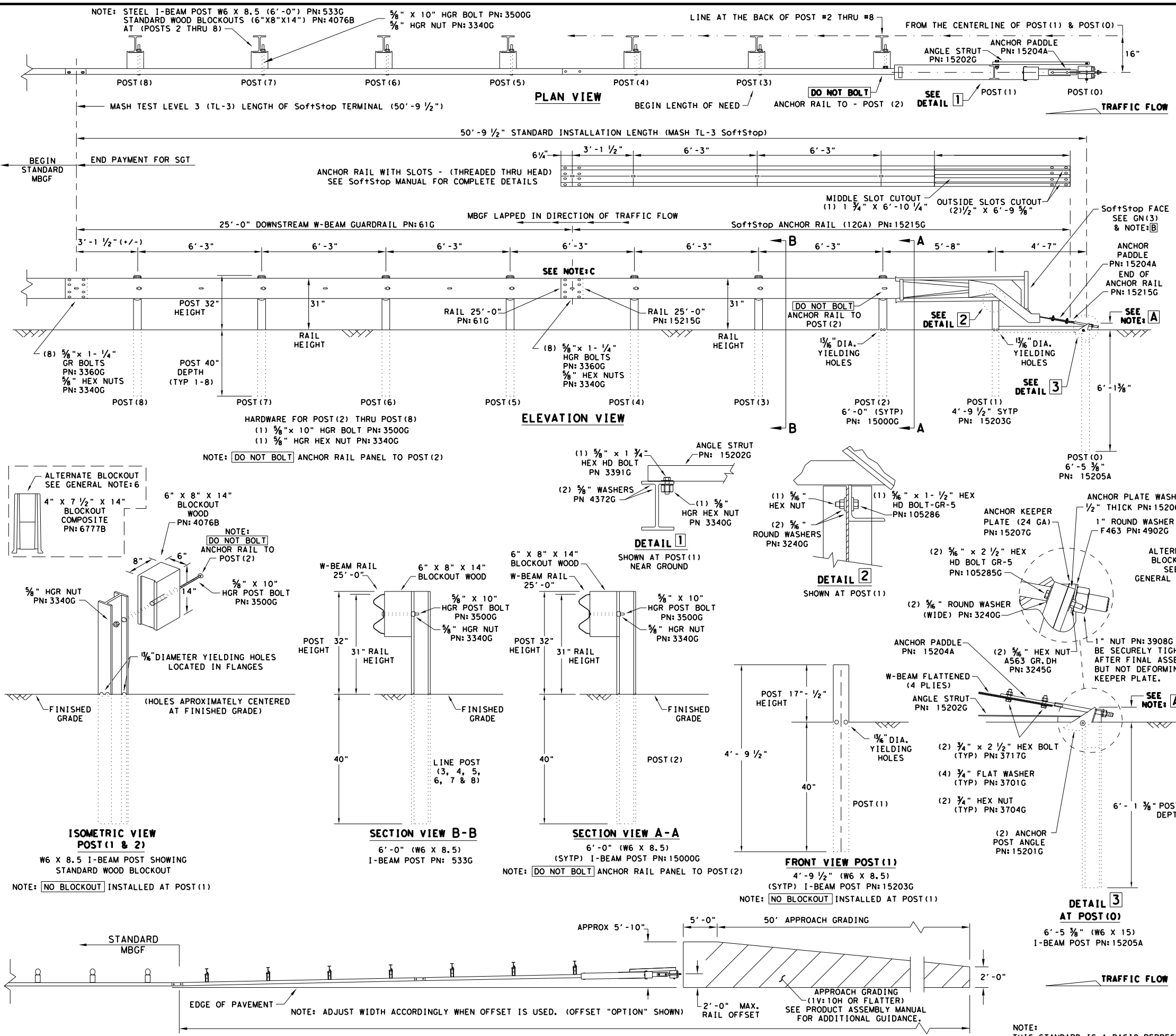
FILE: qelitem10n20.dgn	DN: TXDOT	CK: KM	DW: VP	CK: AG
© TXDOT: NOVEMBER 2020	CONT	SECT	JOB	HIGHWAY
REVISIONS	091016	139	CR 1102	
	DIST	COUNTY	SHEET NO.	
	TYLER	VAN ZANDT	35	

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

LOW MAINTENANCE

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: 4/28/2023
 FILE: c:\bms\pwe-useast-006\tony.trejo\dms59526\sgt10s3116.dgn



- GENERAL NOTES**
- FOR SPECIFIC INFORMATION REGARDING INSTALLATION AND TECHNICAL GUIDANCE OF THE SYSTEM, CONTACT: TRINITY HIGHWAY AT 1(888)323-6374, 2525 N. STEMMONS FREEWAY, DALLAS, TX 75207
 - FOR INSTALLATION, REPAIR AND MAINTENANCE REFER TO THE: SoftStop END TERMINAL, PRODUCT DESCRIPTION ASSEMBLY MANUAL. PN:620237B
 - 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.
 - A COMPOSITE MATERIAL BLOCKOUT THAT MEETS THE REQUIREMENTS OF DMS-7210, MAY BE SUBSTITUTED FOR BLOCKOUTS OF SIMILAR DIMENSIONS. SEE CONSTRUCTION DIVISION MATERIAL PRODUCER LIST (MPL) FOR CERTIFIED PRODUCERS.
 - IF SOLID ROCK IS ENCOUNTERED SEE THE MANUFACTURER'S INSTALLATION MANUAL AND REFER TO THE LATEST ROADWAY MBGF STANDARD FOR INSTALLATION GUIDANCE.
 - POSTS SHALL NOT BE SET IN CONCRETE.
 - IT IS ACCEPTABLE TO INSTALL THE SoftStop IMPACT HEAD PARALLEL TO THE GRADE LINE OR WITH AN UPWARD TILT.
 - DO NOT ATTACH THE SoftStop SYSTEM DIRECTLY TO A RIGID BARRIER.
 - UNDER NO CIRCUMSTANCES SHALL THE GUARDRAIL WITHIN THE SoftStop SYSTEM BE CURVED.
 - A FLARE RATE OF UP TO 25:1 MAY BE USED TO PREVENT THE TERMINAL HEAD FROM ENCRoaching ON THE SHOULDER. THE FLARE MAY BE DECREASED OR ELIMINATED FOR SPECIFIC INSTALLATIONS, IF DIRECTED BY THE ENGINEER.

NOTE: A THE INSTALLATION HEIGHT OF FULLY ASSEMBLED ANCHOR POST WILL VARY FROM 3-3/4" MIN. TO 4" MAX. ABOVE FINISHED GRADE.

NOTE: B PART PN:5852B RIGHT-SIDE (HIGH INTENSITY REFLECTIVE SHEETING)
 PART PN:5851B LEFT-SIDE (HIGH INTENSITY REFLECTIVE SHEETING)

NOTE: C W-BEAM SPLICE LOCATED BETWEEN LINE POST (4) AND LINE POST (5)
 GUARDRAIL PANEL 25'-0" PN:61G
 ANCHOR RAIL 25'-0" PN:15215G
 LAP GUARDRAIL IN DIRECTION OF TRAFFIC FLOW.

MAIN SYSTEM COMPONENTS		
PART	QTY	DESCRIPTION
620237B	1	PRODUCT DESCRIPTION ASSEMBLY MANUAL (LATEST REV.)
15208A	1	SoftStop HEAD (SEE MANUAL FOR RIGHT-LEFT APPROACH)
15215G	1	SoftStop ANCHOR RAIL (12GA) WITH CUTOUT SLOTS
61G	1	SoftStop DOWNSTREAM W-BEAM RAIL (12GA) (25' - 0")
15205A	1	POST #0 - ANCHOR POST (6' - 5 3/8")
15203G	1	POST #1 - (SYTP) (4' - 9 1/2")
15000G	1	POST #2 - (SYTP) (6' - 0")
533G	6	POST #3 THRU #8 - I-BEAM (W6 X 8.5) (6' - 0")
4076B	7	BLOCKOUT - WOOD (ROUTED) (6" X 8" X 14")
6777B	7	BLOCKOUT - COMPOSITE (4" X 7 1/2" X 14")
15204A	1	ANCHOR PADDLE
15207G	1	ANCHOR KEEPER PLATE (24 GA)
15206G	1	ANCHOR PLATE WASHER (1/2" THICK)
15201G	2	ANCHOR POST ANGLE (10" LONG)
15202G	1	ANGLE STRUT

HARDWARE		
PN	QTY	DESCRIPTION
4902G	1	1" ROUND WASHER F436
3908G	1	1" HEAVY HEX NUT A563 GR.DH
3717G	2	3/4" X 2 1/2" HEX BOLT A325
3701G	4	3/4" ROUND WASHER F436
3704G	2	3/4" HEAVY HEX NUT A563 GR.DH
3360G	16	5/8" X 1 1/4" W-BEAM RAIL SPLICE BOLTS HGR
3340G	25	5/8" W-BEAM RAIL SPLICE NUTS HGR
3500G	7	5/8" X 10" HGR POST BOLT A307
3391G	1	5/8" X 1 3/4" HEX HD BOLT A325
4489G	1	5/8" X 9" HEX HD BOLT A325
4372G	4	5/8" WASHER F436
105285G	2	5/8" X 2 1/2" HEX HD BOLT GR-5
105286G	1	5/8" X 1 1/2" HEX HD BOLT GR-5
3240G	6	5/8" ROUND WASHER (WIDE)
3245G	3	5/8" HEX NUT A563 GR.DH
5852B	1	HIGH INTENSITY REFLECTIVE SHEETING - SEE NOTE: B

Texas Department of Transportation

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

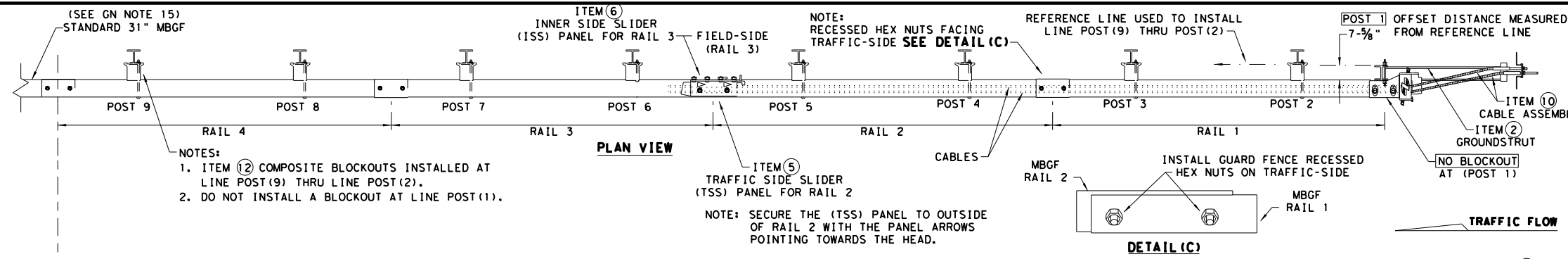
FILE: sgt10s3116	DN: TxDOT	CK: KM	DW: VP	CK: MB/VP
©TxDOT: JULY 2016	CONT	SECT	JOB	HIGHWAY
REVISIONS	091016		139	CR 1102
	DIST	COUNTY		SHEET NO.
	TYLER	VAN ZANDT		37

Design Division Standard

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

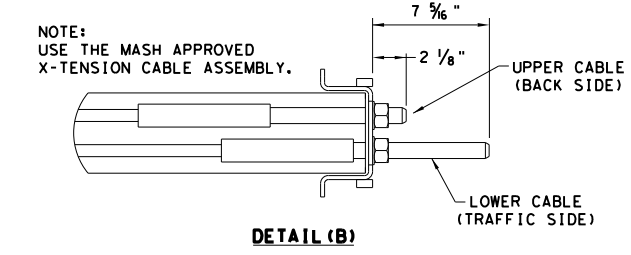
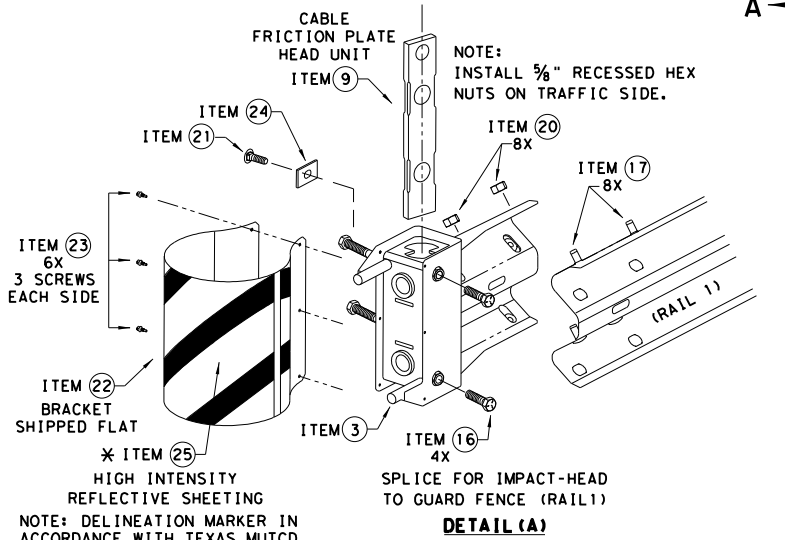
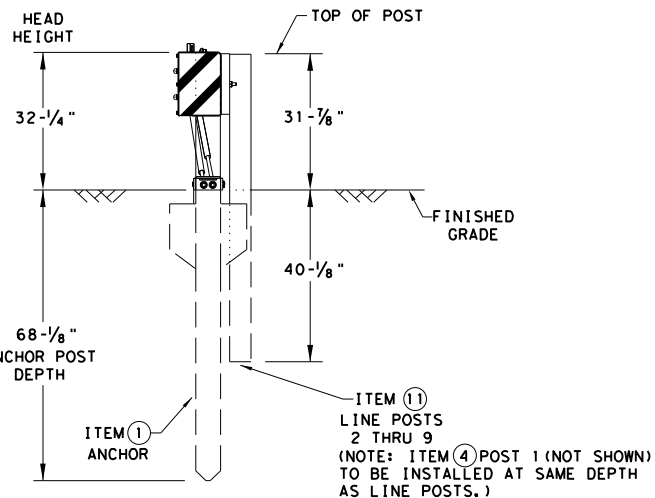
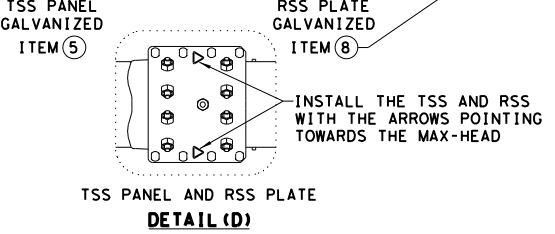
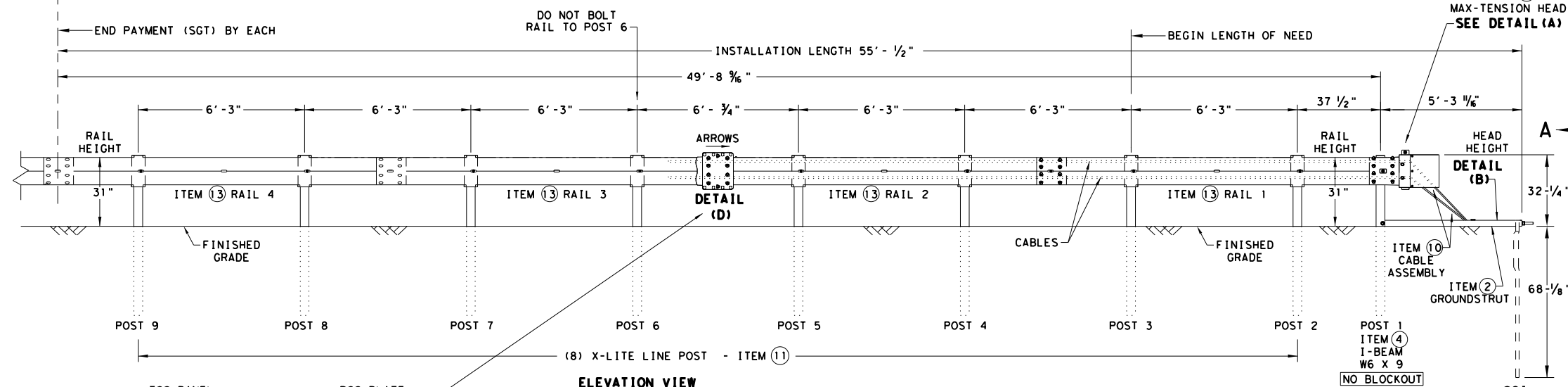
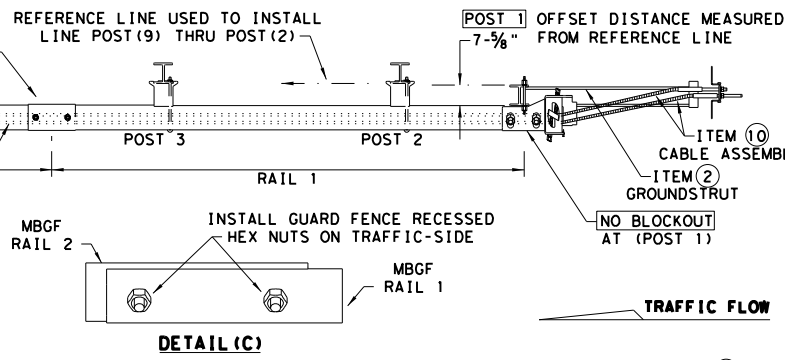
DISCLAIMER: The use of this standard is governed by the "Texas Engineering Practice Act". No warranty of any kind is made by TxDOT for any purpose whatsoever. TxDOT assumes no responsibility for the conversion of this standard to other formats or for incorrect results or damages resulting from its use.

DATE: 4/28/2023
 FILE: c:\bms\pwe-useast-006\tony.trejo\dms59526\sgt11s3118.dgn



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

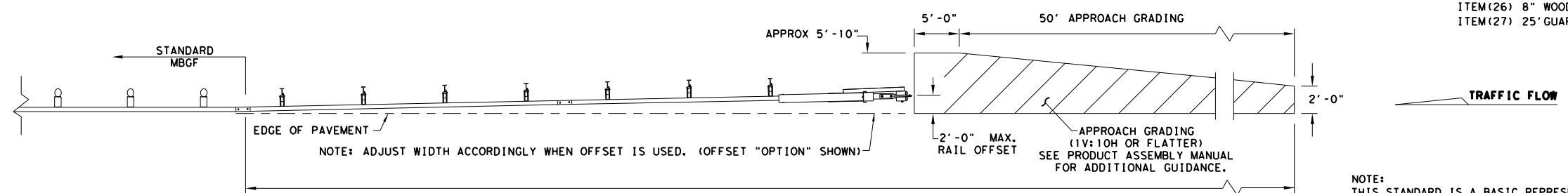
NOTE: SECURE THE (TSS) PANEL TO OUTSIDE OF RAIL 2 WITH THE PANEL ARROWS POINTING TOWARDS THE HEAD.



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

ITEM #	PART NUMBER	DESCRIPTION	QTY
1	BSI-1610060-00	SOIL ANCHOR - GALVANIZED	1
2	BSI-1610061-00	GROUND STRUT - GALVANIZED	1
3	BSI-1610062-00	MAX-TENSION IMPACT HEAD	1
4	BSI-1610063-00	W6x9 I-BEAM POST 6FT. -GALVANIZED	1
5	BSI-1610064-00	TSS PANEL - TRAFFIC SIDE SLIDER	1
6	BSI-1610065-00	ISS PANEL - INNER SIDE SLIDER	1
7	BSI-1610066-00	TOOTH - GEOMET	1
8	BSI-1610067-00	RSS PLATE - REAR SIDE SLIDER	1
9	B061058	CABLE FRICTION PLATE - HEAD UNIT	1
10	BSI-1610069-00	CABLE ASSEMBLY - MASH X-TENSION	2
11	BSI-1012078-00	X-LITE LINE POST-GALVANIZED	8
12	B090534	8" W-BEAM COMPOSITE-BLOCKOUT XT110	8
13	BSI-4004386	12'-6" W-BEAM GUARD FENCE PANELS 12GA.	4
14	BSI-1102027-00	X-LITE SQUARE WASHER	1
15	BSI-2001886	5/8" X 7" THREAD BOLT HH (GR.5)GEOMET	1
16	BSI-2001885	3/4" X 3" ALL-THREAD BOLT HH (GR.5)GEOMET	4
17	4001115	5/8" X 1 1/4" GUARD FENCE BOLTS (GR.2)MGAL	48
18	2001840	5/8" X 10" GUARD FENCE BOLTS MGAL	8
19	2001636	5/8" WASHER F436 STRUCTURAL MGAL	2
20	4001116	5/8" RECESSED GUARD FENCE NUT (GR.2)MGAL	59
21	BSI-2001888	5/8" X 2" ALL THREAD BOLT (GR.5)GEOMET	1
22	BSI-1701063-00	DELINEATION MOUNTING (BRACKET)	1
23	BSI-2001887	1/4" X 3/4" SCREW SD HH 410SS	7
24	4002051	GUARDRAIL WASHER RECT AASHTO FWRO3	1
25	SEE NOTE BELOW	HIGH INTENSITY REFLECTIVE SHEETING	1
26	4002337	8" W-BEAM TIMBER-BLOCKOUT, PDB01B	8
27	BSI-4004431	25' W-BEAM GUARDRAIL PANEL, 8-SPACE, 12GA.	2
28	MANMAX Rev-(D)	MAX-TENSION INSTALLATION INSTRUCTIONS	1

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



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

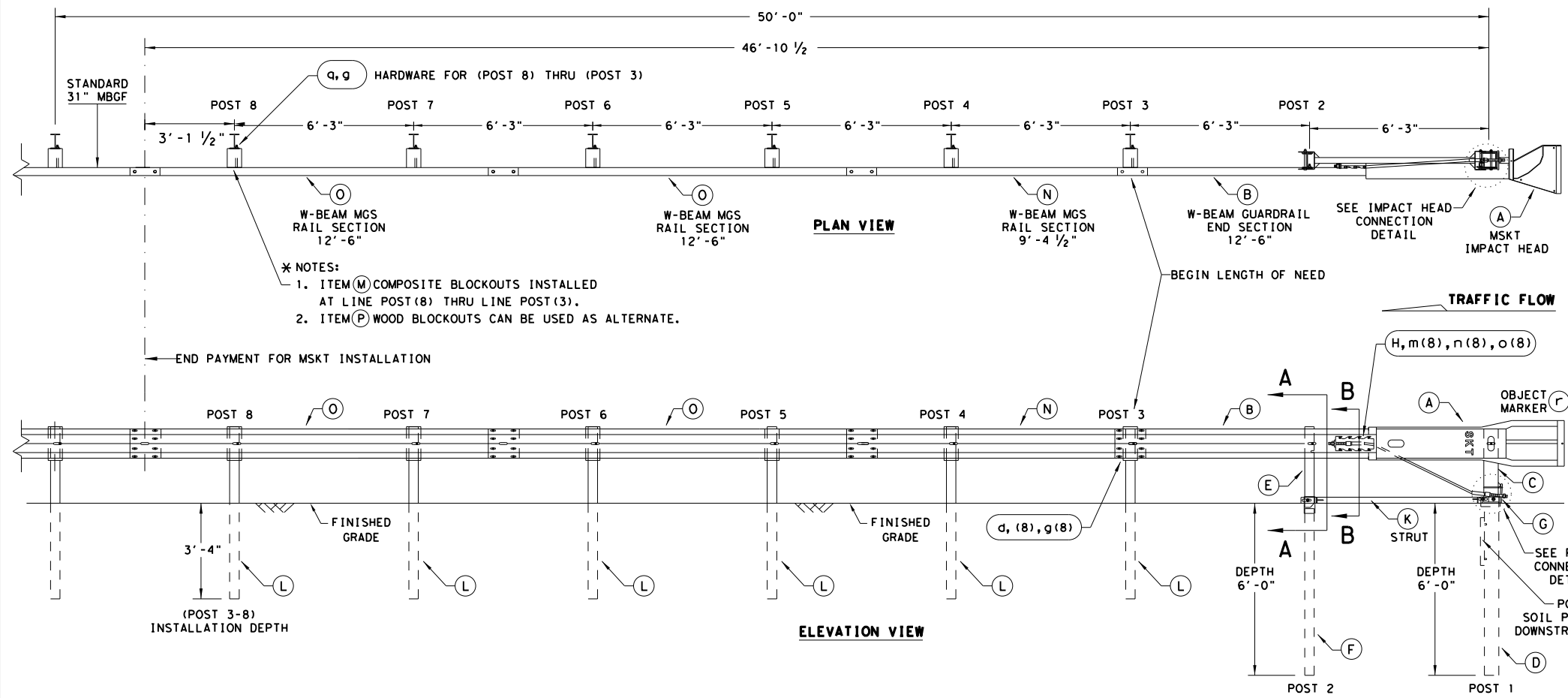
NOTE: THIS STANDARD IS A BASIC REPRESENTATION OF THE MAX-TENSION END TERMINAL, IT IS NOT INTENDED TO REPLACE THE PRODUCT DESCRIPTION ASSEMBLY MANUAL.

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	091016	139	CR	1102
	DIST	COUNTY		SHEET NO.
	TYLER	VAN ZANDT		38

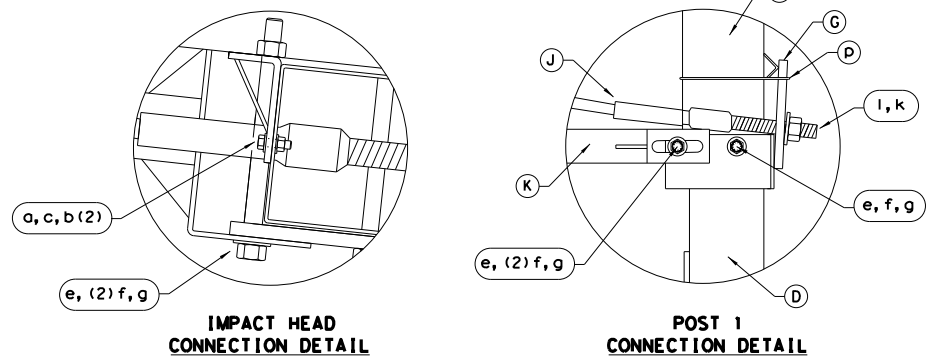
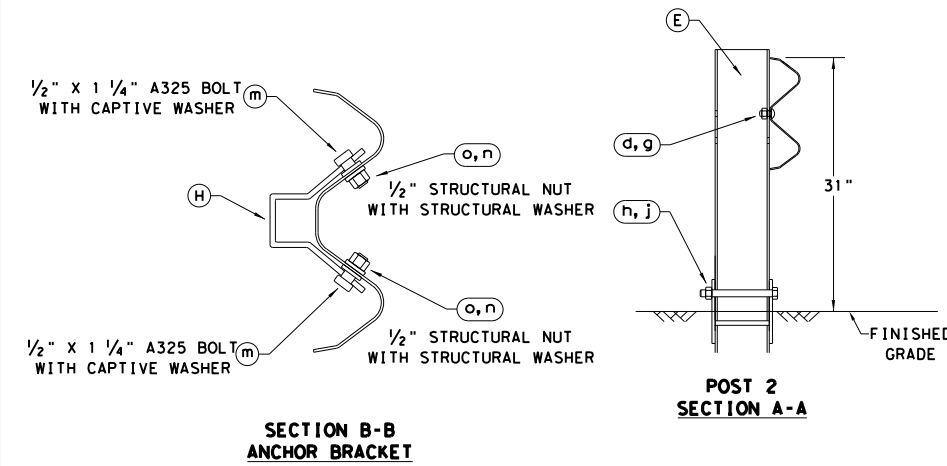
DATE: 4/28/2023
 FILE: c:\bms\pwe-useast-006\tony.tre\o\dms59526\sgt12s3118.dgn
 DISCLAIMER: THIS STANDARD IS GOVERNED BY THE "TEXAS ENGINEERING PRACTICE ACT". NO WARRANTY OF ANY KIND IS MADE BY TXDOT FOR ANY PURPOSE WHATSOEVER. TXDOT ASSUMES NO RESPONSIBILITY FOR THE CONVERSION OF THIS STANDARD TO OTHER FORMATS OR FOR INCORRECT RESULTS OR DAMAGES RESULTING FROM ITS USE.



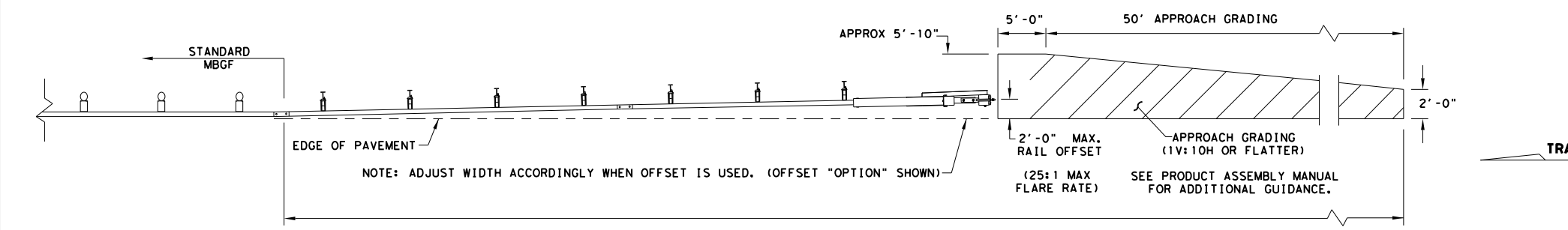
- * NOTES:**
- ITEM (M) COMPOSITE BLOCKOUTS INSTALLED AT LINE POST (8) THRU LINE POST (3).
 - ITEM (P) WOOD BLOCKOUTS CAN BE USED AS ALTERNATE.

- 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 MOW STRIP STANDARD FOR INSTALLATION GUIDANCE.
 - POSTS SHALL NOT BE SET IN CONCRETE.
 - SYSTEM MUST BE ATTACHED TO STANDARD 31" MBGF.
 - 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" MBGF PANELS, ONE 25'-0" MBGF PANEL IS ALSO ALLOWED IN ITS PLACE.
 - A DRIVING CAP WITH A TIMBER OR PLASTIC INSERT SHALL BE USED WHEN DRIVING POSTS 3-8 TO PREVENT DAMAGE TO THE GALVANIZING ON TOP OF THE POST. SPECIAL DRIVING CAP TO BE USED ON LOWER POSTS 1 & 2 TO PREVENT DAMAGE TO THE WELDED PLATES.

ITEM	QTY	MAIN SYSTEM COMPONENTS	ITEM NUMBERS
A	1	MSKT IMPACT HEAD	MS3000
B	1	W-BEAM GUARDRAIL END SECTION, 12 Go.	SF1303
C	1	POST 1 - TOP (6" X 6" X 1/8" TUBE)	MTPHP1A
D	1	POST 1 - BOTTOM (6' W6X15)	MTPHP1B
E	1	POST 2 - ASSEMBLY TOP	UHP2A
F	1	POST 2 - ASSEMBLY BOTTOM (6' W6X9)	HP2B
G	1	BEARING PLATE	E750
H	1	CABLE ANCHOR BOX	S760
J	1	BCT CABLE ANCHOR ASSEMBLY	E770
K	1	GROUND STRUT	MS785
L	6	W6X9 OR W6X8.5 STEEL POST	P621
M	6	COMPOSITE BLOCKOUTS	CBSP-14
N	1	W-BEAM MGS RAIL SECTION (9'-4 1/2")	G12025
O	2	W-BEAM MGS RAIL SECTION (12'-6")	G1203A
P	6	WOOD BLOCKOUT 6" X 8" X 14"	P675
Q	1	W-BEAM MGS RAIL SECTION (25'-0")	G1209
SMALL HARDWARE			
o	2	3/8" x 1" HEX BOLT (GRD 5)	B5160104A
b	4	3/8" WASHER	W0516
c	2	3/8" HEX NUT	N0516
d	25	3/8" Dia. x 1 1/4" SPLICE BOLT (POST 2)	B580122
e	2	3/8" Dia. x 9" HEX BOLT (GRD A449)	B580904A
f	3	3/8" WASHER	W050
g	33	3/8" Dia. H.G.R NUT	N050
h	1	3/4" Dia. x 8 1/2" HEX BOLT (GRD A449)	B340854A
j	1	3/4" Dia. HEX NUT	N030
k	2	1 ANCHOR CABLE HEX NUT	N100
l	2	1 ANCHOR CABLE WASHER	W100
m	8	1/2" x 1 1/4" A325 BOLT WITH CAPTIVE WASHER	SB12A
n	8	1/2" STRUCTURAL NUTS	N012A
o	8	1 1/8" O.D. x 3/8" I.D. STRUCTURAL WASHERS	W012A
p	1	BEARING PLATE RETAINER TIE	CT-100ST
q	6	3/8" x 10" H.G.R. BOLT	B581002
r	1	OBJECT MARKER 18" X 18"	E3151



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



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

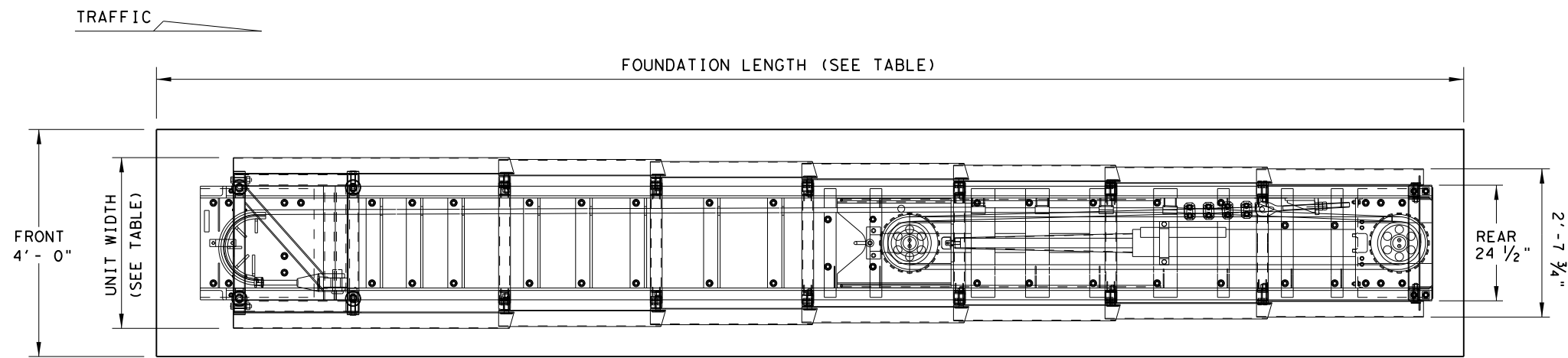
MSKT-MASH-TL-3

SGT (12S) 31-18

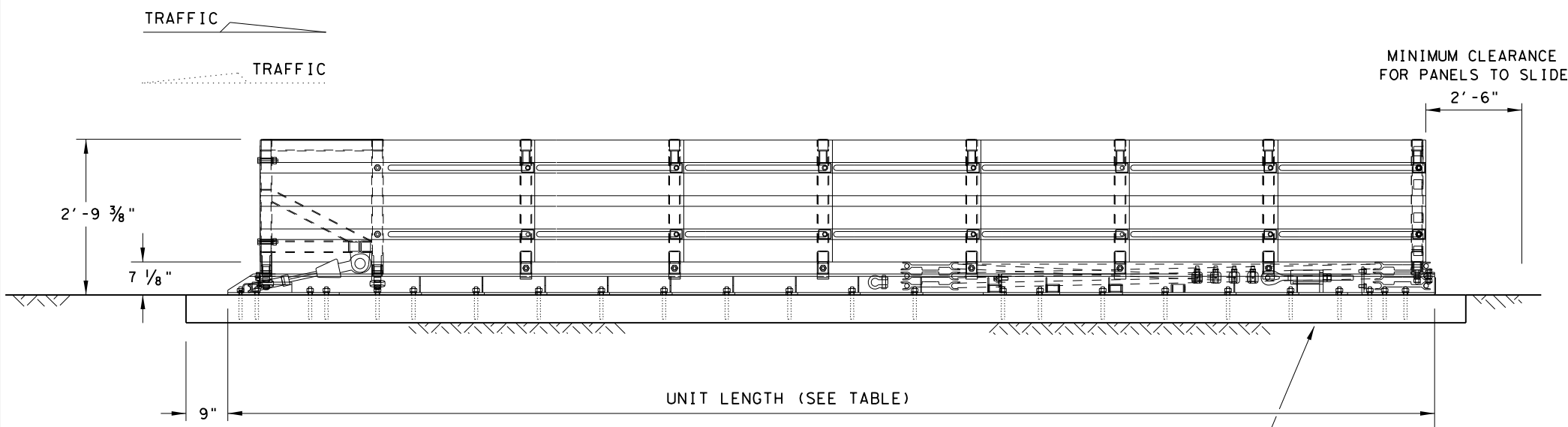
FILE: sgt12s3118.dgn	DN: TXDOT	CK: KM	DW: VP	CK: CL
© TXDOT: APRIL 2018	CONT SECT	JOB	HIGHWAY	
REVISIONS	0910	16	139	CR 1102
	DIST	COUNTY		SHEET NO.
	TYLER	VAN ZANDT		39

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: 4/28/2023
 FILE: c:\bms\pwe-useast-006\brlan_martinez\dms9526_smtcn16.dgn



PLAN VIEW



ELEVATION VIEW

6" REINFORCED PAD SHOWN
(SEE FOUNDATION OPTIONS)

MODEL	TEST LEVEL	UNIT LENGTH (approx.)	UNIT WIDTH	FOUNDATION LENGTH	OBSTACLE WIDTH
SCI70GM	TL-2	13'-6"	2'-10 5/8"	15'- 6 1/4"	24" to 36"
SCI100GM	TL-3	21'-6"	3'-1 1/2"	23'- 0"	24" to 36"

SYSTEM AND PAD LENGTHS VARY DEPENDING ON BACKUP TYPE.

FOUNDATION OPTIONS

6" REINFORCED CONCRETE (5 1/2" ANCHOR EMBEDMENT)
8" UNREINFORCED CONCRETE (5 1/2" ANCHOR EMBEDMENT)
3" MIN. ASPHALT OVER 3" MIN. CONCRETE (16 1/2" ANCHOR EMBED.)
6" ASPHALT OVER 6" COMPACT SUBBASE (16 1/2" ANCHOR EMBED.)
8" MINIMUM ASPHALT (16 1/2" ANCHOR EMBEDMENT)

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

TRANSITION OPTIONS

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

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

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

GENERAL NOTES

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

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

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



**WORK AREA PROTECTION
 CORP
 (SMART-NARROW)
 SMTN (N) - 16**

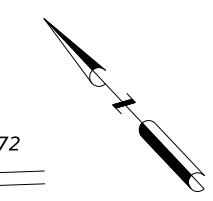
FILE: smtcn16.dgn	DN: TxDOT	CK: KM	DW: VP	CK: VP
©TxDOT: February 2006	CONT	SECT	JOB	HIGHWAY
REVISIONS	0910	16	139	CR 1102
REVISED 06, 2013 (VP)	DIST	COUNTY	SHEET NO.	
REVISED 03, 2016 (VP)	TYLER	VAN ZANDT	40	

LOW MAINTENANCE

CK:
DW:
CK:
DW:

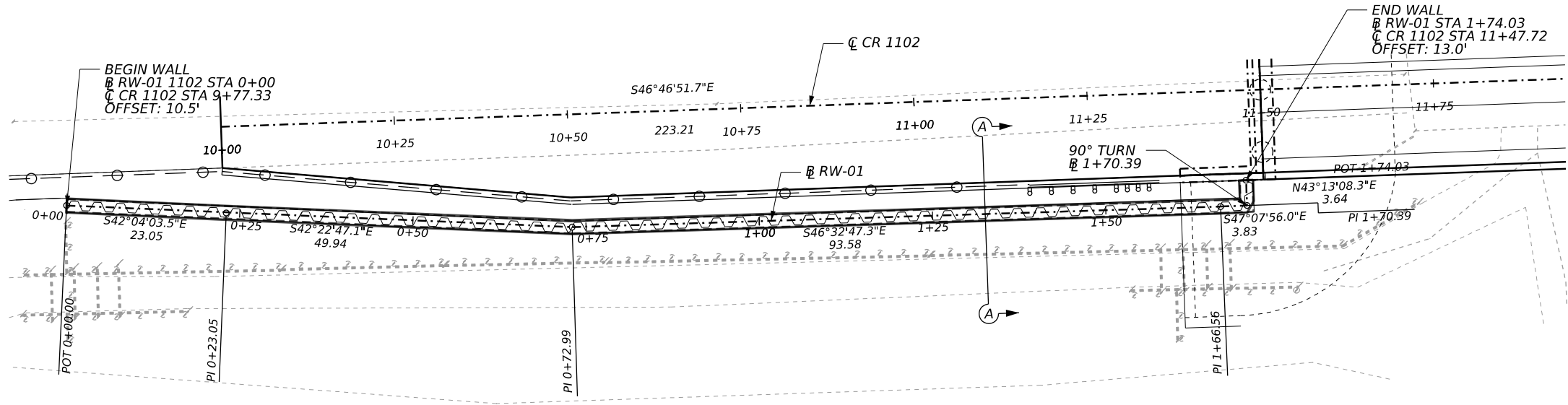
LEGEND

◆ BORING

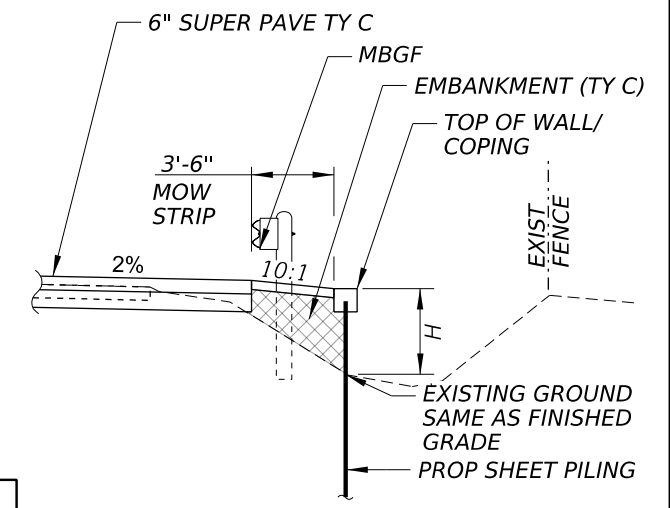


GENERAL NOTES

1. REFER TO RETAINING WALL HORIZONTAL ALIGNMENT DATA, TXDOT STANDARDS FOR ADDITIONAL INFORMATION.
2. SEE ROADWAY, BRIDGE, AND DRAINAGE PLAN SHEETS FOR MORE ADDITIONAL DETAILS.
3. CONTRACTOR IS RESPONSIBLE FOR VERIFYING ALL EXISTING UTILITIES BEFORE ANY TYPE OF WORK.
4. MAINTAIN POSITIVE DRAINAGE IN UNDERDRAIN, MINIMUM 1% SLOPE.
5. CONCRETE RAIL NOT SHOWN FOR CLARITY.
6. SEE STANDARD RW (SF) & RW (SFC) FOR ADDITIONAL INFORMATION.

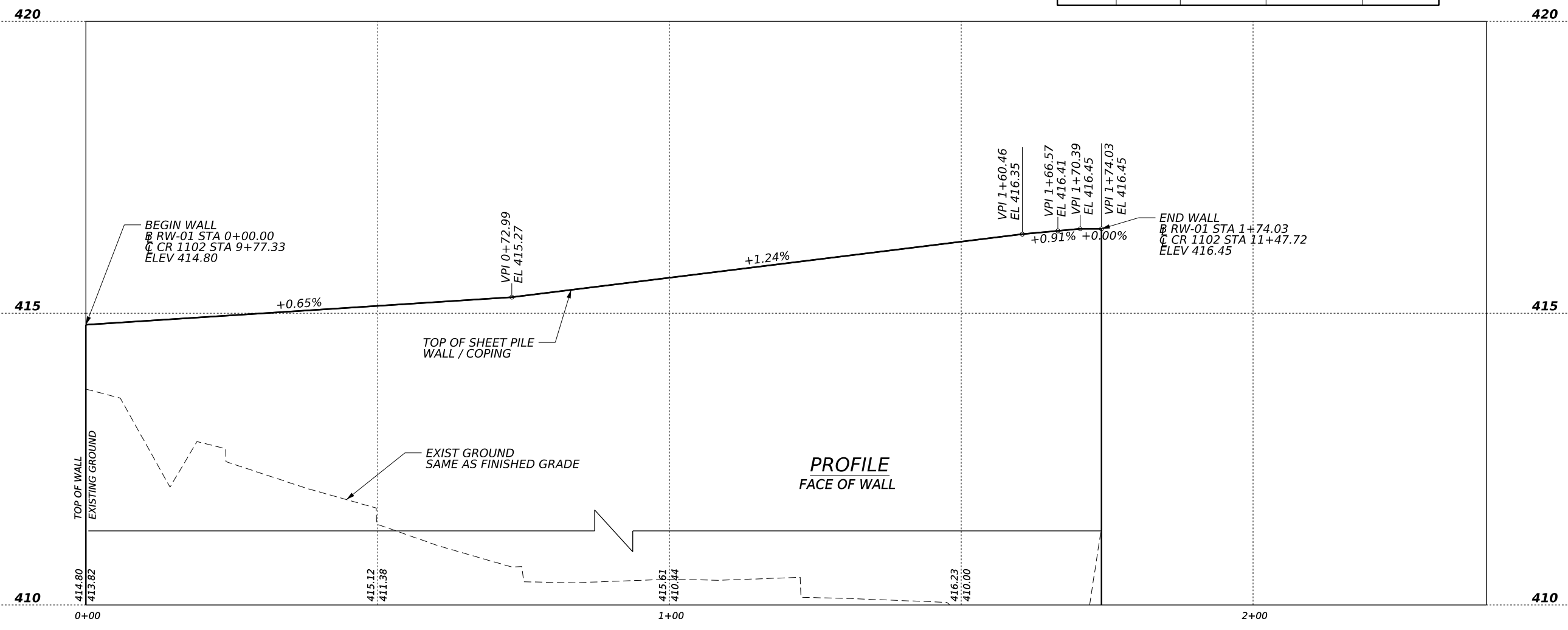


PLAN

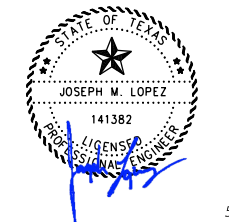
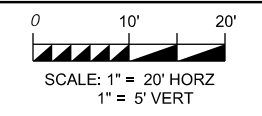


SECTION A-A
NTS

SHEET PILE SUMMARY				
TOTAL SHEET PILE AREA = 5917 SF				
ID	MAX H	ELEV FOR H	WALL TOTAL HEIGHT (FT)	SHEET PILE SECTION
RW-01	8.6	416.4	34	PZC18



PROFILE
FACE OF WALL



5/16/2023



TYLER BRIDGE REPLACEMENTS

CR 1102
AT BUFFALO CREEK

RETAINING WALL LAYOUT

SHEET 1 OF 1

CONT	SECT	JOB	HIGHWAY
0910	12	139	CR 1102
DIST	COUNTY	SHEET NO.	
TYLER	VAN ZANDT	41	

DATE: 5/16/2023 8:45:58 PM
FILE: c:\bms\pwe-useast-006\brian.martinez\dms67145\c_139_s_wrt01.dgn

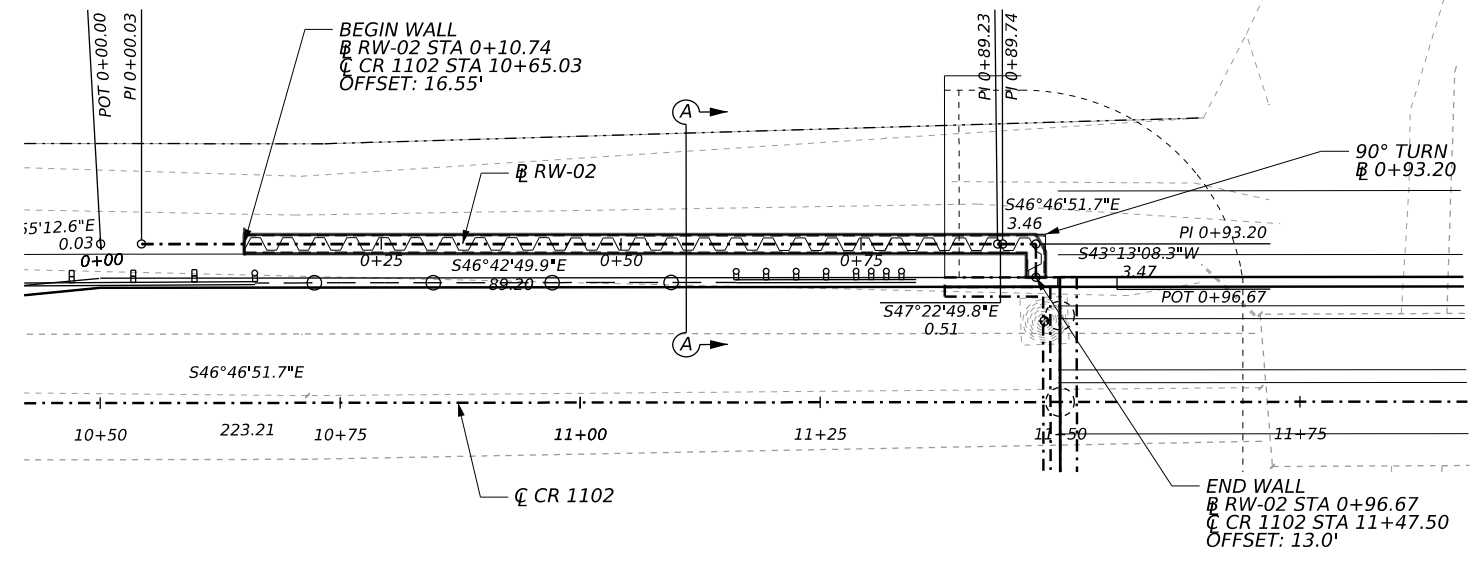
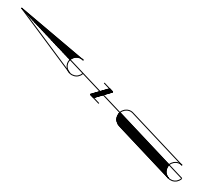
DW: _____
 CK: _____
 DW: _____
 CK: _____

LEGEND

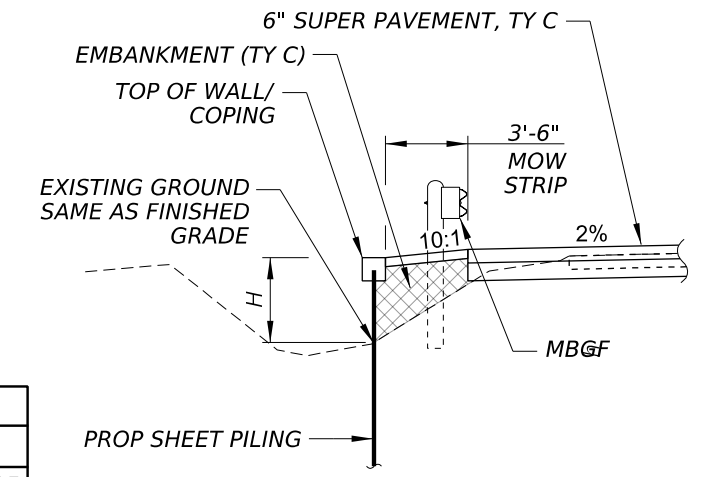
◆ BORING

GENERAL NOTES

1. REFER TO RETAINING WALL HORIZONTAL ALIGNMENT DATA, TXDOT STANDARDS FOR ADDITIONAL INFORMATION.
2. SEE ROADWAY, BRIDGE, AND DRAINAGE PLAN SHEETS FOR MORE ADDITIONAL DETAILS.
3. CONTRACTOR IS RESPONSIBLE FOR VERIFYING ALL EXISTING UTILITIES BEFORE ANY TYPE OF WORK.
4. MAINTAIN POSITIVE DRAINAGE IN UNDERDRAIN, MINIMUM 1% SLOPE.
5. CONCRETE RAIL NOT SHOWN FOR CLARITY.
6. SEE STANDARD RW (SF) & RW (SFC) FOR ADDITIONAL INFORMATION.

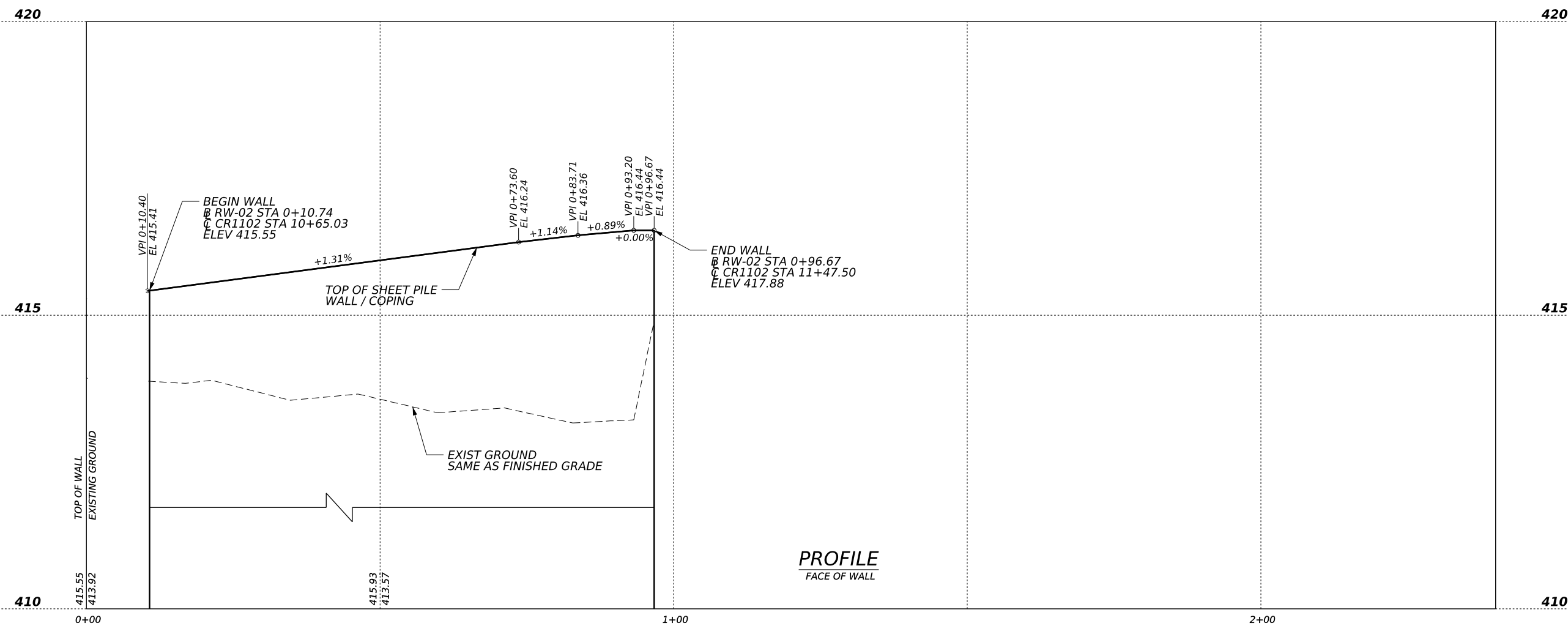


PLAN

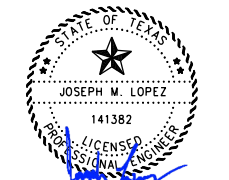
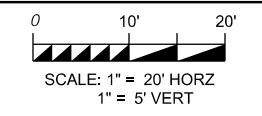


SECTION A-A
NTS

SHEET PILE SUMMARY				
TOTAL SHEET PILE AREA = 860 SF				
ID	MAX H	ELEV FOR H	WALL TOTAL HEIGHT (FT)	SHEET PILE SECTION
RW-02	3.2	416.4	10	PZC18



PROFILE
FACE OF WALL



5/16/2023

NO.	DATE	REVISION	APPROV.



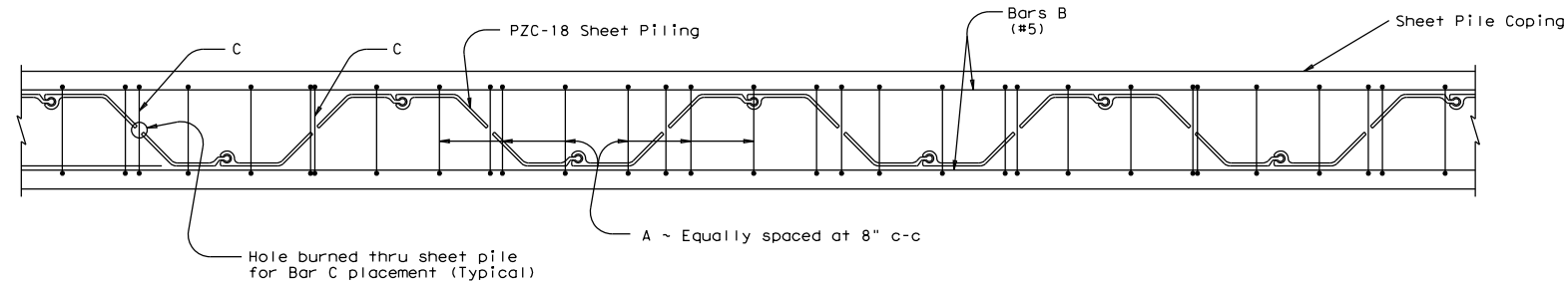
TYLER BRIDGE REPLACEMENTS
CR 1102
AT BUFFALO CREEK

RETAINING WALL LAYOUT

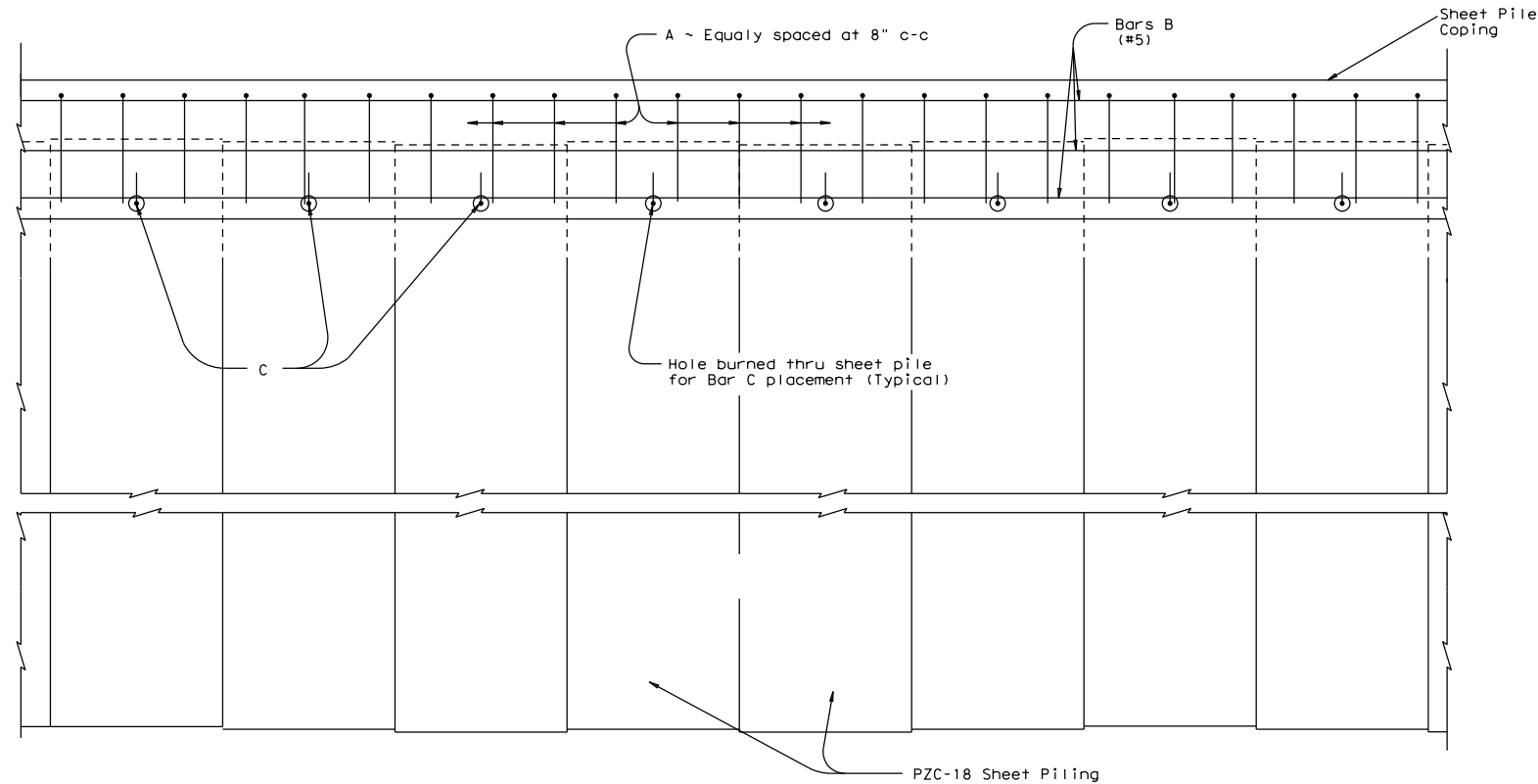
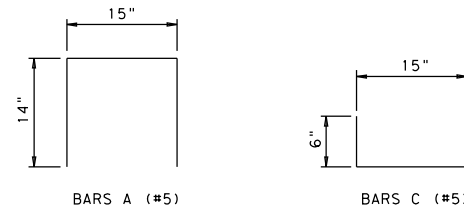
SHEET 1 OF 1			
CONT	SECT	JOB	HIGHWAY
0910	12	139	CR 1102
DIST	COUNTY	SHEET NO.	
TYLER	VAN ZANDT	42	

DATE: 5/16/2023 8:46:16 PM
 FILE: c:\bms\pwe-useast-006\brian.martinez\dms67145\c_139_s_WRT02.dgn

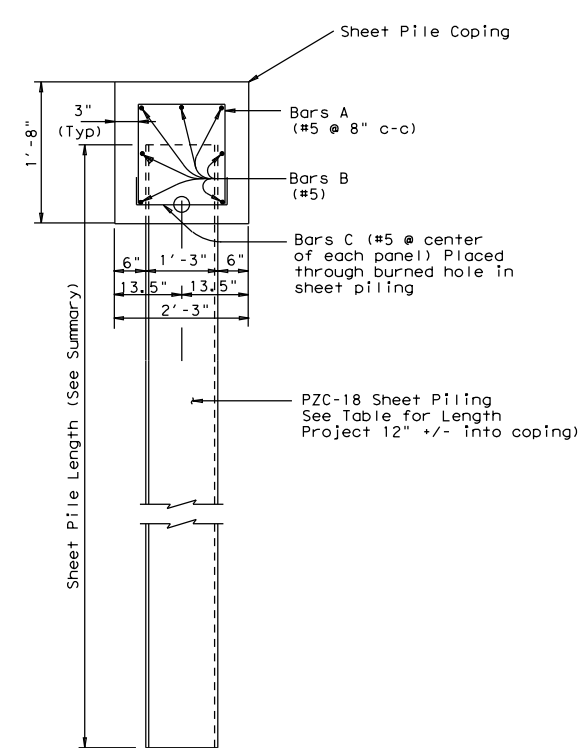
DATE: \$DATE\$ STIMES
 FILE: \$FILES\$
 Csk
 DWG
 Csk
 Dwg



PART PLAN



PART ELEVATION

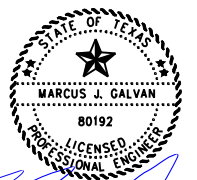


TYP. SEC.

Sheet Pile Summary

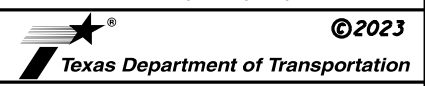
No.	Location	ID	Max H (ft)	Sheet Pile Length (ft)	Wall Depth Below Grade (ft)	Sheet Pile Section
1	CR 1102 at Buffalo Creek	RW-01	8.6	34.0	25.4	PZC-18
2	CR 1102 at Buffalo Creek	RW-02	3.2	10.0	6.8	PZC-18

Scale: NTS



Marcus J. Galvan
04/14/2023

NO.	DATE	REVISION	APPROV.



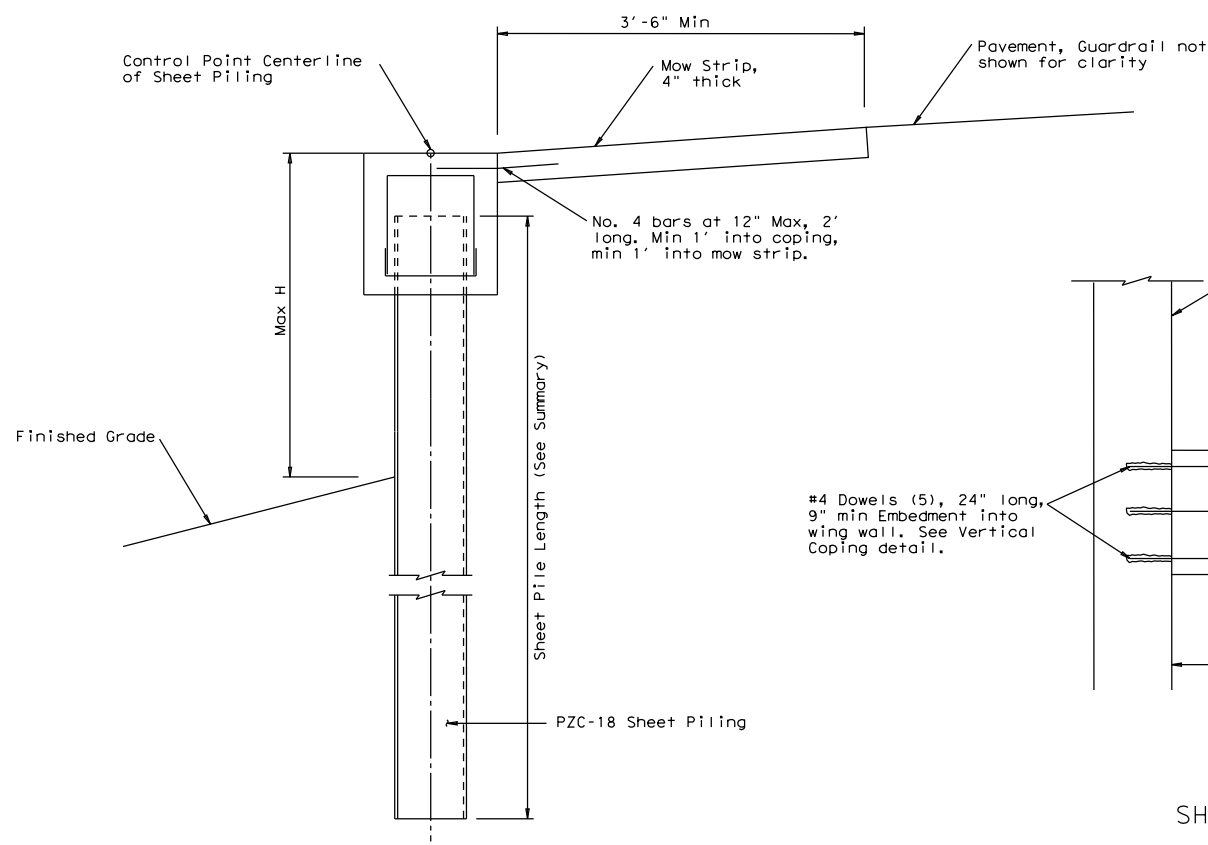
TYLER BRIDGE REPLACEMENTS
CR 1102 AT BUFFALO CREEK

SHEET PILE COPING DETAILS

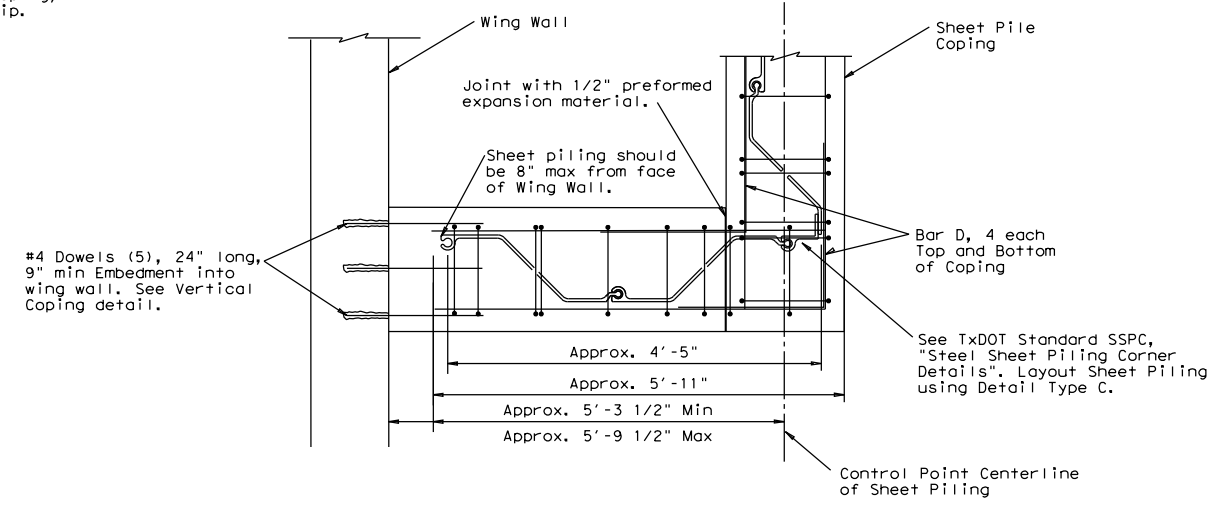
SHEET 1 OF 1			
CONT	SECT	JOB	HIGHWAY
0910	12	139	CR 1102
DIST		COUNTY	SHEET NO.
TYLER		VAN ZANDT	43

DATE: \$DATES\$ FILE: \$FILES\$ STIMES
 Csk DWG Csk Dwg

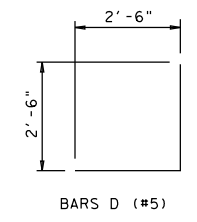
ESTIMATED QUANTITIES			
ITEM		UNIT	QUANTITY
Sheet Piling (PZC-18, Gr. 50)	Item 0407-6019	SF	6777
CL C CONC(COPING)(HPC)	Item 420-6159	LF	265



TYP. SEC.



SHEET PILE CORNER DETAIL



GENERAL NOTES:

SHEET PILING TO BE GRADE 50.

THE CONTRACTOR HAS TO PROVIDE SHOP DRAWINGS FOR THE WALL WITH AN ALTERNATIVE SHEET PILE SECTION OTHER THAN THE ONE SPECIFIED IN THE PLANS TO ACCOMMODATE CHANGES OF WALL GEOMETRY.

NO ADDITIONAL PAYMENT IS ALLOWED FOR THE EXCESS OF SURFACE AREAS AS A RESULT OF CHANGE OF SHEET PILE SECTION.

THE LIMITS OF PAYMENT OF THE WALL WILL BE FROM TOP OF WALL TO BOTTOM OF WALL.

MOW STRIP REINFORCEMENT SHALL BE #3 BARS AT 18" C/C SPACING OR WELDED WIRE REINFORCEMENT (WWR) 6X6-D3XD3. USE LAP SLICES OF A MINIMUM OF 6 INCHES, MEASURED FROM THE TRANSVERSE WIRE OF WWR, OR THE ENDS OF THE REINFORCING BARS.

CONCRETE TO BE CLASS "S"

REINFORCING STEEL SHALL BE GRADE 60.

SHEET PILING SHALL BE DRIVEN SO THAT THE TOP OF PILING ARE APPROXIMATELY 9" BELOW TOP OF WALL ELEVATION.

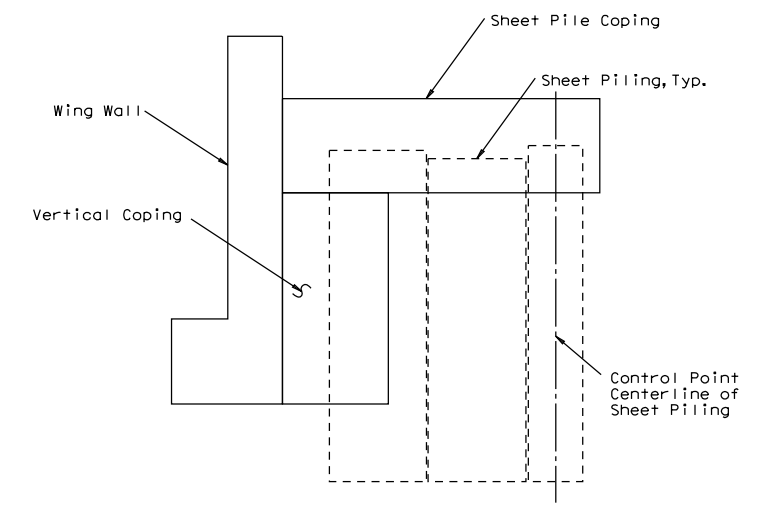
PZC-18 SHALL RECEIVE A SYSTEM III PAINT SYSTEM. REFERENCE ITEM 407 AND 446 FOR ADDITIONAL INFORMATION.

