100% SUBMITTAL
DATE: 5/16/2022 TIME: 1:01:43 PM

INDEX OF SHEETS

SEE SHEET 2

VOLUME I
(CONTRACT CSJ: 0106-04-036)

STATE OF TEXAS
DEPARTMENT OF TRANSPORTATION

PLANS OF PROPOSED
STATE HIGHWAY IMPROVEMENT

PROJECT NO.: BR 2022 (829)

LENGTH OF ROADWAY = 780.00 FT = 0.148 MI
LENGTH OF BRIDGE = 1220.00 FT = 0.231 MI
TOTAL LENGTH OF PROJECT = 2000.00 FT = 0.379 MI

US 380
STONEWALL COUNTY

LIMITS: SALT FORK BRAZOS RIVER

FOR THE CONSTRUCTION OF: BRIDGE REPLACEMENT

CONSISTING OF: REPLACE BRIDGE AND APPROACHES

DESIGN SPEED = 60 MPH
CURRENT A.D.T. (2020) = 697 VPD
PROJECTED A.D.T. (2040) = 976 VPD
FUNCTIONAL CLASS = RURAL ARTERIAL
EXISTING NBI# = 08-217-0-0106-04-043
PROPOSED NBI# = 08-217-0-0106-04-057

FED. RD DIV. No.	PROJECT No.		SHEET No.
6	BR 2022 (829)		1
STATE	STATE DIST.	COUNTY	
TEXAS	ABILENE	STONEWALL	
CONTROL	SECTION	JOB	HIGHWAY No.
0106	04	036	US 380

FINAL PLANS

LETTING DATE: AUGUST 2022
DATE CONTRACTOR BEGAN WORK: _____
DATE WORK WAS COMPLETED: _____
DATE WORK WAS ACCEPTED: _____
FINAL CONTRACT COST: $ _____
CONTRACTOR: _____

CERTIFICATION FOR FINAL PLANS

THIS PROJECT WAS BUILT ACCORDING TO THE PLANS AND SPECIFICATIONS. THESE FINAL PLANS REFLECT THE WORK DONE AND THE QUANTITIES SHOWN THEREON AND ON THE FINAL ESTIMATE ARE FINAL QUANTITIES.

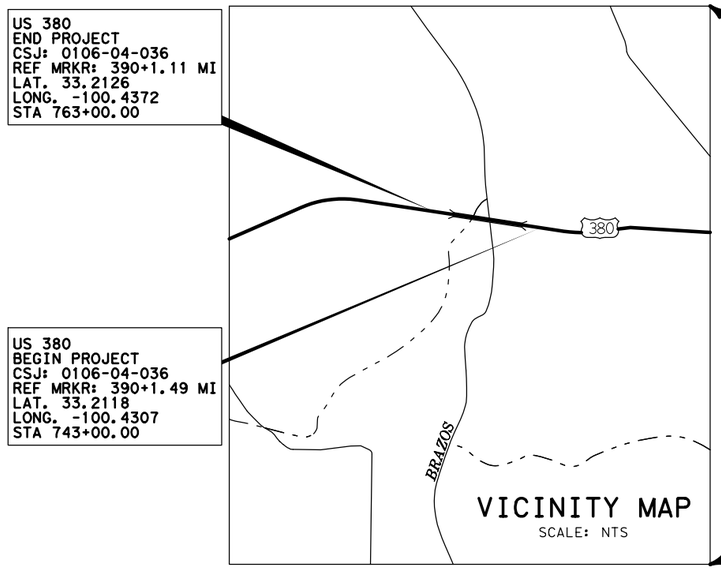
AREA ENGINEER _____ DATE _____

THE DISTRICT TRAFFIC SAFETY COMMITTEE HAS REVIEWED THE TRAFFIC CONTROL PLAN FOR THIS PROJECT AND IT IS IN COMPLIANCE WITH CURRENT TRAFFIC CONTROL STANDARDS.

DocuSigned by:
Casey McGee
2377E0897A804A6...
COMMITTEE CHAIRMAN 5/31/2022 DATE

US 380
END PROJECT
CSJ: 0106-04-036
REF MRKR: 390+1.11 MI
LAT. 33.2126
LONG. -100.4372
STA 763+00.00

US 380
BEGIN PROJECT
CSJ: 0106-04-036
REF MRKR: 390+1.49 MI
LAT. 33.2118
LONG. -100.4307
STA 743+00.00



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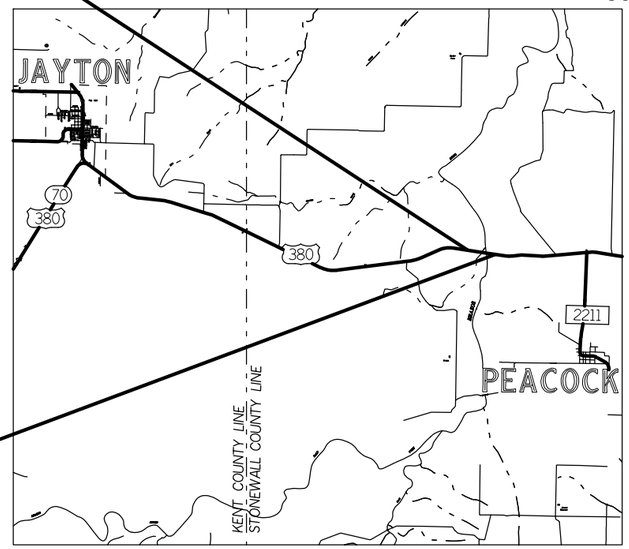

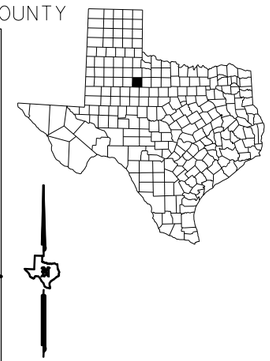

EQUATIONS: NONE
EXCEPTIONS: NONE
RAILROAD CROSSINGS: NONE

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, MAY 1, 2012).

Texas Department of Transportation

RECOMMENDED FOR LETTING: 5/31/2022
DocuSigned by:
Stewart J. Chapman, P.E.
40878C8750864A9...
STEWART J. CHAPMAN, P.E.
AREA ENGINEER

SUBMITTED FOR LETTING: 05/16/2022
Jenelle N Romero, P.E.
JENELLE ROMERO, P.E.
ATKINS PROJECT MANAGER

RECOMMENDED FOR LETTING: 6/3/2022
DocuSigned by:
Michael Haithcock
5757E248798B4FD...
MICHAEL A. HAITHCOCK, P.E.
DIRECTOR OF T P & D

RECOMMENDED FOR LETTING: 5/31/2022
DocuSigned by:
DDD6B1A6E1F74F6...
NATHANIEL MOORE
TxDOT PROJECT MANAGER

APPROVED FOR LETTING: 6/3/2022
DocuSigned by:
Thomas D. Allbritton, P.E.
0F6F7E1483D430...
THOMAS D. ALLBRITTON, P.E.
DISTRICT ENGINEER

PLOT DRIVER: TXDOT_PDF_BW.plt
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DATE: 5/25/2022 TIME: 12:49:56 PM

INDEX OF SHEETS

STATE OF TEXAS
JENELLE N. ROMERO
97940
LICENSED
PROFESSIONAL ENGINEER
5/25/2022

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

STATE OF TEXAS
PRADEEP KUMAR
130846
LICENSED
PROFESSIONAL ENGINEER
5/25/2022

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

ATKINS
TBPE REG. # F-474

Texas Department of Transportation
Abilene District

US 380

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SHEET 1 OF 1

DESIGNED: SG	FED. RD DIV. No.	STATE	PROJECT No.			HIGHWAY No.
CHECKED: JNR	6	TEXAS	SEE TITLE SHEET			US 380
DRAWN: SG	STATE DISTRICT	COUNTY	CONTROL No.	SECTION No.	JOB No.	SHEET No.
CHECKED: JNR	ABL	STONEWALL	0106	04	036	2

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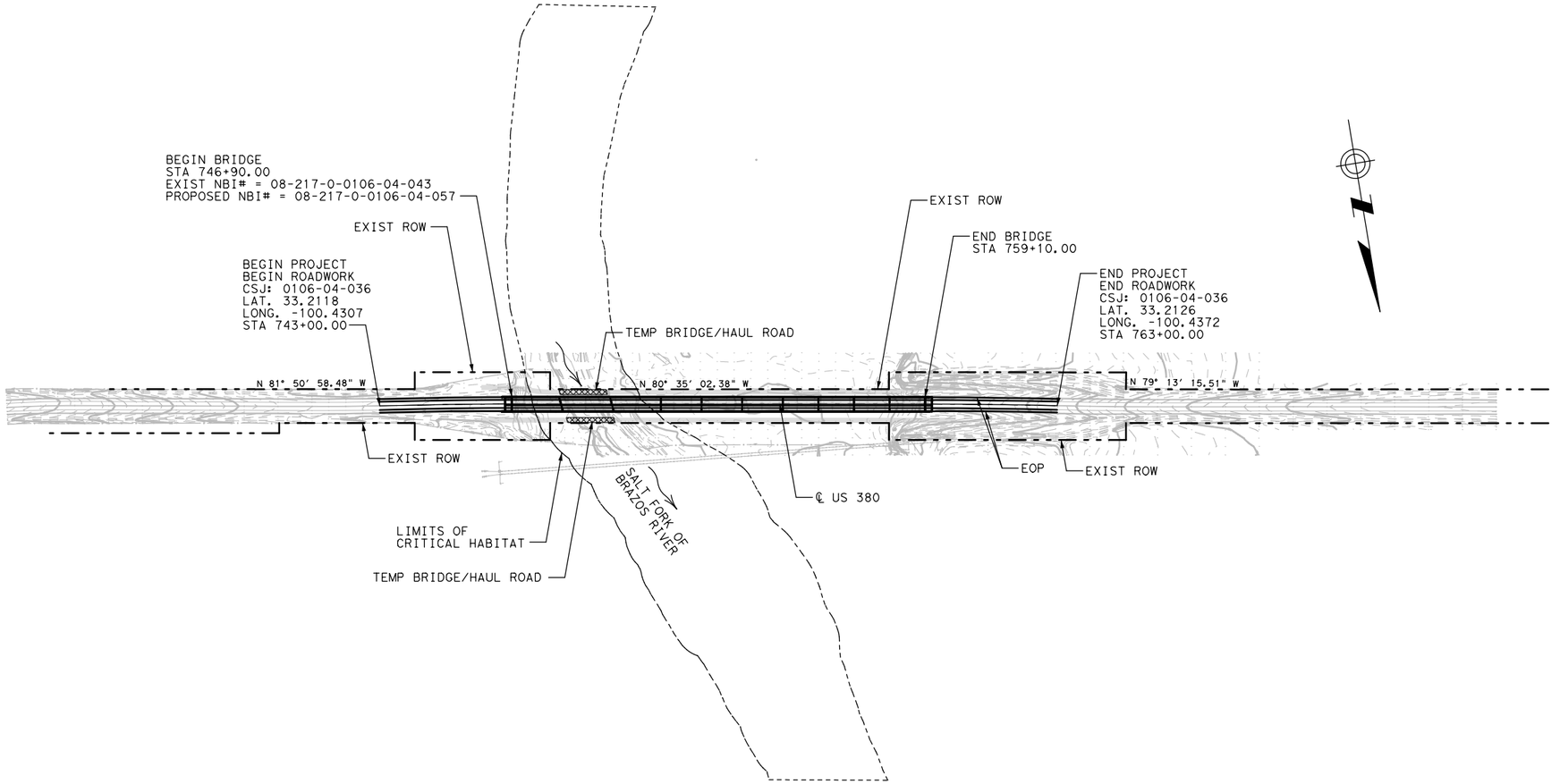

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SCALE = 1"=400' H

STATE OF TEXAS
JENELLE N. ROMERO
97940
LICENSED
PROFESSIONAL ENGINEER
4/28/2022

ATKINS
TBPE REG. # F-474

Texas Department of Transportation
Abilene District

US 380

PROJECT LAYOUT

SCALE: 1"=400' SHEET 1 OF 1

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DRAWN: SG	STATE DISTRICT	COUNTY	CONTROL No.	SECTION No.	JOB No.	SHEET No.
CHECKED: JNR	ABL	STONEWALL	0106	04	036	3

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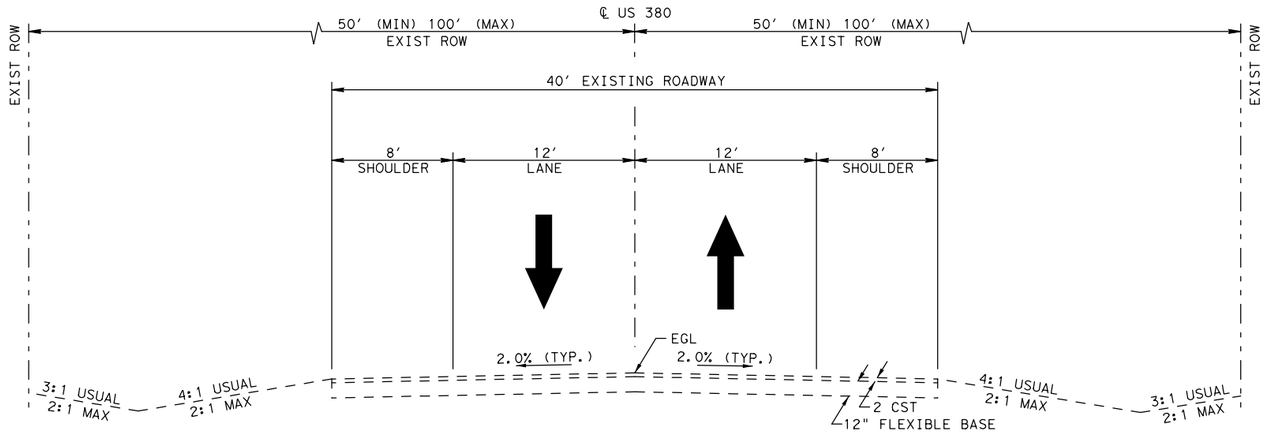
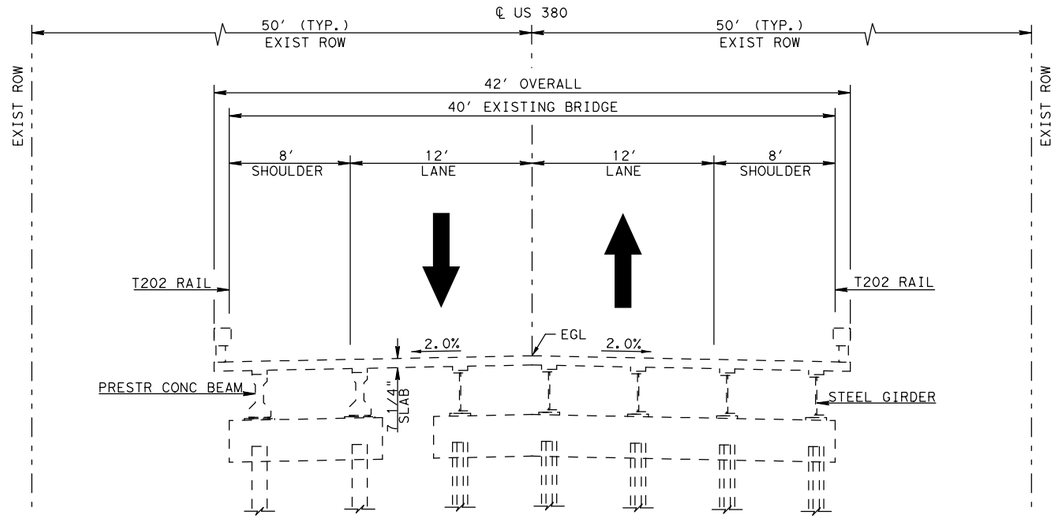


US 380
EXISTING ROADWAY TYPICAL
STA 743+00.00 TO STA 747+00.00
STA 758+97.00 TO STA 763+00.00



US 380
EXISTING ROADWAY TYPICAL
STA 747+00.00 TO STA 758+97.00

ATKINS
TBPE REG. # F-474

Texas Department of Transportation
Abilene District

US 380

TYPICAL SECTIONS

SCALE: N.T.S. SHEET 1 OF 2

DESIGNED: SG	FED. RD DIV. No.	STATE	PROJECT No.			HIGHWAY No.
CHECKED: JNR	6	TEXAS	SEE TITLE SHEET			US 380
DRAWN: SG	STATE DISTRICT	COUNTY	CONTROL No.	SECTION No.	JOB No.	SHEET No.
CHECKED: JNR	ABL	STONEWALL	0106	04	036	4

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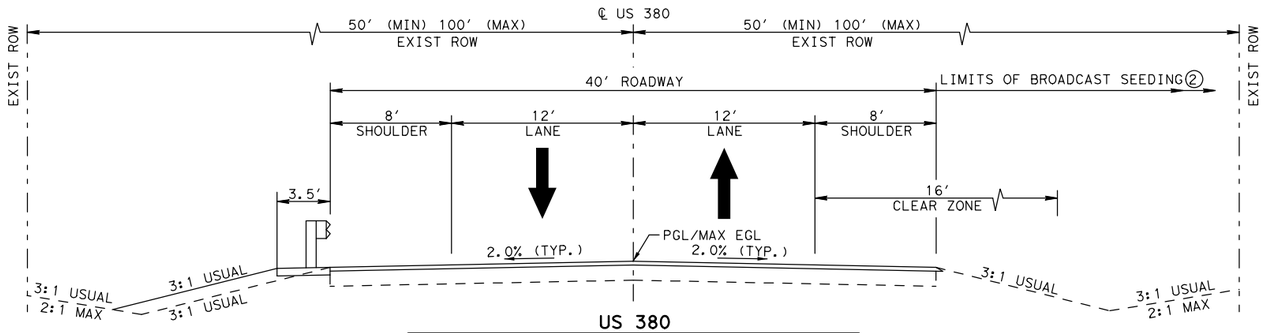

US 380
PROPOSED ROADWAY TYPICAL
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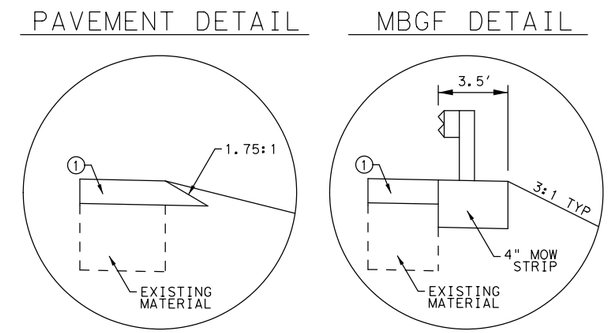
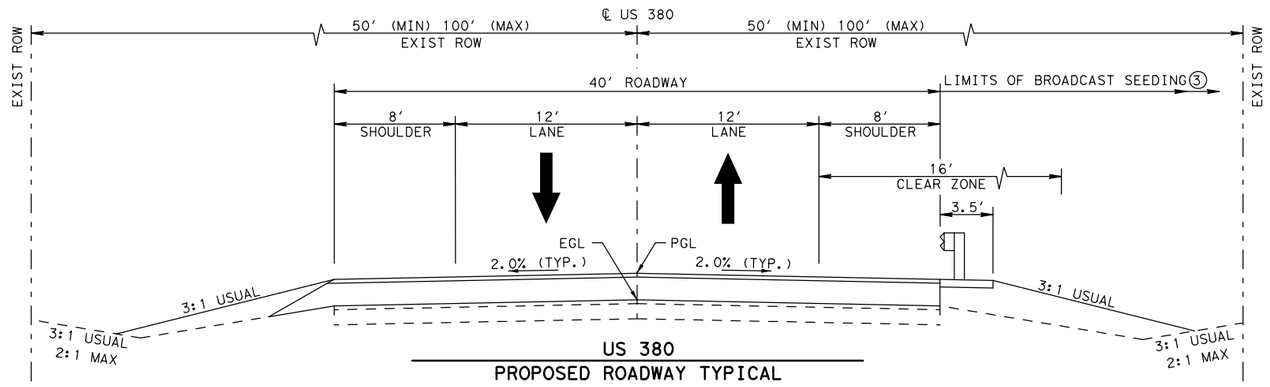
STA 762+68.67 TO STA 763+00.00





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PROPOSED ROADWAY TYPICAL
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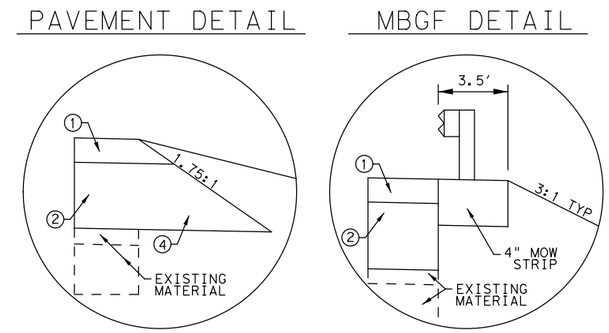

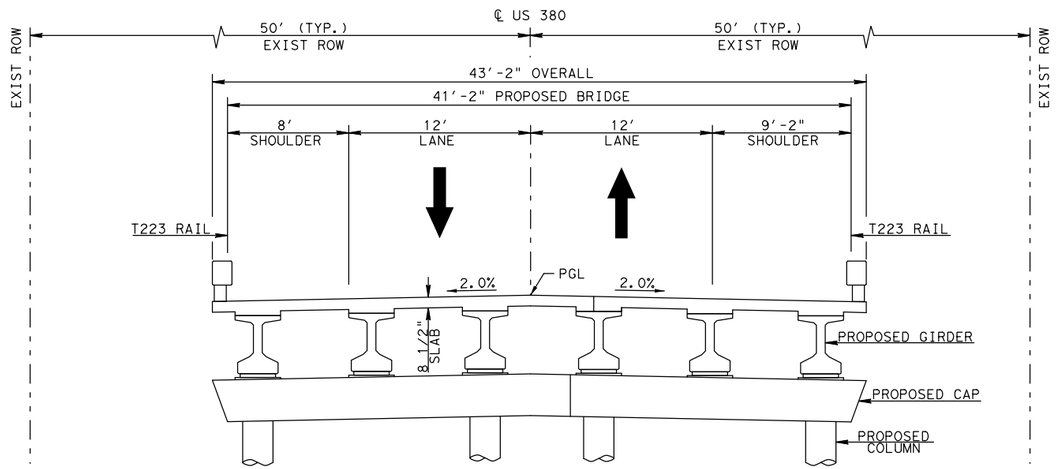

US 380
PROPOSED ROADWAY TYPICAL
STA 746+90.00 TO STA 759+10.00

① 2" SP-C SAC-B PG 70-22 AND PRIME COAT
② MINIMUM 8" FLEX BASE
③ LIMITS OF SEEDING VARIES ALONG PROJECT
④ FLEX BASE TAPER IS SUBSIDIARY

RATES OF APPLICATION

ITEM 310 PRIME COAT @ 0.25 GAL/SY
ITEM 3077 SP-C SAC-B PG 70-22 @ 110 LB/SY/IN

NEW FLEX BASE (TY A) (GR 1-2)

STATE OF TEXAS
JENELLE N. ROMERO
97940
LICENSE
PROFESSIONAL ENGINEER
Jenelle N. Romero, P.E.
5/16/2022

ATKINS
TBPE REG. # F-474

Texas Department of Transportation
Abilene District

US 380

TYPICAL SECTIONS

SCALE: N.T.S. SHEET 2 OF 2

DESIGNED: SG	FED. RD DIV. No.	STATE	PROJECT No.			HIGHWAY No.
CHECKED: JNR	6	TEXAS	SEE TITLE SHEET			US 380
DRAWN: SG	STATE DISTRICT	COUNTY	CONTROL No.	SECTION No.	JOB No.	SHEET No.
CHECKED: JNR	ABL	STONEWALL	0106	04	036	5

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ABILENE DISTRICT GENERAL NOTES
2014 SPECIFICATIONS

General

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

Stewart Chapman, P.E.: Stewart.Chapman@txdot.gov
Maxie Allen, P.E.: Maxie.Allen@txdot.gov
(Snyder Area Office)

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

All contractor questions will be reviewed by the Engineer. Once a response is developed, it will be posted to TxDOT's Public FTP at the following Address:
https://ftp.dot.state.tx.us/pub/txdot-info/Pre-Letting%20Responses/

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

Modified Standards:
CSAB (MOD)
FD(MOD)

Failure to make necessary corrections to SW3P based on SW3P inspections will be cause for withholding the monthly estimate until such corrections have been made.

Failure to make necessary corrections to traffic control items based on barricade inspections will be cause for withholding the monthly estimate until such corrections have been made.

Provide ingress/egress to the adjacent properties in areas under construction. Phased construction of driveways and streets shall be required to provide uninterrupted access to adjacent properties. Coordinate work with the property owners before beginning any construction in the vicinity of the drive.

Cut neat, straight lines with vertical faces along pavement edges or along joints between existing asphalt or concrete pavement and new pavement perpendicular or parallel to the direction of traffic by methods described in applicable bid items, or as directed. Provide clean edges or joints

Project Number: BR 2022 (829)
Control: 0106-04-036 & 2011-02-015
County: Stonewall & Kent
Highway: US 380 & SH 208

without jagged appearance or chunks broken out. This work is considered subsidiary to various bid items.

The Contractor must submit a demolition plan.

Construction will not be allowed at the same time on SH 208 and US 380 without approval of the Engineer.

Environmental

Endangered and Protected Species

1. Migratory Birds
   - **a. Bird nesting season is typically 15Feb through 15Sep annually.**
   - b. The Contractor will avoid disturbing, destroying, removing, or relocating migratory birds and active nests found in trees, culverts, bridges, on the ground, or anywhere they are encountered.
   - c. Perform all tree trimming and other vegetation clearing activities during the non-breeding season (typically 15Sep-15Feb annually). Perform any inactive nest removal and bird exclusion methods to prevent birds from establishing nests. Phasing of work during construction may be necessary to stay in compliance.
   - d. When active nests are unexpectedly encountered on-site during construction, the Contractor will stop work and immediately notify the Engineer. Take measures to avoid disturbance of these birds, their occupied nest, eggs, and/or young, in accordance with the Migratory Bird Treaty Act, Texas Parks and Wildlife Code, and TxDOT policy.
   - e. The Engineer will notify the Contractor when work may resume.
   - f. The Contractor should be prepared to prevent migratory birds from building nests by utilizing nest prevention methods, such as bird-deterrent netting and bird-repelling sprays and/or gels, between 15Feb and 15Sep. The Contractor can discuss other preventative measures with the Engineer and/or District Environmental Staff.

Best Management Practices

1. Comply with the SW3P and associated sheets.
2. Construction Schedule
   - a. The construction activity schedule is designed to minimize potential impacts to endangered aquatic species. Peak spawning season is Apr – Sep. Work in the water should be avoided during this time. Adhere to the schedule to the maximum extent possible.
   - b. Work will be avoided in the wetted channel during peak spawning season, and especially during flood events. Flow will be monitored with the closest gauge to the Project area with real-time stream data available. Work in the wetted channel

ATKINS
TBPE REG. # F-474

Texas Department of Transportation
Abilene District

US 380

GENERAL NOTES

SHEET 1 OF 6

DESIGNED: SG	FED. RD DIV. No.	STATE	PROJECT No.			HIGHWAY No.
CHECKED: JNR	6	TEXAS	SEE TITLE SHEET			US 380
DRAWN: SG	STATE DISTRICT	COUNTY	CONTROL No.	SECTION No.	JOB No.	SHEET No.
CHECKED: JNR	ABL	STONEWALL	0106	04	036	6

will be halted if precipitation events in the basin result in an increase in gauge height of 2' or more over the monthly median.

3. Construction Access and Staging
   a. The Critical Habitat Unit (CHU) will be delineated with temporary fencing and signage.
   b. No PSL, laydown area, washout area, portable sanitary facilities, or any other storage area will be placed within 100' of the CHU.
   c. Work within the CHU will be limited to the minimum necessary to complete the project.
   d. Work in the water should be avoided unless necessary.
   e. Access to the CHU will limited to a temporary haul road from both sides of the bridge. Temporary bridges will be constructed to span the wetted channel; one bridge is allowed on each side of US 380, and one bridge is allowed only on the west side of SH 208. The temporary access bridges will allow access for bridge removal and reconstruction activities. The temporary bridge structures will be supported by up to 4 driven pilings each within the wetted channel. Additional support pilings may be placed within the CHU and outside of the wetted channel.
4. Construction
   a. Work within the CHU will be minimized to that necessary to remove the existing bridge and construct the new bridge.
   b. Any activity involving dewatering (e.g., cofferdams) will need to be cleared by a permitted biologist, supplied by TxDOT. This activity involves clearing endangered fish from the impact area and monitoring the work to ensure aquatic organisms are not impacted by the construction/demolition work.
   c. Access to the bridge from below within the CHU will be limited to the use of the temporary haul road/bridge. Minimize activities off the temporary haul road/bridge to only necessary activities.
   d. When access to under the bridge is no longer required, remove the temporary haul road/bridge and restore the are to pre-construction conditions.
   e. Use district designated seed mix for erosion control and re-seeding.
   f. If erosion control blankets are used on sloped surfaces, use wildlife friendly products from the Approved Product List as designated by the Engineer.
   g. Silt fences and BIOLOGS are to be used in tandem for erosion control, sediment control, and protection of protected fish.
   h. BIOLOGS are to be left in place post construction (TxDOT to remove after one growing season). Silt fence will be removed once post construction erosion control is in place.
5. Bird BMPs
   a. Not disturbing, destroying, or removing active nests, including ground nesting birds, during the nesting season;
   b. Avoiding the removal of unoccupied, inactive nests, as practicable;

Project Number: BR 2022 (829)
Control: 0106-04-036 & 2011-02-015
County: Stonewall & Kent
Highway: US 380 & SH 208

   c. Preventing the establishment of active nests during the nesting season on TxDOT owned and operated facilities and structures proposed for replacement or repair;
   d. Not collecting, capturing, relocating, or transporting birds, eggs, young, or active nests without a permit.
6. Other Best Management Practices for State Protected Species
   a. If Black Tailed Prairie Dog (BTPD) burrows or pocket gopher mounds are found near or within the project area, place barrier fencing to discourage the individual animals of moving into or through the construction area.
   b. While seeding or revegetating, if BTPD or pocket gopher mounds are discovered near or within the planned area, a vegetative barrier should be planted to discourage the dispersal of the species within the TxDOT ROW.
   c. If animals are within the project area, avoid harming when encountered. Let them leave the area without harassment.
   d. Avoid or minimize disturbing or removing downed trees, rotting stumps, and leaf litter which may be refugia for terrestrial reptile or amphibians, where feasible.
   e. For open trenches and excavated pits, install escape ramps at an angle of less than 45 degrees (1:1) in areas left uncovered. Visually inspect excavation areas for the presence of wildlife prior to backfilling.
   f. Rubbish found near bridges on TxDOT ROW should be removed and disposed of properly to minimize the risk of pollution. Rubbish does not include brush piles or snags.

Item 5, "Control of Work"
Use Method C for construction surveying.

All known utilities are identified in the plans, including the crossing of power lines. Use this information to identify potential issues with power poles and power lines prior to bidding. Make necessary arrangements with utility owners regarding temporary protections such as bracing power poles, and de-energizing power lines. The Department will not reimburse the cost of such temporary protections to the Contractor, unless the Engineer determines that inadequate information was available at the time the project was bid. **"Call Before You Dig" "Call 811"**

Provide notification to the Traffic Engineering Section by telephone at 325-676-6991 and by email at ABL-TrafficFix@txdot.gov when planning drilling or excavation work in areas where existing TxDOT underground utilities exist. Visual evidence of TxDOT underground utilities in the area include illumination poles, ground boxes, flashing beacons, traffic signals, etc. This notification must be provided 72 hours in advance of performing the work.

Drilled shaft locations or excavation areas must be staked prior to the notification so that the underground utilities can be located in relationship to the proposed work. Preserve and document the marked utility locations to prevent unnecessary secondary notifications. Notify the Engineer of conflicts between proposed work and underground utilities.

ATKINS
TBPE REG. # F-474

Texas Department of Transportation
Abilene District

US 380

GENERAL NOTES

SHEET 2 OF 6

DESIGNED: SG	FED. RD DIV. No.	STATE	PROJECT No.			HIGHWAY No.	
CHECKED: JNR	6	TEXAS	SEE TITLE SHEET			US 380	
DRAWN: SG	STATE DISTRICT	COUNTY	CONTROL No.	SECTION No.	JOB No.	SHEET No.	
CHECKED: JNR	ABL	STONEWALL	0106	04	036	7	

Obtain approval from the Engineer of staked locations for illumination foundations, pull boxes, and power source prior to construction.

When a precast or cast-in-place concrete element is included in the plans, a precast concrete alternate may be submitted in accordance with "Standard Operating Procedure for Alternate Precast Proposal Submission" found online at https://www.txdot.gov/inside-txdot/forms-publications/consultants-contractors/publications/bridge.html#design. Acceptance or denial of an alternate is at the sole discretion of the Engineer. Impacts to the project schedule and any additional costs resulting from the use of alternates are the sole responsibility of the Contractor.

Item 7, "Legal Relations and Responsibilities"
The total area disturbed for this project is 2.23 acres. The disturbed area in this project, all project locations in the Contract, and the Contractor project specific locations (PSLs), within 1 mile of the project limits, for the Contract will further establish the authorization requirements for storm water discharges. The Department will obtain an authorization to discharge storm water from the Texas Commission on Environmental Quality (TCEQ) for the construction activities shown on the plans. The Contractor is to obtain required authorization from the TCEQ for Contractor PSLs for construction support activities on or off the ROW. When the total area disturbed in the Contract and PSLs within 1 mile of the project limits exceeds 5 acres, provide a copy of the Contractor NOI for PSLs on the ROW to the Engineer and to the government that operates a separate storm sewer system.

Provide one SW3P Notification Board for this project. Notification Boards are to be placed at locations within the right-of-way but outside the clear zone as directed by the Engineer. Consider this work to be subsidiary to the various bid items of the contract.
No significant traffic generator events identified.
Hard hats are required at all times during construction when construction personnel are in TxDOT Right-of-Way.

Item 8 "Prosecution and Progress"
Each contract awarded by the Department stands on its own and as such, is separate from other contracts. A Contractor awarded multiple contracts must be capable and sufficiently staffed to concurrently process and/or execute all contracts at the same time.

The Contractor is hereby authorized to begin work prior to the expiration of the number of calendar days provided in the Special Provision to Item 8, Article 8.1. Notify the Engineer in writing of the date to begin work. Time charges will commence when work begins or on the expiration of the number of calendar days provided, whichever occurs first.

Coordinate and update the work schedule with the project inspector daily. Give a minimum of 24 hours of notice to project inspector if work requiring inspection or testing is to be performed. Failure to do so may cause that work to be delayed or postponed if TxDOT personnel are not

Project Number: BR 2022 (829)
Control: 0106-04-036 & 2011-02-015
County: Stonewall & Kent
Highway: US 380 & SH 208

available. Work performed without suitable inspection, as determined by the Engineer, may be ordered removed and replaced at Contractor's expense.

In accordance with SP-000-658, liquidated damages will be increased by $8,588 per working day.

Item 9, "Measurement and Payment"
The progress payment period shall end on the 25th of each month, unless directed by the Area Office Engineer. Material on Hand (MOH) is due two business days before estimate cut off.

Item 100, "Preparing Right of Way"
The Contractor's attention is directed to potential regulations against burning within the project limits. Abide by all local ordinances and county imposed burn bans. When burning is prohibited, dispose of material in accordance with regulations set forth by other regulatory agencies including the Texas Commission for Environmental Quality. The cost of burning or disposal of any product is subsidiary to various bid items.

Item 164, "Seed for Erosion Control"
Quantities shown are approximate; limits of the temporary and permanent seeding will be determined during construction.

Item 168, "Vegetation Watering"
Water rate for this project shall be ¼" of water per acre every two weeks for a 3-month period.

Item 420, "Concrete Substructures"
The following elements are Plans Quantity Elements.
- Abutment
- Cap
- Column

Item 432, "Riprap"
Provide structural fiber reinforced or conventionally reinforced concrete for formed M.B.G.F. concrete mow strip.

Meet the following requirements when using structural fiber reinforcement:
- If slip forming, use an approved method that ensures adequate concrete consolidation. Sprinkle and consolidate the subgrade before the concrete is placed. Finish the surface with a wood float or broom finish as approved. Immediately after finishing operation, cure the riprap according to Item 420, "Concrete Structures".

Item 502, "Barricades, Signs and Traffic Handling"
Mobile traffic control in accordance with TPC 3 series will be required for placement of short duration, short term, intermediate term, and long-term traffic control.

ATKINS
TBPE REG. # F-474

Texas Department of Transportation
Abilene District

US 380

GENERAL NOTES

SHEET 3 OF 6

DESIGNED: SG	FED. RD DIV. No.	STATE	PROJECT No.			HIGHWAY No.
CHECKED: JNR	6	TEXAS	SEE TITLE SHEET			US 380
DRAWN: SG	STATE DISTRICT	COUNTY	CONTROL No.	SECTION No.	JOB No.	SHEET No.
CHECKED: JNR	ABL	STONEWALL	0106	04	036	8

Provide the Engineer with written notification seven (7) days in advance of major traffic changes. A major traffic change is defined as the temporary (greater than one day) or permanent relocation of traffic lanes typically in an urban setting. The notice will, at a minimum, include the expected date, time and scope of the traffic change. The Department will utilize the information provided to inform the traveling public of the changes. Failure to provide advance notice, or to provide accurate information, will result in delaying the work until such time that the public has been notified.

Additional signs, barricades and traffic handling may be necessary to complete the work shown herein and will be provided by the contractor as required and will be considered subsidiary to this item.

Provide separate attenuators for each work area within a common lane closure as approved or directed by the Engineer.

In sections where traffic is restricted to one lane, two-way traffic, flaggers will be stationed at each end of that section with two-way communication devices and a pilot car will control operations.

Relocate existing roadside signs to temporary supports as approved by the engineer.

All safety appurtenances such as signs, delineators, object markers and route markers will be in place prior to opening each phase of the construction to traffic, unless otherwise directed.

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

The Contractor's person responsible for TCP compliance must be available by local telephone and have a response time within 45 minutes.

Work will not be allowed on both sides of the roadbed at the same time.

Equip all work vehicles within 30 feet of the traveled way with a functioning amber strobe light or rotating beacon visible from all directions.

Repair barricades within the timeline shown on the barricade inspection report. Failure to comply will cease all work until barricades are repaired to the satisfaction of the Department.

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County: Stonewall & Kent
Highway: US 380 & SH 208

Replace all damaged traffic control devices immediately. Remove any damaged traffic control devices from the project within 24 hours.

Conflicting guide signs shall be covered as approved by the Engineer.

Pilot car is subsidiary to item 502.

Reduced regulatory speed limit signs should only be posted in the vicinity of ongoing work activity as shown on BC (3)-14 and not throughout the entire project. Removing, relocating or covering speed limit signs shall be considered subsidiary to item 502.

Item 504, "Field Office for Laboratory"

Field Laboratory:
Furnish a "Type D" structure for the asphalt mix control laboratory for the Engineer's exclusive use. In addition to the requirements of Item 504, furniture and equipment to be furnished by the Contractor shall include*:*

- eye wash station
- first-aid kit
- two fire extinguishers
- Provide internet connectivity for use by TxDOT lab testing personnel at all laboratory structures on this project.

Item 510, "One-way Traffic Control"
The contractor shall use ADDCO PTS-2000 or equivalent, that shall show wait time, as temporary traffic signals. Two (2) temporary traffic signals will be required for this project.

Item 512, "Portable Concrete Traffic Barrier
The contractor shall furnish new single slope portable concrete traffic barrier (PCTB) sections using SSCB(2)-10 standard.

Quick-Bolt (SSCB)Type X Joint installation shall be used.

Upon completion of the project, PCTB will become the property of the TxDOT and will be stockpiled as approved by the Engineer at the intersection of US 380 and SH 283, near the community of Old Glory in Stonewall County, approx. 24 miles from the project limits.

Item 533, "Milled Rumble Strips"
The milled rumble strips should be placed on shoulder according to rs(1-4)-13 standards and the shoulder widths as shown below.

- Shoulder width of greater than 6 feet the rumble strip will begin 2 feet from the edge line.
- Or as directed by the engineer

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Texas Department of Transportation
Abilene District

US 380

GENERAL NOTES

SHEET 4 OF 6

DESIGNED: SG	FED. RD DIV. No.	STATE	PROJECT No.			HIGHWAY No.
CHECKED: JNR	6	TEXAS	SEE TITLE SHEET			US 380
DRAWN: SG	STATE DISTRICT	COUNTY	CONTROL No.	SECTION No.	JOB No.	SHEET No.
CHECKED: JNR	ABL	STONEWALL	0106	04	036	9

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Control: 0106-04-036 & 2011-02-015
County: Stonewall & Kent
Highway: US 380 & SH 208

Item 540, "Metal Beam Guard Fence"
Core drill 1 ¼ diameter holes through existing slab. Percussion or impact drilling is not permitted. Patch spalls, when directed by the engineer, in accordance with item 429, "Concrete Structure Repair", at the contractor's expense.

Item 542, "Removing Metal Beam Guard Fence"
All metal beam guard fence removed from the project will become property of the Contractor.

Item 585, "Ride Quality for Pavement Surfaces"
The Engineer reserves the right to prohibit corrective work and assess the penalty for each occurrence of localized roughness per Article 585.3.4.2.3.2.
Use pay adjustment schedule **2 (two)** for Ride Quality bonus/penalty calculation.

Item 644, "Small Roadside Sign Supports and Assemblies"
Use the latest edition of the "Standard Highway Sign Designs for Texas" for Sign types for which design details are not shown on the plans.

Sign placement shall be in accordance with the latest edition of the TMUTCD & TxDOT's Sign Crew Field Book located at the following addresses.
TMUTCD - https://www.txdot.gov/business/resources/signage/tmutcd.html
TxDOT's Sign Crew Field Book - http://onlinemanuals.txdot.gov/txdotmanuals/sfb/index.htm

Before final sign installation, stake all sign locations for approval by the engineer.

All triangle slip base small sign mounts installed under this item shall utilize clamp type bases.

Remove entire small sign foundation.

Deliver and stockpile all signs to be salvaged to the Kent County maintenance yard in Jayton.

Item 658, "Delineator and Object Marker Assemblies"
All MBGF delineation shall be GF2 mounted on posts.

Use a minimum 2 inch long lag screws with washers to attach flexible GF2 barrier reflectors to wooden post. For steel posts, use an approved adhesive, or other method approved by Engineer.

Concrete Barrier Reflectors shall be equivalent to Shure-tite CTB "Cup Mount" Delineator (8"). Attach delineators to concrete rail with concrete anchors as approved by the Engineer.

Item 662, "Work Zone Pavement Markings"
Dispose of tabs and paper in an approved trash receptacle. (Reference Standard **SW3P**, waste material)

Use traffic paint for non-removable work zone pavement markings.

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Highway: US 380 & SH 208

Item 666, "Retro reflectorized Pavement Markings"
Provide a complete system of thermoplastic pavement markings at locations indicated on the plans and as directed by the engineer. The plans are intended to show typical conditions, which can be extended to similar conditions throughout this project as approved or directed.

All longitudinal pavement markings (including profile pavement markings) must meet minimum retro reflectivity requirements.

Contractor is responsible for re-establishing location and alignment for new pavement markings matching pavement marking alignment prior to construction activities. This work will be considered subsidiary.

Item 672, "Raised Pavement Markers"
Provide a complete system of raised pavement markers at locations indicated on the plans and as directed by the engineer. The plans are intended to show typical conditions, which can be extended to similar conditions throughout this project as approved or directed.

Bituminous adhesive shall be used on this project.

Item 677, "Eliminating Existing Pavement Markings and Markers"
Remove the existing raised pavement markings (RPMs) and profile pavement markings as the work progresses, or as directed by the Engineer. Removal methods shall be approved by the Engineer. Properly dispose of materials removed. Removal of existing profile pavement markings will be paid for directly. Removal of RPMs will not be paid for directly but will be subsidiary to the pertinent bid items.

Item 3077, "Superpave Mixtures"
Furnish aggregate for final surfaces with a minimum surface aggregate classification of "**B**".

Provide an SP-C Fine Mixture with a minimum design VMA of 16.0% and a minimum plant-produced VMA of 15.5%.

The Engineer reserves the right to test all sources even if the source is listed in the Bituminous Source Rated Quality Catalog.

Provide the testing lab samples to calibrate the ignition oven no later than five **(5)** working days prior to mix design verification.

Meet the minimum Hamburg Wheel Test requirements shown below:

- PG 64 or lower – 5,000 passes
- PG 70 – 10,000 passes
- PG 76 – 20,000 passes

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Abilene District

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GENERAL NOTES

SHEET 9 OF 8

DESIGNED: SG	FED. RD DIV. No.	STATE	PROJECT No.			HIGHWAY No.
CHECKED: JNR	6	TEXAS	SEE TITLE SHEET			US 380
DRAWN: SG	STATE DISTRICT	COUNTY	CONTROL No.	SECTION No.	JOB No.	SHEET No.
CHECKED: JNR	ABL	STONEWALL	0106	04	036	10

Paving operations will not be allowed to begin until TxDOT has tested and obtained passing Hamburg results on the trial batch.

A maximum of 0.50% anti-stripping agent will be allowed for each specified mix type.

Dilution of tack coat is not allowed.

Do not exceed a laydown width of 16' per pass.

Substitute Binders will not be allowed unless RAP or RAS is used in the production of the mixture.
RAS will not be allowed in surface mixes.

A warm mix additive will be required for hotmix hauls over 50 miles.

Unless otherwise directed by the engineer, a warm mix additive will be required when paving during November 1st through March 15th.
The maximum allowable dust / asphalt ratio that will be allowed is 0.6 to 1.2.

The use of a tapered longitudinal joint will be required for pavement thicker than 2 inches.

Use a self-propelled, wheel-mounted material transfer vehicle (MTV) capable of receiving hot mix from the haul trucks separate from the paver on this project. Minimum requirements for the MTV are a storage capacity of approximately 25 tons, a pivoting discharge conveyor, and a means of completely remixing the ACP prior to placement.

Provide PG 64-22 tack coat at a rate of 0.15 gal/sy.

The Contractor will be required to tack 100% of the surfaces with uniform coverage prior to the subsequent lift. The type and grade of tack will be approved by the Engineer prior to use.

Tack all vertical joints unless otherwise directed.

Cement and kiln dust will not be allowed to be used as mineral fillers.

Shoulders shall not be placed prior to adjoining main lanes.
Final surface of driveway shall not be placed prior to adjoining surface.

Item 6185, "Truck Mounted Attenuator (TMA) and Trailer Attenuator (TA)"
Truck Mounted Attenuator (TMA) and Trailer Attenuator (TA) will not be considered a major item of work on this project.

TMA's will only be paid while workers are present or to protect a blunt object.

Project Number: BR 2022 (829)
Control: 0106-04-036 & 2011-02-015
County: Stonewall & Kent
Highway: US 380 & SH 208

BASIS OF ESTIMATE FOR STATIONARY TMAs				
		TMA (Stationary)		
Phase	Standard	Required	Additional	TOTAL
III	TCP 2-2	2		2
Basis of Estimate for Mobile TMAs				
		TMA (Mobile)		
Phase	Standard	Required	Additional	TOTAL
III	TCP 3-1	2		2

The contractor will be responsible for determining if one or more of these operations will be ongoing at the same time to determine the total number of TMAs needed for the project. The Contractor must get approval from the Engineer for any changes in the number of TMA as shown in the plans.

If a TMA is used for both mobile and stationary traffic control on the same day, it will be paid for as stationary for that day.

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Abilene District

US 380

GENERAL NOTES

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DESIGNED: SG	FED. RD DIV. No.	STATE	PROJECT No.			HIGHWAY No.
CHECKED: JNR	6	TEXAS	SEE TITLE SHEET			US 380
DRAWN: SG	STATE DISTRICT	COUNTY	CONTROL No.	SECTION No.	JOB No.	SHEET No.
CHECKED: JNR	ABL	STONEWALL	0106	04	036	11

Estimate & Quantity Sheet

CONTROLLING PROJECT ID 0106-04-036 **DISTRICT** Abilene **COUNTY** Kent, Stonewall
HIGHWAY SH 208, US 380

			CONTROL SECTION JOB		**0106-04-036**		**2011-02-015**		TOTAL EST.	TOTAL FINAL
			PROJECT ID		**A00129546**		**A00129545**			
			COUNTY		**Stonewall**		**Kent**			
			HIGHWAY		**US 380**		**SH 208**			
ALT	**BID CODE**	**DESCRIPTION**		**UNIT**	EST.	FINAL	EST.	FINAL		
	100-6002	PREPARING ROW		STA	8.000		15.000		23.000	
	105-6011	REMOVING STAB BASE AND ASPH PAV (2"-6")		SY			6,490.000		6,490.000	
	110-6001	EXCAVATION (ROADWAY)		CY	82.000		860.000		942.000	
	132-6004	EMBANKMENT (FINAL)(DENS CONT)(TY B)		CY	423.000		10,639.000		11,062.000	
	164-6002	BROADCAST SEED (PERM) (RURAL) (SANDY)		AC			1.260		1.260	
	164-6004	BROADCAST SEED (PERM) (RURAL) (CLAY)		AC	0.440				0.440	
	164-6010	BROADCAST SEED (TEMP) (WARM)		AC	0.220		0.630		0.850	
	164-6012	BROADCAST SEED (TEMP) (COOL)		AC	0.220		0.630		0.850	
	168-6001	VEGETATIVE WATERING		MG	17.800		51.400		69.200	
	247-6041	FL BS (CMP IN PLC)(TYA GR1-2)(FNAL POS)		CY	439.000		1,061.000		1,500.000	
	310-6009	PRIME COAT (MC-30)		GAL	874.000		1,592.000		2,466.000	
	354-6021	PLANE ASPH CONC PAV(0" TO 2")		SY	2,297.000				2,297.000	
	400-6005	CEM STABIL BKFL		CY	312.000		179.000		491.000	
	403-6001	TEMPORARY SPL SHORING		SF	1,700.000				1,700.000	
	416-6001	DRILL SHAFT (18 IN)		LF	120.000		182.000		302.000	
	416-6004	DRILL SHAFT (36 IN)		LF	80.000		384.000		464.000	
	416-6005	DRILL SHAFT (42 IN)		LF	1,582.000				1,582.000	
	416-6006	DRILL SHAFT (48 IN)		LF			930.000		930.000	
	420-6014	CL C CONC (ABUT)(HPC)		CY	82.000		59.000		141.000	
	420-6030	CL C CONC (CAP)(HPC)		CY	197.000		115.000		312.000	
	420-6038	CL C CONC (COLUMN)(HPC)		CY	91.000		60.000		151.000	
	422-6002	REINF CONC SLAB (HPC)		SF	52,664.000		23,142.000		75,806.000	
	422-6016	APPROACH SLAB (HPC)		CY	66.000		58.000		124.000	
	425-6038	PRESTR CONC GIRDER (TX46)		LF			2,282.000		2,282.000	
	425-6039	PRESTR CONC GIRDER (TX54)		LF	4,659.000				4,659.000	
	425-6041	PRESTR CONC GIRDER (TX70)		LF	2,631.000		747.000		3,378.000	
	427-6004	SILICONE RESIN PAINT FINISH		SF	4,823.000		2,918.000		7,741.000	
	432-6031	RIPRAP (STONE PROTECTION)(12 IN)		CY	292.000		2,794.000		3,086.000	
	432-6045	RIPRAP (MOW STRIP)(4 IN)		CY	43.100		75.600		118.700	
	450-6007	RAIL (TY T223)(HPC)		LF	2,522.000				2,522.000	
	450-6017	RAIL (TY T552)(HPC)		LF			1,282.000		1,282.000	
	454-6018	SEALED EXPANSION JOINT (4 IN) (SEJ - M)		LF	256.000		157.000		413.000	
	496-6010	REMOV STR (BRIDGE 100 - 499 FT LENGTH)		EA			1.000		1.000	
	496-6012	REMOV STR (BRIDGE 1000 FT OR GREATER)		EA	1.000				1.000	
	500-6001	MOBILIZATION		LS	1.000				1.000	
	502-6001	BARRICADES, SIGNS AND TRAFFIC HANDLING		MO	13.000		11.000		24.000	
	506-6001	ROCK FILTER DAMS (INSTALL) (TY 1)		LF			60.000		60.000	

Estimate & Quantity Sheet

CONTROLLING PROJECT ID 0106-04-036 **DISTRICT** Abilene **COUNTY** Kent, Stonewall
HIGHWAY SH 208, US 380

			CONTROL SECTION JOB		**0106-04-036**		**2011-02-015**		TOTAL EST.	TOTAL FINAL
			PROJECT ID		**A00129546**		**A00129545**			
			COUNTY		**Stonewall**		**Kent**			
			HIGHWAY		**US 380**		**SH 208**			
ALT	**BID CODE**	**DESCRIPTION**		**UNIT**	EST.	FINAL	EST.	FINAL		
	506-6003	ROCK FILTER DAMS (INSTALL) (TY 3)		LF	80.000		80.000		160.000	
	506-6011	ROCK FILTER DAMS (REMOVE)		LF	80.000		140.000		220.000	
	506-6020	CONSTRUCTION EXITS (INSTALL) (TY 1)		SY	230.000		230.000		460.000	
	506-6024	CONSTRUCTION EXITS (REMOVE)		SY	230.000		230.000		460.000	
	506-6038	TEMP SEDMT CONT FENCE (INSTALL)		LF	200.000				200.000	
	506-6039	TEMP SEDMT CONT FENCE (REMOVE)		LF	200.000				200.000	
	506-6041	BIODEG EROSN CONT LOGS (INSTL) (12")		LF	1,050.000		1,700.000		2,750.000	
	506-6043	BIODEG EROSN CONT LOGS (REMOVE)		LF	1,050.000		1,700.000		2,750.000	
	510-6003	ONE-WAY TRAF CONT (PORT TRAF SIG)		MO	13.000				13.000	
	512-6001	PORT CTB (FUR & INST)(SGL SLOPE)(TY 1)		LF	1,420.000				1,420.000	
	512-6025	PORT CTB (MOVE)(SGL SLP)(TY 1)		LF	1,420.000				1,420.000	
	512-6037	PORT CTB (STKPL)(SGL SLP)(TY 1)		LF	1,420.000				1,420.000	
	533-6001	RUMBLE STRIPS (SHOULDER)		LF	1,360.000		2,784.000		4,144.000	
	533-6002	RUMBLE STRIPS (CENTERLINE)		LF	680.000		1,392.000		2,072.000	
	540-6001	MTL W-BEAM GD FEN (TIM POST)		LF	500.000		1,300.000		1,800.000	
	540-6006	MTL BEAM GD FEN TRANS (THRIE-BEAM)		EA	4.000		4.000		8.000	
	542-6004	RM MTL BM GD FENCE TRANS (THRIE-BEAM)		EA	4.000		4.000		8.000	
	544-6001	GUARDRAIL END TREATMENT (INSTALL)		EA	4.000		4.000		8.000	
	544-6003	GUARDRAIL END TREATMENT (REMOVE)		EA	4.000		4.000		8.000	
	545-6003	CRASH CUSH ATTEN (MOVE & RESET)		EA	2.000				2.000	
	545-6005	CRASH CUSH ATTEN (REMOVE)		EA	2.000				2.000	
	545-6019	CRASH CUSH ATTEN (INSTL)(S)(N)(TL3)		EA	2.000				2.000	
	552-6001	WIRE FENCE (TY A)		LF			2,175.000		2,175.000	
	552-6006	GATE (TY 2)		EA			2.000		2.000	
	644-6001	IN SM RD SN SUP&AM TY10BWG(1)SA(P)		EA			8.000		8.000	
	644-6004	IN SM RD SN SUP&AM TY10BWG(1)SA(T)		EA	4.000		2.000		6.000	
	644-6076	REMOVE SM RD SN SUP&AM		EA	4.000		10.000		14.000	
	658-6014	INSTL DEL ASSM (D-SW)SZ (BRF)CTB (BI)		EA	26.000		14.000		40.000	
	658-6062	INSTL DEL ASSM (D-SW)SZ 1(BRF)GF2(BI)		EA	8.000		15.000		23.000	
	662-6050	WK ZN PAV MRK REMOV (REFL) TY II-A-A		EA	190.000				190.000	
	662-6063	WK ZN PAV MRK REMOV (W)4"(SLD)		LF	5,680.000				5,680.000	
	662-6075	WK ZN PAV MRK REMOV (W)24"(SLD)		LF	80.000				80.000	
	662-6095	WK ZN PAV MRK REMOV (Y)4"(SLD)		LF	7,600.000				7,600.000	
	666-6224	PAVEMENT SEALER 4"		LF	3,120.000		5,964.000		9,084.000	
	666-6303	RE PM W/RET REQ TY I (W)4"(SLD)(100MIL)		LF	4,000.000		4,200.000		8,200.000	
	666-6315	RE PM W/RET REQ TY I (Y)4"(SLD)(100MIL)		LF	4,000.000		4,200.000		8,200.000	
	672-6009	REFL PAV MRKR TY II-A-A		EA	50.000		53.000		103.000	

Estimate & Quantity Sheet

CONTROLLING PROJECT ID 0106-04-036 **DISTRICT** Abilene **COUNTY** Kent, Stonewall
HIGHWAY SH 208, US 380

			CONTROL SECTION JOB		**0106-04-036**		**2011-02-015**		TOTAL EST.	TOTAL FINAL
			PROJECT ID		**A00129546**		**A00129545**			
			COUNTY		**Stonewall**		**Kent**			
			HIGHWAY		**US 380**		**SH 208**			
ALT	**BID CODE**	**DESCRIPTION**		**UNIT**	EST.	FINAL	EST.	FINAL		
	677-6001	ELIM EXT PAV MRK & MRKS (4")		LF	13,280.000				13,280.000	
	677-6007	ELIM EXT PAV MRK & MRKS (24")		LF	80.000				80.000	
	678-6001	PAV SURF PREP FOR MRK (4")		LF	4,880.000		2,436.000		7,316.000	
	3077-6023	SP MIXESSP-CSAC-B PG70-22		TON	385.000		1,401.000		1,786.000	
	4027-6001	TEMP CONSTRUCTION ACCESS		LS	2.000		1.000		3.000	
	6001-6002	PORTABLE CHANGEABLE MESSAGE SIGN		EA	2.000		2.000		4.000	
	6185-6002	TMA (STATIONARY)		DAY	4.000				4.000	
	6185-6005	TMA (MOBILE OPERATION)		DAY	4.000				4.000	

100% SUBMITTAL

DATE: 5/16/2022 TIME: 12:19:04 PM

SUMMARY OF REMOVAL QUANTITIES	
ITEM NO. DESC. CODE	496-6012
LOCATION	REMOV STR (BRIDGE 1000 FT OR GREATER)
	EA
US 380	1
TOTAL	1

SUMMARY OF REMOVAL QUANTITIES				
ITEM NO. DESC. CODE			542-6004	544-6003
SHEET NO.	BEGINNING STATION	ENDING STATION	RM MTL BM GD FENCE TRANS (THRIE-BEAM)	GUARDRAIL END TREATMENT (REMOVE)
			EA	EA
1 of 3	743+00.00	750+00.00	2	2
2 of 3	750+00.00	760+00.00	2	1
3 of 3	760+00.00	763+00.00		1
TOTAL			4	4

SUMMARY OF SIGNING AND PAVEMENT MARKING QUANTITIES												
ITEM NO. DESC. CODE			533-6001	533-6002	644-6004	644-6076	658-6014	658-6062	666-6224	666-6303	666-6315	672-6009	678-6001
SHEET NO.	BEGINNING STATION	ENDING STATION	RUMBLE STRIPS (SHOULDER)	RUMBLE STRIPS (CENTERLINE)	IN SM RD SN SUP&AM TY10BWG(1) SA(T)	REMOVE SM RD SN SUP&AM	INSTL DEL ASSM (D-SW) SZ (BRF) CTB (BI)	INSTL DEL ASSM (D-SW) SZ 1(BRF) GF2(BI)	PAVEMENT SEALER 4"	RE PM W/RET REQ TY I (W) 4"(SLD) (100MIL)	RE PM W/RET REQ TY I (Y) 4"(SLD) (100MIL)	REFL PAV MRKR TY II-A-A	PAV SURF PREP FOR MRK (4")
			LF	LF	EA	EA	EA	EA	LF	LF	LF	EA	LF
1 of 2	743+00.00	750+00.00	680	340	1	1	6	4	1560	1400	1400	18	1240
	750+00.00	760+00.00	80	40	1	1	20	2	360	2000	2000	25	3640
2 of 2	760+00.00	763+00.00	600	300				2	1200	600	600	8	
TOTAL			1360	680	2	2	26	8	3120	4000	4000	50	4880

SUMMARY OF TRAFFIC CONTROL PLAN QUANTITIES																				
ITEM NO.	403-6001	510-6003	512-6001	512-6025	512-6037	545-6003	545-6005	545-6019	644-6004	644-6076	662-6050	662-6063	662-6075	662-6095	677-6001	677-6007	4027-6001	6001-6002	6185-6002	6185-6005
LOCATION	TEMPORARY SPL SHORING	ONE-WAY TRAF CONT (PORT TRAF SIG)	PORT CTB (FUR & INST) (SGL SLOPE) (TY 1)	PORT CTB (MOVE) (SGL SLP) (TY 1)	PORT CTB (STKPL) (SGL SLP) (TY 1)	CRASH CUSH ATTEN (MOVE & RESET)	CRASH CUSH ATTEN (REMOVE)	CRASH CUSH ATTEN (INSTL)(S) (N)(TL3)	IN SM RD SN SUP&AM TY10BWG(1) SA(T)	REMOVE SM RD SN SUP&AM	WK ZN PAV MRK REMOV (REFL) TY II-A-A	WK ZN PAV MRK REMOV (W)4"(SLD)	WK ZN PAV MRK REMOV (W)24"(SLD)	WK ZN PAV MRK REMOV (Y)4"(SLD)	ELIM EXT PAV MRK & MRKS (4")	ELIM EXT PAV MRK & MRKS (24")	✳ TEMP CONSTRUCTION ACCESS	PORTABLE CHANGEABLE MESSAGE SIGN	TMA (STATIONARY)	TMA (MOBILE OPERATION)
	SF	MO	LF	LF	LF	EA	EA	EA	EA	EA	EA	LF	LF	LF	LF	LF	LS	EA	DAY	DAY
PHASE I	1700	7	1420					2	2	2	95	2840	40	3800	6640	40	1	2	4	4
PHASE II		6		1420	1420	2	2		2	2	95	2840	40	3800	6640	40		2	4	4
PHASE III																		2	4	4
JOB CLOSEOUT																			4	4
TOTAL	1700	13	1420	1420	1420	2	2	2	2	2	190	5680	80	7600	13280	80	1	2	4	4

✳ INCLUDES PAYMENT FOR TEMPORARY HAUL ROAD/BRIDGE
SEE SHEET TITLED "HAUL ROAD SEQUENCE OF WORK"

SUMMARY OF ROADWAY QUANTITIES											
ITEM NO. DESC. CODE			100-6002	247-6041	310	354-6021	432-6045	540-6001	540-6006	544-6001	3077
SHEET NO.	BEGINNING STATION	ENDING STATION	PREPARING ROW	FL BS (CMP IN PLC) (TYA GR1-2) (FNAL POS)	PRIME COAT (MC-30)	PLANE ASPH CONC PAV (0" TO 2")	RIPRAP (MOW STRIP) (4 IN)	MTL W-BEAM GD FEN (TIM POST)	MTL BEAM GD FEN TRANS (THRIE-BEAM)	GUARDRAIL END TREATMENT (INSTALL)	SP MIXES SP-C SAC-B PG70-22
			STA	CY	SY	SY	CY	LF	EA	EA	SY
1 of 3	743+00.00	750+00.00	4		1747	1747	21.4	250	2	2	1747
2 of 3	750+00.00	760+00.00			410	410	6.7	156	2		410
3 of 3	760+00.00	763+00.00	4	439	1336	140	14.9	94		2	1336
TOTAL			8	439	3493	2297	43.1	500	4	4	3493

BASIS OF ESTIMATE							
CSJ: 0106-04-036							
ITEM	DESCRIPTION		AREA (SY)	RATE		QUANTITY	UNIT
310-6009	PRIME COAT (MC-30)	PRIME COAT	3493	0.25	GAL/SY	874	GAL
3077-6023	SP-C SAC-B PG 70-22	2" OVERLAY	3493	110	LB/SY/IN	385	TON

SUMMARY OF EROSION CONTROL QUANTITIES													
ITEM NO. DESC. CODE			164-6004	164-6010	164-6012	168-6001	506-6003	506-6011	506-6020	506-6024	506-6038	506-6039	506-6041	506-6043
SHEET NO.	BEGINNING STATION	ENDING STATION	BROADCAST SEED (PERM) (RURAL) (CLAY)	BROADCAST SEED (TEMP) (WARM)	BROADCAST SEED (TEMP) (COOL)	VEGETATIVE WATERING	ROCK FILTER DAMS (INSTALL) (TY 3)	ROCK FILTER DAMS (REMOVE)	CONSTRUCTION EXITS (INSTALL) (TY 1)	CONSTRUCTION EXITS (REMOVE)	TEMP SEDMT CONT FENCE (INSTALL)	TEMP SEDMT CONT FENCE (REMOVE)	BIODEG EROSN CONT LOGS (INSTL) (12")	BIODEG EROSN CONT LOGS (REMOVE)
			AC	AC	AC	MG	LF	LF	SY	SY	LF	LF	LF	LF
1 of 2	743+00.00	750+00.00	0.10	0.05	0.05	4.20	40	40	115	115	100	100	500	500
	750+00.00	760+00.00	0.10	0.05	0.05	4.10	40	40					170	170
2 of 2	760+00.00	763+00.00	0.23	0.12	0.12	9.53			115	115	100	100	380	380
TOTAL			0.44	0.22	0.22	17.8	80	80	230	230	200	200	1050	1050

SUMMARY OF EARTHWORK QUANTITIES		
ITEM NO. DESC. CODE	110-6001	132-6004
LOCATION	EXCAVATION (ROADWAY)	EMBANKMENT (FINAL) (DENS CONT) (TY B)
	CY	CY
743+00.00		
744+00.00	9	2
745+00.00	25	9
746+00.00	48	9
747+00.00		1
748+00.00		
749+00.00		
750+00.00		
751+00.00		
752+00.00		
753+00.00		
754+00.00		
755+00.00		
756+00.00		
757+00.00		
758+00.00		
759+00.00		
760+00.00		94
761+00.00		190
762+00.00		102
763+00.00		16
TOTAL	82	423

STATE OF TEXAS
JENELLE N. ROMERO
97940
LICENSED
PROFESSIONAL ENGINEER
5/16/2022

ATKINS
TBPE REG. # F-474

Texas Department of Transportation
Abilene District

US 380

QUANTITY SUMMARIES

SHEET 1 OF 1

DESIGNED: SG	FED. RD DIV. No.	STATE	PROJECT No.			HIGHWAY No.
CHECKED: JNR	6	TEXAS	SEE TITLE SHEET			US 380
DRAWN: SG	STATE DISTRICT	COUNTY	CONTROL No.	SECTION No.	JOB No.	SHEET No.
CHECKED: JNR	ABL	STONEWALL	0106	04	036	13

PLOT DRIVER: TXDOT_PDF_BW.plt
PEN TABLE: US380_pen.tbl
FILE: c:\pw_work\atkndtx01\rome2243\dms57910\008 SUMMARY OF QUANTITIES.dgn

100% SUBMITTAL

DATE: 4/29/2022 TIME: 11:13:16 AM

SUMMARY OF BRIDGES

CSJ	PLAN PROFILE SHEET	BRIDGE NBI #		DESIGN		BRIDGE LOCATION	STATION		LENGTH	CLEAR RDWY WIDTH	LOADING	CEM STABIL BKFL	DRILL SHAFT (18 IN)	DRILL SHAFT (36 IN)	DRILL SHAFT (42 IN)
		EXISTING	PROPOSED	EXISTING	PROPOSED		BEGIN	END	FT	FT		CY	LF	LF	LF
0106-04-036	**59-60**	08-217-0106-04-043	08-217-0-0106-04-057	SIMPLE SPAN DECK STEEL I-BEAM WIDENED WITH PRESTRESS CONCRETE GIRDERS	10 SPANS CONCRETE TX GIRDER SUPPORTED ON MULTI-COLUMN CONCRETE BENT CAPS	US 380 SALT FORK OF BRAZOS RIVER BRIDGE	746+90.0	759+10.0	1220'	41'-2"	HL93	**312**	**120**	**80**	**1582**
TOTALS												312	120	80	1582

CSJ (CONT'D FROM ABOVE)	CL C CONC (ABUT) (HPC)	CL C CONC (CAP) (HPC)	CL C CONC (COLUMN) (HPC)	REINF CONC SLAB (HPC)	APPROACH SLAB (HPC)	PRESTR CONC GIRDER (TX54)	PRESTR CONC GIRDER (TX70)	SILICONE RESIN PAINT FINISH	RIPRAP (STONE PROTECTION) (12 IN)	RAIL (TY T223) (HPC)	SEALED EXPANSION JOINT (4 IN) (SEJ-M)
	CY	CY	CY	SF	LF	LF	LF	SF	CY	LF	LF
0106-04-036	**81.9**	**196.8**	**91.0**	**52664**	**66.0**	**4659.00**	**2631.05**	**4823**	**292.0**	**2522.0**	**256**
TOTALS	81.9	196.8	91.0	52664	66.0	4659.00	2631.05	4823	292.0	2522.0	256

STATE OF TEXAS
PRADEEP KUMAR
130846
LICENSED
PROFESSIONAL ENGINEER
4/29/2022

HL93 LOADING

REV. No.	DATE	REVISION	BY

ATKINS
TBPE REG. # F-474

Texas Department of Transportation
Abilene District
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US 380
BRIDGE SUMMARY

SALT FORK OF BRAZOS RIVER BRIDGE

SCALE: NO SCALE SHEET 1 OF 1

DESIGNED: **TS**	FED. RD DIV. No.	STATE	PROJECT No.			HIGHWAY No.
CHECKED: **SK**	6	TEXAS	SEE TITLE SHEET			US 380
DRAWN: **DN**	STATE DISTRICT	COUNTY	CONTROL No.	SECTION No.	JOB No.	SHEET No.
CHECKED: **TS**	ABL	STONEWALL	0106	04	036	**14**

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FILE: c:\pw_work\atkmdtx01\rome2243\dms57899\107 BRIDGE SUMMARY.dgn

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DATE: 4/28/2022 TIME: 6:33:57 PM

GENERAL

1. PLACE TEMPORARY EROSION CONTROL DEVICES AS SHOWN IN THE PLANS, AND AS DIRECTED BY THE ENGINEER, PRIOR TO BEGINNING ANY OTHER WORK.

2. BEFORE THE COMMENCEMENT OF EACH PHASE, INSTALL OR MAINTAIN ADVANCE WARNING SIGNS, TRAFFIC CONTROL DEVICES, WORK ZONE PAVEMENT MARKINGS, AND SIGNS AS SHOWN IN THE STANDARDS.

3. PROVIDE ADDITIONAL SIGNS AND BARRICADES AS NECESSARY TO ADDRESS FIELD CONSTRUCTABILITY & VISIBILITY. THESE ADDITIONAL SIGNS WILL BE CONSIDERED SUBSIDIARY TO ITEM 502.

4. CONTRACTOR SHALL ONLY ACCESS THE CRITICAL HABITAT AREA AT THE HAUL ROAD.

5. CONTRACTOR SHALL SUBMIT A PLAN FOR APPROVAL OF THE CONSTRUCTION LIMITS THAT ENSURES THE LIMITS OF CONSTRUCTION DURING THE DAY CAN BE OPEN TO TRAFFIC AT NIGHT WITHOUT THE USE OF FLAGMEN OR AS DIRECTED BY THE ENGINEER IN THE FIELD.

6. UPON COMPLETION OF THE WORK AND BEFORE FINAL ACCEPTANCE AND FINAL PAYMENT IS MADE, THE CONTRACTOR SHALL CLEAR AND REMOVE THE SITE OF ALL SURPLUS AND DISCARDED MATERIALS AND DEBRIS OF EVERY KIND AND LEAVE THE ENTIRE PROJECT IN A SMOOTH, NEAT, AND SIGHTLY CONDITION.

PHASE I - CONSTRUCT WESTBOUND:

1. PLACE WORK ZONE SIGNS AT THE BEGINNING AND END OF THE PROJECT LIMITS PRIOR TO BEGINNING WORK. USE TXDOT STANDARDS FOR ALL TRAFFIC CONTROL DEVICES, SIGNS, AND SIGN SPACING.

2. CONSTRUCT TEMPORARY HAUL BRIDGES AND ROADS WITH MATERIAL AT CONTRACTOR'S DISCRETION. THE TEMPORARY BRIDGE STRUCTURE MAY BE NO MORE THAN 14 FT WIDE OR 140 FT IN LENGTH AND MAYBE SUPPORTED BY NO MORE THAN 4 UNTREATED TIMBERS OR METAL BEAMS WITHIN THE SALT FORK BRAZOS RIVER CHANNEL. ADDITIONAL SUPPORT TIMBERS OR BEAMS MAY BE PLACED WITHIN THE CRITICAL HABITAT UNIT BUT OUTSIDE OF THE RIVER CHANNEL ABOVE THE NORMAL BANKFULL CONTOUR.

3. SHIFT EASTBOUND AND WESTBOUND TRAFFIC TO ONE-LANE, TWO WAY TRAFFIC OPERATIONS ON THE EASTBOUND SIDE USING A TEMPORARY TRAFFIC SIGNAL, PER TXDOT STANDARD TCP (2-8).

4. CONSTRUCT TEMPORARY SPECIAL SHORING. PLACE TEMPORARY CONCRETE BARRIER.

5. CONSTRUCT WESTBOUND PORTION OF BRIDGE AND ROADWAY. USE LIFTS CONSISTING OF SP-C SAC-B PG 70-22, WITH TACK COAT PLACED BETWEEN LAYERS.

6. PLACE PHASE II TEMPORARY CONCRETE BARRIER, CRASH CUSHIONS, AND TEMPORARY STRIPING ALONG WESTBOUND SIDE.

SEE "TRAFFIC CONTROL PLAN TYPICAL SECTIONS" AND "HAUL ROAD SEQUENCE OF WORK" SHEET FOR MORE INFORMATION.

PHASE II - CONSTRUCT EASTBOUND:

1. PLACE WORK ZONE SIGNS AT THE BEGINNING AND END OF THE PROJECT LIMITS PRIOR TO BEGINNING WORK. USE TXDOT STANDARDS FOR ALL TRAFFIC CONTROL DEVICES, SIGNS, AND SIGN SPACING.

2. PHASE II TEMPORARY CONCRETE BARRIER, CRASH CUSHIONS, AND TEMPORARY STRIPING WILL NEED TO BE PLACED BEFORE PHASE I TEMPORARY CONCRETE BARRIER CAN BE SAFELY REMOVED.

3. SHIFT EASTBOUND AND WESTBOUND TRAFFIC TO THE NEWLY CONSTRUCTED WESTBOUND PAVEMENT AND BRIDGE WITH ONE-LANE, TWO WAY TRAFFIC OPERATIONS USING A TEMPORARY TRAFFIC SIGNAL, PER TXDOT STANDARD TCP (2-8).

4. CONSTRUCT EASTBOUND PORTION OF BRIDGE AND ROADWAY. USE LIFTS CONSISTING OF SP-C SAC-B PG 70-22, WITH TACK COAT PLACED BETWEEN LAYERS.

SEE "TRAFFIC CONTROL PLAN TYPICAL SECTIONS" FOR MORE INFORMATION.

PHASE III - CONSTRUCT FINAL PAVEMENT MARKINGS AND MISCELLANEOUS ITEMS

1. USING TCP (2-2)-18 AND TCP (3-1)-13, AND TCP (3-3)-14 PLACE PERMANENT PAVEMENT MARKINGS, SIGNS, AND ALL OTHER APPURTENANCES REQUIRED TO COMPLETE US 380 TO THE FINAL CONFIGURATION SHOWN IN THE PLANS AND STANDARDS. CONSTRUCTION SHALL BE LIMITED TO WORK THE CONTRACTOR IS ABLE TO COMPLETE IN ONE WORKING DAY OR AS DIRECTED BY THE ENGINEER. RETURN TRAFFIC TO TWO-LANE OPERATIONS DURING NON-CONSTRUCTION HOURS.

2. REMOVE BARRICADES, WORK ZONE SIGNS, AND PORTABLE TRAFFIC SIGNALS.

3. OPEN ROADWAY AND BRIDGE TO TRAFFIC.

STATE OF TEXAS
JENELLE N. ROMERO
97940
LICENSED
PROFESSIONAL ENGINEER
4/28/2022

ATKINS
TBPE REG. # F-474

Texas Department of Transportation
Abilene District

US 380

TRAFFIC CONTROL SEQUENCE OF WORK

SHEET 1 OF 1

DESIGNED: SG	FED. RD DIV. No.	STATE	PROJECT No.			HIGHWAY No.
CHECKED: JNR	6	TEXAS	SEE TITLE SHEET			US 380
DRAWN: SG	STATE DISTRICT	COUNTY	CONTROL No.	SECTION No.	JOB No.	SHEET No.
CHECKED: JNR	ABL	STONEWALL	0106	04	036	15

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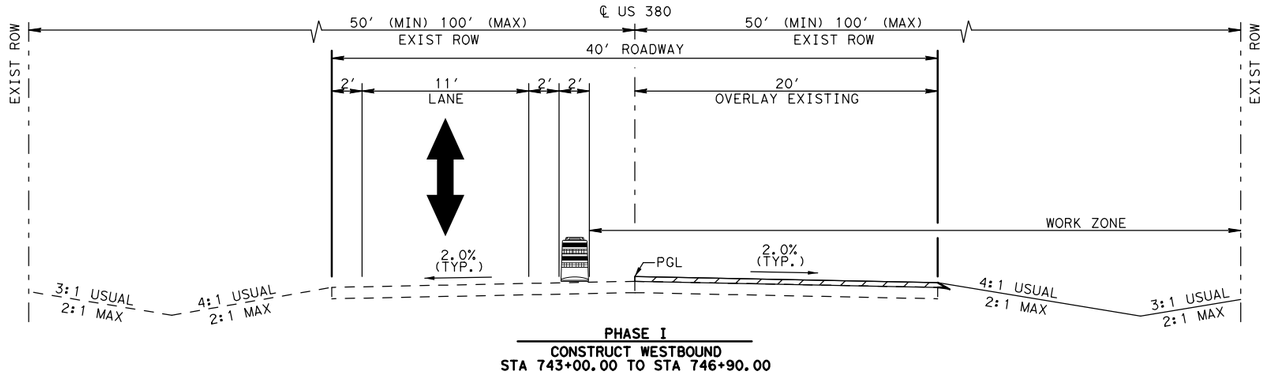
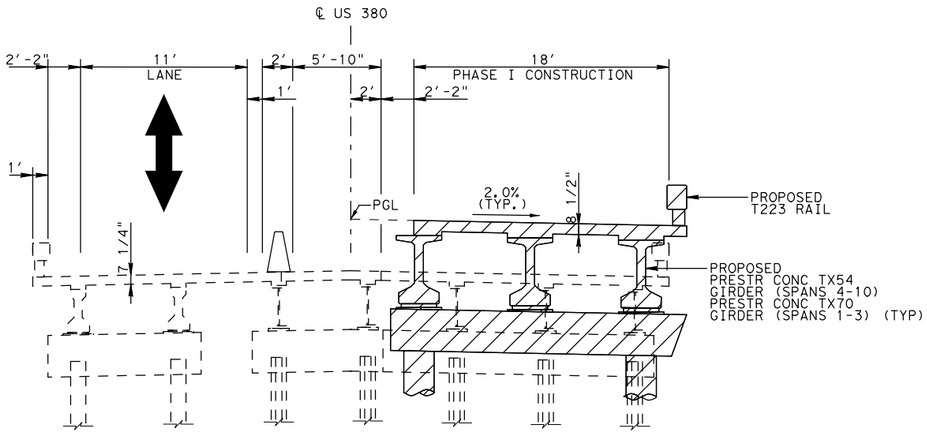
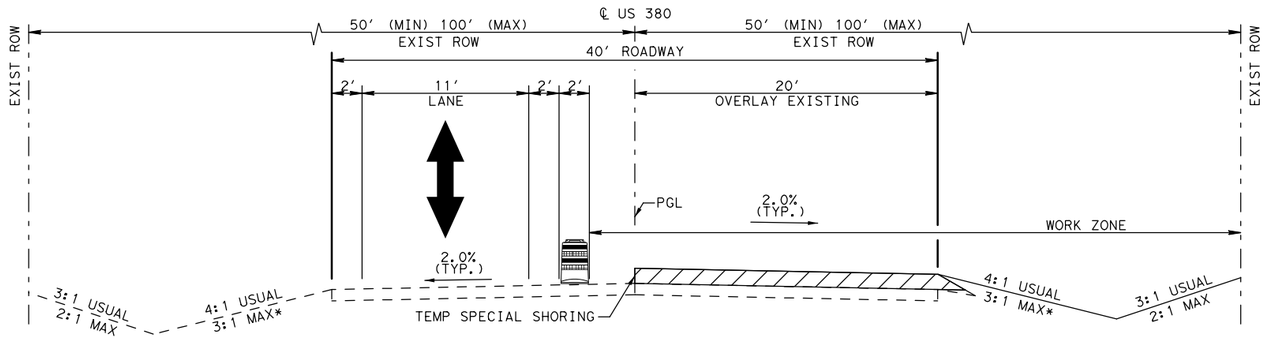


PHASE I
CONSTRUCT WESTBOUND
STA 743+00.00 TO STA 746+90.00



PHASE I
CONSTRUCT WESTBOUND
STA 746+90.00 TO STA 759+10.00



PHASE I
CONSTRUCT WESTBOUND
STA 759+10.00 TO STA 763+00.00

NOTES:

1. SEE PLAN AND PROFILE SHEETS FOR ROADWAY LIMITS AND DETAILS.
2. SEE TYPICAL SECTIONS FOR DETAILED PROPOSED TYPICAL SECTIONS.
3. SEE TRAFFIC CONTROL SEQUENCE NARRATIVE AND TRAFFIC CONTROL STANDARDS FOR MORE INFORMATION.
4. SEE PAVEMENT MARKING LAYOUT SHEETS FOR PERMANANT STRIPING INFORMATION.
5. SEE BRIDGE LAYOUT SHEETS FOR BRIDGE DETAILS
6. REFERENCE TXDOT TRAFFIC CONTROL STANDARD TCP (2-2), TCP (2-8b) AND TCP (3-1), AND TCP (3-3) FOR ALL TRAFFIC CONTROL DEVICES, SIGNS, AND SIGN SPACINGS.
7. TEMPORARY TRAFFIC SIGNALS SHALL BE PLACED IN ACCORDANCE WITH THE TEXAS MUTCD, TCP (2-8), OR AS DIRECTED BY THE ENGINEER.
8. PLACE FINAL SURFACE AFTER WORK IS COMPLETE.

LEGEND

- EXISTING STRUCTURE
- UNDER CONSTRUCTION
- COMPLETED CONSTRUCTION
- TRAFFIC FLOW ARROW

STATE OF TEXAS
JENELLE N. ROMERO
97940
LICENSED
PROFESSIONAL ENGINEER
Jenelle N. Romero, P.E.
4/28/2022

SCALE = N.T.S.

ATKINS
TBPE REG. # F-474

Texas Department of Transportation
Abilene District

US 380

TRAFFIC CONTROL PLAN TYPICAL SECTIONS

SHEET 1 OF 2

DESIGNED: SG	FED. RD DIV. No.	STATE	PROJECT No.			HIGHWAY No.
CHECKED: JNR	6	TEXAS	SEE TITLE SHEET			US 380
DRAWN: SG	STATE DISTRICT	COUNTY	CONTROL No.	SECTION No.	JOB No.	SHEET No.
CHECKED: JNR	ABL	STONEWALL	0106	04	036	16

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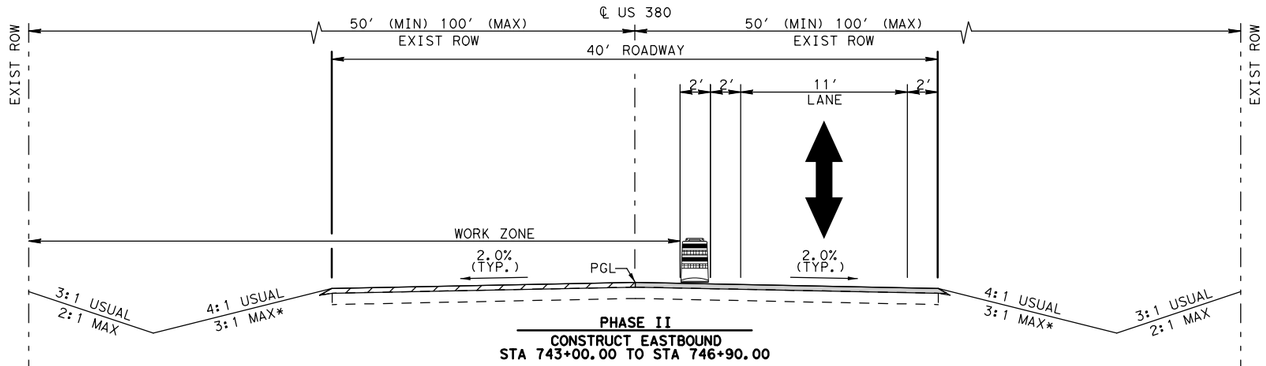
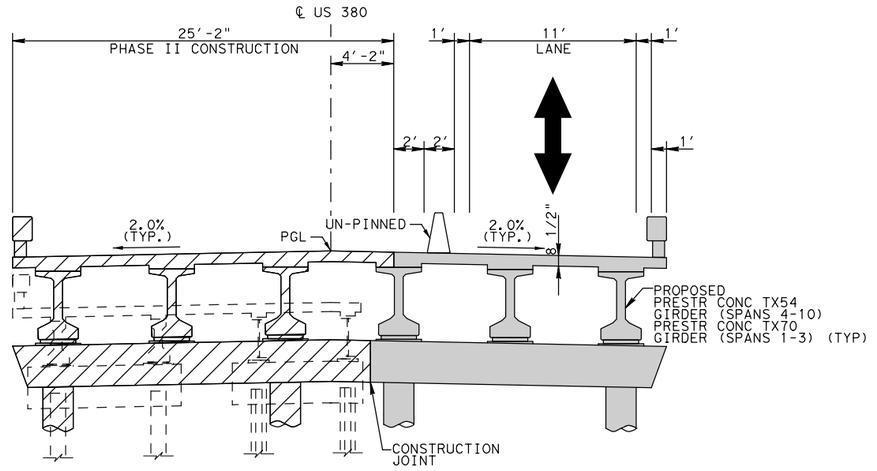
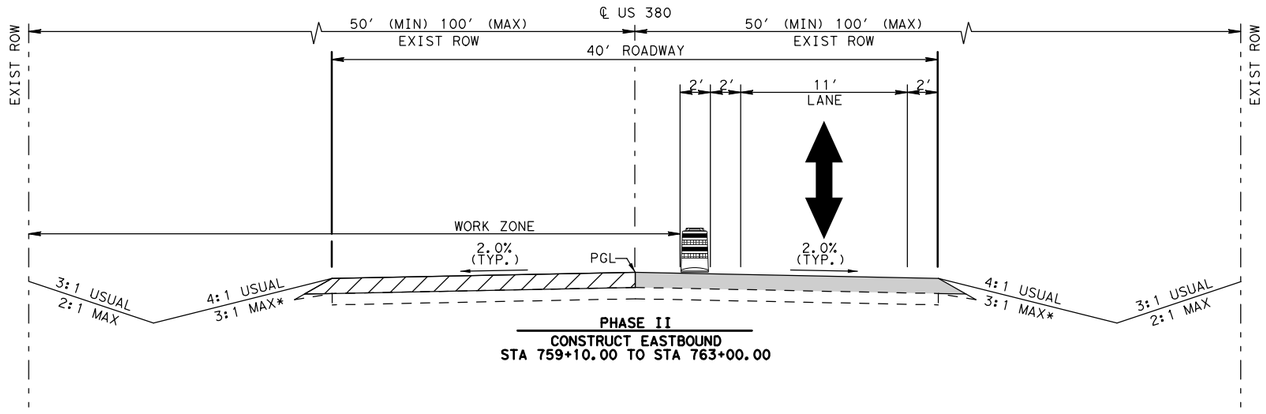


PHASE II
CONSTRUCT EASTBOUND
STA 743+00.00 TO STA 746+90.00



PHASE II
CONSTRUCT EASTBOUND
STA 746+90.00 TO STA 759+10.00



PHASE II
CONSTRUCT EASTBOUND
STA 759+10.00 TO STA 763+00.00

NOTES:

1. SEE PLAN AND PROFILE SHEETS FOR ROADWAY LIMITS AND DETAILS.
2. SEE TYPICAL SECTIONS FOR DETAILED PROPOSED TYPICAL SECTIONS.
3. SEE TRAFFIC CONTROL SEQUENCE NARRATIVE AND TRAFFIC CONTROL STANDARDS FOR MORE INFORMATION.
4. SEE PAVEMENT MARKING LAYOUT SHEETS FOR PERMANANT STRIPING INFORMATION.
5. SEE BRIDGE LAYOUT SHEETS FOR BRIDGE DETAILS
6. REFERENCE TXDOT TRAFFIC CONTROL STANDARD TCP (2-2), TCP (2-8b) AND TCP (3-1), AND TCP (3-3) FOR ALL TRAFFIC CONTROL DEVICES, SIGNS, AND SIGN SPACINGS.
7. TEMPORARY TRAFFIC SIGNALS SHALL BE PLACED IN ACCORDANCE WITH THE TEXAS MUTCD, TCP (2-8), OR AS DIRECTED BY THE ENGINEER.
8. PLACE FINAL SURFACE AFTER WORK IS COMPLETE.

LEGEND

- EXISTING STRUCTURE
- UNDER CONSTRUCTION
- COMPLETED CONSTRUCTION
- TRAFFIC FLOW ARROW

STATE OF TEXAS
JENELLE N. ROMERO
97940
LICENSED
PROFESSIONAL ENGINEER
4/28/2022

SCALE = N.T.S.

ATKINS
TBPE REG. # F-474

Texas Department of Transportation
Abilene District

US 380

TRAFFIC CONTROL PLAN TYPICAL SECTIONS

SHEET 2 OF 2

DESIGNED: SG	FED. RD DIV. No.	STATE	PROJECT No.			HIGHWAY No.
CHECKED: JNR	6	TEXAS	SEE TITLE SHEET			US 380
DRAWN: SG	STATE DISTRICT	COUNTY	CONTROL No.	SECTION No.	JOB No.	SHEET No.
CHECKED: JNR	ABL	STONEWALL	0106	04	036	17

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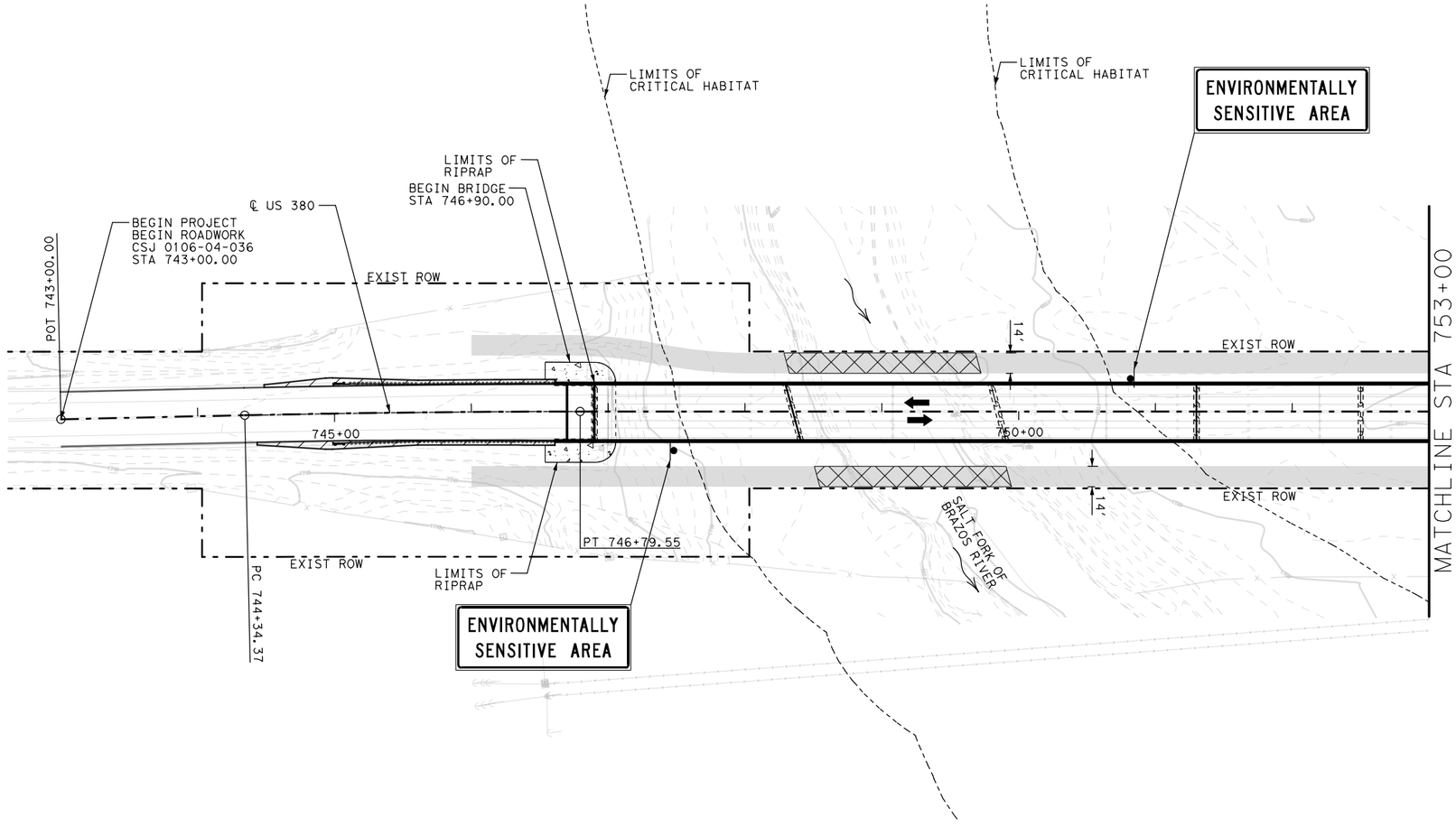


LEGEND

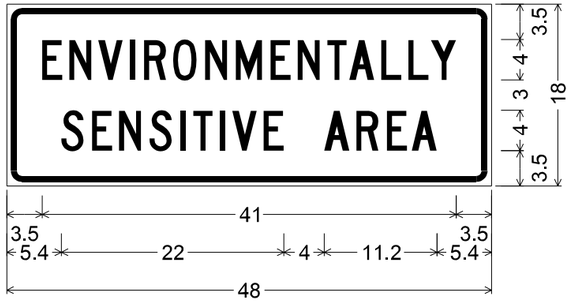
- PROPOSED RIPRAP
- TEMPORARY HAUL ROAD
- MAXIMUM LIMITS OF TEMPORARY HAUL BRIDGE
- LIMITS OF CRITICAL HABITAT

0 25 50 100

SCALE = 1"=100' H

SUGGESTED SEQUENCE OF WORK:

1. INSTALL BARRICADES, DETOUR SIGNING, AND ADVANCED WARNING SIGNS ACCORDING TO THE PLANS.
2. INSTALL SEDIMENT CONTROL DEVICES IN ACCORDANCE WITH SW3P PLANS.
3. CONSTRUCT TEMPORARY HAUL BRIDGES AND ROADS WITH MATERIAL AT CONTRACTOR'S DISCRETION. THE TEMPORARY BRIDGE STRUCTURE MAY BE NO MORE THAN 14 FT WIDE OR 140 FT IN LENGTH AND MAYBE SUPPORTED BY NO MORE THAN 4 UNTREATED TIMBERS OR METAL BEAMS WITHIN THE SALT FORK BRAZOS RIVER CHANNEL. ADDITIONAL SUPPORT TIMBERS OR BEAMS MAY BE PLACED WITHIN THE CRITICAL HABITAT UNIT BUT OUTSIDE OF THE RIVER CHANNEL ABOVE THE NORMAL BANKFULL CONTOUR.
4. CONSTRUCT ROADWAY AND BRIDGE ACCORDING TO "TRAFFIC CONTROL SEQUENCE OF WORK".
5. REMOVE TEMPORARY HAUL ROADS/BRIDGES AND RETURN TO PREVIOUS CONDITIONS.



1.5" Radius, 0.6" Border, 0.4" Indent, Black on White;
"ENVIRONMENTALLY", C specified length;
"SENSITIVE", C; "AREA", C;

ATKINS TBPE REG. # F-474

Texas Department of Transportation Abilene District

US 380

HAUL ROAD SEQUENCE OF WORK

SHEET 1 OF 2

DESIGNED: SG	FED. RD DIV. No.	STATE	PROJECT No.			HIGHWAY No.
CHECKED: JNR	6	TEXAS	SEE TITLE SHEET			US 380
DRAWN: SG	STATE DISTRICT	COUNTY	CONTROL No.	SECTION No.	JOB No.	SHEET No.
CHECKED: JNR	ABL	STONEWALL	0106	04	036	18

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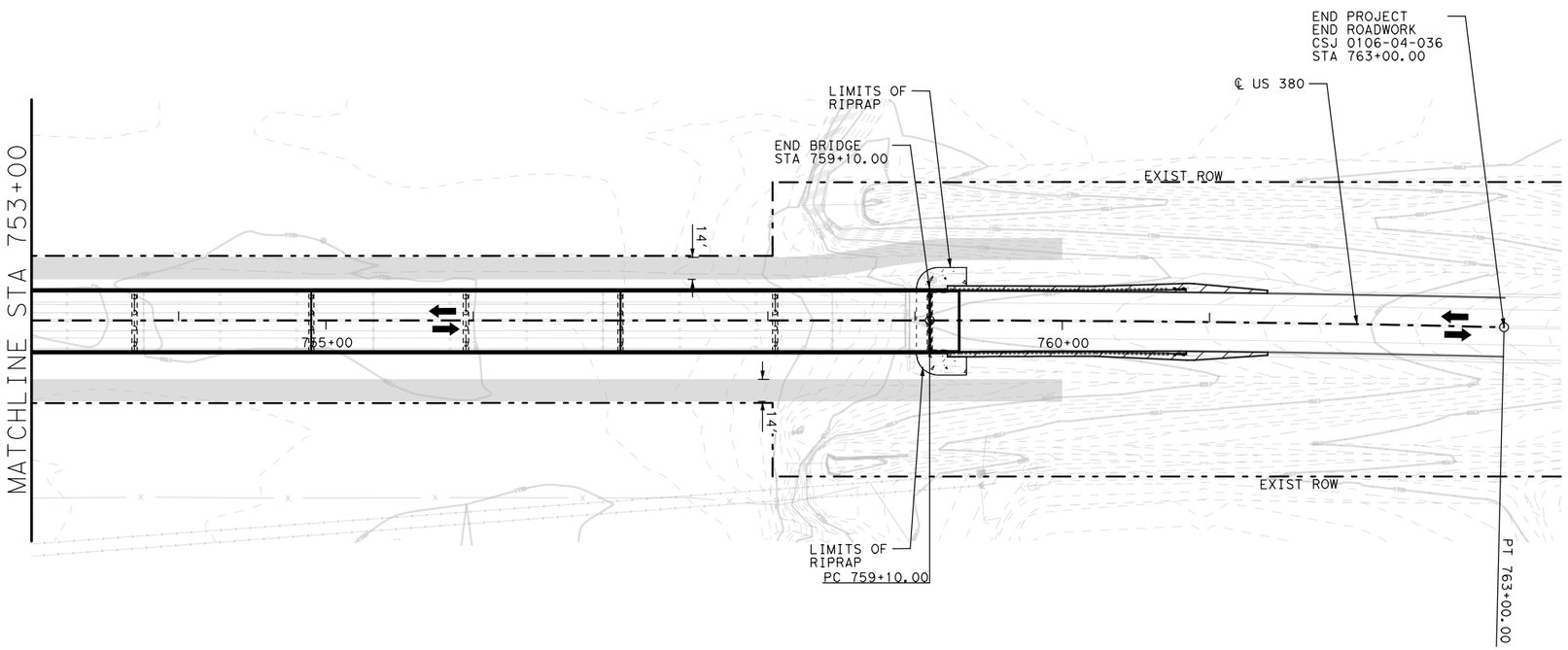
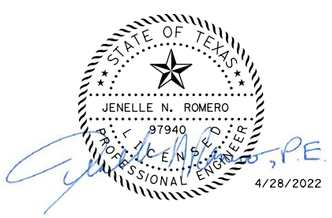


LEGEND

- PROPOSED RIPRAP
- TEMPORARY HAUL ROAD
- MAXIMUM LIMITS OF TEMPORARY HAUL BRIDGE
- LIMITS OF CRITICAL HABITAT

0 25 50 100

SCALE = 1"=100' H



SUGGESTED SEQUENCE OF WORK:

1. INSTALL BARRICADES, DETOUR SIGNING, AND ADVANCED WARNING SIGNS ACCORDING TO THE PLANS.
2. INSTALL SEDIMENT CONTROL DEVICES IN ACCORDANCE WITH SW3P PLANS.
3. CONSTRUCT TEMPORARY HAUL BRIDGES AND ROADS WITH MATERIAL AT CONTRACTOR'S DISCRETION. THE TEMPORARY BRIDGE STRUCTURE MAY BE NO MORE THAN 14 FT WIDE OR 140 FT IN LENGTH AND MAYBE SUPPORTED BY NO MORE THAN 4 UNTREATED TIMBERS OR METAL BEAMS WITHIN THE SALT FORK BRAZOS RIVER CHANNEL. ADDITIONAL SUPPORT TIMBERS OR BEAMS MAY BE PLACED WITHIN THE CRITICAL HABITAT UNIT BUT OUTSIDE OF THE RIVER CHANNEL ABOVE THE NORMAL BANKFULL CONTOUR.
4. CONSTRUCT ROADWAY AND BRIDGE ACCORDING TO "TRAFFIC CONTROL SEQUENCE OF WORK".
5. REMOVE TEMPORARY HAUL ROADS/BRIDGES AND RETURN TO PREVIOUS CONDITIONS.

ATKINS TBPE REG. # F-474

Texas Department of Transportation
Abilene District

US 380

HAUL ROAD
SEQUENCE OF WORK

SHEET 2 OF 2

DESIGNED: SG	FED. RD DIV. No.	STATE	PROJECT No.			HIGHWAY No.
CHECKED: JNR	6	TEXAS	SEE TITLE SHEET			US 380
DRAWN: SG	STATE DISTRICT	COUNTY	CONTROL No.	SECTION No.	JOB No.	SHEET No.
CHECKED: JNR	ABL	STONEWALL	0106	04	036	19

PLOT DRIVER: TXDOT_PDF_BW.plt
PEN TABLE: US380_pen.tbl
FILE: c:\pw_work\atkinst\x01\rome2243\dms57939\US 380_HAUL ROAD_02.dgn

LOC NO.	TCP PHASE	PLAN SHEET NUMBER	LOCATION	STA	TEST LEVEL	DIRECTION OF TRAFFIC (UNI/BI)	FOUNDATION PAD		BACKUP SUPPORT			AVAILABLE SITE LENGTH	CRASH CUSHION									
															MOVE / RESET		L	L	R	R	S	S
							PROPOSED MATERIAL	PROPOSED THICKNESS	DESCRIPTION	WIDTH	HEIGHT		INSTALL	REMOVE	MOVE/ RESET	FROM LOC. #	N	W	N	W	N	W
1	1	16	US 380 BRIDGE - EAST END	746+90.00	TL3	BI	N/A	N/A	PORTABLE TRAFFIC BARRIER	24"	3'-6"		X								X	
2	1	16	US 380 BRIDGE - WEST END	759+10.00	TL3	BI	N/A	N/A	PORTABLE TRAFFIC BARRIER	24"	3'-6"		X								X	
3	2	17	US 380 BRIDGE - EAST END	746+90.00	TL3	BI	N/A	N/A	PORTABLE TRAFFIC BARRIER	24"	3'-6"			X	X	1					X	
4	2	17	US 380 BRIDGE - WEST END	759+10.00	TL3	BI	N/A	N/A	PORTABLE TRAFFIC BARRIER	24"	3'-6"			X	X	1					X	
												TOTALS	2	2	2							

LEGEND:

L=LOW MAINTENANCE
R=REUSABLE
S=SACRIFICIAL
N=NARROW
W=WIDE

FOR DEFINITIONS SEE THE "CRASH CUSHION CATEGORIZATION CHART.PDF" AT THE DESIGN DIVISION (ROADWAY STANDARDS) WEBSITE. USE QUICK LINKS TO ACCESS ATTENUATORS / CRASH CUSHIONS SECTION.
http://www.dot.state.tx.us/insdtdot/orgchart/cmd/cserve/standard/rdwylse.htm

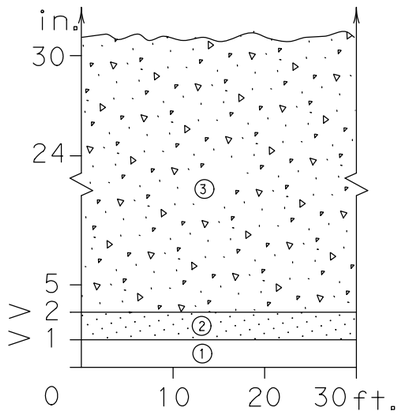
CRASH CUSHION SUMMARY SHEET

FILE: ccss.dgn	DN: TxDOT	CK:	CK:
© TxDOT	CONT	SECT	JOB
REVISIONS	0106	04	036
	DIST	COUNTY	HIGHWAY
	ABL	STONEWALL	US 380
	FEDERAL AID PROJECT		SHEET NO.
			20

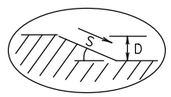
DATE: 4/28/2022 6:34:51 PM
FILE: c:\pw_work\dfkmartx01\rome2243\dms57939\TREATMENT FOR VARIOUS EDGE CONDITIONS.dgn

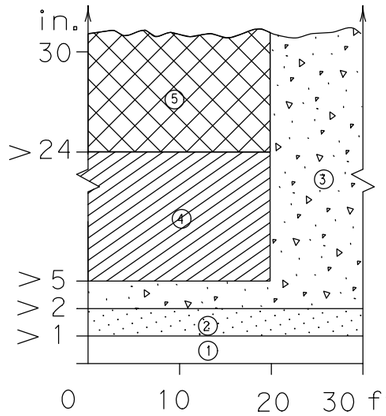
DEFINITION OF TREATMENT ZONES FOR VARIOUS EDGE CONDITIONS

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

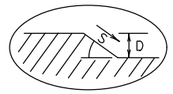


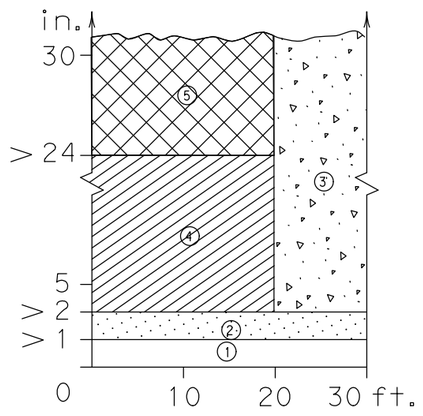
Edge Condition I
S = (3:1) (or flatter)



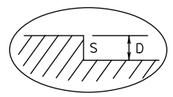


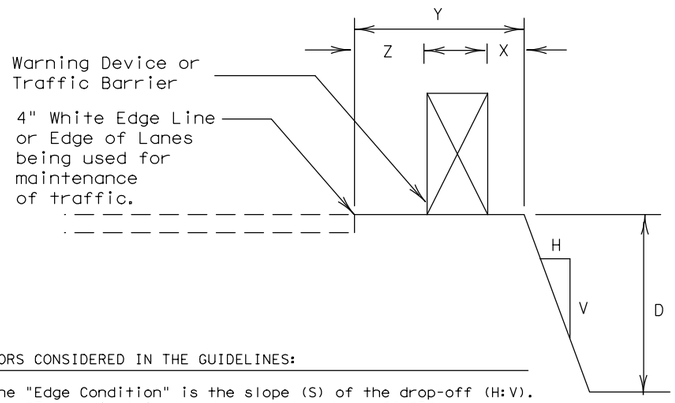
Edge Condition II
S = ((2.99):1) to (1:1)





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





FACTORS CONSIDERED IN THE GUIDELINES:

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

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

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

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

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

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

Edge Condition Notes:

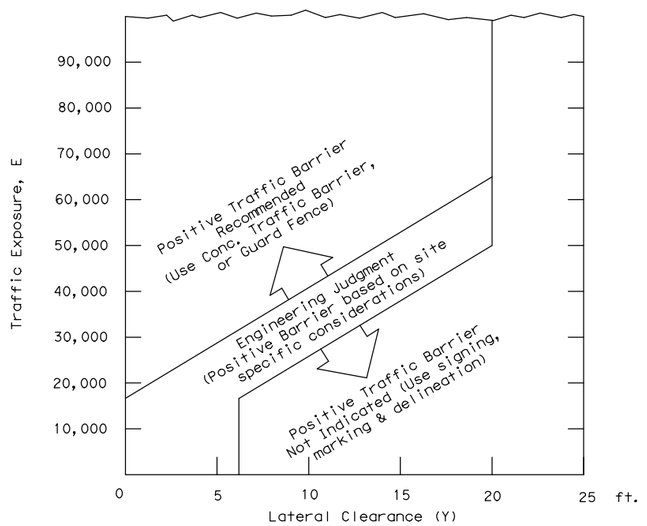
1. Edge Condition I: Most vehicles are able to traverse an edge condition with a slope rate of (3 to 1) or flatter. The slope must be constructed with a compacted material capable of supporting vehicles.

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

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

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

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



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

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

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

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

Engineer's Seal

STATE OF TEXAS
JENELLE N. ROMERO
97940
LICENSED
PROFESSIONAL ENGINEER

4/28/2022

Date _____

Texas Department of Transportation
Traffic Operations Division

TREATMENT FOR VARIOUS EDGE CONDITIONS

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

REVISIONS
03-01
08-01 correct typos

CONT	SECT	JOB	HIGHWAY
0106	04	036	US 380
DIST	COUNTY		SHEET NO.
ABL	STONEWALL		21

SUMMARY OF SMALL SIGNS

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

PLAN SHEET NO.	SIGN NO.	SIGN NOMENCLATURE	SIGN	DIMENSIONS	FLAT ALUMINUM (TYPE A)	EXAL ALUMINUM (TYPE G)	POST TYPE FRP = Fiberglass TWT = Thin-Wall 10BWG = 10 BWG S80 = Sch 80	POSTS 1 or 2	ANCHOR TYPE UA=Universal Conc UB=Universal Bolt SA=Slipbase-Conc SB=Slipbase-Bolt WS=Wedge Steel WP=Wedge Plastic	MOUNTING DESIGNATION PREFABRICATED P = "Plain" T = "T" U = "U"	MOUNTING DESIGNATION 1EXT or 2EXT = # of Ext BM = Extruded Wind Beam WC = 1.12 #/ft Wing Channel EXAL= Extruded Alum Sign Panels	BRIDGE MOUNT CLEARANCE SIGNS (See Note 2) TY = TYPE TY N TY S
SW3P 1	1	MODIFIED SIGN	ENVIRONMENTALLY SENSITIVE AREA NOTE: TEMPORARY SIGN TO BE REMOVED AFTER CONSTRUCTION	48" x 18"	X		10BWG	1	SA	T		
SW3P 1	2	MODIFIED SIGN	ENVIRONMENTALLY SENSITIVE AREA NOTE: TEMPORARY SIGN TO BE REMOVED AFTER CONSTRUCTION	48" x 18"	X		10BWG	1	SA	T		

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

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

http://www.txdot.gov/

NOTE:

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

Texas Department of Transportation

Traffic Operations Division Standard

TEMPORARY SUMMARY OF SMALL SIGNS

SOSS

FILE:	sums16.dgn	DN: TxDOT	CK: TxDOT	DW: TxDOT	CK: TxDOT
© TxDOT	May 1987	CONT	SECT	JOB	HIGHWAY
REVISIONS		0106	04	036	US 380
4-16		DIST	COUNTY		SHEET NO.
8-16		ABL	STONEWALL		22

18

DATE: 4/28/2022 6:34:56 PM
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BARRICADE AND CONSTRUCTION (BC) STANDARD SHEETS GENERAL NOTES:

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

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

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

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

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

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

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

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

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

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

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

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

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

WORKER SAFETY NOTES:

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

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

COMPLIANT WORKZONE TRAFFIC CONTROL DEVICES

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

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

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

Texas Department of Transportation

Traffic Safety Division Standard

BARRICADE AND CONSTRUCTION GENERAL NOTES AND REQUIREMENTS

BC(1)-21

FILE: bc-21.dgn	DN: TxDOT	CK: TxDOT	DW: TxDOT	CK: TxDOT
©TxDOT November 2002	CONT	SECT	JOB	HIGHWAY
REVISIONS 4-03 7-13 9-07 8-14 5-10 5-21	0106	04	036	US 380
	DIST	COUNTY		SHEET NO.
	ABL	STONEWALL		23

DATE: 4/28/2022 6:35:03 PM
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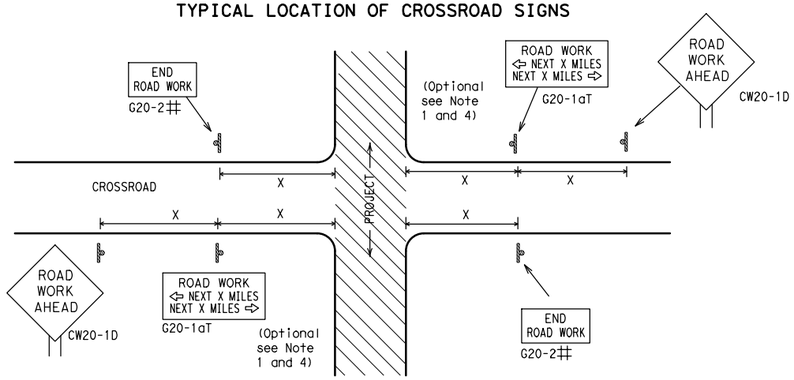
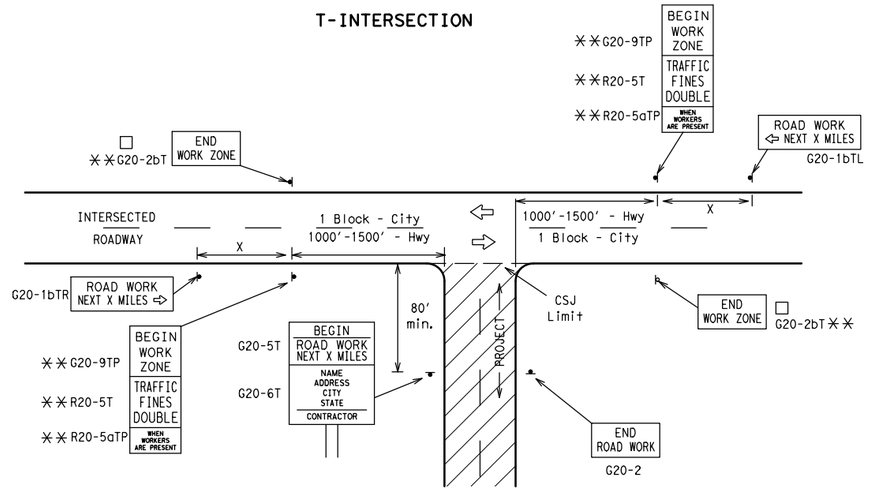
TYPICAL LOCATION OF CROSSROAD SIGNS



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

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

T-INTERSECTION



CSJ LIMITS AT T-INTERSECTION

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

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

SIZE

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

SPACING

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

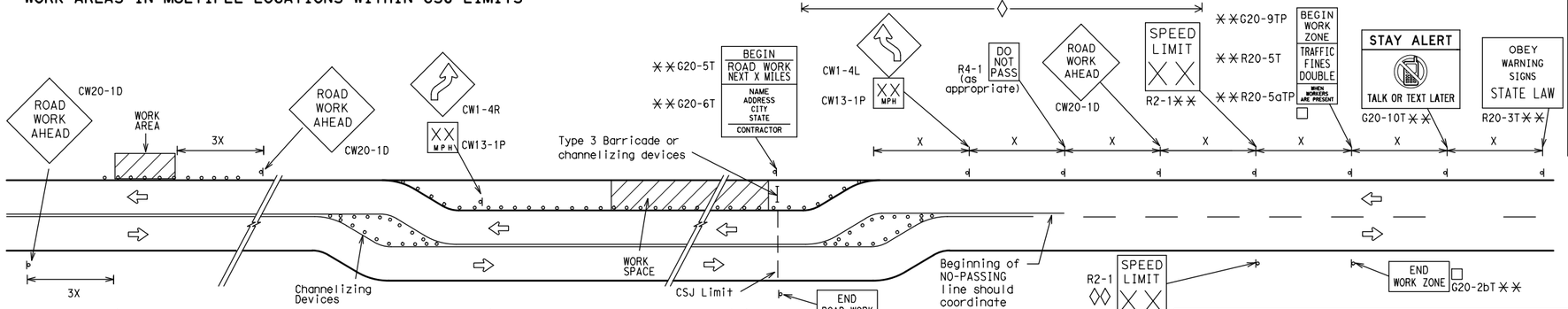
* For typical sign spacings on divided highways, expressways and freeways, see Part 6 of the "Texas Manual on Uniform Traffic Control Devices" (TMUTCD) typical application diagrams or TCP Standard Sheets.

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

GENERAL NOTES

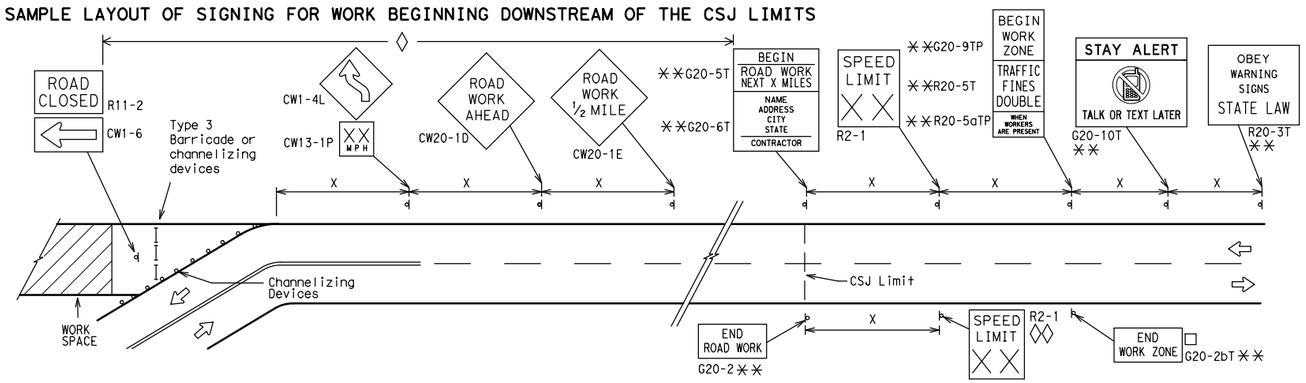
1. Special or larger size signs may be used as necessary.
2. Distance between signs should be increased as required to have 1500 feet advance warning.
3. Distance between signs should be increased as required to have 1/2 mile or more advance warning.
4. 36" x 36" "ROAD WORK AHEAD" (CW20-1D)signs may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

WORK AREAS IN MULTIPLE LOCATIONS WITHIN CSJ LIMITS



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

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



SAMPLE LAYOUT OF SIGNING FOR WORK BEGINNING AT THE CSJ LIMITS

NOTES

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

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

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

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

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

LEGEND

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

Texas Department of Transportation

Traffic Safety Division Standard

BARRICADE AND CONSTRUCTION PROJECT LIMIT

BC(2)-21

FILE: bc-21.dgn	DN: TxDOT	CK: TxDOT	DW: TxDOT	CK: TxDOT
©TxDOT November 2002	CONT	SECT	JOB	HIGHWAY
REVISIONS	0106	04	036	US 380
9-07 8-14	DIST	COUNTY		SHEET NO.
7-13 5-21	ABL	STONEWALL		24

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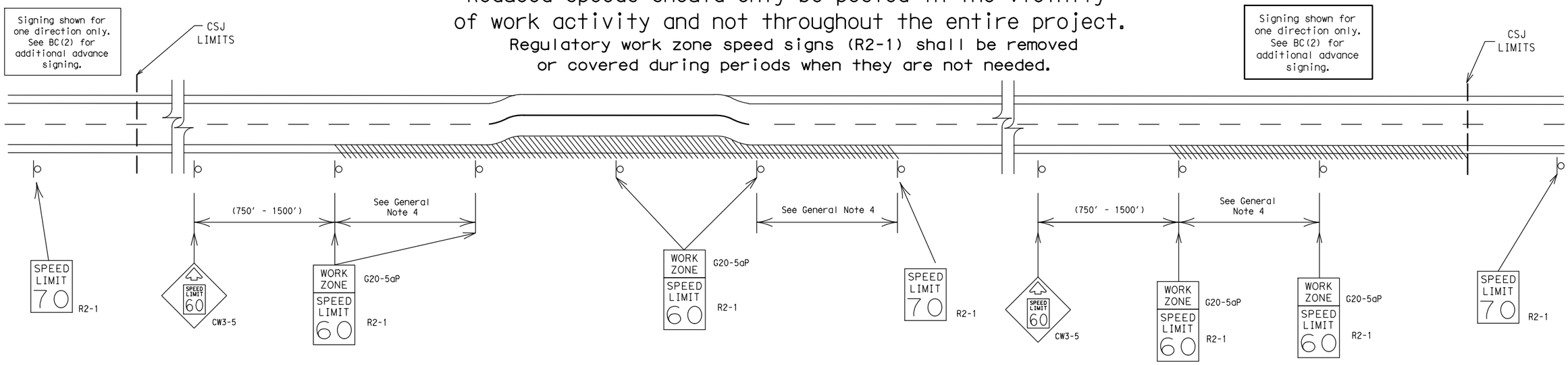
TYPICAL APPLICATION OF WORK ZONE SPEED LIMIT SIGNS

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

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

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



GUIDANCE FOR USE:

LONG/INTERMEDIATE TERM WORK ZONE SPEED LIMITS

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

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

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

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

SHORT TERM WORK ZONE SPEED LIMITS

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

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

GENERAL NOTES

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

Texas Department of Transportation

Traffic Safety Division Standard

BARRICADE AND CONSTRUCTION WORK ZONE SPEED LIMIT

BC(3)-21

FILE: bc-21.dgn	DN: TxDOT	CK: TxDOT	DW: TxDOT	CK: TxDOT
©TxDOT November 2002	CONT	SECT	JOB	HIGHWAY
REVISIONS 9-07 8-14 7-13 5-21	0106	04	036	US 380
	DIST	COUNTY		SHEET NO.
	ABL	STONEWALL		25

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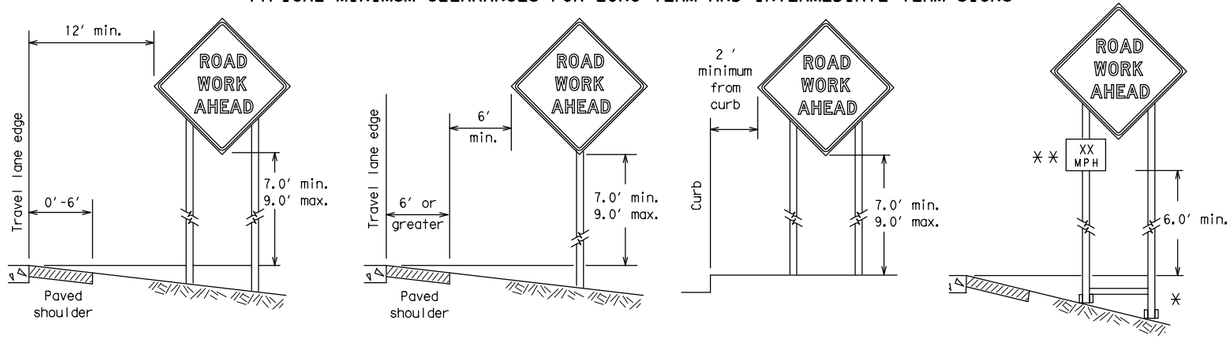
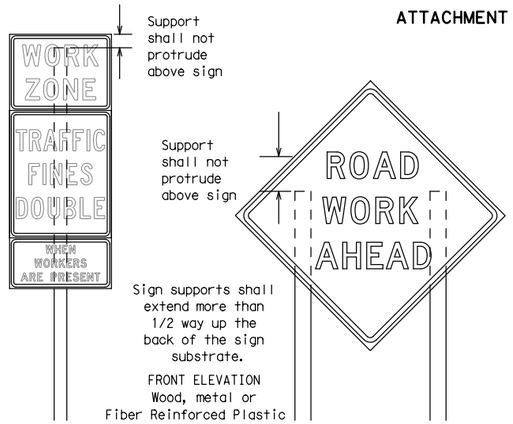
TYPICAL MINIMUM CLEARANCES FOR LONG TERM AND INTERMEDIATE TERM SIGNS

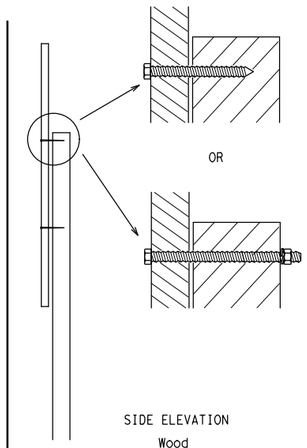


⚹ When placing skid supports on unlevel ground, the leg post lengths must be adjusted so the sign appears straight and plumb. Objects shall NOT be placed under skids as a means of leveling.

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

ATTACHMENT FOR SIGN SUPPORTS





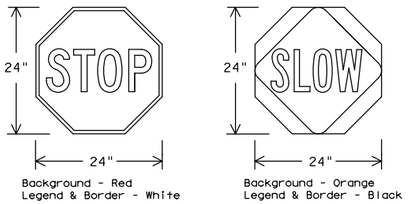
Attachment to wooden supports will be by bolts and nuts or screws. Use TxDOT's or manufacturer's recommended procedures for attaching sign substrates to other types of sign supports

Nails shall NOT be allowed. Each sign shall be attached directly to the sign support. Multiple signs shall not be joined or spliced by any means. Wood supports shall not be extended or repaired by splicing or other means.

Splicing embedded perforated square metal tubing in order to extend post height will only be allowed when the splice is made using four bolts, two above and two below the spice point. Splice must be located entirely behind the sign substrate, not near the base of the support. Splice insert lengths should be at least 5 times nominal post size, centered on the splice and of at least the same gauge material.

STOP/SLOW PADDLES

1. STOP/SLOW paddles are the primary method to control traffic by flaggers. The STOP/SLOW paddle size should be 24" x 24".
2. STOP/SLOW paddles shall be retroreflectorized when used at night.
3. STOP/SLOW paddles may be attached to a staff with a minimum length of 6′ to the bottom of the sign.
4. Any lights incorporated into the STOP or SLOW paddle faces shall only be as specifically described in Section 6E.03 Hand Signaling Devices in the TMUTCD.



Background - Red
Legend & Border - White

Background - Orange
Legend & Border - Black

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

CONTRACTOR REQUIREMENTS FOR MAINTAINING PERMANENT SIGNS WITHIN THE PROJECT LIMITS

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

GENERAL NOTES FOR WORK ZONE SIGNS

1. Contractor shall install and maintain signs in a straight and plumb condition and/or as directed by the Engineer.
2. Wooden sign posts shall be painted white.
3. Barricades shall NOT be used as sign supports.
4. All signs shall be installed in accordance with the plans or as directed by the Engineer. Signs shall be used to regulate, warn, and guide the traveling public safely through the work zone.
5. The Contractor may furnish either the sign design shown in the plans or in the "Standard Highway Sign Designs for Texas" (SHSD). The Engineer/Inspector may require the Contractor to furnish other work zone signs that are shown in the TMUTCD but may have been omitted from the plans. Any variation in the plans shall be documented by written agreement between the Engineer and the Contractor's Responsible Person. All changes must be documented in writing before being implemented. This can include documenting the changes in the Inspector's TxDOT diary and having both the Inspector and Contractor initial and date the agreed upon changes.
6. The Contractor shall furnish sign supports listed in the "Compliant Work Zone Traffic Control Device List" (CWZTCD) for small roadside signs. Supports for temporary large roadside signs shall meet the requirements detailed on the Temporary Large Roadside Signs (TLRS) standard sheets.The Contractor shall install the sign support in accordance with the manufacturer's recommendations. If there is a question regarding installation procedures, the Contractor shall furnish the Engineer a copy of the manufacturer's installation recommendations so the Engineer can verify the correct procedures are being followed.
7. The Contractor is responsible for installing signs on approved supports and replacing signs with damaged or cracked substrates and/or damaged or marred reflective sheeting as directed by the Engineer/Inspector.
8. Identification markings may be shown only on the back of the sign substrate. The maximum height of letters and/or company logos used for identification shall be 1 inch.
9. The Contractor shall replace damaged wood posts. New or damaged wood sign posts shall not be spliced.

DURATION OF WORK (as defined by the "Texas Manual on Uniform Traffic Control Devices" Part 6)

1. The types of sign supports, sign mounting height,the size of signs, and the type of sign substrates can vary based on the type of work being performed. The Engineer is responsible for selecting the appropriate size sign for the type of work being performed. The Contractor is responsible for ensuring the sign support, sign mounting height and substrate meets manufacturer's recommendations in regard to crashworthiness and duration of work requirements.
   a. Long-term stationary - work that occupies a location more than 3 days.
   b. Intermediate-term stationary - work that occupies a location more than one daylight period up to 3 days, or nighttime work lasting more than one hour.
   c. Short-term stationary - daytime work that occupies a location for more than 1 hour in a single daylight period.
   d. Short, duration - work that occupies a location up to 1 hour.
   e. Mobile - work that moves continuously or intermittently (stopping for up to approximately 15 minutes.)

SIGN MOUNTING HEIGHT

1. The bottom of Long-term/Intermediate-term signs shall be at least 7 feet, but not more than 9 feet, above the paved surface, except as shown for supplemental plaques mounted below other signs.
2. The bottom of Short-term/Short Duration signs shall be a minimum of 1 foot above the pavement surface but no more than 2 feet above the ground.
3. Long-term/Intermediate-term Signs may be used in lieu of Short-term/Short Duration signing.
4. Short-term/Short Duration signs shall be used only during daylight and shall be removed at the end of the workday or raised to appropriate Long-term/Intermediate sign height.
5. Regulatory signs shall be mounted at least 7 feet, but not more than 9 feet, above the paved surface regardless of work duration.

SIZE OF SIGNS

1. The Contractor shall furnish the sign sizes shown on BC (2) unless otherwise shown in the plans or as directed by the Engineer.

SIGN SUBSTRATES

1. The Contractor shall ensure the sign substrate is installed in accordance with the manufacturer's recommendations for the type of sign support that is being used. The CWZTCD lists each substrate that can be used on the different types and models of sign supports.
2. "Mesh" type materials are NOT an approved sign substrate, regardless of the tightness of the weave.
3. All wooden individual sign panels fabricated from 2 or more pieces shall have one or more plywood cleat, 1/2" thick by 6" wide, fastened to the back of the sign and extending fully across the sign. The cleat shall be attached to the back of the sign using wood screws that do not penetrate the face of the sign panel. The screws shall be placed on both sides of the splice and spaced at 6" centers. The Engineer may approve other methods of splicing the sign face.

REFLECTIVE SHEETING

1. All signs shall be retroreflective and constructed of sheeting meeting the color and retro-reflectivity requirements of DMS-8300 for rigid signs or DMS-8310 for roll-up signs. The web address for DMS specifications is shown on BC(1).
2. White sheeting, meeting the requirements of DMS-8300 Type A, shall be used for signs with a white background.
3. Orange sheeting, meeting the requirements of DMS-8300 Type B_{FL} or Type C_{FL}, shall be used for rigid signs with orange backgrounds.

SIGN LETTERS

1. All sign letters and numbers shall be clear, and open rounded type uppercase alphabet letters as approved by the Federal Highway Administration (FHWA) and as published in the "Standard Highway Sign Design for Texas" manual. Signs, letters and numbers shall be of first class workmanship in accordance with Department Standards and Specifications.

REMOVING OR COVERING

1. When sign messages may be confusing or do not apply, the signs shall be removed or completely covered.
2. Long-term stationary or intermediate stationary signs installed on square metal tubing may be turned away from traffic 90 degrees when the sign message is not applicable. This technique may not be used for signs installed in the median of divided highways or near any intersections where the sign may be seen from approaching traffic.
3. Signs installed on wooden skids shall not be turned at 90 degree angles to the roadway. These signs should be removed or completely covered when not required.
4. When signs are covered, the material used shall be opaque, such as heavy mil black plastic, or other materials which will cover the entire sign face and maintain their opaque properties under automobile headlights at night, without damaging the sign sheeting.
5. Burlap shall NOT be used to cover signs.
6. Duct tape or other adhesive material shall NOT be affixed to a sign face.
7. Signs and anchor stubs shall be removed and holes backfilled upon completion of work.

SIGN SUPPORT WEIGHTS

1. Where sign supports require the use of weights to keep from turning over, the use of sandbags with dry, cohesionless sand should be used.
2. The sandbags will be tied shut to keep the sand from spilling and to maintain a constant weight.
3. Rock, concrete, iron, steel or other solid objects shall not be permitted for use as sign support weights.
4. Sandbags should weigh a minimum of 35 lbs and a maximum of 50 lbs.
5. Sandbags shall be made of a durable material that tears upon vehicular impact. Rubber (such as tire inner tubes) shall NOT be used.
6. Rubber ballasts designed for channelizing devices should not be used for ballast on portable sign supports. Sign supports designed and manufactured with rubber bases may be used when shown on the CWZTCD list.
7. Sandbags shall only be placed along or laid over the base supports of the traffic control device and shall not be suspended above ground level or hung with rope, wire, chains or other fasteners. Sandbags shall be placed along the length of the skids to weigh down the sign support.
8. Sandbags shall NOT be placed under the skid and shall not be used to level sign supports placed on slopes.

FLAGS ON SIGNS

1. Flags may be used to draw attention to warning signs. When used, the flag shall be 16 inches square or larger and shall be orange or fluorescent red-orange in color. Flags shall not be allowed to cover any portion of the sign face.

Texas Department of Transportation

Traffic Safety Division Standard

BARRICADE AND CONSTRUCTION TEMPORARY SIGN NOTES

BC(4)-21

FILE: bc-21.dgn	DN: TxDOT	CK: TxDOT	DW: TxDOT	CK: TxDOT
©TxDOT November 2002	CONT	SECT	JOB	HIGHWAY
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9-07 8-14	DIST	COUNTY		SHEET NO.
7-13 5-21	ABL	STONEWALL		26

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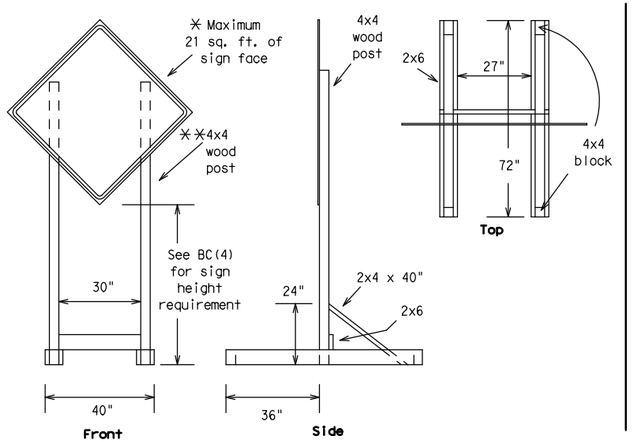
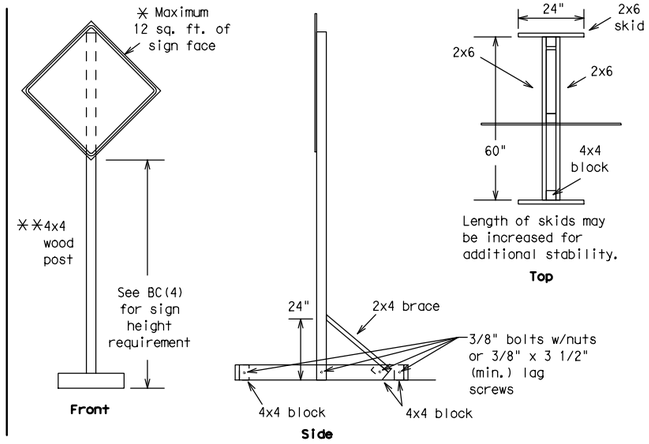
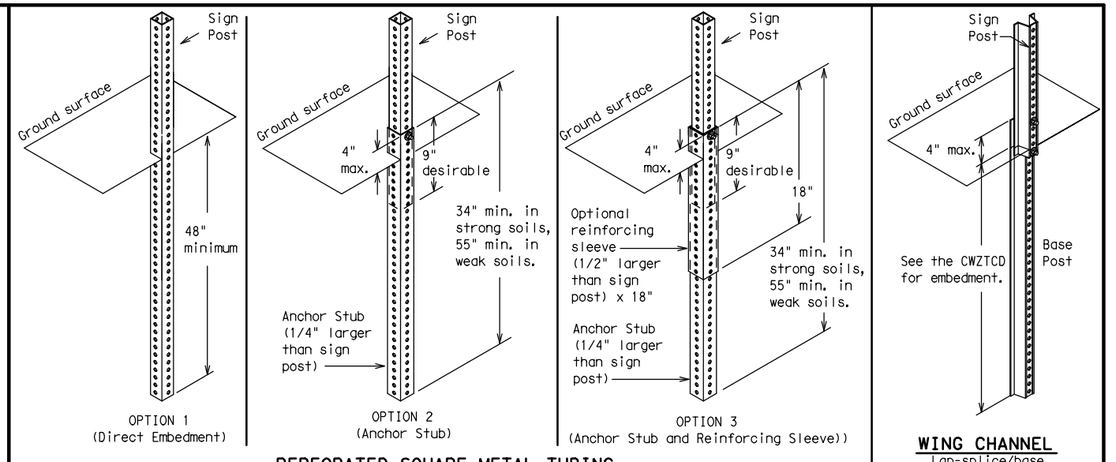




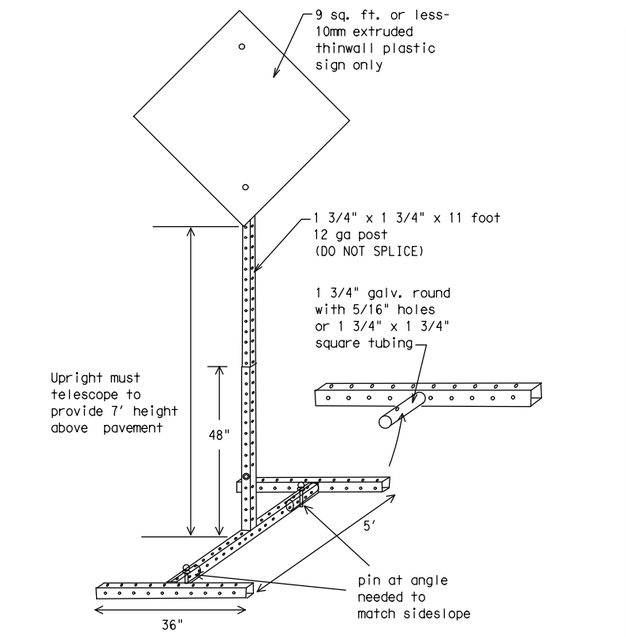
SKID MOUNTED WOOD SIGN SUPPORTS

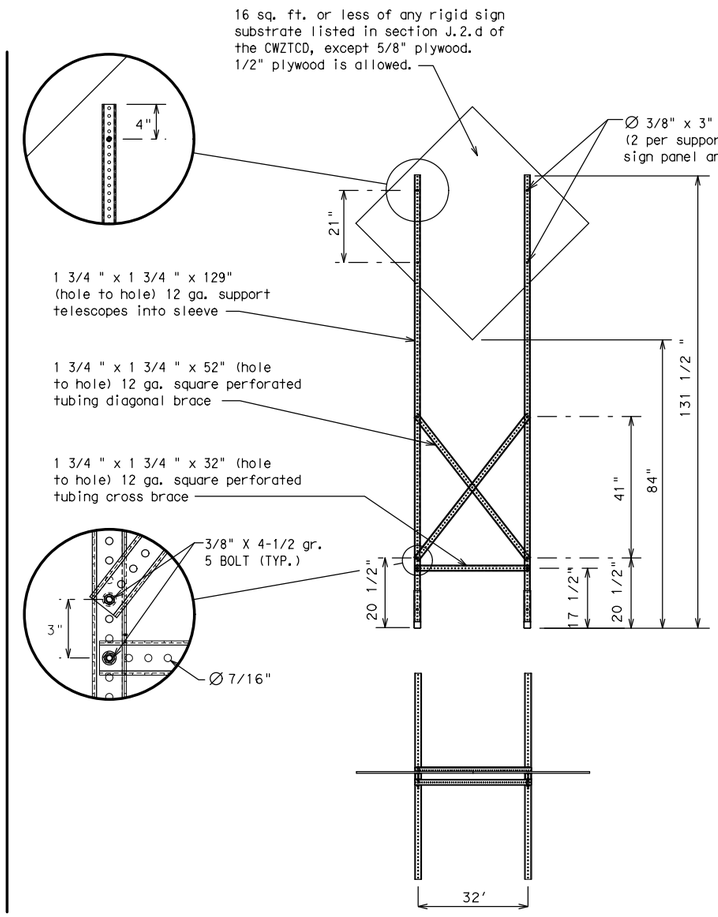
* LONG/INTERMEDIATE TERM STATIONARY - PORTABLE SKID MOUNTED SIGN SUPPORTS

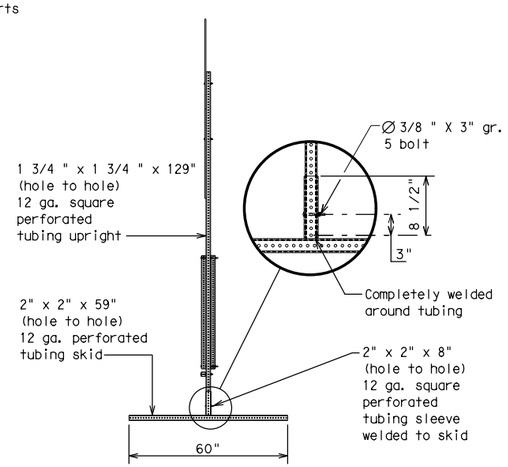


GROUND MOUNTED SIGN SUPPORTS

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







SKID MOUNTED PERFORATED SQUARE STEEL TUBING SIGN SUPPORTS

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

WEDGE ANCHORS

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

OTHER DESIGNS

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

GENERAL NOTES

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

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

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

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

Texas Department of Transportation

Traffic Safety Division Standard

BARRICADE AND CONSTRUCTION TYPICAL SIGN SUPPORT

BC(5)-21

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9-07 8-14	DIST	COUNTY		SHEET NO.
7-13 5-21	ABL	STONEWALL		27

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

PORTABLE CHANGEABLE MESSAGE SIGNS

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

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

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

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

RECOMMENDED PHASES AND FORMATS FOR PCMS MESSAGES DURING ROADWORK ACTIVITIES

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

Phase 1: Condition Lists

Road/Lane/Ramp Closure List

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

Other Condition List

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

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

Phase 2: Possible Component Lists

Action to Take/Effect on Travel List

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

Location List

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

Warning List

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

✳✳ Advance Notice List

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

✳✳ See Application Guidelines Note 6.

APPLICATION GUIDELINES

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

WORDING ALTERNATIVES

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

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

FULL MATRIX PCMS SIGNS

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

Texas Department of Transportation

Traffic Safety Division Standard

BARRICADE AND CONSTRUCTION PORTABLE CHANGEABLE MESSAGE SIGN (PCMS)

BC(6)-21

FILE: bc-21.dgn	DN: TxDOT	CK: TxDOT	DW: TxDOT	CK: TxDOT
©TxDOT November 2002	CONT	SECT	JOB	HIGHWAY
REVISIONS	0106	04	036	US 380
9-07 8-14	DIST	COUNTY		SHEET NO.
7-13 5-21	ABL	STONEWALL		28

100

DATE: 4/28/2022 6:35:07 PM
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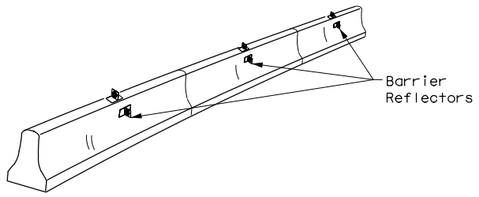
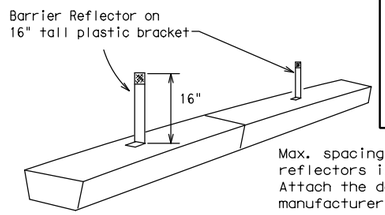
1. Barrier Reflectors shall be pre-qualified, and conform to the color and reflectivity requirements of DMS-8600. A list of prequalified Barrier Reflectors can be found at the Material Producer List web address shown on BC(1).
2. Color of Barrier Reflectors shall be as specified in the TMUTCD. The cost of the reflectors shall be considered subsidiary to Item 512.



CONCRETE TRAFFIC BARRIER (CTB)

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

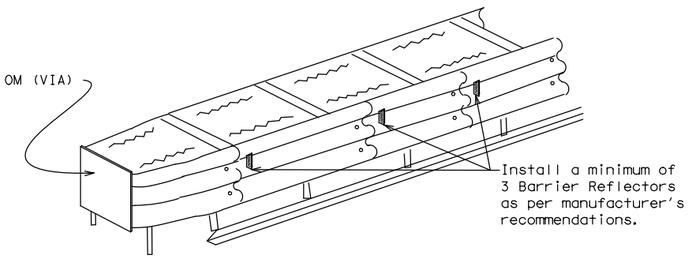


Max. spacing of barrier reflectors is 20 feet. Attach the delineators as per manufacturer's recommendations.

LOW PROFILE CONCRETE BARRIER (LPCB)

LOW PROFILE CONCRETE BARRIER (LPCB) USED IN WORK ZONES

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

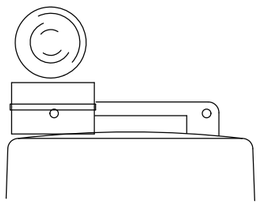


DELINEATION OF END TREATMENTS

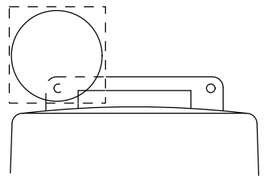
END TREATMENTS FOR CTB'S USED IN WORK ZONES

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

BARRIER REFLECTORS FOR CONCRETE TRAFFIC BARRIER AND ATTENUATORS



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



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

WARNING LIGHTS

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

WARNING LIGHTS MOUNTED ON PLASTIC DRUMS

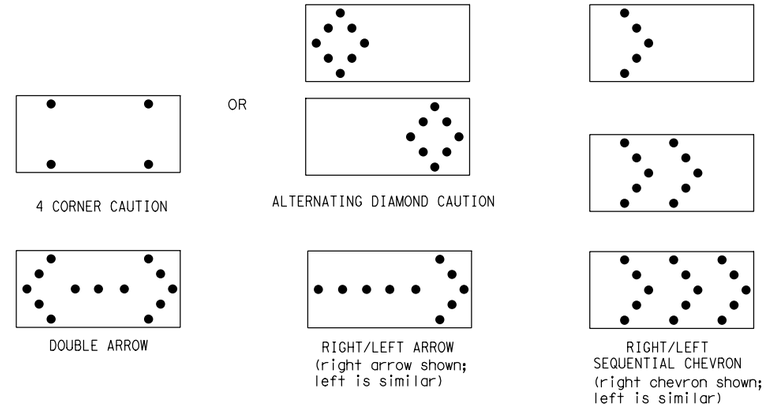
1. Type A flashing warning lights are intended to warn drivers that they are approaching or are in a potentially hazardous area.
2. Type A random flashing warning lights are not intended for delineation and shall not be used in a series.
3. A series of sequential flashing warning lights placed on channelizing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

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

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

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

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



4 CORNER CAUTION

ALTERNATING DIAMOND CAUTION

DOUBLE ARROW

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

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

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

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

ATTENTION

Flashing Arrow Boards shall be equipped with automatic dimming devices.

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

FLASHING ARROW BOARDS

TRUCK-MOUNTED ATTENUATORS

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

Texas Department of Transportation

Traffic Safety Division Standard

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

BC(7)-21

FILE: bc-21.dgn	DN: TxDOT	CK: TxDOT	DW: TxDOT	CK: TxDOT
©TxDOT November 2002	CONT	SECT	JOB	HIGHWAY
REVISIONS	0106	04	036	US 380
9-07 8-14	DIST	COUNTY		SHEET NO.
7-13 5-21	ABL	STONEWALL		29

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GENERAL NOTES

1. For long term stationary work zones on freeways, drums shall be used as the primary channelizing device.
2. For intermediate term stationary work zones on freeways, drums should be used as the primary channelizing device but may be replaced in tangent sections by vertical panels, or 42" two-piece cones. In tangent sections, one-piece cones may be used with the approval of the Engineer but only if personnel are present on the project at all times to maintain the cones in proper position and location.
3. For short term stationary work zones on freeways, drums are the preferred channelizing device but may be replaced in tapers, transitions and tangent sections by vertical panels, two-piece cones or one-piece cones as approved by the Engineer.
4. Drums and all related items shall comply with the requirements of the current version of the "Texas Manual on Uniform Traffic Control Devices" (TMUTCD) and the "Compliant Work Zone Traffic Control Devices List" (CWZTCD).
5. Drums, bases, and related materials shall exhibit good workmanship and shall be free from objectionable marks or defects that would adversely affect their appearance or serviceability.
6. The Contractor shall have a maximum of 24 hours to replace any plastic drums identified for replacement by the Engineer/Inspector. The replacement device must be an approved device.

GENERAL DESIGN REQUIREMENTS

Pre-qualified plastic drums shall meet the following requirements:

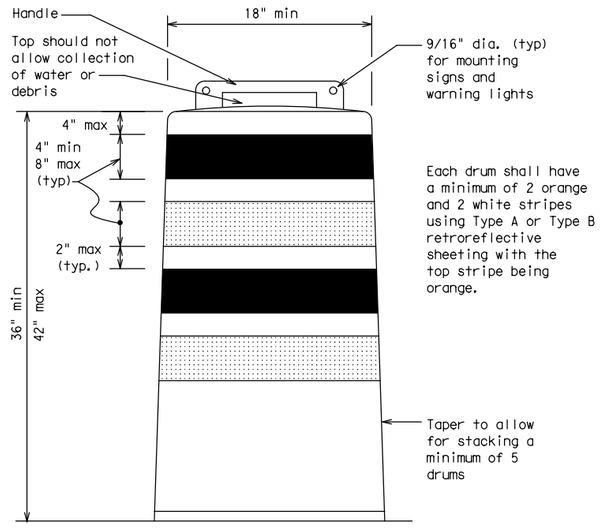
1. Plastic drums shall be a two-piece design; the "body" of the drum shall be the top portion and the "base" shall be the bottom.
2. The body and base shall lock together in such a manner that the body separates from the base when impacted by a vehicle traveling at a speed of 20 MPH or greater but prevents accidental separation due to normal handling and/or air turbulence created by passing vehicles.
3. Plastic drums shall be constructed of lightweight flexible, and deformable materials. The Contractor shall NOT use metal drums or single piece plastic drums as channelization devices or sign supports.
4. Drums shall present a profile that is a minimum of 18 inches in width at the 36 inch height when viewed from any direction. The height of drum unit (body installed on base) shall be a minimum of 36 inches and a maximum of 42 inches.
5. The top of the drum shall have a built-in handle for easy pickup and shall be designed to drain water and not collect debris. The handle shall have a minimum of two widely spaced 9/16 inch diameter holes to allow attachment of a warning light, warning reflector unit or approved compliant sign.
6. The exterior of the drum body shall have a minimum of four alternating orange and white retroreflective circumferential stripes not less than 4 inches nor greater than 8 inches in width. Any non-reflectorized space between any two adjacent stripes shall not exceed 2 inches in width.
7. Bases shall have a maximum width of 36 inches, a maximum height of 4 inches, and a minimum of two footholds of sufficient size to allow base to be held down while separating the drum body from the base.
8. Plastic drums shall be constructed of ultra-violet stabilized, orange, high-density polyethylene (HDPE) or other approved material.
9. Drum body shall have a maximum unballasted weight of 11 lbs.
10. Drum and base shall be marked with manufacturer's name and model number.

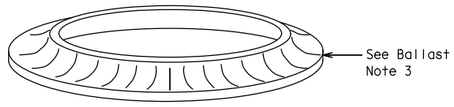
RETROREFLECTIVE SHEETING

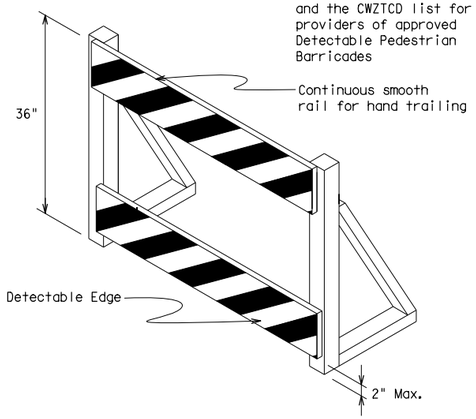
1. The stripes used on drums shall be constructed of sheeting meeting the color and retroreflectivity requirements of Departmental Materials Specification DMS-8300, "Sign Face Materials," Type A or Type B reflective sheeting shall be supplied unless otherwise specified in the plans.
2. The sheeting shall be suitable for use on and shall adhere to the drum surface such that, upon vehicular impact, the sheeting shall remain adhered in-place and exhibit no delaminating, cracking, or loss of retroreflectivity other than that loss due to abrasion of the sheeting surface.

BALLAST

1. Unballasted bases shall be large enough to hold up to 50 lbs. of sand. This base, when filled with the ballast material, should weigh between 35 lbs (minimum) and 50 lbs (maximum). The ballast may be sand in one to three sandbags separate from the base, sand in a sand-filled plastic base, or other ballasting devices as approved by the Engineer. Stacking of sandbags will be allowed, however height of sandbags above pavement surface may not exceed 12 inches.
2. Bases with built-in ballast shall weigh between 40 lbs. and 50 lbs. Built-in ballast can be constructed of an integral crumb rubber base or a solid rubber base.
3. Recycled truck tire sidewalls may be used for ballast on drums approved for this type of ballast on the CWZTCD list.
4. The ballast shall not be heavy objects, water, or any material that would become hazardous to motorists, pedestrians, or workers when the drum is struck by a vehicle.
5. When used in regions susceptible to freezing, drums shall have drainage holes in the bottoms so that water will not collect and freeze becoming a hazard when struck by a vehicle.
6. Ballast shall not be placed on top of drums.
7. Adhesives may be used to secure base of drums to pavement.

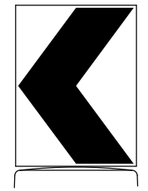




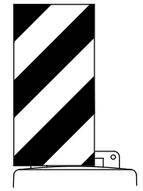


DETECTABLE PEDESTRIAN BARRICADES

1. When existing pedestrian facilities are disrupted, closed, or relocated in a TTC zone, the temporary facilities shall be detectable and include accessibility features consistent with the features present in the existing pedestrian facility. Refer to WZ(BTS-2) for Pedestrian Control requirements for Sidewalk Diversions, Sidewalk Detours and Crosswalk Closures.
2. Where pedestrians with visual disabilities normally use the closed sidewalk, a Detectable Pedestrian Barricade shall be placed across the full width of the closed sidewalk instead of a Type 3 Barricade.
3. Detectable pedestrian barricades similar to the one pictured above, longitudinal channelizing devices, some concrete barriers, and wood or chain link fencing with a continuous detectable edging can satisfactorily delineate a pedestrian path.
4. Tape, rope, or plastic chain strung between devices are not detectable, do not comply with the design standards in the "Americans with Disabilities Act Accessibility Guidelines (ADAAG)" and should not be used as a control for pedestrian movements.
5. Warning lights shall not be attached to detectable pedestrian barricades.
6. Detectable pedestrian barricades should use 8" nominal barricade rails as shown on BC(10) provided that the top rail provides a smooth continuous rail suitable for hand trailing with no splinters, burrs, or sharp edges.



18" x 24" Sign
(Maximum Sign Dimension)
Chevron CW1-8, Opposing Traffic Lane Divider, Driveway sign D70a, Keep Right R4 series or other signs as approved by Engineer



12" x 24"
Vertical Panel
mount with diagonals sloping down towards travel way

Plywood, Aluminum or Metal sign substrates shall NOT be used on plastic drums

SIGNS, CHEVRONS, AND VERTICAL PANELS MOUNTED ON PLASTIC DRUMS

1. Signs used on plastic drums shall be manufactured using substrates listed on the CWZTCD.
2. Chevrons and other work zone signs with an orange background shall be manufactured with Type B_{FL} or Type C_{FL} Orange sheeting meeting the color and retroreflectivity requirements of DMS-8300, "Sign Face Material," unless otherwise specified in the plans.
3. Vertical Panels shall be manufactured with orange and white sheeting meeting the requirements of DMS-8300 Type A or Type B. Diagonal stripes on Vertical Panels shall slope down toward the intended traveled lane.
4. Other sign messages (text or symbolic) may be used as approved by the Engineer. Sign dimensions shall not exceed 18 inches in width or 24 inches in height, except for the R9 series signs discussed in note 8 below.
5. Signs shall be installed using a 1/2 inch bolt (nominal) and nut, two washers, and one locking washer for each connection.
6. Mounting bolts and nuts shall be fully engaged and adequately torqued. Bolts should not extend more than 1/2 inch beyond nuts.
7. Chevrons may be placed on drums on the outside of curves, on merging tapers or on shifting tapers. When used in these locations, they may be placed on every drum or spaced not more than on every third drum. A minimum of three (3) should be used at each location called for in the plans.
8. R9-9, R9-10, R9-11 and R9-11a Sidewalk Closed signs which are 24 inches wide may be mounted on plastic drums, with approval of the Engineer.

Texas Department of Transportation

Traffic Safety Division Standard

BARRICADE AND CONSTRUCTION CHANNELIZING DEVICES

BC(8)-21

FILE: bc-21.dgn	DN: TxDOT	CK: TxDOT	DW: TxDOT	CK: TxDOT
©TxDOT November 2002	CONT	SECT	JOB	HIGHWAY
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9-07 5-21	ABL	STONEWALL		30
7-13				

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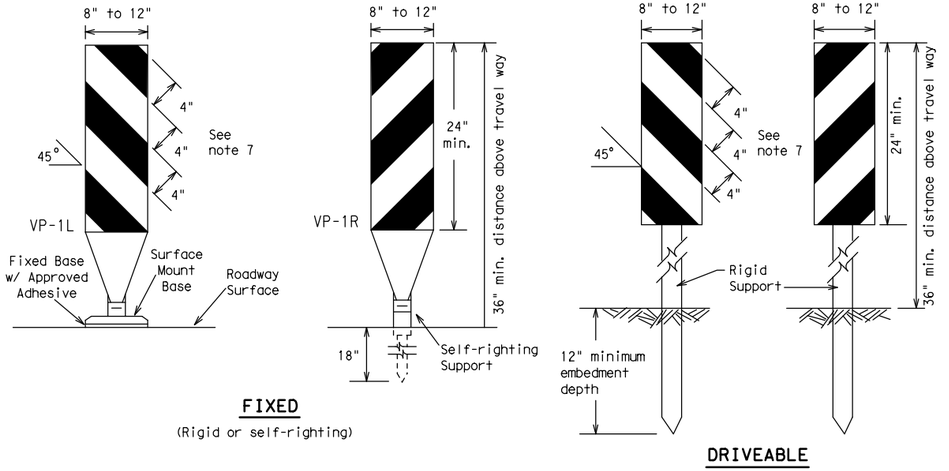
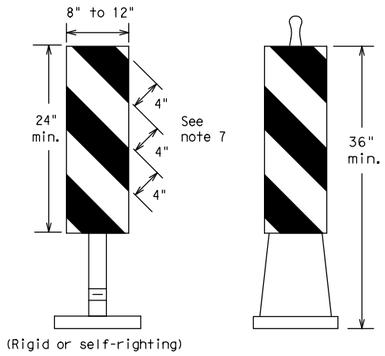


FIXED
(Rigid or self-righting)

DRIVEABLE

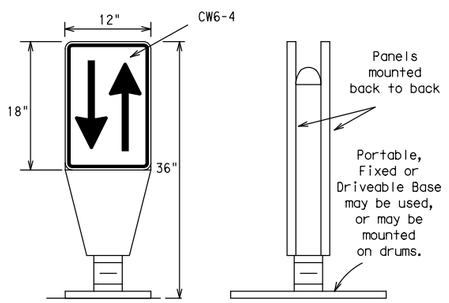


(Rigid or self-righting)

PORTABLE

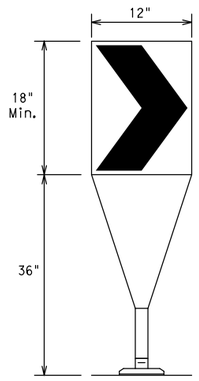
1. Vertical Panels (VP's) are normally used to channelize traffic or divide opposing lanes of traffic.
2. VP's may be used in daytime or nighttime situations. They may be used at the edge of shoulder drop-offs and other areas such as lane transitions where positive daytime and nighttime delineation is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

VERTICAL PANELS (VPs)



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

OPPOSING TRAFFIC LANE DIVIDERS (OTLD)



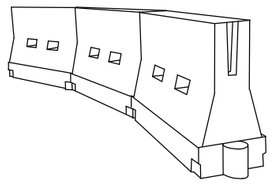
Fixed Base w/ Approved Adhesive (Driveable Base, or Flexible Support can be used)

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

CHEVRONS

GENERAL NOTES

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



LONGITUDINAL CHANNELIZING DEVICES (LCD)

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

WATER BALLASTED SYSTEMS USED AS BARRIERS

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

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

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

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

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

SUGGESTED MAXIMUM SPACING OF CHANNELIZING DEVICES AND MINIMUM DESIRABLE TAPER LENGTHS

SHEET 9 OF 12

Texas Department of Transportation | Traffic Safety Division Standard

BARRICADE AND CONSTRUCTION CHANNELIZING DEVICES

BC(9)-21

FILE: bc-21.dgn	DN: TxDOT	CK: TxDOT	DW: TxDOT	CK: TxDOT
©TxDOT November 2002	CONT	SECT	JOB	HIGHWAY
REVISIONS	0106	04	036	US 380
9-07 8-14	DIST	COUNTY		SHEET NO.
7-13 5-21	ABL	STONEWALL		31

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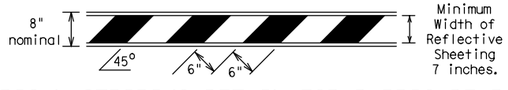
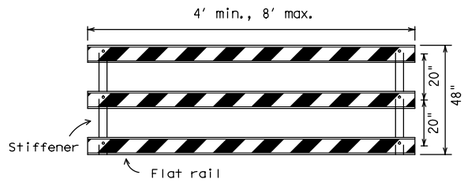
TYPE 3 BARRICADES

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

Barricades shall NOT be used as a sign support.



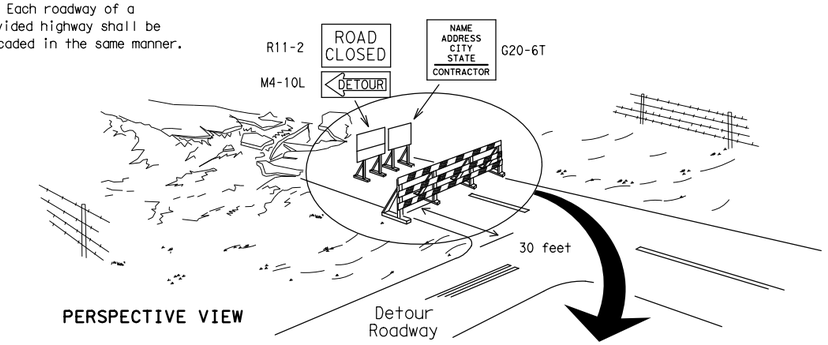
TYPICAL STRIPING DETAIL FOR BARRICADE RAIL



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

TYPICAL PANEL DETAIL FOR SKID OR POST TYPE BARRICADES

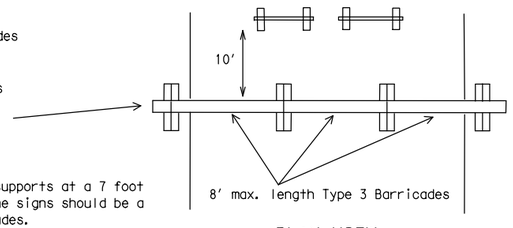
Each roadway of a divided highway shall be barricaded in the same manner.



PERSPECTIVE VIEW

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

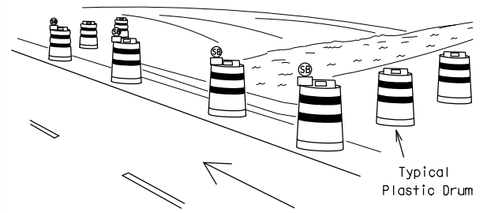
Barricade striping should slant downward in the direction of detour.



PLAN VIEW

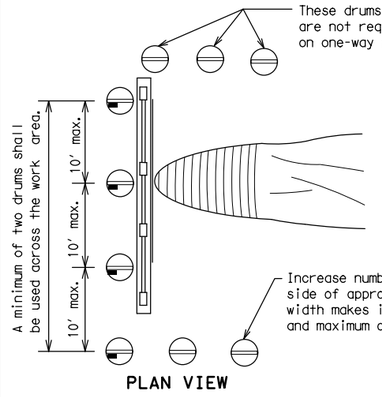
1. Signs should be mounted on independent supports at a 7 foot mounting height in center of roadway. The signs should be a minimum of 10 feet behind Type 3 Barricades.
2. Advance signing shall be as specified elsewhere in the plans.

TYPE 3 BARRICADE (POST AND SKID) TYPICAL APPLICATION



PERSPECTIVE VIEW

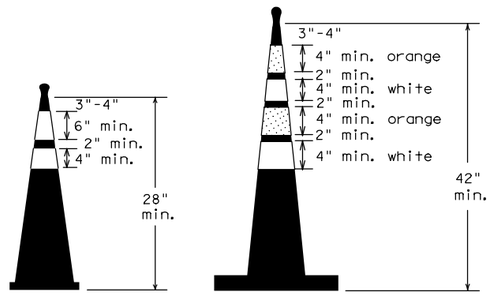
1. Where positive redirectional capability is provided, drums may be omitted.
2. Plastic construction fencing may be used with drums for safety as required in the plans.
3. Vertical Panels on flexible support may be substituted for drums when the shoulder width is less than 4 feet.
4. When the shoulder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



PLAN VIEW

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

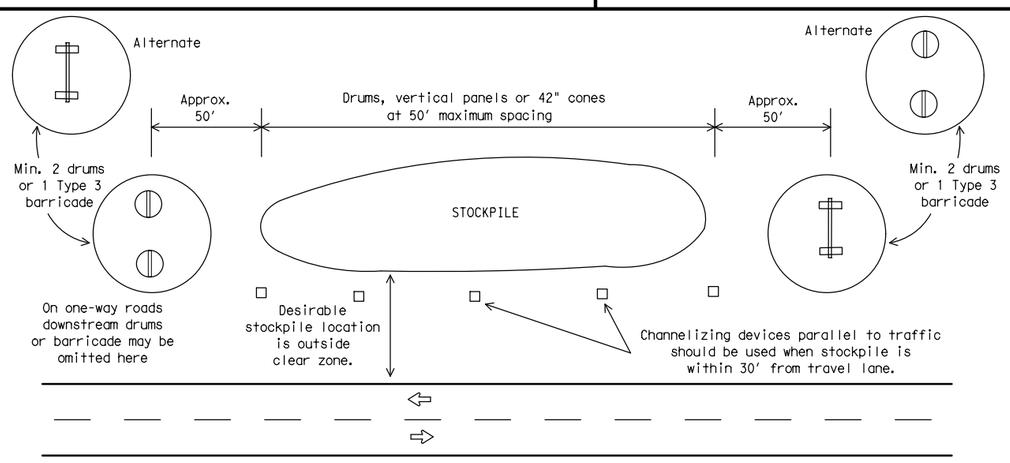
CULVERT WIDENING OR OTHER ISOLATED WORK WITHIN THE PROJECT LIMITS



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

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

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



TRAFFIC CONTROL FOR MATERIAL STOCKPILES

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Texas Department of Transportation — Traffic Safety Division Standard

BARRICADE AND CONSTRUCTION CHANNELIZING DEVICES

BC(10)-21

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REVISIONS	0106	04	036	US 380
9-07 8-14	DIST	COUNTY		SHEET NO.
7-13 5-21	ABL	STONEWALL		32

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WORK ZONE PAVEMENT MARKINGS

GENERAL

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

RAISED PAVEMENT MARKERS

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

PREFABRICATED PAVEMENT MARKINGS

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

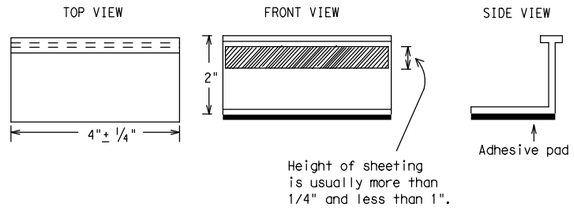
MAINTAINING WORK ZONE PAVEMENT MARKINGS

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

REMOVAL OF PAVEMENT MARKINGS

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

Temporary Flexible-Reflective Roadway Marker Tabs



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

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

RAISED PAVEMENT MARKERS USED AS GUIDEMARKS

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

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

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

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

Texas Department of Transportation

Traffic Safety Division Standard

BARRICADE AND CONSTRUCTION PAVEMENT MARKINGS

BC(11)-21

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11-02 8-14	ABL	STONEWALL		33

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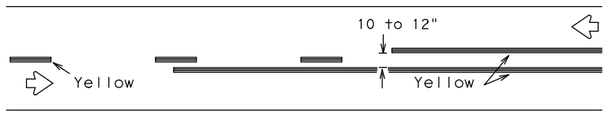
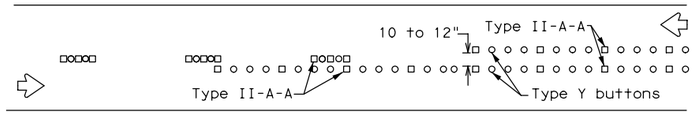
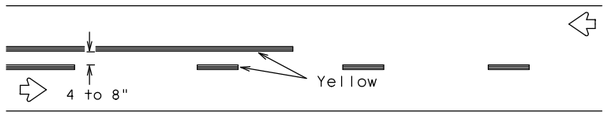
PAVEMENT MARKING PATTERNS



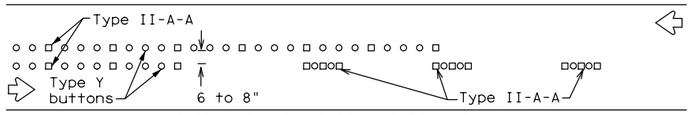
REFLECTORIZED PAVEMENT MARKINGS - PATTERN A



RAISED PAVEMENT MARKERS - PATTERN A



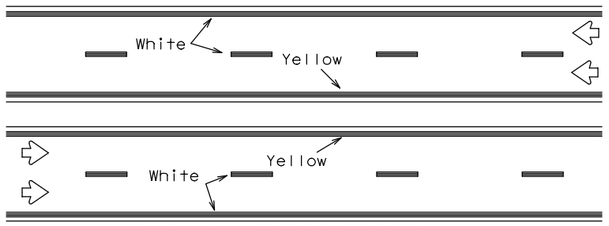
REFLECTORIZED PAVEMENT MARKINGS - PATTERN B



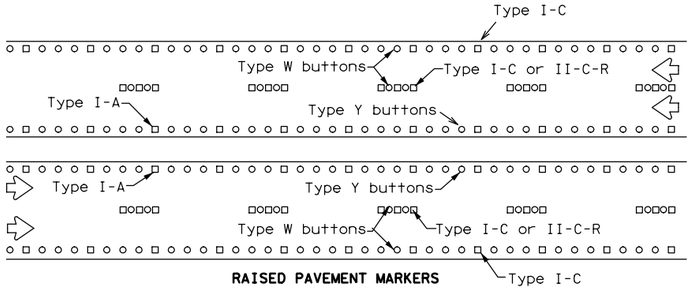
RAISED PAVEMENT MARKERS - PATTERN B

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

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



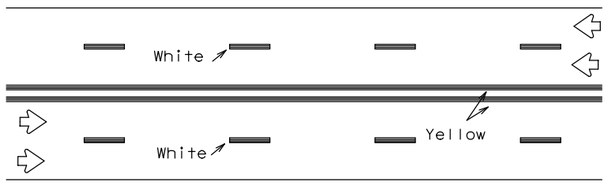
REFLECTORIZED PAVEMENT MARKINGS



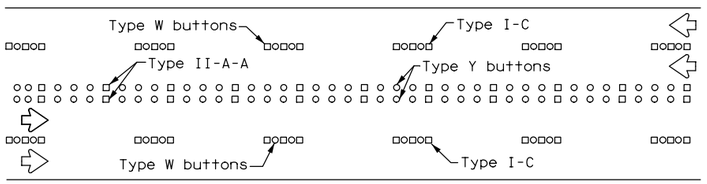
RAISED PAVEMENT MARKERS

Prefabricated markings may be substituted for reflectorized pavement markings.

EDGE & LANE LINES FOR DIVIDED HIGHWAY



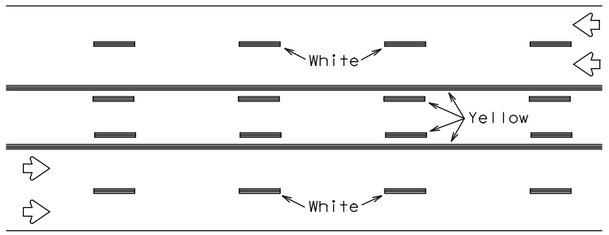
REFLECTORIZED PAVEMENT MARKINGS



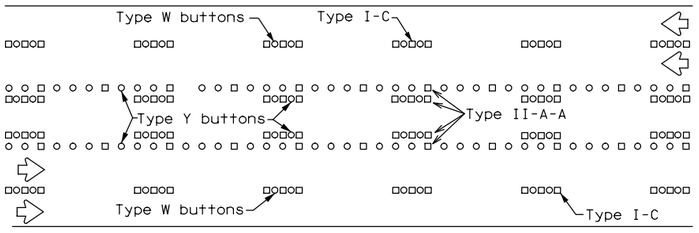
RAISED PAVEMENT MARKERS

Prefabricated markings may be substituted for reflectorized pavement markings.

LANE & CENTER LINES FOR MULTILANE UNDIVIDED HIGHWAYS



REFLECTORIZED PAVEMENT MARKINGS



RAISED PAVEMENT MARKERS

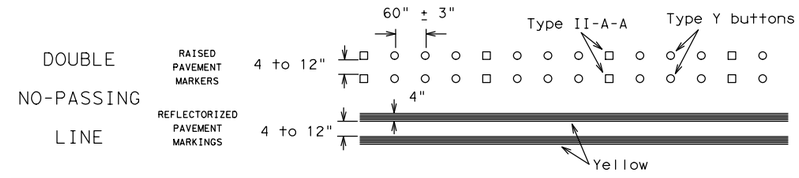
Prefabricated markings may be substituted for reflectorized pavement markings.

TWO-WAY LEFT TURN LANE

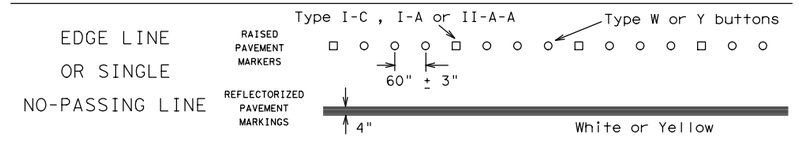
STANDARD WORK ZONE PAVEMENT MARKINGS DETAILS

SOLID LINES

DOUBLE NO-PASSING LINE

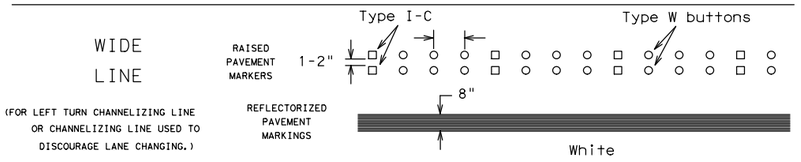


EDGE LINE OR SINGLE NO-PASSING LINE



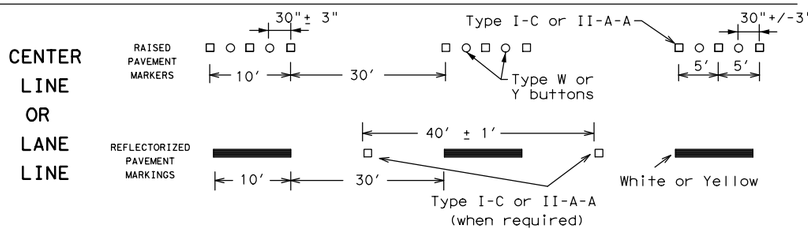
WIDE LINE

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

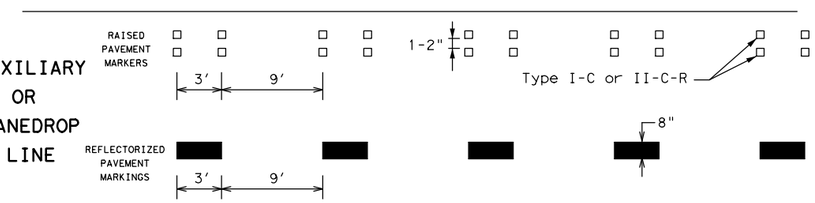


BROKEN LINES

CENTER LINE OR LANE LINE

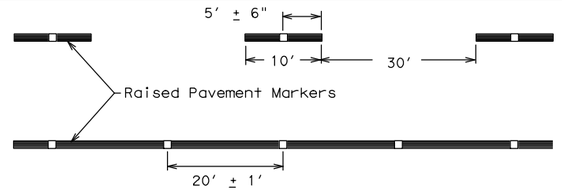


AUXILIARY OR LANEDROP LINE



REMOVABLE MARKINGS WITH RAISED PAVEMENT MARKERS

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



Centerline only - not to be used on edge lines

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

Texas Department of Transportation

Traffic Safety Division Standard

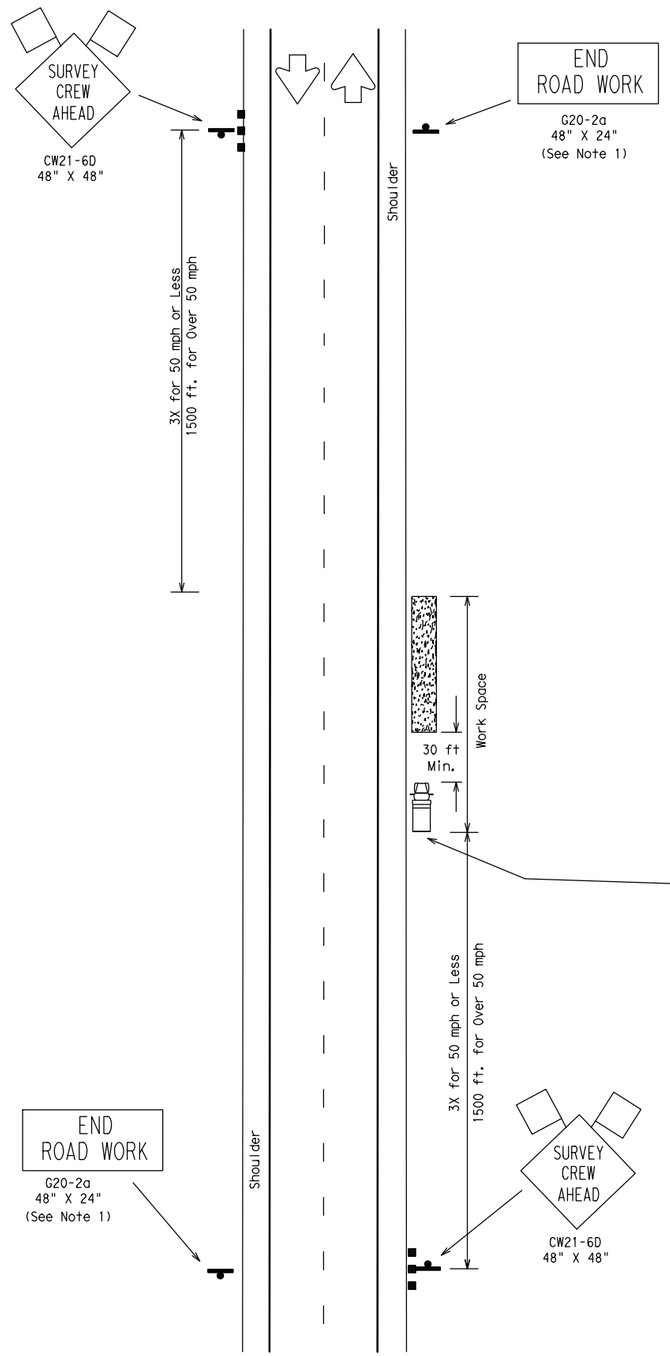
BARRICADE AND CONSTRUCTION PAVEMENT MARKING PATTERNS

BC(12)-21

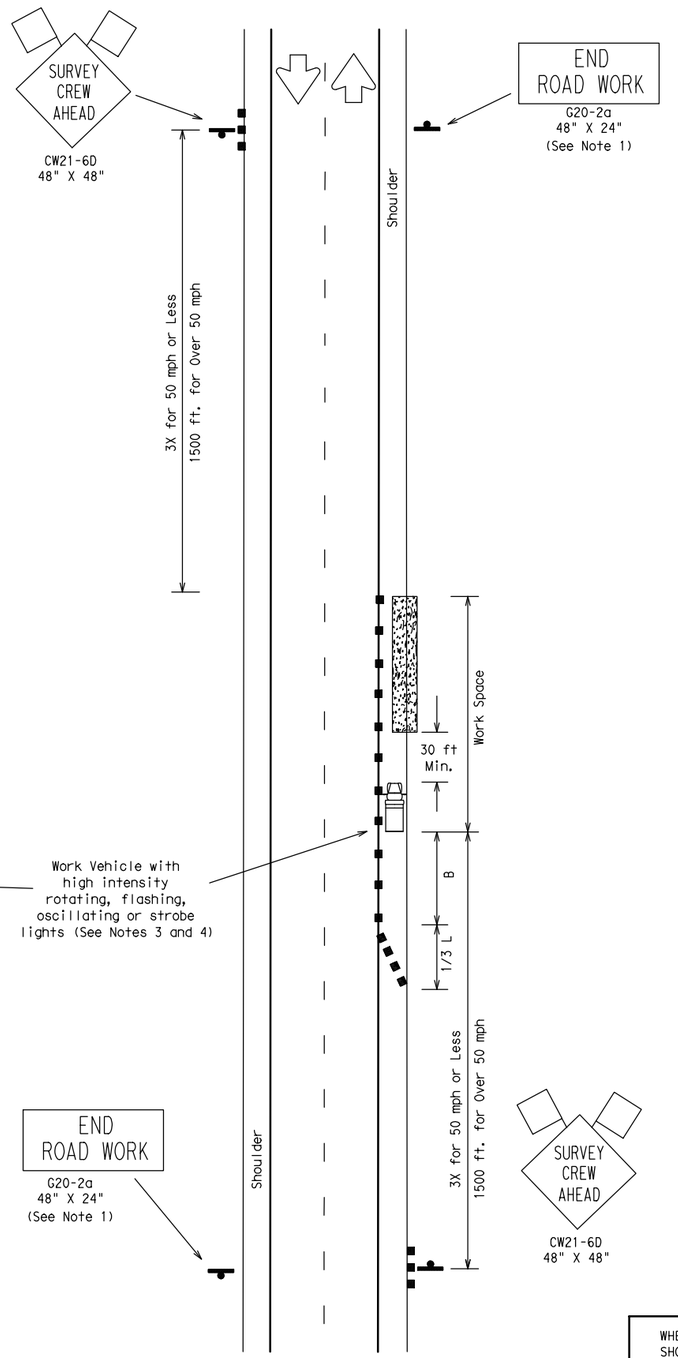
FILE: bc-21.dgn	DN: TxDOT	CK: TxDOT	DW: TxDOT	CK: TxDOT
©TxDOT February 1998	CONT	SECT	JOB	HIGHWAY
REVISIONS 1-97 9-07 5-21 2-98 7-13 11-02 8-14	0106	04	036	US 380
	DIST	COUNTY		SHEET NO.
	ABL	STONEWALL		34

DATE: 4/28/2022 6:35:11 PM
FILE: c:\pw_work\atkmatx01\rome2243\dms57940\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.



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



TCP (S-1b)
WORK ON SHOULDER

LEGEND

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

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

✳ Conventional Roads Only

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

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

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

GENERAL NOTES:

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

TCP(S-1a)

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

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

8-18-08 Revision
1 Corrected misspelling.

Texas Department of Transportation
Traffic Operations Division

TRAFFIC CONTROL PLAN FOR SURVEYING OPERATIONS

TCP(S-1)-08A

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

REVISIONS
8-08

CONT	SECT	JOB	HIGHWAY
0106	04	036	US 380
DIST	COUNTY		SHEET NO.
ABL	STONEWALL		35

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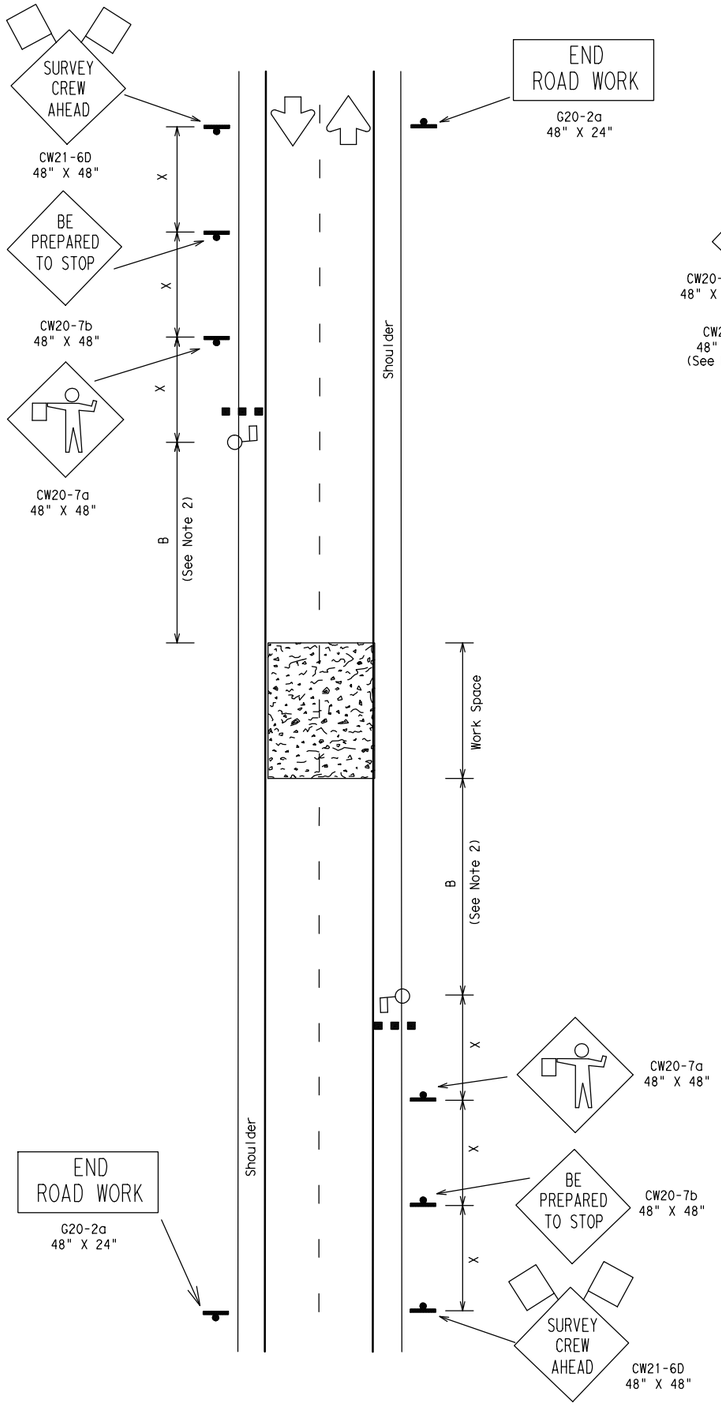
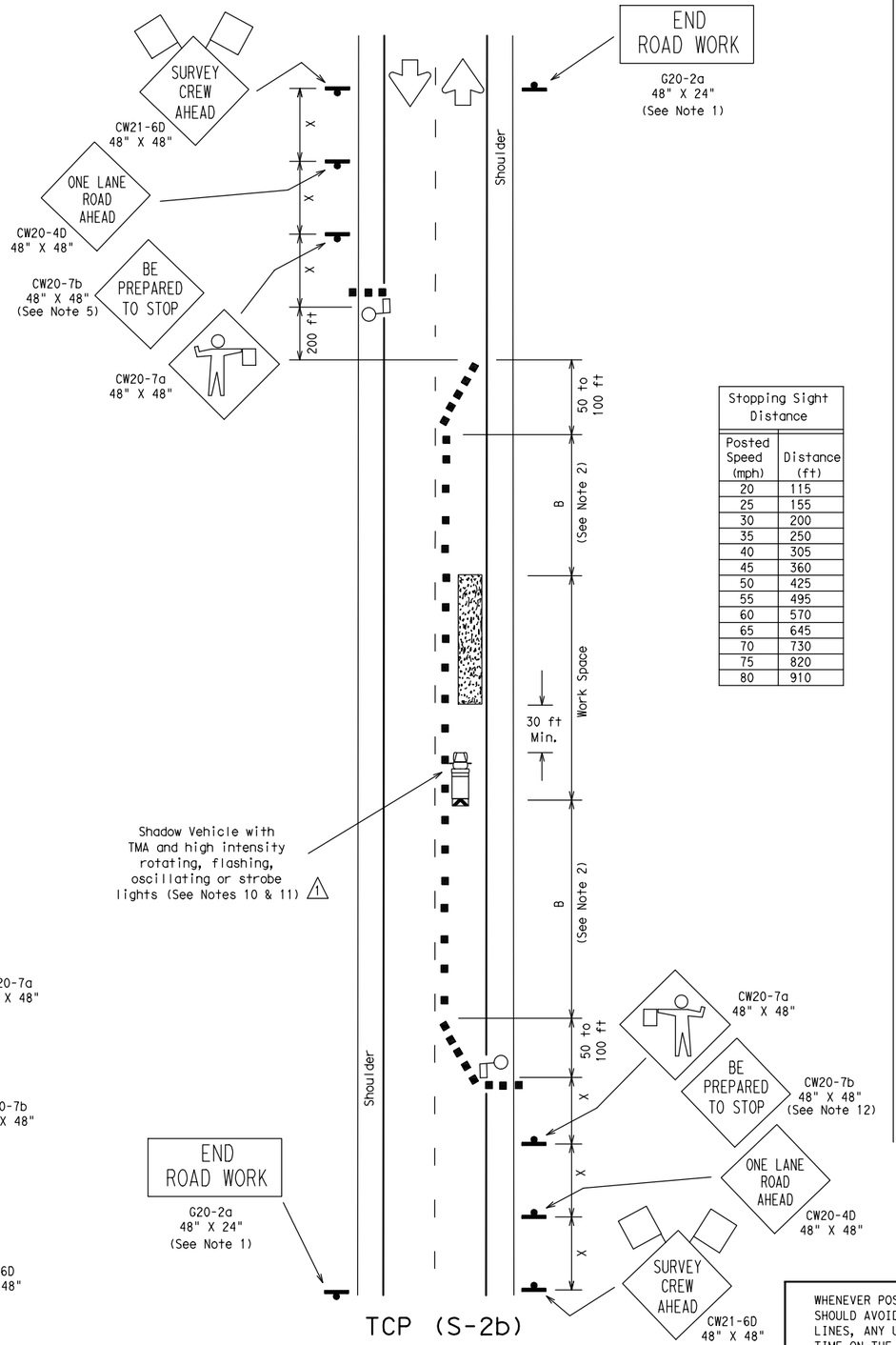


TCP (S-2a)
ROAD CLOSED FOR LESS THAN 20 MINUTES -
OFF PEAK TRAFFIC HOURS
WITH OR WITHOUT SHOULDERS



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

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

LEGEND

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

Posted Speed ✳	Formula	Minimum Desirable Taper Lengths ✳✳ 10′ Offset	11′ Offset	12′ Offset	Suggested Maximum Spacing of Device On a Taper	On a Tangent	Min. Sign Spacing "X" Distance	Longitudinal Buffer Space "B"
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45	L=WS	450′	495′	540′	45′	90′-110′	320′	195′
50		500′	550′	600′	50′	100′-125′	400′	240′
55		550′	605′	660′	55′	110′-140′	500′	295′
60		600′	660′	720′	60′	120′-150′	600′	350′
65		650′	715′	780′	65′	130′-165′	700′	410′
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✳ Conventional Roads Only

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

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

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

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

TCP(S-2a)

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

TCP (S-2B)

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

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

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

Texas Department of Transportation
Traffic Operations Division

TRAFFIC CONTROL PLAN FOR SURVEYING OPERATIONS

TCP(S-2)-08A

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

REVISIONS
8-08

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ABL	STONEWALL		36

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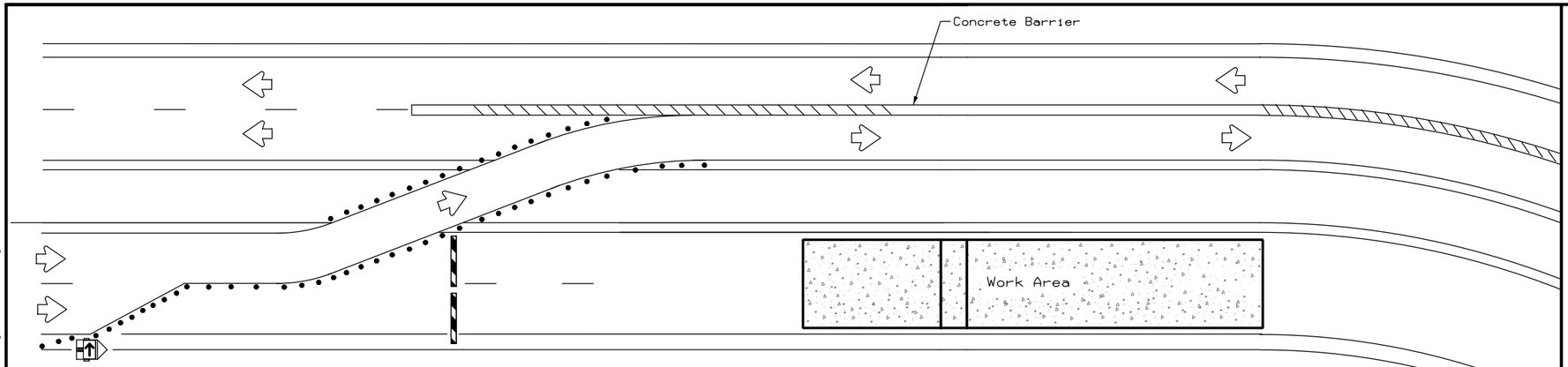


NOTES:

1. Length of Safety Glare screen will be specified elsewhere in the plans.
2. The cumulative nominal length of the modular safety glare screen units shall equal the length of the individual sections of temporary concrete traffic barrier on which they are installed so the joint between barrier sections will not be spanned by any one safety glare screen unit.
3. Screen Panel/blades will be designed such that reflective sheeting conforming with Departmental Material Specification DMS-8300, Sign Face Materials, Type B or C Yellow, minimum size of 2 inches by 12 inches can be attached to the edge of the panel/blade. The sheeting shall be attached to one glare screen panel/blade per section of concrete barrier not to exceed a spacing of 30 feet. Barrier reflectors are not necessary when panel/blades are installed with reflective sheeting as described.
4. Payment for these devices will be under statewide Special Specification "Modular Glare Screens for Headlight Barrier."
5. This detail is only intended to show types of locations where Glare Screens would be appropriate. Required signing and other devices shall be as shown elsewhere in the plans.

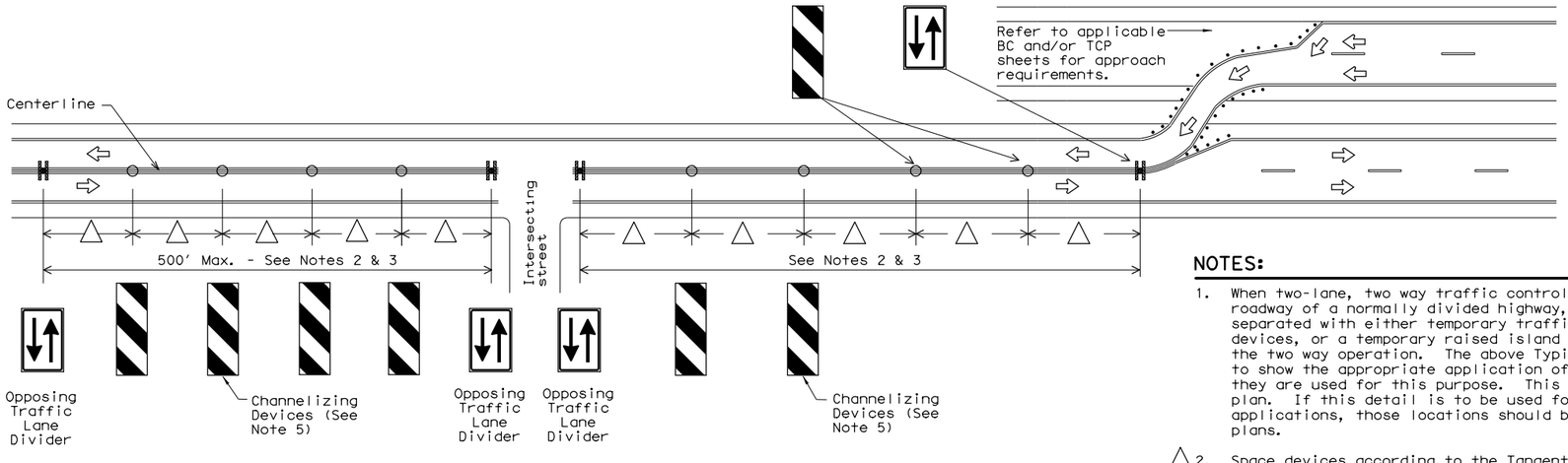
BARRIER DELINEATION WITH MODULAR GLARE SCREENS

LEGEND	
	Type 3 Barricade
• • •	Channelizing Devices
	Trailer Mounted Flashing Arrow Board
	Sign
\\\\	Safety glare screen

DEPARTMENTAL MATERIAL SPECIFICATIONS	
SIGN FACE MATERIALS	DMS-8300
DELINEATORS AND OBJECT MARKERS	DMS-8600
MODULAR GLARE SCREENS FOR HEADLIGHT BARRIER	DMS-8610

Only pre-qualified products shall be used. A copy of the Compliant Work Zone Traffic Control Devices List" CWZTCD)describes pre-qualified products and their sources and may be found at the following web address:

http://www.txdot.gov/business/resources/producer-list.html



VERTICAL PANELS & OPPOSING TRAFFIC LANE DIVIDERS (OTLD) SEPARATING TWO-WAY TRAFFIC ON NORMALLY DIVIDED HIGHWAYS

NOTES:

1. When two-lane, two way traffic control must be maintained on one roadway of a normally divided highway, opposing traffic shall be separated with either temporary traffic barriers, channelizing devices, or a temporary raised island throughout the length of the two way operation. The above Typical Application is intended to show the appropriate application of channelizing devices when they are used for this purpose. This is not a traffic control plan. If this detail is to be used for other types of roads or applications, those locations should be stated elsewhere in the plans.
2. △ Space devices according to the Tangent Spacing shown on the Device Spacing table on BC(9) but not exceeding 100′.
3. Every fifth device should be an OTLD except when spaced closer to accommodate an intersection. An OTLD should be the first device on each side of intersecting streets or roads.
4. Locations where surface mount bases with adhesives or self-righting devices will be required in order to maintain them in their proper position should be noted elsewhere in the plans.
5. Channelizing devices are to be vertical panels, 42" cones or tubular markers that are at least 36" tall. Tubular markers used to separate traffic should have a rubber base weighing at least 30 pounds. Tubular markers that are 42" tall or more shall have four bands of reflective material as detailed for 42" cones on BC(10). Tubular markers less than 42" but at least 36" tall shall have three bands of 3" wide white reflective material spaced 2" apart. Reflective material shall meet DMS-8300, Type A.

Texas Department of Transportation

Traffic Operations Division Standard

TRAFFIC CONTROL PLAN TYPICAL DETAILS

WZ(TD)-17

FILE: wztd-17.dgn	DN: TxDOT	CK: TxDOT	DW: TxDOT	CK: TxDOT
©TxDOT February 1998	CONT	SECT	JOB	HIGHWAY
REVISIONS 4-98 2-17 3-03 7-13	0106	04	036	US 380
	DIST	COUNTY		SHEET NO.
	ABL	STONEWALL		37

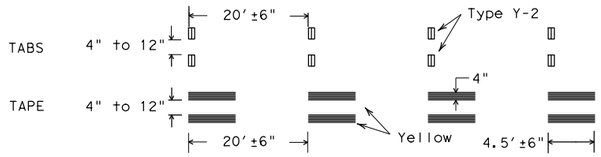
110

DATE: 4/28/2022 6:35:41 PM
FILE: c:\pw_work\atkndtx01\rome22243\dms57940\043 WZ(STPM)-13.dgn

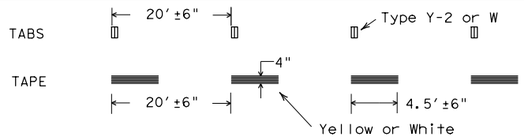
WORK ZONE SHORT TERM PAVEMENT MARKINGS DETAILS

SOLID LINES

DOUBLE NO-PASSING LINE

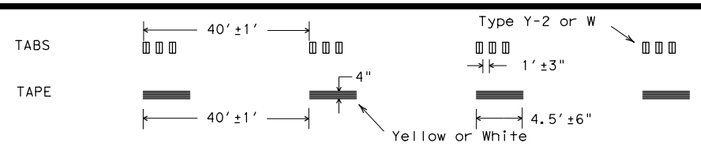


SINGLE NO-PASSING LINE or CHANNELIZATION LINE



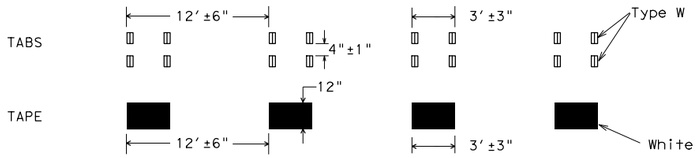
BROKEN LINES

(FOR CENTER LINE OR LANE LINE)

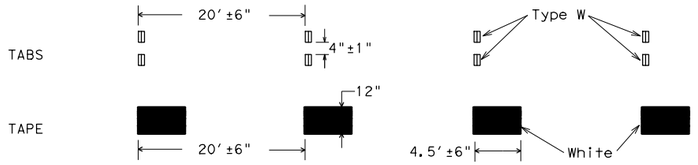


WIDE DOTTED LINES

(FOR LANE DROP LINES)



WIDE GORE MARKINGS



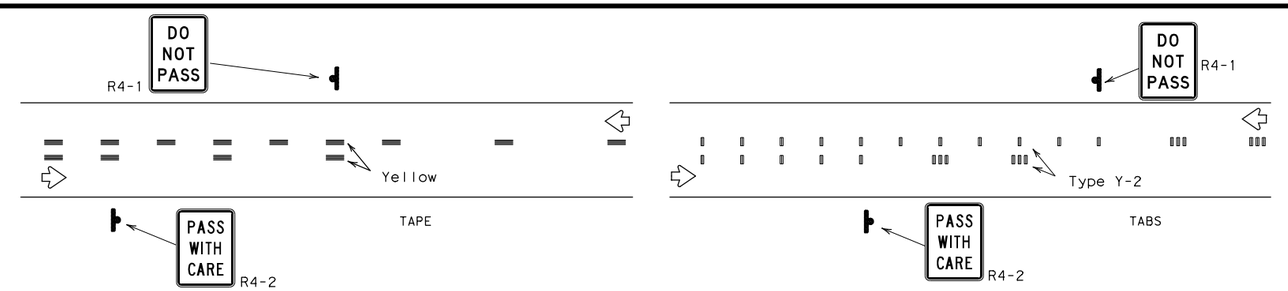
NOTES:

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

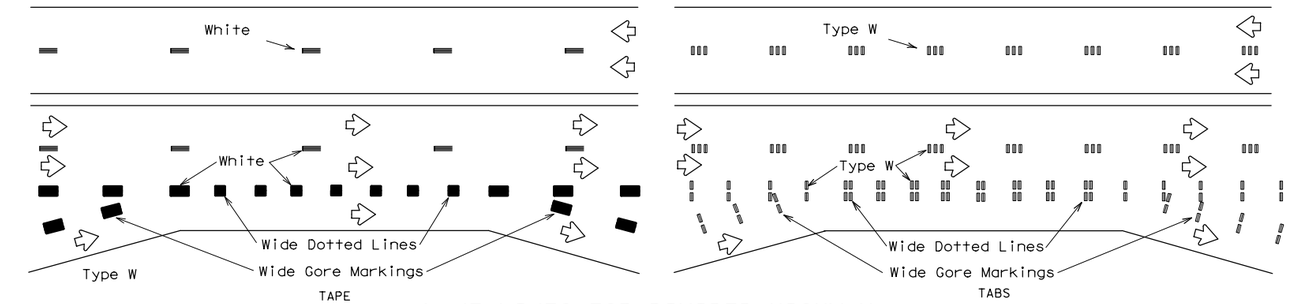
TEMPORARY FLEXIBLE, REFLECTIVE ROADWAY MARKER TABS (TABS)

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

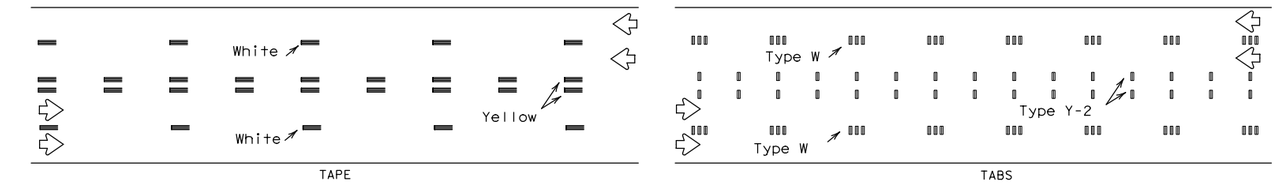
WORK ZONE SHORT TERM PAVEMENT MARKINGS PATTERNS



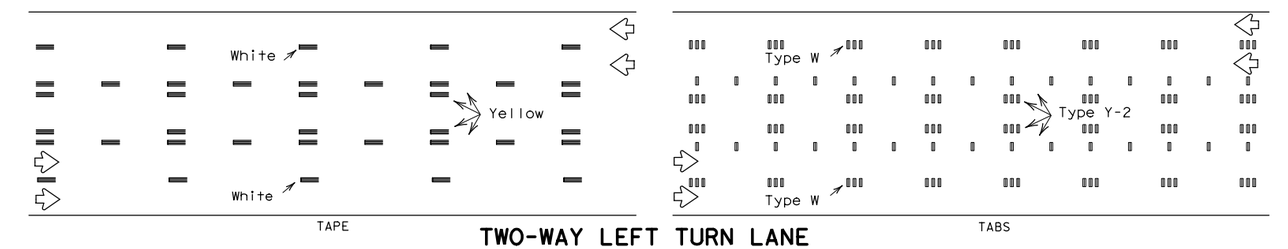
CENTER LINE & NO-PASSING ZONE BARRIER LINES FOR TWO LANE TWO-WAY HIGHWAYS



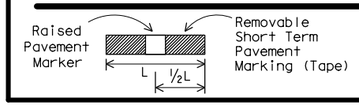
LANE LINES FOR DIVIDED HIGHWAY



LANE & CENTER LINES FOR MULTILANE UNDIVIDED HIGHWAYS



TWO-WAY LEFT TURN LANE



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

PREFABRICATED PAVEMENT MARKINGS

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

RAISED PAVEMENT MARKERS

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

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

1. DMSs referenced above can be found along with embedded links to their respective MPLs at the following website:
   http://www.txdot.gov/business/contractors_consultants/material_specifications/default.htm

Texas Department of Transportation

Traffic Operations Division Standard

WORK ZONE SHORT TERM PAVEMENT MARKINGS

WZ(STPM)-13

FILE: wzstpm-13.dgn	DN: TxDOT	CK: TxDOT	DW: TxDOT	CK: TxDOT
©TxDOT April 1992	CONT	SECT	JOB	HIGHWAY
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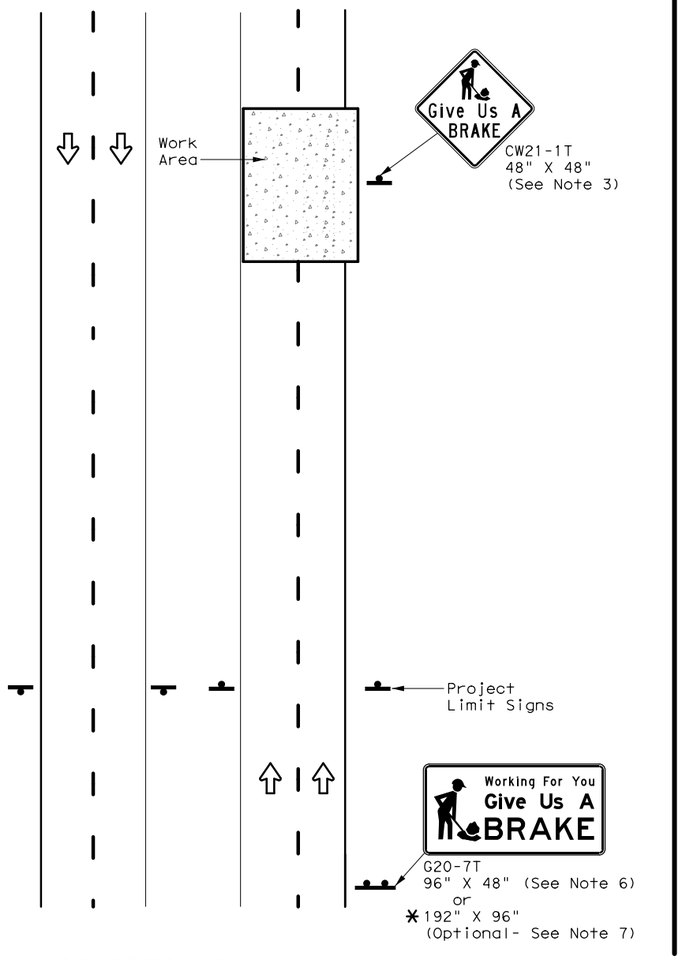
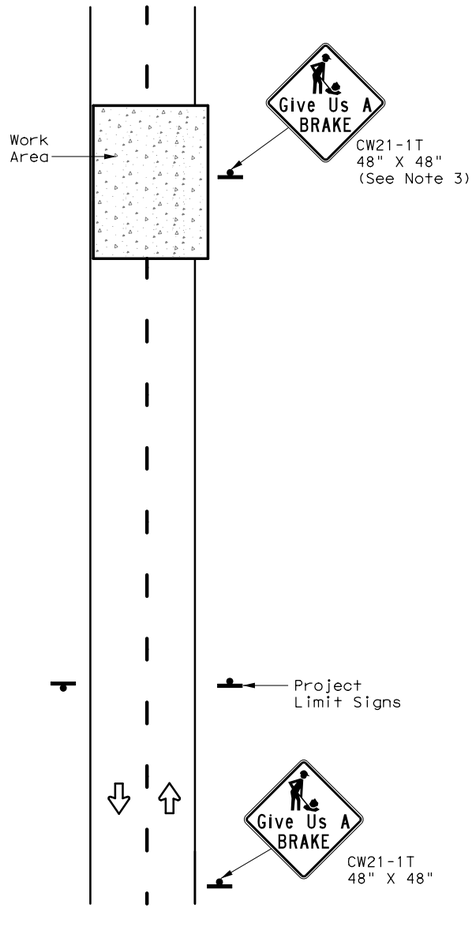
1-97	DIST	COUNTY		SHEET NO.
3-03	ABL	STONEWALL		38
7-13				

111



DIVIDED HIGHWAY



UNDIVIDED HIGHWAY

SIGNS ARE SHOWN FOR ONE DIRECTION OF TRAVEL

* When the optional larger WORKING FOR YOU GIVE US A BRAKE (G20-7T) 192" x 96" sign is required, the locations shall be noted elsewhere in the plans.

SUMMARY OF LARGE SIGNS

BACKGROUND COLOR	SIGN DESIGNATION	SIGN	SIGN DIMENSIONS	REFLECTIVE SHEETING	SQ FT	GALVANIZED STRUCTURAL STEEL			DRILLED SHAFT 24" DIA. (LF)
						Size	(LF) ①	(LF) ②	
Orange	G20-7T	Working For You Give Us A BRAKE	96" X 48"	Type B_{FL} or C_{FL}	32	▲	▲	▲	▲
Orange	G20-7T	Working For You Give Us A BRAKE	192" X 96"	Type B_{FL} or C_{FL}	128	W8x18	16	17	12

▲ See Note 6 Below

LEGEND	
	Sign
	Large Sign
	Traffic Flow

DEPARTMENTAL MATERIAL SPECIFICATIONS	
PLYWOOD SIGN BLANKS	DMS-7100
ALUMINUM SIGN BLANKS	DMS-7110
SIGN FACE MATERIALS	DMS-8300

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

GENERAL NOTES

1. See BC and SMD sheets for additional sign support details.
2. Sign locations shall be approved by the Engineer.
3. For projects more than two miles in length, Give Us a BRAKE signs should be repeated halfway through the project. The Give Us a Brake (CW21-1T) may be used for this purpose.
4. Work zone speed limits are sometimes used in conjunction with GIVE US A BRAKE signing. See BC(3) for location and spacing of construction speed zone signing when required.
5. Give Us a Brake (CW21-1T) signs and supports shall be considered subsidiary to Item 502, "Barricades, Signs and Traffic Handling."
6. The 96" X 48" Working For You Give Us A BRAKE (G20-7T) may use a 1/2" or 5/8" plywood substrate or 0.125" aluminum sheeting substrate and may be supported by two 4" x 6" wood posts with drilled holes for breakaway as per BC(5) and will be subsidiary to Item 502.
7. The Working For You Give Us A BRAKE (G20-7T) 192" X 96" sign shall be paid for under the following specification items:
   Item 636 - Aluminum Signs
   Item 647 - Large Roadside Sign Supports and Assemblies.
   Item 416 - Drilled Shaft Foundations
8. All signs shall be constructed in accordance with the details found in the "Standard Highway Sign Designs for Texas," latest edition. Sign details not shown in this manual shall be shown in the plans or the Engineer shall provide a detail to the Contractor before the sign is manufactured.

Texas Department of Transportation

Traffic Operations Division Standard

WORK ZONE "GIVE US A BRAKE" SIGNS

WZ(BRK)-13

FILE: wzbrk-13.dgn	DN: TxDOT	CK: TxDOT	DW: TxDOT	CK: TxDOT
©TxDOT August 1995	CONT	SECT	JOB	HIGHWAY
REVISIONS	0106	04	036	US 380
6-96 5-98 7-13	DIST	COUNTY		SHEET NO.
8-96 3-03	ABL	STONEWALL		39

116

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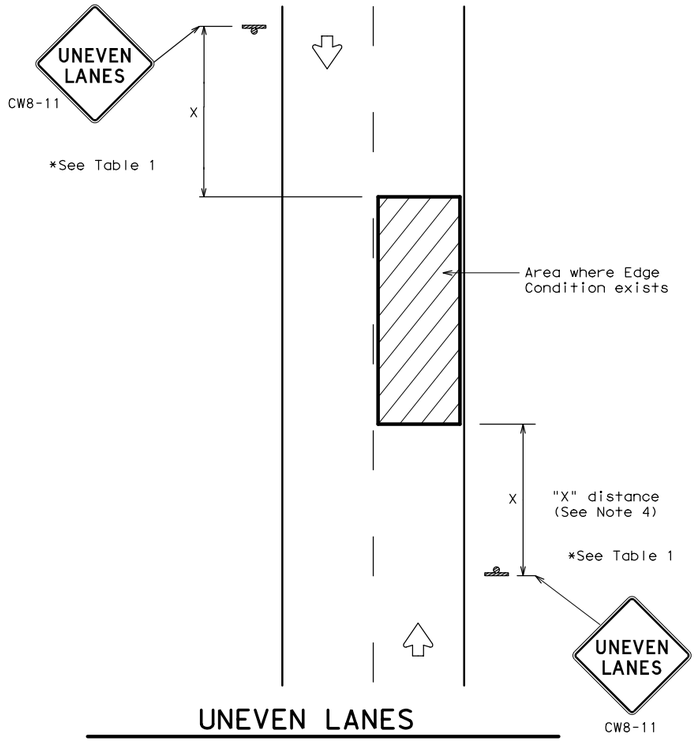
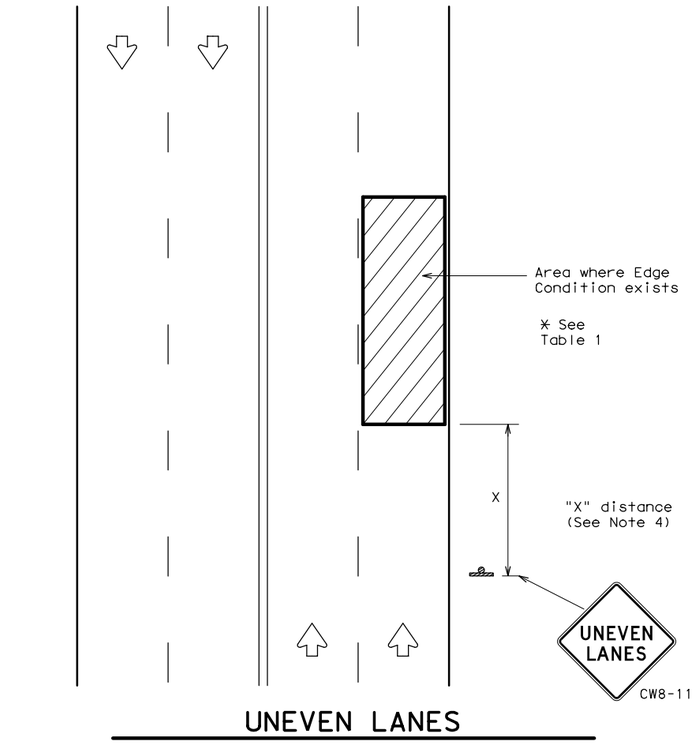
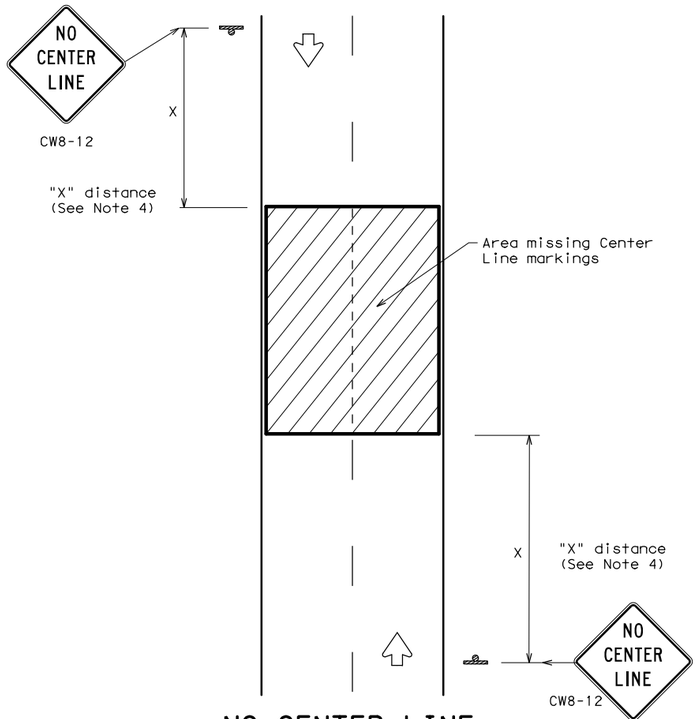


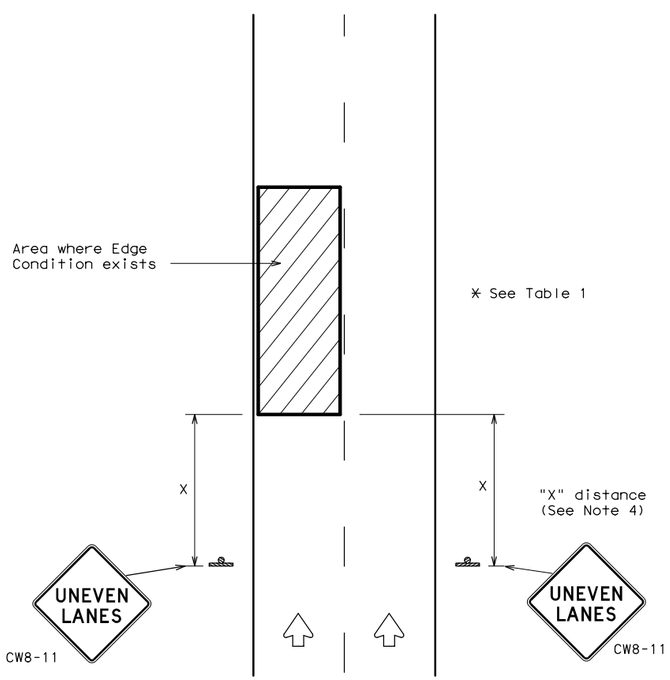
UNEVEN LANES
TWO LANE CONVENTIONAL ROAD



UNEVEN LANES
FOUR LANE CONVENTIONAL ROAD



NO CENTER LINE
TWO LANE CONVENTIONAL ROAD



UNEVEN LANES
DIVIDED ROADWAY

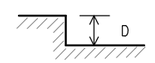
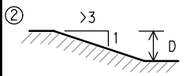
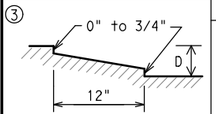
DEPARTMENTAL MATERIAL SPECIFICATIONS	
PERMANENT PREFABRICATED PAVEMENT MARKINGS	DMS-8240
TEMPORARY (REMOVABLE) PREFABRICATED PAVEMENT MARKINGS	DMS-8241
SIGN FACE MATERIALS	DMS-8300

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

GENERAL NOTES

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

TABLE 1

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

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

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

Texas Department of Transportation

Traffic Operations Division Standard

SIGNING FOR UNEVEN LANES

WZ(UL)-13

FILE: wzul-13.dgn	DN: TxDOT	CK: TxDOT	DW: TxDOT	CK: TxDOT
©TxDOT April 1992	CONT	SECT	JOB	HIGHWAY
REVISIONS	0106	04	036	US 380
8-95 2-98 7-13	DIST	COUNTY		SHEET NO.
1-97 3-03	ABL	STONEWALL		40

112

DATE: 4/28/2022 6:35:53 PM
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DATE: 4/28/2022 6:36:00 PM
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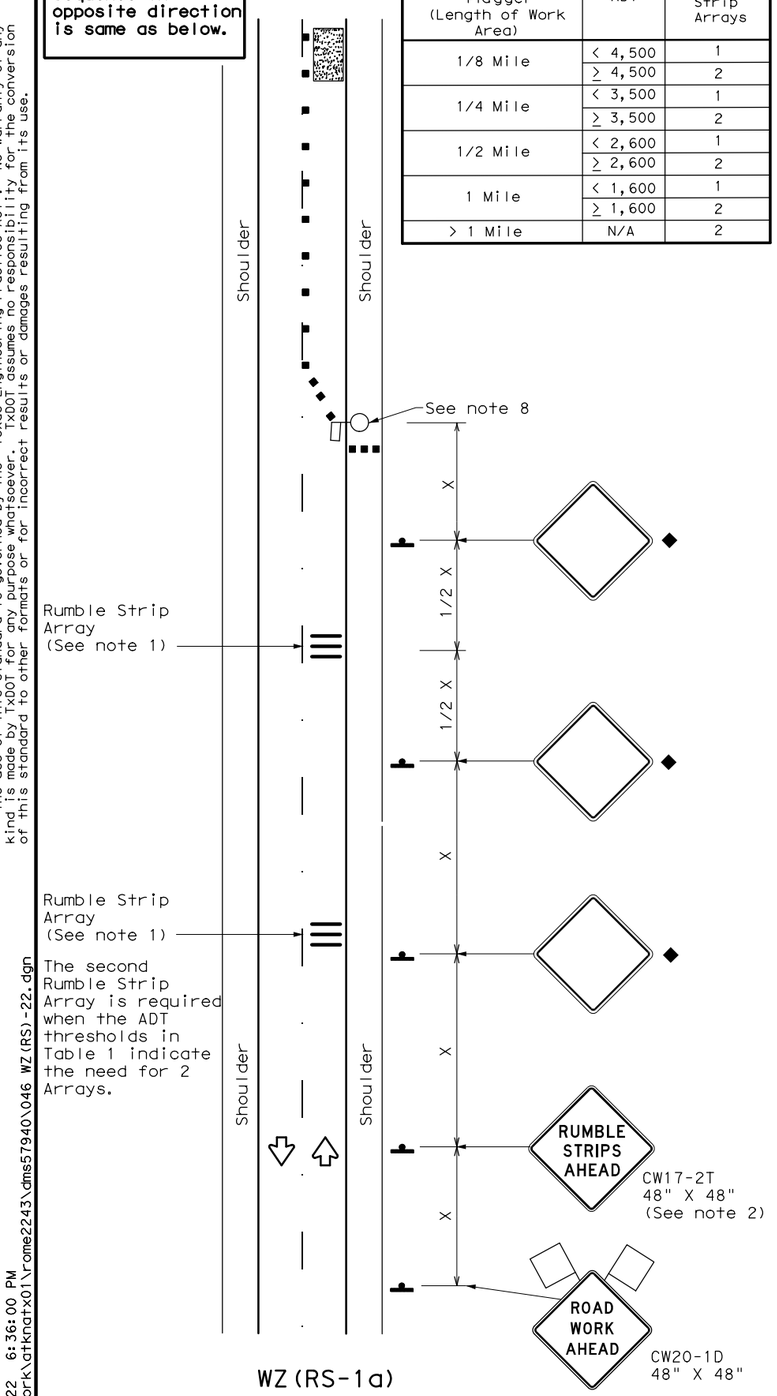
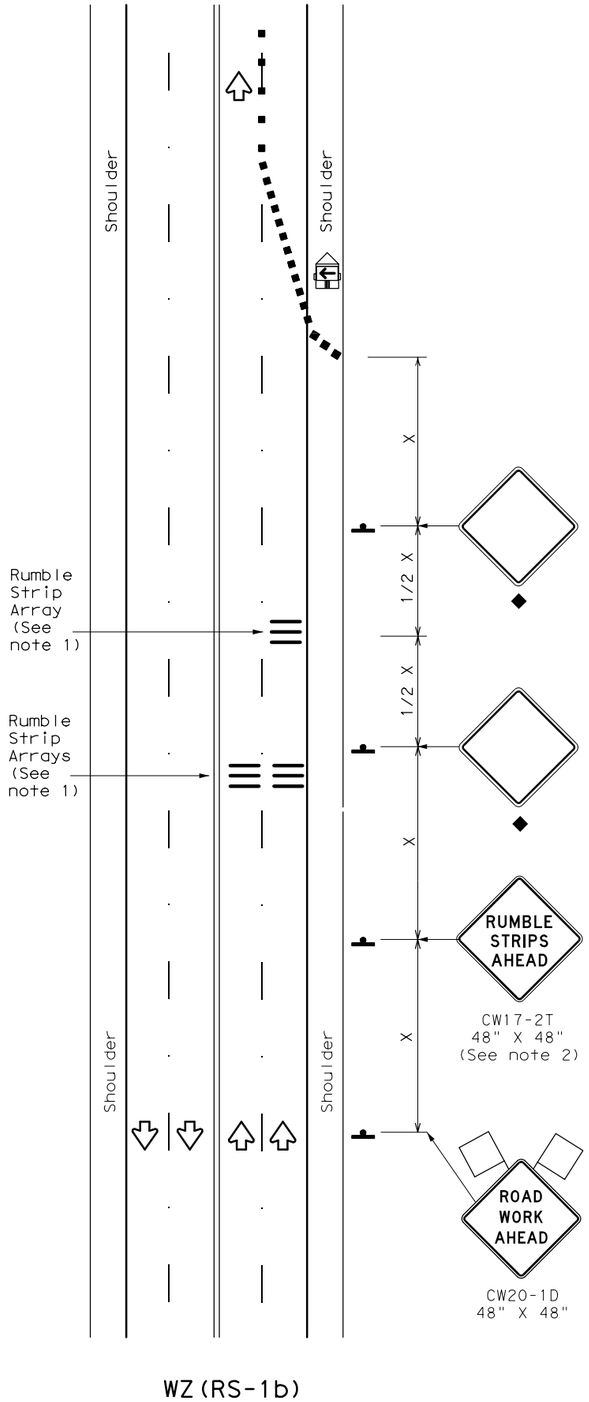
Warning sign and rumble strip sequence in opposite direction is same as below.

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



WZ(RS-1a)

RUMBLE STRIPS ON ONE-LANE TWO-WAY APPLICATION



WZ(RS-1b)

RUMBLE STRIPS FOR LANE CLOSURE ON CONVENTIONAL ROADWAY

GENERAL NOTES

1. Each Rumble Strip Array should consist of three rumble strips spaced center to center at the spacing shown in Table 2, placed transverse across the lane at locations shown.
2. The CW17-2T "RUMBLE STRIPS AHEAD" sign should be located after the CW20-1D "ROAD WORK AHEAD sign and spaced as shown. If traffic is observed to be queuing, or is expected to queue beyond the Rumble Strips, the CW17-2T sign and the first Rumble Strip Array may be located upstream of the CW20-1D sign as necessary to provide needed warning.
3. Temporary Rumble Strips will be considered subsidiary to Item 502, and shall be a product listed on the Compliant Work Zone Traffic Control Devices.
4. Remove Temporary Rumble Strips before removing the advanced warning signs.
5. Temporary Rumble Strips should not be used on horizontal curves, loose gravel, soft or bleeding asphalt, heavily rutted pavements or unpaved surfaces.
6. Temporary Rumble Strips shall be installed and maintained as per manufacturer's recommendations.
7. This standard sheet shall be used in conjunction with other appropriate TCP standard, TMUTCD typical application or project specific detail for the project.
8. The one-lane two-way application may utilize a flagger, an Automated Flagger Assistance Device (AFAD) or a Portable Traffic Signal (PTS).
9. Replace defective Temporary Rumble Strips as directed by the Engineer.
10. Temporary Rumble Strips may be used on freeways or expressways based on engineering judgment and written direction from the Engineer.

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

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

⁎ Conventional Roads Only

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

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

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

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

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

Texas Department of Transportation

Traffic Safety Division Standard

TEMPORARY RUMBLE STRIPS

WZ(RS)-22

FILE: wzrs22.dgn	DN: TxDOT	CK: TxDOT	DW: TxDOT	CK: TxDOT
©TxDOT November 2012	CONT	SECT	JOB	HIGHWAY
REVISIONS 2-14 1-22 4-16	0106	04	036	US 380
	DIST	COUNTY		SHEET NO.
	ABL	STONEWALL		41

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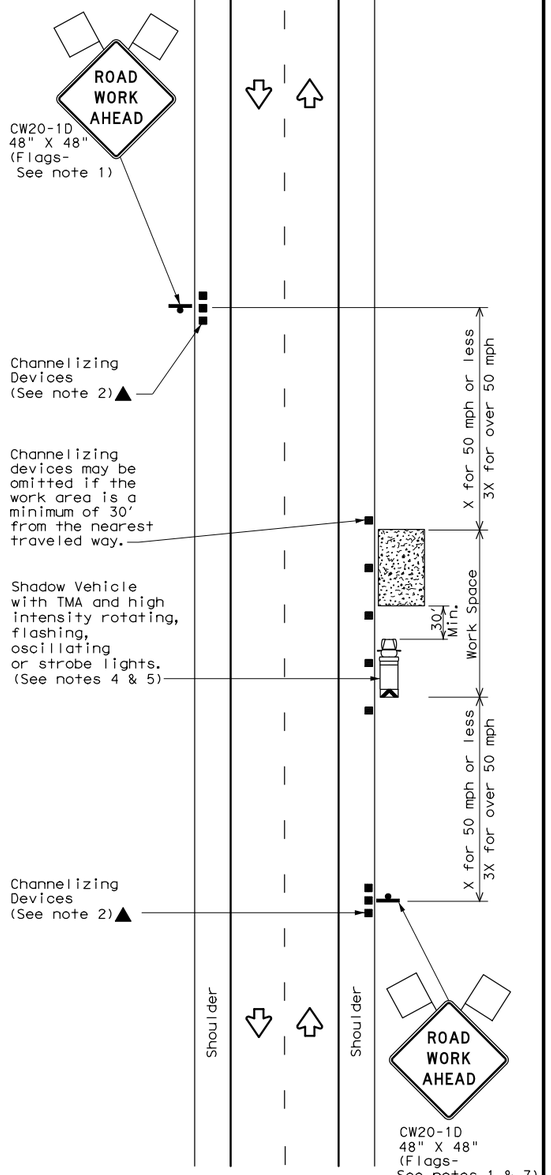
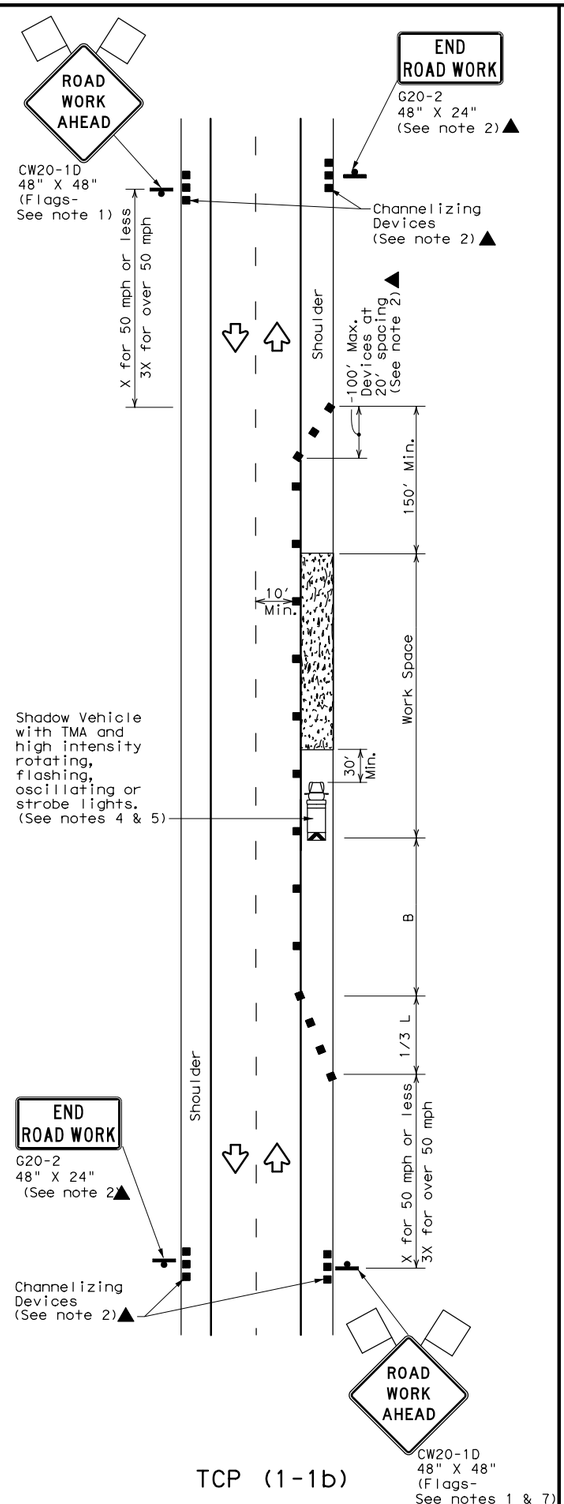


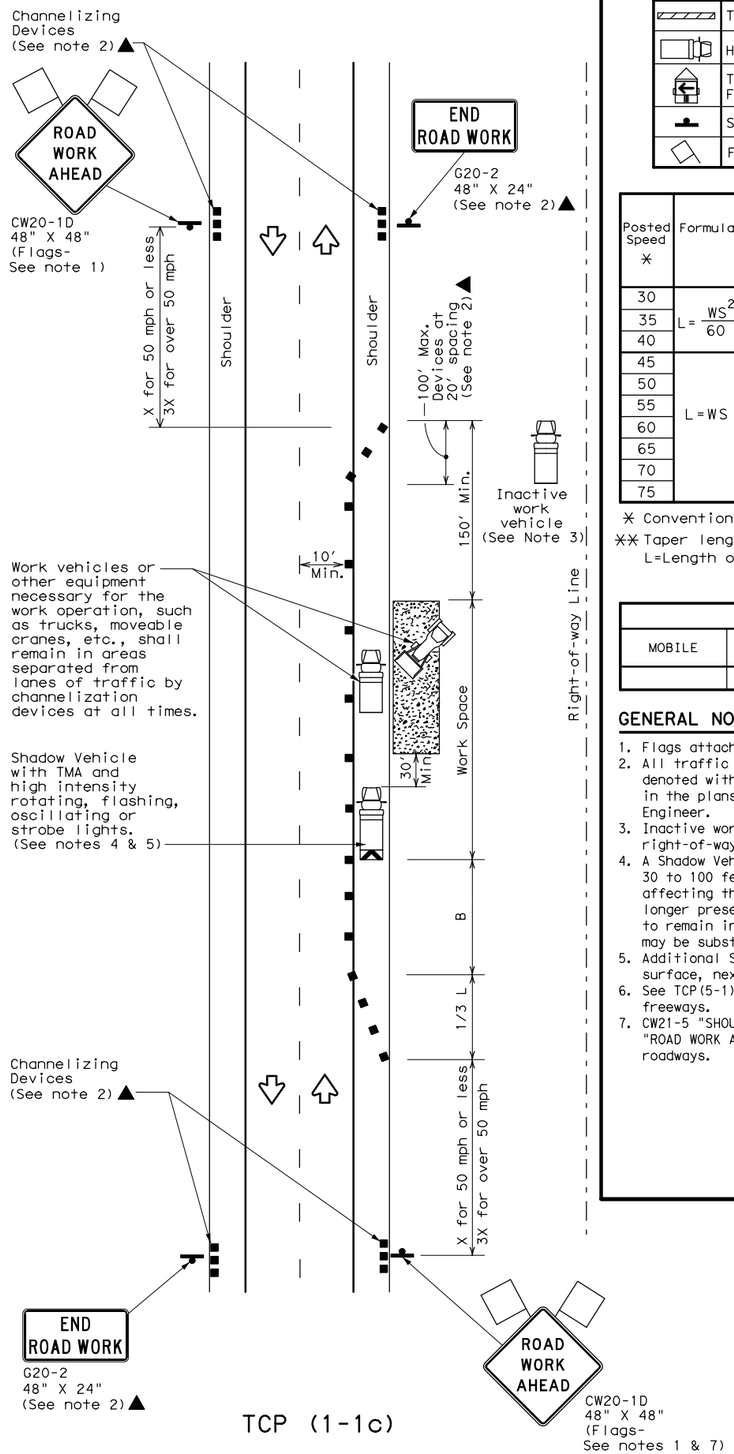
TCP (1-1a)

WORK SPACE NEAR SHOULDER
Conventional Roads



TCP (1-1b)

WORK SPACE ON SHOULDER
Conventional Roads



TCP (1-1c)

WORK VEHICLES ON SHOULDER
Conventional Roads

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

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

* Conventional Roads Only

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

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

GENERAL NOTES

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

Texas Department of Transportation

Traffic Operations Division Standard

TRAFFIC CONTROL PLAN CONVENTIONAL ROAD SHOULDER WORK

TCP(1-1)-18

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© TxDOT December 1985	CONT	SECT	JOB	HIGHWAY
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	ABL	STONEWALL		42

151

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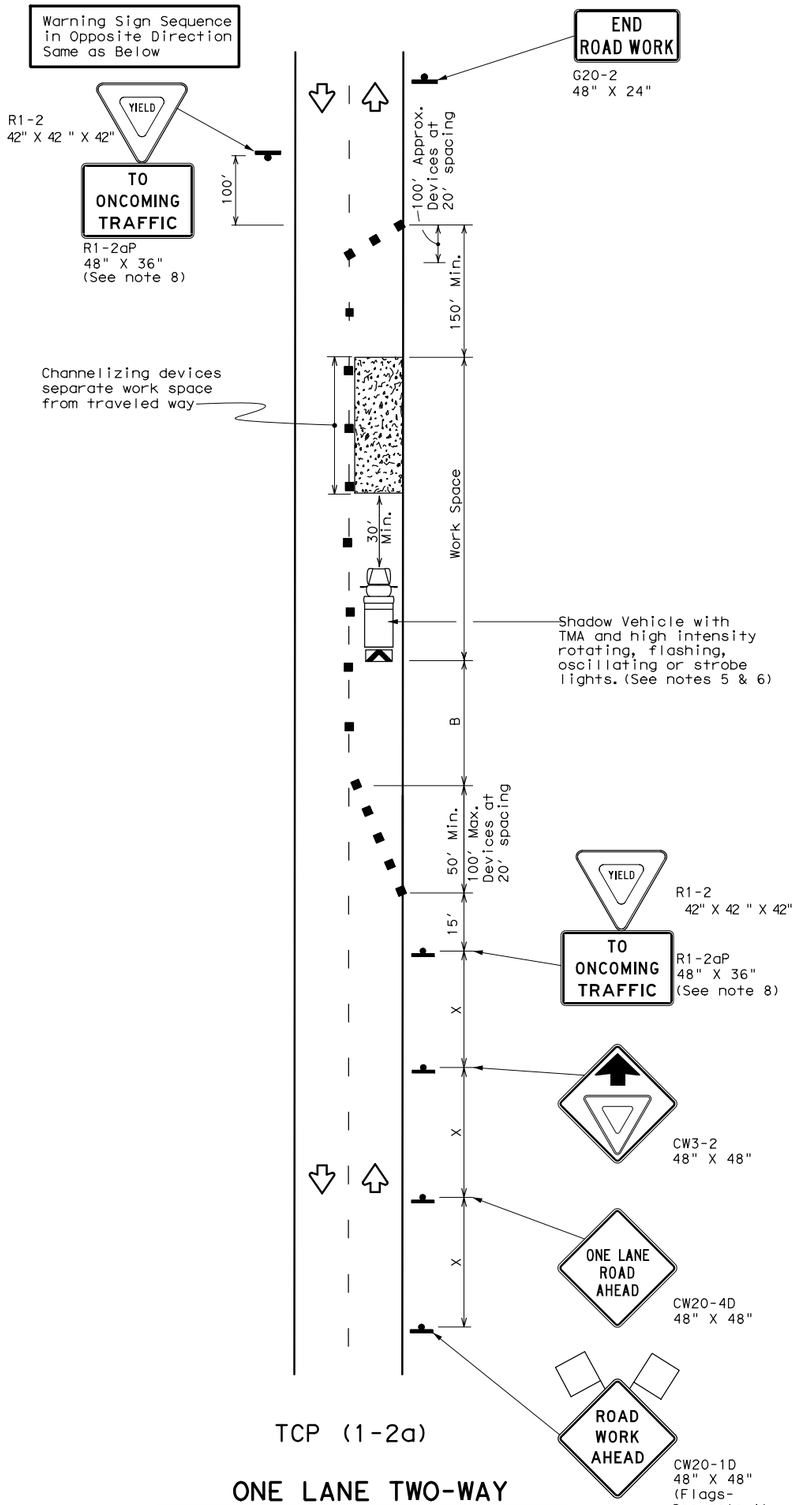
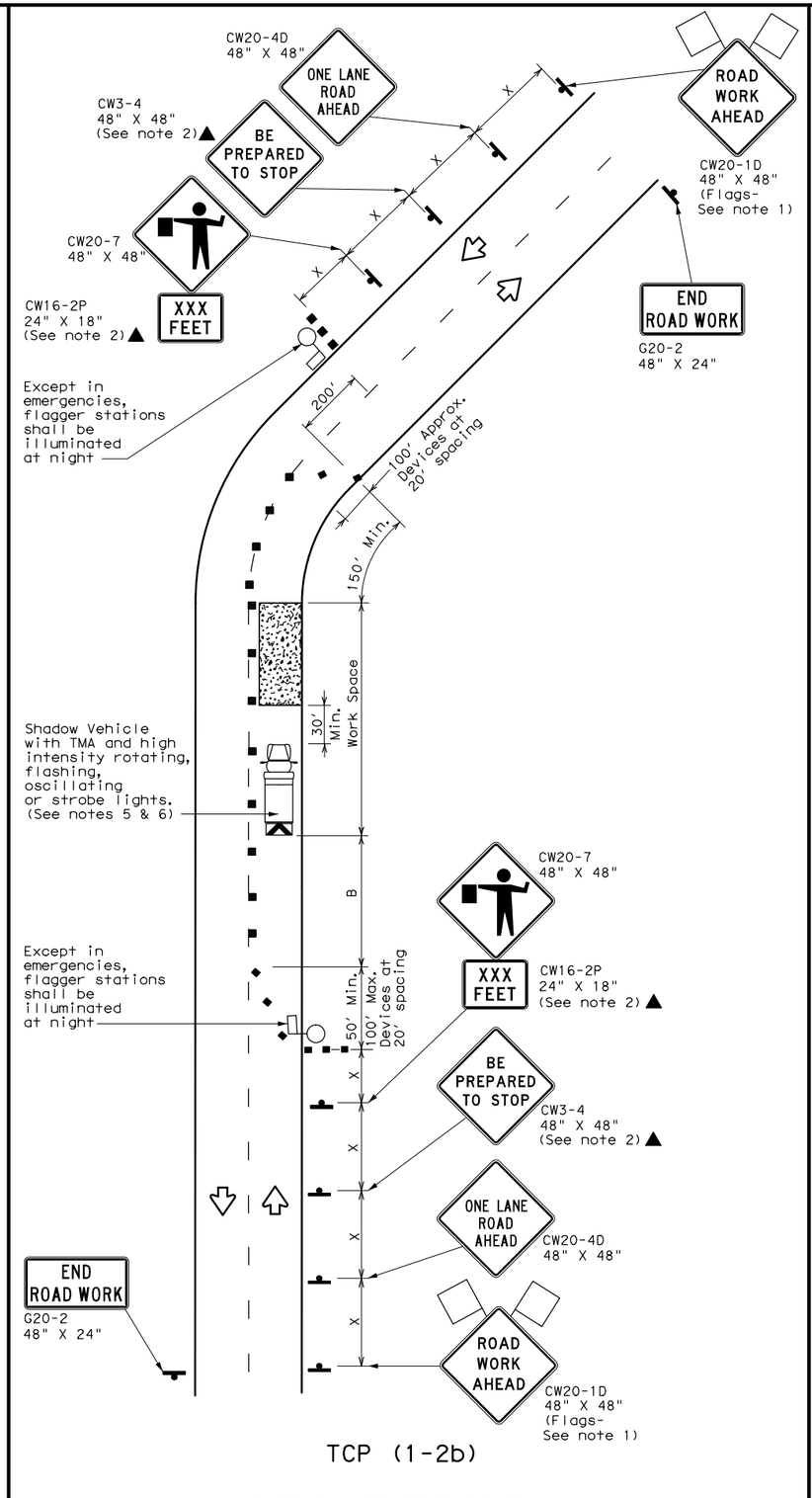


TCP (1-2a)

ONE LANE TWO-WAY CONTROL WITH YIELD SIGNS

(Less than 2000 ADT - See note 7)



TCP (1-2b)

ONE LANE TWO-WAY CONTROL WITH FLAGGERS

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

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

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

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

GENERAL NOTES

1. Flags attached to signs where shown are REQUIRED.
2. All traffic control devices illustrated are REQUIRED, except those denoted with the triangle symbol may be omitted when stated elsewhere in the plans, or for routine maintenance work, when approved by the Engineer.
3. The CW3-4 "BE PREPARED TO STOP" sign may be installed after the CW20-4D "ONE LANE ROAD AHEAD" sign, but proper sign spacing shall be maintained.
4. Sign spacing may be increased or an additional CW20-1D "ROAD WORK AHEAD" sign may be used if advance warning ahead of the flagger or R1-2 "YIELD" sign is less than 1500 feet.
5. A Shadow Vehicle with a TMA should be used anytime it can be positioned 30 to 100 feet in advance of the area of crew exposure without adversely affecting the performance or quality of the work. If workers are no longer present but road or work conditions require the traffic control to remain in place, Type 3 Barricades or other channelizing devices may be substituted for the Shadow Vehicle and TMA.
6. Additional Shadow Vehicles with TMAs may be positioned off the paved surface, next to those shown in order to protect wider work spaces.

TCP (1-2a)

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

TCP (1-2b)

9. Flaggers should use two-way radios or other methods of communication to control traffic.
10. Length of work space should be based on the ability of flaggers to communicate.
11. If the work space is located near a horizontal or vertical curve, the buffer distances should be increased in order to maintain adequate stopping sight distance to the flagger and a queue of stopped vehicles (see table above).
12. Channelizing devices on the center-line may be omitted when a pilot car is leading traffic and approved by the Engineer.
13. Flaggers should use 24" STOP/SLOW paddles to control traffic. Flags should be limited to emergency situations.

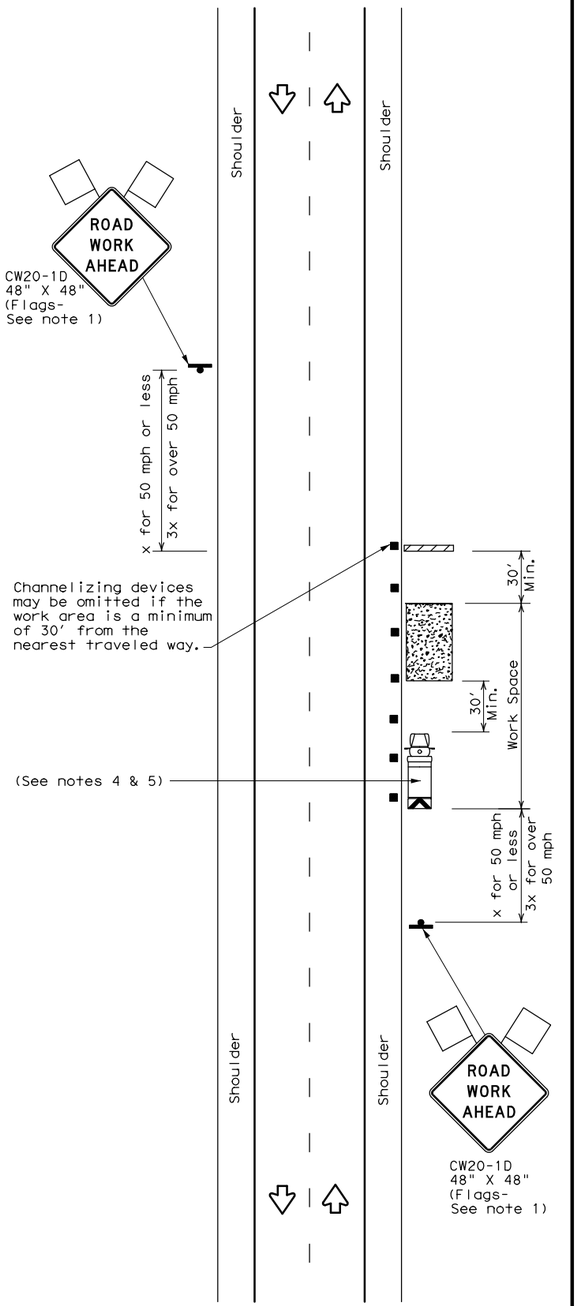
Texas Department of Transportation

Traffic Operations Division Standard

TRAFFIC CONTROL PLAN ONE-LANE TWO-WAY TRAFFIC CONTROL

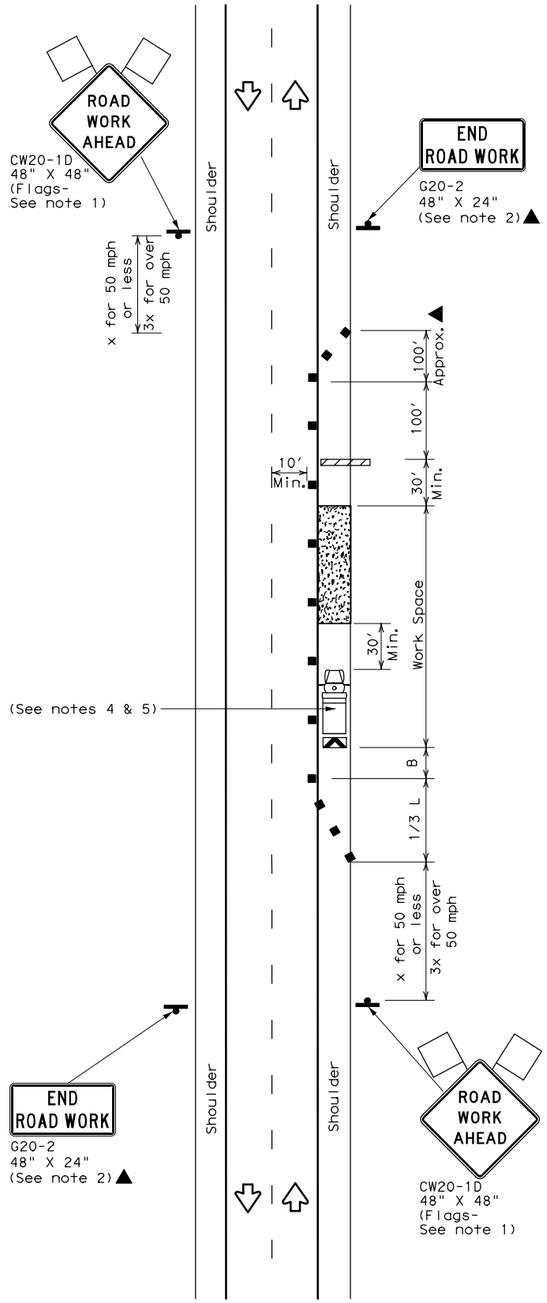
TCP(1-2)-18

FILE: tcp1-2-18.dgn	DN:	CK:	DW:	CK:
© TxDOT December 1985	CONT	SECT	JOB	HIGHWAY
REVISIONS 4-90 4-98	0106	04	036	US 380
2-94 2-12	DIST	COUNTY		SHEET NO.
1-97 2-18	ABL	STONEWALL		43



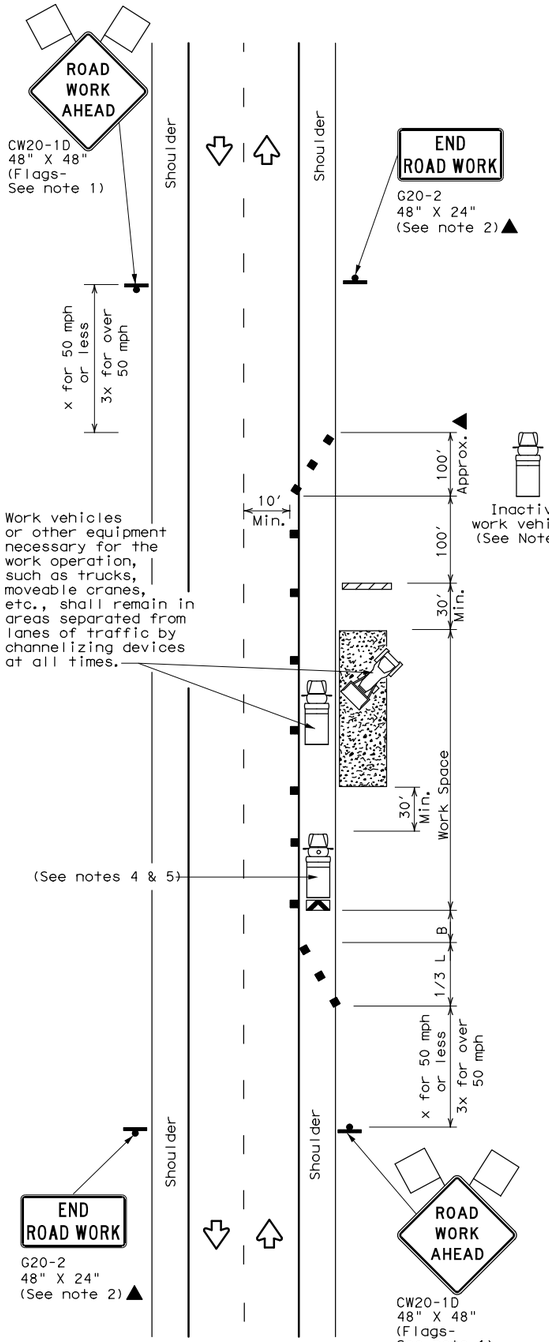
TCP (2-1a)

WORK SPACE NEAR SHOULDER
Conventional Roads



TCP (2-1b)

WORK SPACE ON SHOULDER
Conventional Roads



TCP (2-1c)

WORK VEHICLES ON SHOULDER
Conventional Roads

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

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

✳ Conventional Roads Only

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

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

GENERAL NOTES

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

Texas Department of Transportation — Traffic Operations Division Standard

TRAFFIC CONTROL PLAN CONVENTIONAL ROAD SHOULDER WORK

TCP(2-1)-18

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© TxDOT December 1985	CONT	SECT	JOB	HIGHWAY
REVISIONS	0106	04	036	US 380
2-94 4-98	DIST	COUNTY		SHEET NO.
8-95 2-12	ABL	STONEWALL		44
1-97 2-18				

161

DATE: 4/28/2022 6:36:20 PM
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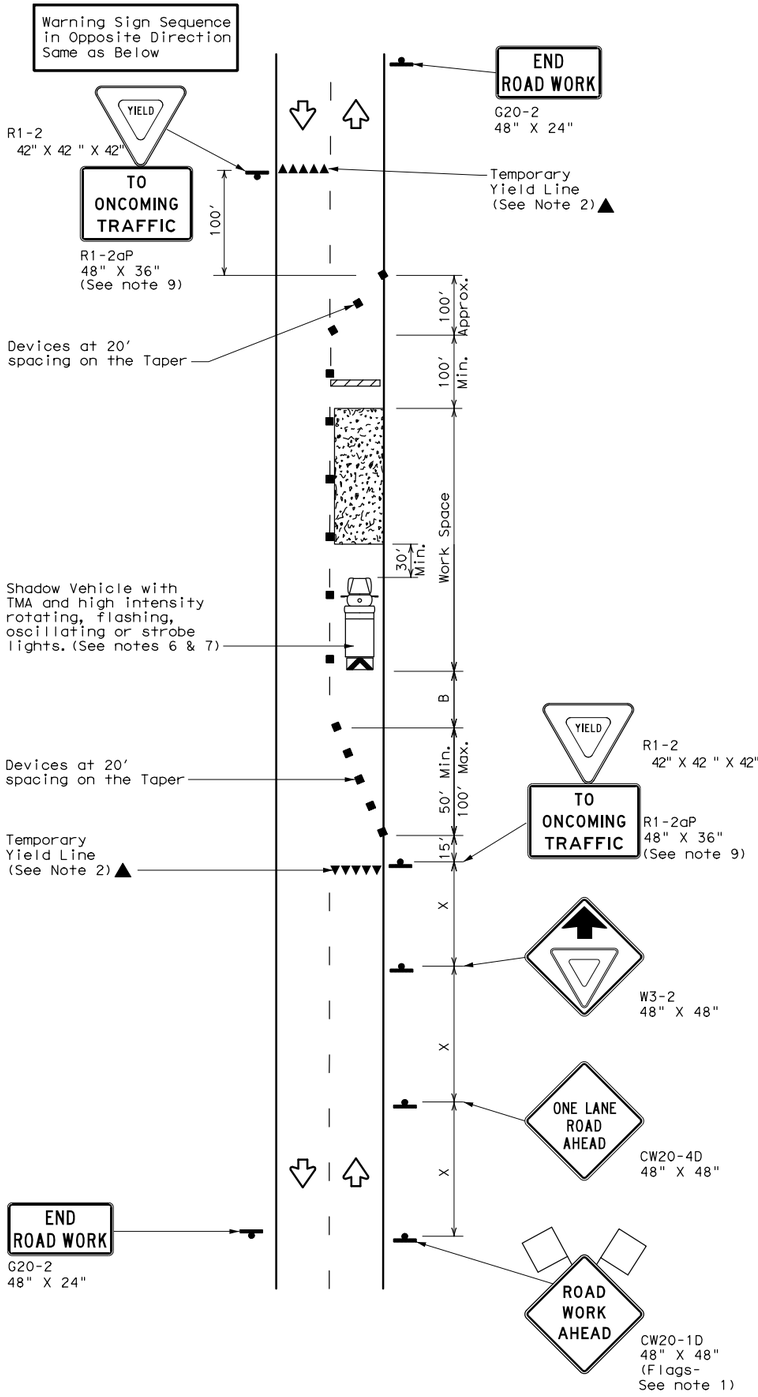
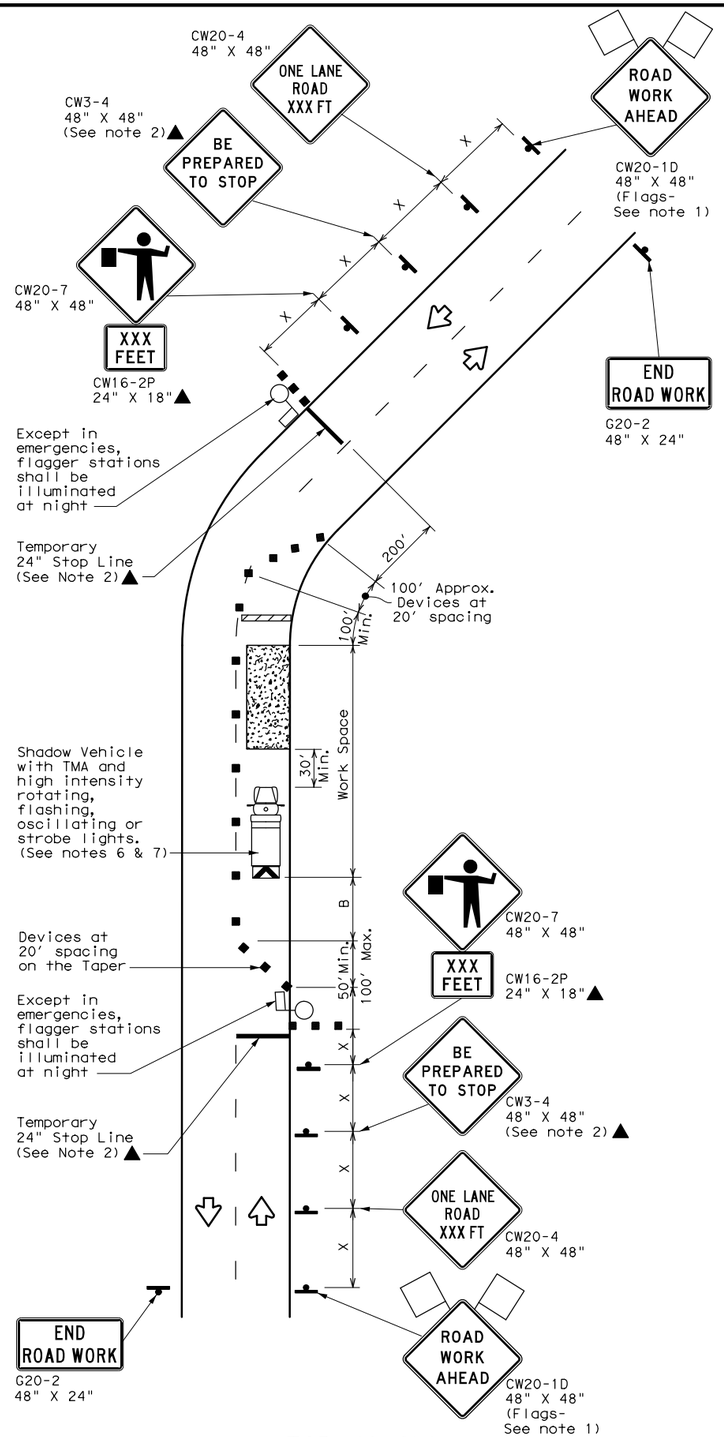


TCP (2-2a)
2-LANE ROADWAY WITHOUT PAVED SHOULDERS
ONE LANE TWO-WAY
CONTROL WITH YIELD SIGNS
(Less than 2000 ADT - See Note 9)



TCP (2-2b)
2-LANE ROADWAY WITHOUT PAVED SHOULDERS
ONE LANE TWO-WAY
CONTROL WITH FLAGGERS

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

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

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

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

GENERAL NOTES

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

TCP (2-2a)

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

TCP (2-2b)

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

Texas Department of Transportation
Traffic Operations Division Standard

TRAFFIC CONTROL PLAN
ONE-LANE TWO-WAY
TRAFFIC CONTROL

TCP(2-2)-18

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©TxDOT December 1985	CONT	SECT	JOB	HIGHWAY
REVISIONS 8-95 3-03	0106	04	036	US 380
1-97 2-12	DIST	COUNTY		SHEET NO.
4-98 2-18	ABL	STONEWALL		45

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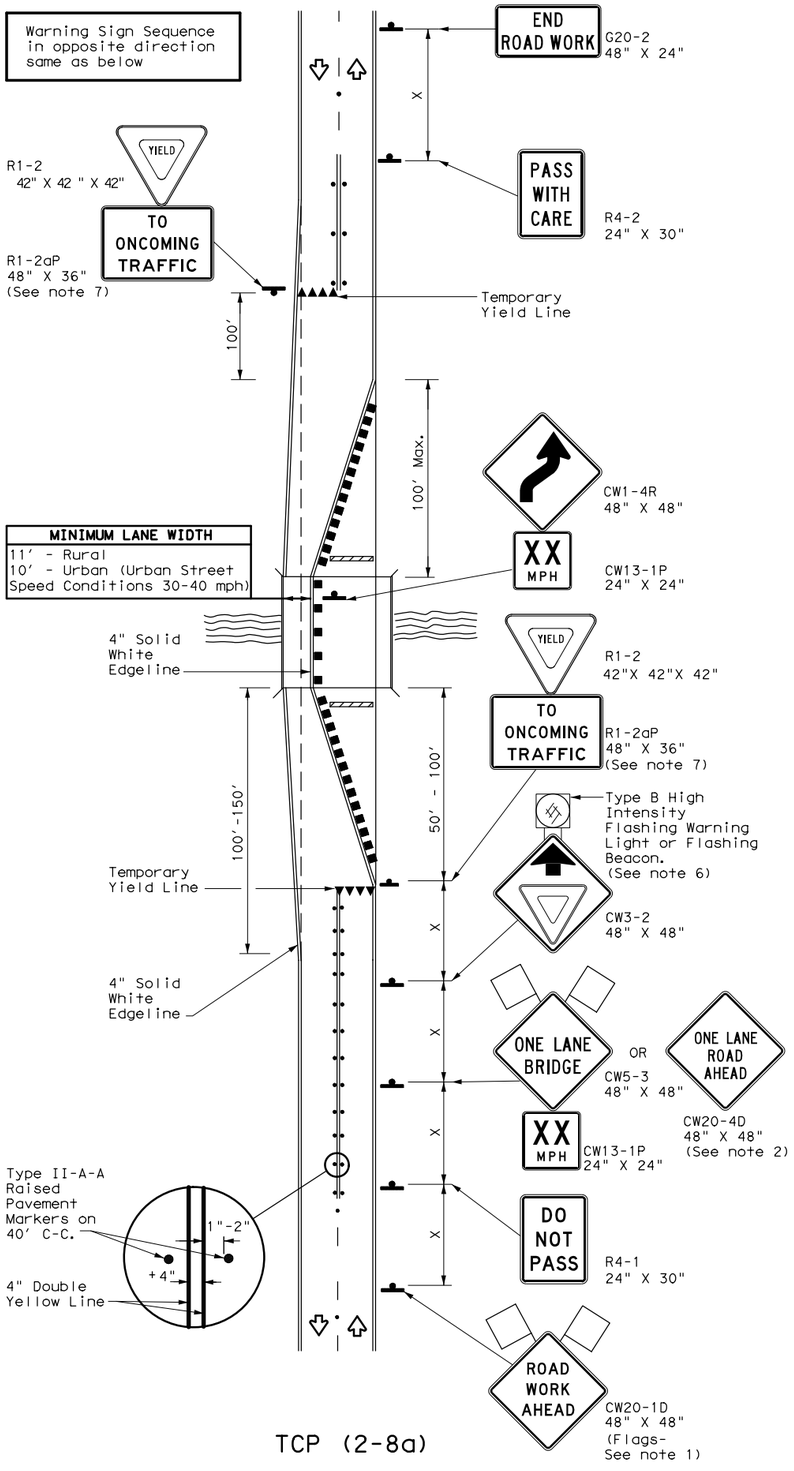
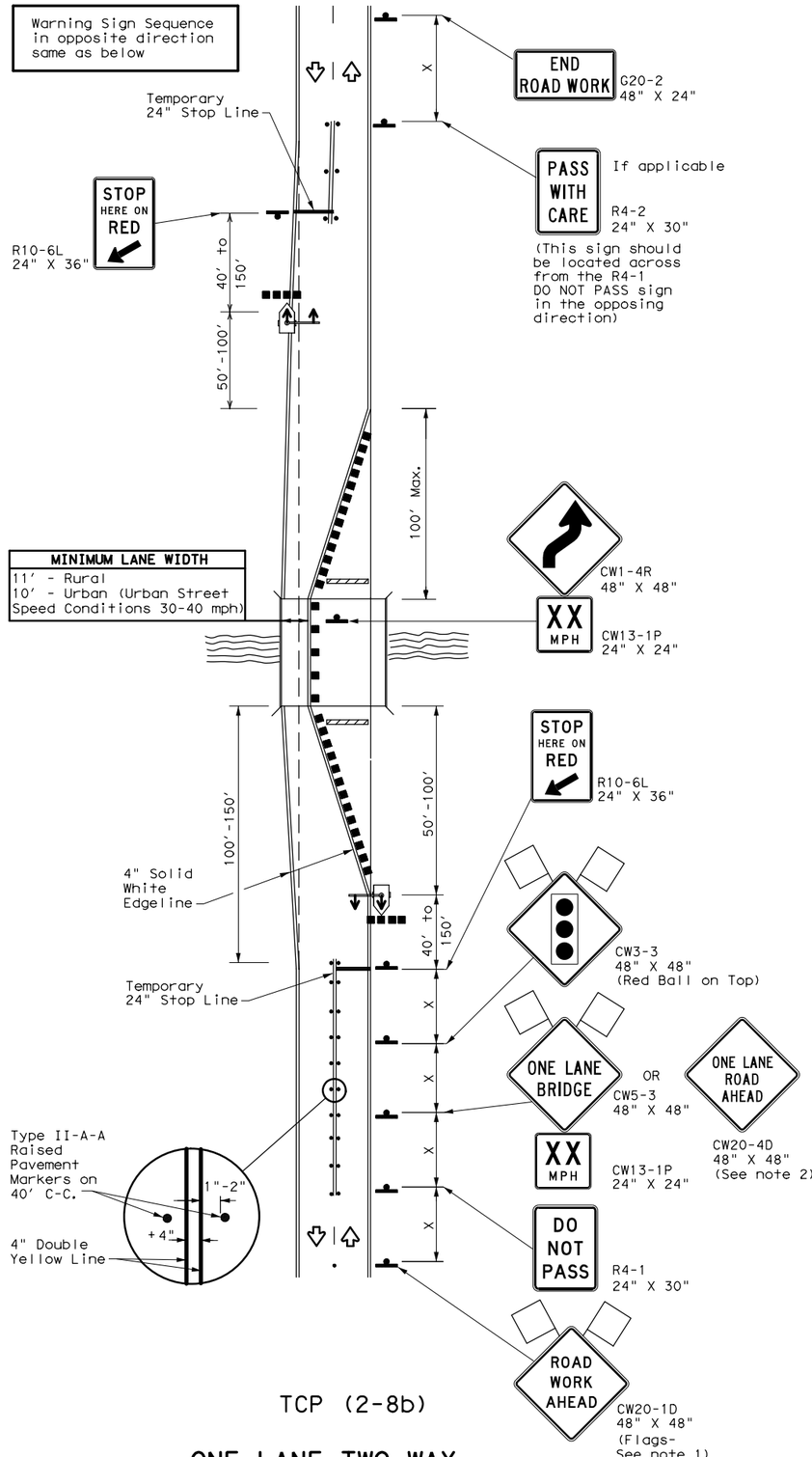


TCP (2-8a)

ONE LANE TWO-WAY
TRAFFIC CONTROL WITH YIELD SIGNS
(Less Than 2000 ADT-See Note 5)



TCP (2-8b)

ONE LANE TWO-WAY
TRAFFIC CONTROL WITH TRAFFIC SIGNAL

LEGEND			
	Type 3 Barricade		Channelizing Devices
	Sign		Traffic Flow
	Flag		Flagger
	Raised Pavement Markers Ty II-AA		Temporary or Portable Traffic Signal

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

* Conventional Roads Only

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

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

GENERAL NOTES

1. Flags attached to signs where shown are REQUIRED.
2. When this TCP is used at a location which does not involve a bridge, a 48" x 48" CW20-4D "ONE LANE ROAD AHEAD" signs should be used in lieu of the CW5-3 "ONE LANE BRIDGE" signs. The CW13-1P Advisory Speed Plaque is required with either warning sign.
3. Raised pavement markers shall be placed 40 feet c-c on centerline between DO NOT PASS signs and stop or yield lines.
4. For intermediate term situations, when it is not feasible to remove and restore pavement markings, the channelization must be made dominant by using a very close spacing. This is especially important in locations of conflicting information, such as where traffic is directed over a double yellow centerline. In such locations a maximum channelizing device spacing of 20 feet is recommended. The 20 foot channelizing device spacing recommendation is intended for the area of conflicting information and not the entire work zone.

TCP (2-8a)

5. Traffic control by CW3-2 "YIELD AHEAD" symbol signs for one lane two-way traffic control operations should be limited to work spaces less than 400 feet long and roadways with less than 2000 ADT. Otherwise, portable traffic signals should be used.
6. If power is available, a flashing beacon should be attached to the CW3-2 "YIELD AHEAD" symbol sign for emphasis.
7. The R1-2 "YIELD" and R1-2aP "TO ONCOMING TRAFFIC" signs and other regulatory signs shall be installed at 7 foot minimum mounting height.

TCP (2-8b)

8. A list of approved Portable Traffic Signals can be found in the "Compliant Work Zone Traffic Control Devices" list.
9. Portable traffic signals should be located to provide adequate stopping sight distance for approaching motorist (See table above).

Texas Department of Transportation — Traffic Operations Division Standard

TRAFFIC CONTROL PLAN LONG TERM ONE-LANE TWO-WAY CONTROL

TCP(2-8)-18

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© TxDOT December 1985	CONT	SECT	JOB	HIGHWAY
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1-97 2-12	ABL	STONEWALL		46
4-98 2-18				

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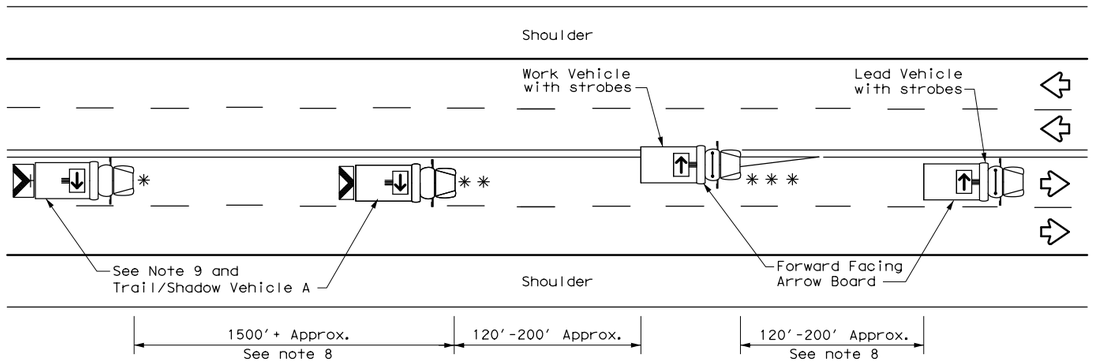
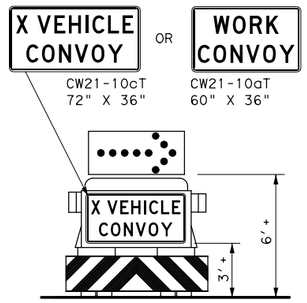


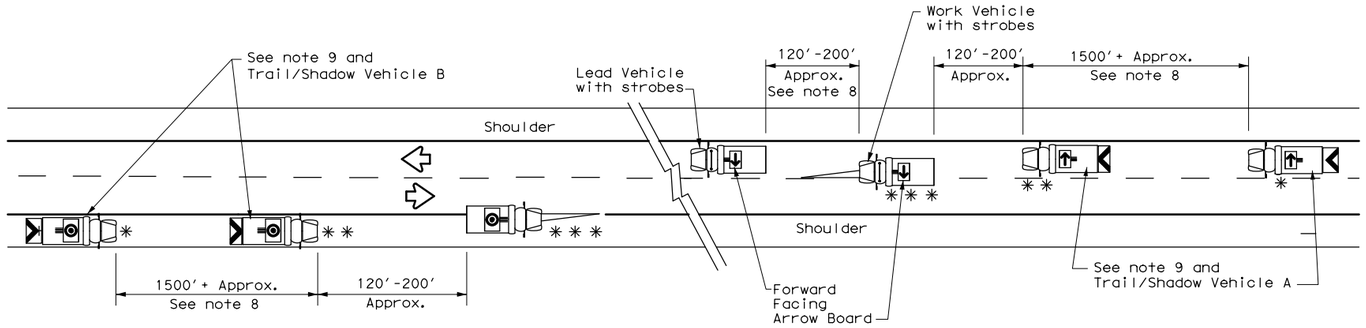
TCP (3-1a)

UNDIVIDED MULTILANE ROADWAY



TRAIL/SHADOW VEHICLE A

with RIGHT Directional display Flashing Arrow Board

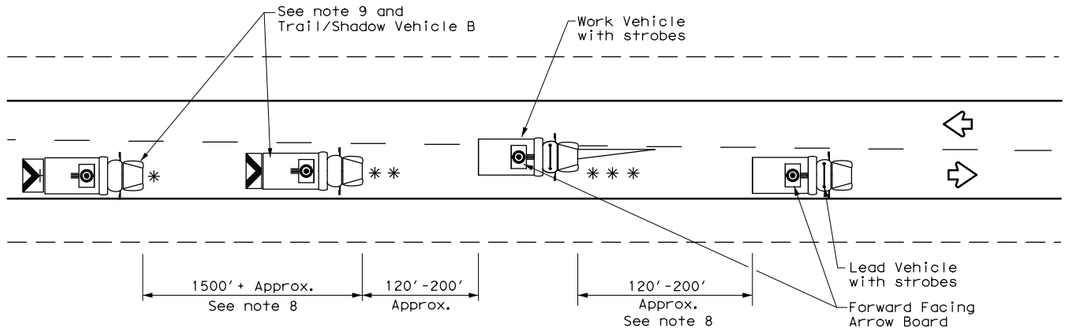


WORK ON SHOULDER

WORK ON TRAVEL LANE

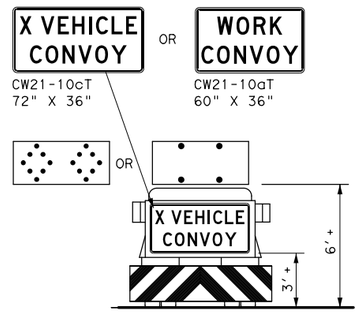
TCP (3-1b)

TWO-WAY ROADWAY WITH PAVED SHOULDERS



TCP (3-1c)

TWO-WAY ROADWAY WITHOUT PAVED SHOULDERS



TRAIL/SHADOW VEHICLE B

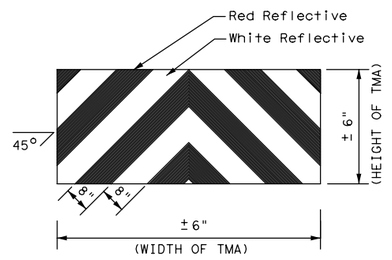
with Flashing Arrow Board in CAUTION display

LEGEND			
*	Trail Vehicle	ARROW BOARD DISPLAY	
* *	Shadow Vehicle		
* * *	Work Vehicle		RIGHT Directional
	Heavy Work Vehicle		LEFT Directional
	Truck Mounted Attenuator (TMA)		Double Arrow
	Traffic Flow		CAUTION (Alternating Diamond or 4 Corner Flash)

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

GENERAL NOTES

1. TRAIL, SHADOW, and LEAD vehicles shall be equipped with arrow boards as illustrated. When a LEAD vehicle is not used the WORK vehicle must be equipped with an arrow board. The Engineer will determine if the LEAD VEHICLE and/or TRAIL VEHICLE are required based on prevailing roadway conditions, traffic volume, and sight distance restrictions.
2. The use of amber high intensity rotating, flashing, oscillating, or strobe lights on vehicles are required. Blue high intensity rotating, flashing, oscillating or strobe lights when mounted on the driver's side of the vehicle may be operated simultaneously with the amber beacons or strobe lights.
3. The use of truck mounted attenuators (TMA) on the SHADOW VEHICLE and TRAIL VEHICLE are required.
4. Reflective sheeting on the rear of the TMA shall meet or exceed the reflectivity and color requirements of DEPARTMENTAL MATERIAL SPECIFICATION DMS 8300, Type A.
5. Flashing arrow boards shall be Type B or Type C as per the Barricade and Construction (BC) standards. The board shall be controlled from inside the vehicle.
6. Each vehicle shall have two-way radio communication capability.
7. When work convoys must change lanes, the TRAIL VEHICLE should change lanes first to shadow the other convoy vehicles.
8. Vehicle spacing between the TRAIL VEHICLE and the SHADOW VEHICLE will vary depending on sight distance restrictions. Motorists approaching the work convoy should be able to see the TRAIL VEHICLE in time to slow down and/or change lanes as they approach the TRAIL VEHICLE. Vehicle spacing between the WORK VEHICLE and SHADOW VEHICLE and vehicle spacing between WORK VEHICLE and LEAD VEHICLE may vary according to terrain, work activity and other factors.
9. "X VEHICLE CONVOY" (CW21-10cT) or "WORK CONVOY" (CW21-10aT) signs shall be used on TRAIL VEHICLES and SHADOW VEHICLES as shown. As an option 48" X 48" diamond shaped "WORK CONVOY"(CW21-10T) or "X VEHICLE CONVOY" (CW21-10bT) signs may be used where adequate mounting space exists. When used, the X VEHICLE CONVOY sign shall have the number of the convoy vehicles displayed on the sign in the number designation "X" location. The "X VEHICLE CONVOY" sign shall not be used on the SHADOW VEHICLE if a TRAIL VEHICLE is used.
10. On two-lane two-way roadways, the work and protection vehicles should pull over periodically to allow motor vehicle traffic to pass. If motorists are not allowed to pass the work convoy, a "DO NOT PASS" (R4-1) sign should be placed on the back of the rearmost protection vehicle.