90 DEGREE ANGLE SHALL BE ACCOMPLISHED WITH A MANUFACTURED ONE PIECE ELEMENT.

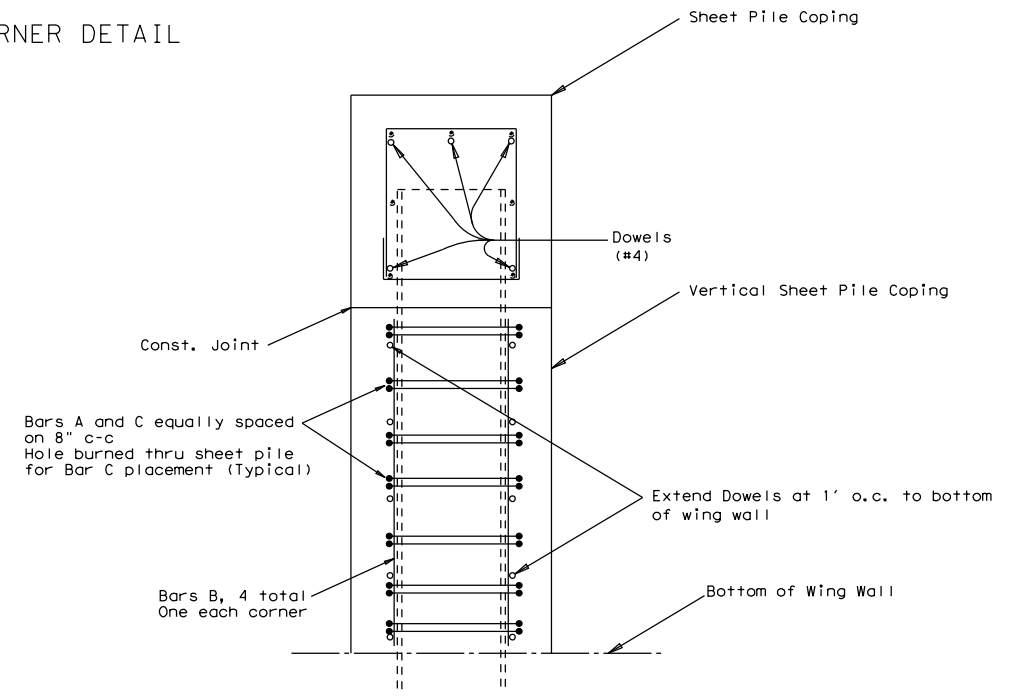
BARS C SHALL BE PLACED THRU 1" DIAMETER HOLES BURNED THRU THE ANGLED WEB OF THE SHEET PILING AT THE LOCATIONS SHOWN.

CONCRETE COPING AND RAILING SHALL BE JOINTED AT 32 FOOT INCREMENTS, OR AS DIRECTED BY THE ENGINEER. FOR CONTRACTOR'S INFORMATION ONLY, ESTIMATED QUANTITIES FOR COPING ARE: 0.14 CY/LF AND 15 LBS REINFORCING STEEL/LF.

CONTRACTOR IS TO SEQUENCE CONSTRUCTION TO MINIMIZE CONFLICT BETWEEN WING WALL AND SHEET PILE CONSTRUCTION. AT THE CONTRACTOR'S OPTION #4 DOWELS MAY BE CAST INTEGRAL WITH WING WALL.



TYPICAL SECTION AT CORNER



VERTICAL COPING DETAIL

Scale: NTS

04/14/2023

NO.	DATE	REVISION	APPROV.

FORESIGHT
 PLANNING & ENGINEERING SERVICES, LLC
 Texas Registered Engineering Firm F-17373

©2023
 Texas Department of Transportation

TYLER BRIDGE REPLACEMENTS
 CR 1102 AT BUFFALO CREEK

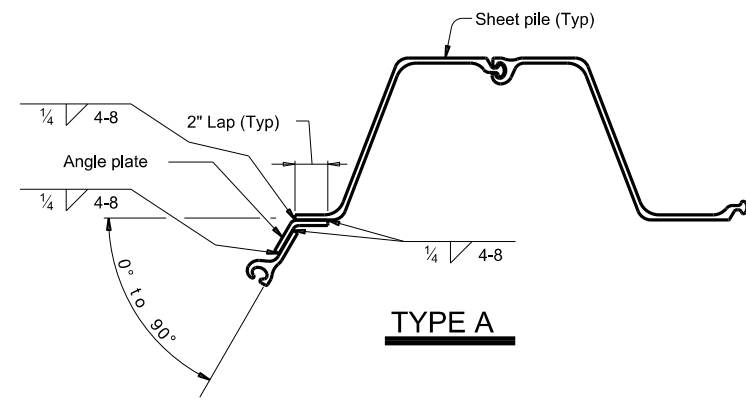
SHEET PILE RETAINING WALL DETAILS

SHEET 1 OF 1

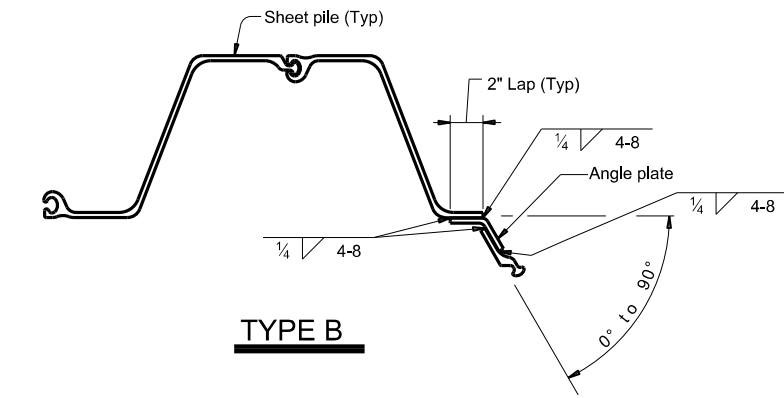
CONT	SECT	JOB	HIGHWAY
0910	12	139	CR 1102
DIST	COUNTY	SHEET NO.	
TYLER	VAN ZANDT	44	

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

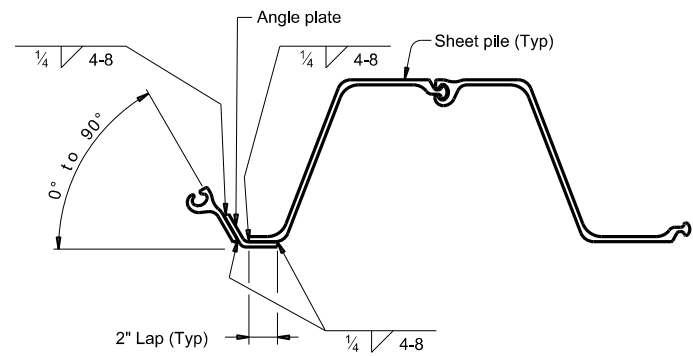
DATE: 4/28/2023 4:02:06 PM
 FILE: c:\bms\pwe-usecast-006\tony.trejo\dms59707\sspcstde.dgn



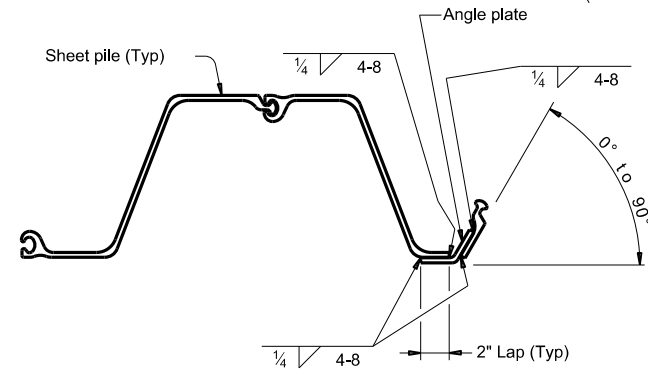
TYPE A



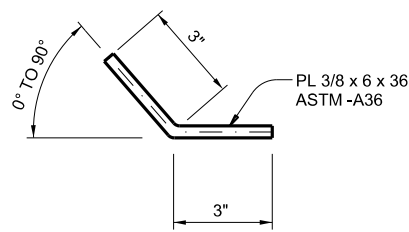
TYPE B



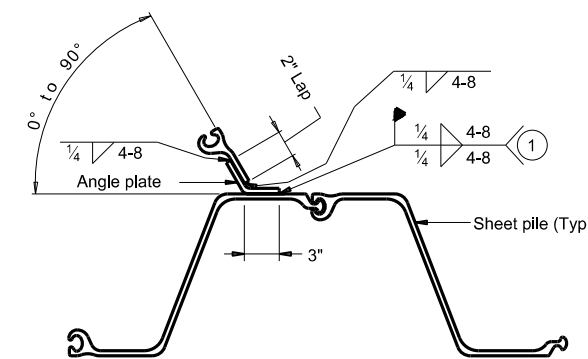
TYPE C



TYPE D



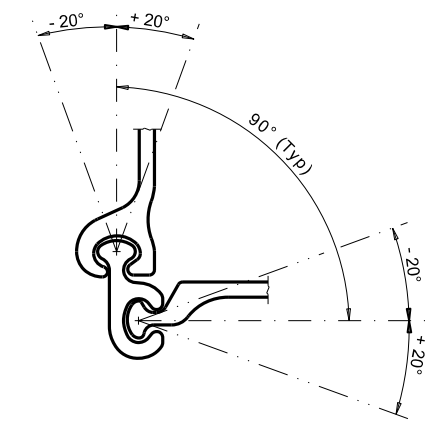
ANGLE PLATE DETAIL



TYPE E

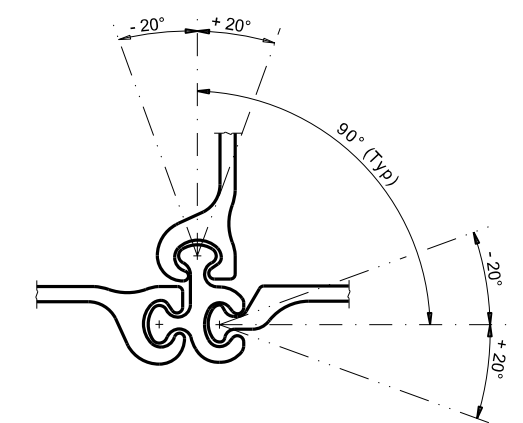
OPTION 1: PLATE WITH WELD

1 Remove paint at weld locations. Clean welded seam in accordance with Section 446.4.7.3.2.2. Stripe coat seam with intermediate coat and appearance coat in accordance with Item 446, "Field Cleaning and Painting Steel."



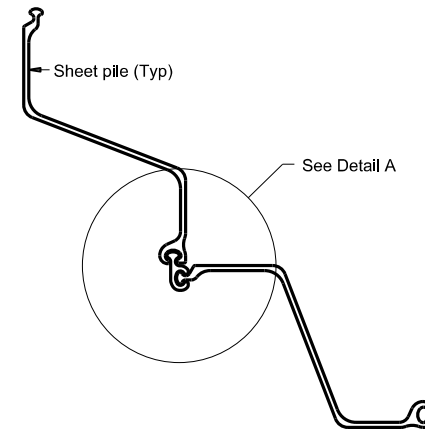
DETAIL A

(Shown PZ 90® by PilePro®)



DETAIL B

(Shown PZ Tee® by PilePro®)



OPTION 2: PREFABRICATED

GENERAL NOTES:

- The Contractor may use a prefabricated connector as shown above. The connectors shown are PZ 90® and PZ Tee®, which are produced by PilePro® (www.pilepro.com). An equivalent connector may also be used. Install the connector using the Manufacturer's guidelines. In brief, these are:
1. Thread the connector to the pile while the sheet pile is out of the ground. The connector will extend the full length of the sheet pile.
 2. Tack weld the connector in place.
 3. Drive the sheet pile with connector using normal procedures.
- Provide sheet piling in accordance with Item 407, "Steel Piling".
 Paint connector using same requirements for sheet piling, as shown elsewhere in the plans.

		Bridge Division Standard	
STEEL SHEET PILING CORNER DETAILS			
SSPC			
FILE: sspcstde.dgn	DN: TxDOT	CK: JGD	DW: AMS
©TxDOT January 2016	CON: SECT	JOB	HIGHWAY
REVISIONS	0910 16	139	CR 1102
DIST	COUNTY	SHEET NO.	
TYLER	VAN ZANDT	45	

Existing Culvert Hydraulic Calculations

Structure No.	Drainage Area (sqmi)	FEMA Flood Zone	2-YR Q (cfs)	100-YR Q (cfs)	Hydrologic Method	Existing Structure	Road Width (ft)	*Overtopping HW (ft)	2-YR HW (ft)	100-YR HW (ft)	2-YR VOUT (fps)	100-YR VOUT (fps)	Existing LOS
CR 1102	4.98	Zone A	2107	7999	Curve Number	31' span	16	415.3	416.43	418.83	8.88	2.5	< 2-YR

* Overtopping Headwater elevation defined as controlling low point along corridor within drainage area which may not be located near bridge structure.

Proposed Culvert Hydraulic Calculations

Structure No.	Drainage Area (sqmi)	FEMA Flood Zone	2-YR Q (cfs)	100-YR Q (cfs)	Hydrologic Method	Proposed Structure	Road Width (ft)	*Overtopping HW (ft)	2-YR HW (ft)	100-YR HW (ft)	2-YR VOUT (fps)	100-YR VOUT (fps)	Proposed LOS	Comments
CR 1102	4.98	Zone A	2107	7999	Curve Number	60' span	26	415.95	415.35	418.9	5.38	2.62	< 2-YR	0.07' Rise in WSE outside ROW, No adverse impact to habitable structures

* Overtopping Headwater elevation defined as controlling low point along corridor within drainage area which may not be located near bridge structure.

NOTES:

1. TXDOT HYDRAULIC DESIGN MANUAL (HDM), SEPTEMBER 2019, WAS USED TO DETERMINE HYDRAULIC DATA.
2. HYDROLOGIC & HYDRAULIC MODELS DEVELOPED WITH HEC-HMS V. 4.9 AND HEC-RAS V. 6.2.
3. DOWNSTREAM BOUNDARY CONDITIONS WERE BASED ON NORMAL DEPTH CALCULATIONS USING DEFINED SLOPES BASED ON AVAILABLE TOPOGRAPHIC DATA. REFER TO HYDRAULIC DATA SHEETS FOR ADDITIONAL INFORMATION.



NO.	DATE	REVISION	APPR BY



HDR HDR Engineering Inc.
 613 NW Loop 410, Suite 700
 San Antonio, TX 78216
 Texas P.E. Firm Registration No. F-754

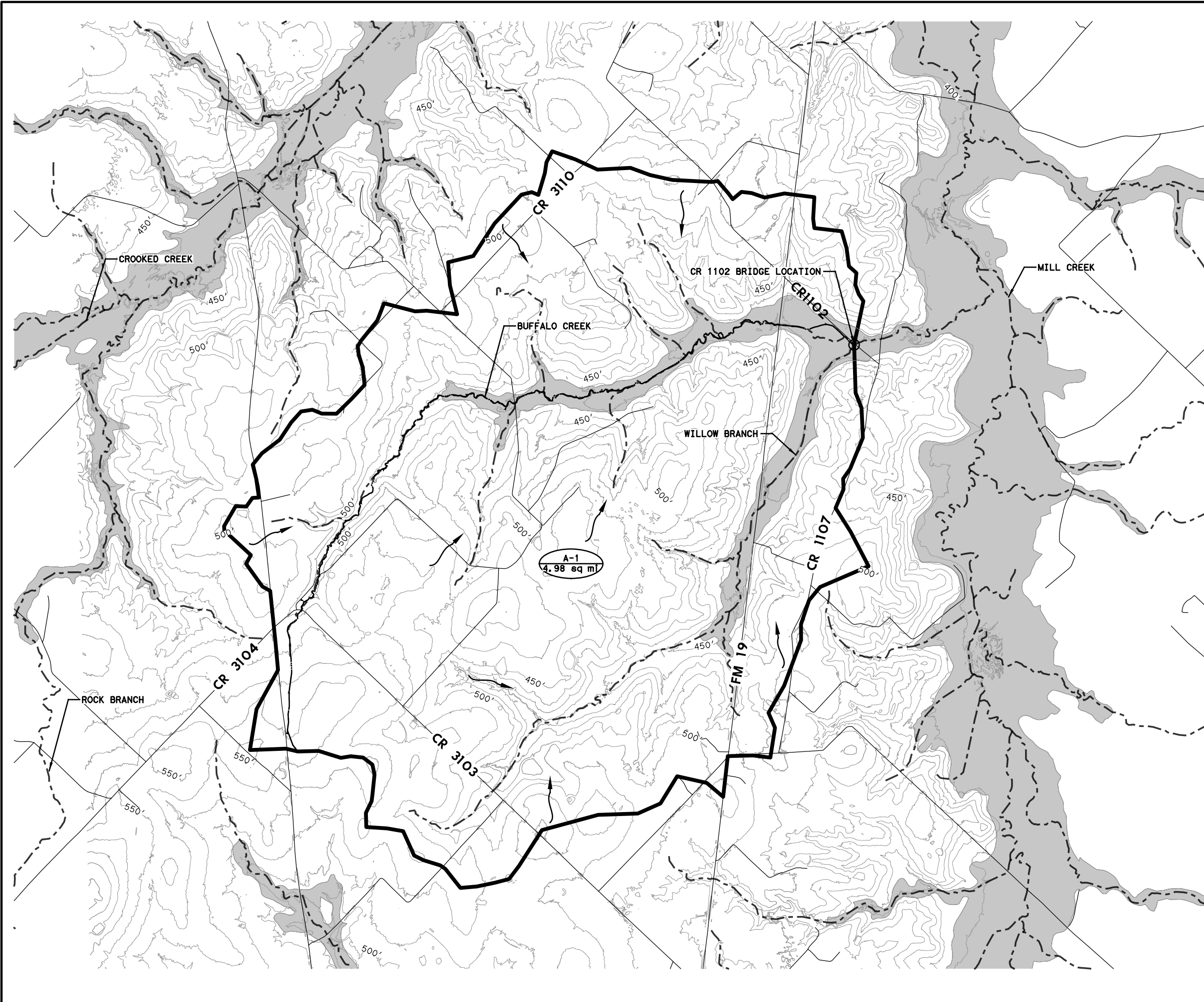


VAN ZANDT COUNTY

HYDRAULIC SUMMARY SHEET

SHEET 1 OF 1

FED RD DIV NO.	FEDERAL AID PROJECT	SHEET NO.	
6	SEE TITLE SHEET	46	
STATE	DISTRICT	COUNTY	
TEXAS	TYLER	VAN ZANDT	
CONTROL	SECTION	JOB	HIGHWAY
0910	12	139	CR1102

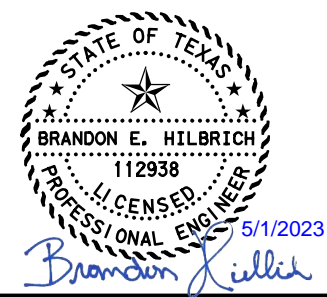


0 1000 2000 3000 4000
SCALE IN FEET

DRAINAGE LEGEND

- DA-XX
X.XX sq mi DRAINAGE AREA
- EFFECTIVE FLOODWAY
- EFFECTIVE ZONE A SFHA
- EFFECTIVE ZONE AE SFHA
- EFFECTIVE ZONE X 0.2% AC
- FLOW PATH
- DRAINAGE SUBBASINS
- 10-FT CONTOURS
- STREAM CL
- ROADWAYS
- FLOW DIRECTION

1. FOR PEAK FLOW CALCULATIONS REFER TO THE HYDROLOGIC DATA SHEET.
2. EFFECTIVE ZONE A FLOODPLAIN SOURCE SMITH COUNTY FEMA FIRM PANEL 48467C0175C, EFFECTIVE DECEMBER 17TH, 2010.
3. INITIAL COORDINATION TO INFORM THE SMITH COUNTY FLOODPLAIN ADMINISTRATOR OF THE PROJECT COMPLETED ON JULY 18TH, 2022.
4. REFER TO DRAINAGE REPORT FOR ADDITIONAL INFORMATION ON HYDROLOGIC MODELING APPROACH AND DAM STRUCTURE.



NO.	DATE	REVISION	APPR BY

CONSOR
F-12040

HDR HDR Engineering Inc.
613 NW Loop 410, Suite 700
San Antonio, TX 78216
Texas P.E. Firm Registration No. F-754

© 2023
Texas Department of Transportation

**CR 1102 AT BUFFALO CREEK
BRIDGE REPLACEMENT
OVERALL DRAINAGE
AREA MAP**

SCALE: 1"=2000' SHEET 1 OF 1

FED RD DIV NO.	FEDERAL AID PROJECT		SHEET NO.
6	SEE TITLE SHEET		47
STATE	DISTRICT	COUNTY	
TEXAS	TYLER	VAN ZANDT	
CONTROL	SECTION	JOB	HIGHWAY
0910	12	139	CR 1102

HYDROLOGIC BASINS

HYDROLOGIC ELEMENT	CURVE NUMBER	AREA (SQ. MI)	IMPERVIOUS %	LAG (HR)	EXISTING CONDITIONS (NOAA ATLAS 14) PEAK FLOWS*						
					2-YEAR	5-YEAR	10-YEAR	25-YEAR	50-YEAR	100-YEAR	500-YEAR
					(CFS)	(CFS)	(CFS)	(CFS)	(CFS)	(CFS)	(CFS)
A1	78	4.98	0	1.02	2107	3357	4365	5749	6850	7999	11008

Composite CN: Composite curve number values developed using SSURGO hydrologic soil groups and landuse including open space, fair condition, crops, woods, and developed.

*Utilized for Design Peak Flow

REGIONAL REGRESSION COMPUTATIONS

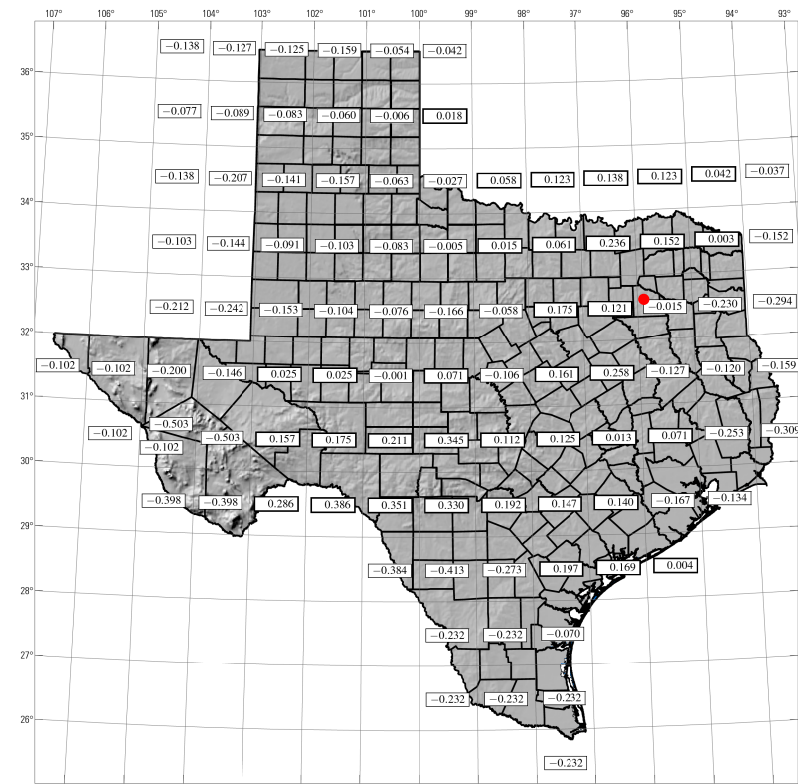
DRAINAGE AREA ID	DRAINAGE AREA (ACRE)	DRAINAGE AREA (SQ. MI)	MEAN ANNUAL PRECIPITATION (IN)	MAIN CHANNEL SLOPE (FT/FT)	OmegaEm PARAMETER	DESIGN YEAR	a	b	c	d	e	f	Q (CFS)
A1	3187.3	4.980	42.00	0.00733	-0.015	2-YR	50.98	-50.30	1.398	0.270	0.776	-0.0058	672
						5-YR	16.62	-15.32	1.308	0.372	0.885	-0.0215	1366
						10-YR	13.62	-11.97	1.203	0.403	0.918	-0.0289	1868
						25-YR	11.79	-9.819	1.140	0.446	0.945	-0.0374	2675
						50-YR	11.17	-8.997	1.105	0.476	0.961	-0.0424	3373
						100-YR	10.82	-8.448	1.071	0.507	0.969	-0.0467	4205
500-YR	10.4	-7.605	0.988	0.569	0.976	-0.0554	6554						

DESIGN REQUIREMENTS:

1. MINIMUM DESIGN STORM BASED ON EXISTING LEVEL OF SERVICE.
2. NO ADVERSE IMPACT TO THE EFFECTIVE 100-YEAR FLOODPLAIN OUTSIDE TXDOT ROW PER FEMA GUIDELINES.
3. NO RISE IN 100-YEAR WSE OUTSIDE TXDOT ROW PER FEMA GUIDELINES.
4. NO SIGNIFICANT ADVERSE IMPACTS TO EXISTING INSURABLE STRUCTURES.

NOTES:

1. TXDOT HYDRAULIC DESIGN MANUAL (HDM), SEPTEMBER 2019, WAS USED TO DETERMINE HYDROLOGIC DATA.
2. BASE CN DEVELOPED USING SSURGO HYDROLOGIC SOIL GROUPS AND LANDUSE CURVE NUMBERS WITH ANTECEDENT MOISTURE CONDITION (AMC) II.
3. PEAK FLOWS (HEC-HMS V4.9) DEVELOPED USING ATLAS 14 DDF INFORMATION LOCATED ININ VAN ZANDT COUNTY ZONE 1 PER THE TXDOT EBDLKUP-2019-V6.2.10 SPREADSHEET.
4. OMEGA EM REGIONAL REGRESSION EQUATIONS COMPARED TO TR-55 METHOD BECAUSE DRAINAGE AREAS > 1 SQ MI AND < 10 SQ MI.



Base from Texas Natural Resources Information System digital data
 Scale 1:7,920,000
 Albers equal-area projection, datum NAD 83
 Standard parallels 27°30' and 35°00', latitude of origin 31°00', central meridian -100°00'
 Horizontal coordinate information is referenced to the North American Datum of 1983 (NAD 83).

HILL-SHADE RELIEF IN TEXAS WITH SUPERIMPOSED VALUES OF OmegaEm PARAMETER THAT REPRESENTS A GENERALIZED TERRAIN AND CLIMATE INDEX FOR REGIONALIZATION OF PEAK-STREAMFLOW FREQUENCY

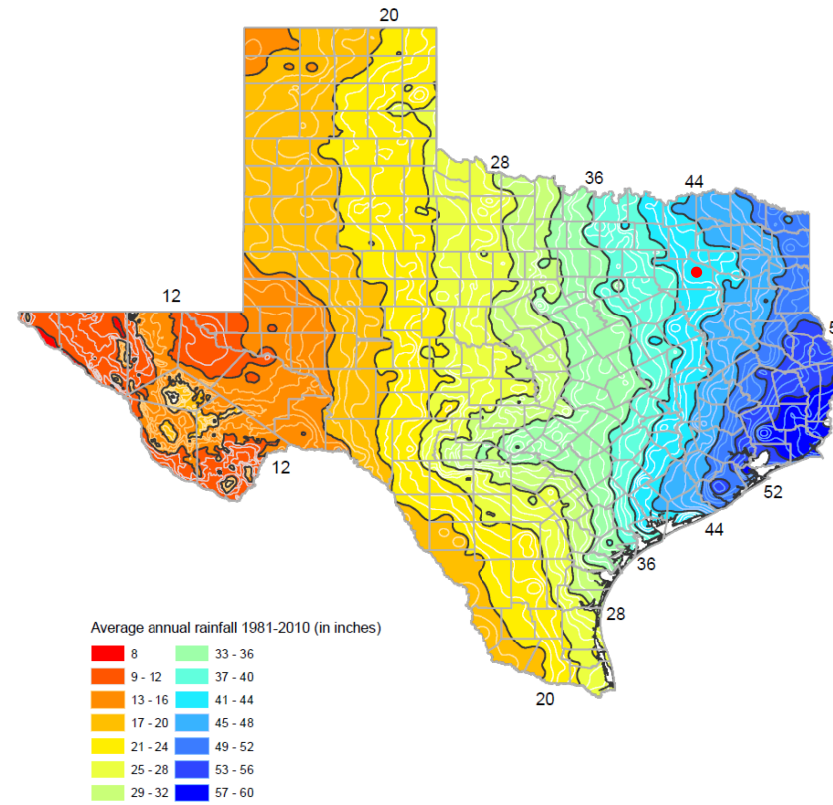
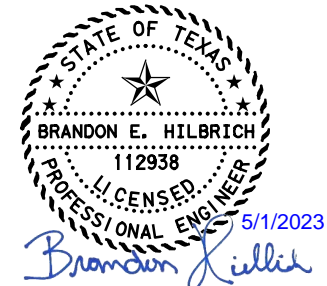
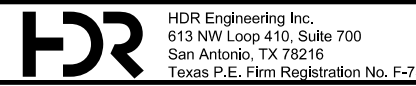


Figure 4-6. Mean annual precipitation, in inches (Source: Texas Water Development Board 2017)

MEAN ANNUAL PRECIPITATION (P) MAP OF TEXAS



NO.	DATE	REVISION	APPR BY

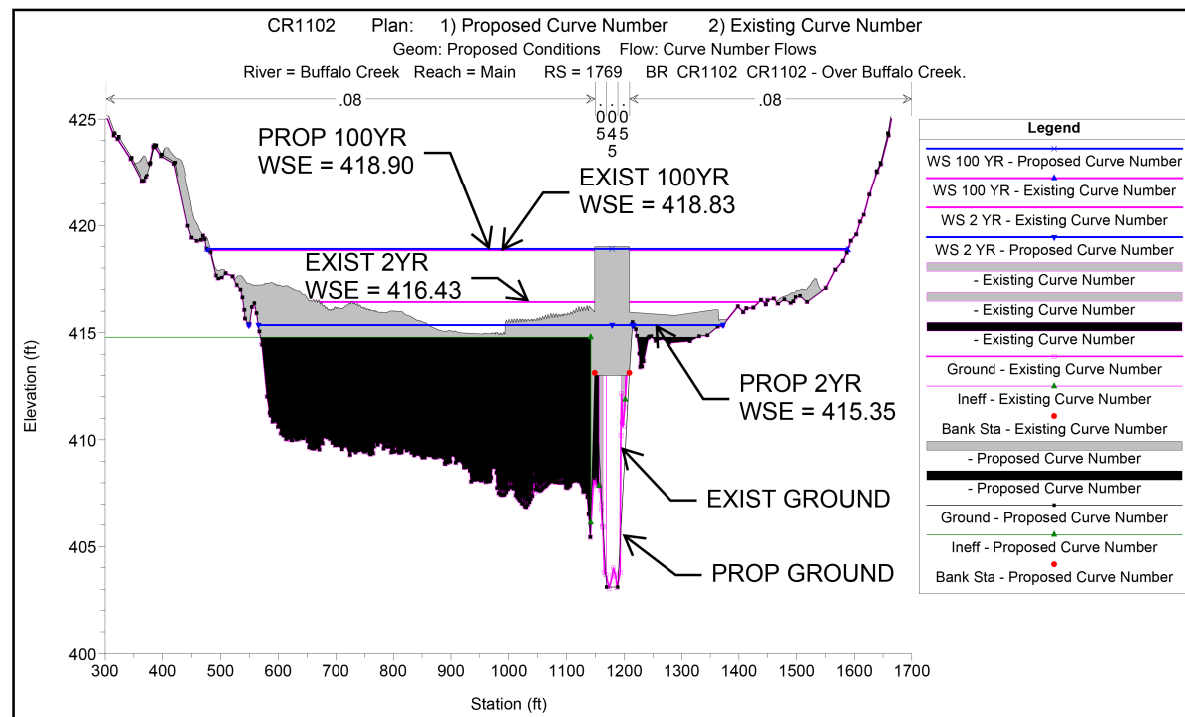


CR 1102 AT BUFFALO CREEK BRIDGE REPLACEMENT
HYDROLOGIC DATA SHEET

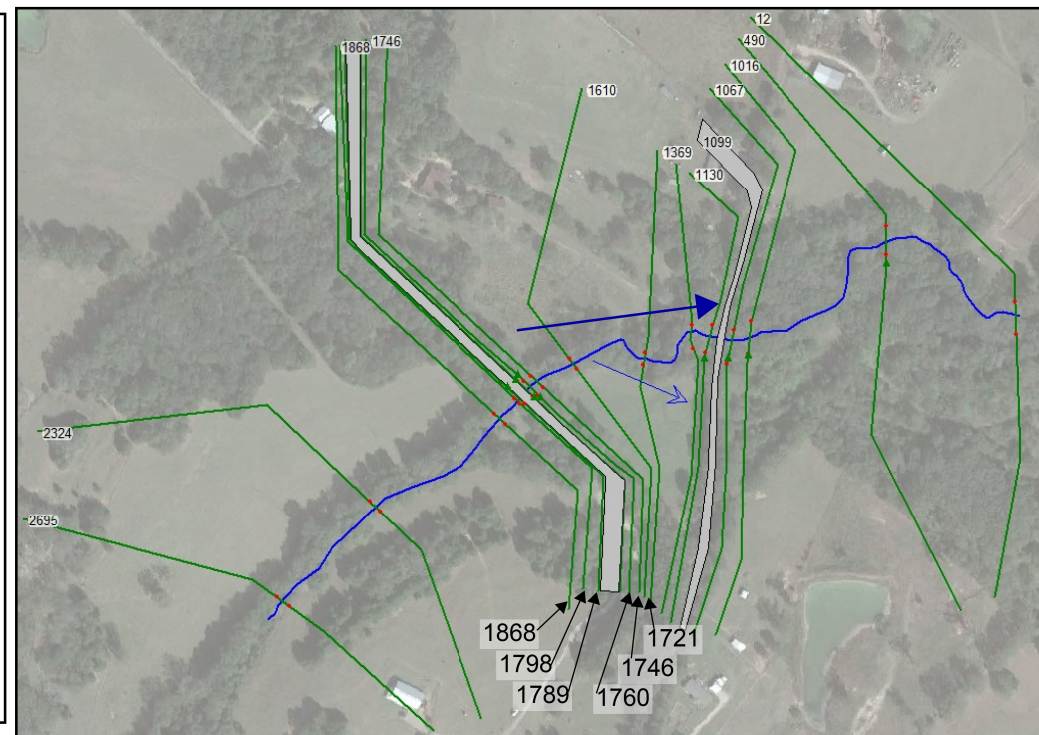
SHEET 1 OF 1

FED RD DIV NO.	FEDERAL AID PROJECT	SHEET NO.	
6	SEE TITLE SHEET	48	
STATE	DISTRICT	COUNTY	
TEXAS	TYLER	VAN ZANDT	
CONTROL	SECTION	JOB	HIGHWAY
0910	12	139	CR 1102

HEC-RAS STRUCTURE UPSTREAM SECTION



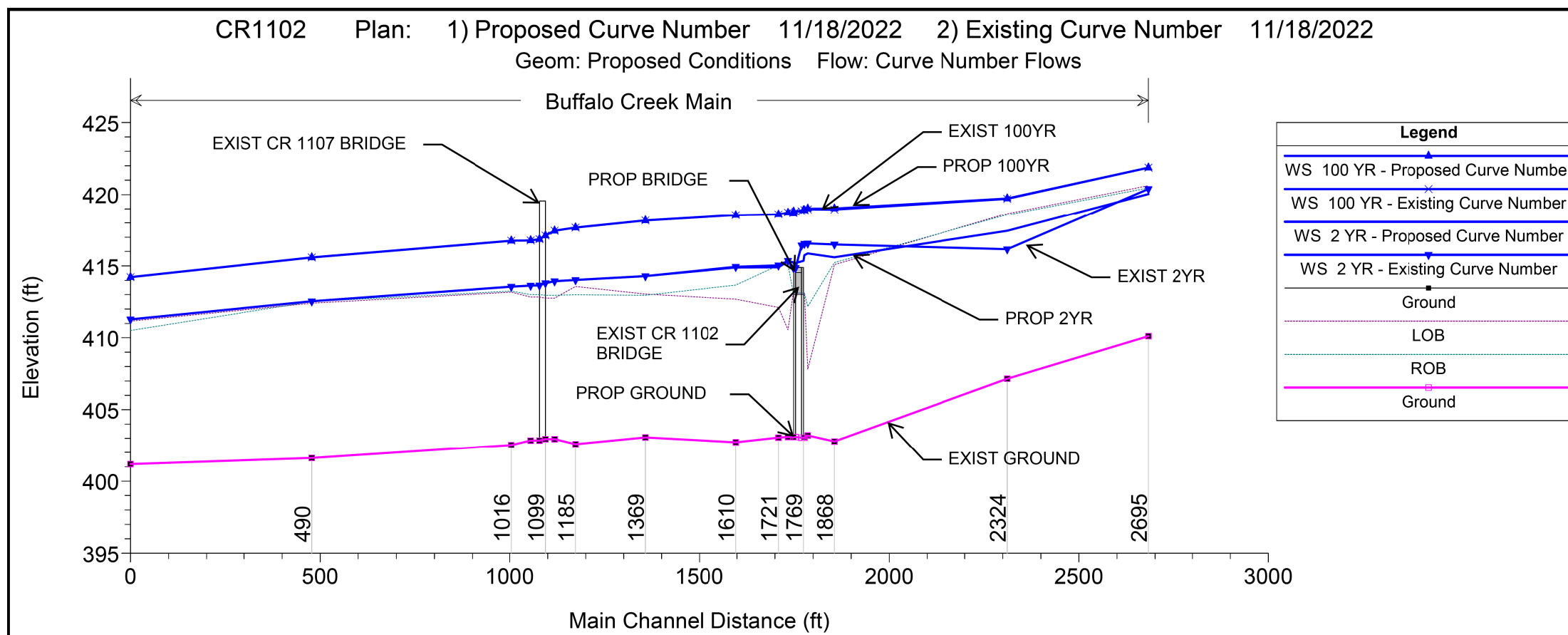
HEC-RAS CROSS SECTION LAYOUT



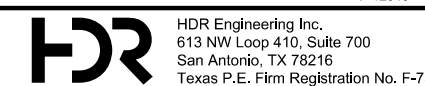
NOTES:

1. HEC-RAS 6.2 USED FOR HYDRAULIC ANALYSIS.
2. STRUCTURE WITHIN EFFECTIVE ZONE AE AND FLOODZONE FLOORPLAIN SOURCE VAN ZANDT COUNTY FEMA FIRM PANEL 48467C0175C, EFFECTIVE DECEMBER 17TH, 2010.
3. A NORMAL DEPTH COMPUTATION USED FOR DOWNSTREAM BOUNDARY CONDITION WITH A SLOPE OF 0.003 FT/FT TO DETERMINE THE STARTING WATER SURFACE ELEVATION (WSE). SLOPE DERIVED FROM USGS LIDAR (2017).
4. HYDRAULIC GEOMETRIES CROSS SECTION DATA BASED ON LIDAR (2017) AND TOPOGRAPHIC SURVEY WITHIN TXDOT ROW.
5. VERTICAL DATUM IS NAVD 88, FOR PEAK FLOWS USED IN HYDRAULIC HEC-RAS MODELS, REFER TO THE HYDROLOGIC DATA SHEETS.
6. MANNING'S N-VALUES BASED ON AERIAL IMAGERY AND SITE PHOTOS REFERENCING TXDOT HDM.
7. INITIAL COORDINATION TO INFORM THE VAN ZANDT COUNTY FLOODPLAIN ADMINISTRATOR OF THE PROJECT COMPLETED JULY 18, 2022.

HEC-RAS PROFILE



NO.	DATE	REVISION	APPR BY



CR 1102 AT BUFFALO CREEK
 BRIDGE REPLACEMENT
 HYDRAULIC CALCULATION
 DATA SHEET

SHEET 1 OF 2

FED RD DIV NO.	FEDERAL AID PROJECT	SHEET NO.	
6	SEE TITLE SHEET	49	
STATE	DISTRICT	COUNTY	
TEXAS	TYLER	VAN ZANDT	
CONTROL	SECTION	JOB	HIGHWAY
0910	12	139	CR 1102

Summary Table

River	Reach	River Station	Profile	Plan	Q Total	Min Ch El	W.S. Elev	Crit W.S.	E.G. Elev	E.G. Slope	Vel Chnl	Flow Area	Top Width	Froude #
					(cfs)	(ft)	(ft)	(ft)	(ft)	(ft/ft)	(ft/s)	(sq ft)	(ft)	Chl
Buffalo Creek	Main	2695	2 YR	Existing Curve Number	2107.00	410.12	420.39	419.35	420.52	0.00	3.94	933.90	469.81	0.29
Buffalo Creek	Main	2695	2 YR	Proposed Curve Number	2107.00	410.12	420.02		420.25	0.00	4.95	765.92	452.53	0.37
Buffalo Creek	Main	2695	100 YR	Existing Curve Number	7999.00	410.12	421.87		422.33	0.00	7.74	1669.29	521.09	0.52
Buffalo Creek	Main	2695	100 YR	Proposed Curve Number	7999.00	410.12	421.86		422.32	0.00	7.76	1665.17	520.91	0.52

NOTES:

- HEC-RAS 6.2 USED FOR HYDRAULIC ANALYSIS.
- STRUCTURE WITHIN EFFECTIVE ZONE AE AND FLOODZONE FLOORPLAIN SOURCE VAN ZANDT COUNTY FEMA FIRM PANEL 48467C0175C, EFFECTIVE DECEMBER 17TH, 2010.
- A NORMAL DEPTH COMPUTATION USED FOR DOWNSTREAM BOUNDARY CONDITION WITH A SLOPE OF 0.003 FT/FT TO DETERMINE THE STARTING WATER SURFACE ELEVATION (WSE). SLOPE DERIVED FROM USGS LIDAR (2017).
- HYDRAULIC GEOMETRIES CROSS SECTION DATA BASED ON LIDAR (2017) AND TOPOGRAPHIC SURVEY WITHIN TXDOT ROW.
- VERTICAL DATUM IS NAVD 88, FOR PEAK FLOWS USED IN HYDRAULIC HEC-RAS MODELS, REFER TO THE HYDROLOGIC DATA SHEETS.
- MANNING'S N-VALUES BASED ON AERIAL IMAGERY AND SITE PHOTOS REFERENCING TXDOT HDM.
- INITIAL COORDINATION TO INFORM THE VAN ZANDT COUNTY FLOODPLAIN ADMINISTRATOR OF THE PROJECT COMPLETED JULY 18, 2022.

Existing 2-Year Detailed Bridge Summary

Plan: Existing Curve Number Buffalo Creek Main RS: 1769 Profiles: 2 YR			
E.G. US. (ft)	416.57	Element	Inside BR US Inside BR DS
W.S. US. (ft)	416.54	E.G. Elev (ft)	416.54 416.08
Q Total (cfs)	2107	W.S. Elev (ft)	416.43 414.86
Q Bridge (cfs)	1407.5	Crit W.S. (ft)	409.1 411.6
Q Weir (cfs)		Max Chl Dpth (ft)	13.38 11.77
Weir Sta Lft (ft)		Vel Total (ft/s)	2.15 8.88
Weir Sta Rgt (ft)		Flow Area (sq ft)	982.28 237.32
Weir Submerg		Froude # Chl	0.13 0.46
Weir Max Depth (ft)		Specif Force (cu ft)	2887.09 1776.19
Min El Weir Flow (ft)	415.37	Hydr Depth (ft)	1.28
Min El Prs (ft)	414.53	W.P. Total (ft)	870.94 81.48
Delta EG (ft)	0.61	Conv. Total (cfs)	33443.6 15982.3
Delta WS (ft)	1.66	Top Width (ft)	768.38
BR Open Area (sq ft)	237.32	Frcn Loss (ft)	0.12 0.06
BR Open Vel (ft/s)	5.93	C & E Loss (ft)	0.33 0.07
BR Sluice Coef		Shear Total (lb/sq ft)	0.28 3.16
BR Sel Method	Energy only	Power Total (lb/ft s)	0.6 28.06

Existing 100-Year Detailed Bridge Summary

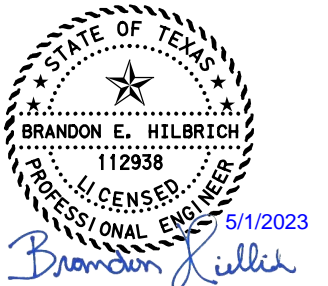
Plan: Existing Curve Number Buffalo Creek Main RS: 1769 Profiles: 100 YR				
E.G. US. (ft)	418.99	Element	Inside BR US	Inside BR DS
W.S. US. (ft)	418.91	E.G. Elev (ft)	418.96	418.91
Q Total (cfs)	7999	W.S. Elev (ft)	418.83	418.8
Q Bridge (cfs)	1351.89	Crit W.S. (ft)	416.94	417.16
Q Weir (cfs)		Max Chl Dpth (ft)	15.78	15.71
Weir Sta Lft (ft)		Vel Total (ft/s)	2.37	2.5
Weir Sta Rgt (ft)		Flow Area (sq ft)	3377.26	3194.95
Weir Submerg		Froude # Chl	0.13	0.12
Weir Max Depth (ft)		Specif Force (cu ft)	8469.52	7203.93
Min El Weir Flow (ft)	415.37	Hydr Depth (ft)	3.06	2.9
Min El Prs (ft)	414.53	W.P. Total (ft)	1208.16	1184.83
Delta EG (ft)	0.11	Conv. Total (cfs)	164620.6	154453
Delta WS (ft)	0.23	Top Width (ft)	1105.41	1102.68
BR Open Area (sq ft)	237.32	Frcn Loss (ft)	0.04	0.01
BR Open Vel (ft/s)	5.7	C & E Loss (ft)	0.01	0.02
BR Sluice Coef		Shear Total (lb/sq ft)	0.41	0.45
BR Sel Method	Energy only	Power Total (lb/ft s)	0.98	1.13

Proposed 2-Year Detailed Bridge Summary

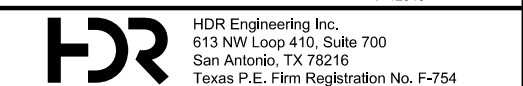
Plan: Proposed Curve Number Buffalo Creek Main RS: 1769 Profiles: 2 YR			
E.G. US. (ft)	415.88	Element	Inside BR US Inside BR DS
W.S. US. (ft)	415.74	E.G. Elev (ft)	415.78 415.61
Q Total (cfs)	2107	W.S. Elev (ft)	415.35 415.16
Q Bridge (cfs)	2075.81	Crit W.S. (ft)	408.89 408.89
Q Weir (cfs)		Max Chl Dpth (ft)	12.25 12.06
Weir Sta Lft (ft)		Vel Total (ft/s)	4.84 5.38
Weir Sta Rgt (ft)		Flow Area (sq ft)	435.5 391.64
Weir Submerg		Froude # Chl	0.26 0.27
Weir Max Depth (ft)		Specif Force (cu ft)	2882.29 2807.57
Min El Weir Flow (ft)	415.37	Hydr Depth (ft)	3.28
Min El Prs (ft)	413.01	W.P. Total (ft)	256.81 123.72
Delta EG (ft)	0.37	Conv. Total (cfs)	26253.3 25864.7
Delta WS (ft)	0.48	Top Width (ft)	132.8
BR Open Area (sq ft)	391.64	Frcn Loss (ft)	0.17 0
BR Open Vel (ft/s)	5.3	C & E Loss (ft)	0.01 0.1
BR Sluice Coef		Shear Total (lb/sq ft)	0.68 1.31
BR Sel Method	Energy only	Power Total (lb/ft s)	3.3 7.06

Proposed 100-Year Detailed Bridge Summary

Plan: Proposed Curve Number Buffalo Creek Main RS: 1769 Profiles: 100 YR				
E.G. US. (ft)	419.04	Element	Inside BR US	Inside BR DS
W.S. US. (ft)	418.89	E.G. Elev (ft)	419.02	418.92
Q Total (cfs)	7999	W.S. Elev (ft)	418.9	418.8
Q Bridge (cfs)	1646.33	Crit W.S. (ft)	417.51	417.32
Q Weir (cfs)		Max Chl Dpth (ft)	15.8	15.7
Weir Sta Lft (ft)		Vel Total (ft/s)	2.51	2.62
Weir Sta Rgt (ft)		Flow Area (sq ft)	3189.78	3055.15
Weir Submerg		Froude # Chl	0.12	0.13
Weir Max Depth (ft)		Specif Force (cu ft)	8679.15	8359.95
Min El Weir Flow (ft)	415.37	Hydr Depth (ft)	3.05	2.93
Min El Prs (ft)	413.01	W.P. Total (ft)	1177.75	1172.78
Delta EG (ft)	0.15	Conv. Total (cfs)	125668.8	138914.6
Delta WS (ft)	0.24	Top Width (ft)	1046.96	1042.57
BR Open Area (sq ft)	391.64	Frcn Loss (ft)	0.1	0
BR Open Vel (ft/s)	4.2	C & E Loss (ft)	0	0.03
BR Sluice Coef		Shear Total (lb/sq ft)	0.69	0.54
BR Sel Method	Energy only	Power Total (lb/ft s)	1.72	1.41



NO.	DATE	REVISION	APPR BY



CR 1102 AT BUFFALO CREEK BRIDGE REPLACEMENT HYDRAULIC CALCULATION DATA SHEET

FED RD DIV NO. 6	FEDERAL AID PROJECT SEE TITLE SHEET		SHEET NO. 50
STATE TEXAS	DISTRICT TYLER	COUNTY VAN ZANDT	
CONTROL 0910	SECTION 12	JOB 139	HIGHWAY CR 1102

CRITICAL VELOCITY SCOUR CALCULATIONS

DESCRIPTION	VARIABLE	Units	Scour Design	Scour Design	Scour Design	Scour Design	Scour Check
			Flood Frequency 2-Year	Flood Frequency 5-Year	Flood Frequency 10-Year	Flood Frequency 25-Year	Flood Frequency 50-Year
UPSTREAM DEPTH OF FLOW	Y1	ft	7.17	8.8	9.11	9.67	10.13
AVERAGE GRAIN SIZE	D50	ft	0.00066	0.00066	0.00066	0.00066	0.00066
COEFFICIENT	Ku	-	11.17	11.17	11.17	11.17	11.17
UPSTREAM VELOCITY	V	ft/s	6.22	4.23	4.77	4.89	4.86
CRITICAL VELOCITY	Vc	ft/s	1.35	1.39	1.40	1.42	1.43
CLEAR WATER IF $V_c > V$, LIVE BED IF $V_c < V$	SCOUR TYPE	-	Live-Bed	Live-Bed	Live-Bed	Live-Bed	Live-Bed

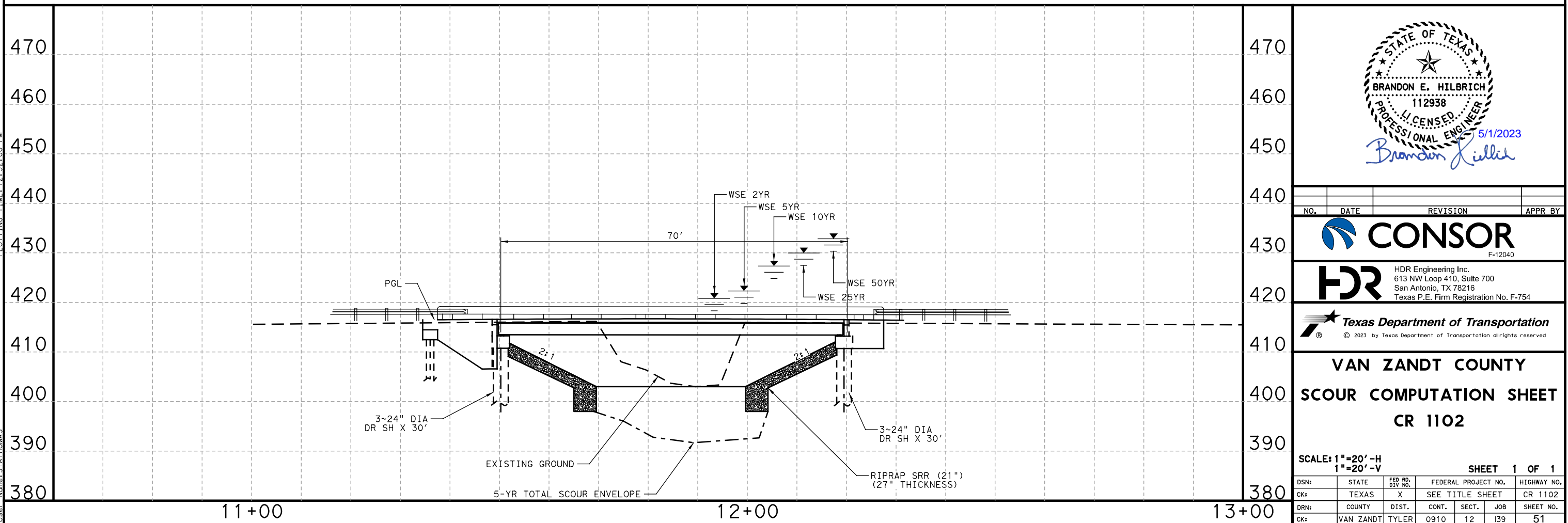
CONTRACTION SCOUR CALCULATIONS (LIVE BED EQUATION WITH PRESSURE FLOW SCOUR)

DESCRIPTION	VARIABLE	Units	Scour Design	Scour Design	Scour Design	Scour Design	Scour Check
			Flood Frequency 2-Year	Flood Frequency 5-Year	Flood Frequency 10-Year	Flood Frequency 25-Year	Flood Frequency 50-Year
UPSTREAM DEPTH OF FLOW	Y1	ft	7.17	8.8	9.11	9.67	10.13
MAIN CHANNEL DISCHARGE IN CONTRACTED SECTION	Q2	ft ³ /s	2016	3068	2216	1938	1790
MAIN CHANNEL DISCHARGE IN UPSTREAM SECTION	Q1	ft ³ /s	3147	2373	2329	2367	2342
MAIN CHANNEL TOP WIDTH OF UPSTREAM SECTION	W1	ft	40.49	40.50	40.50	40.50	40.50
MAIN CHANNEL TOP WIDTH OF CONTRACTED SECTION	W2	ft	60.00	60.00	60.00	60.00	60.00
BED TRANSPORT EXPONENT	k1	-	0.69	0.69	0.69	0.69	0.69
AVERAGE DEPTH IN CONTRACTED SECTION	Y2	ft	3.83	8.36	6.65	6.38	6.14
HEIGHT OF BRIDGE OBSTRUCTION BELOW WATER SURFACE	T	ft	1.77	1.77	1.77	1.77	1.77
VERTICAL SIZE OF BRIDGE OPENING	Hb	ft	9.88	9.88	9.88	9.88	9.88
DISTANCE FROM WATER SURFACE TO BRIDGE LOW CORD	Ht	ft	2.34	3.96	4.23	4.91	5.42
WEIR FLOW HEIGHT	Hw	ft	0.57	2.19	2.46	3.14	3.65
SEPARATION ZONE THICKNESS	t	ft	4.33	4.67	4.70	4.80	4.89
AVERAGE CONTRACTION SCOUR DEPTH	Ys	ft	6.39	11.26	1.47	1.29	1.11

NOTES:

- SCOUR COMPUTATIONS PERFORMED ACCORDING TO FHWA HEC-18 PROCEDURE (APRIL 2012).
- CR 1102 - SECTION 1868 USED AS UPSTREAM SECTION.
- ABUTMENTS WILL BE PROTECTED AGAINST SCOUR WITH RIPRAP - ABUTMENT SCOUR WAS NOT CALCULATED PER TXDOT GEOTECHNICAL MANUAL (07/2020).
- LEFT AND RIGHT OUTERBANK SCOUR WAS NOT CALCULATED BECAUSE BRIDGE DOES NOT SPAN LEFT OR RIGHT OUTERBANKS.
- BRIDGE FOUNDATION DESIGNED TO WITHSTAND 100 YEAR FLOOD.
- D50 LIMITED TO 0.000656 FT FOR COHESIVE MATERIALS PER TXDOT GEOTECHNICAL MANUAL (07/2020).
- D50 INFORMATION REFERENCES BORE LOCATIONS B-13 AND B-14 FROM THE GEOTECHNICAL REPORT DATED AUGUST 2022.
- REFER TO BRIDGE LAYOUT FOR MORE RIPRAP DETAILS.
- CALCULATED SCOUR DEPTHS EXCEED THE MAXIMUM RIPRAP PROTECTION TOEDOWN DEPTHS RECOMMENDED BY TXDOT (5 FEET). A COMPARISON TO EXISTING CONDITIONS SCOUR DEPTHS SHOW SIMILAR RESULTS. BASED ON SITE OBSERVATIONS, MINIMAL EROSION WAS PRESENT AT THIS LOCATION. THEREFORE, MAXIMUM 5 FEET RIPRAP PROTECTION TOEDOWN DEPTHS ARE RECOMMENDED.

ELEVATION



NO.	DATE	REVISION	APPR BY

CONSOR
F-12040

HDR HDR Engineering Inc.
 613 NW Loop 410, Suite 700
 San Antonio, TX 78216
 Texas P.E. Firm Registration No. F-754

Texas Department of Transportation
 © 2023 by Texas Department of Transportation all rights reserved

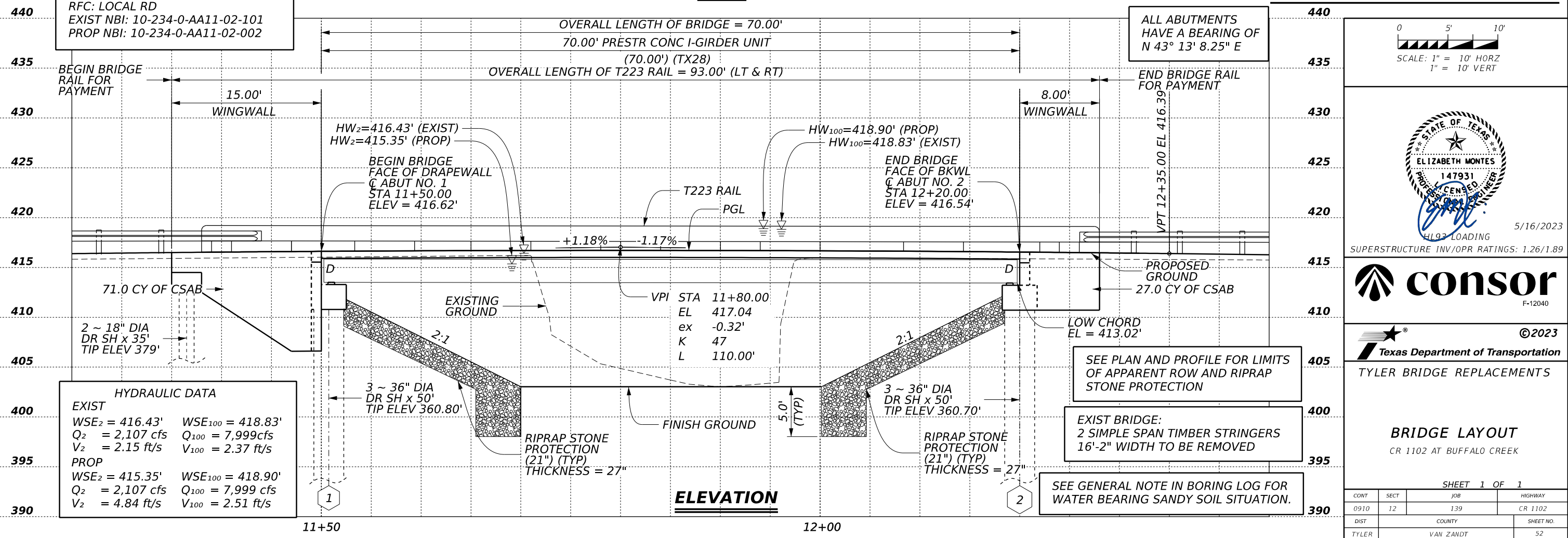
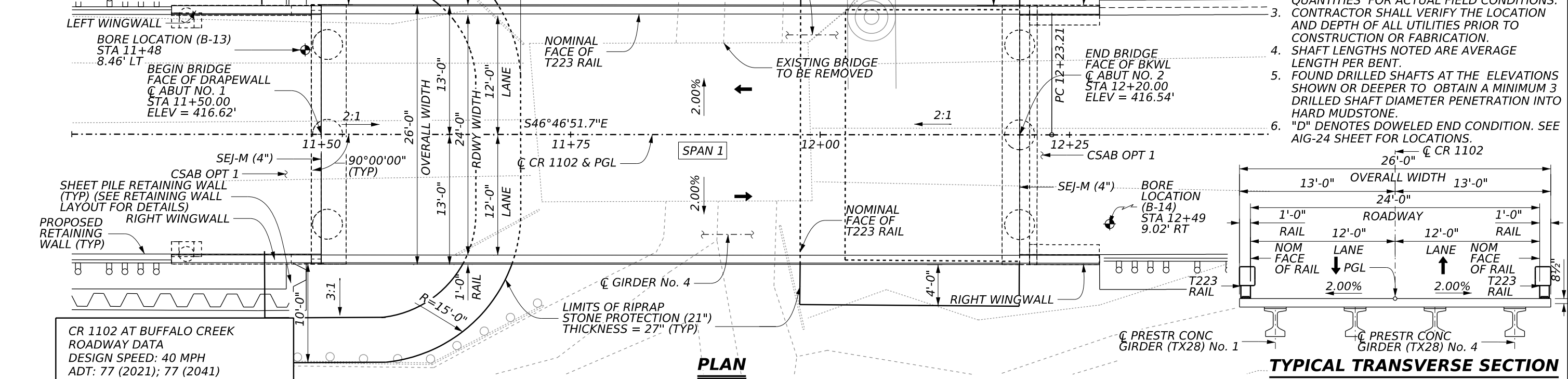
VAN ZANDT COUNTY
SCOUR COMPUTATION SHEET
CR 1102

SCALE: 1"=20'-H
 1"=20'-V SHEET 1 OF 1

DSN:	STATE	FED. RD. DIV. NO.	FEDERAL PROJECT NO.	HIGHWAY NO.		
CK:	TEXAS	X	SEE TITLE SHEET	CR 1102		
DRN:	COUNTY	DIST.	CONT.	SECT.	JOB	SHEET NO.
CK:	VAN ZANDT	TYLER	0910	12	139	51

CR11022
 PI STATION = 12+96.65
 DELTA = 2° 41' 16.90" (LT)
 DEGREE OF CURVE = 1° 49' 49.93"
 TANGENT = 73.44'
 RADIUS = 3130'
 LENGTH = 146.84'
 P.C STATION = 12+23.21
 P.T STATION = 13+70.06

- GENERAL NOTES**
- DESIGNED IN ACCORDANCE WITH AASHTO LRFD BRIDGE DESIGN SPECIFICATIONS (9TH EDITION) (2020) (HL-93 LOADING), AND TXDOT BRIDGE DESIGN MANUAL (NOV 2021)
 - ◆ - DENOTES APPROXIMATE SOIL BORING LOCATION. SEE BORING LOG SHEET FOR GEOTECHNICAL INFORMATION. QUANTITIES FOR ACTUAL FIELD CONDITIONS. CONTRACTOR SHALL VERIFY THE LOCATION AND DEPTH OF ALL UTILITIES PRIOR TO CONSTRUCTION OR FABRICATION.
 - SHAFT LENGTHS NOTED ARE AVERAGE LENGTH PER BENT.
 - FOUND DRILLED SHAFTS AT THE ELEVATIONS SHOWN OR DEEPER TO OBTAIN A MINIMUM 3 DRILLED SHAFT DIAMETER PENETRATION INTO HARD MUDSTONE.
 - "D" DENOTES DOWELED END CONDITION. SEE AIG-24 SHEET FOR LOCATIONS.



DATE: 5/16/2023 3:03:55 PM
 FILE: c:\bms\pwe-use\east-006\rb\vbarely_gonzalez\dms60027\c_139_s_BBL01.dgn

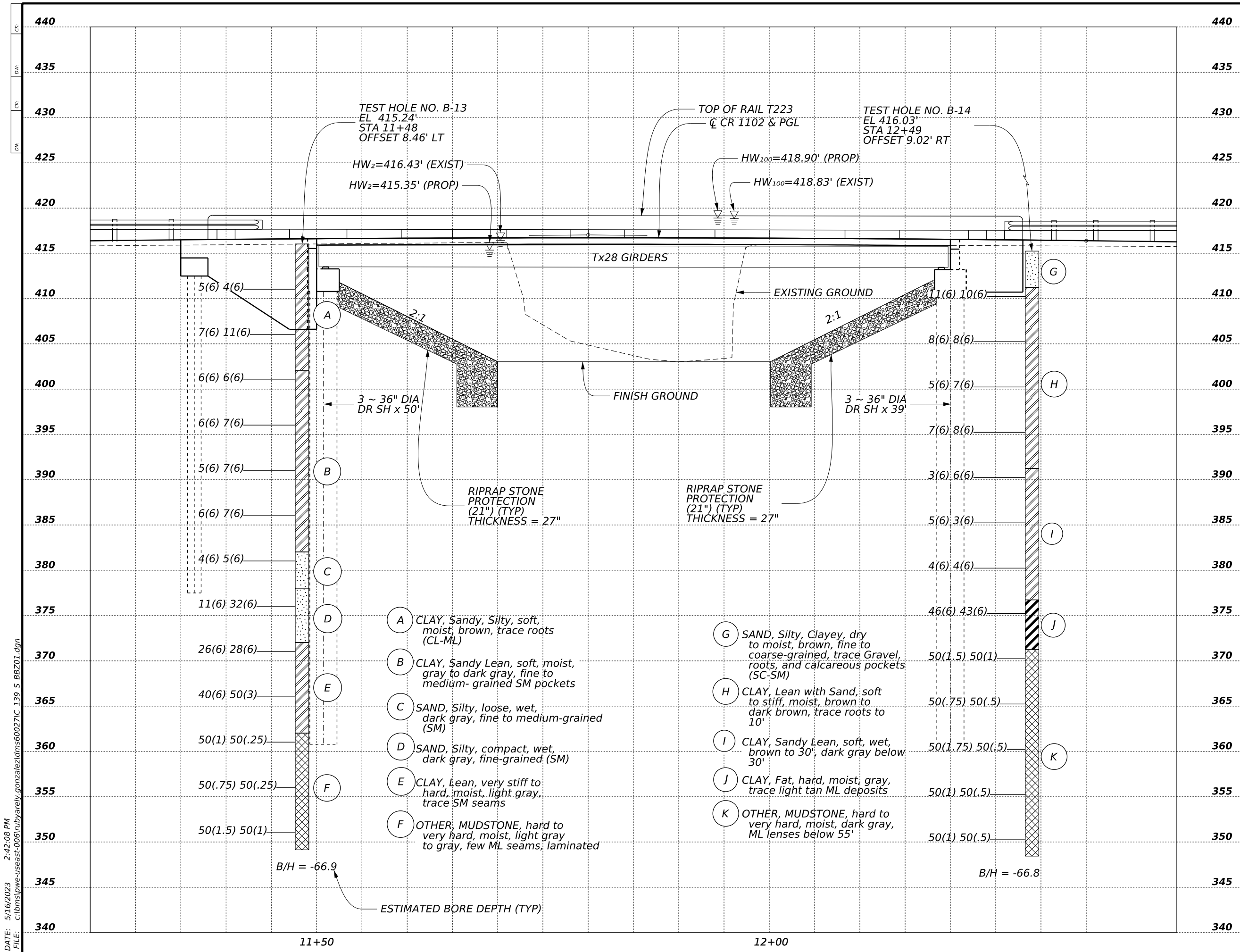
HYDRAULIC DATA

EXIST	WSE ₂ = 416.43'	WSE ₁₀₀ = 418.83'
	Q ₂ = 2,107 cfs	Q ₁₀₀ = 7,999 cfs
	V ₂ = 2.15 ft/s	V ₁₀₀ = 2.37 ft/s
PROP	WSE ₂ = 415.35'	WSE ₁₀₀ = 418.90'
	Q ₂ = 2,107 cfs	Q ₁₀₀ = 7,999 cfs
	V ₂ = 4.84 ft/s	V ₁₀₀ = 2.51 ft/s

SEE PLAN AND PROFILE FOR LIMITS OF APPARENT ROW AND RIPRAP STONE PROTECTION

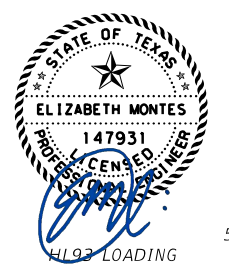
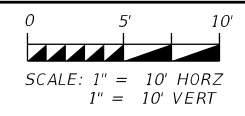
EXIST BRIDGE:
 2 SIMPLE SPAN TIMBER STRINGERS
 16'-2" WIDTH TO BE REMOVED

SEE GENERAL NOTE IN BORING LOG FOR WATER BEARING SANDY SOIL SITUATION.



GENERAL NOTES

- BORING LOGS REPLICATED FROM FORESIGHT PLANNING & ENGINEERING, LLC. BORINGS TAKEN ON 06/19/2022.
- GROUNDWATER ENCOUNTERED AT DEPTHS OF 17.0 FEET FOR BR-13 AND 14.0 FEET FOR BR-14
- ANY GROUNDWATER ELEVATION INFORMATION IS REPRESENTATIVE OF CONDITIONS EXISTING ON THE DAY AND FOR THE SPECIFIC LOCATION WHERE THIS INFORMATION WAS COLLECTED.
- ACTUAL GROUNDWATER ELEVATION MAY FLUCTUATE DUE TO TIME, CLIMATE CONDITIONS, AND/OR CONSTRUCTION ACTIVITY.
- CONTRACTOR'S ATTENTION IS BROUGHT TO WATER BEARING SANDY SOILS SHOWN IN BORING LOGS. THE USE OF TEMPORARY CASING AND/OR DRILLING SLURRY MAY BE NECESSARY TO INSTALL DRILLED SHAFT TO REQUIRE LENGTH AS SHOWN.