STRIPING FOR TMA

Texas Department of Transportation

Traffic Operations Division Standard

TRAFFIC CONTROL PLAN MOBILE OPERATIONS UNDIVIDED HIGHWAYS

TCP (3-1)-13

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©TxDOT December 1985	CONT	SECT	JOB	HIGHWAY
REVISIONS 2-94 4-98 8-95 7-13 1-97	0106	04	036	US 380
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	ABL	STONEWALL		47

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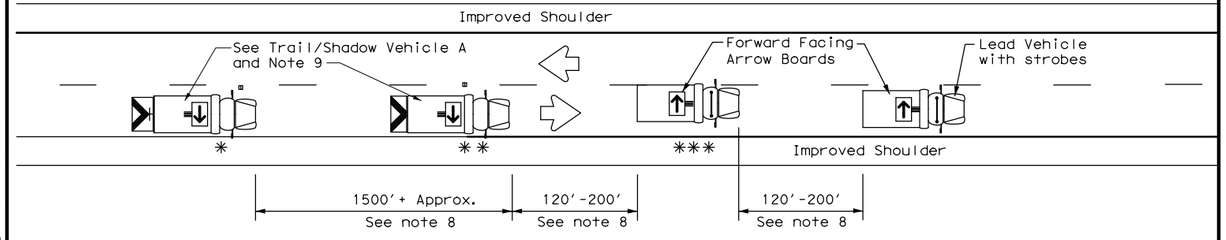
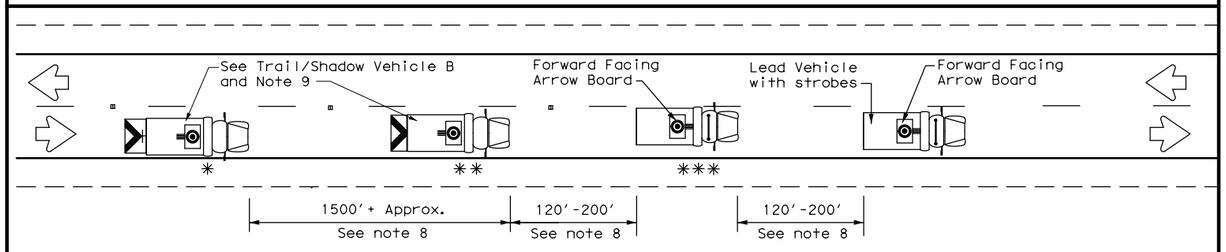


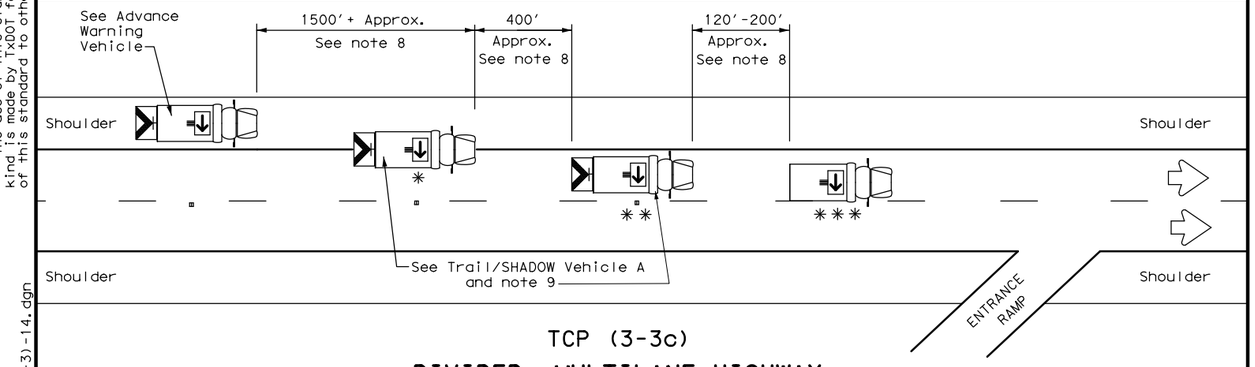
TCP (3-3a)

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



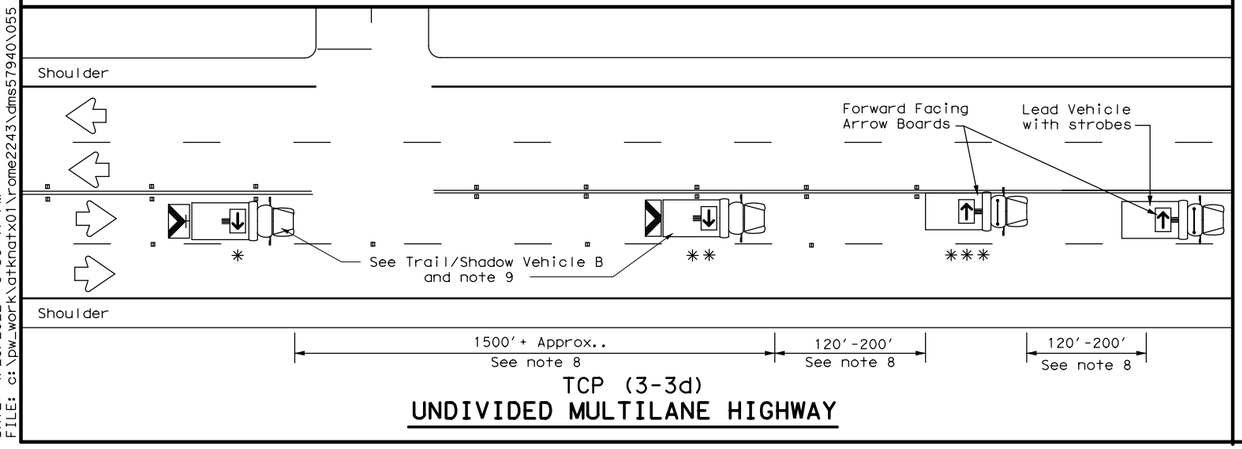
TCP (3-3b)

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



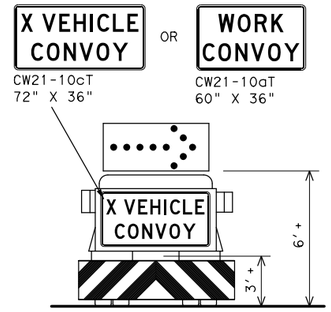
TCP (3-3c)

DIVIDED MULTILANE HIGHWAY



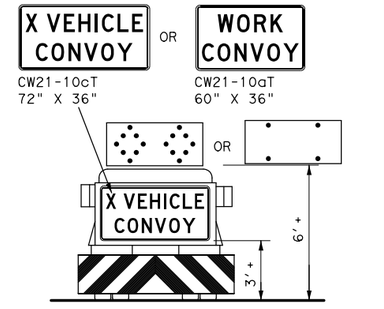
TCP (3-3d)

UNDIVIDED MULTILANE HIGHWAY



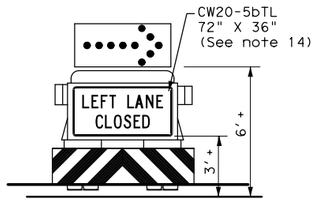
TRAIL/SHADOW VEHICLE A

with RIGHT Directional display
Flashing Arrow Board

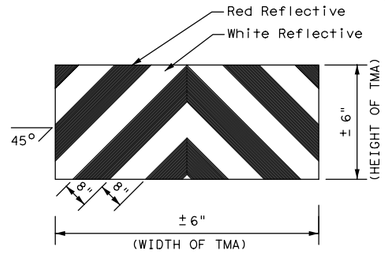


TRAIL/SHADOW VEHICLE B

with Flashing Arrow Board
in Caution Mode



ADVANCE WARNING VEHICLE



STRIPING FOR TMA

LEGEND			
*	Trail Vehicle	ARROW BOARD DISPLAY	
**	Shadow Vehicle		
***	Work Vehicle		RIGHT Directional
	Heavy Work Vehicle		LEFT Directional
	Truck Mounted Attenuator (TMA)		Double Arrow
	Traffic Flow		CAUTION (Alternating Diamond or 4 Corner Flash)

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

GENERAL NOTES

1. TRAIL, SHADOW, and LEAD vehicles shall be equipped with arrow boards as illustrated. When a LEAD vehicle is not used on two way roads the WORK vehicle must have an arrow board. For divided roadways, the arrow board on the WORK vehicle is optional based on the type of work being performed. The Engineer will determine if the LEAD vehicle and/or TRAIL vehicle are required based on prevailing roadway conditions, traffic volume, and sight distance restrictions.
2. The use of amber high intensity rotating, flashing, oscillating, or strobe lights on vehicles are required. Blue high intensity rotating, flashing, oscillating, or strobe lights when mounted on the driver's side of the vehicle may be operated simultaneously with the amber beacons or strobe lights.
3. The use of truck mounted attenuators (TMA) on the SHADOW VEHICLE, ADVANCE WARNING and TRAIL VEHICLE are required.
4. Reflective sheeting on the rear of the TMA shall meet or exceed the reflectivity and color requirements of DEPARTMENTAL MATERIAL SPECIFICATION DMS 8300, Type A.
5. Flashing arrow boards shall be Type B or Type C as per the Barricade and Construction (BC) standards. The board shall be controlled from inside the vehicle.
6. Each vehicle shall have two-way radio communication capability.
7. When work convoys must change lanes, the TRAIL VEHICLE should change lanes first to shadow the other convoy vehicles.
8. Vehicle spacing between the TRAIL VEHICLE and the SHADOW VEHICLE will vary depending on sight distance restrictions. Motorists approaching the convoy should be able to see the TRAIL VEHICLE in time to slow down and/or change lanes as they approach the TRAIL VEHICLE. Vehicle spacing between the WORK VEHICLE and SHADOW VEHICLE and vehicle spacing between WORK VEHICLE and LEAD VEHICLE may vary according to terrain, work activity and other factors.
9. X VEHICLE CONVOY (CW21-10cT) or WORK CONVOY (CW21-10aT) signs shall be used on TRAIL VEHICLES and SHADOW VEHICLES as shown. As an option 48" x 48" diamond shaped WORK CONVOY (CW21-10T) or X VEHICLE CONVOY (CW21-10bT) signs may be used where adequate mounting space exists. When used, the X VEHICLE CONVOY sign shall have the number of the convoy vehicles displayed on the sign in the number designation "X" location. The X VEHICLE CONVOY sign shall not be used on the SHADOW VEHICLE if a TRAIL VEHICLE is used.
10. For divided highways with two or three lanes in one direction, the appropriate LEFT LANE CLOSED (CW20-5bTL), RIGHT LANE CLOSED (CW20-5bTR), or CENTER LANE CLOSED (CW20-5dT) sign should be used on the Advance Warning Vehicle. As an option, a portable changeable message sign (PCMS) or truck mounted changeable message sign (TMCMS) with a minimum character height of 12", and displaying the same legend may be substituted for these signs. An appropriate directional arrow display, simulating the size and legibility of the flashing arrow board may be used in the second phase of the PCMS/TMCMS message. When this is done, the arrow board will not be required on the Advance Warning Vehicle.
11. A double arrow shall not be displayed on the arrow board on the Advance Warning Vehicle.
12. For divided highways with three or four lanes in each direction, use TCP(3-2).
13. Standard diamond shape versions of the CW20-5 series signs may be used as an option if the rectangular signs shown are not available.
14. The Advance Warning Vehicle may straddle the edgeline when Shoulder width makes it necessary.
15. On two-lane two-way roadways, the work and protection vehicles should pull over periodically to allow motor vehicle traffic to pass. If motorists are not allowed to pass the work convoy, a DO NOT PASS (R4-1) sign should be placed on the back of the rearmost protection vehicle.

Texas Department of Transportation

Traffic Operations Division Standard

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

FILE: tcp3-3.dgn	DN: TxDOT	CK: TxDOT	DW: TxDOT	CK: TxDOT
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REVISIONS	0106	04	036	US 380
2-94 4-98	DIST	COUNTY		SHEET NO.
8-95 7-13	ABL	STONEWALL		48
1-97 7-14				

DATE: 4/28/2022 6:36:47 PM
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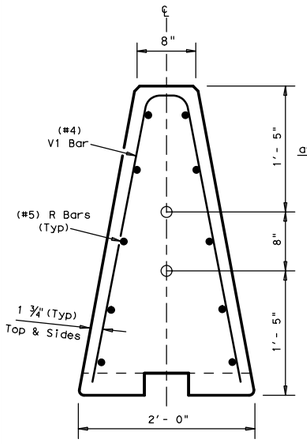
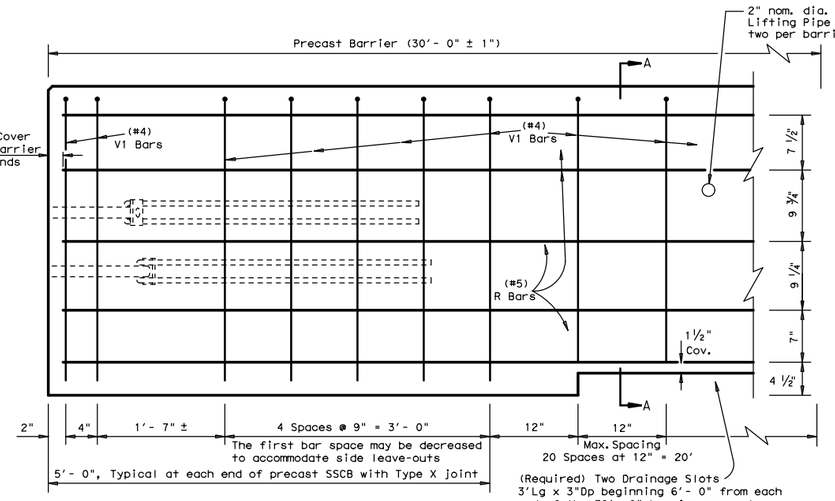
DATE: 4/28/2022
FILE: c:\pw_work\atknatx01\rome2243\dms57940\056 SSCB(2)-10.dgn



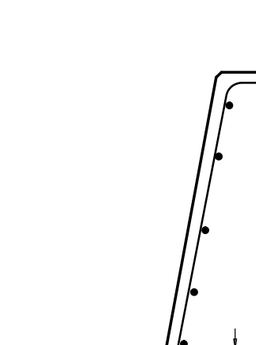
End View Precast Barrier

Pipe locations for Joint Type X connection



Reinforcement for Precast (SSCB) Single Slope Concrete Barrier (Type 1)

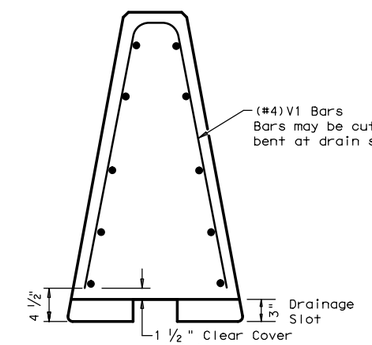
Showing reinforcement for Joint Connection (Type X)



V1 Bar

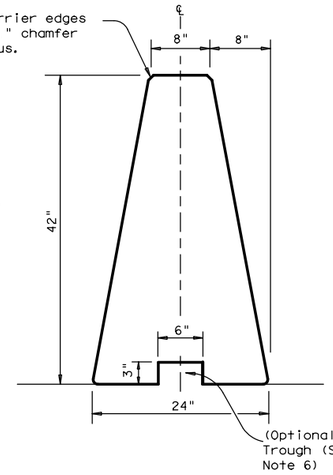
#4 Rebar

Note:
V1 Bars above the drainage slots may bent to accomadate 1 ½" clear cover as directed by the Engineer.



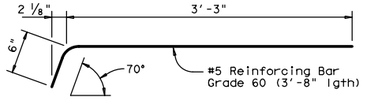
Section A-A

Steel Placement at (Required) Drainage Slots



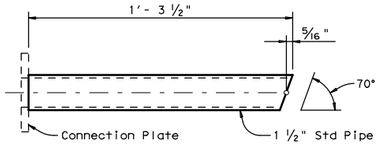
Single Slope Concrete Traffic Barrier

Precast SSCB barrier may be connected to cast-in-place SSBC. The joint connection "Types" may be used in the cast-in-place barrier, to match the precast barrier connection.



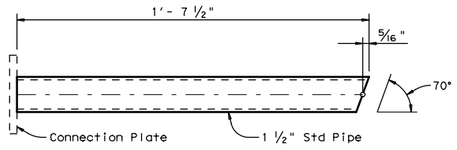
DEFORMED BAR ANCHOR DETAILS

Two (2) Bars required per assembly.
Eight (8) required per Joint.



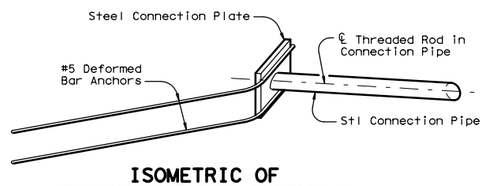
UPPER CONNECTION PIPE DETAILS

One (1) Steel Pipe required per Upper Assembly.
Two (2) required per Joint.



LOWER CONNECTION PIPE DETAILS

One (1) Steel Pipe required per Lower Assembly.
Two (2) required per Joint.

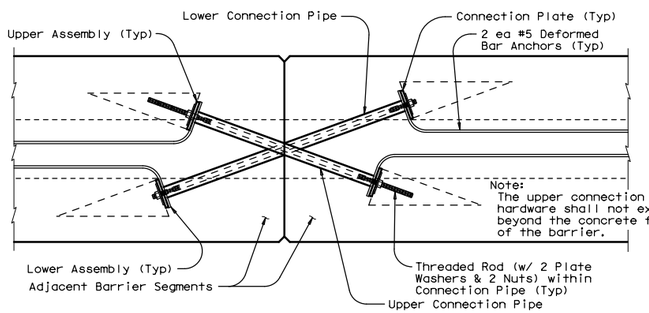


ISOMETRIC OF TYPICAL WELDED ASSEMBLY

Four (4) [2 Upper & 2 Lower] Assemblies required per Joint.

General Notes

1. Concrete shall be Class H with a minimum compressive strength of 3,600 psi.
2. Where used, rebar reinforcement shall be Grade 60 and conform to ASTM A615.
3. Precast barrier length shall be 30 ft. unless otherwise specified on the plans.
4. All precast barrier edges shall have a ¾" chamfer or a tooled radius.
5. All concrete, reinforcement, joint connection systems, grout etc. as shown, are considered as part of the barrier payment.
6. Conduit trough when required shall be shown elsewhere on the plans, or as directed by the Engineer.
7. Regardless of the method of handling, barrier lifting points shall be approx. 7.5 feet from the ends of the barrier. Lifting devices and attachments to barrier sections shall be approved by the Engineer.
8. Surface finishing and grouting (where required) shall be two parts sand one part cement with enough water to make the mixture plastic. Grouting shall be done in a manner that will assure a smooth surface. Surface finishing shall be considered subsidiary to the various bid items.
9. All steel assemblies shall be galvanized after fabrication in accordance with Item 445, "Galvanizing."



TYPE X JOINT INSTALLATION DETAIL

Barrier reinforcing and Type X Joint Leave-Out dimensions not shown for clarity.

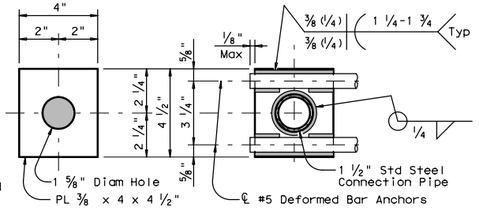
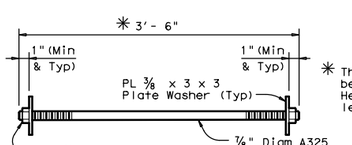


PLATE DIMENSIONS

WELDING DETAILS

CONNECTION PLATE DETAILS

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

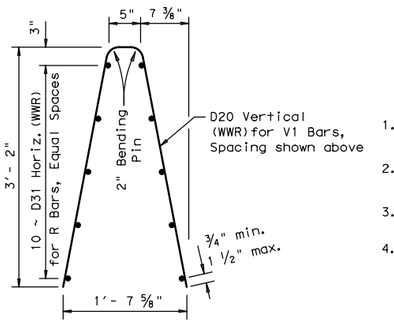


✳ The connection hardware shall not extend beyond the concrete face of the barrier. Hex head bolts may be provided. The proper length of all hardware should be verified.

CONNECTION BOLT OR THREADED ROD DETAIL

Two (2) Threaded Rods (Or Equivalent Hex Hd. Bolts) (w/ Two (2) PL ⅜ x 3 x 3 Plate Washers & Two (2) Std Hex Nuts) required per Joint.

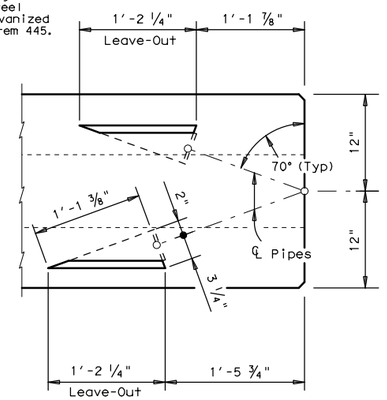
Weight of one precast 30 ft. (SSCB) segment = Approx. 10.5 Tons or 717 lbs per ft.



Welded Wire Reinforcement (WWR) Option for Bars R and V1

(WWR) General Notes

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



BARRIER PLAN AT JOINT

SHEET 1 OF 2

Texas Department of Transportation | Design Division Standard

SINGLE SLOPE CONCRETE BARRIER

PRECAST BARRIER
(TYPE 1)

SSCB(2)-10

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©TxDOT December 2010	CONT	SECT	JOB	HIGHWAY
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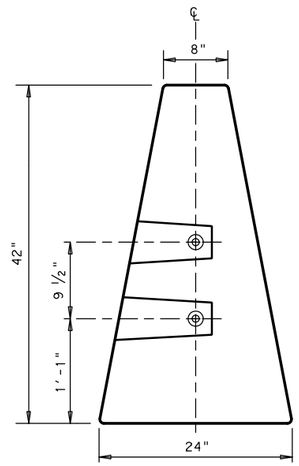
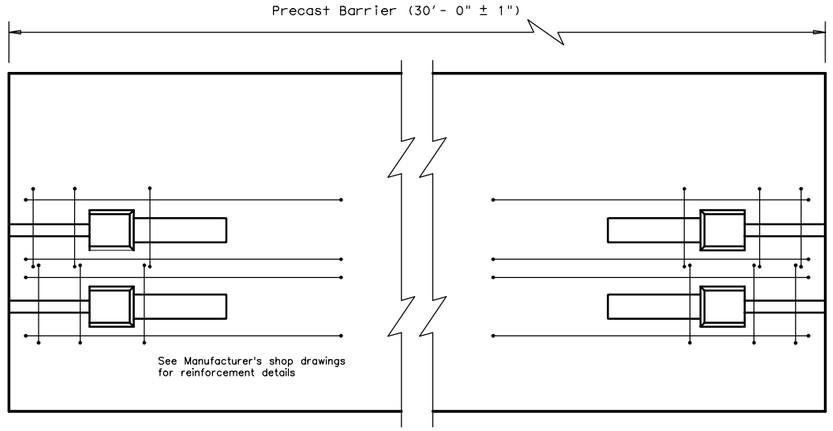
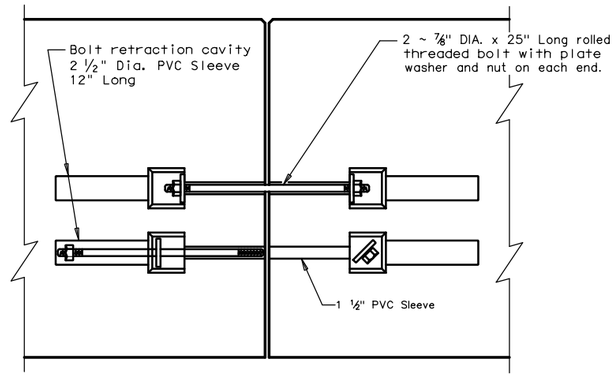


END VIEW
"QUICK-BOLT" POCKET LOCATIONS

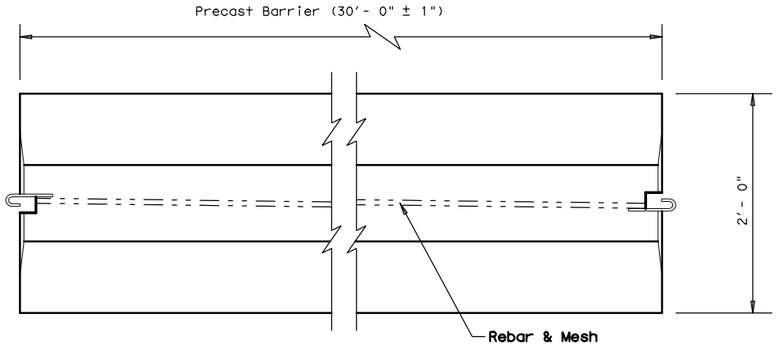


ELEVATION VIEW
"QUICK-BOLT" (SSCB)
See Manufacturer's shop drawing for additional details

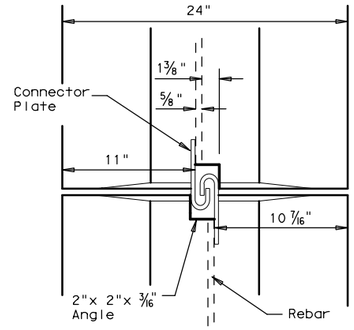


ELEVATION VIEW SHOWING JOINT CONNECTION
"QUICK-BOLT"

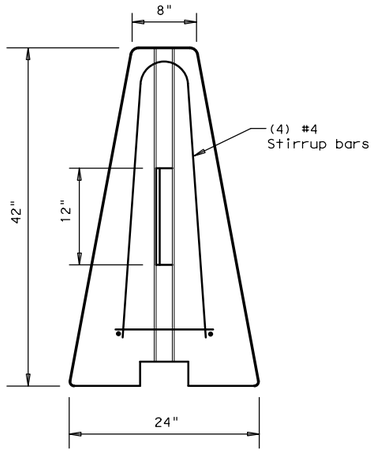
Joint Connection (Type Q)



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



VIEW FROM ABOVE
J-J HOOK CONNECTION



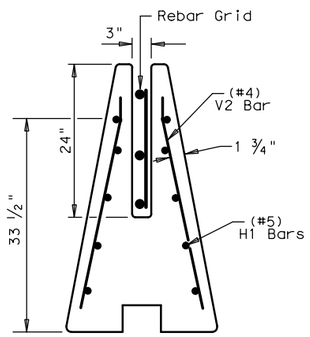
END VIEW

Proprietary Joint Connections (SSCB)

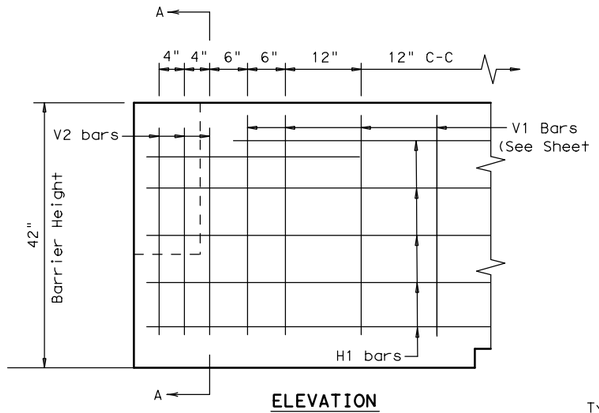
Two proprietary joint connections are acceptable as alternates to the (Type X) connection shown, here on. These joint connections types are:

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

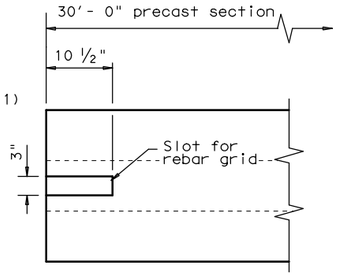
If one of these connection systems are exclusively specified in the plans, prior approval for sole source use must be obtained. Details of the connection components and barrier reinforcement for these systems, will be shown on the manufacturer's shop drawing(s) furnished to the Engineer.



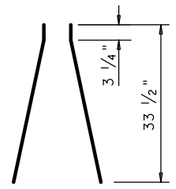
SECTION A-A
Showing (Type R) Rebar Grid



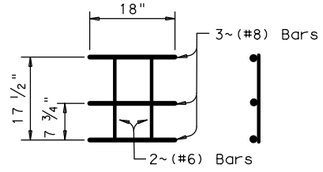
ELEVATION
V1 Bars (See Sheet 1)



TOP VIEW
JOINT CONNECTION
Typical at both ends of barrier segment



(#4) V2 BARS
6 ~ two piece bars per barrier segment



WELDED REBAR GRID

Joint Connection (Type R)

SHEET 2 OF 2

Texas Department of Transportation — Design Division Standard

SINGLE SLOPE CONCRETE BARRIER

PRECAST BARRIER (TYPE 1)

SSCB(2)-10

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©TxDOT December 2010	CONT	SECT	JOB	HIGHWAY
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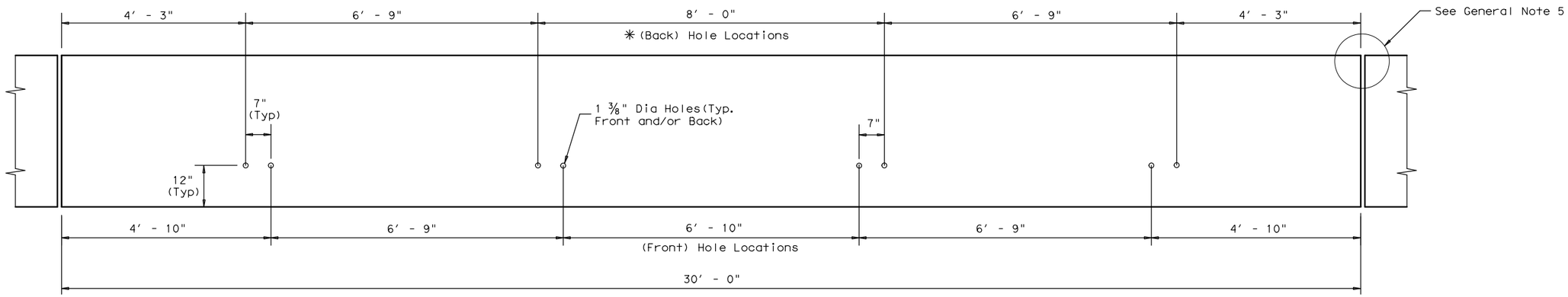
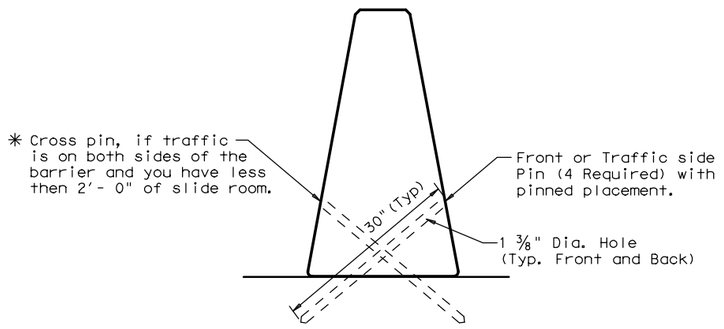


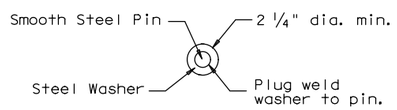
DETAIL 1

Precast SSCB(42")
Showing hole locations

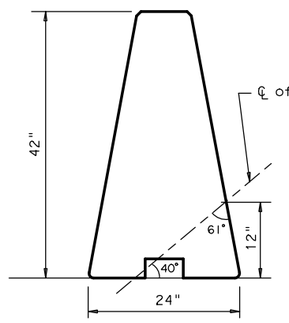


DETAIL 2

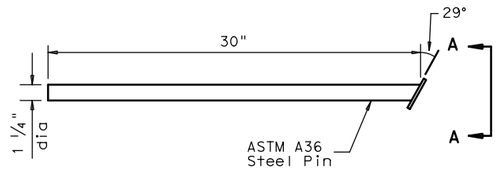
Placement on (ACP)
Asphalt Conc. Pavement
or Treated Base Material
(30" Pin required)



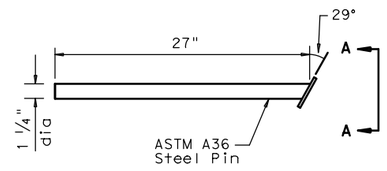
VIEW A-A



HOLE LOCATION DETAIL



(30") PIN DETAIL
See Detail 2

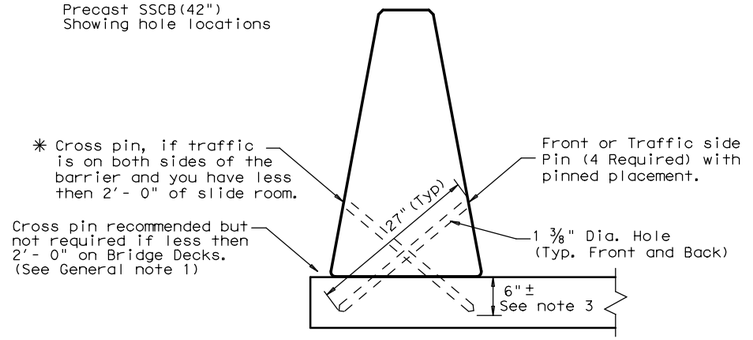


(27") PIN DETAIL
See Detail 3

Note:
Steel washer welded to pin at 29° angle so that the washer is flush with barrier surface. (See View A-A)

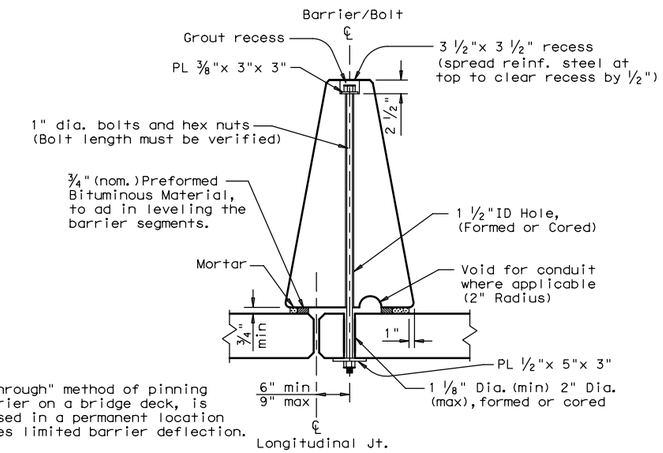
DETAIL 3

Bridge Deck or CRCP
(27" Pin required).



CORE DRILLING EXISTING BARRIER

Core drilling existing concrete barrier is permitted. Holes shall be drilled with coring or masonry drilling type equipment. Percussion (star) drilling shall not be used. A special drill bit (to cut through existing reinforcing) will likely be required. Spalls in the concrete exceeding ½" shall be patched.



Note:
The "Bolt Through" method of pinning precast barrier on a bridge deck, is primarily used in a permanent location that requires limited barrier deflection.

PRECAST SSCB (BOLT THROUGH) PLACEMENT OVER LONGITUDINAL EXPANSION JOINT

For bolt through locations, use the (Front) hole locations shown on Detail 1.

GENERAL NOTES

1. These details provide a method of laterally restraining precast concrete barrier to limit deflections under normally expected passenger vehicle impacts. These details are intended for use in work zones, primarily on bridge decks, or pavement where temporary barrier must be placed less then 2 ft. from the longitudinal edge of the deck or dropoff and parallel to the direction of travel. Other applications of these details are acceptable as directed by the Engineer.
2. Each precast concrete barrier section shall have a minimum of four or total of eight 1 ⅜in. ID holes formed or cored through the barrier. The center lines of the holes are shown in the hole location detail. If rebar is encountered, the entry point may be shifted 2" plus or minus longitudinally along the barrier. The eight holes are spaced along the length of the barrier as shown in Detail 1.
3. The drilling of the travel surface is accomplished by placing the pre-drilled barrier section on the travel surface in the desired position. Then the hole is drilled with the bit passing though the hole in the barrier. The bit is to be inserted into the hole in the barrier so that the travel surface is drilled to a point which is slightly more than the pin length.
4. Note that steel washers have been welded to the top of the steel pins to aid in the removal of the pins, when the barrier is removed.
5. See SSCB(2) standard sheet for reinforcement requirements and joint connection types.
6. The forming or coring of holes in the barrier, drilling of holes in bridge deck or pavement, fabrication and materials for the 1 ¼in. pins, installation of pins, and any repair to the barrier shall be considered as subsidiary to the barrier bid items.
7. The barrier and travel surface will be repaired as directed by the Engineer in accordance with Item 429, "Concrete Structure Repair."
8. All steel pins shall be galvanized after fabrication in accordance with Item 445, "Galvanizing."
9. Weight of barrier is approx. 700 lbs per foot.

Texas Department of Transportation

Design Division Standard

SINGLE SLOPE CONCRETE BARRIER

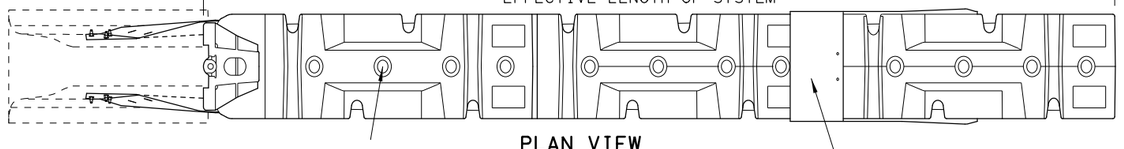
PRECAST BARRIER
(TYPE 1)
PINNED PLACEMENT

SSCB(5)-10

FILE: sscb510.dgn	DN: TxDOT	CK: AM	DW: BD	CK:
©TxDOT December 2010	CONT	SECT	JOB	HIGHWAY
REVISIONS	0106	04	036	US 380
	DIST	COUNTY		SHEET NO.
	ABL	STONEWALL		51

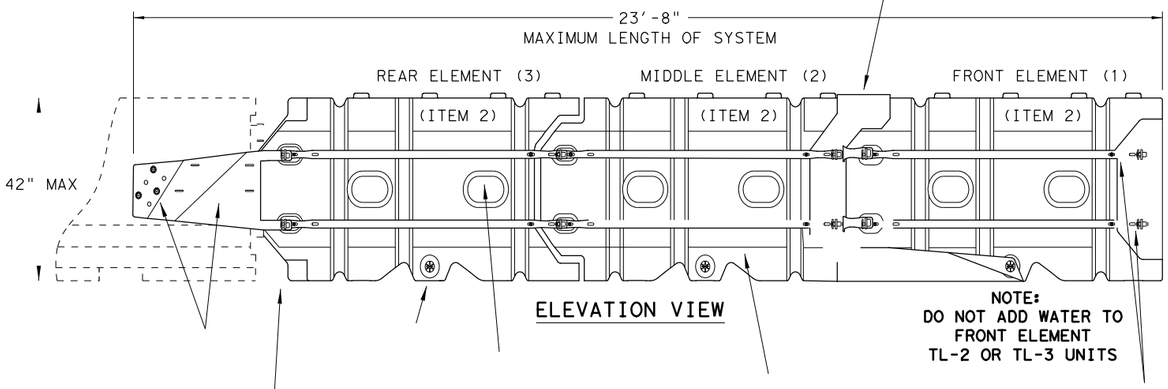
DATE: 4/28/2022
FILE: c:\pw_work\atknatx01\rome2243\dms57940\059 ABSORB(M)-19.dgn

SYSTEM SHOWN - ABSORB-M TL-3



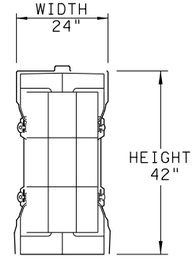
PLAN VIEW

TRAFFIC FLOW

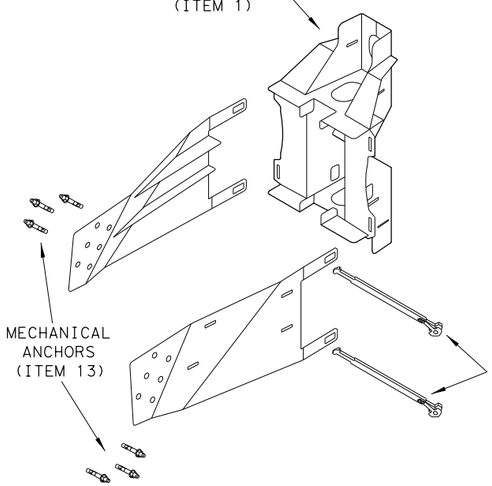


ELEVATION VIEW

TRAFFIC FLOW



SECTION A-A



TEST LEVEL	NUMBER OF ELEMENTS	EFFECTIVE LENGTH	MAXIMUM LENGTH
TL-2	2	14'- 7 3/4"	17'- 4"
TL-3	3	20'- 11 3/4"	23'- 8"

GENERAL NOTES

1. FOR SPECIFIC INFORMATION REGARDING THE INSTALLATION AND TECHNICAL GUIDANCE, CONTACT: LINDSAY TRANSPORTATION SOLUTIONS (LTS) - BARRIER SYSTEMS, INC. AT (707) 374-6800. 180 RIVER ROAD, RIO VISTA, CA 94571
2. THE ABSORB-M SYSTEM IS ONLY APPROVED FOR USE IN (TEMPORARY WORK ZONE) LOCATIONS.
3. THE ABSORB-M IS A WATER FILLED NON-REDIRECTIVE, GATING CRASH CUSHION THAT DOES NOT NEED TO BE ATTACHED TO A FOUNDATION AND CAN BE INSTALLED ON TOP OF CONCRETE, ASPHALT, OR ANY SURFACE CAPABLE OF BEARING THE WEIGHT OF THE SYSTEM.
4. MAXIMUM PERMISSIBLE CROSS-SLOPE IS 8%.
5. THE INSTALLATION AREA SHOULD BE FREE FROM CURBS, ELEVATED OBJECTS, OR DEPRESSIONS.
6. THE ABSORB-M SHOULD BE LOCATED APPROXIMATELY PARALLEL WITH THE BARRIER.
7. THE USE OF THE ABSORB-M IS RESTRICTED TO A BARRIER HEIGHT OF UP TO 42 INCHES.
8. DO NOT ADD WATER TO FRONT ELEMENT (TL-2 OR TL-3 UNIT).

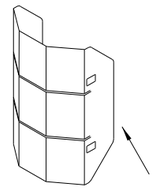
BILL OF MATERIALS (BOM) ABSORB-M TL-3 & TL-2 SYSTEMS			QTY	QTY
ITEM #	PART NUMBER	PART DESCRIPTION	TL-2 SYSTEM	TL-3 SYSTEM
1	BSI-1809036-00	TRANSITION-(GALV)	1	1
* 2	BSI-1808002-00	PRE-ASSEMBLED ABSORBING (ELEMENTS)	2	3
* 3	BSI-4004598	FILL CAPS	8	12
* 4	BSI-4004599	DRAIN PLUGS	2	3
* 5	BSI-1809053-00	TENSION STRAP-(GALV)	8	12
* 6	BSI-2001998	C-SCR FH 3/8-16 X 1 1/2 GR5 PLT	8	12
* 7	BSI-2001999	C-SCR FH 3/8-16 X 1 GR5 PLT	8	12
8	BSI-1809035-00	MIDNOSE-(GALV)	1	1
9	BSI-1808014-00	NOSE PLATE	1	1
10	BSI-1809037-00	TRANSITION STRAP (LEFT-HAND)-(GALV)	1	1
11	BSI-1809038-00	TRANSITION STRAP (RIGHT-HAND)-(GALV)	1	1
12	BSI-1808005-00	PIN ASSEMBLY	8	10
13	BSI-2002001	ANC MECH 5/8-11X5 (GALV)	6	6
14	ABSORB-M	INSTALLATION AND INSTRUCTIONS MANUAL	1	1

*COMPONENTS PRE-ASSEMBLED WITH ELEMENT ASSEMBLY

DELINEATION DECAL PLACEMENT GUIDE

TRAFFIC FLOW LEFT-SIDE BARRIER | TRAFFIC FLOW BOTH-SIDE BARRIER | TRAFFIC FLOW RIGHT-SIDE BARRIER

**APPLY DECAL



NOSE PLATE

** NOTE: (PROVIDED BY OTHERS)
ENGINEER OR CONTRACTOR SHALL COORDINATE WITH THE MANUFACTURER FOR THE CORRECT DECAL PER TRAFFIC FLOW, LEFT, RIGHT OR BOTH-SIDES.

NOTE:
APPLY A HIGH REFLECTIVE DECAL TO THE NOSE PLATE. DELINEATION DECAL ORIENTATION IS SHOWN ON THE CONSTRUCTION PLAN SET AND SHALL BE IN ACCORDANCE WITH THE TEXAS MUTCD FOR (TRAFFIC CONTROL DEVICES). DECALs ARE AVAILABLE FOR TRAFFIC FLOW ON THE LEFT-SIDE, BOTH -SIDES AND RIGHT-SIDE.

NOTE:
THIS STANDARD IS A BASIC REPRESENTATION OF THE ABSORB-M, IT IS NOT INTENDED TO REPLACE THE INSTALLATION INSTRUCTIONS MANUAL.

SACRIFICIAL

Texas Department of Transportation | Design Division Standard

LINDSAY TRANSPORTATION SOLUTIONS
CRASH CUSHION
(MASH TL-3 & TL-2)
TEMPORARY - WORK ZONE
ABSORB(M)-19

FILE: absorbm19	DN: TxDOT	CK: KM	DW: VP	CK:
© TxDOT: JULY 2019	CONT	SECT	JOB	HIGHWAY
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	ABL	STONEWALL		52

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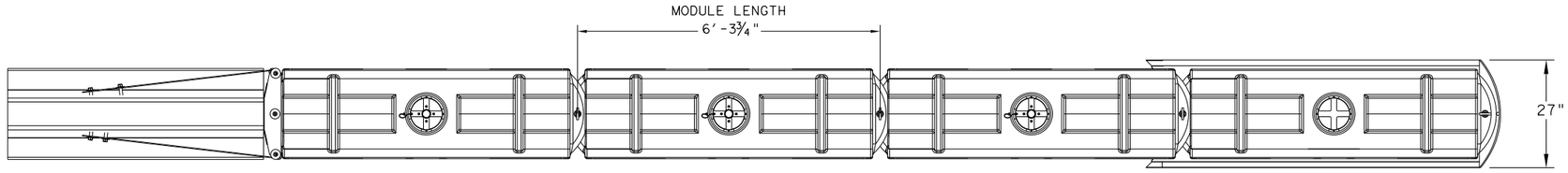
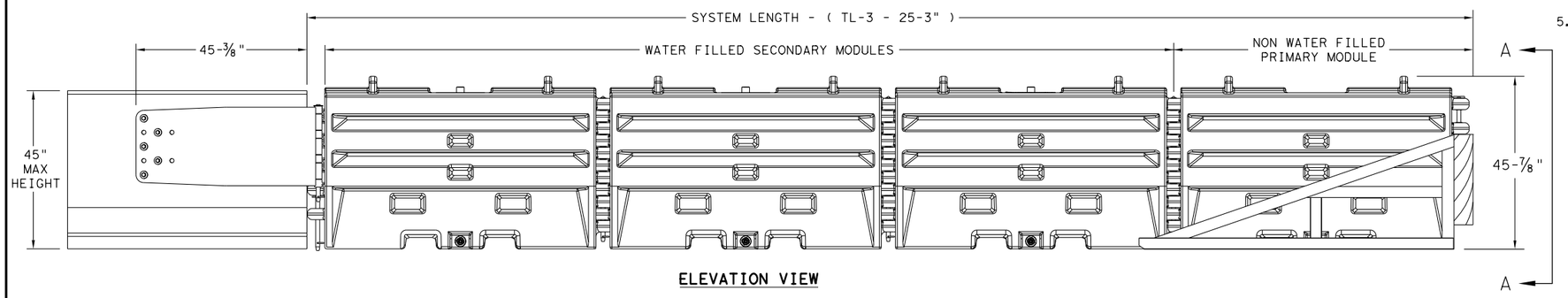
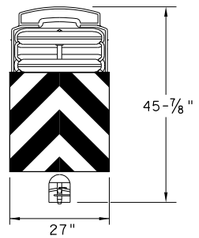


PLAN VIEW



ELEVATION VIEW



SECTION A-A

NOSE SHEETING PANEL DELINEATION

NOTE:
SEE INSTALLATION MANUAL FOR CUSTOMIZED DELINEATION NOSE SHEETING FOR DECAL PLACEMENT.

TEST LEVEL	NUMBER OF SECONDARY MODULES	SYSTEM LENGTH
TL-3	3	25′ 3"

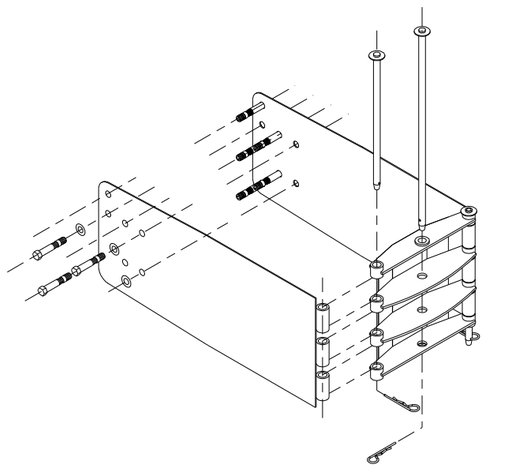
GENERAL NOTES

1. REFER TO THE INSTALLATION MANUAL FOR SPECIFIC SYSTEM ASSEMBLY AND MODULE ORIENTATION. FOR ADDITIONAL INFORMATION, CONTACT TRAFFIX, INC. AT (949) 361-5663.
2. THE SLED SYSTEM IS A MASH APPROVED TEST LEVEL 3 (TL-3) CRASH CUSHION APPROVED FOR USE IN TEMPORARY WORK ZONES. THE SLED SYSTEM IS A NON-REDIRECTIVE, GATING CRASH CUSHION THAT DOES NOT NEED TO BE ATTACHED TO THE GROUND AND CAN BE INSTALLED ON CONCRETE, ASPHALT, GRAVEL OR COMPACTED SOIL.
3. MAXIMUM PERMISSIBLE CROSS SLOPE IS 8° (DEGREES) (14%).
4. THE INSTALLATION AREA SHOULD BE FREE FROM CURBS, ELEVATED OBJECTS, OR DEPRESSIONS.
5. THE SLED SYSTEM CAN BE ATTACHED TO:

- CONCRETE BARRIER, TEMPORARY OR PERMANENT, 45" MAXIMUM HEIGHT
- STEEL BARRIER
- PLASTIC BARRIER
- CONCRETE BRIDGE ABUTMENTS
- W-BEAM GUARD RAIL
- THRIE BEAM GUARD RAIL

BILL OF MATERIAL

PART NUMBER	DESCRIPTION	QTY: TL-3
45131	TRANSITION FRAME, GALVANIZED	1
45150	TRANSITION PANEL, GALVANIZED	2
45147-CP	TRANSITION SHORT DROP PIN W/ KEEPER PIN, GALVANIZED	2
45148-CP	TRANSITION LONG DROP PIN W/ KEEPER PIN, GALVANIZED	1
45050	ANCHOR BOLTS	9
12060	WASHER, 3/4" ID X 2" OD	9
45044-Y	SLED YELLOW WATER FILLED MODULE	3
45044-YH	SLED YELLOW "NO FILL" MODULE	1
45044-S	CIS (CONTAINMENT IMPACT SLED), GALVANIZED	1
45043-CP	T-PIN W/ KEEPER PIN	4
18009-B-I	FILL CAP W/ "DRIVE BY" FLOAT INDICATOR	3
45033-RC-B	DRAIN PLUG	3
45032-DPT	DRAIN PLUG REMOVAL TOOL	1



SLED TRANSITION COMPONENTS FOR ATTACHMENT TO CMB

NOTE:
SEE MANUFACTURER'S INSTALLATION MANUAL FOR FURTHER DETAILS.

TRANSITION OPTIONS
SLED TRANSITION TO CONCRETE TRAFFIC BARRIER (TEMPORARY OR PERMANENT)
SLED TRANSITION TO STEEL TRAFFIC BARRIER (CONTACT MFGR FOR PROPER TRANSITION)
SLED TRANSITION TO PLASTIC TRAFFIC BARRIER (CONTACT MFGR FOR PROPER TRANSITION)
SLED TRANSITION TO W-BEAM OR THRIE BEAM GUARD RAIL (CONTACT MFGR FOR PROPER TRANSITION)
SLED TRANSITION TO CONCRETE BRIDGE ABUTMENT

NOTE:
THIS STANDARD IS A BASIC REPRESENTATION OF THE SLED, IT IS NOT INTENDED TO REPLACE THE INSTALLATION INSTRUCTIONS MANUAL.

SACRIFICIAL

Texas Department of Transportation

Design Division Standard

SLED
CRASH CUSHION
TL-3 MASH COMPLIANT
(TEMPORARY, WORK ZONE)
SLED-19

FILE: sled19.dgn	DN: TxDOT	CK: KM	DW: VP	CK:
©TxDOT: DECEMBER 2019	CONT	SECT	JOB	HIGHWAY
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	ABL	STONEWALL		53

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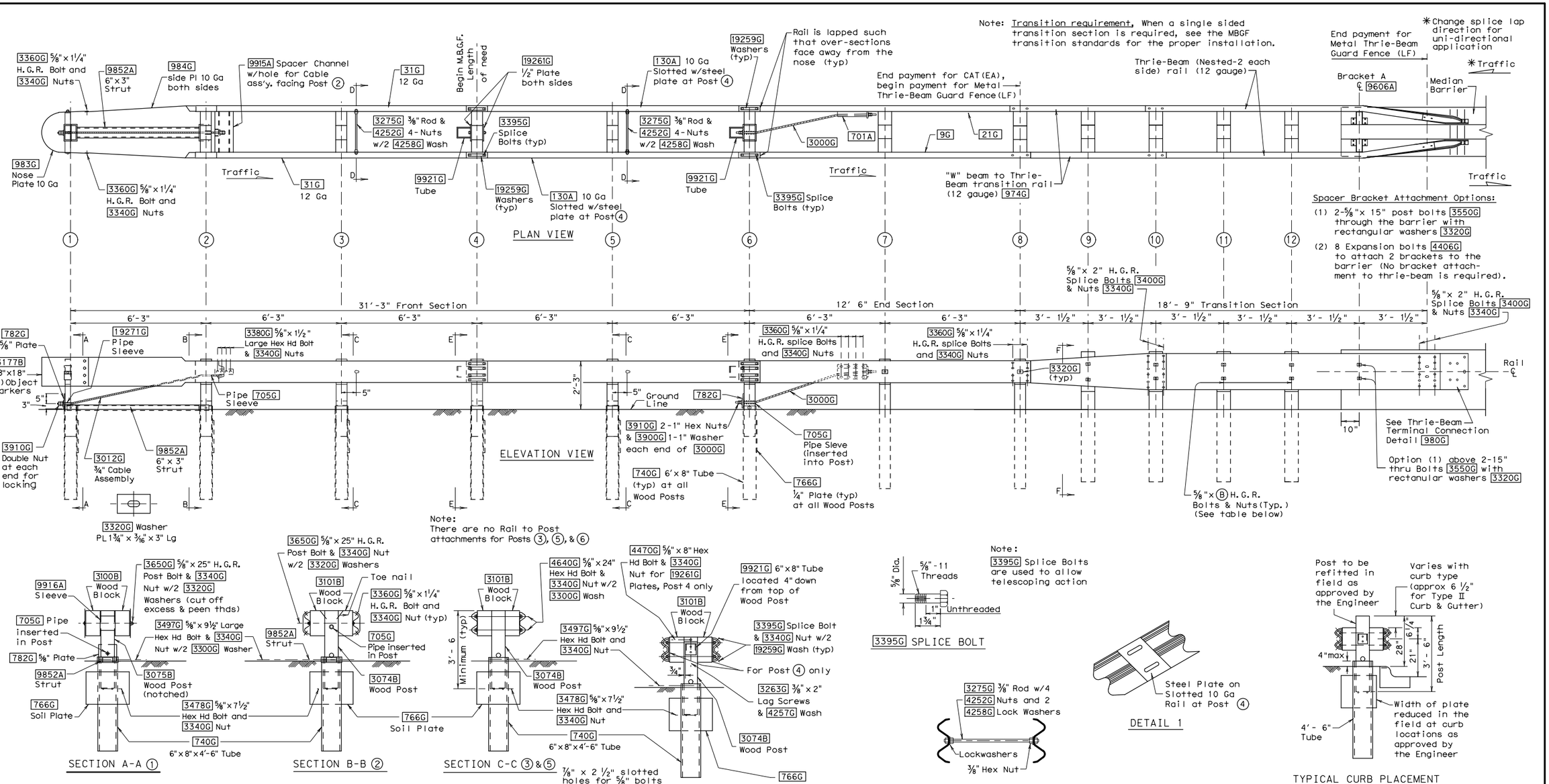

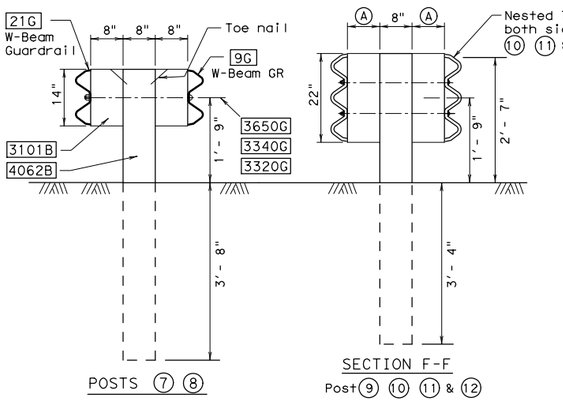

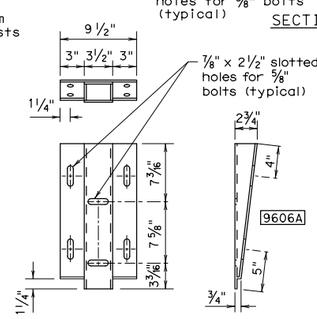

Post	(A) Block Width	Product Code	(B) Post Bolt Length	Product Code
9	6 ½"	3409B	24"	3640G
10	5 ½"	3408B	22"	3620G
11	4 ½"	3407B	20"	3600G
12	3 ½"	3406B	18"	3580G

** Modifications (as approved by the Engineer) in bracket design will be required for other barrier configurations.

SHEET 1 OF 2

Texas Department of Transportation — Design Division Standard

TRINITY HIGHWAY ENERGY ABSORPTION CRASH CUSHION (CONCRETE BARRIER)

CATCB(1)-17

FILE: catcb17.dgn	DN: TxDOT	CK: KM	DW: BD	CK: VP
©TxDOT: 1997	CONT	SECT	JOB	HIGHWAY
REVISIONS REVISED 03,2016 VP REVISED 03,2017 KM	0106	04	036	US 380
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SACRIFICIAL

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CATCB FRONT SECTION (POSTS 1 THRU 6)

BILL OF MATERIAL

Mfr Code #	QTY	DESCRIPTION
983G	1	Nose Plate (10 Ga)
984G	2	Side Plate (10 Ga)
31G	2	"W" Beam 12 Ga x 13'-6 1/2"
130A	2	"W" Beam 10 Ga x 13'-6 1/2"
9852A	1	Channel Strut x 6'-6"
740G	6	Steel Foundation Tube
766G	6	Soil Plate 18"x 24"
3075B	1	Wood Post 5 1/2" x 7 1/2" (Notched) (Post 1)
3074B	5	Wood Post 5 1/2" x 7 1/2"(Post 2-6)
3100B	2	Wood Block 5 1/2" x 7 1/2"(Post 1)
3101B	10	Wood Block 5 1/2" x 7 1/2"(Post 2-6)
9916A	1	Sleeve (Post 1)
9915A	1	Spacer Channel (Post 2)
9921G	2	Steel Tube (Posts 4 & 6)
19271G	1	Pipe Sleeve (Post 1)
705G	1	Pipe Sleeve (Post 2)
19261G	2	Post Plate (Post 4)
782G	1	Bearing Plate (Post 1)
3012G	1	Cable Assembly(Posts 1 to 2)
3275G	2	3/8" Restraint Rod(Post 3 & 5)
19259G	32	Plate Washer (Posts 4 & 6)

HARDWARE

3263G	4	3/8" x 2" Lg Lag Screw
4252G	8	3/8" Hex Nut
4258G	4	3/8" Lock Washer
4257G	4	3/8" Flat Washer
3320G	4	Rectangular Washer
3395G	32	5/8" x 1 3/4" H.H. Splice Bolt
3650G	2	5/8" x 25" Lg H.G.R. Bolt
4640G	8	5/8" x 24" Lg H.H. Bolt
3478G	13	5/8" x 7 1/2" Lg H.H. Bolt
3380G	8	5/8" x 1 1/2" Lg H.H. Bolt
3360G	16	5/8" x 1 1/4" Lg H.G.R. Bolt
3340G	85	5/8" H.G.R. Nut
3300G	8	5/8" Flat Washer
3497G	6	5/8" x 9 1/2" Lg H.H. Bolt
3910G	4	1" Hex Nut
3900G	2	1" Flat Washer

CATCB GUARDRAIL TERMINAL END SECTION (POSTS 7 & 8)

BILL OF MATERIAL

Mfr Code #	QTY	DESCRIPTION
4064B	2	Wood Post 5 1/2" x 7 1/2" x 6'
3101B	4	Wood Block 5 1/2" x 7 1/2"
21G	1	"W" Beam Guard Rail (12 Ga)
9G	1	"W" Beam Guard Rail (12 Ga)
701A	1	Bracket
782G	1	Bearing Plate
705G	1	Pipe Sleve
3000G	1	Cable Assembly
3320G	2	Rectangular Washer

HARDWARE		
3360G	24	5/8" x 1 1/4" H.G.R. Splice Bolt
3400G	4	5/8" x 25" H.G.R. Post Bolt
3380G	8	5/8" x 1 1/2" Hex Hd Bolt
3340G	28	5/8" H.G.R. Nut
3300G	8	5/8" Washer
3910G	4	1" Hex Nut
3900G	2	1" Washer

CATCB TRANSITION SECTION (POST 9 THRU END SHOE)

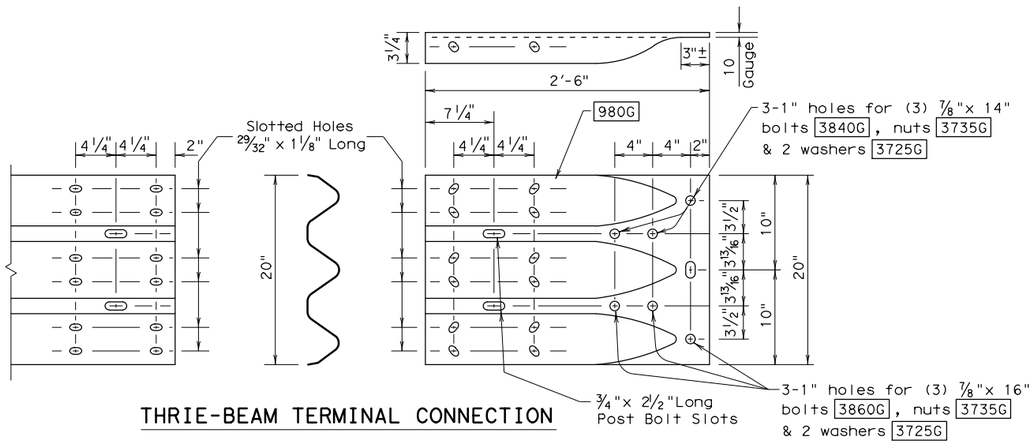
BILL OF MATERIAL

Mfr Code #	QTY	DESCRIPTION
211G	4	Thrie beam 12'-6"(12 Ga)
974G	2	Trans panel 6'-3"(12 Ga)
980G	2	Special Thrie beam end shoe
3078B	3	Wood Post 6"x 8"x 6', (Posts11&12)
3320G	20	Rectangular Washer
3340G	62	5/8" H.G.R. Nut
3400G	52	5/8" x 2" Splice Bolt
3406B	2	22 1/2" Block 6"x 3 1/2" (Post 12)
3407B	2	22 1/2" Block 6"x 4 1/2" (Post 11)
3408B	2	22 1/2" Block 6"x 5 1/2" (Post 10)
3409B	2	22 1/2" Block 6"x 6 1/2" (Post 9)
3412B	1	Wood Post 6"x 8"x 6', (Posts 9)
* 3560G	2	5/8" x 16" Bolt
* 4406G	8	5/8" x 3 3/4" Expansion Bolts w/Nuts
3580G	2	5/8" x 18"Post Bolt (Post 12)
3600G	2	5/8" x 20"Post Bolt (Post 11)
3620G	2	5/8" x 22"Post Bolt (Post 10)
3640G	2	5/8" x 24"Post Bolt (Post 9)
3725G	12	7/8" Washer (End Shoe Bolts)
3735G	6	7/8" Hex Nuts (End Shoe Bolts)
3840G	3	7/8" x 14" Hex Bolt (End Shoe)
3860G	3	7/8" x 16" Hex Bolt (End Shoe)
9606A	2	Spacer Bracket
Delineation		
3177B	2	Object Marker 18"x 18" (Cut to fit)
Optional Hardware for Single Slope Barrier-42"		
3640G	2	5/8" x 24" Bolt
4896G	6	7/8" x 24" Hex Bolt (End Shoe)

* Expansion or through bolts may be used with optional bracket installation.

GENERAL NOTES

1. For specific information regarding installation and technical guidance of the system, contact: Trinity Highway at 1(888)323-6374. 70 W. Madison St. Suite 2350. Chicago, IL 60602
2. Crown will be widened to accommodate the CAT system. The crown should extend at least 3 feet beyond the inside face of rail. The ground line at posts should be an extension of the roadway surface crown.
3. All bolts, nuts, washers, cable assemblies, cable anchors, post tubes, backup plates, and soil plates shall be galvanized.
4. The exposed end segment of an "End Section" should be evaluated as a potential obstacle in the determination of the need of MBGF for the opposing direction of traffic.
5. For placement at curb sections, the height from gutter pan to post bolt will be 21", and the front section shall be flared (See Detail 2).
6. The wood blockouts shall be "toe nailed" to the rectangular wood posts to prevent them from turning when the wood shrinks.
7. Either 6"- 8" or 5 1/2"x 7 1/2" wood blocks may be used at posts 1 thru 8 as supplied by the manufacturer.
8. If a "single sided" transition section is required for the attachment to a rigid concrete rail, see the MBGF transition standards for the proper installation.
9. Object markers shall be installed on the front of the terminal as detailed on the D&OM(VIA).



THRIE-BEAM TERMINAL CONNECTION

SACRIFICIAL

SHEET 2 OF 2

Texas Department of Transportation

Design Division Standard

TRINITY HIGHWAY ENERGY ABSORPTION CRASH CUSHION (CONCRETE BARRIER)

CATCB(1)-17

FILE: catcb17.dgn	DN: TxDOT	CK: KM	DW: BD	CK: VP
© TxDOT: 1997	CONT	SECT	JOB	HIGHWAY
REVISIONS REVISED 03,2016 VP REVISED 03,2017 KM	0106	04	036	US 380
	DIST	COUNTY		SHEET NO.
	ABL	STONEWALL		55

LEGEND:

△ GPS MONUMENT (SET)

POINT	SURFACE COORDINATES NORTHING	EASTING	ELEVATION	DESCRIPTION
PRIMARY CONTROL ESTABLISHED MAY 28, 2020				
2170001	7,130,484.58′	1,379,704.22′	1,770.66′	3 1/2" TXDOT ALUMINUM DISK SET IN CONCRETE (TYPE II)
2170002	7,131,250.28′	1,374,910.18′	1,779.42′	3 1/2" TXDOT ALUMINUM DISK SET IN CONCRETE (TYPE II)

MONUMENT INVERSE			
FROM POINT NO.	BEARING	DISTANCE	TO POINT NO.
2170001	N 80°55′32" W	4,854.80′	2170002

NOTES:

HORIZONTAL COORDINATES ARE IN U.S. SURVEY FEET BASED ON THE TEXAS COORDINATE SYSTEM OF 1983, NORTH CENTRAL ZONE 4202, NORTH AMERICAN DATUM OF 1983 (NAD83) (2011 ADJ.), EPOCH 2010.00, GEOID 12B MODEL, WITH A GRID TO SURFACE ADJUSTMENT FACTOR OF 1.000210 (STONEWALL COUNTY). PRIMARY CONTROL VALUES ARE DERIVED FROM LEVEL 2 STATIC GPS OBSERVATIONS. ELEVATIONS ARE IN U.S. SURVEY FEET BASED ON THE NORTH AMERICAN VERTICAL DATUM OF 1988 (NAVD88) DERIVED FROM LEVEL 2 STATIC GPS OBSERVATIONS. MONUMENTS HELD HORIZONTALLY AND VERTICALLY: TXDK, TXGH, AND TXPI.

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

I, THE UNDERSIGNED, A REGISTERED PROFESSIONAL LAND SURVEYOR IN THE STATE OF TEXAS, DO HEREBY CERTIFY THAT THE COORDINATE AND ELEVATION INFORMATION SHOWN WERE DERIVED FROM A SURVEY MADE ON THE GROUND UNDER MY SUPERVISION.

STATE OF TEXAS
REGISTERED
HEATH W. BROWN
6189
PROFESSIONAL
LAND SURVEYOR

Heath W. B 12-11-2020

HEATH W. BROWN DATE
RPLS NO. 6189

NO.	REVISIONS	BY	DATE

AZ&B
ARREDONDO, ZEPEDA & BRUNZ, LLC
11355 McCree Road - Dallas, Texas 75238
(214) 341-9900
FIRM REGISTRATION No. F-10098
TBPLS REGISTRATION No. 10088700

Texas Department of Transportation

SURVEY CONTROL INDEX SHEET

SHEET 1 OF 2

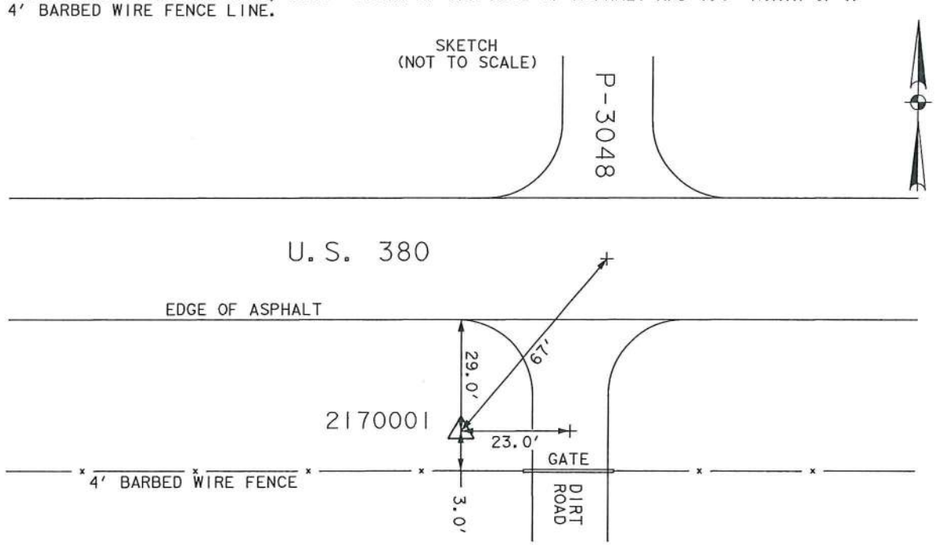
FED.RD. DIV.NO.	FEDERAL AID PROJECT NO.		SHEET NO.
6			56
STATE	DISTRICT	COUNTY	
TEXAS	ABILENE	STONEWALL	
CONTROL	SECTION	JOB	HIGHWAY NO.
0106	04	036	U.S. 380

CONTROL POINT 2170001

APPROXIMATE LOCATION:

A 3-1/2" TXDOT ALUMINUM DISK SET IN CONCRETE (TYPE II) LOCATED APPROXIMATELY 67' SOUTHWEST OF THE CENTERLINE INTERSECTION OF U.S. 380 AND P-3048, 23.0' WEST OF THE CENTERLINE OF A DIRT ROAD, 29.0' SOUTH OF THE EDGE OF ASPHALT AND 3.0' NORTH OF A 4' BARBED WIRE FENCE LINE.

SKETCH
(NOT TO SCALE)



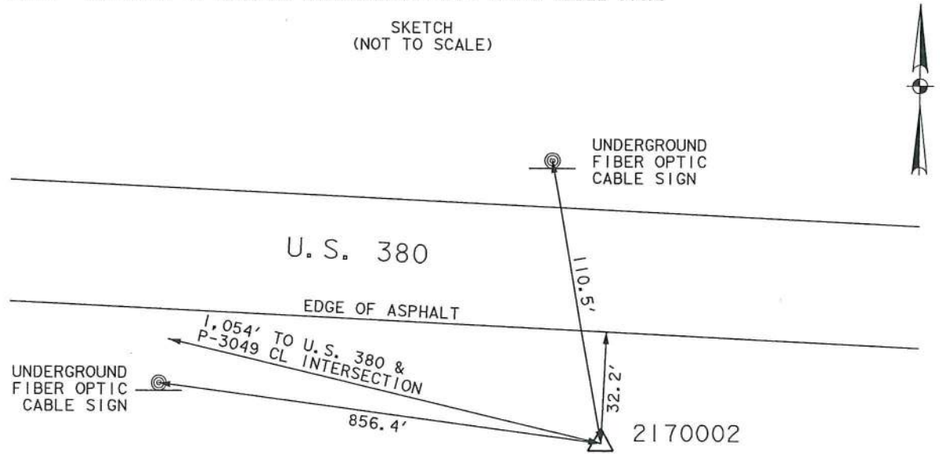
GRID NORTHING:	7,128,987.50'	SURFACE NORTHING:	7,130,484.58'
GRID EASTING:	1,379,414.54'	SURFACE EASTING:	1,379,704.22'
NAVD88 ELEVATION:	1,770.66'	NAVD88 ELEVATION:	1,770.66'

CONTROL POINT 2170002

APPROXIMATE LOCATION:

A 3-1/2" TXDOT ALUMINUM DISK SET IN CONCRETE (TYPE II) LOCATED APPROXIMATELY 1,054' SOUTHEAST OF THE CENTERLINE INTERSECTION OF U.S. 380 AND P-3049, 110.5' SOUTHEAST OF AN UNDERGROUND FIBER OPTIC CABLE SIGN, 32.2' SOUTHWEST OF THE EDGE OF ASPHALT AND 856.4' SOUTHEAST OF ANOTHER UNDERGROUND FIBER OPTIC CABLE SIGN.

SKETCH
(NOT TO SCALE)



GRID NORTHING:	7,129,753.03'	SURFACE NORTHING:	7,131,250.28'
GRID EASTING:	1,374,621.51'	SURFACE EASTING:	1,374,910.18'
NAVD88 ELEVATION:	1,779.42'	NAVD88 ELEVATION:	1,779.42'

NOTES:

HORIZONTAL COORDINATES ARE IN U.S. SURVEY FEET BASED ON THE TEXAS COORDINATE SYSTEM OF 1983, NORTH CENTRAL ZONE 4202, NORTH AMERICAN DATUM OF 1983 (NAD83) (2011 ADJ.), EPOCH 2010.00, GEOID 12B MODEL, WITH A GRID TO SURFACE ADJUSTMENT FACTOR OF 1.000210 (STONEWALL COUNTY). PRIMARY CONTROL VALUES ARE DERIVED FROM LEVEL 2 STATIC GPS OBSERVATIONS. ELEVATIONS ARE IN U.S. SURVEY FEET BASED ON THE NORTH AMERICAN VERTICAL DATUM OF 1988 (NAVD88) DERIVED FROM LEVEL 2 STATIC GPS OBSERVATIONS. MONUMENTS HELD HORIZONTALLY AND VERTICALLY: TXDK, TXGH, AND TXPI.

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Heath W. B 12-11-2020

HEATH W. BROWN
RPLS NO. 6189

DATE

NO.	REVISIONS	BY	DATE

AZ&B
ARREDONDO, ZEPEDA & BRUNZ, LLC
11355 McCree Road - Dallas, Texas 75238
(214) 341-9900
FIRM REGISTRATION No. F-10098
TBPLS REGISTRATION No. 10088700

Texas Department of Transportation

HORIZONTAL AND VERTICAL CONTROL SHEET

SHEET 2 OF 2

FED. RD. DIV. NO.	FEDERAL AID PROJECT NO.		SHEET NO.
6			57
STATE	DISTRICT	COUNTY	
TEXAS	ABILENE	STONEWALL	
CONTROL	SECTION	JOB	HIGHWAY NO.
0106	04	036	U.S. 380

100% SUBMITTAL

DATE: 4/28/2022 TIME: 6:37:32 PM

PROPOSED US 380 - HORIZONTAL ALIGNMENT

Chain 380CL contains:
CUR 380CL_1 CUR 380CL_2 CUR 380CL_5

Beginning chain 380CL description
Feature: Road_Centerline

Point 36 N 7,130,729.3432 E 1,378,353.7144 Sta 743+00.00
Course from 36 to PC 380CL_1 N 81° 50′ 58.48" W Dist 134.3654

		Curve Data			
Curve 380CL_1					
P.I. Station	745+56.96	N	7,130,765.7733	E	1,378,099.3476
Delta =	1° 15′ 56.11"	(RT)			
Degree =	0° 30′ 58.24"				
Tangent =	122.5969				
Length =	245.1839				
Radius =	11,100.0000				
External =	0.6770				
Long Chord =	245.1789				
Mid. Ord. =	0.6770				
P.C. Station	744+34.37	N	7,130,748.3925	E	1,378,220.7062
P.T. Station	746+79.55	N	7,130,785.8304	E	1,377,978.4024
C.C.		N	7,141,736.2745	E	1,379,794.3800
Back = N	81° 50′ 58.48" W				
Ahead = N	80° 35′ 02.38" W				
Chord Bear = N	81° 13′ 00.43" W				

Course from PT 380CL_1 to PC 380CL_2 N 80° 35′ 02.38" W Dist 1,230.4551

		Curve Data			
Curve 380CL_2					
P.I. Station	761+05.01	N	7,131,019.0386	E	1,376,572.1442
Delta =	1° 21′ 46.86"	(RT)			
Degree =	0° 20′ 58.17"				
Tangent =	195.0092				
Length =	390.0000				
Radius =	16,394.0359				
External =	1.1598				
Long Chord =	389.9908				
Mid. Ord. =	1.1597				
P.C. Station	759+10.00	N	7,130,987.1348	E	1,376,764.5259
P.T. Station	763+00.00	N	7,131,055.5095	E	1,376,380.5758
C.C.		N	7,147,160.2855	E	1,379,446.6161
Back = N	80° 35′ 02.38" W				
Ahead = N	79° 13′ 15.51" W				
Chord Bear = N	79° 54′ 08.94" W				

STATE OF TEXAS
JENELLE N. ROMERO
97940
LICENSED
PROFESSIONAL ENGINEER
Jenelle N. Romero, P.E.
4/28/2022

ATKINS
TBPE REG. # F-474

Texas Department of Transportation
Abilene District

US 380

HORIZONTAL ALIGNMENT DATA

SHEET 1 OF 1

DESIGNED: SG	FED. RD DIV. No.	STATE	PROJECT No.			HIGHWAY No.
CHECKED: JNR	6	TEXAS	SEE TITLE SHEET			US 380
DRAWN: SG	STATE DISTRICT	COUNTY	CONTROL No.	SECTION No.	JOB No.	SHEET No.
CHECKED: JNR	ABL	STONEWALL	0106	04	036	58

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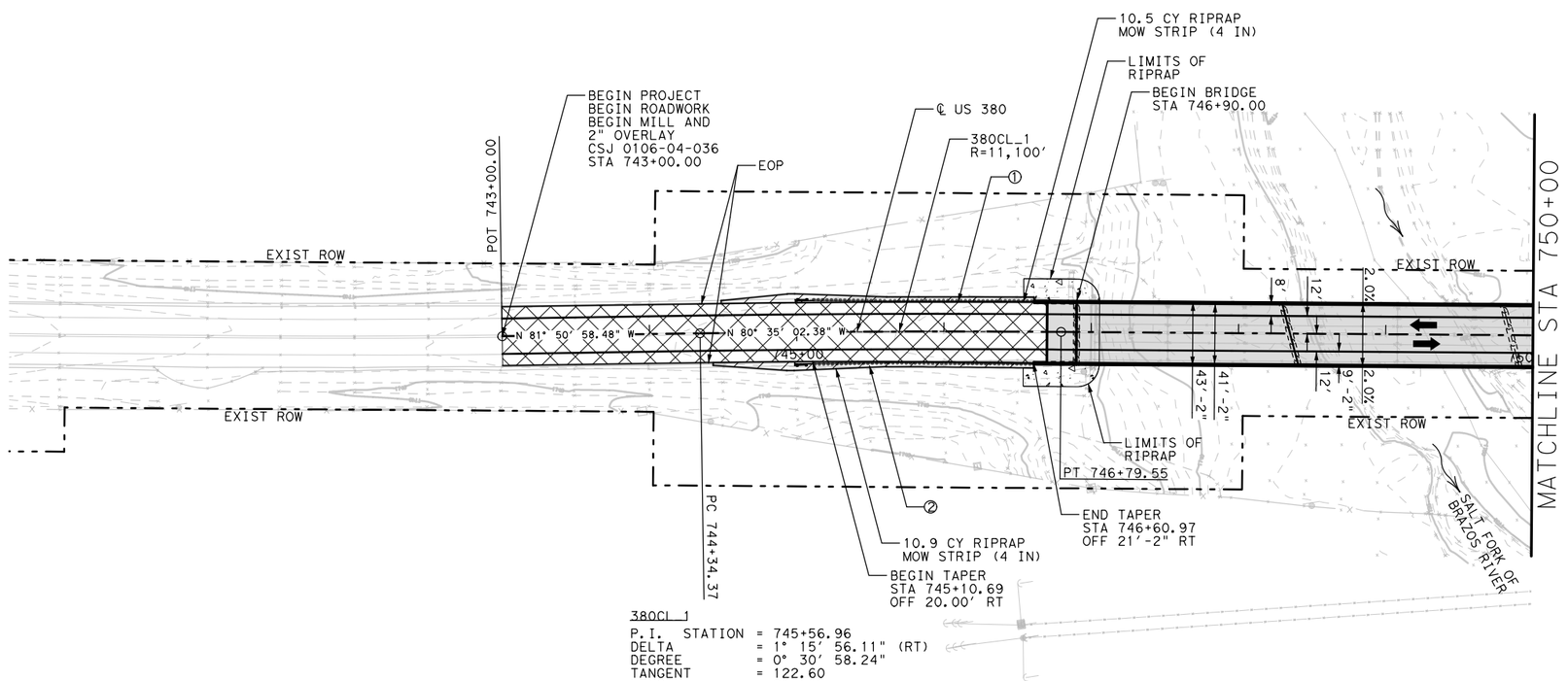
100% SUBMITTAL

DATE: 4/28/2022 TIME: 6:37:39 PM

① 1 GET
150 LF MBGF
1 MBGF TRANS (THRIE-BM)

② 1 GET
150 LF MBGF
1 MBGF TRANS (THRIE-BM)



380CL_1

P.I.	STATION	= 745+56.96
DELTA		= 1° 15' 56.11" (RT)
DEGREE		= 0° 30' 58.24"
TANGENT		= 122.60
LENGTH		= 245.18
RADIUS		= 11,100.00
P.C.	STATION	= 744+34.37
P.T.	STATION	= 746+79.55

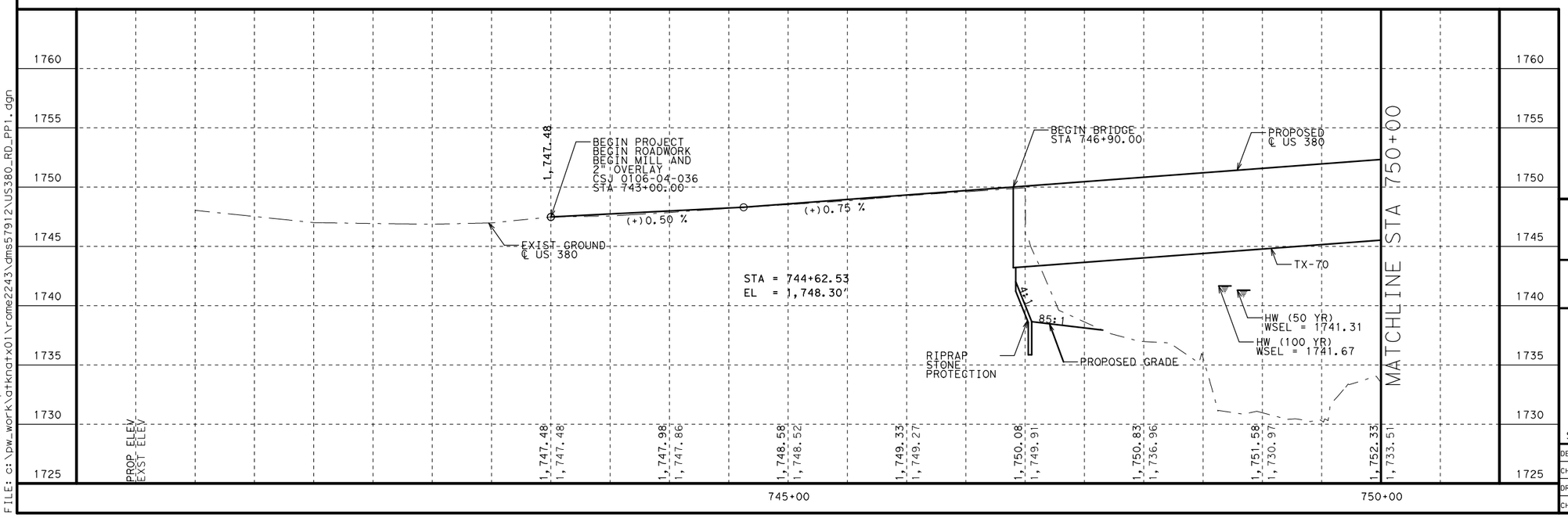
NOTES:

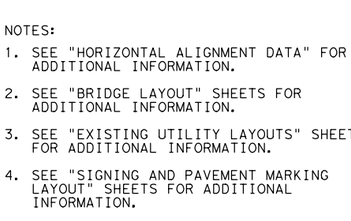
1. SEE "HORIZONTAL ALIGNMENT DATA" FOR ADDITIONAL INFORMATION.
2. SEE "BRIDGE LAYOUT" SHEETS FOR ADDITIONAL INFORMATION.
3. SEE "EXISTING UTILITY LAYOUTS" SHEETS FOR ADDITIONAL INFORMATION.
4. SEE "SIGNING AND PAVEMENT MARKING LAYOUT" SHEETS FOR ADDITIONAL INFORMATION.

LEGEND

- EXISTING ROW
- TRAFFIC DIRECTION
- FULL RECONSTRUCTION
- MILL AND OVERLAY
- PROPOSED MBGF
- MOW STRIP
- PROPOSED RIPRAP
- FLOW DIRECTION

0 25 50 100
SCALE = 1"=100' H





ATKINS
TBPE REG. # F-474

Texas Department of Transportation
Abilene District

US 380

PLAN & PROFILE
BEGIN TO STA 750+00

SCALE: 1"=100'H, 1"=10'V SHEET 1 OF 3

DESIGNED: SG	FED. RD DIV. No.	STATE	PROJECT No.			HIGHWAY No.
CHECKED: JNR	6	TEXAS	SEE TITLE SHEET			US 380
DRAWN: SG	STATE DISTRICT	COUNTY	CONTROL No.	SECTION No.	JOB No.	SHEET No.
CHECKED: JNR	ABL	STONEWALL	0106	04	036	59

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100% SUBMITTAL

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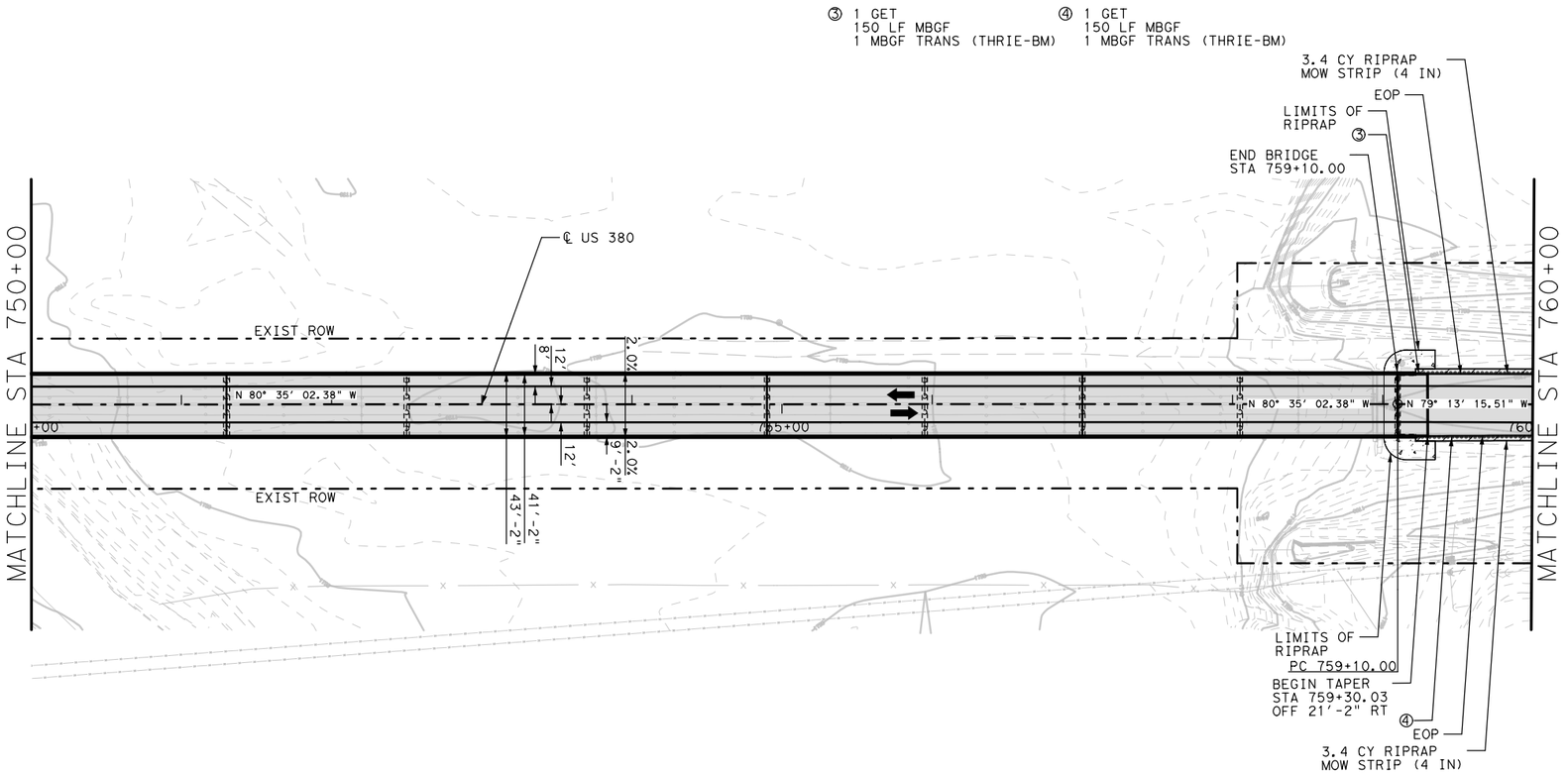


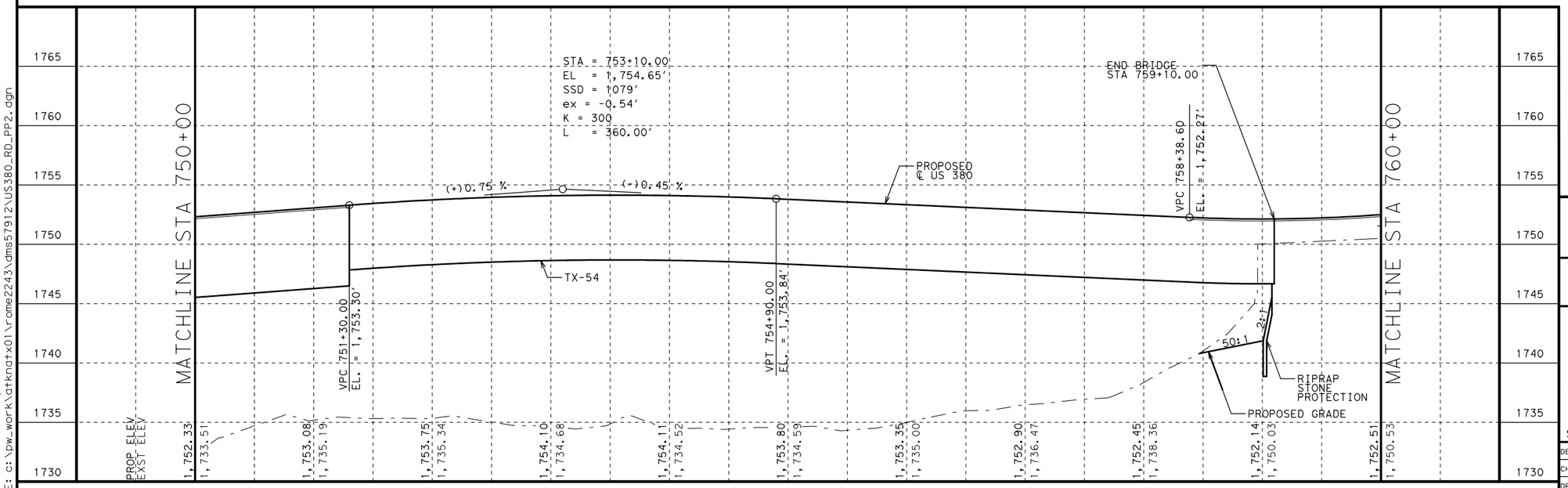
NOTES:

1. SEE "HORIZONTAL ALIGNMENT DATA" FOR ADDITIONAL INFORMATION.
2. SEE "BRIDGE LAYOUT" SHEETS FOR ADDITIONAL INFORMATION.
3. SEE "EXISTING UTILITY LAYOUTS" SHEETS FOR ADDITIONAL INFORMATION.
4. SEE "SIGNING AND PAVEMENT MARKING LAYOUT" SHEETS FOR ADDITIONAL INFORMATION.

LEGEND

- EXISTING ROW
- TRAFFIC DIRECTION
- FULL RECONSTRUCTION
- MILL AND OVERLAY
- PROPOSED MBGF
- MOW STRIP
- PROPOSED RIPRAP
- FLOW DIRECTION

0 25 50 100
SCALE = 1"=100' H



JENELLE N. ROMERO
97940
LICENSED
PROFESSIONAL ENGINEER
STATE OF TEXAS
4/28/2022

ATKINS
TBPE REG. # F-474

Texas Department of Transportation
Abilene District
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US 380

PLAN & PROFILE
STA 750+00 TO STA 760+00

SCALE: 1"=100'H, 1"=10'V SHEET 2 OF 3

DESIGNED: SG	FED. RD DIV. No.	STATE	PROJECT No.			HIGHWAY No.
CHECKED: JNR	6	TEXAS	SEE TITLE SHEET			US 380
DRAWN: SG	STATE DISTRICT	COUNTY	CONTROL No.	SECTION No.	JOB No.	SHEET No.
CHECKED: JNR	ABL	STONEWALL	0106	04	036	60

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100% SUBMITTAL

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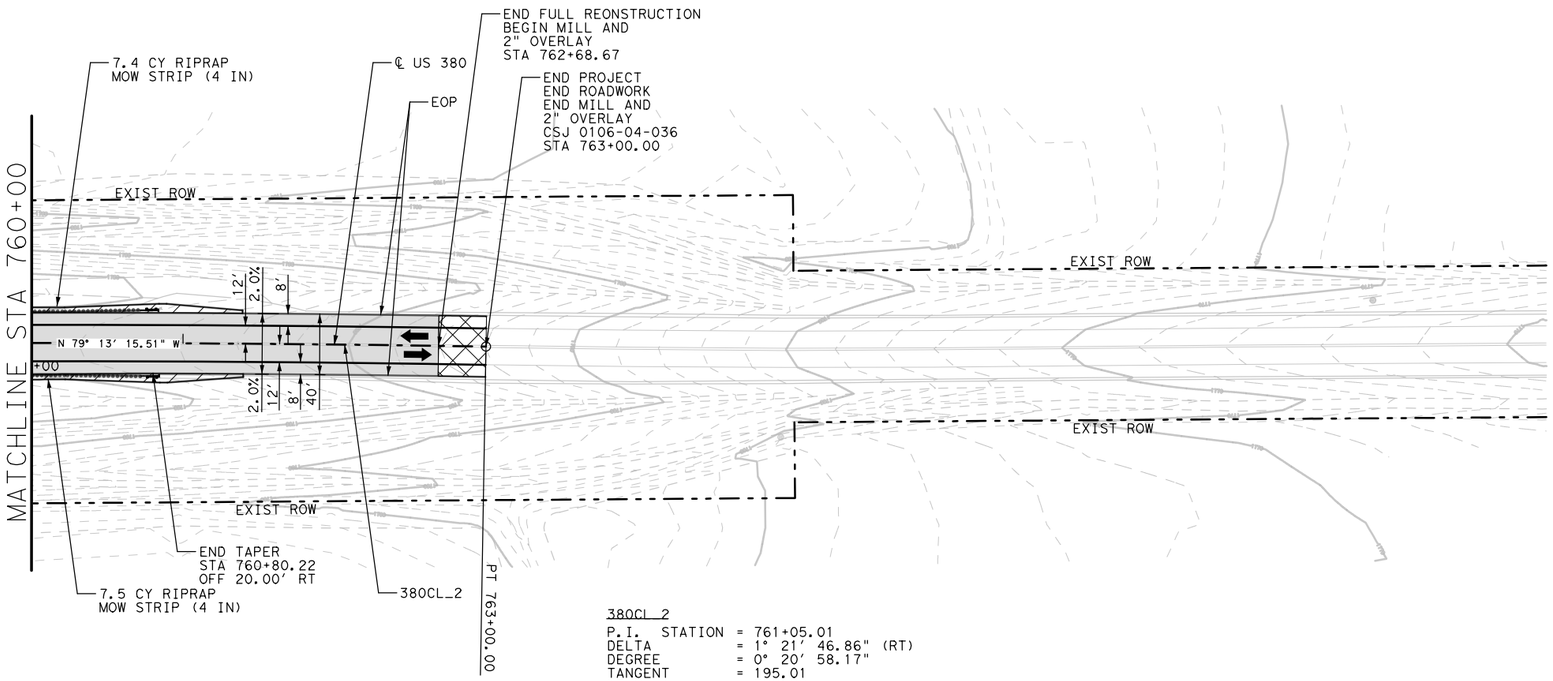


380CL_2

P.I. STATION	= 761+05.01
DELTA	= 1° 21' 46.86" (RT)
DEGREE	= 0° 20' 58.17"
TANGENT	= 195.01
LENGTH	= 390.00
RADIUS	= 16,394.04
P.C. STATION	= 759+10.00
P.T. STATION	= 763+00.00

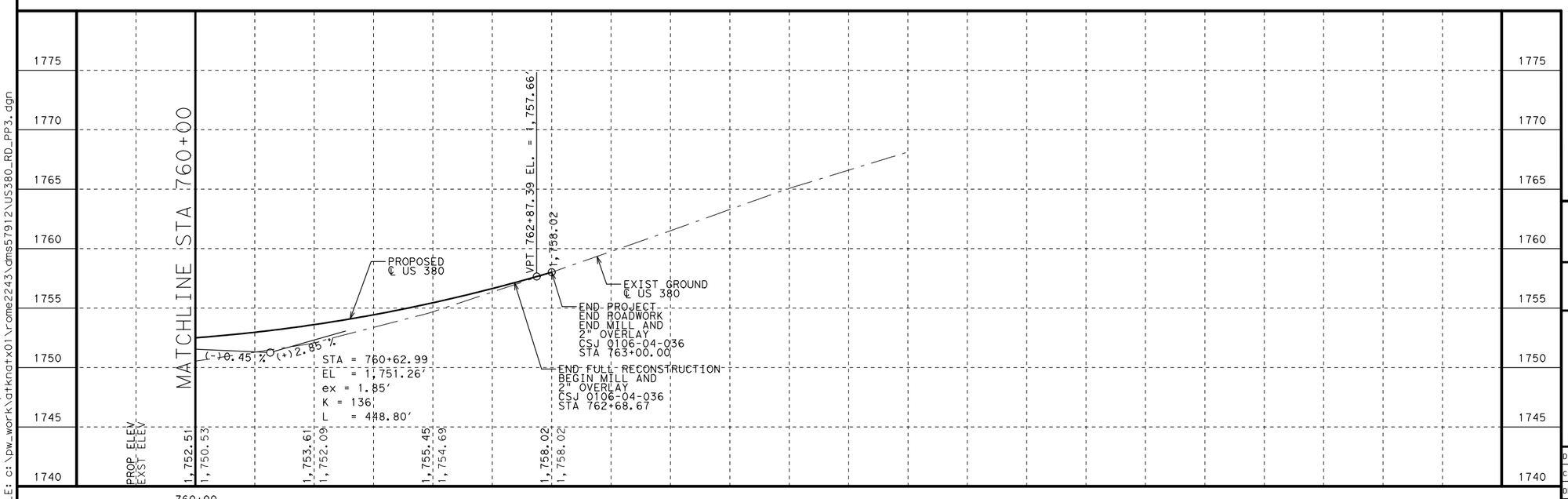
NOTES:

1. SEE "HORIZONTAL ALIGNMENT DATA" FOR ADDITIONAL INFORMATION.
2. SEE "BRIDGE LAYOUT" SHEETS FOR ADDITIONAL INFORMATION.
3. SEE "EXISTING UTILITY LAYOUTS" SHEETS FOR ADDITIONAL INFORMATION.
4. SEE "SIGNING AND PAVEMENT MARKING LAYOUT" SHEETS FOR ADDITIONAL INFORMATION.

LEGEND

- EXISTING ROW
- TRAFFIC DIRECTION
- FULL RECONSTRUCTION
- MILL AND OVERLAY
- PROPOSED MBGF
- MOW STRIP
- PROPOSED RIPRAP
- FLOW DIRECTION

0 25 50 100
SCALE = 1"=100' H



ATKINS
TBPE REG. # F-474

Texas Department of Transportation
Abilene District

US 380

PLAN & PROFILE
STA 760+00 TO END

SCALE: 1"=100'H, 1"=10'V SHEET 3 OF 3

DESIGNED: SG	FED. RD DIV. No.	STATE	PROJECT No.			HIGHWAY No.	
CHECKED: JNR	6	TEXAS	SEE TITLE SHEET			US 380	
DRAWN: SG	STATE DISTRICT	COUNTY	CONTROL No.	SECTION No.	JOB No.	SHEET No.	
CHECKED: JNR	ABL	STONEWALL	0106	04	036	61	

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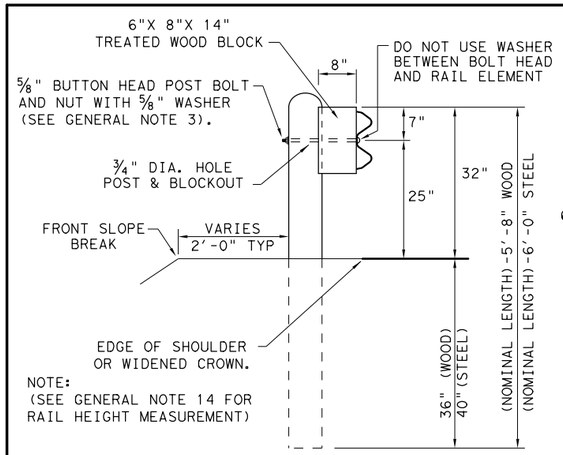
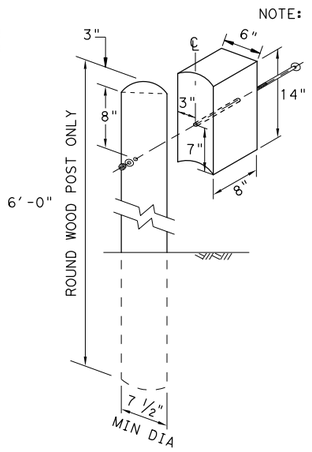
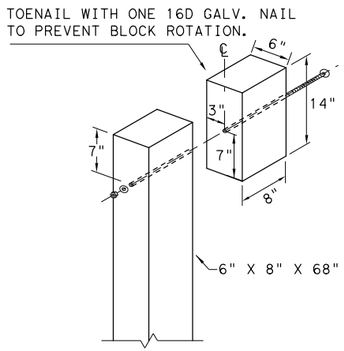


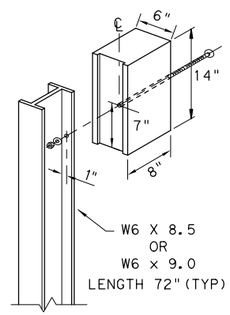
TYPICAL POST PLACEMENT



WOOD BLOCK TO ROUND WOOD POST

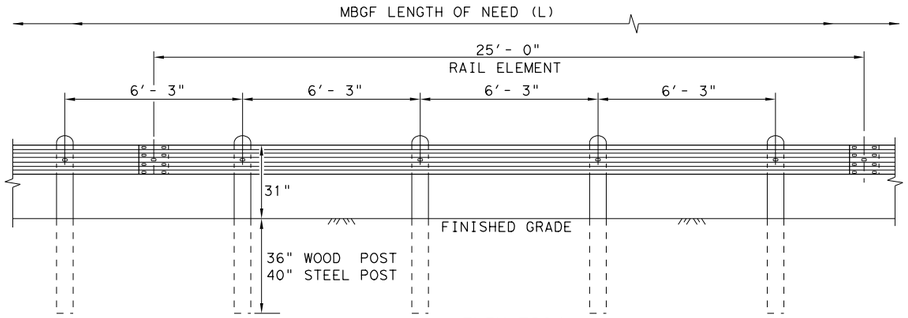


WOOD BLOCK TO RECTANGULAR WOOD POST



ROUTED WOOD BLOCK TO I-BEAM STEEL POST

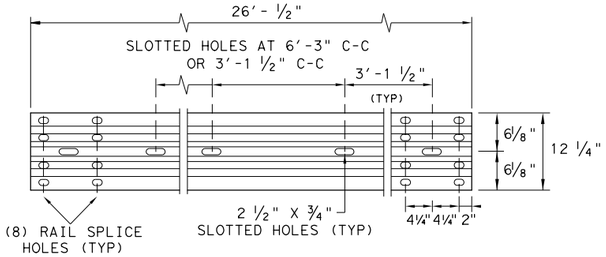
NOTE: ✳✳ "WOOD" INDICATES DIMENSIONS FOR BOTH ROUND AND RECTANGULAR WOOD POST SYSTEMS.



DIRECTION OF TRAFFIC

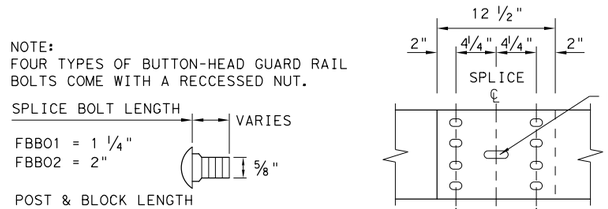
ELEVATION
MID-SPAN RAIL SPLICE

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



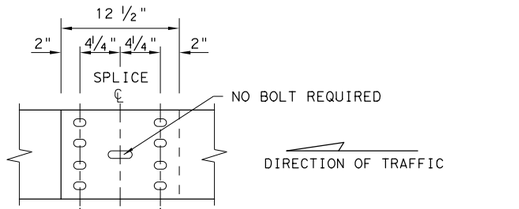
ELEVATION 25'- 0"(NOM.) W-BEAM SECTION

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



BUTTON HEAD BOLT

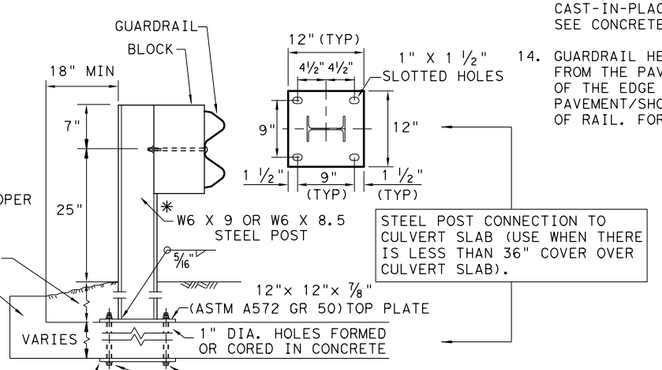
NOTE: SEE GENERAL NOTE 3 FOR SPLICE & POST BOLT DETAILS.



DIRECTION OF TRAFFIC

MID-SPAN RAIL SPLICE DETAIL

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



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

STEEL POST CONNECTION TO CULVERT SLAB (USE WHEN THERE IS LESS THAN 36" COVER OVER CULVERT SLAB).

12" X 12" X ¼"(ASTM A36) STEEL BOTTOM PLATE WITH 1" DIA. HOLES REQUIRED WITH BOLT-THROUGH INSTALLATION.

LOW FILL CULVERT POST

NOTE: TWO INSTALLATION OPTIONS.

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

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

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

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

GENERAL NOTES

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

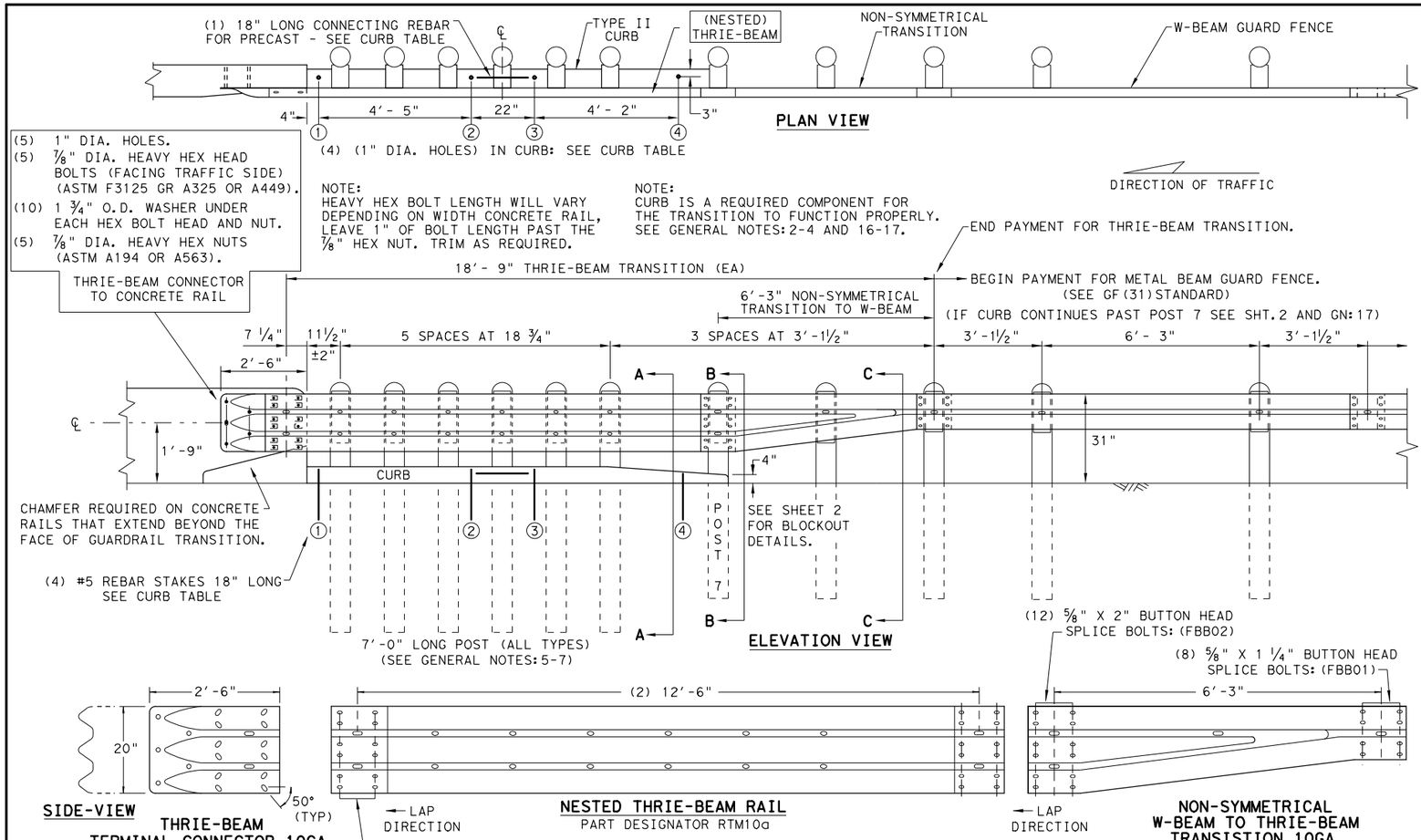
Texas Department of Transportation

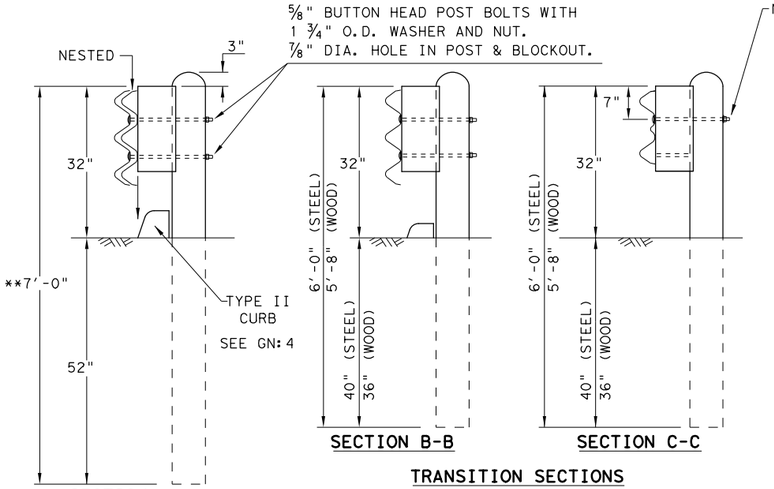
Design Division Standard

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

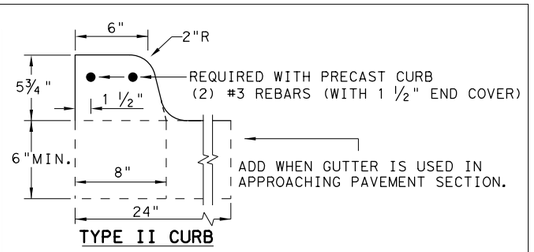
FILE: gf3119.dgn	DN: TxDOT	CK: KM	DW: VP	CK: CGL/AG
©TxDOT: NOVEMBER 2019	CONT	SECT	JOB	HIGHWAY
REVISIONS	0106	04	036	US 380
	DIST	COUNTY		SHEET NO.
	ABL	STONEWALL		62

DATE: 4/28/2022
FILE: c:\pw_work\dthdnatx01\rome2243\dms57913\gf31trt1320.dgn





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



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

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

TYPE II CURB DETAILS

GENERAL NOTES

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

HIGH-SPEED TRANSITION

SHEET 1 OF 2

Texas Department of Transportation | Design Division Standard

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

GF(31)TR TL3-20

FILE: gf31trt1320.dgn	DN: TxDOT	CK: KM	DW: VP	CK: CGL/AG
©TxDOT: NOVEMBER 2020	CONT	SECT	JOB	HIGHWAY
REVISIONS	0106	04	036	US 380
	DIST	COUNTY		SHEET NO.
	ABL	STONEWALL		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: 4/28/2022
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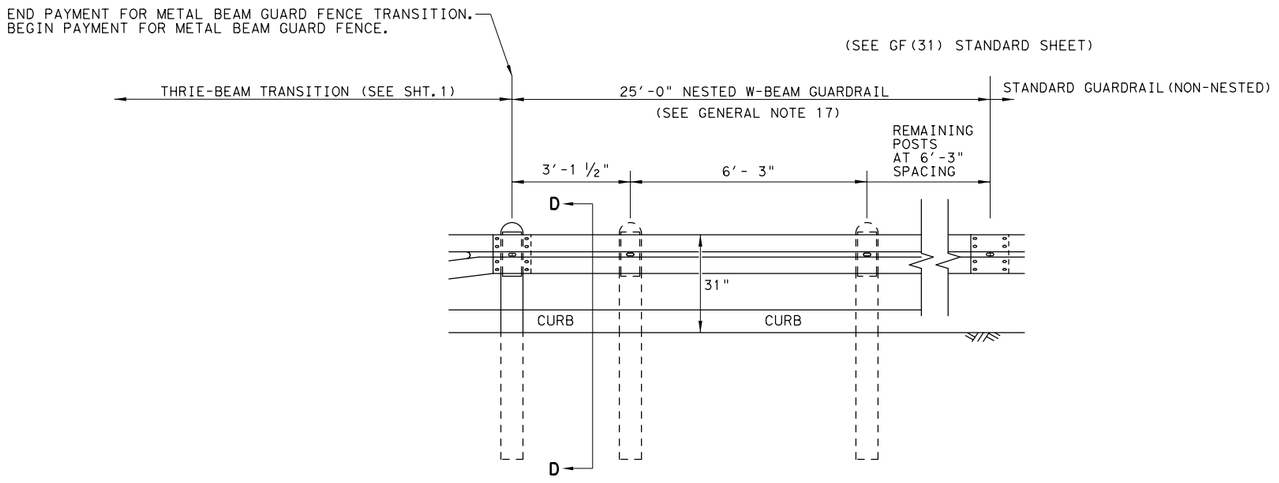
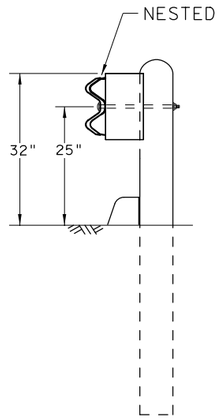
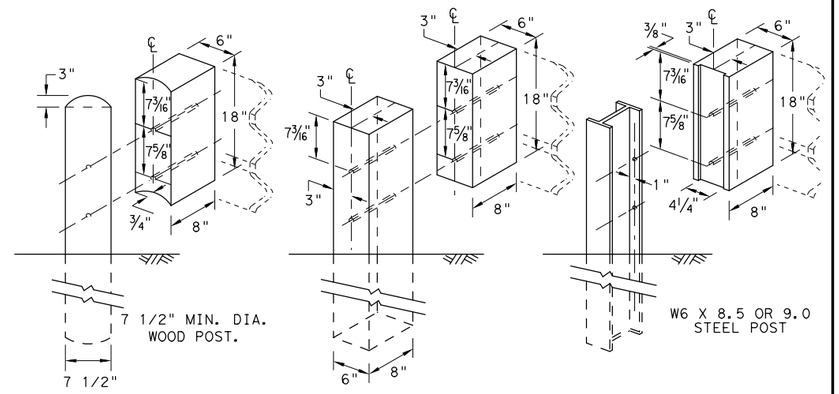
REQUIRED ALTERNATIVE FOR CONTINUOUS CURB EXTENDING PAST POST 7 (SEE SHT. 1 GENERAL NOTE 17)



ELEVATION VIEW



SECTION D-D



THRIE BEAM TRANSITION BLOCKOUT DETAILS

HIGH-SPEED TRANSITION

SHEET 2 OF 2

Texas Department of Transportation | Design Division Standard

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

GF(31)TR TL3-20

FILE: gf31tr11320.dgn	DN: TxDOT	CK: KM	DW: KM	CK: CGL/AG	
©TxDOT: NOVEMBER 2020	CONT	SECT	JOB	HIGHWAY	
REVISIONS	0106	04	036	US 380	
	DIST	COUNTY		SHEET NO.	
	ABL	STONEWALL		64	

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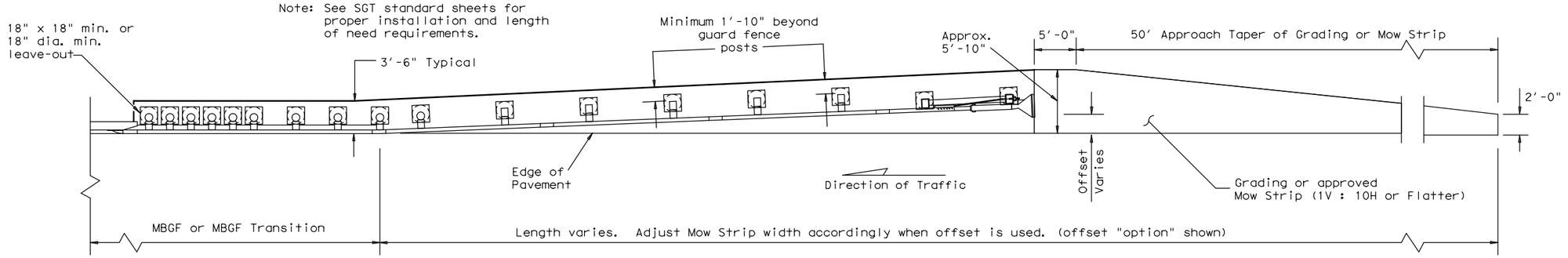
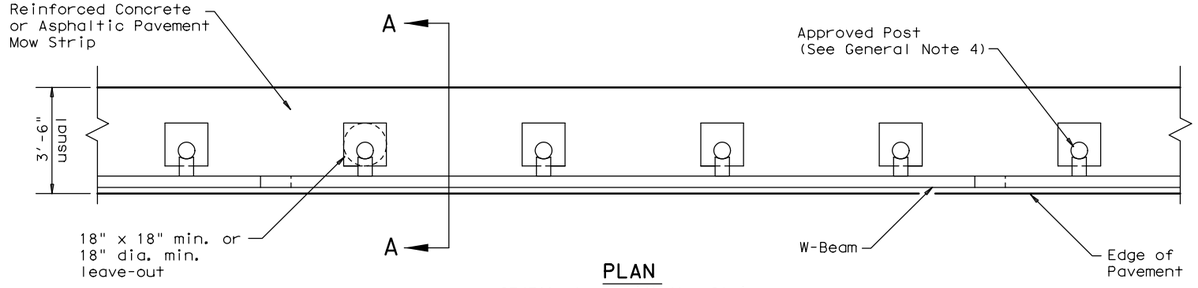
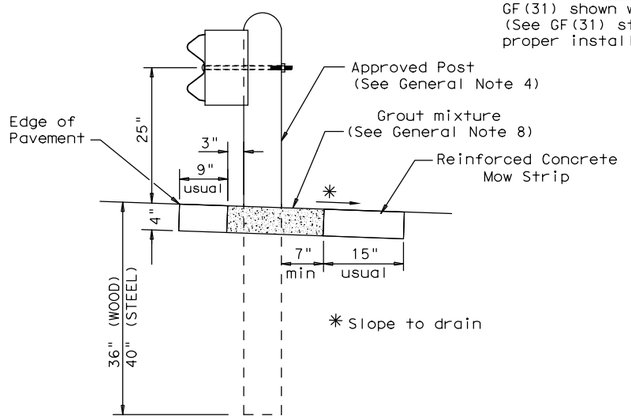


GRADING AND MOW STRIP AT GUARDRAIL END TREATMENTS



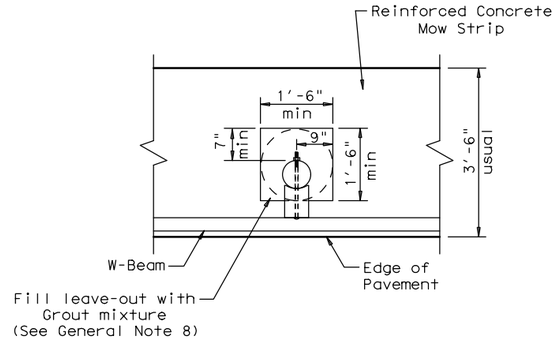
PLAN

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



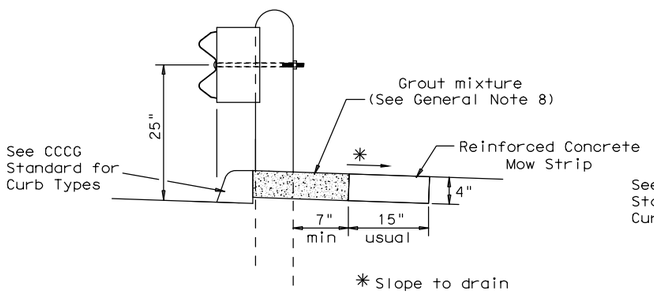
SECTION A-A

Typical



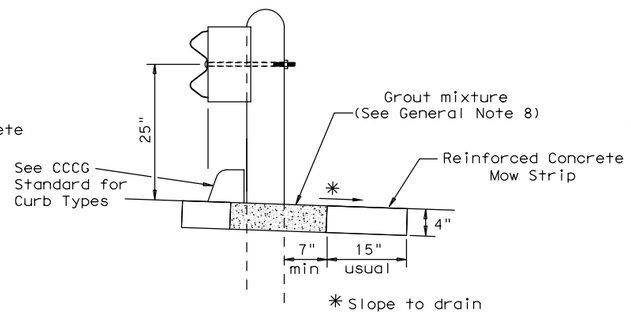
MOW STRIP DETAIL

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



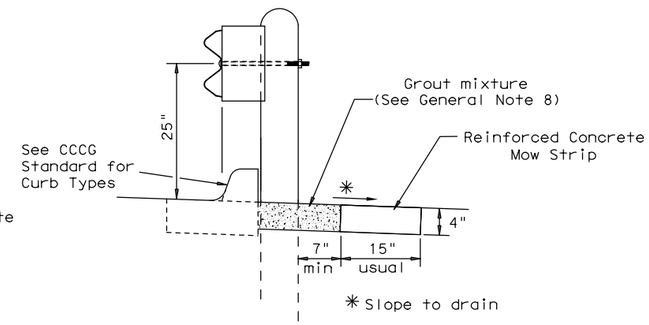
CURB OPTION (1)

This option will increase the post embedment throughout the system.



CURB OPTION (2)

Curb shown on top of mow strip



CURB OPTION (3)

Note: Site Condition(s)

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

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

GENERAL NOTES

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

Texas Department of Transportation

Design Division Standard

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

GF(31)MS-19

FILE: gf31ms19.dgn	DN: TxDOT	CK: KM	DW: VP	CK: CGL/AG
©TxDOT: NOVEMBER 2019	CONT	SECT	JOB	HIGHWAY
REVISIONS	0106	04	036	US 380
	DIST	COUNTY		SHEET NO.
	ABL	STONEWALL		65

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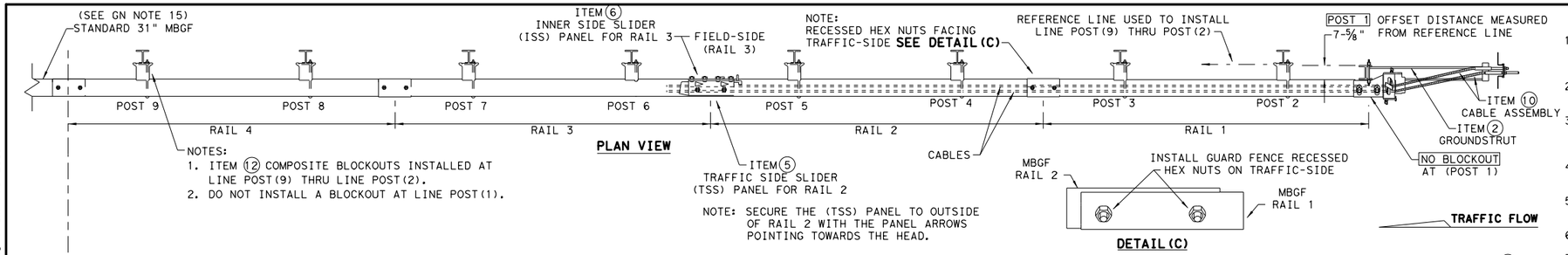

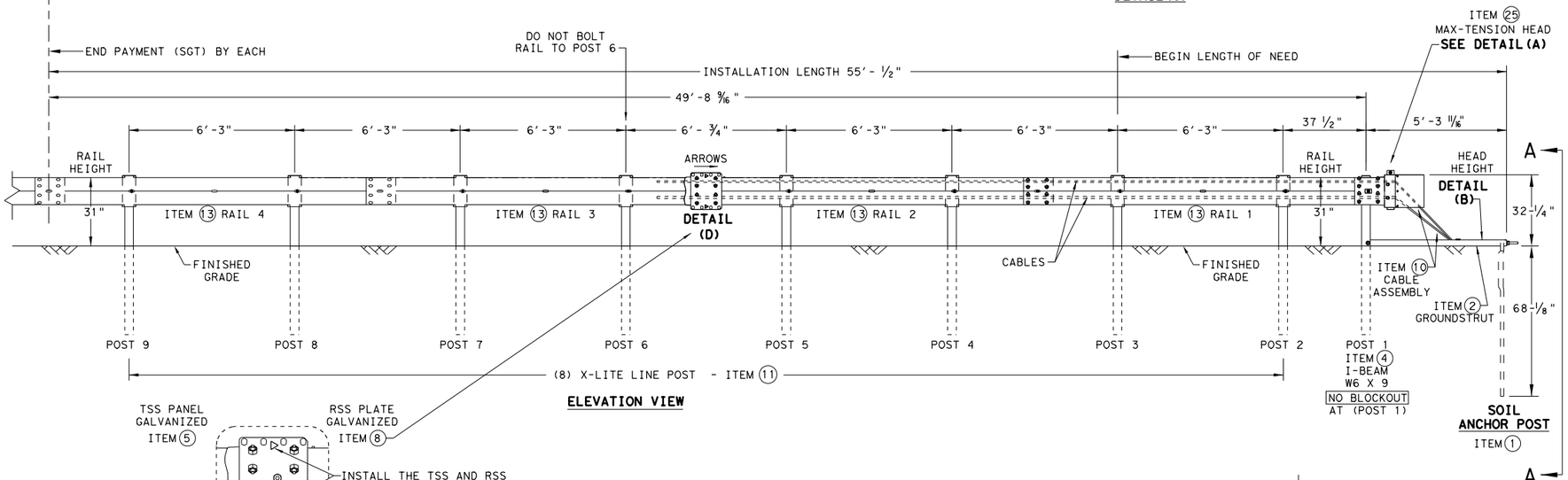

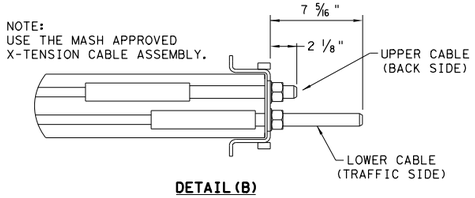

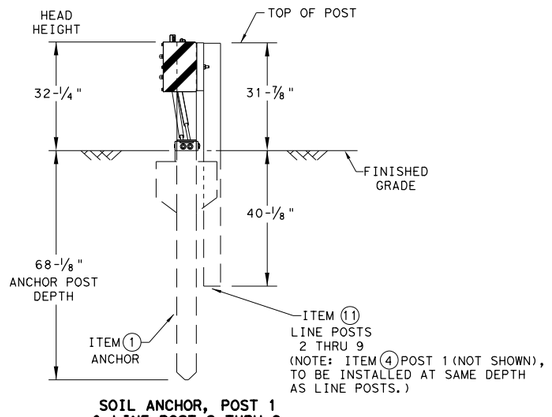

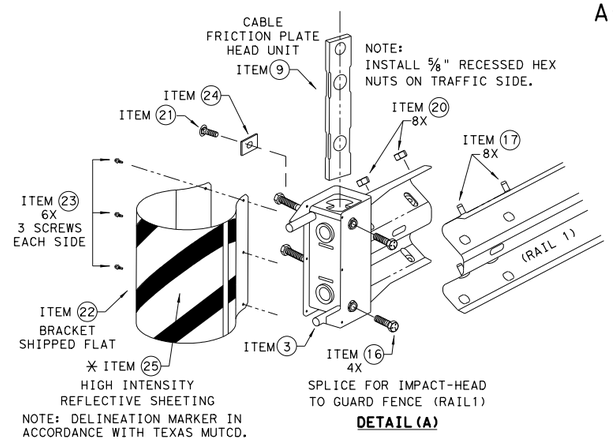

GENERAL NOTES

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

ITEM #	PART NUMBER	DESCRIPTION	QTY
1	BSI-1610060-00	SOIL ANCHOR - GALVANIZED	1
2	BSI-1610061-00	GROUND STRUT - GALVANIZED	1
3	BSI-1610062-00	MAX-TENSION IMPACT HEAD	1
4	BSI-1610063-00	W6x9 I-BEAM POST 6FT.-GALVANIZED	1
5	BSI-1610064-00	TSS PANEL - TRAFFIC SIDE SLIDER	1
6	BSI-1610065-00	ISS PANEL - INNER SIDE SLIDER	1
7	BSI-1610066-00	TOOTH - GEOMET	1
8	BSI-1610067-00	RSS PLATE - REAR SIDE SLIDER	1
9	B061058	CABLE FRICTION PLATE - HEAD UNIT	1
10	BSI-1610069-00	CABLE ASSEMBLY - MASH X-TENSION	2
11	BSI-1012078-00	X-LITE LINE POST-GALVANIZED	8
12	B090534	8" W-BEAM COMPOSITE-BLOCKOUT XT110	8
13	BSI-4004386	12'-6" W-BEAM GUARD FENCE PANELS 12GA.	4
14	BSI-1102027-00	X-LITE SQUARE WASHER	1
15	BSI-2001886	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 FWR03	1
* 25	SEE NOTE BELOW	HIGH INTENSITY REFLECTIVE SHEETING	1
** 26	4002337	8" W-BEAM TIMBER-BLOCKOUT, PDB01B	8
** 27	BSI-4004431	25' W-BEAM GUARDRAIL PANEL,8-SPACE,12GA.	2
28	MANMAX Rev-(D)	MAX-TENSION INSTALLATION INSTRUCTIONS	1

* TO BE PROVIDED BY DISTRIBUTOR OR CONTRACTOR.

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

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	0106	04	036	US 380
	DIST	COUNTY		SHEET NO.
	ABL	STONEWALL		66

DATE: 4/28/2022
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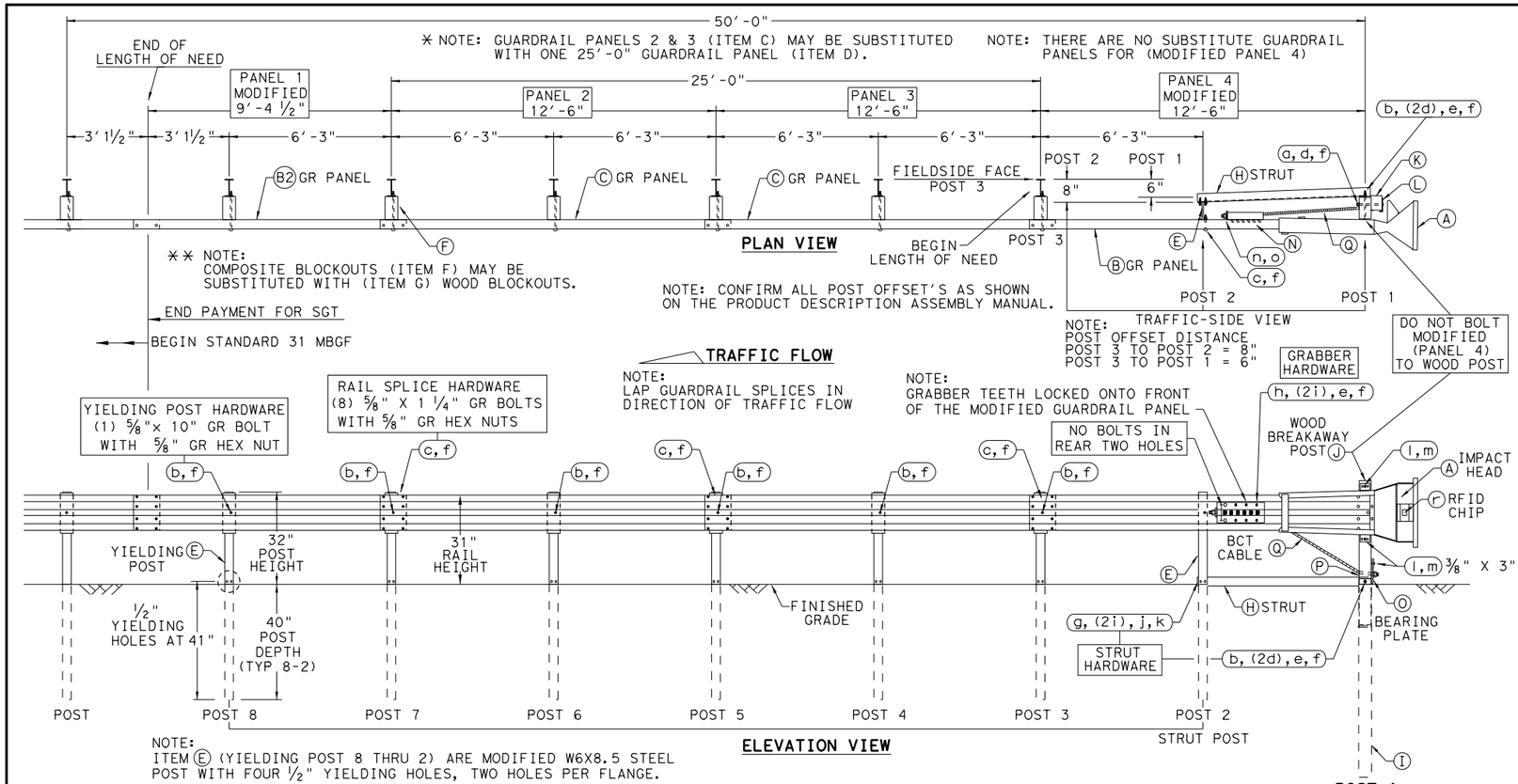
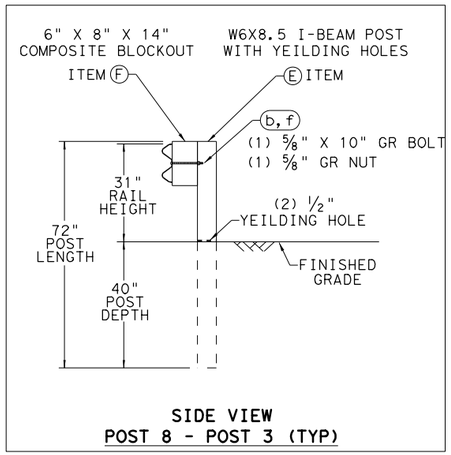


GENERAL NOTES

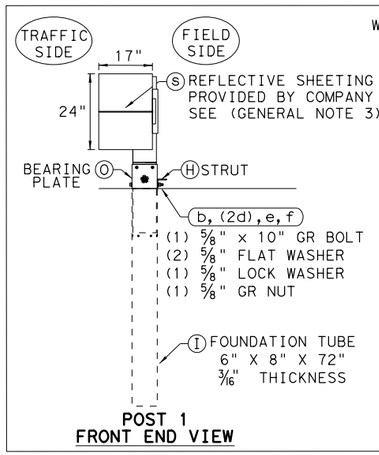
1. FOR SPECIFIC INFORMATION REGARDING INSTALLATION AND TECHNICAL GUIDANCE OF THE SYSTEM, CONTACT: SPIG INDUSTRY, INC. AT 1(267) 644-9510. 14675 INDUSTRIAL PARK RD; BRISTOL, VA 24202
2. FOR INSTALLATION, REPAIR AND MAINTENANCE REFER TO THE MANUFACTURER'S; SGET END TERMINAL, PRODUCT DESCRIPTION ASSEMBLY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

ITEM	QTY	MAIN SYSTEM COMPONENTS	ITEM #
A	1	SGET IMPACT HEAD	SIH1A
B	1	MODIFIED GUARDRAIL PANEL 12'-6" 12GA	126SPZGP
B2	1	MODIFIED GUARDRAIL PANEL 9'-4 1/2" 12GA	GP94
C	2	STANDARD GUARDRAIL PANEL 12'-6" 12GA	GP126
D	1	STANDARD GUARDRAIL PANEL 25'-0" 12GA	GP25
E	7	MODIFIED YIELDING I-BEAM POST W6x8.5	YP6MOD
F	6	COMPOSITE BLOCKOUT 6" X 8" X 14"	CBO8
G	6	WOOD BLOCKOUT 6" X 8" X 14"	WBO8
H	1	STRUT 3" X 3" X 80" x 1/4" A36 ANGLE	STR80
I	1	FOUNDATION TUBE 6" X 8" X 72" x 3/16"	FNDT6
J	1	WOOD BREAKAWAY POST 5 1/2" x 7 1/2" x 50"	WBRK50
K	1	WOOD STRIKE BLOCK	WSBLK14
L	1	STRIKE PLATE 1/4" A36 BENT PLATE	SPLT8
M	1	REINFORCEMENT PLATE 12 GA. GR55	REPLT17
N	1	GUARDRAIL GRABBER 2 1/2" X 2 1/2" X 16 1/2"	GGR17
O	1	BEARING PLATE 8" X 8 5/8" X 5/8" A36	BPLT8
P	1	PIPE SLEEVE 4 1/4" X 2 3/8" O.D. (2 1/8" I.D.)	PSLV4
Q	1	BCT CABLE 3/4" X 81" LENGTH	CBL81
		SMALL HARDWARE	
a	1	5/8" X 12" GUARDRAIL BOLT 307A HDG	12GRBLT
b	7	5/8" X 10" GUARDRAIL BOLT 307A HDG	10GRBLT
c	33	5/8" X 1 1/4" GR SPLICE BOLTS 307A HDG	1GRBLT
d	3	5/8" FLAT WASHER F436 A325 HDG	58FW436
e	1	5/8" LOCK WASHER HDG	58LW
f	39	5/8" GUARDRAIL HEX NUT HDG	58HN563
g	2	1/2" X 2" STRUT BOLT A325 HDG	2BLT
h	6	1/2" X 1 1/4" PLATE BOLT A325 HDG	125BLT
i	16	1/2" FLAT WASHER F436 A325 HDG	12FWF436
j	8	1/2" LOCK WASHER HDG	12LW
k	8	1/2" HEX NUT A563 HDG	12HN563
l	4	3/8" X 3" HEX LAG SCREW GR5 HDG	38LS
m	4	3/8" FLAT WASHER F436 A325 HDG	38FW844
n	2	1" FLAT WASHER F436 A325 HDG	1FWF436
o	2	1" HEX NUT A563DH HDG	1HN563
p	1	18" TO 24" LONG ZIP TIE RATED 175-200LB	ZPT18
q	1	1 1/2" X 4" SCH-40 PVC PIPE	PSPCR4
r	1	RFID CHIP RATED MIL-STD-810F	RFID810F
s	1	IMPACT HEAD REFLECTIVE SHEETING	RS30M

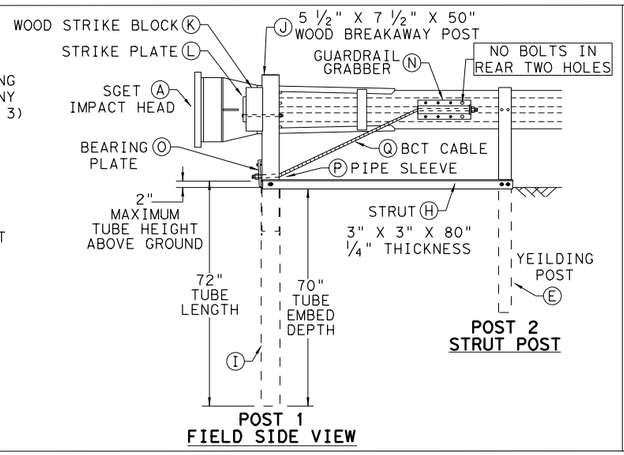
ALTERNATIVE ITEMS
NOTE: SEE PLAN VIEW
* D
** G



SIDE VIEW
POST 8 - POST 3 (TYP)

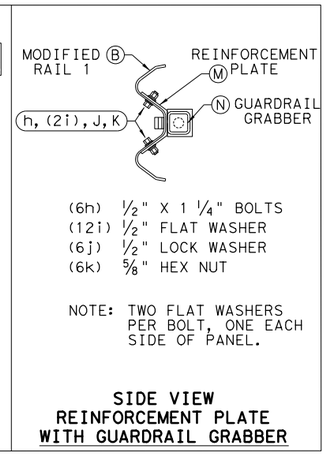


POST 1
FRONT END VIEW

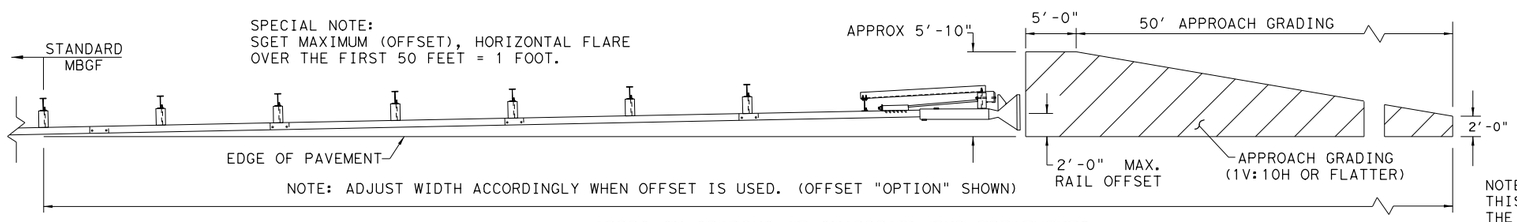


POST 1
FIELD SIDE VIEW

POST 2
STRUT POST



SIDE VIEW
REINFORCEMENT PLATE
WITH GUARDRAIL GRABBER



APPROACH GRADING AT GUARDRAIL END TREATMENTS

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

Texas Department of Transportation
Design Division Standard

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

FILE: sgt153120.dgn	DN: TxDOT	CK: KM	DW: VP	CK: VP		
© TxDOT: APRIL 2020	CONT	SECT	JOB	HIGHWAY		
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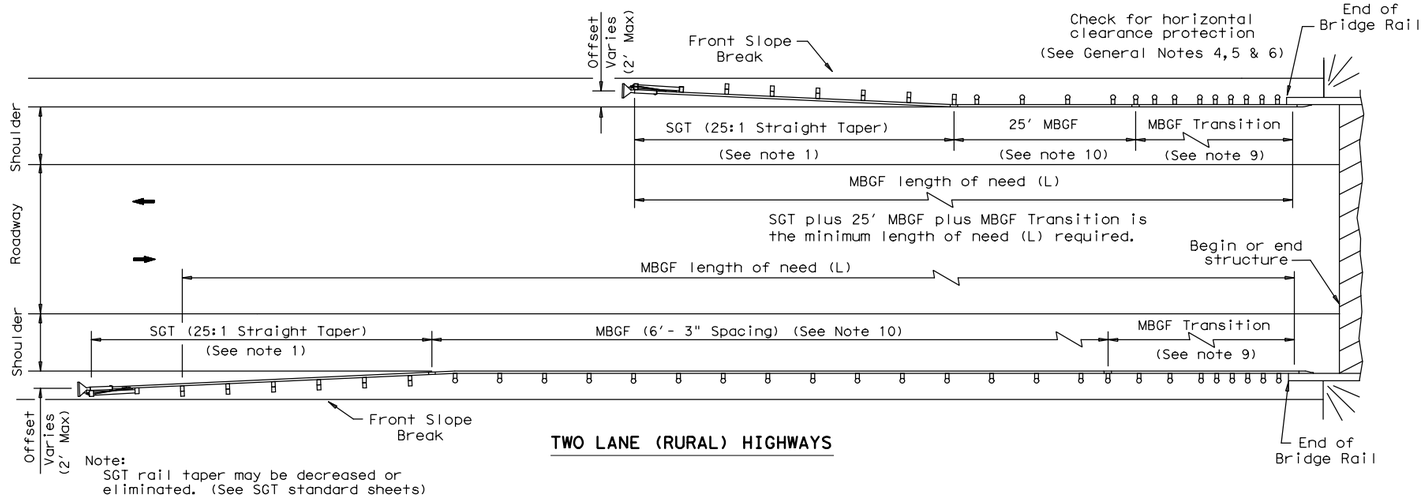
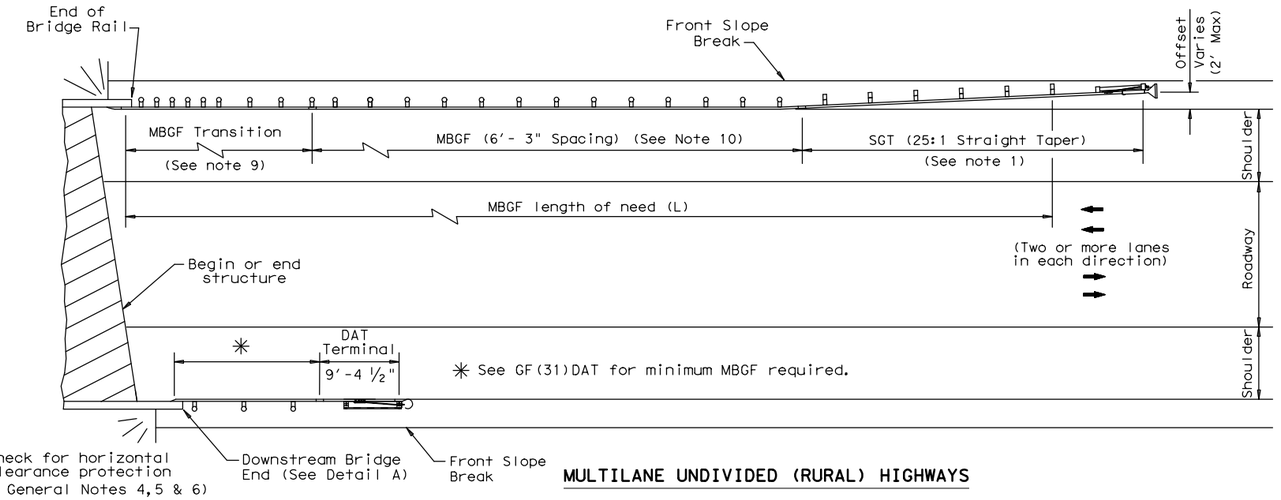
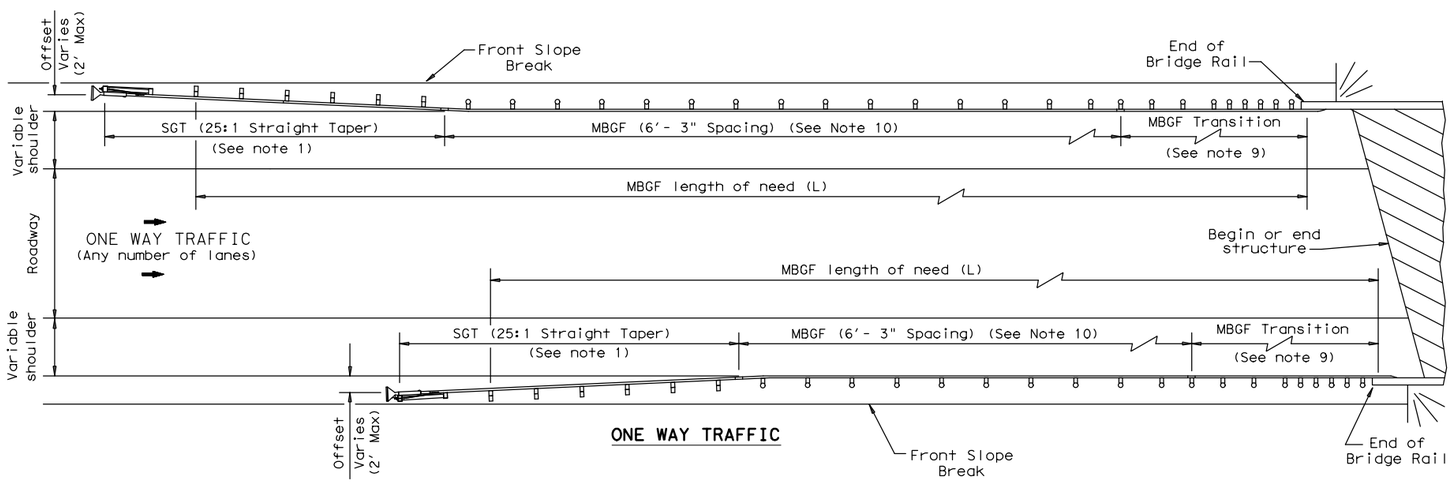


TWO LANE (RURAL) HIGHWAYS

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



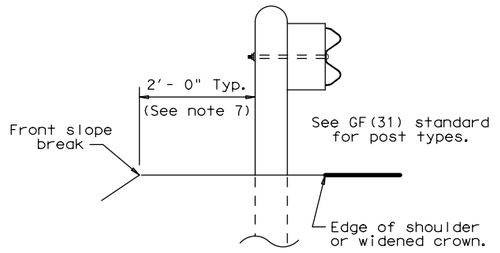
MULTILANE UNDIVIDED (RURAL) HIGHWAYS



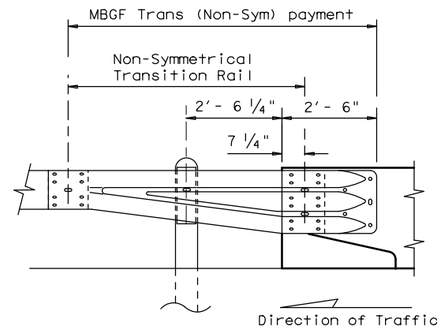
ONE WAY TRAFFIC

GENERAL NOTES

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



TYPICAL CROSS SECTION AT MBGF



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

DETAIL A

Showing Downstream Rail Attachment

Texas Department of Transportation — Design Division Standard

BRIDGE END DETAILS

(METAL BEAM GUARD FENCE APPLICATIONS TO RIGID RAILS)

BED-14

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©TxDOT: December 2011	CONT	SECT	JOB	HIGHWAY
REVISIONS REVISED APRIL 2014 SEE (MEMO 0414)	0106	04	036	US 380
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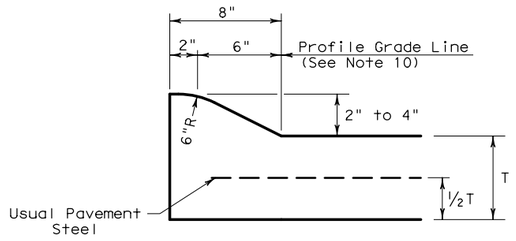
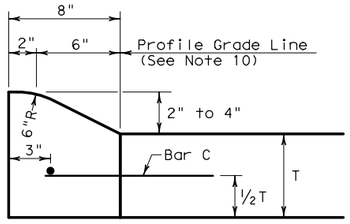


TYPE I CURB (MONOLITHIC)
2" - 4" HEIGHT



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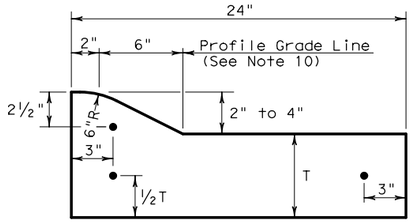
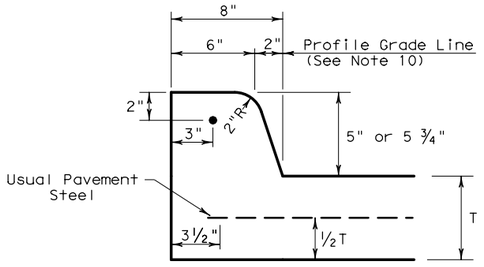
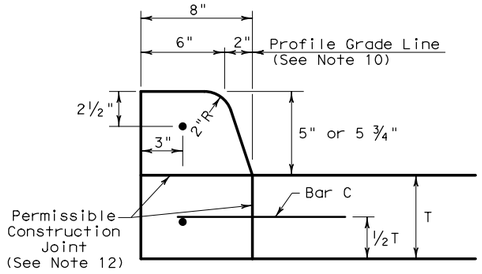
2" - 4" HEIGHT



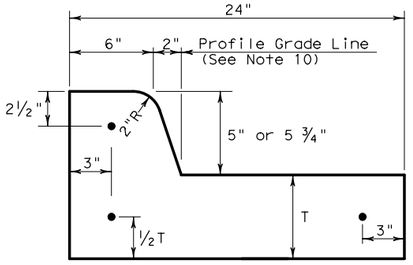
TYPE I CURB AND GUTTER
2" - 4" HEIGHT



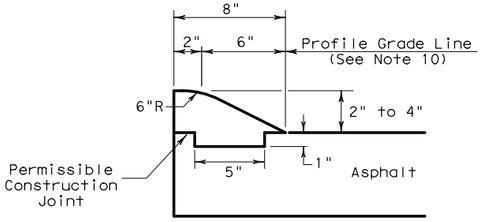
TYPE II CURB (MONOLITHIC)
5" - 5 ¾" HEIGHT



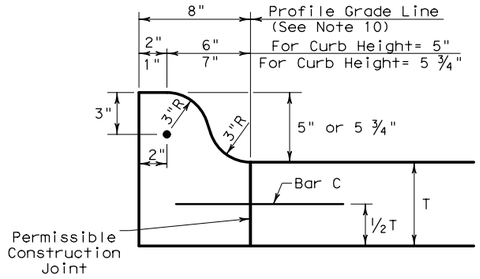
TYPE II CURB
5" - 5 ¾" HEIGHT



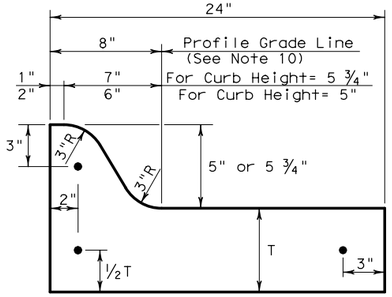
TYPE II CURB AND GUTTER
5" - 5 ¾" HEIGHT



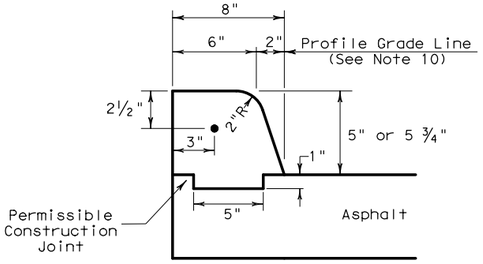
TYPE III CURB (KEYED)
2" - 4" HEIGHT



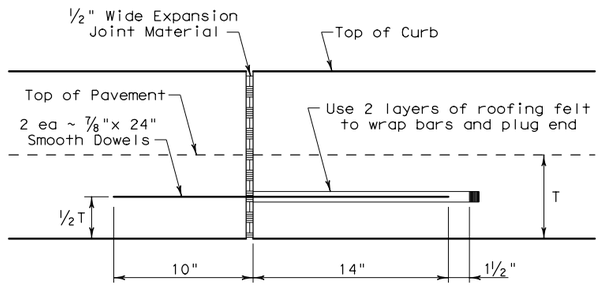
TYPE IIa CURB
5" - 5 ¾" HEIGHT



TYPE IIa CURB AND GUTTER
5" - 5 ¾" HEIGHT

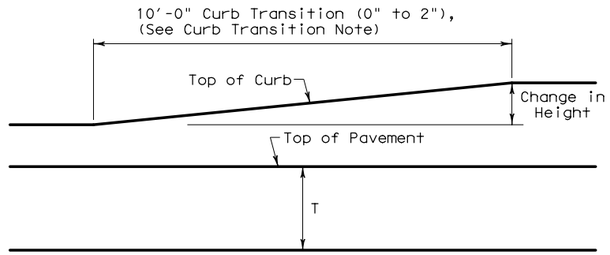


TYPE IV CURB (KEYED)
5" - 5 ¾" HEIGHT



EXPANSION JOINT DETAIL

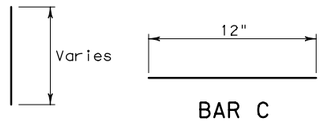
CURB TRANSITION NOTE:
Field conditions may require a longer or shorter transition, and shall be shown elsewhere in the plans, or as directed by the Engineer.