©2023
 Texas Department of Transportation

TYLER BRIDGE REPLACEMENTS

BORING LOGS

CR 1102 AT BUFFALO CREEK

SHEET 1 OF 1

CONT	SECT	JOB	HIGHWAY
0910	12	139	CR 1102
DIST	COUNTY	SHEET NO.	
TYLER	VAN ZANDT	53	

DATE: 5/16/2023 2:42:08 PM
 FILE: c:\bms\pwe-useast-006\rbvarely.gonzalez\dms60027\139_S_BBZ01.dgn

DATE: 5/16/2023 2:42:21 PM
 FILE: c:\bms\pwe-useast-006\rubynary.gonzalez\dms600271c_139_s_BS001.dgn

DW: CK: DW: CK:

SUMMARY OF ESTIMATED QUANTITIES

BID ITEM	BID CODE	400 6005	416 6001	416 6004	420 6013	422 6001	425 6035	432 6034	450 6006	454 6018	496 6009
BRIDGE ELEMENT	BID ITEM DESCRIPTION	CEM STABIL BKFL	DRILL SHAFT (18 IN)	DRILL SHAFT (36 IN)	CL C CONC (ABUT)	REINF CONC SLAB	PRESTR CONC GIRDER (TX28)	RIPRAP (STONE PROTECTION) (21 IN)	RAIL (TY T223)	SEALED EXPANSION JOINT (4 IN) (SEJ - M)	REMOV STR (BRIDGE 0 - 99 FT LENGTH)
		CY	LF	LF	CY	SF	LF	CY	LF	LF	EA
2 ABUTMENTS		98	70	300	55.3			280		52	1
70' PRESTR CONC TX28 GIRDER UNIT						1,820	278.00		186.0		
OVERALL TOTALS		98	70	300	55.3	1,820	278.00	280	186.0	52	1



TYLER BRIDGE REPLACEMENTS

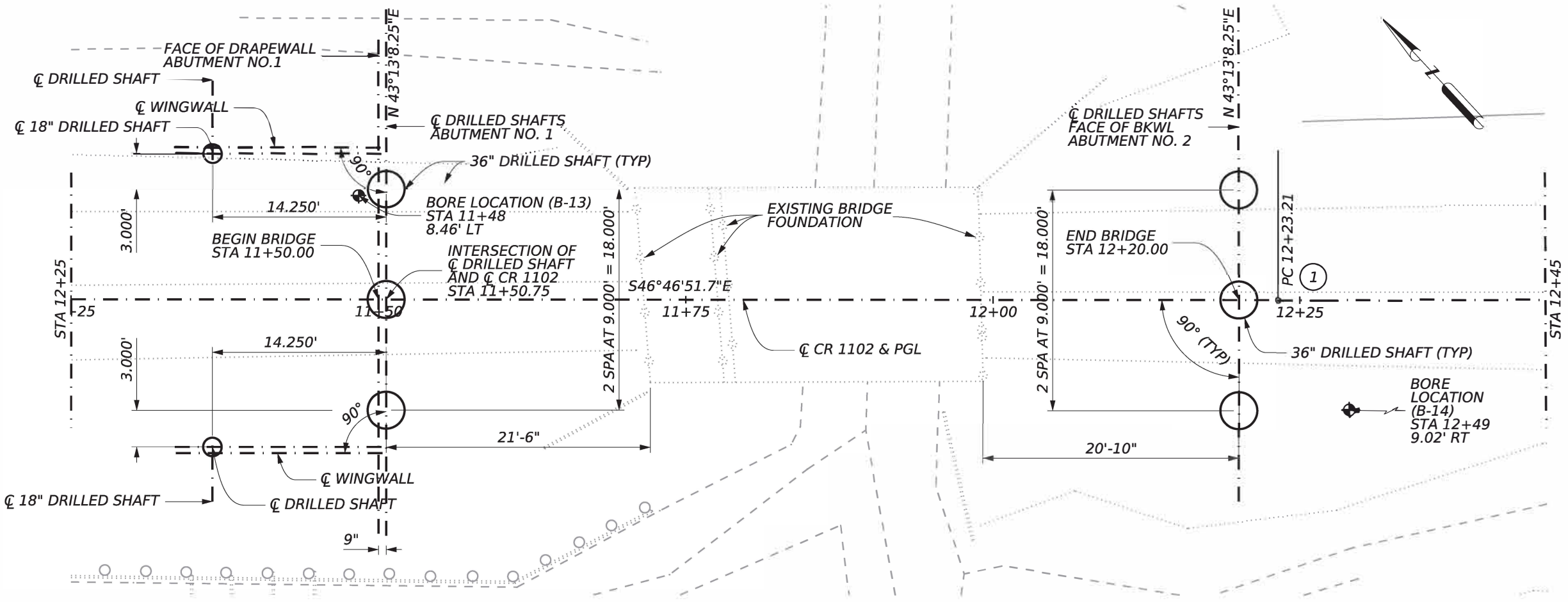
ESTIMATED QUANTITIES

CR 1102 AT BUFFALO CREEK

SHEET 1 OF 1

CONT	SECT	JOB	HIGHWAY
0910	12	139	CR 1102
DIST	COUNTY	SHEET NO.	
TYLER	VAN ZANDT	54	

FOUNDATION LOADS	
ABUT NO.	TONS / D.S.
1	88
2	88

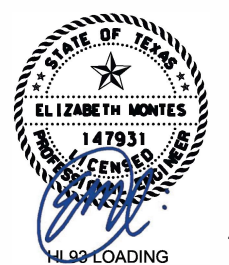
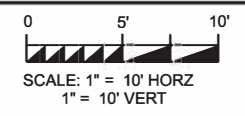


PLAN

GENERAL NOTES

SEE BRIDGE LAYOUT FOR DRILLED SHAFT LENGTHS AND TIP ELEVATIONS.
 SEE ABUTMENT NO.1 SHEETS FOR DRILLED SHAFT DETAILS.

- ① SEE BRIDGE LAYOUT FOR CURVE DATA.



4/28/2023

HL93 LOADING
 SUPERSTRUCTURE INV/OPR RATINGS: 1.26/1.89



TYLER BRIDGE REPLACEMENTS

FOUNDATION LAYOUT
 CR 1102 AT BUFFALO CREEK

SHEET 1 OF 1

CONT	SECT	JOB	HIGHWAY
0910	12	139	CR 1102
DIST	COUNTY	SHEET NO.	
TYLER	VAN ZAN DT	55	

DATE: 4/28/2023 5:08:07 PM
 FILE: c:\bms\pwe-useast-006\tony.tre\oldms67147\C_139_S_BFL01.dgn

DW: CK DW: CK

BEARING SEAT ELEVATIONS (FT)

GIRDER 1 GIRDER 2 GIRDER 3 GIRDER 4
BUT 1 (FWD) 412.860 412.994 412.994 412.860

GIRDER 1 GIRDER 2 GIRDER 3 GIRDER 4
BUT 2 (BK) 412.791 412.924 412.924 412.791

DATE: 4/28/2023 5:08:22 PM
FILE: c:\bms\pwe-useast-006\tony.tre\oldms67147\C_139_S_BEL01.dgn



4/28/2023

NL98 LOADING

SUPERSTRUCTURE INV/OPR RATINGS: 1.26/1.89



©2023

TYLER BRIDGE REPLACEMENTS

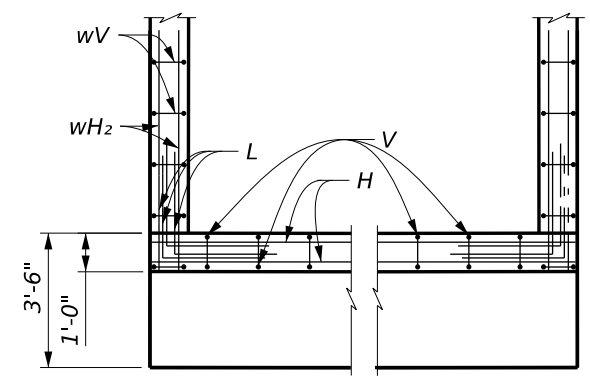
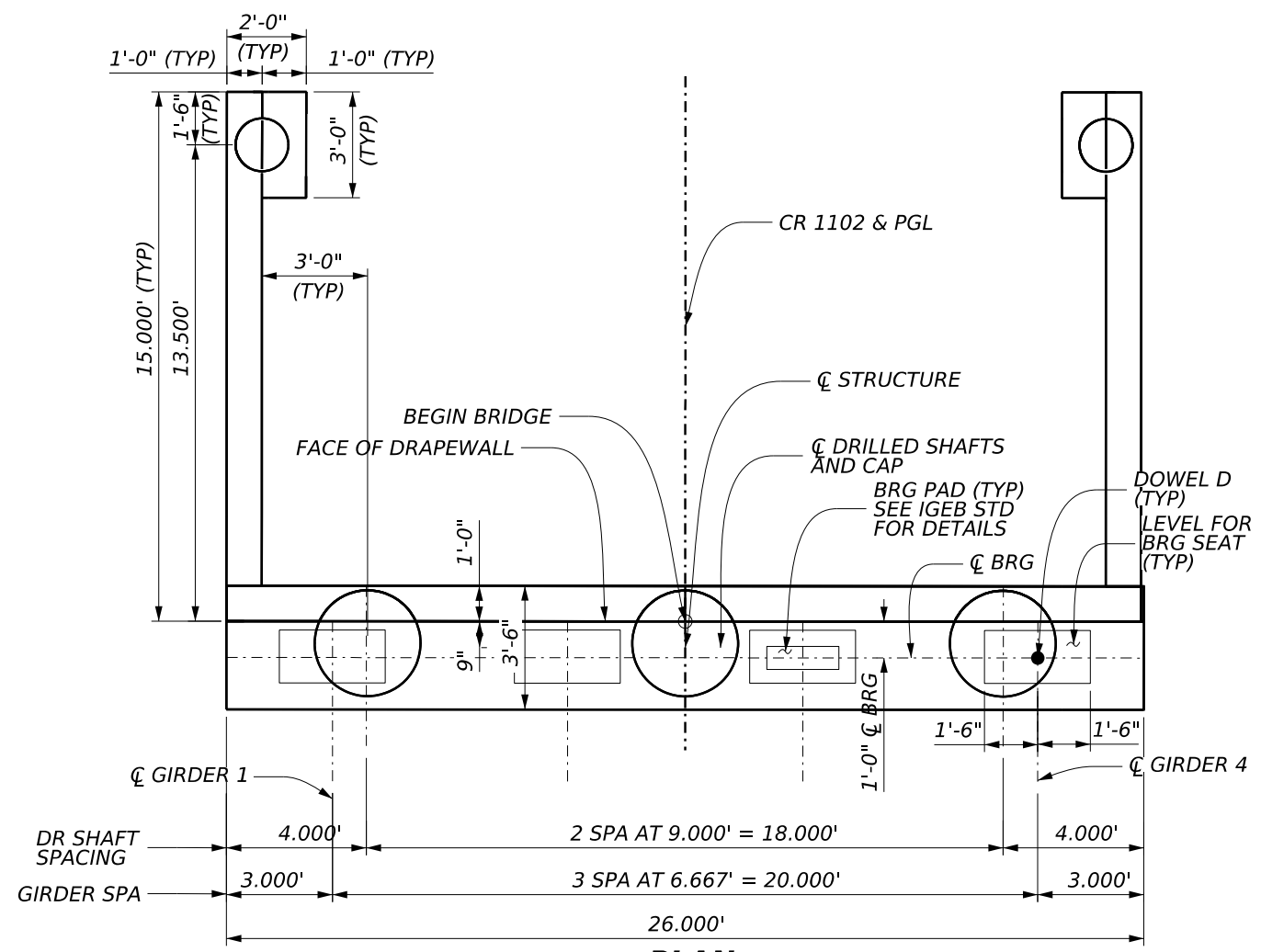
BEARING SEAT
ELEVATIONS

CR 1102 AT BUFFALO CREEK

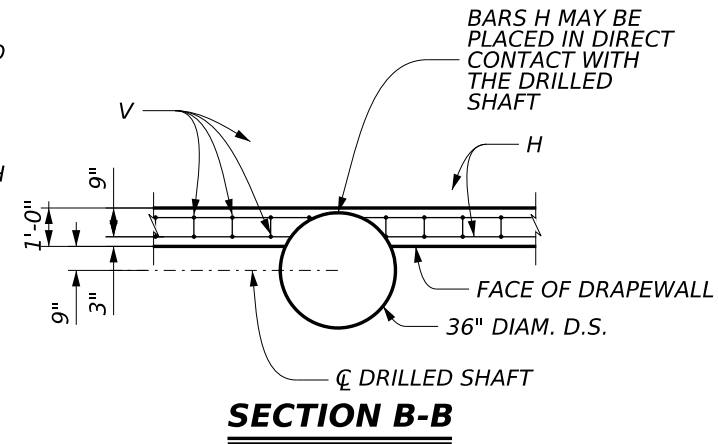
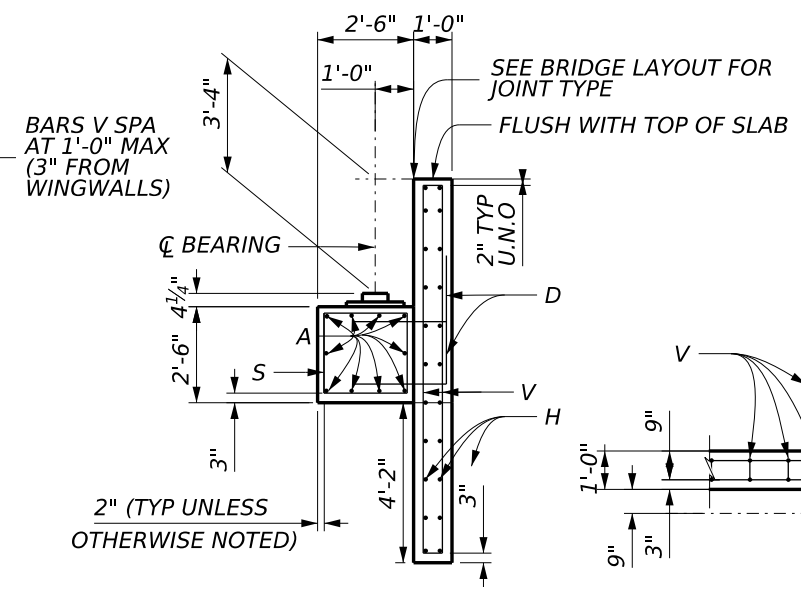
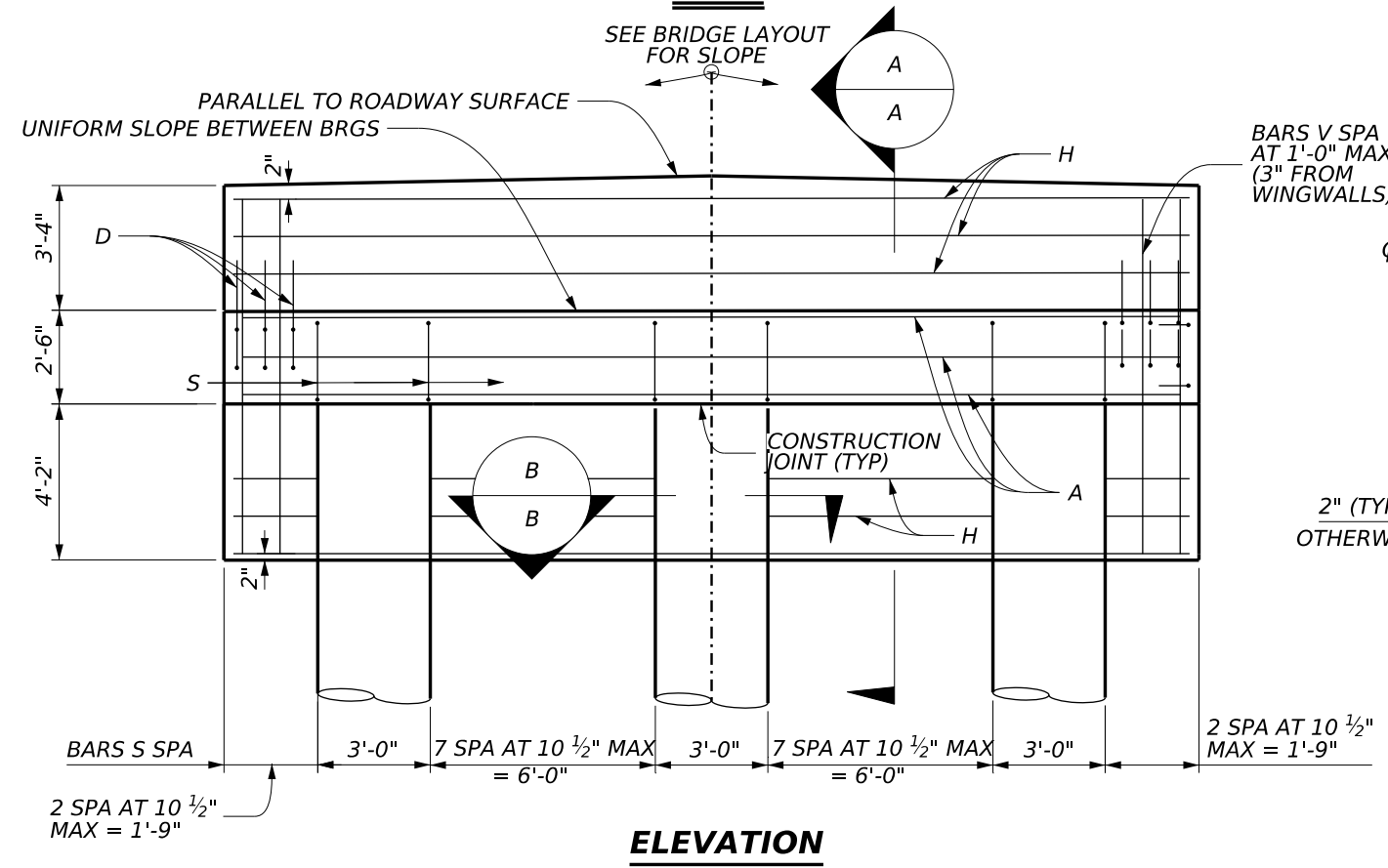
SHEET 1 OF 1

CONT	SECT	JOB	HIGHWAY
0910	12	139	CR 1102
DIST	COUNTY	SHEET NO.	
TYLER	VAN ZANDT	56	

CK: DW: CK: DW:



- 1 SEE CAP ELEVATION AND FRAMING PLAN DETAILS SHEET FOR TOP OF CAP ELEVATIONS.
- 2 1/2" PREFORMED BITUMINOUS FIBER MATERIAL BETWEEN SLAB BEAM AND EARWALL. BOND TO BEAM WITH AN APPROVED ADHESIVE. INSIDE FACE OF EARWALL TO BE CAST WITH VERICAL SIDE OF BEAM. DO NOT CAST EARWALLS UNTIL BEAMS ARE ERECTED IN THEIR FINAL POSITION.
- 3 BARS G, AND H TO BE PLACED WITH 12" MAX SPACING
- 4 SEE WINGWALL DATA TABLE.
- 5 DESIGNED ACCORDING TO AASHTO LRFD SPECIFICATIONS.
- 6 SEE BRIDGE LAYOUT FOR HEADER SLOPE AND FOUNDATION TYPE, SIZE AND LENGTH.
- 7 SEE COMMON FOUNDATION DETAILS (FD) STANDARD SHEET FOR ALL FOUNDATION DETAILS AND NOTES.
- 8 SEE APPLICABLE RAIL DETAILS FOR RAIL ANCHORAGE IN WINGWALLS.
- 9 PROVIDE CLASS C CONCRETE (F'C=3,600 PSI)
- 10 PROVIDE CLASS C (HPC) CONCRETE.
- 11 PROVIDE GRADE 60 REINFORCING STEEL.
- 12 REFER TO STANDARD AIG-24 FOR ABUTMENT 2 DETAILS.



DATE: 5/16/2023 2:43:07 PM
 FILE: c:\bms\pwe-useast-006\rubvarely.gonzalez\dms60027\c_139_s_BAB01.dgn

ELIZABETH MONTES
 147931
 PROFESSIONAL ENGINEER
 CIVIL

5/16/2023
 HL93 LOADING
 SUPERSTRUCTURE INV/OPR RATINGS: 1.26/1.89

F-12040

©2023
 Texas Department of Transportation

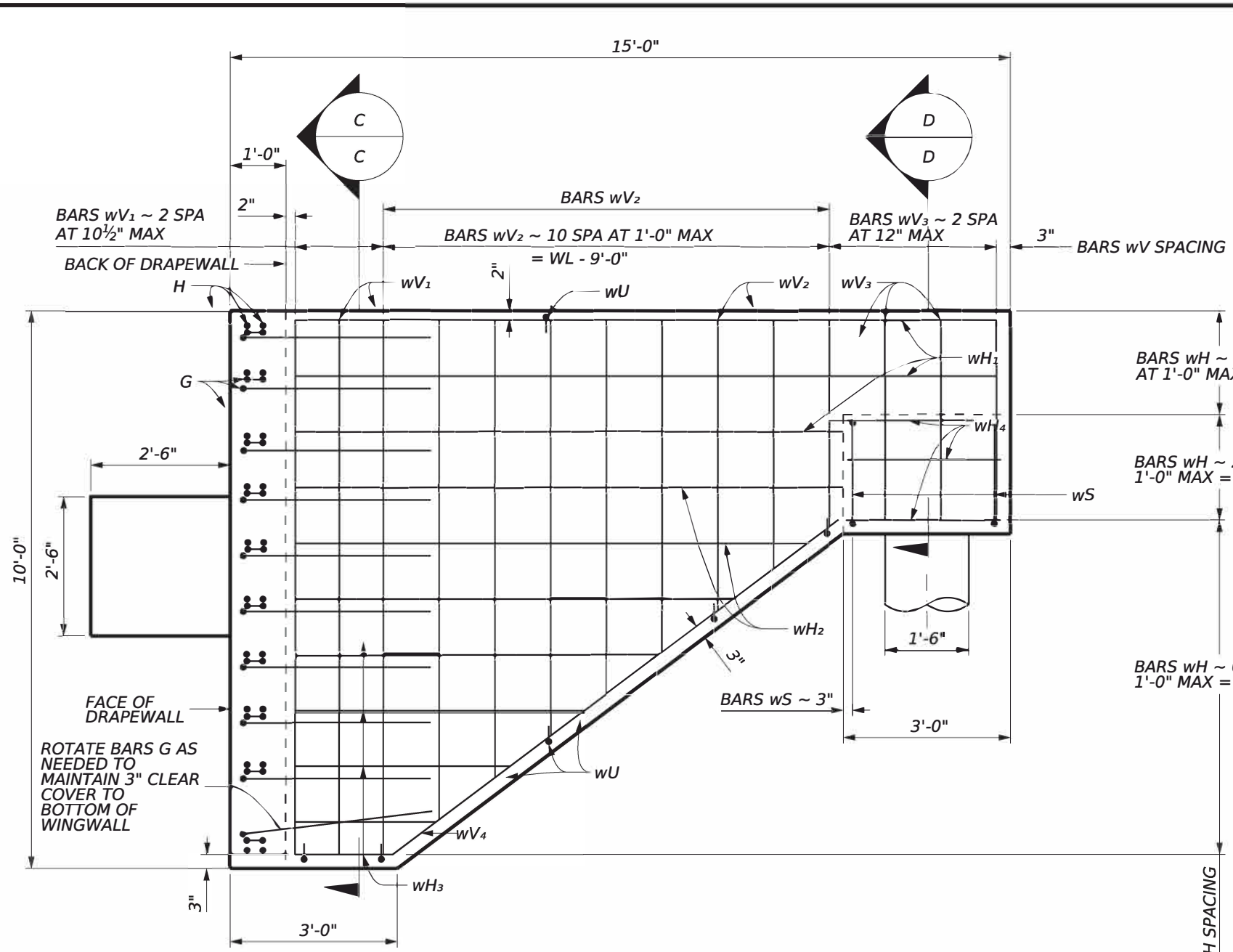
TYLER BRIDGE REPLACEMENTS

ABUTMENT NO. 1
 CR 1102 AT BUFFALO CREEK

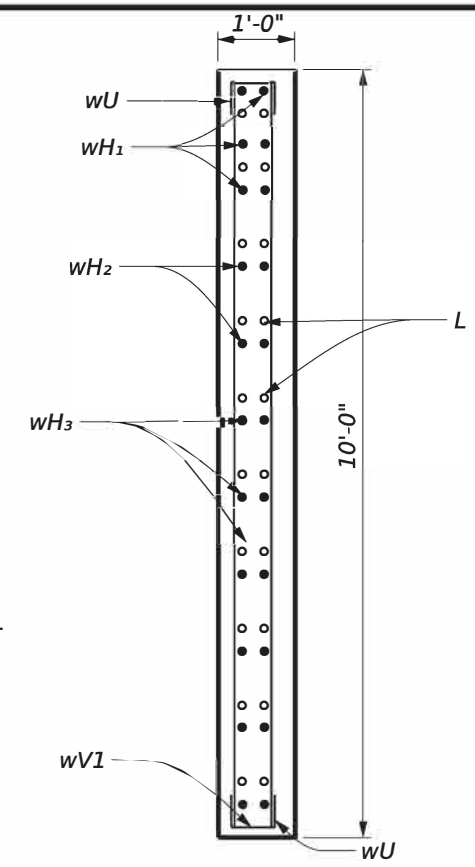
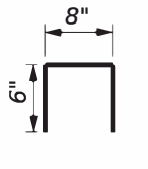
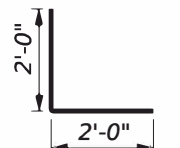
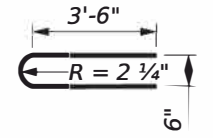
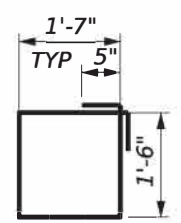
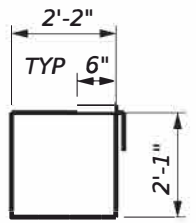
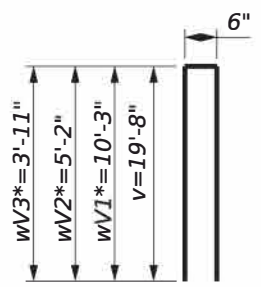
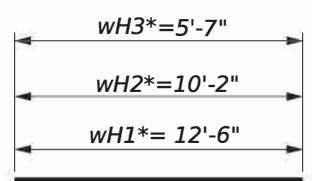
SHEET 1 OF 2

CONT	SECT	JOB	HIGHWAY
0910	12	139	CR 1102
DIST	COUNTY	SHEET NO.	
TYLER	VAN ZANDT	57	

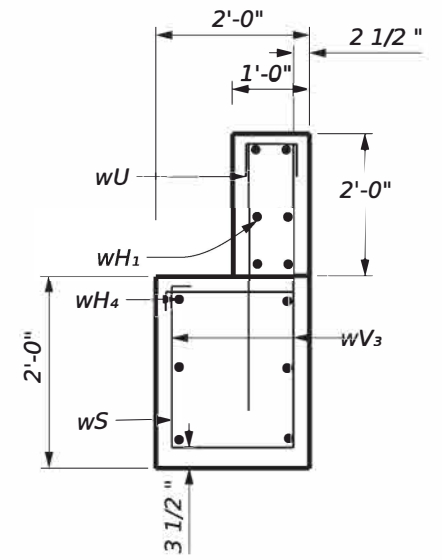
CK
DW
CK
DN



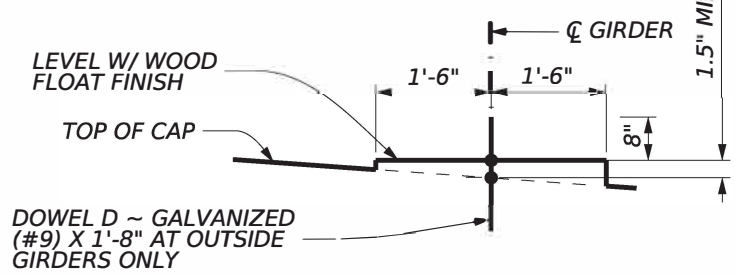
WINGWALL ELEVATION



SECTION C-C



SECTION D-D



BEARING SEAT DETAIL

(BEARING SURFACE MUST BE CLEAN AND FREE OF ALL LOOSE MATERIAL BEFORE PLACING BEARING PAD.)

ABUTMENT CAP AND DRAPEWALL

BAR	No.	SIZE	LENGTH	WEIGHT
A	10	#11	25'-0"	1,328
D	54	#5	25'-9"	1,446
G	32	#6	7'-2"	344
H	22	#6	25'-9"	848
L	8	#6	5'-7"	67
S	22	#4	9'-6"	140
V	27	#6	19'-8"	798
WU	22	#4	1'-8"	24
ITEM		UNIT	QUANTITY	
REINFORCING STEEL		LB	4,995	
CONC (ABUT)		CY	12.3	

ABUTMENT 1 EACH WINGWALL

BAR	No.	SIZE	LENGTH	WEIGHT
Wh1*	6	#6	12'-6"	131
Wh2*	4	#6	10'-2"	71
Wh3*	8	#6	5'-7"	104
Wh4	6	#6	3'-6"	32
Ws	2	#4	7'-4"	10
Wu	9	#4	1'-9"	10
WV1	6	#6	10'-3"	68
WV2*	8	#6	5'-2"	66
WV3*	8	#6	3'-11"	43
WV4	2	#6	6'-6"	20
ITEM		UNIT	QUANTITY	
REINFORCING STEEL		LB	554	
CONC(ABUT)		CY	3.5	

*Average length.



4/28/2023

HL08 LOADING SUPERSTRUCTURE INV/OPR RATINGS: 1.26/1.89



TYLER BRIDGE REPLACEMENTS

ABUTMENT NO. 1
CR 1102 AT BUFFALO CREEK

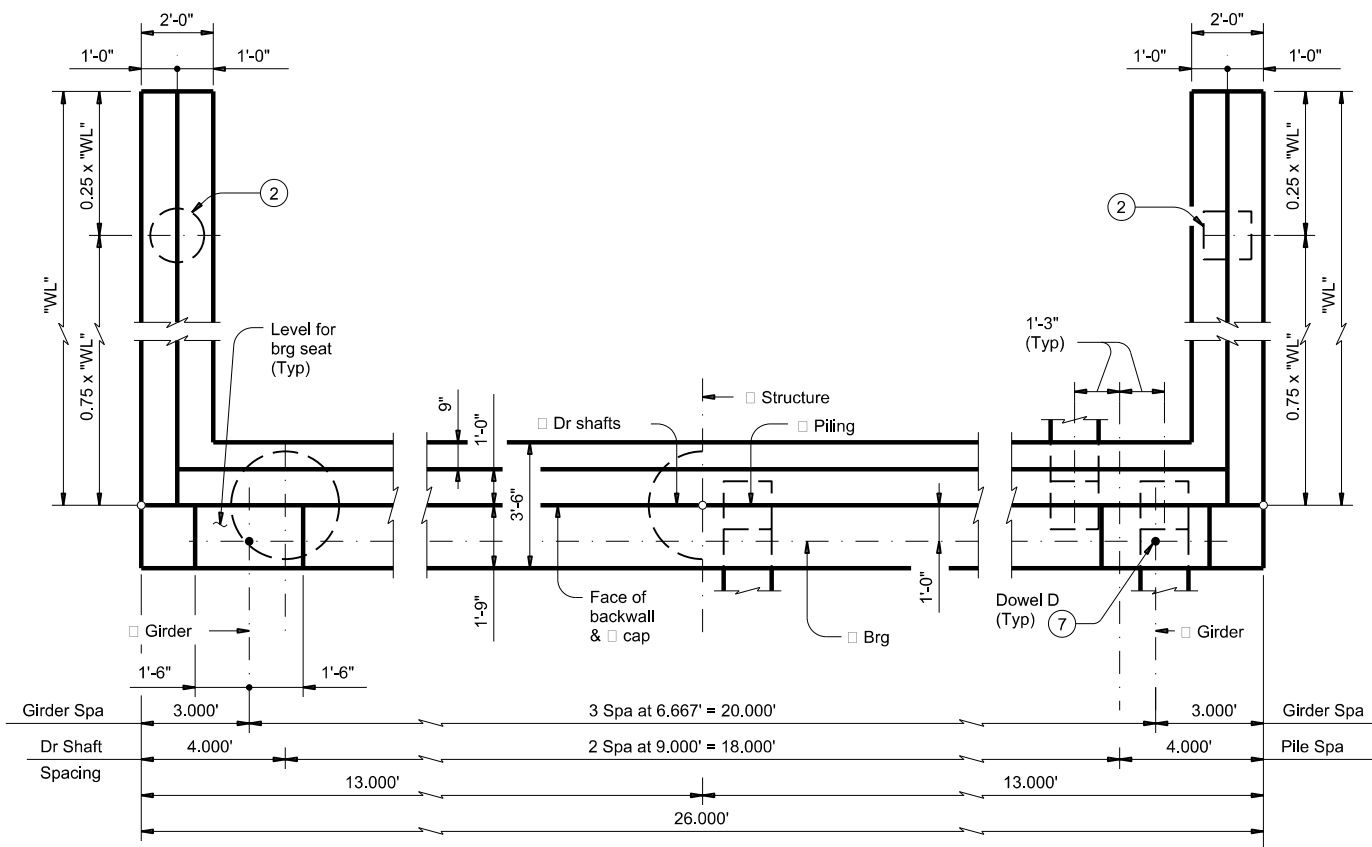
SHEET 2 OF 2

CONT	SECT	JOB	HIGHWAY
0910	12	139	CR 1102
DIST	COUNTY	SHEET NO.	
TYLER	VAN ZANDT	58	

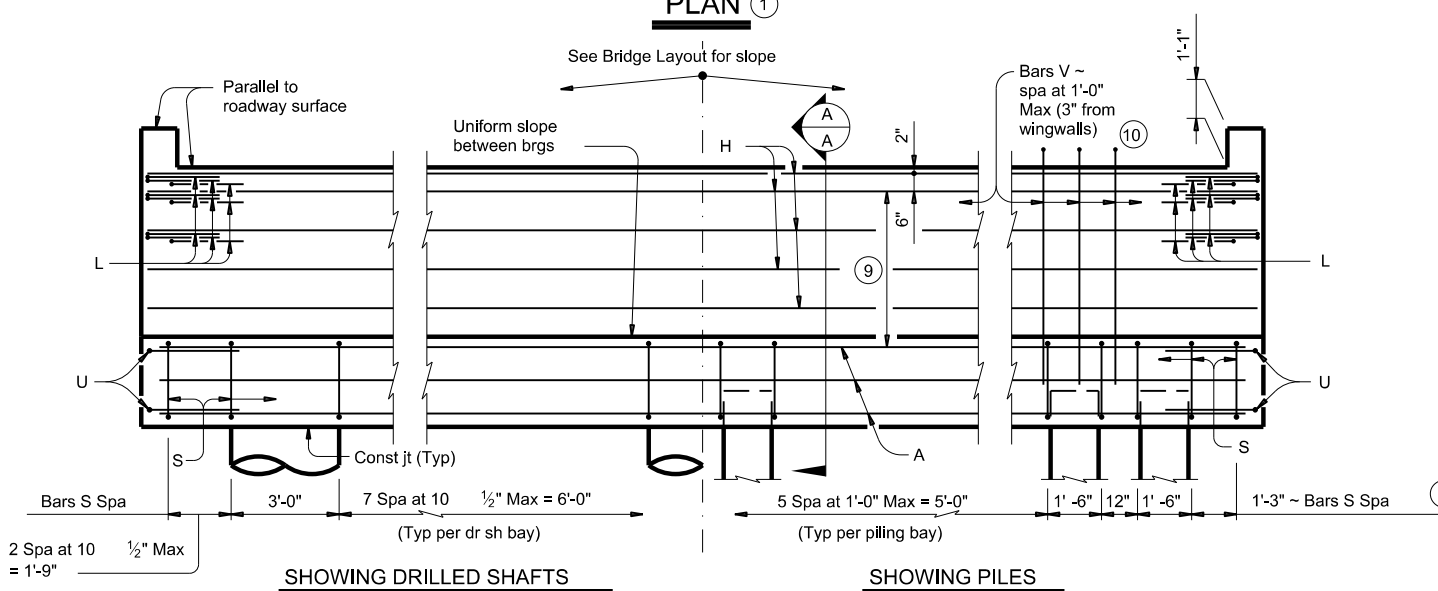
DATE: 4/28/2023 5:08:54 PM
FILE: c:\bms\pwe-useast-006\tony.trejo\dms67147\C_139 S BAB02.dgn

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.

DATE: 4/28/2023 5:09:08 PM
 FILE: c:\bms\pwe-useast-006\tony.tre\o\dms58523\ai01sts-17-1.dgn



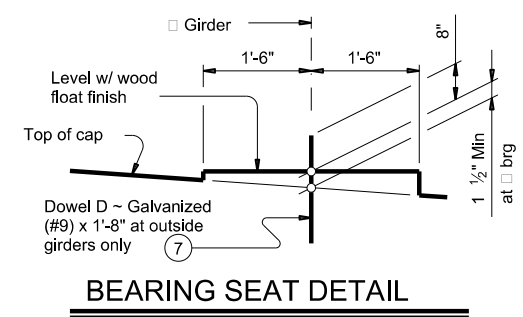
SHOWING DRILLED SHAFTS SHOWING PILES



SHOWING DRILLED SHAFTS SHOWING PILES

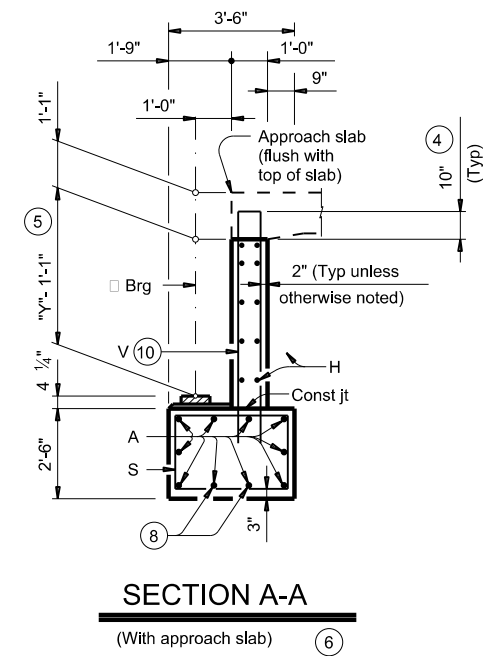
Header Slope	Girder Type	Wingwall Type	Wingwall Lgth "WL"
2:1	Tx28	Cantilevered	8.000'
	Tx34	Cantilevered	9.000'
	Tx40	Cantilevered	10.000'
	Tx46	Cantilevered	11.000'
	Tx54	Cantilevered	12.000'
3:1	Tx28	Cantilevered	12.000'
	Tx34	Founded	13.000'
	Tx40	Founded	15.000'
	Tx46	Founded	16.000'
	Tx54	Founded	18.000'

ELEVATION



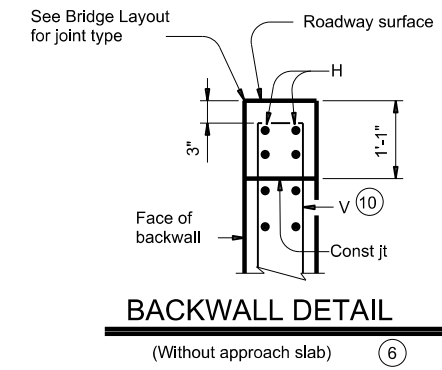
BEARING SEAT DETAIL

(Bearing surface must be clean and free of all loose material before placing bearing pad.)



SECTION A-A

(With approach slab) 6



BACKWALL DETAIL

(Without approach slab) 6

- 1 See Table A for variable dimensions based on header slope and girder type.
- 2 See Table A to determine if wingwall foundations are required.
- 3 For piling larger than 16" adjust Bars S spacing as required to avoid piling.
- 4 Increase as required to maintain 3" from finished grade.
- 5 See Span details for "Y" value.
- 6 See Bridge Layout to determine if approach slab is present.
- 7 Omit Dowels D at end of multi-span unit. Adjust reinforcing steel total accordingly.
- 8 With pile foundations, move Bars A shown to clear piles.
- 9 Spacing based on girder type:
 Tx28 ~ 3 spaces at 1'-0" Max
 Tx34 ~ 3 spaces at 1'-0" Max
 Tx40 ~ 4 spaces at 1'-0" Max
 Tx46 ~ 4 spaces at 1'-0" Max
 Tx54 ~ 5 spaces at 1'-0" Max
- 10 Field bend as needed to clear piles.

GENERAL NOTES:
 Designed according to AASHTO LRFD Bridge Design Specifications.
 See Bridge Layout for header slope and foundation type, size and length.
 See Common Foundation Details (FD) standard sheet for all foundation details and notes.
 See Concrete Riprap (CRR) standard sheet or Stone Riprap (SRR) standard sheet for riprap attachment details, if applicable.
 See applicable rail details for rail anchorage in wingwalls.
 These abutment details may be used with standard SIG-24 only.

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

MATERIAL NOTES:
 Provide Class C concrete (f_c = 3,600 psi).
 Provide Class C (HPC) concrete if shown elsewhere in the plans.
 Provide Grade 60 reinforcing steel.
 Galvanize dowel bars D.

Span Length	All Girder Types	
	Tons/Shaft	Tons/Pile
40	64	54
45	69	56
50	73	59
55	77	61
60	81	63
65	85	65
70	88	67
75	92	69
80	96	71
85	100	73
90	104	75
95	108	77
100	111	79
105	115	80
110	119	82
115	123	84
120	126	86
125	130	88

HL93 LOADING SHEET 1 OF 3

Texas Department of Transportation *Bridge Division Standard*

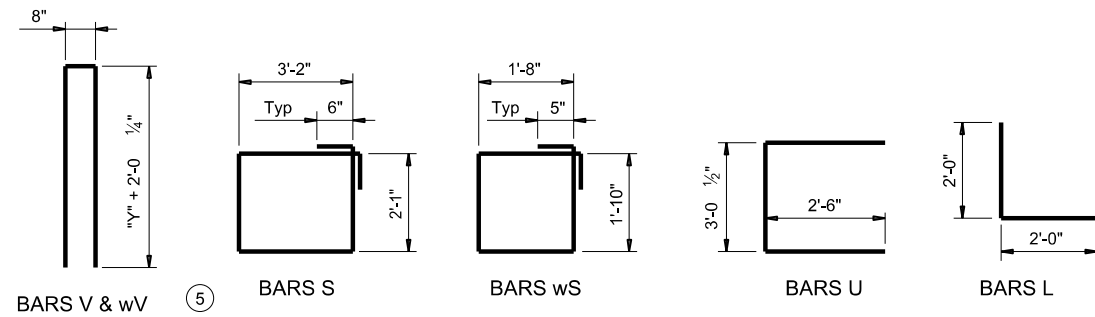
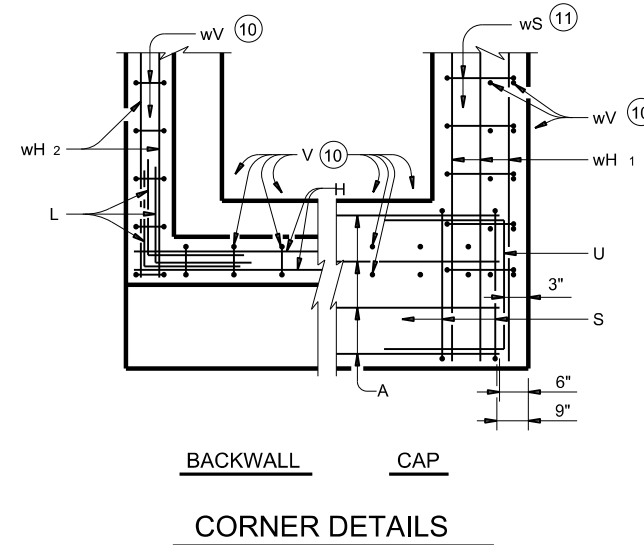
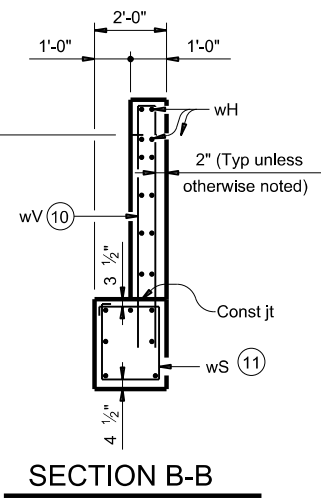
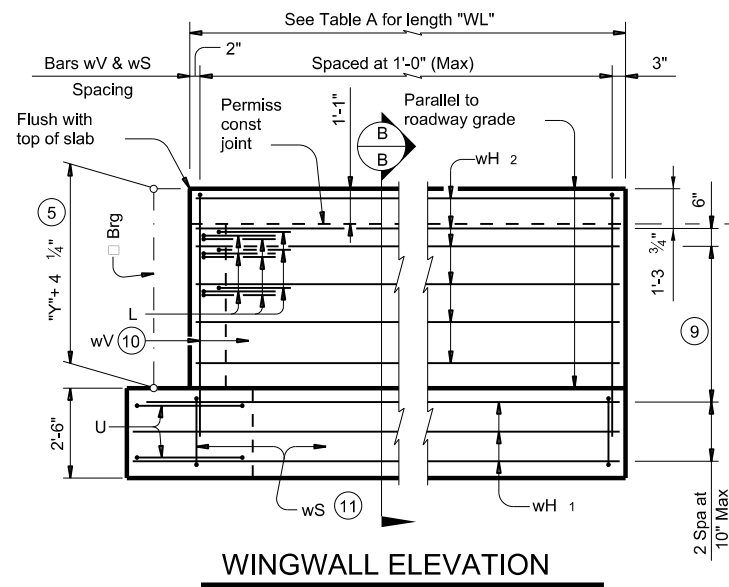
ABUTMENTS
 TYPE TX28 THRU TX54
 PRESTR CONC I-GIRDERS
 24' ROADWAY

AIG-24

FILE: aig01sts-17.dgn	DN: TAR	CK: KCM	DW: JTR	CK: TAR
©TxDOT August 2017	CONT	SECT	JOB	HIGHWAY
REVISIONS	0910	16	139	CR 1102
DIST	COUNTY	SHEET NO.		
TYLER	VAN ZANDT	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: 4/28/2023 5:09:22 PM
FILE: c:\bms\pwe-useast-006\tony.tre\o\dms58523\ai\g01sts-17-2.dgn



- ⑤ See Span details for "Y" value.
- ⑨ Spacing based on girder type:
Tx28 ~ 3 spaces at 1'-0" Max
Tx34 ~ 3 spaces at 1'-0" Max
Tx40 ~ 4 spaces at 1'-0" Max
Tx46 ~ 4 spaces at 1'-0" Max
Tx54 ~ 5 spaces at 1'-0" Max
- ⑩ Field bend as needed to clear piles.
- ⑪ Adjust as required to avoid piling.

HL93 LOADING

SHEET 2 OF 3

		Bridge Division Standard	
ABUTMENTS TYPE TX28 THRU TX54 PRESTR CONC I-GIRDERS 24' ROADWAY AIG-24			
FILE: aig01sts-17.dgn	DN: TAR	CK: KCM	DW: JTR
©TxDOT August 2017	CONT: 0910	SECT: 16	HIGHWAY: 139
REVISIONS	0910	16	139
DIST: TYLER	COUNTY: VAN ZANDT	SHEET NO.: 60	

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: 4/28/2023 5:09:37 PM
FILE: c:\bms\pwe-useast-006\tony.tre\o\dms58523\ai\g01sts-17-3.dgn

TABLES OF ESTIMATED QUANTITIES WITH 2:1 HEADER SLOPE

12

TYPE Tx28 Girders					TYPE Tx34 Girders					TYPE Tx40 Girders					TYPE Tx46 Girders					TYPE Tx54 Girders									
Bar	No.	Size	Length	Weight	Bar	No.	Size	Length	Weight	Bar	No.	Size	Length	Weight	Bar	No.	Size	Length	Weight	Bar	No.	Size	Length	Weight					
A	10	#11	25'-0"	1,328	A	10	#11	25'-0"	1,328	A	10	#11	25'-0"	1,328	A	10	#11	25'-0"	1,328	A	10	#11	25'-0"	1,328					
D (7)	2	#9	1'-8"	11	D (7)	2	#9	1'-8"	11	D (7)	2	#9	1'-8"	11	D (7)	2	#9	1'-8"	11	D (7)	2	#9	1'-8"	11					
H	8	#6	25'-8"	308	H	8	#6	25'-8"	308	H	10	#6	25'-8"	386	H	10	#6	25'-8"	386	H	12	#6	25'-8"	463					
L	18	#6	4'-0"	108	L	18	#6	4'-0"	108	L	18	#6	4'-0"	108	L	18	#6	4'-0"	108	L	18	#6	4'-0"	108					
S	22	#5	11'-6"	264	S	22	#5	11'-6"	264	S	22	#5	11'-6"	264	S	22	#5	11'-6"	264	S	22	#5	11'-6"	264					
U	4	#6	8'-1"	49	U	4	#6	8'-1"	49	U	4	#6	8'-1"	49	U	4	#6	8'-1"	49	U	4	#6	8'-1"	49					
V	25	#5	11'-4"	296	V	25	#5	12'-4"	322	V	25	#5	13'-4"	348	V	25	#5	14'-4"	374	V	25	#5	15'-8"	409					
wH1	14	#6	9'-5"	198	wH1	14	#6	10'-5"	219	wH1	14	#6	11'-5"	240	wH1	14	#6	12'-5"	261	wH1	14	#6	13'-5"	282					
wH2	20	#6	7'-8"	230	wH2	20	#6	8'-8"	260	wH2	24	#6	9'-8"	348	wH2	24	#6	10'-8"	385	wH2	28	#6	11'-8"	491					
wS	18	#4	7'-10"	94	wS	20	#4	7'-10"	105	wS	22	#4	7'-10"	115	wS	24	#4	7'-10"	126	wS	26	#4	7'-10"	136					
wV	18	#5	11'-4"	213	wV	20	#5	12'-4"	257	wV	22	#5	13'-4"	306	wV	24	#5	14'-4"	359	wV	26	#5	15'-8"	425					
Reinforcing Steel				Lb	3,099	Reinforcing Steel				Lb	3,231	Reinforcing Steel				Lb	3,503	Reinforcing Steel				Lb	3,651	Reinforcing Steel				Lb	3,966
Class "C" Concrete				CY	15.2	Class "C" Concrete				CY	16.6	Class "C" Concrete				CY	18.1	Class "C" Concrete				CY	19.7	Class "C" Concrete				CY	21.6

TABLES OF ESTIMATED QUANTITIES WITH 3:1 HEADER SLOPE

12


TYPE Tx28 Girders					TYPE Tx34 Girders					TYPE Tx40 Girders					TYPE Tx46 Girders					TYPE Tx54 Girders									
Bar	No.	Size	Length	Weight	Bar	No.	Size	Length	Weight	Bar	No.	Size	Length	Weight	Bar	No.	Size	Length	Weight	Bar	No.	Size	Length	Weight					
A	10	#11	25'-0"	1,328	A	10	#11	25'-0"	1,328	A	10	#11	25'-0"	1,328	A	10	#11	25'-0"	1,328	A	10	#11	25'-0"	1,328					
D (7)	2	#9	1'-8"	11	D (7)	2	#9	1'-8"	11	D (7)	2	#9	1'-8"	11	D (7)	2	#9	1'-8"	11	D (7)	2	#9	1'-8"	11					
H	8	#6	25'-8"	308	H	8	#6	25'-8"	308	H	10	#6	25'-8"	386	H	10	#6	25'-8"	386	H	12	#6	25'-8"	463					
L	18	#6	4'-0"	108	L	18	#6	4'-0"	108	L	18	#6	4'-0"	108	L	18	#6	4'-0"	108	L	18	#6	4'-0"	108					
S	22	#5	11'-6"	264	S	22	#5	11'-6"	264	S	22	#5	11'-6"	264	S	22	#5	11'-6"	264	S	22	#5	11'-6"	264					
U	4	#6	8'-1"	49	U	4	#6	8'-1"	49	U	4	#6	8'-1"	49	U	4	#6	8'-1"	49	U	4	#6	8'-1"	49					
V	25	#5	11'-4"	296	V	25	#5	12'-4"	322	V	25	#5	13'-4"	348	V	25	#5	14'-4"	374	V	25	#5	15'-8"	409					
wH1	14	#6	13'-5"	282	wH1	14	#6	14'-5"	303	wH1	14	#6	16'-5"	345	wH1	14	#6	17'-5"	366	wH1	14	#6	19'-5"	408					
wH2	20	#6	11'-8"	350	wH2	20	#6	12'-8"	381	wH2	24	#6	14'-8"	529	wH2	24	#6	15'-8"	565	wH2	28	#6	17'-8"	743					
wS	26	#4	7'-10"	136	wS	28	#4	7'-10"	147	wS	32	#4	7'-10"	167	wS	34	#4	7'-10"	178	wS	38	#4	7'-10"	199					
wV	26	#5	11'-4"	307	wV	28	#5	12'-4"	360	wV	32	#5	13'-4"	445	wV	34	#5	14'-4"	508	wV	38	#5	15'-8"	621					
Reinforcing Steel				Lb	3,439	Reinforcing Steel				Lb	3,581	Reinforcing Steel				Lb	3,980	Reinforcing Steel				Lb	4,137	Reinforcing Steel				Lb	4,603
Class "C" Concrete				CY	17.8	Class "C" Concrete				CY	19.3	Class "C" Concrete				CY	21.7	Class "C" Concrete				CY	23.4	Class "C" Concrete				CY	26.4

7 Omit Dowels D at end of multi-span unit. Adjust reinforcing steel total accordingly.

12 Quantities shown are for one abutment only (with approach slab). With no approach slab, add 1.0 CY Class "C" concrete and 154 lbs reinforcing steel for 4 additional Bars H.

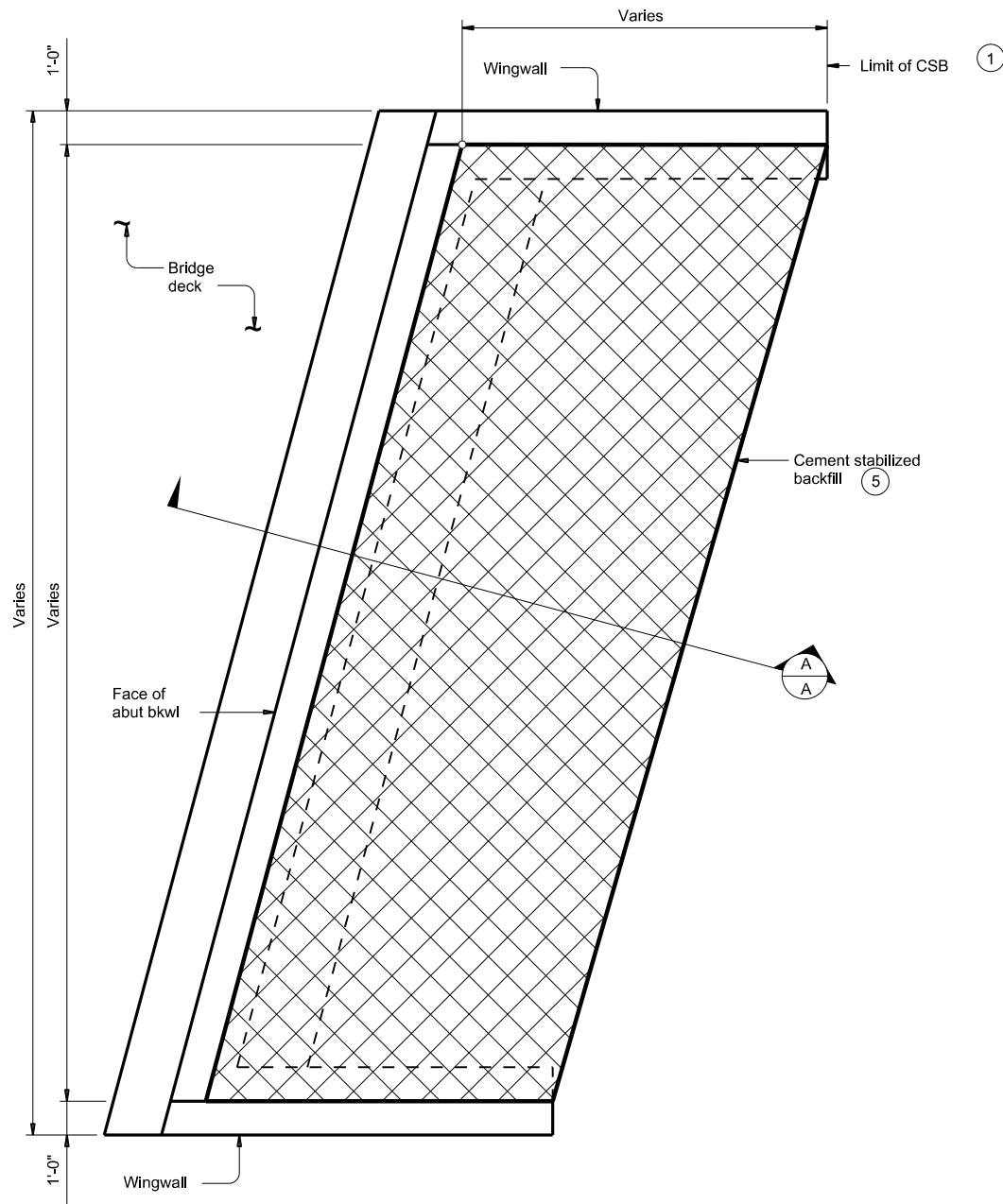
HL93 LOADING

SHEET 3 OF 3

		Bridge Division Standard	
ABUTMENTS TYPE TX28 THRU TX54 PRESTR CONC I-GIRDERS 24' ROADWAY			
AIG-24			
FILE: aig01sts-17.dgn	DN: TAR	CK: KCM	DW: JTR
©TxDOT August 2017	CONT SECT	JOB	HIGHWAY
REVISIONS	0910 16	139	CR 1102
DIST	COUNTY	SHEET NO.	
TYLER	VAN ZANDT	61	

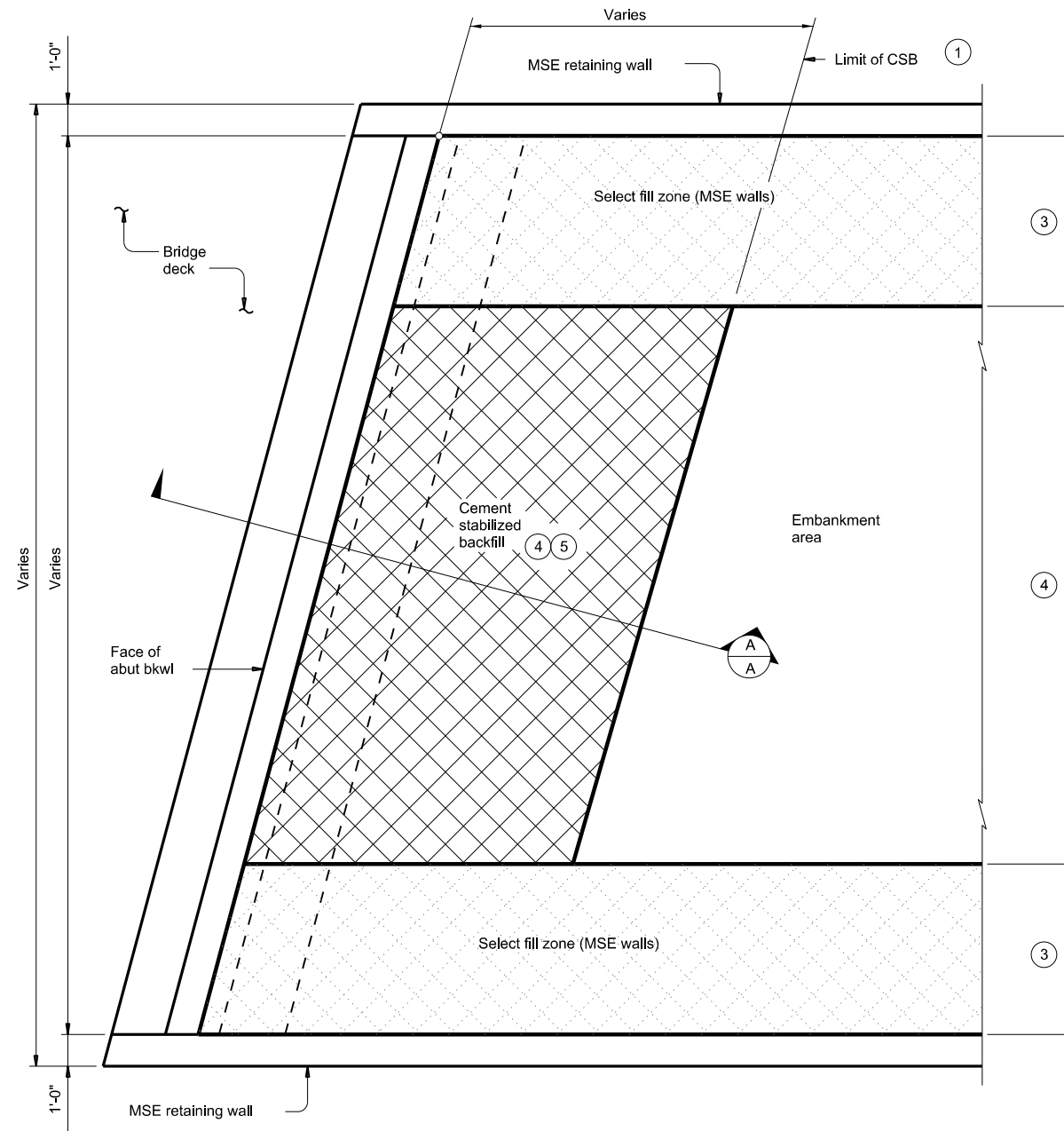
DISCLAIMER:
The use of this standard is governed by the "Texas Engineering Practice Act". No warranty of any kind is made by TxDOT for any purpose whatsoever. TxDOT assumes no responsibility for the conversion of this standard to other formats or for incorrect results or damages resulting from its use.

DATE: 4/28/2023 5:09:51 PM
FILE: c:\bms\pwe-useast-006\tony.tre\o\dms58523\csabste1-20-1.dgn



OPTION 1 ~ PLAN WITH WINGWALLS

Cast-in-place retaining walls similar.

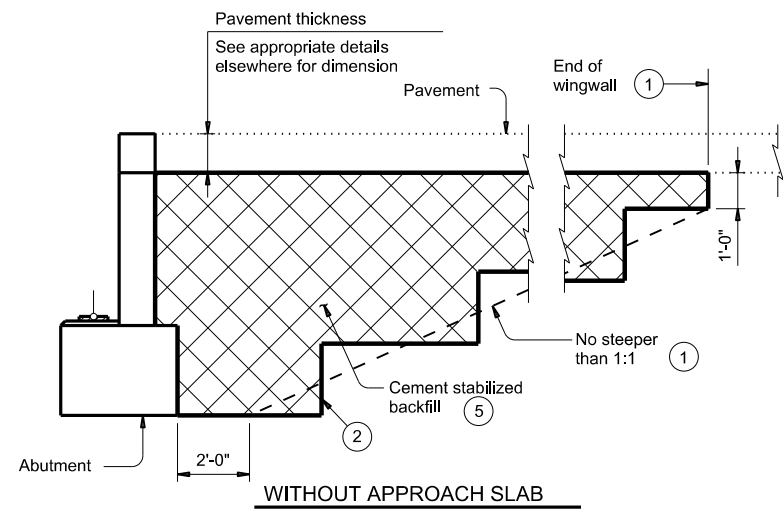


OPTION 1 ~ PLAN WITH MSE RETAINING WALLS

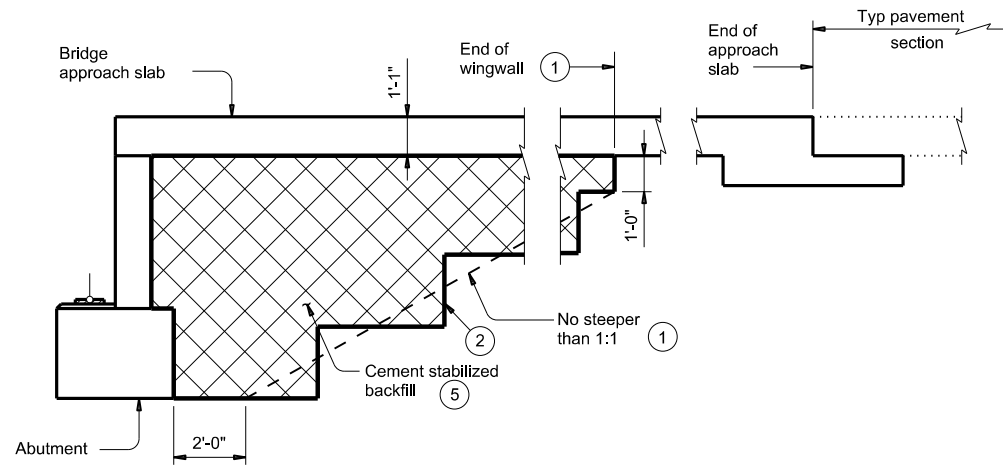
- ① Usual limit of Cement Stabilized Backfill is at end of wingwall. Extend CSB limits as required to maintain a slope no steeper than 1:1 at bottom of backfill.
- ② Bench backfill as shown with 12" (approximate) bench depths.
- ③ Where MSE retaining walls are present, adjust CSB limits to accommodate 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 2 is intended for new construction requiring high plasticity embankment fill with a plasticity index (PI) greater than 30 or pavement built in poor native soil. Poor soils are defined as high plasticity clays or expansive clays. Option 1 is intended for construction only requiring PI controlled embankment fill or excavation in competent soils/rocks in order to construct the abutment.
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.)

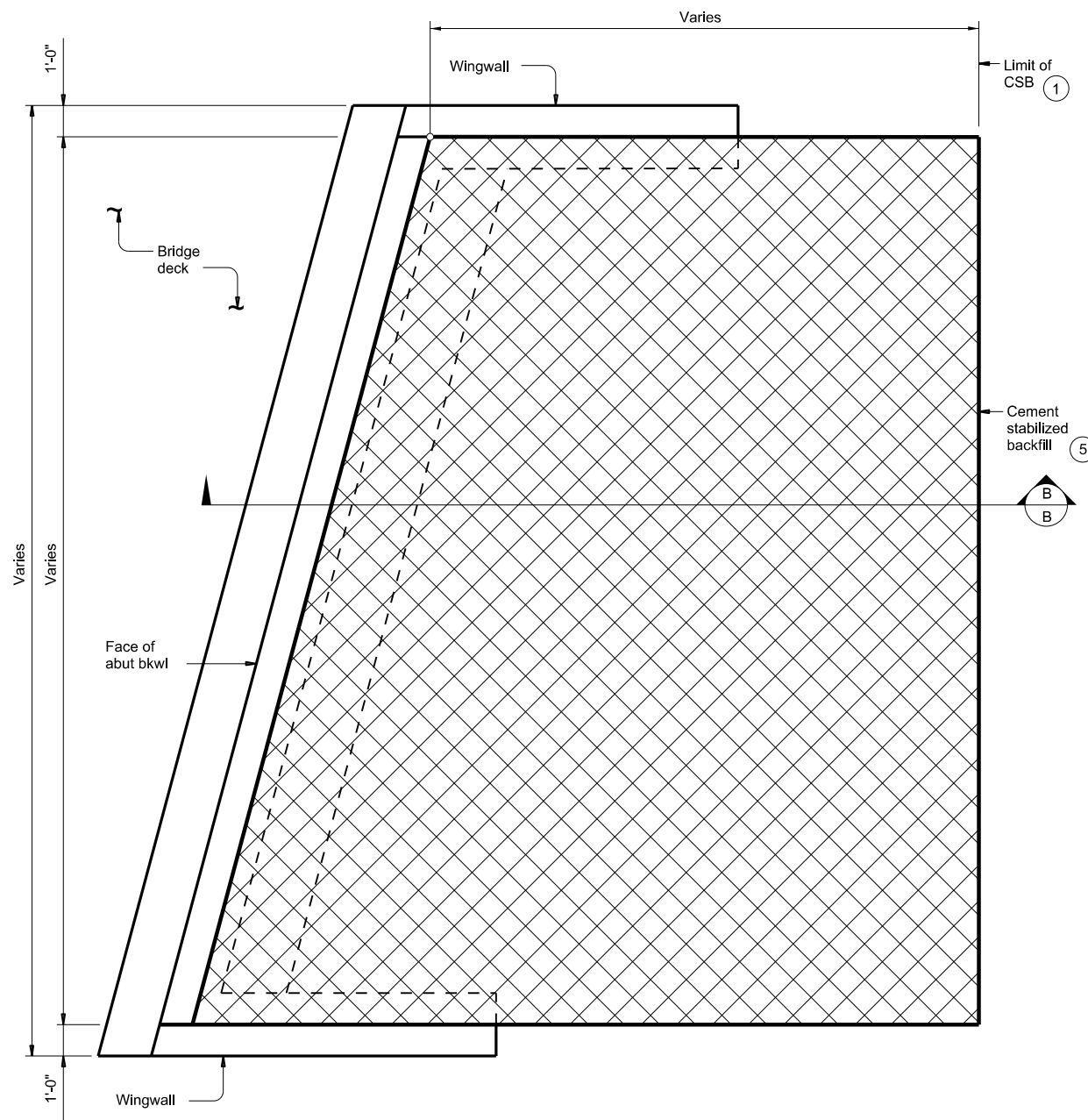
SECTION A-A

SHEET 1 OF 2

		Bridge Division Standard	
CEMENT STABILIZED ABUTMENT BACKFILL BRIDGE ABUTMENT			
CSAB			
FILE: csabste1-20.dgn	DN: TxDOT	CK: TxDOT	DW: TxDOT
©TxDOT	CONTRACT: 0910	SECTION: 16	JOB: 139
REVISIONS	APRIL 2019		CR 1102
02-20z Added Option 2.	DIST: TYLER	COUNTY: VAN ZANDT	SHEET NO.: 62

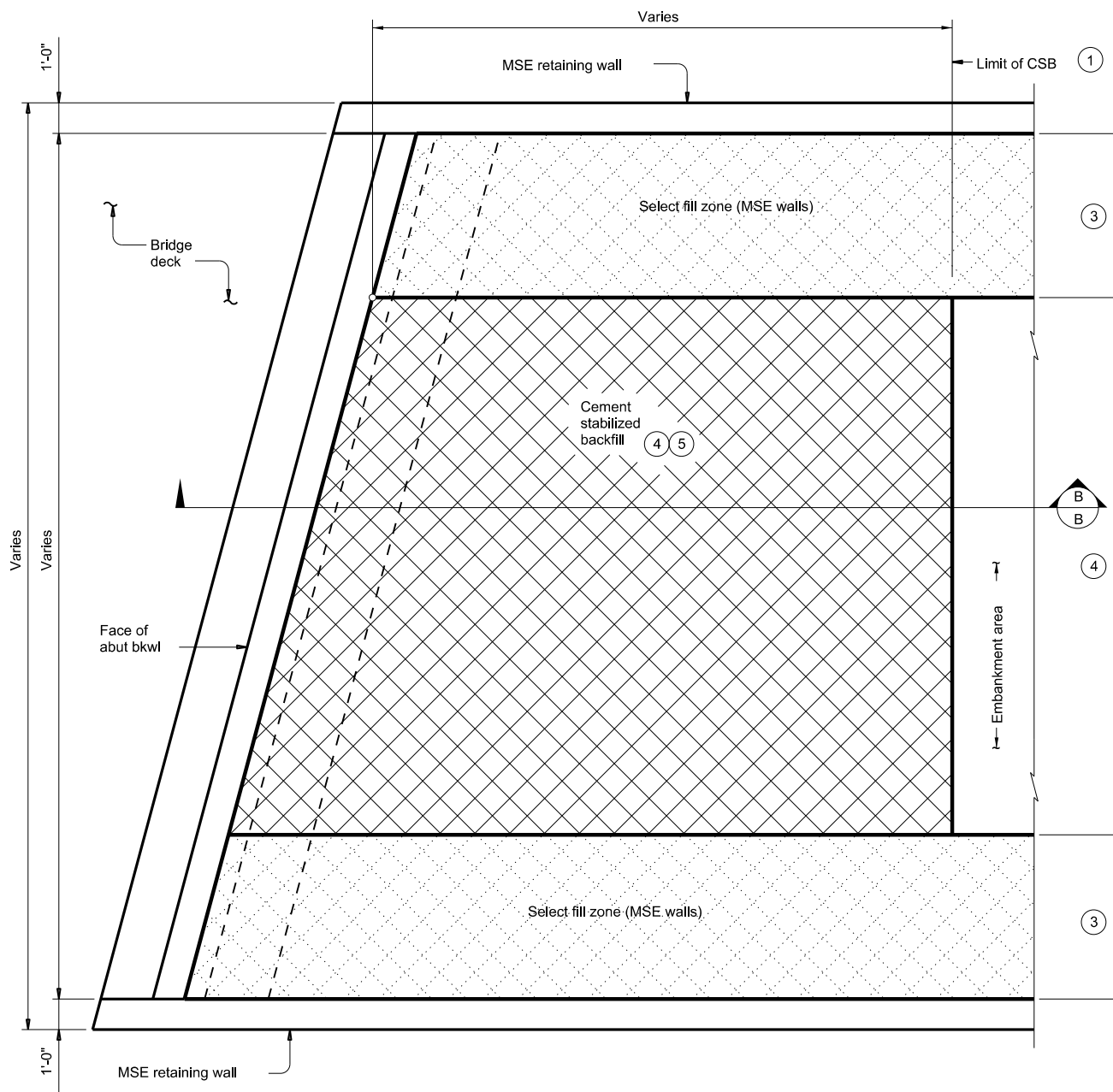
DISCLAIMER:
The use of this standard is governed by the "Texas Engineering Practice Act". No warranty of any kind is made by TxDOT for any purpose whatsoever. TxDOT assumes no responsibility for the conversion of this standard to other formats or for incorrect results or damages resulting from its use.

DATE: 4/28/2023 5:10:06 PM
FILE: c:\bms\pwe-useast-006\tony.tre\o\dms58523\csabste1-20-2.dgn



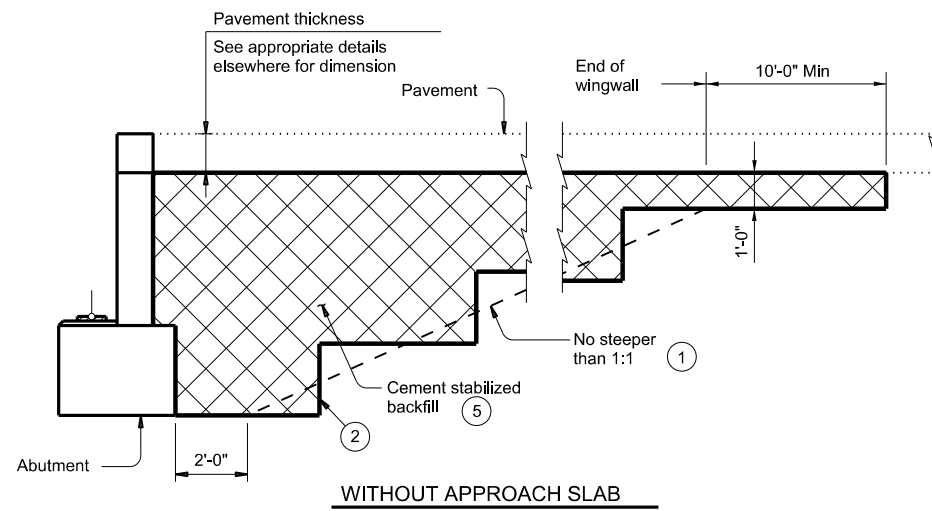
OPTION 2 ~ PLAN WITH WINGWALLS

Cast-in-place retaining walls similar.

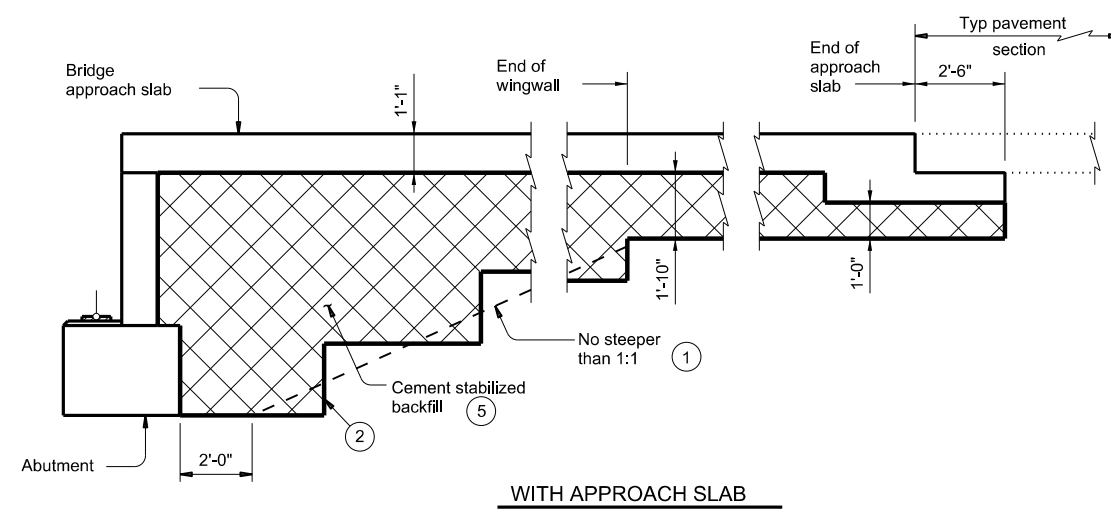


OPTION 2 ~ PLAN WITH MSE RETAINING WALLS

- 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).



WITHOUT APPROACH SLAB



SECTION B-B

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

SHEET 2 OF 2



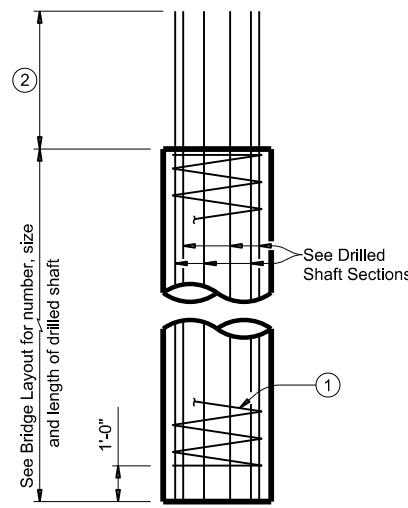
**CEMENT STABILIZED
ABUTMENT BACKFILL
BRIDGE ABUTMENT**

CSAB

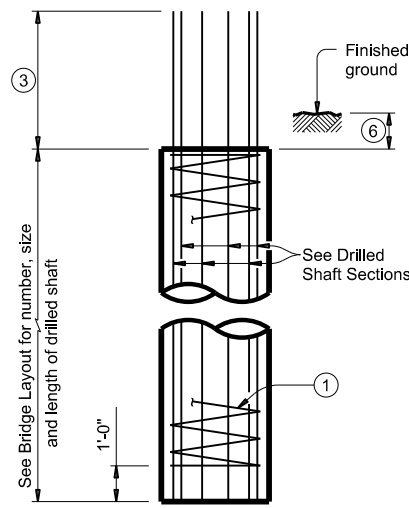
FILE: csabste1-20.dgn	DN: TxDOT	CK: TxDOT	DW: TxDOT	CK: TxDOT
©TxDOT April 2019	CONT	SECT	JOB	HIGHWAY
REVISIONS	0910	16	139	CR 1102
02-20z Added Option 2.	DIST	COUNTY	SHEET NO.	
	TYLER	VAN ZANDT	63	

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.

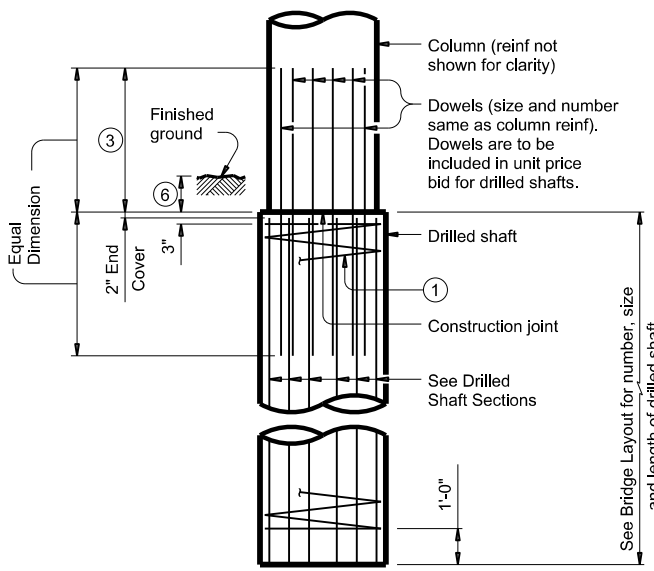
DATE: 4/28/2023 5:10:21 PM
 FILE: c:\bms\pwe-useast-006\tony.tre\o\dms58523\fastde01-20-1.dgn



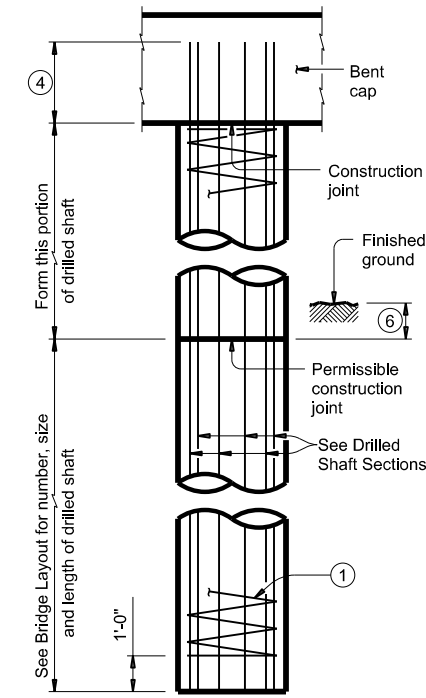
ABUTMENTS, WINGWALLS AND MULTI-DRILLED SHAFT FOOTINGS



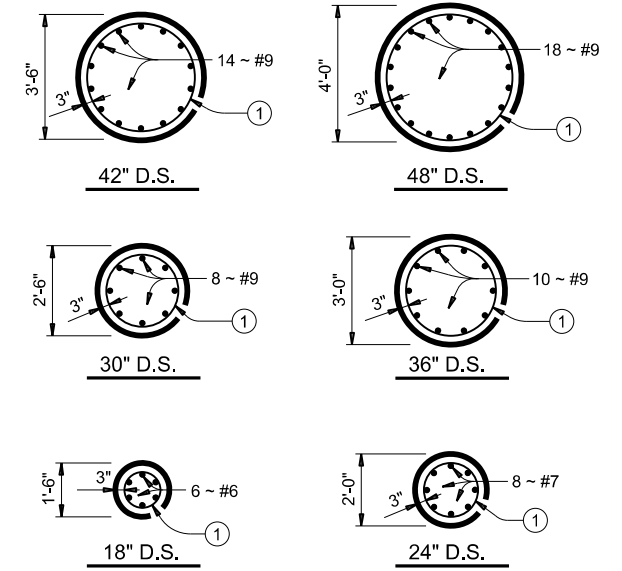
INTERIOR BENTS DRILLED SHAFT DIA EQUAL TO COLUMN DIA



INTERIOR BENTS DRILLED SHAFT DIA GREATER THAN COLUMN DIA



OPTIONAL INTERIOR BENT DRILLED SHAFT DETAIL

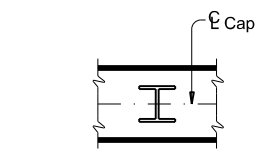


DRILLED SHAFT SECTIONS

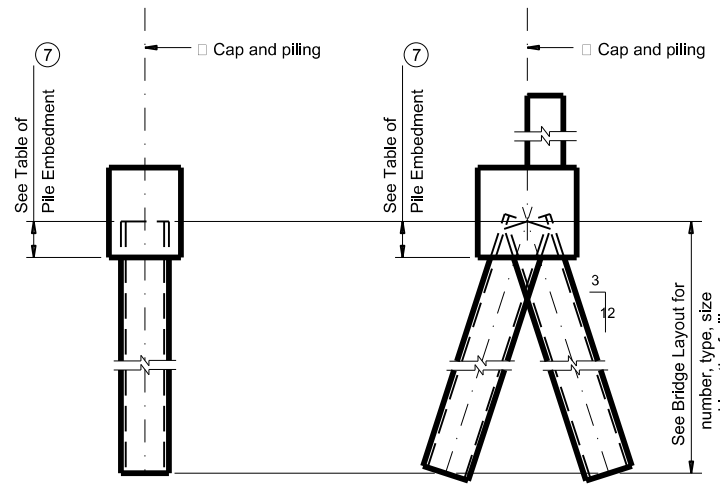
DRILLED SHAFT DETAILS

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.

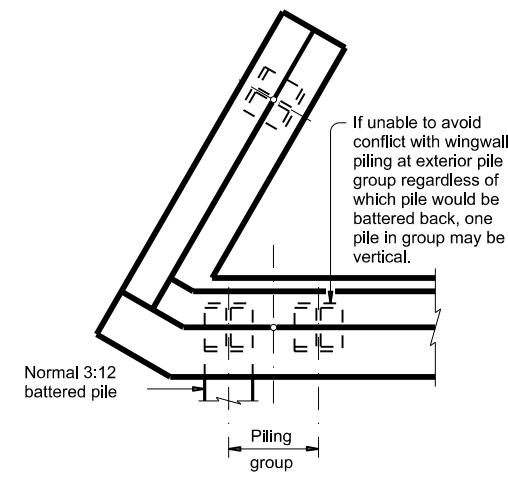


ORIENTATION OF STEEL H-PILING



VERTICAL PILE BATTERED PILE

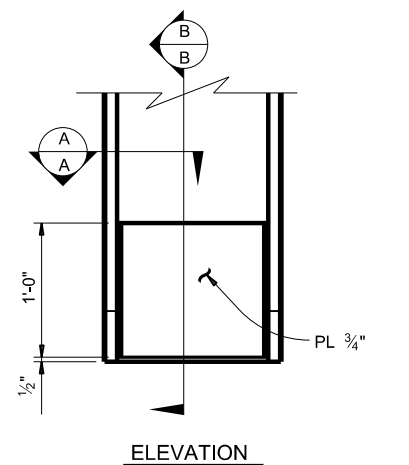
PILING DETAILS (Concrete or steel H)



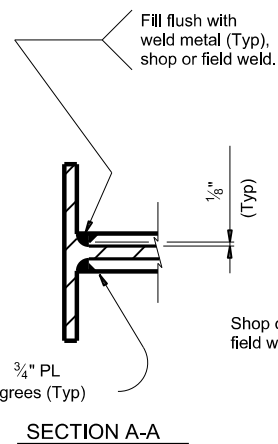
DETAIL "A"

(Showing plan view of a 30° skewed abutment)

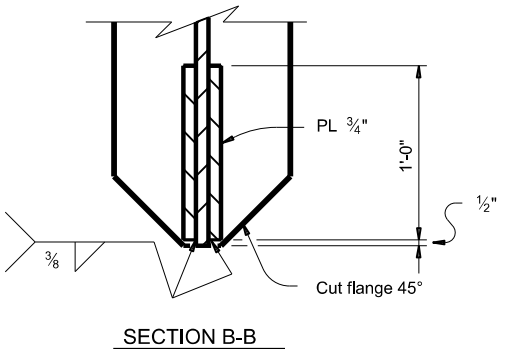
- ① #3 spiral at 6" pitch (one and a half flat turns top and bottom).
- ② Min extension into supported element:
#6 Bars = 1'-11"
#7 Bars = 2'-0"
#9 Bars = 2'-3"
- ③ Min lap with column reinf:
#7 Bars = 2'-11"
#9 Bars = 3'-9"
#11 Bars = 4'-8"
- ④ Min extension into supported element:
#6 Bars = 1'-11"
#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.



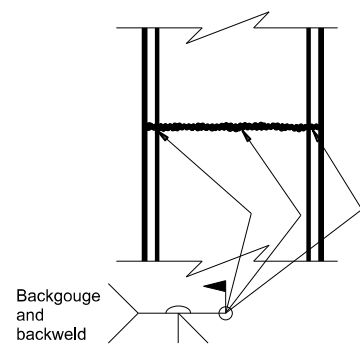
ELEVATION



SECTION A-A

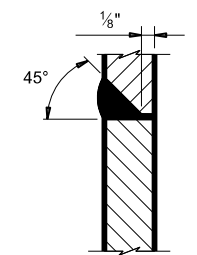


SECTION B-B



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

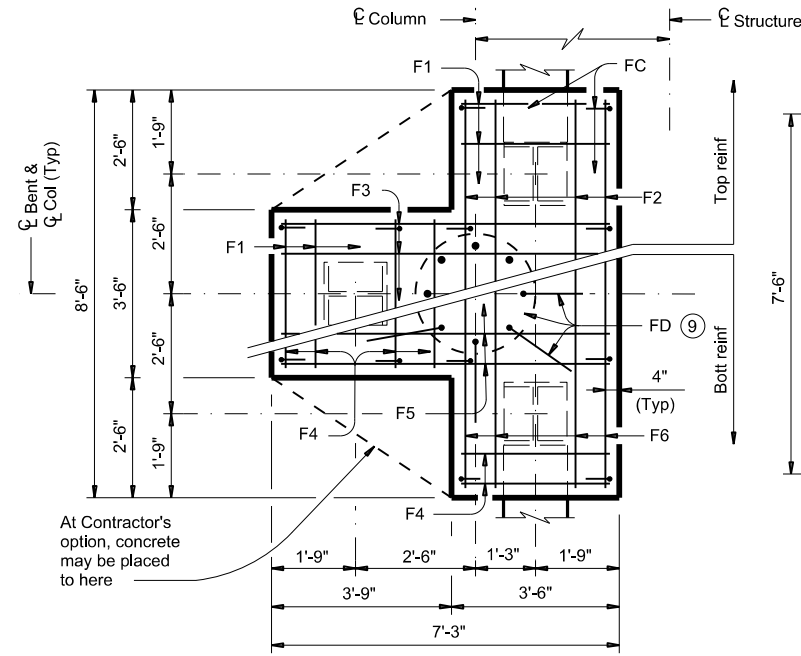
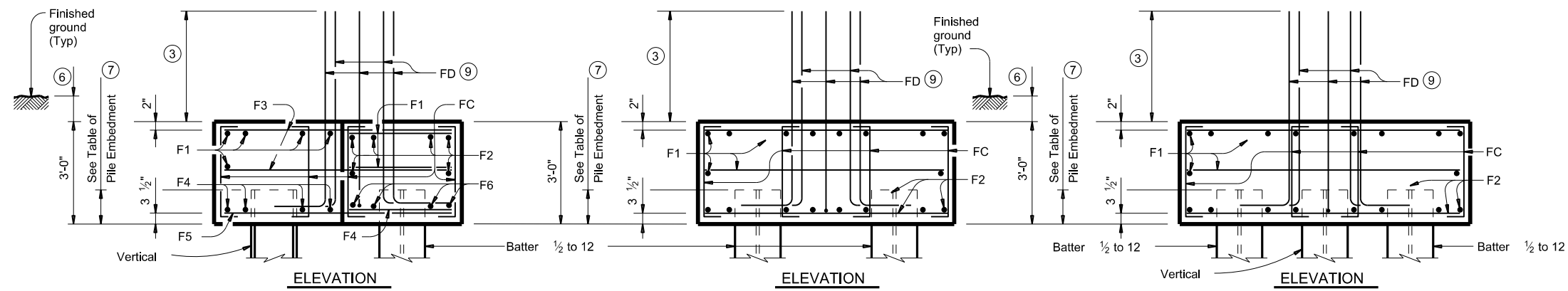
		Bridge Division Standard	
<h2>COMMON FOUNDATION DETAILS</h2>			
FD			
FILE: fdside01-20.dgn	DN: TxDOT	CK: TxDOT	DW: TxDOT
©TxDOT April 2019	CONT	SECT	JOB
REVISIONS	0910	16	139
01-20: Added #11 bars to the FD bars.	DIST	COUNTY	SHEET NO.
TYLER	VAN ZANDT		64

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.

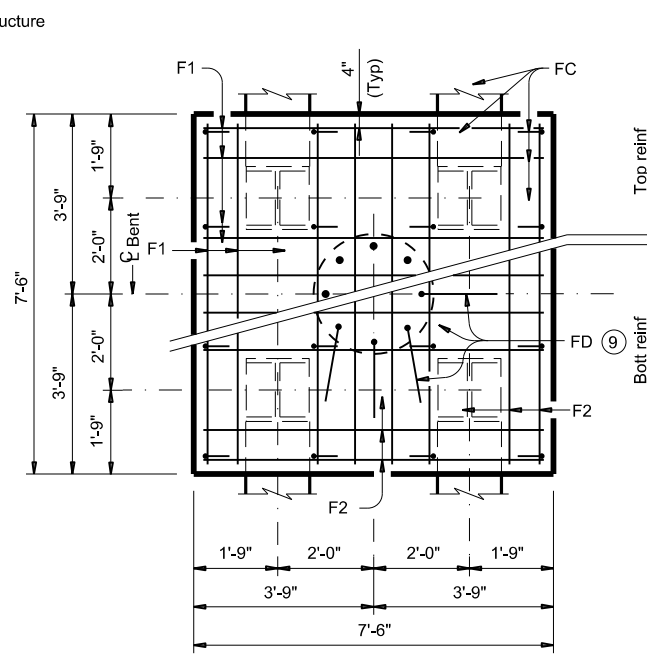
DATE: 4/28/2023 5:10:37 PM
 FILE: c:\bms\pwe-useast-006\tony.tre\o\dms58523\fastde01-20-2.dgn

TABLE OF FOOTING QUANTITIES FOR 30" COLUMNS

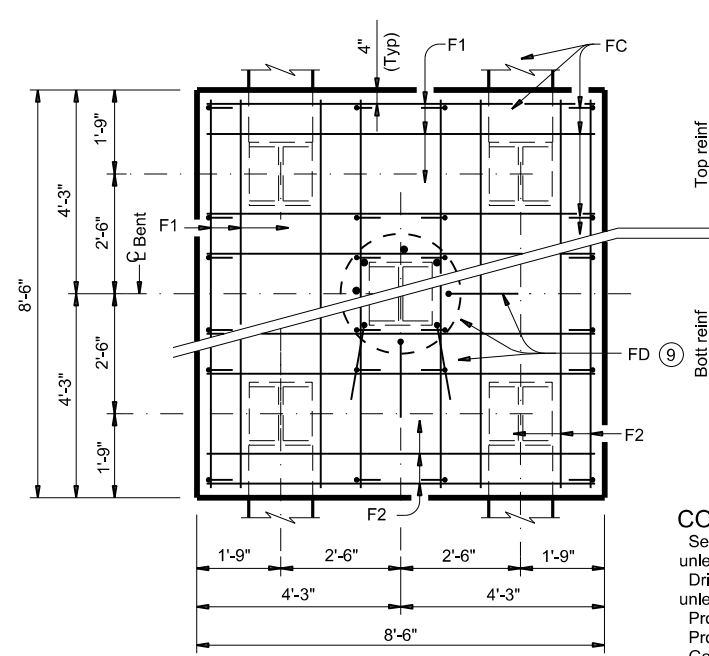
ONE 3 PILE FOOTING					
Bar	No.	Size	Length	Weight	
F1	11	#4	3'-2"	23	
F2	6	#4	8'-2"	33	
F3	6	#4	6'-11"	28	
F4	8	#9	3'-2"	86	
F5	4	#9	6'-11"	94	
F6	4	#9	8'-2"	111	
FC	12	#4	3'-6"	28	
FD (10)	8	#9	8'-1"	220	
Reinforcing Steel				Lb	623
Class "C" Concrete				CY	4.8
ONE 4 PILE FOOTING					
Bar	No.	Size	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



THREE PILE FOOTING
 For 36" Dia and smaller columns.



FOUR PILE FOOTING
 For 42" Dia and smaller columns.



FIVE PILE FOOTING
 For 42" Dia and smaller columns.

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"

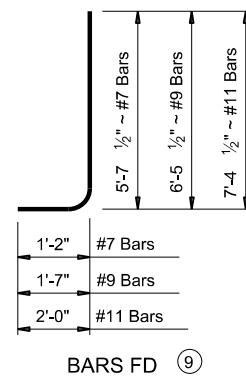
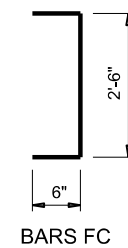
GENERAL NOTES:

Designed according to AASHTO LFRD 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



- (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.

SHEET 2 OF 2



COMMON FOUNDATION DETAILS

FD

FILE: fdsde01-20.dgn	DN: TxDOT	CK: TxDOT	DW: TxDOT	CK: TxDOT
©TxDOT April 2019	CONT	SECT	JOB	HIGHWAY
REVISIONS	0910	16	139	CR 1102
01-20: Added #11 bars to the FD bars.	DIST	COUNTY	SHEET NO.	
	TYLER	VAN ZANDT	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: 4/28/2023 5:10:53 PM
FILE: c:\bms\pwe-useast-006\tony.tre\o\dms58523\ig01stds-21-1.dgn

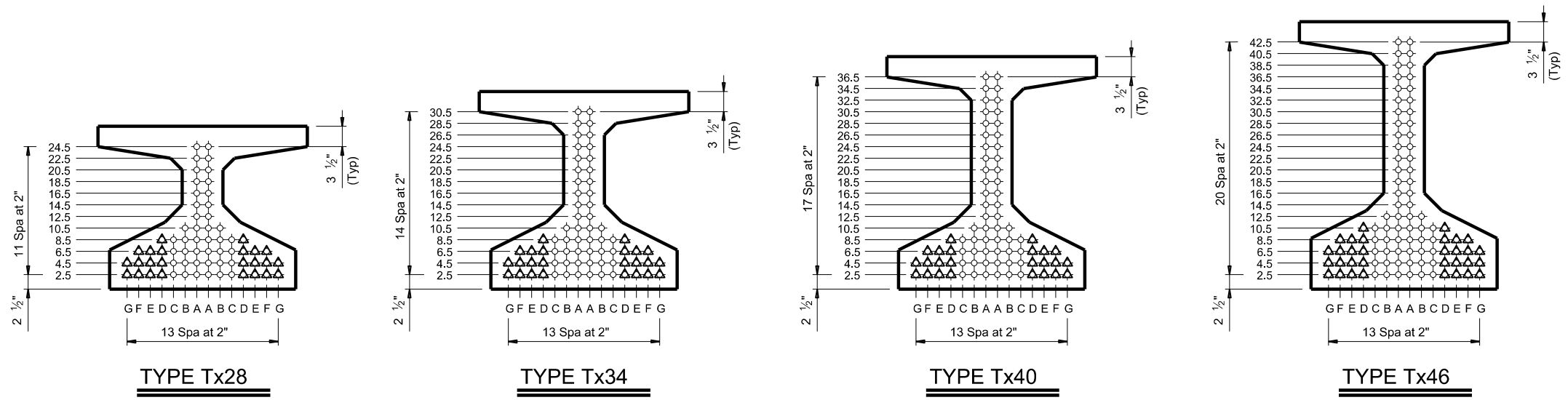
STRUCTURE	DESIGNED GIRDERS									DEPRESSED STRAND PATTERN	CONCRETE		OPTIONAL DESIGN				LOAD RATING FACTORS				
	SPAN NO.	GIRDER NO.	GIRDER TYPE	PRESTRESSING STRANDS					NO.		TO END (in)	RELEASE STRGTH (1) fci (ksi)	MINIMUM 28 DAY COMP STRGTH (2) fc (ksi)	DESIGN LOAD COMP STRESS (TOP \square) (SERVICE I) fct(ksi)	DESIGN LOAD TENSILE STRESS (BOTT \square) (SERVICE III) fcb(ksi)	REQUIRED MINIMUM ULTIMATE MOMENT CAPACITY (STRENGTH I) (kip-ft)	LIVE LOAD DISTRIBUTION FACTOR		STRENGTH I SERVICE III		
				NON-STD STRAND PATTERN	TOTAL NO.	SIZE (in)	STRGTH fpu (ksi)	"e" \bar{C} (in)									"e" END (in)	Moment	Shear	Inv	Opr
Type Tx28 Girders 24' Roadway 8.5" Slab	40	ALL	Tx28		10	0.6	270	10.48	10.48	2	8.5	4,000	5,000	1,055	-1,423	1382	0.670	0.850	1.56	2.02	1.98
	45	ALL	Tx28		12	0.6	270	10.48	10.48			4,500	5,000	1,332	-1,744	1525	0.650	0.850	1.58	2.05	1.79
	50	ALL	Tx28		12	0.6	270	10.48	10.48			4,200	5,000	1,645	-2,113	1657	0.630	0.860	1.25	1.62	1.25
	55	ALL	Tx28		14	0.6	270	10.48	9.62			4,000	5,000	1,969	-2,490	1919	0.610	0.860	1.27	1.64	1.11
	60	ALL	Tx28		18	0.6	270	10.04	7.81			4,000	5,600	2,320	-2,901	2206	0.600	0.870	1.43	1.86	1.14
	65	ALL	Tx28		22	0.6	270	9.75	6.12			4,300	5,900	2,716	-3,337	2486	0.580	0.870	1.55	2.00	1.14
	70	ALL	Tx28		26	0.6	270	9.56	6.48			5,200	6,300	3,131	-3,802	2793	0.570	0.870	1.26	1.89	1.01
Type Tx34 Girders 24' Roadway 8.5" Slab	40	ALL	Tx34		10	0.6	270	13.01	13.01	2	6.5	4,000	5,000	0,835	-1,089	1605	0.690	0.830	1.85	2.40	2.60
	45	ALL	Tx34		10	0.6	270	13.01	13.01			4,500	5,500	1,050	-1,332	1750	0.670	0.840	1.90	2.46	2.42
	50	ALL	Tx34		12	0.6	270	13.01	13.01			4,000	5,000	1,294	-1,612	1868	0.650	0.840	1.53	1.98	1.81
	55	ALL	Tx34		12	0.6	270	13.01	13.01			4,000	5,000	1,553	-1,904	1981	0.630	0.840	1.24	1.61	1.33
	60	ALL	Tx34		14	0.6	270	13.01	12.44			4,000	5,000	1,845	-2,231	2287	0.620	0.850	1.27	1.64	1.22
	65	ALL	Tx34		16	0.6	270	12.76	11.76			4,000	5,000	2,161	-2,579	2605	0.610	0.850	1.25	1.62	1.06
	70	ALL	Tx34		20	0.6	270	12.41	9.61			4,000	5,100	2,461	-2,902	2888	0.590	0.850	1.46	1.89	1.13
	75	ALL	Tx34		24	0.6	270	12.18	7.84			4,300	5,400	2,818	-3,283	3223	0.580	0.860	1.57	2.04	1.15
Type Tx40 Girders 24' Roadway 8.5" Slab	40	ALL	Tx40		10	0.6	270	15.60	15.60	4	6.5	4,000	5,000	0,697	-0,889	1671	0.720	0.820	2.10	2.73	3.15
	45	ALL	Tx40		10	0.6	270	15.60	15.60			4,000	5,000	0,873	-1,080	1972	0.690	0.820	1.74	2.26	2.50
	50	ALL	Tx40		12	0.6	270	15.60	15.60			4,000	5,000	1,065	-1,299	2276	0.670	0.830	1.78	2.31	2.33
	55	ALL	Tx40		12	0.6	270	15.60	15.60			4,000	5,000	1,283	-1,538	2237	0.650	0.830	1.46	1.90	1.80
	60	ALL	Tx40		14	0.6	270	15.60	15.60			4,200	5,000	1,522	-1,801	2434	0.640	0.830	1.49	1.93	1.66
	65	ALL	Tx40		14	0.6	270	15.60	15.60			4,000	5,000	1,780	-2,081	2688	0.630	0.840	1.24	1.60	1.25
	70	ALL	Tx40		16	0.6	270	15.35	14.85			4,000	5,000	2,035	-2,349	2989	0.610	0.840	1.28	1.65	1.17
	75	ALL	Tx40		18	0.6	270	15.16	14.27			4,000	5,000	2,328	-2,657	3337	0.600	0.840	1.28	1.66	1.05
	80	ALL	Tx40		22	0.6	270	14.87	11.24			4,000	5,000	2,616	-2,961	3681	0.590	0.850	1.47	1.90	1.11
	85	ALL	Tx40		26	0.6	270	14.68	9.76			4,400	5,100	2,930	-3,287	4041	0.580	0.850	1.60	2.08	1.22
	90	ALL	Tx40		28	0.6	270	14.60	10.03			4,800	5,500	3,259	-3,626	4410	0.570	0.850	1.55	2.01	1.07
Type Tx46 Girders 24' Roadway 8.5" Slab	40	ALL	Tx46		10	0.6	270	17.60	17.60	4	6.5	4,000	5,000	0,613	-0,708	1732	0.740	0.810	2.35	3.05	3.78
	45	ALL	Tx46		10	0.6	270	17.60	17.60			4,000	5,000	0,768	-0,865	2066	0.720	0.810	1.93	2.50	3.01
	50	ALL	Tx46		12	0.6	270	17.60	17.60			4,000	5,000	0,937	-1,042	2452	0.700	0.820	1.97	2.55	2.81
	55	ALL	Tx46		12	0.6	270	17.60	17.60			4,000	5,000	1,127	-1,235	2726	0.680	0.820	1.63	2.11	2.22
	60	ALL	Tx46		14	0.6	270	17.60	17.60			4,000	5,000	1,332	-1,438	2951	0.660	0.820	1.68	2.18	2.10
	65	ALL	Tx46		14	0.6	270	17.60	17.60			4,000	5,000	1,557	-1,662	2905	0.650	0.820	1.41	1.82	1.64
	70	ALL	Tx46		14	0.6	270	17.60	17.60			4,000	5,000	1,798	-1,898	3157	0.640	0.830	1.18	1.52	1.25
	75	ALL	Tx46		16	0.6	270	17.35	16.85			4,000	5,000	2,050	-2,137	3495	0.620	0.830	1.23	1.59	1.17
	80	ALL	Tx46		18	0.6	270	17.16	16.27			4,000	5,000	2,304	-2,384	3859	0.610	0.830	1.25	1.63	1.09
	85	ALL	Tx46		22	0.6	270	16.88	15.06			4,000	5,000	2,591	-2,656	4249	0.600	0.830	1.46	1.89	1.30
	90	ALL	Tx46		24	0.6	270	16.77	14.10			4,000	5,000	2,870	-2,923	4631	0.590	0.840	1.45	1.88	1.06
Type Tx28 Girders 24' Roadway 8.5" Slab	95	ALL	Tx46		28	0.6	270	16.60	11.46	4,200	5,000	3,192	-3,234	5087	0.590	0.840	1.57	2.03	1.08		
	100	ALL	Tx46		32	0.6	270	16.23	9.48	4,400	5,000	3,524	-3,542	5513	0.580	0.840	1.65	2.14	1.07		
	105	ALL	Tx46		36	0.6	270	15.94	9.94	5,000	5,800	3,856	-3,851	5937	0.570	0.840	1.72	2.23	1.17		
	110	ALL	Tx46		38	0.6	270	15.81	10.45	5,400	6,300	4,200	-4,169	6370	0.560	0.840	1.67	2.16	1.04		
	115	ALL	Tx46		42	0.6	270	15.60	10.75	6,000	7,000	4,584	-4,532	6886	0.560	0.840	1.46	1.96	1.05		

① Based on the following allowable stresses (ksi):
Compression = 0.65 fci
Tension = 0.24 $f_{ci} \sqrt{\bar{C}}$
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.
Optional designs for girders 120 feet or longer must have a calculated residual camber equal to or greater than that of the designed girder.
Prestress losses for the designed girders have been calculated for a relative humidity of 60 percent. Optional designs must likewise conform.

FABRICATION NOTES:
Provide Class H concrete.
Provide Grade 60 reinforcing steel bars.
Use low relaxation strands, each pretensioned to 75 percent of fpu.
Strand debonding must comply with Item 424.4.2.2.4. Full-length debonded strands are only permitted in positions marked Δ . Double wrap full-length debonded strands in outer most position of each row.
When shown on this sheet, the Fabricator has the option of furnishing either the designed girder or an approved optional design. All optional design submittals must be signed, sealed and dated by a Professional Engineer registered in the State of Texas.
Seal cracks in girder ends exceeding 0.005" in width as directed by the Engineer. The fabricator is permitted to decrease the spacing of Bars R and S by providing additional bars to help limit crack width provided the decreased spacing results in no less than 1" clear between bars. The fabricator must take an approved corrective action if cracks greater than 0.005" form on a repetitive basis.

DEPRESSED STRAND DESIGNS:
Locate strands for the designed girder 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", then row "6.5", etc., beginning each row in the "A" position and working outward until the required number of strands is reached. All strands in the "A" position must be depressed, maintaining the 2" spacing so that, at the girder ends, the upper two strands are in the position shown in the table.



HL93 LOADING SHEET 1 OF 2



PRESTRESSED CONCRETE I-GIRDER STANDARD DESIGNS
24' ROADWAY

IGSD-24

FILE: Ig01stds-21.dgn	DN: EFC	CK: AJF	DW: EFC	CK: TAR
©TxDOT August 2017	CONT	SECT	JOB	HIGHWAY
REVISIONS	0910	16	139	CR 1102
10-19: Redesign of girders. 1-21: Added load rating.	DIST	COUNTY	SHEET NO.	
TYLER	VAN ZANDT	66		

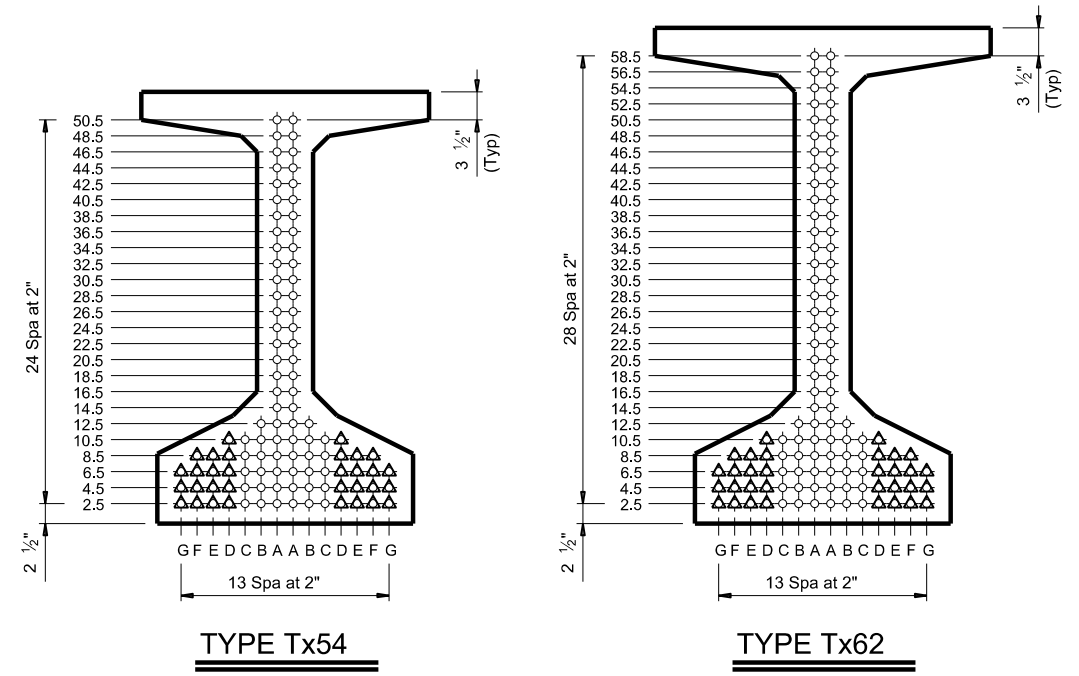
DISCLAIMER:
The use of this standard is governed by the "Texas Engineering Practice Act". No warranty of any kind is made by TxDOT for any purpose whatsoever. TxDOT assumes no responsibility for the conversion of this standard to other formats or for incorrect results or damages resulting from its use.

DATE: 4/28/2023 5:11:06 PM
FILE: c:\bms\pwe-useast-006\tony.tre\o\dms58523\ig01stds-21-2.dgn

STRUCTURE	DESIGNED GIRDERS									DEPRESSED STRAND PATTERN		CONCRETE		OPTIONAL DESIGN					LOAD RATING FACTORS		
	SPAN NO.	GIRDER NO.	GIRDER TYPE	PRESTRESSING STRANDS					NO.			TO END (in)	RELEASE STRGTH (1) fci (ksi)	MINIMUM 28 DAY COMP STRGTH fc (ksi)	DESIGN LOAD COMP STRESS (TOP I) (SERVICE I) fct(ksi)	DESIGN LOAD TENSILE STRESS (BOTTT II) (SERVICE III) fctb(ksi)	REQUIRED MINIMUM ULTIMATE MOMENT CAPACITY (STRENGTH I) (kip-ft)	LIVE LOAD DISTRIBUTION FACTOR (2)		STRENGTH I SERVICE III	
				NON-STD STRAND PATTERN	TOTAL NO.	SIZE (in)	STRGTH fpu (ksi)	"e" e (in)		"e" END (in)	Moment							Shear	Inv	Opr	Inv
Type Tx54 Girders 24' Roadway 8.5" Slab	40	ALL	Tx54		8	0.6	270	21.01	21.01			4.000	5.000	0.511	-0.578	1798	0.770	0.800	2.05	2.66	3.76
	45	ALL	Tx54		10	0.6	270	21.01	21.01			4.000	5.000	0.636	-0.703	2126	0.740	0.800	2.24	2.90	3.69
	50	ALL	Tx54		12	0.6	270	21.01	21.01			4.000	5.000	0.781	-0.850	2533	0.720	0.810	1.81	2.35	2.91
	55	ALL	Tx54		12	0.6	270	21.01	21.01			4.000	5.000	0.938	-1.007	2951	0.700	0.810	1.90	2.46	2.79
	60	ALL	Tx54		12	0.6	270	21.01	21.01			4.000	5.000	1.108	-1.173	3271	0.680	0.810	1.60	2.07	2.25
	65	ALL	Tx54		14	0.6	270	21.01	21.01			4.000	5.000	1.285	-1.348	3547	0.670	0.810	1.66	2.16	2.16
	70	ALL	Tx54		14	0.6	270	21.01	21.01			4.000	5.000	1.482	-1.540	3502	0.660	0.820	1.41	1.82	1.73
	75	ALL	Tx54		16	0.6	270	20.76	20.26	4	6.5	4.000	5.000	1.689	-1.733	3745	0.640	0.820	1.47	1.91	1.66
	80	ALL	Tx54		16	0.6	270	20.76	20.76			4.000	5.000	1.912	-1.944	4001	0.630	0.820	1.26	1.63	1.30
	85	ALL	Tx54		18	0.6	270	20.56	19.67	4	8.5	4.000	5.000	2.148	-2.166	4406	0.620	0.820	1.07	1.39	1.00
	90	ALL	Tx54		20	0.6	270	20.41	19.21	4	10.5	4.000	5.000	2.379	-2.384	4806	0.610	0.820	1.33	1.73	1.16
	95	ALL	Tx54		22	0.6	270	20.28	18.46	4	14.5	4.000	5.000	2.639	-2.624	5234	0.600	0.820	1.35	1.75	1.07
	100	ALL	Tx54		26	0.6	270	20.08	16.39	4	28.5	4.000	5.000	2.896	-2.871	5699	0.600	0.830	1.52	1.97	1.14
	105	ALL	Tx54		30	0.6	270	19.81	12.21	6	44.5	4.000	5.000	3.180	-3.130	6153	0.590	0.830	1.51	1.96	1.02
	110	ALL	Tx54		32	0.6	270	19.63	11.38	6	50.5	4.100	5.000	3.477	-3.400	6619	0.580	0.830	1.63	2.12	1.03
115	ALL	Tx54		36	0.6	270	19.34	12.01	6	50.5	4.700	5.500	3.786	-3.679	7096	0.570	0.830	1.60	2.07	1.00	
120	ALL	Tx54		38	0.6	270	19.22	13.22	6	44.5	5.200	6.100	4.116	-3.985	7646	0.570	0.830	1.65	2.14	1.01	
125	ALL	Tx54		42	0.6	270	19.01	12.72	6	50.5	5.600	6.600	4.415	-4.257	8113	0.560	0.830	1.71	2.24	1.09	
Type Tx62 Girders 24' Roadway 8.5" Slab	60	ALL	Tx62		12	0.6	270	25.78	25.78			4.000	5.000	0.878	-0.986	3525	0.700	0.800	1.81	2.35	2.73
	65	ALL	Tx62		12	0.6	270	25.78	25.78			4.000	5.000	1.016	-1.133	3847	0.690	0.800	1.89	2.45	2.64
	70	ALL	Tx62		14	0.6	270	25.78	25.78			4.000	5.000	1.171	-1.293	4173	0.680	0.810	1.61	2.08	2.16
	75	ALL	Tx62		14	0.6	270	25.78	25.78			4.000	5.000	1.332	-1.455	4132	0.660	0.810	1.68	2.18	2.10
	80	ALL	Tx62		16	0.6	270	25.53	25.53			4.000	5.000	1.506	-1.633	4429	0.650	0.810	1.45	1.88	1.72
	85	ALL	Tx62		16	0.6	270	25.53	25.53			4.000	5.000	1.691	-1.819	4610	0.640	0.810	1.24	1.61	1.37
	90	ALL	Tx62		16	0.6	270	25.53	25.53			4.000	5.000	1.885	-2.013	5051	0.630	0.810	1.29	1.68	1.31
	95	ALL	Tx62		20	0.6	270	25.18	24.78	4	6.5	4.000	5.000	2.081	-2.209	5493	0.620	0.820	1.11	1.44	1.02
	100	ALL	Tx62		22	0.6	270	25.05	23.96	4	10.5	4.000	5.000	2.295	-2.420	5959	0.610	0.820	1.16	1.50	1.01
	105	ALL	Tx62		24	0.6	270	24.94	23.28	4	14.5	4.000	5.000	2.514	-2.642	6475	0.610	0.820	1.37	1.78	1.10
	110	ALL	Tx62		26	0.6	270	24.85	22.70	4	18.5	4.000	5.000	2.723	-2.850	6936	0.600	0.820	1.39	1.80	1.03
	115	ALL	Tx62		30	0.6	270	24.58	17.78	6	40.5	4.000	5.000	2.963	-3.083	7440	0.590	0.820	1.56	2.02	1.09
	120	ALL	Tx62		34	0.6	270	24.25	15.07	6	58.5	4.200	5.000	3.213	-3.325	7957	0.580	0.820	1.55	2.01	1.00
	125	ALL	Tx62		36	0.6	270	24.11	17.11	6	48.5	4.700	5.600	3.480	-3.591	8551	0.580	0.820	1.64	2.13	1.04
	130	ALL	Tx62		40	0.6	270	23.88	16.68	6	54.5	5.100	6.100	3.733	-3.836	9072	0.570	0.820	1.52	2.09	1.02
135	ALL	Tx62		42	0.6	270	23.78	16.35	6	58.5	5.300	6.300	4.002	-4.104	9676	0.570	0.830	1.61	2.18	1.05	

- ① Based on the following allowable stresses (ksi):
Compression = 0.65 fci
Tension = 0.24 fci
- ② Portion of full HL93.

NON-STANDARD STRAND PATTERNS	
PATTERN	STRAND ARRANGEMENT AT E.O.F GIRDER



HL93 LOADING SHEET 2 OF 2

Texas Department of Transportation
Bridge Division Standard

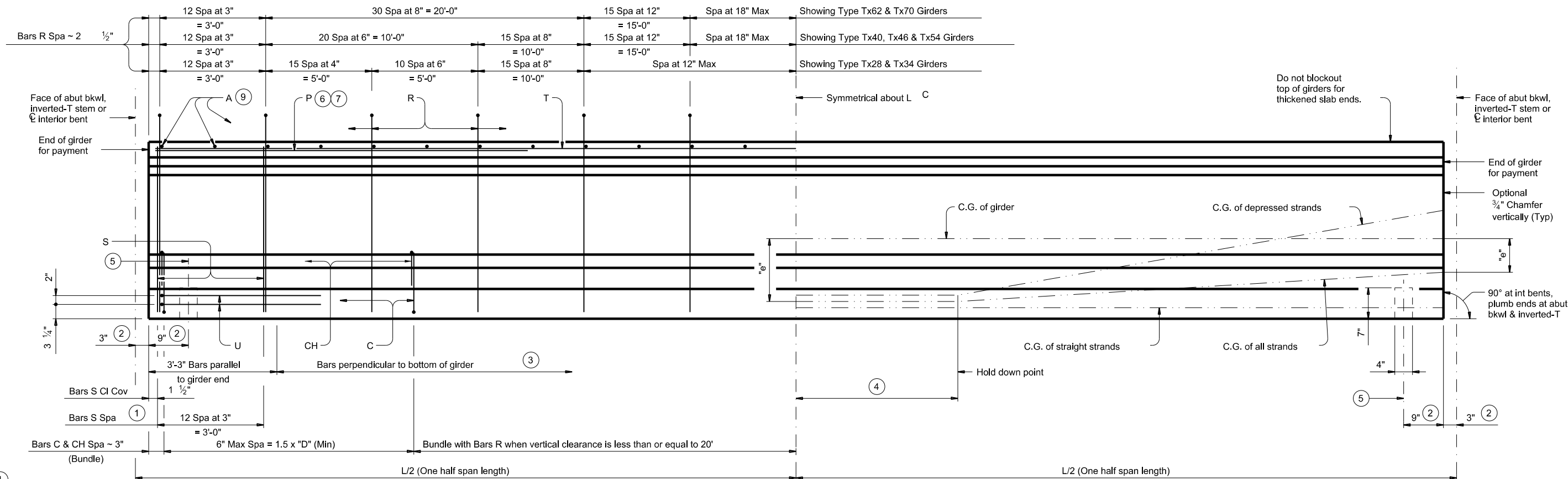
PRESTRESSED CONCRETE I-GIRDER STANDARD DESIGNS
24' ROADWAY

IGSD-24

FILE: Ig01stds-21.dgn	DN: EFC	CK: AJF	DW: EFC	CK: TAR
©TxDOT August 2017	CONT	SECT	JOB	HIGHWAY
REVISIONS	0910	16	139	CR 1102
10-19: Redesign girders. 1-21: Added load rating.	DIST	COUNTY	SHEET NO.	
	TYLER	VAN ZANDT	67	

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: 4/28/2023 5:11:19 PM
 FILE: c:\bms\pwe-useast-006\tony.tre\o\dms58523\igdsstds1-19-1.dgn

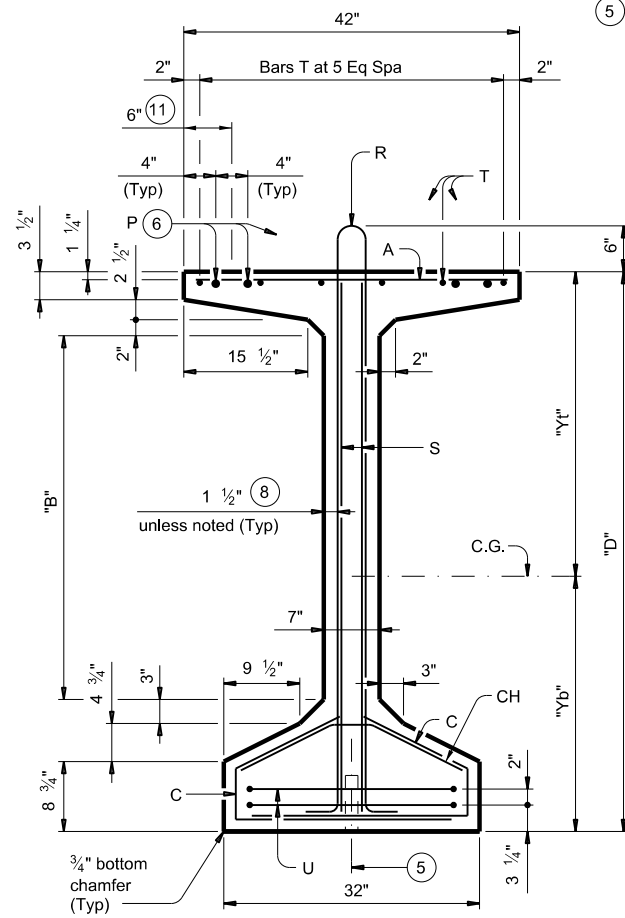


- ① Bundle with Bars R.
- ② Measured along \square Girder at interior bents; perpendicular to abutment bkwl or inverted-T stem.
- ③ The average of the top and bottom spacing of Bars R cannot exceed the required spacing.
- ④ L/20, but not less than 5'-0" (-0,+2').

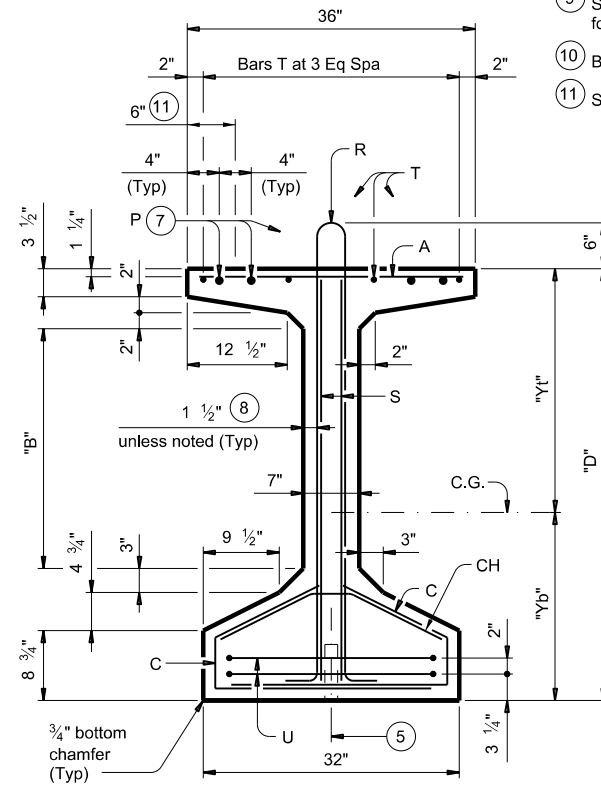
GIRDER ELEVATION

- ⑥ Bars P (#6 x 15'-0") required in Tx62 and Tx70 girders. At the fabricator's option bars larger than #6 may be used. When L is less than 50 ft, Bars P are to be the same length as Bars T.
- ⑦ Bars P (#6 x 15'-0") are only required in Tx28, Tx34, Tx40, Tx46, and Tx54 girders when "e" at girder ends exceeds 0.25 x "D". At the fabricator's option bars larger than #6 may be used. When L is less than 50 ft, Bars P are to be the same length as Bars T.
- ⑧ 1 3/8" Clear Cover to Bars S.
- ⑨ Space Bars A at 6" Max for girders requiring overhang bracket hangers. Space at 12" Max for all other girders. Tie to Bars R as necessary. See standard IGMS for "Deck Forming Notes".
- ⑩ Based on 155 pcf total weight of concrete and reinforcing steel.
- ⑪ Smooth trowel finish on the slab overhang side of exterior girder.

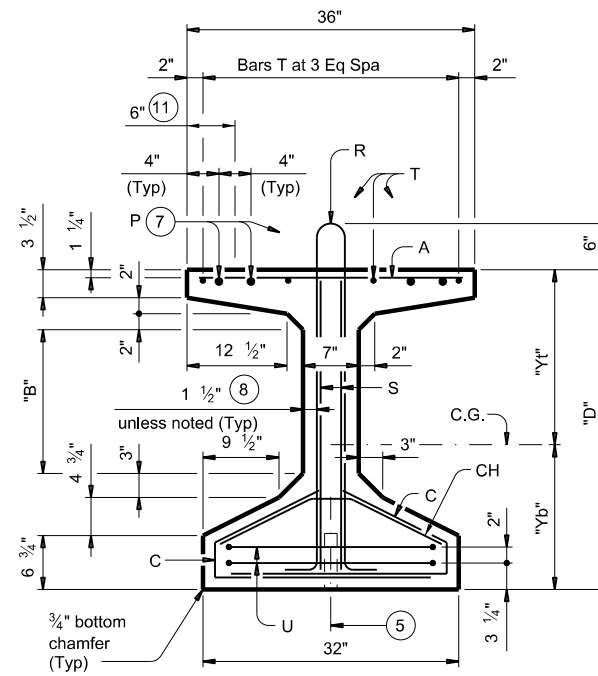
⑤ \square 4" x 1 1/2" Vertical Slotted Hole at doweled girder end [labeled (D) on Bridge Layout]. Required for outside girder only or as shown on substructure details. Anchorage holes may be tapered (4 3/4" x 1 5/8") at base. If holes are formed with sheet metal, forms may be left in place.



TYPE Tx62 & Tx70



TYPE Tx46 & Tx54



TYPE Tx28, Tx34 & Tx40

GIRDER DIMENSIONS AND SECTION PROPERTIES

Girder Type	"D" (in.)	"B" (in.)	"Yt" (in.)	"Yb" (in.)	Area (in. ²)	"Ix" (in. ⁴)	"Iy" (in. ⁴)	Weight (plf)
Tx28	28	6	15.02	12.98	585	52,772	40,559	630
Tx34	34	12	18.49	15.51	627	88,355	40,731	675
Tx40	40	18	21.90	18.10	669	134,990	40,902	720
Tx46	46	22	25.90	20.10	761	198,089	46,478	819
Tx54	54	30	30.49	23.51	817	299,740	46,707	880
Tx62	62	37 1/2"	33.72	28.28	910	463,072	57,351	980
Tx70	70	45 1/2"	38.09	31.91	966	628,747	57,579	1,040

GENERAL NOTES:

Designed according to AASHTO LRFD Bridge Design Specifications.
 Provide Class H concrete.
 Provide Grade 60 reinforcing steel.
 An equal area of deformed Welded Wire Reinforcement (WWR) (ASTM A1064) may be substituted for Bars A, C, R or T unless otherwise noted.
 It is permissible for bars or strands to come in contact with materials used in forming anchor holes.

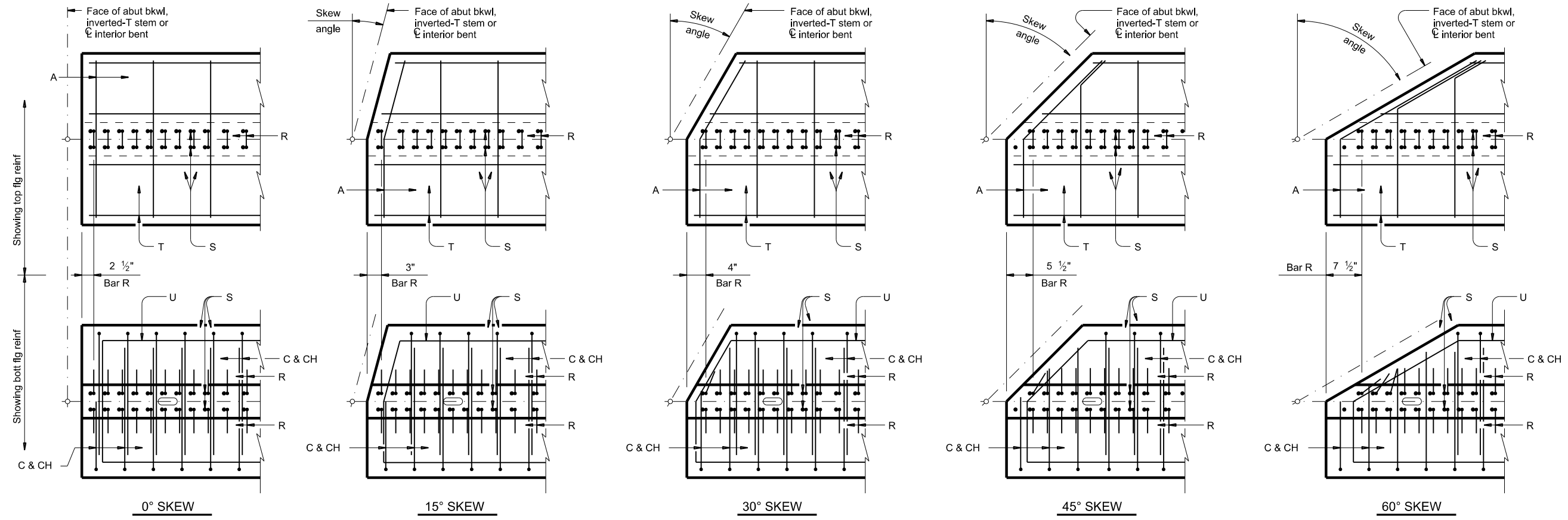
Cover dimensions are clear dimensions, unless noted otherwise.
 Reinforcing bar dimensions shown are out-to-out of bar.

HL93 LOADING SHEET 1 OF 2

		Bridge Division Standard	
<h2>PRESTRESSED CONCRETE I-GIRDER DETAILS</h2>			
<h3>IGD</h3>			
FILE: igds1-19.dgn	DN: TxDOT	CK: JMH	DW: JTR
©TxDOT	REVISIONS	CONTRACT NO.	HIGHWAY
August 2017	0910 16	139	CR 1102
10-19; Added Bars C and CH full length for VC=20'	DIST	COUNTY	SHEET NO.
	TYLER	VAN ZANDT	68

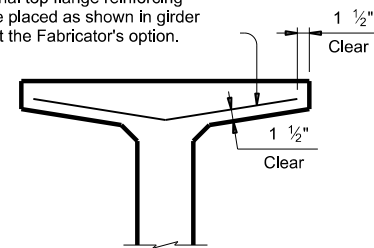
DISCLAIMER: The use of this standard is governed by the "Texas Engineering Practice Act". No warranty of any kind is made by TxDOT for any purpose whatsoever. TxDOT assumes no responsibility for the conversion of this standard to other formats or for incorrect results or damages resulting from its use.

DATE: 4/28/2023 5:11:33 PM
 FILE: c:\bms\pwe-use\east-006\tony.tre\o\dms58523\igdstds1-19-2.dgn

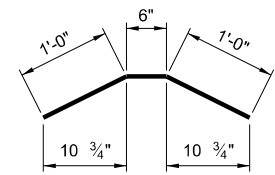


PLAN OF GIRDER ENDS (12)

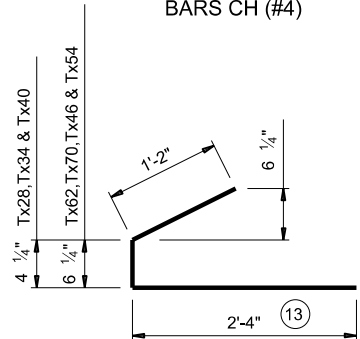
To control top flange cracking that may occur during form removal, additional top flange reinforcing may be placed as shown in girder ends at the Fabricator's option.



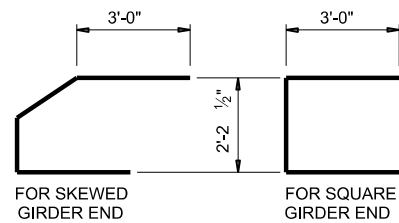
OPTIONAL TOP FLANGE REINFORCING DETAIL



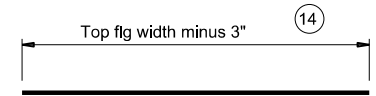
BARS CH (#4)



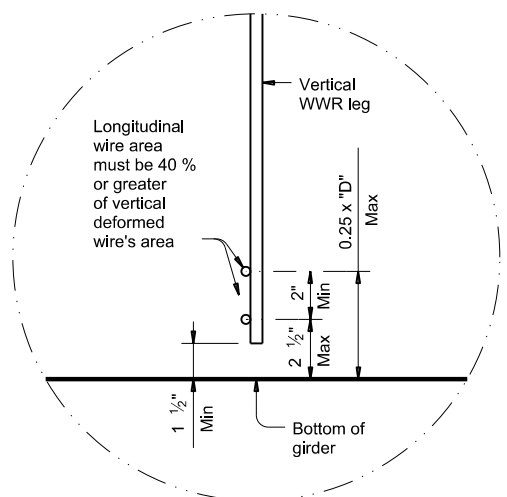
BARS C (#4)



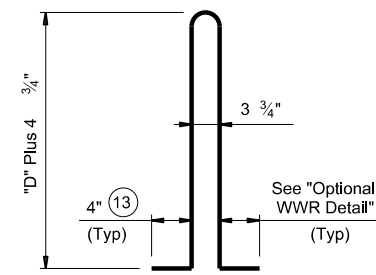
BARS U (#5)



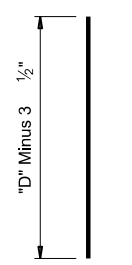
BARS A (#3)



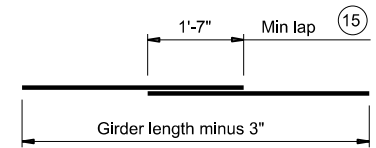
OPTIONAL WELDED WIRE REINFORCEMENT (WWR) DETAIL



BARS R (#4)



BARS S (#6)



BARS T (#4)

- (12) Reinforcing patterns shown are provided as guides to determine reinforcement placement in skewed ends. Place Bars S as close to girder end as cover requirements permit, which may prevent them to be bundled with Bars R.
- (13) Bars may be cut or bent at skewed end as required.
- (14) Increase as necessary for bars at skewed end.
- (15) No portion of bar less than 10 ft.
- (16) For Welded Wire Reinforcement (WWR) option, area of Bars R may be reduced in proportion to the increase in reinforcement yield strength over 60 ksi. Yield strength of WWR is limited to 75 ksi.



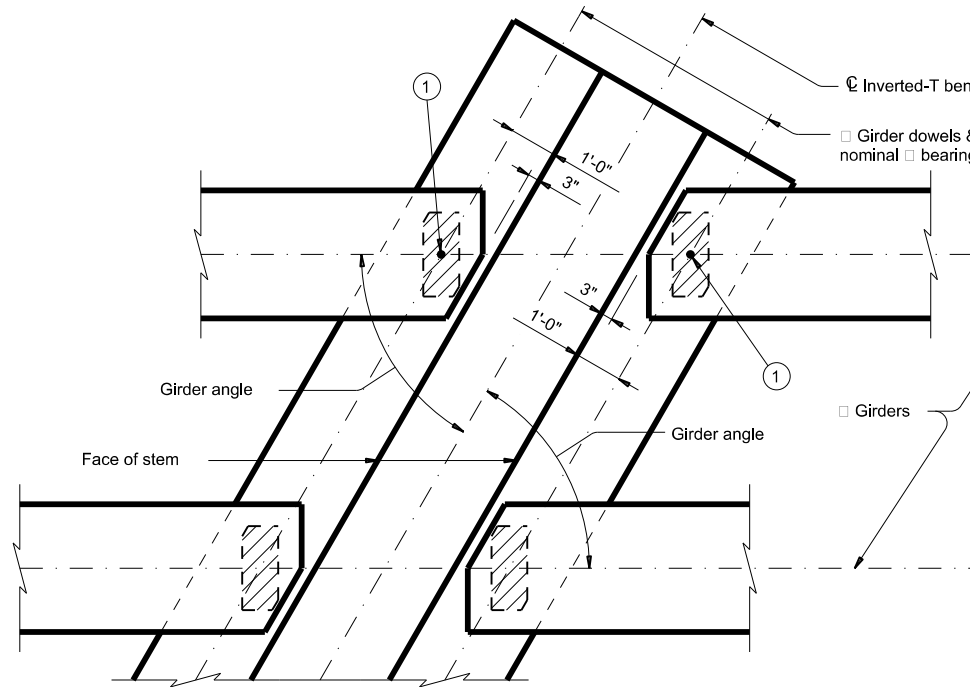
PRESTRESSED CONCRETE I-GIRDER DETAILS

IGD

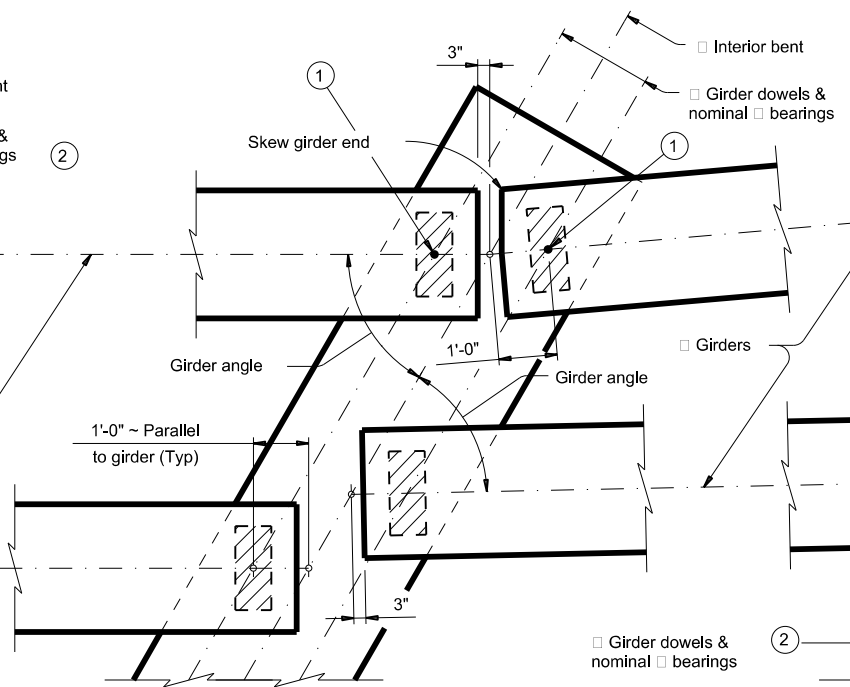
FILE: igdstds1-19.dgn	DN: TxDOT	CK: JMH	DW: JTR	CK: TAR
©TxDOT August 2017	CONT	SECT	JOB	HIGHWAY
REVISIONS	0910	16	139	CR 1102
10-19; Added Bars C and CH full length for VC=20'	DIST	COUNTY	SHEET NO.	
	TYLER	VAN ZANDT	69	

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.

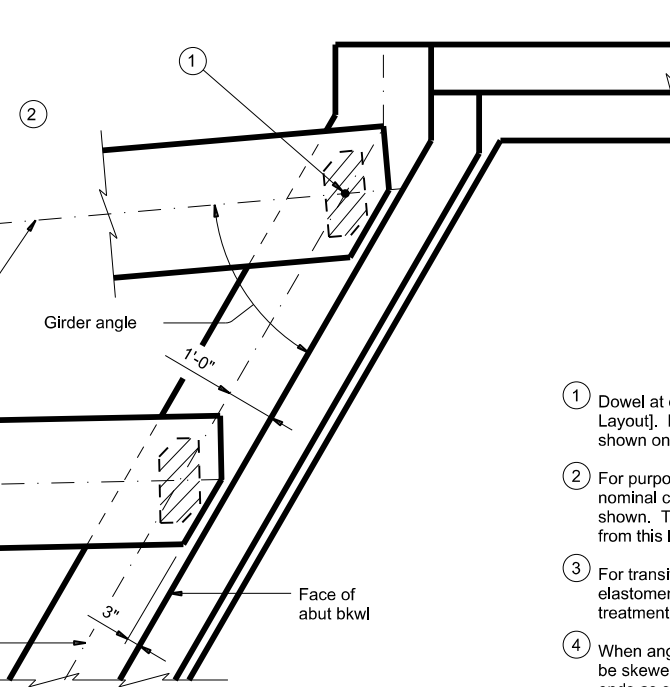
DATE: 4/28/2023 5:11:50 PM
 FILE: c:\bms\pwe-useast-006\tony.tre\o\dms58523\igebsts1-17-1.dgn



AT INVERTED-T BENT W/SKEW

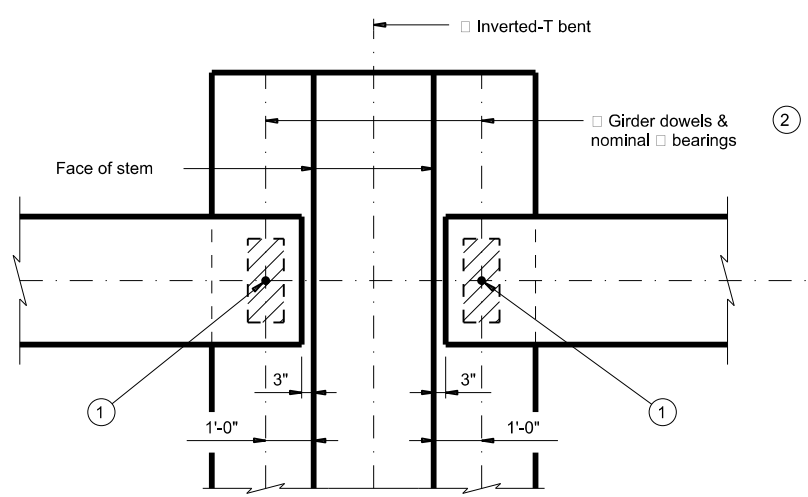


AT CONVENTIONAL INTERIOR BENT W/SKEW

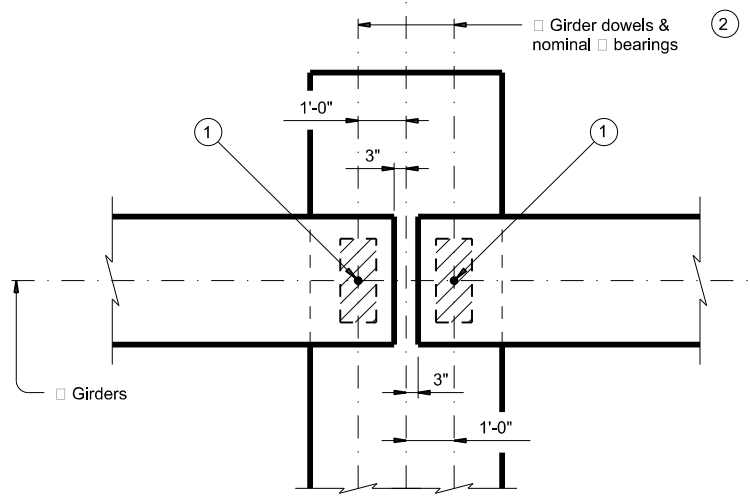


AT ABUTMENT W/SKEW

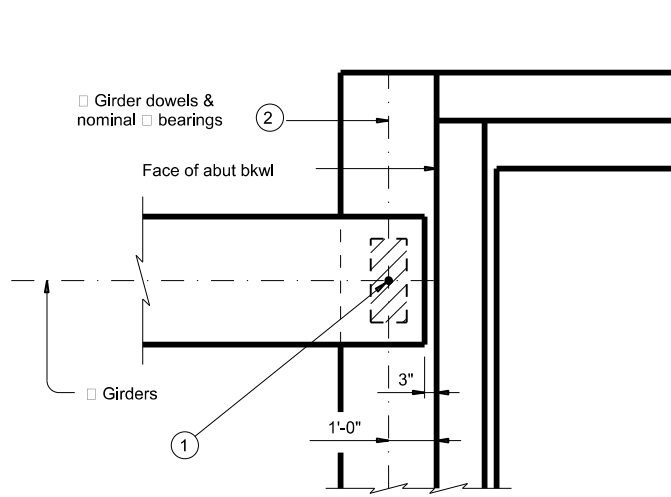
- ① Dowel at doweled girder end [labeled (D) on Bridge Layout]. Required for outside girder only or as shown on substructure details.
- ② For purposes of computing bearing seat elevations, nominal centerline of bearing must be defined as shown. The actual center of bearing pad may vary from this line.
- ③ For transition bents with backwall, girder and elastomeric bearings must receive the same treatment as shown for abutments.
- ④ When angle exceeds 0°, one or both girder ends must be skewed to maintain the clearance between girder ends as shown in view.
- ⑤ See Table of Bearing Pad Dimensions for bearing size. Girder end skew angles in Table not applicable for this situation. Table reflects girder conflicts of this type on radial bents only.