CURB TRANSITION
Note: To be paid for as Highest Curb

GENERAL NOTES

1. All materials and construction shall be in accordance with Item 529, "Concrete Curb, Gutter, and Combined Curb and Gutter."
2. Concrete shall be Class A.
3. When reinforcing bars are used, they shall be No.4 unless otherwise shown. The use of fiber reinforced concrete in lieu of reinforcing steel is acceptable. Use fibers meeting the requirements of DMS 4550, "Fibers for Concrete," and dose fibers in accordance with Material Producers List (MPL) "Fibers for Class A and B Concrete Applications."
4. Round exposed sharp edges with a rounding tool, to a minimum radius of ¼ inch.
5. All existing curbs and driveways to be removed shall be sawed or removed at existing joints.
6. Where concrete curb is to be placed on existing concrete pavement, Bar B may be drilled and the grouted in place, or may be inserted into fresh concrete.
7. Expansion and contraction joints shall be constructed to match pavement joints in all curbs and curb and gutter adjacent to jointed concrete pavement. Where placement of curb or curb and gutter is not adjacent to concrete pavement, expansion joints shall be provided at structures, curb returns at streets, and at locations directed by The Engineer.
8. Vertical and horizontal dowel bars and transverse reinforcing bars shall be placed at four feet C~C.
9. Dimension 'T' shown is the thickness of concrete pavement. When curb is installed adjacent to flexible pavement dimension 'T' is 8" maximum.
10. Usual profile grade line. Refer to typical sections and plan-profile sheets for exact locations.
11. One-half inch expansion joint material shall be provided where curb or curb and gutter is adjacent to sidewalk or riprap.
12. When horizontal permissible construction joints are used, the longitudinal pavement steel shall be placed in accordance with pavement details shown elsewhere in the plans. Reinforcing steel for curb section shall then conform to that required for concrete curb.
13. Bar B used as needed to support curb reinforcing steel during concrete placement.



BAR B

BAR C

Texas Department of Transportation

Design Division Standard

CONCRETE CURB AND CURB AND GUTTER

CCCG-21

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©TxDOT: FEBRUARY 2021 REVISIONS	CONT	SECT	JOB	HIGHWAY
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	ABL	STONEWALL		69

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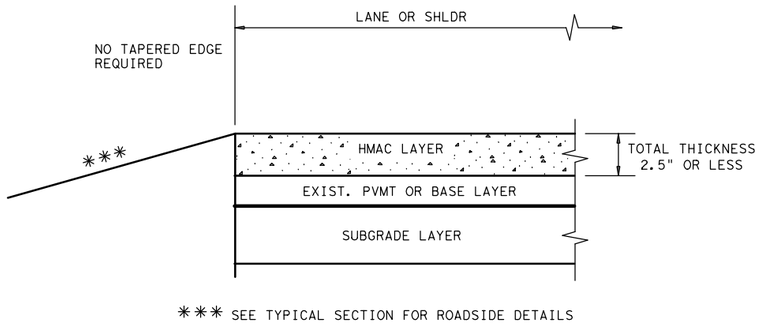
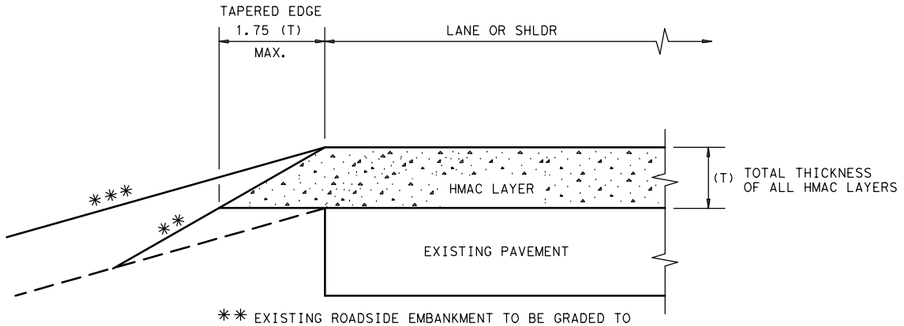


*** SEE TYPICAL SECTION FOR ROADSIDE DETAILS

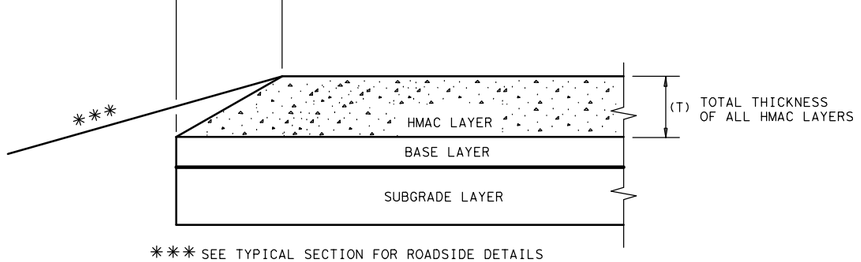
CONDITION - 1
THIN HMAC SURFACES OR HMAC OVERLAY
WITH THICKNESS OF 2.5" OR LESS



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

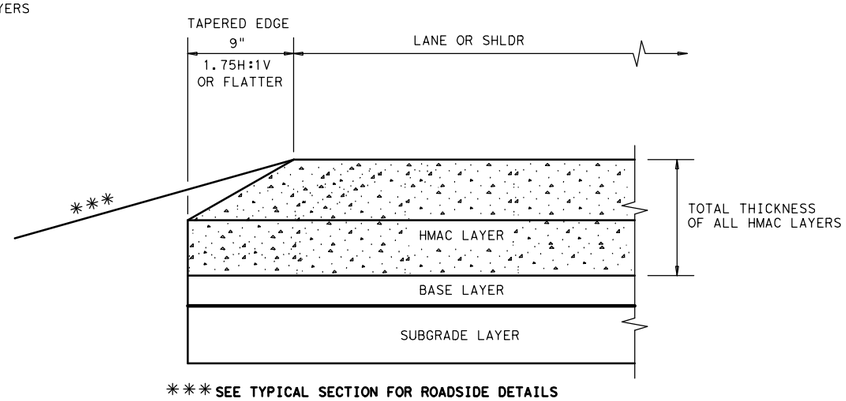
*** SEE TYPICAL SECTION FOR ROADSIDE DETAILS

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



*** SEE TYPICAL SECTION FOR ROADSIDE DETAILS

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



*** SEE TYPICAL SECTION FOR ROADSIDE DETAILS

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

(NOT TO SCALE)

GENERAL NOTES

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

Texas Department of Transportation

Design Division Standard

TAPERED EDGE DETAILS
HMAC PAVEMENT

TE(HMAC)-11

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	ABL	STONEWALL			70		

100% SUBMITTAL

DATE: 4/29/2022 TIME: 9:10:25 AM

UTILITY QUALITY LEVELS

(OBTAINED FROM ASCE PUBLICATION CI/ASCE STANDARD 38-02)

1. UTILITY QUALITY LEVEL D (QL D): INFORMATION DERIVED FROM EXISTING RECORDS OR ORAL RECOLLECTIONS.
2. UTILITY QUALITY LEVEL C (QL C): INFORMATION OBTAINED BY SURVEYING AND PLOTTING VISIBLE ABOVE-GROUND UTILITY FEATURES AND BY USING PROFESSIONAL JUDGEMENT IN CORRELATING THIS INFORMATION TO QUALITY LEVEL D INFORMATION.
3. UTILITY QUALITY LEVEL B (QL B): INFORMATION OBTAINED THROUGH THE APPLICATION OF APPROPRIATE SURFACE GEOPHYSICAL METHODS TO DETERMINE THE EXISTENCE AND APPROXIMATE HORIZONTAL POSITION OF SUBSURFACE UTILITIES. QUALITY LEVEL B DATA SHOULD BE REPRODUCIBLE BY SURFACE GEOPHYSICS AT ANY POINT OF THEIR DEPICTION. THIS INFORMATION IS SURVEYED TO APPLICABLE TOLERANCES DEFINED BY THE PROJECT AND REDUCED ONTO PLAN DOCUMENTS.
4. UTILITY QUALITY LEVEL A (QL A): PRECISE HORIZONTAL AND VERTICAL LOCATION OF UTILITIES OBTAINED BY THE ACTUAL EXPOSURE (OR VERIFICATION OF PREVIOUSLY EXPOSED AND SURVEYED UTILITIES) AND SUBSEQUENT MEASUREMENT OF SUBSURFACE UTILITIES, USUALLY AT A SPECIFIC POINT. MINIMALLY INTRUSIVE EXCAVATION EQUIPMENT IS TYPICALLY USED TO MINIMIZE THE POTENTIAL FOR UTILITY DAMAGE. A PRECISE HORIZONTAL AND VERTICAL LOCATION, AS WELL AS OTHER UTILITY ATTRIBUTES, IS SHOWN ON PLAN DOCUMENTS. ACCURACY IS TYPICALLY SET TO 15-MM VERTICAL AND TO APPLICABLE HORIZONTAL SURVEY AND MAPPING ACCURACY AS DEFINED OR EXPECTED BY THE PROJECT OWNER.

GENERAL NOTES

1. THE UTILITIES DEPICTED WERE INVESTIGATED BY LAMB-STAR ENGINEERING, ALL OTHER PLAN INFORMATION, NOTABLY THE BACKGROUND INFORMATION, WERE PROVIDED BY OTHERS AND LAMB-STAR ENGINEERING DISCLAIMS RESPONSIBILITY FOR ITS ACCURACY.
2. UTILITY LOCATIONS ON THESE DRAWINGS ARE INTENDED FOR DESIGN PURPOSES AND NOT CONSTRUCTION. THEY REFLECT SUBSURFACE UTILITIES FROM RECORDS RECEIVED. CALL TEXAS 811 FOR UTILITY LOCATIONS 48-HOURS PRIOR TO ANY WORK.
3. UTILITIES ON THESE DRAWINGS HAVE BEEN IDENTIFIED TO ASCE STANDARD 38-02. QUALITY LEVEL D INFORMATION IS SHOWN AS NOTED IN THE LEGEND.
4. UTILITIES ON THESE DRAWINGS HAVE BEEN IDENTIFIED TO ASCE STANDARD 38-02. QUALITY LEVEL C INFORMATION IS SHOWN AS NOTED IN THE LEGEND.

STATE OF TEXAS
ANDREW GRIFFIN
141981
LICENSED
PROFESSIONAL ENGINEER
4/29/2022

REV. No.	DATE	REVISION	BY

LAMB-STAR ENGINEERING, L.L.C.
5700 W. PLANO PARKWAY, SUITE 1000
PLANO, TEXAS 75093 (214) 440-3600
TEXAS REGISTERED ENGINEERING FIRM F-9073
TBPE REG. # F-9073

Texas Department of Transportation
Abilene District

US 380

EXISTING UTILITY NOTES

SHEET 1 OF 1

DESIGNED: JVH	FED. RD DIV. No.	STATE	PROJECT No.	HIGHWAY No.
CHECKED: ASG	6	TEXAS	SEE TITLE SHEET	US 380

DRAWN: ASG	STATE DISTRICT	COUNTY	CONTROL No.	SECTION No.	JOB No.	SHEET No.
CHECKED: JVH	ABL	STONEWALL	0106	04	036	71

PLOT DRIVER: TXDOT_PDF_BW.plt
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FILE: c:\pw_work\dfkmartx01\andrew.griffin\dms57948\US380_UTIL_NOTES.dgn

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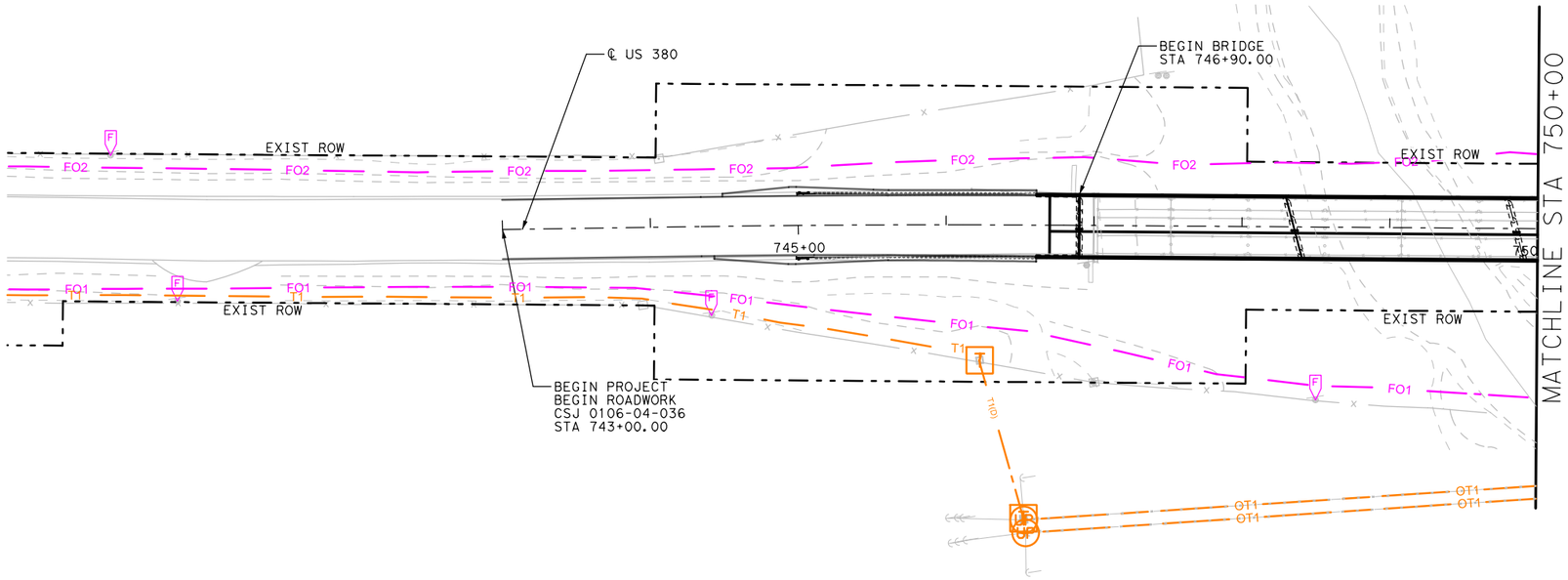

LEGEND

FO1	FIBER - CAPROCK (QLB)
FO1(D)	FIBER - CAPROCK (QLD)
FO2	FIBER - CENTURYLINK (QLB)
FO2(D)	FIBER - CENTURYLINK (QLD)
T1	TELEPHONE - CAPROCK (QLB)
T1(D)	TELEPHONE - CAPROCK (QLD)
OT1	OH TELEPHONE - CAPROCK (QLC)
T	TELEPHONE PEDESTAL
UP	TELEPHONE UTILITY POLE
F	UNDERGROUND FIBER MARKER

0 25 50 100
SCALE = 1"=100'

STATE OF TEXAS
ANDREW GRIFFIN
141981
LICENSED
PROFESSIONAL ENGINEER
4/29/2022

REV. No.	DATE	REVISION	BY

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PLANO, TEXAS 75093 (214) 440-3600
TEXAS REGISTERED ENGINEERING FIRM F-9073
TBPE REG. # F-9073

Texas Department of Transportation
Abilene District

US 380

UTILITY LAYOUT
BEGIN TO STA 750+00

SCALE: 1"=100' SHEET 1 OF 3

DESIGNED: JVH	FED. RD DIV. No.	STATE	PROJECT No.	HIGHWAY No.
CHECKED: ASG	6	TEXAS	SEE TITLE SHEET	US 380

DRAWN: ASG	STATE DISTRICT	COUNTY	CONTROL No.	SECTION No.	JOB No.	SHEET No.
CHECKED: JVH	ABL	STONEWALL	0106	04	036	72

PLOT DRIVER: TXDOT_PDF_BW.plt
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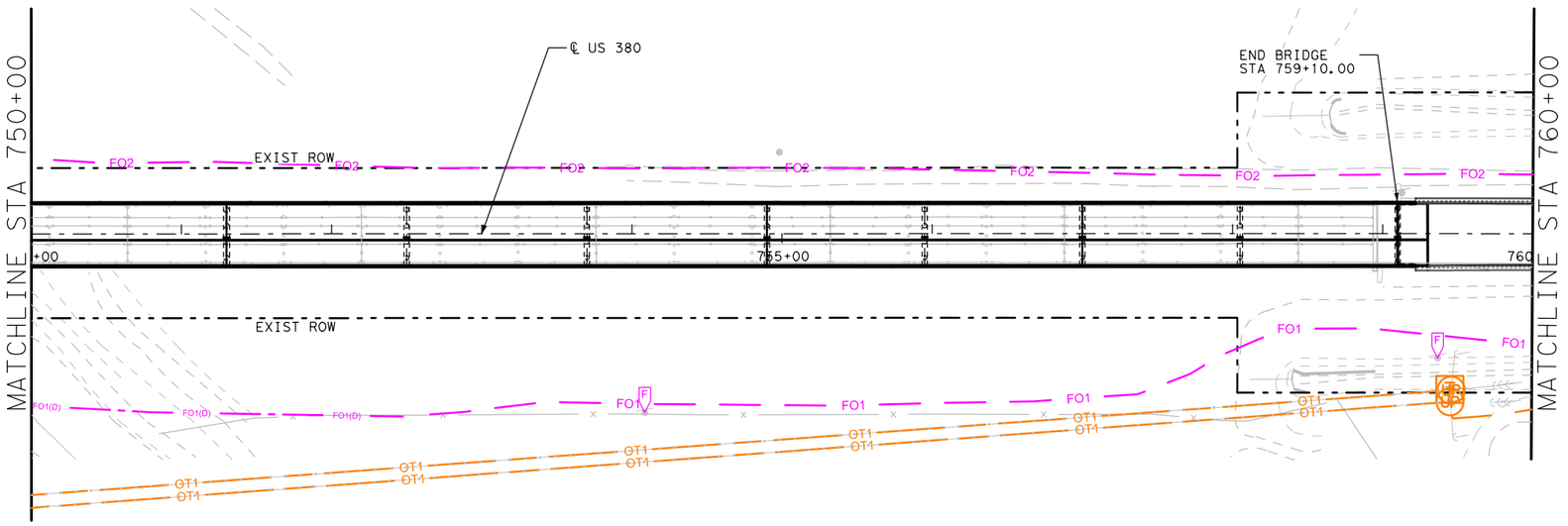

LEGEND

FO1	FIBER - CAPROCK (QLB)
FO1(D)	FIBER - CAPROCK (QLD)
FO2	FIBER - CENTURYLINK (QLB)
FO2(D)	FIBER - CENTURYLINK (QLD)
T1	TELEPHONE - CAPROCK (QLB)
T1(D)	TELEPHONE - CAPROCK (QLD)
OT1	OH TELEPHONE - CAPROCK (QLC)
T	TELEPHONE PEDESTAL
UP	TELEPHONE UTILITY POLE
F	UNDERGROUND FIBER MARKER

0 25 50 100
SCALE = 1"=100'

STATE OF TEXAS
ANDREW GRIFFIN
141981
LICENSED PROFESSIONAL ENGINEER
4/29/2022

REV. No.	DATE	REVISION	BY

LAMB-STAR ENGINEERING, L.L.C.
5700 W. PLANO PARKWAY, SUITE 1000
PLANO, TEXAS 75093 (214) 440-3600
TEXAS REGISTERED ENGINEERING FIRM F-9073
TBPE REG. # F-9073

Texas Department of Transportation
Abilene District

US 380

UTILITY LAYOUT
STA 750+00 TO STA 760+00

SCALE: 1"=100' SHEET 2 OF 3

DESIGNED: JVH	FED. RD DIV. No.	STATE	PROJECT No.	HIGHWAY No.
CHECKED: ASG	6	TEXAS	SEE TITLE SHEET	US 380

DRAWN: ASG	STATE DISTRICT	COUNTY	CONTROL No.	SECTION No.	JOB No.	SHEET No.
CHECKED: JVH	ABL	STONEWALL	0106	04	036	73

PLOT DRIVER: TXDOT_PDF_BW.plt
PEN TABLE: US380_pen.tbl
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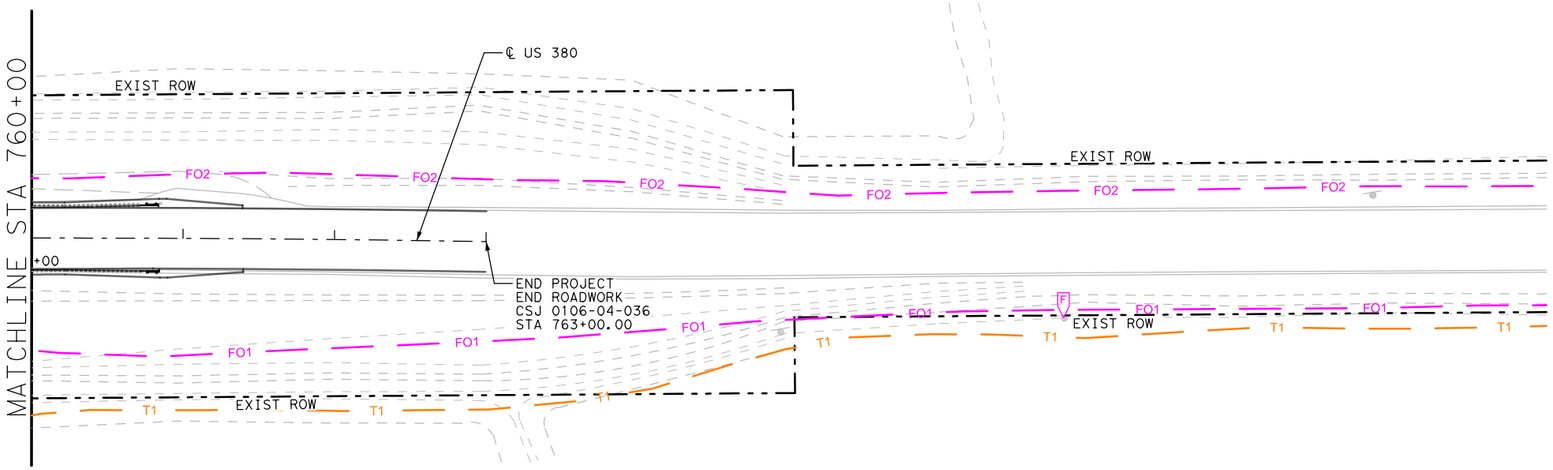

LEGEND

FO1	FIBER - CAPROCK (QLB)
FO1(D)	FIBER - CAPROCK (QLD)
FO2	FIBER - CENTURYLINK (QLB)
FO2(D)	FIBER - CENTURYLINK (QLD)
T1	TELEPHONE - CAPROCK (QLB)
T1(D)	TELEPHONE - CAPROCK (QLD)
OT1	OH TELEPHONE - CAPROCK (QLC)
T	TELEPHONE PEDESTAL
UP	TELEPHONE UTILITY POLE
F	UNDERGROUND FIBER MARKER

0 25 50 100
SCALE = 1"=100'

STATE OF TEXAS
ANDREW GRIFFIN
141981
LICENSED PROFESSIONAL ENGINEER
4/29/2022

REV. No.	DATE	REVISION	BY

LAMB-STAR ENGINEERING, L.L.C.
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PLANO, TEXAS 75093 (214) 440-3600
TEXAS REGISTERED ENGINEERING FIRM F-9073
TBPE REG. # F-9073

Texas Department of Transportation
Abilene District

US 380

UTILITY LAYOUT
STA 760+00 TO END

SCALE: 1"=100' SHEET 3 OF 3

DESIGNED: JVH	FED. RD DIV. No.	STATE	PROJECT No.	HIGHWAY No.
CHECKED: ASG	6	TEXAS	SEE TITLE SHEET	US 380

DRAWN: ASG	STATE DISTRICT	COUNTY	CONTROL No.	SECTION No.	JOB No.	SHEET No.
CHECKED: JVH	ABL	STONEWALL	0106	04	036	74

PLOT DRIVER: TXDOT_PDF_BW.plt
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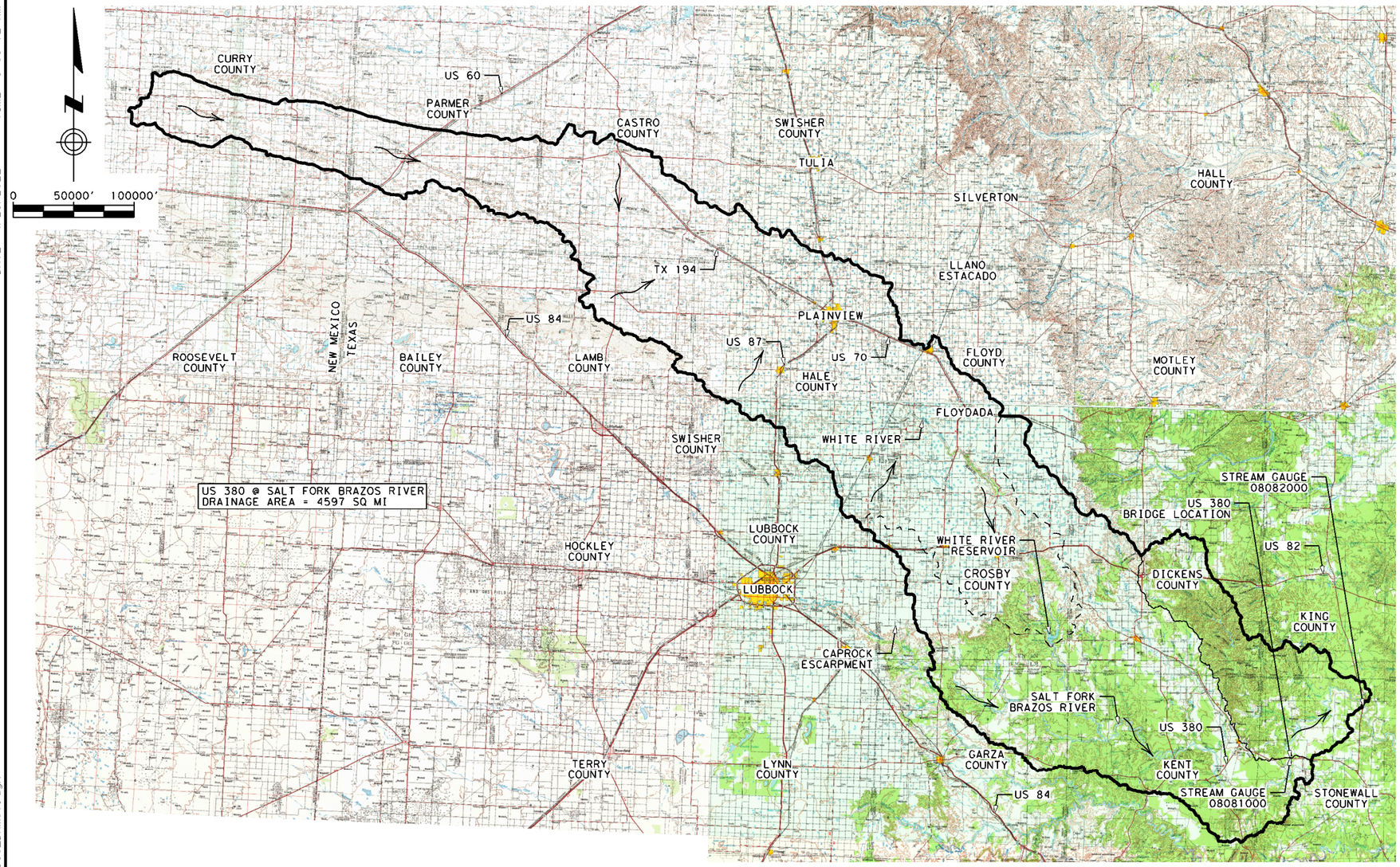

$$Q_1 = Q_2\sqrt{\frac{A_1}{A_2}}$$

From TxDOT Hydraulic Design Manual, Equation 4-10
Where
Q1=Estimated AEP discharge at ungauged watershed 1
Q2=Known AEP discharge at gauged watershed 2
A1=Area of watershed 1
A2=Area of watershed 2

% Chance Exceedance	Storm Frequency	Q1	Q2	A1	A2
		CFS	CFS	sq. mi.	sq. mi.
50	2	**20500**	21600	4597	5130
20	5	**27700**	29200	4597	5130
10	10	**32500**	34300	4597	5130
4	25	**37300**	39300	4597	5130
2	50 (DESIGN)	**43400**	45800	4597	5130
1	100 (CHECK)	**48100**	50800	4597	5130
0.5	200 (CHECK)	**53000**	55900	4597	5130
0.2	500	**59500**	62800	4597	5130

NOTES:

1. PEAK FLOWS WERE COMPUTED USING STATISTICAL ANALYSIS OF STREAM GAUGE DATA (USGS STREAM GAUGE 08082000, "SALT FK BRAZOS RV NR ASPERMONT, TX) BASED ON BULLETIN 17C PROCEDURES USING HEC-SSP VERSION 2.2. WITH THE CONSTRUCTION OF THE WHITE RIVER RESERVOIR IN 1963, MUCH OF THIS WATERSHED BECAME REGULATED AND UNUSABLE IN THE STATISTICAL ANALYSIS. THEREFORE, ONLY RECORDED AND HISTORICAL PEAK Q DATA FROM 1939 TO 1962 WAS UTILIZED IN THE HYDROLOGIC ANALYSIS. A FULL POOL LAKE LEVEL CONDITION IS ASSUMED.

2. FEMA HAS NOT COMPLETED A STUDY TO DETERMINE FLOOD HAZARD FOR THE BRIDGE LOCATION; THEREFORE, A FLOOD MAP WAS NOT PUBLISHED AT THE TIME OF THIS ANALYSIS.

3. THE PROJECT LOCATION LIES IN AN AREA NOT MAPPED BY FEMA. INFORMAL COORDINATION WAS COMPLETED ON 06/09/2021 WITH THE HONORABLE RONNIE MOORHEAD, STONEWALL COUNTY.

STATE OF TEXAS
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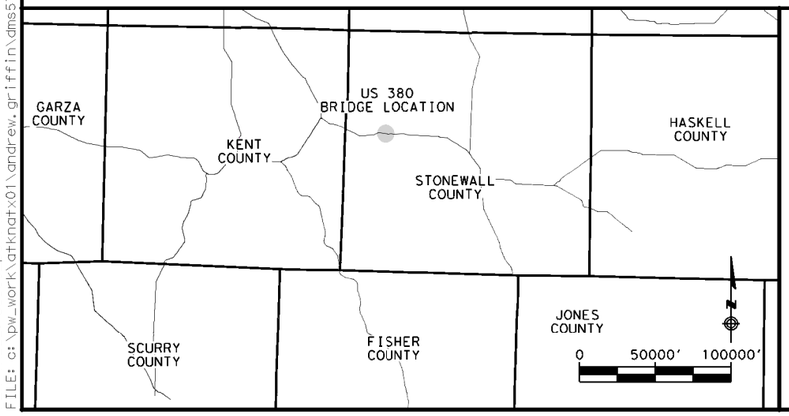
4/29/2022



LEGEND

- DRAINAGE AREA 1 - PROJECT SITE
- DRAINAGE AREA 2 - STREAM GAUGE 08082000
- DRAINAGE AREA - WHITE RIVER RESERVOIR
- FLOW DIRECTION

REV. No.	DATE	REVISION	BY

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TEXAS REGISTERED ENGINEERING FIRM F-9073
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Texas Department of Transportation
Abilene District

US 380

BRIDGE HYDROLOGIC DATA

SALT FORK BRAZOS RIVER BRIDGE

SHEET 1 OF 1

DESIGNED: JVH	FED. RD DIV. No.	STATE	PROJECT No.	HIGHWAY No.
CHECKED: ASG	6	TEXAS	SEE TITLE SHEET	US 380

DRAWN: ASG	STATE DISTRICT	COUNTY	CONTROL No.	SECTION No.	JOB No.	SHEET No.
CHECKED: JVH	ABL	STONEWALL	0106	04	036	75

PLOT DRIVER: TXDOT_PDF_BW.plt
PEN TABLE: US380_pen.tbl
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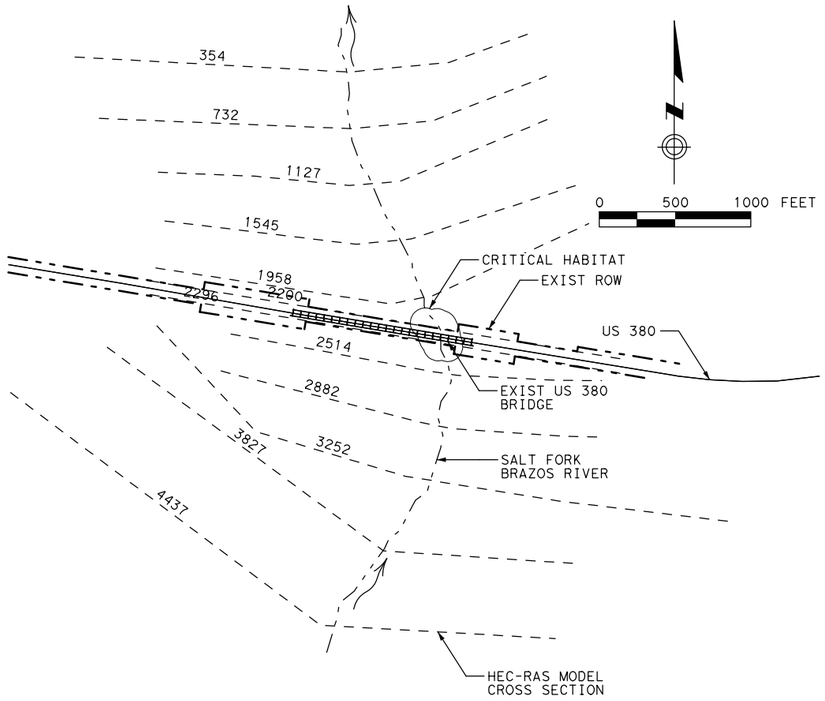
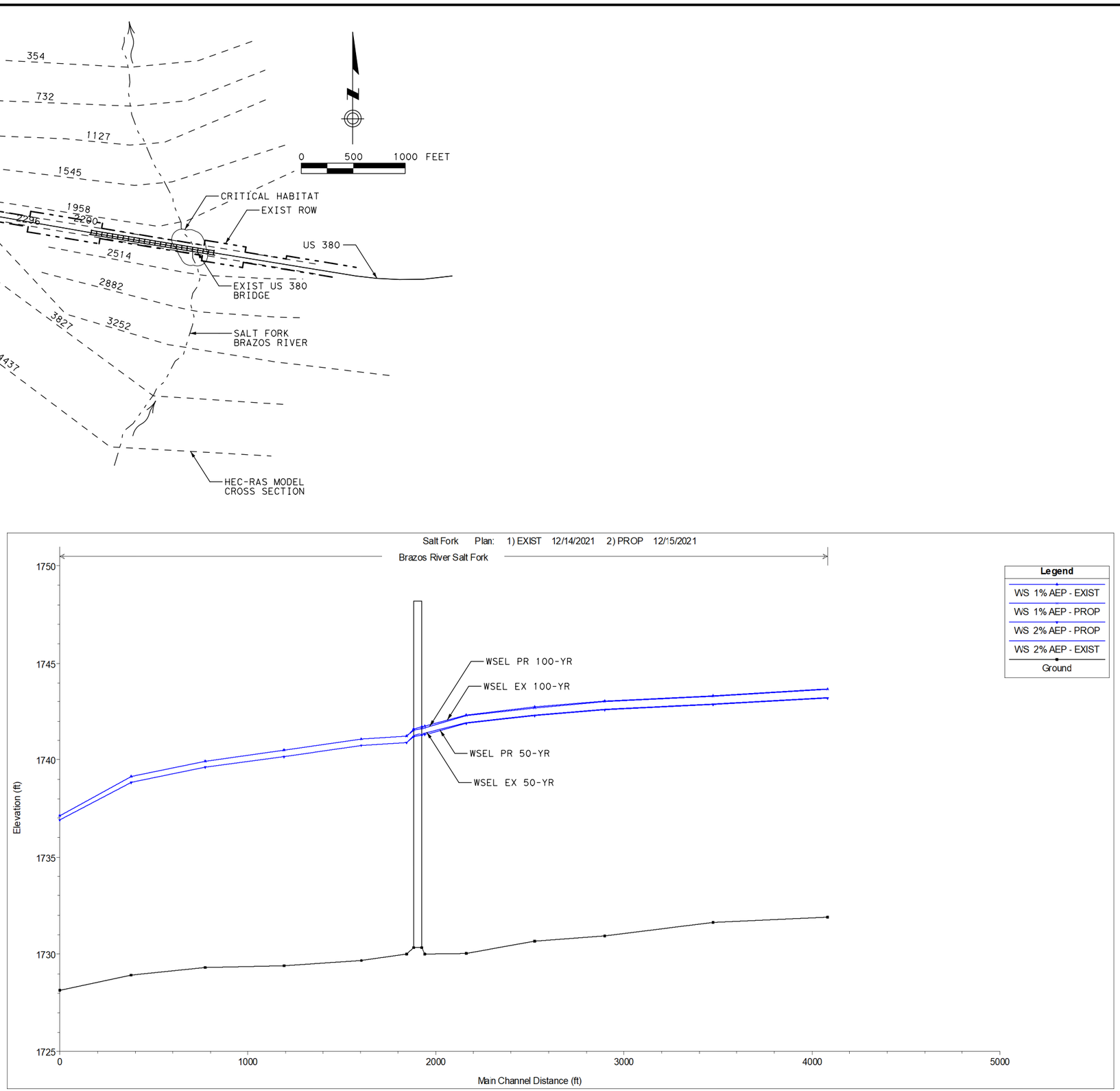


NOTES:

1. HYDRAULIC MODELING WAS PERFORMED USING HEC-RAS VERSION 5.0.7 WITH STEADY FLOW ANALYSIS.
2. THE PROJECT LOCATION LIES IN AN AREA NOT MAPPED BY FEMA. INFORMAL COORDINATION WAS COMPLETED ON 06/09/2021 WITH THE HONORABLE RONNIE MOORHEAD, STONEWALL COUNTY.



STATE OF TEXAS
ANDREW GRIFFIN
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LICENSED PROFESSIONAL ENGINEER
4/29/2022

REV. No.	DATE	REVISION	BY

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TBPE REG. # F-9073

Texas Department of Transportation
Abilene District

US 380

BRIDGE HYDRAULIC DATA

SALT FORK BRAZOS RIVER BRIDGE

SHEET 1 OF 3

DESIGNED: JVH	FED. RD DIV. No.	STATE	PROJECT No.	HIGHWAY No.
CHECKED: ASG	6	TEXAS	SEE TITLE SHEET	US 380

DRAWN: ASG	STATE DISTRICT	COUNTY	CONTROL No.	SECTION No.	JOB No.	SHEET No.
CHECKED: JVH	ABL	STONEWALL	0106	04	036	76

PLOT DRIVER: TXDOT_PDF_BW.plt
PEN TABLE: US380_pen.tbl
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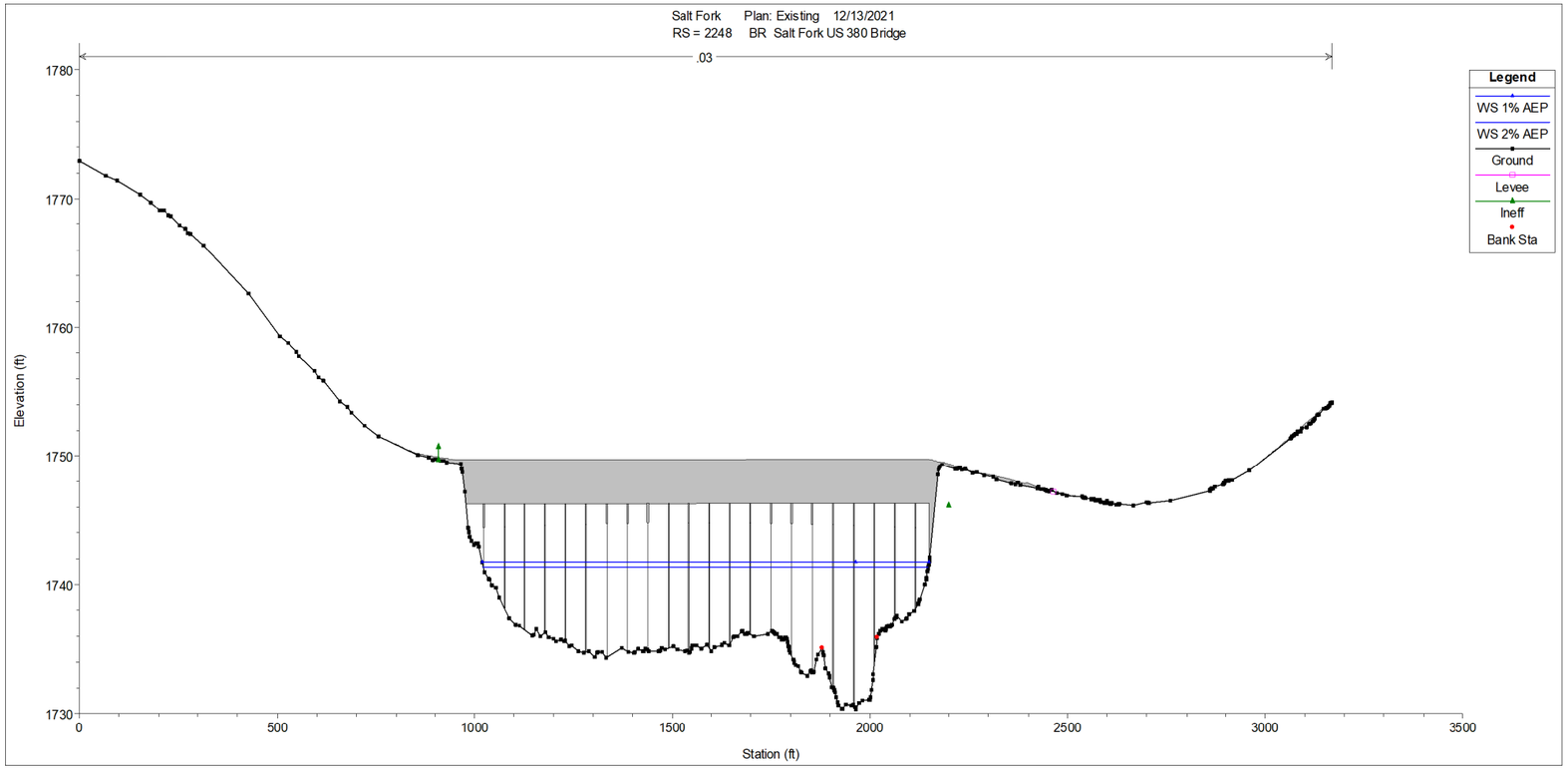

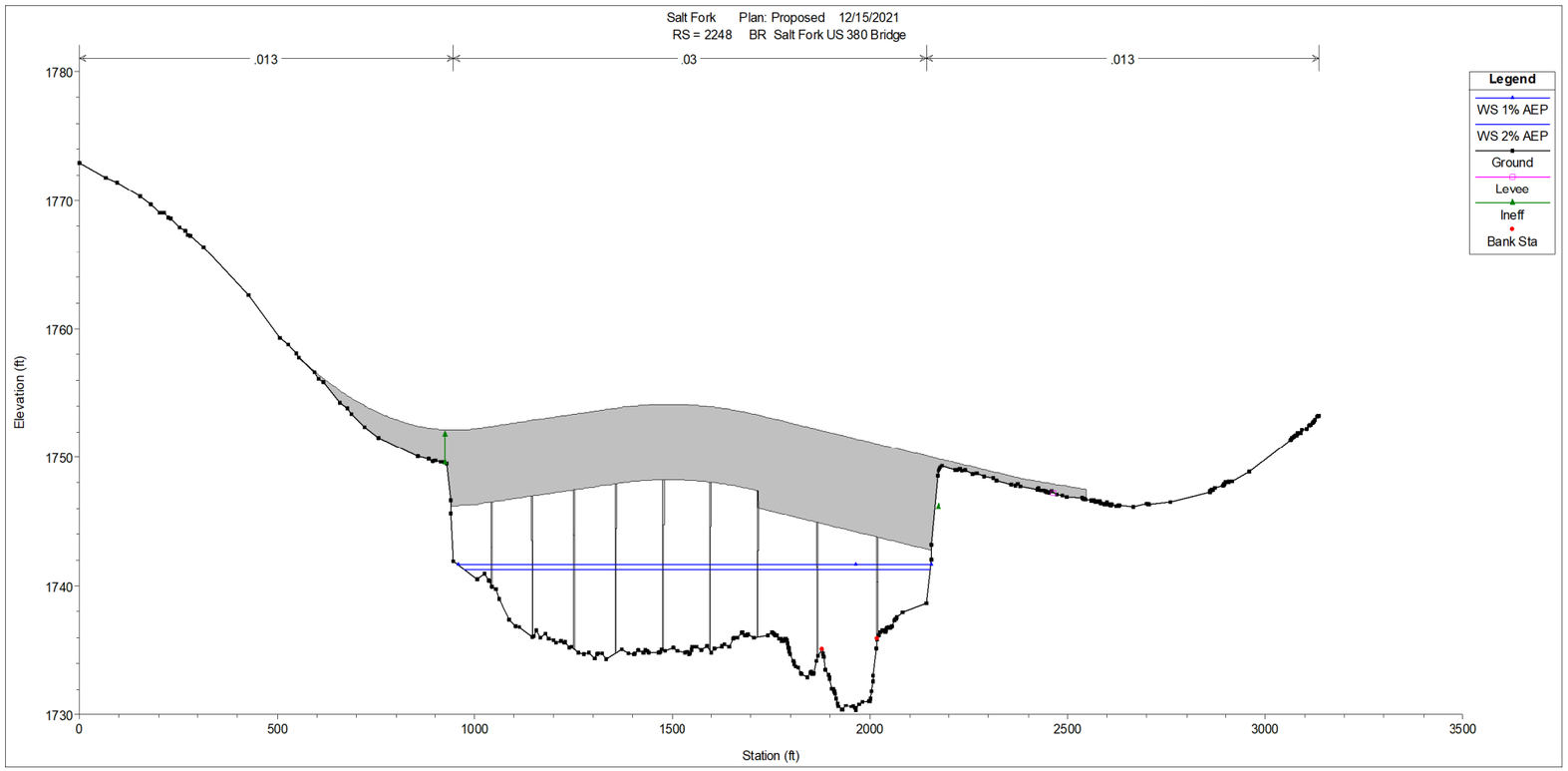

NOTES:

1. THE PROJECT LOCATION LIES IN AN AREA NOT MAPPED BY FEMA. INFORMAL COORDINATION WAS COMPLETED ON 06/09/2021 WITH THE HONORABLE RONNIE MOORHEAD, STONEWALL COUNTY.
2. BOTH EXISTING AND PROPOSED ELEVATIONS ON THIS SHEET FACE DOWNSTREAM (NORTH).

STATE OF TEXAS
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4/29/2022

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TBPE REG. # F-9073

Texas Department of Transportation
Abilene District

US 380

BRIDGE HYDRAULIC DATA

SALT FORK BRAZOS RIVER BRIDGE

SHEET 2 OF 3

DESIGNED: JVH	FED. RD DIV. No.	STATE	PROJECT No.	HIGHWAY No.
CHECKED: ASG	6	TEXAS	SEE TITLE SHEET	US 380

DRAWN: ASG	STATE DISTRICT	COUNTY	CONTROL No.	SECTION No.	JOB No.	SHEET No.
CHECKED: JVH	ABL	STONEWALL	0106	04	036	77

PLOT DRIVER: TXDOT_PDF_BW.plt
PEN TABLE: US380_pen.tbl
FILE: c:\pw_work\atkndtx01\andrew.griffin\dms57905\US380_HYD02.dgn

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DATE: 4/29/2022 TIME: 9:08:47 AM

Reach	River Sta	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 # Chl
				(cfs)	(ft)	(ft)	(ft)	(ft)	(ft/ft)	(ft/s)	(sq ft)	(ft)	
Salt Fork	4437	2% AEP	EXIST	43400	1731.91	1743.23	1740.06	1743.41	0.000424	4.22	13004.42	2265.93	0.25
Salt Fork	4437	2% AEP	PROP	43400	1731.91	1743.20	1740.06	1743.39	0.000430	4.24	12948.28	2265.84	0.25
Salt Fork	4437	1% AEP	EXIST	48100	1731.91	1743.66	1740.23	1743.85	0.000413	4.30	13980.59	2267.32	0.25
Salt Fork	4437	1% AEP	PROP	48100	1731.91	1743.63	1740.23	1743.83	0.000419	4.32	13912.5	2267.23	0.25
Salt Fork	3827	2% AEP	EXIST	43400	1731.62	1742.88	1739.43	1743.12	0.000495	4.64	11382.21	1792.55	0.28
Salt Fork	3827	2% AEP	PROP	43400	1731.62	1742.85	1739.43	1743.09	0.000502	4.66	11329.04	1792.44	0.28
Salt Fork	3827	1% AEP	EXIST	48100	1731.62	1743.31	1739.60	1743.57	0.000492	4.77	12148.2	1794.21	0.28
Salt Fork	3827	1% AEP	PROP	48100	1731.62	1743.28	1739.60	1743.53	0.000500	4.80	12084.69	1794.08	0.28
Salt Fork	3252	2% AEP	EXIST	43400	1730.93	1742.63	1739.16	1742.91	0.000591	5.04	10322.29	1600.03	0.29
Salt Fork	3252	2% AEP	PROP	43400	1730.93	1742.59	1739.16	1742.88	0.000601	5.07	10267.8	1599.72	0.29
Salt Fork	3252	1% AEP	EXIST	48100	1730.93	1743.05	1739.35	1743.36	0.000593	5.20	10998.53	1603.99	0.29
Salt Fork	3252	1% AEP	PROP	48100	1730.93	1743.01	1739.35	1743.32	0.000604	5.23	10934.31	1603.62	0.29
Salt Fork	2882	2% AEP	EXIST	43400	1730.67	1742.31	1738.84	1742.66	0.000728	5.20	9396.9	1419.98	0.29
Salt Fork	2882	2% AEP	PROP	43400	1730.67	1742.27	1738.84	1742.62	0.000742	5.24	9340.4	1419.61	0.29
Salt Fork	2882	1% AEP	EXIST	48100	1730.67	1742.73	1739.06	1743.10	0.000735	5.37	9983.58	1423.83	0.29
Salt Fork	2882	1% AEP	PROP	48100	1730.67	1742.68	1739.06	1743.06	0.000751	5.41	9917.37	1423.40	0.30
Salt Fork	2514	2% AEP	EXIST	43400	1730.05	1741.93	1738.65	1742.37	0.000833	6.25	8370.17	1217.42	0.35
Salt Fork	2514	2% AEP	PROP	43400	1730.05	1741.89	1738.65	1742.33	0.000852	6.30	8311.93	1216.97	0.36
Salt Fork	2514	1% AEP	EXIST	48100	1730.05	1742.33	1738.90	1742.81	0.000856	6.48	8851.06	1221.13	0.36
Salt Fork	2514	1% AEP	PROP	48100	1730.05	1742.27	1738.90	1742.76	0.000878	6.54	8782.81	1220.60	0.36
Salt Fork	2296	2% AEP	EXIST	43400	1730.00	1741.38	1739.19	1742.11	0.001679	8.31	6605.89	1111.08	0.47
Salt Fork	2296	2% AEP	PROP	43400	1730.00	1741.31	1739.19	1742.06	0.001738	8.41	6532.55	1109.96	0.48
Salt Fork	2296	1% AEP	EXIST	48100	1730.00	1741.74	1739.45	1742.54	0.001715	8.61	7013.58	1116.95	0.48
Salt Fork	2296	1% AEP	PROP	48100	1730.00	1741.67	1739.45	1742.48	0.001782	8.73	6927.05	1115.71	0.49
Salt Fork	2248			Bridge									
Salt Fork	2200	2% AEP	EXIST	43400	1730.01	1740.88	1739.35	1741.82	0.002133	9.70	5955.38	1067.27	0.55
Salt Fork	2200	2% AEP	PROP	43400	1730.01	1740.88	1739.35	1741.82	0.002133	9.70	5955.38	1067.27	0.55
Salt Fork	2200	1% AEP	EXIST	48100	1730.01	1741.21	1739.61	1742.24	0.002196	10.06	6312.06	1073.35	0.56
Salt Fork	2200	1% AEP	PROP	48100	1730.01	1741.21	1739.61	1742.24	0.002196	10.06	6312.06	1073.35	0.56
Salt Fork	1958	2% AEP	EXIST	43400	1729.69	1740.71	1738.57	1741.41	0.001378	8.06	6831.67	1146.17	0.47
Salt Fork	1958	2% AEP	PROP	43400	1729.69	1740.71	1738.57	1741.41	0.001378	8.06	6831.67	1146.17	0.47
Salt Fork	1958	1% AEP	EXIST	48100	1729.69	1741.04	1738.85	1741.81	0.001431	8.41	7212.76	1150.21	0.48
Salt Fork	1958	1% AEP	PROP	48100	1729.69	1741.04	1738.85	1741.81	0.001431	8.41	7212.76	1150.21	0.48
Salt Fork	1545	2% AEP	EXIST	43400	1729.40	1740.15	1738.07	1740.83	0.001541	7.82	6986.39	1389.96	0.48
Salt Fork	1545	2% AEP	PROP	43400	1729.40	1740.15	1738.07	1740.83	0.001541	7.82	6986.39	1389.96	0.48
Salt Fork	1545	1% AEP	EXIST	48100	1729.40	1740.47	1738.31	1741.21	0.001575	8.12	7439.72	1407.79	0.49
Salt Fork	1545	1% AEP	PROP	48100	1729.40	1740.47	1738.31	1741.21	0.001575	8.12	7439.72	1407.79	0.49
Salt Fork	1127	2% AEP	EXIST	43400	1729.32	1739.61	1737.76	1740.20	0.001436	7.43	7494.75	1516.94	0.47
Salt Fork	1127	2% AEP	PROP	43400	1729.32	1739.61	1737.76	1740.20	0.001436	7.43	7494.75	1516.94	0.47
Salt Fork	1127	1% AEP	EXIST	48100	1729.32	1739.93	1737.97	1740.56	0.001454	7.68	7983.05	1528.32	0.47
Salt Fork	1127	1% AEP	PROP	48100	1729.32	1739.93	1737.97	1740.56	0.001454	7.68	7983.05	1528.32	0.47
Salt Fork	732	2% AEP	EXIST	43400	1728.94	1738.84	1737.43	1739.57	0.001918	8.68	6843.32	1474.74	0.54
Salt Fork	732	2% AEP	PROP	43400	1728.94	1738.84	1737.43	1739.57	0.001918	8.68	6843.32	1474.74	0.54
Salt Fork	732	1% AEP	EXIST	48100	1728.94	1739.15	1737.67	1739.92	0.001956	8.99	7292.12	1518.55	0.55
Salt Fork	732	1% AEP	PROP	48100	1728.94	1739.15	1737.67	1739.92	0.001956	8.99	7292.12	1518.55	0.55
Salt Fork	354	2% AEP	EXIST	43400	1728.16	1736.93	1736.93	1738.39	0.004802	12.31	5048.27	1463.22	0.83
Salt Fork	354	2% AEP	PROP	43400	1728.16	1736.93	1736.93	1738.39	0.004802	12.31	5048.27	1463.22	0.83
Salt Fork	354	1% AEP	EXIST	48100	1728.16	1737.13	1737.13	1738.71	0.005007	12.81	5340.24	1472.57	0.85
Salt Fork	354	1% AEP	PROP	48100	1728.16	1737.13	1737.13	1738.71	0.005007	12.81	5340.24	1472.57	0.85

Existing Conditions Hydraulic Results

2% AEP Event

E.G. US. (ft)	1742.11	Element	Inside BR US	Inside BR DS
W.S. US. (ft)	1741.38	E.G. Elev (ft)	1742.06	1741.97
Q Total (cfs)	43400	W.S. Elev (ft)	1741.36	1741.23
Q Bridge (cfs)	43400	Crit W.S. (ft)	1739.11	1739.1
Q Weir (cfs)		Max Chl Dpth (ft)	11.03	10.9
Weir Sta Lft (ft)		Vel Total (ft/s)	6.58	6.73
Weir Sta Rgt (ft)		Flow Area (sq ft)	6592.44	6451.68
Weir Submerg		Froude # Chl	0.45	0.47
Weir Max Depth (ft)		Specif Force (cu ft)	31148.79	30513.25
Min El Weir Flow (ft)	1748.01	Hydr Depth (ft)	6.01	5.89
Min El Prs (ft)	1746.28	W.P. Total (ft)	1360.56	1353.02
Delta EG (ft)	0.28	Conv. Total (cfs)	972089.7	942356.6
Delta WS (ft)	0.5	Top Width (ft)	1097.05	1095.18
BR Open Area (sq ft)	12064.93	Frctn Loss (ft)	0.09	0.08
BR Open Vel (ft/s)	6.73	C & E Loss (ft)	0.01	0.06
BR Sluice Coef		Shear Total (lb/sq ft)	0.6	0.63
BR Sel Method	Energy only	Power Total (lb/ft s)	3.97	4.25

1% AEP Event

E.G. US. (ft)	1742.54	Element	Inside BR US	Inside BR DS
W.S. US. (ft)	1741.74	E.G. Elev (ft)	1742.49	1742.39
Q Total (cfs)	48100	W.S. Elev (ft)	1741.73	1741.59
Q Bridge (cfs)	48100	Crit W.S. (ft)	1739.38	1739.38
Q Weir (cfs)		Max Chl Dpth (ft)	11.4	11.26
Weir Sta Lft (ft)		Vel Total (ft/s)	6.88	7.02
Weir Sta Rgt (ft)		Flow Area (sq ft)	6995.18	6847
Weir Submerg		Froude # Chl	0.37	0.38
Weir Max Depth (ft)		Specif Force (cu ft)	35039.11	34338.42
Min El Weir Flow (ft)	1748.01	Hydr Depth (ft)	6.35	6.22
Min El Prs (ft)	1746.28	W.P. Total (ft)	1380.84	1373.77
Delta EG (ft)	0.3	Conv. Total (cfs)	1058869	1026635
Delta WS (ft)	0.53	Top Width (ft)	1101.01	1099.93
BR Open Area (sq ft)	12064.93	Frctn Loss (ft)	0.09	0.08
BR Open Vel (ft/s)	7.02	C & E Loss (ft)	0.01	0.07
BR Sluice Coef		Shear Total (lb/sq ft)	0.65	0.68
BR Sel Method	Energy only	Power Total (lb/ft s)	4.49	4.8

Proposed Conditions Hydraulic Results

2% AEP Event

E.G. US. (ft)	1742.06	Element	Inside BR US	Inside BR DS
W.S. US. (ft)	1741.31	E.G. Elev (ft)	1742.03	1741.95
Q Total (cfs)	43400	W.S. Elev (ft)	1741.28	1741.19
Q Bridge (cfs)	43400	Crit W.S. (ft)	1739.25	1739.23
Q Weir (cfs)		Max Chl Dpth (ft)	10.95	10.86
Weir Sta Lft (ft)		Vel Total (ft/s)	6.62	6.75
Weir Sta Rgt (ft)		Flow Area (sq ft)	6552.88	6434.27
Weir Submerg		Froude # Chl	0.37	0.37
Weir Max Depth (ft)		Specif Force (cu ft)	30937.7	30349.85
Min El Weir Flow (ft)	1748.01	Hydr Depth (ft)	5.69	5.61
Min El Prs (ft)	1748.21	W.P. Total (ft)	1253.38	1255.32
Delta EG (ft)	0.24	Conv. Total (cfs)	1059255	1015641
Delta WS (ft)	0.43	Top Width (ft)	1151.11	1146.63
BR Open Area (sq ft)	12511	Frctn Loss (ft)	0.07	0.07
BR Open Vel (ft/s)	6.75	C & E Loss (ft)	0	0.05
BR Sluice Coef		Shear Total (lb/sq ft)	0.55	0.58
BR Sel Method	Energy only	Power Total (lb/ft s)	3.63	3.94

1% AEP Event

E.G. US. (ft)	1742.48	Element	Inside BR US	Inside BR DS
W.S. US. (ft)	1741.67	E.G. Elev (ft)	1742.45	1742.37
Q Total (cfs)	48100	W.S. Elev (ft)	1741.64	1741.55
Q Bridge (cfs)	48100	Crit W.S. (ft)	1739.52	1739.49
Q Weir (cfs)		Max Chl Dpth (ft)	11.31	11.22
Weir Sta Lft (ft)		Vel Total (ft/s)	6.9	7.02
Weir Sta Rgt (ft)		Flow Area (sq ft)	6971.16	6849.35
Weir Submerg		Froude # Chl	0.38	0.38
Weir Max Depth (ft)		Specif Force (cu ft)	34778.16	34144.76
Min El Weir Flow (ft)	1748.01	Hydr Depth (ft)	5.97	5.89
Min El Prs (ft)	1748.21	W.P. Total (ft)	1277.96	1279.31
Delta EG (ft)	0.24	Conv. Total (cfs)	1158531	1112418
Delta WS (ft)	0.45	Top Width (ft)	1167.15	1163.1
BR Open Area (sq ft)	12511	Frctn Loss (ft)	0.08	0.08
BR Open Vel (ft/s)	7.02	C & E Loss (ft)	0	0.06
BR Sluice Coef		Shear Total (lb/sq ft)	0.59	0.62
BR Sel Method	Energy only	Power Total (lb/ft s)	4.05	4.39

NOTE:

1. THE PROJECT LOCATION LIES IN AN AREA NOT MAPPED BY FEMA. INFORMAL COORDINATION WAS COMPLETED ON 06/09/2021 WITH THE HONORABLE RONNIE MOORHEAD, STONEWALL COUNTY.

STATE OF TEXAS
JILL M. VAN HOEWYK
110940
LICENSED
PROFESSIONAL ENGINEER
4/29/2022

REV. No.	DATE	REVISION	BY

LAMB-STAR ENGINEERING, L.L.C.
5700 W. PLANO PARKWAY, SUITE 1000
PLANO, TEXAS 75093 (214) 440-3600
TEXAS REGISTERED ENGINEERING FIRM F-9073
TBPE REG. # F-9073

Texas Department of Transportation
Abilene District
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US 380

BRIDGE HYDRAULIC DATA

SALT FORK BRAZOS RIVER BRIDGE

SHEET 3 OF 3

DESIGNED: JVH	FED. RD DIV. No.	STATE	PROJECT No.			HIGHWAY No.
CHECKED: ASG	6	TEXAS	SEE TITLE SHEET			US 380
DRAWN: ASG	STATE DISTRICT	COUNTY	CONTROL No.	SECTION No.	JOB No.	SHEET No.
CHECKED: JVH	ABL	STONEWALL	0106	04	036	78

PLOT DRIVER: TXDOT_PDF_BW.plt
PEN TABLE: US380_pen.tbl
FILE: c:\pw_work\atknatx01\andrew.griffin\dms57905\US380_HYD03.dgn

100% SUBMITTAL

DATE: 4/29/2022 TIME: 9:08:53 AM

US380 Contraction Scour Data

Contraction Scour							
Input Parameter	Units	West Overbank		Main Channel		East Overbank	
		100-yr	200-yr	100-yr	200-yr	100-yr	200-yr
Average Depth Upstream of Contraction	ft	5.99	6.33	9.94	10.31	3.89	4.17
D50	ft	0.001083					
Average Velocity Upstream	ft/s	6.84	7.15	8.73	9.01	3.23	3.41
Temperature of Water	°F	60					
Slope of Energy Grade Line at Approach Section	ft/ft	0.001782	0.001810	0.001782	0.001810	0.001782	0.001810
Flow in Contracted Section	cfs	32798.45	36360.13	48100.00	53000.00	2577.68	3028.98
Flow Upstream that is Transporting Sediment	cfs	35856.84	39762.18	48100.00	53000.00	1464.40	1695.48
Width in Contracted Section	ft	896.05	907.44	1167.15	1180.02	133.80	135.29
Width Upstream that is Transporting Sediment	ft	874.64	878.00	1115.71	1121.49	116.86	119.29
Depth Prior to Scour in Contracted Section	ft	7.29	7.66	11.31	11.68	5.72	6.09
Unit Weight of Water	lb/ft^3	62.4					
Unit Weight of Sediment	lb/ft^3	165					
Results							
Recommended Scour Depth	ft	-1.83	-1.93	-1.67	-1.73	0.03	0.20
Critical velocity above which bed material of size D and smaller will be transported	ft/s	1.55	1.56	1.68	1.69	1.44	1.46
Equation	N/A	Live Bed					

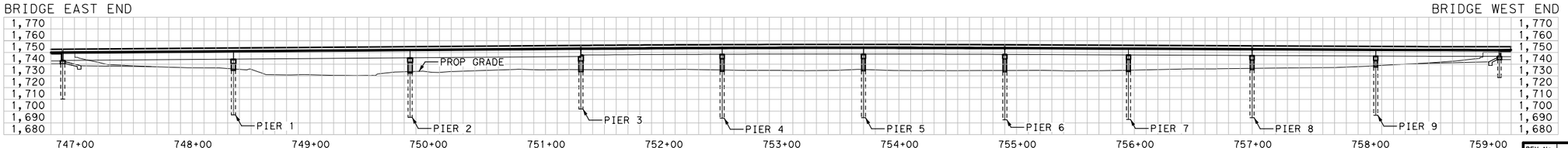
US380 Riprap Data

Riprap Design Data					
Input Parameter	Units	West Abutment		East Abutment	
		100-yr	200-yr	100-yr	200-yr
Average Water Depth in Channel	ft	5.67	5.97	3.81	4.13
Average Channel Veolocity	ft/s	6.45	6.71	5.06	5.42
Abutment Sideslope	N/A	2:1		4:1	
Angle of Sideslope to Horizontal	*	26.6		14.04	
Factor of Safety	N/A	1.5			
Gravitational Acceleration	ft/s^2	32.2			
Riprap Specific Gravity	N/A	2.65			
Stability Coefficient, Cs	N/A	0.3			
Vertical Velocity Distribution Coefficient, Cv	N/A	1			
Sideslope Correction Factor, K	N/A	1			
D30	ft	0.26	0.28	0.13	0.15
Results					
Calculated D50	in	3.7	4.0	1.9	2.2
Recommended D50	in	12	12	12	12
Riprap Thickness	in	18	18	18	18
Abutment Toe Width	ft	3	3	3	3
Abutment Toe Depth	ft	3	3	3	3

NOTES:
1. Scour calculations performed using Hydraulic Toolbox version 5.0 based on HEC-18 (FHWA, 2012).
2. Refer to Drainage Report for information on scour envelope.

US380 Pier Scour Data

Pier Scour (Piers Numbered from East to West)																			
Input Parameter	Units	Pier 1		Pier 2		Pier 3		Pier 4		Pier 5		Pier 6		Pier 7		Pier 8		Pier 9	
		100-yr	200-yr	100-yr	200-yr	100-yr	200-yr	100-yr	200-yr	100-yr	200-yr	100-yr	200-yr	100-yr	200-yr	100-yr	200-yr	100-yr	200-yr
Computation Method	N/A	HEC-18																	
Pier Shape	N/A	Group of Cylinders																	
Bed Condition	N/A	Clear-Water Scour																	
Depth Upstream of Pier	ft	5.69	6.06	7.94	8.31	6.24	6.61	6.62	6.99	6.17	6.54	7.07	7.44	6.75	7.12	5.14	5.54	2.99	3.36
Velocity Upstream of Pier	ft/s	9.21	9.51	6.45	6.71	6.45	6.71	6.45	6.71	6.45	6.71	6.45	6.71	6.45	6.71	6.45	6.71	6.45	6.71
Width of Column	ft	3.5		3.5		3		3		3		3		3		3		3	
Angle of Attack	Degrees	15																	
Spacing between Columns of Piers	ft	11.67		11.67		10.67		10.67		10.67		10.67		10.67		10.67		10.67	
Number of Columns	N/A	4																	
Angle of Repose	Degrees	44																	
Results																			
Pier Scour Depth	ft	17.76	18.04	14.27	14.52	14.61	14.85	14.31	14.55	14.67	14.92	13.94	14.18	14.20	14.44	15.44	15.69	16.96	17.25
Total Scour at Pier	ft	17.76	18.04	14.27	14.52	14.61	14.85	14.31	14.55	14.67	14.92	13.94	14.18	14.20	14.44	15.44	15.69	16.96	17.25
Froude Number Upstream	N/A	0.68	0.68	0.40	0.41	0.46	0.46	0.44	0.45	0.46	0.46	0.43	0.43	0.44	0.44	0.50	0.50	0.66	0.65



STATE OF TEXAS
JILL M. VAN HOEWYK
110940
LICENSED
PROFESSIONAL ENGINEER
4/29/2022

REV. No.	DATE	REVISION	BY

LAMB-STAR ENGINEERING, L.L.C.
5700 W. PLANO PARKWAY, SUITE 1000
PLANO, TEXAS 75093 (214) 440-3600
TEXAS REGISTERED ENGINEERING FIRM F-9073
TBPE REG. # F-9073

Texas Department of Transportation
Abilene District

US 380

SCOUR ANALYSIS

SALT FORK BRAZOS RIVER BRIDGE

SHEET 1 OF 1

DESIGNED: JVH	FED. RD DIV. No.	STATE	PROJECT No.	HIGHWAY No.
CHECKED: ASG	6	TEXAS	SEE TITLE SHEET	US 380

DRAWN: ASG	STATE DISTRICT	COUNTY	CONTROL No.	SECTION No.	JOB No.	SHEET No.
CHECKED: JVH	ABL	STONEWALL	0106	04	036	79

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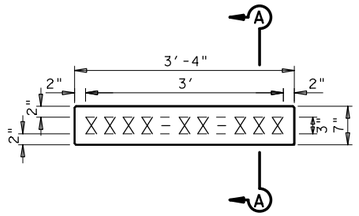
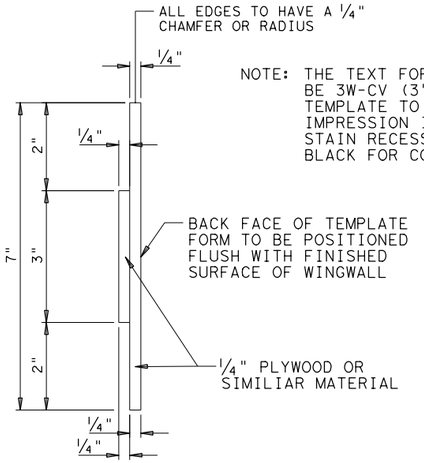
100% SUBMITTAL
DATE: 4/28/2022 TIME: 7:10:46 PM

STRUCTURE ID TEMPLATES



NOTE: THE SYMBOLS XXXX-XX-XXX REPRESENT THE STRUCTURE NUMBER WHICH IS SHOWN IN THE TABLE TO THE RIGHT.

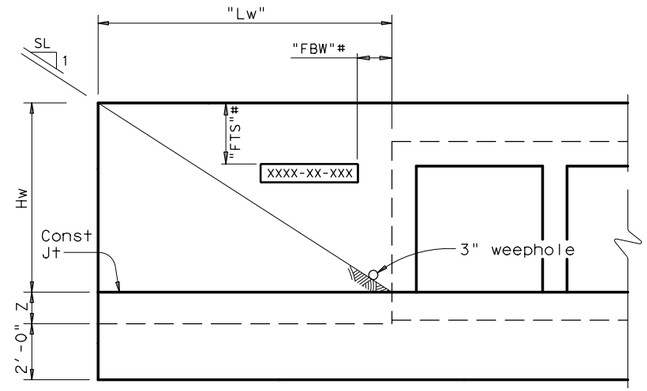
ALL CHARACTERS ARE REQUIRED, AND ARE TO BE FORMATTED EXACTLY AS SHOWN IN THE STRUCTURE NUMBER COLUMN TO THE RIGHT.



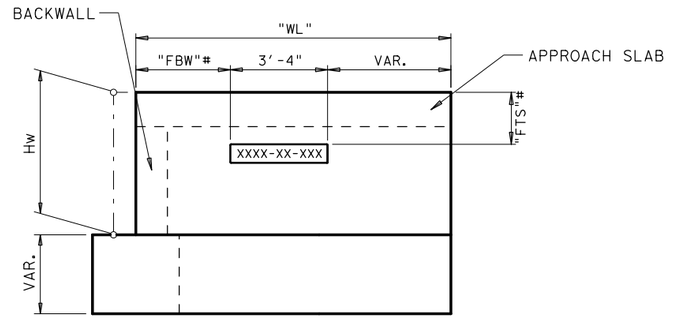
SECTION A-A

NOTE: THE TEXT FOR ALL TEMPLATES SHOULD BE 3W-CV (3") CLEAR VIEW FONT. TEMPLATE TO PROVIDE A RECESSED IMPRESSION INTO CAST CONCRETE. STAIN RECESSED NUMERAL SURFACES BLACK FOR CONTRAST.

STRUCTURE ID TEMPLATE NUMBERS							
NBI NUMBER	LOCATION	STRUCTURE NUMBER	"WL"	"Lw"	"Hw"	"FBW"#	"FTS"#
08-217-0-0106-04-057	SALT FORK OF BRAZOS RIVER BRIDGE	CSJ 0106-04-036	ABUT 1: 29' ABUT 11: 12'	NA	ABUT 1: 7'-2¾" ABUT 11: 5'-11"	VARIOUS	VARIOUS

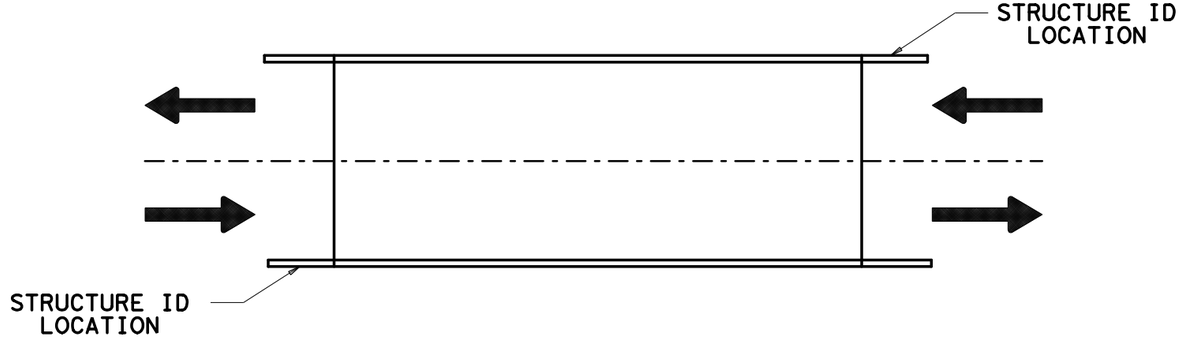


PARALLEL WING ELEVATION



WINGWALL ELEVATION

FIELD LOCATE TO AVOID CONFLICT WITH REINFORCEMENT AND RIPRAP. THE ENGINEER SHALL APPROVE INSTALLATION LOCATION PRIOR TO PLACEMENT.



NOTE:
THE STRUCTURE ID'S ARE USUALLY PLACED ON THE RIGHT HAND SIDE OF APPROACHES. THIS PLACES THE ID'S ON DIAGONAL CORNERS. THE STRUCTURE ID'S WILL NOT BE PAID FOR DIRECTLY, BUT WILL BE CONSIDERED SUBSIDIARY TO THE VARIOUS BRIDGE ITEMS.

STATE OF TEXAS
PRADEEP KUMAR
130846
LICENSED
PROFESSIONAL ENGINEER
4/28/2022

HL93 LOADING

REV. No.	DATE	REVISION	BY

ATKINS
TBPE REG. # F-474

Texas Department of Transportation
Abilene District
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US 380
STRUCTURE ID DETAILS
SIDD-14

SALT FORK OF BRAZOS RIVER BRIDGE

DESIGNED: TS	FED. RD DIV. No.	STATE	PROJECT No.			HIGHWAY No.
CHECKED: SK	6	TEXAS	SEE TITLE SHEET			US 380
DRAWN: DN	STATE DISTRICT	COUNTY	CONTROL No.	SECTION No.	JOB No.	SHEET No.
CHECKED: TS	ABL	STONEWALL	0106	04	036	80

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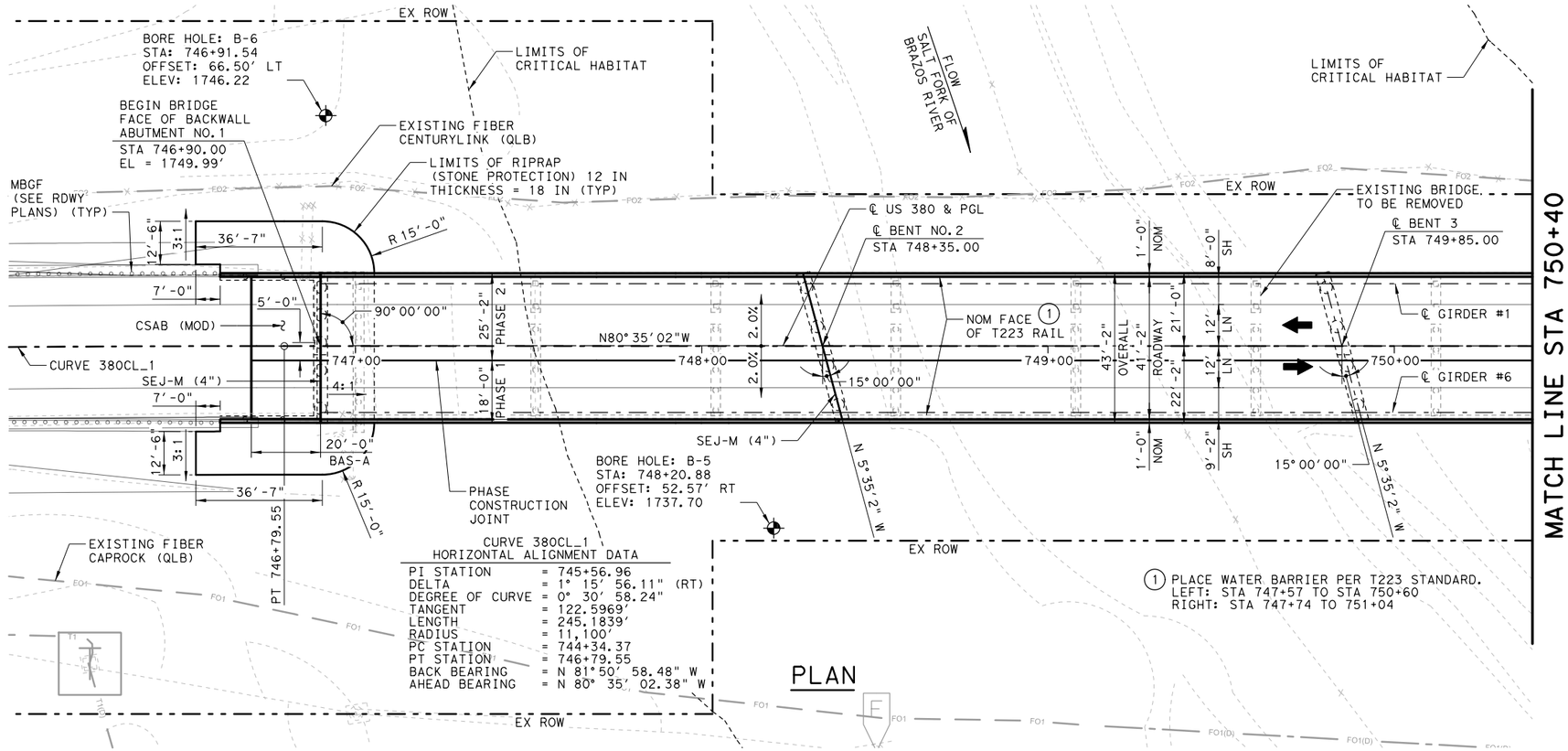
PEN TABLE: US380.tbl
FILE: c:\pw_work\dftrnatx01\rome2243\dms57899\106 SIDD.DGN
4/28/2022

100% SUBMITTAL
DATE: 4/28/2022
TIME: 7:10:59 PM

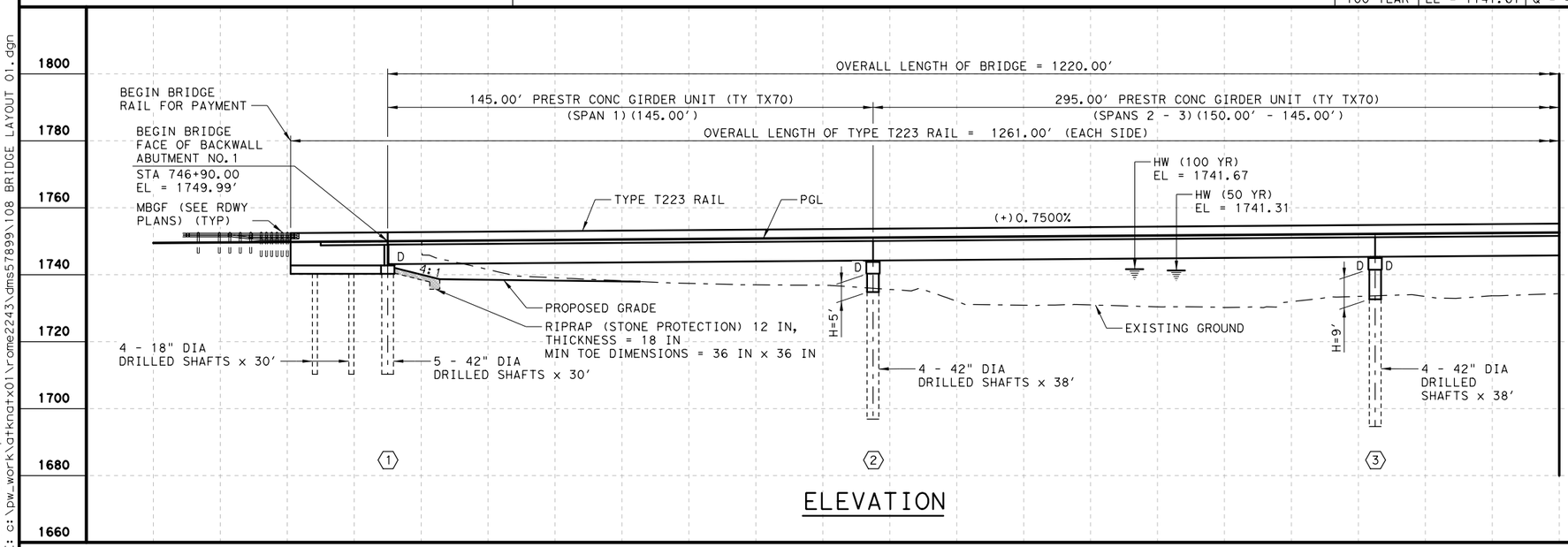


CURVE 380CL_1
HORIZONTAL ALIGNMENT DATA

PI STATION	= 745+56.96
DELTA	= 1° 15' 56.11" (RT)
DEGREE OF CURVE	= 0° 30' 58.24"
TANGENT	= 122.5969'
LENGTH	= 245.1839'
RADIUS	= 11,100'
PC STATION	= 744+34.37
PT STATION	= 746+79.55
BACK BEARING	= N 81° 50' 58.48" W
AHEAD BEARING	= N 80° 35' 02.38" W

PLAN

ALL BENTS ON BEARING N 9° 24' 58" E (UNO)



ELEVATION

HYDRAULIC DATA			
50 YEAR	EL = 1741.31	Q = 43400 CFS	V = 6.62 FPS
100 YEAR	EL = 1741.67	Q = 48100 CFS	V = 6.90 FPS

DESIGN SPEED: 50 MPH
ADT (2020): 697 VPD
ADT (2040): 976 VPD
FUNCTION CLASS: RURAL ARTERIAL
EXISTING NBI: 08-217-0106-04-043
PROPOSED NBI: 08-217-0106-04-057

GENERAL NOTES:

1. DESIGNED IN ACCORDANCE WITH AASHTO LRFD BRIDGE DESIGN SPECIFICATION, 8TH EDITION (2017), AS MODIFIED BY 2020 TXDOT BDM.
2. FOR VERTICAL PROFILE AND HORIZONTAL ALIGNMENT SEE ROADWAY PLAN AND PROFILE SHEETS.
3. ALL DIMENSIONS ARE EITHER HORIZONTAL OR VERTICAL AND MUST BE CORRECTED FOR GRADE, CROWN AND/OR SUPERELEVATION.
4. THE CONTRACTOR IS RESPONSIBLE FOR FIELD VERIFYING THE LOCATION OF ALL UTILITIES AND EXISTING STRUCTURES PRIOR TO ORDERING MATERIALS. NOTIFY ENGINEERING IN WRITING OF ANY DISCREPANCIES OR CONFLICTS.
5. THE H VALUES SHOWN ARE ESTIMATED COLUMN HEIGHTS. THE CONTRACTOR IS RESPONSIBLE FOR CALCULATING THE ACTUAL COLUMN HEIGHTS BASED ON FIELD CONDITIONS.
6. THE EXISTING 23 SPAN BRIDGE IS TO BE REMOVED BY THE CONTRACTOR. STEEL I-BEAMS AND PRESTRESSED CONCRETE BEAMS SUPPORTED ON CAST-IN-PLACE SUBSTRUCTURE ON PRECAST CONCRETE PILES FOUNDATION. THIS BRIDGE IS TO BE REMOVED AND DISPOSED OF IN ACCORDANCE WITH STANDARD SPECIFICATION ITEM 496. CONTRACTOR IS REQUIRED TO SUBMIT SIGN AND SEALED DEMO PLAN TO THE ENGINEER FOR APPROVAL.
7. "D" DENOTES DOWEL IN OUTSIDE GIRDER.
8. SEE TYPICAL SECTION FOR PHASED CONSTRUCTION DETAILS.
9. SHEAR KEYS REQUIRED AT ABUTMENT 1 AND BENTS, 2 - 3 SEE "IGSK" STANDARD AND DETAILS SHEETS.
10. FOUND DRILLED SHAFTS AT LENGTHS SHOWN OR LONGER TO OBTAIN A MINIMUM ONE DRILLED SHAFT DIAMETER PENETRATION INTO HARD ROCK.

STATE OF TEXAS
PRADEEP KUMAR
130846
LICENSED PROFESSIONAL ENGINEER
4/28/2022

HL93 LOADING

REV. No.	DATE	REVISION	BY

ATKINS
TBPE REG. # F-474

Texas Department of Transportation
Abilene District
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US 380
BRIDGE LAYOUT

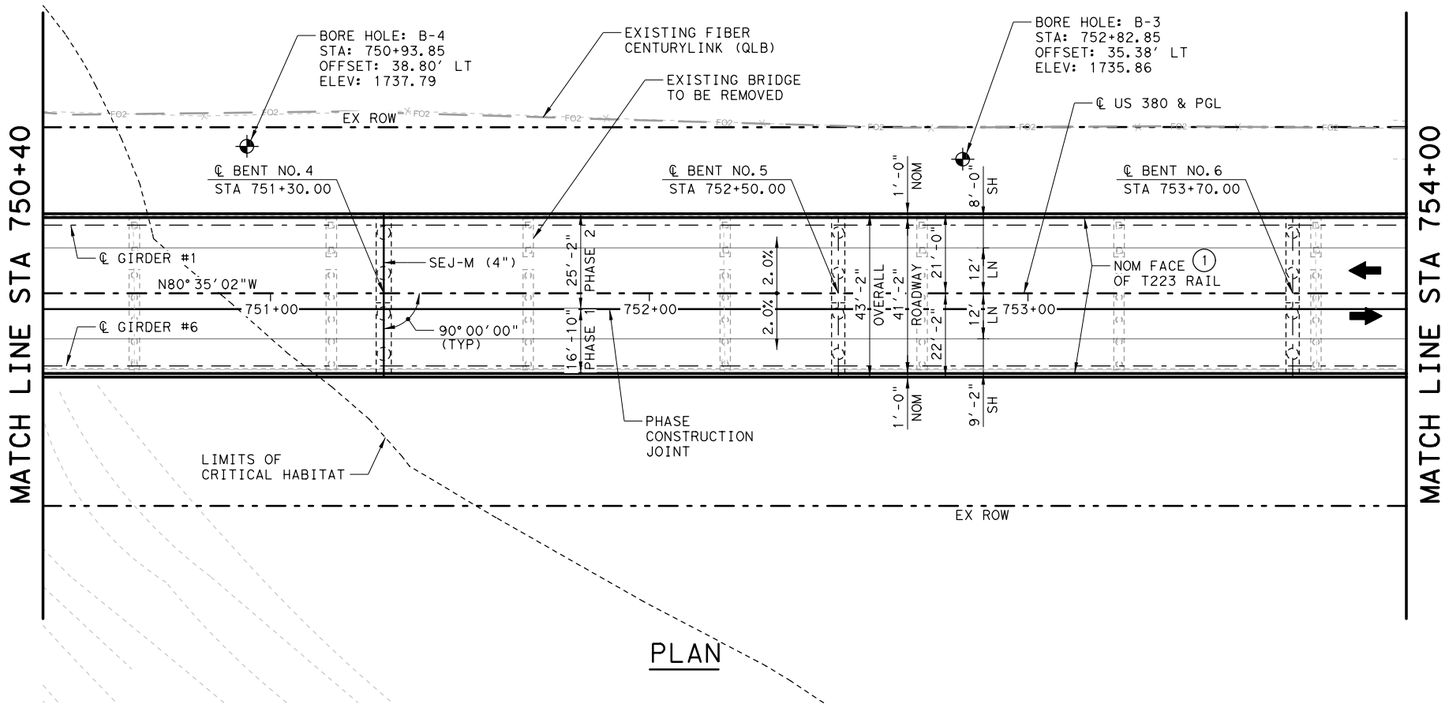
SALT FORK OF BRAZOS RIVER BRIDGE

SCALE: 1" = 40'-0" SHEET 1 OF 4

DESIGNED: TS	FED. RD DIV. No.	STATE	PROJECT No.			HIGHWAY No.
CHECKED: SK	6	TEXAS	SEE TITLE SHEET			US 380
DRAWN: DN	STATE DISTRICT	COUNTY	CONTROL No.	SECTION No.	JOB No.	SHEET No.
CHECKED: TS	ABL	STONEWALL	0106	04	036	81

PLOT DRIVER: TXDOT_PDF_BW.plt
PEN TABLE: US380_pen.tbl
FILE: c:\pw_work\atkndtx01\rome22243\dms57899\108 BRIDGE LAYOUT 01.dgn

100% SUBMITTAL
DATE: 4/28/2022 TIME: 7:11:11 PM



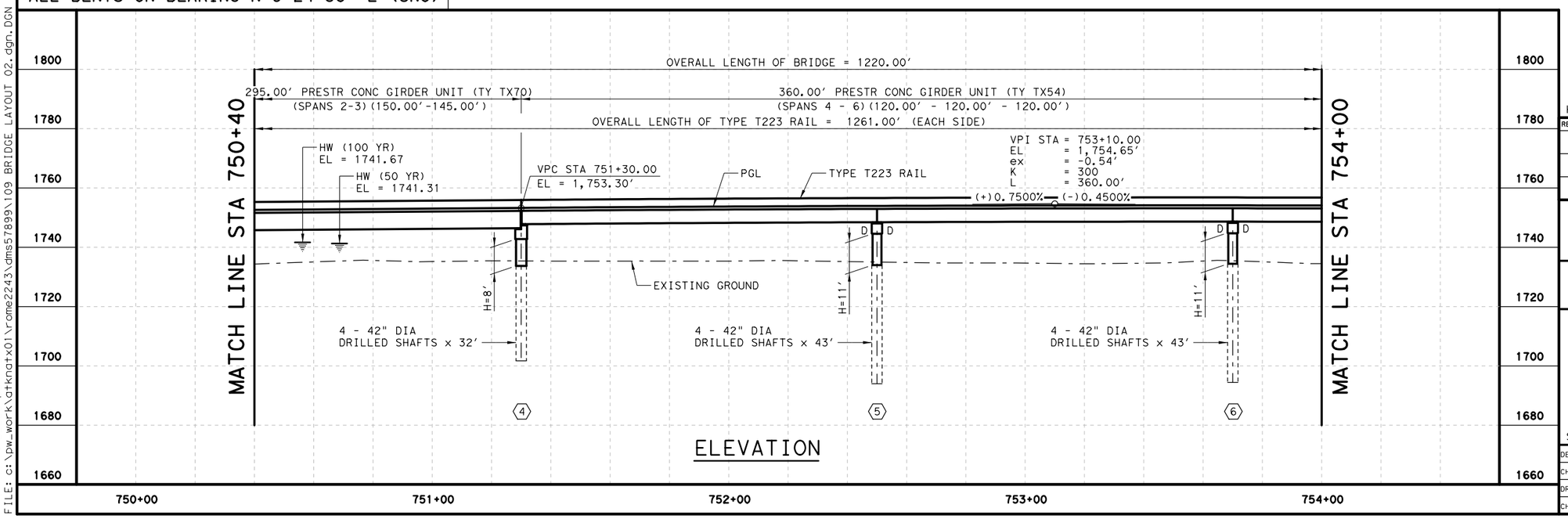
PLAN

NOTES:

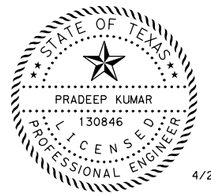
1. FOR GENERAL NOTES SEE BRIDGE LAYOUT 1 OF 4.

(1) PLACE WATER BARRIER PER T223 STANDARD.
LEFT: STA 747+57 TO STA 750+60
RIGHT: STA 747+74 TO 751+04

ALL BENTS ON BEARING N 9° 24' 58" E (UNO)



ELEVATION



4/28/2022

HL93 LOADING

REV. No.	DATE	REVISION	BY

ATKINS
TBPE REG. # F-474

Texas Department of Transportation
Abilene District

US 380
BRIDGE LAYOUT

SALT FORK OF BRAZOS RIVER BRIDGE

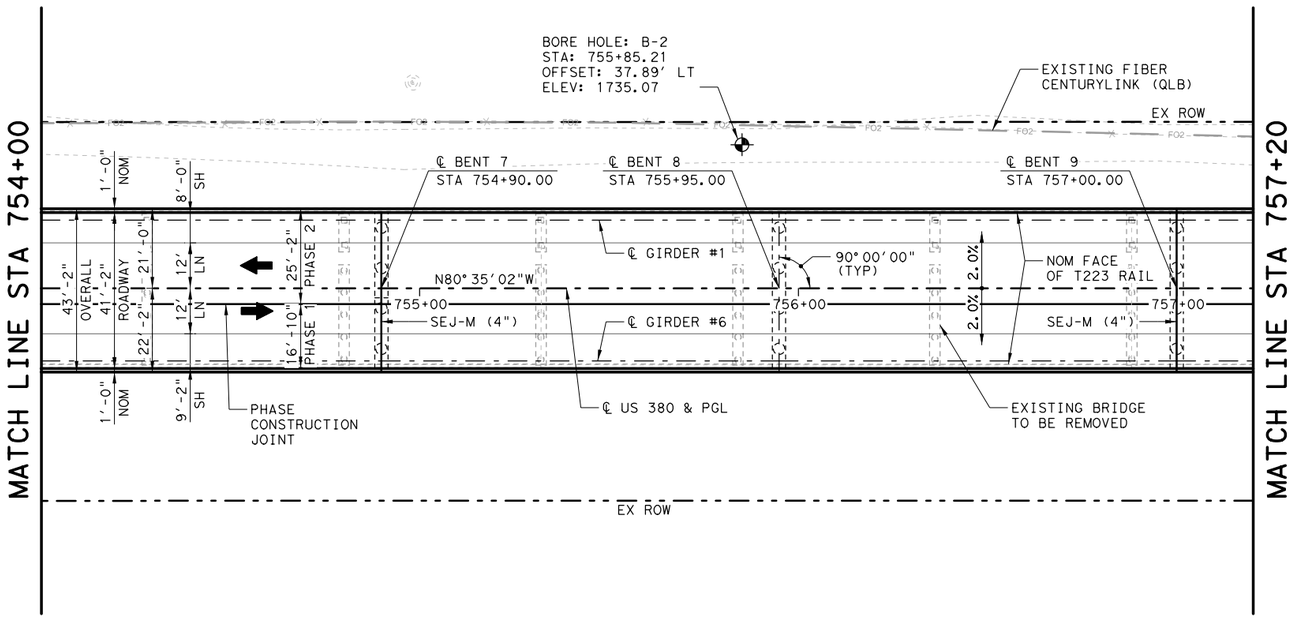
SCALE: 1" = 40'-0" SHEET 2 OF 4

DESIGNED: TS	FED. RD DIV. No.	STATE	PROJECT No.			HIGHWAY No.
CHECKED: SK	6	TEXAS	SEE TITLE SHEET			US 380
DRAWN: DN	STATE DISTRICT	COUNTY	CONTROL No.	SECTION No.	JOB No.	SHEET No.
CHECKED: TS	ABL	STONEWALL	0106	04	036	82

PLOT DRIVER: TXDOT_PDF_BW.plt
PEN TABLE: US380_pen.tbl
FILE: c:\pw_work\atkrndtx01\rome22243\dms57899\109 BRIDGE LAYOUT 02.dgn.DGN

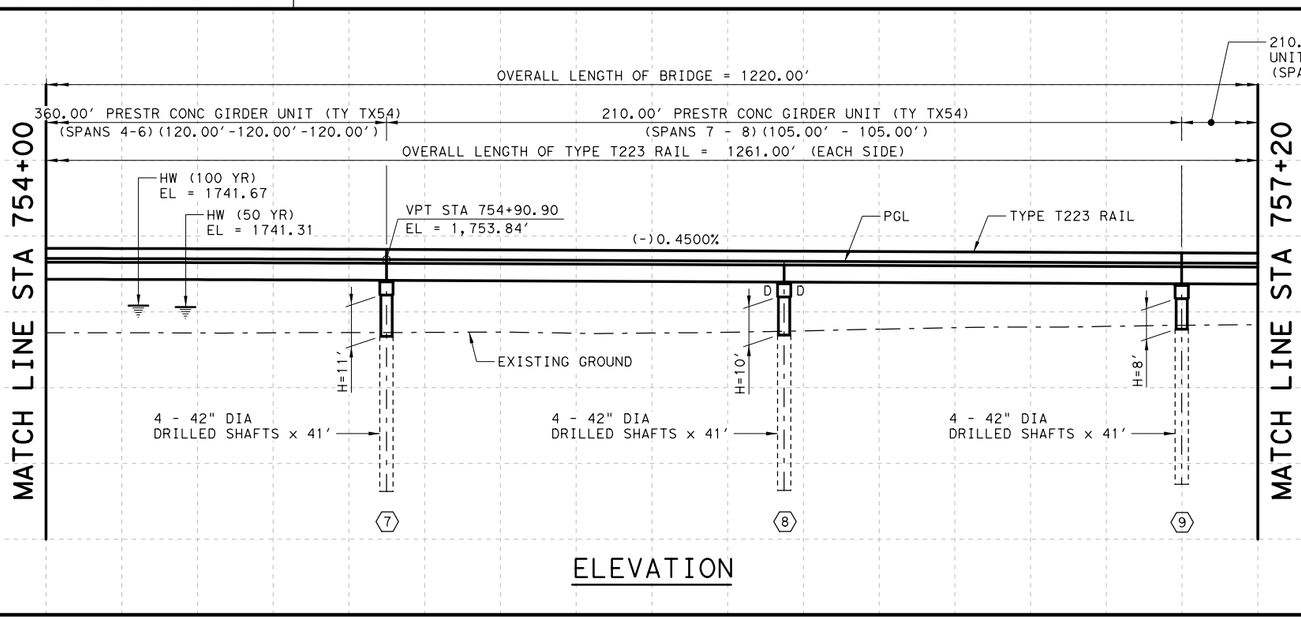
100% SUBMITTAL

DATE: 4/28/2022 TIME: 7:11:20 PM



PLAN

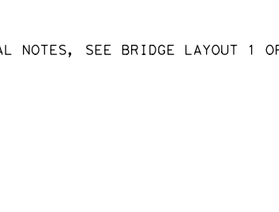
ALL BENTS ON BEARING N 9°24'58" E (UNO)



ELEVATION

NOTES:

1. FOR GENERAL NOTES, SEE BRIDGE LAYOUT 1 OF 4.



HL93 LOADING

REV. No.	DATE	REVISION	BY

ATKINS TBPE REG. # F-474

Texas Department of Transportation
Abilene District

US 380
BRIDGE LAYOUT

SALT FORK OF BRAZOS RIVER BRIDGE

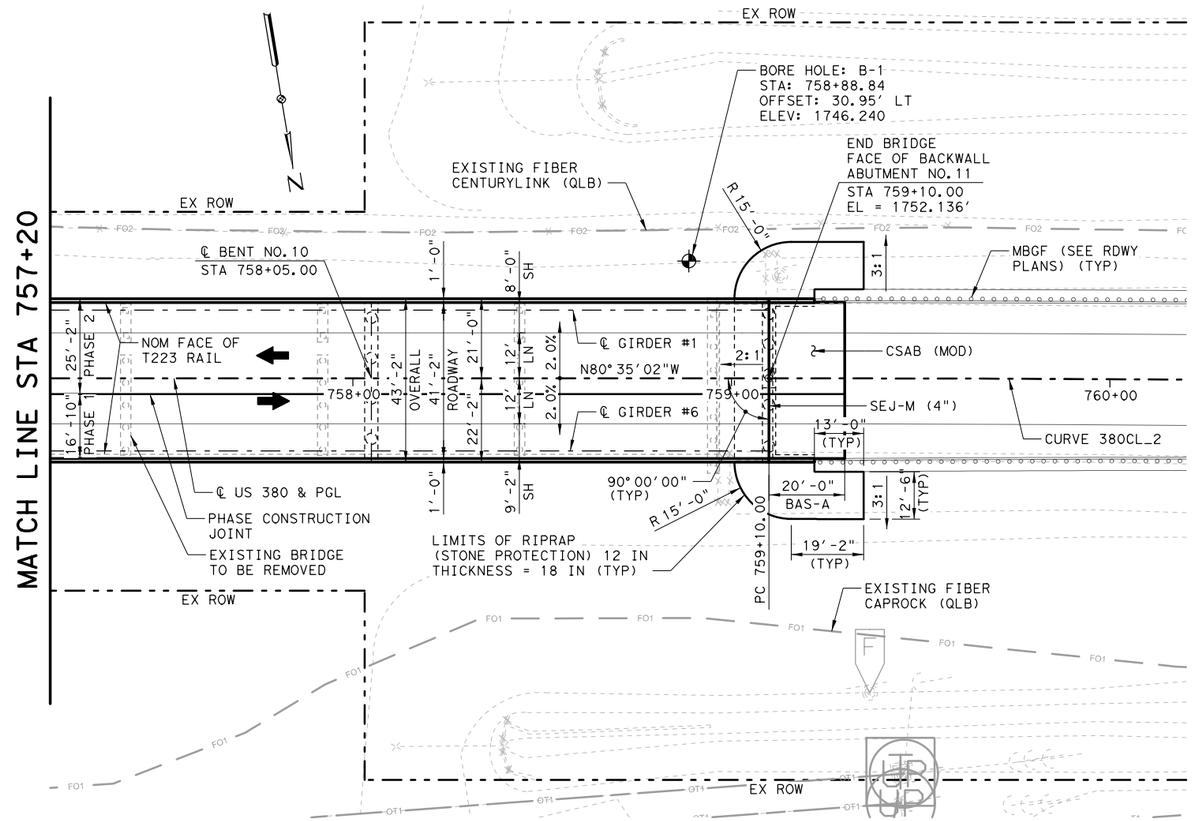
SCALE: 1" = 40'-0" SHEET 3 OF 4

DESIGNED: TS	FED. RD DIV. No.	STATE	PROJECT No.	HIGHWAY No.
CHECKED: SK	6	TEXAS	SEE TITLE SHEET	US 380

DRAWN: DN	STATE DISTRICT	COUNTY	CONTROL No.	SECTION No.	JOB No.	SHEET No.
CHECKED: TS	ABL	STONEWALL	0106	04	036	83

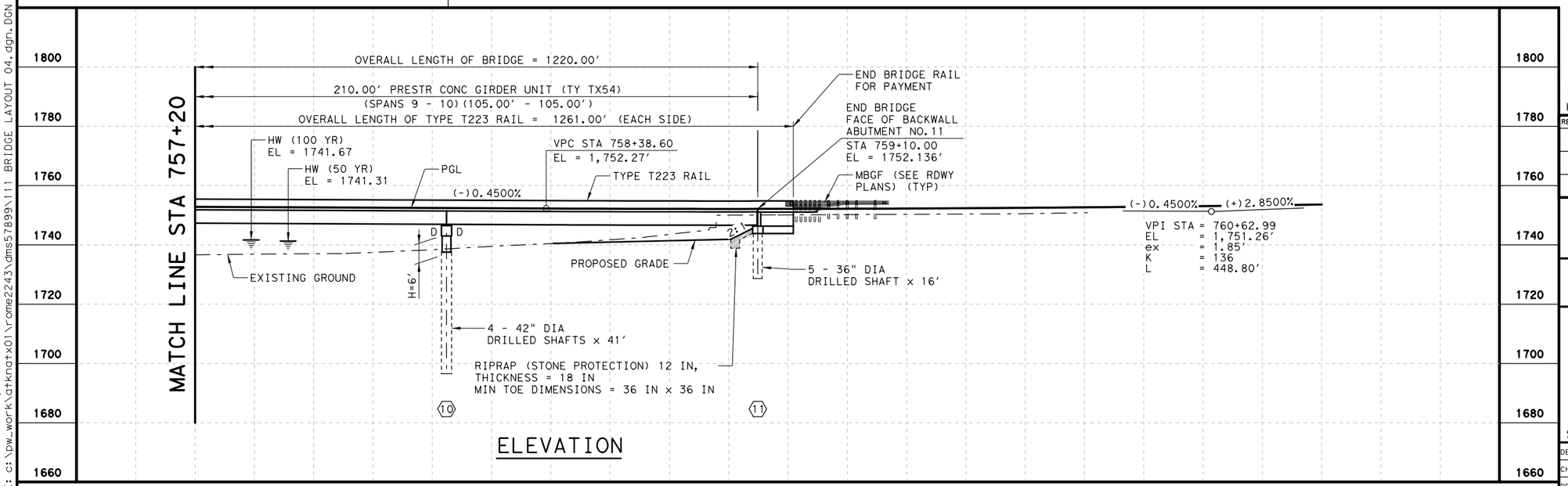
PLOT DRIVER: TXDOT_PDF_BW.plt
PEN TABLE: US380_pen.tbl
FILE: c:\pw_work\dfkrdtx01\rome2243\dms57899\110 BRIDGE LAYOUT 03.dgn.DGN

100% SUBMITTAL
DATE: 4/28/2022 TIME: 7:11:32 PM



PLAN

ALL BENTS ON BEARING N 9°24'58" E (UNO)



ELEVATION

NOTES:

1. FOR GENERAL NOTES, SEE BRIDGE LAYOUT 1 OF 4.

CURVE 380CL_2
HORIZONTAL ALIGNMENT DATA

PI STATION	= 761+05.01
DELTA	= 1° 21' 46.86" (RT)
DEGREE OF CURVE	= 0° 20' 58.17"
TANGENT	= 195.0092'
LENGTH	= 390.0000'
RADIUS	= 16,394.0359'
PC STATION	= 759+10.00 N
PT STATION	= 763+00.00 N
BACK BEARING	= N 80° 35' 02.38" W
AHEAD BEARING	= N 79° 13' 15.51" W

STATE OF TEXAS
PRADEEP KUMAR
130846
LICENSED PROFESSIONAL ENGINEER
4/28/2022

HL93 LOADING

REV. No.	DATE	REVISION	BY

ATKINS
TBPE REG. # F-474

Texas Department of Transportation
Abilene District
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US 380
BRIDGE LAYOUT

SALT FORK OF BRAZOS RIVER BRIDGE

SCALE: 1" = 40'-0" SHEET 4 OF 4

DESIGNED: TS	FED. RD DIV. No.	STATE	PROJECT No.			HIGHWAY No.
CHECKED: SK	6	TEXAS	SEE TITLE SHEET			US 380
DRAWN: DN	STATE DISTRICT	COUNTY	CONTROL No.	SECTION No.	JOB No.	SHEET No.
CHECKED: TS	ABL	STONEWALL	0106	04	036	84

PLOT DRIVER: TXDOT_PDF_BW.plt
PEN TABLE: US380_pen.tbl
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100% SUBMITTAL

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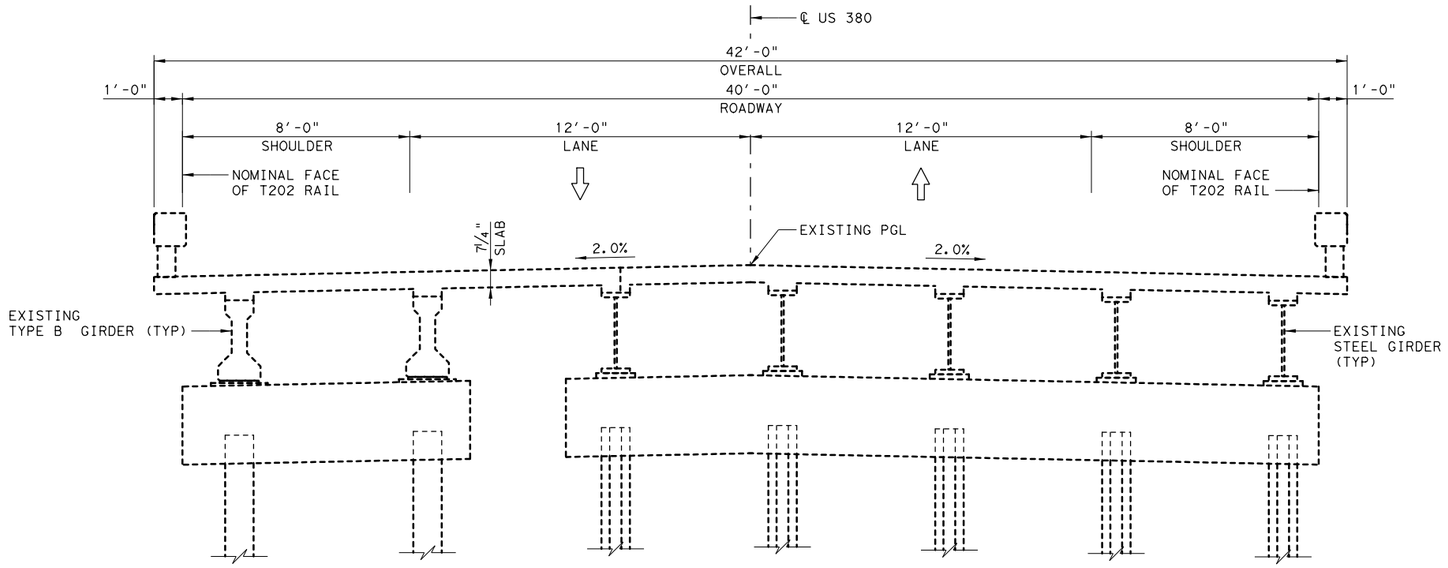
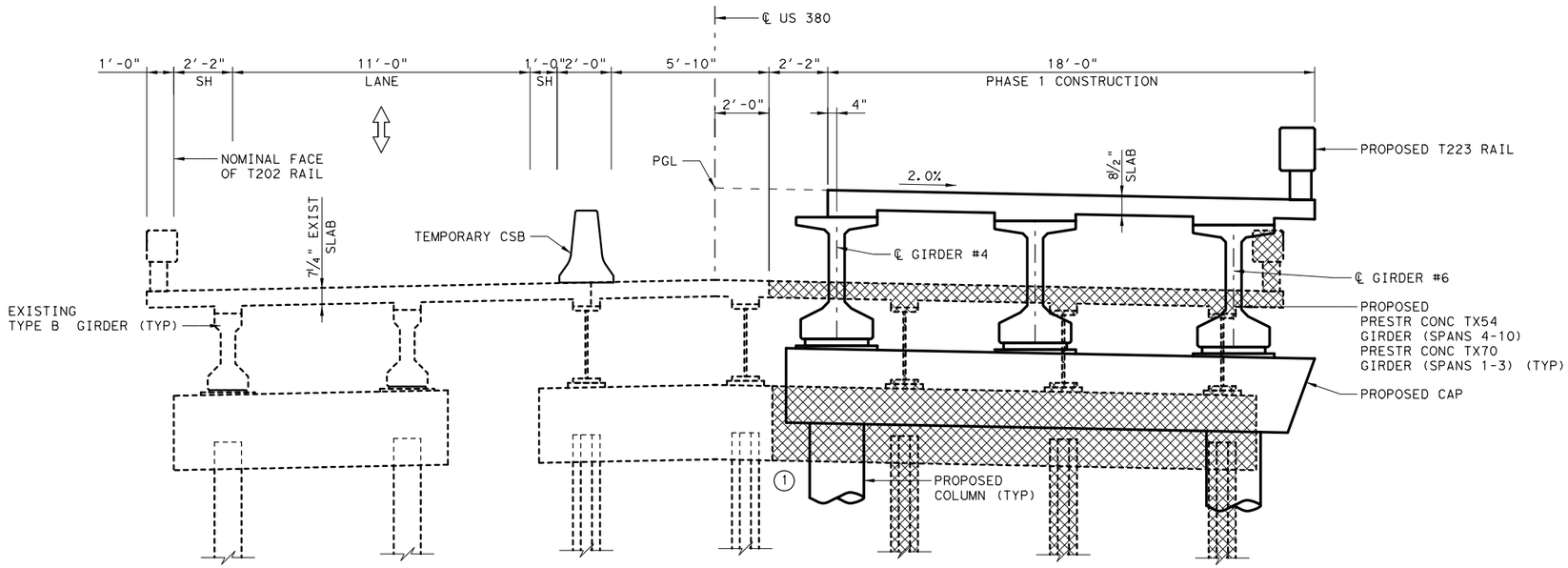


EXISTING TYPICAL SECTION



PHASE 1

PORTION OF EXISTING BRIDGE TO BE REMOVED IN PHASE INDICATED

① AT PROPOSED TX70 (SPANS 1-3, EXISTING BENTS 2-8), THERE IS NO CLEARANCE BETWEEN BOTTOM OF GIRDERS AND TOP OF EXISTING BENT CAP. PHASED REMOVAL REQUIRED. AT PROPOSED SPANS 8-10 (EXISTING BENTS 20-23), THERE IS MINIMAL CLEARANCE BETWEEN BOTTOM OF THE TX54 GIRDERS AND TOP OF EXISTING BENT CAP. PHASED REMOVAL REQUIRED.

NOTE:

1. CONTRACTOR SHALL FIELD VERIFY EXISTING STRUCTURE DIMENSIONS AND ELEVATIONS PRIOR TO COMMENCING DEMOLITION AND NEW CONSTRUCTION.

STATE OF TEXAS
PRADEEP KUMAR
130846
LICENSED
PROFESSIONAL ENGINEER
4/28/2022

HL93 LOADING

REV. No.	DATE	REVISION	BY

ATKINS
TBPE REG. # F-474

Texas Department of Transportation
Abilene District

US 380

TYPICAL SECTION

SALT FORK OF BRAZOS RIVER BRIDGE

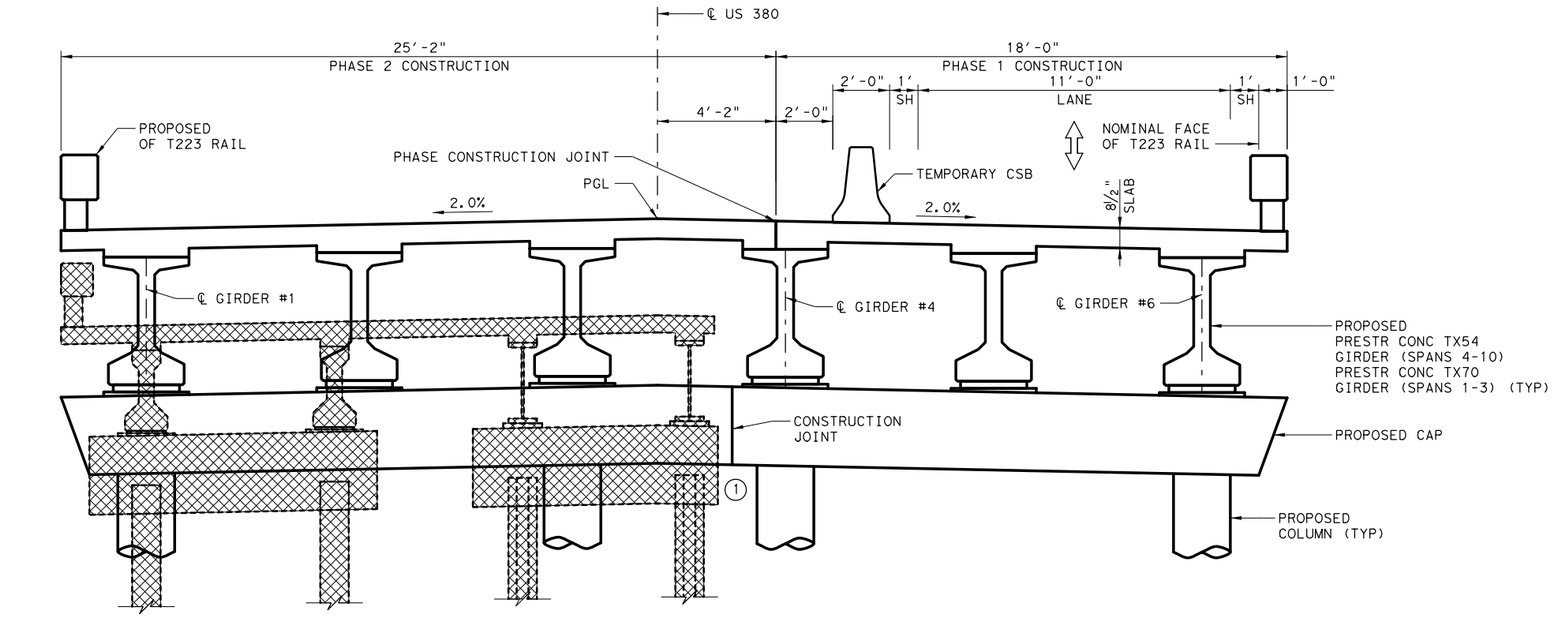
SCALE: 3/16"=1′-0" SHEET 1 OF 2

DESIGNED: TS	FED. RD DIV. No.	STATE	PROJECT No.			HIGHWAY No.
CHECKED: SK	6	TEXAS	SEE TITLE SHEET			US 380
DRAWN: DN	STATE DISTRICT	COUNTY	CONTROL No.	SECTION No.	JOB No.	SHEET No.
CHECKED: TS	ABL	STONEWALL	0106	04	036	85

PLOT DRIVER: TXDOT_PDF_BW.plt
PEN TABLE: US380_pen.tbl
FILE: c:\pw_work\atkrndtx01\rome2243\dms57899\112 TYPICAL SECTION 01.dgn

100% SUBMITTAL

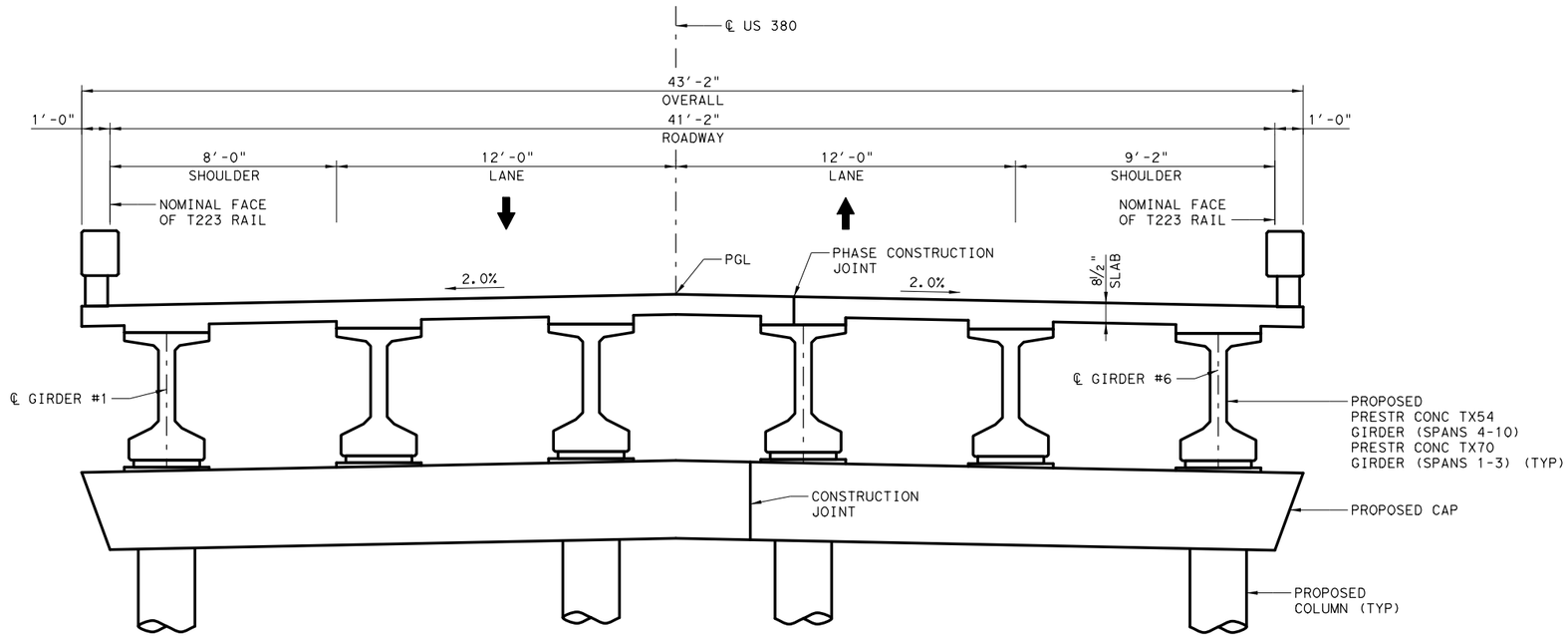
DATE: 4/28/2022 TIME: 7:11:53 PM



PHASE 2

PORTION OF EXISTING BRIDGE TO BE REMOVED IN PHASE INDICATED

(1) AT PROPOSED TX70 (SPANS 1-3, EXISTING BENTS 2-8), THERE IS NO CLEARANCE BETWEEN BOTTOM OF GIRDERS AND TOP OF EXISTING BENT CAP. PHASED REMOVAL REQUIRED. AT PROPOSED SPANS 8-10 (EXISTING BENTS 20-23), THERE IS MINIMAL CLEARANCE BETWEEN BOTTOM OF THE TX54 GIRDERS AND TOP OF EXISTING BENT CAP. PHASED REMOVAL REQUIRED.



FINAL

PRADEEP KUMAR
130846
LICENSED PROFESSIONAL ENGINEER
STATE OF TEXAS
4/28/2022

HL93 LOADING

REV. No.	DATE	REVISION	BY

ATKINS
TBPE REG. # F-474

Texas Department of Transportation
Abilene District

US 380

TYPICAL SECTION

SALT FORK OF BRAZOS RIVER BRIDGE

SCALE: 3/16"=1′-0" SHEET 2 OF 2

DESIGNED: TS	FED. RD DIV. No.	STATE	PROJECT No.			HIGHWAY No.
CHECKED: SK	6	TEXAS	SEE TITLE SHEET			US 380
DRAWN: DN	STATE DISTRICT	COUNTY	CONTROL No.	SECTION No.	JOB No.	SHEET No.
CHECKED: TS	ABL	STONEWALL	0106	04	036	86

PLOT DRIVER: TXDOT_PDF_BW.plt
PEN TABLE: US380_pen.tbl
FILE: c:\pw_work\atkrndrtx01\rome2243\dms57899\113 TYPICAL SECTION 02.dgn

100% SUBMITTAL

DATE: 4/28/2022 TIME: 7:12:03 PM

DRILLING LOG

WinCore Version 3.3

County	Stonewall	Hole	B-1	District	Abilene
Highway	US 380	Structure	Bridge	Date	07/17/20 to 07/18/20
CSJ	0106-04-036	Station	758+88.84	Grnd. Elev.	1746.24 ft
		Offset	30.95' LT	GW Elev.	1726.84 ft

Elev. (ft)	LOG	Texas Cone Penetrometer	Strata Description	Triaxial Test Lateral Press. (psi)	Triaxial Test Deviator Stress (psi)	Properties MC	LL	PI	Wet Den. (pcf)	Additional Remarks
			SAND, Clayey with Gravel, dry, brown, fine grained, trace roots (SC)			1				SSS@0', N=29
1744.2			CLAY, Sandy, Silty, soft, moist, reddish brown (CL-ML)			4	20	6		SSS@3', N=8, -#200=53.3%
5		6 (6) 9 (6)								
1738.7			CLAY, Lean, hard, moist, reddish brown and gray, trace Gravel (CL)			15				SSS@7.5', N=55
10		50 (5.5) 50 (2.5)				15	37	20		SSS@10.8', N=24, 38, 50/5, -#200=98.9%
1732.2			SHALE, hard, reddish brown, trace Gypsum crystals							
15		50 (1.5) 50 (0.5)				9				SSS@15.3', N=50/5.75
20		50 (1.25) 50 (1.5)								SSS@20.3', N=24, 38, 50/2.25, Sulfate Content=8,960 ppm
1722.2			SHALE, very hard, reddish brown, trace Gypsum crystals to 35.6							
25		50 (1) 50 (0.5)								SSS@25.2', N=30/4, 10/0
30		50 (1) 50 (0.25)				16				SSS@30.2', N=30/4, 10/0
35		50 (1) 50 (0.5)				13	30	14		SSS@35.3', N=30/3.25, 10/0
40		50 (0.75) 50 (0.25)								

Remarks: Drill Rig: CME 75 with TxDOT 170-pound Automatic Hammer; SSS: Split Spoon Sample; PTS: Push Tube Sample; PP: Pocket Penetrometer Reading (tsf); Drilling Method: CFA to 25', then Mud Rotary; Northing: 7130953.14, Easting: 1376780.34

Any ground water elevation information provided on this boring log is representative of conditions existing on the day and for the specific location where this information was collected. The actual groundwater elevation may fluctuate due to time, climatic conditions, and/or construction activity.

Driller: CoreCo USA **Logger:** Luis Salgado **Organization:** Corsair Consulting LLC

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DRILLING LOG

WinCore Version 3.3

County	Stonewall	Hole	B-1	District	Abilene
Highway	US 380	Structure	Bridge	Date	07/17/20 to 07/18/20
CSJ	0106-04-036	Station	758+88.84	Grnd. Elev.	1746.24 ft
		Offset	30.95' LT	GW Elev.	1726.84 ft

Elev. (ft)	LOG	Texas Cone Penetrometer	Strata Description	Triaxial Test Lateral Press. (psi)	Triaxial Test Deviator Stress (psi)	Properties MC	LL	PI	Wet Den. (pcf)	Additional Remarks
			SHALE, very hard, reddish brown, trace Gypsum crystals to 35.6							SSS@40.2', N=20/2, 10/0
45		50 (0.75) 50 (0.125)				14				SSS@45.2', N=25/2.5, 10/0
50		50 (0.25) 50 (0.25)								SSS@50.1', N=50/3.5
1692.2			SHALE, hard to very hard, reddish brown							
55		50 (2.25) 50 (0.75)								SSS@55.3', N=50/4.75
60		50 (2.75) 50 (0.5)								SSS@60.5', N=50/4.5
1681.65		50 (1.5) 50 (0.125)								Boring Terminated at 65.2'
70										
75										
80										

Remarks: Drill Rig: CME 75 with TxDOT 170-pound Automatic Hammer; SSS: Split Spoon Sample; PTS: Push Tube Sample; PP: Pocket Penetrometer Reading (tsf); Drilling Method: CFA to 25', then Mud Rotary; Northing: 7130953.14, Easting: 1376780.34

Any ground water elevation information provided on this boring log is representative of conditions existing on the day and for the specific location where this information was collected. The actual groundwater elevation may fluctuate due to time, climatic conditions, and/or construction activity.

Driller: CoreCo USA **Logger:** Luis Salgado **Organization:** Corsair Consulting LLC

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NOTE:

1. BORING LOGS CONDUCTED BY CORSAIR CONSULTING LLC ARE SHOWN HERE FOR INFORMATIONAL PURPOSES ONLY. SEE GEOTECHNICAL MEMORANDUM US 380 AND SH 208 BRIDGE REPLACEMENT, STONEWALL AND KENT COUNTIES, TEXAS, CORSAIR PROJECT NO. 2000515, DATED AUGUST 20, 2020.

REV. No.	DATE	REVISION	BY

ATKINS

TBPE REG. # F-474

Texas Department of Transportation

Abilene District

US 380
BORING LOGS

SALT FORK OF BRAZOS RIVER BRIDGE

SCALE: NO SCALE SHEET 1 OF 6

DESIGNED: XX	FED. RD DIV. No.	STATE	PROJECT No.			HIGHWAY No.	
CHECKED: SK	6	TEXAS	SEE TITLE SHEET			US 380	
DRAWN: DN	STATE DISTRICT	COUNTY	CONTROL No.	SECTION No.	JOB No.	SHEET No.	
CHECKED: XX	ABL	STONEWALL	0106	04	036	87	

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PEN TABLE: US380_pen.tbl
FILE: c:\pw_work\atknd1x01\rome2243\dms57899\114 BORING LOGS 01.dgn

100% SUBMITTAL

DATE: 4/28/2022 TIME: 7:12:16 PM

DRILLING LOG

WinCore Version 3.3

County	Stonewall	Hole	B-2	District	Abilene
Highway	US 380	Structure	Bridge	Date	07/18/20 to 07/19/20
CSJ	0106-04-036	Station	755+85.21	Grnd. Elev.	1735.07 ft
		Offset	37.89' LT	GW Elev.	1731.27 ft

Elev. (ft)	LOG	Texas Cone Penetrometer	Strata Description	Triaxial Test Lateral Press. (psi)	Triaxial Test Deviator Stress (psi)	Properties MC	LL	PI	Wet Den. (pcf)	Additional Remarks
			SAND, Clayey, moist, brown, fine grained, traces Gravel and ferrous staining (SC)			9				SSS@0', N=13
1731.3										SSS@3', N=9
5		13 (6) 18 (6)	SAND, Poorly Graded, slightly compact, wet, brown, fine to medium grained, few Gravel; SM layer to 5' (SP)			20				
1727.1						17				SSS@6.5', N=10, -#200=4.2%
10		5 (6) 3 (6)	SAND, Poorly Graded, loose, wet, brown, fine to medium grained, few Gravel (SP)			17				SSS@11.5', N=8
1721.1										
15		11 (6) 8 (6)	CLAY, Lean, soft, moist, brown and gray, trace Gravel, little ferrous deposits (CL)			15	34	17		SSS@16.5', N=33, -#200=95.7% Sulfate Content=720 ppm
1716.1										
20		24 (6) 22 (6)	CLAY, Lean, very stiff, moist, brown and gray, few ferrous deposits (CL)			19				SSS@21.5', N=16
1711.1										
25		34 (6) 42 (6)	CLAY, Silty, very stiff, moist, brown and gray, few ferrous deposits (CL-ML)			20	6			SSS@26.5', N=36, -#200=88.4%
1706.1										
30		50 (6) 50 (5.75)	CLAY, Lean, hard, moist, brown and gray, few ferrous deposits (CL)			17				SSS@31.2', N=72
1701.1										
35		50 (1.5) 50 (0.5)	SHALE, hard to very hard, reddish brown, trace Gypsum crystals							SSS@35.3', N=50/4.75
40		50 (1.25) 50 (0.5)								

Remarks: Drill Rig: CME 75 with TxDOT 170-pound Automatic Hammer; SSS: Split Spoon Sample; PTS: Push Tube Sample; PP: Pocket Penetrometer Reading (tsf); Drilling Method: CFA to 5', HSA to 45', then Mud Rotary; Northing: 7130896.62, Easting: 1377078.74

Any ground water elevation information provided on this boring log is representative of conditions existing on the day and for the specific location where this information was collected. The actual groundwater elevation may fluctuate due to time, climatic conditions, and/or construction activity.