AT INVERTED-T BENT



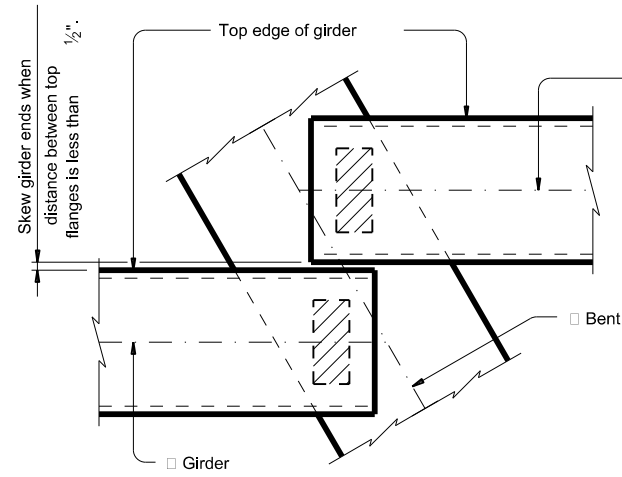
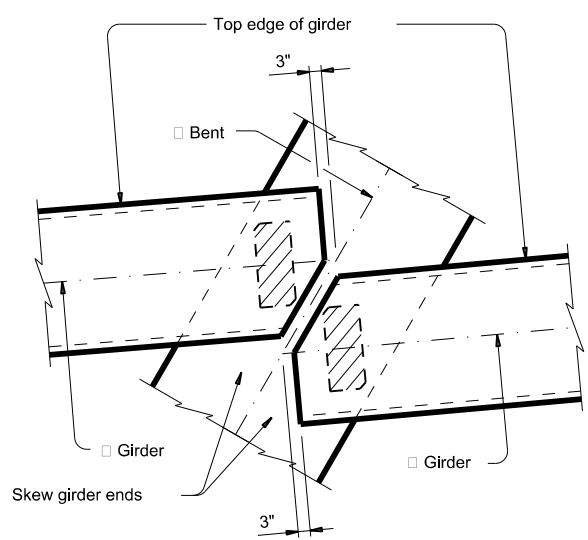
AT CONVENTIONAL INTERIOR BENT



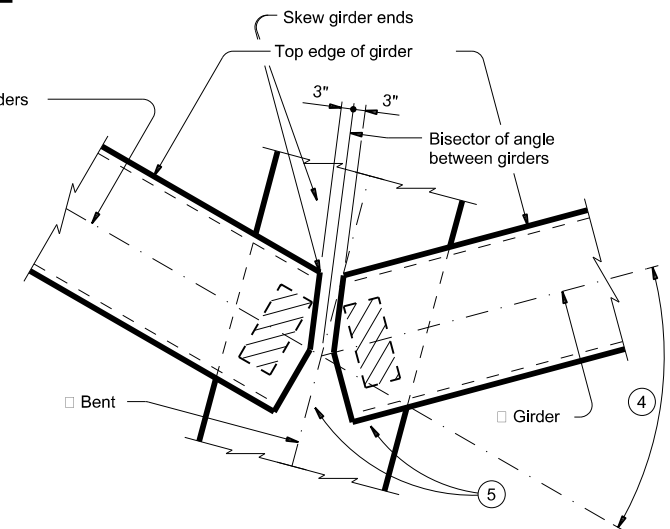
AT ABUTMENT

GENERAL NOTES:
 These details accommodate skew angles up to 60°. Shop drawings for approval are required. A bearing layout which identifies location and orientation of all bearings must be developed by the bearing fabricator. Permanently mark each bearing in accordance with the bearing layout. A copy of the bearing layout is to be provided to the Engineer. Cost of furnishing and installing elastomeric bearings, including beveled and embedded steel plates, must be included in unit price bid for "Prestressed Concrete Girders".

GIRDER END DETAILS



GIRDER CONFLICT DETAILS



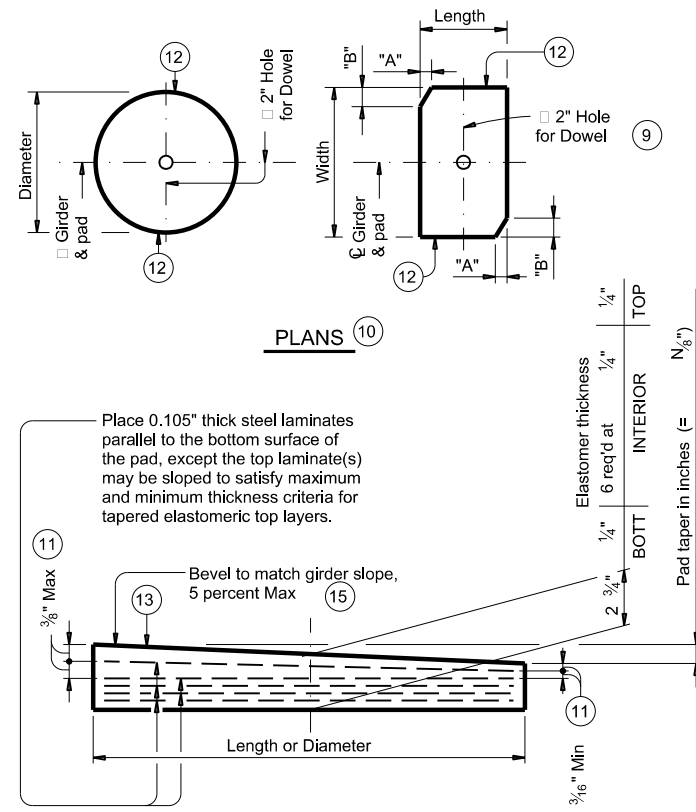
ELASTOMERIC BEARING AND GIRDER END DETAILS PRESTR CONCRETE I-GIRDERS

IGEB

FILE: igebsts1-17.dgn	DN: AEE	CK: JMH	DW: JTR	CK: TxDOT
©TxDOT August 2017	CONT	SECT	JOB	HIGHWAY
REVISIONS	0910	16	139	CR 1102
DIST	COUNTY	SHEET NO.		
TYLER	VAN ZANDT			70

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.

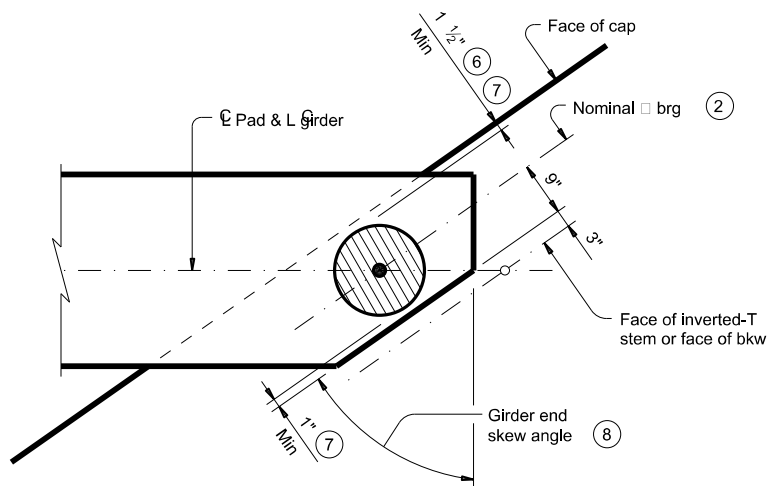
DATE: 4/28/2023 5:12:05 PM
 FILE: c:\bms\pwe-useast-006\tony.tre\o\dms58523\lgebsts1-17-2.dgn



LAMINATED ELASTOMERIC BEARING PAD
(50 DUROMETER)

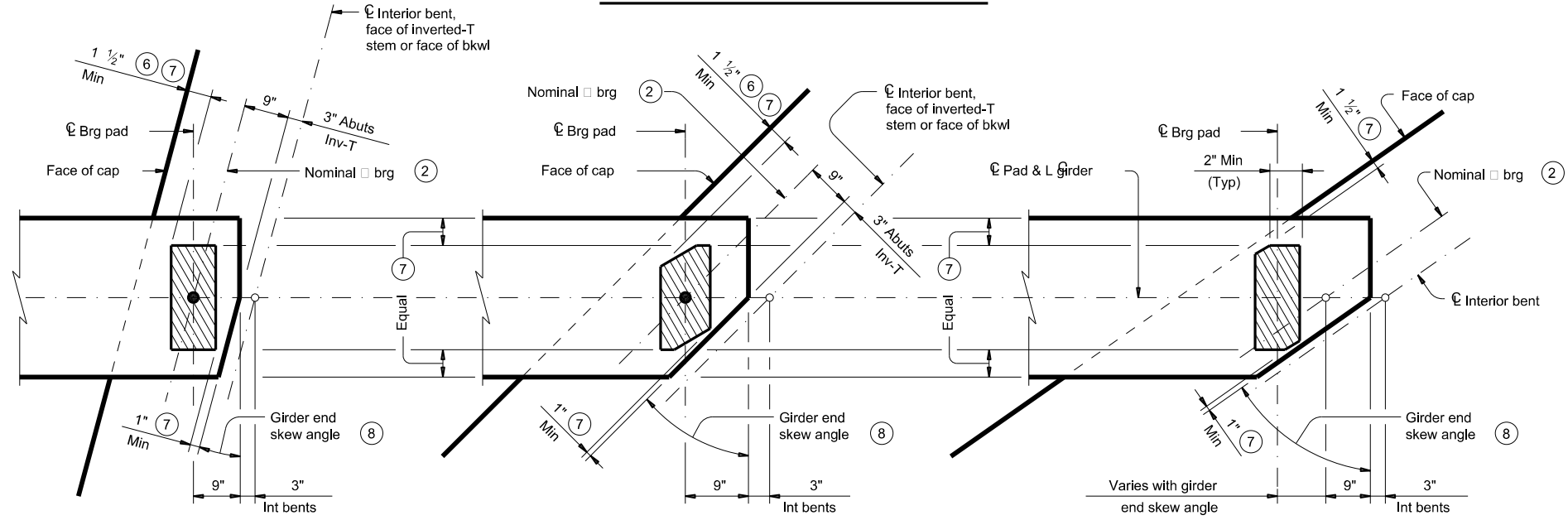
Girder Type	Abutments	Int Bents	Inv-T Bents
	Face of Bkwl to Face of Cap	Overall Cap Width	Corbel Width
Tx28 thru Tx54	1'-9"	3'-6"	1'-10 1/2"
Tx62 & Tx70	2'-0"	4'-0"	2'-1 1/2"

Bent Type	Girder Type	Bearing Type (13)	Girder End Skew Angle Range	Pad Size Lgth x Wdth	Pad Clip Dimensions	
					"A"	"B"
ABUTMENTS, INVERTED-T AND TRANSITION BENTS WITH BACKWALLS	Tx28, Tx34, Tx40, Tx46 & Tx54	G-1-"N"	0° thru 21°	8" x 21"	---	---
		G-2-"N"	21°+ thru 30°	8" x 21"	1 1/2"	2 1/2"
		G-3-"N"	30°+ thru 45°	9" x 21"	4 1/2"	4 1/2"
		G-4-"N"	45°+ thru 60°	15" Dia	---	---
	Tx62 & Tx70	G-5-"N"	0° thru 21°	9" x 21"	---	---
		G-6-"N"	21°+ thru 30°	9" x 21"	1 1/2"	2 1/2"
		G-7-"N"	30°+ thru 45°	10" x 21"	4 1/2"	4 1/2"
		G-8-"N"	45°+ thru 60°	10" x 21"	7 1/4"	4 1/4"
CONVENTIONAL INTERIOR BENTS	Tx28, Tx34, Tx40, Tx46 & Tx54	---	---	---	---	---
	Tx62 & Tx70	G-5-"N"	0° thru 60°	9" x 21"	---	---
CONVENTIONAL INTERIOR BENTS WITH SKEWED GIRDER ENDS (GIRDER CONFLICTS) (16)	Tx28, Tx34, Tx40, Tx46 & Tx54	G-1-"N"	0° thru 18°	8" x 21"	---	---
		G-2-"N"	18°+ thru 30°	8" x 21"	1 1/2"	2 1/2"
		G-9-"N"	30°+ thru 45°	8" x 21"	3"	3"
		G-10-"N"	45°+ thru 60°	9" x 21"	6"	3 1/2"
	Tx62 & Tx70	G-5-"N"	0° thru 18°	9" x 21"	---	---
		G-5-"N"	18°+ thru 30°	9" x 21"	---	---
		G-11-"N"	30°+ thru 45°	9" x 21"	1 1/2"	1 1/2"
		G-12-"N"	45°+ thru 60°	9" x 21"	3"	1 3/4"



ROUND BEARINGS FOR SKEWED GIRDER ENDS AT FACE OF INVERTED-T STEM OR FACE OF BKWL

- (2) For purposes of computing bearing seat elevations, nominal centerline of bearing must be defined as shown. The actual center of bearing pad may vary from this line.
- (6) 3" for inverted-T.
- (7) Place centerline pad as near nominal centerline bearing as possible between limits shown.
- (8) Girder end skew angle is equal to 90° minus the girder angle except at some conflicting girders.
- (9) Provide 2" dia hole only at locations required. See Substructure details for location.
- (10) See Table of Bearing Pad Dimensions for dimensions.
- (11) Maximum and minimum layer thicknesses shown are for elastomer only, on tapered layers.
- (12) Locate Permanent Mark here.
- (13) Indicate BEARING TYPE on all pads. For tapered pads, locate BEARING TYPE on the high side. The Fabricator must include the value of "N" (amount of taper in 1/8" increments) in this mark.
 Examples: N=0, (for 0" taper)
 N=1, (for 1/8" taper)
 N=2, (for 1/4" taper)
 (etc.)
 Fabricated pad top surface slope must not vary from plan girder slope by more than $\frac{0.04\% \text{ N}}{\text{Length or Dia}}$
- (14) Substructure dimensions must satisfy the minimums provided to accommodate the elastomeric bearings shown on this standard.
- (15) See sheet 3 of 3 for beveled plate use when slopes exceed 5 percent.
- (16) If girder end is skewed for a girder conflict at an interior bent and a beveled sole plate is required, use bearing type for abutments at this location. Location of bearing centerline is to be set as for abutments in this case.



SKEWED GIRDER ENDS AT INT BENTS, FACE OF INVERTED-T STEM OR FACE OF BKWL
SKEWED GIRDER ENDS AT CONVENTIONAL INTERIOR BENTS (NO GIRDER DOWELS)

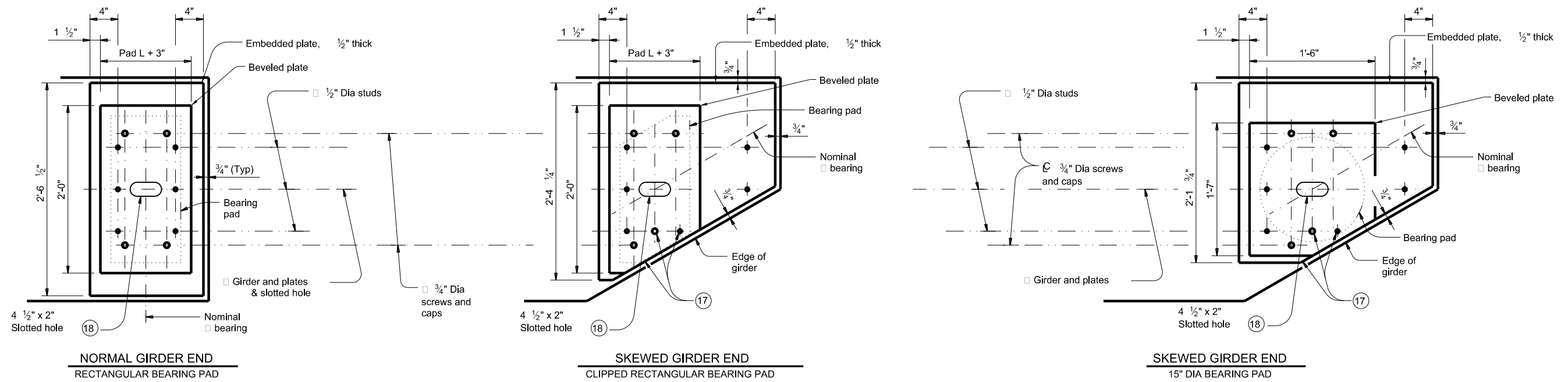
BEARING PAD PLACEMENT DIAGRAMS

HL93 LOADING SHEET 2 OF 3

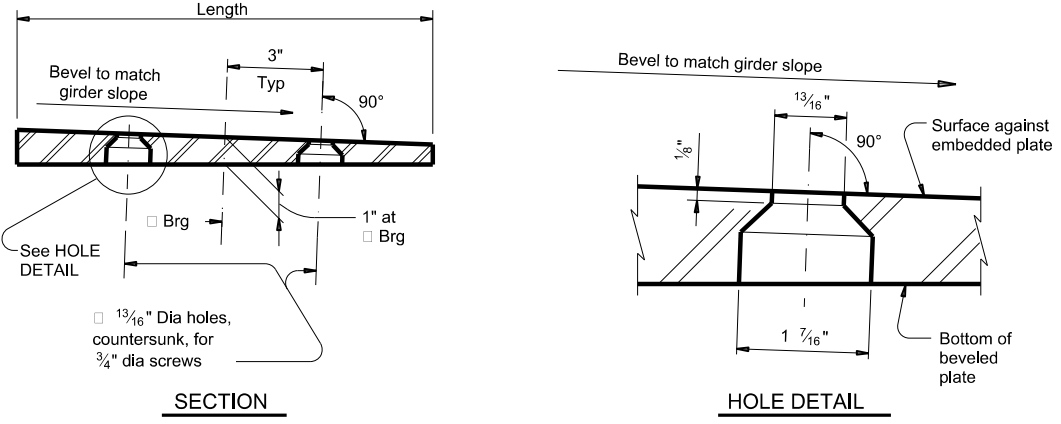
		Bridge Division Standard	
ELASTOMERIC BEARING AND GIRDER END DETAILS PRESTR CONCRETE I-GIRDERS			
IGEB			
FILE: lgebsts1-17.dgn	DN: AEE	CK: JMH	DW: JTR
©TxDOT August 2017	CON: 0910	SECT: 16	JOB: 139
REVISIONS	COUNTY: TYLER		CR: 1102
	COUNTY: VAN ZANDT		SHEET NO.: 71

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: 4/28/2023 5:12:18 PM
 FILE: c:\bms\pwe-usecast-006\tony.tre\o\dms58523\igebsts1-17-3.dgn

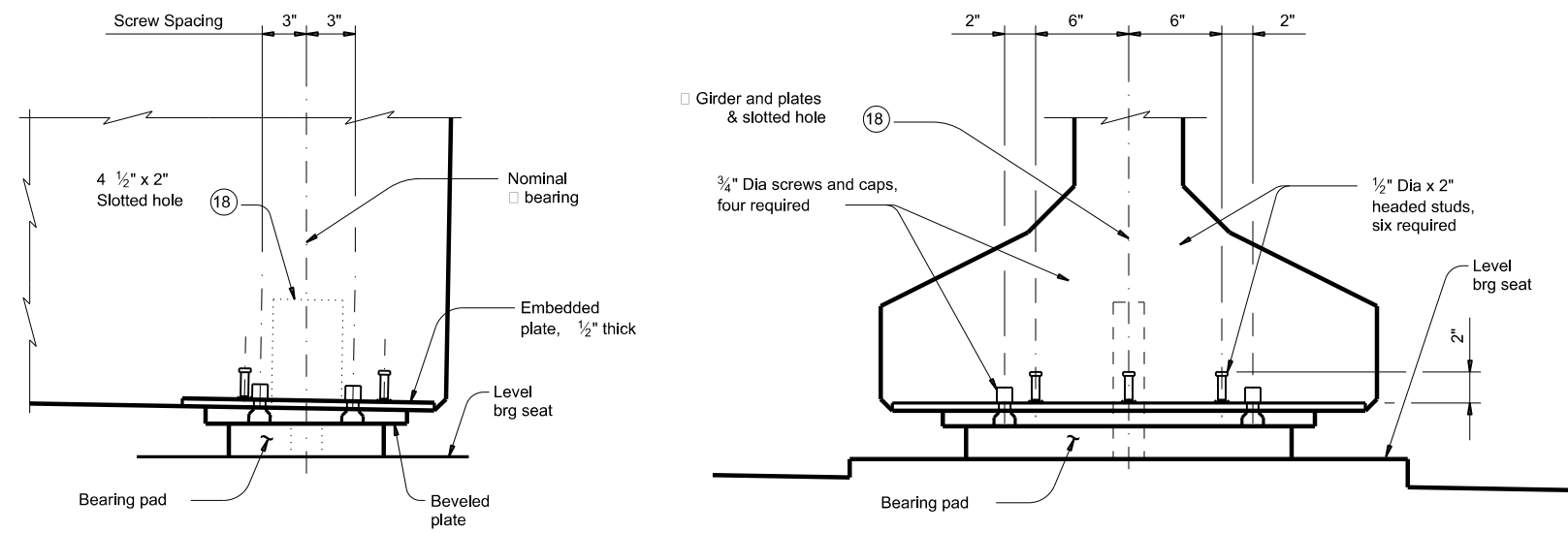


PLAN VIEW OF SOLE PLATE DETAILS



BEVELED PLATE DETAILS

- 17 Cut beveled and embedded plates to match girder end skew. Adjust location of screw and stud as shown when necessary.
- 18 Slotted hole is required at doweled girder end locations.



GIRDER DETAILS

SOLE PLATE NOTES:
 Provide constant thickness elastomeric bearings with beveled and embedded steel sole plates in accordance with these details when the girder slope exceeds 5 percent or if otherwise required in the plans. Provide for all girders in the span.
 On the shop drawings, dimension sole plates to the nearest required thickness at centerline of bearing and slope of girder. Thickness tolerance variation from the approved shop drawings is except variation from a plane parallel to the theoretical top surface can not exceed 1/16" total. Bearing surface tolerances listed in Item 424 apply to embedded and beveled plates.
 Steel plate must conform to ASTM A36, A572 Gr 50, or A709 Gr 36 or Gr 50. Hot dip galvanize both the embedded plate and beveled sole plate after fabrication. Seal weld caps to embedded plate before galvanizing.
 When determining if relocation of screw holes and studs are necessary for skewed girder ends, minimum clearance from screw or stud centerline to plate edge is 1.25".
 Tap threads in the embedded plate only. Drill and tap prior to galvanizing.
 3/4" Dia screws must be electroplated, socket flat head countersunk cap screws conforming to ASTM F835. Electroplating must conform to ASTM B633, SC 2, Type I. Provide screws long enough to maintain a minimum embedment into the embedded plate and galvanized cap. Provide galvanized steel caps (16 ga Min) with a nominal 1" inside diameter and deep enough to accommodate the screws, but not less than 1/2" deep or deeper than 1".
 Install beveled sole plates prior to shipping girders. Installed screw heads must not protrude below the bottom of the beveled plate.

HL93 LOADING SHEET 3 OF 3

Texas Department of Transportation Bridge Division Standard

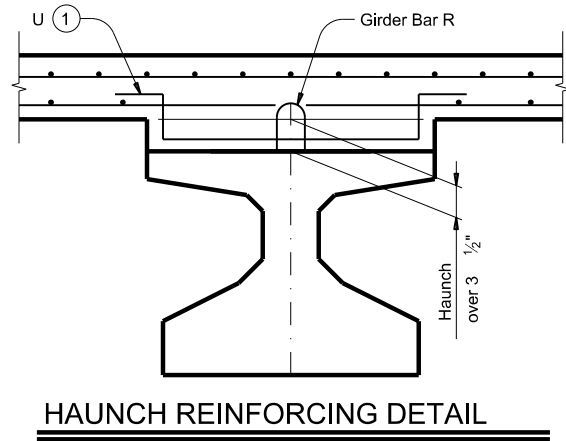
ELASTOMERIC BEARING AND GIRDER END DETAILS
 PRESTR CONCRETE I-GIRDERS

IGEB

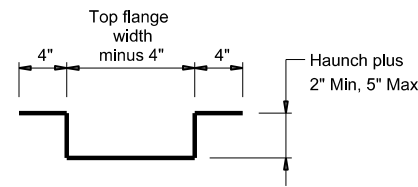
FILE: igebsts1-17.dgn	DN: AEE	CK: JMH	DW: JTR	CK: TxDOT
©TxDOT August 2017	CONT	SECT	JOB	HIGHWAY
REVISIONS	0910	16	139	CR 1102
DIST	COUNTY	SHEET NO.		
TYLER	VAN ZANDT			72

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.

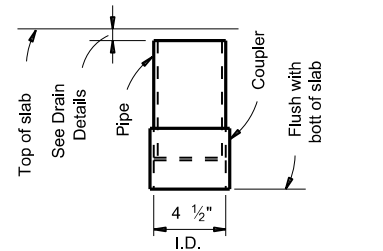
DATE: 4/28/2023 5:12:32 PM
 FILE: c:\bms\pwe-useast-006\tony.tre\o\dms58523\igmssts1-19-1.dgn



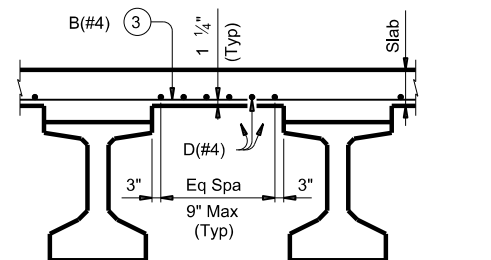
HAUNCH REINFORCING DETAIL



BARS U (#4)

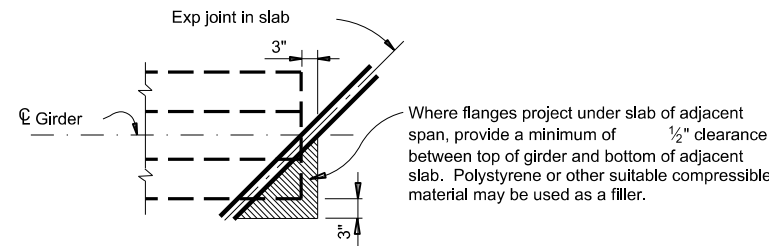


C-I-P DRAIN DETAIL

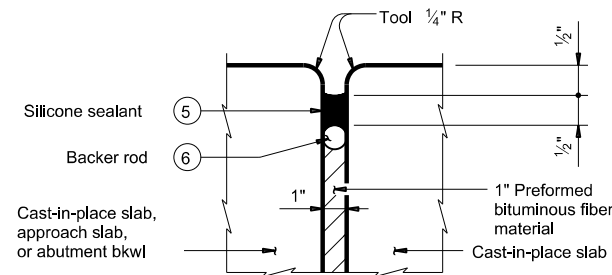


TYPICAL PART TRANSVERSE SLAB SECTION WITHOUT PCP

Top reinforcing steel not shown for clarity.

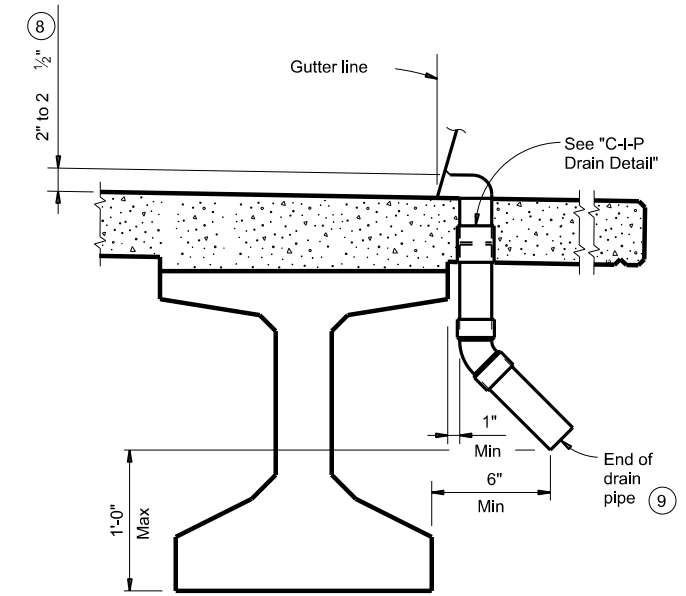


TREATMENT AT GIRDER END FOR SKEWED SPANS



TYPE A JOINT DETAIL

- 1 Space Bars U with girder Bars R in all areas where measured haunch exceeds 3 1/2".
- 2 Roughen outside of PVC with coarse rasp or equal to ensure bond with cast-in-place concrete.
- 3 Bars B(#4) spaced at 9" Max with 2" end cover. Overhang option, Contractor's may end alternating bars B(#4) at centerline outside girder.
- 4 Provide Grade 60 reinforcing steel. Provide bar laps, where required, as follows:
 Uncoated ~ #4 = 1'-7"
 Epoxy coated ~ #4 = 2'-5"
- 5 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.
- 6 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.
- 7 The maximum distance between Type A expansion joints is 100'. See Bridge Layout for location of joints.
- 8 Drain entrance formed in rail or sidewalk.
- 9 Water may not be discharged onto girders.
- 10 All drain pipe and fittings to be 4" diameter (Sch 40) PVC. See Item 481 "Pipe for Drains" for pipe, connections and solvent welding. Bend reinforcing steel to clear PVC 1". Drain length and location is as directed by the Engineer. Drains are not permitted over roadways or railways, or within 10'-0" of bent caps. Degrease outside of exposed PVC, apply acrylic water base primer, then coat with same surface finishing material as used for outside girder face. Variations of the above designs, as required for the type of rail used and its location on the structure, may be installed with the approval and direction of the Engineer.



DRAIN DETAIL

GENERAL NOTES:
 Designed according to AASHTO LRFD Bridge Design Specifications.
 Payment for Type A joint will be as per Item 454, "Bridge Expansion Joints."
 All other items (reinforcing steel, drains, etc.) shown on this sheet are subsidiary to other bid items.

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

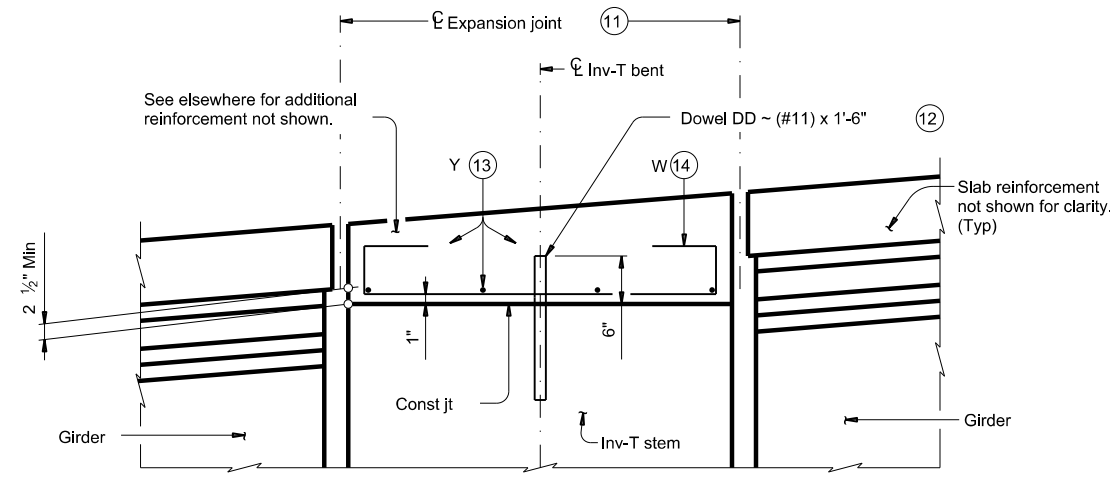
DECK FORMWORK NOTES:
 Overhang bracket hangers are limited to a safe working load of 3,600 lbs, applied to and along the axis of a coil rod at 45 degrees from vertical, regardless of higher loads permitted by hanger manufacturers. Do not place a hanger less than 12" from girder end. Space hangers accordingly.

SHEET 1 OF 2

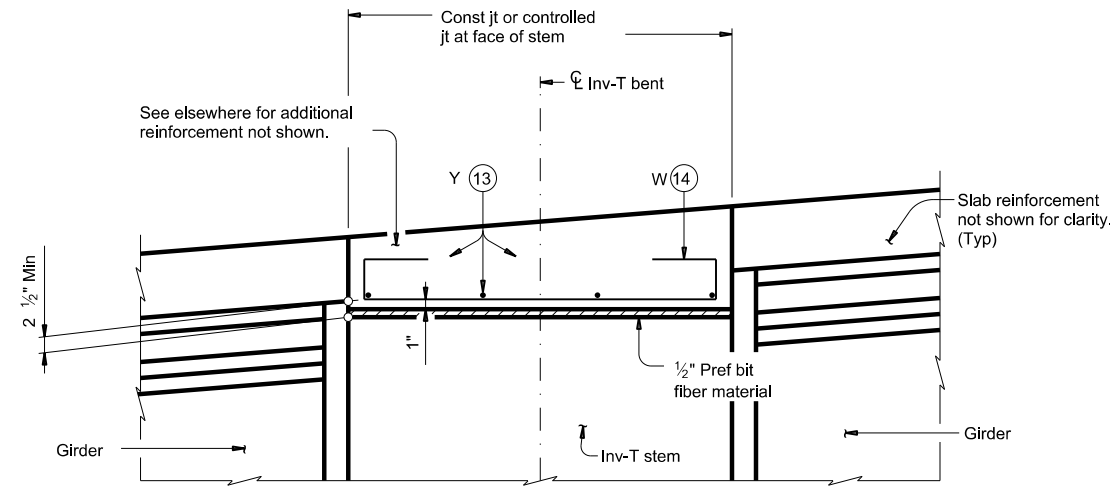
		Bridge Division Standard	
MISCELLANEOUS SLAB DETAILS PRESTR CONCRETE I-GIRDERS			
IGMS			
FILE: igmssts1-19.dgn	DN: TxDOT	CK: TxDOT	DW: JTR
©TxDOT August 2017	CONT	SECT	HIGHWAY
REVISIONS	0910	16	139 CR 1102
10-19: Modified Note 7. Type A now a pay item.	DIST	COUNTY	SHEET NO.
	TYLER	VAN ZANDT	73

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.

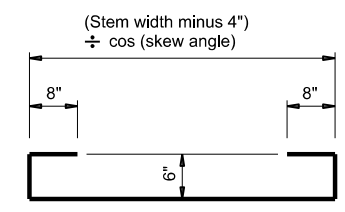
DATE: 4/28/2023 5:12:48 PM
 FILE: c:\bms\pwe-useast-006\tony.tre\o\dms58523\igmssts1-19-2.dgn



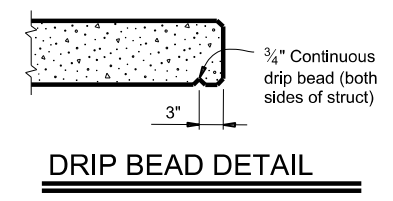
SHOWING EXPANSION JOINTS



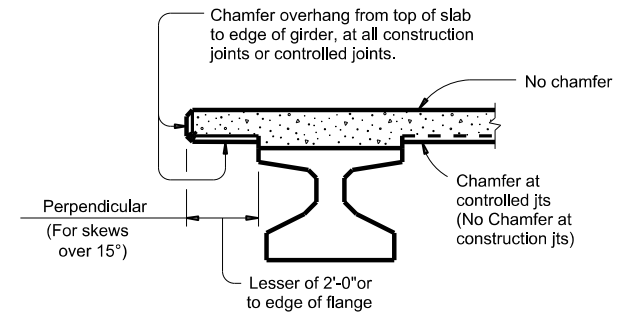
SHOWING CONST JTS OR CONTROLLED JTS
 REINFORCEMENT OVER INV-T BENTS



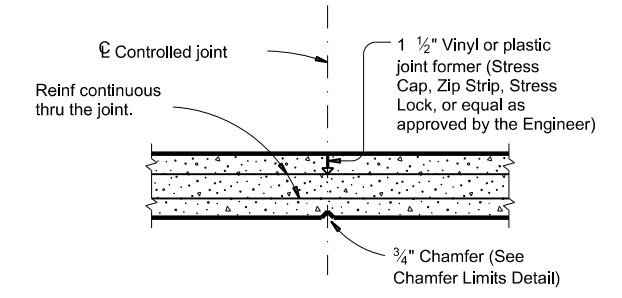
BARS W (#4)



DRIP BEAD DETAIL



CHAMFER LIMITS DETAIL



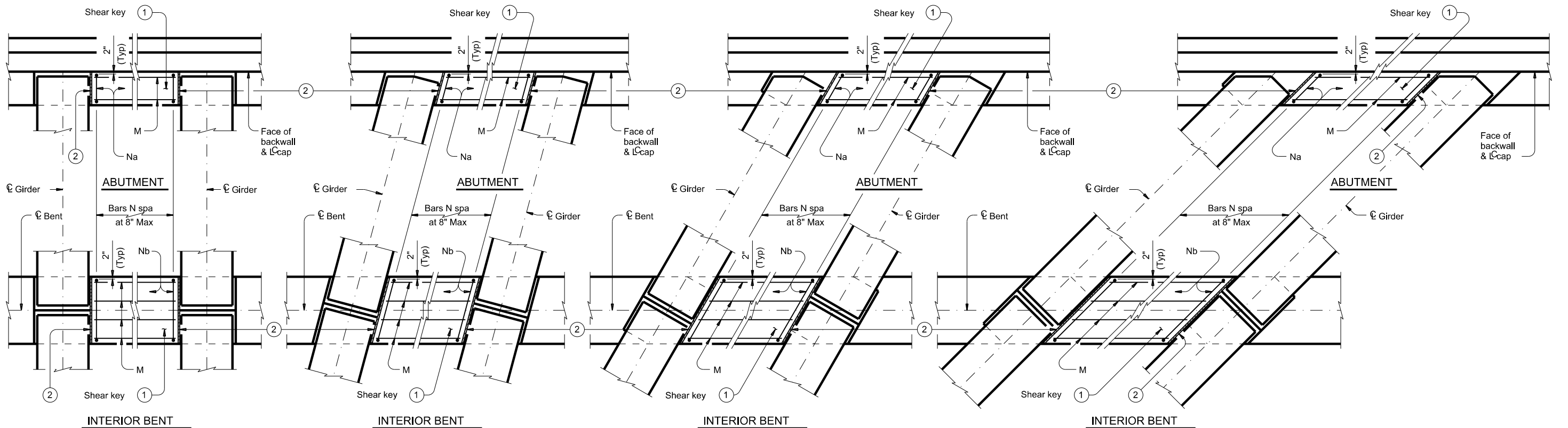
CONTROLLED JOINT DETAIL
 (Saw-cutting is not allowed)

- 11 See Layout for joint type.
- 12 Dowels DD (#11) spaced at 5 Ft Max. See Inv-T bents for quantity and location.
- 13 Space Bars Y (#4) at 12" Max. Use 2" end cover. Number of Bars Y must satisfy spacing limit. Place parallel to bent.
- 14 Space Bars W at 12" Max (3" from end of cap). Tilt if necessary to maintain cover requirements. Place parallel to longitudinal slab reinforcement.
- 15 See Span details for type of joint and joint locations.

		Bridge Division Standard	
MISCELLANEOUS SLAB DETAILS PRESTR CONCRETE I-GIRDERS			
IGMS			
FILE: igmssts1-19.dgn	DN: TxDOT	CK: TxDOT	DW: JTR
©TxDOT August 2017	CONT	SECT	HIGHWAY
REVISIONS	0910	16	139 CR 1102
10-19: Modified Note 7. Type A now a pay item.	DIST	COUNTY	SHEET NO.
	TYLER	VAN ZANDT	74

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: 4/28/2023 5:13:01 PM
 FILE: c:\bms\pwe-useast-006\tony.tre\o\ams58523\igsksstds-17.dgn



PARTIAL PLANS WITH NO SKEW

Showing shear keys on 3'-6" wide caps. 4'-0" caps similar.

PARTIAL PLANS WITH 15° SKEW

Showing shear keys on 3'-6" wide caps. 4'-0" caps similar.

PARTIAL PLANS WITH 30° SKEW

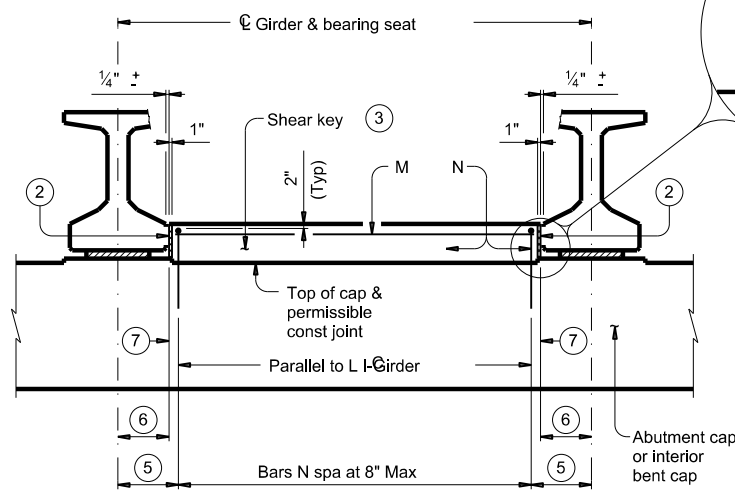
Showing shear keys on 3'-6" wide caps. 4'-0" caps similar.

PARTIAL PLANS WITH 45° SKEW

Showing shear keys on 3'-6" wide caps. 4'-0" caps similar.

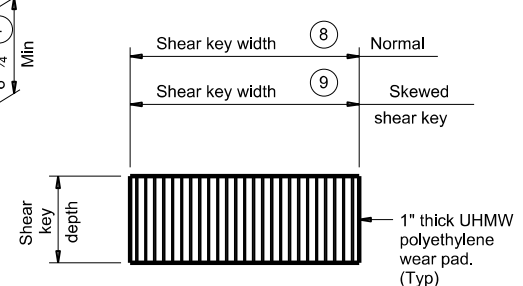
- ① Place shear keys on the upstream side of structure between outside girder and next adjacent girder, unless shown otherwise on plans.
- ② UHMW polyethylene wear pad. (Typ)
- ③ Leave a 1/4" gap plus or minus between girder and face of wear pad. Cast wear pad with shear key, smooth side facing girder. Care must be taken to keep concrete from flowing under girder. Slope top of shear keys in accordance with Item 420.4.9, "Treatment and Finishing of Horizontal Surfaces."
- ④ Measure at higher bearing seat elevation forward or back. Dimension based on typical bearing pad and bearing seat. Increase as necessary to maintain 5" overlap.
- ⑤ With No Skew = 1'-8" 1/4", measured along L cap.
 With Skew = 1'-8" 1/4" Cos Skew, measured along L cap. C

- ⑥ With No Skew = 1'-4" 1/4", measured along L cap.
 With Skew = 1'-4" 1/4" Cos Skew, measured along L cap. C
- ⑦ Face of UHMW polyethylene wear pad. Smooth side of pad facing girder.
- ⑧ Abutments = 1/2 Cap width.
 Interior bents = Cap width.
- ⑨ Abutments = 1/2 Cap width Cos Skew.
 Interior bents = Cap width Cos Skew.

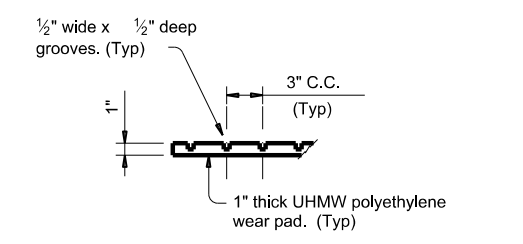


PARTIAL ELEVATION OF ABUTMENT OR INTERIOR BENT CAP

Showing shear key with girder Type Tx46. Other I-Girder types similar.

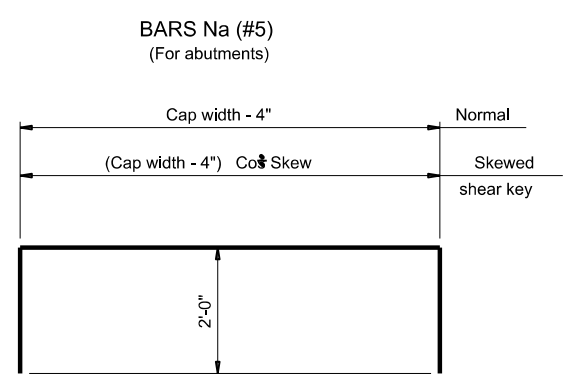
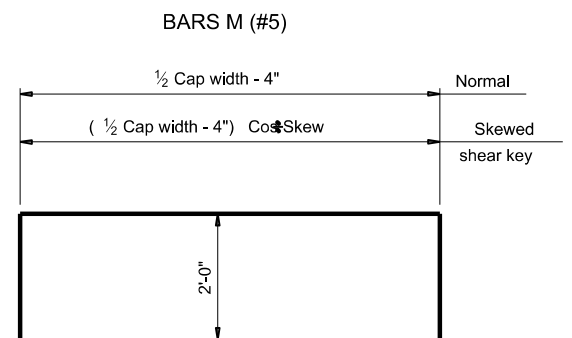
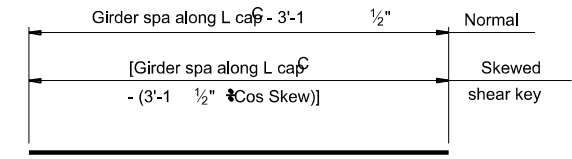


ELEVATION



PART SECTION

ULTRA HIGH MOLECULAR WEIGHT (UHMW) POLYETHYLENE WEAR PAD DETAILS



CONSTRUCTION NOTES:
 Provide Class "C" concrete (f'c = 3,600 psi). Provide Class "C" (HPC) if shown elsewhere on the plans.
 Provide Grade 60 reinforcing steel.
 Provide epoxy coated reinforcing steel for shear key if abutment or interior bent reinforcing steel is epoxy coated.
 Provide Ultra High Molecular Weight (UHMW) polyethylene wear pads in accordance with ASTM D6712.

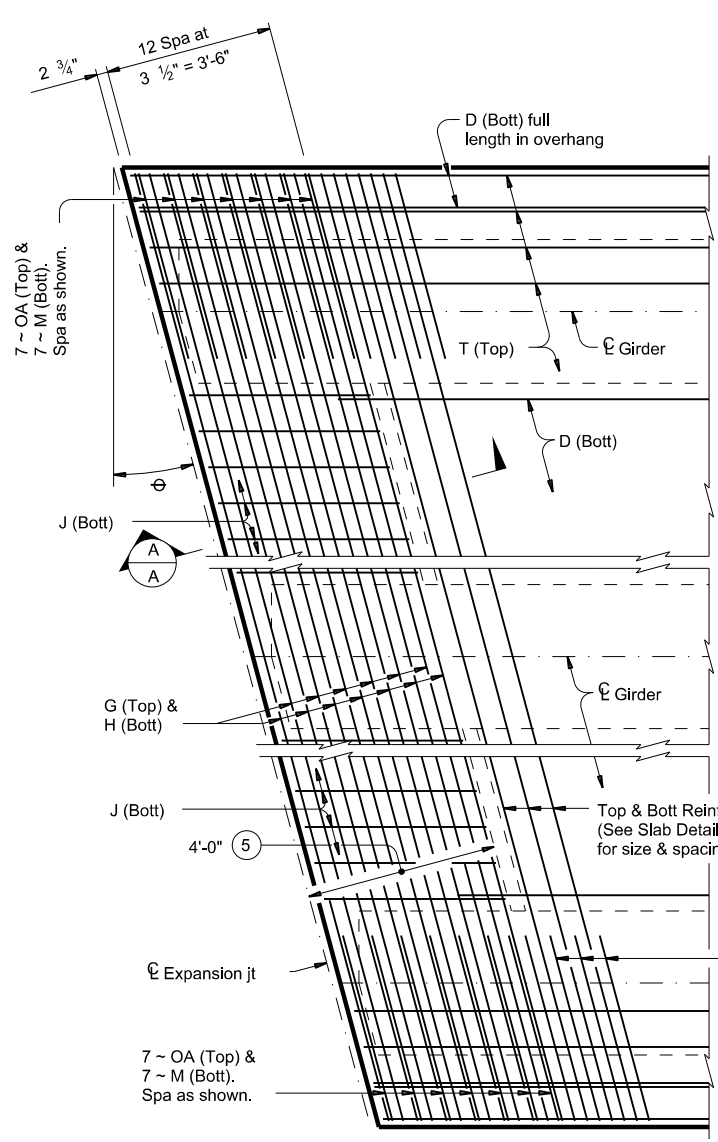
GENERAL NOTES:
 Designed according to AASHTO LRFD Bridge Design Specifications. Details showing skew are drawn showing right forward skew. See Bridge Layout for actual skew direction.
 These details are limited to bridges skewed 45 degrees and less. This standard is only applicable for I-Girders.
 Modify details for bearing conditions, and girder spacing not shown on this standard. Details do not account for sole plate or pedestal bearing seat.
 Include shear key concrete in abutment or bent concrete for payment.
 UHMW polyethylene wear pads are subsidiary to Class "C" concrete.

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

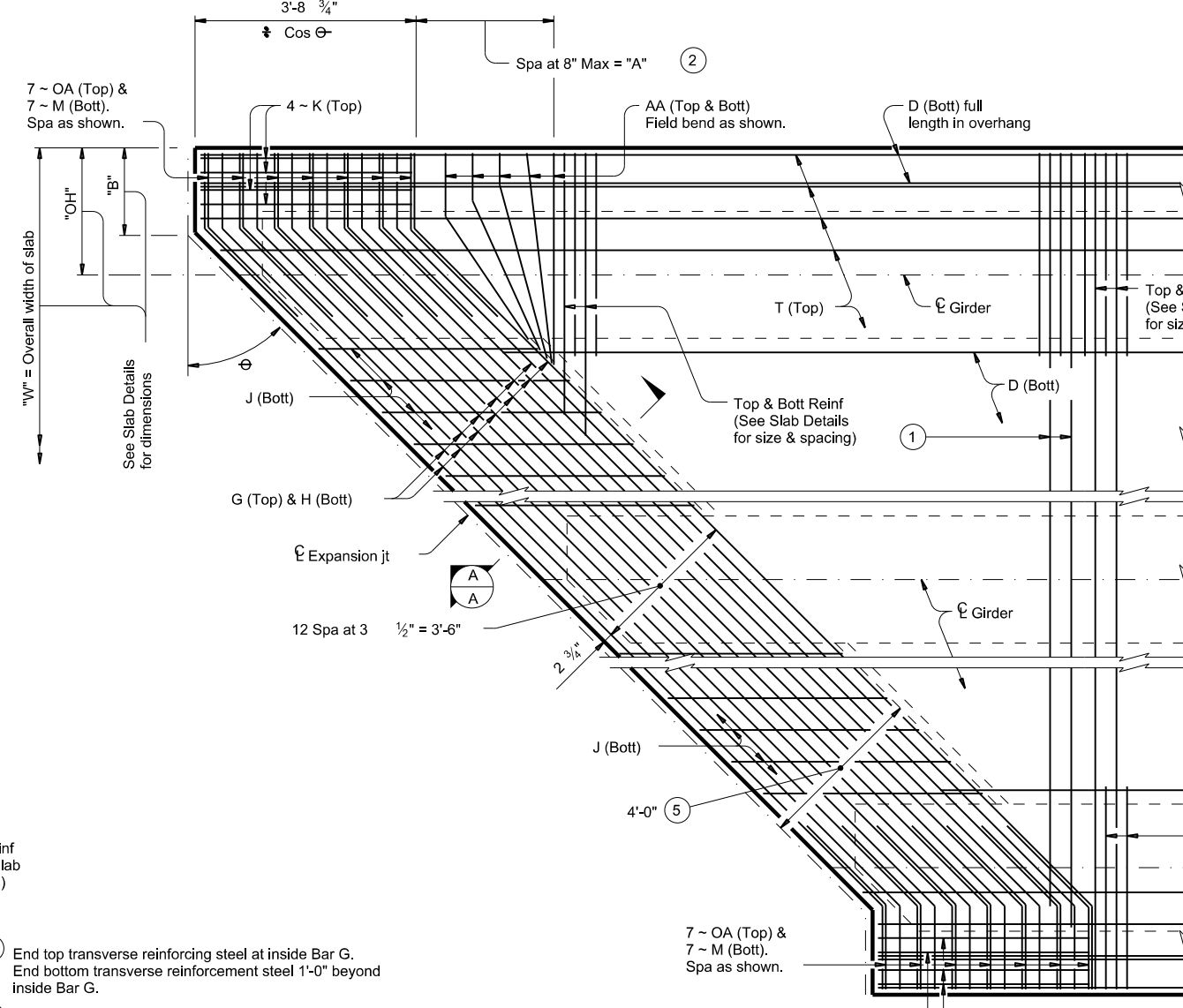
		Bridge Division Standard	
SHEAR KEY DETAILS PRESTR CONCRETE I-GIRDERS			
IGSK			
FILE: igsksstds-17.dgn	DN: TxDOT	CK: TxDOT	DW: JTR
©TxDOT August 2017	CON: 0910	SECT: 16	JOB: 139
REVISIONS	COUNTY: VAN ZANDT		HIGHWAY: CR 1102
	DIST: TYLER	COUNTY: VAN ZANDT	SHEET NO.: 75

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

DATE: 4/28/2023 5:13:15 PM
 FILE: c:\bms\pwe-useast-006\tony.tre\igssts1-17.dgn

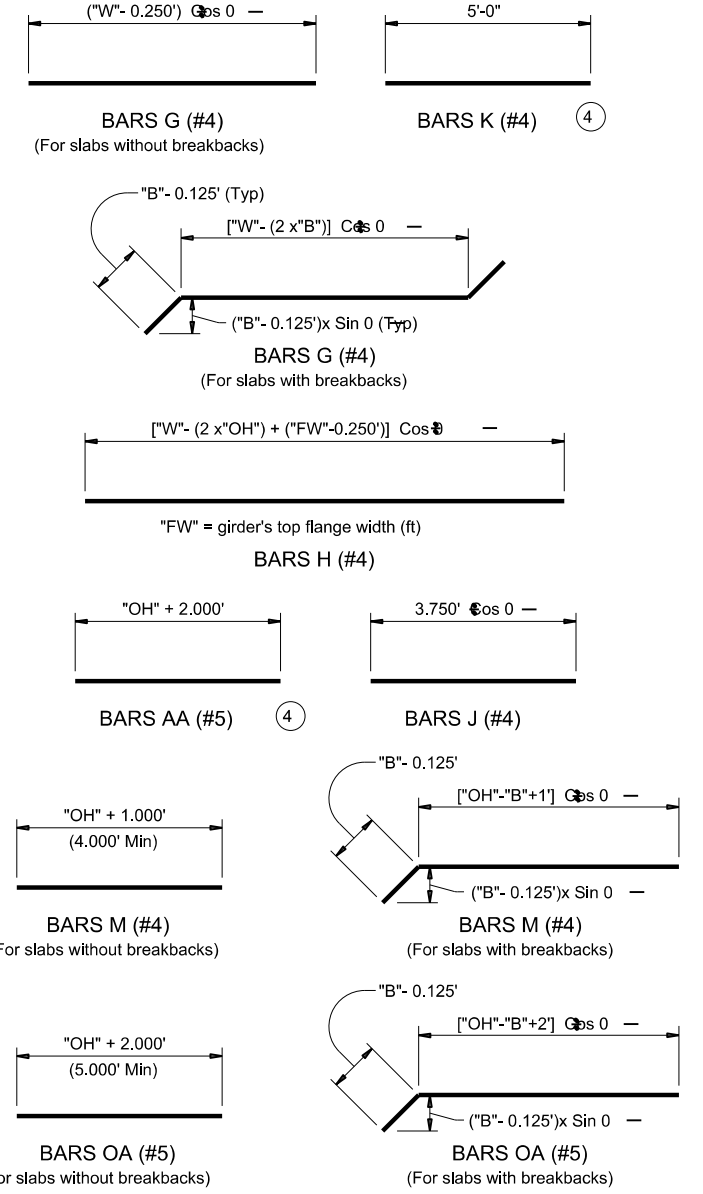


PARTIAL PLAN FOR SLABS WITHOUT BREAKBACK



PARTIAL PLAN FOR SLABS WITH BREAKBACK

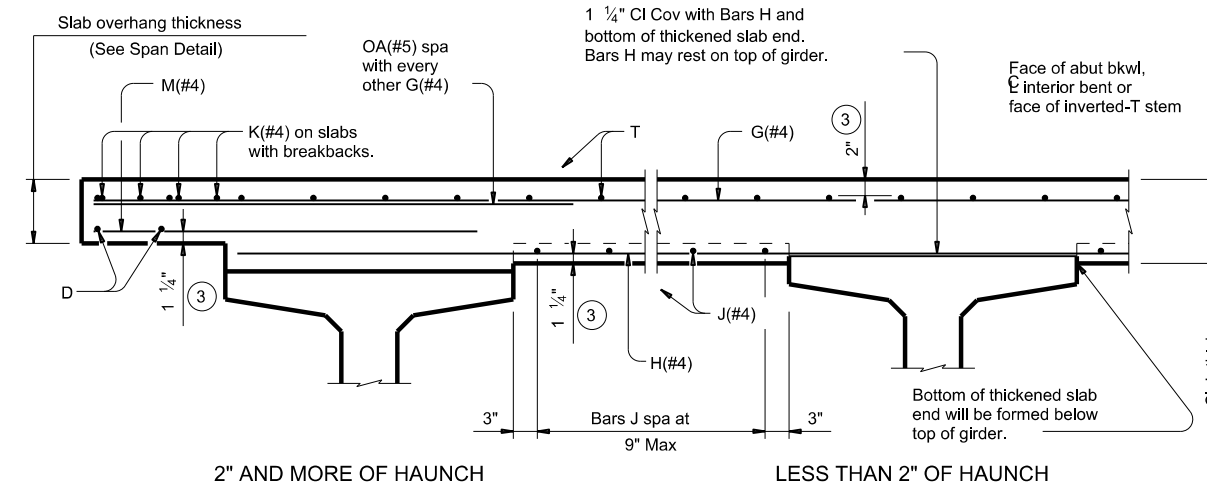
- 1 End top transverse reinforcing steel at inside Bar G. End bottom transverse reinforcement steel 1'-0" beyond inside Bar G.
- 2 "A" = ("OH" + 2.333' - "B") x Tan θ
- 3 Provide clear cover as indicated unless otherwise shown on Span Details.
- 4 Only required on slabs with breakbacks.
- 5 Thickened slab end dimensioned perpendicular to face of bkwl, centerline interior bent or face of inverted-T stem.



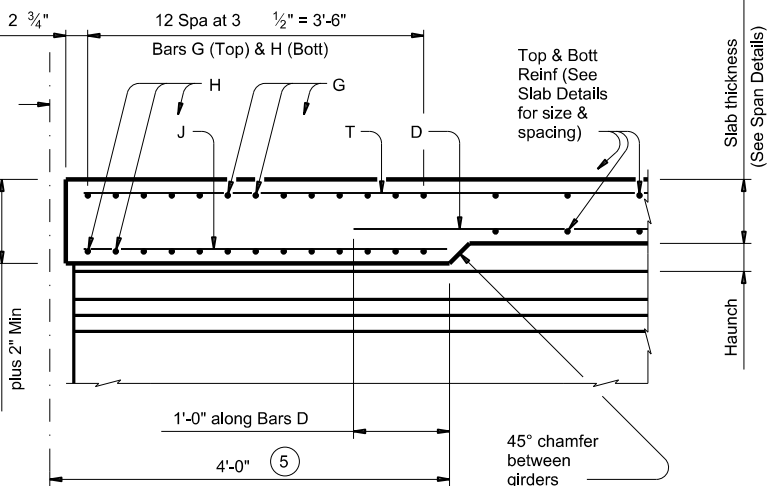
GENERAL NOTES:
 Designed according to AASHTO LRFD Bridge Design Specifications. These details are restricted to Prestressed Concrete I-Girder Spans. These details are to be used in conjunction with the Span Details and PCP standard (if prestressed concrete panels are used). When Option 2 from PCP standard is used, provide Bars AA, G, K and OA in the slab.

MATERIAL NOTES:
 Provide Grade 60 reinforcing steel. If slab reinforcing steel is shown on the Slab Details to be epoxy coated, then Bars AA, G, K, H, J, M and OA must be epoxy coated. Provide bar laps, where required, as follows:
 Uncoated ~ #4 = 1'-7"
 Epoxy Coated ~ #4 = 2'-5"

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



TYPICAL TRANSVERSE SECTION
 (Showing Prestressed Conc I-Girders at L Brg)

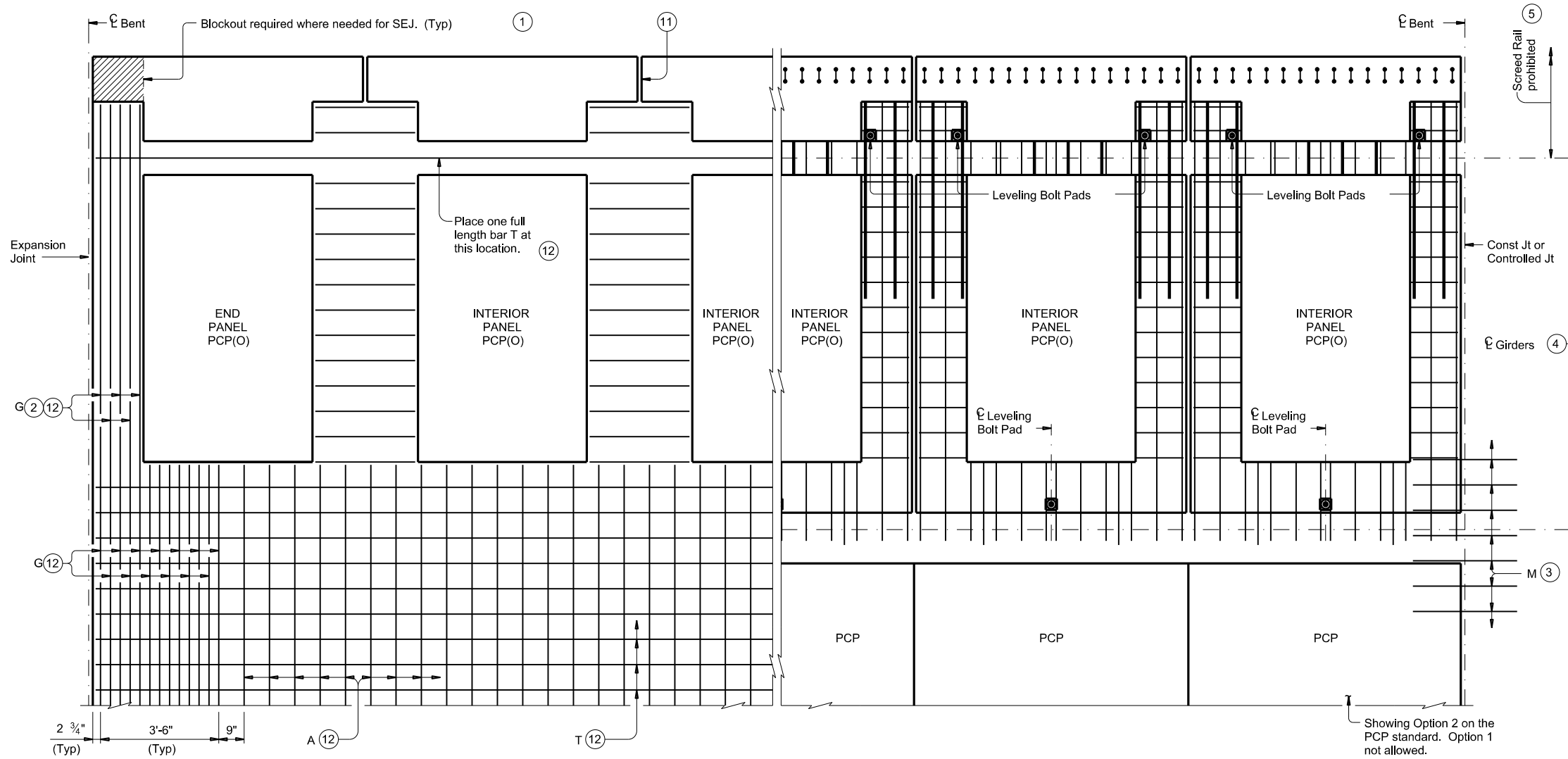


SECTION A-A
 (Showing with 2" and more of haunch)

HL93 LOADING		Texas Department of Transportation		Bridge Division Standard
THICKENED SLAB END DETAILS				
PRESTRESSED CONCRETE I-GIRDER SPANS				
IGTS				
FILE: igssts1-17.dgn	DN: TxDOT	CK: TxDOT	DW: JTR	CK: TxDOT
©TxDOT August 2017	CONT	SECT	JOB	HIGHWAY
REVISIONS	0910	16	139	CR 1102
DIST	COUNTY	SHEET NO.		
TYLER	VAN ZANDT	76		

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: 4/28/2023 5:13:31 PM
 FILE: c:\bms\pwe-usecast-006\tony.tre\o\dms58523\pccpostd1-17-1.dgn



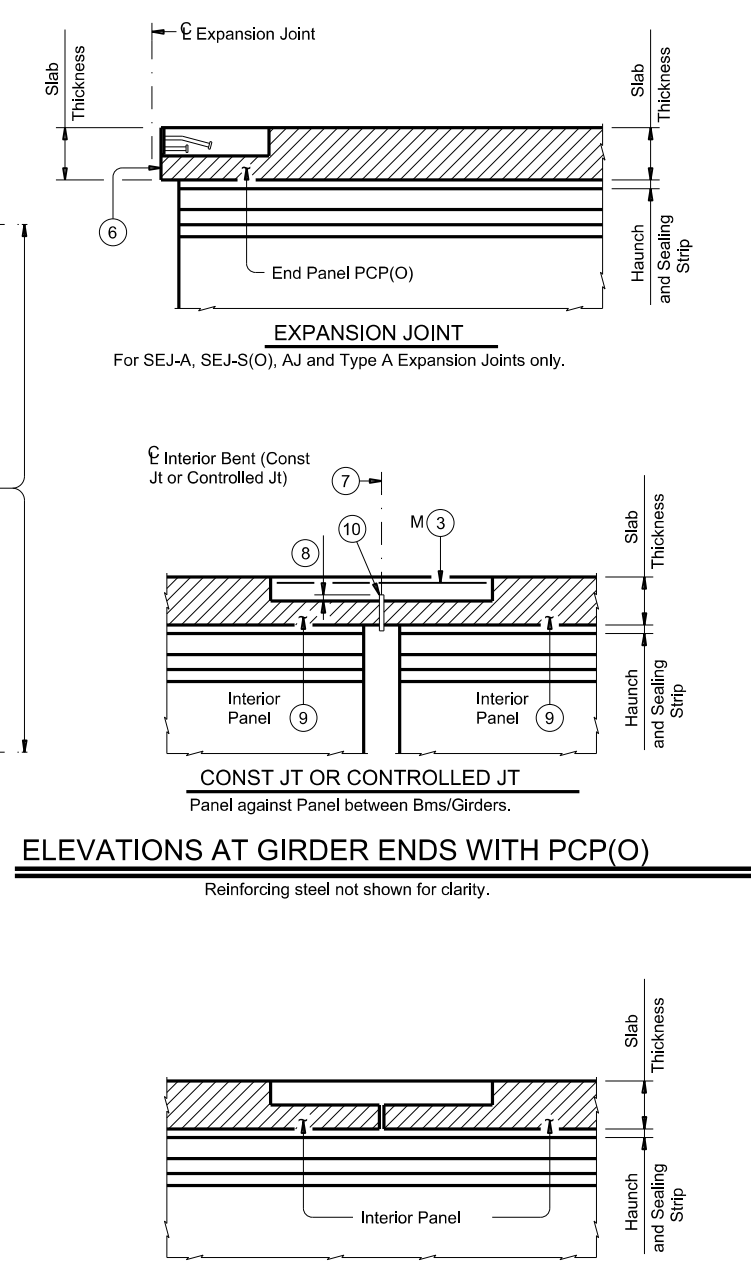
SHOWING FIELD PLACEMENT OF TOP REINFORCING STEEL

SHOWING PCP(O) EXPOSED REINFORCING STEEL

PANEL LAYOUT

PCP(O) shown with gaps between panels for clarity. The gap cannot be considered as a panel fabrication tolerance.

- ① 1'-4" x 1'-6" x 4 1/2" blockout to accommodate SEJ that require an upturn. Contractor to communicate with fabricator the location and type of SEJ to be utilized.
- ② When blockout is required, extend bars G into blockout.
- ③ Place additional bars M 2'-11" in length on top of bars A and between every bar T. Center bars M at center of bent. Located at bents with construction joints or controlled joints only. Bars M may replace additional (#4) bars 5'-0" in length as shown on PCP standard in Option 2 ~ Elevations At Beam Ends. Option 1 not allowed.
- ④ It is recommended to profile every 4 ft by surveying each girder under PCP(O) for proper grading of panels.
- ⑤ Screed rail used to set grade for paving machine is not allowed past exterior girder as shown.
- ⑥ Place end panel PCP(O) within 1/2" of expansion joint opening. Do not encroach on required expansion joint opening.
- ⑦ Top Plastic Joint Former at Controlled Joints (Stress Cap, Zip Strip, Stress Lock, etc.) is not required with these Details.
- ⑧ 0" Min, 3/4" Max, support as necessary.
- ⑨ Place panel within 1/2" of 3/4" thick board.
- ⑩ 3/4" thick wood/timber board, leave in place. Place straight, within 1/4" of Centerline of Bent, across bridge width and end board at exterior flange edge of fascia girders. Do not extend into overhang.
- ⑪ Seal top of panel only, with a Class 4 sealant prior to rail construction. Typical between panels. Do not seal at Expansion Joints.
- ⑫ 1 1/2" End Cover. (Typ)



ELEVATIONS AT GIRDER ENDS WITH PCP(O)

Reinforcing steel not shown for clarity.

ELEVATION BETWEEN PCP(O)

The gap cannot be considered as a panel fabrication tolerance. Reinforcing steel not shown for clarity.