Driller: CoreCo USA **Logger:** Luis Salgado **Organization:** Corsair Consulting LLC

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DRILLING LOG

WinCore Version 3.3

County	Stonewall	Hole	B-2	District	Abilene
Highway	US 380	Structure	Bridge	Date	07/18/20 to 07/19/20
CSJ	0106-04-036	Station	755+85.21	Grnd. Elev.	1735.07 ft
		Offset	37.89' LT	GW Elev.	1731.27 ft

Elev. (ft)	LOG	Texas Cone Penetrometer	Strata Description	Triaxial Test Lateral Press. (psi)	Triaxial Test Deviator Stress (psi)	Properties MC	LL	PI	Wet Den. (pcf)	Additional Remarks
			SHALE, hard to very hard, reddish brown, trace Gypsum crystals							SSS@40.3', N=50/4.5
45		50 (1.75) 50 (0.5)								SSS@45.4', N=20/2.75, 10/0
1686.1			SHALE, very hard, reddish brown, trace Gypsum crystals to 55.5'							
50		50 (0.75) 50 (0.25)				13	39	23		SSS@50.2', N=50/4.75
55		50 (1) 50 (0.5)				16				SSS@55.2', N=50/4
60		50 (0.25) 50 (0.125)								SSS@60.1', N=50/2.25
65		50 (0.25) 50 (0.125)								SSS@65.1', N=10/0.5, 10/0
1665. 70		50 (0.5) 50 (0.125)								Boring Terminated at 70.1'
75										
80										

Remarks: Drill Rig: CME 75 with TxDOT 170-pound Automatic Hammer; SSS: Split Spoon Sample; PTS: Push Tube Sample; PP: Pocket Penetrometer Reading (tsf); Drilling Method: CFA to 5', HSA to 45', then Mud Rotary; Northing: 7130896.62, Easting: 1377078.74

Any ground water elevation information provided on this boring log is representative of conditions existing on the day and for the specific location where this information was collected. The actual groundwater elevation may fluctuate due to time, climatic conditions, and/or construction activity.

Driller: CoreCo USA **Logger:** Luis Salgado **Organization:** Corsair Consulting LLC

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NOTE:

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REV. No.	DATE	REVISION	BY

ATKINS TBPE REG. # F-474

Texas Department of Transportation Abilene District

US 380
BORING LOGS

SALT FORK OF BRAZOS RIVER BRIDGE

SCALE: NO SCALE SHEET 2 OF 6

DESIGNED: XX	FED. RD DIV. No.	STATE	PROJECT No.	HIGHWAY No.
CHECKED: SK	6	TEXAS	SEE TITLE SHEET	US 380

DRAWN: DN	STATE DISTRICT	COUNTY	CONTROL No.	SECTION No.	JOB No.	SHEET No.
CHECKED: XX	ABL	STONEWALL	0106	04	036	88

PLOT DRIVER: TXDOT_PDF_BW.plt
PEN TABLE: US380_pen.tbl
FILE: c:\pw_work\atknd1x01\rome2243\dms57899\115 BORING LOGS 02.dgn

DRILLING LOG

WinCore Version 3.3

County	Stonewall	Hole	B-3	District	Abilene
Highway	US 380	Structure	Bridge	Date	07/19/20 to 07/20/20
CSJ	0106-04-036	Station	752+82.85	Grnd. Elev.	1735.86 ft
		Offset	35.38' LT	GW Elev.	1729.86 ft

Elev. (ft)	LOG	Texas Cone Penetrometer	Strata Description	Triaxial Test Lateral Press. (psi)	Triaxial Test Deviator Stress (psi)	Properties MC	LL	PI	Wet Den. (pcf)	Additional Remarks
			SAND, Clayey, moist, brown, fine grained, traces Gravel and ferrous staining (SC)			7				SSS@0', N=6
1732.9							22	8		SSS@3', N=7, -#200=60.3%
5		6 (6) 5 (6)	CLAY, Sandy Lean, soft, moist, brown, traces ferrous staining, 3" GP with Sand seam at 7.8' (CL)			20				SSS@6.5', N=10
1727.9						10				SSS@8', N=6 -#200=4.9%
10		5 (6) 7 (6)	SAND, Silty, loose, wet, brown, fine grained; SP layers to 9.5' and below 13.8' (SM)			19				SSS@11.5', N=1
						19				SSS@13', N=1
1721.4										
15		15 (6) 14 (6)	SAND, Poorly Graded with Silt, slightly compact, wet, brown, fine to medium grained, trace Gravel; CL layer below 17.7' (SP-SM)			14				SSS@16.5', N=25, -#200=7.5%
1716.9										
20		26 (6) 20 (6)	SAND, Clayey, compact, wet, brown, fine to coarse grained, trace Gravel (SC)			17				SSS@21.3', N=4
1713.9						21	27	12		-#200=93.2%
			CLAY, Lean, very soft, moist, brown and gray, traces calcareous deposits and Gypsum crystals (CL)							
25		4 (6) 3 (6)				20				SSS@26.5', N=3, 17, 50/1.5
1706.9										
30		50 (0.5) 50 (0.25)	SHALE, very hard, reddish brown							SSS@30.2', N=49, 50/3.5
1701.9										
35		50 (2.5) 50 (1)	SHALE, hard, reddish brown							SSS@35.5', N=45, 50/3
40		50 (1) 50 (0.5)								

Remarks: Drill Rig: CME 75 with TxDOT 170-pound Automatic Hammer; SSS: Split Spoon Sample; PTS: Push Tube Sample; PP: Pocket Penetrometer Reading (tsf); Drilling Method: CFA to 5', HSA to 30', then Mud Rotary; Northing: 7130849.63, Easting: 1377377.44

Any ground water elevation information provided on this boring log is representative of conditions existing on the day and for the specific location where this information was collected. The actual groundwater elevation may fluctuate due to time, climatic conditions, and/or construction activity.

Driller: CoreCo USA **Logger:** Luis Salgado **Organization:** Corsair Consulting LLC

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DRILLING LOG

WinCore Version 3.3

County	Stonewall	Hole	B-3	District	Abilene
Highway	US 380	Structure	Bridge	Date	07/19/20 to 07/20/20
CSJ	0106-04-036	Station	752+82.85	Grnd. Elev.	1735.86 ft
		Offset	35.38' LT	GW Elev.	1729.86 ft

Elev. (ft)	LOG	Texas Cone Penetrometer	Strata Description	Triaxial Test Lateral Press. (psi)	Triaxial Test Deviator Stress (psi)	Properties MC	LL	PI	Wet Den. (pcf)	Additional Remarks
			SHALE, hard, reddish brown							SSS@40.2', N=50/4
1691.9										
45		50 (0.5) 50 (0.5)	SHALE, very hard, reddish brown, trace Gypsum crystals				16			SSS@45.1', N=50/3
50		50 (0.75) 50 (0.25)								SSS@50.2', N=50/3.5
55		50 (1.25) 50 (0.5)					12	43	24	SSS@55.3', N=50/6 Sulfate Content=9,200 ppm
60		50 (0.5) 50 (0.25)								SSS@60.1', N=28/1.75, 10/0
65		50 (0.75) 50 (0.125)								SSS@65.1', N=10/0.25, 10/0
1665.8 70		50 (0.5) 50 (0.125)								Boring Terminated at 70.1'
75										
80										

Remarks: Drill Rig: CME 75 with TxDOT 170-pound Automatic Hammer; SSS: Split Spoon Sample; PTS: Push Tube Sample; PP: Pocket Penetrometer Reading (tsf); Drilling Method: CFA to 5', HSA to 30', then Mud Rotary; Northing: 7130849.63, Easting: 1377377.44

Any ground water elevation information provided on this boring log is representative of conditions existing on the day and for the specific location where this information was collected. The actual groundwater elevation may fluctuate due to time, climatic conditions, and/or construction activity.

Driller: CoreCo USA **Logger:** Luis Salgado **Organization:** Corsair Consulting LLC

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NOTE:

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REV. No.	DATE	REVISION	BY

ATKINS
TBPE REG. # F-474

Texas Department of Transportation
Abilene District

US 380
BORING LOGS

SALT FORK OF BRAZOS RIVER BRIDGE

SCALE: NO SCALE SHEET 3 OF 6

DESIGNED: XX	FED. RD DIV. No.	STATE	PROJECT No.			HIGHWAY No.	
CHECKED: SK	6	TEXAS	SEE TITLE SHEET			US 380	
DRAWN: DN	STATE DISTRICT	COUNTY	CONTROL No.	SECTION No.	JOB No.	SHEET No.	
CHECKED: XX	ABL	STONEWALL	0106	04	036	89	

100% SUBMITTAL

DATE: 4/28/2022 TIME: 7:12:38 PM

DRILLING LOG

WinCore Version 3.3

County	Stonewall	Hole	B-4	District	Abilene
Highway	US 380	Structure	Bridge	Date	07/23/20 to 07/24/20
CSJ	0106-04-036	Station	750+93.85	Grnd. Elev.	1737.79 ft
		Offset	38.80' LT	GW Elev.	1728.79 ft

Elev. (ft)	LOG	Texas Cone Penetrometer	Strata Description	Triaxial Test Lateral Press. (psi)	Triaxial Test Deviator Stress (psi)	Properties MC	LL	PI	Wet Den. (pcf)	Additional Remarks
			SAND, Silty, dry, light brown, fine grained (SM)			4				SSS@0', N=10
						2				SSS@3', N=5
1732.85		6 (6) 12 (6)								
			SAND, Silty, loose, wet, light brown, fine grained (SM)			17				SSS@6.5', N=18
1729.8						12				SSS@8', N=4
10		4 (6) 8 (6)	SAND, Poorly Graded with Silt and Gravel, loose, wet, brown, fine to coarse grained; SM layer to 10' (SP-SM)							
						9				SSS@11.5', N=12, -#200=6.4%
1723.3		18 (6) 18 (6)								
15			CLAY, Lean, stiff, moist, reddish brown and gray (CL)							
						21				SSS@16.5', N=7
1717.820		50 (2) 50 (1.5)								
			SHALE, hard, reddish brown, trace calcareous deposits and Gypsum crystals							SSS@20.5', N=40, 50/5.75 Sulfate Content=8,080 ppm
1713.8										
25		50 (0.5) 50 (0.75)	SHALE, very hard, reddish brown, trace Gypsum crystals to 25.6'							SSS@25.2', N=50/5
30		50 (0.5) 50 (0.25)								SSS@30.1', N=50/5
35		50 (1.5) 50 (0.5)								SSS@35.2', N=50/4.5
		50 (0.25) 50 (0.75)								
40										

Remarks: Drill Rig: CME 75 with TxDOT 170-pound Automatic Hammer; SSS: Split Spoon Sample; PTS: Push Tube Sample; PP: Pocket Penetrometer Reading (tsf); Drilling Method: HSA to 20', then Mud Rotary; Northing: 7130815.33, Easting: 1377563.33

Any ground water elevation information provided on this boring log is representative of conditions existing on the day and for the specific location where this information was collected. The actual groundwater elevation may fluctuate due to time, climatic conditions, and/or construction activity.

Driller: CoreCo USA **Logger:** Jose Flores **Organization:** Corsair Consulting LLC

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DRILLING LOG

WinCore Version 3.3

County	Stonewall	Hole	B-4	District	Abilene
Highway	US 380	Structure	Bridge	Date	07/23/20 to 07/24/20
CSJ	0106-04-036	Station	750+93.85	Grnd. Elev.	1737.79 ft
		Offset	38.80' LT	GW Elev.	1728.79 ft

Elev. (ft)	LOG	Texas Cone Penetrometer	Strata Description	Triaxial Test Lateral Press. (psi)	Triaxial Test Deviator Stress (psi)	Properties MC	LL	PI	Wet Den. (pcf)	Additional Remarks
			SHALE, very hard, reddish brown, trace Gypsum crystals to 25.6'							SSS@40.2', N=50/3.5
45		50 (0.5) 50 (0.25)								SSS@45.1', N=50/3
50		50 (1.25) 50 (0.5)								SSS@50.2', N=20/2.5, 10/0
55		50 (1) 50 (0.125)								SSS@55.2', N=20/1, 10/0
60		50 (0.5) 50 (0.25)				13				SSS@60.2', N=50/2.5
65		50 (0.5) 50 (0.5)								SSS@65.2', N=20/0.75, 10/0
1667.770		50 (0.5) 50 (0.25)								Boring Terminated at 70.1'
75										
80										

Remarks: Drill Rig: CME 75 with TxDOT 170-pound Automatic Hammer; SSS: Split Spoon Sample; PTS: Push Tube Sample; PP: Pocket Penetrometer Reading (tsf); Drilling Method: HSA to 20', then Mud Rotary; Northing: 7130815.33, Easting: 1377563.33

Any ground water elevation information provided on this boring log is representative of conditions existing on the day and for the specific location where this information was collected. The actual groundwater elevation may fluctuate due to time, climatic conditions, and/or construction activity.

Driller: CoreCo USA **Logger:** Jose Flores **Organization:** Corsair Consulting LLC

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REV. No.	DATE	REVISION	BY

ATKINS

TBPE REG. # F-474

Texas Department of Transportation

Abilene District

US 380
BORING LOGS

SALT FORK OF BRAZOS RIVER BRIDGE

SCALE: NO SCALE SHEET 4 OF 6

DESIGNED: XX	FED. RD DIV. No.	STATE	PROJECT No.			HIGHWAY No.	
CHECKED: SK	6	TEXAS	SEE TITLE SHEET			US 380	
DRAWN: DN	STATE DISTRICT	COUNTY	CONTROL No.	SECTION No.	JOB No.	SHEET No.	
CHECKED: XX	ABL	STONEWALL	0106	04	036	90	

PLOT DRIVER: TXDOT_PDF_BW.plt
PEN TABLE: US380_pen.tbl
FILE: c:\pw_work\atknatx01\rome2243\dms57899\117 BORING LOGS 04.dgn

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DATE: 4/28/2022 TIME: 7:12:47 PM

DRILLING LOG

WinCore Version 3.3

County	Stonewall	Hole	B-5	District	Abilene
Highway	US 380	Structure	Bridge	Date	07/22/20 to 07/23/20
CSJ	0106-04-036	Station	748+20.88	Grnd. Elev.	1737.70 ft
		Offset	52.57' RT	GW Elev.	1729.20 ft

Elev. (ft)	LOG	Texas Cone Penetrometer	Strata Description	Triaxial Test Lateral Press. (psi)	Triaxial Test Deviator Stress (psi)	Properties MC	LL	PI	Wet Den. (pcf)	Additional Remarks
			SAND, Clayey, dry, reddish brown, fine grained, few Gravel (SC)			4				SSS@0', N=20
1735.2			SAND, Silty, loose, dry to 4.5', wet below 6.5', brown, fine grained, trace CL lenses (SM)			5				SSS@3', N=12
5		10 (6) 9 (6)								
						17				SSS@6.5', N=17
1729.7			SAND, Poorly Graded, loose, wet, brown, fine to coarse grained, trace CL lenses, few Gravel; SM layer to 10' (SP)			17				SSS@8', N=7
10		6 (6) 7 (6)								
						14				SSS@11.5', N=11, -#200=3.6%
1722.715		22 (6) 23 (6)	SAND, Poorly Graded, compact, wet, brown, fine to coarse grained, trace CL lenses, few Gravel (SP)			14				SSS@16.5', N=13
1718.7										
20		20 (6) 18 (6)	SAND, Poorly Graded with Gravel, slightly compact, wet, brown, fine to coarse grained, trace CL lenses (SP)			13				SSS@21.5', N=22, -#200=4.6%
1712.725		50 (1.5) 50 (1)	SHALE, hard, reddish brown, trace Gypsum crystals							SSS@25.3', N=50/4.75
30		50 (1.25) 50 (1.5)								SSS@30.5', N=50/4.5
1703.7			SHALE, very hard, reddish brown, trace Gypsum crystals							
35		50 (1) 50 (0.5)								SSS@35.3', N=50/4.5
40		50 (1) 50 (0.5)								

Remarks: Drill Rig: CME 75 with TxDOT 170-pound Automatic Hammer; SSS: Split Spoon Sample; PTS: Push Tube Sample; PP: Pocket Penetrometer Reading (tsf); Drilling Method: CFA to 5', HSA to 35', then Mud Rotary; Northing: 7130860.80, Easting: 1377847.57

Any ground water elevation information provided on this boring log is representative of conditions existing on the day and for the specific location where this information was collected. The actual groundwater elevation may fluctuate due to time, climatic conditions, and/or construction activity.

Driller: CoreCo USA **Logger:** Jose Flores **Organization:** Corsair Consulting LLC

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DRILLING LOG

WinCore Version 3.3

County	Stonewall	Hole	B-5	District	Abilene
Highway	US 380	Structure	Bridge	Date	07/22/20 to 07/23/20
CSJ	0106-04-036	Station	748+20.88	Grnd. Elev.	1737.70 ft
		Offset	52.57' RT	GW Elev.	1729.20 ft

Elev. (ft)	LOG	Texas Cone Penetrometer	Strata Description	Triaxial Test Lateral Press. (psi)	Triaxial Test Deviator Stress (psi)	Properties MC	LL	PI	Wet Den. (pcf)	Additional Remarks
			SHALE, very hard, reddish brown, trace Gypsum crystals							SSS@40.3', N=50/3.5
45		50 (1) 50 (0.5)								SSS@45.2', N=20/4.5, 10/0
50		50 (1) 50 (0.5)								SSS@50.2', N=20/3.5, 10/0
55		50 (0.75) 50 (1.25)								SSS@55.3', N=50/5.5 Sulfate Content=11,120 ppm
60		50 (1) 50 (0.25)								SSS@60.1', N=50/2
65		50 (0.25) 50 (0.25)								SSS@65.1', N=20/0.75, 10/0
1667.670		50 (0.5) 50 (0.25)								Boring Terminated at 70.1'
75										
80										

Remarks: Drill Rig: CME 75 with TxDOT 170-pound Automatic Hammer; SSS: Split Spoon Sample; PTS: Push Tube Sample; PP: Pocket Penetrometer Reading (tsf); Drilling Method: CFA to 5', HSA to 35', then Mud Rotary; Northing: 7130860.80, Easting: 1377847.57

Any ground water elevation information provided on this boring log is representative of conditions existing on the day and for the specific location where this information was collected. The actual groundwater elevation may fluctuate due to time, climatic conditions, and/or construction activity.

Driller: CoreCo USA **Logger:** Jose Flores **Organization:** Corsair Consulting LLC

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REV. No.	DATE	REVISION	BY

ATKINS TBPE REG. # F-474

Texas Department of Transportation Abilene District

US 380
BORING LOGS

SALT FORK OF BRAZOS RIVER BRIDGE

SCALE: NO SCALE SHEET 5 OF 6

DESIGNED: XX	FED. RD DIV. No.	STATE	PROJECT No.			HIGHWAY No.	
CHECKED: SK	6	TEXAS	SEE TITLE SHEET			US 380	
DRAWN: DN	STATE DISTRICT	COUNTY	CONTROL No.	SECTION No.	JOB No.	SHEET No.	
CHECKED: XX	ABL	STONEWALL	0106	04	036	91	

PLOT DRIVER: TXDOT_PDF_BW.plt
PEN TABLE: US380_pen.tbl
FILE: c:\pw_work\dfkhatx01\rome2243\dms57899\118 BORING LOGS 05.dgn

100% SUBMITTAL
DATE: 4/28/2022 TIME: 7:12:57 PM

DRILLING LOG

WinCore Version 3.3

County	Stonewall	Hole	B-6	District	Abilene
Highway	US 380	Structure	Bridge	Date	07/21/20
CSJ	0106-04-036	Station	746+91.54	Grnd. Elev.	1746.22 ft
		Offset	66.50' LT	GW Elev.	1728.22 ft

Elev. (ft)	LOG	Texas Cone Penetrometer	Strata Description	Triaxial Test Lateral Press. (psi)	Triaxial Test Deviator Stress (psi)	Properties MC	LL	PI	Wet Den. (pcf)	Additional Remarks
			SAND, Clayey, dry, reddish brown, fine grained, traces Gravel and roots (SC)			2				SSS@0', N=21
1743.2						4				SSS@3', N=7
5		4 (6) 3 (6)	SAND, Clayey, very loose, dry to moist, reddish brown, fine grained, trace Gravel (SC)			7				SSS@6.5', N=3
						6				SSS@8', N=2
1736.210		12 (6) 10 (6)	CLAY, Sandy Lean, stiff, moist, reddish brown (CL)			13	23	8		SSS@11.5', N=5, -#200=58.1%
1732.2										
15		11 (6) 10 (6)	SAND, Poorly Graded with Silt and Gravel, slightly compact, wet, brown, fine to coarse grained (SP-SM)			14				SSS@16.5', N=8, -#200=7.0%
1727.2										
20		14 (6) 12 (6)	SAND, Poorly Graded with Silt, slightly compact, wet, brown, fine to medium grained (SP-SM)			17				SSS@21.5', N=3
1721.225		48 (6) 46 (6)	SAND, Poorly Graded with Silt, dense, wet, brown, fine to medium grained (SP-SM)			19				SSS@26.2', N=33, -#200=5.2%
1717.2										
30		40 (6) 50 (3.5)	CLAY, Lean, hard, moist, reddish brown and gray, trace Gypsum crystals (CL)			25	35	19		SSS@31.1', N=16, 50/4.5, -#200=91.4%
1714.2			SHALE, hard, reddish brown, traces calcareous deposits and Gypsum crystals			21				SSS@32', N=50/4
35		50 (1.5) 50 (0.75)								SSS@35.3', N=20/3.5, 10/0, Sulfate Content=10,216 ppm
1706.240		50 (0.75) 50 (0.5)								

Remarks: Drill Rig: CME 75 with TxDOT 170-pound Automatic Hammer; SSS: Split Spoon Sample; PTS: Push Tube Sample; PP: Pocket Penetrometer Reading (tsf); Drilling Method: CFA to 5', HSA to 20', then Mud Rotary; Northing: 7130722.19, Easting: 1377955.72

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Driller: CoreCo USA **Logger:** Jose Flores **Organization:** Corsair Consulting LLC

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DRILLING LOG

WinCore Version 3.3

County	Stonewall	Hole	B-6	District	Abilene
Highway	US 380	Structure	Bridge	Date	07/21/20
CSJ	0106-04-036	Station	746+91.54	Grnd. Elev.	1746.22 ft
		Offset	66.50' LT	GW Elev.	1728.22 ft

Elev. (ft)	LOG	Texas Cone Penetrometer	Strata Description	Triaxial Test Lateral Press. (psi)	Triaxial Test Deviator Stress (psi)	Properties MC	LL	PI	Wet Den. (pcf)	Additional Remarks
			SHALE, very hard, reddish brown, traces calcareous deposits and Gypsum crystals to 40.5'							SSS@40.3', N=25/2, 10/0
45		50 (0.5) 50 (0.25)								SSS@45.1', N=30/3, 10/0
50		50 (0.5) 50 (0.5)								SSS@50.2', N=25/4, 10/0
55		50 (0.5) 50 (0.25)				14				SSS@55.1', N=50/3
1687.2										
60		50 (2) 50 (0.75)	SHALE, hard, reddish brown			15	35	18		SSS@60.3', N=30/5, 10/0
1682.2										
65		50 (0.5) 50 (0.5)	SHALE, very hard, reddish brown, trace Gypsum crystals							SSS@65.4', N=50/5
70		50 (0.25) 50 (0.25)								Boring Terminated at 70.6'
1675.6										
75										
80										

Remarks: Drill Rig: CME 75 with TxDOT 170-pound Automatic Hammer; SSS: Split Spoon Sample; PTS: Push Tube Sample; PP: Pocket Penetrometer Reading (tsf); Drilling Method: CFA to 5', HSA to 20', then Mud Rotary; Northing: 7130722.19, Easting: 1377955.72

Any ground water elevation information provided on this boring log is representative of conditions existing on the day and for the specific location where this information was collected. The actual groundwater elevation may fluctuate due to time, climatic conditions, and/or construction activity.

Driller: CoreCo USA **Logger:** Jose Flores **Organization:** Corsair Consulting LLC

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NOTE:

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REV. No.	DATE	REVISION	BY

ATKINS
TBPE REG. # F-474

Texas Department of Transportation
Abilene District

US 380
BORING LOGS

SALT FORK OF BRAZOS RIVER BRIDGE

SCALE: NO SCALE SHEET 6 OF 6

DESIGNED: XX	FED. RD DIV. No.	STATE	PROJECT No.			HIGHWAY No.	
CHECKED: SK	6	TEXAS	SEE TITLE SHEET			US 380	
DRAWN: DN	STATE DISTRICT	COUNTY	CONTROL No.	SECTION No.	JOB No.	SHEET No.	
CHECKED: XX	ABL	STONEWALL	0106	04	036	92	

PLOT DRIVER: TXDOT_PDF_BW.plt
PEN TABLE: US380_pen.tbl
FILE: c:\pw_work\dfkhatx01\rcme2243\dms57899\119 BORING LOGS 06.dgn

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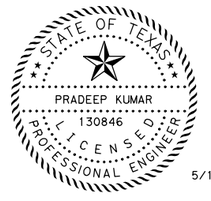
DATE: 5/16/2022 TIME: 1:15:46 PM

SUMMARY OF ESTIMATED QUANTITIES

BID CODES	400	416	416	416	420	420	420	422	422	425	425	427	432	450	454
BID ITEM DESCRIPTION / BRIDGE ELEMENT	CEM STABIL BKFL	DRILL SHAFT (18 IN)	DRILL SHAFT (36 IN)	DRILL SHAFT (42 IN)	CL C CONC (ABUT) (HPC)	CL C CONC (CAP) (HPC)	CL C CONC (COLUMN) (HPC)	REINF CONC SLAB (HPC)	APPROACH SLAB (HPC)	PRESTR CONC GIRDER (TX54)	PRESTR CONC GIRDER (TX70)	SILICONE RESIN PAINT FINISH	RIPRAP (STONE PROTECTION) (12 IN)	RAIL (TY T223) (HPC)	SEALED EXPANSION JOINT (4 IN) (SEJ-M)
	CY	LF	LF	LF	CY	CY	CY	SF	CY	LF	LF	SF	CY	LF	LF
2 ~ ABUTMENTS	312	120	80	150	81.9				66.0			601	292		86
9 ~ INTERIOR BENTS				1432		196.8	91.0					4222			170
1 ~ 145.00' PRESTR CONC GIRDER UNIT								6260			868.09			348.0	
1 ~ 295.00' PRESTR CONC GIRDER UNIT								12734			1762.96			590.0	
1 ~ 360.00' PRESTR CONC GIRDER UNIT								15540		2151.00				720.0	
1 ~ 210.00' PRESTR CONC GIRDER UNIT								9065		1254.00				420.0	
1 ~ 210.00' PRESTR CONC GIRDER UNIT								9065		1254.00				444.0	
TOTAL	312	120	80	1582	81.9	196.8	91.0	52664	66.0	4659.00	2631.05	4823	292	2522.0	256

BEARING SEAT ELEVATION

		BEAM 1	BEAM 2	BEAM 3	BEAM 4	BEAM 5	BEAM 6
BENT 1	(FWD)	1742.548	1742.698	1742.848	1742.818	1742.671	1742.524
		BEAM 1	BEAM 2	BEAM 3	BEAM 4	BEAM 5	BEAM 6
BENT 2	(BK)	1743.583	1743.748	1743.913	1743.898	1743.766	1743.634
	(FWD)	1743.598	1743.763	1743.928	1743.913	1743.781	1743.649
		BEAM 1	BEAM 2	BEAM 3	BEAM 4	BEAM 5	BEAM 6
BENT 3	(BK)	1744.707	1744.872	1745.037	1745.022	1744.890	1744.758
	(FWD)	1744.701	1744.866	1745.031	1745.016	1744.884	1744.753
		BEAM 1	BEAM 2	BEAM 3	BEAM 4	BEAM 5	BEAM 6
BENT 4	(BK)	1745.809	1745.959	1746.109	1746.079	1745.932	1745.786
	(FWD)	1747.261	1747.411	1747.561	1747.531	1747.385	1747.238
		BEAM 1	BEAM 2	BEAM 3	BEAM 4	BEAM 5	BEAM 6
BENT 5	(BK)	1747.910	1748.060	1748.210	1748.180	1748.033	1747.886
	(FWD)	1747.917	1748.067	1748.217	1748.187	1748.040	1747.893
		BEAM 1	BEAM 2	BEAM 3	BEAM 4	BEAM 5	BEAM 6
BENT 6	(BK)	1748.093	1748.243	1748.393	1748.363	1748.216	1748.070
	(FWD)	1748.092	1748.242	1748.392	1748.362	1748.215	1748.069
		BEAM 1	BEAM 2	BEAM 3	BEAM 4	BEAM 5	BEAM 6
BENT 7	(BK)	1747.797	1747.947	1748.097	1748.067	1747.920	1747.773
	(FWD)	1747.767	1747.917	1748.067	1748.037	1747.890	1747.744
		BEAM 1	BEAM 2	BEAM 3	BEAM 4	BEAM 5	BEAM 6
BENT 8	(BK)	1747.303	1747.453	1747.603	1747.573	1747.427	1747.280
	(FWD)	1747.294	1747.444	1747.594	1747.564	1747.417	1747.271
		BEAM 1	BEAM 2	BEAM 3	BEAM 4	BEAM 5	BEAM 6
BENT 9	(BK)	1746.830	1746.980	1747.130	1747.100	1746.954	1746.807
	(FWD)	1746.821	1746.971	1747.121	1747.091	1746.945	1746.798
		BEAM 1	BEAM 2	BEAM 3	BEAM 4	BEAM 5	BEAM 6
BENT 10	(BK)	1746.358	1746.508	1746.658	1746.628	1746.481	1746.334
	(FWD)	1746.265	1746.415	1746.565	1746.535	1746.389	1746.242
		BEAM 1	BEAM 2	BEAM 3	BEAM 4	BEAM 5	BEAM 6
BENT 11	(BK)	1745.984	1746.134	1746.284	1746.254	1746.107	1745.961



5/16/2022

HL93 LOADING

REV. No.	DATE	REVISION	BY

ATKINS

TBPE REG. # F-474

Texas Department of Transportation

Abilene District

US 380
ESTIMATED QUANTITIES AND BEARING SEAT ELEVATIONS
SALT FORK OF BRAZOS RIVER BRIDGE

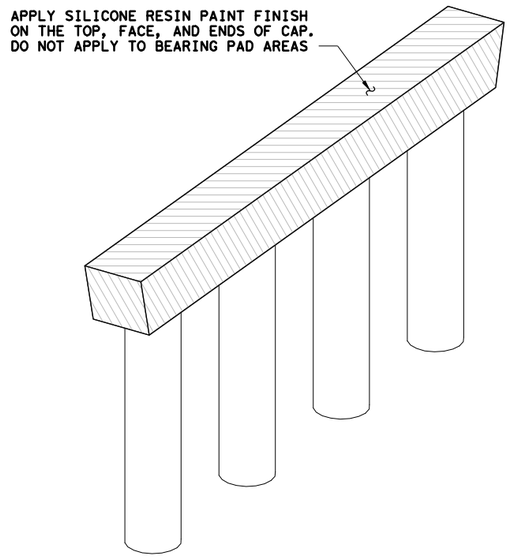
SCALE: NO SCALE SHEET 1 OF 1

DESIGNED: TS	FED. RD DIV. No.	STATE	PROJECT No.			HIGHWAY No.
CHECKED: SK	6	TEXAS	SEE TITLE SHEET			US 380
DRAWN: DN	STATE DISTRICT	COUNTY	CONTROL No.	SECTION No.	JOB No.	SHEET No.
CHECKED: TS	ABL	STONEWALL	0106	04	036	93

PLOT DRIVER: TXDOT_PDF_BW.plt
PEN TABLE: US380_pen.tbl
FILE: c:\pw_work\atkmdtx01\rome2243\dms57899\120 SUMMARY OF QUANTITIES.dgn

100% SUBMITTAL

DATE: 4/28/2022 TIME: 7:13:21 PM



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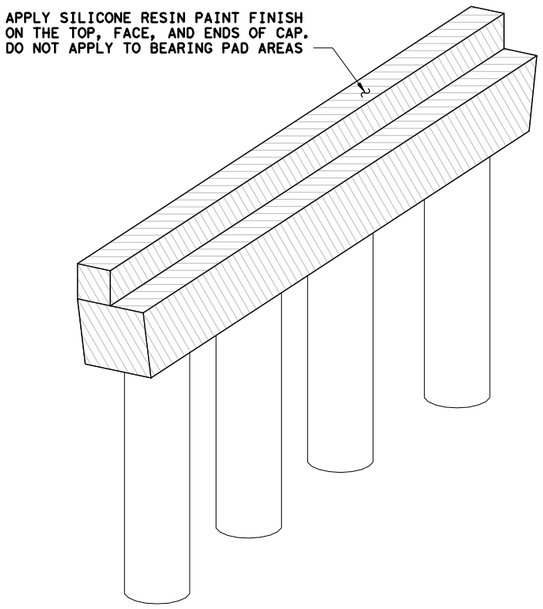
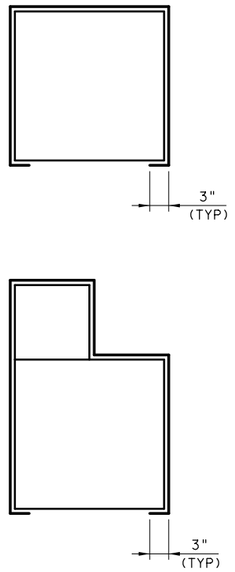
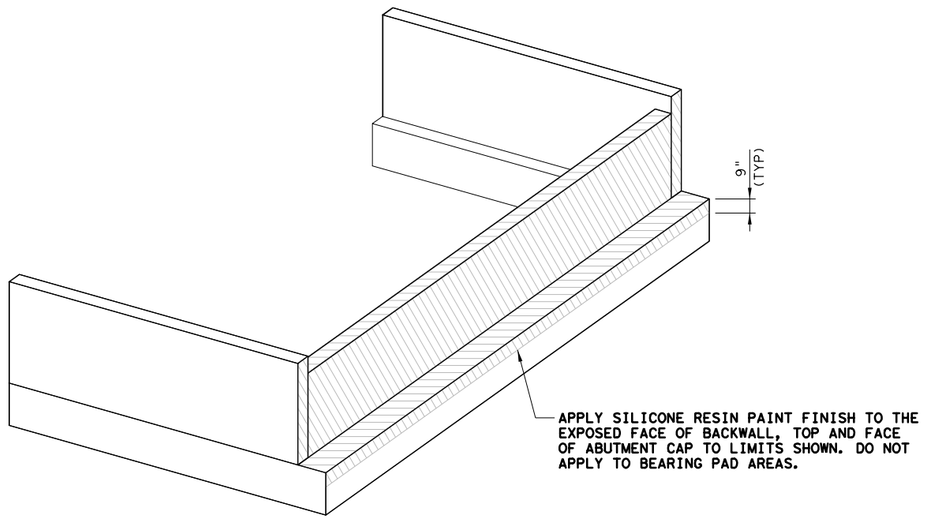




CAP SECTION

CAP WATERPROOFING DETAIL



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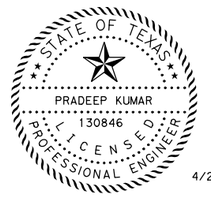

4/28/2022

HL93 LOADING

REV. No.	DATE	REVISION	BY

ATKINS

TBPE REG. # F-474

Texas Department of Transportation

Abilene District

US 380

CONCRETE WATERPROOFING DETAIL

SALT FORK OF BRAZOS RIVER BRIDGE

SCALE: NO SCALE SHEET 1 OF 1

DESIGNED: TS	FED. RD DIV. No.	STATE	PROJECT No.			HIGHWAY No.
CHECKED: SK	6	TEXAS	SEE TITLE SHEET			US 380
DRAWN: DN	STATE DISTRICT	COUNTY	CONTROL No.	SECTION No.	JOB No.	SHEET No.
CHECKED: TS	ABL	STONEWALL	0106	04	036	94

PLOT DRIVER: TXDOT_PDF_BW.plt
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100% SUBMITTAL

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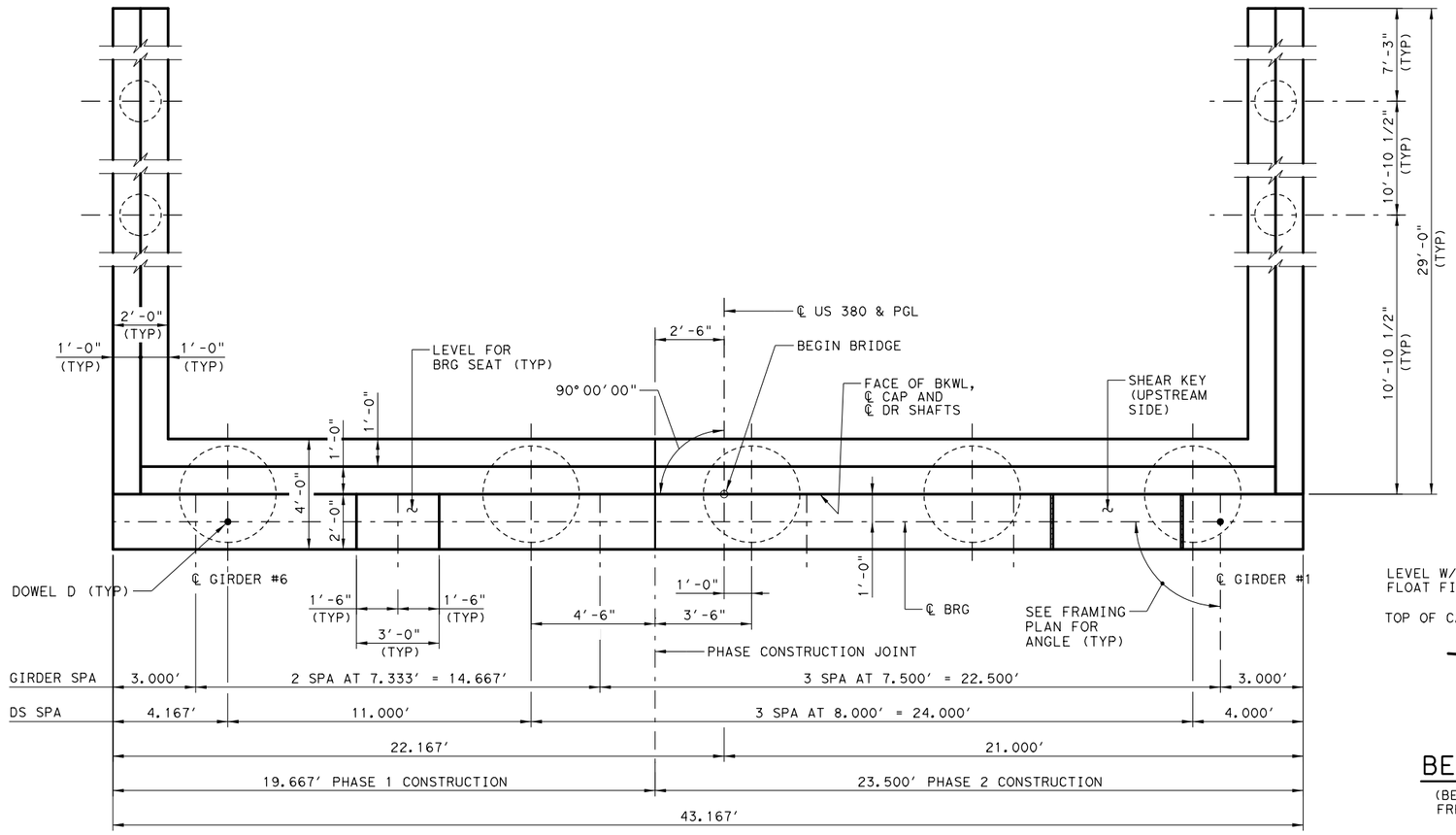
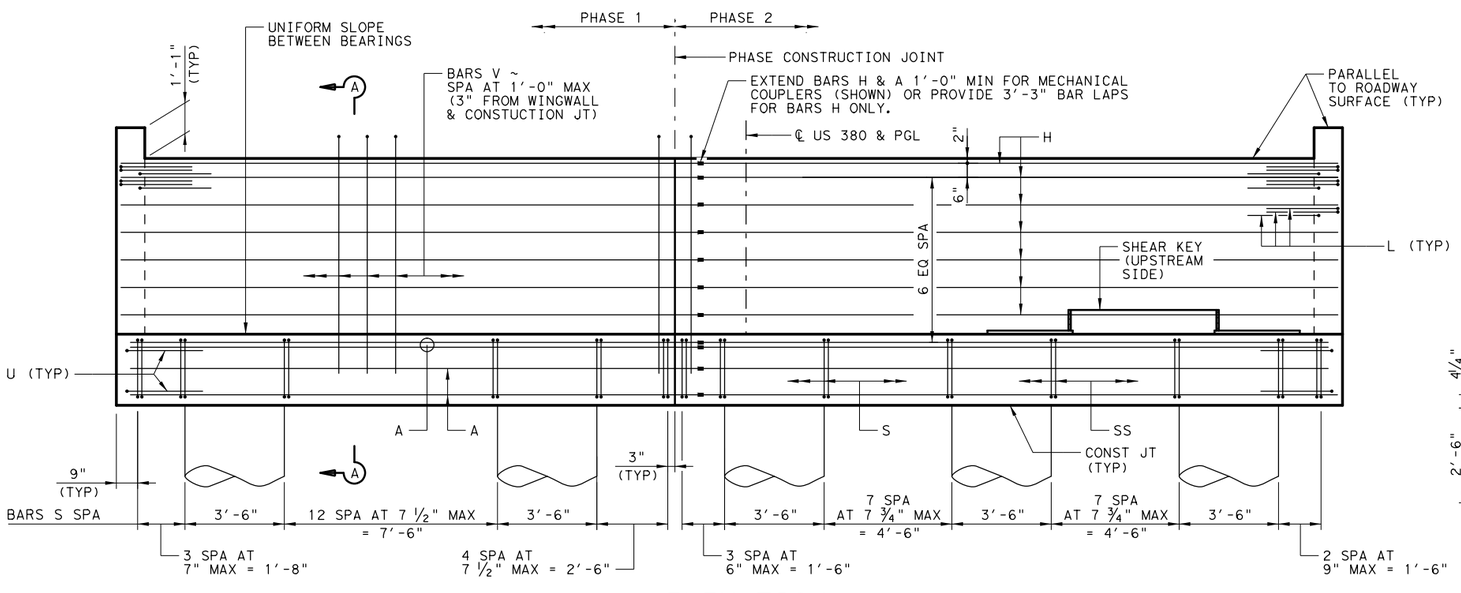
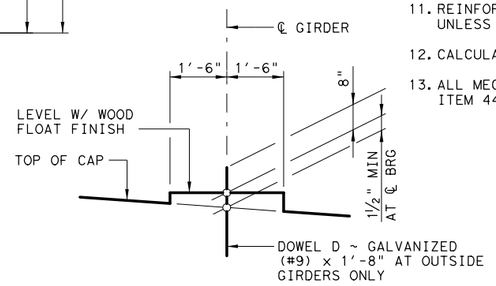


PLAN

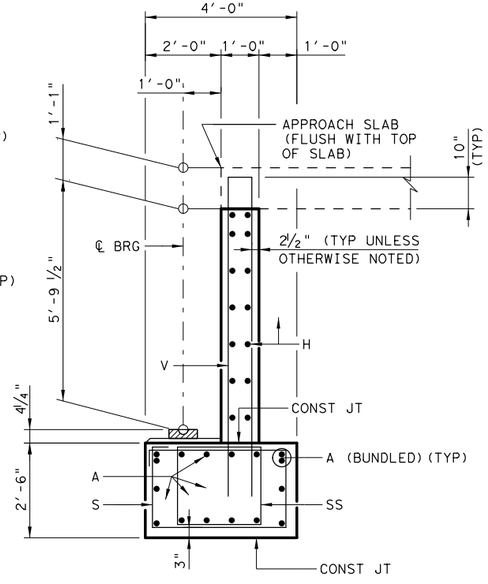


ELEVATION



BEARING SEAT DETAIL

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



SECTION A-A

GENERAL NOTES:

1. DESIGNED IN ACCORDANCE WITH AASHTO LRFD BRIDGE DESIGN SPECIFICATIONS, 8TH EDITION (2017), AS MODIFIED BY 2020 TXDOT BDM.
2. CONCRETE SHALL BE CLASS C (HPC), f'c = 3600 PSI.
3. ALL REINFORCING STEEL SHALL BE GRADE 60 (EPOXY COATED).
4. SEE FRAMING PLAN FOR GIRDER ANGLES.
5. SEE BRIDGE LAYOUT FOR HEADER SLOPE, FOUNDATION TYPE, SIZE AND LENGTH.
6. SEE COMMON FOUNDATION DETAILS, FD, STANDARD SHEET FOR ALL FOUNDATION DETAILS AND NOTES.
7. SEE STONE RIPRAP, SRR, STANDARD SHEET FOR RIPRAP ATTACHMENT DETAILS.
8. SEE SHEAR KEY DETAILS, IGSK, STANDARD SHEET FOR ALL SHEAR KEY DETAILS AND NOTES.
9. SEE RAIL DETAILS FOR RAIL ANCHORAGE CAST IN WINGWALLS.
10. COVER DIMENSIONS ARE CLEAR DIMENSIONS, UNLESS NOTED OTHERWISE.
11. REINFORCING BAR DIMENSIONS SHOWN ARE OUT-TO-OUT OF BAR UNLESS NOTED OTHERWISE.
12. CALCULATED FOUNDATION LOADS = 142 TONS/DS
13. ALL MECHANICAL COUPLERS SHALL BE IN ACCORDANCE WITH ITEM 440, "REINFORCING STEEL".

STATE OF TEXAS
PRADEEP KUMAR
130846
LICENSED
PROFESSIONAL ENGINEER
4/28/2022

HL93 LOADING

REV. No.	DATE	REVISION	BY

ATKINS
TBPE REG. # F-474

Texas Department of Transportation
Abilene District

US 380
ABUTMENT 1

SALT FORK OF BRAZOS RIVER BRIDGE

SCALE: 3/16" = 1'-0" SHEET 1 OF 2

DESIGNED: TS	FED. RD DIV. No.	STATE	PROJECT No.			HIGHWAY No.
CHECKED: SK	6	TEXAS	SEE TITLE SHEET			US 380
DRAWN: DN	STATE DISTRICT	COUNTY	CONTROL No.	SECTION No.	JOB No.	SHEET No.
CHECKED: TS	ABL	STONEWALL	0106	04	036	95

PLOT DRIVER: TXDOT_PDF_BW.plt
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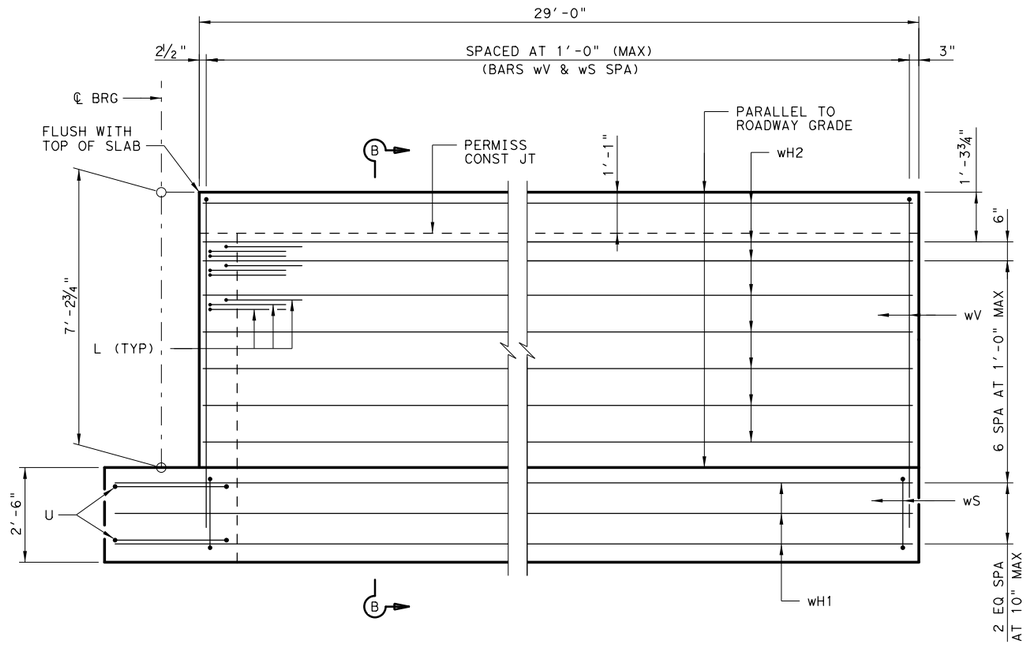
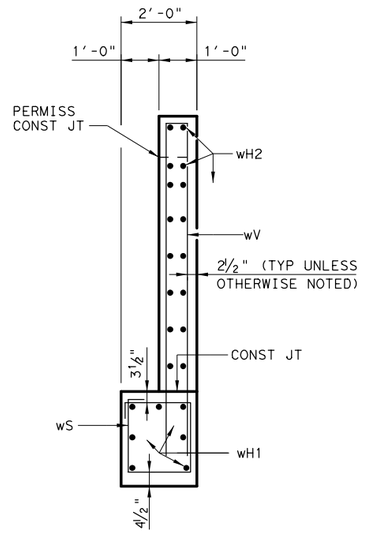


WINGWALL ELEVATION



SECTION B-B

	BAR	NO.	SIZE	LENGTH	WEIGHT
	A	16	#11	42'-2"	3585
	D	2	#9	1'-8"	12
(1)	H	14	#6	42'-9"	899
	L	18	#6	4'-0"	109
(2)	M	2	#5	4'-5"	10
(2)	N	8	#5	5'-7"	47
	S	45	#5	12'-3"	575
	SS	45	#5	9'-7"	450
	U	4	#6	8'-6"	52
	V	43	#5	18'-5"	826
	wH1	14	#6	30'-7"	644
	wH2	32	#6	28'-7"	1374
	wS	60	#4	7'-8"	308
	wV	60	#5	18'-5"	1153
REINFORCING STEEL				LB	10044
CLASS "C" CONCRETE (ABUT)(HPC)				CY	51.3

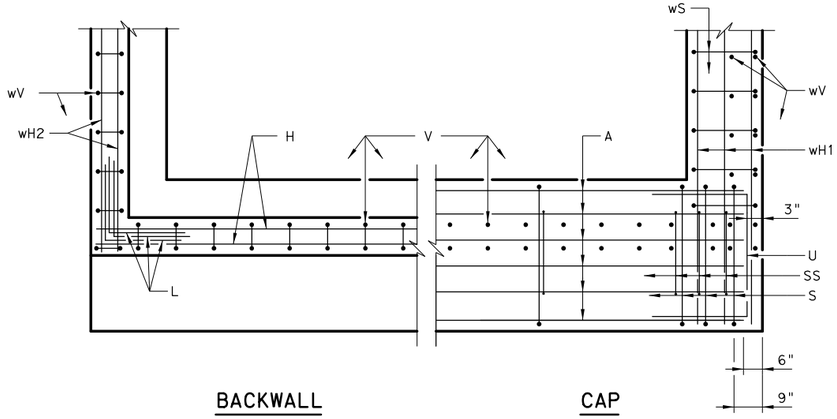
TABLE OF ESTIMATED QUANTITIES

(1) WHERE BAR LAPS ARE PROVIDED IN LIEU OF COUPLERS, MAKE THE FOLLOWING ADJUSTMENTS FOR THE ADDITIONAL STEEL REQUIRED:
BARS H LENGTH: 3'-3"
REINFORCING STEEL: 68 LBS

(2) SEE "IGSK" STANDARD SHEET FOR BARS M AND N.

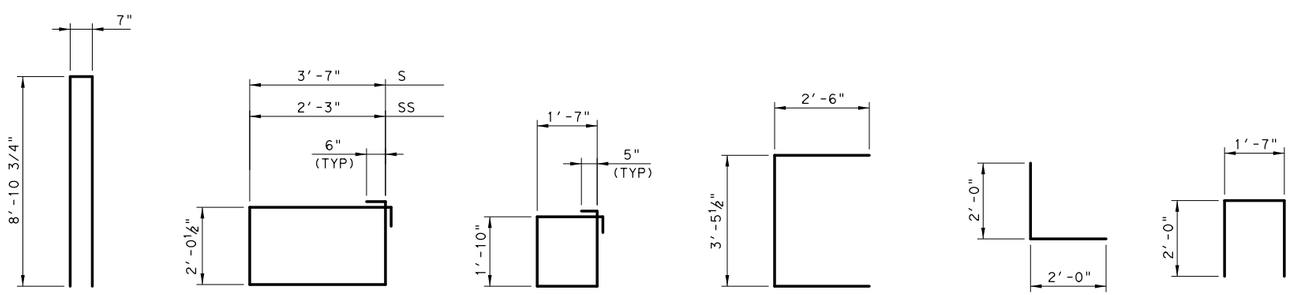
NOTES:

1. FOR GENERAL NOTES SEE "ABUTMENT 1" SHEET 1 OF 2.



BACKWALL CAP

CORNER DETAILS



BARS V & wV BARS S & SS BARS wS BARS U BARS L BARS N

STATE OF TEXAS
PRADEEP KUMAR
130846
LICENSED PROFESSIONAL ENGINEER
4/28/2022

HL93 LOADING

REV. No.	DATE	REVISION	BY

ATKINS
TBPE REG. # F-474

Texas Department of Transportation
Abilene District
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US 380
ABUTMENT 1

SALT FORK OF BRAZOS RIVER BRIDGE

SCALE: ¼" = 1'-0" SHEET 2 OF 2

DESIGNED: TS	FED. RD DIV. No.	STATE	PROJECT No.			HIGHWAY No.
CHECKED: SK	6	TEXAS	SEE TITLE SHEET			US 380
DRAWN: DN	STATE DISTRICT	COUNTY	CONTROL No.	SECTION No.	JOB No.	SHEET No.
CHECKED: TS	ABL	STONEWALL	0106	04	036	96

PLOT DRIVER: TXDOT_PDF_BW.plt
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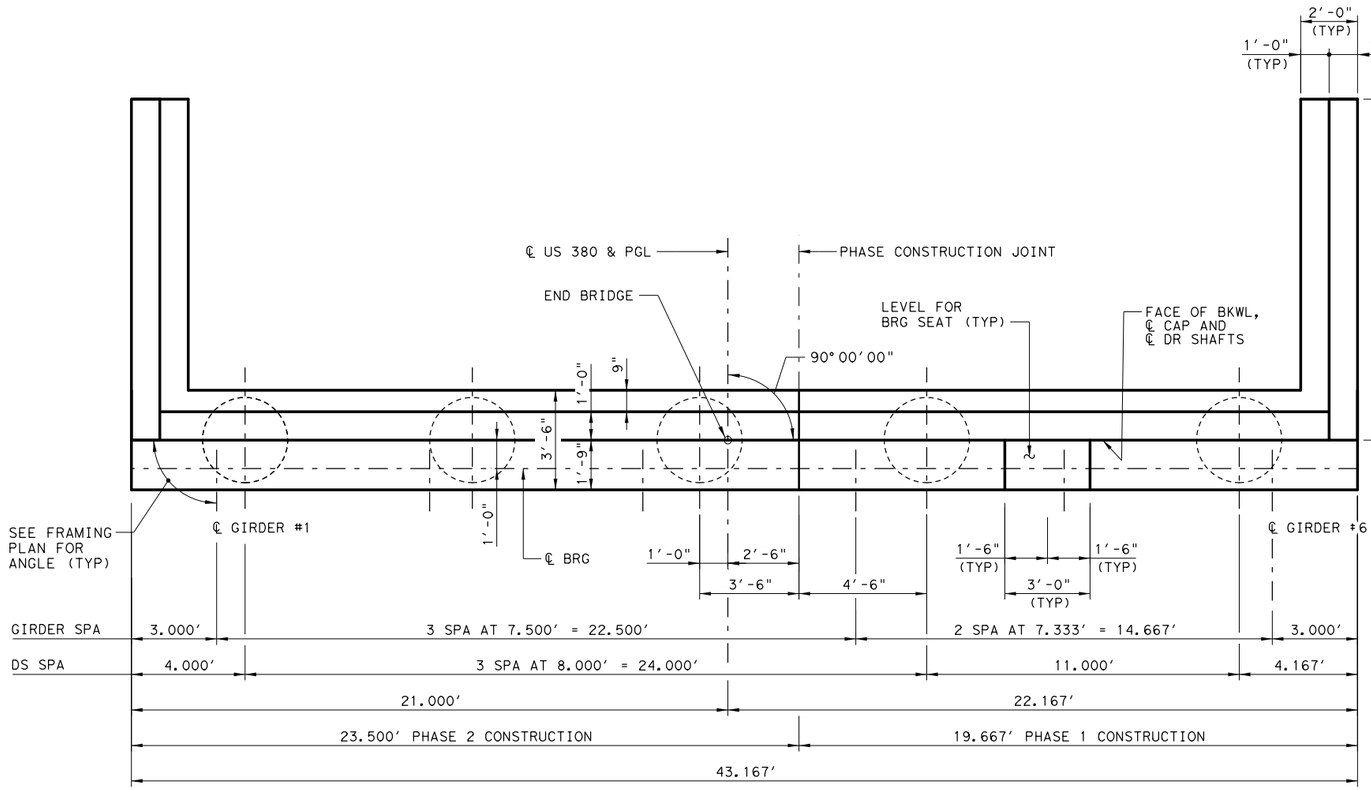
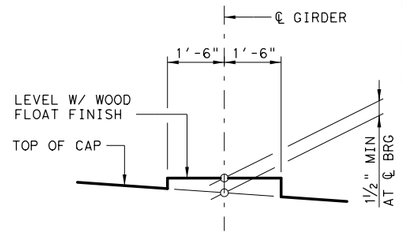


PLAN

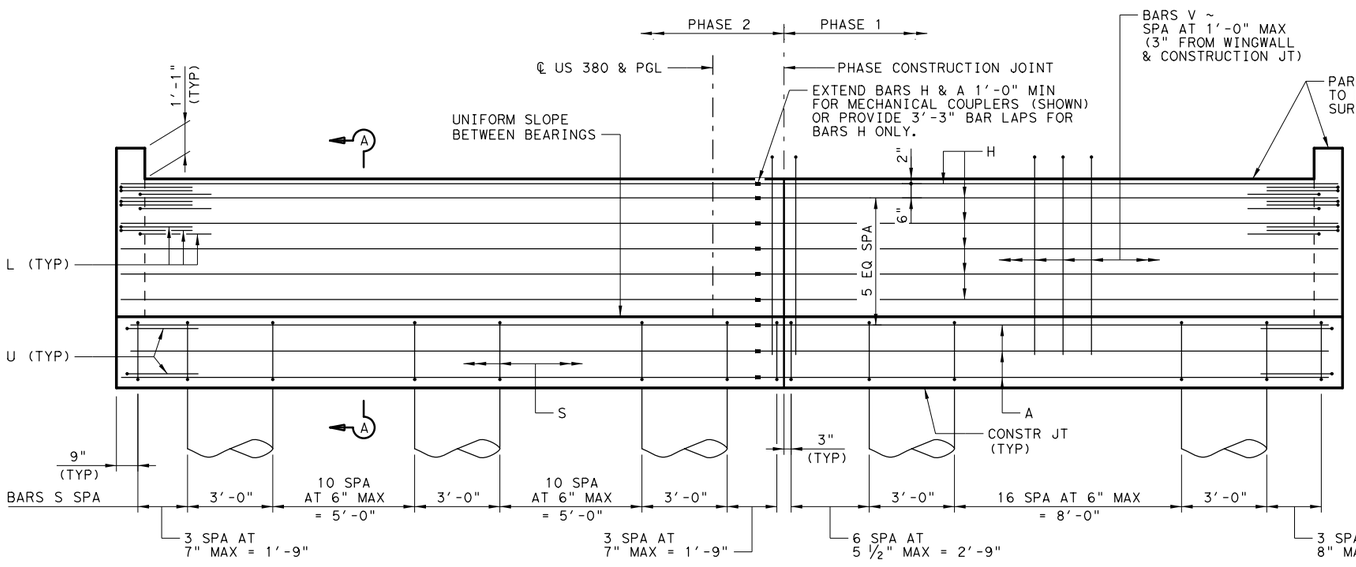


BEARING SEAT DETAIL

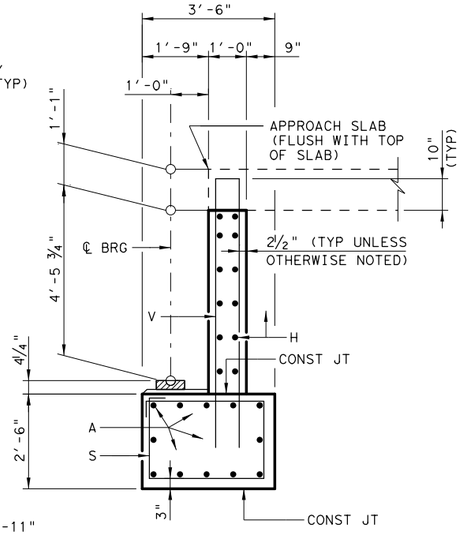
(BEARING SURFACE MUST BE CLEAN AND FREE OF ALL LOOSE MATERIAL BEFORE PLACING BEARING PAD)

GENERAL NOTES:

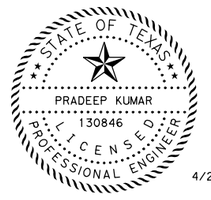
1. DESIGNED IN ACCORDANCE WITH AASHTO LRFD BRIDGE DESIGN SPECIFICATIONS, 8TH EDITION (2017), AS MODIFIED BY 2020 TXDOT BDM.
2. CONCRETE SHALL BE CLASS C (HPC), f′c = 3600 PSI.
3. ALL REINFORCING STEEL SHALL BE GRADE 60 (EPOXY COATED).
4. SEE FRAMING PLAN FOR GIRDER ANGLES.
5. SEE BRIDGE LAYOUT FOR HEADER SLOPE, FOUNDATION TYPE, SIZE AND LENGTH.
6. SEE COMMON FOUNDATION DETAILS, FD, STANDARD SHEET FOR ALL FOUNDATION DETAILS AND NOTES.
7. SEE STONE RIPRAP, SRR, STANDARD SHEET FOR RIPRAP ATTACHMENT DETAILS.
8. SEE SHEAR KEY DETAILS, IGSK, STANDARD SHEET FOR ALL SHEAR KEY DETAILS AND NOTES.
9. SEE RAIL DETAILS FOR RAIL ANCHORAGE CAST IN WINGWALLS.
10. COVER DIMENSIONS ARE CLEAR DIMENSIONS, UNLESS NOTED OTHERWISE.
11. REINFORCING BAR DIMENSIONS SHOWN ARE OUT-TO-OUT OF BAR UNLESS NOTED OTHERWISE.
12. CALCULATED FOUNDATION LOADS = 104 TONS/DS
13. ALL MECHANICAL COUPLERS SHALL BE IN ACCORDANCE WITH ITEM 440, "REINFORCING STEEL".



ELEVATION



SECTION A-A



HL93 LOADING

REV. No.	DATE	REVISION	BY

ATKINS
TBPE REG. # F-474

Texas Department of Transportation
Abilene District

US 380
ABUTMENT 11

SALT FORK OF BRAZOS RIVER BRIDGE

SCALE: 3/16" = 1′-0" SHEET 1 OF 2

DESIGNED: TS	FED. RD DIV. No.	STATE	PROJECT No.			HIGHWAY No.
CHECKED: SK	6	TEXAS	SEE TITLE SHEET			US 380
DRAWN: DN	STATE DISTRICT	COUNTY	CONTROL No.	SECTION No.	JOB No.	SHEET No.
CHECKED: TS	ABL	STONEWALL	0106	04	036	97

PLOT DRIVER: TXDOT_PDF_BW.plt
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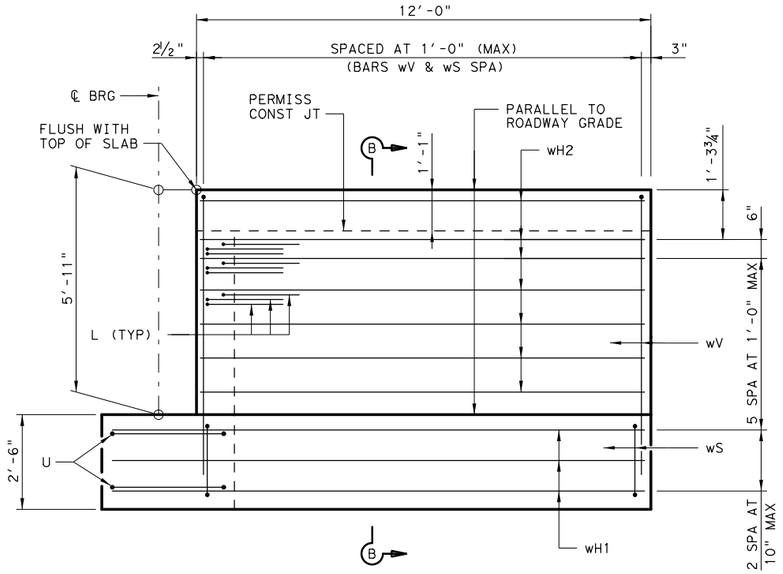
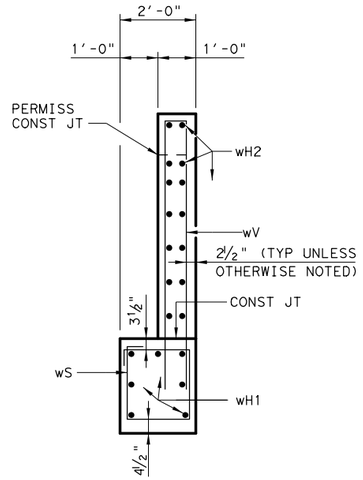


WINGWALL ELEVATION



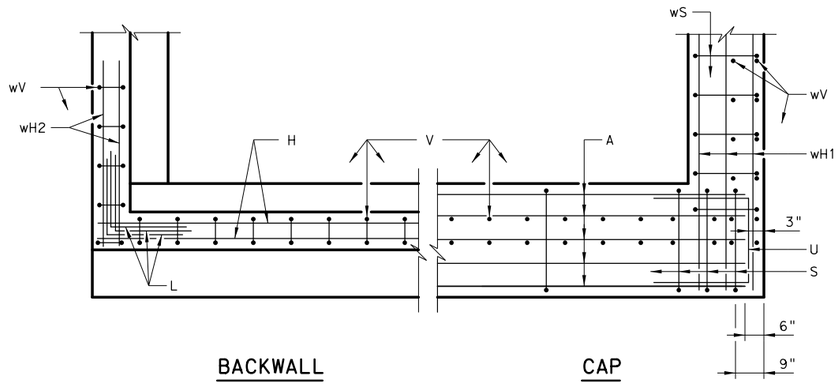
SECTION B-B

TABLE OF ESTIMATED QUANTITIES				
BAR	NO.	SIZE	LENGTH	WEIGHT
A	12	#11	42'-2"	2689
(1) H	12	#6	42'-9"	771
L	18	#6	4'-0"	109
S	58	#5	11'-2"	676
U	4	#6	8'-1"	49
V	43	#5	15'-9"	707
wH1	14	#6	13'-4"	281
wH2	28	#6	11'-7"	488
wS	26	#4	7'-8"	134
wV	26	#5	15'-9"	427
REINFORCING STEEL			LB	6331
CLASS "C" CONCRETE (ABUT) (HPC)			CY	30.6

(1) WHERE BAR LAPS ARE PROVIDED IN LIEU OF COUPLERS, MAKE THE FOLLOWING ADJUSTMENTS FOR THE ADDITIONAL STEEL REQUIRED:
BARS H LENGTH: 3'-3"
REINFORCING STEEL: 59 LBS

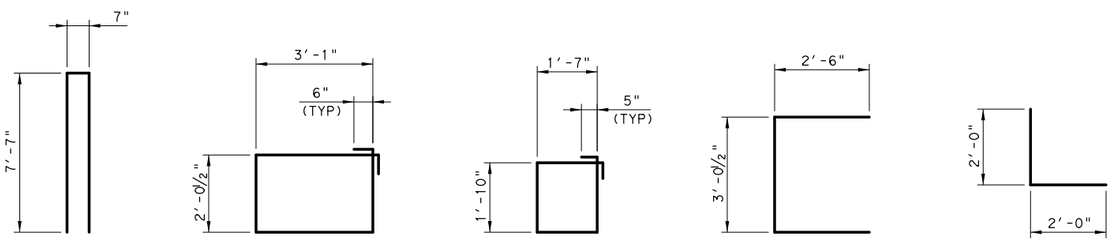
NOTES:

1. FOR GENERAL NOTES SEE "ABUTMENT 11" SHEET 1 OF 2.

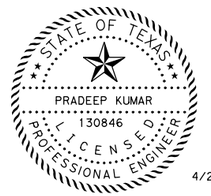


BACKWALL CAP

CORNER DETAILS



BARS V & wV BARS S BARS wS BARS U BARS L



4/28/2022

HL93 LOADING

REV. No.	DATE	REVISION	BY

ATKINS
TBPE REG. # F-474

Texas Department of Transportation
Abilene District

US 380
ABUTMENT 11

SALT FORK OF BRAZOS RIVER BRIDGE

SCALE: ¼" = 1'-0" SHEET 2 OF 2

DESIGNED: TS	FED. RD DIV. No.	STATE	PROJECT No.			HIGHWAY No.
CHECKED: SK	6	TEXAS	SEE TITLE SHEET			US 380
DRAWN: DN	STATE DISTRICT	COUNTY	CONTROL No.	SECTION No.	JOB No.	SHEET No.
CHECKED: TS	ABL	STONEWALL	0106	04	036	98

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100% SUBMITTAL
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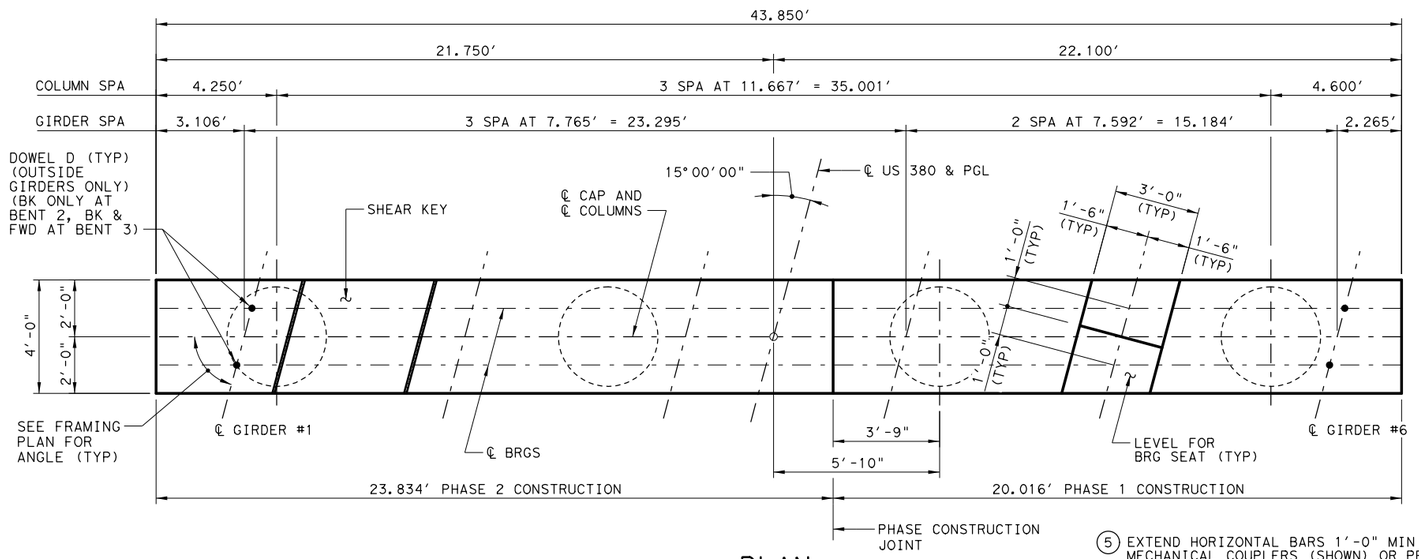

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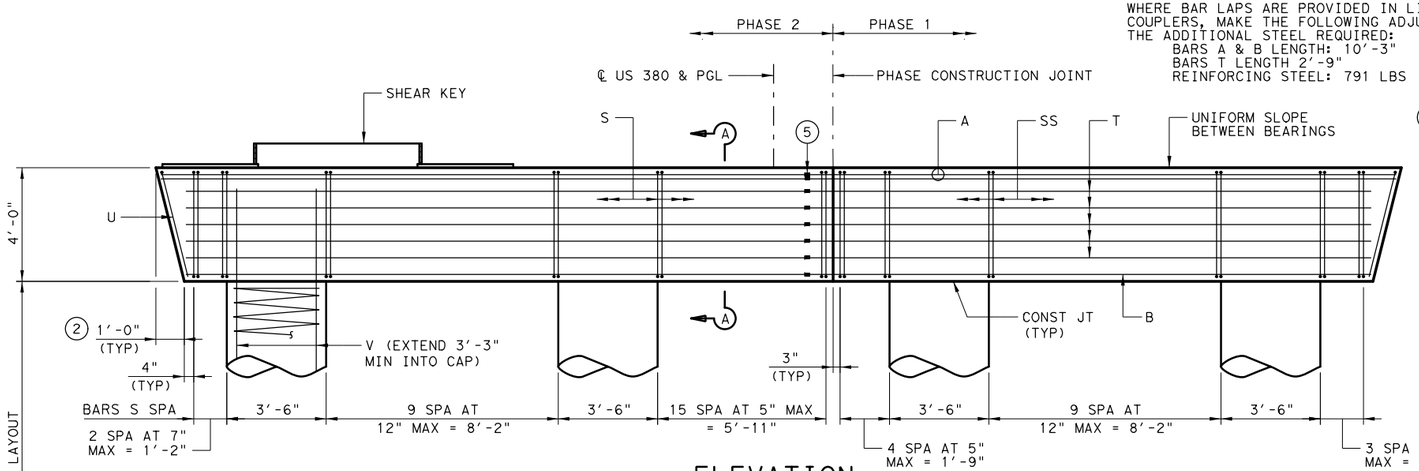

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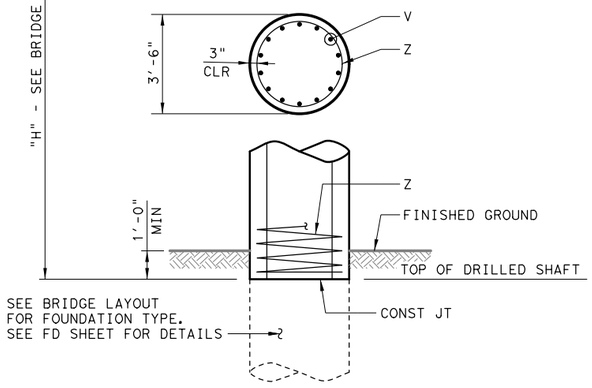
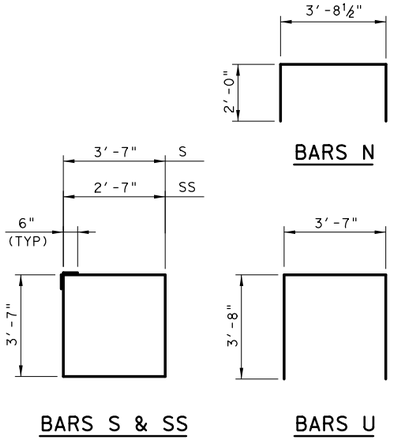
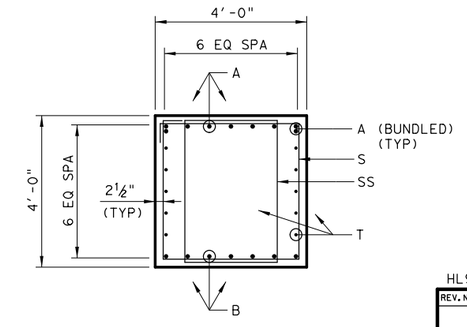
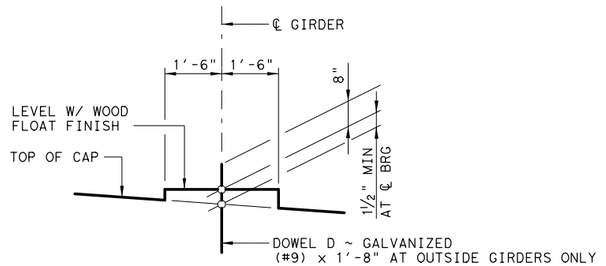






SECTION A-A



BEARING SEAT DETAIL

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

GENERAL NOTES:

1. DESIGNED IN ACCORDANCE WITH AASHTO LRFD BRIDGE DESIGN SPECIFICATIONS, 8TH EDITION (2017), AS MODIFIED BY 2020 TXDOT BDM.
2. CONCRETE SHALL BE CLASS C (HPC), f'c = 3600 PSI.
3. ALL REINFORCING STEEL SHALL BE GRADE 60 (EPOXY COATED).
4. SEE FRAMING PLAN FOR GIRDER ANGLES.
5. SEE BRIDGE LAYOUT FOR FOUNDATION TYPE, SIZE AND LENGTH.
6. SEE COMMON FOUNDATION DETAILS STANDARD SHEET, FD, FOR ALL FOUNDATION DETAILS AND NOTES.
7. SEE SHEAR KEY DETAILS STANDARD SHEET, IGSK, FOR ALL SHEAR KEY DETAILS AND NOTES.
8. COVER DIMENSIONS ARE CLEAR DIMENSIONS, UNLESS NOTED OTHERWISE.
9. REINFORCING BAR DIMENSIONS SHOWN ARE OUT-TO-OUT OF BAR UNLESS NOTED OTHERWISE.
10. CALCULATED FOUNDATION LOADS = 355 TONS/DS

(5) EXTEND HORIZONTAL BARS 1'-0" MIN FOR MECHANICAL COUPLERS (SHOWN) OR PROVIDE BAR LAPS AS FOLLOWS:
#5 = 2'-9"
#11 = 10'-3"
WHERE BAR LAPS ARE PROVIDED IN LIEU OF COUPLERS, MAKE THE FOLLOWING ADJUSTMENTS FOR THE ADDITIONAL STEEL REQUIRED:
BARS A & B LENGTH: 10'-3"
BARS T LENGTH 2'-9"
REINFORCING STEEL: 791 LBS

(6) SEE "IGSK" STANDARD SHEET FOR BARS M AND N.

(3) TABLE OF ESTMATED QUANTITIES

	BAR	NO.	SIZE	LENGTH	WEIGHT
(5)	A	9	#11	43'-4"	2072
(5)	B	7	#11	41'-7"	1547
(4)	D	4	#9	1'-8"	23
(6)	M	4	#5	4'-5"	19
(6)	N	9	#5	7'-9"	73
	S	48	#5	15'-4"	766
	SS	48	#5	13'-4"	668
(5)	T	10	#5	41'-7"	434
	U	2	#5	10'-11"	23
REINFORCING STEEL				LB	5625
CLASS "C" CONCRETE (CAP)(HPC)				CY	27.0

(1) FOR EACH LINEAR FOOT VARIATION IN "H" VALUE, MAKE THE FOLLOWING ADJUSTMENTS:
BARS V LENGTH: 1'-0"
BARS Z LENGTH: 37'-9"
REINFORCING STEEL: 292 LBS
CLASS C CONCRETE (COLUMN) (HPC): 1.42 CY

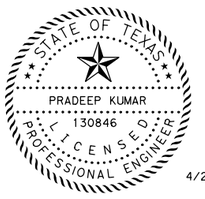
(2) MEASURED PARALLEL TO TOP OF CAP CROSS-SLOPE.

(3) QUANTITIES SHOWN ARE FOR ONE BENT ONLY.

(4) DEDUCT 12 LBS OF REINFORCING STEEL AT BENT 2.

TABLE OF COLUMNS QUANTITIES (1) (3)

BENT	"H"	BARS V 56 ~ #9		BARS Z 4 ~ #4 SPIRAL		REINF STEEL	CLASS "C" CONC (HPC)
NO.	HEIGHT	LENGTH	WEIGHT	LENGTH	WEIGHT	LB	CY
2	5'	8'-3"	1571	217'-0"	580	2151	7.1
3	9'	12'-3"	2333	368'-0"	987	3320	12.8



HL93 LOADING

REV. No.	DATE	REVISION	BY

ATKINS
TBPE REG. # F-474

Texas Department of Transportation
Abilene District

US 380 INTERIOR BENTS 2 AND 3

SALT FORK OF BRAZOS RIVER BRIDGE

SCALE: 3/16" = 1'-0" SHEET 1 OF 1

DESIGNED: TS	FED. RD DIV. No.	STATE	PROJECT No.			HIGHWAY No.
CHECKED: SK	6	TEXAS	SEE TITLE SHEET			US 380
DRAWN: DN	STATE DISTRICT	COUNTY	CONTROL No.	SECTION No.	JOB No.	SHEET No.
CHECKED: TS	ABL	STONEWALL	0106	04	036	99

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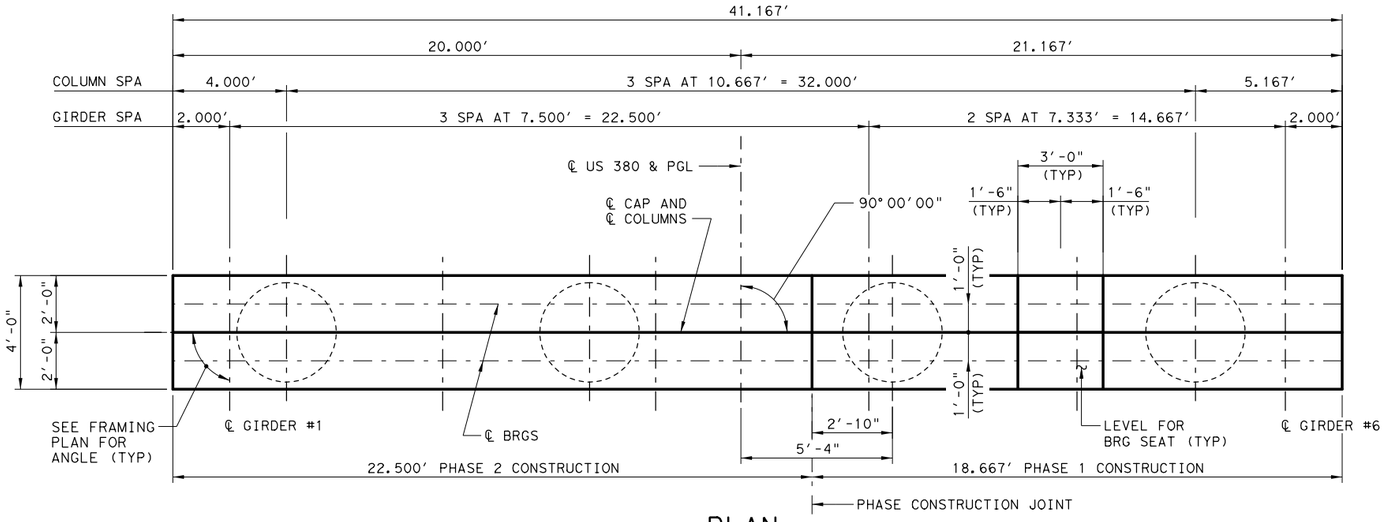

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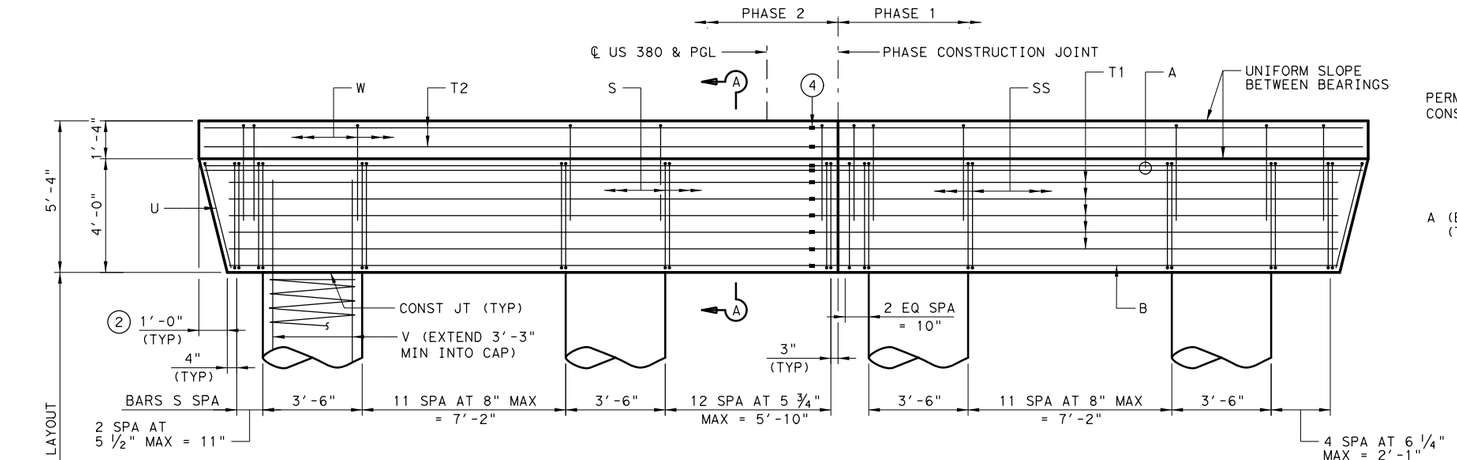

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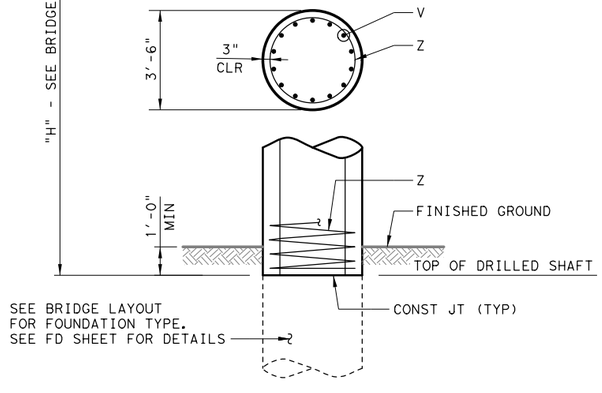

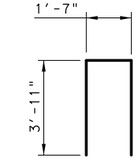

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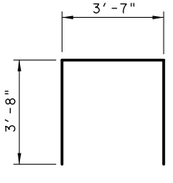

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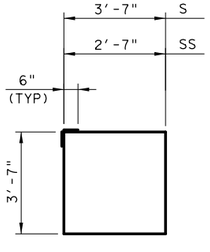
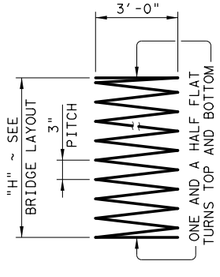


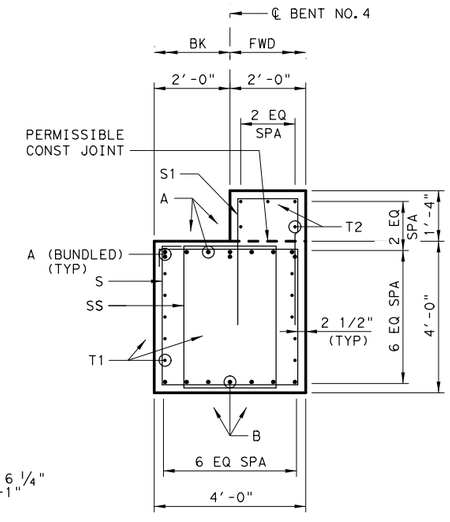
BARS S



BARS Z

GENERAL NOTES:

1. DESIGNED IN ACCORDANCE WITH AASHTO LRFD BRIDGE DESIGN SPECIFICATIONS, 8TH EDITION (2017), AS MODIFIED BY 2020 TXDOT BDM.
2. CONCRETE SHALL BE CLASS C (HPC), f'c = 3600 PSI.
3. ALL REINFORCING STEEL SHALL BE GRADE 60 (EPOXY COATED).
4. SEE FRAMING PLAN FOR GIRDER ANGLES.
5. SEE BRIDGE LAYOUT FOR FOUNDATION TYPE, SIZE AND LENGTH.
6. SEE COMMON FOUNDATION DETAILS STANDARD SHEET, FD, FOR ALL FOUNDATION DETAILS AND NOTES.
7. COVER DIMENSIONS ARE CLEAR DIMENSIONS, UNLESS NOTED OTHERWISE.
8. REINFORCING BAR DIMENSIONS SHOWN ARE OUT-TO-OUT OF BAR UNLESS NOTED OTHERWISE.
9. CALCULATED FOUNDATION LOADS = 311 TONS/DS



SECTION A-A

③ TABLE OF ESTMATED QUANTITIES

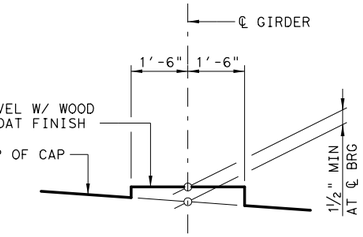
	BAR	NO.	SIZE	LENGTH	WEIGHT
④	A	10	#11	40'-8"	2161
④	B	7	#11	38'-11"	1448
	S	42	#5	15'-4"	672
	SS	42	#5	13'-4"	585
	S1	42	#5	9'-5"	413
④	T1	10	#5	38'-11"	406
	T2	5	#5	40'-8"	213
	U	2	#5	10'-11"	23
	V	56	#9	11'-3"	2142
	Z	4	#4	330'-3"	883
REINFORCING STEEL				LB	8946
CLASS "C" CONCRETE (CAP) (HPC)				CY	30.7
CLASS "C" CONCRETE (COL) (HPC)				CY	11.4

(1) BASED ON "H" VALUE SHOWN ON BRIDGE LAYOUT. FOR EACH LINEAR FOOT VARIATION IN "H" VALUE, MAKE THE FOLLOWING ADJUSTMENTS:
BARS V LENGTH: 1'-0"
BARS Z LENGTH: 37'-9"
REINFORCING STEEL: 292 LBS
CLASS C CONCRETE (COLUMN) (HPC): 1.42 CY

(2) MEASURED PARALLEL TO TOP OF CAP CROSS-SLOPE.

(3) QUANTITIES SHOWN ARE FOR ONE BENT ONLY.

(4) BARS T2 SHALL BE SPLICED WITH A MECHANICAL COUPLER ONLY. BARS A, T1, AND B SHALL BE EXTENDED 1'-0" MIN FOR MECHANICAL COUPLERS (SHOWN) OR PROVIDE BAR LAPS AS FOLLOWS:
#5 = 2'-9"
#11 = 10'-3"
WHERE BAR LAPS ARE PROVIDED IN LIEU OF COUPLERS, MAKE THE FOLLOWING ADJUSTMENTS FOR THE ADDITIONAL STEEL REQUIRED:
BARS A & B LENGTH: 10'-3"
BARS T1 LENGTH: 2'-9"
REINFORCING STEEL: 791 LBS



BEARING SEAT DETAIL

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

STATE OF TEXAS
PRADEEP KUMAR
130846
LICENSED PROFESSIONAL ENGINEER
4/28/2022

HL93 LOADING

REV. No.	DATE	REVISION	BY

ATKINS TBPE REG. # F-474

Texas Department of Transportation
Abilene District
©2022 by TxDOT

US 380

INTERIOR BENT 4

SALT FORK OF BRAZOS RIVER BRIDGE

SCALE: 3/16" = 1'-0" SHEET 1 OF 1

DESIGNED: TS	FED. RD DIV. No.	STATE	PROJECT No.			HIGHWAY No.
CHECKED: SK	6	TEXAS	SEE TITLE SHEET			US 380
DRAWN: DN	STATE DISTRICT	COUNTY	CONTROL No.	SECTION No.	JOB No.	SHEET No.
CHECKED: TS	ABL	STONEWALL	0106	04	036	100

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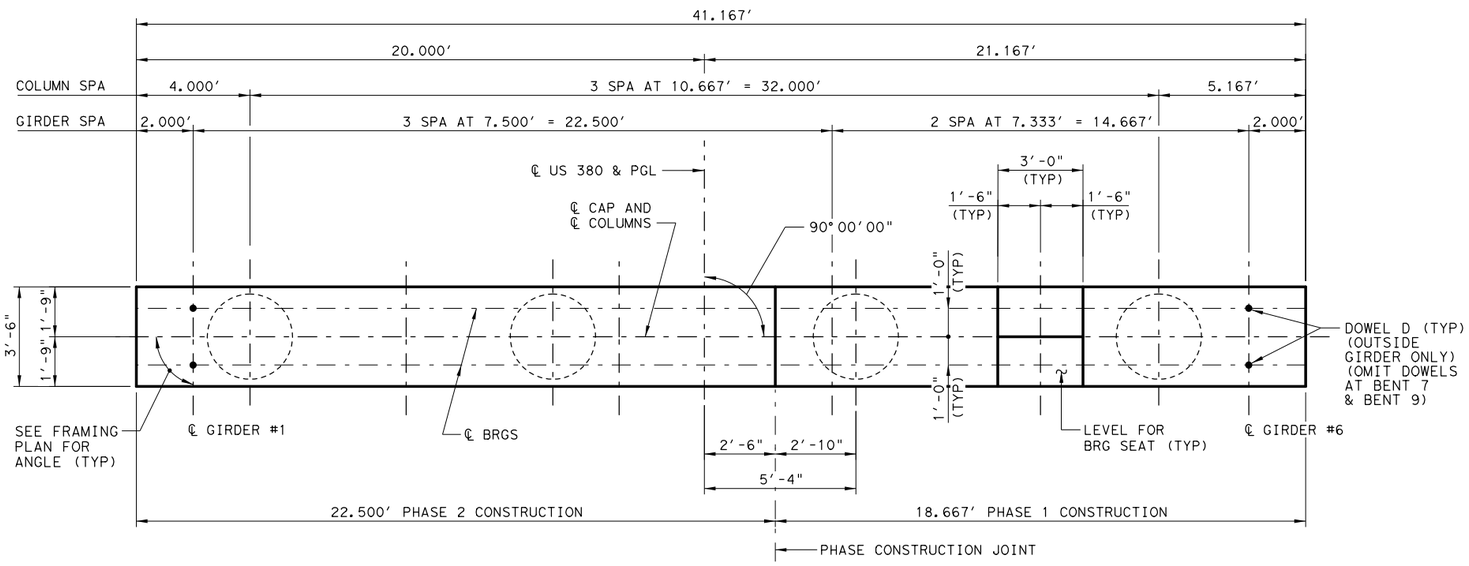

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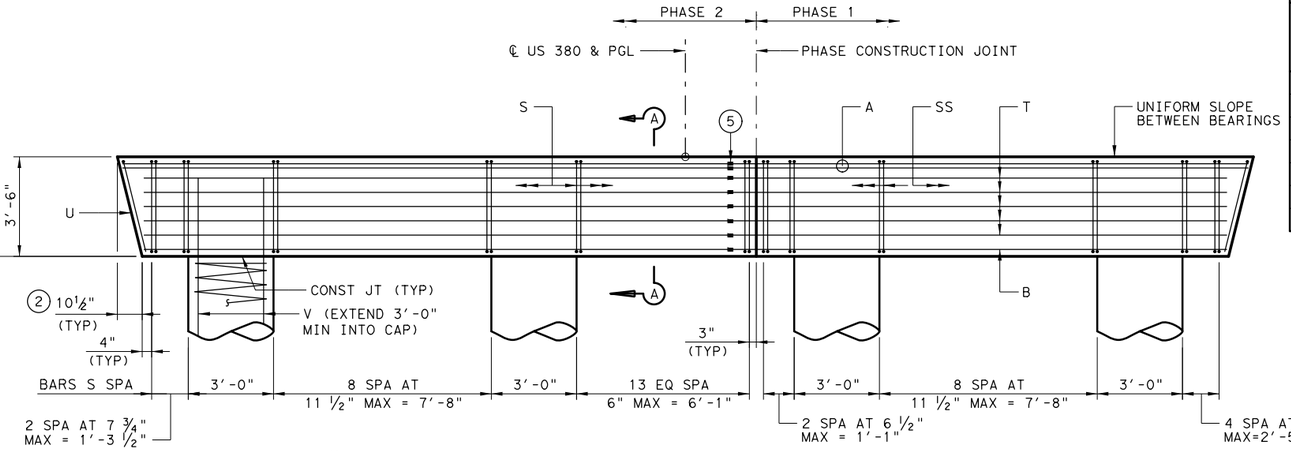

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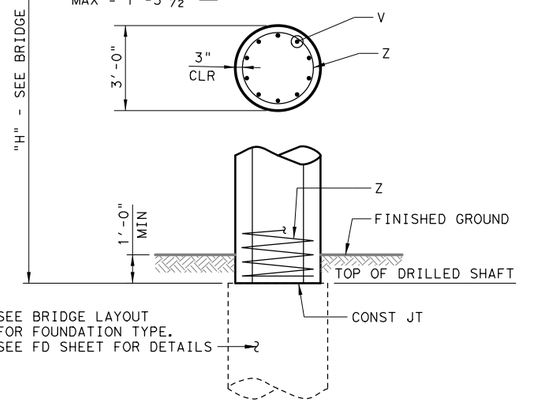

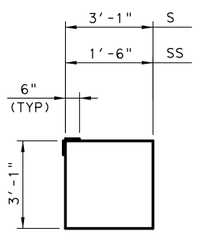

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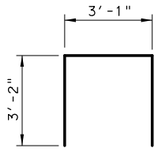

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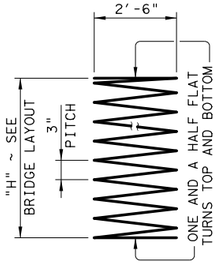


BARS Z

GENERAL NOTES:

1. DESIGNED IN ACCORDANCE WITH AASHTO LRFD BRIDGE DESIGN SPECIFICATIONS, 8TH EDITION (2017), AS MODIFIED BY 2020 TXDOT BDM.
2. CONCRETE SHALL BE CLASS C (HPC), f'c = 3600 PSI.
3. ALL REINFORCING STEEL SHALL BE GRADE 60 (EPOXY COATED).
4. SEE FRAMING PLAN FOR GIRDER ANGLES.
5. SEE BRIDGE LAYOUT FOR FOUNDATION TYPE, SIZE AND LENGTH.
6. SEE COMMON FOUNDATION DETAILS STANDARD SHEET, FD, FOR ALL FOUNDATION DETAILS AND NOTES.
7. COVER DIMENSIONS ARE CLEAR DIMENSIONS, UNLESS NOTED OTHERWISE.
8. REINFORCING BAR DIMENSIONS SHOWN ARE OUT-TO-OUT OF BAR UNLESS NOTED OTHERWISE.
9. CALCULATED FOUNDATION LOADS =
   314 TONS/DS AT BENTS 5 & 6
   286 TONS/DS AT BENTS 7 TO 10

③ TABLE OF ESTMATED QUANTITIES

	BAR	NO.	SIZE	LENGTH	WEIGHT
(5)	A	11	#11	40'-8"	2377
(5)	B	8	#11	38'-11"	1655
(4)	D	4	#9	1'-8"	23
	S	43	#5	13'-4"	598
	SS	43	#5	10'-2"	456
(5)	T	10	#5	38'-11"	406
	U	2	#5	9'-5"	20
REINFORCING STEEL				LB	5535
CLASS "C" CONCRETE (CAP) (HPC)				CY	19.0

(1) FOR EACH LINEAR FOOT VARIATION IN "H" VALUE, MAKE THE FOLLOWING ADJUSTMENTS:
BARS V LENGTH: 1'-0"
BARS Z LENGTH: 31'-5"
REINFORCING STEEL: 220 LBS
CLASS C CONCRETE (COLUMN) (HPC): 1.05 CY

(2) MEASURED PARALLEL TO TOP OF CAP CROSS-SLOPE.

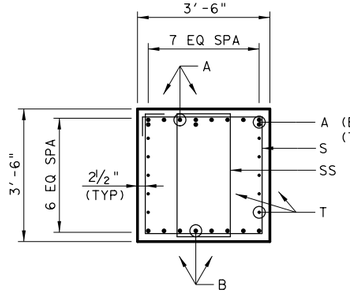
(3) QUANTITIES SHOWN ARE FOR ONE BENT ONLY.

(4) DEDUCT 23 LBS OF REINFORCING STEEL AT BENT 7 AND BENT 9.

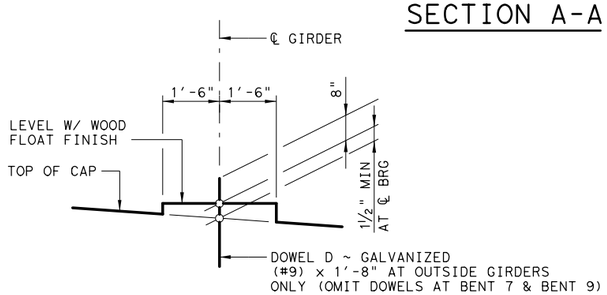
(5) HORIZONTAL BARS IN BENTS 5-9 SHALL BE SPLICED WITH A MECHANICAL COUPLER ONLY. HORIZONTAL BARS IN BENT 10 MAY BE SPLICED WITH A MECHANICAL COUPLER OR BAR LAPS.
EXTEND BARS 1'-0" MIN FOR MECHANICAL COUPLERS (SHOWN) OR PROVIDE BAR LAPS (AT BENT 10 ONLY) AS FOLLOWS:
#5 = 2'-9"
#11 = 10'-3"
AT BENT 10, WHERE BAR LAPS ARE PROVIDED IN LIEU OF COUPLERS, MAKE THE FOLLOWING ADJUSTMENTS FOR THE ADDITIONAL STEEL REQUIRED:
BARS A & B LENGTH: 10'-3"
BARS T LENGTH: 2'-9"
REINFORCING STEEL: 900 LBS

TABLE OF COLUMNS QUANTITIES (1) (3)

BENT	"H"	BARS V 40 ~ #9		BARS Z 4 ~ #4 SPIRAL		REINF STEEL	CLASS "C" CONC (HPC)
NO.	HEIGHT	LENGTH	WEIGHT	LENGTH	WEIGHT	LB	CY
5	11'	14'-0"	1904	369'-2"	987	2891	11.5
6	11'	14'-0"	1904	369'-2"	987	2891	11.5
7	11'	14'-0"	1904	369'-2"	987	2891	11.5
8	10'	13'-0"	1768	337'-9"	903	2671	10.5
9	8'	11'-0"	1496	274'-11"	735	2231	8.4
10	6'	9'-0"	1224	212'-1"	567	1791	6.3



SECTION A-A



BEARING SEAT DETAIL

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

STATE OF TEXAS
PRADEEP KUMAR
130846
LICENSED PROFESSIONAL ENGINEER
4/28/2022

HL93 LOADING

REV. No.	DATE	REVISION	BY

ATKINS
TBPE REG. # F-474

Texas Department of Transportation
Abilene District

US 380 INTERIOR BENTS 5 TO 10

SALT FORK OF BRAZOS RIVER BRIDGE

SCALE: 3/16" = 1'-0" SHEET 1 OF 1

DESIGNED: TS	FED. RD DIV. No.	STATE	PROJECT No.			HIGHWAY No.	
CHECKED: SK	6	TEXAS	SEE TITLE SHEET			US 380	
DRAWN: DN	STATE DISTRICT	COUNTY	CONTROL No.	SECTION No.	JOB No.	SHEET No.	
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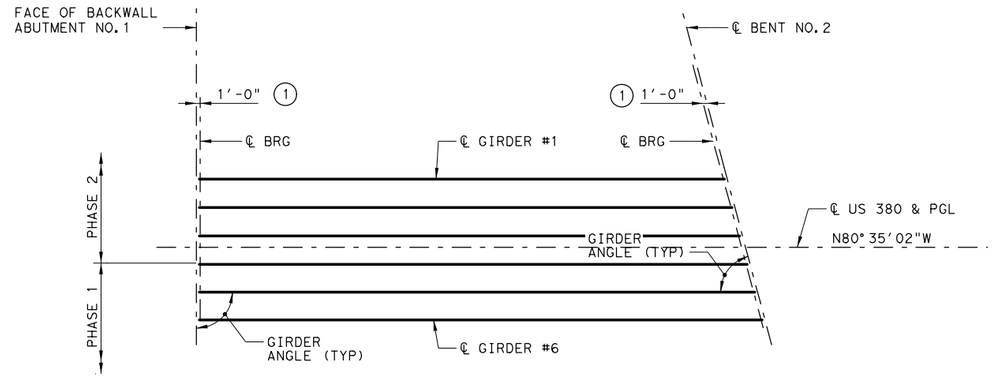

SPAN 1
(TX70 GIRDERS)

(1) SEE ELASTOMERIC BEARING AND GIRDER END DETAILS (IGEB) STANDARD SHEET FOR ORIENTATION OF DIMENSIONS.

(2) GIRDER LENGTHS SHOWN ARE BOTTOM GIRDER FLANGE LENGTHS WITH ADJUSTMENTS MADE FOR GIRDER SLOPE.

BENT REPORT

BENT NO. 1 (N 9 24 57.61 E)
DISTANCE BETWEEN STATION LINE AND BEAM 1, 18.000 L

			BEAM SPAC. (C.L. BENT)	BEAM ANGLE D	M	S
SPAN 1	BEAM	1	0.000	90	0	0
	BEAM	2	7.500	90	0	0
	BEAM	3	7.500	90	0	0
	BEAM	4	7.500	90	0	0
	BEAM	5	7.333	90	0	0
	BEAM	6	7.334	90	0	0
	TOTAL		37.167			

BENT NO. 2 (N 5 35 2.39 W)
DISTANCE BETWEEN STATION LINE AND BEAM 1, 18.635 L

			BEAM SPAC. (C.L. BENT)	BEAM ANGLE D	M	S
SPAN 1	BEAM	1	0.000	75	0	0
	BEAM	2	7.765	75	0	0
	BEAM	3	7.765	75	0	0
	BEAM	4	7.765	75	0	0
	BEAM	5	7.592	75	0	0
	BEAM	6	7.593	75	0	0
	TOTAL		38.478			

GIRDER REPORT

BEAM REPORT, SPAN 1

		HORIZONTAL DISTANCE C-C BENT	C-C BRG.	TRUE DISTANCE BOT. BM. FLG. (2)	BEAM SLOPE
BEAM	1	140.177	138.177	139.68	0.0075
BEAM	2	142.187	140.187	141.69	0.0075
BEAM	3	144.196	142.196	143.70	0.0075
BEAM	4	146.206	144.206	145.71	0.0075
BEAM	5	148.171	146.171	147.67	0.0075
BEAM	6	150.136	148.136	149.64	0.0075

STATE OF TEXAS
PRADEEP KUMAR
130846
LICENSED PROFESSIONAL ENGINEER
4/28/2022

HL93 LOADING

REV. No.	DATE	REVISION	BY

ATKINS
TBPE REG. # F-474

Texas Department of Transportation
Abilene District

US 380
FRAMING PLAN (SPAN 1)

SALT FORK OF BRAZOS RIVER BRIDGE

SCALE: 1" = 40'-0" SHEET 1 OF 5

DESIGNED: TS	FED. RD DIV. No.	STATE	PROJECT No.			HIGHWAY No.
CHECKED: SK	6	TEXAS	SEE TITLE SHEET			US 380
DRAWN: DN	STATE DISTRICT	COUNTY	CONTROL No.	SECTION No.	JOB No.	SHEET No.
CHECKED: TS	ABL	STONEWALL	0106	04	036	102

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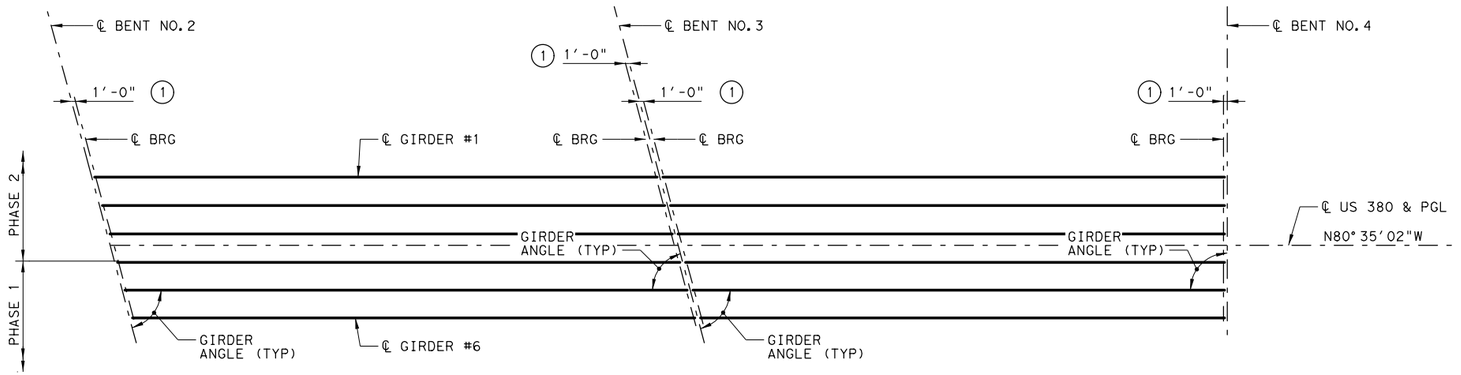

SPAN 2
(TX70 GIRDERS)

SPAN 3
(TX70 GIRDERS)

1. SEE ELASTOMERIC BEARING AND GIRDER END DETAILS (IGEB) STANDARD SHEET FOR ORIENTATION OF DIMENSIONS.
2. GIRDER LENGTHS SHOWN ARE BOTTOM GIRDER FLANGE LENGTHS WITH ADJUSTMENTS MADE FOR GIRDER SLOPE.

BENT REPORT

BENT NO. 2 (N 5 35 2.39 W)
DISTANCE BETWEEN STATION LINE AND BEAM 1, 18.635 L

			BEAM SPAC. (C.L. BENT)	BEAM ANGLE D	M	S
SPAN 2	BEAM	1	0.000	75	0	0
	BEAM	2	7.765	75	0	0
	BEAM	3	7.765	75	0	0
	BEAM	4	7.765	75	0	0
	BEAM	5	7.592	75	0	0
	BEAM	6	7.593	75	0	0
	TOTAL		38.478			

BENT NO. 3 (N 5 35 2.39 W)
DISTANCE BETWEEN STATION LINE AND BEAM 1, 18.635 L

			BEAM SPAC. (C.L. BENT)	BEAM ANGLE D	M	S
SPAN 2	BEAM	1	0.000	75	0	0
	BEAM	2	7.765	75	0	0
	BEAM	3	7.765	75	0	0
	BEAM	4	7.765	75	0	0
	BEAM	5	7.592	75	0	0
	BEAM	6	7.593	75	0	0
	TOTAL		38.478			
SPAN 3	BEAM	1	0.000	75	0	0
	BEAM	2	7.765	75	0	0
	BEAM	3	7.765	75	0	0
	BEAM	4	7.765	75	0	0
	BEAM	5	7.592	75	0	0
	BEAM	6	7.593	75	0	0
	TOTAL		38.478			

BENT NO. 4 (N 9 24 57.61 E)
DISTANCE BETWEEN STATION LINE AND BEAM 1, 18.000 L

			BEAM SPAC. (C.L. BENT)	BEAM ANGLE D	M	S
SPAN 3	BEAM	1	0.000	90	0	0
	BEAM	2	7.500	90	0	0
	BEAM	3	7.500	90	0	0
	BEAM	4	7.500	90	0	0
	BEAM	5	7.333	90	0	0
	BEAM	6	7.334	90	0	0
	TOTAL		37.167			

GIRDER REPORT

BEAM REPORT, SPAN 2

		HORIZONTAL DISTANCE C-C BENT	C-C BRG.	TRUE DISTANCE BOT. BM. FLG. (2)	BEAM SLOPE
BEAM	1	150.000	148.000	149.50	0.0075
BEAM	2	150.000	148.000	149.50	0.0075
BEAM	3	150.000	148.000	149.50	0.0075
BEAM	4	150.000	148.000	149.50	0.0075
BEAM	5	150.000	148.000	149.50	0.0075
BEAM	6	150.000	148.000	149.50	0.0075

BEAM REPORT, SPAN 3

		HORIZONTAL DISTANCE C-C BENT	C-C BRG.	TRUE DISTANCE BOT. BM. FLG. (2)	BEAM SLOPE
BEAM	1	149.823	147.823	149.33	0.0075
BEAM	2	147.813	145.813	147.32	0.0075
BEAM	3	145.804	143.804	145.31	0.0075
BEAM	4	143.794	141.794	143.30	0.0075
BEAM	5	141.829	139.829	141.33	0.0075
BEAM	6	139.864	137.864	139.37	0.0075

STATE OF TEXAS
PRADEEP KUMAR
130846
LICENSED
PROFESSIONAL ENGINEER
4/28/2022

HL93 LOADING

REV. No.	DATE	REVISION	BY

ATKINS
TBPE REG. # F-474

Texas Department of Transportation
Abilene District

US 380
FRAMING PLAN (SPANS 2-3)

SALT FORK OF BRAZOS RIVER BRIDGE

SCALE: 1" = 40'-0" SHEET 2 OF 5

DESIGNED: TS	FED. RD DIV. No.	STATE	PROJECT No.	HIGHWAY No.
CHECKED: SK	6	TEXAS	SEE TITLE SHEET	US 380
DRAWN: DN	STATE DISTRICT	COUNTY	CONTROL No. / SECTION No. / JOB No.	SHEET No.
CHECKED: TS	ABL	STONEWALL	0106 / 04 / 036	103

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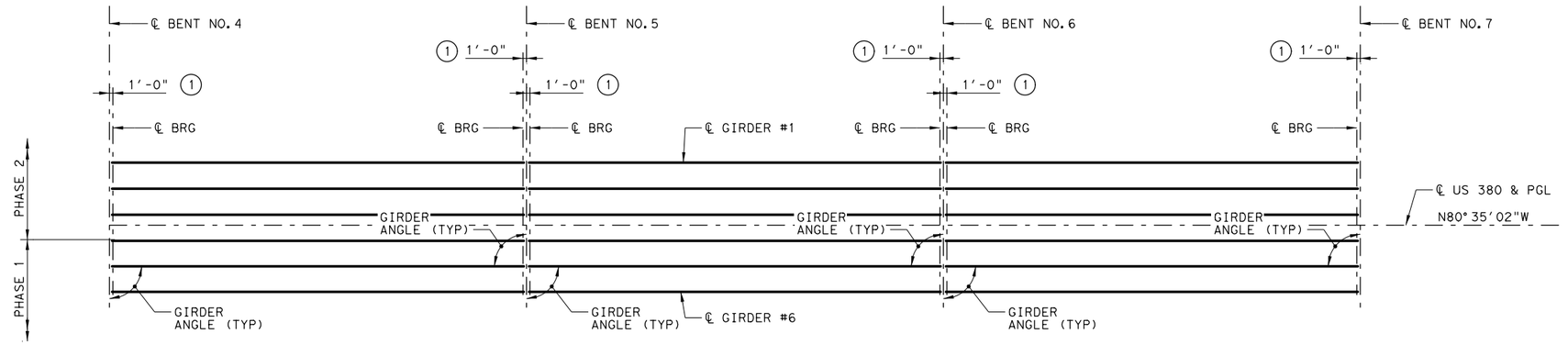

SPAN 4
(TX54 GIRDERS)

SPAN 5
(TX54 GIRDERS)

SPAN 6
(TX54 GIRDERS)

BENT REPORT

BENT NO. 4 (N 9 24 57.61 E)
DISTANCE BETWEEN STATION LINE AND BEAM 1, 18.000 L

			BEAM SPAC. (C.L. BENT)	BEAM ANGLE D	M	S
SPAN 4	BEAM	1	0.000	90	0	0
	BEAM	2	7.500	90	0	0
	BEAM	3	7.500	90	0	0
	BEAM	4	7.500	90	0	0
	BEAM	5	7.333	90	0	0
	BEAM	6	7.334	90	0	0
	TOTAL		37.167			

BENT NO. 5 (N 9 24 57.61 E)
DISTANCE BETWEEN STATION LINE AND BEAM 1, 18.000 L

			BEAM SPAC. (C.L. BENT)	BEAM ANGLE D	M	S
SPAN 4	BEAM	1	0.000	90	0	0
	BEAM	2	7.500	90	0	0
	BEAM	3	7.500	90	0	0
	BEAM	4	7.500	90	0	0
	BEAM	5	7.333	90	0	0
	BEAM	6	7.334	90	0	0
	TOTAL		37.167			
SPAN 5	BEAM	1	0.000	90	0	0
	BEAM	2	7.500	90	0	0
	BEAM	3	7.500	90	0	0
	BEAM	4	7.500	90	0	0
	BEAM	5	7.333	90	0	0
	BEAM	6	7.334	90	0	0
	TOTAL		37.167			

BENT NO. 6 (N 9 24 57.61 E)
DISTANCE BETWEEN STATION LINE AND BEAM 1, 18.000 L

			BEAM SPAC. (C.L. BENT)	BEAM ANGLE D	M	S
SPAN 5	BEAM	1	0.000	90	0	0
	BEAM	2	7.500	90	0	0
	BEAM	3	7.500	90	0	0
	BEAM	4	7.500	90	0	0
	BEAM	5	7.333	90	0	0
	BEAM	6	7.334	90	0	0
	TOTAL		37.167			
SPAN 6	BEAM	1	0.000	90	0	0
	BEAM	2	7.500	90	0	0
	BEAM	3	7.500	90	0	0
	BEAM	4	7.500	90	0	0
	BEAM	5	7.333	90	0	0
	BEAM	6	7.334	90	0	0
	TOTAL		37.167			

BENT NO. 7 (N 9 24 57.61 E)
DISTANCE BETWEEN STATION LINE AND BEAM 1, 18.000 L

			BEAM SPAC. (C.L. BENT)	BEAM ANGLE D	M	S
SPAN 6	BEAM	1	0.000	90	0	0
	BEAM	2	7.500	90	0	0
	BEAM	3	7.500	90	0	0
	BEAM	4	7.500	90	0	0
	BEAM	5	7.333	90	0	0
	BEAM	6	7.334	90	0	0
	TOTAL		37.167			

GIRDER REPORT

BEAM REPORT, SPAN 4

		C-C BENT	HORIZONTAL DISTANCE C-C BRG.	TRUE DISTANCE BOT. BM. FLG. (2)	BEAM SLOPE
BEAM	1	120.000	118.000	119.50	0.0055
BEAM	2	120.000	118.000	119.50	0.0055
BEAM	3	120.000	118.000	119.50	0.0055
BEAM	4	120.000	118.000	119.50	0.0055
BEAM	5	120.000	118.000	119.50	0.0055
BEAM	6	120.000	118.000	119.50	0.0055

BEAM REPORT, SPAN 5

		C-C BENT	HORIZONTAL DISTANCE C-C BRG.	TRUE DISTANCE BOT. BM. FLG. (2)	BEAM SLOPE
BEAM	1	120.000	118.000	119.50	0.0015
BEAM	2	120.000	118.000	119.50	0.0015
BEAM	3	120.000	118.000	119.50	0.0015
BEAM	4	120.000	118.000	119.50	0.0015
BEAM	5	120.000	118.000	119.50	0.0015
BEAM	6	120.000	118.000	119.50	0.0015

BEAM REPORT, SPAN 6

		C-C BENT	HORIZONTAL DISTANCE C-C BRG.	TRUE DISTANCE BOT. BM. FLG. (2)	BEAM SLOPE
BEAM	1	120.000	118.000	119.50	-0.0025
BEAM	2	120.000	118.000	119.50	-0.0025
BEAM	3	120.000	118.000	119.50	-0.0025
BEAM	4	120.000	118.000	119.50	-0.0025
BEAM	5	120.000	118.000	119.50	-0.0025
BEAM	6	120.000	118.000	119.50	-0.0025

(1) SEE ELASTOMERIC BEARING AND GIRDER END DETAILS (IGEB) STANDARD SHEET FOR ORIENTATION OF DIMENSIONS.

(2) GIRDER LENGTHS SHOWN ARE BOTTOM GIRDER FLANGE LENGTHS WITH ADJUSTMENTS MADE FOR GIRDER SLOPE.

STATE OF TEXAS
PRADEEP KUMAR
130846
LICENSED
PROFESSIONAL ENGINEER
4/28/2022

HL93 LOADING

REV. No.	DATE	REVISION	BY

ATKINS
TBPE REG. # F-474

Texas Department of Transportation
Abilene District

US 380
FRAMING PLAN (SPANS 4-6)

SALT FORK OF BRAZOS RIVER BRIDGE

SCALE: 1" = 40'-0" SHEET 3 OF 5

DESIGNED: TS	FED. RD DIV. No.	STATE	PROJECT No.	HIGHWAY No.
CHECKED: SK	6	TEXAS	SEE TITLE SHEET	US 380

DRAWN: DN	STATE DISTRICT	COUNTY	CONTROL No.	SECTION No.	JOB No.	SHEET No.
CHECKED: TS	ABL	STONEWALL	0106	04	036	104

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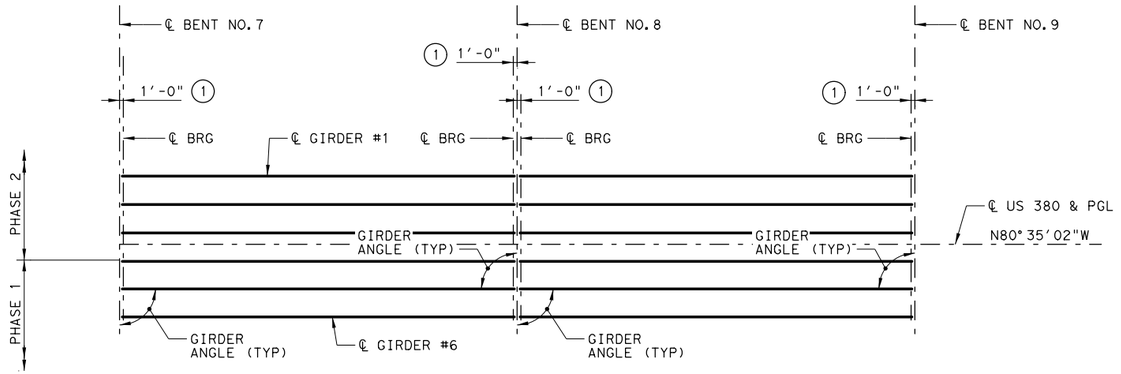

SPAN 7
(TX54 GIRDERS)

SPAN 8
(TX54 GIRDERS)

1. SEE ELASTOMERIC BEARING AND GIRDER END DETAILS (IGEB) STANDARD SHEET FOR ORIENTATION OF DIMENSIONS.
2. GIRDER LENGTHS SHOWN ARE BOTTOM GIRDER FLANGE LENGTHS WITH ADJUSTMENTS MADE FOR GIRDER SLOPE.

BENT REPORT

BENT NO. 7 (N 9 24 57.61 E)
DISTANCE BETWEEN STATION LINE AND BEAM 1, 18.000 L

			BEAM SPAC. (C.L. BENT)	BEAM ANGLE D	M	S
SPAN 7	BEAM	1	0.000	90	0	0
	BEAM	2	7.500	90	0	0
	BEAM	3	7.500	90	0	0
	BEAM	4	7.500	90	0	0
	BEAM	5	7.333	90	0	0
	BEAM	6	7.334	90	0	0
	TOTAL		37.167			

BENT NO. 8 (N 9 24 57.61 E)
DISTANCE BETWEEN STATION LINE AND BEAM 1, 18.000 L

			BEAM SPAC. (C.L. BENT)	BEAM ANGLE D	M	S
SPAN 7	BEAM	1	0.000	90	0	0
	BEAM	2	7.500	90	0	0
	BEAM	3	7.500	90	0	0
	BEAM	4	7.500	90	0	0
	BEAM	5	7.333	90	0	0
	BEAM	6	7.334	90	0	0
	TOTAL		37.167			
SPAN 8	BEAM	1	0.000	90	0	0
	BEAM	2	7.500	90	0	0
	BEAM	3	7.500	90	0	0
	BEAM	4	7.500	90	0	0
	BEAM	5	7.333	90	0	0
	BEAM	6	7.334	90	0	0
	TOTAL		37.167			

BENT NO. 9 (N 9 24 57.61 E)
DISTANCE BETWEEN STATION LINE AND BEAM 1, 18.000 L

			BEAM SPAC. (C.L. BENT)	BEAM ANGLE D	M	S
SPAN 8	BEAM	1	0.000	90	0	0
	BEAM	2	7.500	90	0	0
	BEAM	3	7.500	90	0	0
	BEAM	4	7.500	90	0	0
	BEAM	5	7.333	90	0	0
	BEAM	6	7.334	90	0	0
	TOTAL		37.167			

GIRDER REPORT

BEAM REPORT, SPAN 7

		C-C BENT	HORIZONTAL DISTANCE C-C BRG.	TRUE DISTANCE BOT. BM. FLG. (2)	BEAM SLOPE
BEAM	1	105.000	103.000	104.50	-0.0045
BEAM	2	105.000	103.000	104.50	-0.0045
BEAM	3	105.000	103.000	104.50	-0.0045
BEAM	4	105.000	103.000	104.50	-0.0045
BEAM	5	105.000	103.000	104.50	-0.0045
BEAM	6	105.000	103.000	104.50	-0.0045

BEAM REPORT, SPAN 8

		C-C BENT	HORIZONTAL DISTANCE C-C BRG.	TRUE DISTANCE BOT. BM. FLG. (2)	BEAM SLOPE
BEAM	1	105.000	103.000	104.50	-0.0045
BEAM	2	105.000	103.000	104.50	-0.0045
BEAM	3	105.000	103.000	104.50	-0.0045
BEAM	4	105.000	103.000	104.50	-0.0045
BEAM	5	105.000	103.000	104.50	-0.0045
BEAM	6	105.000	103.000	104.50	-0.0045

STATE OF TEXAS
PRADEEP KUMAR
130846
LICENSED
PROFESSIONAL ENGINEER
4/28/2022

HL93 LOADING

REV. No.	DATE	REVISION	BY

ATKINS
TBPE REG. # F-474

Texas Department of Transportation
Abilene District

US 380
FRAMING PLAN (SPANS 7-8)

SALT FORK OF BRAZOS RIVER BRIDGE

SCALE: 1" = 40′-0" SHEET 4 OF 5

DESIGNED: TS	FED. RD DIV. No.	STATE	PROJECT No.		HIGHWAY No.
CHECKED: SK	6	TEXAS	SEE TITLE SHEET		US 380
DRAWN: DN	STATE DISTRICT	COUNTY	CONTROL No.	SECTION No.	JOB No.	SHEET No.
CHECKED: TS	ABL	STONEWALL	0106	04	036	105

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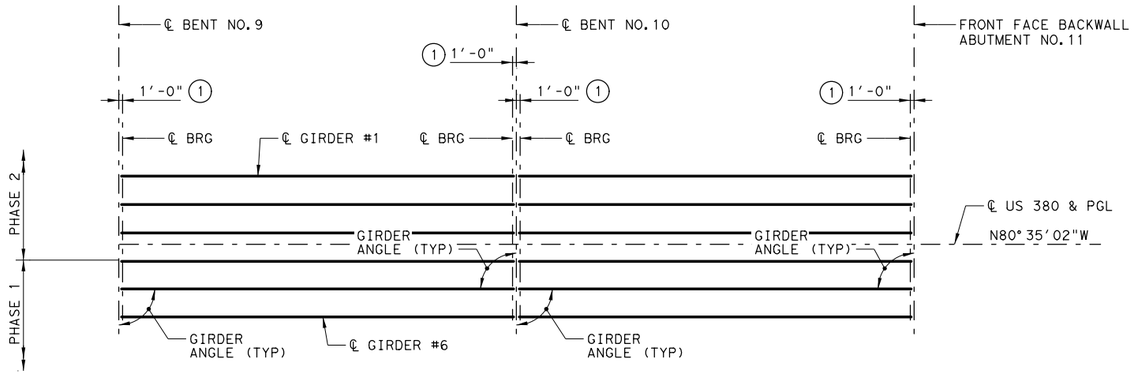

SPAN 9
(TX54 GIRDERS)

SPAN 10
(TX54 GIRDERS)

(1) SEE ELASTOMERIC BEARING AND GIRDER END DETAILS (IGEB) STANDARD SHEET FOR ORIENTATION OF DIMENSIONS.

(2) GIRDER LENGTHS SHOWN ARE BOTTOM GIRDER FLANGE LENGTHS WITH ADJUSTMENTS MADE FOR GIRDER SLOPE.

BENT REPORT

BENT NO. 9 (N 9 24 57.61 E)
DISTANCE BETWEEN STATION LINE AND BEAM 1, 18.000 L

		BEAM SPAC. (C.L. BENT)	BEAM ANGLE D	M	S
SPAN 9	BEAM 1	0.000	90	0	0
	BEAM 2	7.500	90	0	0
	BEAM 3	7.500	90	0	0
	BEAM 4	7.500	90	0	0
	BEAM 5	7.333	90	0	0
	BEAM 6	7.334	90	0	0
	TOTAL	37.167			

BENT NO. 10 (N 9 24 57.61 E)
DISTANCE BETWEEN STATION LINE AND BEAM 1, 18.000 L

		BEAM SPAC. (C.L. BENT)	BEAM ANGLE D	M	S
SPAN 9	BEAM 1	0.000	90	0	0
	BEAM 2	7.500	90	0	0
	BEAM 3	7.500	90	0	0
	BEAM 4	7.500	90	0	0
	BEAM 5	7.333	90	0	0
	BEAM 6	7.334	90	0	0
	TOTAL	37.167			
SPAN 10	BEAM 1	0.000	90	0	0
	BEAM 2	7.500	90	0	0
	BEAM 3	7.500	90	0	0
	BEAM 4	7.500	90	0	0
	BEAM 5	7.333	90	0	0
	BEAM 6	7.334	90	0	0
	TOTAL	37.167			

BENT NO. 11 (N 9 24 57.63 E)
DISTANCE BETWEEN STATION LINE AND BEAM 1, 18.000 L

		BEAM SPAC. (C.L. BENT)	BEAM ANGLE D	M	S
SPAN 10	BEAM 1	0.000	90	0	0
	BEAM 2	7.500	90	0	0
	BEAM 3	7.500	90	0	0
	BEAM 4	7.500	90	0	0
	BEAM 5	7.333	90	0	0
	BEAM 6	7.334	90	0	0
	TOTAL	37.167			

GIRDER REPORT

BEAM REPORT, SPAN 9

	HORIZONTAL DISTANCE C-C BENT	C-C BRG.	TRUE DISTANCE BOT. BM. FLG. (2)	BEAM SLOPE
BEAM 1	105.000	103.000	104.50	-0.0045
BEAM 2	105.000	103.000	104.50	-0.0045
BEAM 3	105.000	103.000	104.50	-0.0045
BEAM 4	105.000	103.000	104.50	-0.0045
BEAM 5	105.000	103.000	104.50	-0.0045
BEAM 6	105.000	103.000	104.50	-0.0045

BEAM REPORT, SPAN 10

	HORIZONTAL DISTANCE C-C BENT	C-C BRG.	TRUE DISTANCE BOT. BM. FLG. (2)	BEAM SLOPE
BEAM 1	105.000	103.000	104.50	-0.0027
BEAM 2	105.000	103.000	104.50	-0.0027
BEAM 3	105.000	103.000	104.50	-0.0027
BEAM 4	105.000	103.000	104.50	-0.0027
BEAM 5	105.000	103.000	104.50	-0.0027
BEAM 6	105.000	103.000	104.50	-0.0027

STATE OF TEXAS
PRADEEP KUMAR
130846
LICENSED
PROFESSIONAL ENGINEER
4/28/2022

HL93 LOADING

REV. No.	DATE	REVISION	BY

ATKINS
TBPE REG. # F-474

Texas Department of Transportation
Abilene District

US 380
FRAMING PLAN (SPANS 9-10)

SALT FORK OF BRAZOS RIVER BRIDGE

SCALE: 1" = 40'-0" SHEET 5 OF 5

DESIGNED: TS	FED. RD DIV. No.	STATE	PROJECT No.	HIGHWAY No.
CHECKED: SK	6	TEXAS	SEE TITLE SHEET	US 380

DRAWN: DN	STATE DISTRICT	COUNTY	CONTROL No.	SECTION No.	JOB No.	SHEET No.
CHECKED: TS	ABL	STONEWALL	0106	04	036	106

PLOT DRIVER: TXDOT_PDF_BW.plt
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100% SUBMITTAL

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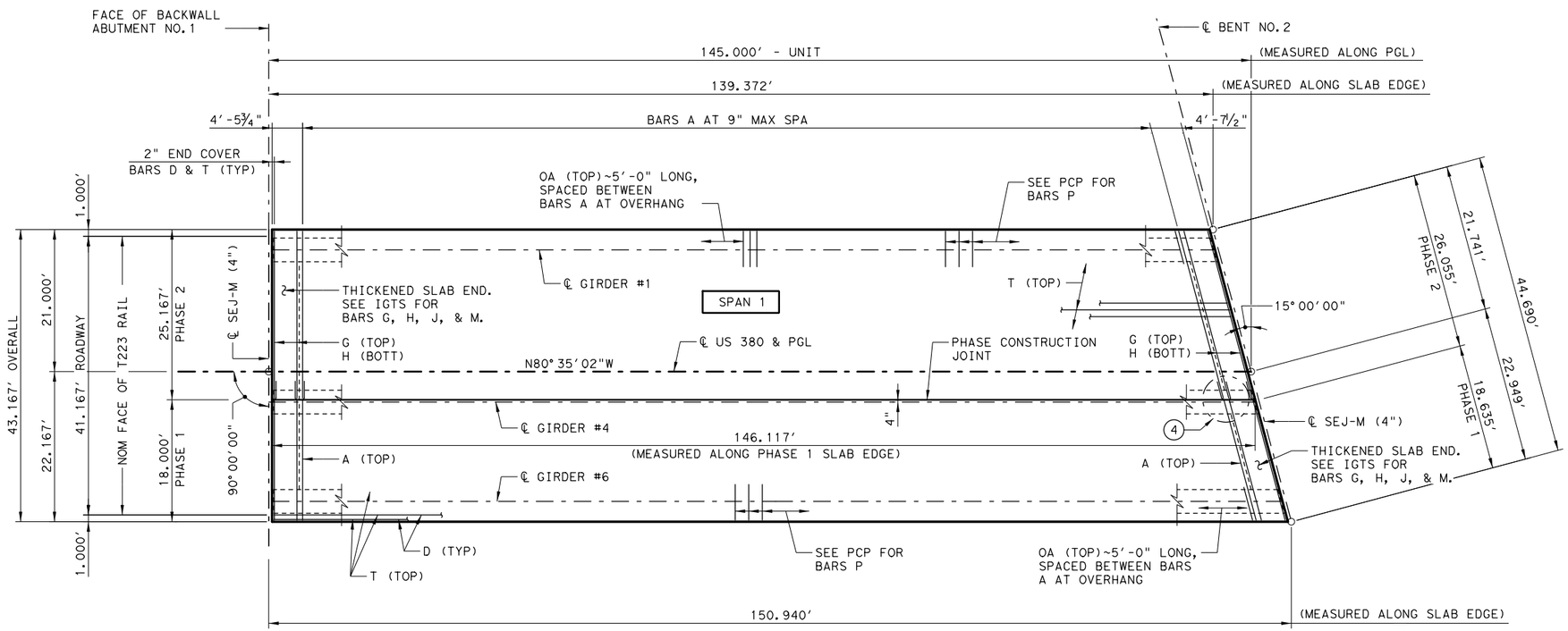

PLAN

GENERAL NOTES:

DESIGNED IN ACCORDANCE WITH AASHTO LRFD BRIDGE DESIGN SPECIFICATIONS, 8TH EDITION (2017), AS MODIFIED BY 2020 TXDOT BDM.

CONCRETE SHALL BE CLASS S (HPC), f′c = 4000 PSI.

PROVIDE GFRP BARS, CONFORMING TO ASTM D7957/7957M, EXCEPT PROVIDE A MINIMUM MODULUS OF ELASTICITY OF 7500 KSI.

PROVIDE GFRP BARS FOR TOP MAT ONLY. ALL OTHER REINFORCING STEEL SHALL BE GRADE 60 (EPOXY COATED).

SEE RAIL STANDARD FOR ANCHORAGE IN SLAB.

SEE GFRP SLAB (IGFRP) STANDARD FOR ADDITIONAL NOTES AND TOP MAT OF SLAB REINFORCEMENT AT THE THICKENED SLAB END.

SEE PCP AND PCP-FAB FOR PANEL DETAILS NOT SHOWN.

SEE PCP(O) AND PCP(O)-FAB FOR PRECAST OVERHANG PANEL DETAILS IF THIS OPTION IS USED.

SEE IGMS STANDARD FOR MISCELLANEOUS DETAILS.

SEE PMDF STANDARD FOR DETAILS AND QUANTITY ADJUSTMENTS IF THIS OPTION IS USED.

BAR LAPS, WHERE REQUIRED SHALL BE AS FOLLOWS:
EPOXY COATED ~ #4 = 2′-5"
GFRP ~ #5 = 2′-9"

(4) EXTEND BARS A, G & H ACROSS PHASED CONSTRUCTION JOINT.

STATE OF TEXAS
PRADEEP KUMAR
130846
LICENSED
PROFESSIONAL ENGINEER
4/28/2022

HL93 LOADING

REV. No.	DATE	REVISION	BY

ATKINS
TBPE REG. # F-474

Texas Department of Transportation
Abilene District
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US 380
145.000′ PRESTRESSED CONCRETE I-GIRDER UNIT

SALT FORK OF BRAZOS RIVER BRIDGE

SCALE: NONE SHEET 1 OF 2

DESIGNED: TS	FED. RD DIV. No.	STATE	PROJECT No.			HIGHWAY No.
CHECKED: SK	6	TEXAS	SEE TITLE SHEET			US 380
DRAWN: DN	STATE DISTRICT	COUNTY	CONTROL No.	SECTION No.	JOB No.	SHEET No.
CHECKED: TS	ABL	STONEWALL	0106	04	036	107

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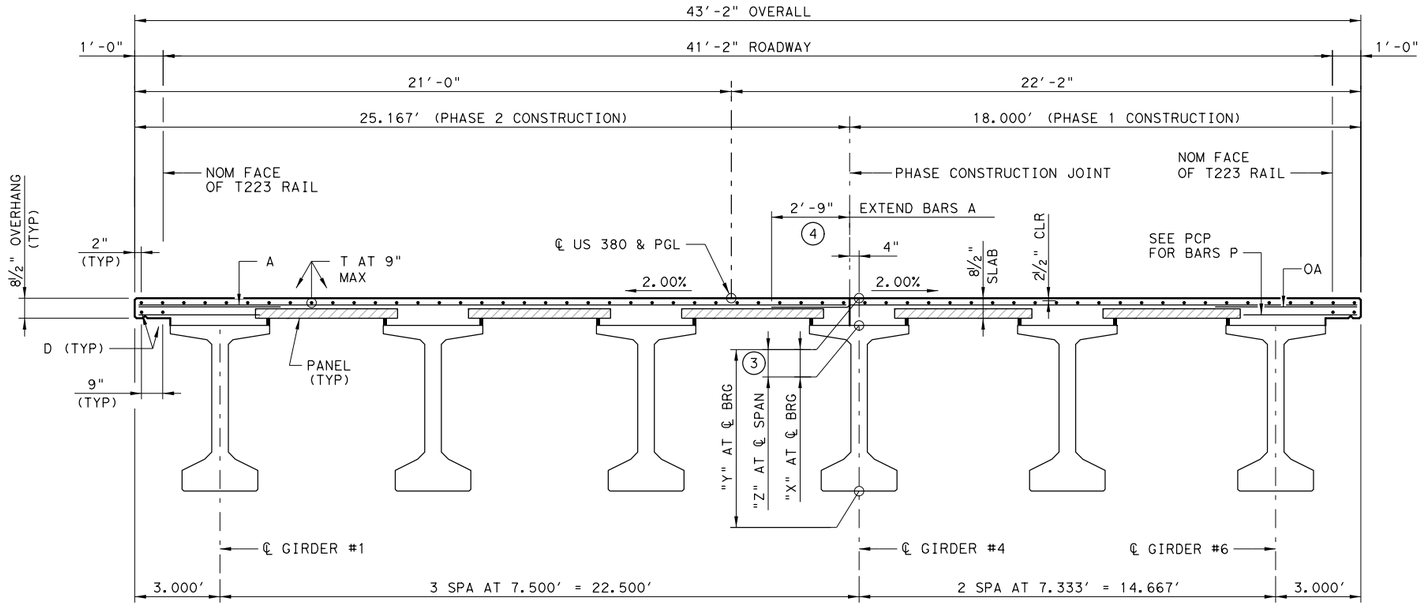


TYPICAL TRANSVERSE SECTION

(4) EXTEND BARS A, G & H ACROSS PHASED CONSTRUCTION JOINT.

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

TABLE OF ESTIMATED QUANTITIES

SPAN	REINFORCED CONCRETE SLAB	PRESTR CONCRETE GIRDER (2) (TX70)	REINF STEEL (1)
NO.	SF	LF	LB
1	6260	868.09	14398
TOTAL	6260	868.09	14398

(1) REINFORCING STEEL WEIGHT IS CALCULATED USING AN APPROXIMATE FACTOR OF 2.3 LBS/SF.

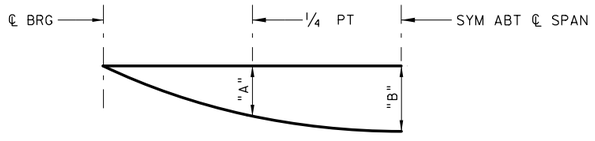
(2) LENGTHS SHOWN ARE BOTTOM GIRDER FLANGE LENGTHS WITH ADJUSTMENTS MADE FOR GIRDER SLOPE.

NOTES:

1. FOR GENERAL NOTES SEE 145.000' PRESTRESSED CONCRETE I-GIRDER UNIT SHEET 1 OF 2.
2. THE HAUNCH DEPTH REQUIRES ADDITIONAL REINFORCING, SEE PCP OR IGMS FOR HAUNCH REINFORCING DETAILS.

TABLE OF DEFLECTIONS

SPAN NO.	GIRDER NO.	"A" FT	"B" FT
1	1	0.110	0.156
	2	0.129	0.184
	3	0.137	0.194
	4	0.077	0.110
	5	0.149	0.212
	6	0.143	0.203



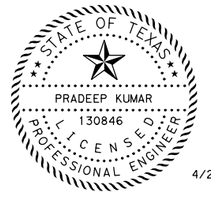
DEAD LOAD DEFLECTION DIAGRAM

DEFLECTIONS SHOWN ARE DUE TO CONCRETE SLAB ONLY. (Ec = 5,000 KSI). CALCULATED DEFLECTIONS SHOWN ARE THEORETICAL AND ACTUAL DEFLECTIONS MAY BE LESS. ADJUST VALUES AS REQUIRED IF OPTIONAL SLAB FORMING IS USED. THESE VALUES MAY REQUIRE FIELD VERIFICATION.

TABLE OF SECTION DEPTHS

SPAN NO.	GIRDER NO.	"X" AT ℄ BRG	"Y" AT ℄ BRG	"Z" AT ℄ SPAN (3)
1	1	12 ½"	6'-10 ½"	10"
	2	12 ½"	6'-10 ½"	10 ¼"
	3	12 ½"	6'-10 ½"	10 ⅜"
	4	12 ½"	6'-10 ½"	9 ⅝"
	5	12 ½"	6'-10 ½"	10 ⅝"
	6	12 ½"	6'-10 ½"	10 ⅝"

(3) THEORETICAL DIMENSION



4/28/2022

HL93 LOADING

REV. No.	DATE	REVISION	BY

ATKINS TBPE REG. # F-474

Texas Department of Transportation
Abilene District

US 380
145.000' PRESTRESSED CONCRETE I-GIRDER UNIT

SALT FORK OF BRAZOS RIVER BRIDGE

SCALE: 3/16" = 1'-0" SHEET 2 OF 2

DESIGNED: TS	FED. RD DIV. No.	STATE	PROJECT No.			HIGHWAY No.
CHECKED: SK	6	TEXAS	SEE TITLE SHEET			US 380
DRAWN: DN	STATE DISTRICT	COUNTY	CONTROL No.	SECTION No.	JOB No.	SHEET No.
CHECKED: TS	ABL	STONEWALL	0106	04	036	108

PLOT DRIVER: TXDOT_PDF_BW.plt
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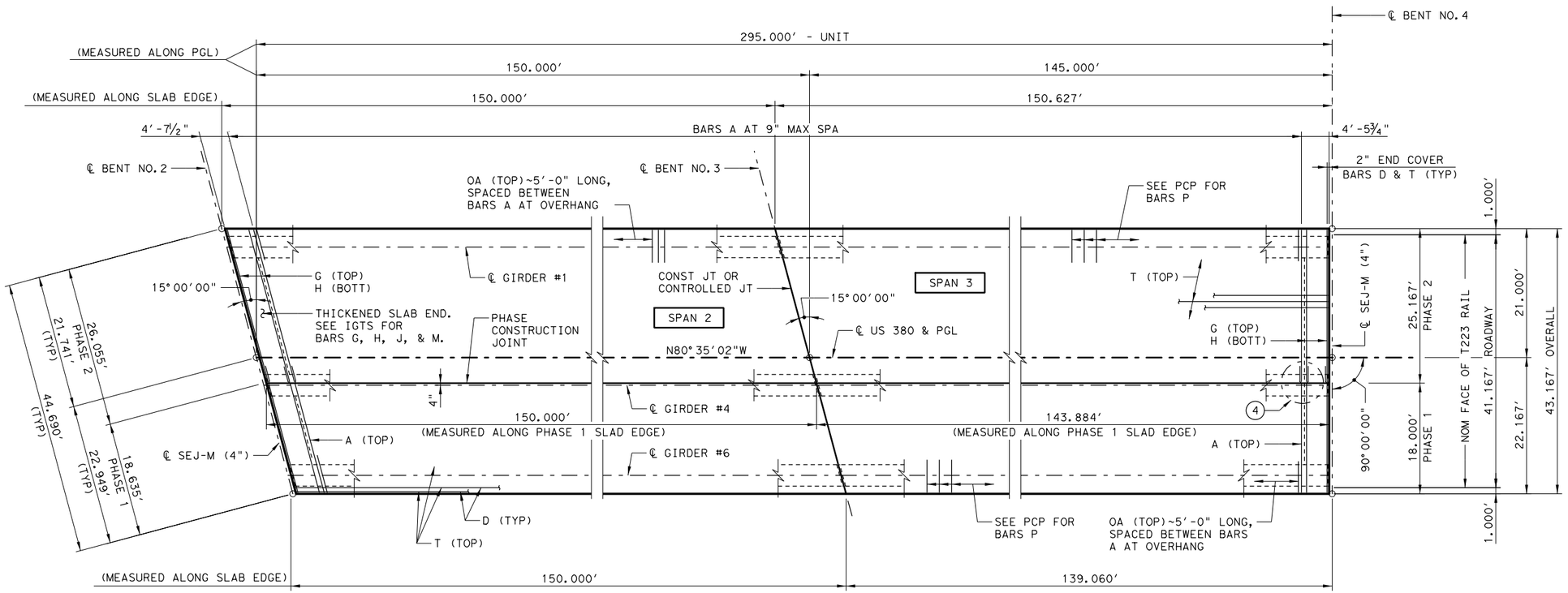

GENERAL NOTES:

DESIGNED IN ACCORDANCE WITH AASHTO LRFD BRIDGE DESIGN SPECIFICATIONS, 8TH EDITION (2017), AS MODIFIED BY 2020 TXDOT BDM.

CONCRETE SHALL BE CLASS S (HPC), f′c = 4000 PSI.

PROVIDE GFRP BARS, CONFORMING TO ASTM D7957/7957M, EXCEPT PROVIDE A MINIMUM MODULUS OF ELASTICITY OF 7500 KSI.

PROVIDE GFRP BARS FOR TOP MAT ONLY. ALL OTHER REINFORCING STEEL SHALL BE GRADE 60 (EPOXY COATED).

SEE RAIL STANDARD FOR ANCHORAGE IN SLAB.

SEE GFRP SLAB (IGFRP) STANDARD FOR ADDITIONAL NOTES AND TOP MAT OF SLAB REINFORCEMENT AT THE THICKENED SLAB END.

SEE PCP AND PCP-FAB FOR PANEL DETAILS NOT SHOWN.

SEE PCP(O) AND PCP(O)-FAB FOR PRECAST OVERHANG PANEL DETAILS IF THIS OPTION IS USED.

SEE IGMS STANDARD FOR MISCELLANEOUS DETAILS.

SEE PMDF STANDARD FOR DETAILS AND QUANTITY ADJUSTMENTS IF THIS OPTION IS USED.

BAR LAPS, WHERE REQUIRED SHALL BE AS FOLLOWS:
EPOXY COATED ~ #4 = 2′-5"
GFRP ~ #5 = 2′-9"

(4) EXTEND BARS A, G & H ACROSS PHASED CONSTRUCTION JOINT.

STATE OF TEXAS
PRADEEP KUMAR
130846
LICENSED
PROFESSIONAL ENGINEER
4/28/2022

HL93 LOADING

REV. No.	DATE	REVISION	BY

ATKINS
TBPE REG. # F-474

Texas Department of Transportation
Abilene District

US 380
295.000′ PRESTRESSED CONCRETE I-GIRDER UNIT

SALT FORK OF BRAZOS RIVER BRIDGE

SCALE: NONE SHEET 1 OF 2

DESIGNED: TS	FED. RD DIV. No.	STATE	PROJECT No.			HIGHWAY No.
CHECKED: SK	6	TEXAS	SEE TITLE SHEET			US 380
DRAWN: DN	STATE DISTRICT	COUNTY	CONTROL No.	SECTION No.	JOB No.	SHEET No.
CHECKED: TS	ABL	STONEWALL	0106	04	036	109

PLOT DRIVER: TXDOT_PDF_BW.plt
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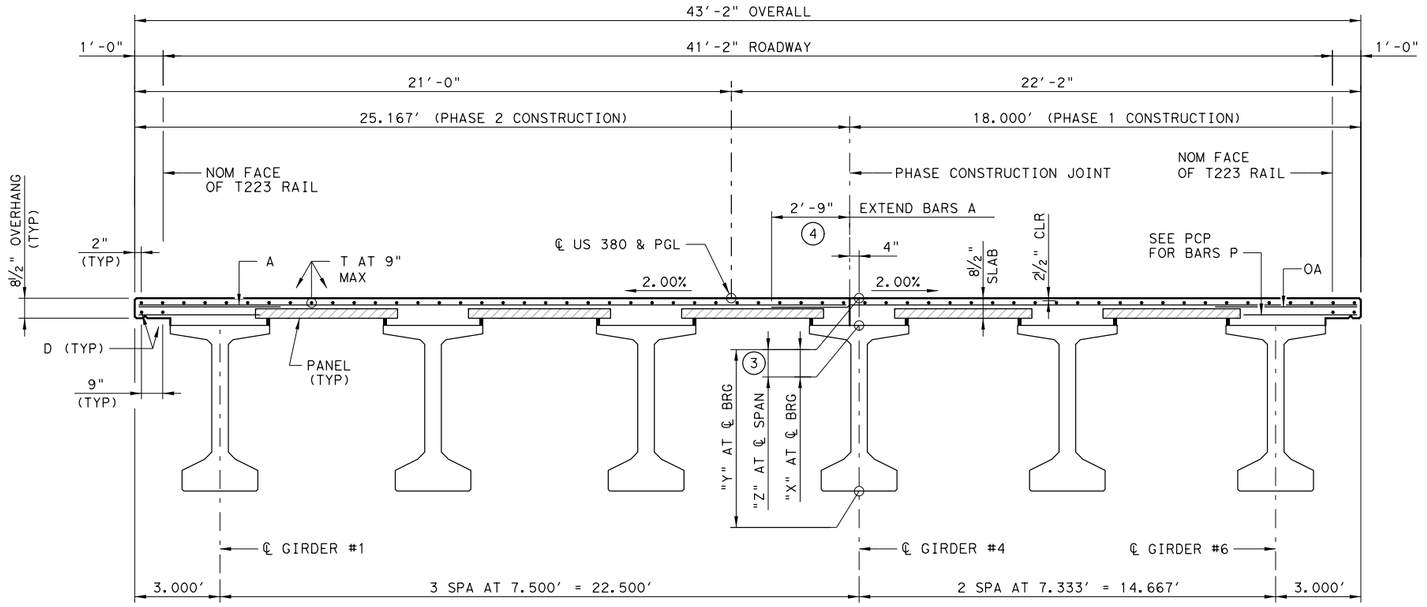


TYPICAL TRANSVERSE SECTION

(4) EXTEND BARS A, G & H ACROSS PHASED CONSTRUCTION JOINT.

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

TABLE OF ESTIMATED QUANTITIES

SPAN	REINFORCED CONCRETE SLAB	PRESTR CONCRETE GIRDER (2) (TX70)	REINF STEEL (1)
NO.	SF	LF	LB
2	6476	897.00	14895
3	6260	865.96	14398
TOTAL	12390	1762.96	29293

(1) REINFORCING STEEL WEIGHT IS CALCULATED USING AN APPROXIMATE FACTOR OF 2.3 LBS/SF.

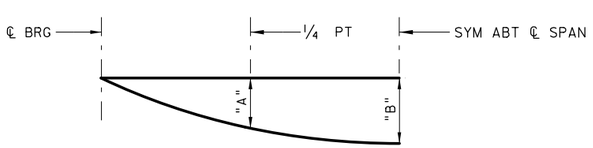
(2) LENGTHS SHOWN ARE BOTTOM GIRDER FLANGE LENGTHS WITH ADJUSTMENTS MADE FOR GIRDER SLOPE.

NOTES:

1. FOR GENERAL NOTES SEE 295.000′ PRESTRESSED CONCRETE I-GIRDER UNIT SHEET 1 OF 2.
2. THE HAUNCH DEPTH REQUIRES ADDITIONAL REINFORCING, SEE PCP OR IGMS FOR HAUNCH REINFORCING DETAILS.

TABLE OF DEFLECTIONS

SPAN NO.	GIRDER NO.	"A" FT	"B" FT
2	1	0.144	0.205
	2	0.160	0.228
	3	0.160	0.228
	4	0.086	0.112
	5	0.157	0.223
	6	0.143	0.203
3	1	0.144	0.204
	2	0.151	0.215
	3	0.143	0.203
	4	0.072	0.102
	5	0.125	0.178
	6	0.107	0.153



DEAD LOAD DEFLECTION DIAGRAM

DEFLECTIONS SHOWN ARE DUE TO CONCRETE SLAB ONLY. (Ec = 5,000 KSI). CALCULATED DEFLECTIONS SHOWN ARE THEORETICAL AND ACTUAL DEFLECTIONS MAY BE LESS. ADJUST VALUES AS REQUIRED IF OPTIONAL SLAB FORMING IS USED. THESE VALUES MAY REQUIRE FIELD VERIFICATION.

TABLE OF SECTION DEPTHS

SPAN NO.	GIRDER NO.	"X" AT ℄ BRG	"Y" AT ℄ BRG	"Z" AT ℄ SPAN (3)
2	1	12 ½"	6′-10 ½"	10 ⅝"
	2	12 ½"	6′-10 ½"	10 ⅞"
	3	12 ½"	6′-10 ½"	10 ⅞"
	4	12 ½"	6′-10 ½"	9 ⅞"
	5	12 ½"	6′-10 ½"	10 ¾"
	6	12 ½"	6′-10 ½"	10 ⅝"
3	1	12 ¾"	6′-10 ¾"	10 ⅞"
	2	12 ¾"	6′-10 ¾"	10 ⅞"
	3	12 ¾"	6′-10 ¾"	10 ¾"
	4	12 ¾"	6′-10 ¾"	9 ¾"
	5	12 ¾"	6′-10 ¾"	10 ½"
	6	12 ¾"	6′-10 ¾"	10 ¼"

(3) THEORETICAL DIMENSION

STATE OF TEXAS
PRADEEP KUMAR
130846
LICENSED PROFESSIONAL ENGINEER
4/28/2022

HL93 LOADING

REV. No.	DATE	REVISION	BY

ATKINS TBPE REG. # F-474

Texas Department of Transportation
Abilene District

US 380
295.000′ PRESTRESSED CONCRETE I-GIRDER UNIT

SALT FORK OF BRAZOS RIVER BRIDGE

SCALE: 3/16" = 1′-0" SHEET 2 OF 2

DESIGNED: TS	FED. RD DIV. No.	STATE	PROJECT No.			HIGHWAY No.
CHECKED: SK	6	TEXAS	SEE TITLE SHEET			US 380
DRAWN: DN	STATE DISTRICT	COUNTY	CONTROL No.	SECTION No.	JOB No.	SHEET No.
CHECKED: TS	ABL	STONEWALL	0106	04	036	110

PLOT DRIVER: TXDOT_PDF_BW.plt
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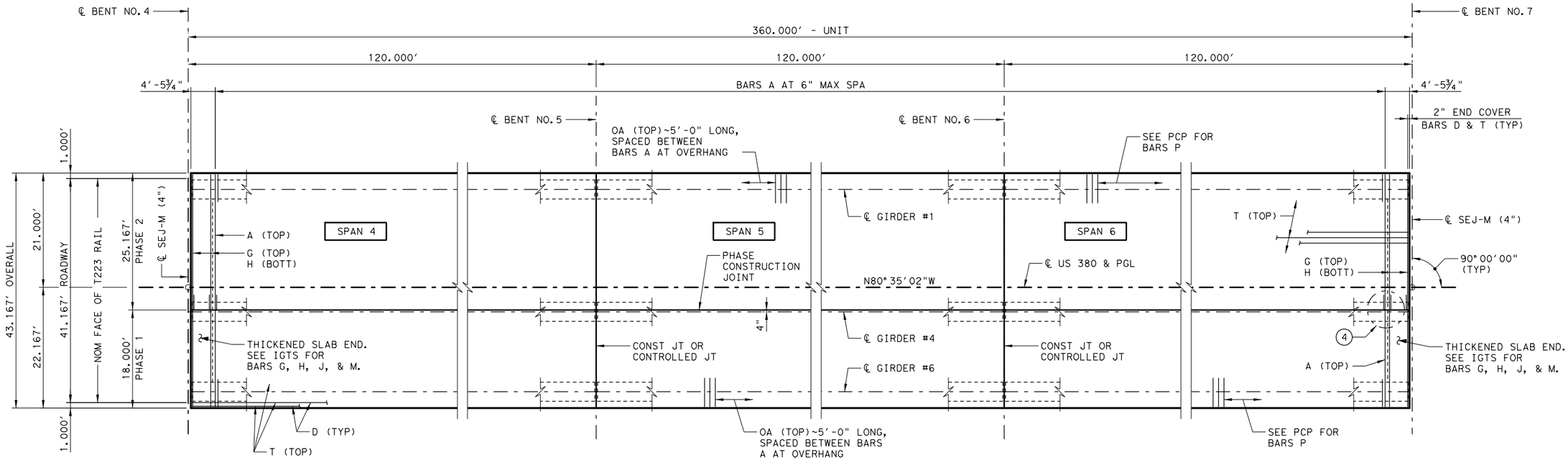


PLAN

GENERAL NOTES:

DESIGNED IN ACCORDANCE WITH AASHTO LRFD BRIDGE DESIGN SPECIFICATIONS, 8TH EDITION (2017), AS MODIFIED BY 2020 TXDOT BDM.

CONCRETE SHALL BE CLASS S (HPC), f'c = 4000 PSI.

PROVIDE GFRP BARS, CONFORMING TO ASTM D7957/7957M, EXCEPT PROVIDE A MINIMUM MODULUS OF ELASTICITY OF 7500 KSI.

PROVIDE GFRP BARS FOR TOP MAT ONLY. ALL OTHER REINFORCING STEEL SHALL BE GRADE 60 (EPOXY COATED).

SEE RAIL STANDARD FOR ANCHORAGE IN SLAB.

SEE GFRP SLAB (IGFRP) STANDARD FOR ADDITIONAL NOTES AND TOP MAT OF SLAB REINFORCEMENT AT THE THICKENED SLAB END.

SEE PCP AND PCP-FAB FOR PANEL DETAILS NOT SHOWN.

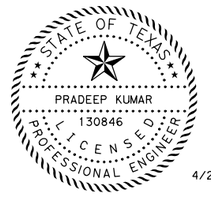
SEE PCP(O) AND PCP(O)-FAB FOR PRECAST OVERHANG PANEL DETAILS IF THIS OPTION IS USED.

SEE IGMS STANDARD FOR MISCELLANEOUS DETAILS.

SEE PMDF STANDARD FOR DETAILS AND QUANTITY ADJUSTMENTS IF THIS OPTION IS USED.

BAR LAPS, WHERE REQUIRED SHALL BE AS FOLLOWS:
EPOXY COATED ~ #4 = 2'-5"
GFRP ~ #5 = 2'-9"

(4) EXTEND BARS A, G & H ACROSS PHASED CONSTRUCTION JOINT.



4/28/2022

HL93 LOADING

REV. No.	DATE	REVISION	BY

ATKINS
TBPE REG. # F-474

Texas Department of Transportation
Abilene District

US 380
360.000' PRESTRESSED CONCRETE I-GIRDER UNIT

SALT FORK OF BRAZOS RIVER BRIDGE

SCALE: NONE
SHEET 1 OF 2

DESIGNED: TS	FED. RD DIV. No.	STATE	PROJECT No.			HIGHWAY No.
CHECKED: SK	6	TEXAS	SEE TITLE SHEET			US 380
DRAWN: DN	STATE DISTRICT	COUNTY	CONTROL No.	SECTION No.	JOB No.	SHEET No.
CHECKED: TS	ABL	STONEWALL	0106	04	036	111

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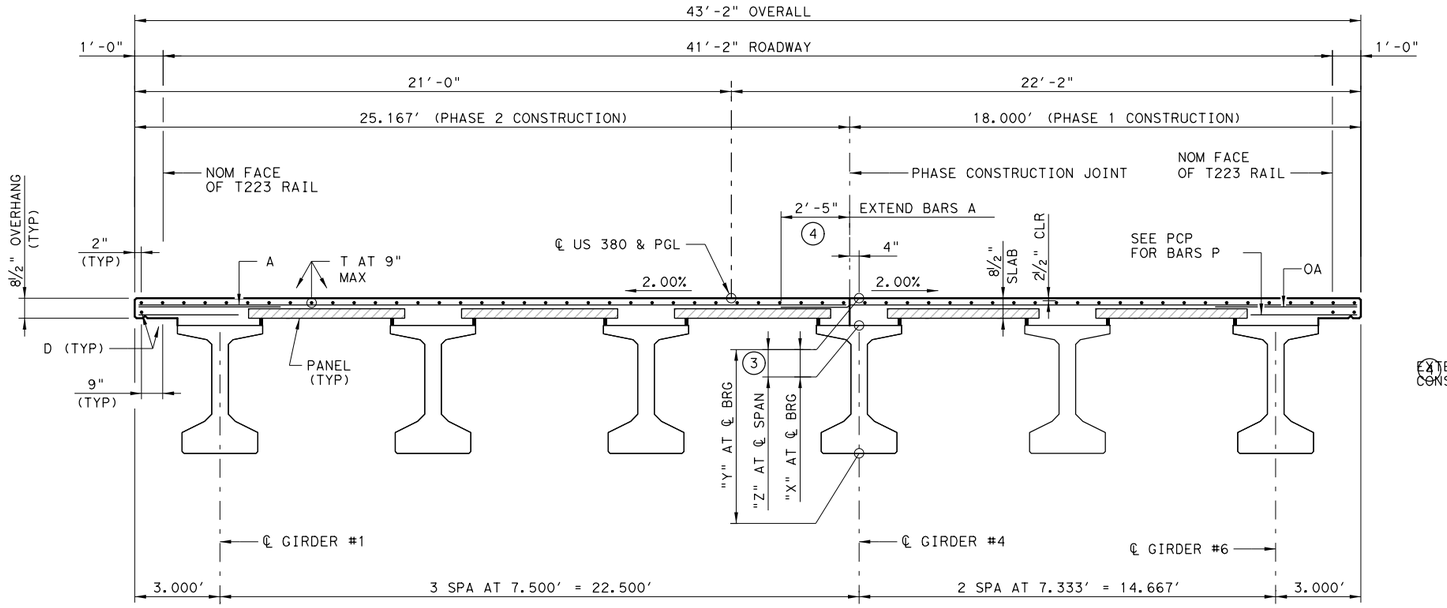


TYPICAL TRANSVERSE SECTION

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

TABLE OF ESTIMATED QUANTITIES

SPAN	REINFORCED CONCRETE SLAB	PRESTR CONCRETE GIRDER (2) (TX54)	REINF STEEL (1)
NO.	SF	LF	LB
4	5180	717.00	11914
5	5180	717.00	11914
6	5180	717.00	11914
TOTAL	15540	2151.00	35742

(1) REINFORCING STEEL WEIGHT IS CALCULATED USING AN APPROXIMATE FACTOR OF 2.3 LBS/SF.

(2) LENGTHS SHOWN ARE BOTTOM GIRDER FLANGE LENGTHS WITH ADJUSTMENTS MADE FOR GIRDER SLOPE.

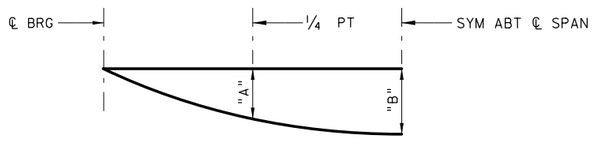
(4) EXTEND BARS A, G & H ACROSS PHASED CONSTRUCTION JOINT.

NOTES:

1. FOR GENERAL NOTES SEE 360.000' PRESTRESSED CONCRETE I-GIRDER UNIT SHEET 1 OF 2.

TABLE OF DEFLECTIONS

SPAN NO.	GIRDER NO.	"A"	"B"
		FT	FT
4-6	1	0.122	0.174
	2	0.136	0.193
	3	0.136	0.193
	4	0.073	0.103
	5	0.133	0.189
	6	0.121	0.172



DEAD LOAD DEFLECTION DIAGRAM

DEFLECTIONS SHOWN ARE DUE TO CONCRETE SLAB ONLY. (Ec = 5,000 KSI). CALCULATED DEFLECTIONS SHOWN ARE THEORETICAL AND ACTUAL DEFLECTIONS MAY BE LESS. ADJUST VALUES AS REQUIRED IF OPTIONAL SLAB FORMING IS USED. THESE VALUES MAY REQUIRE FIELD VERIFICATION.

TABLE OF SECTION DEPTHS

SPAN NO.	GIRDER NO.	"X" AT ℄ BRG	"Y" AT ℄ BRG	"Z" AT ℄ SPAN (3)
4-6	1	11 ½"	5'-5 ½"	10 ¼"
	2	11 ½"	5'-5 ½"	10 ½"
	3	11 ½"	5'-5 ½"	10 ½"
	4	11 ½"	5'-5 ½"	9 ⅝"
	5	11 ½"	5'-5 ½"	10 ⅜"
	6	11 ½"	5'-5 ½"	10 ¼"

(3) THEORETICAL DIMENSION

STATE OF TEXAS
PRADEEP KUMAR
130846
LICENSED PROFESSIONAL ENGINEER
4/28/2022

HL93 LOADING

REV. No.	DATE	REVISION	BY

ATKINS
TBPE REG. # F-474

Texas Department of Transportation
Abilene District

US 380
360.000' PRESTRESSED CONCRETE I-GIRDER UNIT

SALT FORK OF BRAZOS RIVER BRIDGE

SCALE: 3/16" = 1'-0" SHEET 2 OF 2

DESIGNED: TS	FED. RD DIV. No.	STATE	PROJECT No.			HIGHWAY No.
CHECKED: SK	6	TEXAS	SEE TITLE SHEET			US 380
DRAWN: DN	STATE DISTRICT	COUNTY	CONTROL No.	SECTION No.	JOB No.	SHEET No.
CHECKED: TS	ABL	STONEWALL	0106	04	036	112

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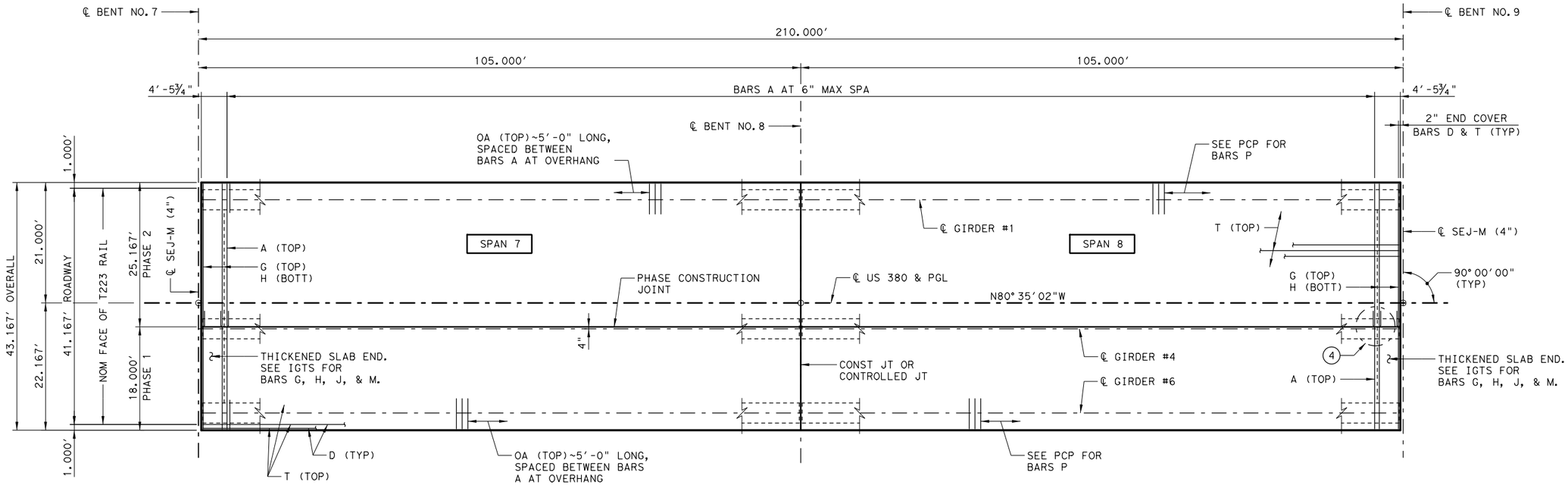

PLAN

GENERAL NOTES:

DESIGNED IN ACCORDANCE WITH AASHTO LRFD BRIDGE DESIGN SPECIFICATIONS, 8TH EDITION (2017), AS MODIFIED BY 2020 TXDOT BDM.

CONCRETE SHALL BE CLASS S (HPC), f′c = 4000 PSI.

PROVIDE GFRP BARS, CONFORMING TO ASTM D7957/7957M, EXCEPT PROVIDE A MINIMUM MODULUS OF ELASTICITY OF 7500 KSI.

PROVIDE GFRP BARS FOR TOP MAT ONLY. ALL OTHER REINFORCING STEEL SHALL BE GRADE 60 (EPOXY COATED).

SEE RAIL STANDARD FOR ANCHORAGE IN SLAB.

SEE GFRP SLAB (IGFRP) STANDARD FOR ADDITIONAL NOTES AND TOP MAT OF SLAB REINFORCEMENT AT THE THICKENED SLAB END.

SEE PCP AND PCP-FAB FOR PANEL DETAILS NOT SHOWN.

SEE PCP(O) AND PCP(O)-FAB FOR PRECAST OVERHANG PANEL DETAILS IF THIS OPTION IS USED.

SEE IGMS STANDARD FOR MISCELLANEOUS DETAILS.

SEE PMDF STANDARD FOR DETAILS AND QUANTITY ADJUSTMENTS IF THIS OPTION IS USED.

BAR LAPS, WHERE REQUIRED SHALL BE AS FOLLOWS:
EPOXY COATED ~ #4 = 2′-5"
GFRP ~ #5 = 2′-9"

(4) EXTEND BARS A, G & H ACROSS PHASED CONSTRUCTION JOINT.

STATE OF TEXAS
PRADEEP KUMAR
130846
LICENSED
PROFESSIONAL ENGINEER
4/28/2022

HL93 LOADING

REV. No.	DATE	REVISION	BY

ATKINS
TBPE REG. # F-474

Texas Department of Transportation
Abilene District

US 380
210.000′ PRESTRESSED CONCRETE I-GIRDER UNIT

SALT FORK OF BRAZOS RIVER BRIDGE

SCALE: NONE SHEET 1 OF 2

DESIGNED: TS	FED. RD DIV. No.	STATE	PROJECT No.			HIGHWAY No.
CHECKED: SK	6	TEXAS	SEE TITLE SHEET			US 380
DRAWN: DN	STATE DISTRICT	COUNTY	CONTROL No.	SECTION No.	JOB No.	SHEET No.
CHECKED: TS	ABL	STONEWALL	0106	04	036	113

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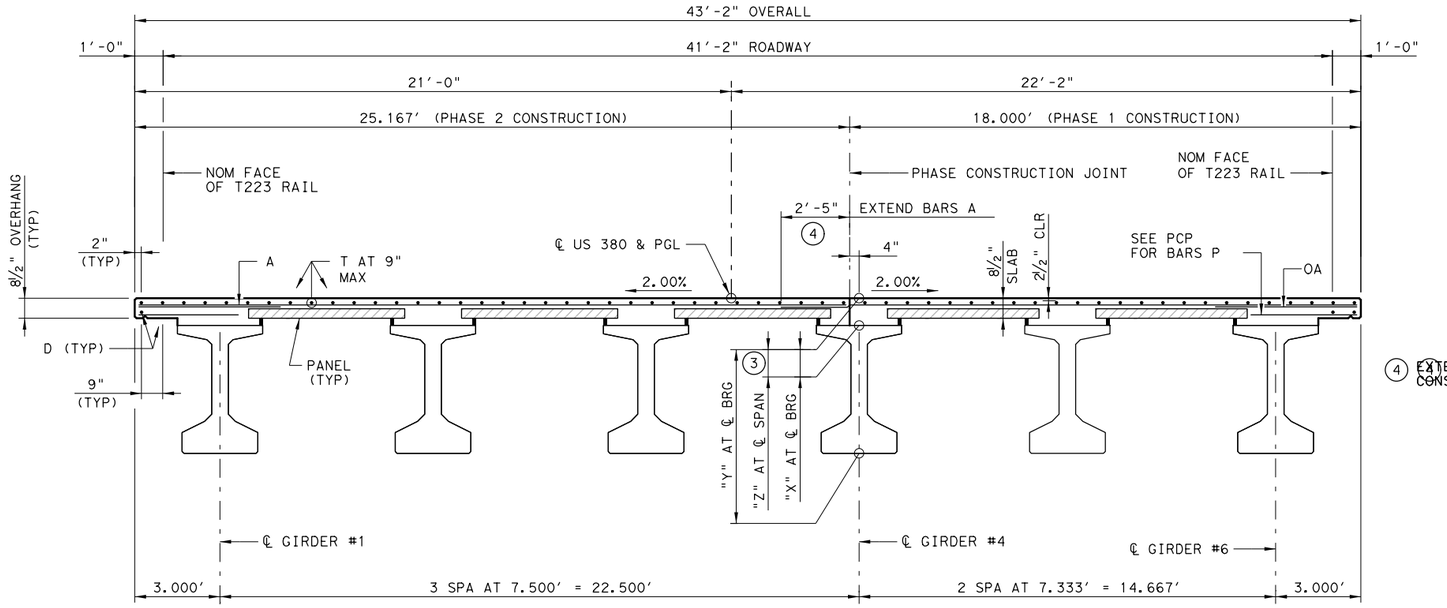


TYPICAL TRANSVERSE SECTION

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

TABLE OF ESTIMATED QUANTITIES			
SPAN	REINFORCED CONCRETE SLAB	PRESTR CONCRETE GIRDER (2) (TX54)	REINF STEEL (1)
NO.	SF	LF	LB
7	4533	627.00	10426
8	4533	627.00	10426
TOTAL	9066	1254.00	20852

(1) REINFORCING STEEL WEIGHT IS CALCULATED USING AN APPROXIMATE FACTOR OF 2.3 LBS/SF.

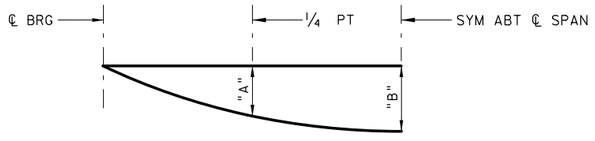
(2) LENGTHS SHOWN ARE BOTTOM GIRDER FLANGE LENGTHS WITH ADJUSTMENTS MADE FOR GIRDER SLOPE.

(4) EXTEND BARS A, G & H ACROSS PHASED CONSTRUCTION JOINT.

NOTES:

1. FOR GENERAL NOTES SEE 210.000' PRESTRESSED CONCRETE I-GIRDER UNIT SHEET 1 OF 2.

TABLE OF DEFLECTIONS			
SPAN NO.	GIRDER NO.	"A" FT	"B" FT
7-8	1	0.071	0.101
	2	0.079	0.112
	3	0.079	0.112
	4	0.042	0.060
	5	0.077	0.110
	6	0.070	0.100

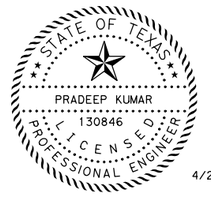


DEAD LOAD DEFLECTION DIAGRAM

DEFLECTIONS SHOWN ARE DUE TO CONCRETE SLAB ONLY. (Ec = 5,000 KSI). CALCULATED DEFLECTIONS SHOWN ARE THEORETICAL AND ACTUAL DEFLECTIONS MAY BE LESS. ADJUST VALUES AS REQUIRED IF OPTIONAL SLAB FORMING IS USED. THESE VALUES MAY REQUIRE FIELD VERICATION.

TABLE OF SECTION DEPTHS				
SPAN NO.	GIRDER NO.	"X" AT ℄ BRG	"Y" AT ℄ BRG	"Z" AT ℄ SPAN (3)
7-8	1	11 ¾"	5'-5 ⅞"	9 ⅞"
	2	11 ¾"	5'-5 ⅞"	10"
	3	11 ¾"	5'-5 ⅞"	10"
	4	11 ¾"	5'-5 ⅞"	9 ½"
	5	11 ¾"	5'-5 ⅞"	10"
	6	11 ¾"	5'-5 ⅞"	9 ⅞"

(3) THEORETICAL DIMENSION



4/28/2022

HL93 LOADING

REV. No.	DATE	REVISION	BY

ATKINS
TBPE REG. # F-474

Texas Department of Transportation
Abilene District

US 380
210.000' PRESTRESSED CONCRETE I-GIRDER UNIT

SALT FORK OF BRAZOS RIVER BRIDGE

SCALE: 3/16" = 1'-0" SHEET 2 OF 2

DESIGNED: TS	FED. RD DIV. No.	STATE	PROJECT No.			HIGHWAY No.
CHECKED: SK	6	TEXAS	SEE TITLE SHEET			US 380
DRAWN: DN	STATE DISTRICT	COUNTY	CONTROL No.	SECTION No.	JOB No.	SHEET No.
CHECKED: TS	ABL	STONEWALL	0106	04	036	114

100% SUBMITTAL

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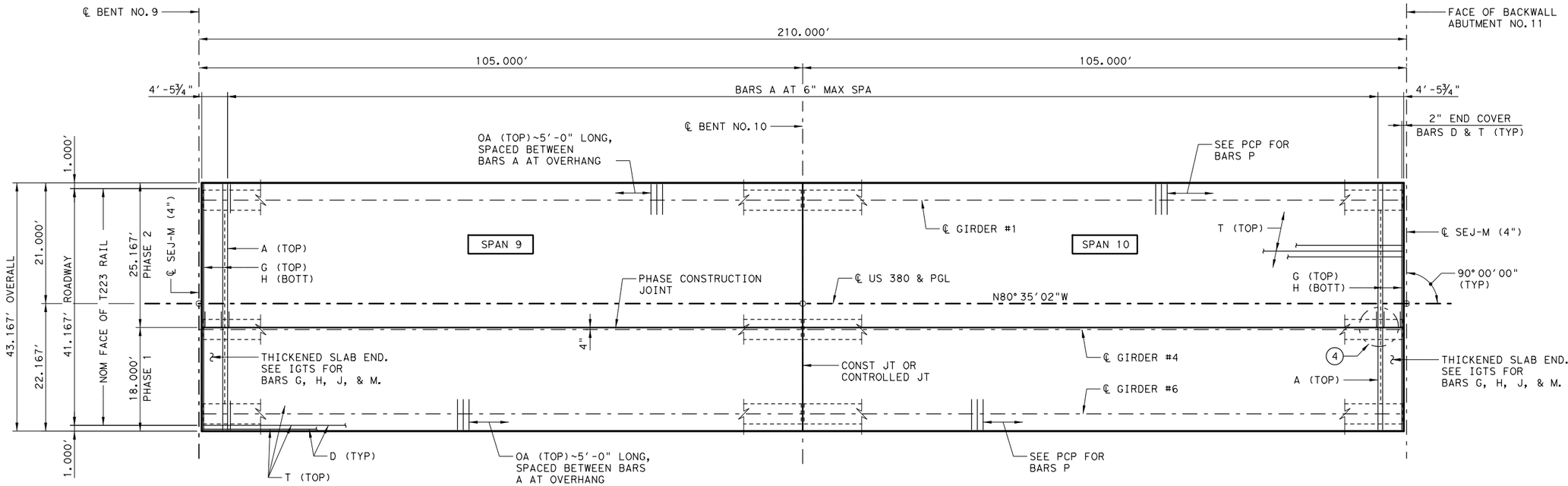

PLAN

GENERAL NOTES:

DESIGNED IN ACCORDANCE WITH AASHTO LRFD BRIDGE DESIGN SPECIFICATIONS, 8TH EDITION (2017), AS MODIFIED BY 2020 TXDOT BDM.

CONCRETE SHALL BE CLASS S (HPC), f′c = 4000 PSI.

PROVIDE GFRP BARS, CONFORMING TO ASTM D7957/7957M, EXCEPT PROVIDE A MINIMUM MODULUS OF ELASTICITY OF 7500 KSI.

PROVIDE GFRP BARS FOR TOP MAT ONLY. ALL OTHER REINFORCING STEEL SHALL BE GRADE 60 (EPOXY COATED).

SEE RAIL STANDARD FOR ANCHORAGE IN SLAB.

SEE GFRP SLAB (IGFRP) STANDARD FOR ADDITIONAL NOTES AND TOP MAT OF SLAB REINFORCEMENT AT THE THICKENED SLAB END.

SEE PCP AND PCP-FAB FOR PANEL DETAILS NOT SHOWN.

SEE PCP(O) AND PCP(O)-FAB FOR PRECAST OVERHANG PANEL DETAILS IF THIS OPTION IS USED.

SEE IGMS STANDARD FOR MISCELLANEOUS DETAILS.

SEE PMDF STANDARD FOR DETAILS AND QUANTITY ADJUSTMENTS IF THIS OPTION IS USED.

BAR LAPS, WHERE REQUIRED SHALL BE AS FOLLOWS:
EPOXY COATED ~ #4 = 2′-5"
GFRP ~ #5 = 2′-9"

(4) EXTEND BARS A, G & H ACROSS PHASED CONSTRUCTION JOINT.

STATE OF TEXAS
PRADEEP KUMAR
130846
LICENSED PROFESSIONAL ENGINEER
4/28/2022

HL93 LOADING

REV. No.	DATE	REVISION	BY

ATKINS
TBPE REG. # F-474

Texas Department of Transportation
Abilene District

US 380
210.000′ PRESTRESSED CONCRETE I-GIRDER UNIT

SALT FORK OF BRAZOS RIVER BRIDGE

SCALE: NONE SHEET 1 OF 2

DESIGNED: TS	FED. RD DIV. No.	STATE	PROJECT No.			HIGHWAY No.
CHECKED: SK	6	TEXAS	SEE TITLE SHEET			US 380
DRAWN: DN	STATE DISTRICT	COUNTY	CONTROL No.	SECTION No.	JOB No.	SHEET No.
CHECKED: TS	ABL	STONEWALL	0106	04	036	115

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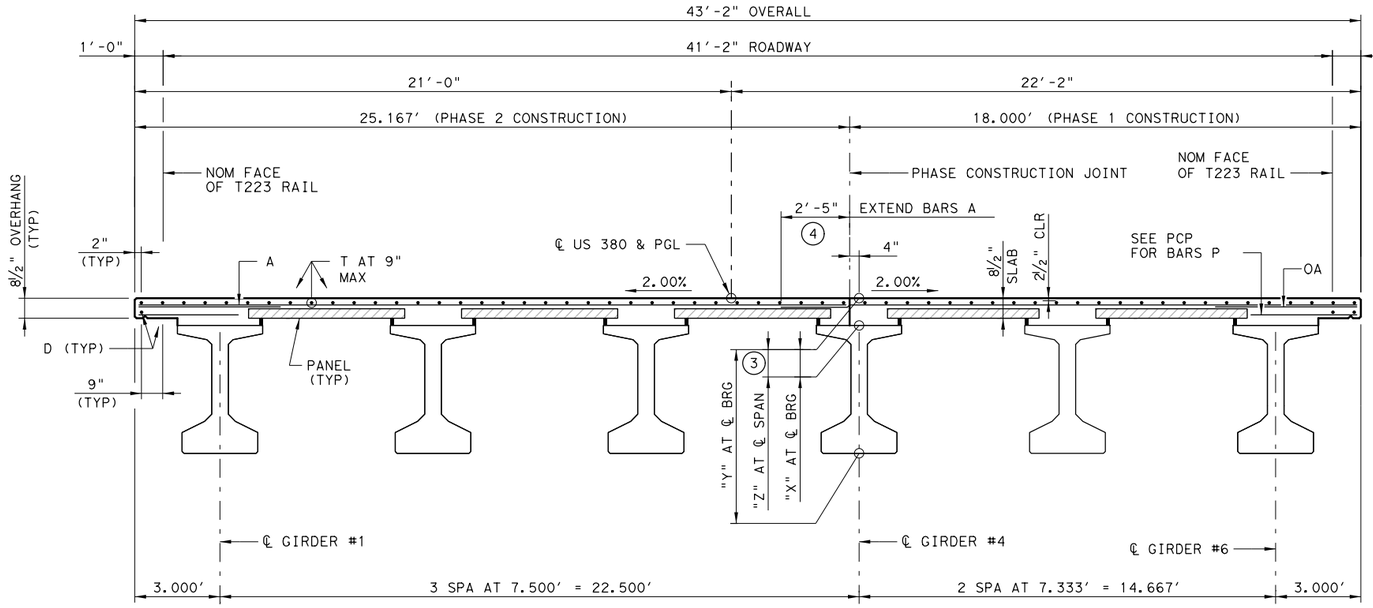


TYPICAL TRANSVERSE SECTION

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

TABLE OF ESTIMATED QUANTITIES			
SPAN	REINFORCED CONCRETE SLAB	PRESTR CONCRETE GIRDER (2) (TX54)	REINF STEEL (1)
NO.	SF	LF	LB
9	4533	627.00	10426
10	4533	627.00	10426
TOTAL	9066	1254.00	20852

(1) REINFORCING STEEL WEIGHT IS CALCULATED USING AN APPROXIMATE FACTOR OF 2.3 LBS/SF.

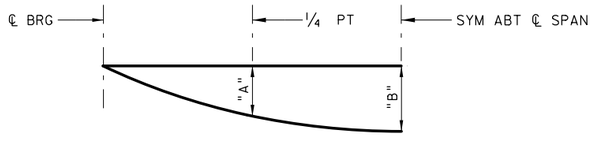
(2) LENGTHS SHOWN ARE BOTTOM GIRDER FLANGE LENGTHS WITH ADJUSTMENTS MADE FOR GIRDER SLOPE.

(4) EXTEND BARS A, G & H ACROSS PHASED CONSTRUCTION JOINT.

NOTES:

1. FOR GENERAL NOTES SEE 210.000' PRESTRESSED CONCRETE I-GIRDER UNIT SHEET 1 OF 2.

TABLE OF DEFLECTIONS			
SPAN NO.	GIRDER NO.	"A" FT	"B" FT
9-10	1	0.071	0.101
	2	0.079	0.112
	3	0.079	0.112
	4	0.042	0.060
	5	0.077	0.110
	6	0.070	0.100

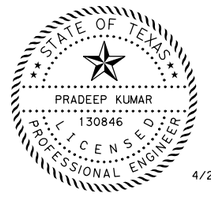


DEAD LOAD DEFLECTION DIAGRAM

DEFLECTIONS SHOWN ARE DUE TO CONCRETE SLAB ONLY. (Ec = 5,000 KSI). CALCULATED DEFLECTIONS SHOWN ARE THEORETICAL AND ACTUAL DEFLECTIONS MAY BE LESS. ADJUST VALUES AS REQUIRED IF OPTIONAL SLAB FORMING IS USED. THESE VALUES MAY REQUIRE FIELD VERICATION.

TABLE OF SECTION DEPTHS				
SPAN NO.	GIRDER NO.	"X" AT ℄ BRG	"Y" AT ℄ BRG	"Z" AT ℄ SPAN (3)
9	1	11 ¾"	5'-5 ⅞"	9 ⅞"
	2	11 ¾"	5'-5 ⅞"	10"
	3	11 ¾"	5'-5 ⅞"	10"
	4	11 ¾"	5'-5 ⅞"	9 ½"
	5	11 ¾"	5'-5 ⅞"	10"
	6	11 ¾"	5'-5 ⅞"	9 ⅞"
10	1	12 ¾"	5'-6 ¾"	10"
	2	12 ¾"	5'-6 ¾"	10 ⅛"
	3	12 ¾"	5'-6 ¾"	10 ⅛"
	4	12 ¾"	5'-6 ¾"	9 ⅝"
	5	12 ¾"	5'-6 ¾"	10"
	6	12 ¾"	5'-6 ¾"	10"

(3) THEORETICAL DIMENSION



4/28/2022

HL93 LOADING

REV. No.	DATE	REVISION	BY

ATKINS TBPE REG. # F-474

Texas Department of Transportation Abilene District

US 380
210.000' PRESTRESSED CONCRETE I-GIRDER UNIT

SALT FORK OF BRAZOS RIVER BRIDGE

SCALE: 3/16" = 1'-0" SHEET 2 OF 2

DESIGNED: TS	FED. RD DIV. No.	STATE	PROJECT No.			HIGHWAY No.
CHECKED: SK	6	TEXAS	SEE TITLE SHEET			US 380
DRAWN: DN	STATE DISTRICT	COUNTY	CONTROL No.	SECTION No.	JOB No.	SHEET No.
CHECKED: TS	ABL	STONEWALL	0106	04	036	116

PLOT DRIVER: TXDOT_PDF_BW.plt
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DATE: 4/28/2022 TIME: 7:16:27 PM

DESIGNED GIRDERS

STRUCTURE	SPAN NO.	GIRDER NO.	GIRDER TYPE	PRESTRESSING STRANDS: NON-STD STRAND PATTERN	PRESTRESSING STRANDS: TOTAL NO.	PRESTRESSING STRANDS: SIZE (in)	PRESTRESSING STRANDS: STRGTH f_{pu} (ksi)	PRESTRESSING STRANDS: "e" ℄ (in)	PRESTRESSING STRANDS: "e" END (in)
US380 - SALT FORK OF BRAZOS RIVER BRIDGE	1-3	ALL	Tx70		48	0.6	270	26.91	17.58
	4-6	ALL	Tx54		40	0.6	270	19.11	12.51
	7-10	ALL	Tx54		34	0.6	270	19.48	11.71

DEPRESSED STRAND PATTERN

NO.	TO END (in)
8	64.5
6	50.5
6	50.5

CONCRETE

RELEASE STRGTH (1) f'_{ci} (ksi)	MINIMUM 28 DAY COMP STRGTH f'_c (ksi)
6.000	7.500
5.500	7.500
5.000	6.000

OPTIONAL DESIGN

DESIGN LOAD COMP STRESS (TOP ℄) (SERVICE I) fct(ksi)	DESIGN LOAD TENSILE STRESS (BOTT ℄) (SERVICE III) fcb(ksi)	REQUIRED MINIMUM ULTIMATE MOMENT CAPACITY (STRENGTH I) (kip-ft)	LIVE LOAD DISTRIBUTION FACTOR (2) Moment	LIVE LOAD DISTRIBUTION FACTOR (2) Shear
4.365	-4.352	12171	0.602	0.812
4.239	-4.069	7812	0.595	0.779
3.254	-3.185	6280	0.617	0.779

NON-STANDARD STRAND PATTERNS

PATTERN	STRAND ARRANGEMENT AT ℄ OF GIRDER

(1) Based on the following allowable stresses (ksi):

Compression = 0.65 f'_{ci}

Tension = $0.24\sqrt{f'_{ci}}$

Optional designs must likewise conform.

(2) Portion of full HL93.

DESIGN NOTES:

Designed according to AASHTO LRFD Bridge Design Specifications.

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.

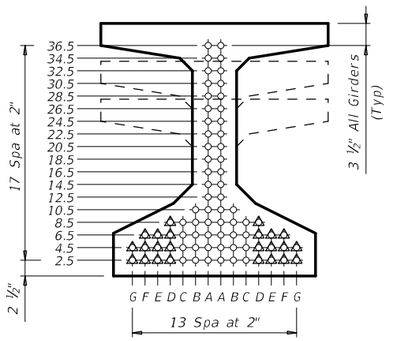
Strand debonding must comply with Item 424.4.2.2.2.4. Full-length debonded strands are only permitted in positions marked △. Double wrap full-length debonded strands in outer most position of each row.

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.

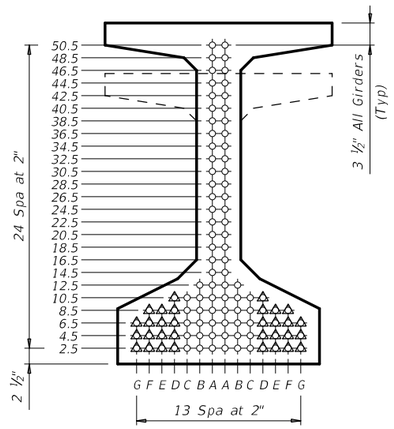
Seal cracks in girder ends exceeding 0.005" in width as directed by the Engineer. The fabricator is permitted to decrease the spacing of Bars R and S by providing additional bars to help limit crack width provided the decreased spacing results in no less than 1" clear between bars. The fabricator must 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.



TYPE Tx28, Tx34 & Tx40



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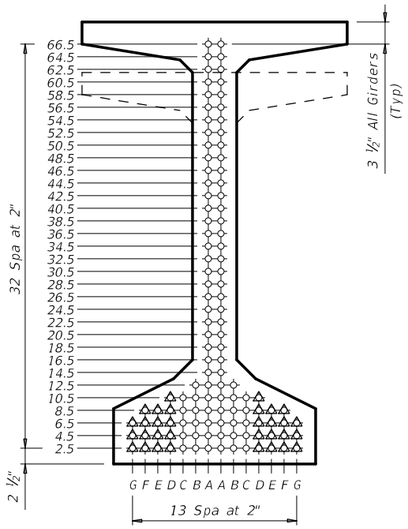

TYPE Tx62 & Tx70

4/28/2022

HL93 LOADING

REV. No.	DATE	REVISION	BY

ATKINS
TBPE REG. # F-474

Texas Department of Transportation
Abilene District

US 380
PRESTRESSED CONCRETE I-GIRDER DESIGNS
(NON-STANDARD SPANS)
IGND
SALT FORK OF BRAZOS RIVER BRIDGE

DESIGNED: TS	FED. RD DIV. No.	STATE	PROJECT No.			HIGHWAY No.
CHECKED: SK	6	TEXAS	SEE TITLE SHEET			US 380
DRAWN: DN	STATE DISTRICT	COUNTY	CONTROL No.	SECTION No.	JOB No.	SHEET No.
CHECKED: TS	ABL	STONEWALL	0106	04	036	117

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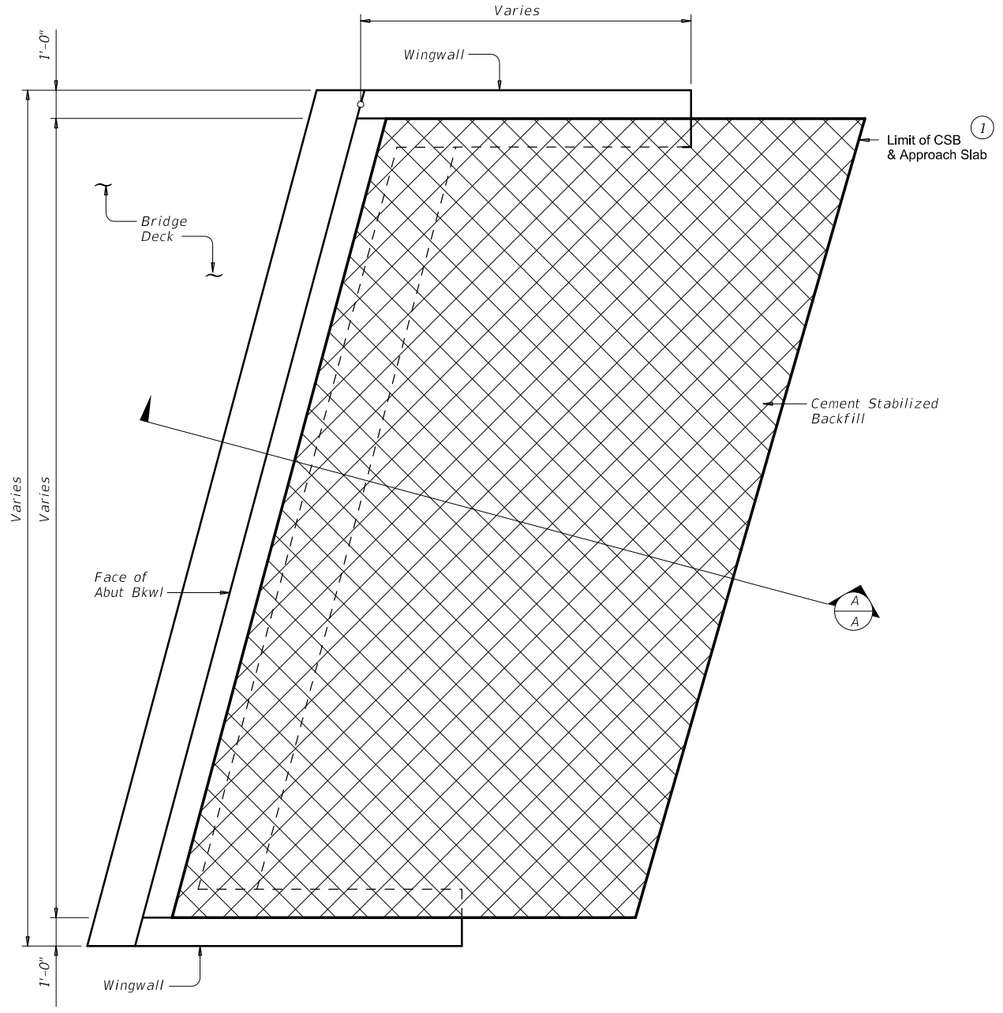
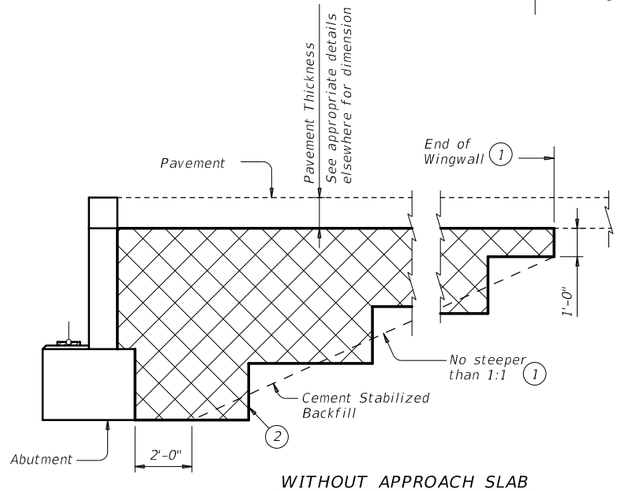
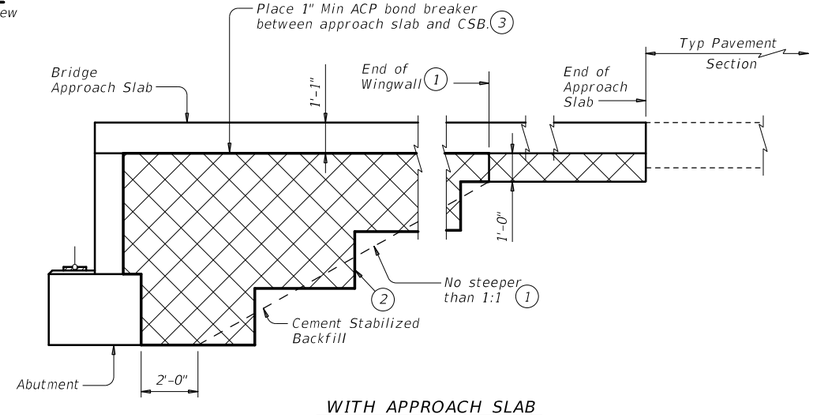


PLAN
Showing Skew



WITHOUT APPROACH SLAB



WITH APPROACH SLAB

SECTION A-A

1. Usual limit of Cement Stabilized Backfill is at end of wingwall. However, extend limits to the end of the Approach Slab.
2. Bench backfill as shown with 12" (approximate) bench depths.
3. Other materials can be used as a bond breaker if permitted by the Engineer. 2 layers of 30 Lb roofing felt or 2 layers of heavy mil polyethylene sheeting are examples.

GENERAL NOTES:

Provide Cement Stabilized Backfill meeting the requirements of Item 400, "Excavation and Backfill for Structures", 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 MSE or Concrete Block retaining walls are used in lieu of wingwalls.

MODIFICATION:

Modifications are extending cement stabilized abutment backfill to the end of the approach slab and note 1.

STATE OF TEXAS
PRADEEP KUMAR
130846
LICENSED
PROFESSIONAL ENGINEER
4/28/2022

Texas Department of Transportation

Bridge Division Standard

CEMENT STABILIZED ABUTMENT BACKFILL
BRIDGE ABUTMENT

CSAB (MOD)

FILE: csabstle1.dgn	DN: TxDOT	CK: TxDOT	DW: TxDOT	CK: TxDOT
©TxDOT January 2015	CONT	SECT	JOB	HIGHWAY
REVISIONS	0106	04	036	US 380
	DIST	COUNTY		SHEET NO.
	ABL	STONEWALL		118

DATE: 4/28/2022 7:16:32 PM
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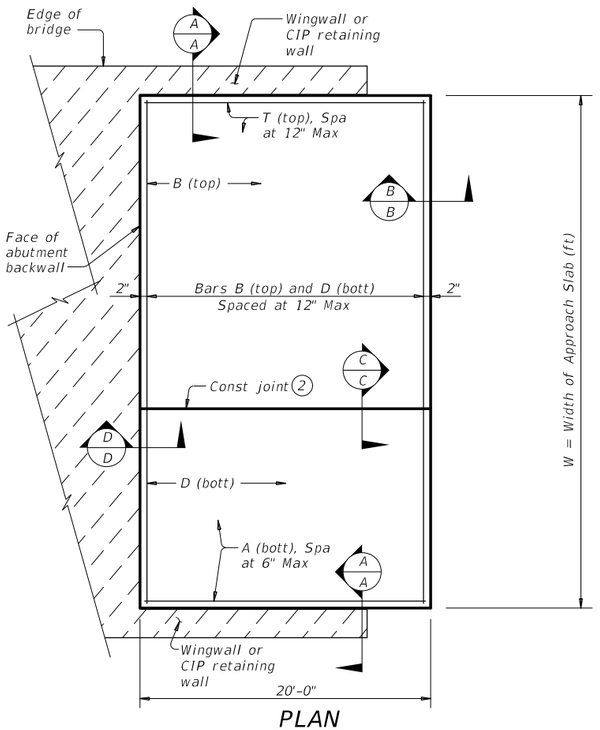
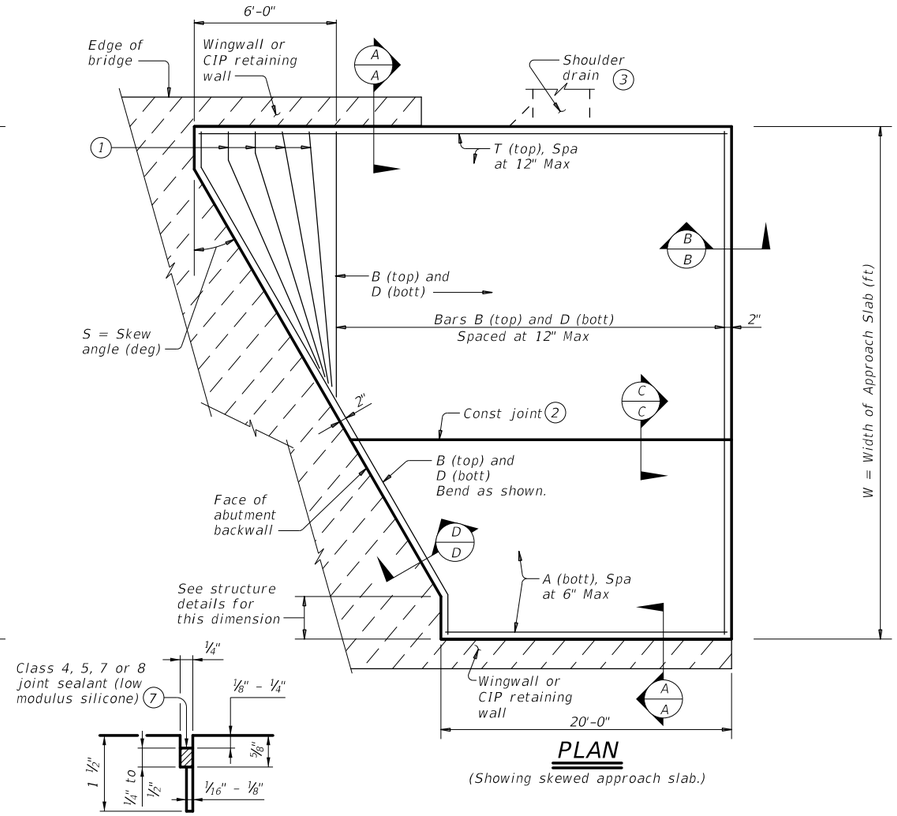


PLAN

(Showing non-skewed approach slab.)



PLAN

(Showing skewed approach slab.)

BAR TABLE

BAR	SIZE
A	#8
B	#5
D	#5
T	#5

APPROXIMATE QUANTITIES (4)

Reinf steel weight = 8.5 Lbs/SF of Approach Slab

Volume of Appr Slab Conc (CY) = $0.802W + 0.02W^2 \tan S$

W = Width of Approach Slab (ft)

S = Skew Angle (deg)

(1) Flare Bars B and D in this region (1'-6" Max Spa, 3" Min Spa). Minimum flared bar length = 2'-6". Bend bars as necessary.

(2) Provide longitudinal construction joints that align with longitudinal construction joints in the bridge slab with bridges built in stages. Other longitudinal construction joints must receive approval of the Engineer.

(3) See details elsewhere in plans for shoulder drain location and details.

(4) For Contractor's information only. Quantities shown are for one approach slab.

(5) Multiple piece tie bars are acceptable at longitudinal construction joints provided minimum laps shown are achieved.

(6) See details elsewhere in plans for required cross-slope.

(7) Place in accordance with Item 438.

(8) Provide backer rod that is 25% larger than joint opening and compatible with the sealant.

(9) If bridge rail is present at the wingwall or CIP retaining wall, place ½" rebonded recycled tire rubber between concrete railing and top of approach slab as shown when concrete railing projects over the approach slab.

GENERAL NOTES:

Construct approach slab in accordance with Item 422.

Provide Class "S" concrete with a minimum compressive strength of 4,000 psi.

Provide Grade 60 reinforcing steel.

Provide longitudinal joints as shown on the Longitudinal Saw Cut Joint Detail at lane lines and shoulders when width between longitudinal construction joints or edges of approach slab exceeds 16 feet. Saw cut joints within 24 hours of concrete placement to a depth of 1 ½" and seal in accordance with Item 438. Alternately, provide a controlled joint consisting of 1 ½" vinyl or plastic joint former (Stress Cap, Zip Strip, Stress Lock, or equal as approved by the Engineer.)

Provide rebonded recycled tire rubber joint filler that meets the requirements of DMS-6310, "Joint Sealants and Fillers."

Construct the subgrade or subbase away from the bridge for a minimum distance of 100 feet prior to the approach slab, unless otherwise indicated on the plans.

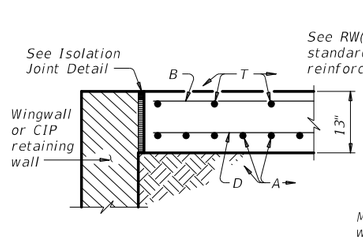
Compact and finish the subgrade or foundation for the approach slab to the typical cross-section and to the lines and grades shown on the plans.

Cure for 4 days using water or membrane curing per Item 422.

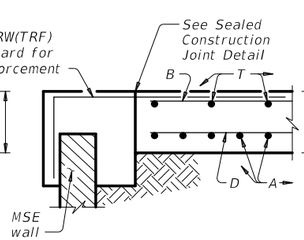
All details shown herein are subsidiary to bridge approach slab.

Cover dimensions are clear dimensions, unless noted otherwise.

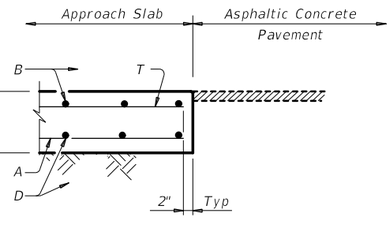
LONGITUDINAL SAW CUT JOINT DETAIL

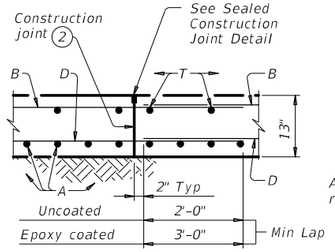


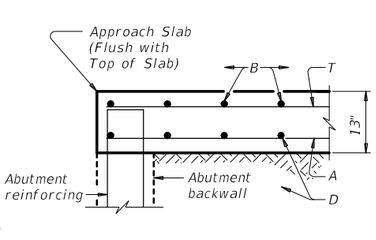
SHOWING WINGWALL OR CIP RETAINING WALL



SHOWING MSE WALL





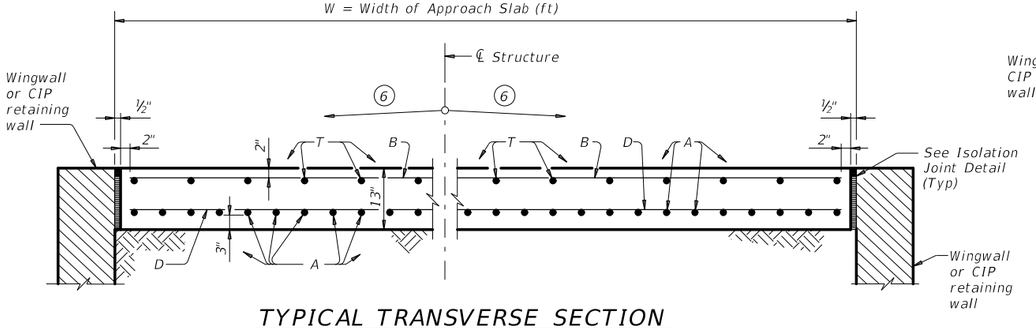


SECTION A-A

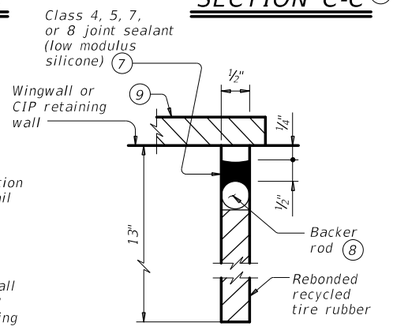
SECTION B-B

SECTION C-C (5)

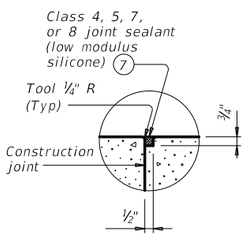
SECTION D-D



TYPICAL TRANSVERSE SECTION



ISOLATION JOINT DETAIL



SEALED CONSTRUCTION JOINT DETAIL

Texas Department of Transportation

Bridge Division Standard

BRIDGE APPROACH SLAB

ASPHALTIC CONCRETE PAVEMENT

BAS-A

FILE: basaste1-20.dgn	DN: TxDOT	CK: TxDOT	DW: TxDOT	CK: TxDOT
©TxDOT April 2019	CONT	SECT	JOB	HIGHWAY
REVISIONS	0106	04	036	US 380
02-20: Removed stress relieving pad.	DIST	COUNTY		SHEET NO.
	ABL	STONEWALL		119

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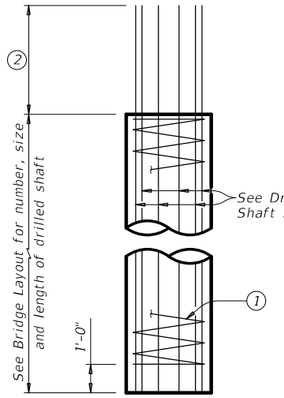
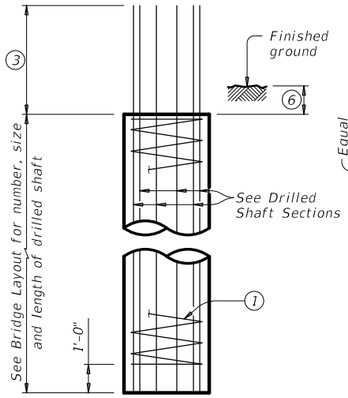
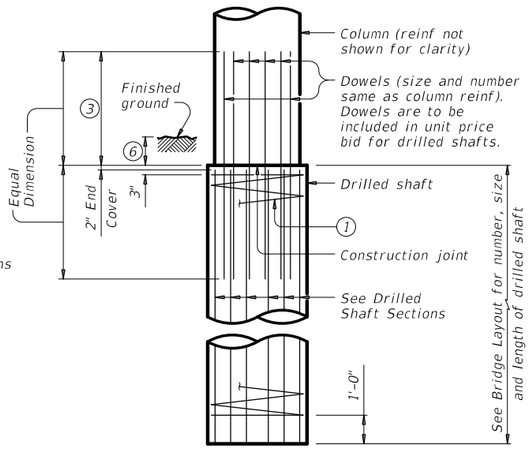


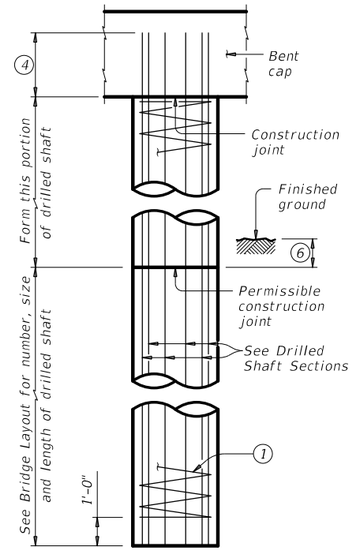
ABUTMENTS, WINGWALLS AND MULTI-DRILLED SHAFT FOOTINGS



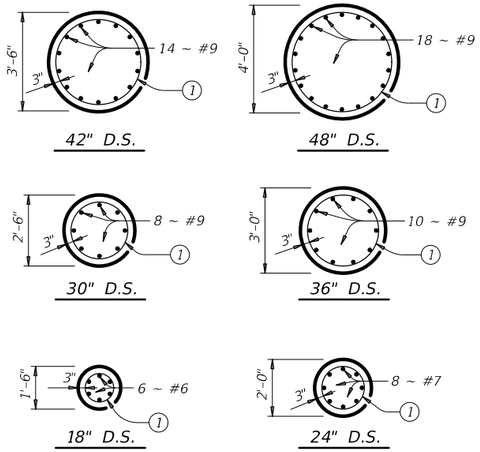
INTERIOR BENTS DRILLED SHAFT DIA EQUAL TO COLUMN DIA



INTERIOR BENTS DRILLED SHAFT DIA GREATER THAN COLUMN DIA



OPTIONAL INTERIOR BENT DRILLED SHAFT DETAIL (5)

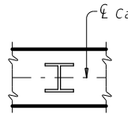


DRILLED SHAFT SECTIONS

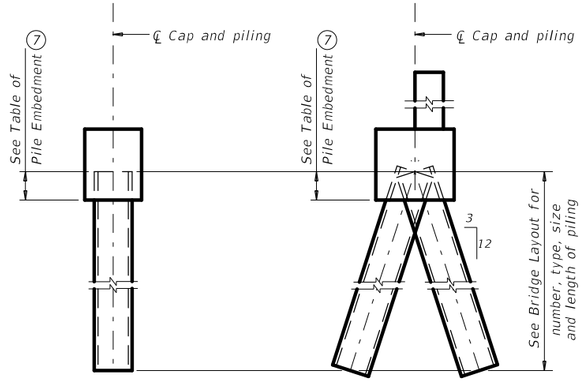
DRILLED SHAFT DETAILS

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"

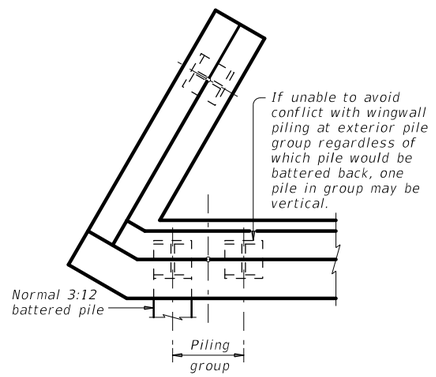
See Prestressed Concrete Piling (CP) standard for additional details on concrete pile embedment.



ORIENTATION OF STEEL H-PILING



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"

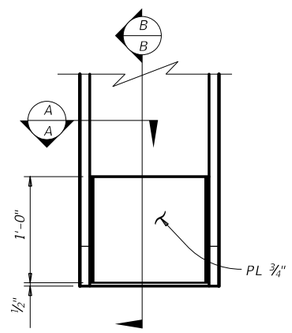
(3) Min lap with column reinf:
#7 Bars = 2'-11"
#9 Bars = 3'-9"
#11 Bars = 4'-8"

(4) Min extension into supported element:
#6 Bars = 1'-11"
#7 Bars = 2'-3"
#9 Bars = 2'-9"

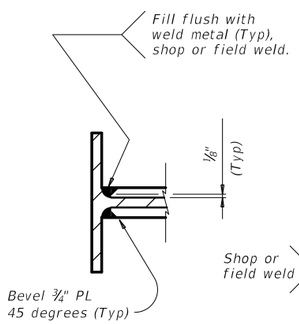
(5) Drilled shafts may extend to the bottom of bent caps for "H" heights of 6 ft and less (as shown on the Bridge Layout), if approved. This option can only be used when the drilled shaft diameter equals the column diameter. Obtain approval of the forming method above the ground line prior to construction. No adjustments in payment will be made if this option is used.

(6) 1'-0" Min, unless shown otherwise on plans.

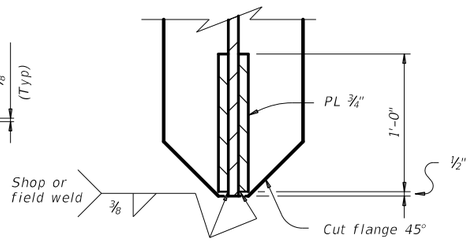
(7) Or as shown on plans.



ELEVATION

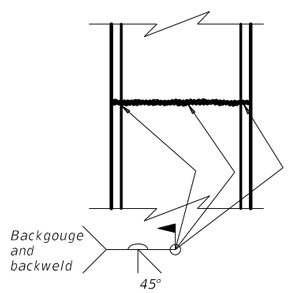


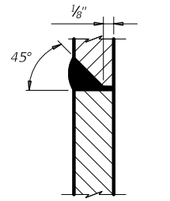
SECTION A-A



SECTION B-B

STEEL H-PILE TIP REINFORCEMENT
See Item 407 "Steel Piling" to determine when tip reinforcement is required and for options to the details shown.





SECTION THRU FLANGE OR WEB

STEEL H-PILE SPLICE DETAIL
Use when required.

SHEET 1 OF 2

Texas Department of Transportation

Bridge Division Standard

COMMON FOUNDATION DETAILS

FD

FILE: fdstde01-20.dgn	DN: TxDOT	CK: TxDOT	DW: TxDOT	CK: TxDOT
©TxDOT April 2019	CONT	SECT	JOB	HIGHWAY
REVISIONS	0106	04	036	US 380
01-20: Added #11 bars to the FD bars.	DIST	COUNTY		SHEET NO.
	ABL	STONEWALL		120

DATE: 4/28/2022 7:16:49 PM
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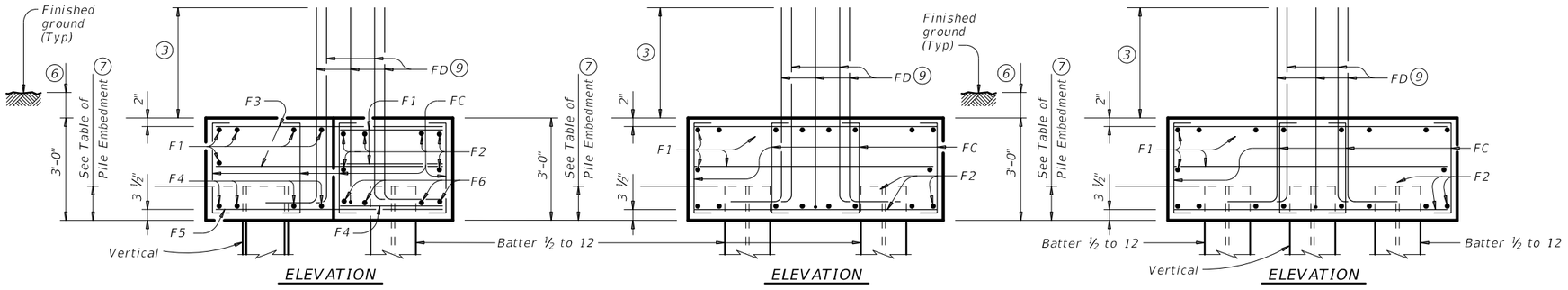
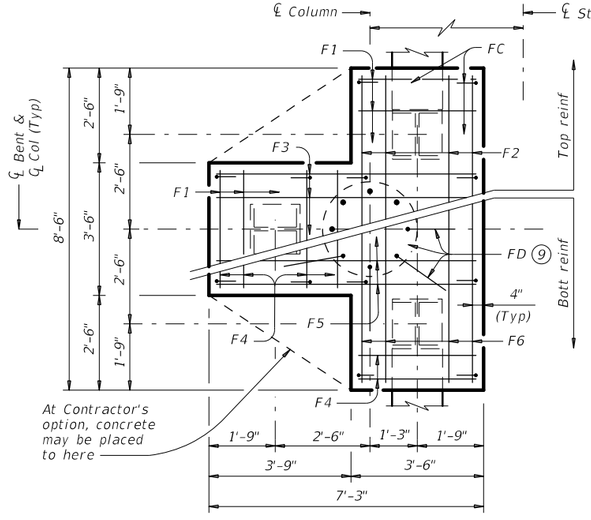


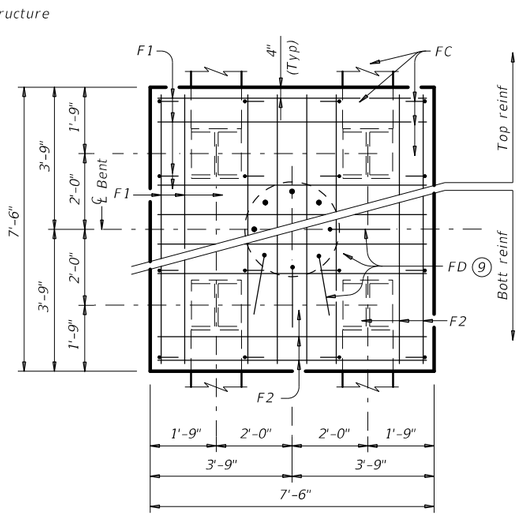
ELEVATION ELEVATION ELEVATION



PLAN

THREE PILE FOOTING (8)

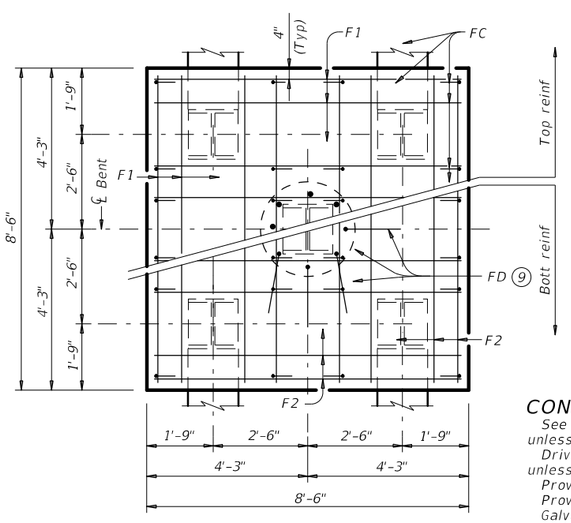
For 36" Dia and smaller columns.



PLAN

FOUR PILE FOOTING (8)

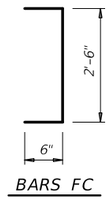
For 42" Dia and smaller columns.



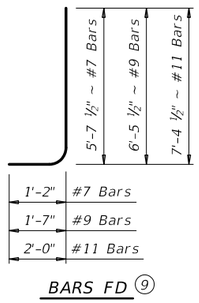
PLAN

FIVE PILE FOOTING (8)

For 42" Dia and smaller columns.



BARS FC



BARS FD (9)

(3) Min lap with column reinforcing:
#7 Bars = 2'-11"
#9 Bars = 3'-9"
#11 Bars = 4'-8"

(6) 1'-0" Min, unless shown otherwise on plans.

(7) Or as shown on plans.

(8) See Bridge Layout for type, size and length of piling.

(9) Number and size of FD bars must match column reinforcing. Tie FD bars to the top of the bottom reinforcing mat.

(10) Adjust FD quantity, size and weight as needed to match column reinforcing.

TABLE OF FOOTING QUANTITIES FOR 30" COLUMNS

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

ONE 4 PILE FOOTING				
Bar	No.	Size	Length	Weight
F1	20	#4	7'- 2"	96
F2	16	#8	7'- 2"	306
FC	16	#4	3'- 6"	37
FD (10)	8	#9	8'- 1"	220
Reinforcing Steel			Lb	659
Class "C" Concrete			CY	6.3

ONE 5 PILE FOOTING				
Bar	No.	Size	Length	Weight
F1	20	#4	8'- 2"	109
F2	16	#9	8'- 2"	444
FC	24	#4	3'- 6"	56
FD (10)	8	#9	8'- 1"	220
Reinforcing Steel			Lb	829
Class "C" Concrete			CY	8.0

CONSTRUCTION NOTES:

See Bridge Layout for foundation type required. Use these foundation details unless shown otherwise.

Drive piling under abutment wingwalls to a minimum resistance of 10 Tons/Pile unless shown otherwise.

Provide Class C Concrete (f'c = 3,600 psi), unless shown otherwise.

Provide Grade 60 reinforcing steel.

Galvanize reinforcing if shown elsewhere in the plans.

Provide bar laps for drilled shaft reinforcing, where required, as follows:

Uncoated or galvanized (#6) ~ 2'-6"
Uncoated or galvanized (#7) ~ 2'-11"
Uncoated or galvanized (#9) ~ 3'-9"

GENERAL NOTES:

Designed according to AASHTO LRFD Bridge Design Specifications.

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

DESIGNER NOTES:

Do not use the drilled shaft details shown on this standard for retaining wall, noise wall, barrier, or sign foundations without structural evaluation.

Do not use the footings shown on this standard in direct contact with salt water or exposed to salt water spray.

Maximum allowable pile loads for the footings shown are:

72 Tons/Pile with 24" Dia Columns
80 Tons/Pile with 30" Dia Columns
100 Tons/Pile with 36" Dia Columns
120 Tons/Pile with 42" Dia Columns

Texas Department of Transportation

Bridge Division Standard

COMMON FOUNDATION DETAILS

FD

FILE: fdstde01-20.dgn	DN: TxDOT	CK: TxDOT	DW: TxDOT	CK: TxDOT
©TxDOT April 2019	CONT	SECT	JOB	HIGHWAY
REVISIONS 01-20: Added #11 bars to the FD bars.	0106	04	036	US 380
	DIST	COUNTY		SHEET NO.
	ABL	STONEWALL		121

DATE: 4/28/2022 7:16:53 PM
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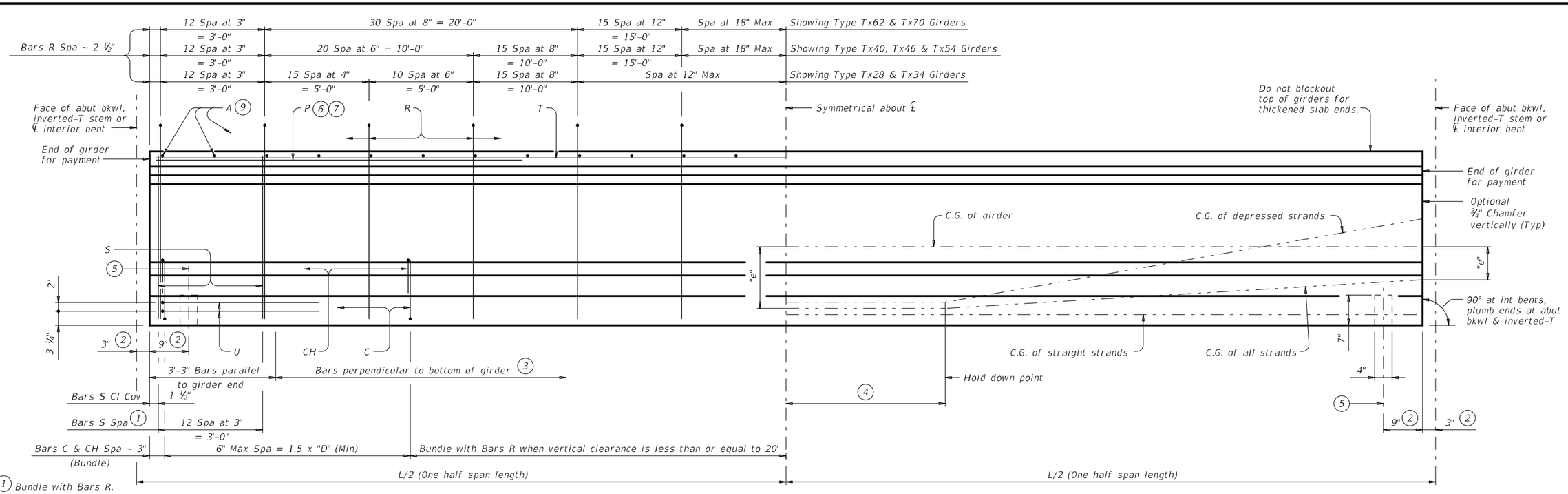


(1) Bundle with Bars R.

(2) Measured along ℄ 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').

(5) ℄ 4" x 1 ½" 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 ¾" x 1 ⅝") at base. If holes are formed with sheet metal, forms may be left in place.

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.

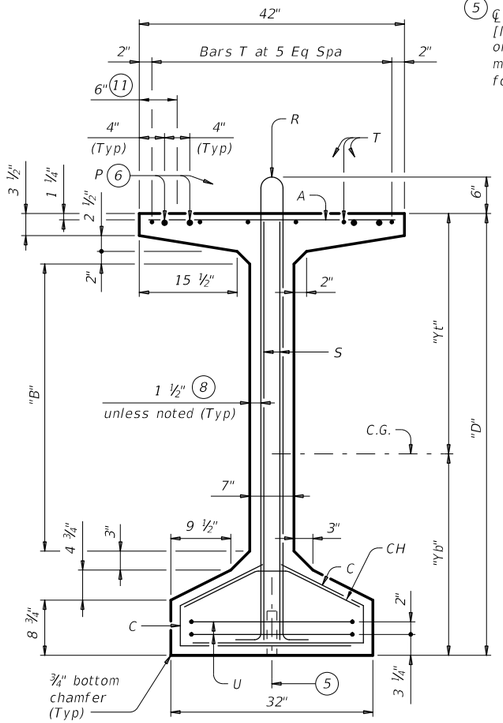
(7) Bars P (#6 x 15'-0") are only required in Tx28, Tx34, Tx40, Tx46, and Tx54 girders when "e" at girder ends exceeds 0.25 x "D". At the fabricator's option bars larger than #6 may be used. When L is less than 50 ft, Bars P are to be the same length as Bars T.

(8) 1 ⅜" Clear Cover to Bars S.

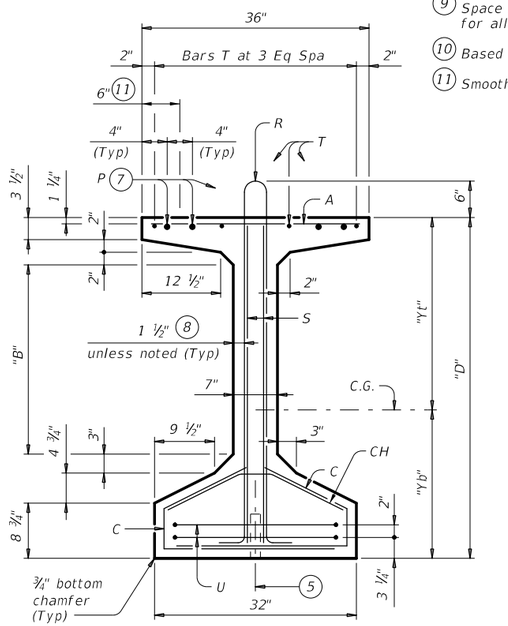
(9) Space Bars A at 6" Max for girders requiring overhang bracket hangers. Space at 12" Max for all other girders. Tie to Bars R as necessary. See standard IGMS for "Deck Forming Notes".

(10) Based on 155 pcf total weight of concrete and reinforcing steel.

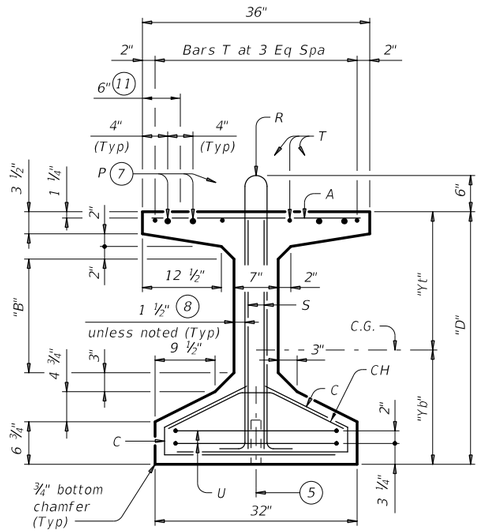
(11) Smooth trowel finish on the slab overhang side of exterior girder.



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 (10) (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 ½"	33.72	28.28	910	463,072	57,351	980
Tx70	70	45 ½"	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

Texas Department of Transportation

Bridge Division Standard

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	0106	04	036	US 380
10-19: Added Bars C and CH full length for VC<= 20'	DIST	COUNTY		SHEET NO.
	ABL	STONEWALL		122

DATE: 4/28/2022 7:16:58 PM
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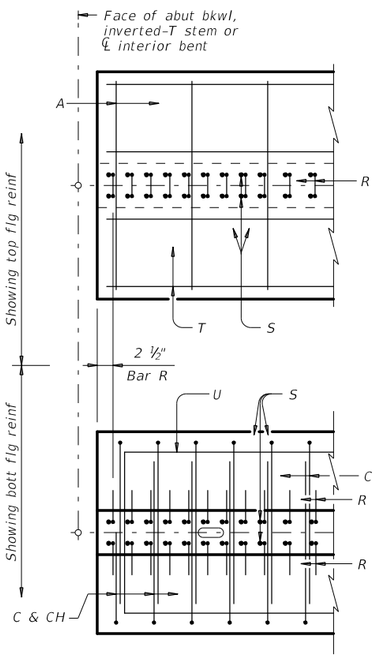
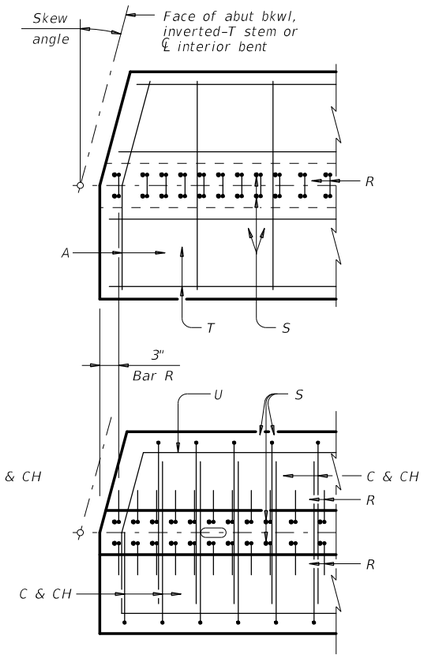
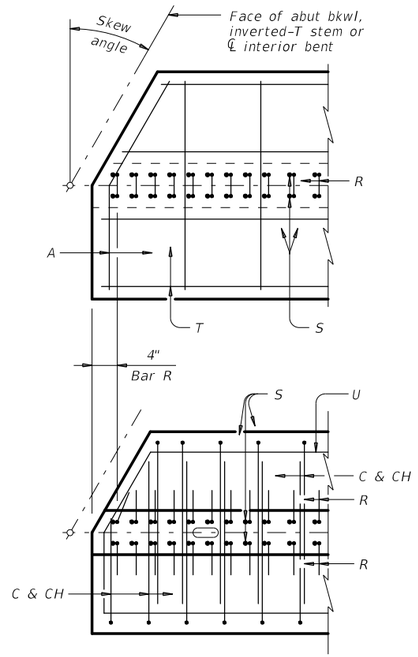
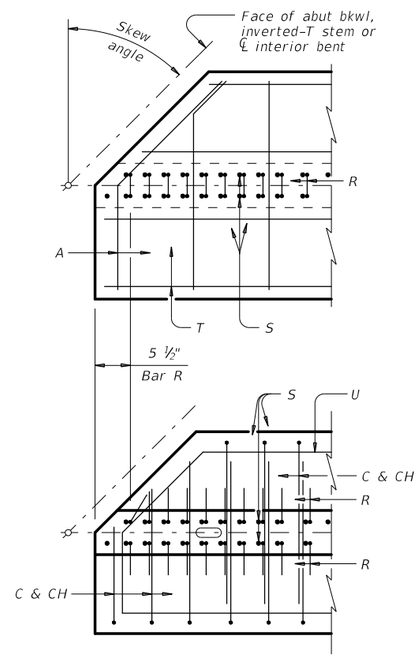
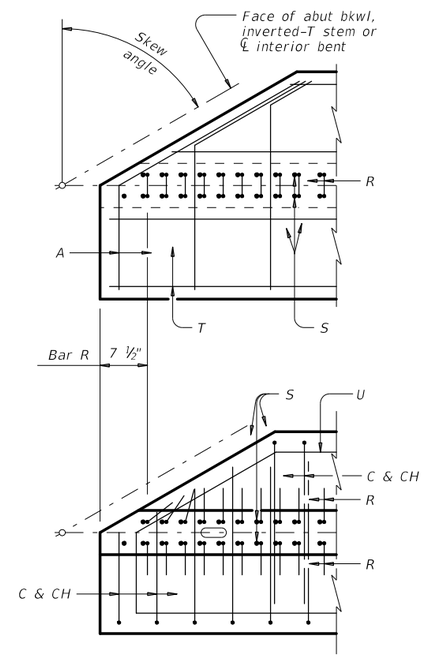




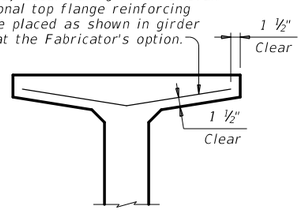




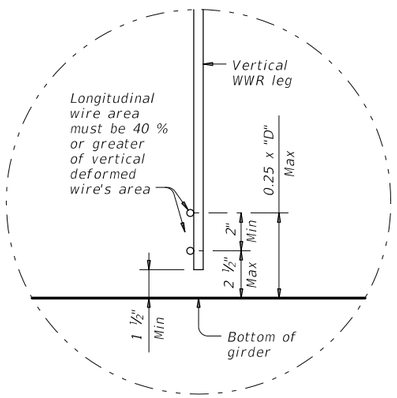


PLAN OF GIRDER ENDS (12)

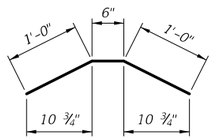
To control top flange cracking that may occur during form removal, additional top flange reinforcing may be placed as shown in girder ends at the Fabricator's option.



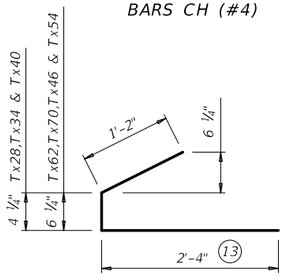
OPTIONAL TOP FLANGE REINFORCING DETAIL



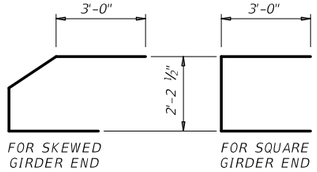
OPTIONAL WELDED WIRE REINFORCEMENT (WWR) DETAIL



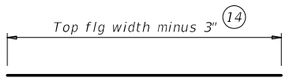
BARS CH (#4)



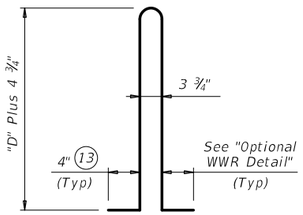
BARS C (#4)



BARS U (#5)

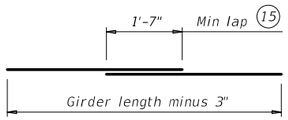


BARS A (#3)



BARS R (#4) (16)

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.

HL93 LOADING SHEET 2 OF 2

Texas Department of Transportation

Bridge Division Standard

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 10-19: Added Bars C and CH full length for VC<= 20'	0106	04	036	US 380
	DIST	COUNTY		SHEET NO.
	ABL	STONEWALL		123

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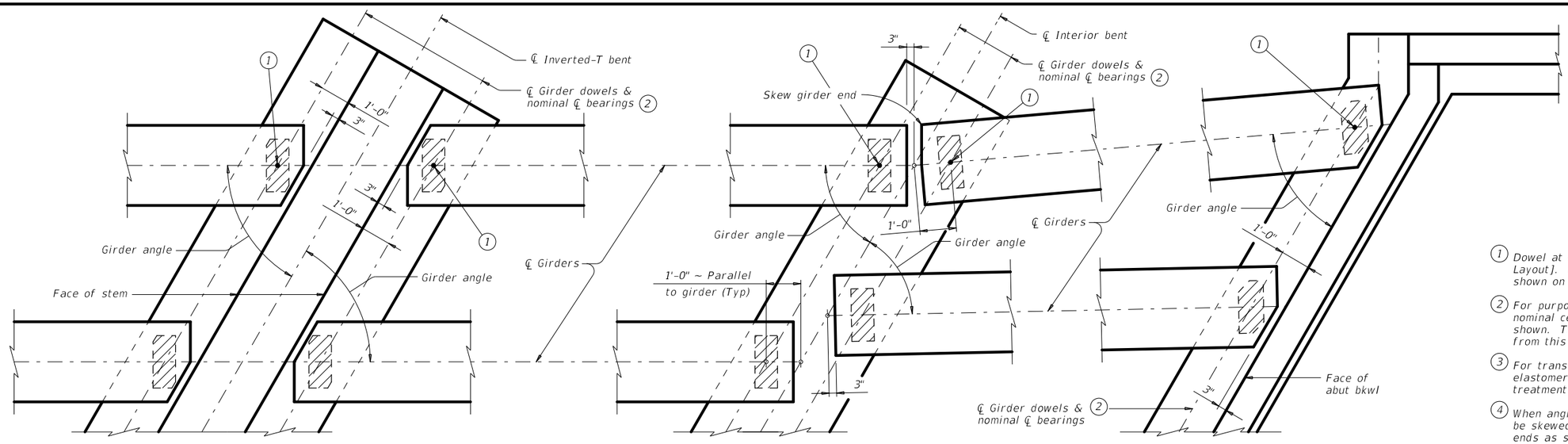


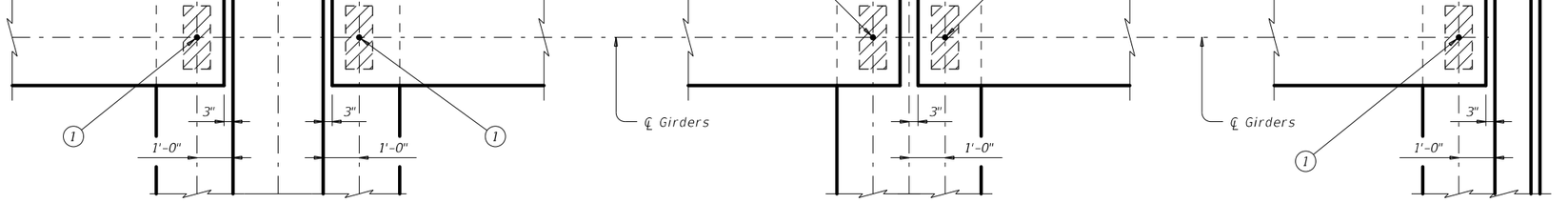
(1) Dowel at doweled girder end [labeled (D) on Bridge Layout]. Required for outside girder only or as shown on substructure details.

(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.

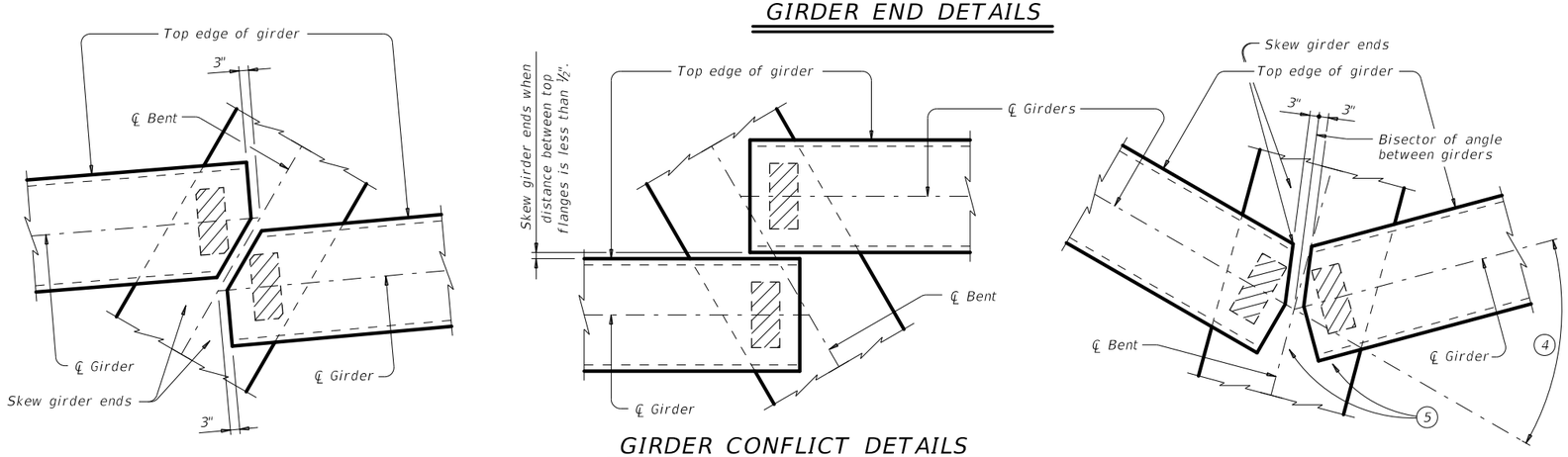
(3) For transition bents with backwall, girder and elastomeric bearings must receive the same treatment as shown for abutments.

(4) When angle exceeds 0°, one or both girders 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.



GIRDER END DETAILS



GIRDER CONFLICT DETAILS

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".

HL93 LOADING SHEET 1 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
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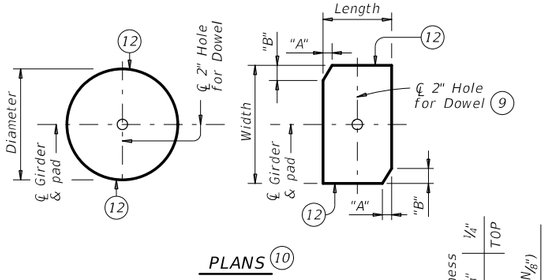
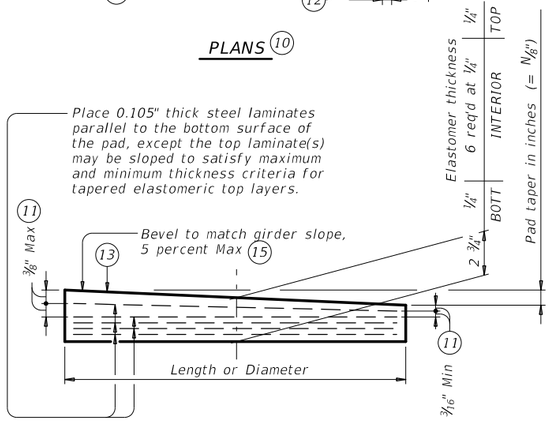


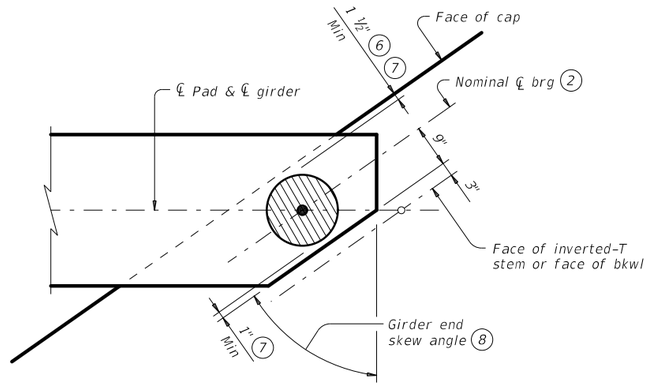
PLANS (10)



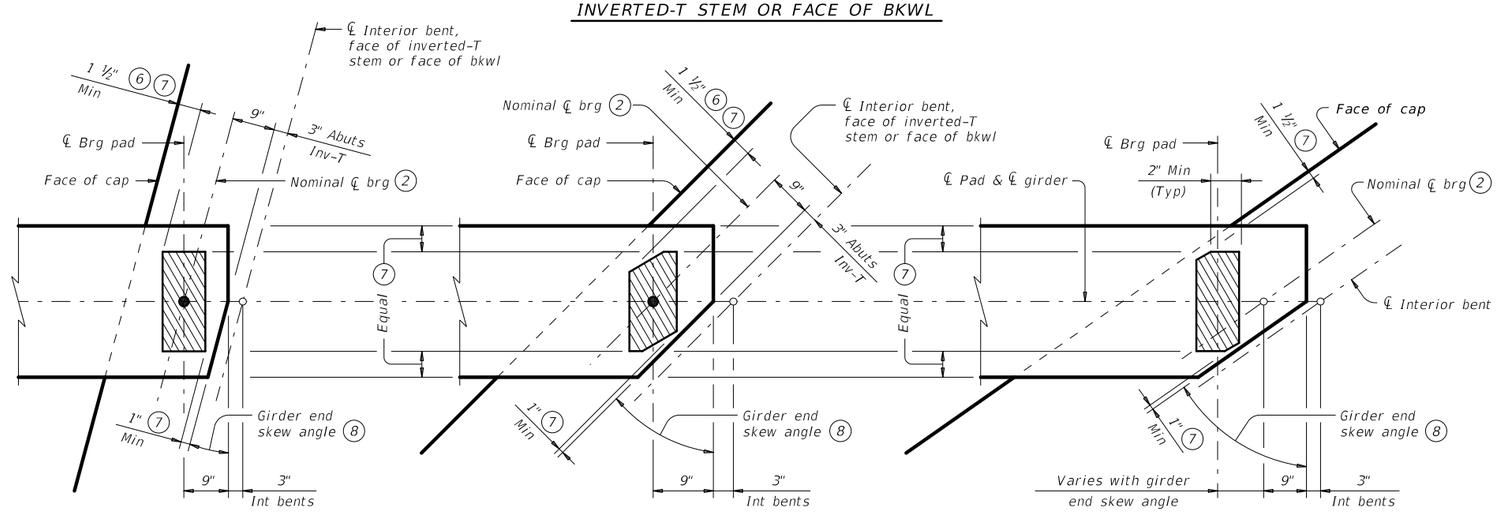
ELEVATION

LAMINATED ELASTOMERIC BEARING PAD

(50 DUROMETER)



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



SKEWED GIRDER ENDS AT INT BENTS, FACE OF INVERTED-T STEM OR FACE OF BKWL

SKEWED GIRDER ENDS AT CONVENTIONAL INTERIOR BENTS (16)

(NO GIRDER DOWELS)

BEARING PAD PLACEMENT DIAGRAMS

TABLE OF MINIMUM SUBSTRUCTURE DIMENSIONS (14)

Girder Type	Abutments: Face of Bkwl to Face of Cap	Int Bents: Overall Cap Width	Inv-T Bents: Corbel Width
Tx28 thru Tx54	1'-9"	3'-6"	1'-10 ½"
Tx62 & Tx70	2'-0"	4'-0"	2'-1 ½"

TABLE OF BEARING PAD DIMENSIONS

Bent Type	Girder Type	Bearing Type (13)	Girder End Skew Angle Range	Pad Size Lgth x Wdth	Pad Clip Dimensions "A"	Pad Clip Dimensions "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 ½"	2 ½"
		G-3-"N"	30°+ thru 45°	9" x 21"	4 ½"	4 ½"
		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 ½"	2 ½"
		G-7-"N"	30°+ thru 45°	10" x 21"	4 ½"	4 ½"
		G-8-"N"	45°+ thru 60°	10" x 21"	7 ¼"	4 ¼"
CONVENTIONAL INTERIOR BENTS	Tx28,Tx34, Tx40,Tx46 & Tx54	---	---	---	---	---
		---	---	---	---	---
		G-1-"N"	0° thru 60°	8" x 21"	---	---
	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 ½"	2 ½"
		G-9-"N"	30°+ thru 45°	8" x 21"	3"	3"
		G-10-"N"	45°+ thru 60°	9" x 21"	6"	3 ½"
	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 ½"	1 ½"
		G-12-"N"	45°+ thru 60°	9" x 21"	3"	1 ¾"

(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 ⅛" increments) in this mark.
Examples: N=0, (for 0" taper)
N=1, (for ⅛" taper)
N=2, (for ¼" taper)
(etc.)
Fabricated pad top surface slope must not vary from plan girder slope by more than $\left(\frac{0.0625"}{\text{Length or Dia}}\right)$ IN/IN.

(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.

HL93 LOADING SHEET 2 OF 3

Texas Department of Transportation | Bridge Division Standard

ELASTOMERIC BEARING AND GIRDER END DETAILS

PRESTR CONCRETE I-GIRDERS

IGEB

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©TxDOT August 2017 REVISIONS	CONT	SECT	JOB	HIGHWAY
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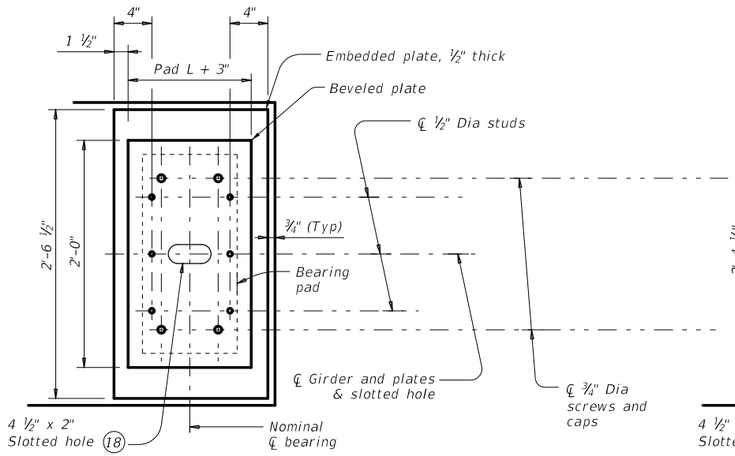
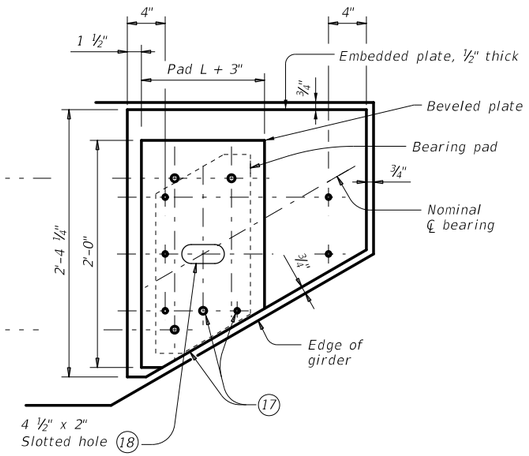
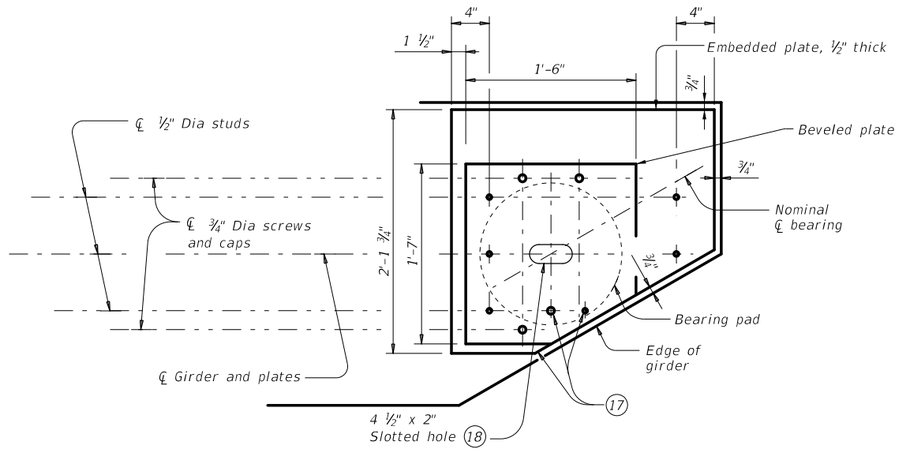


NORMAL GIRDER END
RECTANGULAR BEARING PAD

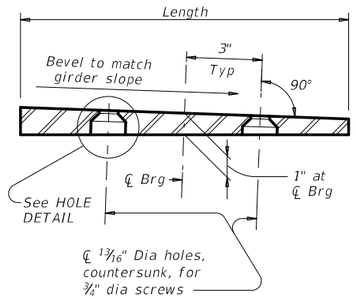


SKEWED GIRDER END
CLIPPED RECTANGULAR BEARING PAD

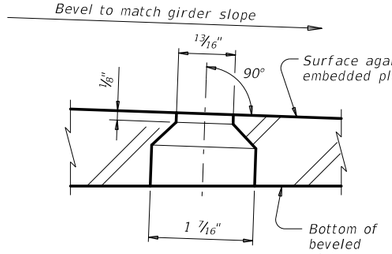


SKEWED GIRDER END
15" DIA BEARING PAD

PLAN VIEW OF SOLE PLATE DETAILS



SECTION



HOLE DETAIL

(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.

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 1/16" based on required thickness at centerline of bearing and slope of girder. Thickness tolerance variation from the approved shop drawings is 1/16"+/-, 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.

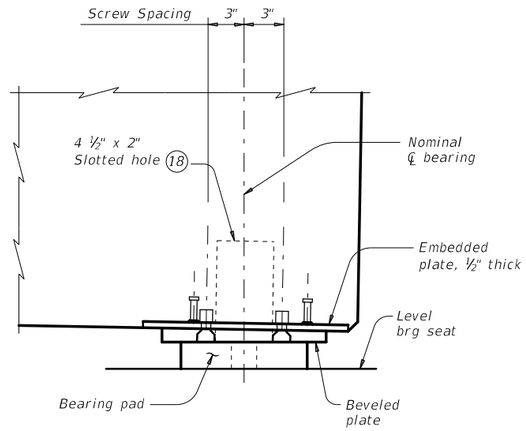
When determining if relocation of screw holes and studs are necessary for skewed girder ends, minimum clearance from screw or stud centerline to plate edge is 1.25".

Tap threads in the embedded plate only. Drill and tap prior to galvanizing.

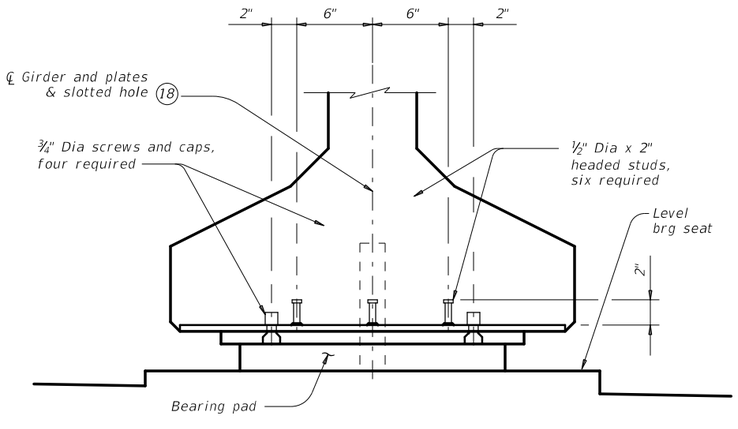
¾" Dia screws must be electroplated, socket flat head countersunk cap screws conforming to ASTM F835. Electroplating must conform to ASTM B633, SC 2, Type I. Provide screws long enough to maintain a ¾" minimum embedment into the embedded plate and galvanized cap. Provide galvanized steel caps (16 ga Min) with a nominal 1" inside diameter and deep enough to accommodate the screws, but not less than ½" 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.

BEVELED PLATE DETAILS



SIDE ELEVATION



END ELEVATION
Showing normal girder end.

GIRDER DETAILS

HL93 LOADING SHEET 3 OF 3

Texas Department of Transportation
Bridge Division Standard

ELASTOMERIC BEARING AND GIRDER END DETAILS
PRESTR CONCRETE I-GIRDERS

IGEB

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©TxDOT August 2017 REVISIONS	CONT	SECT	JOB	HIGHWAY
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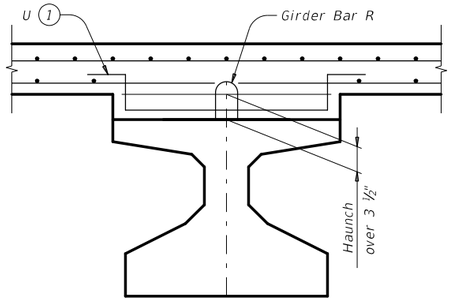
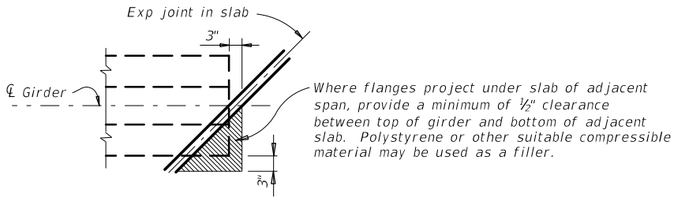
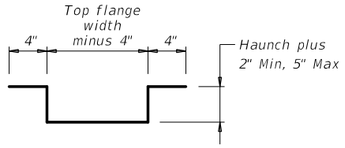


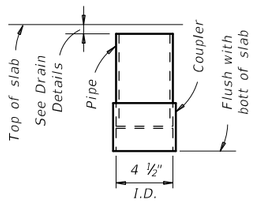
HAUNCH REINFORCING DETAIL



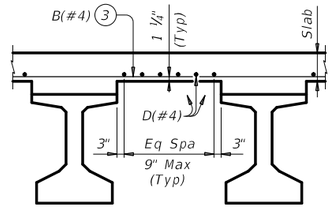
TREATMENT AT GIRDER END FOR SKEWED SPANS



BARS U (#4)

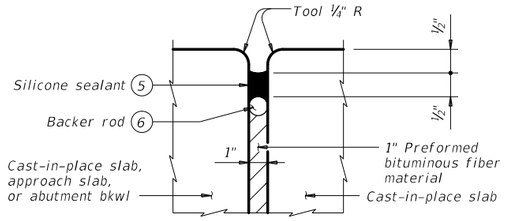


C-I-P DRAIN DETAIL (2)

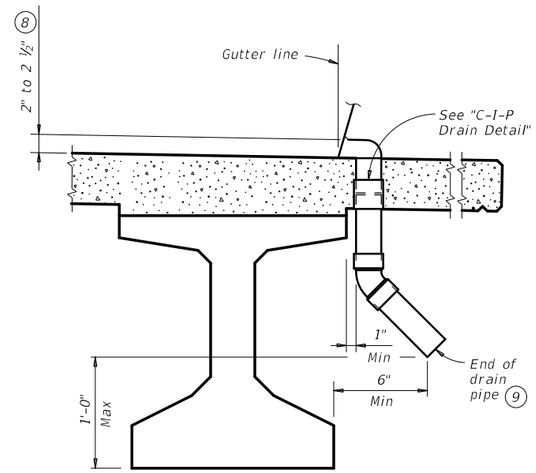


TYPICAL PART TRANSVERSE SLAB SECTION WITHOUT PCP (4)

Top reinforcing steel not shown for clarity.



TYPE A JOINT DETAIL (7)



DRAIN DETAIL (10)

(1) Space Bars U with girder Bars R in all areas where measured haunch exceeds 3 ½".

(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 ¼" 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.

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.

Texas Department of Transportation

Bridge Division Standard

MISCELLANEOUS SLAB DETAILS

PRESTR CONCRETE I-GIRDERS

IGMS

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REVISIONS	0106	04	036	US 380
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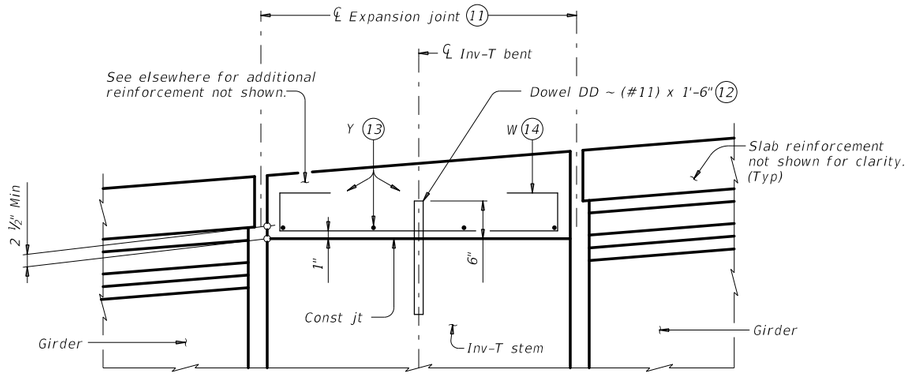
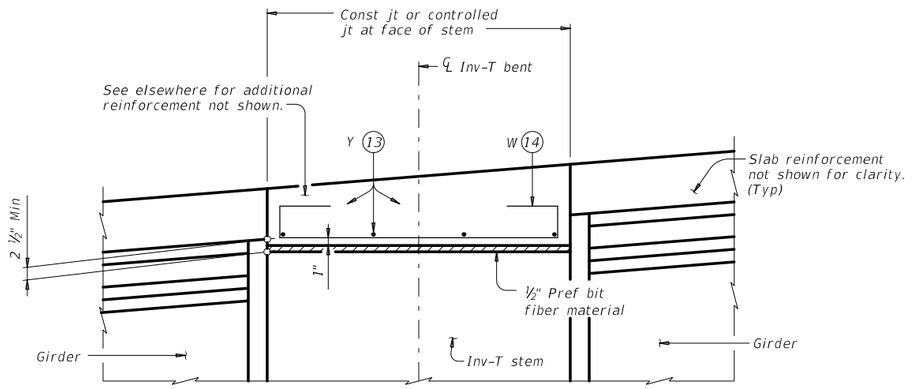
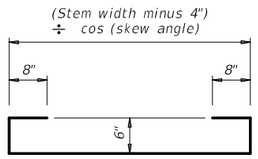


SHOWING EXPANSION JOINTS

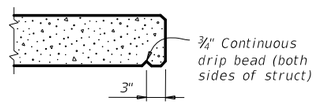


SHOWING CONST JTS OR CONTROLLED JTS

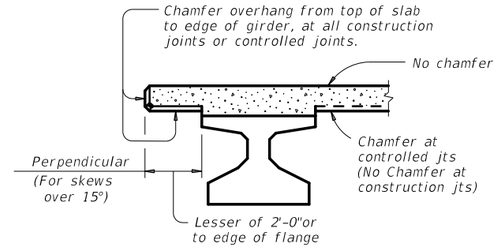
REINFORCEMENT OVER INV-T BENTS



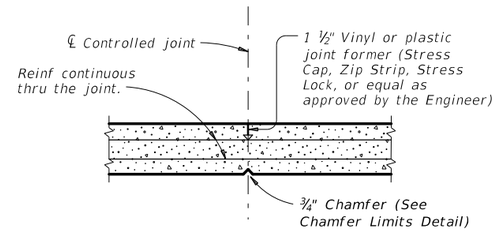
BARS W (#4)



DRIP BEAD DETAIL



CHAMFER LIMITS DETAIL (15)



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.

Texas Department of Transportation

Bridge Division Standard

MISCELLANEOUS SLAB DETAILS

PRESTR CONCRETE I-GIRDERS

IGMS

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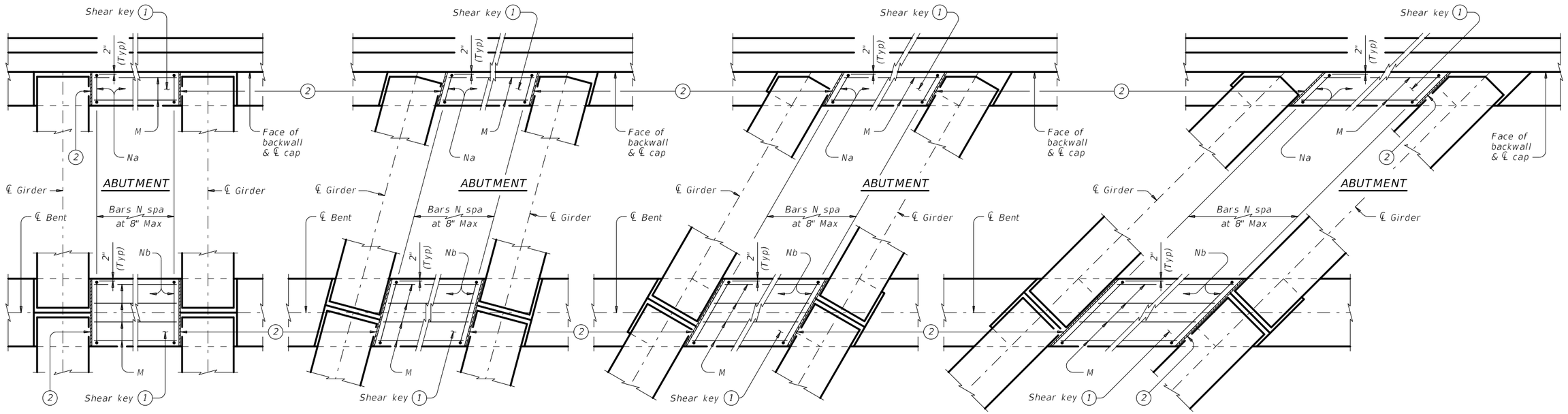


PARTIAL PLANS WITH NO SKEW

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 ¼" 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.

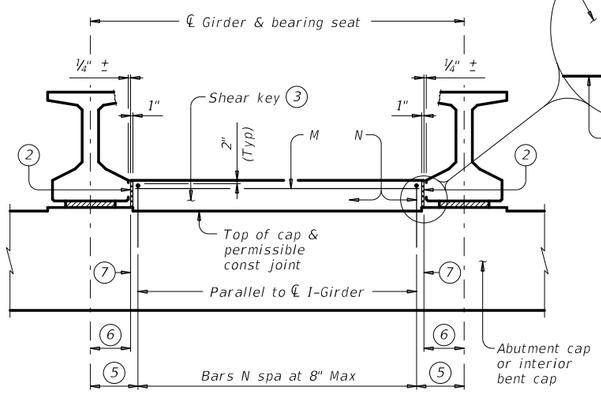
(5) With No Skew = 1'-8 ¼", measured along ℄ cap.
With Skew = 1'-8 ¼" ÷ Cos Skew, measured along ℄ cap.

(6) With No Skew = 1'-4 ¼", measured along ℄ cap.
With Skew = 1'-4 ¼" ÷ Cos Skew, measured along ℄ cap.

(7) Face of UHMW polyethylene wear pad. Smooth side of pad facing girder.

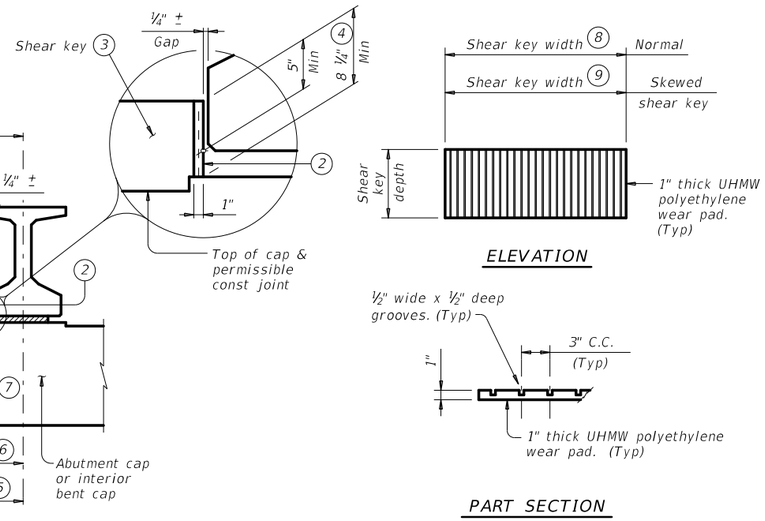
(8) Abutments = ½ Cap width.
Interior bents = Cap width.

(9) Abutments = ½ Cap width ÷ Cos Skew.
Interior bents = Cap width ÷ Cos Skew.

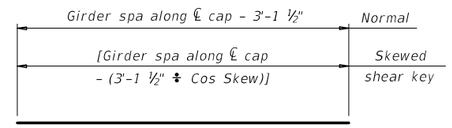


PARTIAL ELEVATION OF ABUTMENT OR INTERIOR BENT CAP (1)

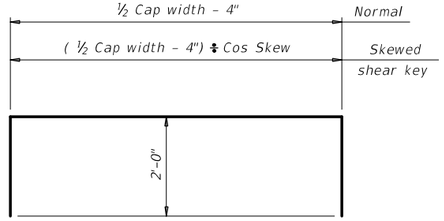
Showing shear key with girder Type Tx46.
Other I-Girder types similar.



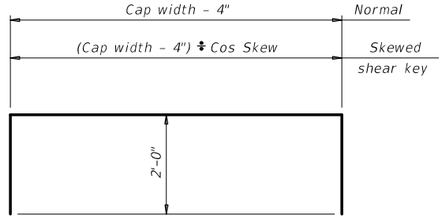
ULTRA HIGH MOLECULAR WEIGHT (UHMW) POLYETHYLENE WEAR PAD DETAILS



BARS M (#5)



BARS Na (#5)
(For abutments)



BARS Nb (#5)
(For interior bents)

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.

Texas Department of Transportation

Bridge Division Standard

SHEAR KEY DETAILS
PRESTR CONCRETE I-GIRDERS

IGSK

FILE: igskstds-17.dgn	DN: TxDOT	CK: TxDOT	DW: JTR	CK: AES
©TxDOT August 2017 REVISIONS	CONT	SECT	JOB	HIGHWAY
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	DIST	COUNTY		SHEET NO.
	ABL	STONEWALL		129

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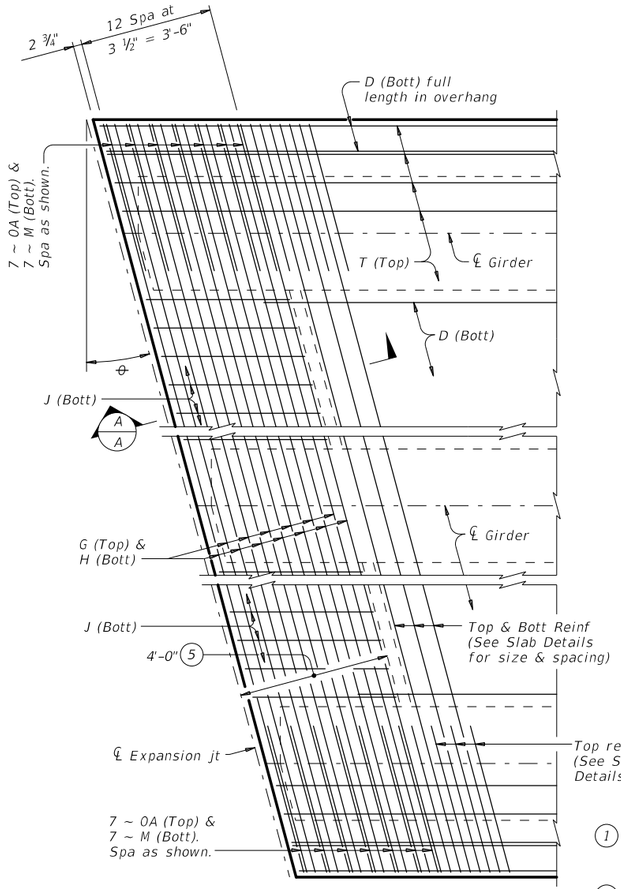
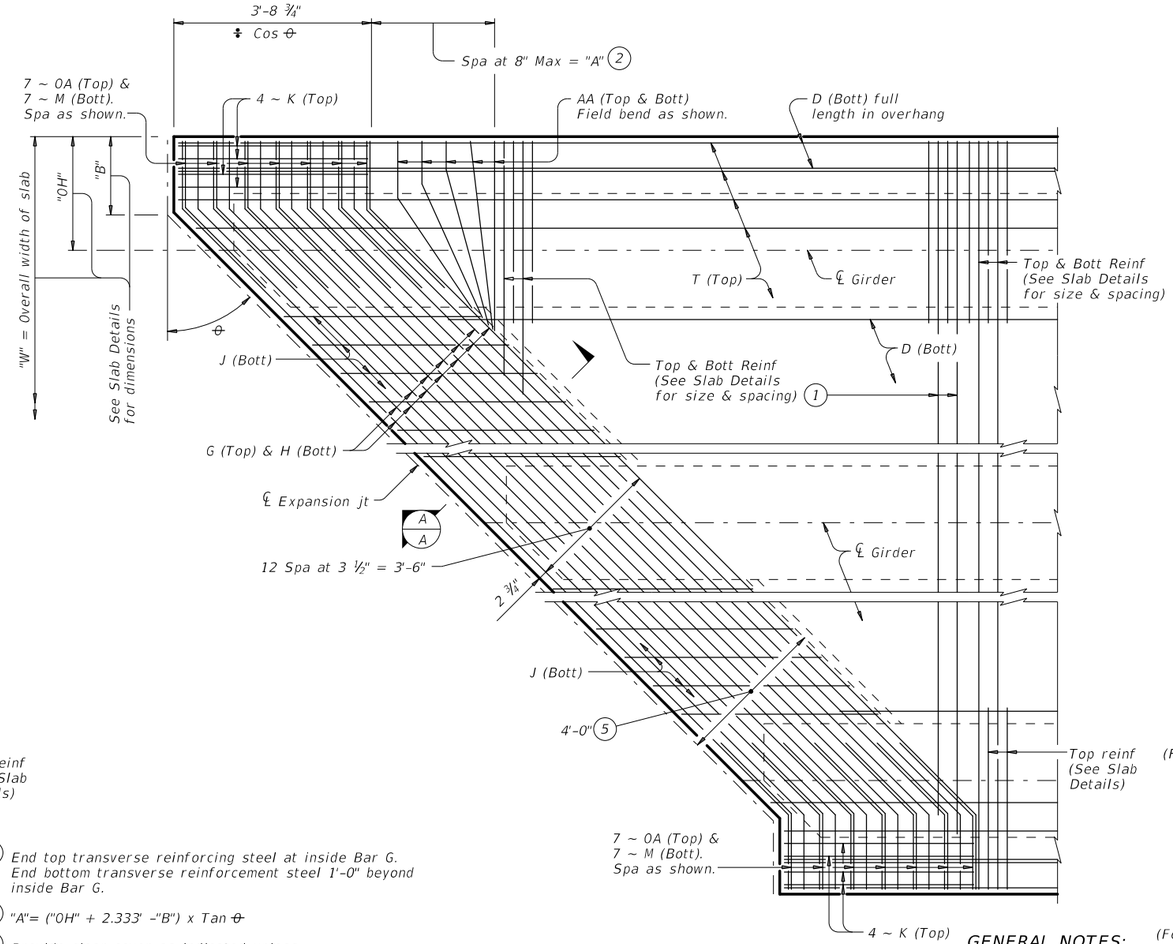


PARTIAL PLAN FOR SLABS WITHOUT BREAKBACK



PARTIAL PLAN FOR SLABS WITH BREAKBACK

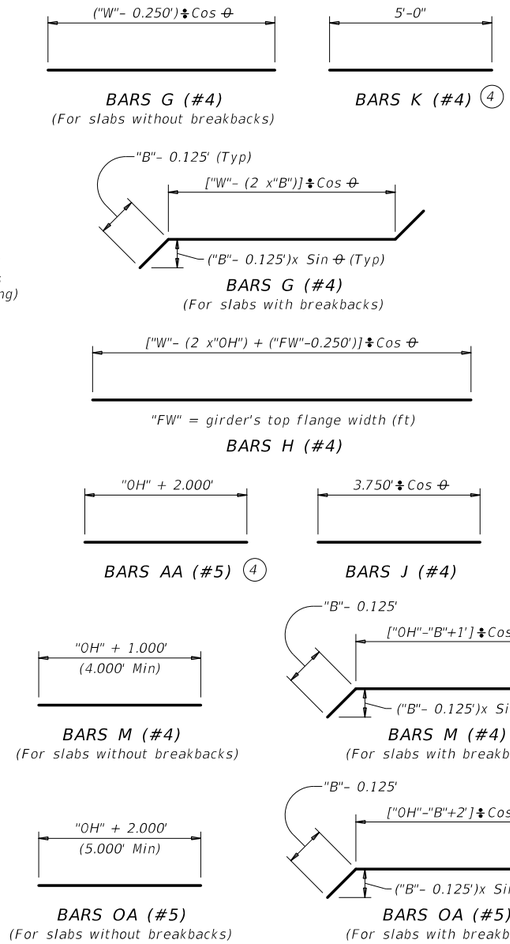
(1) End top transverse reinforcing steel at inside Bar G. End bottom transverse reinforcement steel 1'-0" beyond inside Bar G.

(2) "A"= ("0H" + 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.



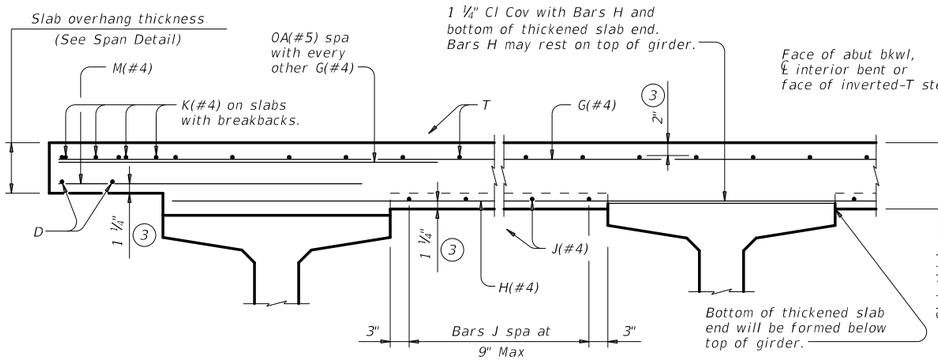
GENERAL NOTES:

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"

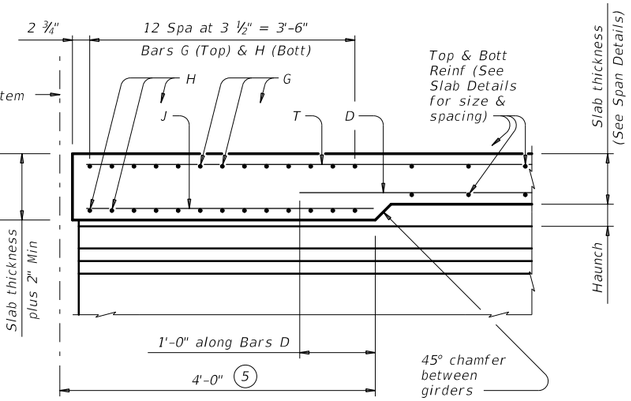
Cover dimensions are clear dimensions, unless noted otherwise.
Reinforcing bar dimensions shown are out-to-out of bar.



2" AND MORE OF HAUNCH — LESS THAN 2" OF HAUNCH

TYPICAL TRANSVERSE SECTION

(Showing Prestressed Conc I-Girders at ℄ 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: igtssts1-17.dgn	DN: TxDOT	CK: TxDOT	DW: JTR	CK: TxDOT
©TxDOT August 2017 REVISIONS	CONT	SECT	JOB	HIGHWAY
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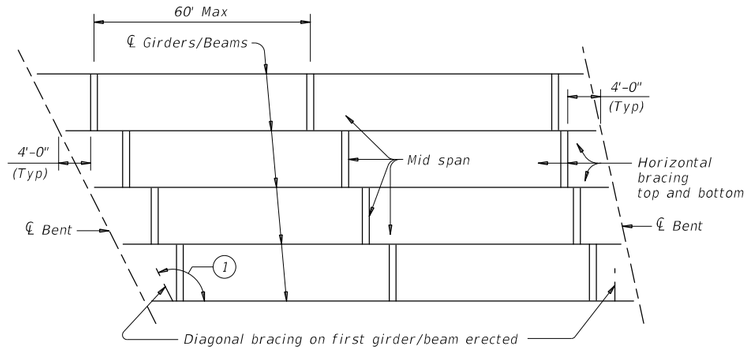
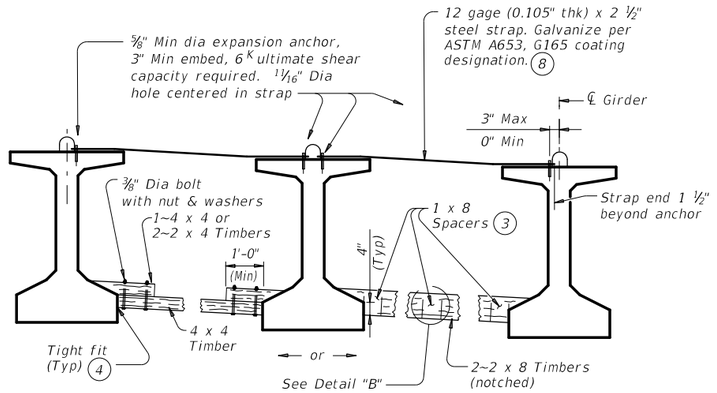
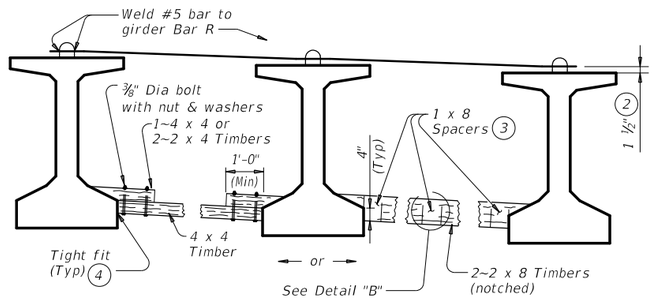


ERECTION BRACING



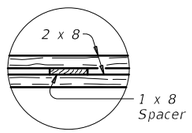
FOR ERECTION BRACING, OPTION 1

(This option is not allowed when slab is formed with PMDF or plywood.)