HL93 LOADING SHEET 1 OF 2

Texas Department of Transportation **Bridge Division**

PRECAST CONCRETE PANELS FOR OVERHANGS

PCP(O)

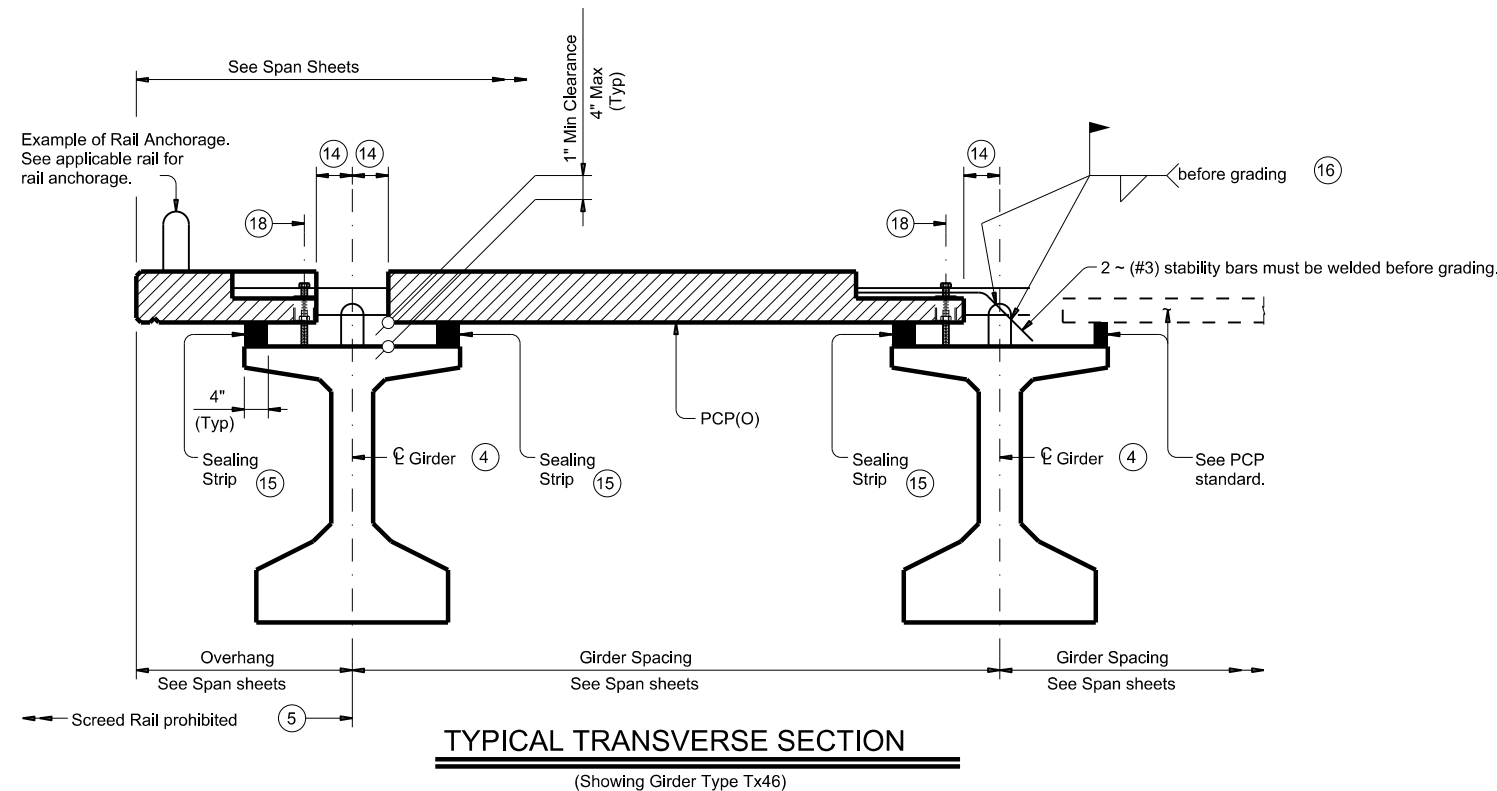
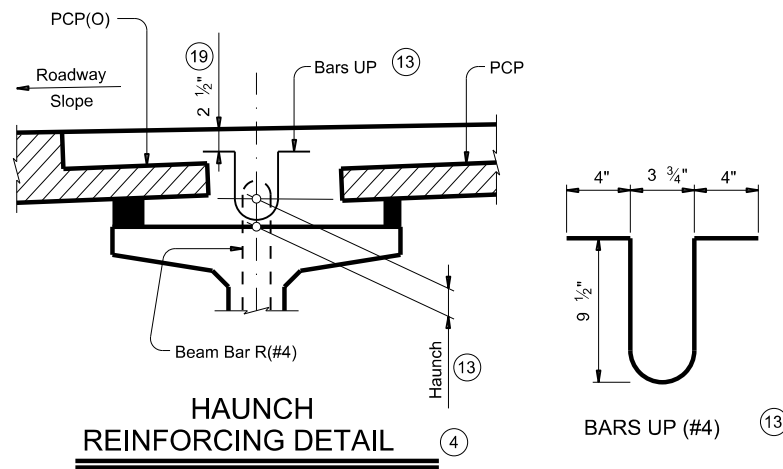
FILE: pccpostd1-17.dgn	DN: KLM	CK: DVL	DW: JTR	CK: KLM
©TxDOT August 2017	CONT	SECT	JOB	HIGHWAY
REVISIONS	0910	16	139	CR 1102
DIST	COUNTY	SHEET NO.		
TYLER	VAN ZANDT	77		

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: 4/28/2023 5:13:47 PM
FILE: c:\bms\pwe-usecast-006\tony.tre\o\dms58523\pcpostd1-17-2.dgn

BAR TABLE		
BAR	SIZE	MAX SPA (IN)
A (12/17)	#4	9"
G (12/17)	#4	3 1/2"
M	#4	9"
T (12/17)	#4	9"

- ④ It is recommended to profile every 4 ft by surveying each girder under PCP(O) for proper grading of panels.
- ⑤ Screed rail used to set grade for paving machine is not allowed past exterior girder as shown.
- ⑫ 1 1/2" End Cover on bars. (Typ)
- ⑬ Space bars UP(#4) with girder bars R(#4) in all areas where measured haunch exceeds 3 1/2" with 6" plus or minus.
- ⑭ Place sealing strip at flange edge as shown. Butt adjacent sealing strips longitudinally together with adhesive. Use pencil vibrators with concrete placement over girder and between sealing strips to avoid rupturing sealing strips. Cut sealing strips 2" higher than anticipated haunch thickness and compress to grade.
- ⑮ (#3) Panel bars F must be field bent and welded to the R bars in girder. Two bars F per panel.
- ⑯ Field placed bars that are allowed to be lapped. Reinforcing steel that protrudes from panels are not considered bars to be lapped. See "Material Notes" for applicable bar laps.
- ⑰ Leveling Bolt Pad. 1" Dia Coil Rod or 1" Dia Coil Bolt shown, are furnished by the contractor. After grading each PCP(O) panel with the 1" Dia coil rods or coil bolts, secure each panel in its final resting position (plastic shims, welding, etc) and remove all 1" Dia coil rods or coil bolts for the cast-in-place concrete. Coil rods/bolts may be left in place at contractor's option. If coil rods/bolts are left in place, coil rods/bolts must have at least 2 1/2" of cover to top of finish grade. Grading bolts are inadequate to carry all conceivable screed/construction loads. Panel support method must be calculated, location identified, and placed on shop drawings. Method chosen to support panels must be adequate for all construction loads. Panel support method must be placed/constructed after final grading and before screed rail placement.
- ⑲ Unless shown otherwise on Span Details.



CONSTRUCTION NOTES:

Placing panels adjacent to expansion joints and bent centerlines prior to completing interior panel placement is recommended. Ensure proper cleaning of construction debris and consolidation of concrete mortar under the edges of the panels. Place sealing strips at girder flange edges so that adequate space is provided for the mortar to flow a minimum of 8" transversely under the panels as the slab concrete is placed. Panel placement with Option 1 on the PCP standard is not allowed. It is recommended to profile every 4 ft by surveying each girder under PCP(O) for proper grading of panels. To allow the proper amount of mortar to flow between girder and panel, maintain a minimum vertical opening of 1". Roadway cross-slope reduces the opening available for entry of the mortar. Sealing strips vary in thickness along girder are therefore required. Seal the top panel with a Class 4 sealant as shown in the Panel Layout.

MATERIAL NOTES:

Provide Grade 60 reinforcing steel in cast-in-place slab. See Table of Reinforcing Steel for size and spacing of reinforcement. If the reinforcing steel is shown on the Span Details to be epoxy coated, then epoxy coat bars A, G, M, & T. Provide bar laps, where required, as follows:
 Uncoated ~ #4 = 1'-7"
 Epoxy Coated ~ #4 = 2'-5"
 Provide sealing strips comprised of one layer low density polyurethane (1.0 Lbs density) foam sealing strips or equivalent. Oversize the height of sealing strips by 2". Bond sealing strips to the girder with 3M Scotch @ 4693 or equivalent adhesive compatible with sealing strips.

GENERAL NOTES:

Designed according to AASHTO LRFD Specifications. These details can be used as an option to construct the deck overhang when noted on the Span details and in conjunction with the PCP(O)-FAB, PCP and applicable Standard sheets. These details are only applicable for Prestr Conc I-Girders. Any additional reinforcement or concrete required on these details is subsidiary to the bid item "Reinforced Concrete Slab".

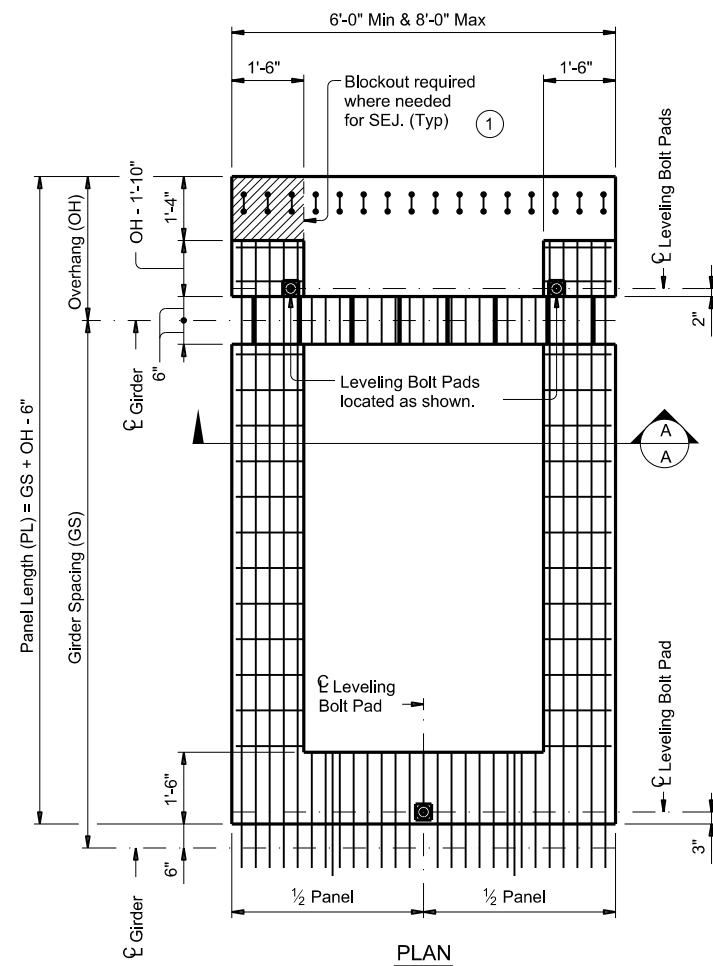
Cover dimensions are clear dimensions, unless noted otherwise. Reinforcing bar dimensions shown are out-to-out of bar.

HL93 LOADING SHEET 2 OF 2

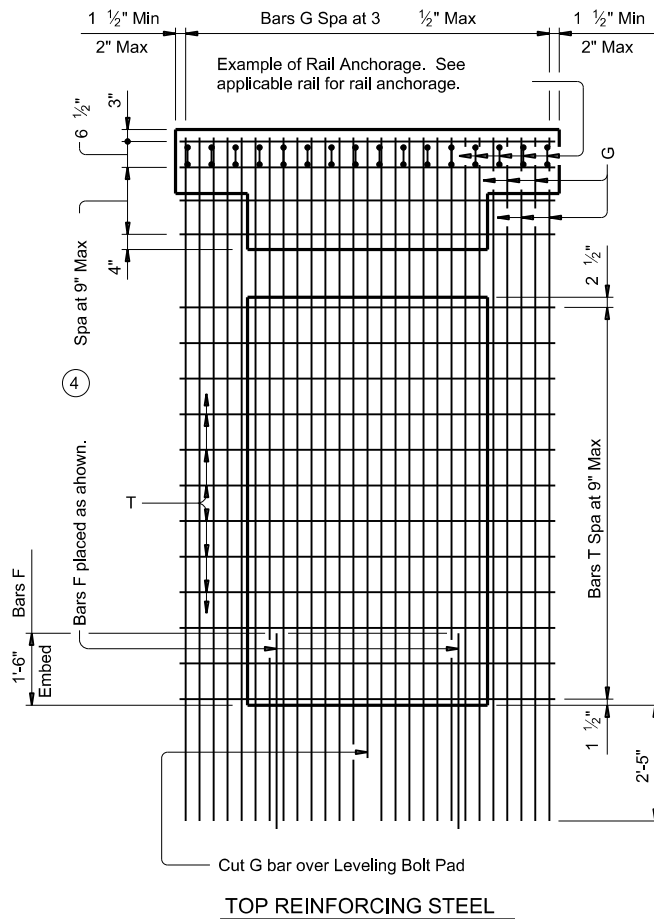
		Bridge Division	
<h2>PRECAST CONCRETE PANELS FOR OVERHANGS</h2>			
<h3>PCP(O)</h3>			
FILE: pcpostd1-17.dgn	DN: KLM	CK: DVL	DW: JTR
©TxDOT August 2017	CONT: 0910	SECT: 16	JOB: 139
REVISIONS	HIGHWAY: CR 1102		SHEET NO.: 78
DIST: TYLER	COUNTY: VAN ZANDT	SHEET NO.: 78	

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: 4/28/2023 5:14:03 PM
FILE: c:\bms\pwe-usecast-006\tony.tre\o\dms58523\pccpostd2-17-1.dgn

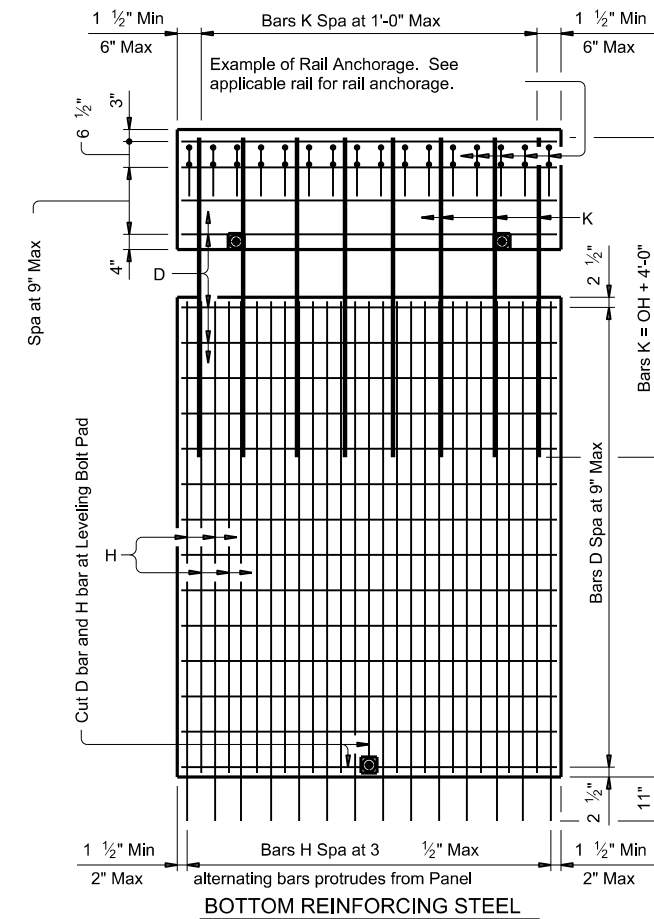


PLAN

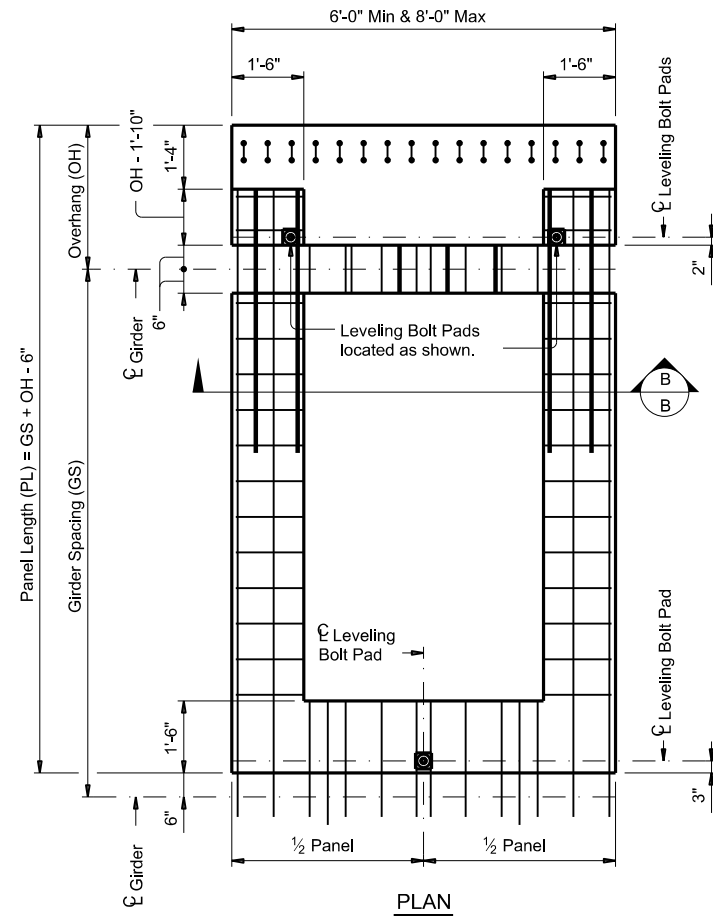


TOP REINFORCING STEEL

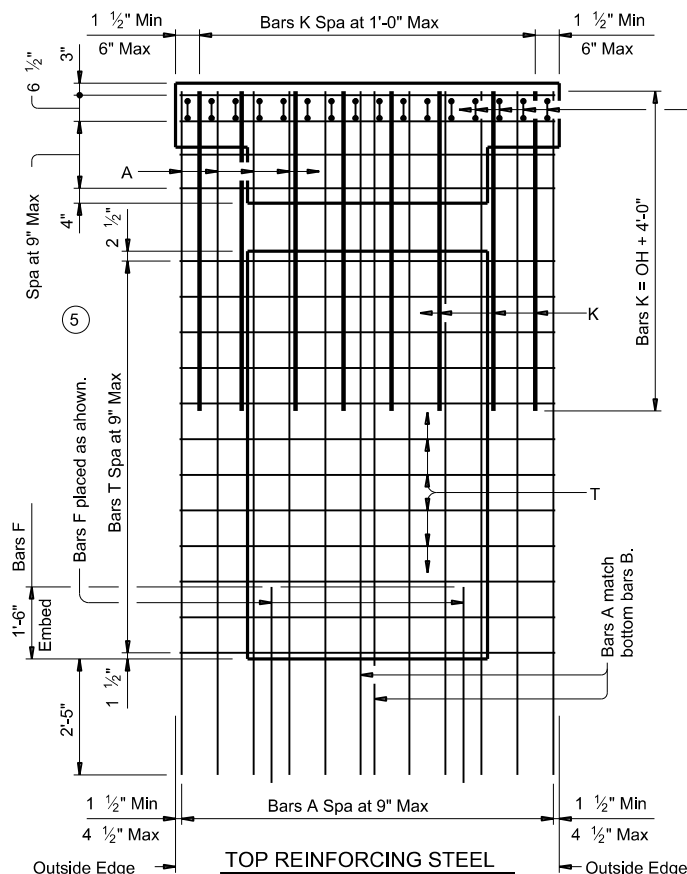
END PANEL



BOTTOM REINFORCING STEEL

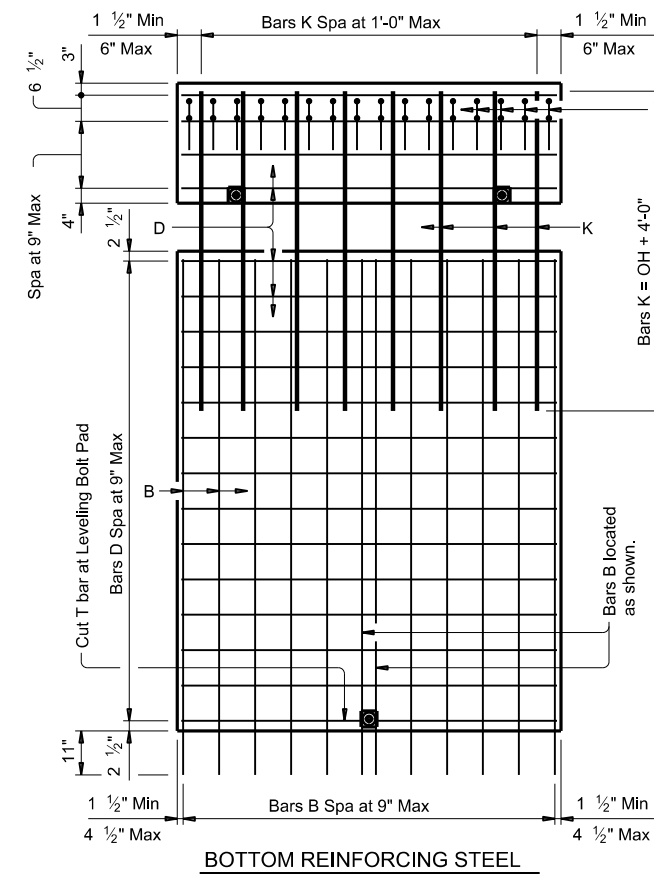


PLAN



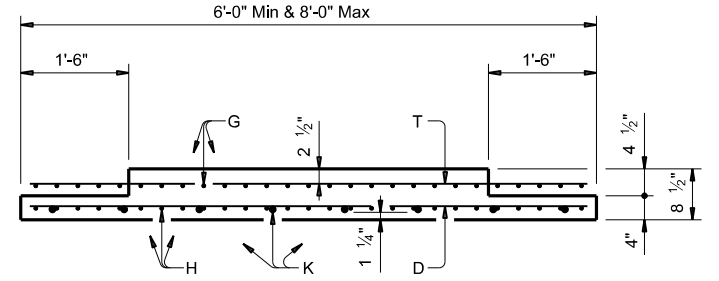
TOP REINFORCING STEEL

INTERIOR PANEL

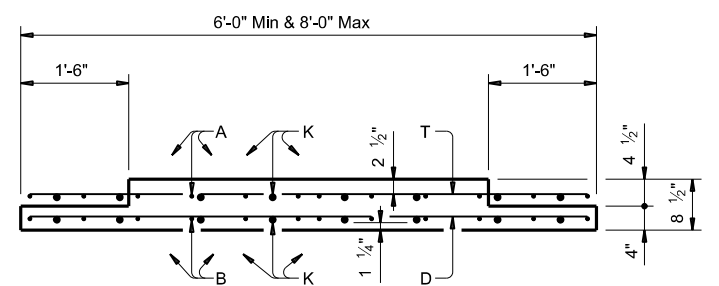


BOTTOM REINFORCING STEEL

- ① 1'-4" x 1'-6" x 4 1/2" blockout to accommodate SEJ that require an upturn. Contractor to communicate with fabricator the location and type of SEJ to be utilized.
- ② 1 1/2" End Cover on bars. (Typ)
- ③ Bars that are not allowed to have lap splices.
- ④ Place F bars under bars T and against bars G.
- ⑤ Place F bars under bars T and between bars A.



SECTION A-A



SECTION B-B

HL93 LOADING SHEET 1 OF 2

Texas Department of Transportation Bridge Division

PRECAST CONCRETE PANELS FOR OVERHANGS FABRICATION DETAILS

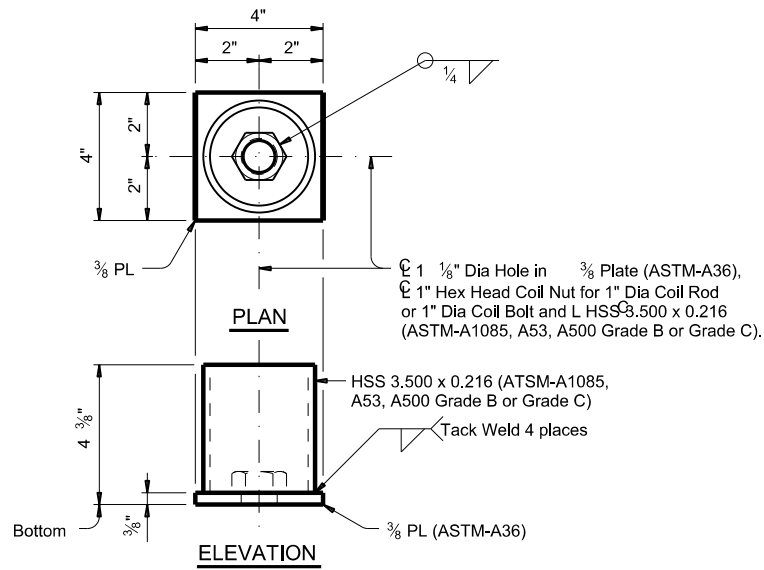
PCP(O)-FAB

FILE: pccpostd2-17.dgn	DN: KLM	CK: DVL	DW: JTR	CK: KLM
©TxDOT August 2017	CONT	SECT	JOB	HIGHWAY
REVISIONS	0910	16	139	CR 1102
DIST	COUNTY	SHEET NO.		
TYLER	VAN ZANDT	79		

BAR	SIZE
A (2)	#4
B (2)	#4
D (2,3)	#4
F (3)	#3
G (2)	#4
H (2)	#4
K (2,3)	#8
T (2,3)	#4

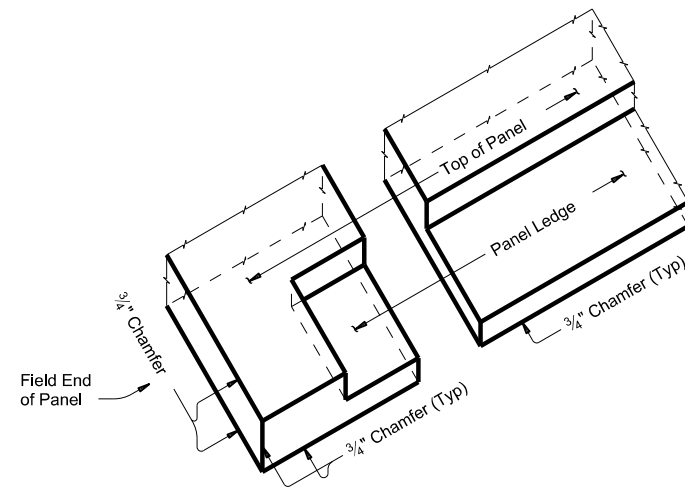
DISCLAIMER: The use of this standard is governed by the "Texas Engineering Practice Act". No warranty of any kind is made by TxDOT for any purpose whatsoever. TxDOT assumes no responsibility for the conversion of this standard to other formats or for incorrect results or damages resulting from its use.

DATE: 4/28/2023 5:14:20 PM
 FILE: c:\bms\pwe-useast-006\tony.tre\o\dms58523\pcpostd2-17-2.dgn



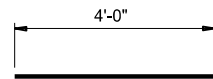
LEVELING BOLT PAD DETAILS

Galvanize if epoxy coated reinforcing steel is used in slab. Do not oil this assembly.

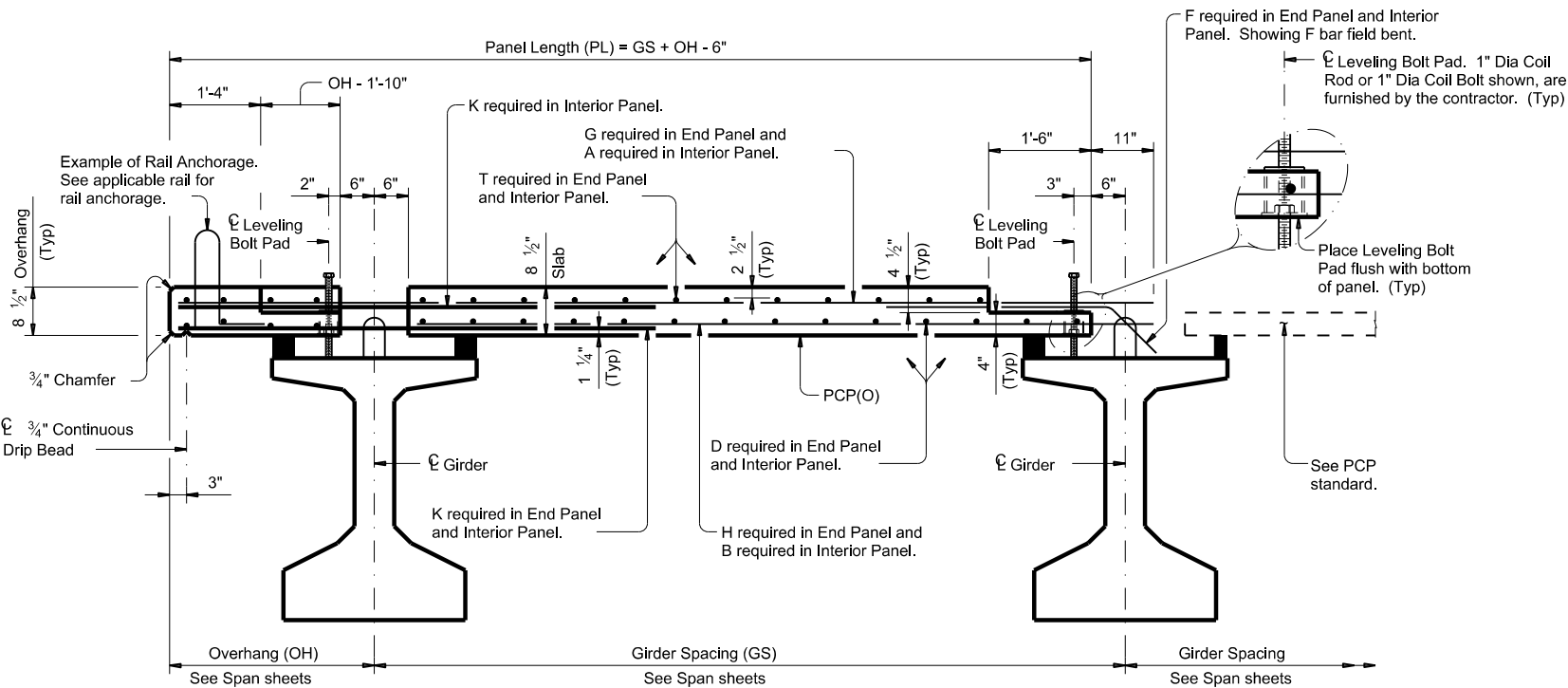


ISOMETRIC VIEW AT CORNER OF PANEL

Showing Typical Chamfers on Panel. Drip Bead and reinforcing steel not shown for clarity.



BARS F



TYPICAL TRANSVERSE SECTION

(Showing Girder Type Tx46)

CONSTRUCTION/FABRICATION NOTES:

Remove laitance from top panel surface.
 Finish top surface area of panel with a broom finish.
 Finish top ledge of panel to a roughness between a No. 6 and No. 9 concrete surface profile, inclusive, as specified by the International Concrete Repair Institute (ICRI).
 Provide 3/4" concrete chamfers as shown on these details.
 Do not lap splice bars D, F, K & T. Bars A, B, G & H, may be spliced with only one lap splice allowed on each bar.
 Panels must be fabricated by a fabricator meeting the requirements of DMS 7300 for Multi-Project Nonstressed Member Fabrication Plant.

MATERIAL NOTES:

Provide Class H concrete (f'c=4000 psi) in panels. Provide Class H (HPC) concrete for panels if required elsewhere in plans. Maximum large aggregate size is 1".
 Provide material as shown on this standard for the Leveling Bolt Pad.
 Provide Grade 60 conventional reinforcing steel.
 Provide epoxy coated reinforcement for bars A, B, D, G, H, K & T if slab reinforcement is epoxy coated.
 An equal area and spacing of deformed Welded Wire Reinforcement (WWR) ASTM-A1064 may be substituted for bars A, B, D, G, H & T, unless otherwise noted. Bars F and K can not be replaced with WWR.
 Galvanize leveling bolt pad assembly if epoxy-coated reinforcing steel is used in slab.

GENERAL NOTES:

Designed according to AASHTO LRFD Specifications. These details are only applicable for Prestr Conc I-Girders. Any additional reinforcement, lifting devices or epoxy coated reinforcement required on these details are subsidiary to the bid item "Reinforced Concrete Slab".
 See railing details for rail anchorage in panel overhang. A panel layout which identifies location of each panel must be developed by the fabricator. Permanently mark each panel in accordance with the panel layout. A copy of the layout is to be provided to the Engineer.
 Submit stable lifting methods and devices to the Engineer for approval.
 Shop drawings for the fabrication of panels will require the Engineer's approval.

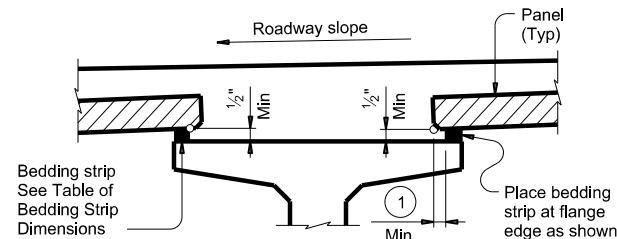
Cover dimensions are clear dimensions, unless noted otherwise.
 Reinforcing bar dimensions shown are out-to-out of bar.

HL93 LOADING SHEET 2 OF 2

<p>PRECAST CONCRETE PANELS FOR OVERHANGS FABRICATION DETAILS</p>			
<p>PCP(O)-FAB</p>			
FILE: pcpostd2-17.dgn	DN: KLM	CK: DVL	DW: JTR
©TxDOT August 2017	CONT	SECT	JOB
REVISIONS	0910	16	139
DIST	COUNTY	SHEET NO.	
TYLER	VAN ZANDT	80	

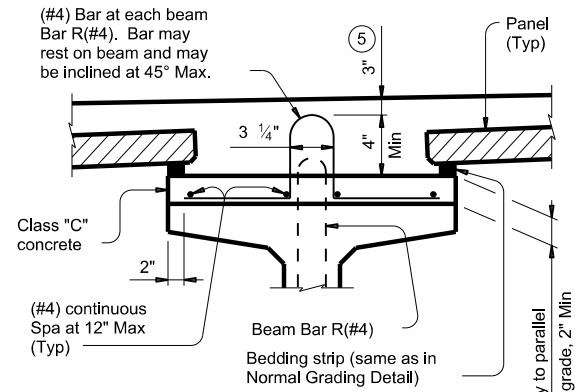
DISCLAIMER: The use of this standard is governed by the "Texas Engineering Practice Act". No warranty of any kind is made by TxDOT for any purpose whatsoever. TxDOT assumes no responsibility for the conversion of this standard to other formats or for incorrect results or damages resulting from its use.

DATE: 4/28/2023 5:14:34 PM
 FILE: c:\bms\pwe-useast-006\tony.tre\o\dms58523\pcpsr\del-19-1.dgn



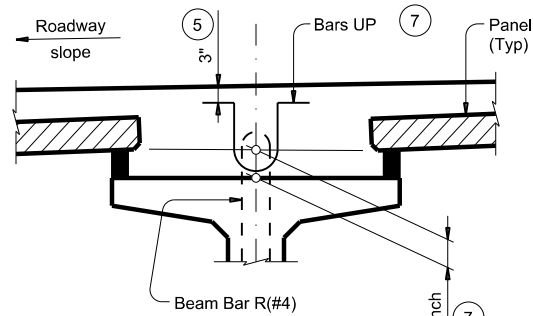
NORMAL GRADING DETAIL

Showing prestressed concrete I-girders.
 (Other beam types similar)



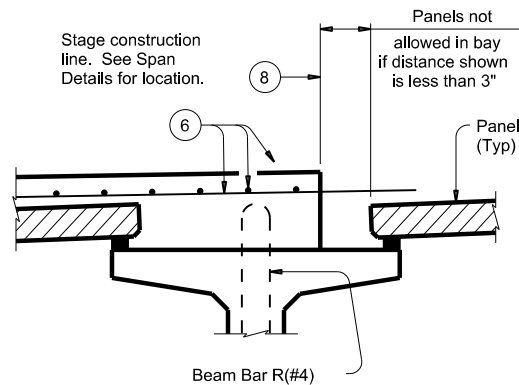
SPECIAL GRADING DETAIL FOR CONCRETE BEAMS

Showing prestressed concrete I-girders.
 (Other beam types similar)



HAUNCH REINFORCING DETAIL

Showing prestressed concrete I-girders.
 (Other beam types similar)



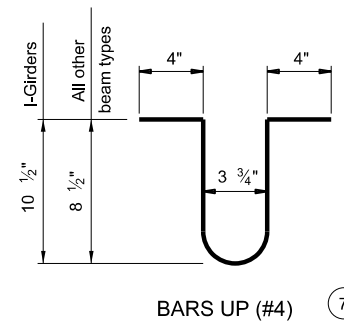
PRESTR CONC I-GIRDERS

STAGE CONSTRUCTION LIMITATIONS

(Other beam types similar)

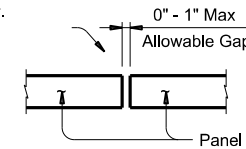
WIDTH	HEIGHT (4)	
	Min	Max
1" (Min)	1/2"	2"
1 1/4"	1/2"	2 1/2"
1 1/2"	1/2"	3"
1 3/4"	1/2"	3 1/2"
2"	1/2"	4"
2 1/4"	1/2"	4 1/2"
2 1/2"	1/2"	5"
2 3/4"	1/2"	5 1/2"
3" (Max)	1/2"	6"

- 1 2" Min for I-girders, 1 1/2" Min for all other beam types.
- 2 Allowed for I-girders, not allowed on other beam types.
- 3 To reduce the quantity of cast-in-place concrete, bedding strip thickness may be increased in 1/4" increments. Bedding strips must be comprised of one layer. Bond bedding strips to the beams with an adhesive compatible with bedding strips. Bedding strips over 2.5" high may need to be bonded to panels. The same thickness strip must be used under any one panel edge and the maximum change in thickness between adjacent panels is 1/4". Alternatively, bedding strips may be cut to grade. Panels may be supported by an alternate method, using a commercial product, if approved by the Engineer of Bridge Design, Bridge Division. If bedding strips exceed 6" high for I-Girders, 4" high for all other beam types, use Special Grading Detail for Concrete Beams or submit an alternate method to the Bridge Division for approval.
- 4 Height must not exceed twice the width.
- 5 Provide clear cover as indicated unless otherwise shown on Span Details.
- 6 See Span Details and Thickened Slab End Details for top slab reinforcement and clear cover. Transverse top slab reinforcement may rest on top of prestressed concrete panels if necessary to maintain clear cover.
- 7 Space Bars UP(#4) with Beam Bars R(#4) in all areas where measured haunch exceeds 3 1/2" with I-girders, and 3" for all other beam types. Epoxy coating for Bars UP is not required.
- 8 Do not locate construction joints on top of a panel.
- 9 Butt adjacent bedding strips together with adhesive. Cut v-notches, approx 1/4" deep, in the top of the bedding strips at 8' o.c..



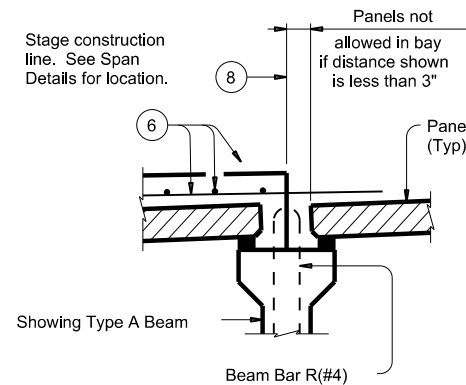
BARS UP (#4)

Seal joint between panels when gap exceeds 1/4" with polyurethane sealant or expanding foam sealer. Make seal flush with top of panel.



PANEL JOINTS

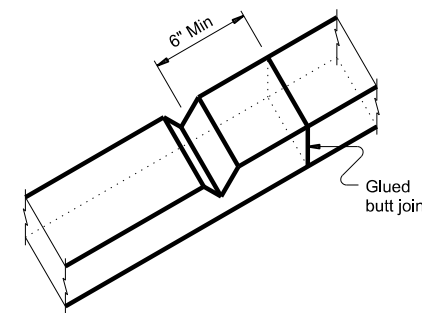
(Panel reinforcing not shown for clarity. The gap cannot be considered as a panel fabrication tolerance. Adjust panel placement to minimize joint openings.)



PRESTR CONC I-BEAMS

STAGE CONSTRUCTION LIMITATIONS

(Other beam types similar)



BEDDING STRIP DETAIL

9

CONSTRUCTION NOTES:

Erected panels must bear uniformly on bedding strips of extruded polystyrene placed along top flange edges. Placing panels to minimize joint openings is recommended. If additional blocking is needed, special grading details for supporting the panels and extra reinforcing between beam and slab will be considered subsidiary to deck construction.

Bars U, shown on PCP-FAB, may be bent over or cut off if necessary.

Care must be taken to ensure proper cleaning of construction debris and consolidation of concrete material under the edges of the panels. Bedding strips must be placed at beam flange edges so that adequate space is provided for the mortar to flow a minimum of 1 1/2" under the panels as the slab concrete is placed.

To allow the proper amount of mortar to flow between beam and panel, the minimum vertical opening must be at least 1/2". Roadway cross-slope reduces the opening available for entry of the mortar. Bedding strips varying in thickness across the beam are therefore required.

For clear span between U-beams less than or equal to 18", see Permissible Slab Forming Detail on Miscellaneous Slab Detail sheets, UBMS.

MATERIAL NOTES:

Provide Grade 60 reinforcing steel in the cast-in-place slab. See Table of Reinforcing Steel for size and spacing of reinforcement.

If the top and bottom layer of reinforcing steel is shown on the Span Details to be epoxy coated, then the D, E, P, & Z bars must be epoxy coated.

Provide bar Laps, where required, as follows:

- Uncoated ~ #4 = 1'-7"
- Epoxy Coated ~ #4 = 2'-5"

GENERAL NOTES:

Designed according to AASHTO LRFD Bridge Design Specifications.

Panel placement may follow either Option 1 or Option 2 except Option 1 must be used if the skew exceeds 45 degrees.

Use of Prestressed Concrete Panels is not permitted for horizontally curved steel plate or tub girders. See Span Details for other possible restrictions on their use.

These details are to be used in conjunction with the Span Details, PCP-FAB and other applicable standard drawings.

When panel support (bedding strips) deviates from what is shown herein, provide details signed and sealed by a professional Engineer.

Any additional reinforcement or concrete required on this standard is considered subsidiary to the bid item "Reinforced Concrete Slab".

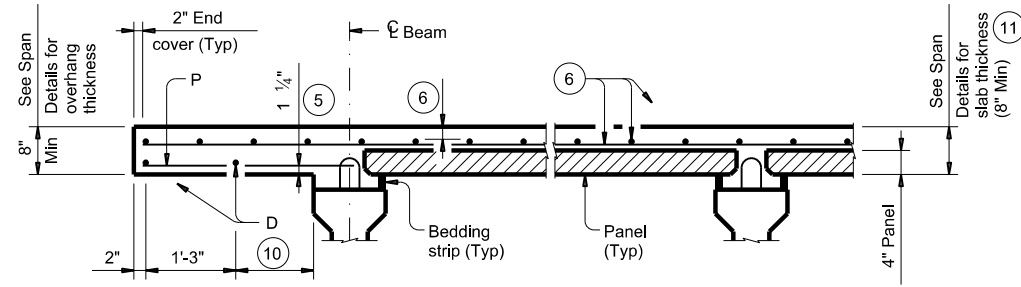
Cover dimensions are clear dimensions, unless noted otherwise.
 Reinforcing bar dimensions shown are out-to-out of bar.

HL93 LOADING SHEET 1 OF 4

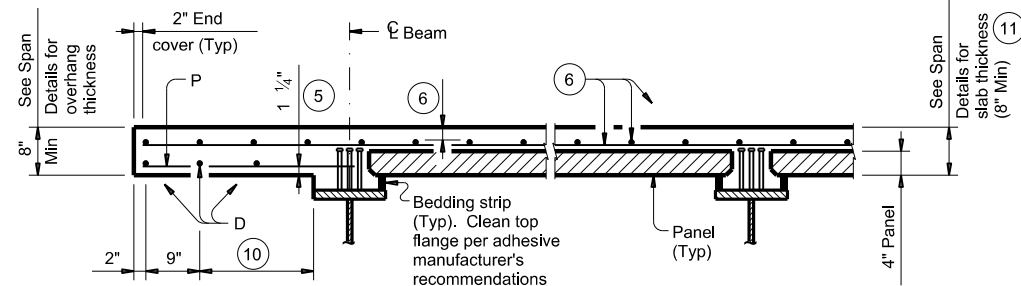
		Bridge Division Standard	
PRESTRESSED CONCRETE PANELS DECK DETAILS			
PCP			
FILE: pcpsr\del-19.dgn	DN: TxDOT	CK: TxDOT	DW: JTR
©TxDOT April 2019	CONT	SECT	JOB
REVISIONS	0910	16	139
DIST	COUNTY	SHEET NO.	
TYLER	VAN ZANDT	81	

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.

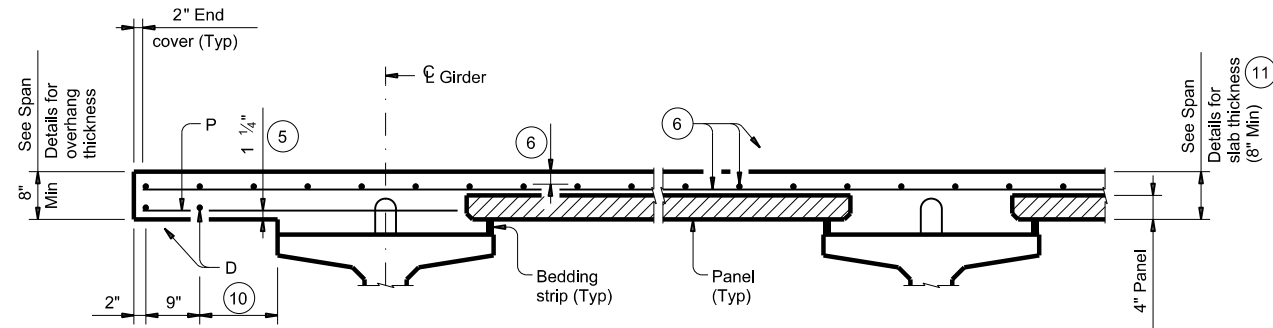
DATE: 4/28/2023 5:14:50 PM
 FILE: c:\bms\pwe-useast-006\tony.trejo\dms58523\pcps1de1-19-2.dgn



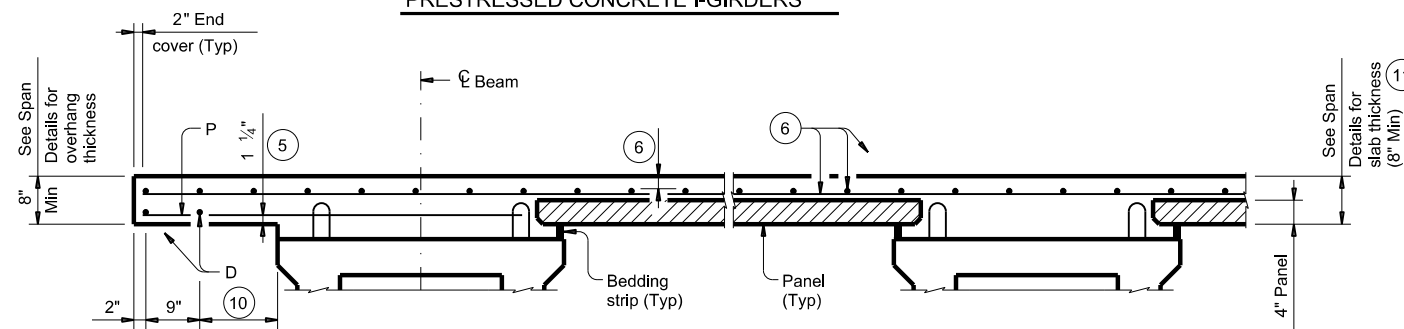
PRESTRESSED CONCRETE I-BEAMS



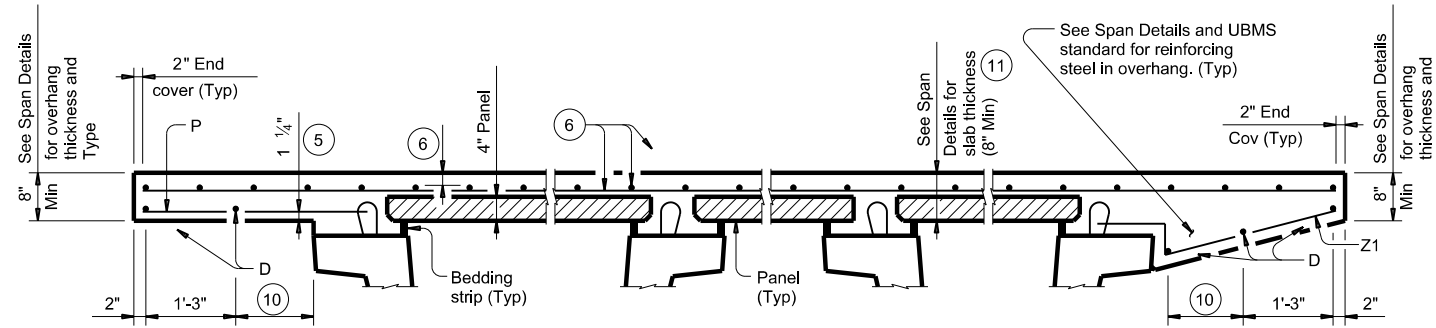
STEEL BEAMS



PRESTRESSED CONCRETE I-GIRDERS



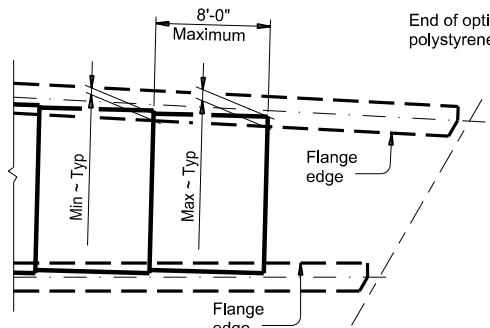
PRESTRESSED CONCRETE X-BEAMS



NORMAL OVERHANG WITH PRESTR CONC U-BEAMS

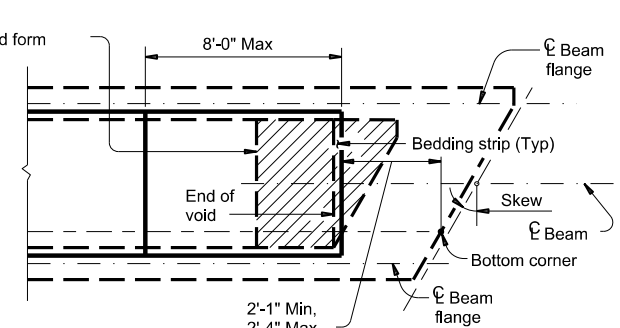
TYPICAL PART TRANSVERSE SECTIONS

SLOPED OVERHANG WITH PRESTR CONC U-BEAMS

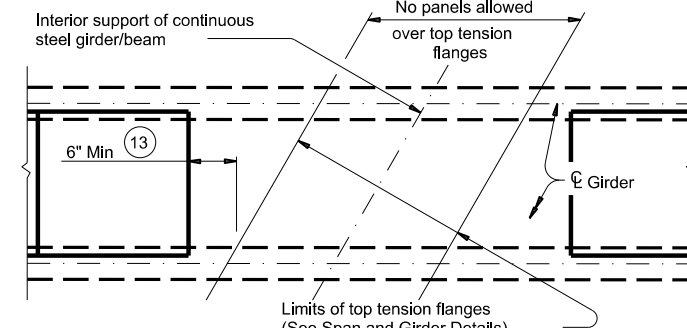


AT FLARED BEAMS OR GIRDERS

See PCP-FAB standard for Min and Max dimensions based on beam/girder type.



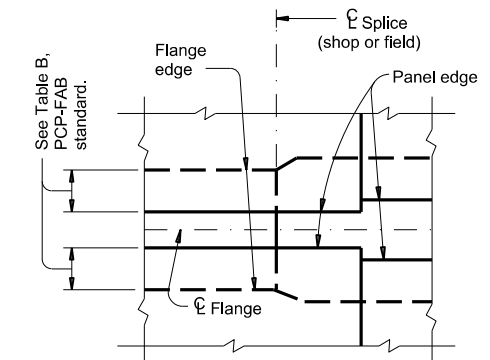
OVER CONC U-BEAMS



AT INT SUPPORTS OF CONTINUOUS STEEL GIRDERS

PART PLANS OF PANEL PLACEMENT

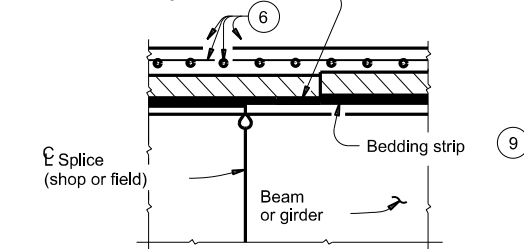
- 5 Provide clear cover as indicated unless otherwise shown on Span Details.
- 6 See Span Details and Thickened Slab End Details for top slab reinforcement and clear cover. Transverse top slab reinforcement may rest on top of prestressed concrete panels if necessary to maintain clear cover.
- 9 Butt adjacent bedding strips together with adhesive. Cut v-notches, approx 1/4" deep, in the top of the bedding strips at 8' o.c..
- 10 Equally space additional bar if more than 1'-3" Max.
- 11 The actual thickness constructed may exceed the slab thickness shown on the Span Details but the extra thickness may be no more than 2" (1" for prestressed concrete U-beams and steel beams). Bearing seat elevations or finished grade may be adjusted.
- 12 Field adjust Bars Z1(#4) to match actual slope of slab overhangs. Width of slab overhang will vary along span with curved slab edges. Adjust Bar Z1(#4) dimensions to maintain proper cover. Bars Z2(#4) are located at Inverted-Tee stems only.
- 13 Location of concrete placement sequence boundaries and bolted field splices should be considered by the contractor in determining panel limits.



PLAN AT SPLICE

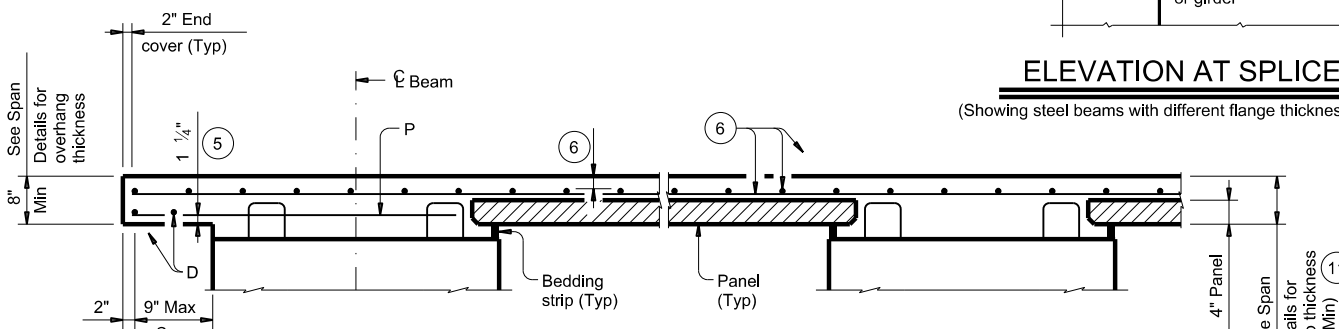
(Showing steel beams with flange width transition)

Cut bedding strip to adjust for difference in flange thickness.



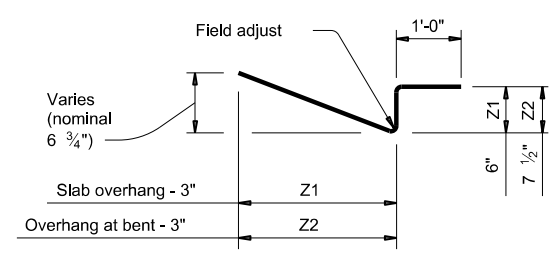
ELEVATION AT SPLICE

(Showing steel beams with different flange thickness)



PRESTRESSED CONCRETE SPREAD SLAB BEAMS

Bars P over exterior beams are still required when no overhang is used. In this case, only one Bar D, 2" from slab edge, is required.



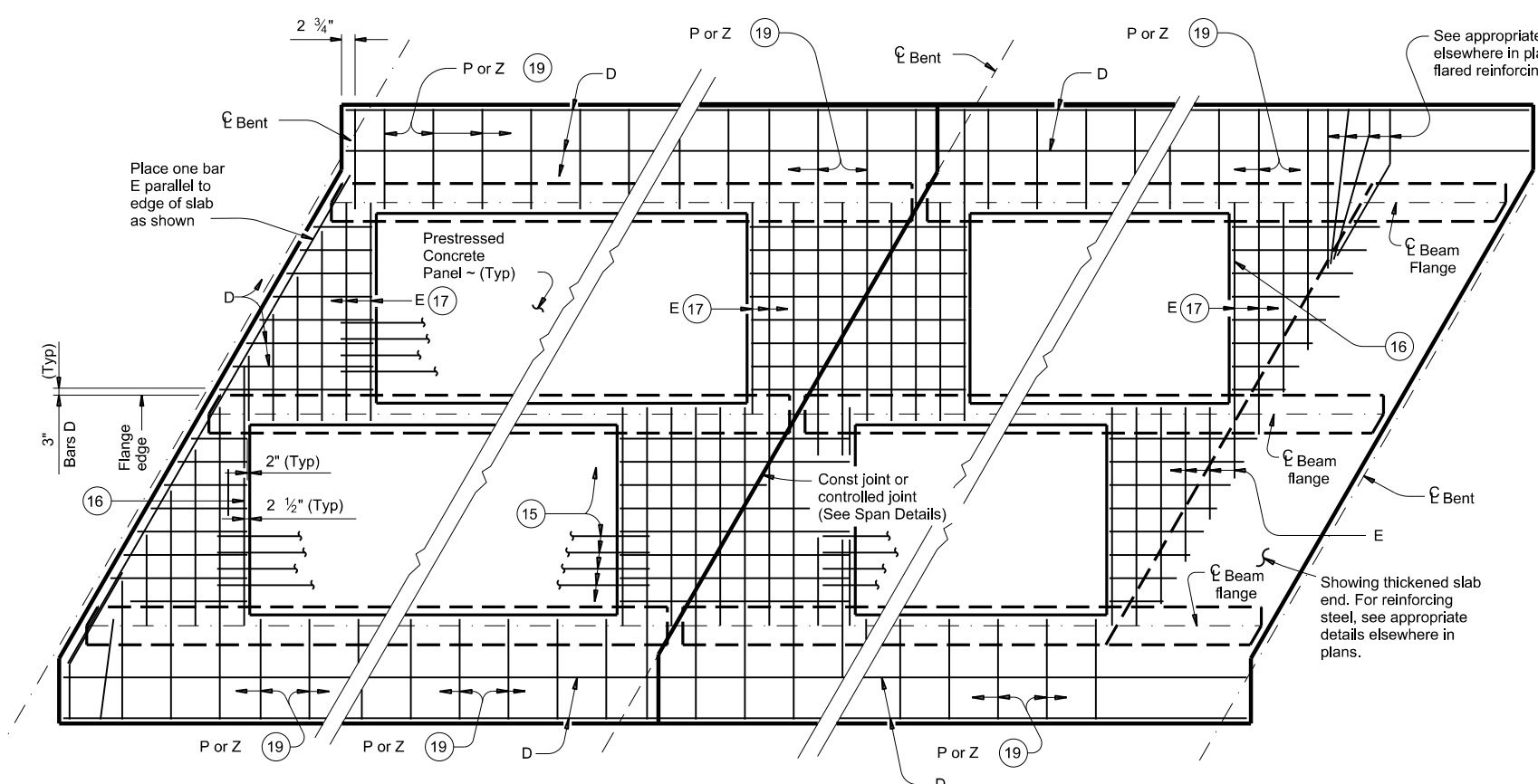
BARS Z (#4) 12

HL93 LOADING SHEET 2 OF 4

		Bridge Division Standard	
<h2>PRESTRESSED CONCRETE PANELS DECK DETAILS</h2>			
<h3>PCP</h3>			
FILE: pcps1de1-19.dgn	DN: TxDOT	CK: TxDOT	DW: JTR
©TxDOT April 2019	CON: 0910	SECT: 16	JOB: 139
REVISIONS	CR: 1102	HIGHWAY	
DIST: TYLER	COUNTY: VAN ZANDT	SHEET NO. 82	

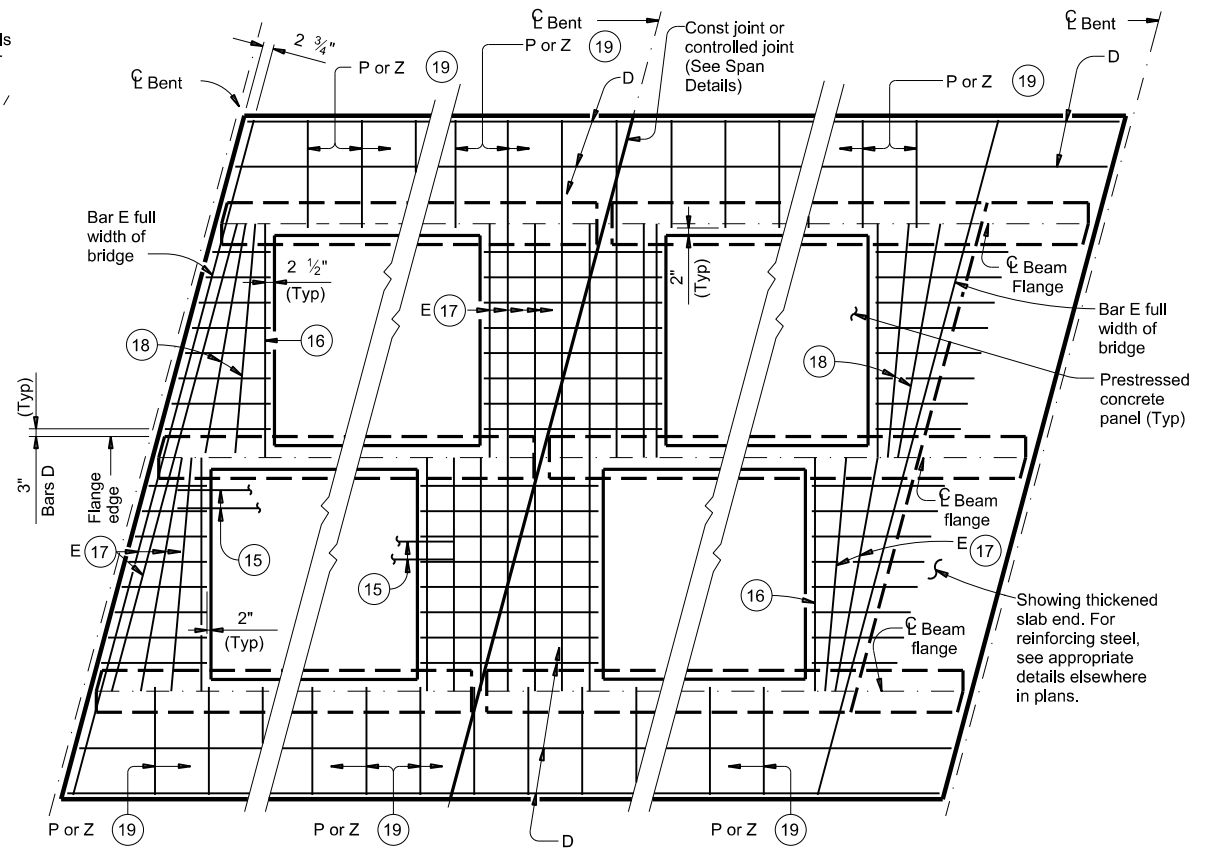
DISCLAIMER: The use of this standard is governed by the "Texas Engineering Practice Act". No warranty of any kind is made by TxDOT for any purpose whatsoever. TxDOT assumes no responsibility for the conversion of this standard to other formats or for incorrect results or damages resulting from its use.

DATE: 4/28/2023 5:15:04 PM
 FILE: c:\bms\pwe-useast-006\tony.tre\o\dms58523\pcpsr\del-19-3.dgn



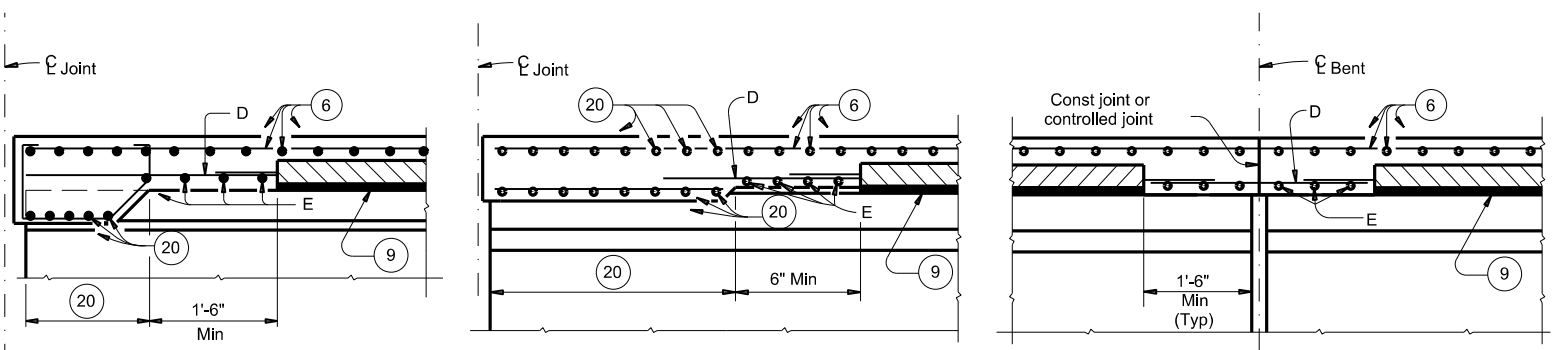
AT ALL SPAN ENDS UNLESS NOTED OTHERWISE AT INTERIOR BENTS AT THICKENED END SLABS

OPTION 1 ~ PLAN OF SLABS WITH NORMAL REINFORCEMENT

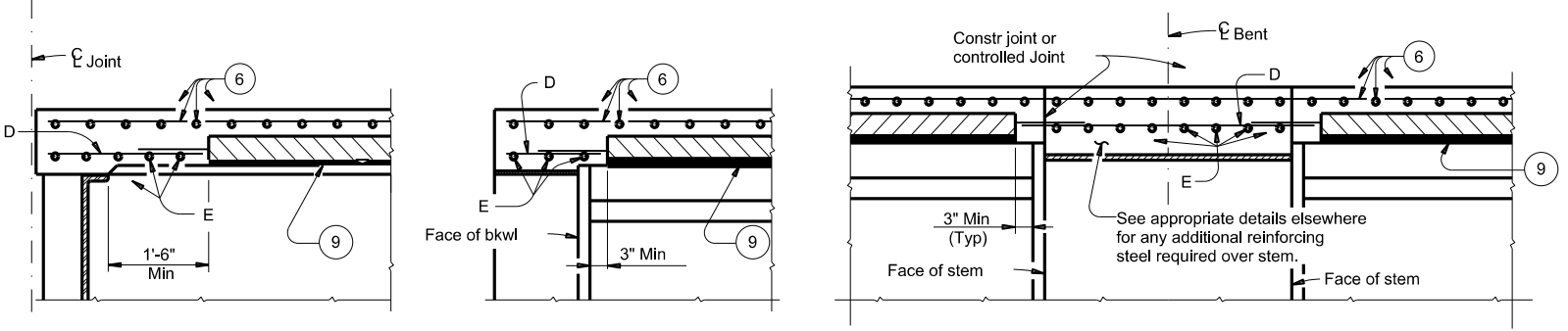


AT ALL SPAN ENDS UNLESS NOTED OTHERWISE AT INTERIOR BENTS AT THICKENED END SLABS

OPTION 1 ~ PLAN OF SLABS WITH SKEWED REINFORCEMENT



AT THICKENED SLAB ENDS FOR PRESTR CONC U-BMS AT THICKENED SLAB ENDS FOR PRESTR CONC I-BMS AND STEEL BMS AT SLAB CONTINUOUS OVER CONVENTIONAL INTERIOR BENTS FOR ALL SIMPLE SPAN BMS



AT CONVENTIONAL END DIAPHRAGMS FOR STEEL BMS AT SLAB OVER ABUTMENT BACKWALL FOR ALL BMS AT SLAB CONTINUOUS OVER INVERTED-T BENTS FOR ALL BMS

OPTION 1 ~ ELEVATIONS AT BEAM ENDS

- 6 See Span Details and Thickened Slab End Details for top slab reinforcement and clear cover. Transverse top slab reinforcement may rest on top of prestressed concrete panels if necessary to maintain clear cover.
- 9 Butt adjacent bedding strips together with adhesive. Cut v-notches, approx 1/4" deep, in the top of the bedding strips at 8' o.c.
- 14 Max Spacing as listed unless otherwise shown.
- 15 At connection with cast-in-place slab, extend longitudinal panel reinforcement. See PCP-FAB for details.
- 16 Maintain one Bar E(#4) parallel to panel ends (Typ).
- 17 Bars E(#4) not continuous over beam flanges must overlap beam flange 6" Min.
- 18 Add flared Bars E(#4) (Min Spa = 6", Max Spa = 12") as required at panel ends.
- 19 Where possible, Bars E(#4) may be extended into overhangs to replace Bars P(#4). Bars Z(#4) are required for sloped overhangs with U-Beams.
- 20 See appropriate thickened slab end details for reinforcing and limits of thickened slab end.

TABLE OF REINFORCING STEEL (14)		
BAR	SIZE	Max Spa (in.)
D	#4	9
E	#4	9
P	#4	18
UP	#4	~
Z	#4	18

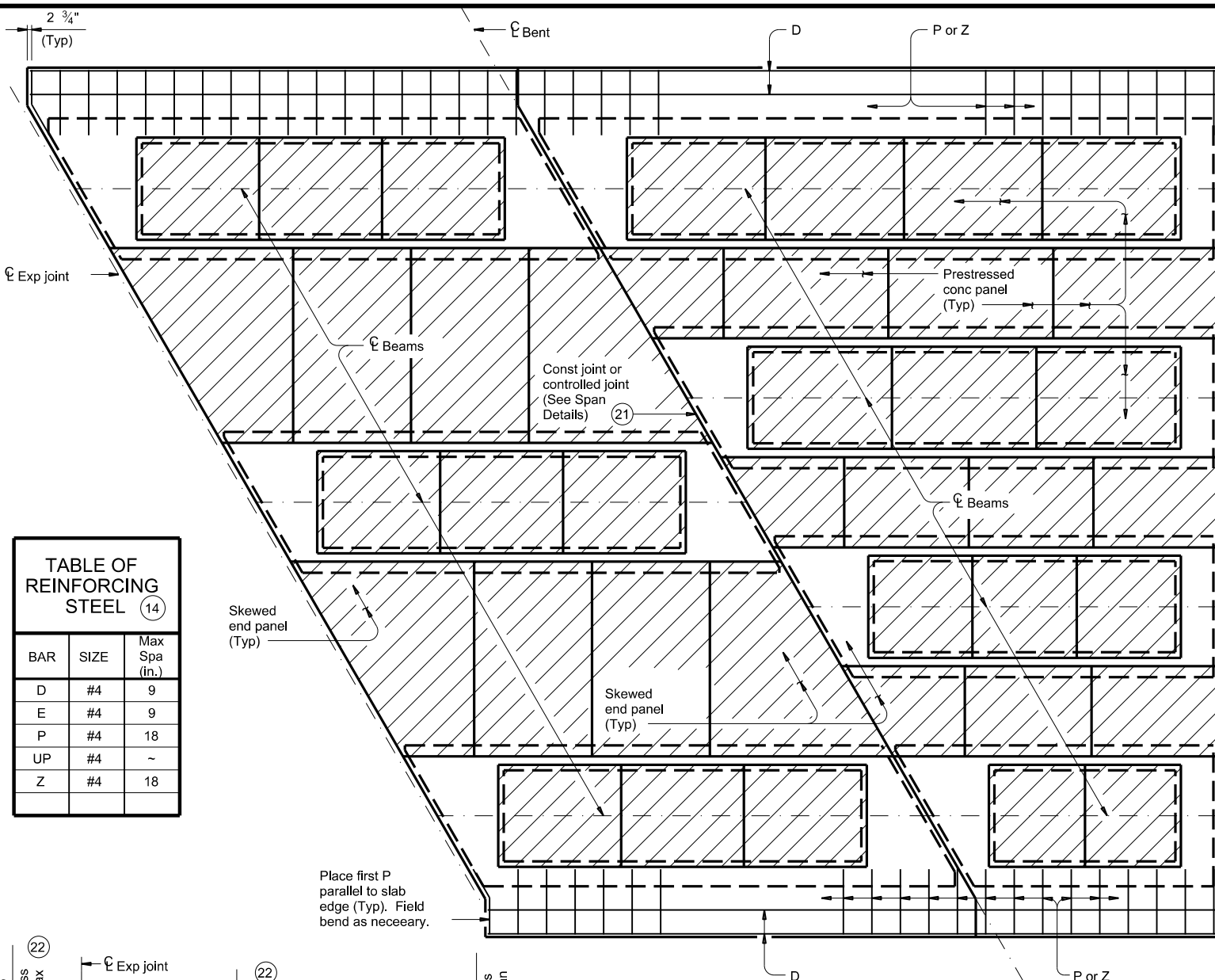
HL93 LOADING SHEET 3 OF 4

Texas Department of Transportation
 PRESTRESSED CONCRETE PANELS DECK DETAILS
 PCP

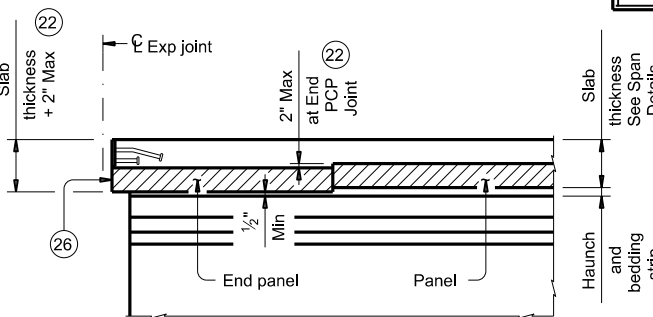
FILE: pcpsr\del-19.dgn	DN: TxDOT	CK: TxDOT	DW: JTR	CK: JMH
©TxDOT April 2019	CONT	SECT	JOB	HIGHWAY
REVISIONS	0910	16	139	CR 1102
DIST	COUNTY	SHEET NO.		
TYLER	VAN ZANDT			83

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: 4/28/2023 5:15:19 PM
 FILE: c:\bms\pwe-useast-006\tony.tre\o\dms58523\pcpsdte1-19-4.dgn

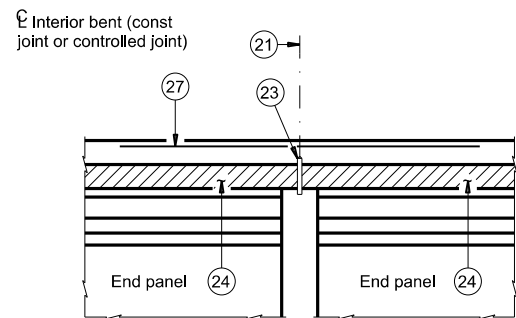


BAR	SIZE	Max Spa (in.)
D	#4	9
E	#4	9
P	#4	18
UP	#4	~
Z	#4	18

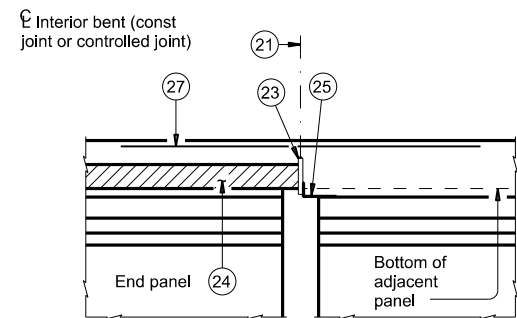


JOINTS (BETWEEN BEAMS/GIRDERS OR AT INV-T STEM)

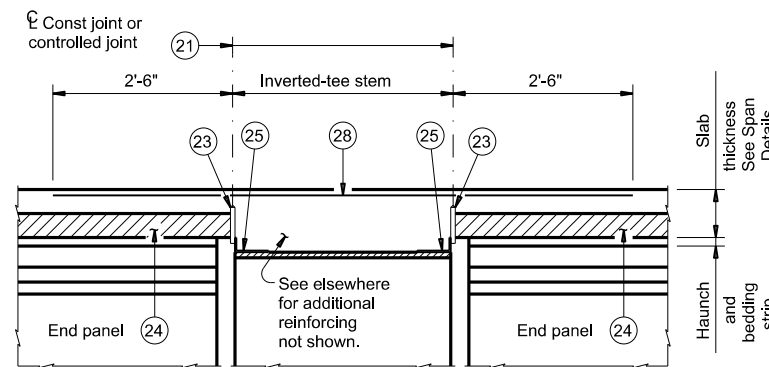
For SEJ-B, SEJ-M, SEJ-S(O), AJ, and Type A expansion joints only.