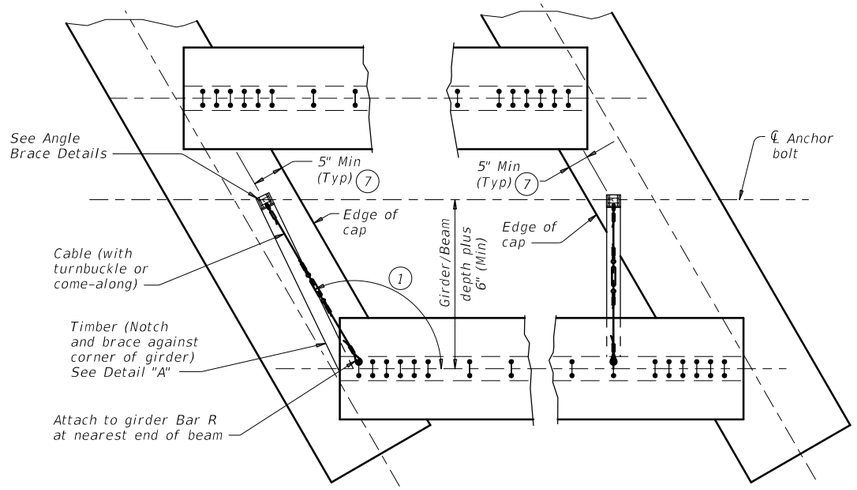
FOR ERECTION BRACING, OPTION 2

HORIZONTAL BRACING DETAILS (5)

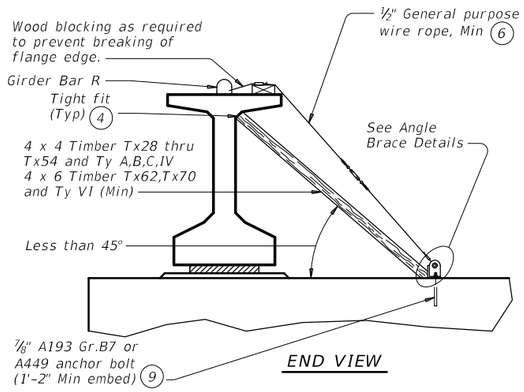


PLAN

DETAIL "B"



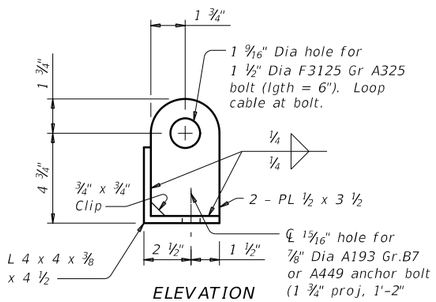
PLAN



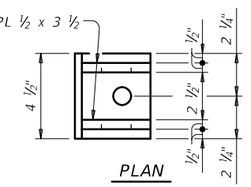
END VIEW

DIAGONAL BRACING DETAILS (5)

(To be used on both ends of the first girder/beam erected in the span in each phase.)



ELEVATION



PLAN

ANGLE BRACE DETAILS

HAULING & ERECTION:

The Contractor's attention is directed to the possible lateral instability of prestressed concrete girders and beams over 130' long, especially during hauling and erection. The use of the following methods to improve stability is encouraged: Locate lifting devices at the maximum practical distance from girder ends; use external lateral stiffening devices during hauling and erection; lift with vertical lines using two machines; and take care in handling to minimize inertial and impact forces.

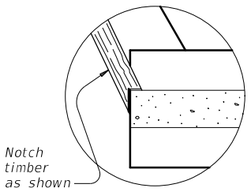
ERECTION BRACING:

Erection bracing details shown are considered the minimum for fulfilling the bracing requirements of Item 425.

Required erection bracing must be placed immediately after erection of each girder and remain in place until additional bracing as required for slab placement is in place. This standard is needed in all cases to meet requirements for Slab Placement Bracing.

PHASED CONSTRUCTION:

Place erection and slab placement bracing for all girders in a phase as shown in these details. For phases after first, also place erection and slab placement bracing between outer girder of completed phase and adjacent girder of current phase. When the phase construction joint is between girders, top bracing can be omitted.



DETAIL "A"

(1) If angle shown exceeds 120 degrees, move diagonal brace to other side of girder/beam and place square to girder/beam. This may prevent exterior girder from being erected first.

(2) Place and weld #5 bars as shown during erection. If forming deck with prestressed panels, bars can be temporarily removed, one at a time, during panel erection. Re-install bar prior to additional panel erection. Bars can rest on panels and be bent down and welded to girder Bars R (See Sheet 2 of 2).

(3) Clear distance between spacers must not exceed 3'. Nail together with 16d nails.

(4) Use wedges as necessary to obtain tight fit. Nail wedges to timbers.

(5) Pressure treated landscape timbers can not be used.

(6) All hardware used with cable must be able to develop a minimum 25 kips breaking strength. Use thimbles at all loops in cable. Install cable clamps with saddles bearing against the live end and U-bolts bearing aginst the dead end.

(7) It is acceptable to tie anchor bolts to cap reinforcement.

(8) Prior to installing, field bend strap to lay flush on both girders' top flange and slope between flange tips.

(9) Anchor bolt may be drilled and epoxied in place. Provide 25k minimum pullout. Core drill hole.

Texas Department of Transportation

Bridge Division Standard

MINIMUM ERECTION AND BRACING REQUIREMENTS
PRESTRESSED CONCRETE I-GIRDERS AND I-BEAMS

MEBR(C)

FILE: mebcsts1-17.dgn	DN: TxDOT	CK: TxDOT	DW: TxDOT	CK: TxDOT
©TxDOT August 2017 REVISIONS	CONT	SECT	JOB	HIGHWAY
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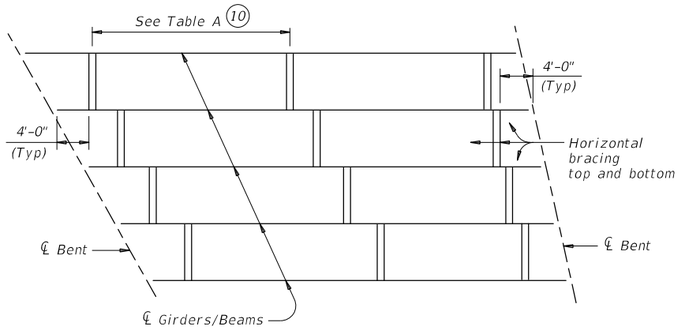
	DIST	COUNTY		SHEET NO.
	ABL	STONEWALL		131



SLAB PLACEMENT BRACING

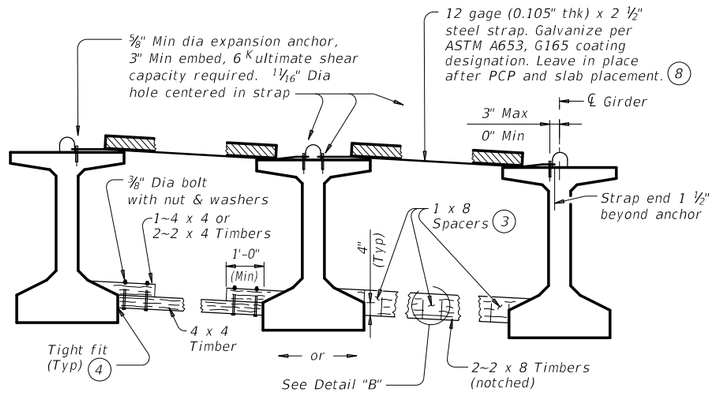
TABLE A

OPTION 1-RIGID BRACING (STEEL STRAP)

Girder or Beam Type	Maximum Bracing Spacing	
	Slab Overhang less than 4'-0" (11)	Slab Overhang 4'-0" and greater (11)
Tx28	¼ points	¼ points
Tx34	¼ points	¼ points
Tx40	¼ points	⅛ points
Tx46	¼ points	⅛ points
Tx54	¼ points	⅛ points
Tx62	¼ points	⅛ points
Tx70	¼ points	⅛ points
A	⅛ points	⅛ points
B	⅛ points	⅛ points
C	⅛ points	⅛ points
IV	¼ points	⅛ points
VI	¼ points	⅛ points

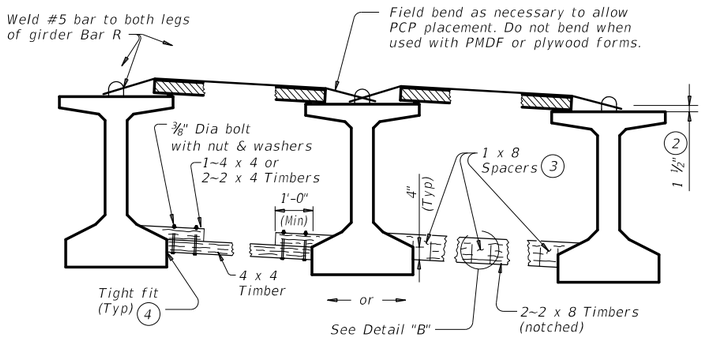
OPTION 2-FLEXIBLE BRACING (NO. 5 OVER PCP)

Girder or Beam Type	Maximum Bracing Spacing	
	Slab Overhang less than 4'-0" (11)	Slab Overhang 4'-0" and greater (11)
Tx28	¼ points	⅛ points
Tx34	¼ points	⅛ points
Tx40	¼ points	⅛ points
Tx46	¼ points	⅛ points
Tx54	¼ points	⅛ points
Tx62	¼ points	⅛ points
Tx70	¼ points	⅛ points
A	2.0 ft	1.5 ft
B	3.0 ft	2.0 ft
C	4.5 ft	2.0 ft
IV	¼ points	4.0 ft
VI	¼ points	4.0 ft



FOR SLAB PLACEMENT BRACING, OPTION 1 - RIGID

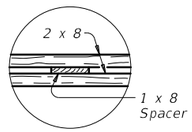
(Showing slab formed with PCP. This option is not allowed when slab is formed with PMDF or plywood.)



FOR SLAB PLACEMENT BRACING, OPTION 2 - FLEXIBLE

(Showing slab formed with PCP.)

HORIZONTAL BRACING DETAILS (5)



PLAN

DETAIL "B"

(2) Place and weld #5 bars as shown during erection. If forming deck with prestressed panels, bars can be temporarily removed, one at a time, during panel erection. Re-install bar prior to additional panel erection. Bars can rest on panels and be bent down and welded to girder Bars R.

(3) Clear distance between spacers must not exceed 3'. Nail together with 16d nails.

(4) Use wedges as necessary to obtain tight fit. Nail wedges to timbers.

(5) Pressure treated landscape timbers can not be used.

(8) Prior to installing, field bend strap to lay flush on both girders' top flange and slope between flange tips.

(10) Bracing spacing (¼ and ⅛ points) measured between first and last typical brace location.

(11) Measure slab overhang from centerline of girder or beam. When overhang varies in span, determine bracing spacing based on largest overhang.

SLAB PLACEMENT BRACING:

The details for slab placement bracing are considered minimum for fulfilling the requirements of Specification Items 422 and 425.

Required slab placement bracing must remain in place until slab concrete has attained a compressive strength of 3000 psi.

GENERAL NOTES:

Bracing details for spans longer than 150' are not provided. The Contractor must submit proposed bracing details for such conditions to the Engineer for approval prior to erection.

Systems equal to or better than those shown may be used provided details of such systems are submitted to and approved by the Engineer prior to erection.

Use of these systems or details does not relieve the Contractor of the responsibility for the adequacy of the bracing and the safety of the structure.

Removal of bracing for short periods of time to align girders and beams is permissible.

All turn-buckles, come-alongs, anchors and other connections must be capable of developing the full strength of the cable shown.

Furnish anchor bolts and nuts in accordance with Item 449, "Anchor Bolts".

Texas Department of Transportation

Bridge Division Standard

MINIMUM ERECTION AND BRACING REQUIREMENTS

PRESTRESSED CONCRETE I-GIRDERS AND I-BEAMS

MEBR(C)

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©TxDOT August 2017	CONT	SECT	JOB	HIGHWAY
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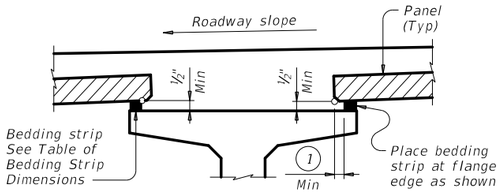
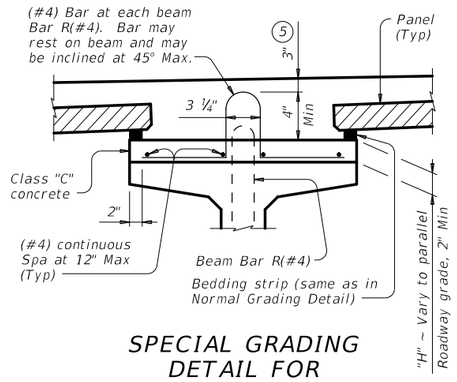


NORMAL GRADING DETAIL (3)

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



SPECIAL GRADING DETAIL FOR CONCRETE BEAMS

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

TABLE OF BEDDING STRIP DIMENSIONS		
WIDTH	HEIGHT (4)	
	Min	Max
1" (Min)	½"	2"
1 ¼"	½"	2 ½"
1 ½"	½"	3"
1 ¾"	½"	3 ½"
2"	½"	4"
2 ¼"	½"	4 ½" (2)
2 ½"	½"	5" (2)
2 ¾"	½"	5 ½" (2)
3" (Max)	½"	6" (2)

(1) 2" Min for I-giders, 1 ½" 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 ¼" 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 ¼". 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 ½" 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 ¼" deep, in the top of the bedding strips at 8' o.c..

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 ½" 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 ½". 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.

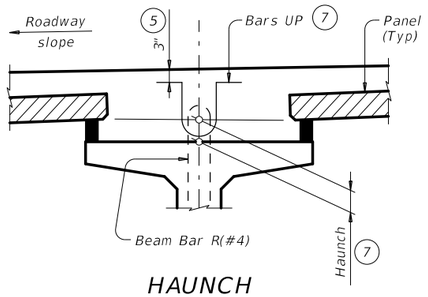
Use of Prestressed Concrete Panels is not permitted for horizontally curved steel plate or tub girders. See Span Details for other possible restrictions on their use.

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.

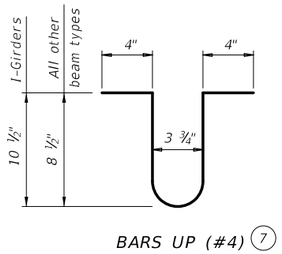
Any additional reinforcement or concrete required on this standard is considered subsidiary to the bid Item "Reinforced Concrete Slab".

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

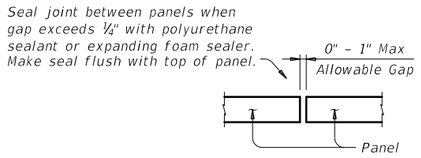


HAUNCH REINFORCING DETAIL

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

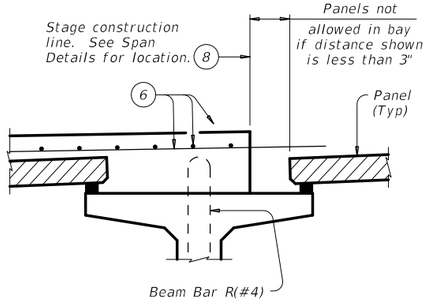


BARS UP (#4) (7)

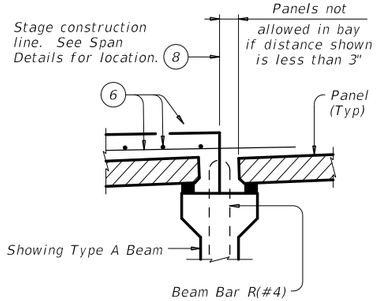


PANEL JOINTS

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



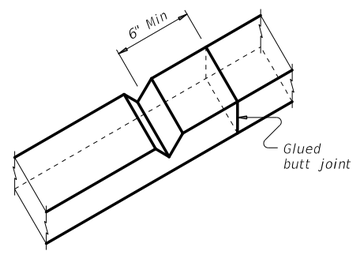
PRESTR CONC I-GIRDERS



PRESTR CONC I-BEAMS

STAGE CONSTRUCTION LIMITATIONS

(Other beam types similar)



BEDDING STRIP DETAIL (9)

HL93 LOADING SHEET 1 OF 4

Texas Department of Transportation | Bridge Division Standard

PRESTRESSED CONCRETE PANELS DECK DETAILS

PCP

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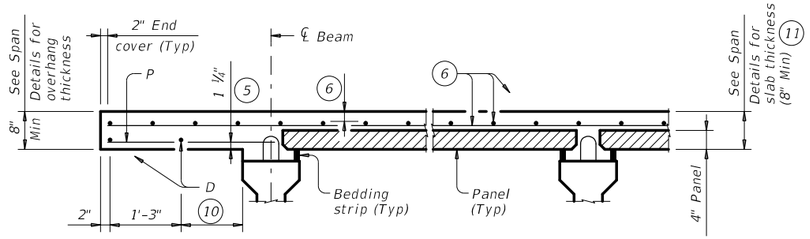
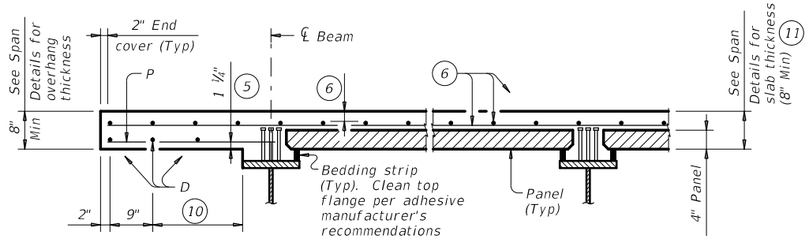
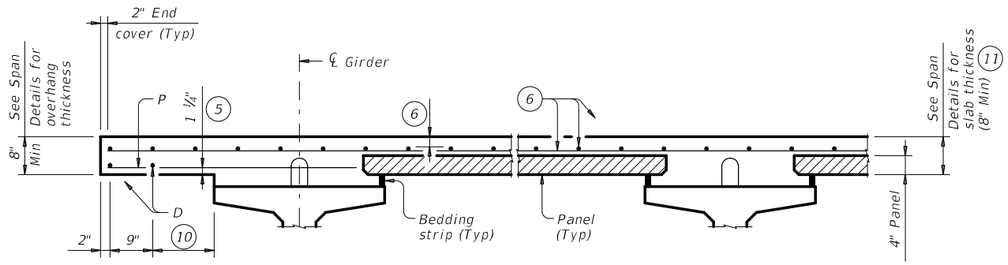


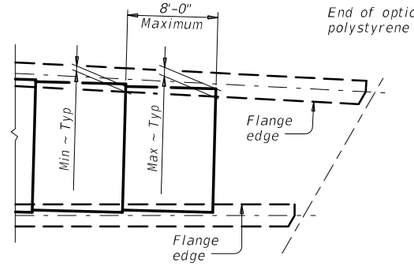
PRESTRESSED CONCRETE I-BEAMS



STEEL BEAMS

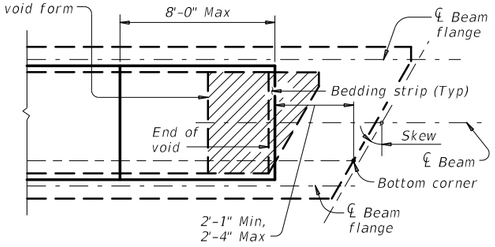


PRESTRESSED CONCRETE I-GIRDERS

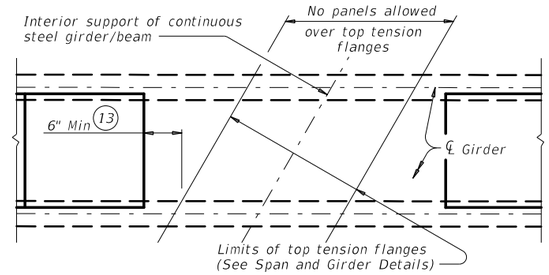


AT FLARED BEAMS OR GIRDERS

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.

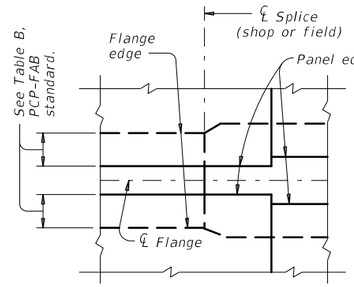
(9) Butt adjacent bedding strips together with adhesive. Cut v-notches, approx ¼" deep, in the top of the bedding strips at 8' o.c..

(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.

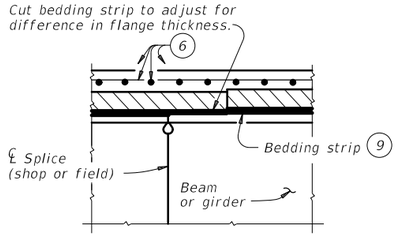
(12) Field adjust Bars Z1(#4) to match actual slope of slab overhangs. Width of slab overhang will vary along span with curved slab edges. Adjust Bar Z1(#4) dimensions to maintain proper cover. Bars Z2(#4) are located at Inverted-Tee stems only.

(13) Location of concrete placement sequence boundaries and bolted field splices should be considered by the contractor in determining panel limits.



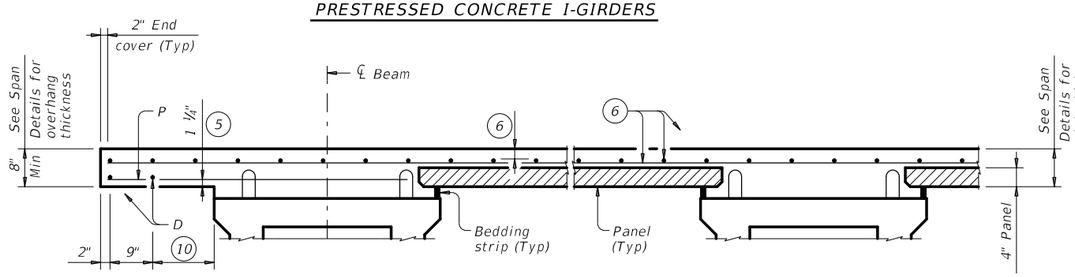
PLAN AT SPLICE

(Showing steel beams with flange width transition)

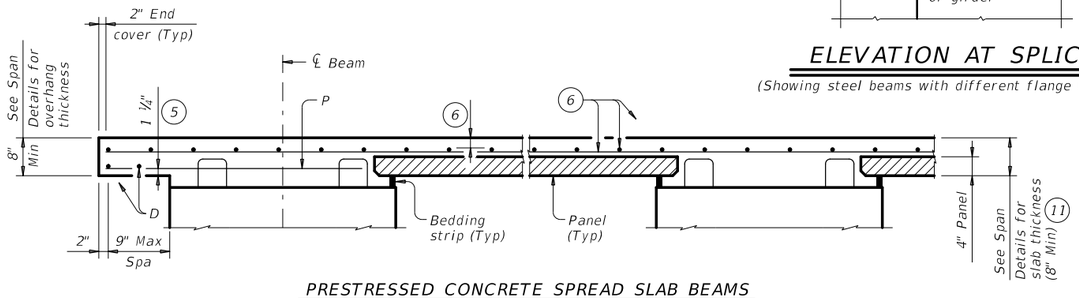


ELEVATION AT SPLICE

(Showing steel beams with different flange thickness)

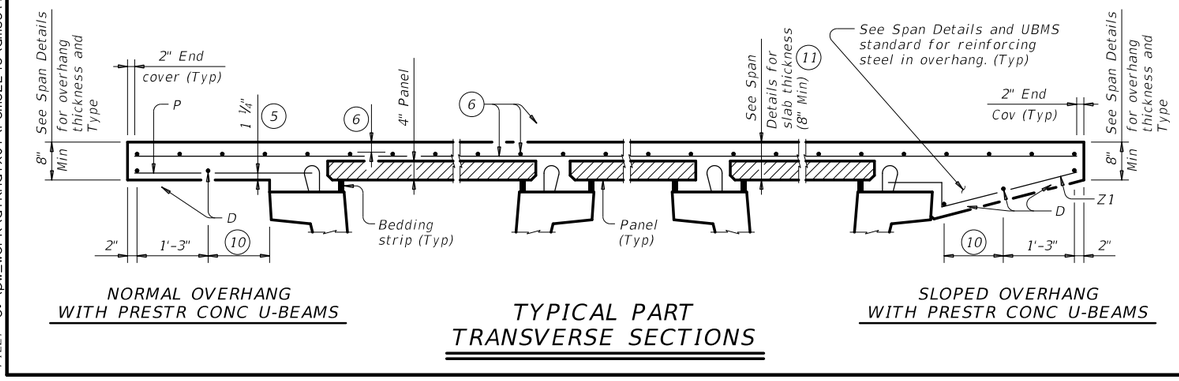


PRESTRESSED CONCRETE X-BEAMS



PRESTRESSED CONCRETE SPREAD SLAB BEAMS

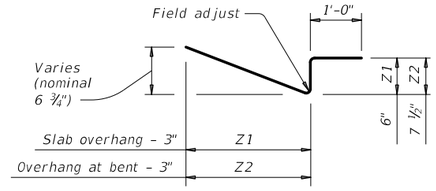
Bars P over exterior beams are still required when no overhang is used. In this case, only one Bar D, 2" from slab edge, is required.



NORMAL OVERHANG WITH PRESTR CONC U-BEAMS

SLOPED OVERHANG WITH PRESTR CONC U-BEAMS

TYPICAL PART TRANSVERSE SECTIONS



BARS Z (#4) (12)

HL93 LOADING SHEET 2 OF 4

Texas Department of Transportation

Bridge Division Standard

PRESTRESSED CONCRETE PANELS
DECK DETAILS

PCP

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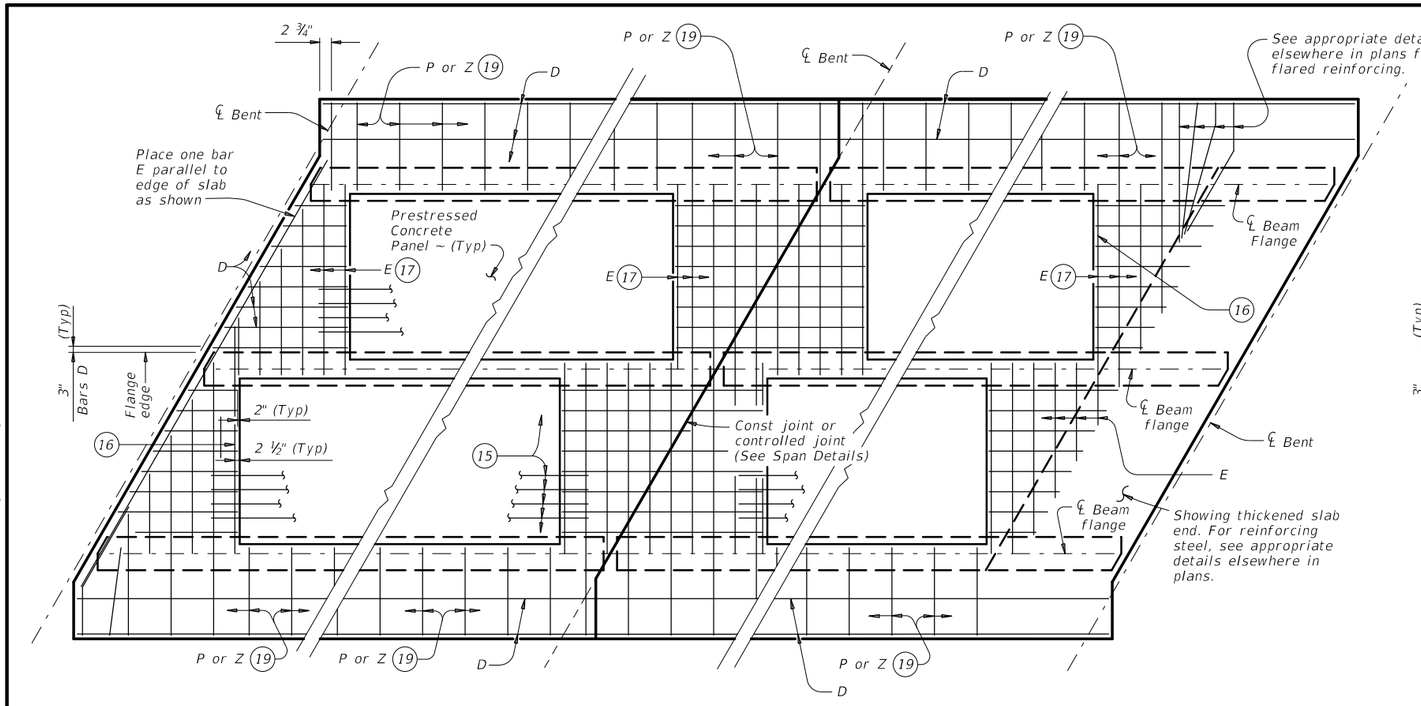
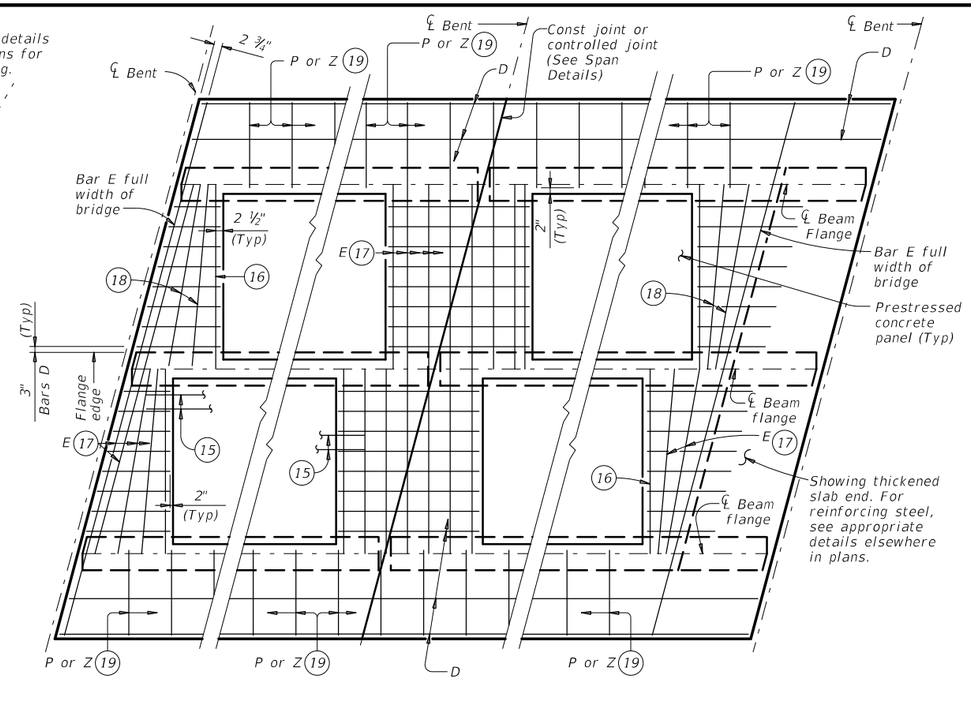


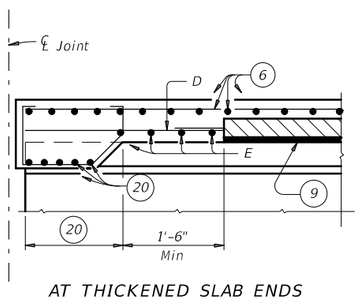
AT ALL SPAN ENDS UNLESS NOTED OTHERWISE | AT INTERIOR BENTS | AT THICKENED END SLABS

OPTION 1 ~ PLAN OF SLABS WITH NORMAL REINFORCEMENT

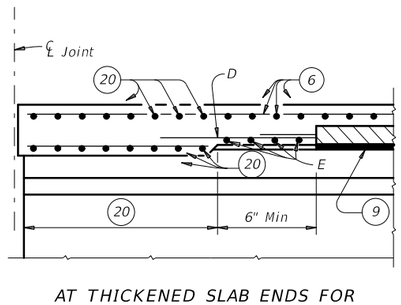


AT ALL SPAN ENDS UNLESS NOTED OTHERWISE | AT INTERIOR BENTS | AT THICKENED END SLABS

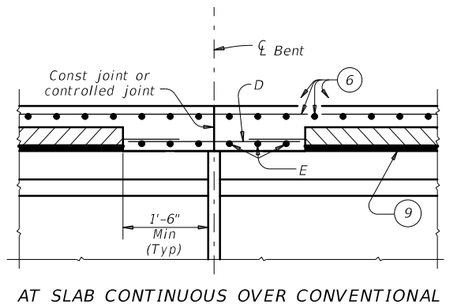
OPTION 1 ~ PLAN OF SLABS WITH SKEWED REINFORCEMENT



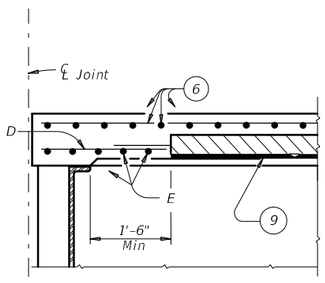
AT THICKENED SLAB ENDS FOR PRESTR CONC U-BMS



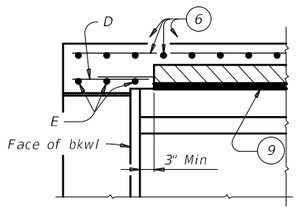
AT THICKENED SLAB ENDS FOR PRESTR CONC I-BMS AND STEEL BMS



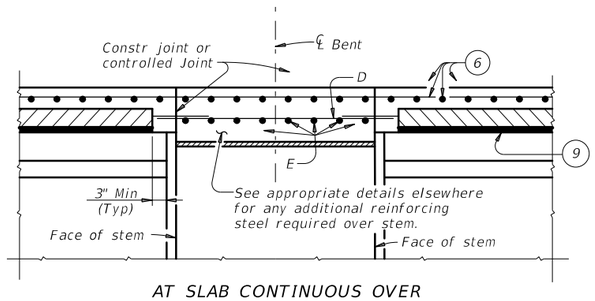
AT SLAB CONTINUOUS OVER CONVENTIONAL INTERIOR BENTS FOR ALL SIMPLE SPAN BMS



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 ¼" 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

Bridge Division Standard

PRESTRESSED CONCRETE PANELS
DECK DETAILS

PCP

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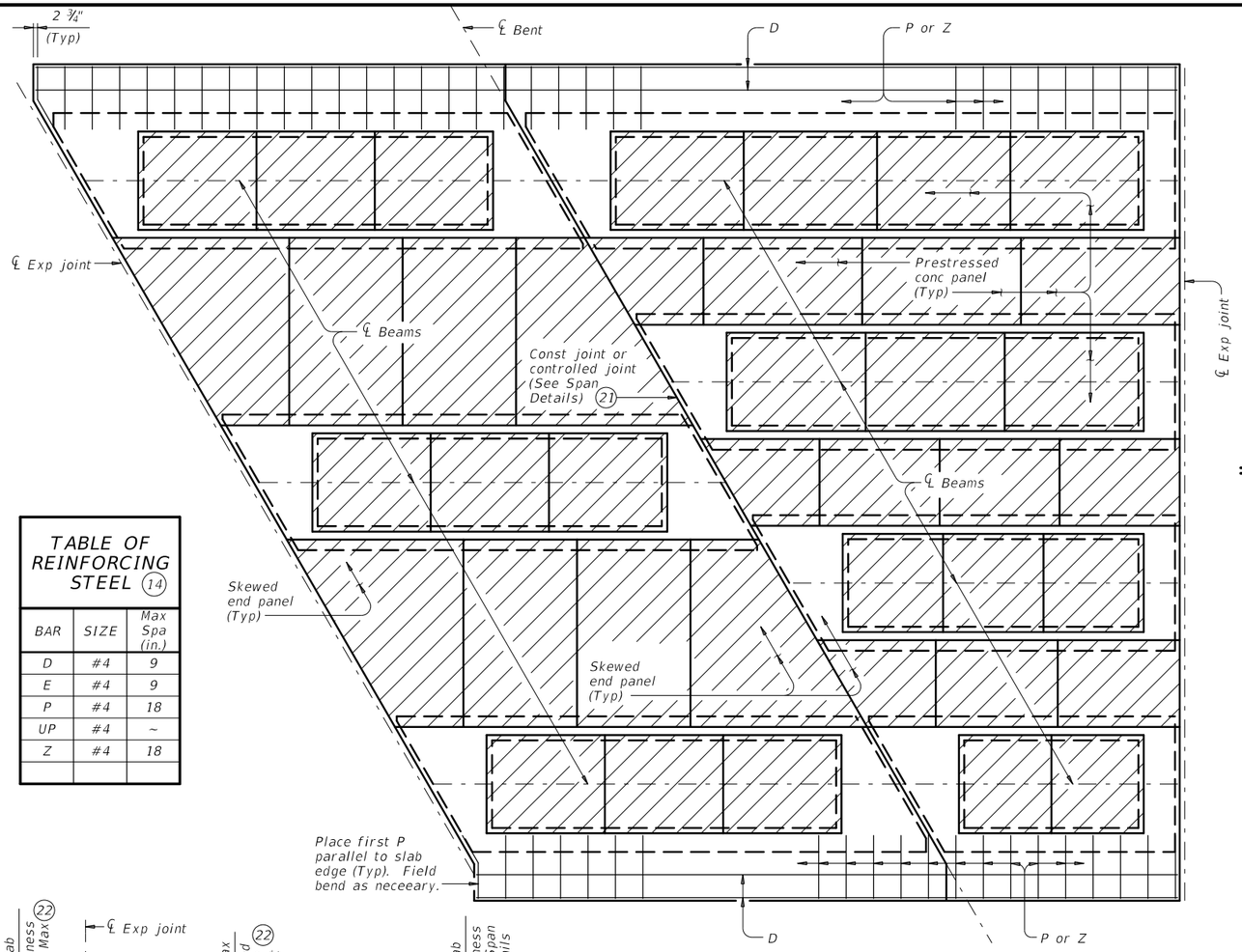
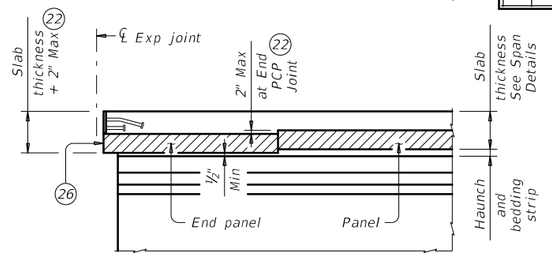


OPTION 2 ~ PLAN OF SLAB

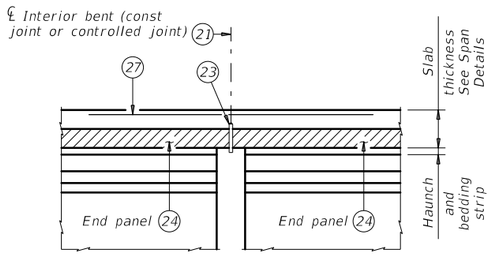
(Showing U-Beams; other beams similar)

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



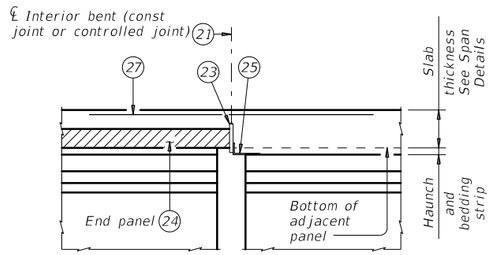
JOINTS (BETWEEN BEAMS/GIRDERS OR AT INV-T STEM)

For SEJ-A, SEJ-S(0), AJ, and Type A expansion joints only.



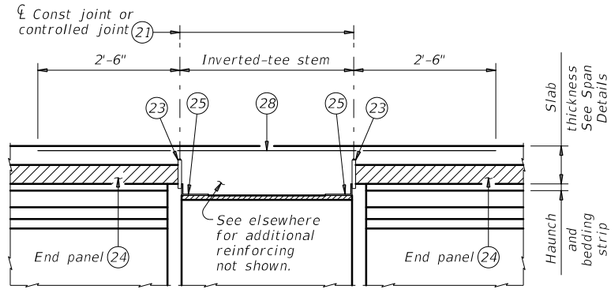
CONVENTIONAL INTERIOR BENT

Panel against panel between beams/girders.



CONVENTIONAL INTERIOR BENT

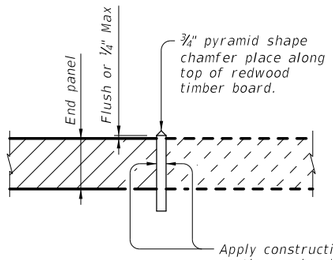
Panel against beam/girder end in adacent span.



INVERTED-T BENT

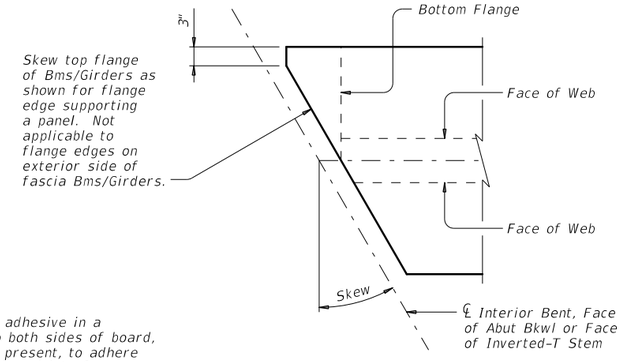
Panels against inverted-tee stem

OPTION 2 ~ ELEVATIONS AT BEAM ENDS (6)



ELEVATION EXAMPLE OF END PANEL AND TIMBER BOARD (23)

See "Option 2 ~ Elevation At Beam Ends".



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 ½" 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 ½" thick.

(23) ¾" thick redwood timber board, leave in place. Redwood timber board placed flush with top of panel or within ¼" Max above panel. Place ¾" pyramid shape chamfer along top of timber board. See "Elevation Example of End Panel and Timber Board". Place straight, within ¼" 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 ½" of ¾" thick board.

(25) Permanent galvanized steel sheet form. Removable formwork is acceptable.

(26) Place end panel within ½" 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 ½".

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-A and SEJ-S(0) 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 0A from standard IGTS in the slab.

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Texas Department of Transportation — Bridge Division Standard

PRESTRESSED CONCRETE PANELS
DECK DETAILS

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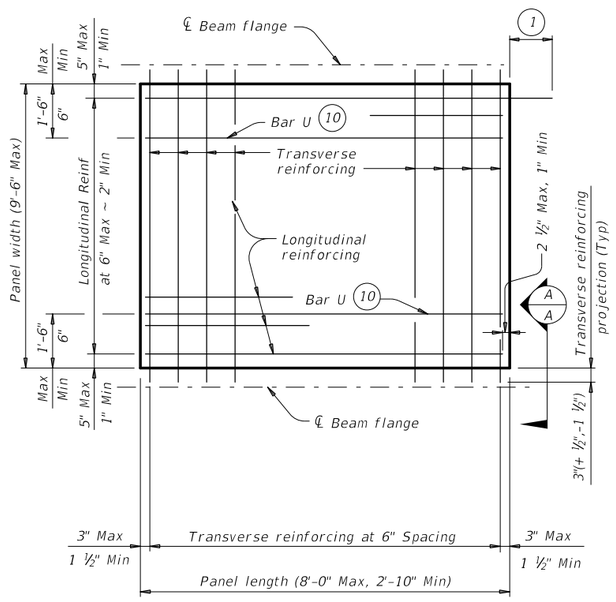
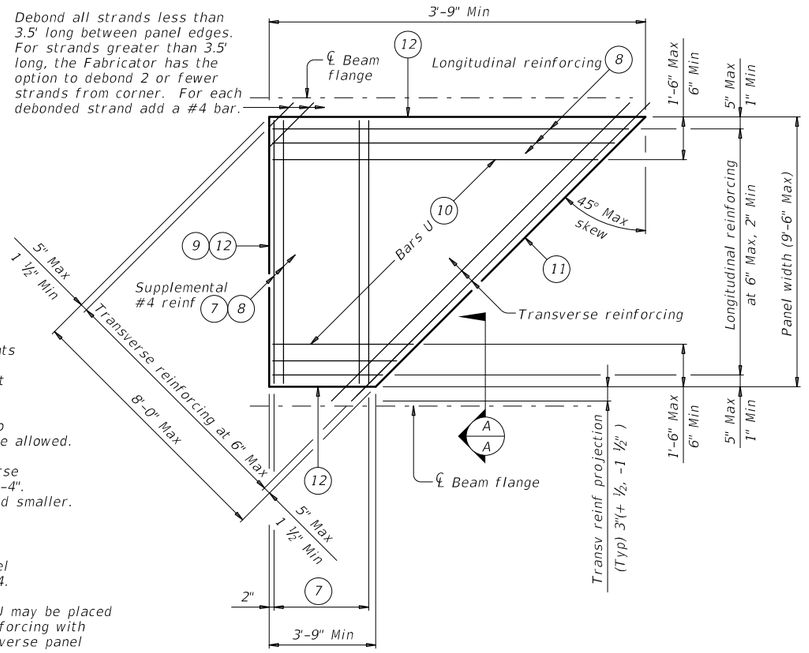


TYPICAL NON-SKEWED PANEL PLAN



TYPICAL SKEWED END PANEL PLAN

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

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. ⅜" or ½" 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 ½" 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.

TABLE A (4) (5)

Beam Type	Normal (In.)	Min (In.)	Max (In.)
A	3	2 ½	3 ½
B	3	2 ½	3 ½
C	4	3	4 ½
IV	6	4	7 ½
VI	6 ½	4 ½"	8 ½
U40 – 54	5 ½	5 ½	7
Tx28-70	6	5	7 ½
XB20 – 40	4	3	4 ½
XSB12 – 15	4	3	4 ½

TABLE B (4) (5)

Top Flange Width	Normal (In.)	Min (In.)	Max (In.)
11" to 12"	2 ¾	2 ½	2 ¾
Over 12" to 15"	3 ¼	3	3 ¼
Over 15" to 18"	4	3	4 ¾
Over 18"	5	3 ½	6 ¼

GENERAL NOTES:

Provide Class H concrete for panels. Release strength f'ci=3,500 psi. Minimum 28 day strength f'c=5,000 psi.

Provide ¾" 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 ⅜" or ½" 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 ⅜" or ½" 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.

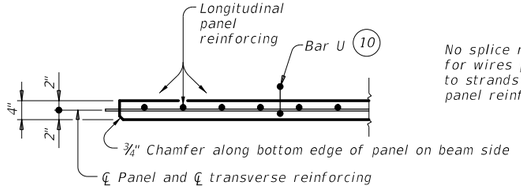
LONGITUDINAL PANEL REINFORCEMENT:

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. ⅜" Dia prestressing strands at 4 ½" Max Spacing (unstressed). No splices allowed.
3. ½" 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.

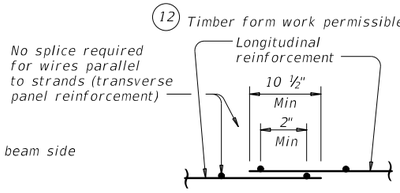
No combination of longitudinal reinforcement options in a panel is allowed.

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.

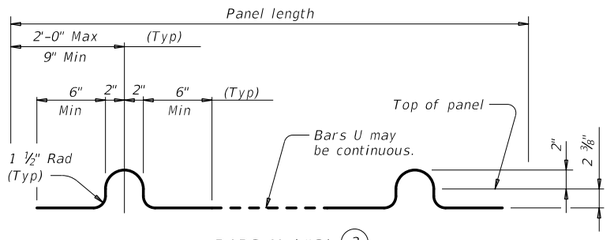


SECTION A-A

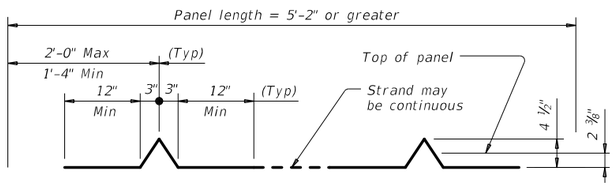
(Not showing supplemental #4 bars for skewed end panels.)



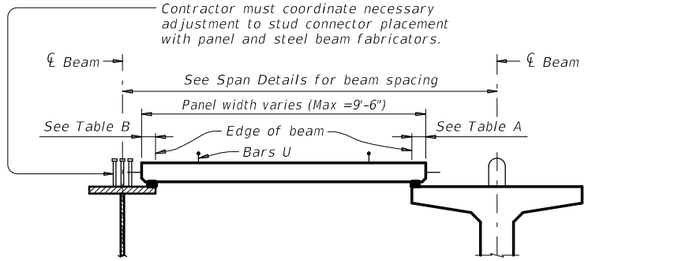
WELDED WIRE REINFORCEMENT (WWR) SPLICE DETAIL (6)



BARS U (#3) (2)



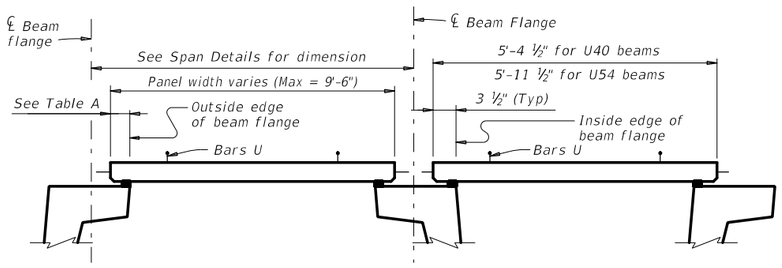
OPTIONAL STRAND FOR BARS U (3)



STEEL BEAMS

PRESTRESSED CONCRETE BEAMS OR GIRDERS

Typ unless noted otherwise



PRESTRESSED CONCRETE U-BEAMS

TYPICAL SECTIONS FOR DETERMINING PANEL WIDTH

HL93 LOADING

Texas Department of Transportation

Bridge Division Standard

PRESTRESSED CONCRETE PANEL FABRICATION DETAILS

PCP-FAB

FILE: pcpstde2-19.dgn	DN: TxDOT	CK: TxDOT	DW: JTR	CK: AES
©TxDOT April 2019 REVISIONS	CONT	SECT	JOB	HIGHWAY
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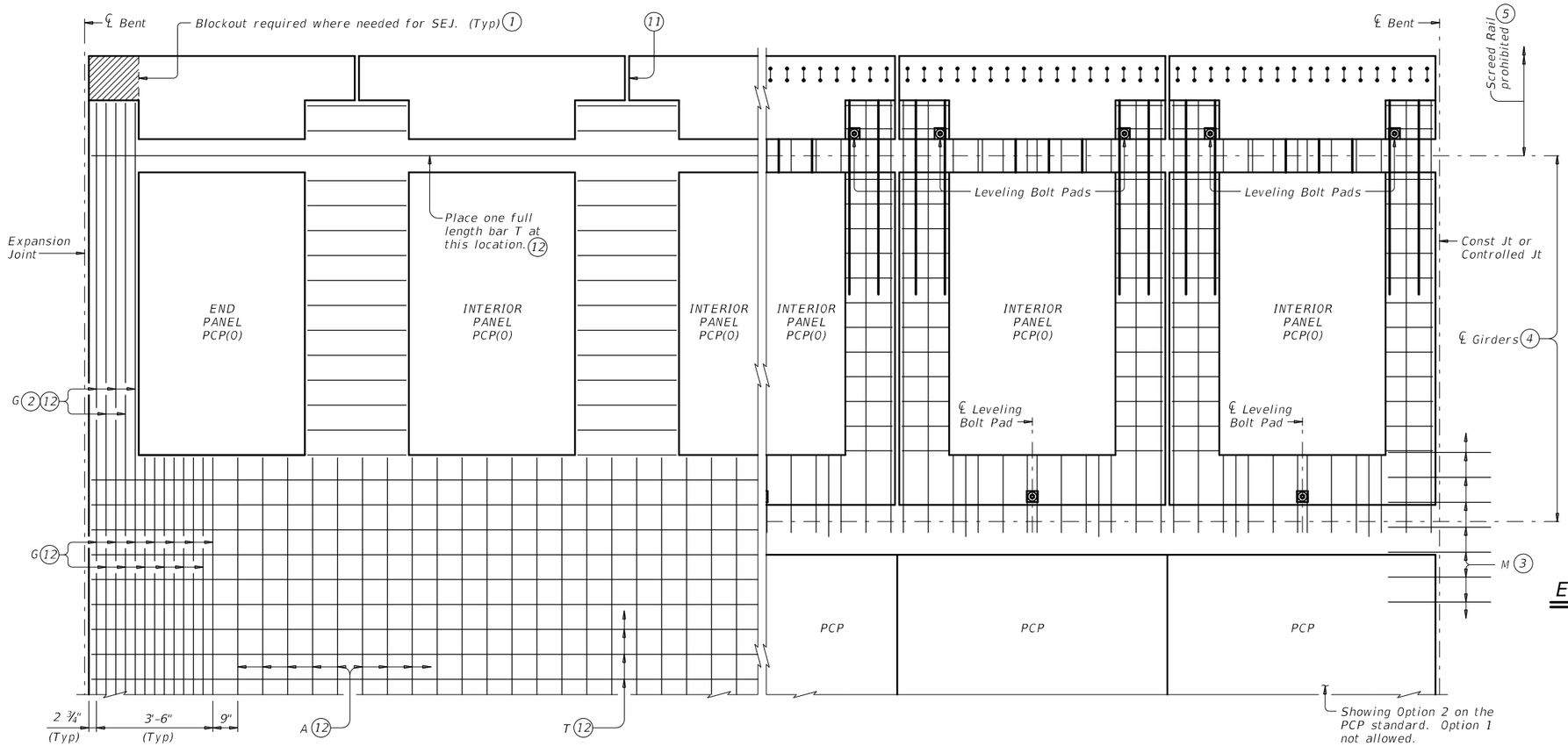
	DIST	COUNTY		SHEET NO.
	ABL	STONEWALL		137



SHOWING FIELD PLACEMENT OF TOP REINFORCING STEEL

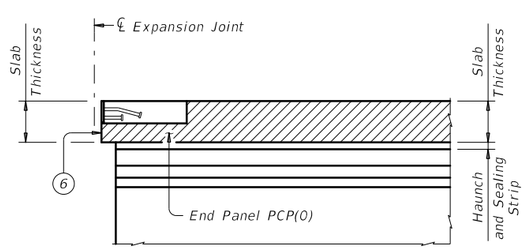
SHOWING PCP(O) EXPOSED REINFORCING STEEL

Field placed bars M shown for clarity.

PANEL LAYOUT

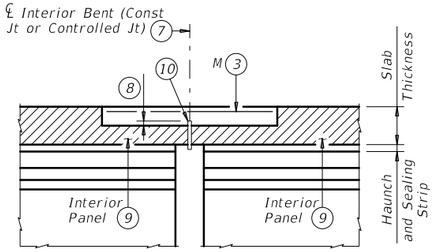
PCP(O) shown with gaps between panels for clarity.
The gap cannot be considered as a panel fabrication tolerance.

1. 1'-4" x 1'-6" x 4 ½" 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 ½" 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, ¾" Max, support as necessary.
9. Place panel within ½" of ¾" thick board.
10. ¾" thick wood/timber board, leave in place. Place straight, within ¼" 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 ½" End Cover. (Typ)



EXPANSION JOINT

For SEJ-A, SEJ-S(0), AJ and Type A Expansion Joints only.

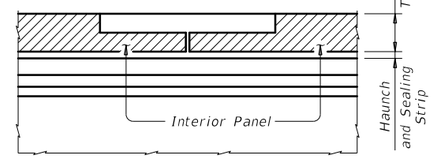


CONST JT OR CONTROLLED JT

Panel against Panel between Bms/Girders.

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

Texas Department of Transportation

Bridge Division

PRECAST CONCRETE PANELS FOR OVERHANGS

PCP(O)

FILE: pcpostd1-17.dgn	DN: KLM	CK: DVL	DW: JTR	CK: KLM
©TxDOT August 2017	CONT	SECT	JOB	HIGHWAY
REVISIONS	0106	04	036	US 380
	DIST	COUNTY		SHEET NO.
	ABL	STONEWALL		138

DATE: 4/28/2022 7:18:13 PM
FILE: c:\pw_work\atknat1x01\rome2243\dms57900\pcpostd1A.dgn

BAR TABLE		
BAR	SIZE	MAX SPA (IN)
A (12)(17)	#4	9"
G (12)(17)	#4	3½"
M	#4	9"
T (12)(17)	#4	9"

(4) It is recommended to profile every 4 ft by surveying each girder under PCP(0) 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 ½" End Cover on bars. (Typ)

(13) Space bars UP(#4) with girder bars R(#4) in all areas where measured haunch exceeds 3 ½" with Prestressed Concrete I-Girders. Epoxy coating for Bars UP is not required.

(14) 6" plus or minus.

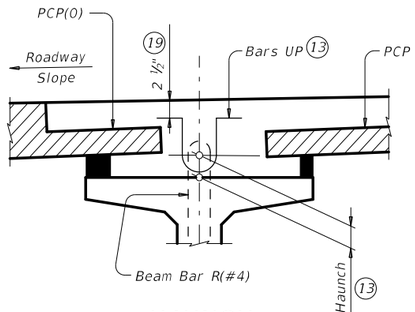
(15) Place sealing strip at flange edge as shown. Butt adjacent sealing strips longitudinally together with adhesive. Use pencil vibrators with concrete placement over girder and between sealing strips to avoid rupturing sealing strips. Cut sealing strips 2" higher than anticipated haunch thickness and compress to grade.

(16) (#3) Panel bars F must be field bent and welded to the R bars in girder. Two bars F per panel.

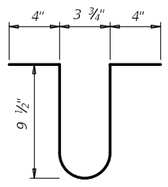
(17) Field placed bars that are allowed to be lapped. Reinforcing steel that protrudes from panels are not considered bars to be lapped. See "Material Notes" for applicable bar laps.

(18) ℄ Leveling Bolt Pad. 1" Dia Coil Rod or 1" Dia Coil Bolt shown, are furnished by the contractor. After grading each PCP(0) 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 ½" 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.

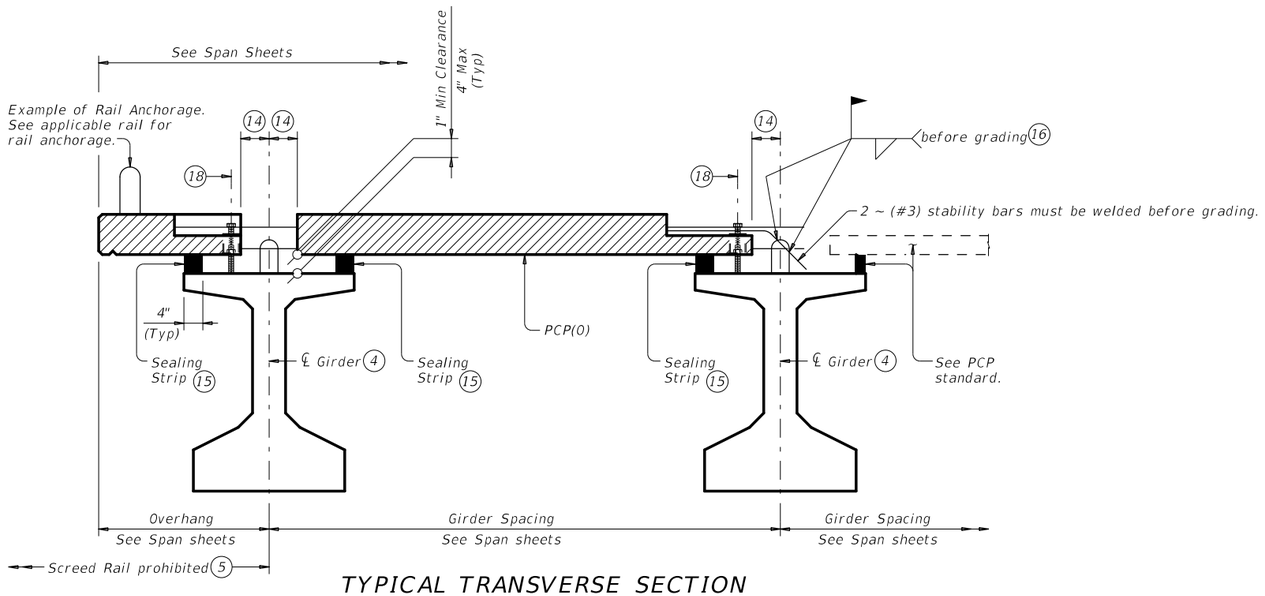
(19) Unless shown otherwise on Span Details.



HAUNCH REINFORCING DETAIL (4)



BARS UP (#4) (13)



TYPICAL TRANSVERSE SECTION

(Showing Girder Type Tx46)

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(0) 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(0)-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

Texas Department of Transportation | Bridge Division

PRECAST CONCRETE PANELS FOR OVERHANGS

PCP(O)

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©TxDOT August 2017	CONT	SECT	JOB	HIGHWAY
REVISIONS	0106	04	036	US 380
	DIST	COUNTY		SHEET NO.
	ABL	STONEWALL		139

DATE: 4/28/2022 7:18:17 PM
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BAR TABLE	
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

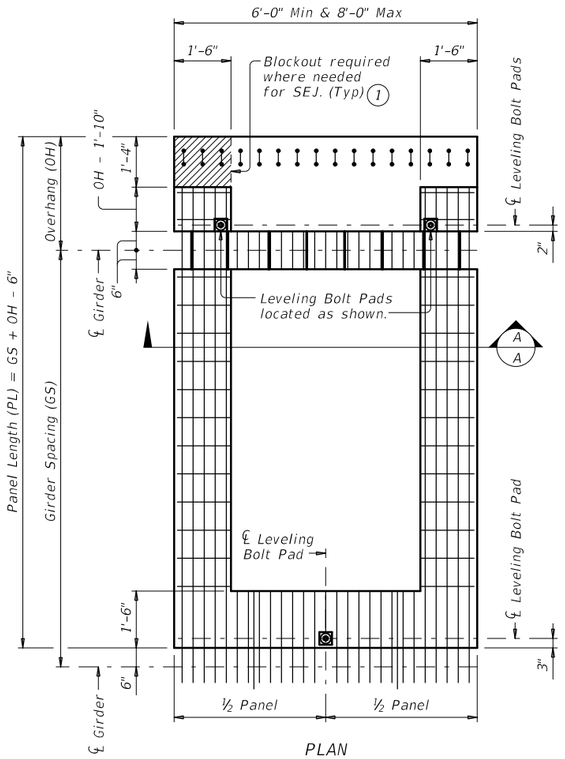
(1) 1'-4" x 1'-6" x 4 ½" blockout to accommodate SEJ that require an upturn. Contractor to communicate with fabricator the location and type of SEJ to be utilized.

(2) 1 ½" End Cover on bars. (Typ)

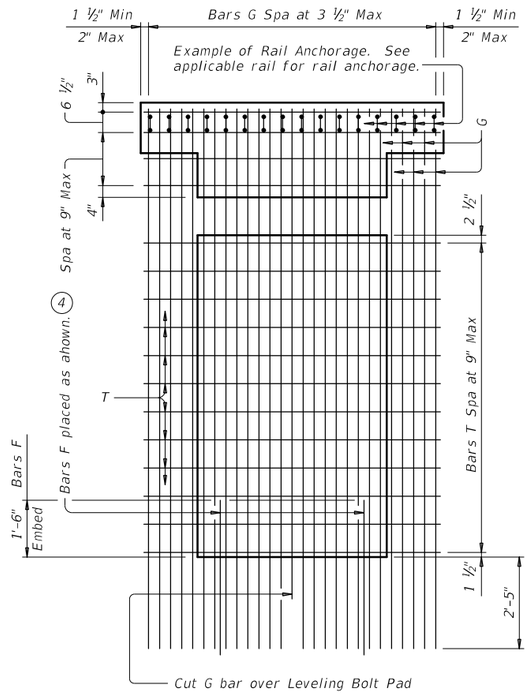
(3) Bars that are not allowed to have lap splices.

(4) Place F bars under bars T and against bars G.

(5) Place F bars under bars T and between bars A.

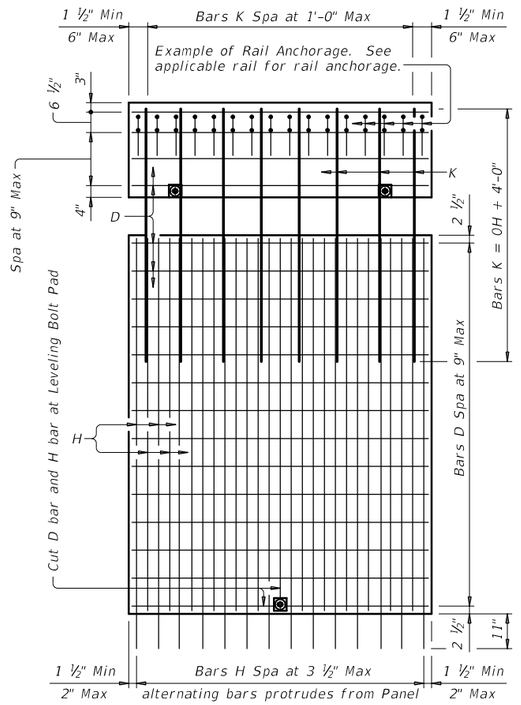


PLAN

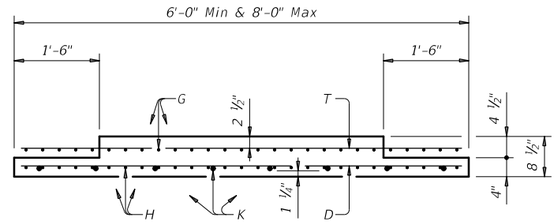


TOP REINFORCING STEEL

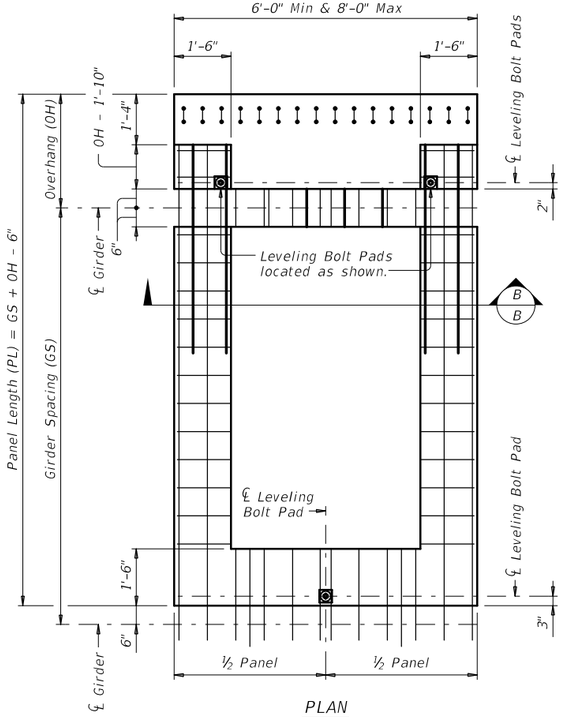
END PANEL



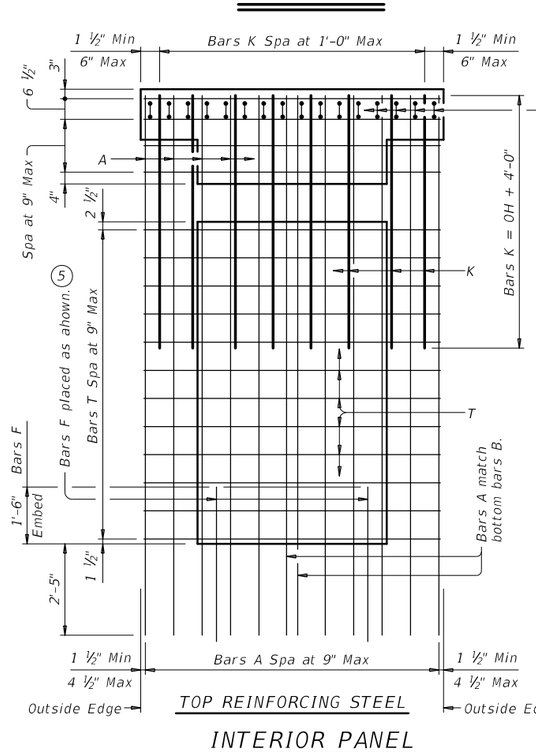
BOTTOM REINFORCING STEEL



SECTION A-A

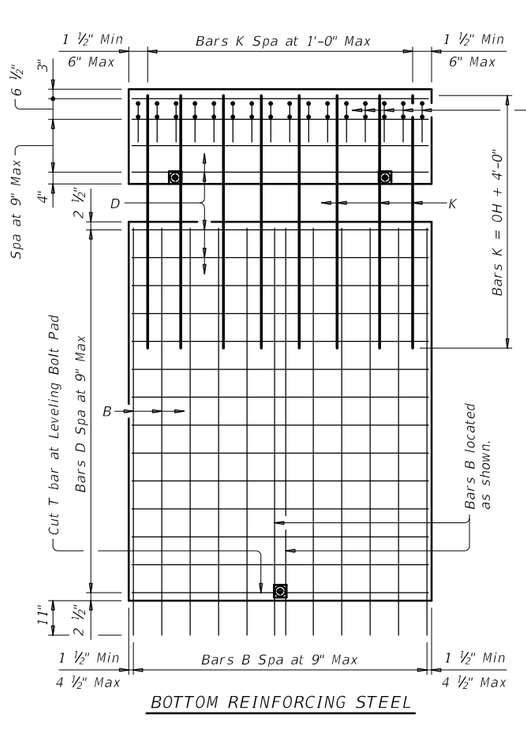


PLAN

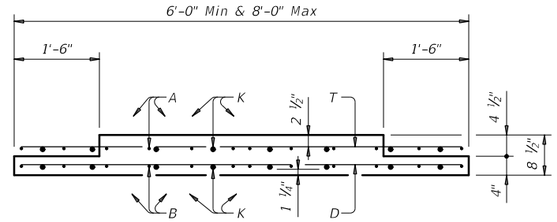


TOP REINFORCING STEEL

INTERIOR PANEL



BOTTOM REINFORCING STEEL



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

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REVISIONS	0106	04	036	US 380
	DIST	COUNTY		SHEET NO.
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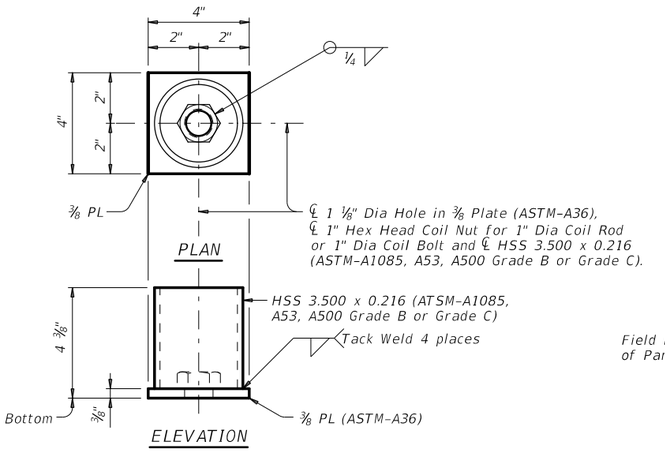
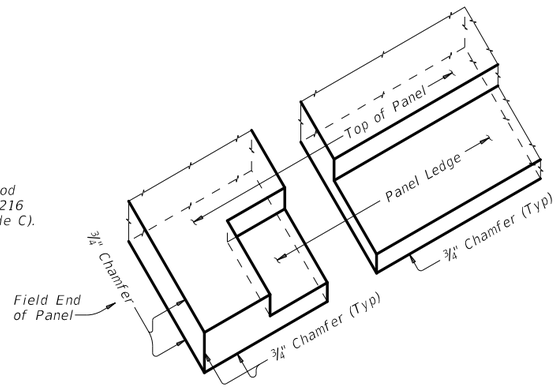


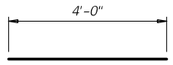
LEVELING BOLT PAD DETAILS

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

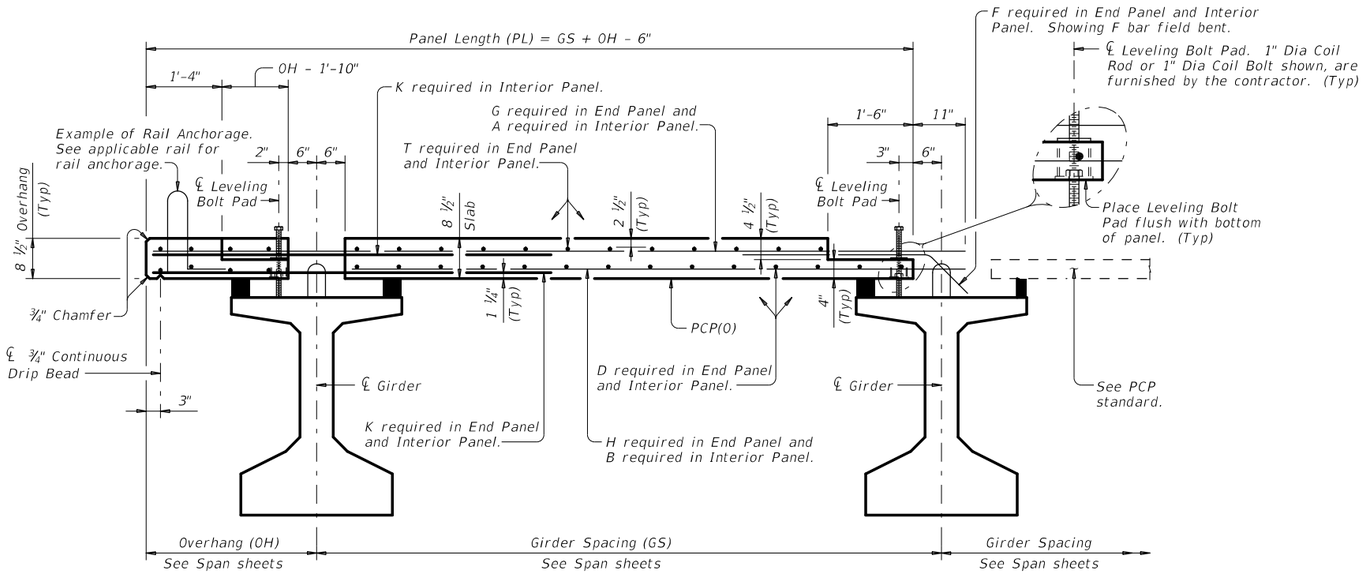


ISOMETRIC VIEW AT CORNER OF PANEL

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 ¾" 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

Texas Department of Transportation

Bridge Division

PRECAST CONCRETE PANELS FOR OVERHANGS FABRICATION DETAILS

PCP(O)-FAB

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©TxDOT August 2017	CONT	SECT	JOB	HIGHWAY
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	DIST	COUNTY		SHEET NO.
	ABL	STONEWALL		141

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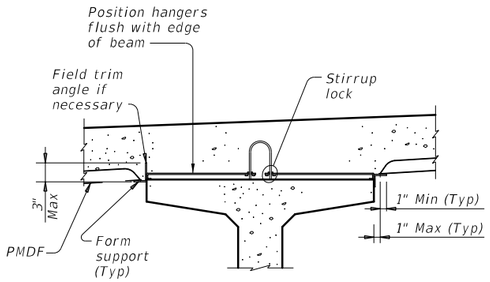
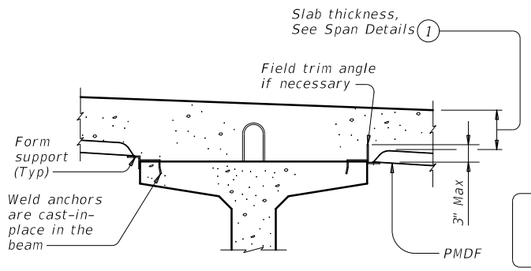
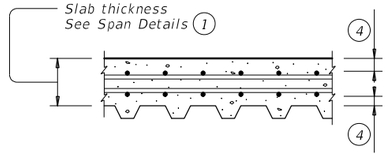


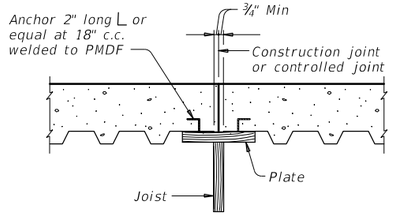
PRESTR CONC I-BEAMS AND I-GIRDERS WITH STIRRUP LOCKS



PRESTR CONC I-BEAMS AND I-GIRDERS WITH WELD ANCHORS

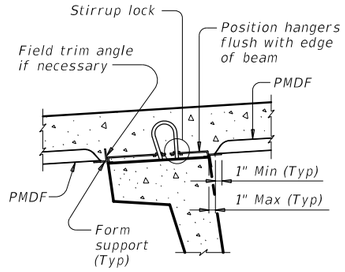


TYP LONGITUDINAL SLAB SECTION

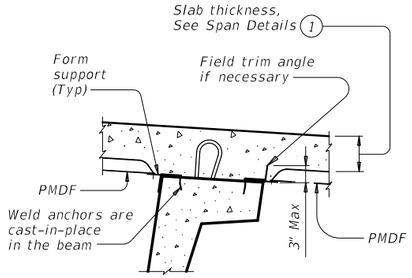


Note: In spans where PMD forms are used, timber forms must be used at construction joints. Adequate provision must be made to support edge of metal form and to provide anchorage of metal form to slab concrete where joined to wood forms.

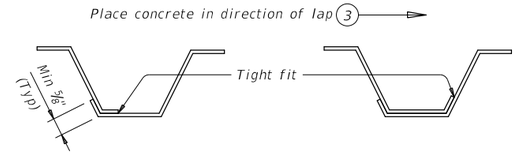
SECTION THRU CONSTRUCTION JOINT



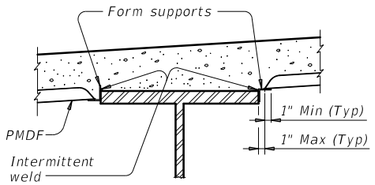
U-BEAMS WITH STIRRUP LOCKS



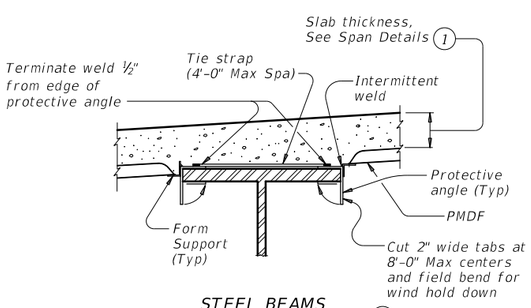
U-BEAMS WITH WELD ANCHORS



SIDE LAP DETAILS

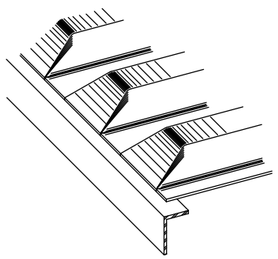


STEEL BEAMS AT COMPRESSION FLANGES

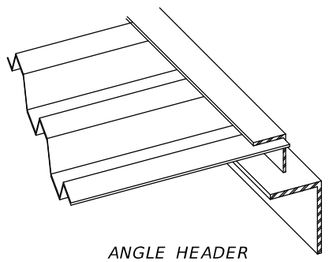


STEEL BEAMS AT TENSION FLANGES (2)

TYPICAL TRANSVERSE SECTIONS



PRECLOSED



ANGLE HEADER

NOTE: This type is to be used for skewed ends only.

TYPES OF END CLOSURES

(1) Slab thickness minus 5/8" if corrugations match reinforcing bars.

(2) Welding of form supports to tension flanges will not be permitted. Other methods of providing wind hold down resistance for PMDF in tension flange zones will be considered. At least one layer of sheet metal must be provided between the flange and the weld joint.

(3) The direction of concrete placement will be such that the upper layer of the form overlap is loaded first.

(4) See Span details for cover requirements.

GENERAL NOTES:

Steel for Permanent Metal Deck Forms (PMDF) and support angles shall conform to ASTM A653, structural steel (SS), with coating designation G165. Steel must have a minimum yield strength of 33 ksi. Minimum thickness of PMDF is 20 gage and that of support angles and protective angles is 12 gage.

Submit two copies of forming plans for PMDF to the Engineer. These plans must show all essential details of proposed form sheets, closures, fasteners, supports, connectors, special conditions and size and location of welds. These plans must clearly show areas of tension flanges for steel beams and provisions for protecting the tension flanges from welding notch effects by inclusion of separating sheet metal or other positive method. These plans must be designed, signed, and sealed by a licensed professional engineer. Department approval of these plans is not required, but the Department reserves the right to require modifications to the plans. The Contractor is responsible for the adequacy of these plans.

The details and notes shown on this standard are to be used as a guide in preparation of the forming plans.

All material, labor, tools and incidentals necessary to form a bridge deck with Permanent Metal Deck Forms is considered subsidiary to Item 422, "Concrete Superstructures".

FOR PRESTR CONC U-BEAM AND STEEL GIRDER BRIDGES:
Unless shown elsewhere in the plans, size, spacing, and orientation of bottom mat of slab reinforcement must match the top mat of reinforcing shown on the span details except all bottom mat bars are to be #5. Bottom mat reinforcement and additional concrete is subsidiary to Item 422 "Concrete Superstructures."

FOR PRESTR CONC TX-GIRDER BRIDGES:
See Miscellaneous Slab Details, Prestr Concrete I-Girders (IGMS) standard sheet for bottom mat reinforcing.

DESIGN NOTES:

As a minimum, PMDF and support angles must be designed for the dead load of the form, reinforcement and concrete plus 50 psf for construction loads. Flexural stresses due to these design loads must not exceed 75 percent of the yield strength of the steel. Allowable stress for weld metal must be 12,400 psi.

Maximum deflection under the weight of forms, reinforcement and concrete or 120 psf, whichever is greater, shall not exceed the following:

1/180 of the form design span, but not more than 0.50", for design spans of 10' or less.

1/240 of the form design span, but not more than 0.75", for design spans greater than 10'.

The form design span must not be less than the clear distance between beam flanges, measured parallel to the form flutes, minus 2".

CONSTRUCTION NOTES:

Form sheets must not be permitted to rest directly on the top of beam flanges. Form sheets must be securely fastened to form supports and must have a minimum bearing length of one inch at each end. Form supports must be placed in direct contact with beam flanges.

All attachments must be made by permissible welds, screws, bolts, clips or other means shown on the the forming plans. All sheet metal assembly screws must be installed with torque-limiting devices to prevent stripping. Only welds or bolts must be used to support vertical loads.

Welding and welds must be in accordance with the provisions of Item 448, "Structural Field Welding", pertaining to fillet welds. All welds must be made by a qualified welder in accordance with Item 448.

All permanently exposed form metal, where the galvanized coating has been damaged, must be thoroughly cleaned and repaired in accordance with Item 445, "Galvanizing". Minor heat discoloration in areas of welds need not be touched up.

Flutes must line up uniformly across the entire width of the structure where main reinforcing steel is located in the flute.

Construction joints will not be permitted unless shown on the plans. The location of and forming details for any construction joint used must be shown on the forming plans. Forms below a construction joint must be removed after curing of the slab.

A sequence for uniform vibration of concrete must be approved by the Engineer prior to concrete placement. Attention must be given to prevent damage to the forms, yet provide proper vibration to prevent voids or honeycomb in the flutes and at headers and/or construction joints.

Texas Department of Transportation

Bridge Division Standard

PERMANENT METAL DECK FORMS

PMDF

FILE: pmdfste1-20.dgn	DN: TxDOT	CK: TxDOT	DW: TxDOT	CK: TxDOT
©TxDOT April 2019	CONT	SECT	JOB	HIGHWAY
REVISIONS	0106	04	036	US 380
02-20: Modified box note by adding steel beams/girders and subsidiary.	DIST	COUNTY		SHEET NO.
	ABL	STONEWALL		142

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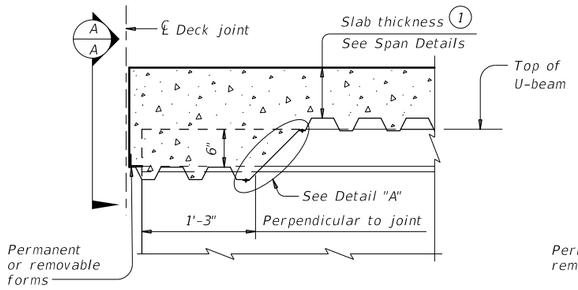
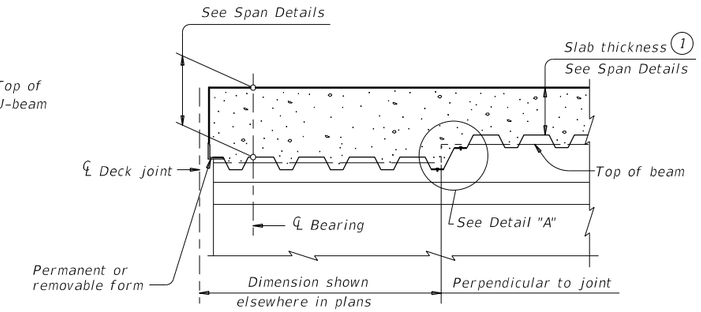
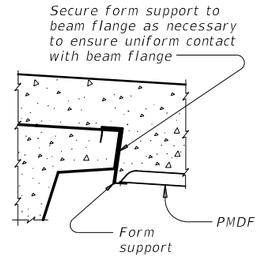


AT THICKENED SLAB END FOR U-BEAMS

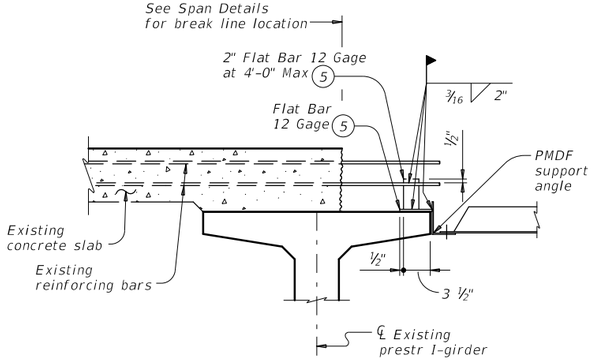


AT THICKENED SLAB END FOR PRESTRESSED I-BEAMS, I-GIRDERS AND STEEL BEAMS

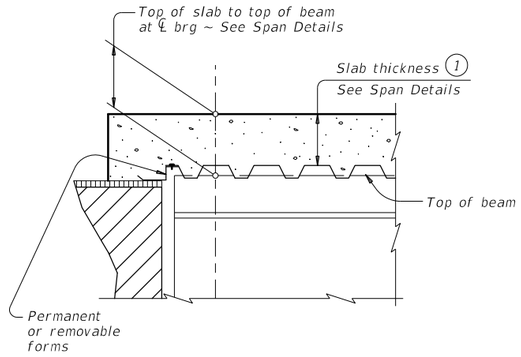
Showing I-beam block-out. No block-out for I-girders or steel beams.



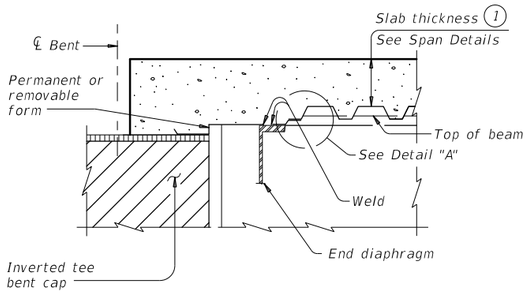
SECTION A-A



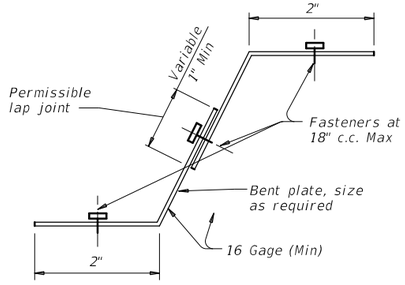
SHOWING PRESTRESSED CONCRETE I-BEAMS, I-GIRDERS AND U-BEAMS



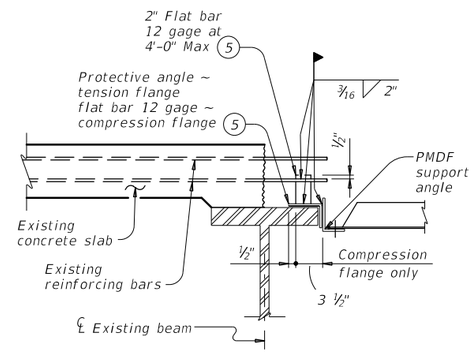
AT SLAB OVER ABUT BKWL OR INV TEE STEM FOR CONC BEAMS WITHOUT THICKENED SLAB END



AT SLAB OVER INV TEE STEM FOR STEEL BEAMS WITHOUT THICKENED SLAB END

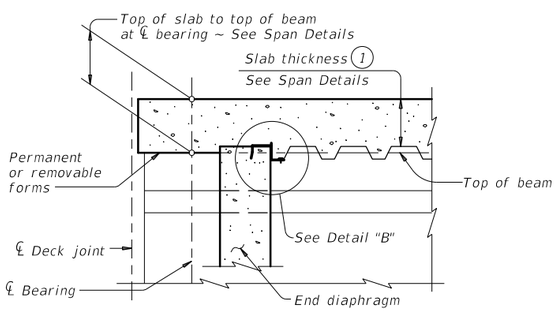


DETAIL "A"

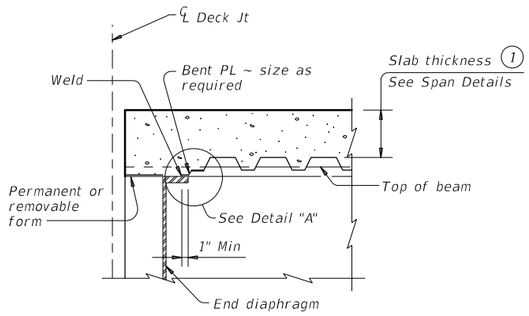


SHOWING STEEL BEAMS

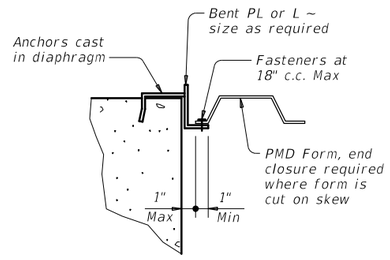
WIDENING DETAILS



AT CONC END DIAPHRAGM FOR PRESTRESSED I-BEAMS AND STEEL BEAMS



AT END DIAPHRAGM FOR STEEL BEAMS WITHOUT THICKENED SLAB END



DETAIL "B"

(1) Slab thickness minus 3/8" if corrugations match reinforcing bars

(5) Minimum yield stress of 12 gage bars shall be 40 ksi

DETAILS AT ENDS OF BEAMS

SHEET 2 OF 2

Texas Department of Transportation

Bridge Division Standard

PERMANENT METAL DECK FORMS

PMDF

FILE: pmdfste1-20.dgn	DN: TxDOT	CK: TxDOT	DW: TxDOT	CK: TxDOT
©TxDOT April 2019	CONT	SECT	JOB	HIGHWAY
REVISIONS	0106	04	036	US 380
02-20: Modified box note by adding steel beams/girders and subsidiary.	DIST	COUNTY		SHEET NO.
	ABL	STONEWALL		143

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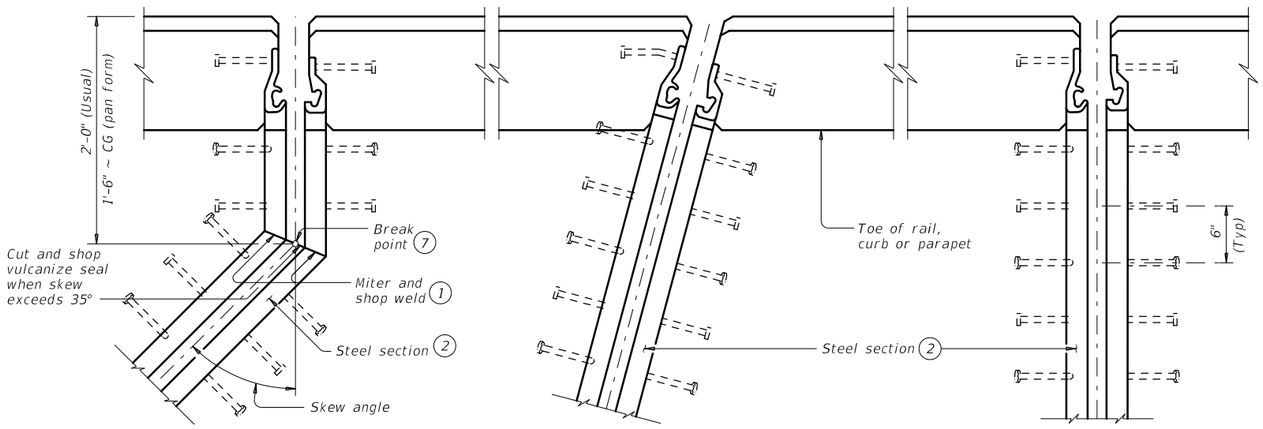
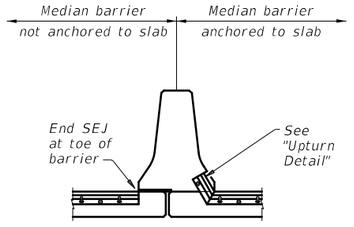


SHOWING SKEWS WITH SLAB BREAKBACKS

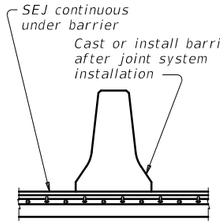
SHOWING SKEWS WITHOUT SLAB BREAKBACKS

SHOWING WITHOUT SKEWS AND SLAB BREAKBACKS

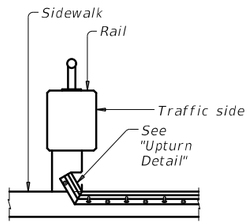
PLANS OF END CONDITIONS



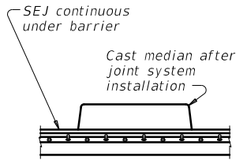
WITH OPEN DECK JOINT BELOW MEDIAN BARRIER



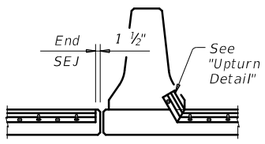
AT MEDIAN BARRIER



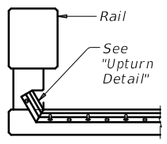
AT SIDEWALK BEHIND BRIDGE RAIL



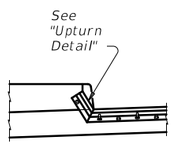
AT RAISED MEDIAN



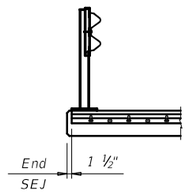
WITH OPEN DECK JOINT ADJACENT TO MEDIAN BARRIER



AT CONCRETE BRIDGE RAIL

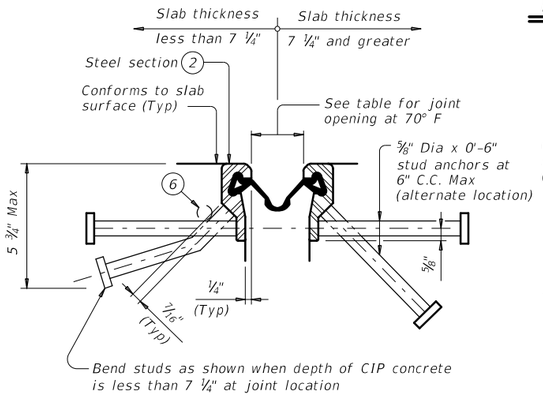


AT SIDEWALK

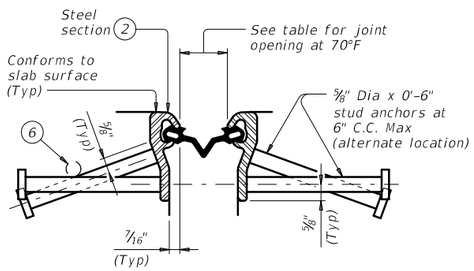


AT STEEL POST BRIDGE RAIL

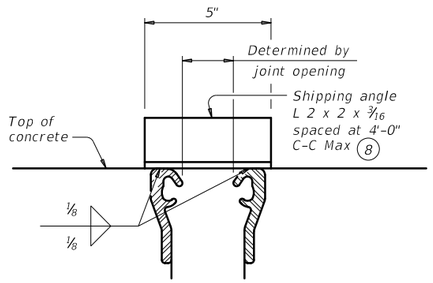
TYPICAL SECTIONS (5)



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



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



SHOWING D.S. BROWN (Ty SSCM2)
(All joints are similar.) (Studs are not shown for clarity.)

SHIPPING ANGLE

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

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 ¾"	A2R-XTRA	2"
Watson Bowman Acme	Type R	SE-400	1 ¾"	SE-500	2"

REDUCED LONGITUDINAL MOVEMENT RANGE

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).

(1) Remove all burrs which will be in contact with seal prior to making splice.

(2) Shape of steel section shown is typical. Variations in sections must be approved by the Engineer.

(3) These openings are also the recommended minimum installation openings.

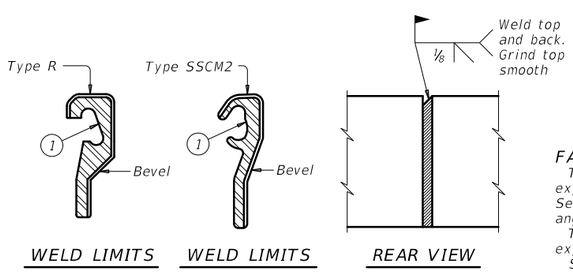
(4) Reduce for sidewalk or parapet heights less than 6".

(5) Other conditions affecting the joint profile should be noted elsewhere.

(6) 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.

(7) See Span details for location of break point.

(8) Align shipping angle perpendicular to joint.



WELD LIMITS WELD LIMITS REAR VIEW

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.

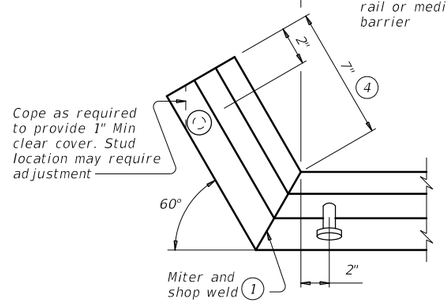
Ship steel sections in convenient lengths of 10'-0" Min and 24'-0" Max unless necessary for staged construction or widenings. One shop splice is permitted in each shipping length provided no piece is less than 2'-0" long and sufficient studs are added to limit the stud to shop splice distance to 2" Min 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, "Feild 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.



UPTURN DETAIL

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 ½".

Texas Department of Transportation

Bridge Division Standard

SEALED EXPANSION JOINT TYPE M WITHOUT OVERLAY

SEJ-M

FILE: sejmste1-19.dgn	DN: TxDOT	CK: TxDOT	DW: JTR	CK: JMH
©TxDOT April 2019 REVISIONS	CONT	SECT	JOB	HIGHWAY
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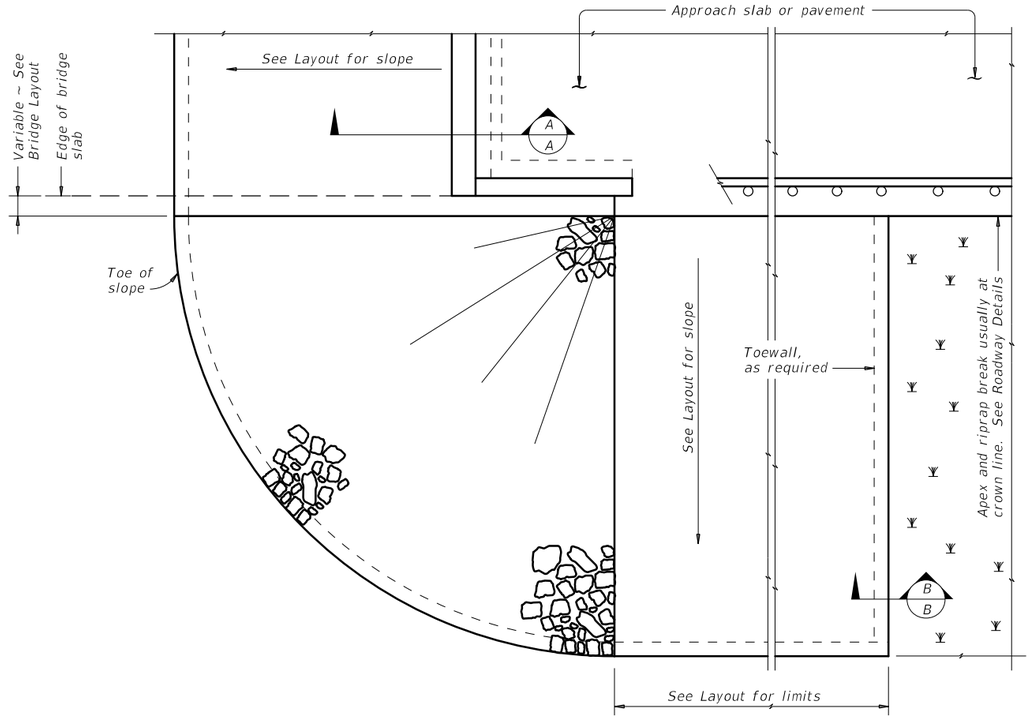
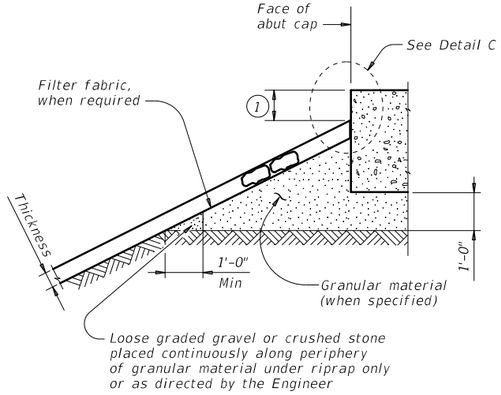
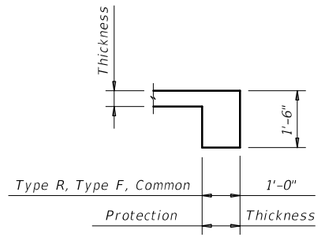
	DIST	COUNTY		SHEET NO.
	ABL	STONEWALL		144



PLAN

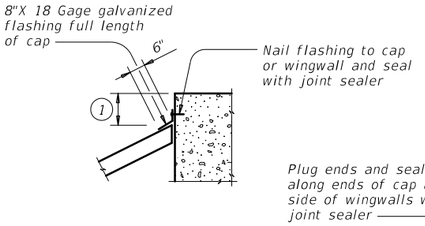


SECTION A-A AT CAP

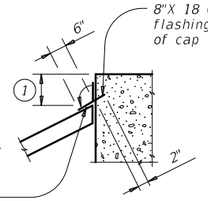


SECTION B-B

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

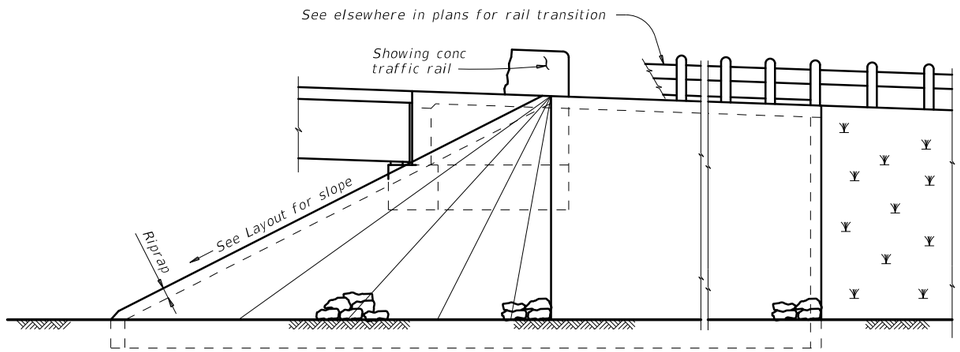


CAP OPTION A



CAP OPTION B

DETAIL C



ELEVATION

(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.

Texas Department of Transportation

Bridge Division Standard

STONE RIPRAP

SRR

FILE: srrstde1-19.dgn	DN: AES	CK: JGD	DW: BWH	CK: AES			
©TxDOT April 2019	CONT	SECT	JOB		HIGHWAY		
REVISIONS	0106	04	036		US 380		
	DIST	COUNTY			SHEET NO.		
	ABL	STONEWALL			145		

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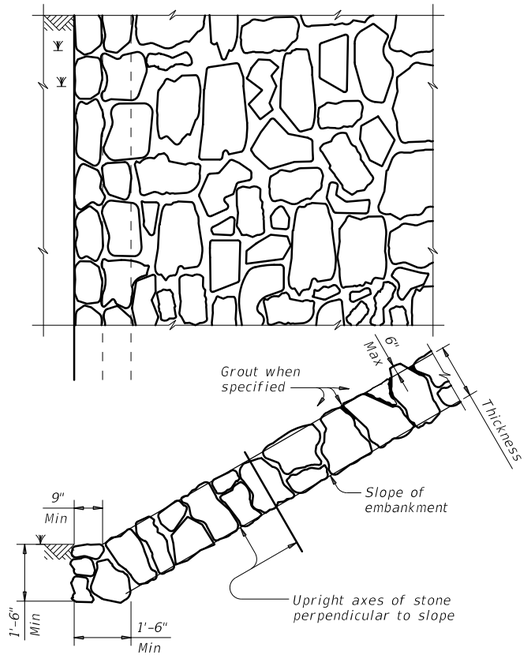


FIGURE 1 ~ TYPE R STONE RIPRAP

dry or grouted

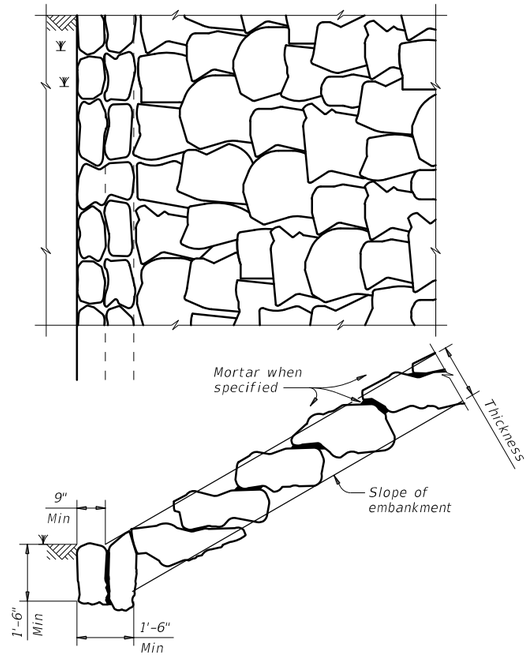


FIGURE 2 ~ TYPE F STONE RIPRAP

dry or mortared

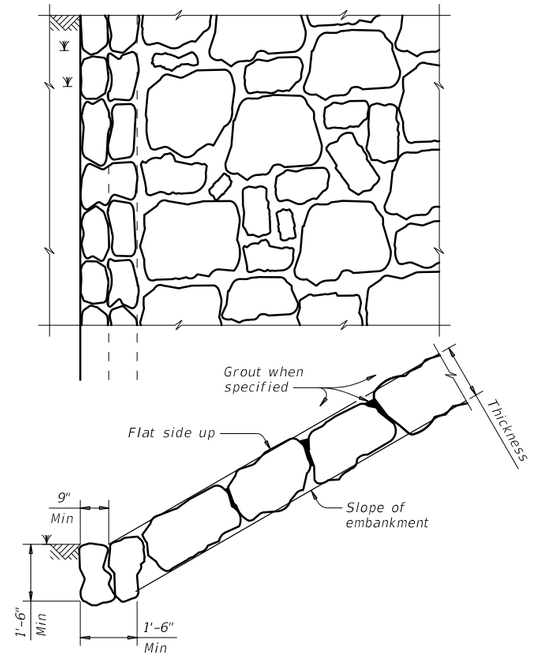


FIGURE 3 ~ TYPE F STONE RIPRAP

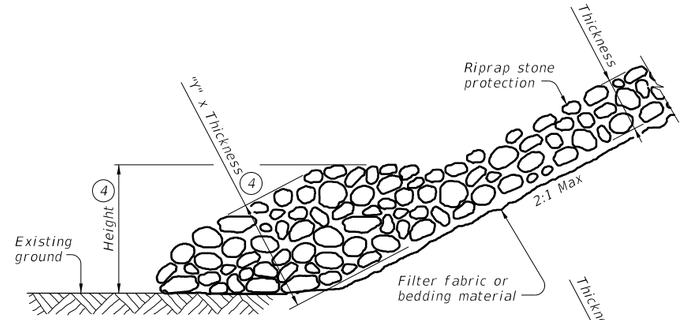
grouted

(2) Provide bedding material instead of filter fabric if shown elsewhere in plans. See Layout for thickness of bedding material.

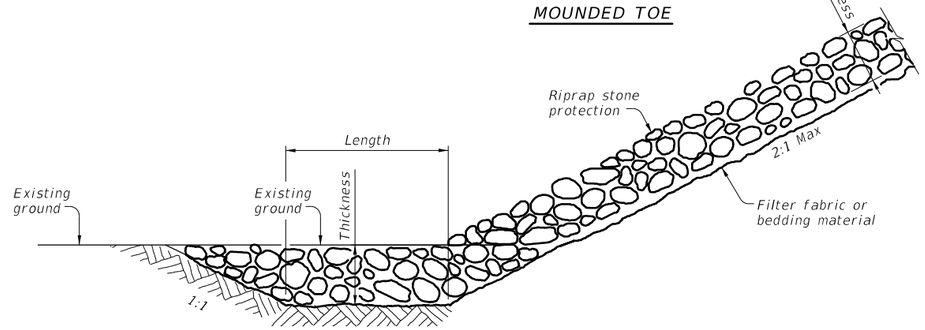
(3) Minimum toe depth is the larger of the maximum scour depth or 2 times the riprap thickness.

(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.



MOUNDED TOE



EXTENDED ROCK FILLED TRENCH

PROTECTION STONE RIPRAP TOE OPTIONS (5)

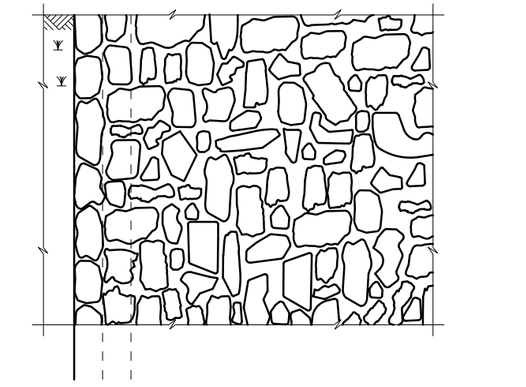


FIGURE 4 ~ COMMON STONE RIPRAP

dry or grouted

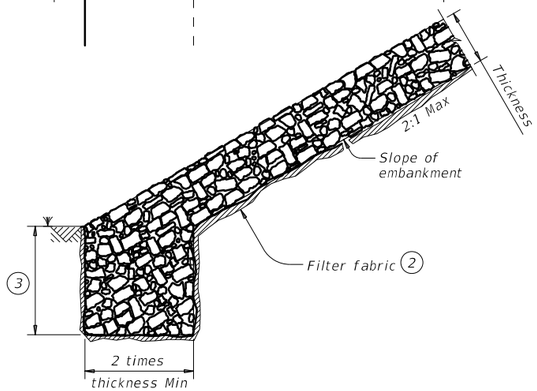


FIGURE 5 ~ PROTECTION STONE RIPRAP (5)

SHEET 2 OF 2

Texas Department of Transportation | Bridge Division Standard

STONE RIPRAP

SRR

FILE: srrstde1-19.dgn	DN: AES	CK: JGD	DW: BWH	CK: AES
©TxDOT April 2019	CONT	SECT	JOB	HIGHWAY
REVISIONS	0106	04	036	US 380
	DIST	COUNTY		SHEET NO.
	ABL	STONEWALL		146

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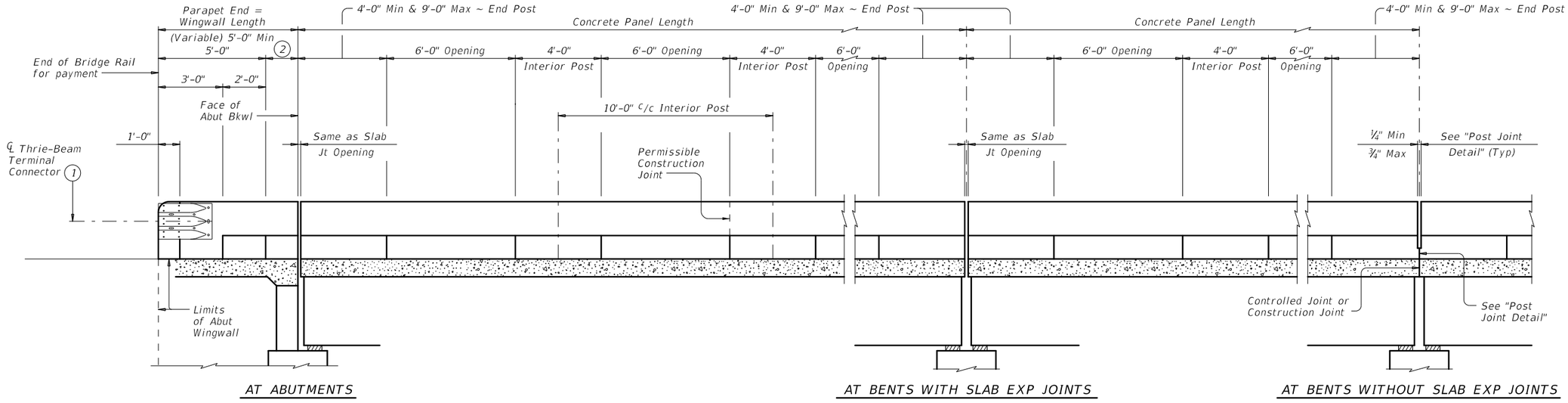
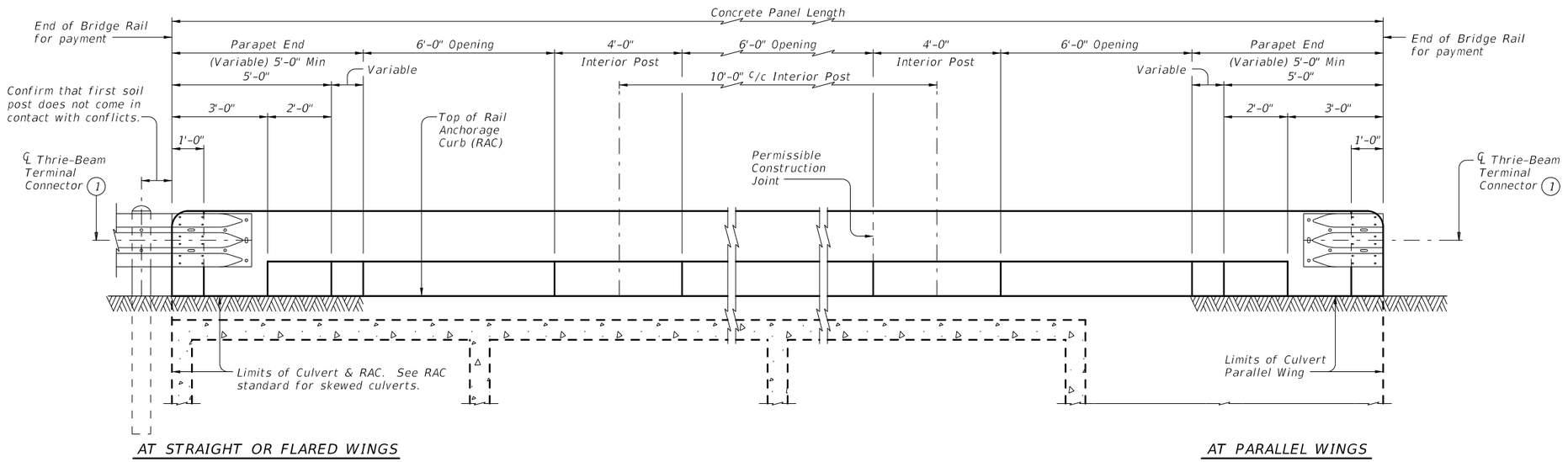


ROADWAY ELEVATION OF RAIL ON BRIDGE



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)

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SHEET 1 OF 3

Texas Department of Transportation

Bridge Division Standard

TRAFFIC RAIL

TYPE T223

FILE: rlstd005-19.dgn	DN: TxDOT	CK: TxDOT	DW: JTR	CK: AES
©TxDOT September 2019 REVISIONS	CONT	SECT	JOB	HIGHWAY
	0106	04	036	US 380
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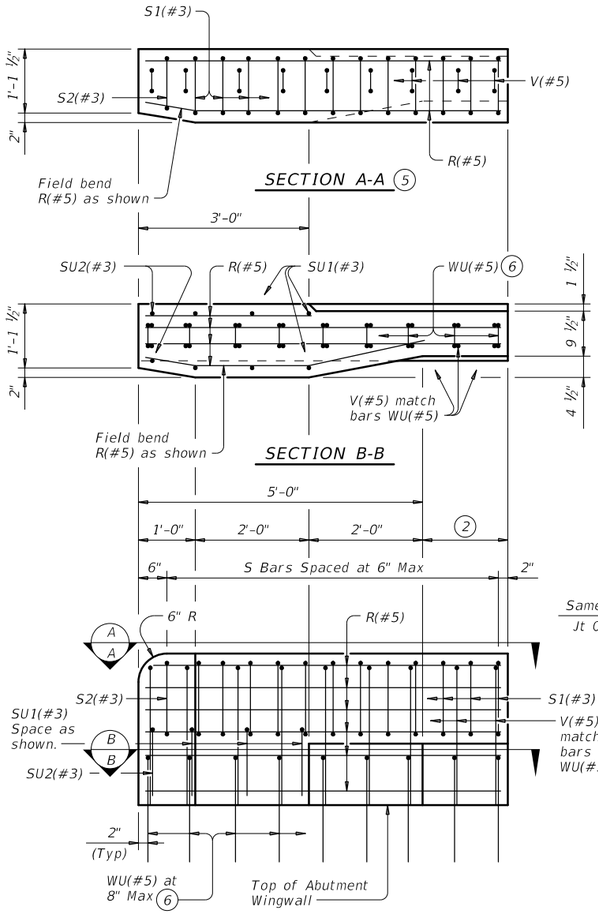
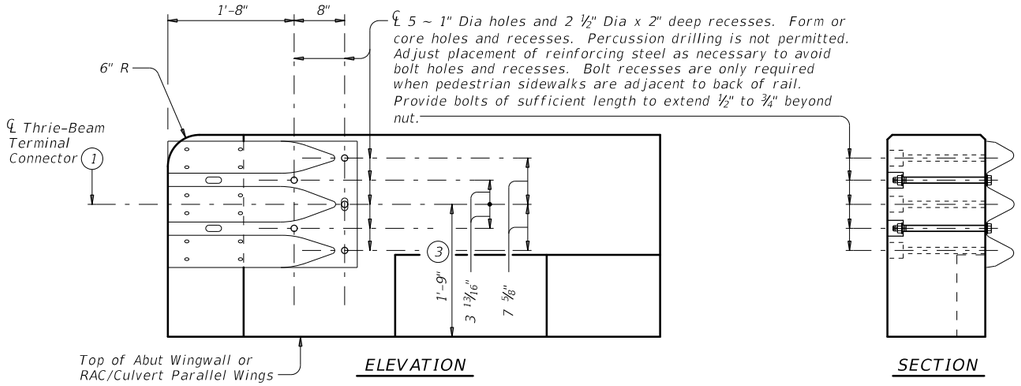
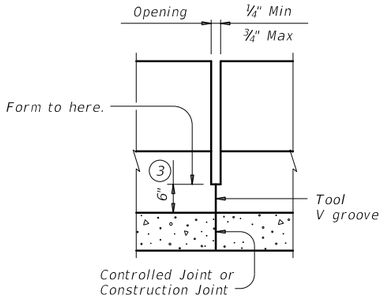
	ABL	STONEWALL		147



PARAPET END AT ABUT WINGWALL (6)

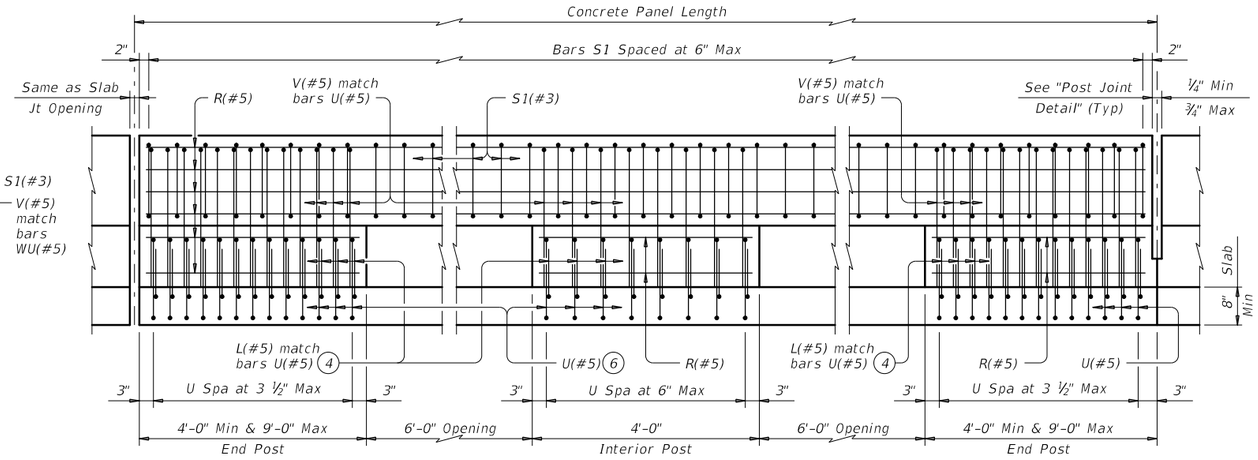


TERMINAL CONNECTION DETAILS



POST JOINT DETAIL

Provide at all interior bents without slab expansion joints.



AT SLAB EXPANSION JOINTS

AT 4' INTERIOR POST

AT BENTS WITHOUT SLAB EXPANSION JOINTS

ELEVATION SHOWING TYPICAL REINFORCING PLACEMENT

Showing rail on slab. Rail on box culvert similar.

(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 achorage curb over culvert top slab. Use Bars WU(#5) in culvert parallel wings.

Texas Department of Transportation

Bridge Division Standard

TRAFFIC RAIL

TYPE T223

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©TxDOT	September 2019	CONT	SECT	JOB	HIGHWAY
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		DIST	COUNTY		SHEET NO.
		ABL	STONEWALL		148

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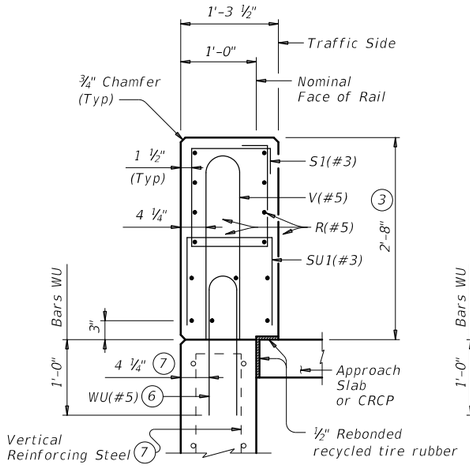
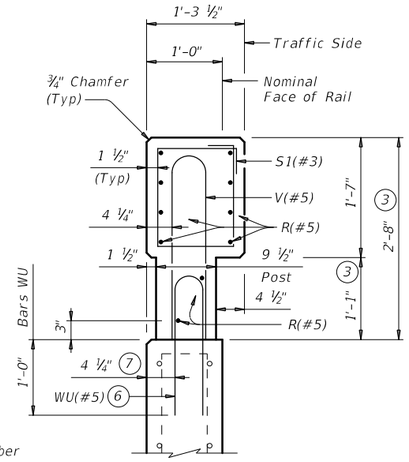
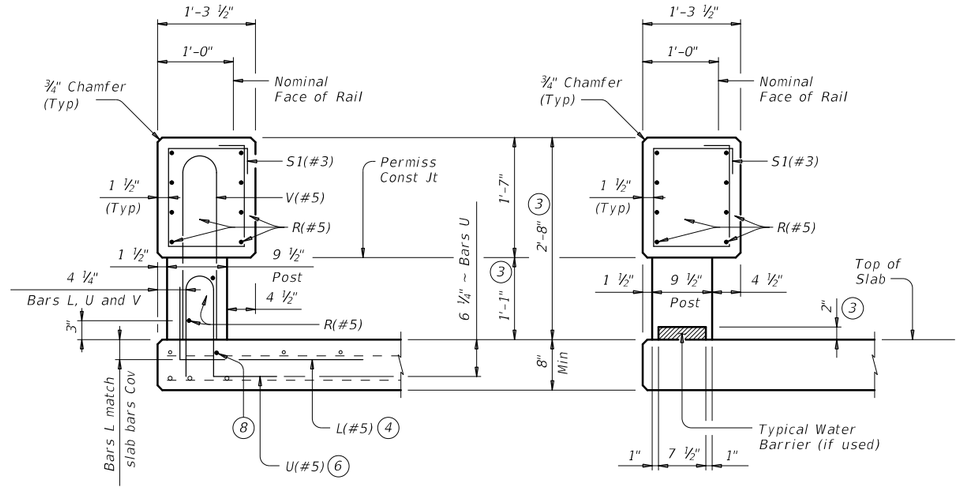


SECTION C-C
ON ABUTMENT WINGWALLS
OR CIP RETAINING WALLS



SECTION D-D
ON ABUTMENT WINGWALLS
OR CIP RETAINING WALLS

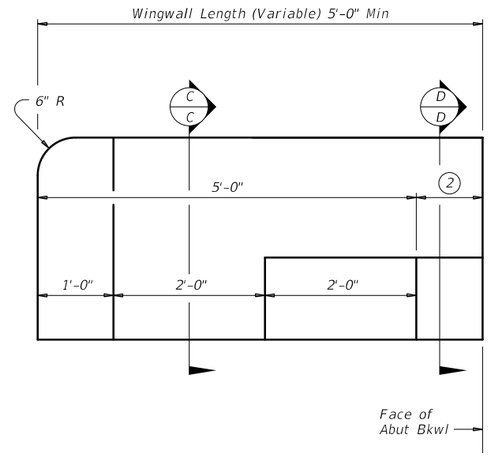


AT POST
ON BRIDGE SLAB

AT OPENING
ON BRIDGE SLAB

SECTIONS THRU RAIL

Sections on box culverts similar.



ELEVATION AT ABUTMENT WINGWALL

Box culvert parallel wings or rail anchorage curb similar.

(2) *Wingwall Length minus 5'-0" (Varies)*

(3) *Increase 2" for structures with overlay.*

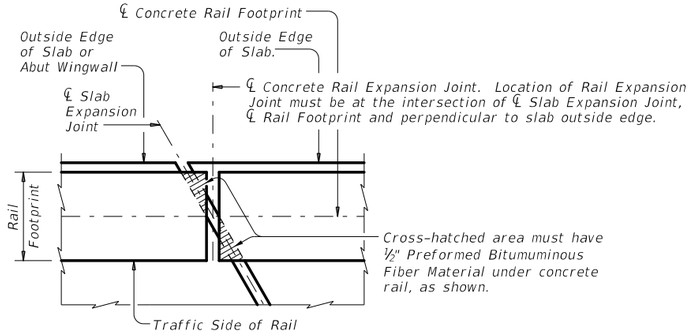
(4) *Bars L(#5) are part of rail reinforcing and are included in unit price bid for railing. Space with Bars U. Bars L match slab bar cover. Bars L may be bundled with top slab reinforcing if spacing is equivalent.*

(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 ¼" 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.

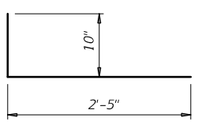
Do not use this railing on bridges with expansion joints providing more than 5" movement.

Rail anchorage details shown on this standard may require modification for select structure types. See appropriate details elsewhere in plans for these modifications.

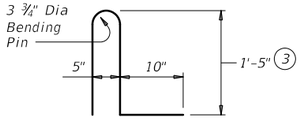
Shop drawings are not required for this rail.

Average weight of railing with no overlay is 358 plf.

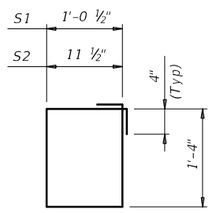
Cover dimensions are clear dimensions, unless noted otherwise. Reinforcing bar dimensions shown are out-to-out of bar.



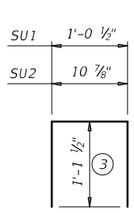
BARS L (#5)



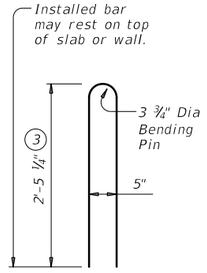
BARS U (#5) (9)



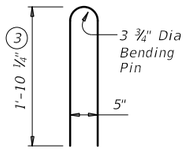
BARS S (#3)



BARS SU (#3)



BARS V (#5) (9)



BARS WU (#5)

SHEET 3 OF 3

Texas Department of Transportation

Bridge Division Standard

TRAFFIC RAIL

TYPE T223

FILE: rlstd005-19.dgn	DN: TxDOT	CK: TxDOT	DW: JTR	CK: AES
©TxDOT September 2019	CONT	SECT	JOB	HIGHWAY
REVISIONS	0106	04	036	US 380
	DIST	COUNTY		SHEET NO.
	ABL	STONEWALL		149

SUMMARY OF SMALL SIGNS

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

PLAN SHEET NO.	SIGN NO.	SIGN NOMENCLATURE	SIGN	DIMENSIONS	FLAT ALUMINUM (TYPE A)	EXAL ALUMINUM (TYPE G)	POST TYPE FRP = Fiberglass TWT = Thin-Wall 10BWG = 10 BWG S80 = Sch 80	POSTS 1 or 2	ANCHOR TYPE UA=Universal Conc UB=Universal Bolt SA=Slipbase-Conc SB=Slipbase-Bolt WS=Wedge Steel WP=Wedge Plastic	MOUNTING DESIGNATION PREFABRICATED P = "Plain" T = "T" U = "U"	MOUNTING DESIGNATION 1EXT or 2EXT = # of Ext BM = Extruded Wind Beam WC = 1.12 #/ft Wing Channel EXAL= Extruded Alum Sign Panels	BRIDGE MOUNT CLEARANCE SIGNS (See Note 2) TY = TYPE TY N TY S
1	1	I-3	Salt Fork of Brazos River	144 X 36	X		10BWG	1	SA	T		
1	2	I-3	Salt Fork of Brazos River	144 X 36	X		10BWG	1	SA	T		

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

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

http://www.txdot.gov/

NOTE:

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

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Texas Department of Transportation

Traffic Operations Division Standard

SUMMARY OF SMALL SIGNS

SOSS

FILE: sums16.dgn	DN: TxDOT	CK: TxDOT	DW: TxDOT	CK: TxDOT
© TxDOT May 1987	CONT	SECT	JOB	HIGHWAY
REVISIONS	0106	04	036	US 380
4-16	DIST	COUNTY		SHEET NO.
8-16	ABL	STONEWALL		150

TB

100% SUBMITTAL

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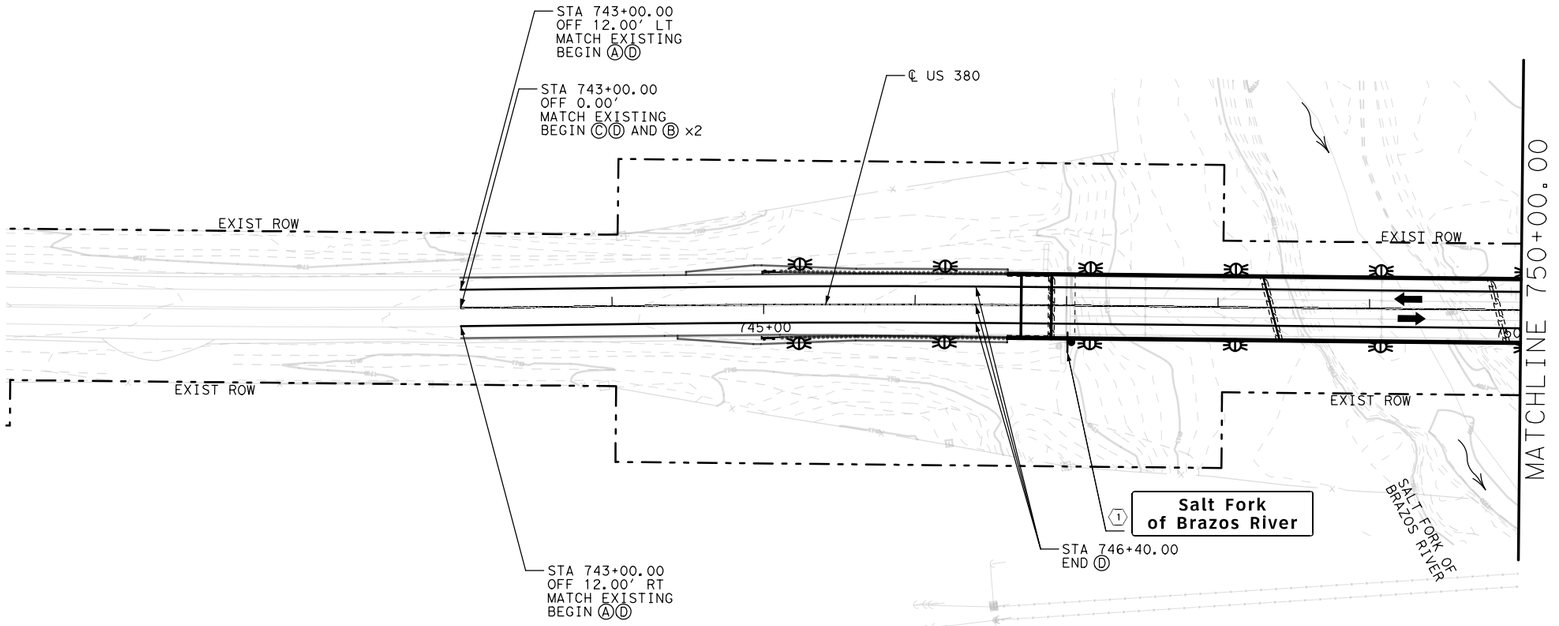


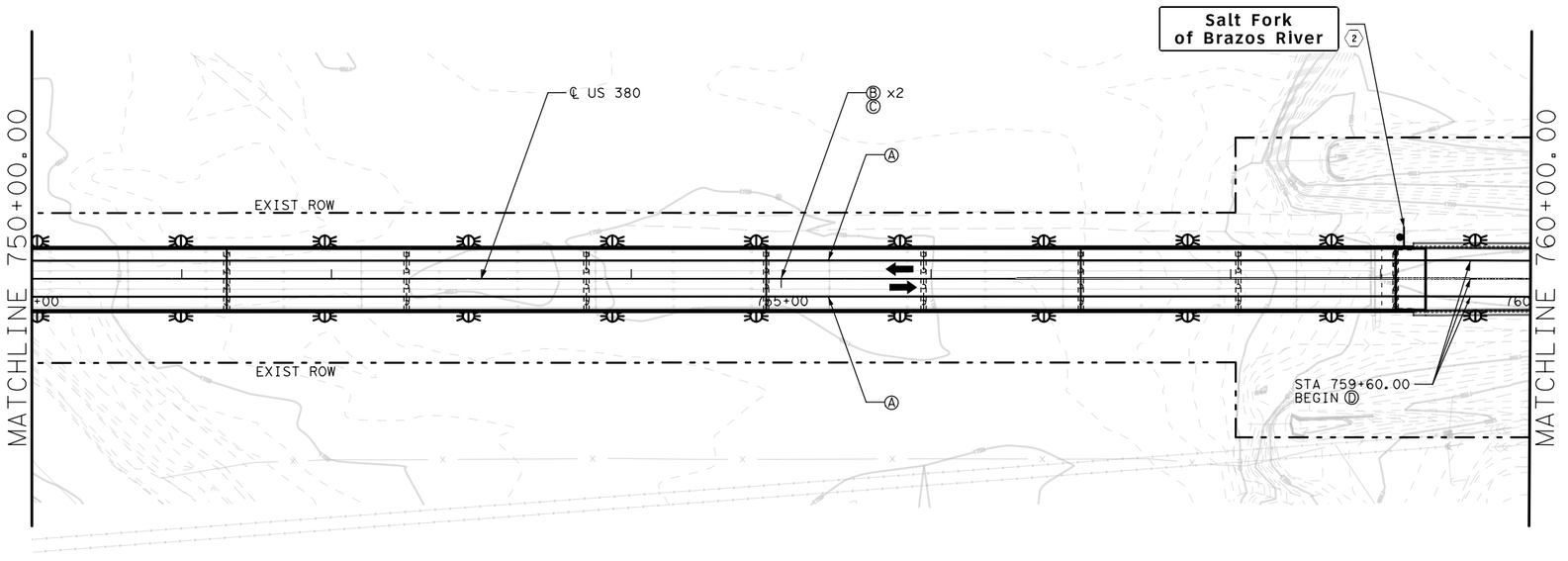
NOTES:

1. ALL SIGNS SHALL BE CONSTRUCTED IN ACCORDANCE WITH DETAILS FOUND IN THE TXDOT "SIGN CREW FIELDBOOK", "TMUTCD" & "STANDARD HIGHWAY SIGN DETAILS FOR TEXAS", LATEST EDITIONS.

LEGEND

- (A) RE PM W/ RET REQ TY I (W)(4")(SLD)(100 MIL)
- (B) RE PM W/ RET REQ TY I (Y)(4")(SLD)(100 MIL)
- (C) REFL PAV MRKR TY II A-A
- (D) CENTERLINE/EDGELINE RUMBLE STRIP
- (X) PROPOSED SMALL SIGN ID
- PROPOSED SMALL SIGN
- PROPOSED OBJECT MARKER
- PROPOSED DELINEATOR
- TRAFFIC DIRECTION

0 25 50 100
SCALE = 1"=100' H



STATE OF TEXAS
JENELLE N. ROMERO
97940
LICENSED
PROFESSIONAL ENGINEER
4/28/2022

ATKINS
TBPE REG. # F-474

Texas Department of Transportation
Abilene District
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US 380

SIGNING AND PAVEMENT MARKING LAYOUT

SHEET 1 OF 2

DESIGNED: SG	FED. RD DIV. No.	STATE	PROJECT No.			HIGHWAY No.
CHECKED: JD	6	TEXAS	SEE TITLE SHEET			US 380
DRAWN: SG	STATE DISTRICT	COUNTY	CONTROL No.	SECTION No.	JOB No.	SHEET No.
CHECKED: JD	ABL	STONEWALL	0106	04	036	151

PLOT DRIVER: TXDOT_PDF_BW.plt
PEN TABLE: US380_pen.tbl
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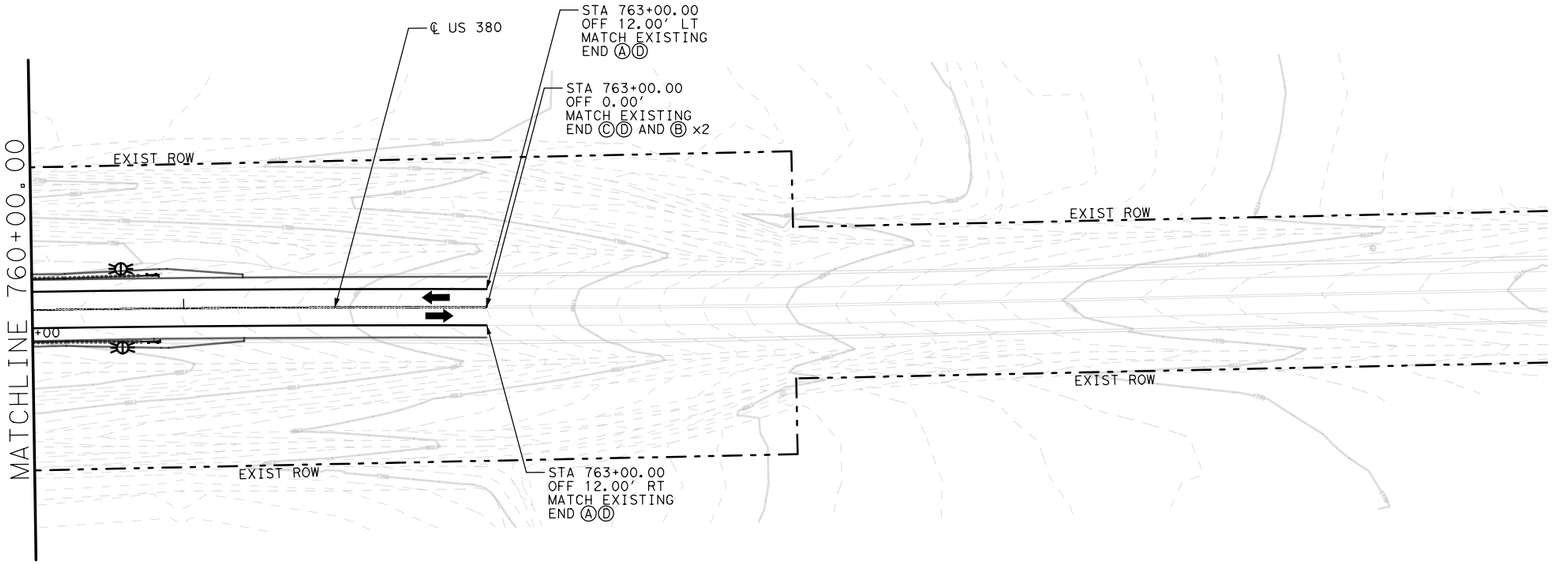
100% SUBMITTAL

DATE: 4/28/2022 TIME: 6:40:15 PM



NOTES:

1. ALL SIGNS SHALL BE CONSTRUCTED IN ACCORDANCE WITH DETAILS FOUND IN THE TXDOT "SIGN CREW FIELDBOOK", "TMUTCD" & "STANDARD HIGHWAY SIGN DETAILS FOR TEXAS", LATEST EDITIONS.