CONVENTIONAL INTERIOR BENT
 Panel against panel between beams/girders.



CONVENTIONAL INTERIOR BENT
 Panel against beam/girder end in adjacent span.

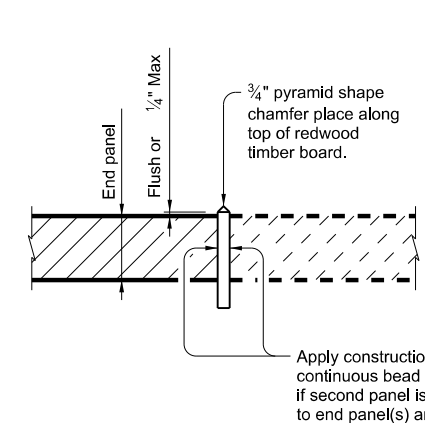


INVERTED-T BENT
 Panels against inverted-tee stem

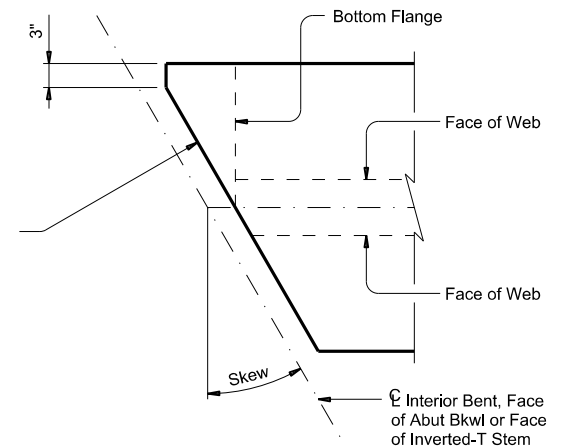
OPTION 2 ~ ELEVATIONS AT BEAM ENDS

ELEVATION EXAMPLE OF END PANEL AND TIMBER BOARD

See "Option 2 ~ Elevation At Beam Ends".



Skew top flange of Bms/Girders as shown for flange edge supporting a panel. Not applicable to flange edges on exterior side of fascia Bms/Girders.



OPTION 2 ~ SHOWING MODIFICATION TO BEAM/GIRDER TOP FLANGE FOR SKEWS OVER 5°

Showing I-Bm/I-Girder, U-Bms and Steel Bms similar.

- 6 See Span Details and Thickened Slab End Details for top slab reinforcement and clear cover. Transverse top slab reinforcement may rest on top of prestressed concrete panels if necessary to maintain clear cover.
- 14 Max Spacing as listed unless otherwise shown.
- 21 1 1/2" Vinyl or plastic joint former at controlled joints (Stress Cap, Zip Strip, Stress Lock, or equal as approved by the Engineer.)
- 22 End panel may be set up to 2" lower to accommodate expansion joint hardware, provided bedding strip is not less than 1/2" thick.
- 23 3/4" thick redwood timber board, leave in place. Redwood timber board placed flush with top of panel or within 1/4" Max above panel. Place 3/4" pyramid shape chamfer along top of timber board. See "Elevation Example of End Panel and Timber Board". Place straight, within 1/4" of centerline of bent or face of inverted-tee, across bridge width and end board at exterior flange edge of fascia beams/girders. Do not extend into overhang.
- 24 Place panel within 1/2" of 3/4" thick board.
- 25 Permanent galvanized steel sheet form. Removable formwork is acceptable.
- 26 Place end panel within 1/2" of expansion joint opening. End panel cannot encroach on required expansion joint opening.
- 27 Place additional (#4) bar 5'-0" in length between every slab bars T. Center (#4) bar on Joint.
- 28 Place additional (#4) bar continuous 2'-6" beyond each side of Inverted-T Stem between every slab bars T.

SPECIAL OPTION 2 CONSTRUCTION NOTES:

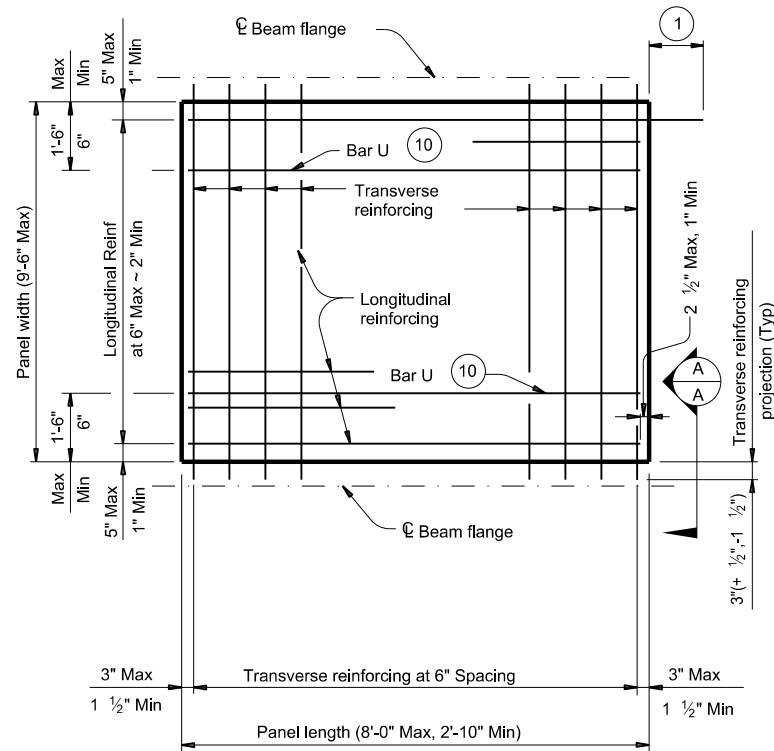
When Option 2 is chosen bottom mat of thickened end slab reinforcing is not required. Use the same top mat as shown on the Thickened Slab End Details sheet.
 Placing panels adjacent to expansion joints and bent centerlines prior to completing interior panel placement is recommended. Saw cutting panels to fit is acceptable when approved by the Engineer. Minimum distance from a saw cut edge to a panel strand is 1 1/2".
 Do not extend the longitudinal panel reinforcement into the cast-in-place slab.
 Top flanges of beams and girders on skewed bridges must be modified as shown on this drawing. The Contractor is responsible for coordinating this modification with the beam fabricator prior to submitting shop drawings for approval.
 Fabricator may optionally skew the whole end. When electing to skew whole end, girder end details and bearing type at conventional interior bent must be changed to use condition at abutment. Fabricator must coordinate change in bearing type, bearing centerline location, and dowel location with Engineer and Contractor. Show appropriate changes on girder and bearing shop drawings.
 Bending of anchor studs of expansion joints shown on standards AJ, SEJ-B, SEJ-M, and SEJ-S(O) is permissible if necessary to clear top of end panels. The Contractor is responsible for coordinating modifications with the joint fabricator. Submit shop drawings for approval when modifications to expansion joint hardware are made.
 Bedding strips under skewed end panels must conform to the requirements of Item 422 except their minimum compressive strength must be 60 psi.
 Provide Bars AA, G, K and OA from standard IGTS in the slab.

HL93 LOADING SHEET 4 OF 4

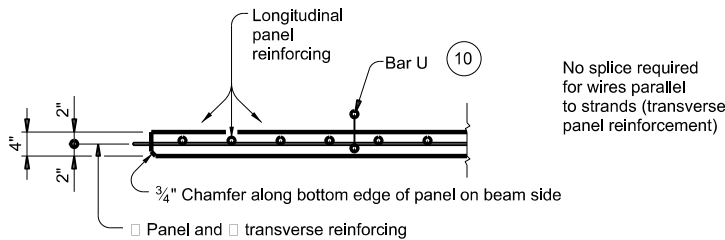
		Bridge Division Standard	
PRESTRESSED CONCRETE PANELS DECK DETAILS			
PCP			
FILE: pcpsdte1-19.dgn	DN: TxDOT	CK: TxDOT	DW: JTR
©TxDOT April 2019	CONT: 0910	SECT: 16	JOB: 139
REVISIONS	0910	16	139
DIST: TYLER	COUNTY: VAN ZANDT	SHEET NO. 84	

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: 4/28/2023 5:15:33 PM
 FILE: c:\bms\pwe-useast-006\tony.tre\o\dms58523\pcpstde2-19.dgn



TYPICAL NON-SKEWED PANEL PLAN

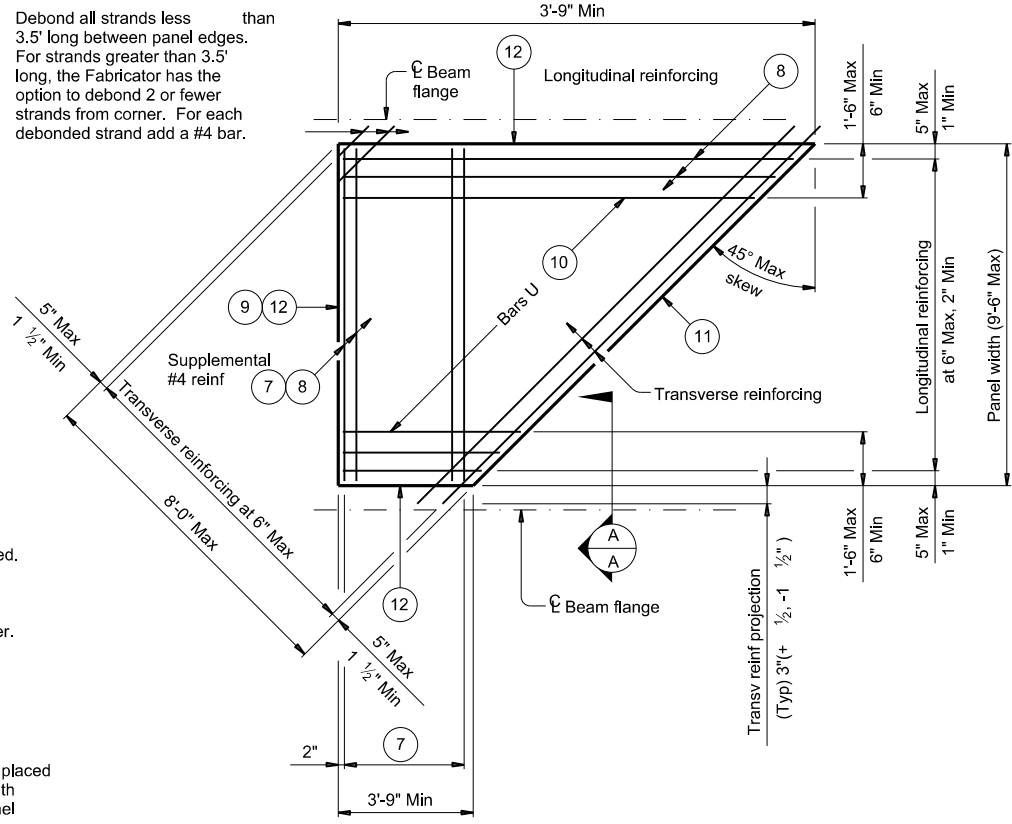


SECTION A-A

(Not showing supplemental #4 bars for skewed end panels.)

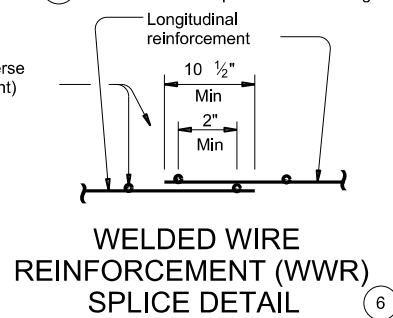
- 1 At connection with cast-in-place slab, extend longitudinal panel reinforcement 1'-0" (+2", -0") past panel end. Alternatively, provide (#3) x 2'-0" dowels at 6" Max Spacing and extend dowels 1'-0" past panel end.
- 2 Four loops required per panel.
- 3 Four loops required per panel. 3/8" or 1/2" strands may be used.
- 4 Normal dimensions must be used on spans with parallel beams. Maximum and Minimum dimensions apply only to spans with flared beams.
- 5 See Normal Grading Detail on PCP standard for lap requirements and bedding strip dimensions. Some laps shown in tables cannot utilize all bedding strip widths.
- 6 One Splice allowed per panel. No more than two sheets of WWR are allowed.
- 7 Provide (#4) bars under transverse reinforcing, 10 Spaces at 4" = 3'-4". Omit for 5 degree (1:12) skew and smaller.
- 8 End Cover 2 1/2" Max, 1" Min.
- 9 Recess strands on indicated panel edge in accordance with Item 424.
- 10 At the fabricator's option, Bars U may be placed parallel to transverse panel reinforcing with horizontal legs in plane of transverse panel reinforcing.
- 11 Use length of indicated panel edge as panel width for purpose of determining type of transverse reinforcing.
- 12 Timber form work permissible this edge.

Debond all strands less than 3.5' long between panel edges. For strands greater than 3.5' long, the Fabricator has the option to debond 2 or fewer strands from corner. For each debonded strand add a #4 bar.

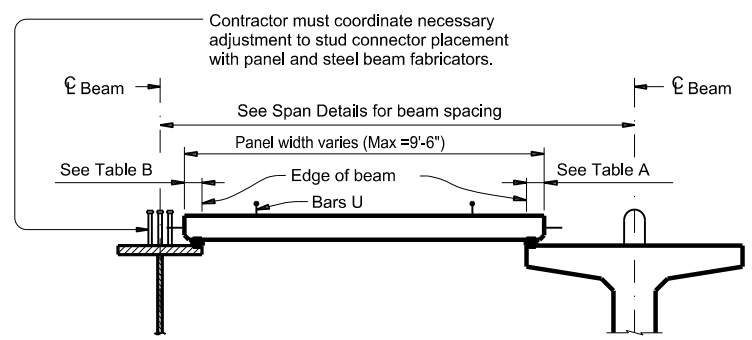


TYPICAL SKEWED END PANEL PLAN

(Only to be used with details shown elsewhere in the plans.)



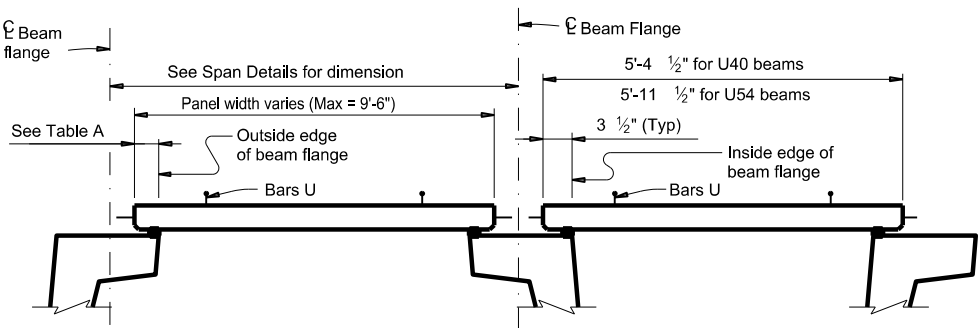
WELDED WIRE REINFORCEMENT (WWR) SPLICE DETAIL



STEEL BEAMS

PRESTRESSED CONCRETE BEAMS OR GIRDERS

Typ unless noted otherwise



PRESTRESSED CONCRETE U-BEAMS

TYPICAL SECTIONS FOR DETERMINING PANEL WIDTH

TABLE A		4	5
Beam Type	Normal (In.)	Min. (In.)	Max. (In.)
A	3	2 1/2	3 1/2
B	3	2 1/2	3 1/2
C	4	3	4 1/2
IV	6	4	7 1/2
VI	6 1/2	4 1/2	8 1/2
U40 - 54	5 1/2	5 1/2	7
Tx28-70	6	5	7 1/2
XB20 - 40	4	3	4 1/2
XSB12 - 15	4	3	4 1/2

TABLE B		4	5
Top Flange Width	Normal (In.)	Min. (In.)	Max. (In.)
11" to 12"	2 3/4	2 1/2	2 3/4
Over 12" to 15"	3 1/4	3	3 1/4
Over 15" to 18"	4	3	4 1/4
Over 18"	5	3 1/2	6 1/4

GENERAL NOTES:

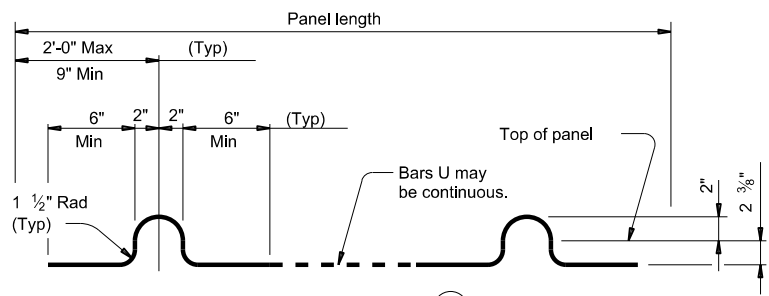
- Provide Class H concrete for panels. Release strength fci=3,500 psi. Minimum 28 day strength f'c=5,000 psi.
- Provide 3/4" chamfer along bottom edge of panel on beam side.
- Do not use epoxy-coated reinforcing steel bar or strand in panels. Remove laitance from top panel surface.
- Finish top of panel to a roughness between a No. 6 and No. 9 concrete surface profile, inclusive, as specified by the International Concrete Repair Institute (ICRI).
- Shop drawings for the fabrication of panels will not require the Engineer's approval if fabrication is in accordance with the details shown on this standard.
- A panel layout which identifies location of each panel must be developed by the Fabricator. Permanently mark each panel in accordance with the panel layout. A copy of the layout is to be provided to the Engineer.

TRANSVERSE PANEL REINFORCEMENT:

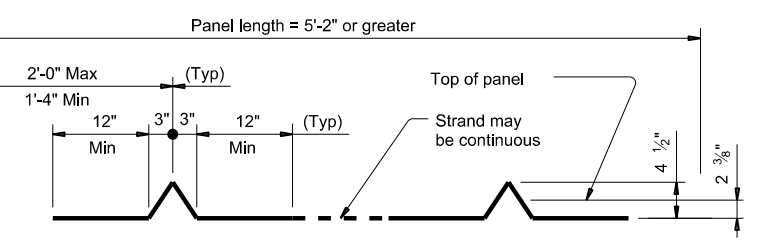
- For panel widths over 5', use 3/8" or 1/2" Dia (270k) prestressing strands with a tension of 14.4 kips per strand.
- For panel widths over 3'-6" up to and including 5', use 3/8" or 1/2" Dia (270k) prestressing strands with a tension of 14.4 kip per strand. Optionally, (#4) Grade 60 reinforcing bars may be used in lieu of prestressed strands.
- For panel widths up to 3'-6", use (#4) Grade 60 reinforcing bars (prestressed strands alone are not allowed).
- Place transverse panel reinforcement at panel centroid and space at 6" Max.

LONGITUDINAL PANEL REINFORCEMENT:

- Any of the following options may be used for longitudinal panel reinforcement:
 1. (#3) Grade 60 reinforcing steel at 6" Max Spacing. No splices allowed.
 2. 3/8" Dia prestressing strands at 4 1/2" Max Spacing (unstressed). No splices allowed.
 3. 1/2" Dia prestressing strands at 6" Max Spacing (unstressed). No splices allowed.
 4. Deformed Welded Wire Reinforcement (WWR) (ASTM A1064) providing 0.22 sq in per foot of panel width. Wires larger than D11 not permitted. Provide transverse wires to ensure proper handling of reinforcing. One splice per panel is allowed. See WWR Splice Detail.
- No combination of longitudinal reinforcement options in a panel is allowed.
- Place longitudinal panel reinforcement above or below transverse panel reinforcement. Must be placed above transverse panel reinforcement for skewed end panels with supplemental (#4) reinforcement.



BARS U (#3)



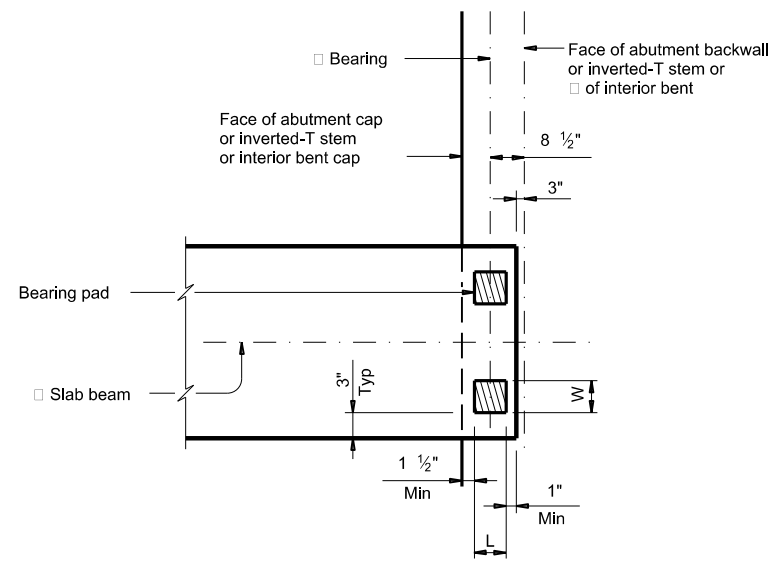
OPTIONAL STRAND FOR BARS U

HL93 LOADING

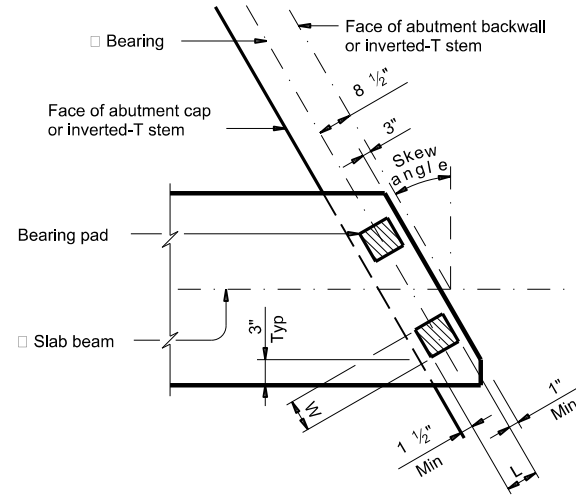
		Bridge Division Standard	
PRESTRESSED CONCRETE PANEL FABRICATION DETAILS			
PCP-FAB			
FILE: pcpstde2-19.dgn	DN: TxDOT	CK: TxDOT	DW: JTR
©TxDOT April 2019	CONT	SECT	JOB
REVISIONS	0910	16	139
DIST	COUNTY	SHEET NO.	
TYLER	VAN ZANDT	85	

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.

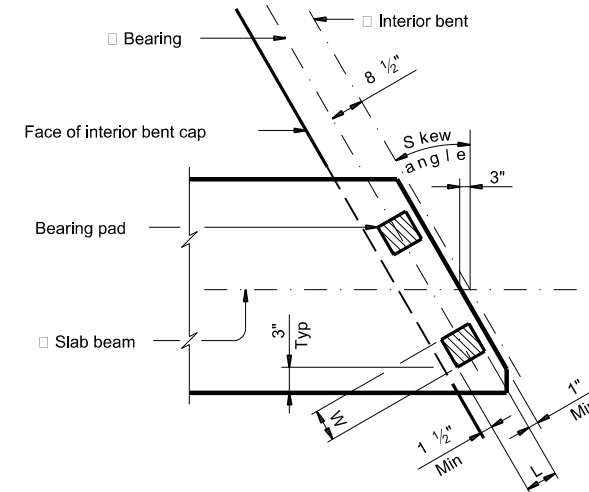
DATE: 4/28/2023 5:15:49 PM
 FILE: c:\bms\pwe-useast-006\tony.tre\o\dms58523\psbste06-17.dgn



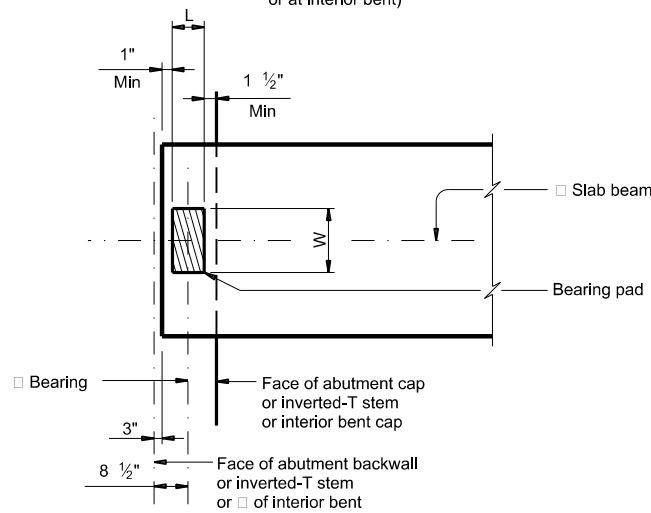
TWO-PAD DETAIL PLAN
 (At abutment or inverted-T cap or at interior bent)



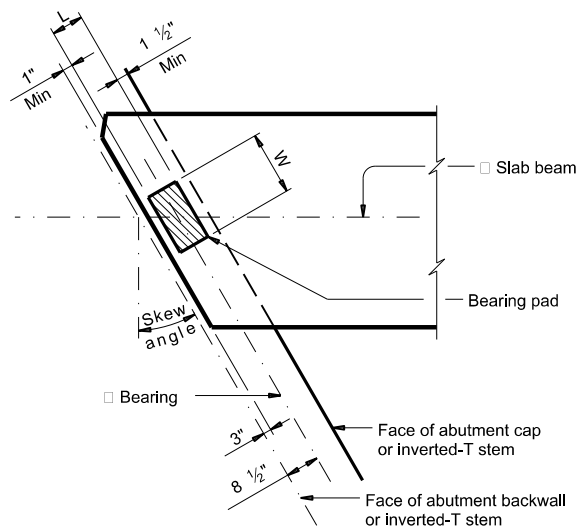
TWO-PAD DETAIL SKEW PLAN
 (At abutment or inverted-T cap)



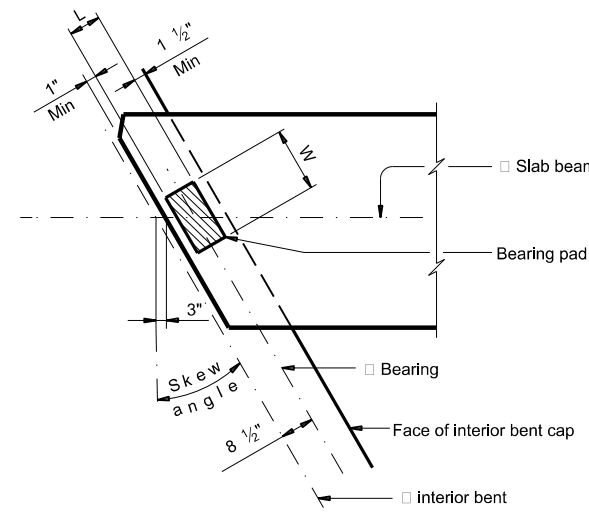
TWO-PAD DETAIL SKEW PLAN
 (At interior bent)



ONE-PAD DETAIL PLAN
 (At abutment or inverted-T cap or at interior bent)



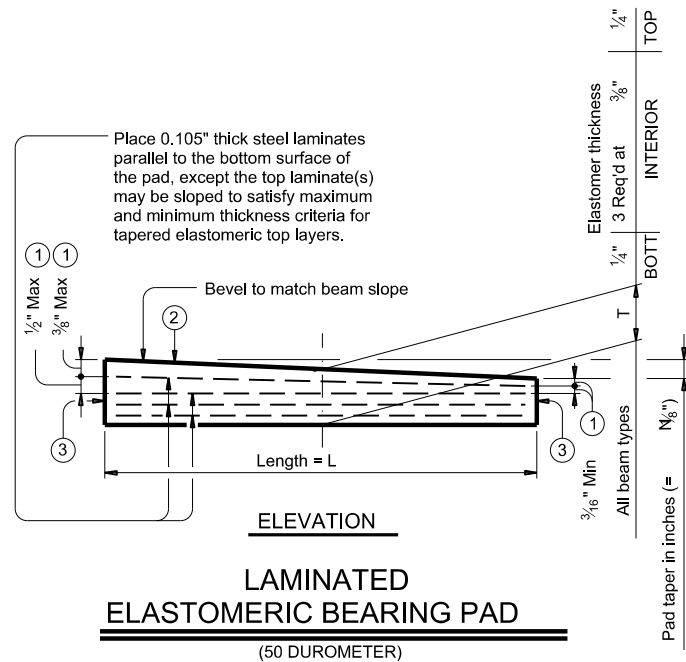
ONE-PAD DETAIL SKEW PLAN
 (At abutment or inverted-T cap)



ONE-PAD DETAIL SKEW PLAN
 (At interior bent)

ELASTOMERIC BEARING PAD PLACEMENT AND BEAM END DIAGRAMS

Place one bearing pad at forward station beam end.
 Place two bearing pads at back station beam end.



LAMINATED ELASTOMERIC BEARING PAD
 (50 DUROMETER)

- Maximum and minimum layer thicknesses shown are for elastomer only, on tapered layers.
- Indicate BEARING TYPE on all pads. For tapered pads, locate BEARING TYPE on the high side. The Fabricator must include the value of "N" (amount of taper in increments) in this mark. Examples: N=0, (for 0" taper)
 N=1, (for 1/8" taper)
 N=2, (for 1/4" taper)
 (etc.)
 Fabricated pad top surface slope must not vary from plan beam slope by more than $(\frac{0.0625N}{\text{Length}})$
- Locate permanent mark here.

TABLE OF BEARING PAD DIMENSIONS (ALL PRESTR CONC SLAB BM TYPES)

One-Pad (Ty SB1-"N") (2)			Two-Pad (Ty SB2-"N") (2)		
W	L	T	W	L	T
14"	7"	2"	7"	7"	2"

Pad sizes shown are applicable for the following conditions:

- All one, two and three span units where the minimum span length is not less than 25' and the maximum span is not more than 50'.
- Skews less than or equal to 30°.

GENERAL NOTES:

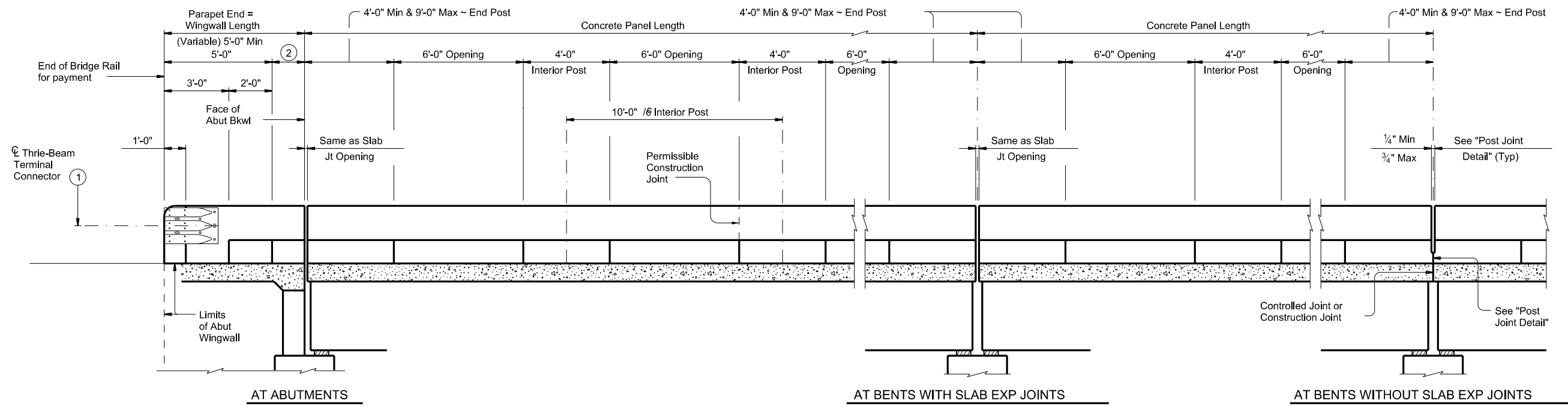
These details accommodate skew angles up to 30°. Shop drawings for approval are required. A bearing layout which identifies location and orientation of all bearings must be developed by the bearing fabricator. Permanently mark each bearing in accordance with the bearing layout. A copy of the bearing layout is to be provided to the Engineer. Cost of furnishing and installing elastomeric bearings must be included in unit price bid for "Prestressed Concrete Slab Beams".

HL93 LOADING

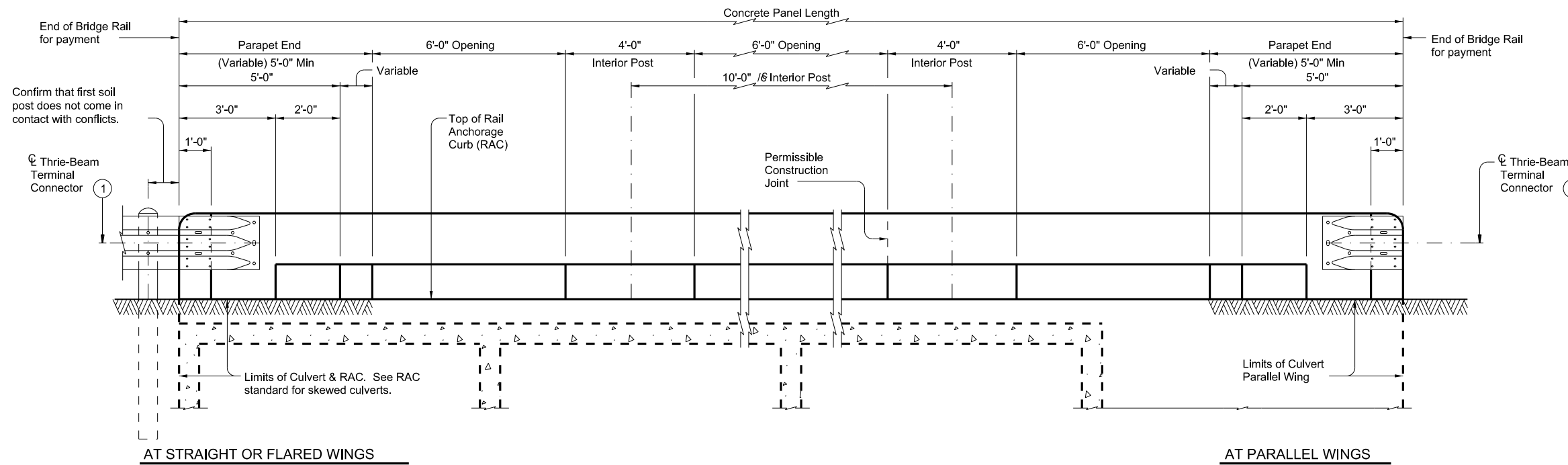
		Bridge Division Standard	
ELASTOMERIC BEARING AND BEAM END DETAILS			
PRESTR CONCRETE SLAB BEAM			
PSBEB			
FILE: psbste06-17.dgn	DN: TxDOT	CK: TxDOT	DW: TxDOT
©TxDOT January 2017	CONT	SECT	JOB
REVISIONS	0910	16	139
DIST	COUNTY	SHEET NO.	
TYLER	VAN ZANDT	86	

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: 4/28/2023 5:16:03 PM
 FILE: c:\bms\pwe-usecast-006\tony.tre\o\dms58523\rlstd005-19-1.dgn



ROADWAY ELEVATION OF RAIL ON BRIDGE



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.

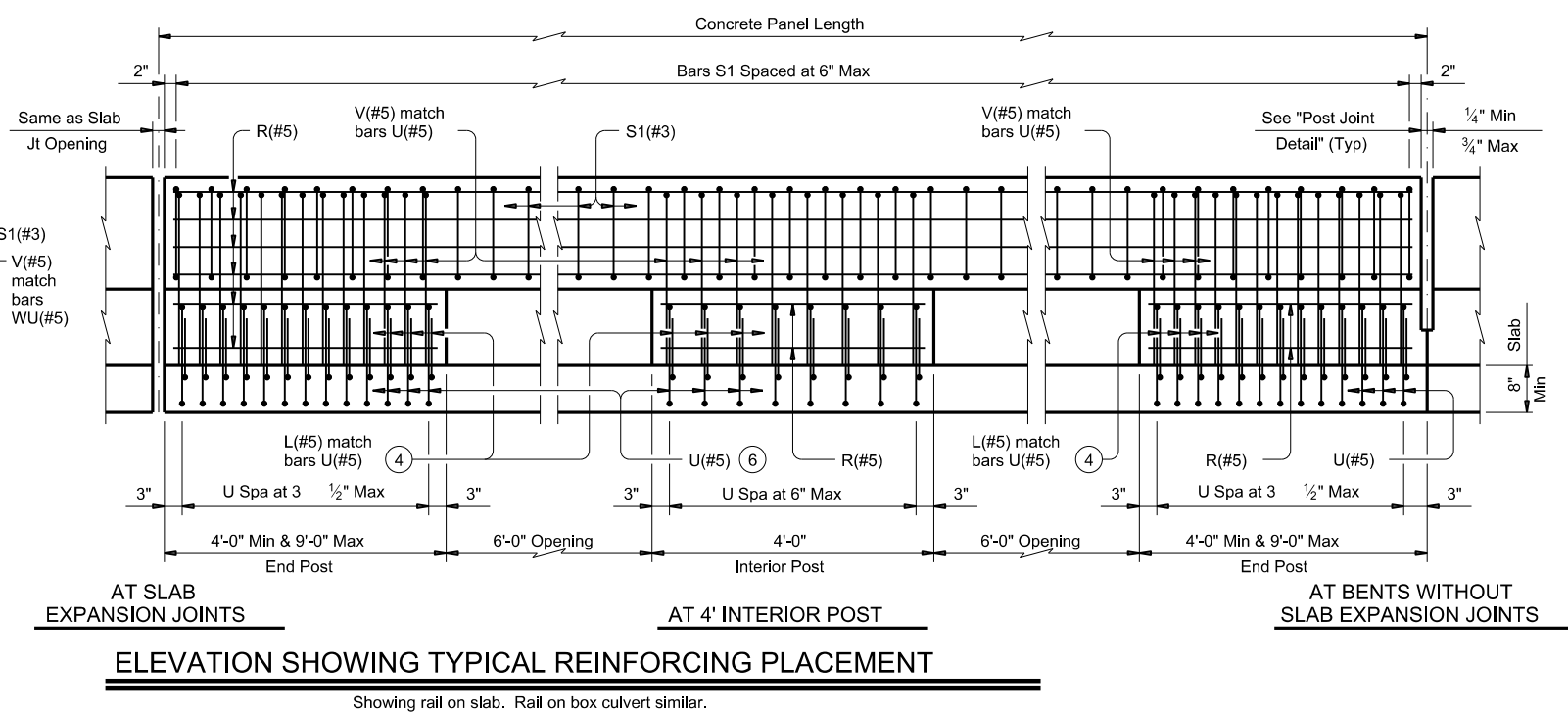
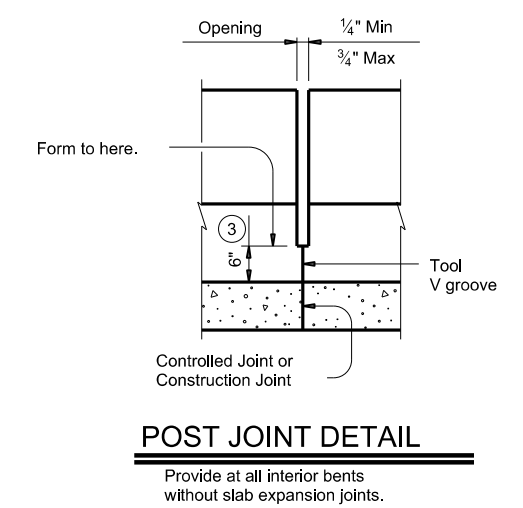
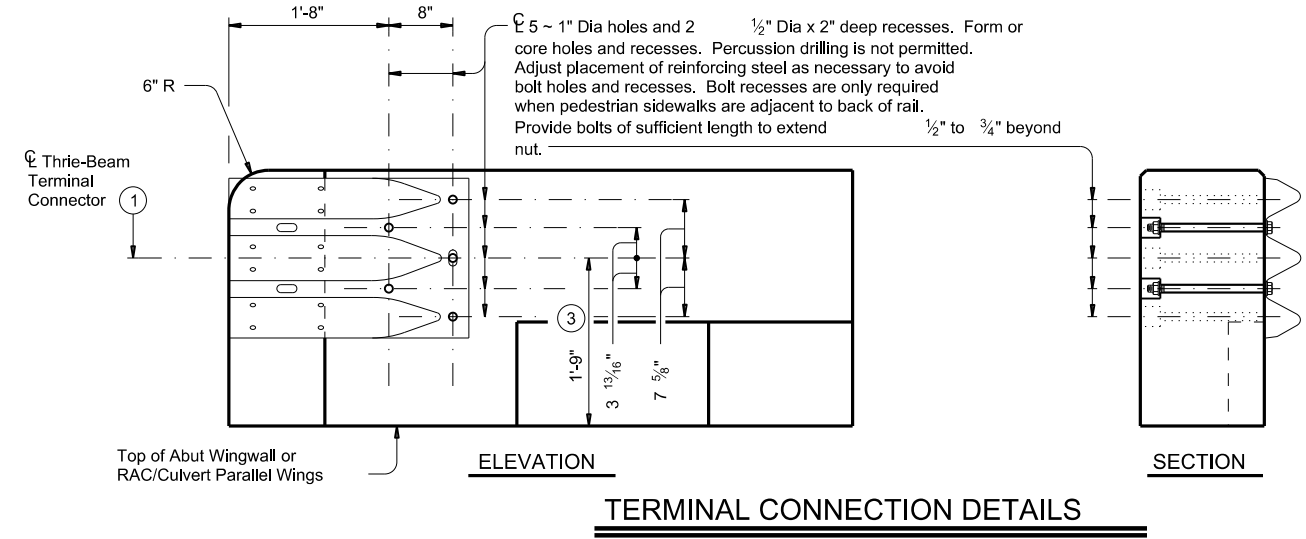
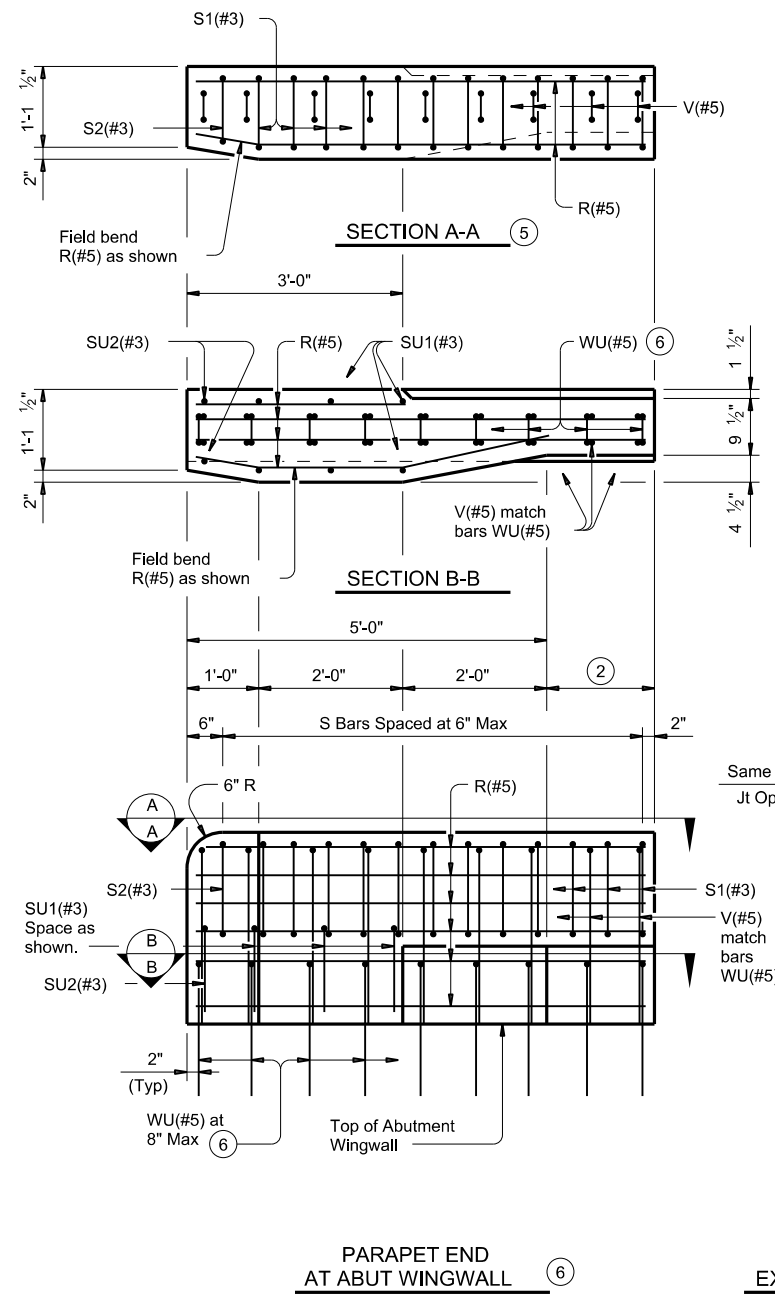
- ① Terminal Connectors and associated hardware are to be paid for under the Item "Metal Beam Guard Fence". Attach Metal Beam Guard Fence Transitions to the bridge rail and extend along the embankment unless otherwise shown in the plans.
- ② Wingwall Length minus 5'-0" (Varies)

SHEET 1 OF 3

		Bridge Division Standard	
<h2>TRAFFIC RAIL</h2>			
<h3>TYPE T223</h3>			
FILE: rstd005-19.dgn	DN: TxDOT	CK: TxDOT	DW: JTR
©TxDOT	REVISIONS	CONTRACT NO. 0910 16	JOB NO. 139
September 2019		COUNTY	HIGHWAY
		DIST	SHEET NO.
		TYLER	87

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: 4/28/2023 5:16:17 PM
 FILE: c:\bms\pwe-useast-006\tony.tre\o\dms58523\1st005-19-2.dgn



- 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 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.
- ⑤ Bars SU1(#3), SU2(#3) and WU(#5) not shown for clarity.
- ⑥ 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.

SHEET 2 OF 3

Texas Department of Transportation
 Bridge Division Standard

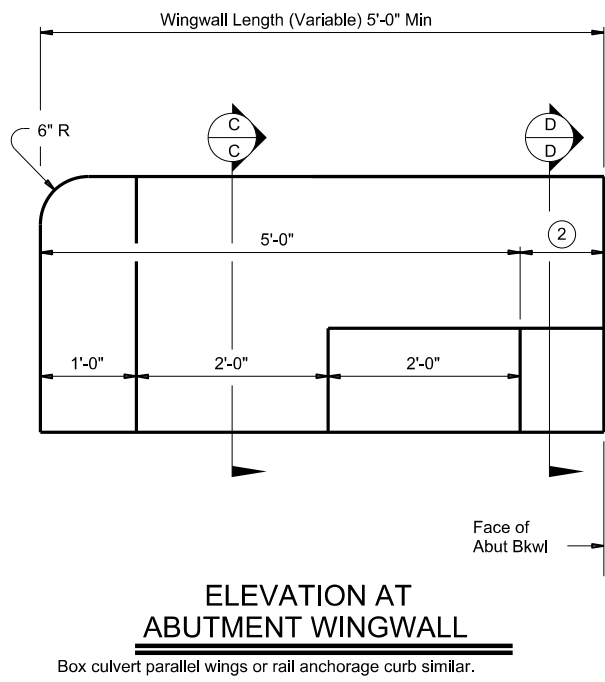
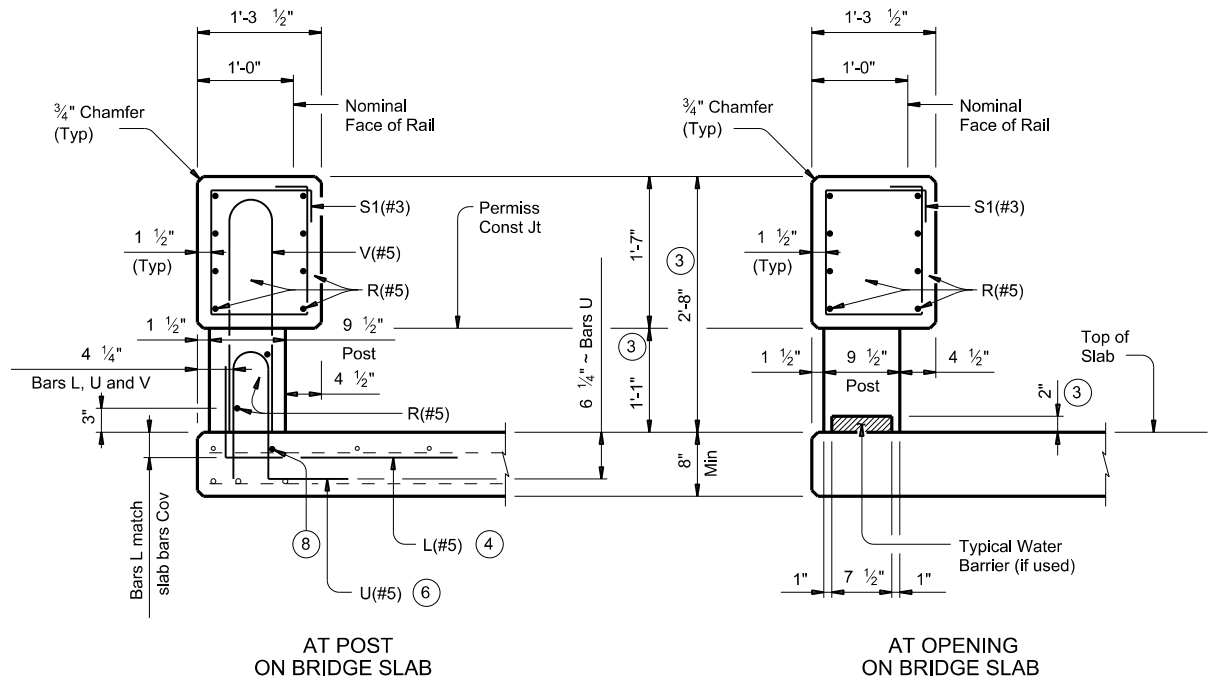
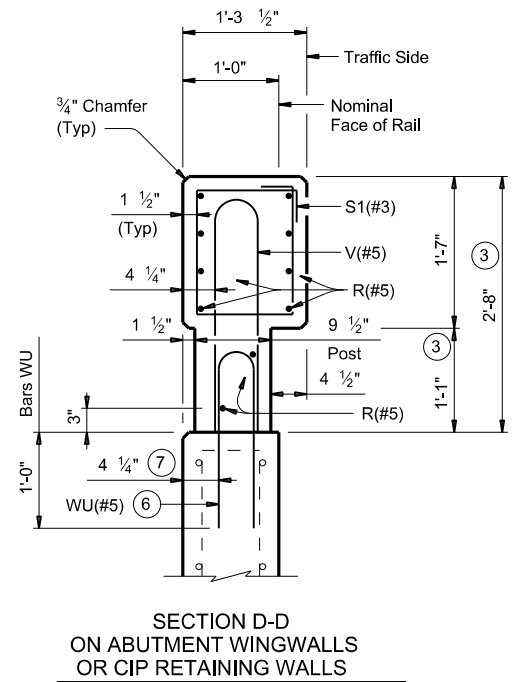
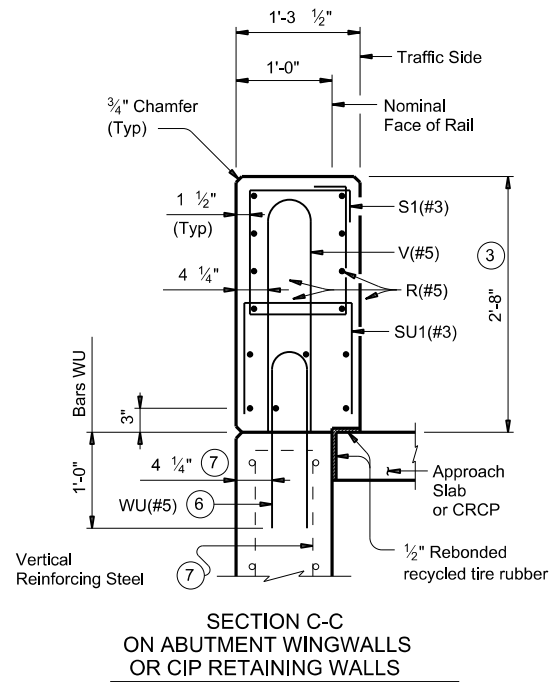
TRAFFIC RAIL

TYPE T223

FILE: r1std005-19.dgn	DN: TxDOT	CK: TxDOT	DW: JTR	CK: AES
©TxDOT September 2019	CONT	SECT	JOB	HIGHWAY
REVISIONS	0910	16	139	CR 1102
DIST	COUNTY	SHEET NO.		
TYLER	VAN ZANDT	88		

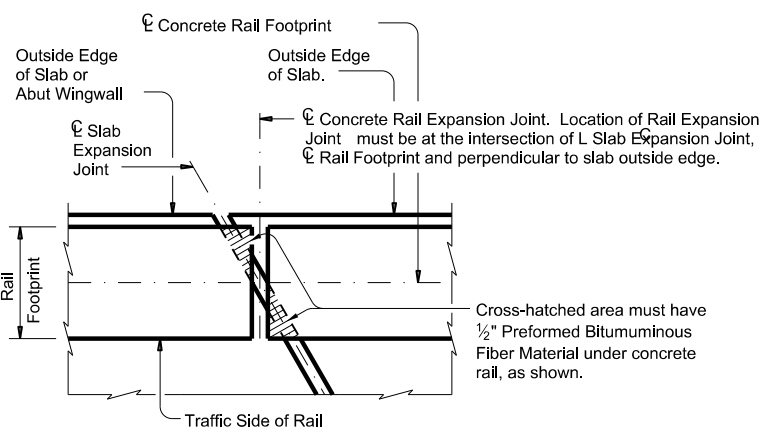
DISCLAIMER: The use of this standard is governed by the "Texas Engineering Practice Act". No warranty of any kind is made by TxDOT for any purpose whatsoever. TxDOT assumes no responsibility for the conversion of this standard to other formats or for incorrect results or damages resulting from its use.

DATE: 4/28/2023 5:16:30 PM
 FILE: c:\bms\pwe-useast-006\tony.tre\o\dms58523\1std005-19-3.dgn



SECTIONS THRU RAIL
 Sections on box culverts similar.

- ② Wingwall Length minus 5'-0" (Varies)
- ③ Increase 2" for structures with overlay.
- ④ 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.
- ⑥ 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.
- ⑦ 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.
- ⑧ Top longitudinal slab bar may be adjusted laterally 3" plus or minus to tie reinforcing.
- ⑨ At the Contractor's option, Bars V may be replaced by extending Bars U to 2'-5 1/4" above the roadway surface without overlay.



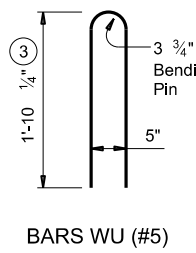
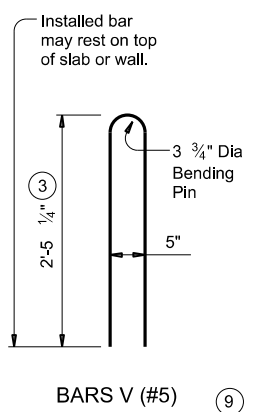
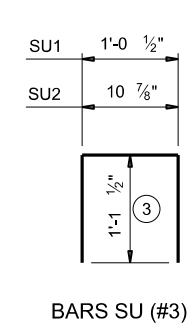
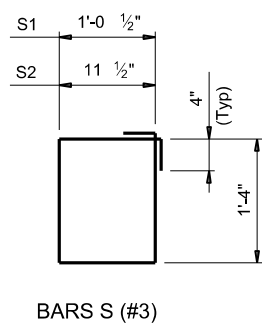
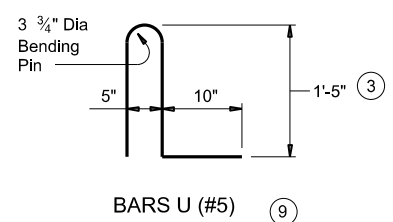
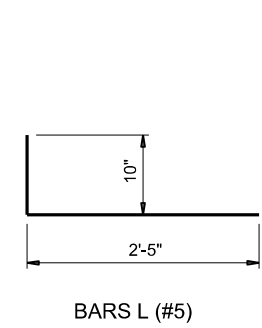
PLAN OF RAIL AT EXPANSION JOINTS
 Example showing Slab Expansion Joints without breakbacks.

CONSTRUCTION NOTES:
 Face of rail and parapet must be vertical transversely unless otherwise shown in the plans or approved by the Engineer.
 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.
 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.
 Deformed Welded Wire Reinforcing (WWR) (ASTM A1064) of equal size and spacing may be substituted for Bars U, V, and WU unless noted otherwise. Provide the same laps as required for reinforcing bars.
 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.
 Shop drawings are not required for this rail.
 Average weight of railing with no overlay is 358 plf.

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

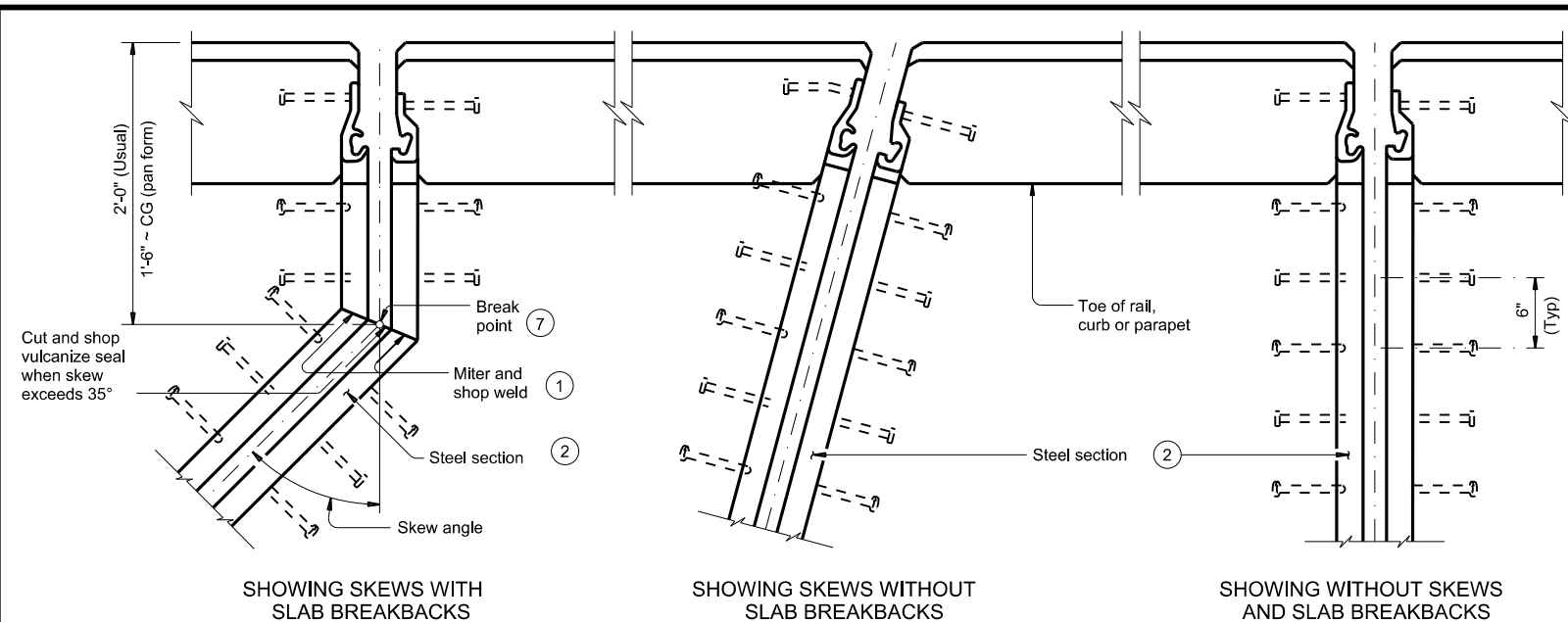


SHEET 3 OF 3

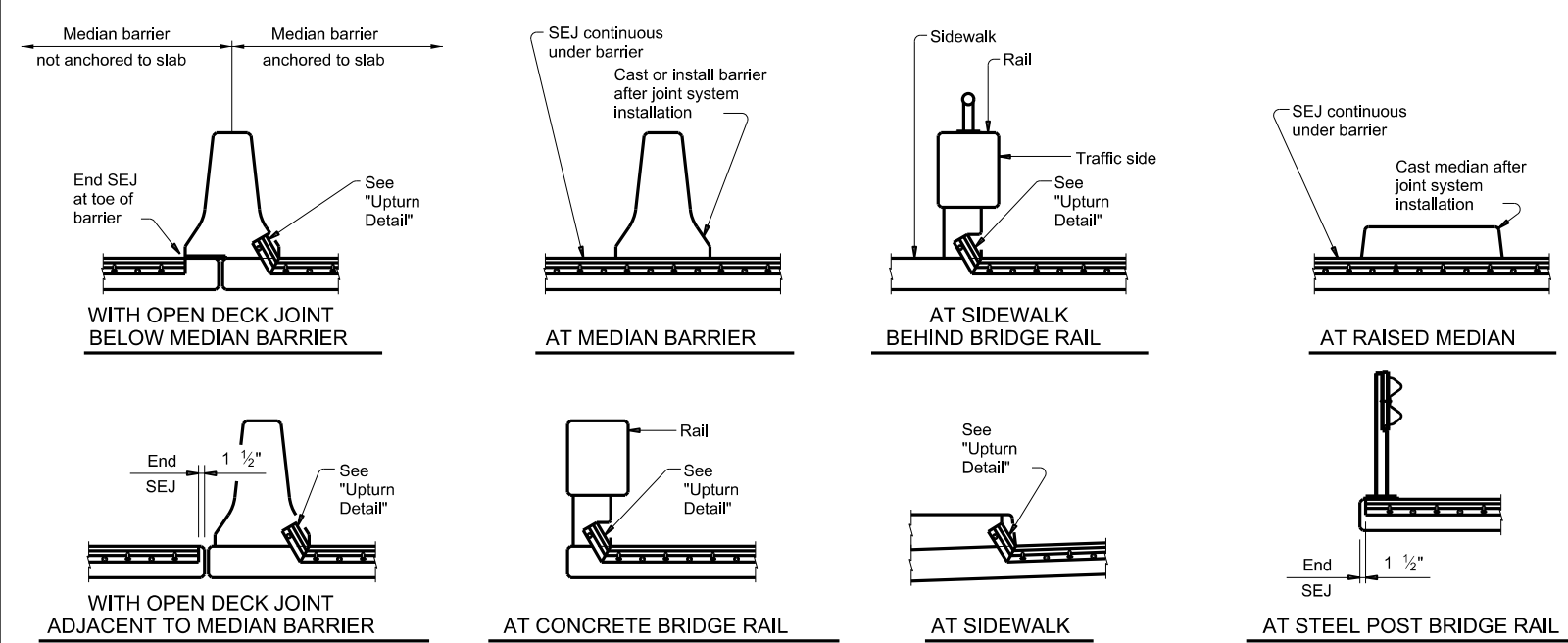
		Bridge Division Standard	
<h1>TRAFFIC RAIL</h1>			
<h2>TYPE T223</h2>			
FILE: tstd005-19.dgn	DN: TxDOT	CK: TxDOT	DW: JTR
©TxDOT September 2019	CON: 0910	SECT: 16	JOB: 139
REVISIONS	0910	16	139
DIST: TYLER	COUNTY: VAN ZANDT	SHEET NO. 89	

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.

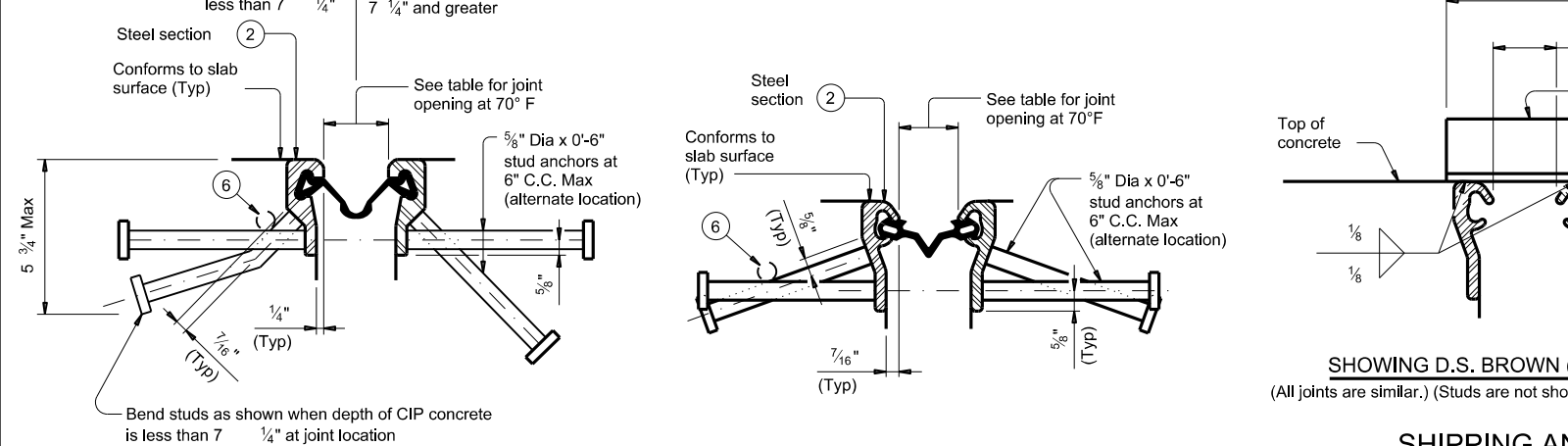
DATE: 4/28/2023 5:16:44 PM
 FILE: c:\bms\pwe-usecast-006\tony.tre\o\dms58523\sejms1e1-19.dgn



PLANS OF END CONDITIONS



TYPICAL SECTIONS



SECTION THRU WATSON BOWMAN ACME (SE-400 OR SE-500) JOINTS

SECTION THRU D.S. BROWN (A2R-400 OR A2R-XTRA) JOINTS

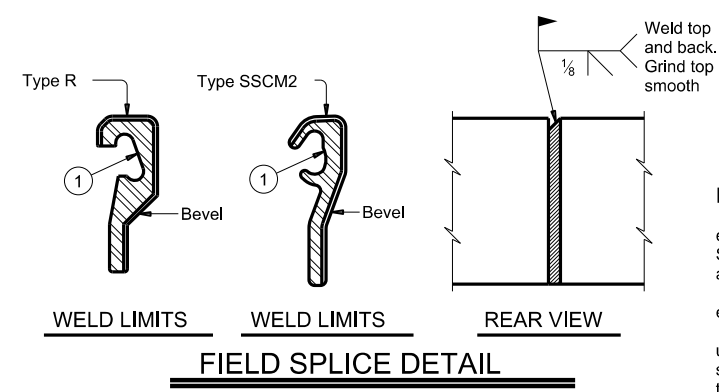
SHIPPING ANGLE
 An alternate method of securing joint sections may be used if approved by the Bridge Division. Erection bolts are not allowed.

TABLE OF SEALED EXPANSION JOINT INFORMATION					
MANUFACTURER	STEEL SECTION ②	STRIP SEAL			
		4" JOINT		5" JOINT	
Seal Type	Joint Opening ③	Seal Type	Joint Opening ③		
D.S. Brown	Type SSCM2	A2R-400	1 3/4"	A2R-XTRA	2"
Watson Bowman Acme	Type R	SE-400	1 3/4"	SE-500	2"

SKEW (deg)	JOINT SIZE	
	4"	5"
0	4.0"	5.0"
15	4.0"	5.0"
30	3.5"	4.3"
45	2.8"	3.5"

DESIGN NOTES:
 Joints installed on a skew have reduced ability to accommodate longitudinal movement. Use table values to determine the correct joint size for skewed installations. For other skews over 25 degrees, calculate reduced movement range by multiplying joint size by cosine (skew).

- Remove all burrs which will be in contact with seal prior to making splice.
- Shape of steel section shown is typical. Variations in sections must be approved by the Engineer.
- These openings are also the recommended minimum installation openings.
- Reduce for sidewalk or parapet heights less than 6".
- Other conditions affecting the joint profile should be noted elsewhere.
- Move transverse bars that are in conflict with SEJ studs, in either the bridge slab or approach slab, to rest at the junction of the studs.
- See Span details for location of break point.
- Align shipping angle perpendicular to joint.



FIELD SPLICE DETAIL

FABRICATION NOTES:
 Temporarily shop assemble corresponding sections of sealed expansion joints (SEJ), check for fit, and match mark for shipment. Secure corresponding sections together for shipment with shipping angle. Do not use erection bolts.

The seal must be continuous and included in the price bid for sealed expansion joint. Ship steel sections in convenient lengths of 10'-0" Min and 24'-0" Max unless necessary for staged 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. Butt weld all shop and field splices and grind smooth areas in contact with seal. Make all necessary field splice joint preparations in the shop. Paint the entire steel section with System II or IV primer in accordance with Item 446, "Field Cleaning and Painting Steel", unless required to galvanize when shown in the plans. Provide galvanizing in accordance with Item 445, "Galvanizing". Provide paints in accordance with Item 446.2. Prepare steel and apply paint in accordance with Item 446.4.7.3 and 446.4.7.4. Shop drawings for the fabrication of sealed expansion joints will not require the Engineer's approval if fabrication is in accordance with the details shown on this standard.

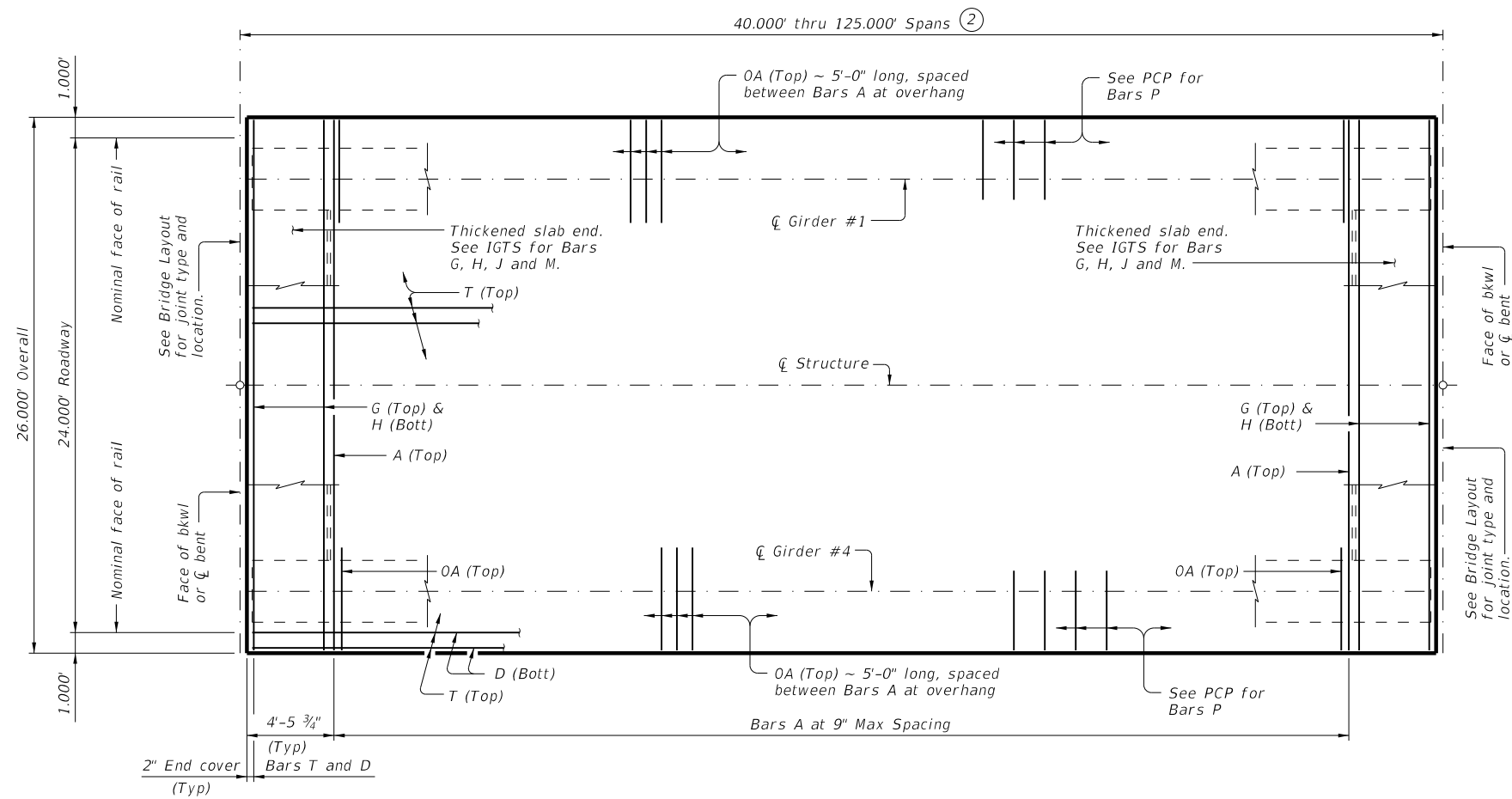
CONSTRUCTION NOTES:
 Secure the sealed expansion joint in position and place to the proper grade and alignment by welding braces to adjacent reinforcing steel, to prestressed beam stirrups, or to anchors cast in concrete diaphragms. Include cost of temporary bracing in the price bid for sealed expansion joint. Remove shipping angle immediately after each joint half is secured in place. Grind smooth, and touch up with organic zinc-rich paint. Clean and prepare seal cavity for seal installation as per the Manufacturer's installation procedures.

GENERAL NOTES:
 Provide sealed expansion joints in the size and at locations shown on the plans. Minimum slab and overhang thickness required for the use of SEJ-M is 6 1/2".

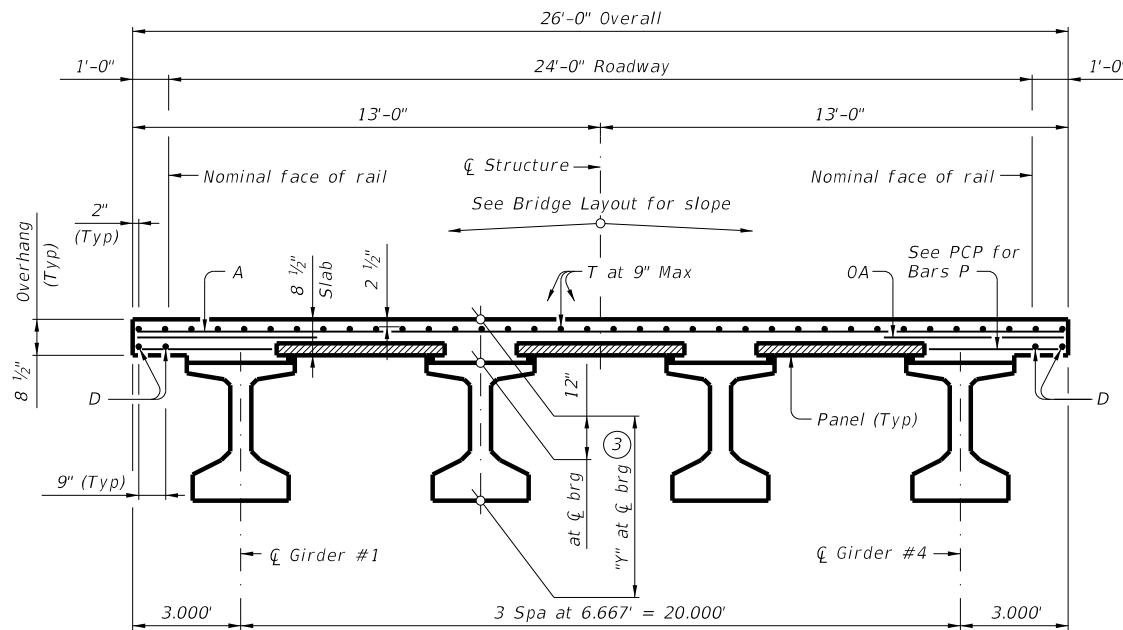
		Bridge Division Standard	
SEALED EXPANSION JOINT TYPE M WITHOUT OVERLAY			
SEJ-M			
FILE: sejmste1-19.dgn	DN: TxDOT	CK: TxDOT	DW: JTR
©TxDOT April 2019	CONT: 0910	SECT: 16	JOB: 139
REVISIONS	0910	16	139
DIST: TYLER	COUNTY: VAN ZANDT	SHEET NO. 90	

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: 4/30/2023 5:52:32 PM
 FILE: c:\bms\pwe-useast-006\brlan_martinez\dms58523\IG-SIG2400-23.dgn



PLAN ①



TYPICAL TRANSVERSE SECTION
 (Showing girder type Tx46)

TABLE OF SECTION DEPTHS	
GIRDER TYPE	"Y" AT \bar{C} BRG ③
	Ft/In
Tx28	3'-4"
Tx34	3'-10"
Tx40	4'-4"
Tx46	4'-10"
Tx54	5'-6"

BAR TABLE

BAR	SIZE
A	#4
D	#4
G	#4
H	#4
J	#4
M	#4
OA	#5
P	#4
T	#4

- ① If multi-span units (with slab continuous over interior bents) are indicated on the Bridge Layout, see standard IGCS for adjustment to slab reinforcement and quantities.
- ② Span lengths for Prestressed Concrete I-Girder type:
 Type Tx28 for spans lengths 40.000' thru 75.000'.
 Type Tx34 for spans lengths 40.000' thru 85.000'.
 Type Tx40 for spans lengths 40.000' thru 100.000'.
 Type Tx46 for spans lengths 40.000' thru 115.000'.
 Type Tx54 for spans lengths 40.000' thru 125.000'.
- ③ "Y" value shown is based on theoretical girder camber, dead load deflection from an 8 1/2" concrete slab, a constant roadway grade, and using precast panels (PCP). The Contractor will adjust this value as necessary for any roadway vertical curve.

HL93 LOADING SHEET 1 OF 2



PRESTRESSED CONCRETE I-GIRDER SPANS (TYPE Tx28 THRU Tx54) 24' ROADWAY

SIG-24

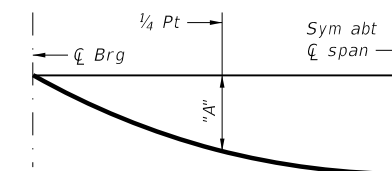
FILE: IG-SIG2400-23.dgn	DN: JMH	CK: NRN	DW: JTR	CK: TAR
©TxDOT August 2017	CONT	SECT	JOB	HIGHWAY
REVISIONS	0910	16	139	CR 1102
10-19: Increased "X" and "Y" Values. 01-23: Removed PCP(O) reference.	DIST	COUNTY	SHEET NO.	
	TYLER	VAN ZANDT	91	

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: 4/30/2023 5:52:33 PM
 FILE: c:\bms\pwe-useast-006\brlan_martinez\dms8523\IG-SIG2400-23.dgn

TABLE OF DEAD LOAD DEFLECTIONS

TYPE Tx28 GIRDERS			TYPE Tx34 GIRDERS			TYPE Tx40 GIRDERS			TYPE Tx46 GIRDERS			TYPE Tx54 GIRDERS		
SPAN LENGTH	"A"	"B"	SPAN LENGTH	"A"	"B"	SPAN LENGTH	"A"	"B"	SPAN LENGTH	"A"	"B"	SPAN LENGTH	"A"	"B"
Ft	Ft	Ft	Ft	Ft	Ft	Ft	Ft	Ft	Ft	Ft	Ft	Ft	Ft	Ft
40	0.007	0.010	40	0.004	0.006	40	0.003	0.004	40	0.002	0.003	40	0.001	0.002
45	0.012	0.017	45	0.007	0.010	45	0.005	0.007	45	0.004	0.005	45	0.002	0.003
50	0.019	0.027	50	0.011	0.016	50	0.007	0.010	50	0.005	0.007	50	0.004	0.005
55	0.028	0.040	55	0.017	0.024	55	0.011	0.016	55	0.008	0.011	55	0.005	0.007
60	0.041	0.057	60	0.024	0.034	60	0.016	0.022	60	0.011	0.015	60	0.007	0.010
65	0.056	0.079	65	0.033	0.047	65	0.022	0.031	65	0.015	0.021	65	0.010	0.014
70	0.077	0.108	70	0.046	0.064	70	0.030	0.042	70	0.021	0.029	70	0.014	0.019
75	0.102	0.143	75	0.061	0.085	75	0.040	0.056	75	0.027	0.038	75	0.018	0.025
			80	0.079	0.111	80	0.052	0.073	80	0.036	0.050	80	0.024	0.033
			85	0.102	0.143	85	0.066	0.093	85	0.046	0.064	85	0.030	0.042
						90	0.084	0.118	90	0.057	0.080	90	0.038	0.053
						95	0.105	0.147	95	0.071	0.100	95	0.047	0.066
						100	0.130	0.182	100	0.088	0.124	100	0.058	0.082
									105	0.108	0.151	105	0.071	0.100
									110	0.130	0.182	110	0.086	0.121
									115	0.156	0.219	115	0.103	0.144
									120			120	0.123	0.172
									125			125	0.145	0.203



DEAD LOAD DEFLECTION DIAGRAM

Calculated deflections shown are due to the concrete slab on interior girders only (Ec = 5000 ksi). Adjust values as required for exterior girders and if optional slab forming is used. These values may require field verification.

TABLE OF ESTIMATED QUANTITIES

SPAN LENGTH	REINF CONCRETE SLAB	Prestressed Concrete Girders			TOTAL REINF STEEL ⁵
		ABUT TO INT BT ⁴	INT BT TO INT BT ⁴	ABUT TO ABUT ⁴	
Ft	SF	LF	LF	LF	Lb
40	1,040	158.00	158.00	158.00	2,392
45	1,170	178.00	178.00	178.00	2,691
50	1,300	198.00	198.00	198.00	2,990
55	1,430	218.00	218.00	218.00	3,289
60	1,560	238.00	238.00	238.00	3,588
65	1,690	258.00	258.00	258.00	3,887
70	1,820	278.00	278.00	278.00	4,186
75	1,950	298.00	298.00	298.00	4,485
80	2,080	318.00	318.00	318.00	4,784
85	2,210	338.00	338.00	338.00	5,083
90	2,340	358.00	358.00	358.00	5,382
95	2,470	378.00	378.00	378.00	5,681
100	2,600	398.00	398.00	398.00	5,980
105	2,730	418.00	418.00	418.00	6,279
110	2,860	438.00	438.00	438.00	6,578
115	2,990	458.00	458.00	458.00	6,877
120	3,120	478.00	478.00	478.00	7,176
125	3,250	498.00	498.00	498.00	7,475

- ④ Fabricator will adjust lengths for girder slopes as required.
- ⑤ Reinforcing steel weight is calculated using an approximate factor of 2.3 lbs/SF.

MATERIAL NOTES:
 Provide Class 5 concrete (f'c = 4,000 psi).
 Provide Class 5 (HPC) concrete if shown elsewhere in the plans.
 Provide Grade 60 reinforcing steel.
 Provide bar laps, where required, as follows:
 Uncoated ~ #4 = 1'-7"
 Epoxy coated ~ #4 = 2'-5"
 Deformed welded wire reinforcement (WWR) (ASTM A1064) of equal size and spacing may be substituted for Bars A, D, OA, P or T unless noted otherwise.

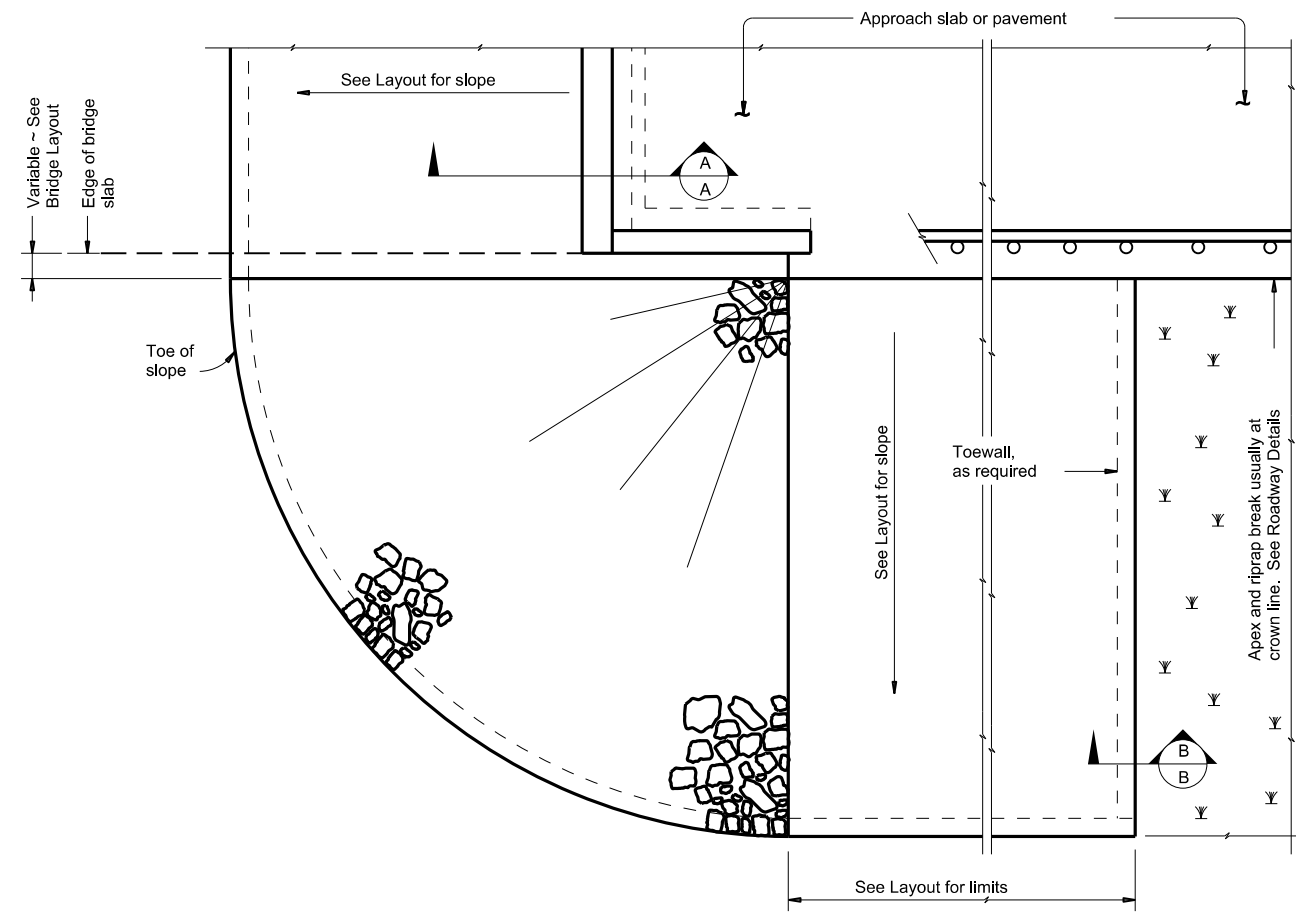
GENERAL NOTES:
 Designed according to AASHTO LRFD Bridge Design Specifications.
 Multi-span units, with slab continuous over interior bents, may be formed with the details shown on this sheet and the I-Girder Continuous Slab Detail (IGCS) standard.
 See I-Girder Thickened Slab End Details (IGTS) standard for details and quantity adjustments.
 See Prestressed Concrete Panels (PCP) standard and Prestressed Concrete Panel Fabrication Details (PCP-FAB) standard for panel details not shown.
 See I-Girder Miscellaneous Slab Details (IGMS) standard for miscellaneous details.
 See applicable rail details for rail anchorage in slab.
 See Permanent Metal Deck Forms (PMDF) standard for details and quantity adjustments if this option is used.
 This standard does not support the use of transition bents.

Cover dimensions are clear dimensions, unless noted otherwise.

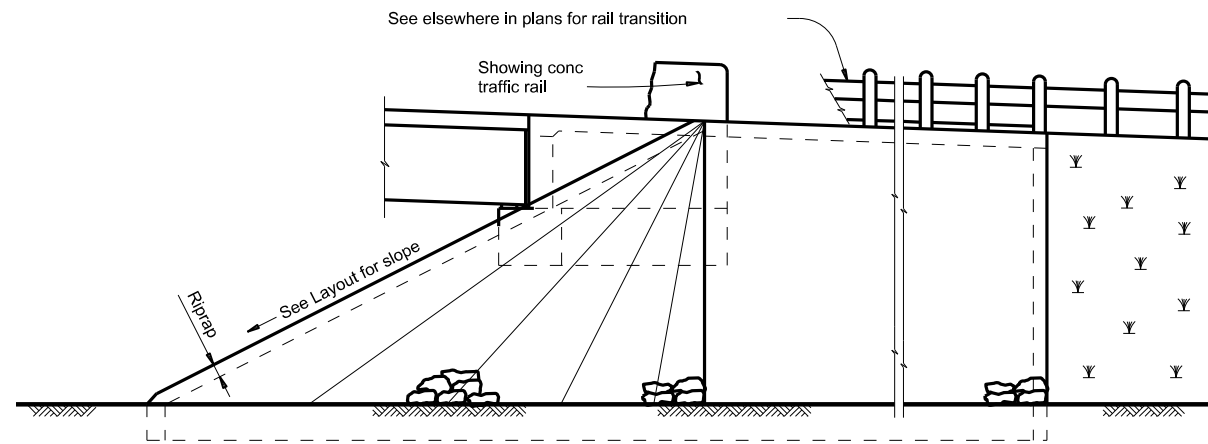
		Bridge Division Standard	
PRESTRESSED CONCRETE I-GIRDER SPANS (TYPE Tx28 THRU Tx54) 24' ROADWAY			
SIG-24			
FILE: IG-SIG2400-23.dgn	DN: JMH	CK: NRN	DW: JTR
©TxDOT August 2017	CONT	SECT	HIGHWAY
REVISIONS	0910	16	139 CR 1102
10-19: Increased "X" and "Y" Values. 01-23: Removed PCP(O) reference.	DIST	COUNTY	SHEET NO.
	TYLER	VAN ZANDT	92

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.

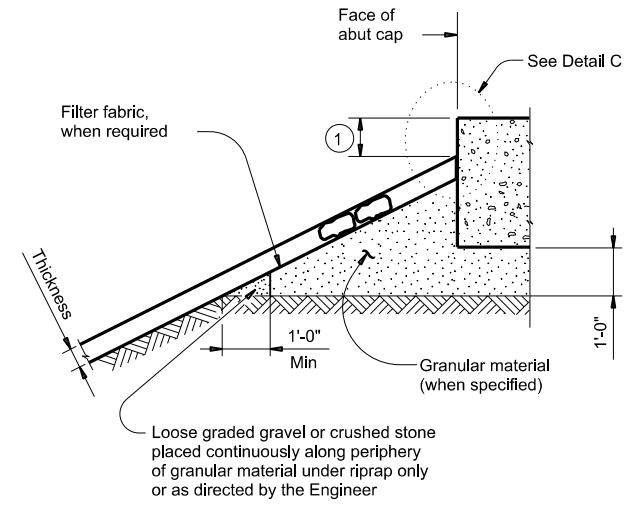
DATE: 4/28/2023 5:17:26 PM
 FILE: c:\bms\pwe-useast-006\tony.tre\o\dms58523\srr\std1-19-1.dgn



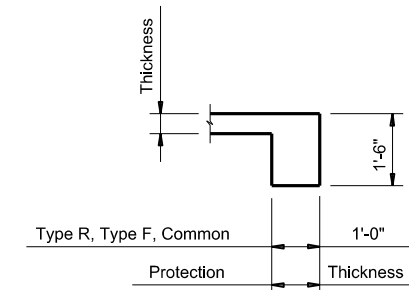
PLAN



ELEVATION

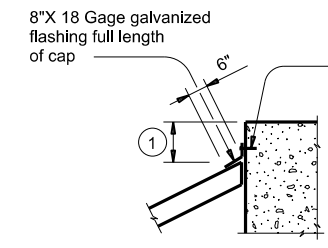


SECTION A-A AT CAP



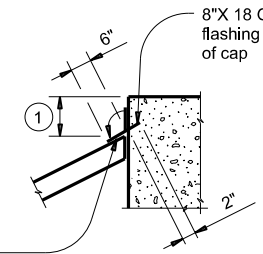
SECTION B-B

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

Nail flashing to cap or wingwall and seal with joint sealer



CAP OPTION B

Plug ends and seal joint along ends of cap and side of wingwalls with joint sealer

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: srrstd1-19.dgn	DN: AES	CK: JGD	DW: BWH
©TxDOT April 2019	CONTRACT NO. 0910 16	SECTION NO. 139	HIGHWAY CR 1102
REVISIONS	DIST TYLER	COUNTY VAN ZANDT	SHEET NO. 93

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: 4/28/2023 5:17:39 PM
 FILE: c:\bms\pwe-useast-006\tony.tre\o\dms58523\srr\stdel1-19-2.dgn

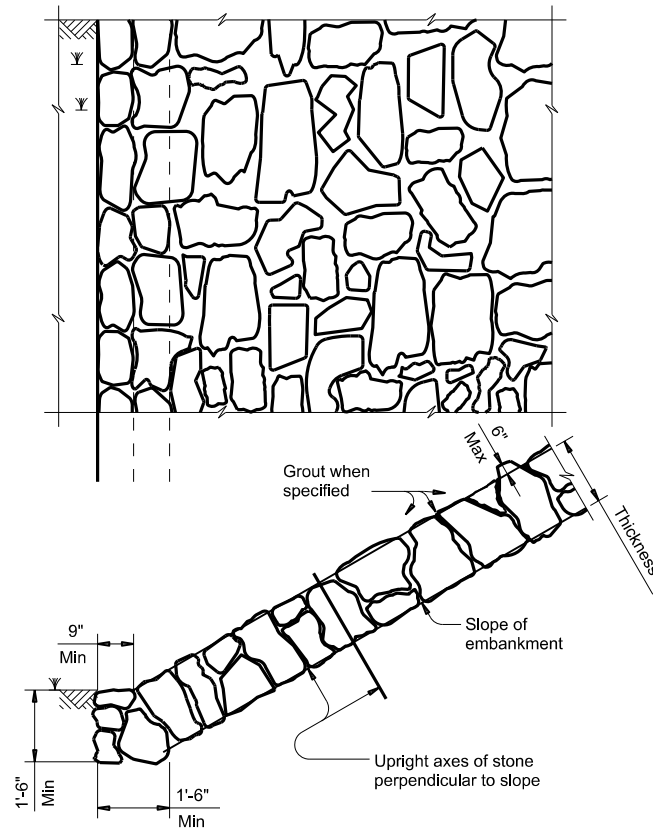


FIGURE 1 ~ TYPE R STONE RIPRAP

dry or grouted

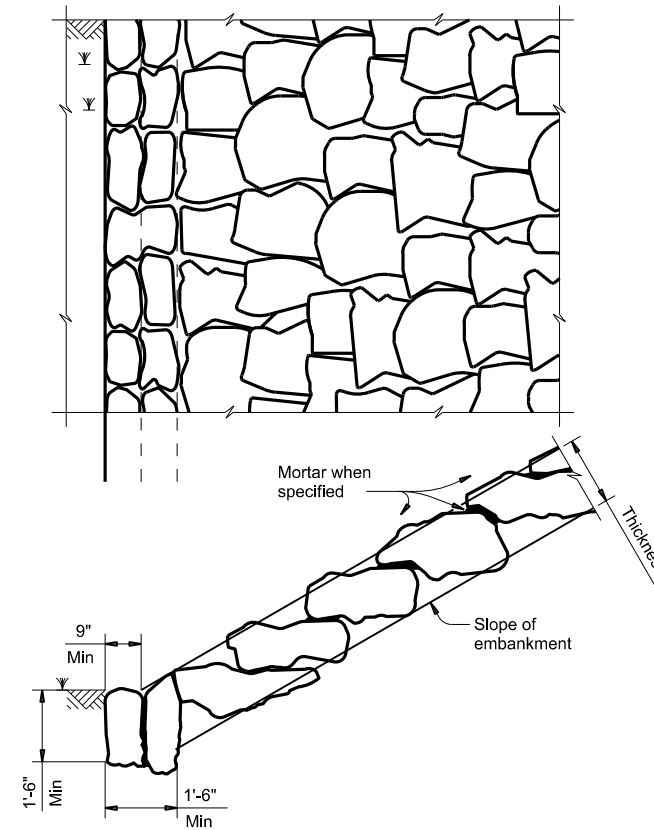


FIGURE 2 ~ TYPE F STONE RIPRAP

dry or mortared

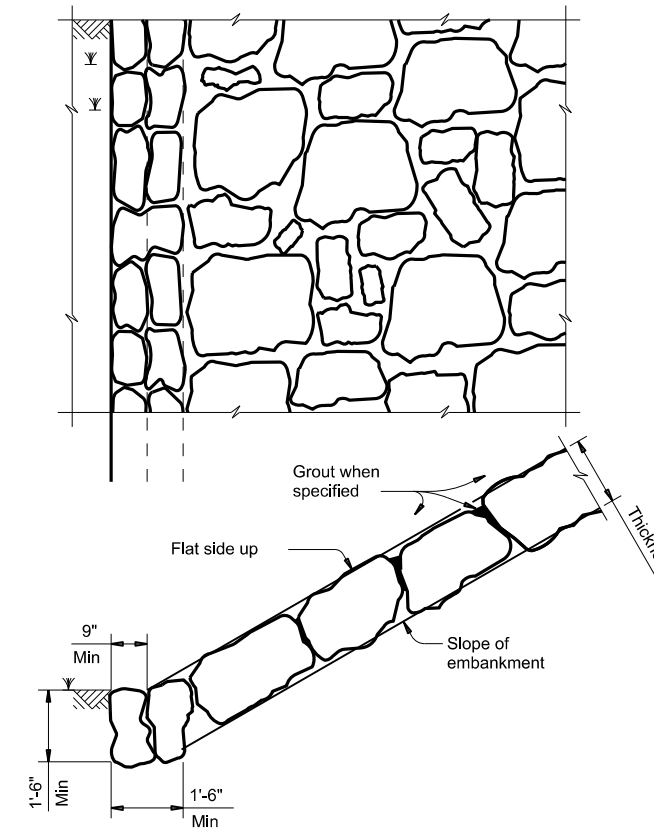


FIGURE 3 ~ TYPE F STONE RIPRAP

grouted

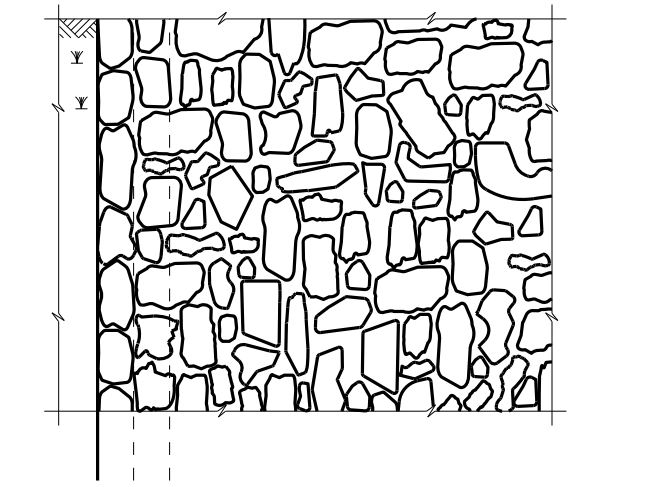


FIGURE 4 ~ COMMON STONE RIPRAP

dry or grouted

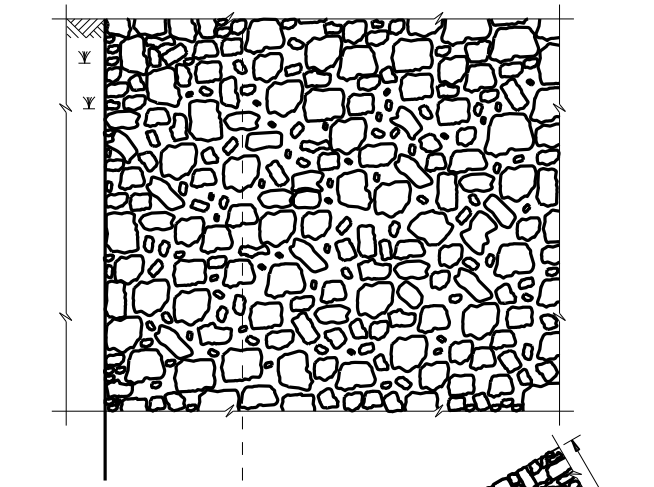
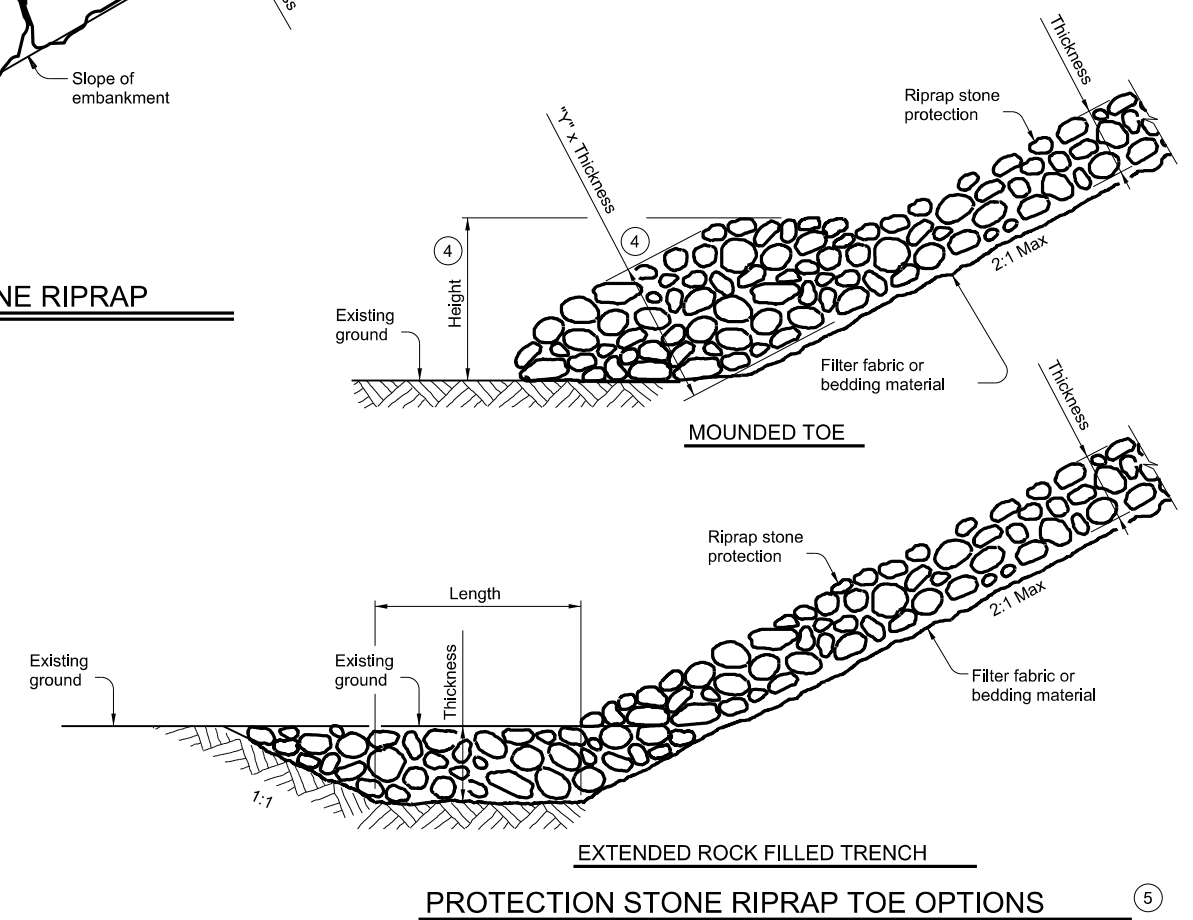


FIGURE 5 ~ PROTECTION STONE RIPRAP

Filter fabric (2)

2 times thickness Min

- 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: srrstdel1-19.dgn	DN: AES	CK: JGD	DW: BWH
©TxDOT	Apr 2019	CONTRACT: 0910	SECTION: 16
REVISIONS		JOB: 139	HIGHWAY: CR 1102
DIST: TYLER	COUNTY: VAN ZANDT	SHEET NO. 94	

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: 10/25/2022
 FILE:

I. STORMWATER POLLUTION PREVENTION-CLEAN WATER ACT SECTION 402

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

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

1.
2.
- No Action Required Required Action

Action No.

- Prevent stormwater pollution by controlling erosion and sedimentation in accordance with TPDES Permit TXR 150000
- Comply with the SW3P and revise when necessary to control pollution or or required by the Engineer.
- Post Construction Site Notice (CSN) with SW3P information on or near the site, accessible to the public and TCEQ, EPA or other inspectors.
- When Contractor project specific locations (PSL's) increase disturbed soil area to 5 acres or more, submit NOI to TCEQ and the Engineer.

II. WORK IN OR NEAR STREAMS, WATERBODIES AND WETLANDS CLEAN WATER ACT SECTIONS 401 AND 404

USACE Permit required for filling, dredging, excavating or other work in any water bodies, rivers, creeks, streams, wetlands or wet areas.

The Contractor must adhere to all of the terms and conditions associated with the following permit(s):

- No Permit Required
- Nationwide Permit 14 - PCN not Required (less than 1/10th acre waters or wetlands affected)
- Nationwide Permit 14 - PCN Required (1/10 to <1/2 acre, 1/3 in tidal waters)
- Individual 404 Permit Required
- Other Nationwide Permit Required: NWP# 3a

Required Actions: List waters of the US permit applies to, location in project and check Best Management Practices planned to control erosion, sedimentation and post-project TSS.

- Buffalo Creek on CR 1102. At the site of bridge work.
-
-
-

The elevation of the ordinary high water marks of any areas requiring work to be performed in the waters of the US requiring the use of a nationwide permit can be found on the Bridge Layouts.

Best Management Practices:

Erosion	Sedimentation	Post-Construction TSS
<input checked="" type="checkbox"/> Temporary Vegetation	<input checked="" type="checkbox"/> Silt Fence	<input checked="" type="checkbox"/> Vegetative Filter Strips
<input type="checkbox"/> Blankets/Matting	<input type="checkbox"/> Rock Berm	<input type="checkbox"/> Retention/Irrigation Systems
<input type="checkbox"/> Mulch	<input type="checkbox"/> Triangular Filter Dike	<input type="checkbox"/> Extended Detention Basin
<input type="checkbox"/> Sodding	<input type="checkbox"/> Sand Bag Berm	<input type="checkbox"/> Constructed Wetlands
<input type="checkbox"/> Interceptor Swale	<input type="checkbox"/> Straw Bale Dike	<input type="checkbox"/> Wet Basin
<input type="checkbox"/> Diversion Dike	<input type="checkbox"/> Brush Berms	<input type="checkbox"/> Erosion Control Compost
<input type="checkbox"/> Erosion Control Compost	<input type="checkbox"/> Erosion Control Compost	<input type="checkbox"/> Mulch Filter Berm and Socks
<input type="checkbox"/> Mulch Filter Berm and Socks	<input type="checkbox"/> Mulch Filter Berm and Socks	<input type="checkbox"/> Compost Filter Berm and Socks
<input type="checkbox"/> Compost Filter Berm and Socks	<input type="checkbox"/> Compost Filter Berm and Socks	<input type="checkbox"/> Vegetation Lined Ditches
	<input type="checkbox"/> Stone Outlet Sediment Traps	<input type="checkbox"/> Sand Filter Systems
	<input type="checkbox"/> Sediment Basins	<input type="checkbox"/> Grassy Swales

III. CULTURAL RESOURCES

Refer to TxDOT Standard Specifications in the event historical issues or archeological artifacts are found during construction. Upon discovery of archeological artifacts (bones, burnt rock, flint, pottery, etc.) cease work in the immediate area and contact the Engineer immediately.

- No Action Required Required Action

Action No.

- No Action necessary above those required by the 2004 Texas Standard for Specifications Construction and Maintenance of Highways, Streets & Bridges.
-
-
-

IV. VEGETATION RESOURCES

Preserve native vegetation to the extent practical. Contractor must adhere to Construction Specification Requirements Specs 162, 164, 192, 193, 506, 730, 751, 752 in order to comply with requirements for invasive species, beneficial landscaping, and tree/brush removal commitments.

- No Action Required Required Action

Action No.

- ADHERE TO THE SPECS AS LISTED ABOVE
-
-
-

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

- No Action Required Required Action

Action No.

- ADHERE TO DIRECTION CONCERNING MIGRATORY BIRDS LISTED BELOW
- Possible species in project area: Louisiana Pigtoe, Texas Heelsplitter, Northern Scarlet Snake.
-
-

If any of the listed species are observed, cease work in the immediate area, do not disturb species or habitat and contact the Engineer immediately. The work may not remove active nests from bridges and other structures during nesting season of the birds associated with the nests. If caves or sinkholes are discovered, cease work in the immediate area, and contact the Engineer immediately.

LIST OF ABBREVIATIONS

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

VI. HAZARDOUS MATERIALS OR CONTAMINATION ISSUES

General (applies to all projects):

Comply with the Hazard Communication Act (the Act) for personnel who will be working with hazardous materials by conducting safety meetings prior to beginning construction and making workers aware of potential hazards in the workplace. Ensure that all workers are provided with personal protective equipment appropriate for any hazardous materials used. Obtain and keep on-site Material Safety Data Sheets (MSDS) for all hazardous products used on the project, which may include, but are not limited to the following categories: Paints, acids, solvents, asphalt products, chemical additives, fuels and concrete curing compounds or additives. Provide protected storage, off bare ground and covered, for products which may be hazardous. Maintain product labelling as required by the Act.

Maintain an adequate supply of on-site spill response materials, as indicated in the MSDS. In the event of a spill, take actions to mitigate the spill as indicated in the MSDS, in accordance with safe work practices, and contact the District Spill Coordinator immediately. The Contractor shall be responsible for the proper containment and cleanup of all product spills.

Contact the Engineer if any of the following are detected:

- Dead or distressed vegetation (not identified as normal)
- Trash piles, drums, canister, barrels, etc.
- Undesirable smells or odors
- Evidence of leaching or seepage of substances

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

- Yes No

If "No", then no further action is required.

If "Yes", then TxDOT is responsible for completing asbestos assessment/inspection.

Are the results of the asbestos inspection positive (is asbestos present)?

- Yes No

If "Yes", then TxDOT must retain a DSHS licensed asbestos consultant to assist with the notification, develop abatement/mitigation procedures, and perform management activities as necessary. The notification form to DSHS must be postmarked at least 15 working days prior to scheduled demolition.

If "No", then TxDOT is still required to notify DSHS 15 working days prior to any scheduled demolition.

In either case, the Contractor is responsible for providing the date(s) for abatement activities and/or demolition with careful coordination between the Engineer and asbestos consultant in order to minimize construction delays and subsequent claims.

Any other evidence indicating possible hazardous materials or contamination discovered on site. Hazardous Materials or Contamination Issues Specific to this Project:

- No Action Required Required Action

Action No.

1.

2.

3.

VII. OTHER ENVIRONMENTAL ISSUES

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

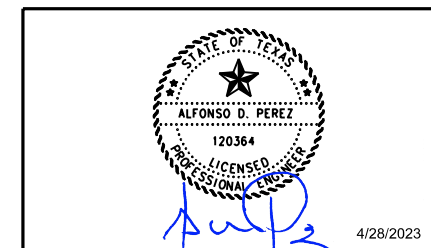
- No Action Required Required Action

Action No.

1.

2.

3.



		Design Division Standard	
ENVIRONMENTAL PERMITS, ISSUES AND COMMITMENTS			
EPIC CR 1102			
FILE: epic.dgn	DN: TxDOT	CK: RG	DW: VP
©TxDOT: February 2015	CONT	SECT	JOB
12-12-2011 (DS) REVISIONS	0910	12	139
05-07-14 ADDED NOTE SECTION IV.	DIST	COUNTY	SHEET NO.
01-23-2015 SECTION I (CHANGED ITEM 1122 TO ITEM 506, ADDED GRASSY SWALES.	TYL	Van Zandt	95

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 all projects with any soil disturbing activities, TxDOT will maintain a SWP3 with all pertinent records, correspondence, environmental documents, etc. at the project field office. If no field office is available, then this SWP3 shall be kept at the appropriate TxDOT Area Office.

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

1.0 SITE/PROJECT DESCRIPTION

1.1 PROJECT CONTROL SECTION JOB (CSJ):
0910-16-157

1.2 PROJECT LIMITS:

From: 1.1 MILES NORTH OF CR 2015

To: 1.1 MILES SOUTH OF SAND FLAT RD

1.3 PROJECT COORDINATES:

BEGIN: (Lat) 32°27'22.39" N, (Long) 95°12'54.86" W

END: (Lat) 32°27'20.96" N, (Long) 95°12'54.88" W

1.4 TOTAL PROJECT AREA (Acres): 0.49

1.5 TOTAL AREA TO BE DISTURBED (Acres): 0.43

1.6 NATURE OF CONSTRUCTION ACTIVITY:

REPLACE BRIDGE AND APPROACHES

1.7 MAJOR SOIL TYPES:

Soil Type	Description
SAND, CLAYEY	LOOSE, MOIST, REDDISH-BROWN, FINE TO COARSE
CLAY, SANDY	SOFT, MOIST, MULTI-COLORED TRACE FINE GRAVEL
SAND, SILTY	VERY LOOSE TO COMPACT, MOIST, BROWN, FINE TO COARSE-GRAINED

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: REMOVE EXISTING BRIDGE AND CONSTRUCT PROPOSED BRIDGE

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
WIGGINS CREEK	

* 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)



Sheet 1 of 2

FED. RD. DIV. NO.	PROJECT NO.			SHEET NO.
				96
STATE	STATE DIST.	COUNTY		
TEXAS	TYLER	VAN ZANDT		
CONT.	SECT.	JOB	HIGHWAY NO.	
0910	12	139	CR1102	

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

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

2.4 OFFSITE VEHICLE TRACKING CONTROLS:

- Excess dirt/mud on road removed daily
- Haul roads dampened for dust control
- Loaded haul trucks to be covered with tarpaulin
- Stabilized construction exit
- Other: _____

Other: _____

Other: _____

Other: _____

2.5 POLLUTION PREVENTION MEASURES:

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

2.6 VEGETATED BUFFER ZONES:

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

Type	Stationing	
	From	To

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 INSPECTIONS:

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

2.9 MAINTENANCE:





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

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

FED. RD. DIV. NO.	PROJECT NO.		SHEET NO.
			97
STATE	STATE DIST.	COUNTY	
TEXAS	TYLER	VAN ZANDT	
CONT.	SECT.	JOB	HIGHWAY NO.
0910	12	139	CR 1102

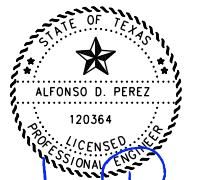
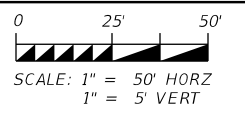
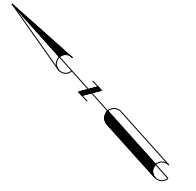
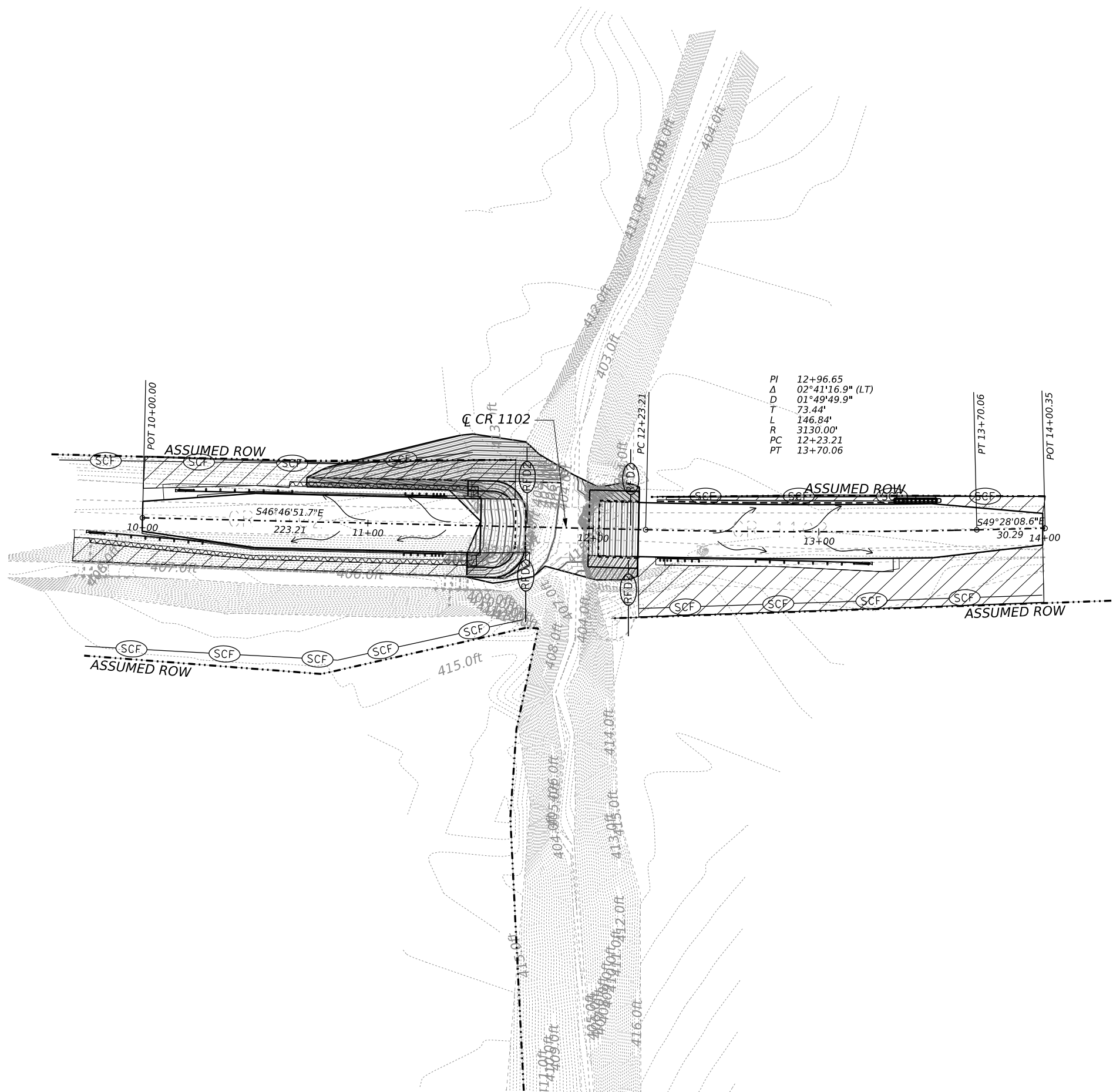
CK:
DW:
CK:
DW:

LEGEND

-  FLOW DIRECTION
-  SEDIMENT CONTROL FENCE
-  ROCK FILTER DAM TYII
-  4" TOPSOIL/BOND FRB MTRX SEED

NOTES:

1. PLACE ALL SW3P ITEMS AS NEEDED AS EARTHWORK OPERATIONS ARE IN PROGRESS.
2. SEE ENVIRONMENTAL STANDARDS FOR SEDIMENT CONTROL FENCE AND ROCK FILTER DAM INSTALLATION DETAILS.
3. PLACE CONSTRUCTION EXITS AS DIRECTED BY ENGINEER.
4. INSTALLATION OF ALL SW3P ITEMS TO BE INSTALLED AS DIRECTED BY ENGR.



Alfonso D. Perez 5/2/2023

NO.	DATE	REVISION	APPROV.



TYLER BRIDGE REPLACEMENTS

CR 1102
AT BUFFALO CREEK

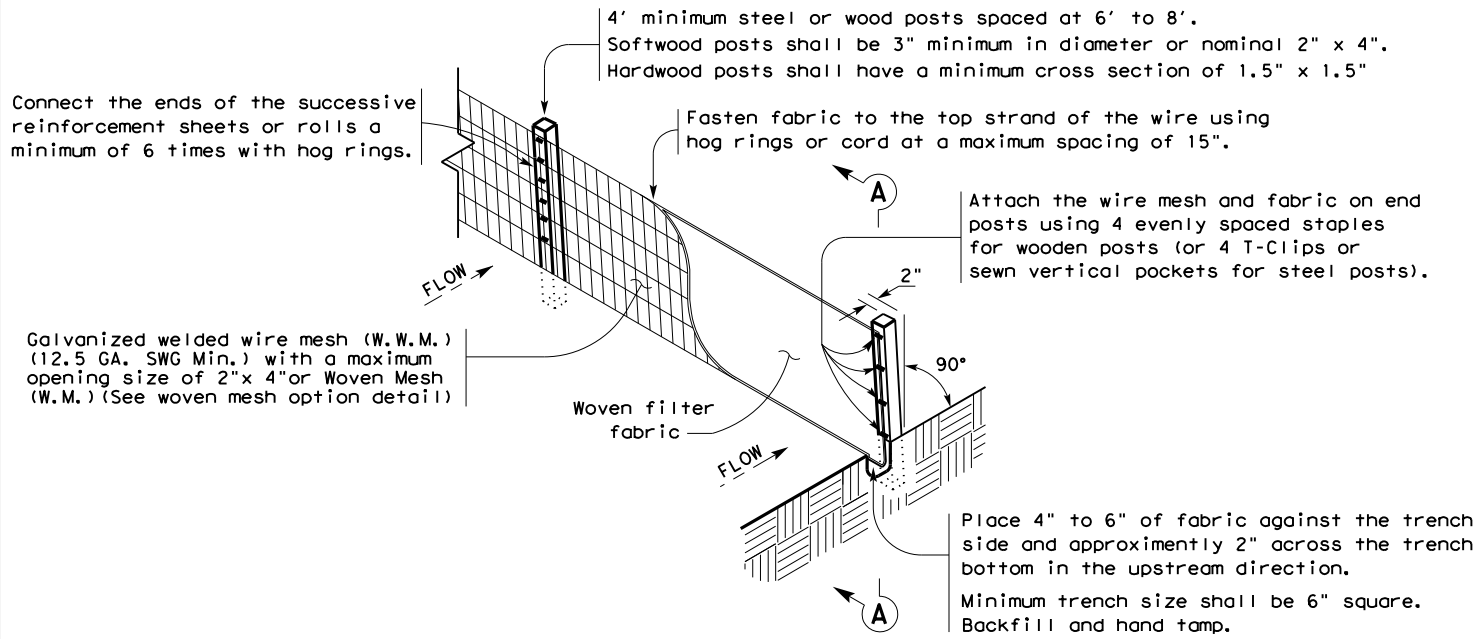
SW3P LAYOUT

CONT	SECT	JOB	HIGHWAY
0910	12	139	CR 1102
DIST	COUNTY	SHEET NO.	
TYLER	VAN ZANDT	98	

DATE: 5/2/2023 2:25:18 PM
FILE: c:\bms\pwe-useast-006\brian.martinez\dms67151\CR1102 - CR1102SW3P.dgn

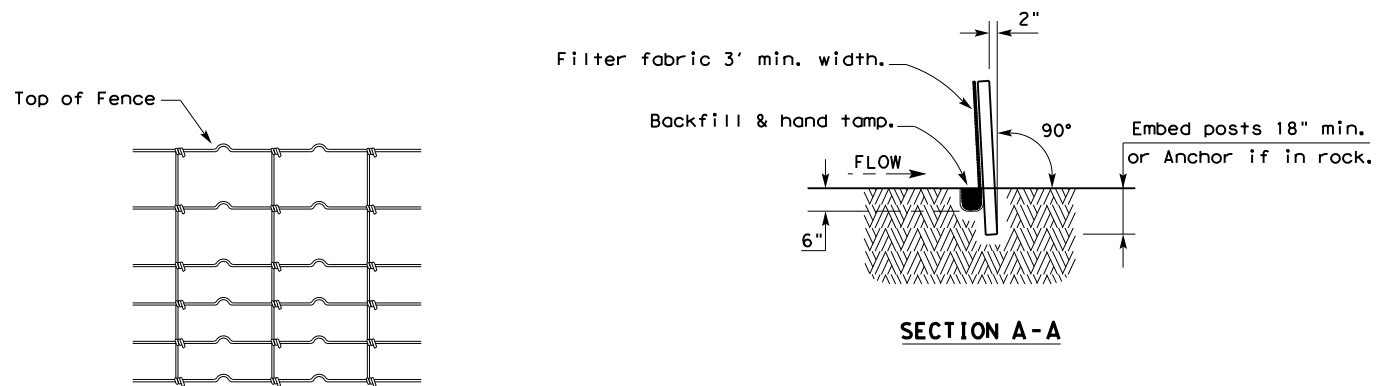
DISCLAIMER: This standard is made by TxDOT for any purpose whatsoever. The use of this standard is governed by the "Texas Engineering Practice Act". No warranty of any kind is made by TxDOT for any purpose whatsoever. TxDOT assumes no responsibility for the conversion of this standard to other formats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

402882023
cf1b6s\pwe-useast-006\tony.trejo\dms59615\ec116.dgn



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.

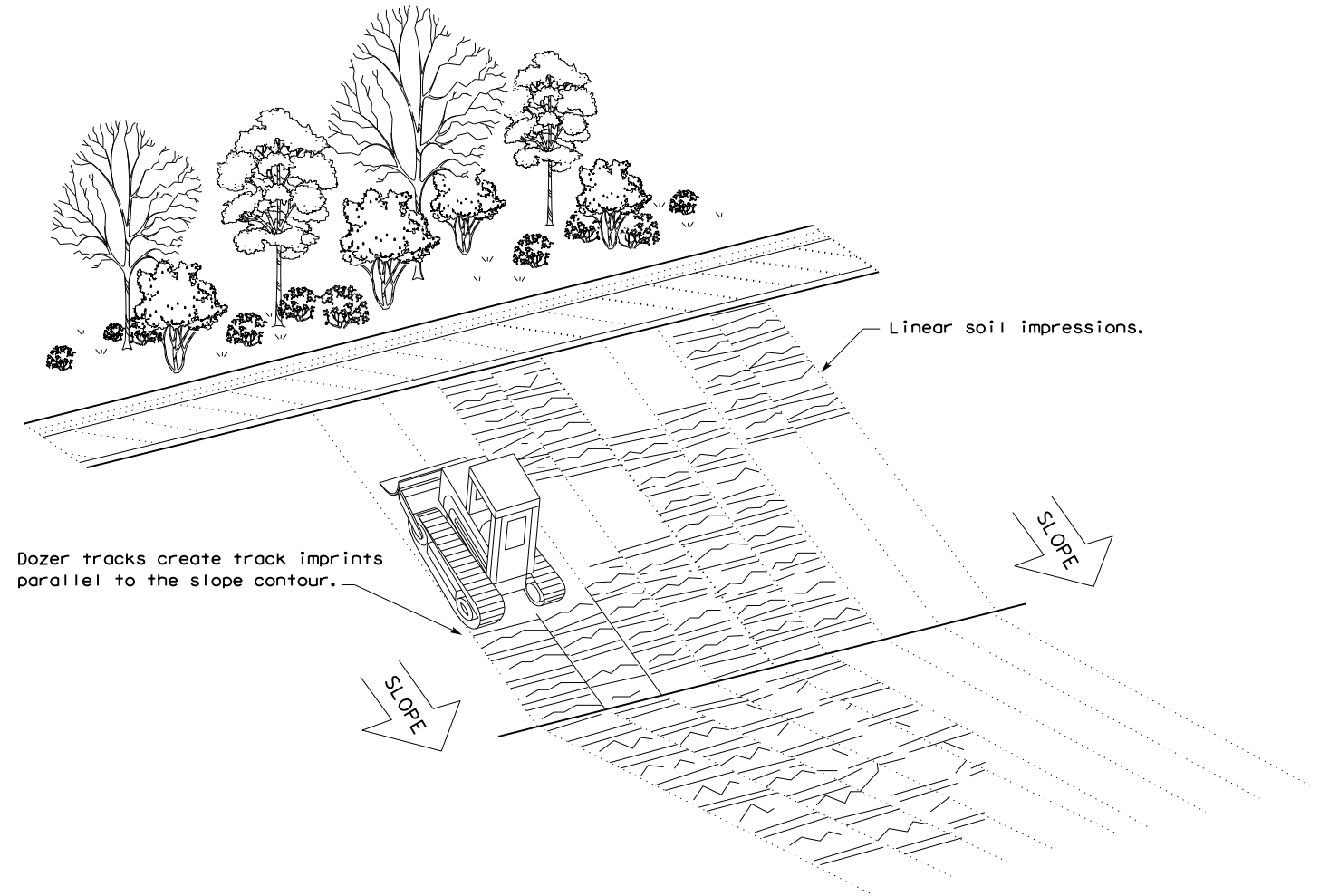
LEGEND

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.

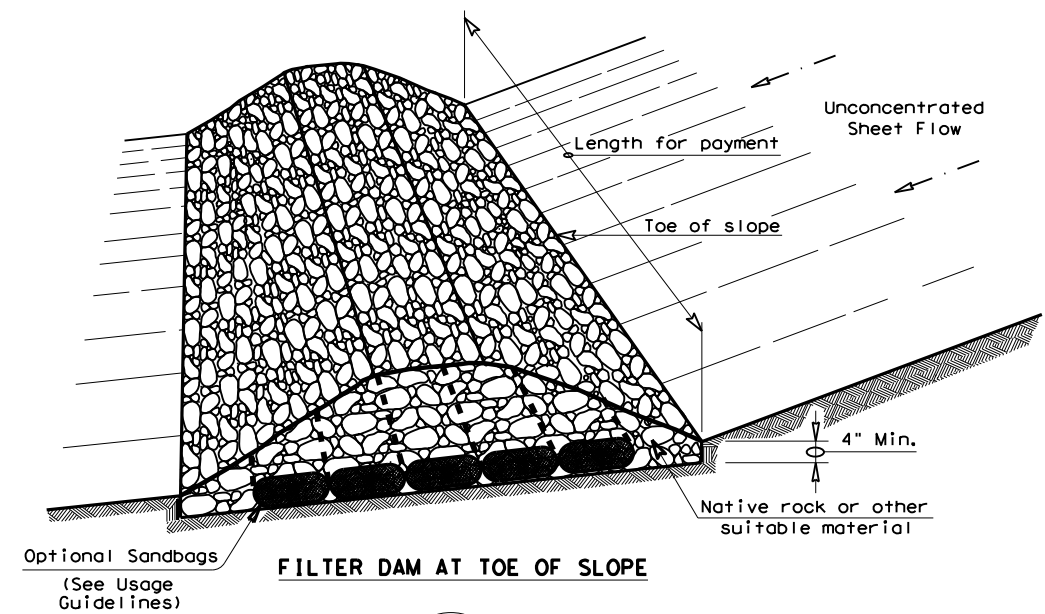


VERTICAL TRACKING

				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	0910	16	139	CR 1102	
	DIST	COUNTY		SHEET NO.	
	TYLER	VAN ZANDT		99	

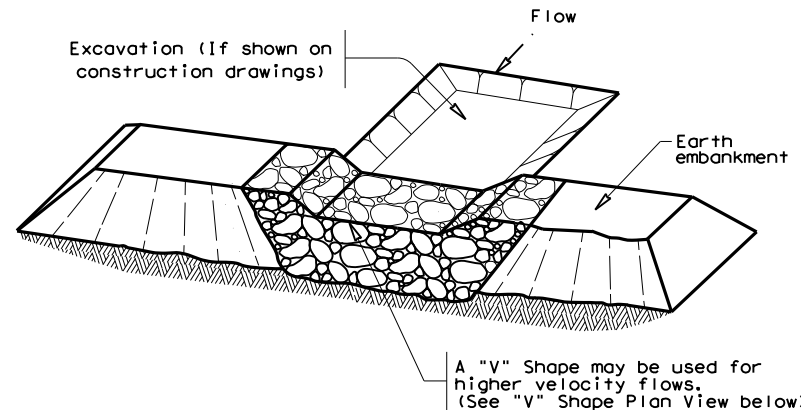
DISCLAIMER: The use of this standard is governed by the "Texas Engineering Practice Act". No warranty of any kind is made by TxDOT for any purpose whatsoever. TxDOT assumes no responsibility for the conversion of this standard to other formats or for incorrect results or damages resulting from its use.

DATE: 4/28/2023
 FILE: c:\bms\pwe-useast-006\tony.tre\jo\dms59615\ec216.dgn



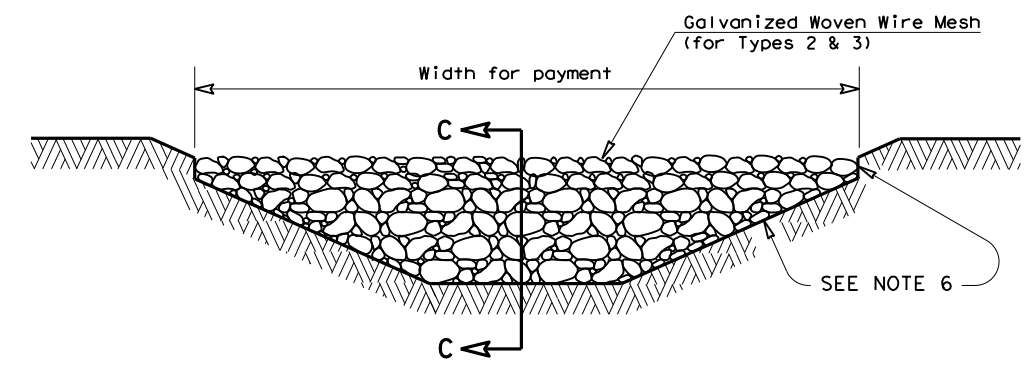
FILTER DAM AT TOE OF SLOPE

(RFD1)



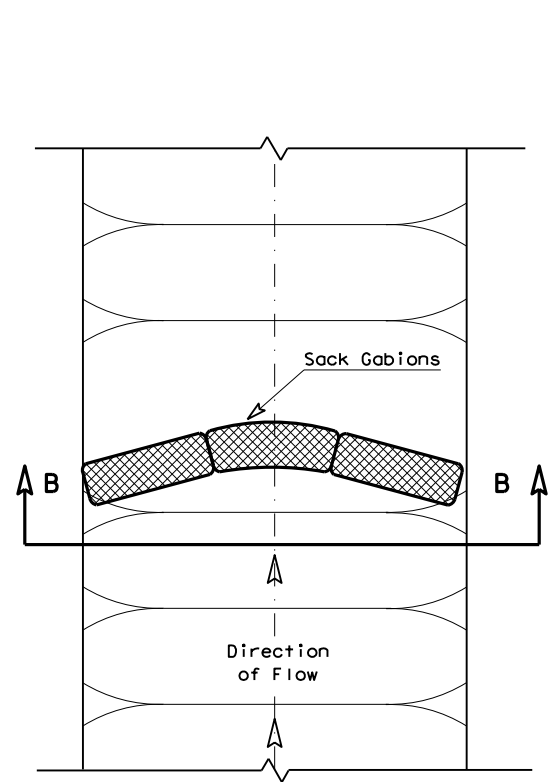
FILTER DAM AT SEDIMENT TRAP

(RFD1) OR (RFD2)

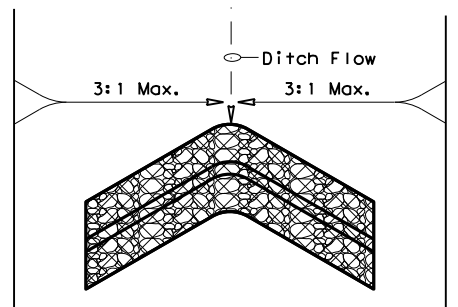


FILTER DAM AT CHANNEL SECTIONS

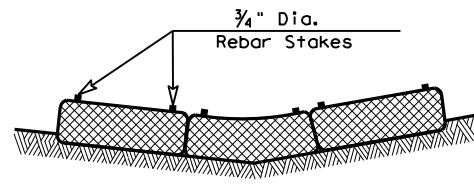
(RFD1) OR (RFD2) OR (RFD3)



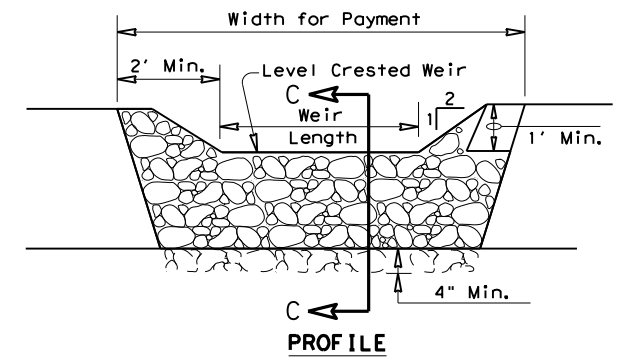
PLAN VIEW



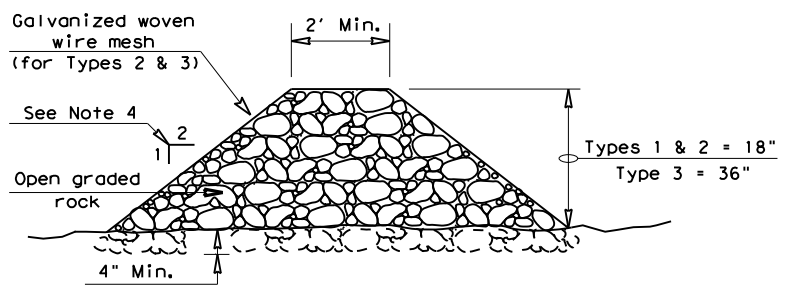
"V" SHAPE PLAN VIEW



SECTION B-B



PROFILE



SECTION C-C

ROCK FILTER DAM USAGE GUIDELINES

Rock Filter Dams should be constructed downstream from disturbed areas to intercept sediment from overland runoff and/or concentrated flow. The dams should be sized to filter a maximum flow through rate of 60 GPM/FT² of cross sectional area. A 2 year storm frequency may be used to calculate the flow rate.

Type 1 (18" high with no wire mesh) (3" to 6" aggregate): Type 1 may be used at the toe of slopes, around inlets, in small ditches, and at dike or swale outlets. This type of dam is recommended to control erosion from a drainage area of 5 acres or less. Type 1 may not be used in concentrated high velocity flows (approximately 8 Ft/Sec or more) in which aggregate wash out may occur. Sandbags may be used at the embedded foundation (4" deep min.) for better filtering efficiency of low flows if called for on the plans or directed by the Engineer.

Type 2 (18" high with wire mesh) (3" to 6" aggregate): Type 2 may be used in ditches and at dike or swale outlets.

Type 3 (36" high with wire mesh) (4" to 8" aggregate): Type 3 may be used in stream flow and should be secured to the stream bed.

Type 4 (Sack gabions) (3" to 6" aggregate): Type 4 May be used in ditches and smaller channels to form an erosion control dam.

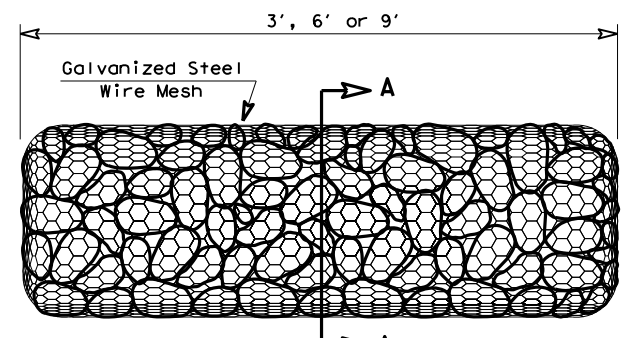
Type 5: Provide rock filter dams as shown on plans.

GENERAL NOTES

1. If shown on the plans or directed by the Engineer, filter dams should be placed near the toe of slopes where erosion is anticipated, upstream and/or downstream at drainage structures, and in roadway ditches and channels to collect sediment.
2. Materials (aggregate, wire mesh, sandbags, etc.) shall be as indicated by the specification for "Rock Filter Dams for Erosion and Sedimentation Control".
3. The rock filter dam dimensions shall be as indicated on the SW3P plans.
4. Side slopes should be 2:1 or flatter. Dams within the safety zone shall have sideslopes of 6:1 or flatter.
5. Maintain a minimum of 1' between top of rock filter dam weir and top of embankment for filter dams at sediment traps.
6. Filter dams should be embedded a minimum of 4" into existing ground.
7. The sediment trap for ponding of sediment laden runoff shall be of the dimensions shown on the plans.
8. Rock filter dam types 2 & 3 shall be secured with 20 gauge galvanized woven wire mesh with 1" diameter hexagonal openings. The aggregate shall be placed on the mesh to the height & slopes specified. The mesh shall be folded at the upstream side over the aggregate and tightly secured to itself on the downstream side using wire ties or hog rings. For in stream use, the mesh should be secured or staked to the stream bed prior to aggregate placement.
9. Sack Gabions should be staked down with 3/4" dia. rebar stakes, and have a double-twisted hexagonal weave with a nominal mesh opening of 2 1/2" x 3 1/4".
10. Flow outlet should be onto a stabilized area (vegetation, rock, etc.).
11. The guidelines shown hereon are suggestions only and may be modified by the Engineer.

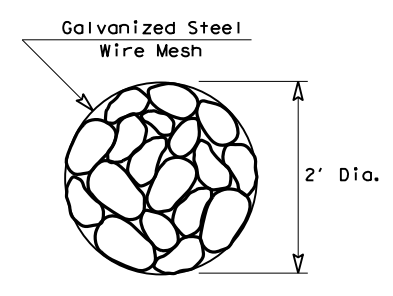
PLAN SHEET LEGEND

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



TYPE 4 (SACK GABIONS)

(RFD4)



SECTION A-A

		Design Division Standard	
TEMPORARY EROSION, SEDIMENT AND WATER POLLUTION CONTROL MEASURES ROCK FILTER DAMS EC(2)-16			
FILE: ec216	DN: TxDOT	CK: KM	DW: VP
© TxDOT: JULY 2016	CONT	SECT	JOB
REVISIONS	091016	139	CR 1102
DIST	COUNTY	SHEET NO.	
TYLER	VAN ZANDT	100	