LEGEND

- (A) RE PM W/ RET REQ TY I (W)(4")(SLD)(100 MIL)
- (B) RE PM W/ RET REQ TY I (Y)(4")(SLD)(100 MIL)
- (C) REFL PAV MRKR TY II A-A
- (D) CENTERLINE/EDGELINE RUMBLE STRIP
- (X) PROPOSED SMALL SIGN ID
- PROPOSED SMALL SIGN
- PROPOSED OBJECT MARKER
- PROPOSED DELINEATOR
- TRAFFIC DIRECTION

0 25 50 100
SCALE = 1"=100' H

STATE OF TEXAS
JENELLE N. ROMERO
97940
LICENSED
PROFESSIONAL ENGINEER
4/28/2022

ATKINS
TBPE REG. # F-474

Texas Department of Transportation
Abilene District

US 380

SIGNING AND PAVEMENT MARKING LAYOUT

SHEET 2 OF 2

DESIGNED: SG	FED. RD DIV. No.	STATE	PROJECT No.			HIGHWAY No.
CHECKED: JD	6	TEXAS	SEE TITLE SHEET			US 380
DRAWN: SG	STATE DISTRICT	COUNTY	CONTROL No.	SECTION No.	JOB No.	SHEET No.
CHECKED: JD	ABL	STONEWALL	0106	04	036	152

PLOT DRIVER: TXDOT_PDF_BW.plt
PEN TABLE: US380_pen.tbl
FILE: c:\pw_work\atkmdtx01\rome2243\dms57965\US380_SPM2.dgn

2.3" Radius, 0.8" Border, White on Green;
[Salt Fork] ClearviewHwy-5-W-R; [of] ClearviewHwy-5-W-R;
[Brazos] ClearviewHwy-5-W-R; [River] ClearviewHwy-5-W-R;

ATKINS
TBPE REG. # F-474

Texas Department of Transportation
Abilene District

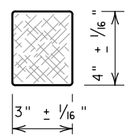
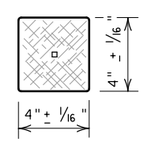
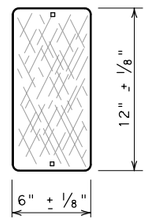
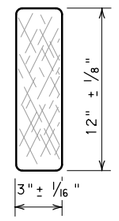
US 380

SIGN DETAILS

N. T. S. SHEET 1 OF 1

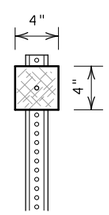
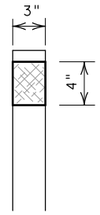
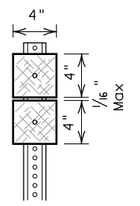
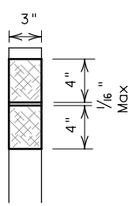
DESIGNED: SG	FED. RD DIV. No.	STATE	PROJECT No.			HIGHWAY No.
CHECKED: JNR	6	TEXAS	SEE TITLE SHEET			US 380
DRAWN: SG	STATE DISTRICT	COUNTY	CONTROL No.	SECTION No.	JOB No.	SHEET No.
CHECKED: JNR	ABL	STONEWALL	0106	04	036	153

REFLECTOR UNIT SIZES FOR DELINEATORS AND OBJECT MARKERS

	SIZE 1	SIZE 2	SIZE 3	SIZE 4
DEVICE				
SHEETING	Yellow, White or Red Type B or C reflective sheeting			

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

DELINEATORS

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

D & OM DESCRIPTIVE CODES

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

NUMBER OF REFLECTORS
S = Single
D = Double

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

REFLECTOR UNIT SIZE
1 or 2

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

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

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

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

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

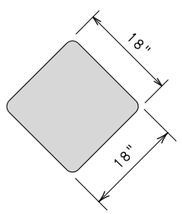
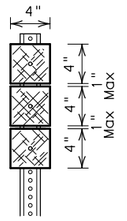
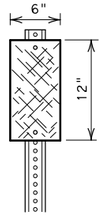
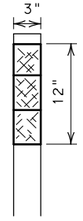
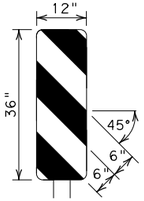
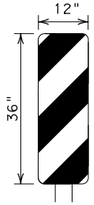
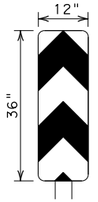
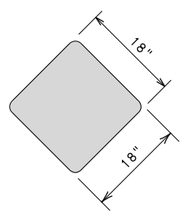
NUMBER OF REFLECTORS OR DIRECTION
X = 3-Size 2 reflector units (Type 2 only)
Y = 1-Size 3 reflector unit (Type 2 only)
Z = 3-Size 1 or 1-Size 4 reflector unit(s)(Type 2 only)
L = Left Side (Type 3 Object Marker only)
R = Right Side (Type 3 Object Marker only)
C = Center (Type 3 Object Marker only)

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

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

DIRECTION
If Required
BI = Bi-Directional

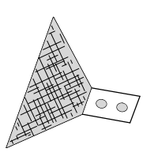
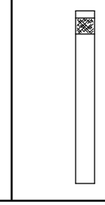
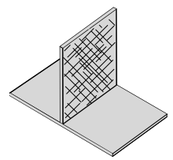
OBJECT MARKERS

	Type 1 (OM-1)	Type 2 (OM-2)			Type 3 (OM-3)			Type 4 (OM-4)
	OM-1	OM-2X	OM-2Y	OM-2Z	OM-3L	OM-3R	OM-3C	OM-4
DEVICE								
		3-Size 2 reflector units	1-Size 3 reflector unit	3-Size 1 reflector units or 1-Size 4 reflector unit				
SHEETING	Yellow-Type B_{FL} or C_{FL} Sheeting	Yellow - Type B or C Sheeting			Alternating acrylic black and retroflective yellow - Type B_{FL} or C_{FL} Sheeting			Red -Type B_{FL} or C_{FL} Sheeting
POST TYPE	TWT	WC	WC	WFLX	TWT			TWT
MOUNT TYPE	WAS, WAP	GND	GND	GND, SRF	WAS, WAP			WAS, WAP

DEPARTMENTAL MATERIAL SPECIFICATIONS

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

BARRIER REFLECTORS (BRF)

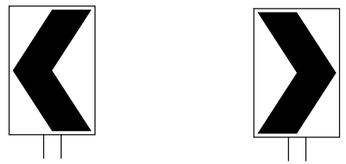
	GF1	GF2	CTB
DEVICE			

1. Barrier reflectors shall meet the requirements of DMS 8600.
2. Approved Barrier Reflectors are listed on the "Barrier Reflectors" Material Producer List at: www.txdot.gov.

SHEETING: Yellow, White, Red

NOTE
1. Reflective sheeting shall have a minimum dimension of 3 inches and minimum surface area of 9 square inches.

CHEVRONS

DEVICE:  W1-8

SIZE (W x L)	18"x 24" (Conventional)	24"x 30" (Conventional Oversize)	30"x 36" (Expressway)	36" x 48" (Freeway)
MOUNTING HEIGHT	4'-0" or 7'-0"		7'-0" Only	

NOTE
1. CHEVRON (W1-8) signs and ONE DIRECTION LARGE ARROW (W1-6) Signs shall be installed per Sign Mounting Details (SMD) Standard Sheets and paid under Item 644 (Small Roadside Sign Assemblies).
2. When there is a need to increase conspicuity, the Texas version of the ONE DIRECTION LARGE ARROW sign (W1-9T) may be used instead of the ONE DIRECTION LARGE ARROW (W1-6).

ONE DIRECTION LARGE ARROW

DEVICE:  W1-6

SIZE (W x L)	48" x 24" (Conventional)	60" x 30" (Expressway & Freeway)
MOUNTING HEIGHT	7'-0"	

NOTE:
Delineator and object marker substrates and sign substrates shall be 0.080" Aluminum sign blank to conform to ASTM B-209 Alloy 6061-T6 or approved alternative.

Texas Department of Transportation — Traffic Safety Division Standard

DELINEATOR & OBJECT MARKER MATERIAL DESCRIPTION

D & OM(1)-20

FILE: dom1-20.dgn	DN: TXDOT	CK: TXDOT	DW: TXDOT	CK: TXDOT
©TxDOT August 2004	CONT	SECT	JOB	HIGHWAY
REVISIONS	0106	04	036	US 380
10-09 3-15	DIST	COUNTY		SHEET NO.
4-10 7-20	ABL	STONEWALL		154

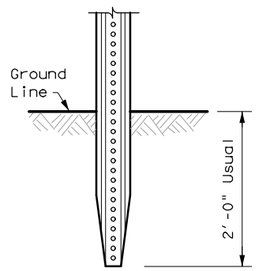
20A

DATE: 4/28/2022 6:40:26 PM
FILE: c:\pw_work\dfrkndfx01\rome2243\dms57969\dom1-20.dgn

POST TYPE AND SUPPORT FOUNDATION DETAILS

WING CHANNEL (WC)

GND

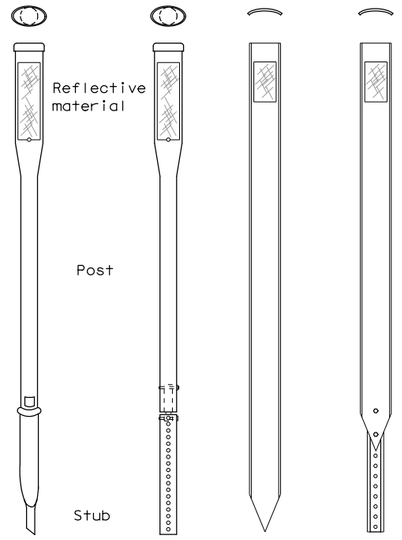


NOTES

1. Embedded Wing Channel (WC) post option may be used for Type 2 Object Markers and Delineators only.
2. 1.12 lbs/ft steel per ASTM A 1011 SS Gr. 50, or ASTM A499.

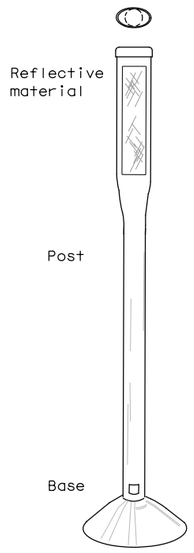
FLEXIBLE POSTS (YFLX, WFLX)

GND



EMBEDDED

SRF



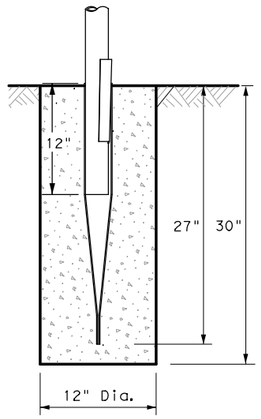
SURFACE MOUNT

NOTES

1. See "Flexible Delineator and Object Marker Posts" Material Producer List for approved devices.
2. Install per manufacturer's recommendations.
3. Post length may vary to meet field conditions.
4. When using yellow delineators with flexible posts to separate opposing direction of travel, such as centerline or median use, the flexible posts shall be yellow.

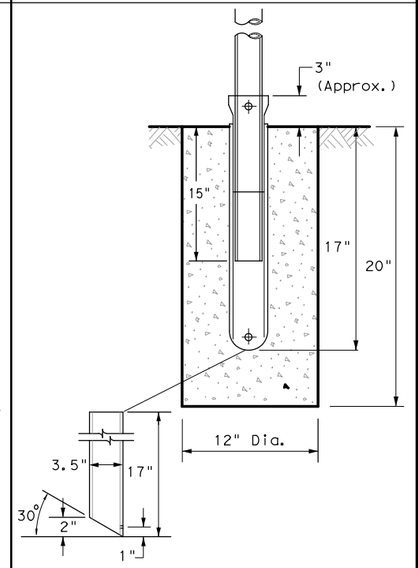
WEDGE ANCHOR SYSTEMS

WAS



STEEL

WAP



PLASTIC

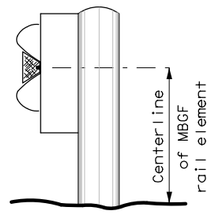
NOTE

1. Install per manufacturer's recommendations.

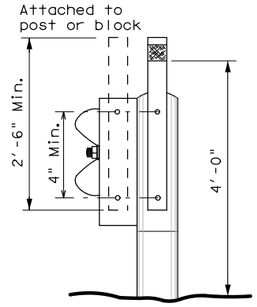
TYPE OF BARRIER MOUNTS

GUARD FENCE ATTACHMENT

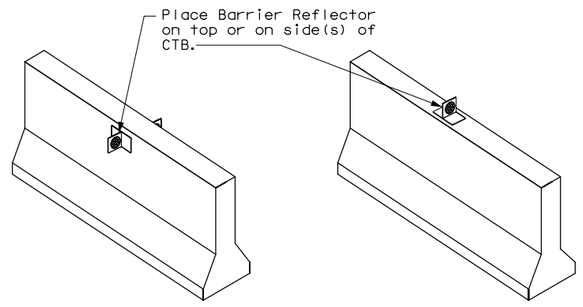
GF1



GF2



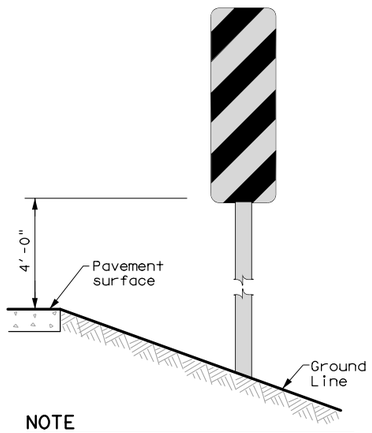
CONCRETE TRAFFIC BARRIER (CTB)



GENERAL NOTES

1. Place delineators on a section of roadway at a consistent distance from the edge of pavement.
2. Where a restriction prevents consistent placement from the pavement edge, place the affected object markers in line with the innermost edge of the obstruction.
3. When Type 2 object markers and delineators are more than 8'-0" from the edge of the pavement, it may not be possible to maintain a height of approximately 4'-0". If this is the case, place the object marker or delineator as close to the desired height as possible.
4. Install all delineators, object markers and barrier reflectors in accordance with the manufacturer's recommendation.
5. Barrier reflectors should be installed a minimum of 18 inches above the edge of the pavement surface.
6. Diagonal stripes on Type 3 object markers shall slope down toward the intended travel lane.

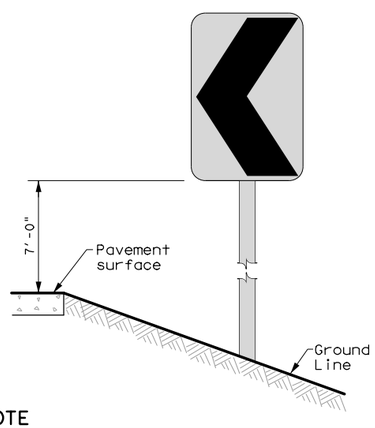
TYPES 1, 3, AND 4 OBJECT MARKERS AND CHEVRONS



NOTE

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

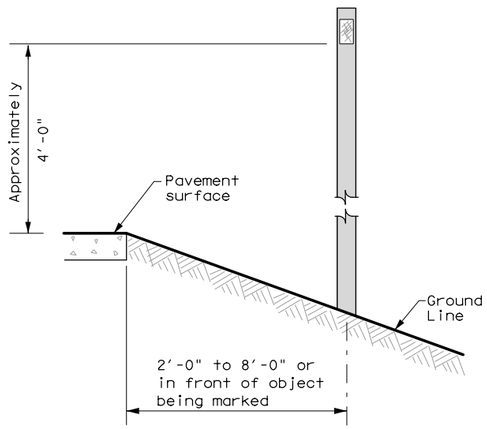
CHEVRONS AND ONE DIRECTION LARGE ARROW SIGN



NOTE

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

DELINEATORS AND TYPE 2 OBJECT MARKERS



See general notes 1, 2 and 3.

Texas Department of Transportation — Traffic Safety Division Standard

DELINEATOR & OBJECT MARKER INSTALLATION

D & OM(2)-20

FILE: dom2-20.dgn	DN: TXDOT	CK: TXDOT	DW: TXDOT	CK: TXDOT
© TxDOT August 2004	CONT	SECT	JOB	HIGHWAY
REVISIONS	0106	04	036	US 380
10-09 3-15	DIST	COUNTY		SHEET NO.
4-10 7-20	ABL	STONEWALL		155

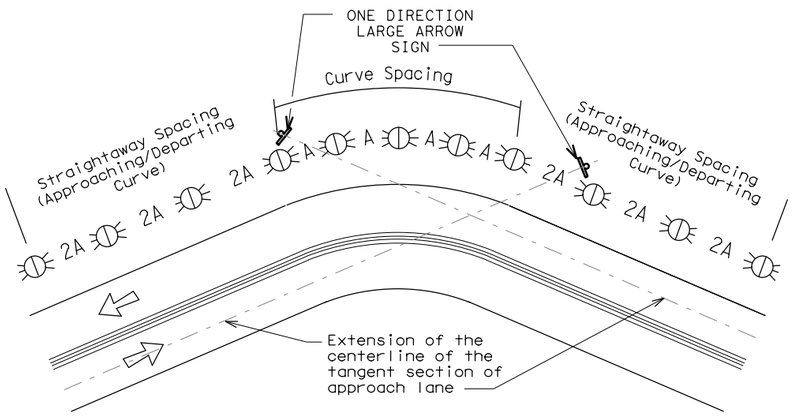
20B

DATE: 4/28/2022 6:40:31 PM
FILE: c:\pw_work\dfknatx01\rome2243\dms5769\dom2-20.dgn

MINIMUM WARNING DEVICES AT CURVES WITH ADVISORY SPEEDS

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

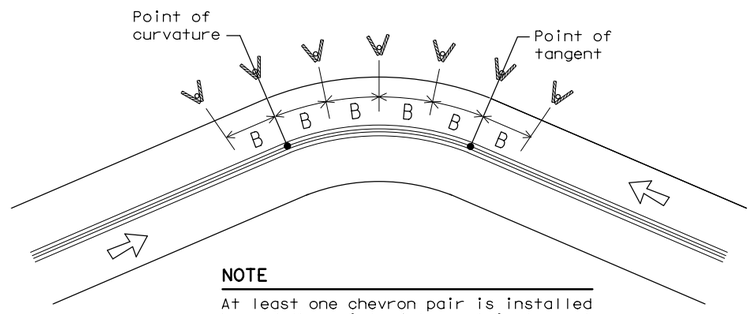
SUGGESTED SPACING FOR DELINEATORS ON HORIZONTAL CURVES



NOTE

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

SUGGESTED SPACING FOR CHEVRONS ON HORIZONTAL CURVES



NOTE

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

DELINEATOR AND CHEVRON SPACING

WHEN DEGREE OF CURVE OR RADIUS IS KNOWN

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

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

DELINEATOR AND CHEVRON SPACING

WHEN DEGREE OF CURVE OR RADIUS IS NOT KNOWN

Advisory Speed (MPH)	Spacing in Curve	Spacing in Straightaway	Chevron Spacing in Curve
	A	2xA	B
65	130	260	200
60	110	220	160
55	100	200	160
50	85	170	160
45	75	150	120
40	70	140	120
35	60	120	120
30	55	110	80
25	50	100	80
20	40	80	80
15	35	70	40

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

DELINEATOR AND OBJECT MARKER APPLICATION AND SPACING

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

NOTES

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

LEGEND	
	Bi-directional Delineator
	Delineator
	Sign

Texas Department of Transportation

Traffic Safety Division Standard

DELINEATOR & OBJECT MARKER PLACEMENT DETAILS

D & OM(3)-20

FILE: dom3-20.dgn	DN: TXDOT	CK: TXDOT	DW: TXDOT	CK: TXDOT
©TxDOT August 2004	CONT	SECT	JOB	HIGHWAY
REVISIONS	0106	04	036	US 380
3-15 8-15	DIST	COUNTY		SHEET NO.
8-15 7-20	ABL	STONEWALL		156

20C

DATE: 4/28/2022 6:40:52 PM
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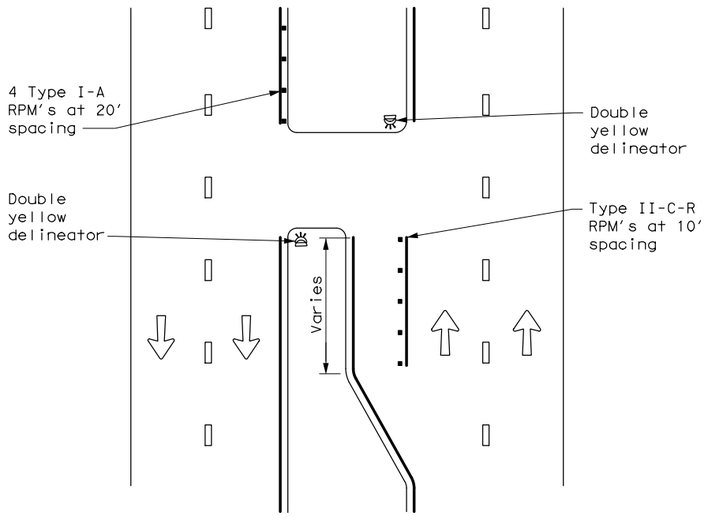
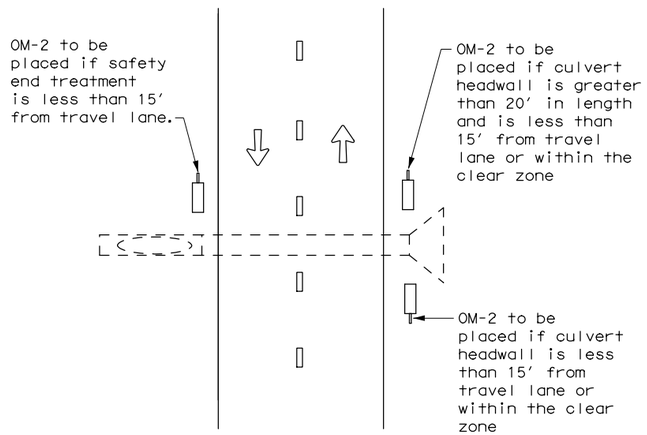
CROSSOVERS



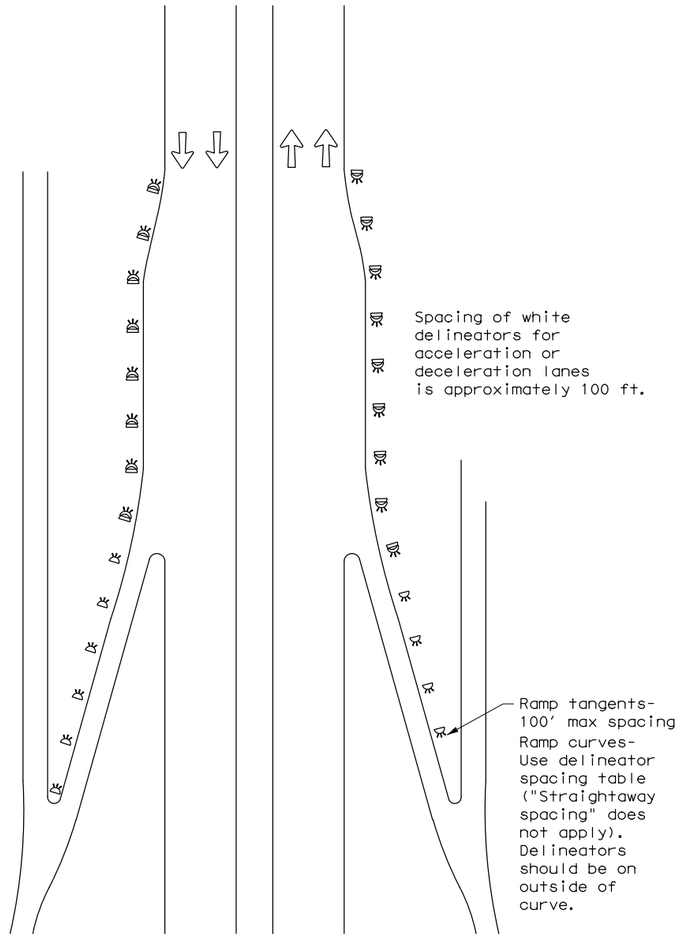
DETAIL 1

FOR CULVERTS WITHOUT MBGF



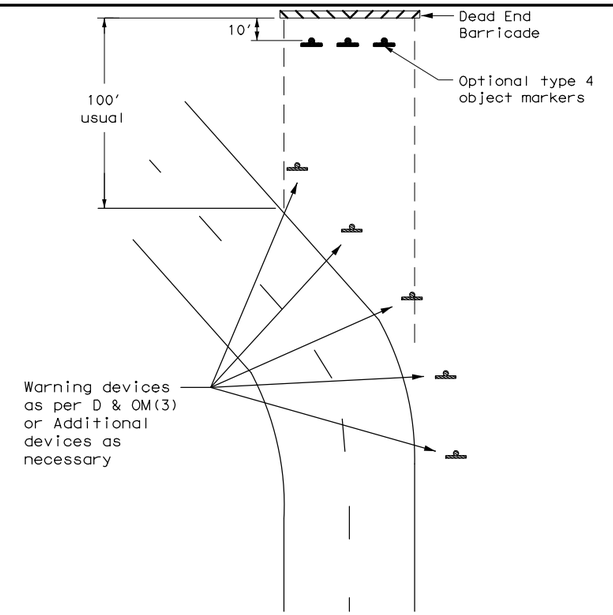
DETAIL 2

FREEWAY DELINEATION FOR RAMPS AND ACCELERATION/DECELERATION LANES



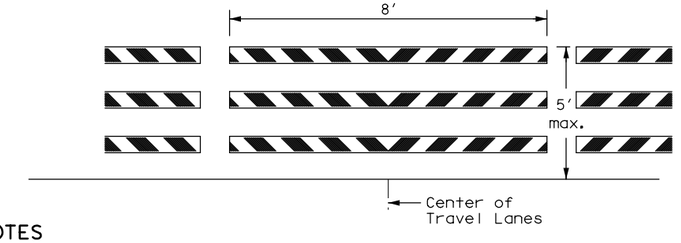
DETAIL 3

TYPICAL APPLICATION OF DEAD END BARRICADE



DETAIL 4

TYPICAL DEAD END BARRICADE INSTALLATION



NOTES

1. Barricade striping shall be red and white reflective sheeting for all permanent road closures.
2. Barricade striping is red and white sloping toward the center of the roadway.
3. Type 3 Barricade Supports should be anchored to soil or pavement as described in compliant Work Zone Traffic Control Devices List, section D.2.f and D.2.g.

DETAIL 5

LEGEND	
	Bidirectional Delineator
	Delineator
	OM-3
	Barricade
	Sign
	OM-2
	Double Delineator

Texas Department of Transportation

Traffic Safety Division Standard

DELINEATOR & OBJECT MARKER PLACEMENT DETAILS

D & OM(4)-20

FILE: dom4-20.dgn	DN: TXDOT	CK: TXDOT	DW: TXDOT	CK: TXDOT
©TxDOT August 2004	CONT	SECT	JOB	HIGHWAY
REVISIONS	0106	04	036	US 380
3-15	DIST	COUNTY		SHEET NO.
7-20	ABL	STONEWALL		157

20D

DATE: 4/28/2022 6:40:56 PM
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DATE: 4/28/2022 6:41:01 PM
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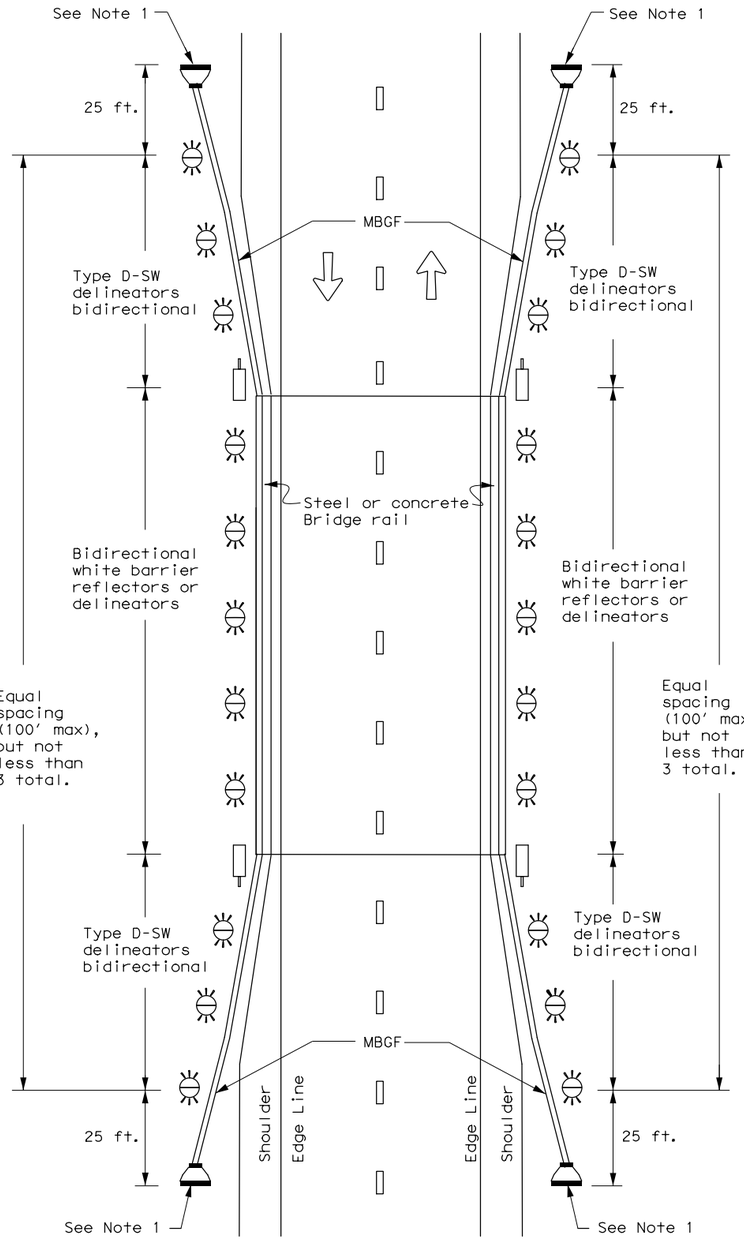
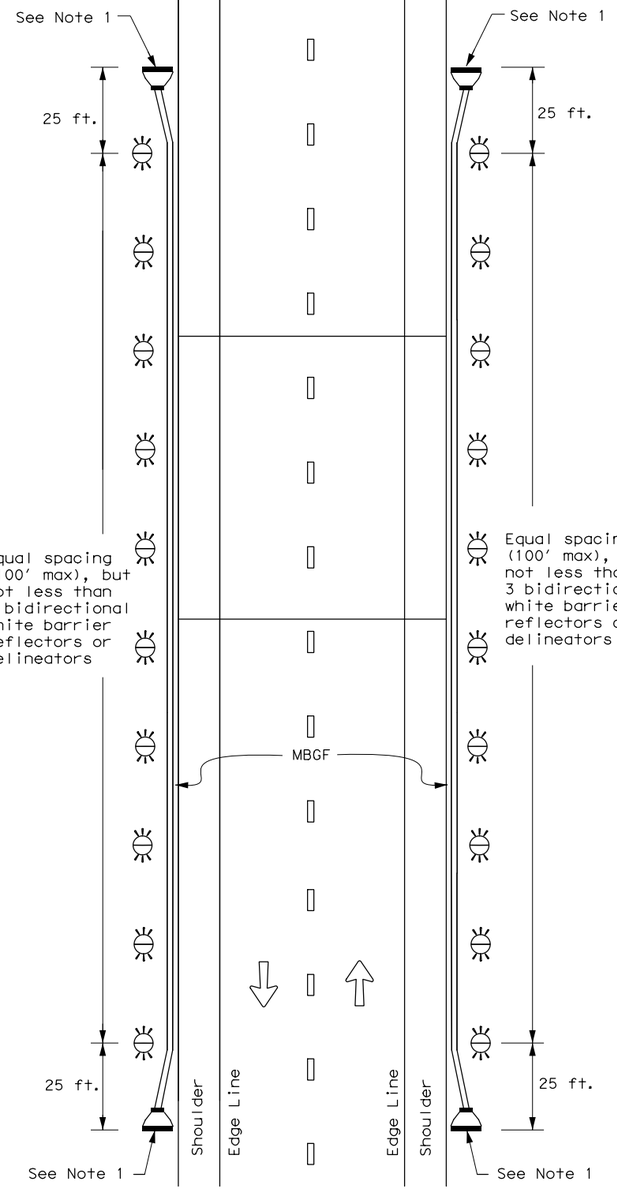
TWO-WAY, TWO LANE ROADWAY WITH REDUCED WIDTH APPROACH RAIL



NOTE:

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

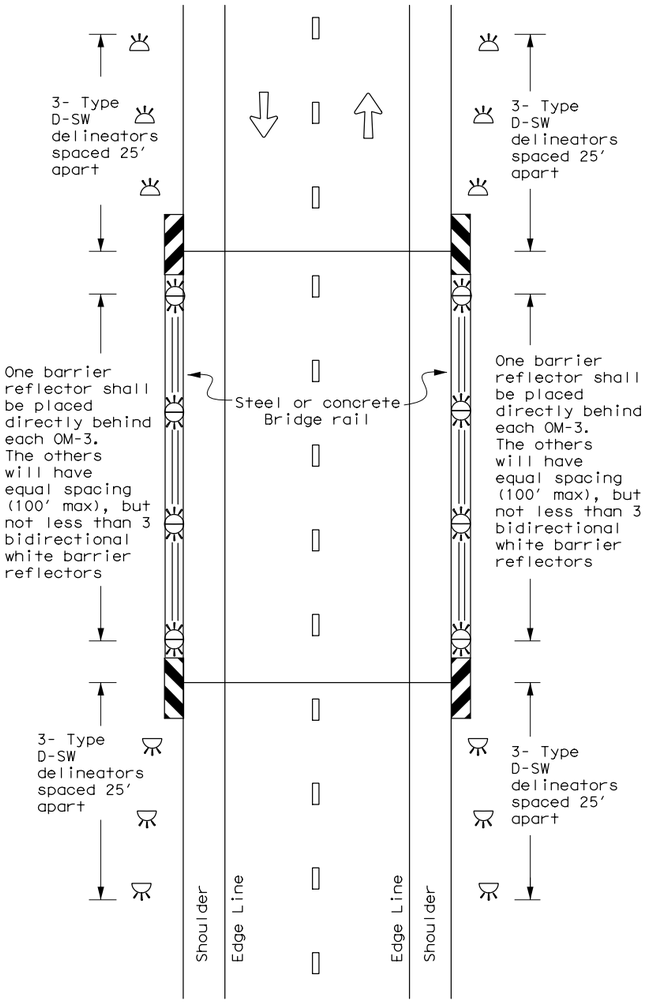
TWO-WAY, TWO LANE ROADWAY WITH METAL BEAM GUARD FENCE (MBGF)



NOTE:

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

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



LEGEND

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

Texas Department of Transportation

Traffic Safety Division Standard

DELINEATOR & OBJECT MARKER PLACEMENT DETAILS

D & OM(5)-20

FILE: dom5-20.dgn	DN: TxDOT	CK: TxDOT	DW: TxDOT	CK: TxDOT
© TxDOT August 2015	CONT	SECT	JOB	HIGHWAY
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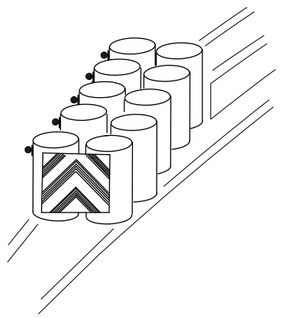
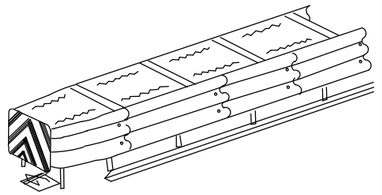
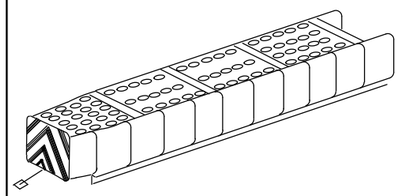
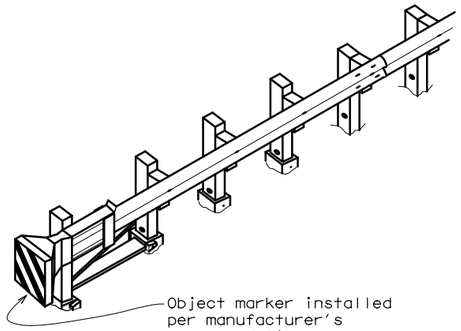
7-20	DIST	COUNTY		SHEET NO.
	ABL	STONEWALL		158

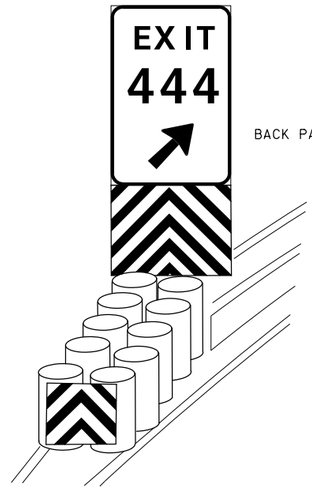
20E

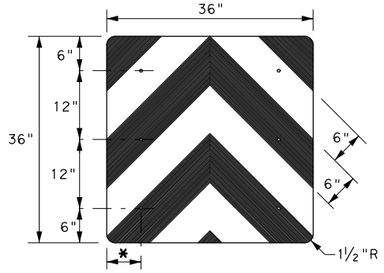


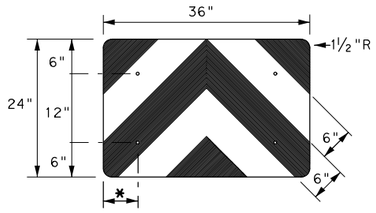




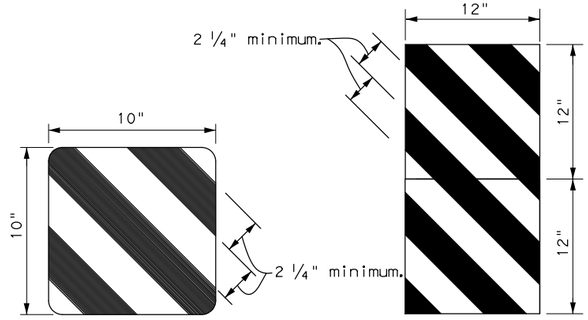




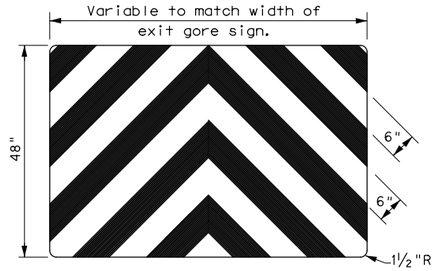


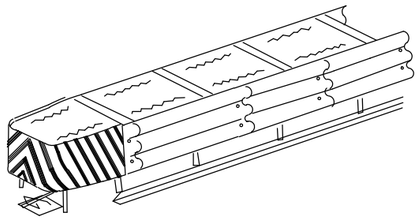


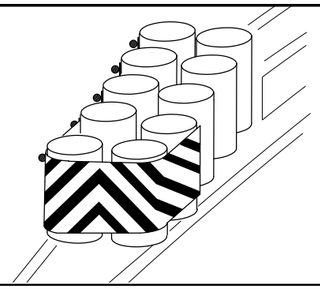
* Adjust to fit attenuator per manufacturer's recommendation, or as directed by the Engineer

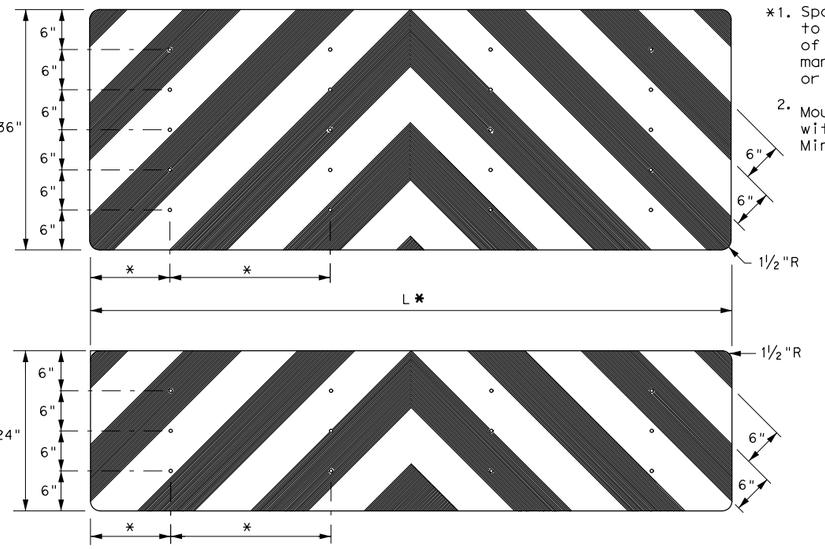


OBJECT MARKERS SMALLER THAN 3 FT^2









NOTES

*1. Spacing should be adjusted to attach through centerline of drum, per attenuator manufacturers recommendation, or as directed by the Engineer.

2. Mounting should be flush with top of attenuator. Minimum size 96" x 24".

NOTES

1. Object Markers shall conform to the Texas MUTCD and meet the color and reflectivity requirement of Department Material Specification DMS 8300. Background shall be yellow reflective sheeting (Type B or C) and Chevron shall be black.

2. Object Markers may be fabricated from adhesive backed reflective sheeting applied directly to guardrail end treatment, or applied directly to an "end cap" as per the manufacturer's recommendation. Direct applied sheeting shall provide a smooth surface and have no wrinkles, air bubbles, cuts or tears. A radius at the corners is not required for direct applied sheeting.

3. Object Marker size may be reduced to fit smaller devices. Width of alternating black and yellow stripes are typically 6". Object Markers smaller than 3ft may have reduced width stripes of a minimum of 2 ¼".

4. Pop rivets, screws, or nuts and bolts may be used to attach object markers and reflectors. Holes, slots or other openings may be cut or drilled through object markers to allow cable or other attachments.

5. Object Marker at nose of attenuator is subsidiary to the attenuator.

6. See D & OM (1-4) for required barrier reflectors.

Texas Department of Transportation

Traffic Safety Division Standard

DELINEATOR & OBJECT MARKER FOR VEHICLE IMPACT ATTENUATORS

D & OM(VIA)-20

FILE: domvia20.dgn	DN: TXDOT	CK: TXDOT	DW: TXDOT	CK: TXDOT
©TxDOT December 1989	CONT	SECT	JOB	HIGHWAY
REVISIONS	0106	04	036	US 380
4-92 8-04	DIST	COUNTY		SHEET NO.
8-95 3-15	ABL	STONEWALL		159
4-98 7-20				
20G				

DATE: 4/28/2022 6:41:05 PM
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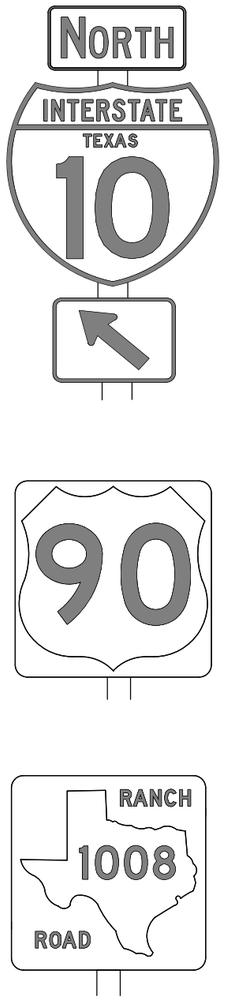
DATE: 4/28/2022 6:41:10 PM
FILE: c:\pw_work\dfrknatx01\rome2243\dms57969\tsr3-13.dgn

REQUIREMENTS FOR INDEPENDENT MOUNTED ROUTE SIGNS

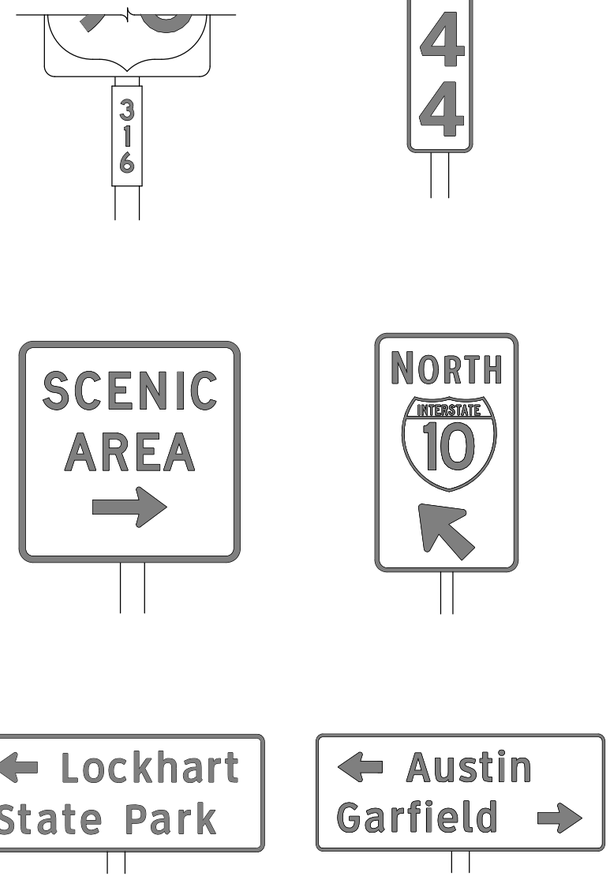
SHEETING REQUIREMENTS		
USAGE	COLOR	SIGN FACE MATERIAL
BACKGROUND	WHITE	TYPE A SHEETING
BACKGROUND	ALL OTHERS	TYPE B OR C SHEETING
LEGEND & BORDERS	WHITE	TYPE A SHEETING
LEGEND & BORDERS	BLACK	ACRYLIC NON-REFLECTIVE FILM
LEGEND & BORDERS	ALL OTHERS	TYPE B or C SHEETING



TYPICAL EXAMPLES

REQUIREMENTS FOR BLUE, BROWN & GREEN D AND I SERIES GUIDE SIGNS

SHEETING REQUIREMENTS		
USAGE	COLOR	SIGN FACE MATERIAL
BACKGROUND	ALL	TYPE B OR C SHEETING
LEGEND & BORDERS	WHITE	TYPE D SHEETING
LEGEND, SYMBOLS & BORDERS	ALL OTHERS	TYPE B OR C SHEETING



TYPICAL EXAMPLES

GENERAL NOTES

1. Signs to be furnished shall be as detailed elsewhere in the plans and/or as shown on sign tabulation sheet. Standard sign designs and arrow dimensions can be found in the "Standard Highway Sign Designs for Texas" (SHSD).

2. White legend shall use the Clearview Alphabet. The following Clearview fonts shall be used to replace the existing white Federal Highway Administration (FHWA) Standard Highway Alphabets, when not specified in the SHSD, or in the plans.

B	CV-1W
C	CV-2W
D	CV-3W
E	CV-4W
Emod	CV-5WR
F	CV-6W

3. Route sign legend (ie. IH, US, SH and FM shields) shall use the Federal Highway Administration (FHWA) Standard Highway Alphabets B, C, D, E, Emod or F).

4. Lateral spacing between letters and numerals shall conform with the SHSD, and any approved changes thereto. Lateral spacing of legend shall provide a balanced appearance when spacing is not shown.

5. Independent mounted route sign with white or colored legend and borders shall be applied by screening process with transparent color ink, transparent colored overlay film to white background sheeting or cut-out white sheeting to colored background sheeting, or combination thereof. White legend, symbols and borders on all other signs shall be cut-out white sheeting applied to colored background sheeting.

6. Information regarding borders and radii for signs is found in the "Standard Highway Sign Designs for Texas". Dimensions shown and described for borders and corner radii on parent sign are nominal. Borders may vary in width as much as 1/2 inch. Corner radii above 3 inches may vary in width as much as 1 inch. Borders and corner radii within a parent sign must be of matching widths. The sign area outside the corner radius should be trimmed or rounded.

7. Sign substrate shall be any material that meets the Departmental Material Specification requirements of DMS-7110 or approved alternative.

8. Mounting details of roadside signs are shown in the "SMD series" Standard Plan Sheets.

DEPARTMENTAL MATERIAL SPECIFICATIONS	
ALUMINUM SIGN BLANKS	DMS-7110
SIGN FACE MATERIALS	DMS-8300

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

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

http://www.txdot.gov/

Texas Department of Transportation

Traffic Operations Division Standard

TYPICAL SIGN REQUIREMENTS

TSR(3)-13

FILE: tsr3-13.dgn	DN: TxDOT	CK: TxDOT	DW: TxDOT	CK: TxDOT
©TxDOT October 2003	CONT	SECT	JOB	HIGHWAY
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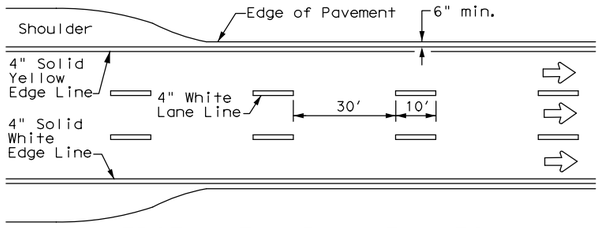
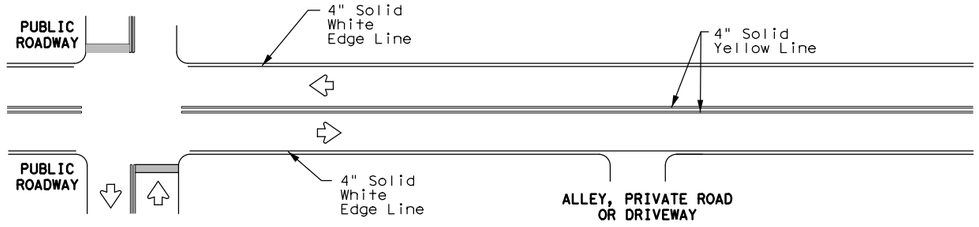
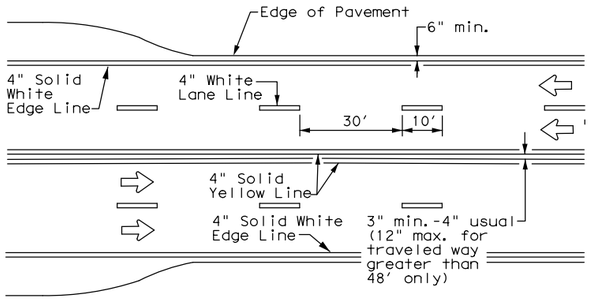
12-03 7-13	DIST	COUNTY		SHEET NO.
9-08	ABL	STONEWALL		160



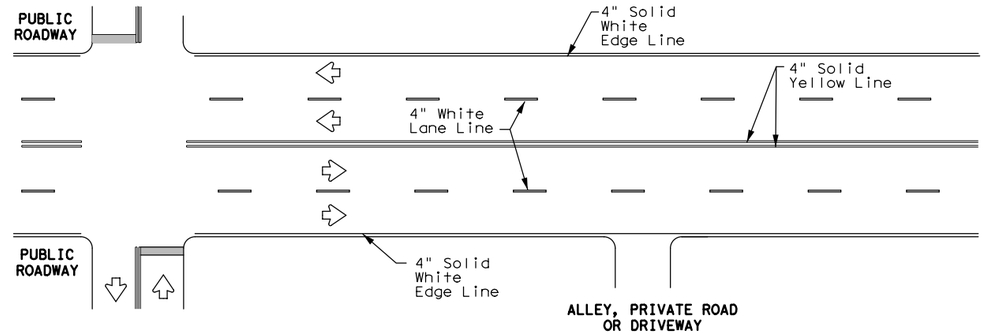
EDGE LINE AND LANE LINES ONE-WAY ROADWAY WITH OR WITHOUT SHOULDERS



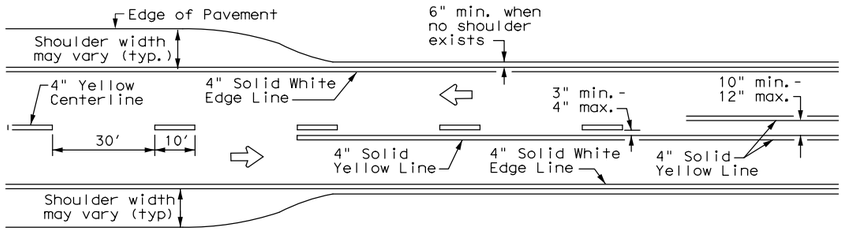
TYPICAL TWO-LANE, TWO-WAY PAVEMENT MARKINGS THROUGH INTERSECTIONS



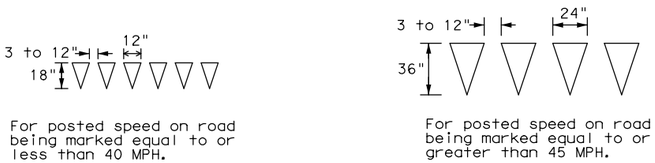
CENTERLINE AND LANE LINES FOUR LANE TWO-WAY ROADWAY WITH OR WITHOUT SHOULDERS



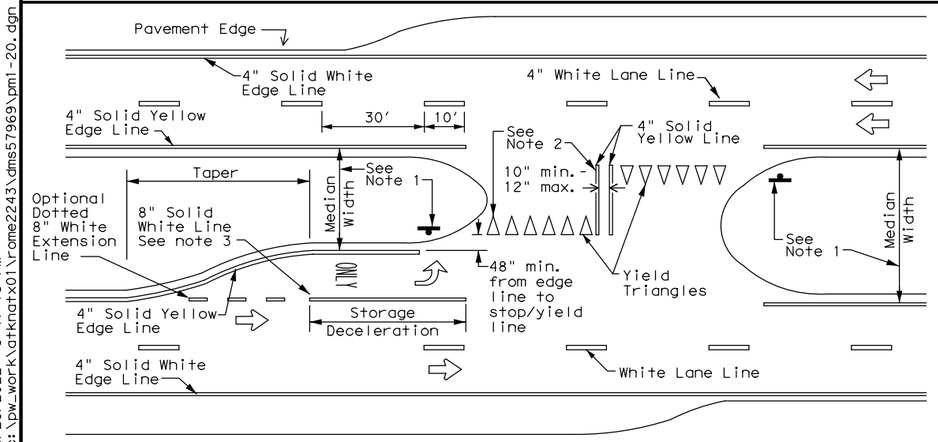
TYPICAL MULTI-LANE, TWO-WAY PAVEMENT MARKINGS THROUGH INTERSECTIONS



TWO LANE TWO-WAY ROADWAY WITH OR WITHOUT SHOULDERS



YIELD LINES



FOUR LANE DIVIDED ROADWAY CROSSOVERS

NOTES

1. Where divided highways are separated by median widths at the median opening itself of 30 feet or more, median openings shall be signed as two separate intersections. Each median opening has two width measurements, with one measurement for each approach. The narrow median width will be the controlling width to determine if signs are required. Yield signs are the typical intersection control. Stop signs are optional as determined by the Engineer.

2. Install median striping (double yellow centerlines and stop bars/yield triangles) when a 50' or greater median centerline can be placed. Stop bars shall only be used with stop signs. Yield traingles shall only be used with yield signs.

3. Length of turn bays, including taper, deceleration, and storage lengths shall be as shown on the plans or as directed by the Engineer.

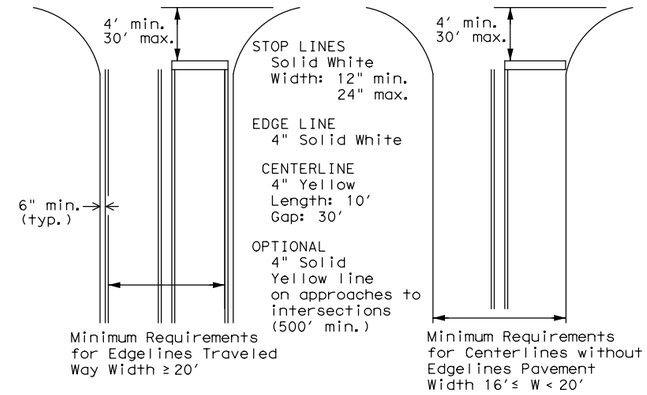
GENERAL NOTES

1. Edgeline striping shall be as shown in the plans or as directed by the Engineer. The edgeline should not be placed less less than 6 inches from the edge of pavement. This distance may vary due to pavement raveling or other conditions. Edgelines are not required in curb and gutter sections of roadways.

2. The traveled way includes only that portion of the roadway used for vehicular travel. It does not include the parking lanes, sidewalks, berms and shoulders. The traveled ways shall be measured from the inside of edgeline to the inside of edgeline of a two lane roadway.

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

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



GUIDE FOR PLACEMENT OF STOP LINES, EDGE LINE & CENTERLINE

Based on Traveled Way and Pavement Widths for Undivided Highways

Texas Department of Transportation

Traffic Safety Division Standard

TYPICAL STANDARD PAVEMENT MARKINGS

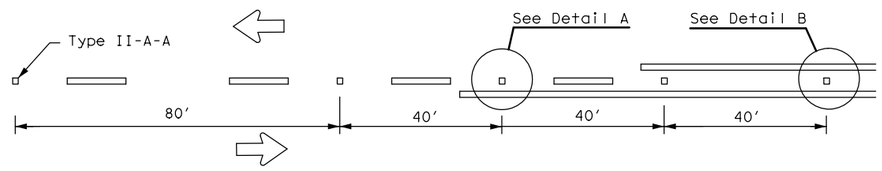
PM(1)-20

FILE: pm1-20.dgn	DN:	CK:	DW:	CK:
© TxDOT November 1978	CONT	SECT	JOB	HIGHWAY
REVISIONS 8-95 3-03	0106	04	036	US 380
5-00 2-12	DIST	COUNTY		SHEET NO.
8-00 6-20	ABL	STONEWALL		161

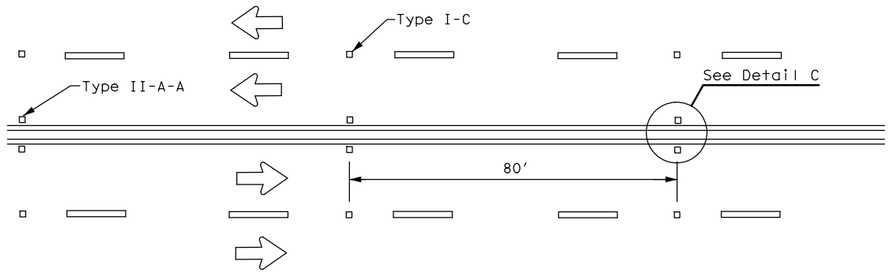
22A

DATE: 4/28/2022 6:41:15 PM
FILE: c:\pw_work\atknadrx01\rome2243\dms57969\pm1-20.dgn

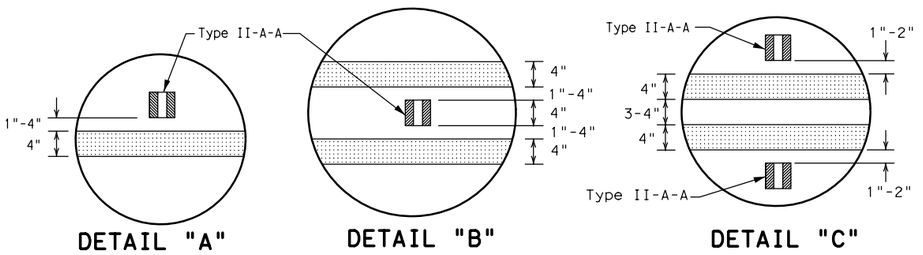
REFLECTIVE RAISED PAVEMENT MARKERS FOR VEHICLE POSITIONING GUIDANCE



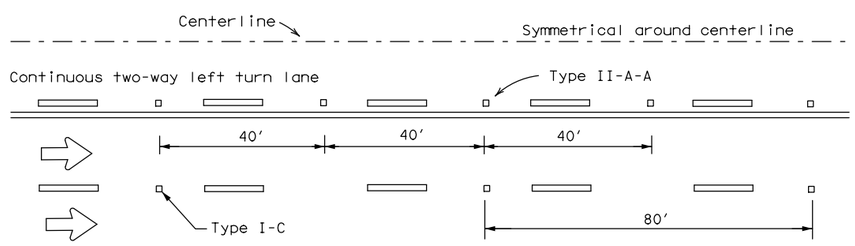
CENTERLINE FOR ALL TWO LANE ROADWAYS



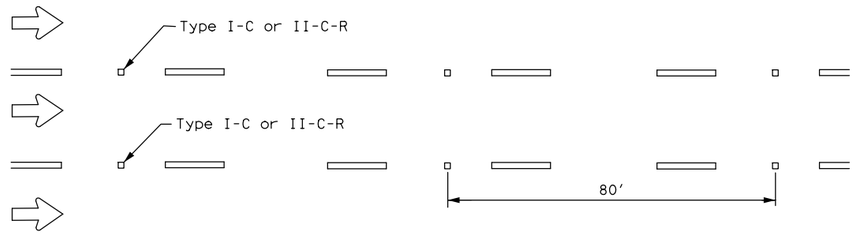
CENTERLINE & LANE LINES FOR FOUR LANE TWO-WAY HIGHWAYS



DETAIL "A" **DETAIL "B"** **DETAIL "C"**



CENTERLINE AND LANE LINES FOR TWO-WAY LEFT TURN LANE

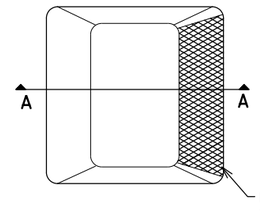


LANE LINES FOR ONE-WAY ROADWAY (NON-FREEWAY FACILITIES)

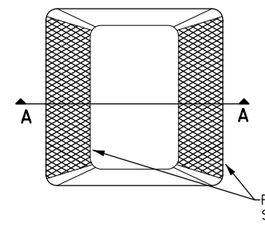
Raised pavement markers Type II-C-R shall have clear face toward normal traffic and red face toward wrong-way traffic.

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

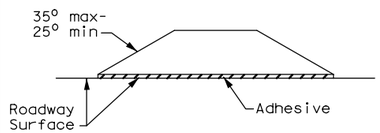
All pavement marking materials shall meet the required Departmental Material Specifications as specified by the plans.



Type I (Top View)

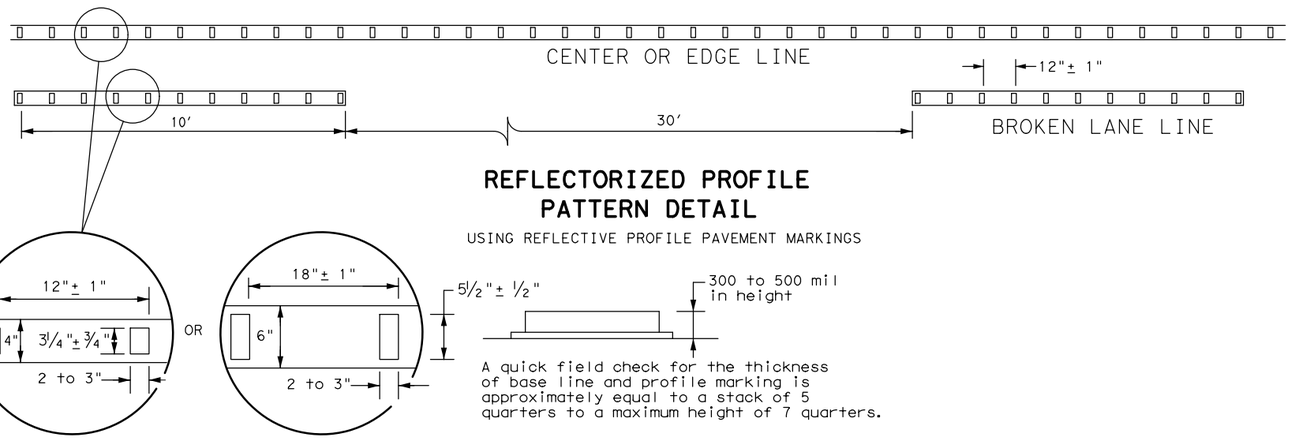


Type II (Top View)



SECTION A

RAISED PAVEMENT MARKERS



REFLECTORIZED PROFILE PATTERN DETAIL

USING REFLECTIVE PROFILE PAVEMENT MARKINGS

A quick field check for the thickness of base line and profile marking is approximately equal to a stack of 5 quarters to a maximum height of 7 quarters.

4" EDGE LINE, CENTER LINE OR LANE LINE

OPTIONAL 6" EDGE LINE, CENTER LINE OR LANE LINE

NOTE

Profile markings shall not be placed on roadways with a posted speed limit of 45 MPH or less.

GENERAL NOTES

1. All raised pavement markers placed in broken lines shall be placed in line with and midway between the stripes.
2. On concrete pavements the raised pavement markers should be placed to one side of the longitudinal joints.

Texas Department of Transportation

Traffic Safety Division Standard

POSITION GUIDANCE USING RAISED MARKERS RELECTORIZED PROFILE MARKINGS PM(2)-20

FILE: pm2-20.dgn	DN:	CK:	DW:	CK:
©TxDOT April 1977	CONT	SECT	JOB	HIGHWAY
REVISIONS 4-92 2-10 5-00 2-12 8-00 6-20	0106	04	036	US 380
	DIST	COUNTY		SHEET NO.
	ABL	STONEWALL		162

22B

DATE: 4/28/2022 6:41:19 PM
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DATE: 4/28/2022 6:41:24 PM
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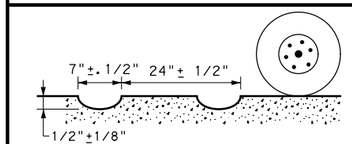
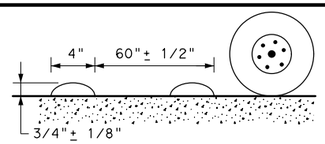
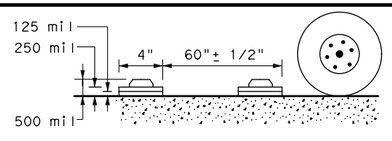
CENTERLINE RUMBLE STRIPS



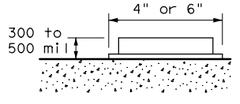
MILLED RUMBLE STRIPS



RAISED TRAFFIC BUTTONS

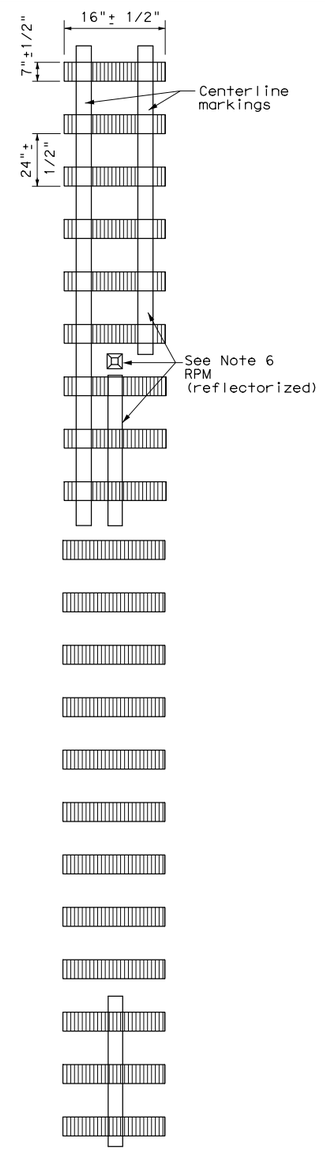


PREFORMED THERMOPLASTIC STRIPS



PROFILE MARKINGS

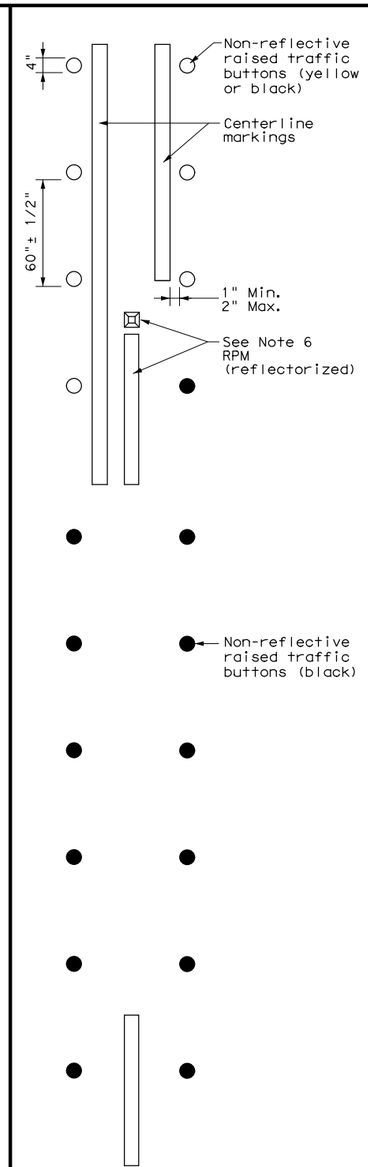
PROFILE VIEW



PLAN VIEW
OPTION 1

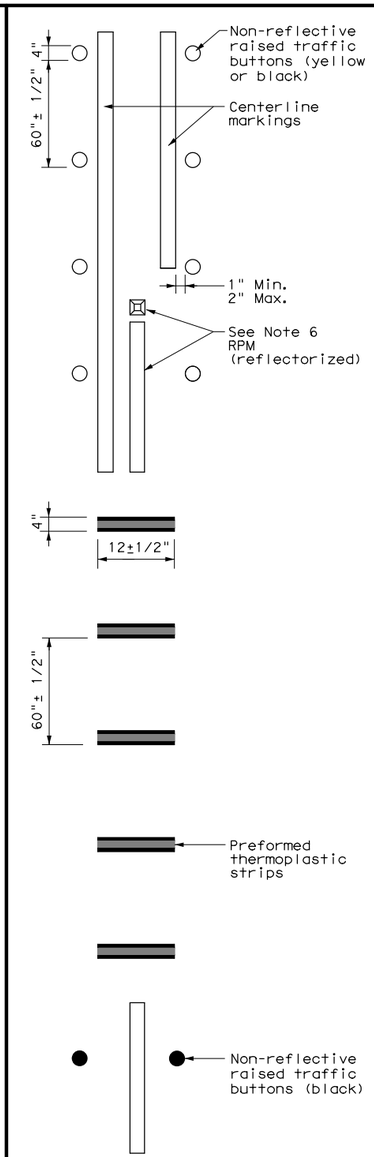
TWO LANE TWO-WAY ROADWAYS

MILLED CENTERLINE RUMBLE STRIPS



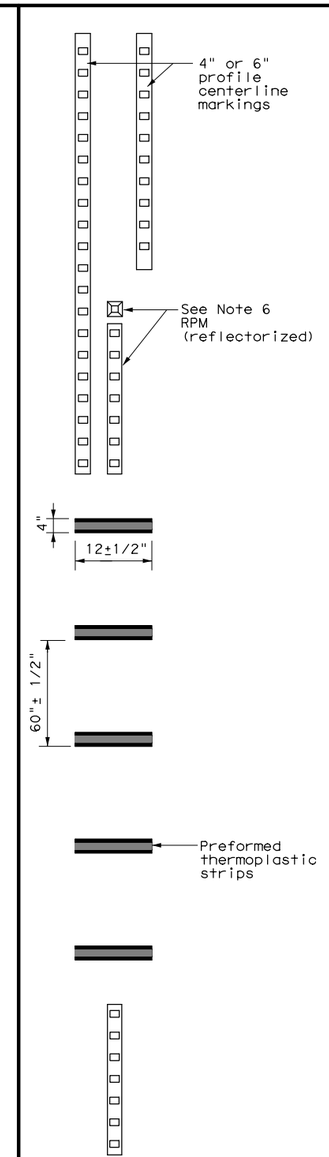
PLAN VIEW
OPTION 2

RAISED CENTERLINE RUMBLE STRIPS



PLAN VIEW
OPTION 3

RAISED CENTERLINE RUMBLE STRIPS AND PREFORMED THERMOPLASTIC STRIPS



PLAN VIEW
OPTION 4

PROFILE CENTERLINE MARKINGS AND PREFORMED THERMOPLASTIC STRIPS

GENERAL NOTES

1. This standard sheet provides guidelines for installing centerline rumble strips on two-lane highways with or without shoulders.
2. Centerline and edgeline rumble strips or profile markings shall not be placed on roadways with a posted speed limit of 45 MPH or less.
3. Milled rumble strips are preferred when adequate pavement depth is available. If pavement thickness is less than 2 inches, milled rumble strips shall not be used. Rumble strips shall not be milled or depressed into bridge decks.
4. See dimensions for milled rumble strips. Other shapes and dimensions may be used if approved by the Traffic Operations Division.
5. Breaks in milled centerline rumble strips shall occur at least 50 feet and no more than 150 feet in advance of bridges, railroad crossings, intersections and driveways with high usage of large trucks.
6. Use Standard Sheet PM(2) for positioning, dimensioning, and spacing of all reflective raised pavement markers, and dimensions pavement markings and profile markings.
7. Consideration should be given to noise levels when centerline rumble strips are installed near residential areas, schools, churches, etc. A minimum of 3/8 inch depth of milled rumble strip may be considered in these areas.
8. Pavement markings must be applied over milled centerline rumble strips.

WHEN INSTALLING CENTERLINE RUMBLE STRIPS:

9. Raised rumble strips consisting of non-reflective raised traffic buttons may be used. Non-reflective raised traffic buttons can be affixed to asphalt or concrete with bitumen or adhesives, as per manufacturer's recommendations.
10. When using non-reflective raised traffic buttons as a centerline rumble strip, the button shall be placed adjacent to the pavement marking delineating the centerline. The buttons will be paid for under Item 672, "Raised Pavement Markers." Non-reflective traffic buttons must meet the requirements of DMS-4300.
11. The color of the button should be yellow for a continuous no passing roadway. Black buttons should be used in areas where passing is allowed.

WHEN INSTALLING EDGELINE RUMBLE STRIPS WITH OR WITHOUT CENTERLINE RUMBLE STRIPS ON UNDIVIDED HIGHWAYS:

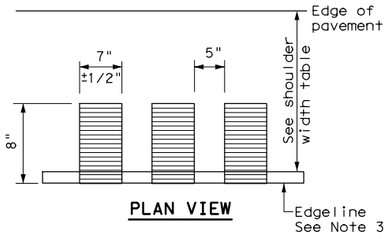
12. See standard sheet RS(4).

Texas Department of Transportation®
Traffic Operations Division Standard

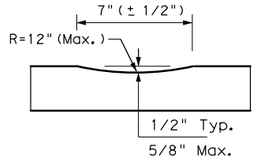
CENTERLINE RUMBLE STRIPS ON TWO LANE TWO-WAY HIGHWAYS

RS(3)-13

FILE: rs(3)-13.dgn	DN: TxDOT	CK: TxDOT	DW: TxDOT	CK: TxDOT
©TxDOT October 2013	CONT	SECT	JOB	HIGHWAY
REVISIONS	0106	04	036	US 380
	DIST	COUNTY		SHEET NO.
	ABL	STONEWALL		163

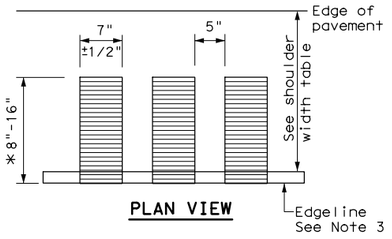


PLAN VIEW

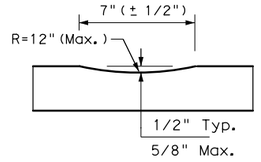


PROFILE VIEW
OPTION 1

CONTINUOUS MILLED DEPRESSIONS (Rumble Stripes)



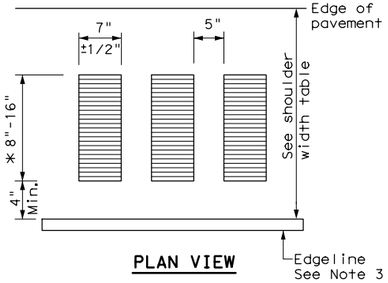
PLAN VIEW



* This distance may vary based on width of shoulder

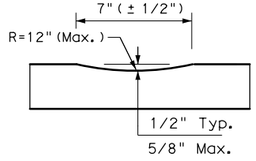
PROFILE VIEW
OPTION 2

CONTINUOUS MILLED DEPRESSIONS (Rumble Stripes)



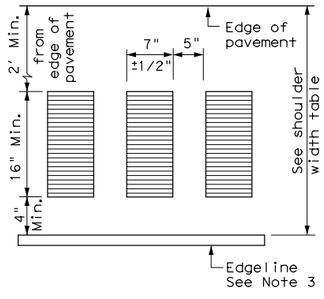
PLAN VIEW

* This distance may vary based on width of shoulder

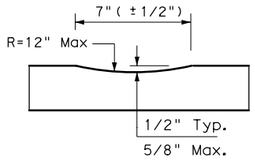


PROFILE VIEW
OPTION 3

CONTINUOUS MILLED DEPRESSIONS (Rumble Strips)

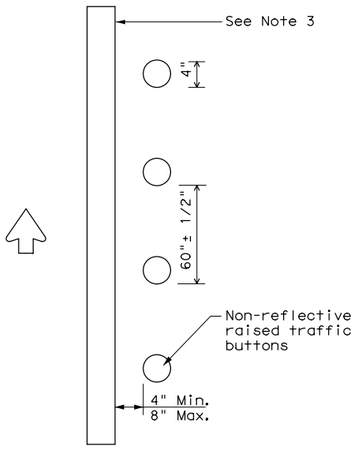


PLAN VIEW



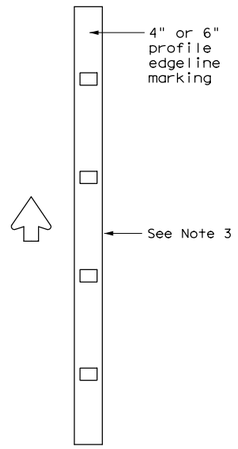
PROFILE VIEW
OPTION 4

CONTINUOUS MILLED DEPRESSIONS (Rumble Strips)



PLAN VIEW
OPTION 5

RAISED EDGELINE RUMBLE STRIPS



PLAN VIEW
OPTION 6

PROFILE EDGELINE MARKINGS

SHOULDER WIDTH TABLE		
EQUAL TO OR LESS THAN 2 FEET	GREATER THAN 2 FEET LESS THAN 4 FEET	EQUAL TO OR GREATER THAN 4 FEET
Option 1, 5 OR 6	Option 1, 2, 3 5 OR 6	Option 2, 4, 5 OR 6

GENERAL NOTES

1. Rumble strips and profile markings shall not be placed on roadways with a posted speed limit of 45 MPH or less.
2. Milled rumble strips are preferred when adequate pavement depth is available. If pavement thickness is less than 2 inches, milled rumble strips shall not be used. Rumble strips shall not be milled or depressed into bridge decks.
3. Use Standard Sheet PM(2) for positioning, dimensioning, and spacing of all reflective raised pavement markers, pavement markings, and profile markings.
4. See the table below for determining what options may be used for edgeline rumble strips.

WHEN INSTALLING MILLED DEPRESSION EDGELINE RUMBLE STRIPS:

5. See dimensions for milled rumble strips. Other shapes and dimensions may be used if approved by the Traffic Operations Division.
6. Pavement markings can be applied over milled shoulder rumble strips to create an edgeline rumble stripe.
7. Breaks in edgeline rumble strips shall occur at least 50 feet and no more than 150 feet in advance of bridges, railroad crossings, intersections and driveways with high usage of large trucks when installed on conventional highways.
8. Rumble strips shall not be placed across exit or entrance ramps, acceleration and deceleration lanes, crossovers, gore areas or intersections with other roadways.
9. Consideration should be given to noise levels when edgeline rumble strips are installed near residential areas, schools, churches, etc. A minimum of 3/8 inches depth of milled rumble strip may be considered in these areas.
10. On roadways with high bicycle activity, consideration should be given before the installation of edgeline rumble strips. Things to consider include size of rumble strips, rumble strip material and location of rumble strips on the shoulder. If the designer determines that gaps are needed in the rumble strips due to bicycle use of the road, then follow the requirement shown in FHWA Technical Advisory T5040.39, or latest version. A detail of the spacing shall be included in the plans.

WHEN INSTALLING RAISED OR PROFILE EDGELINE RUMBLE STRIPS:

11. Raised rumble strips consisting of non-reflective raised traffic buttons may be used. Non-reflective raised traffic buttons can be affixed to asphalt or concrete with bitumen or adhesives, as per the manufacturer's recommendations.
12. Non-reflective traffic buttons shall be placed adjacent to the pavement marking delineating the edgeline when used as a rumble strip. The color of the button should match the color of the adjacent edgeline marking (white or yellow). The buttons will be paid for under Item 672, "Raised Pavement Markers." Non-reflective traffic buttons must meet the requirements of DMS-4300.
13. Non-reflective traffic buttons shall not be placed across exit or entrance ramps, acceleration and deceleration lanes, crossovers, gore areas or intersections with other roadways.
14. Breaks in edgeline rumble strips using raised traffic buttons shall occur at least 50 feet and no more than 150 feet in advance of bridges, railroad crossing, intersections and driveways with high usage of large trucks when installed on conventional highways.
15. The minimum distance between the edgeline and the buttons should be used if the shoulder is less than 8 feet in width.
16. Raised profile thermoplastic markings used as edgelines may substitute for buttons.

Texas Department of Transportation

Traffic Operations Division Standard

EDGELINE RUMBLE STRIPS ON UNDIVIDED OR TWO LANE HIGHWAYS RS(4)-13

FILE: rs(4)-13.dgn	DN: TxDOT	CK: TxDOT	DW: TxDOT	CK: TxDOT
©TxDOT October 2013	CONT	SECT	JOB	HIGHWAY
REVISIONS	0106	04	036	US 380
	DIST	COUNTY		SHEET NO.
	ABL	STONEWALL		164

DATE: 4/28/2022 6:41:28 PM
FILE: c:\pw_work\atknatx01\rome2243\dms57969\rs(4)-13.dgn

SIGN SUPPORT DESCRIPTIVE CODES

(Descriptive Codes correspond to project estimate and quantities sheets)

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

Post Type

FRP = Fiberglass Reinforced Plastic Pipe (see SMD(FRP))
TWT = Thin-Walled Tubing (see SMD(TWT))
10BWG = 10 BWG Tubing (see SMD(SLIP-1) to (SLIP-3))
S80 = Schedule 80 Pipe (see SMD(SLIP-1) to (SLIP-3))

Number of Posts (1 or 2)

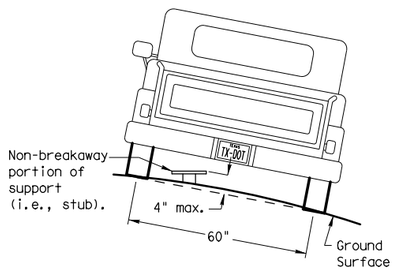
Anchor Type

UA = Universal Anchor - Concreted (see SMD(FRP) and (TWT))
UB = Universal Anchor - Bolted down (see SMD(FRP) and (TWT))
WS = Wedge Anchor Steel - (see SMD(TWT))
WP = Wedge Anchor Plastic (see SMD(TWT))
SA = Slipbase - Concreted (see SMD(SLIP-1) to (SLIP-3))
SB = Slipbase - Bolted Down (see SMD(SLIP-1) to (SLIP-3))

Sign Mounting Designation

P = Prefab. "Plain" (see SMD(SLIP-1) to (SLIP-3), (TWT), (FRP))
T = Prefab. "T" (see SMD(SLIP-1) to (SLIP-3), (TWT))
U = Prefab. "U" (see SMD(SLIP-1) to (SLIP-3))
IF REQUIRED
1EXT or 2EXT = Number of Extensions (see SMD(SLIP-1) to (SLIP-3), (TWT))
BM = Extruded Wind Beam (see SMD(SLIP-1) to (SLIP-3))
WC = 1.12 #/ft Wing Channel (see SMD(SLIP-1) to (SLIP-3))
EXAL = Extruded Aluminum Sign Panels (see SMD(SLIP-1))

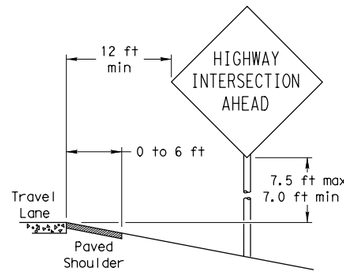
REQUIRED CLEARANCE FOR BREAKAWAY SUPPORT



To avoid vehicle undercarriage snagging, any substantial remains of a breakaway support, when it is broken away, should not project more than 4 inches above a 60-inch chord (i.e., typical space between wheel paths).

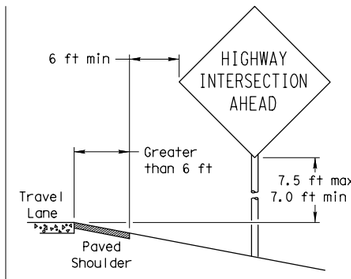
SIGN LOCATION

PAVED SHOULDERS



LESS THAN 6 FT. WIDE

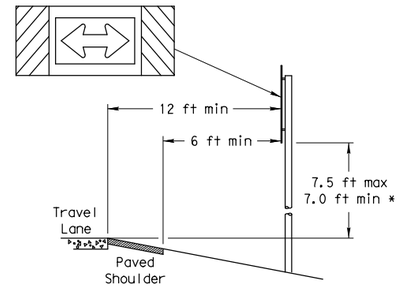
When the shoulder is 6 ft. or less in width, the sign must be placed at least 12 ft. from the edge of the travel lane.



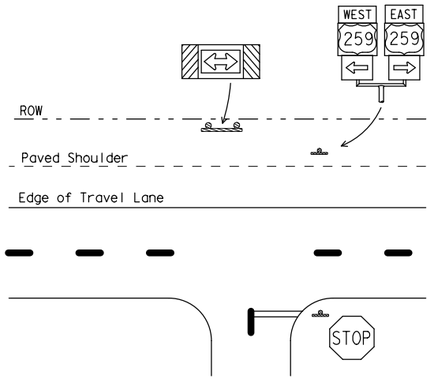
GREATER THAN 6 FT. WIDE

When the shoulder is greater than 6 ft in width, the sign must be placed at least 6 ft. from the edge of the shoulder.

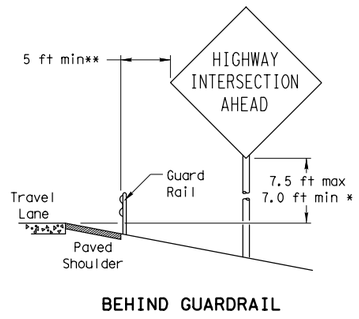
T-INTERSECTION



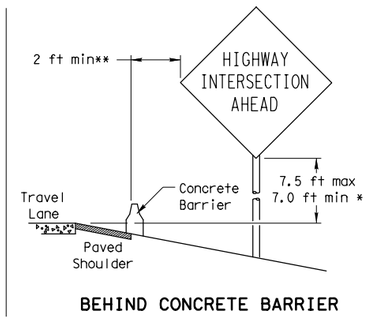
When this sign is needed at the end of a two-lane, two way roadway, the right edge of the sign should be in line with the centerline of the roadway. Place as close to ROW as practical.



BEHIND BARRIER



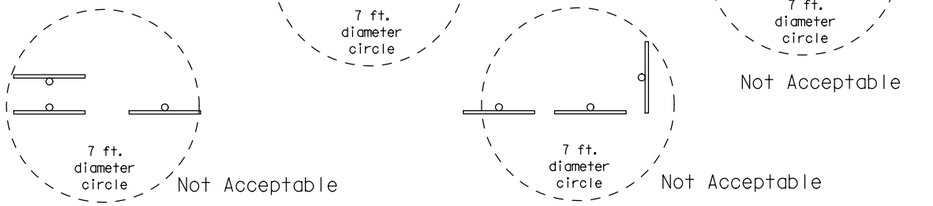
BEHIND GUARDRAIL



BEHIND CONCRETE BARRIER

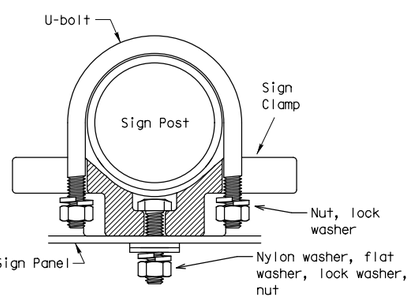
**Sign clearance based on distance required for proper guard rail or concrete barrier performance.

No more than 2 sign posts should be located within a 7 ft. circle.



TYPICAL SIGN ATTACHMENT DETAIL

Single Signs

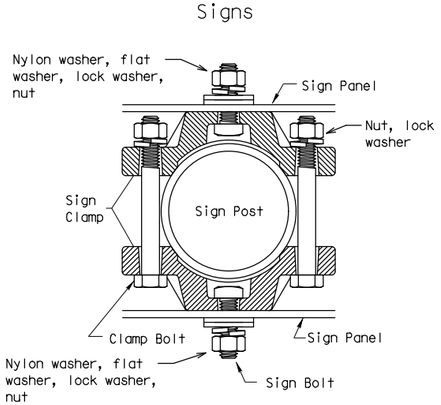


Bolts used to mount sign panels to the clamp are 5/16-18 UNC galvanized square head with nut, nylon washer, flat washer and lock washer. The bolt length is 1 inch for aluminum.

When two sign clamps are used to mount signs back-to-back, use a 5/16-18 UNC galvanized hex head per ASTM A307 with nut and helical-spring lock washer. The approximate bolt lengths for various post sizes and sign clamp types are given in the table at right. The bolt length may need to be adjusted depending upon field conditions.

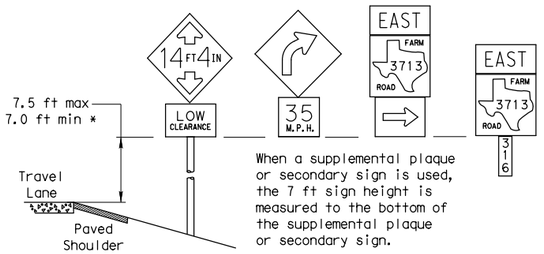
Sign clamps may be either the specific size clamp or the universal clamp.

Back-to-Back Signs



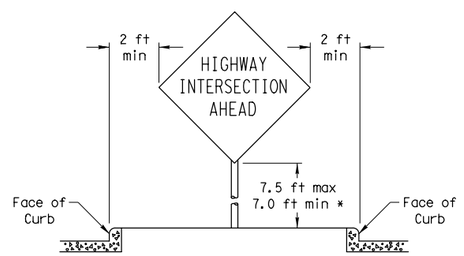
Pipe Diameter	Approximate Bolt Length	
	Specific Clamp	Universal Clamp
2" nominal	3"	3 or 3 1/2"
2 1/2" nominal	3 or 3 1/2"	3 1/2 or 4"
3" nominal	3 1/2 or 4"	4 1/2"

SIGNS WITH PLAQUES



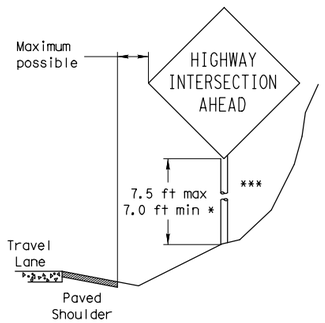
When a supplemental plaque or secondary sign is used, the 7 ft sign height is measured to the bottom of the supplemental plaque or secondary sign.

CURB & GUTTER OR RAISED ISLAND



RESTRICTED RIGHT-OF-WAY

(When 6 ft min. is not possible.)



Right-of-way restrictions may be created by rocks, water, vegetation, forest, buildings, a narrow island, or other factors.

In situations where a lateral restriction prevents the minimum horizontal clearance from the edge of the travel lane, signs should be placed as far from the travel lane as practical.

*** Post may be shorter if protected by guardrail or if Engineer determines the post could not be hit due to extreme slope.

* Signs shall be mounted using the following condition that results in the greatest sign elevation:

(1) a minimum of 7 to a maximum of 7.5 feet above the edge of the travel lane or

(2) a minimum of 7 to a maximum of 7.5 feet above the grade at the base of the support when sign is installed on the backslope.

The maximum values may be increased when directed by the Engineer.

See the Traffic Operations Division website for detailed drawings of sign clamps, Triangular Slipbase System components and Wedge Anchor System components.

The website address is:
http://www.txdot.gov/publications/traffic.htm

Texas Department of Transportation
Traffic Operations Division

SIGN MOUNTING DETAILS SMALL ROADSIDE SIGNS GENERAL NOTES & DETAILS

SMD(GEN)-08

REVISIONS	DN: TXDOT	CK: TXDOT	DW: TXDOT	CK: TXDOT
9-08	CONT	SECT	JOB	HIGHWAY
	0106	04	036	US 380
	DIST	COUNTY		SHEET NO.
	ABL	STONEWALL		165

DATE: 4/28/2022 6:41:33 PM
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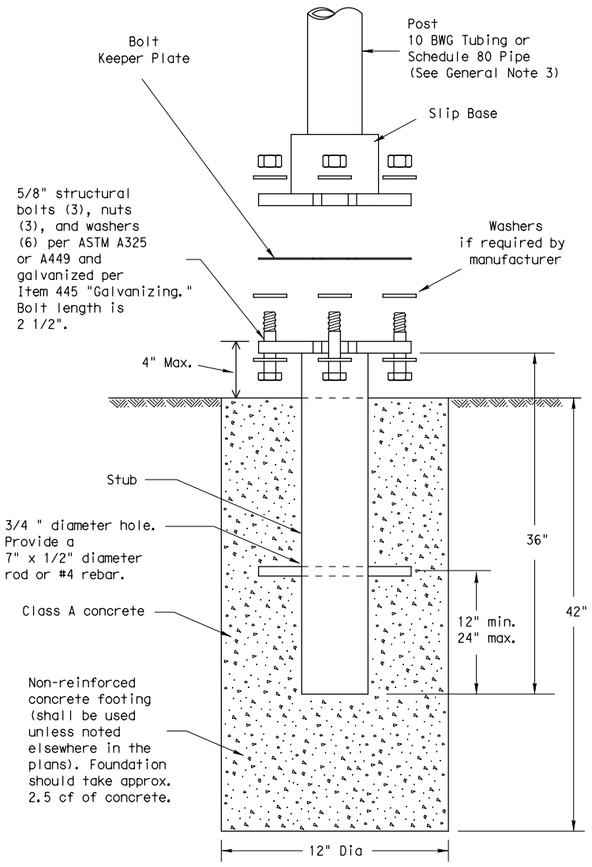
TRIANGULAR SLIPBASE INSTALLATION GENERAL REQUIREMENTS



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

NOTE

There are various devices approved for the Triangular Slipbase System. Please reference the Material Producer List for approved slip base systems. http://www.txdot.gov/business/producer_list.htm The devices shall be installed per manufacturers' recommendations. Installation procedures shall be provided to the Engineer by Contractor.

GENERAL NOTES:

1. Slip base shall be permanently marked to indicate manufacturer. Method, design, and location of marking are subject to approval of the TxDOT Traffic Standards Engineer.
2. Material used as post with this system shall conform to the following specifications:
   10 BWG Tubing (2.875" outside diameter)
   - 0.134" nominal wall thickness
   - Seamless or electric-resistance welded steel tubing or pipe
   - Steel shall be HSLAS Gr 55 per ASTM A1011 or ASTM A1008
   - Other steels may be used if they meet the following:
     - 55,000 PSI minimum yield strength
     - 70,000 PSI minimum tensile strength
     - 20% minimum elongation in 2"
   - Wall thickness (uncoated) shall be within the range of 0.122" to 0.138"
   - Outside diameter (uncoated) shall be within the range of 2.867" to 2.883"
   - Galvanization per ASTM A123 or ASTM A653 G210. For precoated steel tubing (ASTM A653), recoat tube outside diameter weld seam by metallizing with zinc wire per ASTM B833.

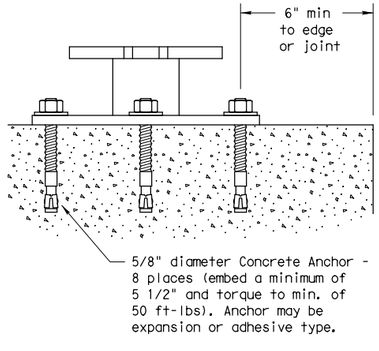
   Schedule 80 Pipe (2.875" outside diameter)
   - 0.276" nominal wall thickness
   - Steel tubing per ASTM A500 Gr C
   - Other seamless or electric-resistance welded steel tubing or pipe with equivalent outside diameter and wall thickness may be used if they meet the following:
     - 46,000 PSI minimum yield strength
     - 62,000 PSI minimum tensile strength
     - 21% minimum elongation in 2"
   - Wall thickness (uncoated) shall be within the range of 0.248" to 0.304"
   - Outside diameter (uncoated) shall be within the range of 2.855" to 2.895"
   - Galvanization per ASTM A123
3. See the Traffic Operations Division website for detailed drawings of sign clamps and Texas Universal Triangular Slipbase System components. The website address is: http://www.txdot.gov/publications/traffic.htm
4. Sign supports shall not be spliced except where shown. Sign support posts shall not be spliced.

ASSEMBLY PROCEDURE

Foundation
1. Prepare 12-inch diameter by 42-inch deep hole. If solid rock is encountered, the depth of the foundation may be reduced such that it is embedded a minimum of 18 inches into the solid rock.
2. The Engineer may permit batches of concrete less than 2 cubic yards to be mixed with a portable, motor-driven concrete mixer. For small placements less than 0.5 cubic yards, hand mixing in a suitable container may be allowed by Engineer. Concrete shall be Class A.
3. Push the pipe end of the slip base stub into the center of the concrete. Rotate the stub back and forth while pushing it down into the concrete to assure good contact between the concrete and stub. Continue to work the stub into the concrete until it is between 2 to 4 inches above the ground.
4. Plumb the stub. Allow a minimum of 4 days to set, unless otherwise directed by the Engineer.
5. The triangular slipbase system is multidirectional and is designed to release when struck from any direction.

Support
1. Cut support so that the bottom of the sign will be 7 to 7.5 feet above the edge of the travelway (i.e., edge of the closest lane) when slip plate is below the edge of pavement or 7 to 7.5 feet above slip plate when the slip plate is above the edge of the travelway. The cut shall be plumb and straight.
2. Attach sign to support using connections shown. When multiple signs are installed on the same support, ensure the minimum clearance between each sign is maintained. See SMD(SLIP-2) for clearances based on sign types.

CONCRETE ANCHOR



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

Concrete anchor consists of 5/8" diameter stud bolt with UNC series bolt threads on the upper end. Heavy hex nut per ASTM A563, and hardened washer per ASTM F436. The stud bolt shall have a minimum yield and ultimate tensile strength of 50 and 75 KSI, respectively. Nuts, bolts and washers shall be galvanized per Item 445, "Galvanizing." Adhesive type anchors shall have stud bolts installed with Type III epoxy per DMS-6100, "Epoxies and Adhesives." Adhesive anchors may be loaded after adequate epoxy cure time per the manufacturer's recommendations. Top of bolt shall extend at least flush with top of the nut when installed. The anchor, when installed in 4000 psi normal-weight concrete with a 5 1/2" minimum embedment, shall have a minimum allowable tension and shear of 3900 and 3100 psi, respectively.

Texas Department of Transportation
Traffic Operations Division

SIGN MOUNTING DETAILS
SMALL ROADSIDE SIGNS
TRIANGULAR SLIPBASE SYSTEM

SMD(SLIP-1)-08

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

REVISIONS
9-08

CONT	SECT	JOB	HIGHWAY
0106	04	036	US 380

DIST	COUNTY	SHEET NO.
ABL	STONEWALL	166

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DATE: 4/28/2022 6:41:43 PM
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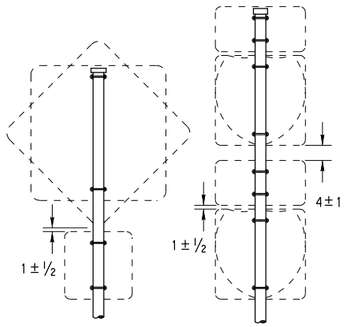
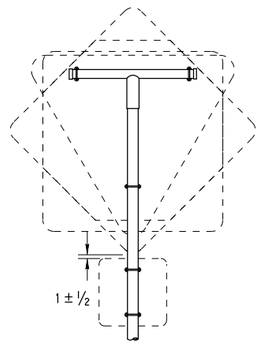


SM RD SGN ASSM TY XXXXX(1)XX(P)



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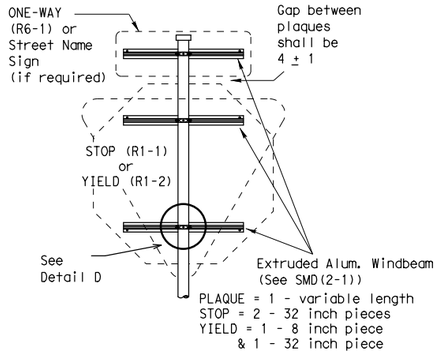

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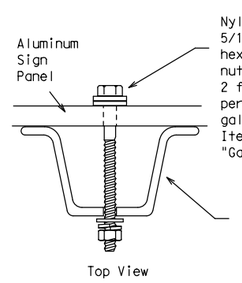
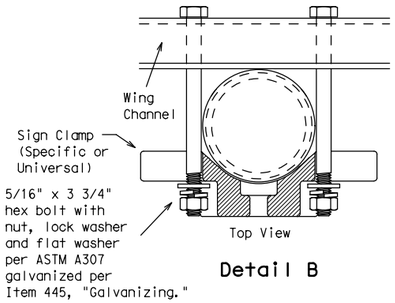
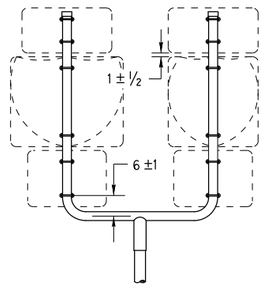


Detail A



Detail B



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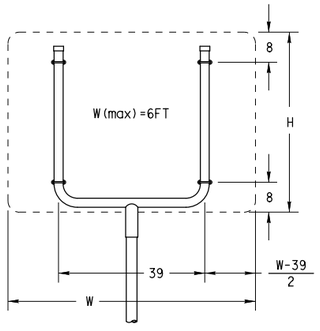

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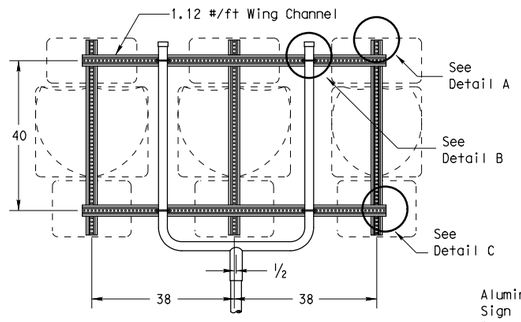


SM RD SGN ASSM TY XXXXX(1)XX(U-WC)
(See Note 11)

Drill 7/16" hole (through) after assembly and install bolt, nut, 2 flat washers and lock washer.

3/8" x 3 1/2" heavy hex bolt with nut, lock washer and 2 flat washers per ASTM A307 galvanized per Item 445 "Galvanizing."

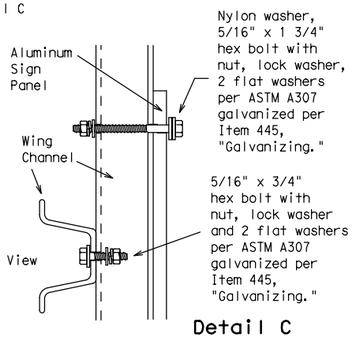
1 1/2"

Extender

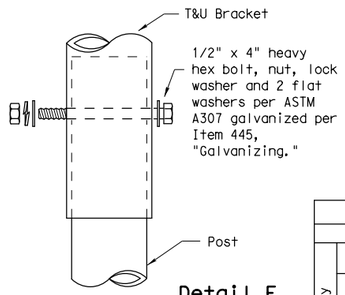
U-Bracket

Detail F

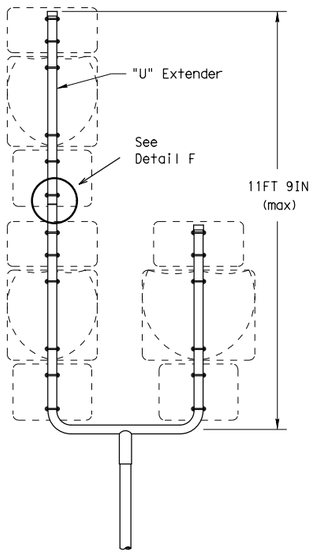
Splices shall only be allowed behind the sign substrate.



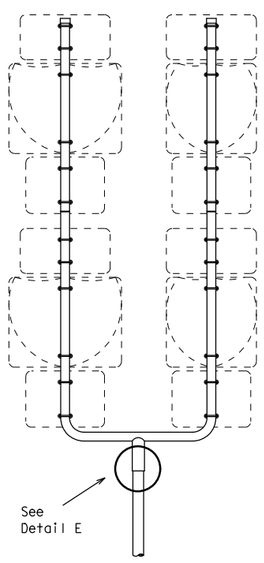
Detail C



Detail E



SM RD SGN ASSM TY S80(1)XX(U-1EXT)



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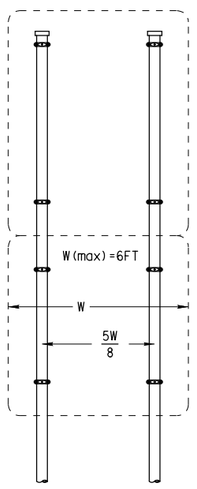
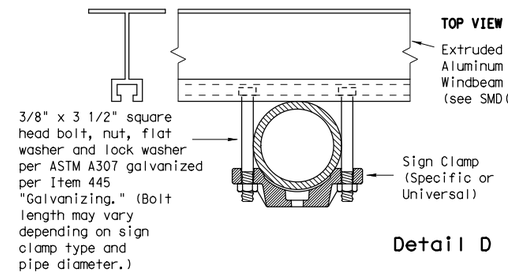
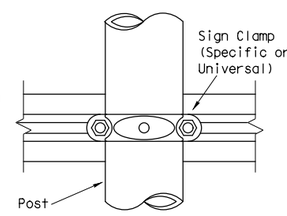


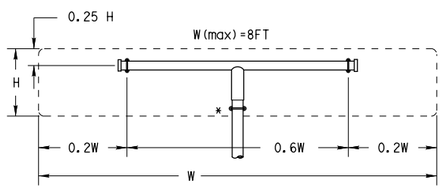
SM RD SGN ASSYM TY XXXXX(2)XX(P)

SIDE VIEW



Detail D

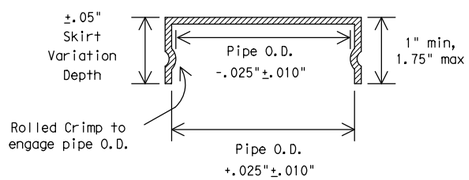




SM RD SGN ASSM TY XXXXX(1)XX(T)
(* - See Note 12)

All dimensions are in english unless detailed otherwise.

FRICTION CAP DETAIL



Friction caps may be manufactured from hot rolled or cold rolled steel sheets. The minimum sheet metal thickness shall be 24 gauge for all cap sizes.

The rim edges shall be reasonably straight and smooth. Caps shall be sized and formed in such a manner as to produce a drive-on friction fit and have no tendency to rock when seated on the pipe. The depth shall be sufficient to give positive protection against entrance of rainwater. They shall be free of sharp creases or indentations and show no evidence of metal fracture.

Caps shall have an electrodeposited coating of zinc in accordance with the requirements of ASTM B633 Class FE/ZN 8.

GENERAL NOTES:

1.

SIGN SUPPORT	# OF POSTS	MAX. SIGN AREA
10 BWG	1	16 SF
10 BWG	2	32 SF
Sch 80	1	32 SF
Sch 80	2	64 SF

2. The Engineer may require that a Schedule 80 post be used in place of a 10 BWG where a sign height is abnormally high due to a fill slope.
3. Sign supports shall not be spliced except where shown. Sign support posts shall not be spliced.
4. Aluminum sign blanks shall conform to Departmental Material Specifications DMS-7110 and shall have the following minimum thicknesses: 0.080 for signs less than 7.5 sq. ft., 0.100 for signs 7.5 to 15 sq. ft., and 0.125 for signs greater than 15 sq. ft.
5. Signs that require specific supports due to reasons in addition to windloading are indicated on the "REQUIRED SUPPORT" table on this sheet.
6. For horizontal rectangular signs fabricated from flat aluminum, T-brackets are used for signs 24 inches or less in height. U-brackets are used for signs of greater height.
7. When two triangular slipbase supports are used to support a single sign, they shall not be "rigidly" connected to each other except through the sign panel. This will allow each support to act independently when impacted by an errant vehicle.
8. Wing channel shall meet ASTM A 1011 SS Gr 50 and be galvanized per ASTM A 123.
9. Excess pipe, wing channel, or windbeam shall be cut off so that it does not extend beyond the sign panel (i.e., excess support shall not be visible when the sign is viewed from the front.) Repair galvanized coating at cut support ends per Item 445, "Galvanizing."
10. Additional route markers may be added vertically, provided the total sign area does not exceed the maximum allowable amount per Note 1.
11. Additional sign clamp required on the "T-bracket" post for 24 inch height signs. Place the clamp 3 inches above bottom of sign when possible.
12. Post open ends shall be fitted with Friction Caps.
13. Sign blanks shall be the sizes and shapes shown on the plans.

REQUIRED SUPPORT

	SIGN DESCRIPTION	SUPPORT
Regulatory	48-inch STOP sign (R1-1)	TY 10BWG(1)XX(T) TY 10BWG(1)XX(P-BM)
	60-inch YIELD sign (R1-2)	TY 10BWG(1)XX(T) TY 10BWG(1)XX(P-BM)
	48x16-inch ONE-WAY sign (R6-1)	TY 10BWG(1)XX(T) TY 10BWG(1)XX(P-BM)
	36x48, 48x36, and 48x48-inch signs	TY 10BWG(1)XX(T)
	48x60-inch signs	TY S80(1)XX(T)
Warning	48x48-inch signs (diamond or square)	TY 10BWG(1)XX(T)
	48x60-inch signs	TY S80(1)XX(T)
	48-inch Advance School X-ing sign (S1-1)	TY 10BWG(1)XX(T)
	48-inch School X-ing sign (S2-1)	TY 10BWG(1)XX(T)
	Large Arrow sign (W1-6 & W1-7)	TY 10BWG(1)XX(T)

Texas Department of Transportation
Traffic Operations Division

SIGN MOUNTING DETAILS SMALL ROADSIDE SIGNS TRIANGULAR SLIPBASE SYSTEM

SMD(SLIP-2)-08

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

9-08 REVISIONS	CONT	SECT	JOB	HIGHWAY
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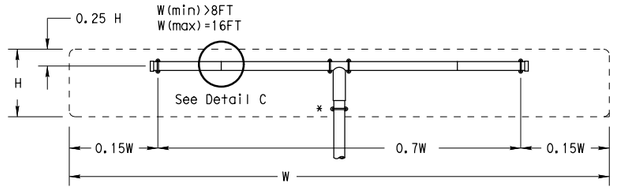
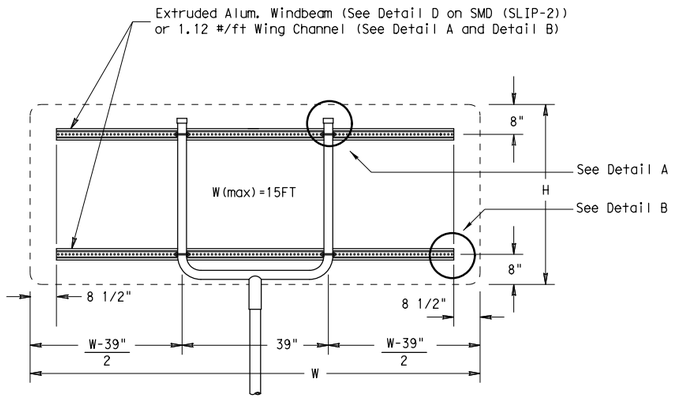
	DIST	COUNTY		SHEET NO.
	ABL	STONEWALL		167

26C



SM RD SGN ASSM TY XXXXX(1)XX(T-2EXT)

(* - See Note 12)



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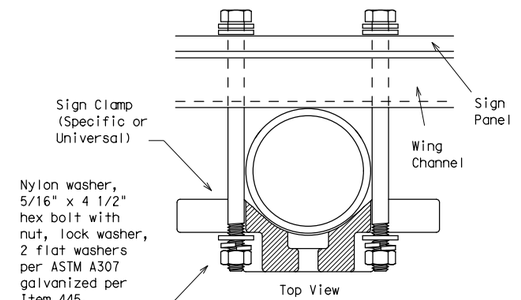
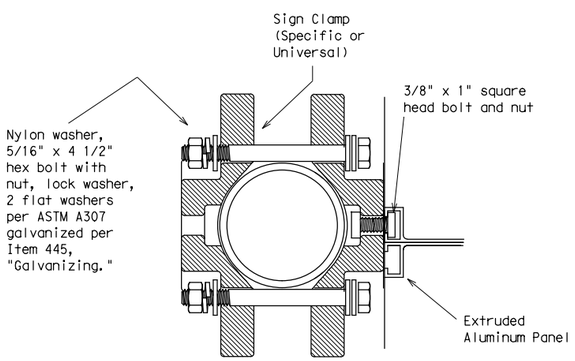
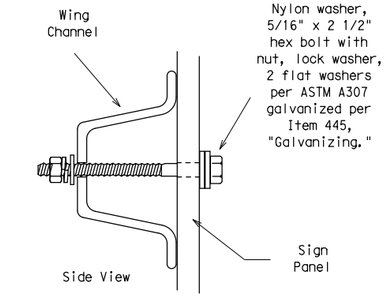


Detail A



Detail D

EXTRUDED ALUMINUM SIGN WITH T BRACKET



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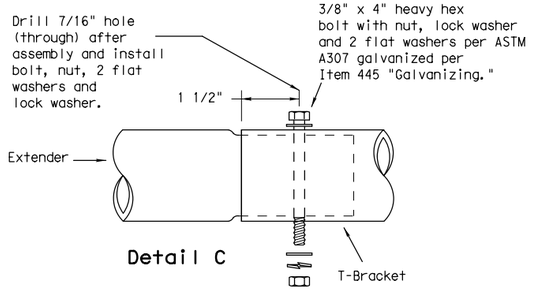
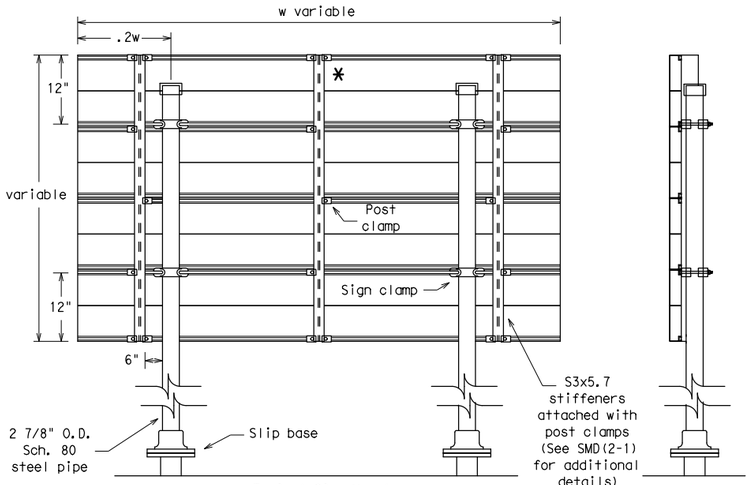


Detail C

Splices shall only be allowed behind the sign substrate.

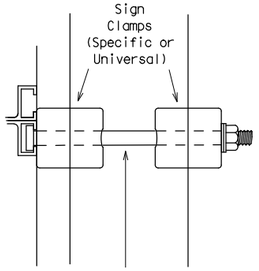


Typical Sign Mount

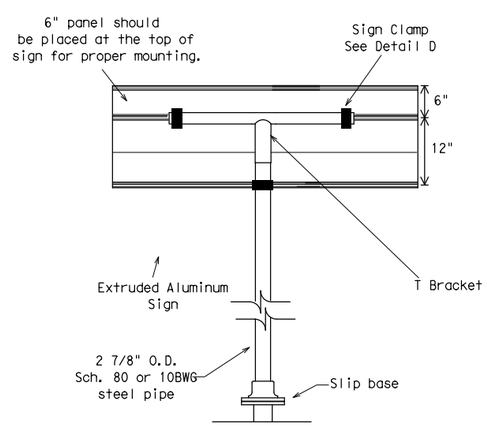
SM RD SGN ASSM TY S80(2)XX(P-EXAL)

* Additional stiffener placed at approximate center of signs when sign width is greater than 10'.

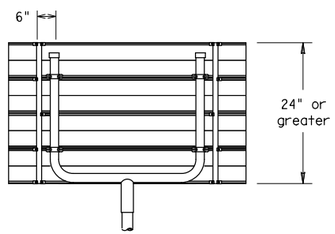
See Detail E
for clamp installation



Detail E



Extruded Aluminum Sign
With T Bracket



Use Extruded Alum. Windbeam as stiffeners
See SMD (2-1) for additional details

See Detail E
for clamp installation

GENERAL NOTES:

SIGN SUPPORT	# OF POSTS	MAX. SIGN AREA
10 BWG	1	16 SF
10 BWG	2	32 SF
Sch 80	1	32 SF
Sch 80	2	64 SF

1. The Engineer may require that a Schedule 80 post be used in place of a 10 BWG where a sign height is abnormally high due to a fill slope.
2. Sign supports shall not be spliced except where shown. Sign support posts shall not be spliced.
3. Aluminum sign blanks shall conform to Departmental Material Specifications DMS-7110 and shall have the following minimum thicknesses: 0.080 for signs less than 7.5 sq. ft., 0.100 for signs 7.5 to 15 sq. ft., and 0.125 for signs greater than 15 sq. ft.
4. Signs that require specific supports due to reasons in addition to windloading are indicated on the "REQUIRED SUPPORT" table on this sheet.
5. For horizontal rectangular signs fabricated from flat aluminum, T-brackets are used for signs 24 inches or less in height. U-brackets are used for signs of greater height.
6. When two triangular slipbase supports are used to support a single sign, they shall not be "rigidly" connected to each other except through the sign panel. This will allow each support to act independently when impacted by an errant vehicle.
7. Wing channel shall meet ASTM A 1011 SS Gr 50 and be galvanized per ASTM A 123.
8. Excess pipe, wing channel, or windbeam shall be cut off so that it does not extend beyond the sign panel (i.e., excess support shall not be visible when the sign is viewed from the front.) Repair galvanized coating at cut support ends per Item 445, "Galvanizing."
9. Sign blanks shall be the sizes and shapes shown on the plans.
10. Additional sign clamp required on the "T-bracket" post for 24 inch high signs. Place the clamp 3 inches above bottom of sign when possible.
11. Post open ends shall be fitted with Friction Caps.

REQUIRED SUPPORT		
	SIGN DESCRIPTION	SUPPORT
Regulatory	48-inch STOP sign (R1-1)	TY 10BWG(1)XX(T) TY 10BWG(1)XX(P-BM)
	60-inch YIELD sign (R1-2)	TY 10BWG(1)XX(T) TY 10BWG(1)XX(P-BM)
	48x16-inch ONE-WAY sign (R6-1)	TY 10BWG(1)XX(T) TY 10BWG(1)XX(P-BM)
	36x48, 48x36, and 48x48-inch signs	TY 10BWG(1)XX(T)
	48x60-inch signs	TY S80(1)XX(T)
Warning	48x48-inch signs (diamond or square)	TY 10BWG(1)XX(T)
	48x60-inch signs	TY S80(1)XX(T)
	48-inch Advance School X-ing sign (S1-1)	TY 10BWG(1)XX(T)
	48-inch School X-ing sign (S2-1)	TY 10BWG(1)XX(T)
	Large Arrow sign (W1-6 & W1-7)	TY 10BWG(1)XX(T)

Texas Department of Transportation
Traffic Operations Division

SIGN MOUNTING DETAILS SMALL ROADSIDE SIGNS TRIANGULAR SLIPBASE SYSTEM

SMD(SLIP-3)-08

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

REVISIONS
9-08

CONT	SECT	JOB	HIGHWAY
0106	04	036	US 380
DIST	COUNTY		SHEET NO.
ABL	STONEWALL		168

DATE: 4/28/2022 6:41:47 PM
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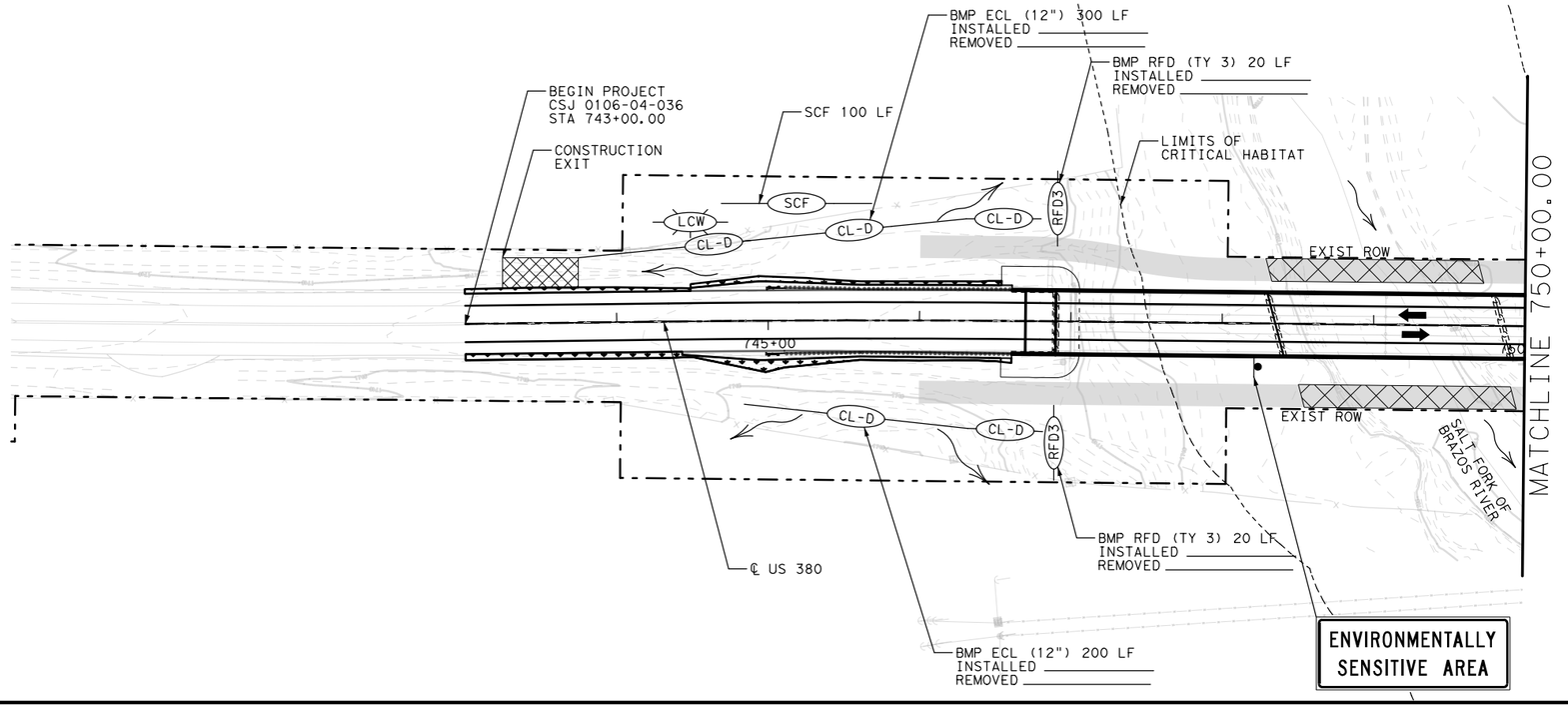


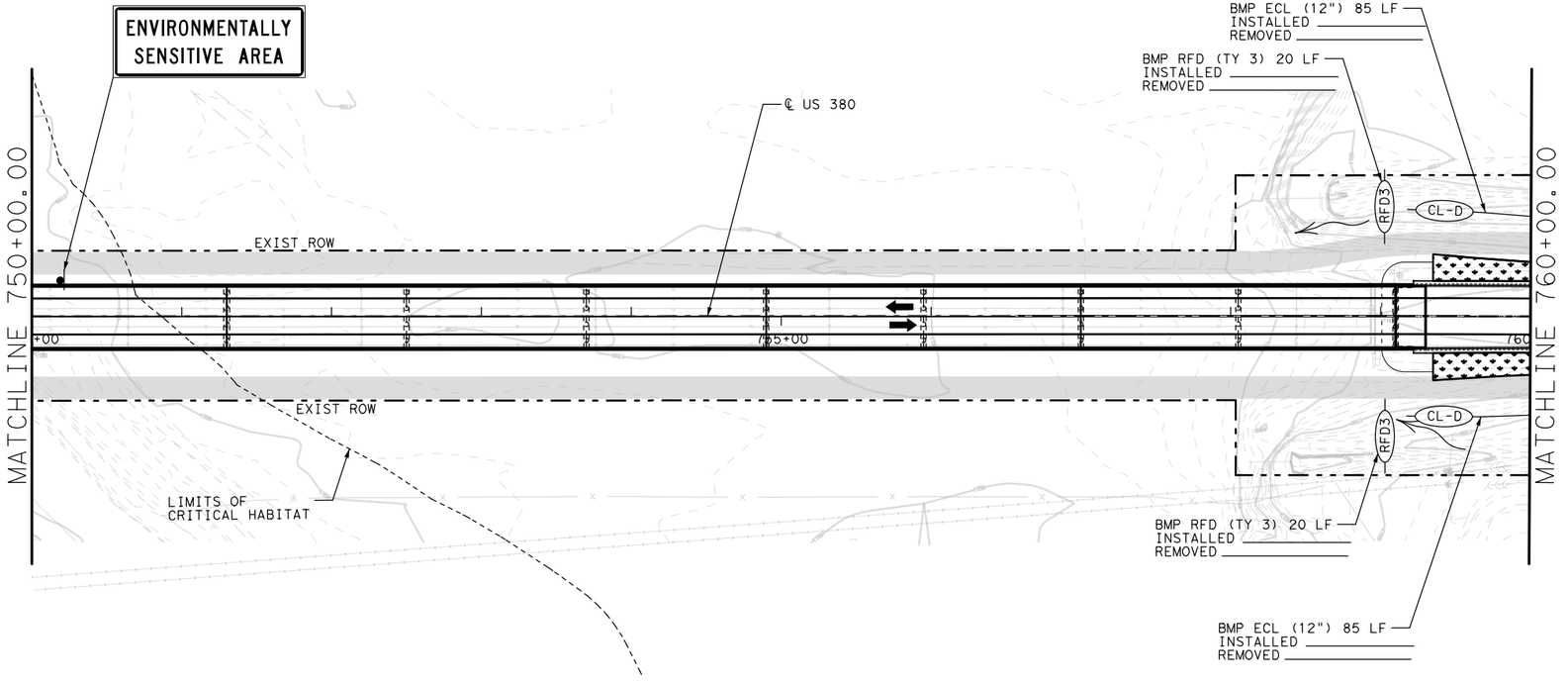
NOTES:

1. SEDIMENT CONTROLS SHALL BE IN PLACE PRIOR TO COMMENCING ANY SOIL DISTURBING ACTIVITIES.
2. ALL CONTROLS TO BE PLACED AS SHOWN ON STANDARDS EC(1), EC(2), EC(3), AND EC(9).
3. ALL PERIMETER SEDIMENT CONTROLS TO REMAIN IN PLACE FOR THE DURATION OF THE PROJECT OR UNTIL DISTURBED AREAS ARE STABILIZED.
4. EROSION CONTROL QUANTITIES ARE APPROXIMATE AND MAY BE ADJUSTED TO MEET FIELD CONDITIONS.
5. EXACT LOCATION OF ROCK FILTER DAM (RDF) AND TEMPORARY SEDIMENT CONTROL FENCE TO BE DETERMINED BY THE ENGINEER.
6. FINAL LOCATIONS OF THE LINED CONCRETE WASHOUTS TO BE DETERMINED BY THE ENGINEER. SUBSIDIARY TO ITEM 506 "TEMPORARY EROSION, SEDIMENTATION, AND ENVIRONMENTAL CONTROLS".

LEGEND

- CL-D — EROSION CONTROL LOGS
- RFD# — ROCK FILTER DAM (TY #)
- SCF — SEDIMENT CONTROL FENCE
- LCW — LINED CONCRETE WASHOUT
- CONSTRUCTION EXIT
- SEEDING
- TRAFFIC DIRECTION
- FLOW DIRECTION

0 25 50 100
SCALE = 1"=100' H



STATE OF TEXAS
JENELLE N. ROMERO
97940
LICENSED PROFESSIONAL ENGINEER
4/28/2022

ATKINS
TBPE REG. # F-474

Texas Department of Transportation
Abilene District

US 380

SW3P SITE PLAN

SHEET 1 OF 2

DESIGNED: SG	FED. RD DIV. No.	STATE	PROJECT No.			HIGHWAY No.
CHECKED: JD	6	TEXAS	SEE TITLE SHEET			US 380
DRAWN: SG	STATE DISTRICT	COUNTY	CONTROL No.	SECTION No.	JOB No.	SHEET No.
CHECKED: JD	ABL	STONEWALL	0106	04	036	169

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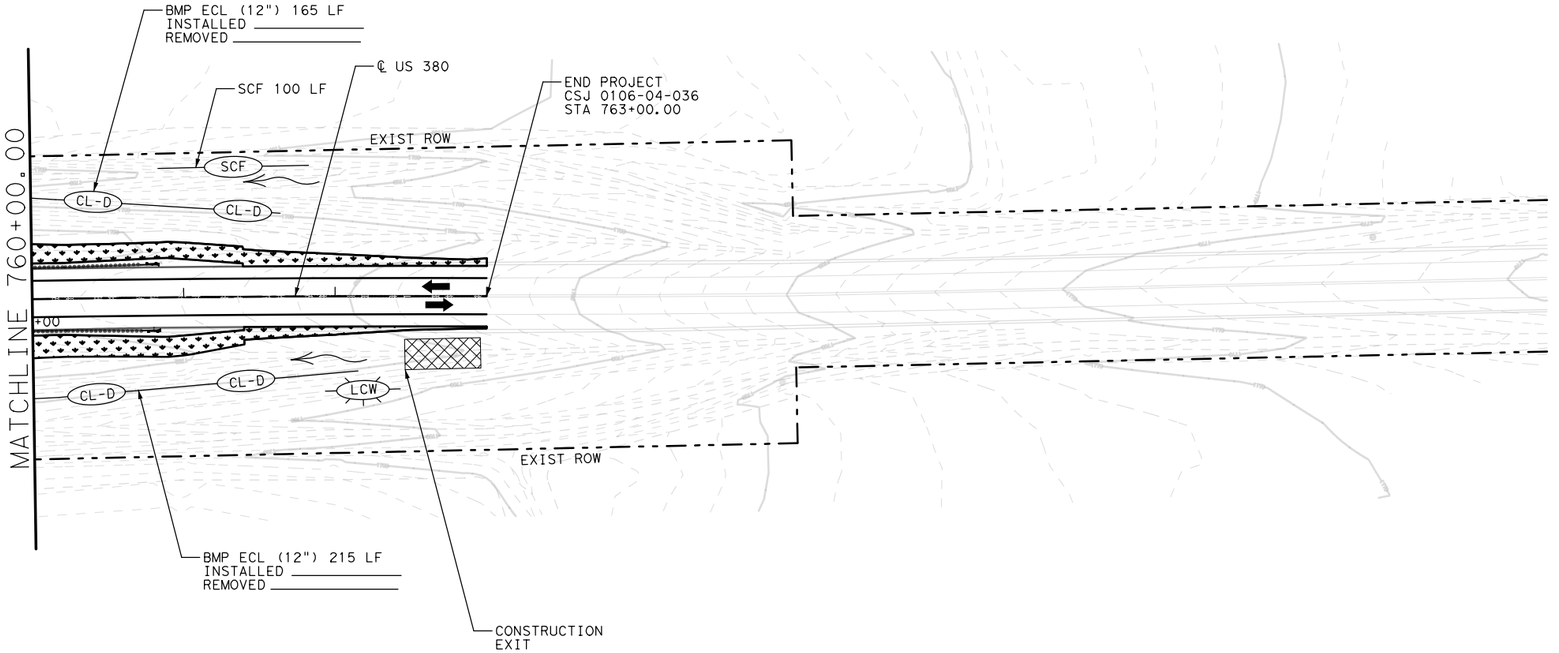

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- CONSTRUCTION EXIT
- SEEDING
- TRAFFIC DIRECTION
- FLOW DIRECTION

0 25 50 100
SCALE = 1"=100' H

STATE OF TEXAS
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PROFESSIONAL ENGINEER
4/28/2022

ATKINS
TBPE REG. # F-474

Texas Department of Transportation
Abilene District

US 380

SW3P SITE PLAN

SHEET 2 OF 2

DESIGNED: SG	FED. RD DIV. No.	STATE	PROJECT No.			HIGHWAY No.
CHECKED: JD	6	TEXAS	SEE TITLE SHEET			US 380
DRAWN: SG	STATE DISTRICT	COUNTY	CONTROL No.	SECTION No.	JOB No.	SHEET No.
CHECKED: JD	ABL	STONEWALL	0106	04	036	170

PLOT DRIVER: TXDOT_PDF_BW.plt
PEN TABLE: US380_pen.tbl
FILE: c:\pw_work\atkmdtx01\rome2243\dms57963\US380_SW3P2.dgn

SITE DESCRIPTION

PROJECT LIMITS:
THE PROJECT LIMITS SHOWN ON THE TITLE SHEET AND LIMITS OF TXDOT RIGHT OF WAY SHALL ALSO BE THE LIMITS OF COVERAGE OF THE SW3P.

PROJECT LOCATION MAPS: TITLE SHEET

DRAINAGE PATTERNS: DRAINAGE AREA MAPS

APPROX. SLOPES ANTICIPATED AFTER MAJOR GRADING AND AREAS OF SOIL DISTURBANCE: TYPICAL SECTIONS

MAJOR CONTROLS AND LOCATIONS OF STABILIZATION PRACTICES: SW3P SITE PLAN

PROJECT SPECIFIC LOCATIONS: TO BE SPECIFIED BY PROJECT FIELD OFFICE AND LOCATED IN THE PROJECT SW3P FILE.

SURFACE WATERS AND DISCHARGE LOCATIONS:
DRAINAGE SHEETS

TYPICAL AREAS WHICH WILL NOT BE DISTURBED:
SW3P SITE PLAN

ENDANGERED SPECIES, DESIGNATED CRITICAL HABITAT AND HISTORIC PROPERTY: EPIC SHEET

ESTIMATED START DATES AND DURATION OF ACTIVITIES IN THE INTENDED SCHEDULE/SEQUENCE OF EARTH-DISTURBING ACTIVITIES: CONTRACT TIME ESTIMATE

NATURE OF ACTIVITY:
FOR THE CONSTRUCTION OF BRIDGE REPLACEMENT CONSISTING OF: REPLACING BRIDGE AND BRIDGE APPROACHES.

MAJOR SOIL DISTURBING ACTIVITIES:
SOIL DISTURBING ACTIVITIES WILL INCLUDE BRIDGE AND BRIDGE APPROACH REPLACEMENT.

TOTAL PROJECT AREA:
6.65 ACRES

TOTAL AREA TO BE DISTURBED (AT EACH SITE):
2.23 ACRES

WEIGHTED RUNOFF COEFFICIENT BEFORE CONSTRUCTION:
0.43

WEIGHTED RUNOFF COEFFICIENT AFTER CONSTRUCTION:
0.44

EXISTING CONDITION OF SOIL & VEGETATIVE COVER:
GOOD

% OF EXISTING VEGETATIVE COVER:
69%

NAME OF RECEIVING WATERS:
STREAM SEGMENT 1238 OF THE BRAZOS RIVER BASIN

EROSION AND SEDIMENT CONTROLS

USE "T" OR "P" IN THE BLANKS BELOW IF APPLICABLE (T= TEMPORARY, P= PERMANENT)

SOIL STABILIZATION PRACTICES:

P	BUFFER ZONES	P	PERMANENT PLANTING, SODDING, OR SEEDING
	MULCHING	P	PRESERVATION OF NATURAL RESOURCES
	TEMPORARY SEEDING		SOIL RETENTION BLANKET
	OTHER		OTHER

OTHER:

DISTURBED AREAS ON WHICH CONSTRUCTION ACTIVITY HAS CEASED (TEMPORARILY OR PERMANENTLY) SHALL BE STABILIZED WITHIN 14 DAYS UNLESS ACTIVITIES ARE SCHEDULED TO RESUME WITHIN 14 DAYS.

FOR CONSTRUCTION PROJECTS, THIS DISTRICT OF THE TEXAS DEPARTMENT OF TRANSPORTATION USES SITEMANAGER, A COMPUTER BASED CONSTRUCTION RECORD-KEEPING SYSTEM, AS PART OF RECORD FOR PROJECT WORK INCLUDING ENVIRONMENTAL RELATED ACTIVITIES. DOCUMENTATION DESCRIBING MAJOR GRADING ACTIVITES, TEMPORARY OR PERMANENT CESSATION OF CONSTRUCTION AND STABILIZATION MEASURE IS PART OF THIS SYSTEM AND IS INCORPORATED BY REFERENCE INTO THIS SW3P.

STRUCTURAL PRACTICES:

	CHANNEL LINERS		DIVERSION DIKE AND SWALE COMBINATIONS
	CURBS AND GUTTERS		DIVERSION, INTERCEPTOR, OR PERIMETER DIKES
	HAY BALES		DIVERSION, INTERCEPTOR, OR PERIMETER SWALES
	PAVED FLUMES		ROCK BEDDING AT CONSTRUCTION EXIT
	PIPE SLOPE DRAINS		STONE OUTLET STRUCTURES
	STORM SEWERS		STORM INLET SEDIMENT TRAP
	SEDIMENT BASINS		TEMPORARY EROSION CONTROL LOGS (BIOLOGS)
	SEDIMENT TRAPS		TIMBER MATTING AT CONSTRUCTION EXIT
T	SILT FENCES		VEGETATIVE FILTER STRIPS
T	ROCK FILTER DAMS		VELOCITY CONTROL DEVICES
T	EROSION CONTROL LOGS	T	LINED CONCRETE WASHOUT

OFFSITE VEHICLE TRACKING CONTROLS:

T	HAUL ROADS DAMPENED FOR DUST CONTROL
	EXCESS DIRT ON ROAD REMOVED DAILY
	LOADED HAUL TRUCKS TO BE COVERED WITH TARPAULIN
T	STABILIZED CONSTRUCTION ENTRANCE
	OTHER

NARRATIVE - SEQUENCE OF CONSTRUCTION (STORM WATER MANAGEMENT) ACTIVITIES:

THE ORDER OF ACTIVITIES WILL BE AS FOLLOWS:
SEE THE SEQUENCE OF WORK SHEET

STORM WATER MANAGEMENT:
INSTALL EROSION CONTROL LOGS (ECL), ROCK FILTER DAMS (RFD), AND SEDIMENT CONTROL FENCE (SCF) PRIOR TO CONSTRUCTION.

STATE OF TEXAS
JENELLE N. ROMERO
97940
LICENSED
PROFESSIONAL ENGINEER
5/16/2022

OTHER EROSION AND SEDIMENT CONTROLS:

MAINTENANCE:
ALL EROSION AND SEDIMENT CONTROLS WILL BE MAINTAINED IN GOOD WORKING ORDER. IF A REPAIR IS NECESSARY, IT WILL BE DONE AT THE EARLIEST DATE POSSIBLE, BUT NO LATER THAN 7 CALENDAR DAYS AFTER THE SURROUNDING EXPOSED GROUND HAS DRIED SUFFICIENTLY TO PREVENT FURTHER DAMAGE FROM HEAVY EQUIPMENT. THE AREAS ADJACENT TO CREEKS AND DRAINAGE WAYS SHALL HAVE PRIORITY FOLLOWED BY DEVICES PROTECTING STORM SEWER INLETS.

INSPECTION:
AN INSPECTION WILL BE PERFORMED BY A TXDOT INSPECTOR EVERY 7 DAYS. AN INSPECTION AND MAINTENANCE REPORT WILL BE MADE PER EACH INSPECTION. BASED ON THE INSPECTION RESULTS, THE CONTROLS SHALL BE REVISED PER THE INSPECTION REPORT.

WASTE MATERIALS:
ALL WASTE MATERIALS WILL BE COLLECTED AND STORED IN A SECURELY LIDDED METAL DUMPSTER. THE DUMPSTER WILL MEET ALL STATE AND LOCAL CITY SOLID WASTE MANAGEMENT REGULATIONS. ALL TRASH AND CONSTRUCTION DEBRIS FROM THE SITE WILL BE DEPOSITED IN THE DUMPSTER. THE DUMPSTER WILL BE EMPTIED AS NECESSARY OR AS REQUIRED BY LOCAL REGULATION AND THE TRASH WILL BE HAULED TO A PERMITTED LANDFILL. NO CONSTRUCTION WASTE MATERIAL WILL BE BURIED ON SITE. CONSTRUCTION DEBRIS AND LITTER SHOULD BE PICKED UP ON A DAILY BASIS UNLESS OTHERWISE DIRECTED BY THE ENGINEER. WASTE AND DIRT PILES SHOULD BE REMOVED ON A WEEKLY BASIS.

HAZARDOUS WASTE (INCLUDING SPILL REPORTING):
NO LONG TERM WATER QUALITY IMPACTS ARE EXPECTED AS A RESULT OF THE PROPOSED PROJECT. SEE THE NEXT PLAN SHEET FOR A LIST OF POTENTIAL POLLUTANTS. IN THE EVENT OF A MAJOR SPILL, NOTIFY THE TXDOT ENGINEER IMMEDIATELY. ALL PERSONNEL WILL BE INSTRUCTED IN THE PROCEDURES FOR SPILL HANDLING AND DISPOSING OF ANY HAZARDOUS MATERIALS THEY WILL BE USING. ALL SPILLS, INCLUDING THOSE OF LESS THAN 25 GALLONS SHALL BE CLEANED IMMEDIATELY AND ANY CONTAMINATED SOIL SHALL BE IMMEDIATELY REMOVED FROM THE SITE AND BE DISPOSED OF PROPERLY. DESIGNATED AREAS SHALL BE DETERMINED BY THE AREA ENGINEER FOR SPOILS DISPOSAL AND MATERIAL STORAGE. THESE AREAS SHALL BE PROTECTED FROM RUN-ON AND RUN-OFF. MATERIALS RESULTING FROM THE DESTRUCTION OF EXISTING ROADS AND BEING REMOVED AND/OR DISPOSED OF BY THE CONTRACTOR WILL BE DONE SO IN ACCORDANCE WITH ALL FEDERAL, STATE, AND LOCAL LAWS, ORDINANCES AND REGULATIONS AND WITH THE APPROVAL OF THE PROJECT ENGINEER. ANY CHANGES TO AMBIENT WATER QUALITY DURING CONSTRUCTION OF THE PROPOSED PROJECT SHALL BE PROHIBITED AND MAY RESULT IN ADDITIONAL WATER QUALITY CONTROL MEASURES, WHICH SHALL BE MITIGATED AS SOON AS POSSIBLE AND SHALL BE REPORTED TO THE TEXAS COMMISSION ON ENVIRONMENTAL QUALITY (TCEQ) WITHIN 24 HOURS OF BECOMING AWARE OF IMPACTS.

SANITARY WASTE:
ALL SANITARY WASTE WILL BE COLLECTED FROM THE PORTABLE UNITS AS NECESSARY OR AS REQUIRED BY LOCAL REGULATION BY A LICENSED SANITARY WASTE MANAGEMENT CONTRACTOR.

REMARKS:
CONSTRUCTION STAGING AREAS AND VEHICLE MAINTENANCE AREAS SHALL BE CONSTRUCTED BY THE CONTRACTOR IN A MANNER TO MINIMIZE THE RUNOFF OF POLLUTANTS.
ALL WATERWAYS SHALL BE CLEARED AS SOON AS PRACTICABLE OF TEMPORARY EMBANKMENT, TEMPORARY BRIDGES, MATTING, FALSEWORK PILING, DEBRIS OR OTHER OBSTRUCTIONS PLACED DURING CONSTRUCTION OPERATIONS THAT ARE NOT PART OF THE FINISHED WORK.
DISPOSAL AREAS, STOCKPILES, AND HAUL ROADS SHALL BE CONSTRUCTED IN A MANNER THAT WILL MINIMIZE AND CONTROL THE AMOUNT OF SEDIMENT THAT MAY ENTER RECEIVING WATERS. DISPOSAL AREAS SHALL NOT BE LOCATED IN ANY WETLAND, WATER BODY OR STREAMBED.

Texas Department of Transportation

NO SCALE

SHEET 1 OF 2

TxDOT STORM WATER POLLUTION PREVENTION PLAN (SW3P)

FHWA DIVISION	PROJECT NO.		HIGHWAY NO.
6	SEE TITLE SHEET		US 380
STATE	COUNTY		SHEET NO.
TEXAS	STONEWALL		171
DISTRICT	CONTROL	SECTION	JOB
ABL	0106	04	036

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LIST OF POTENTIAL POLLUTANTS

POTENTIAL POLLUTANT	RELATED SOURCE	CONTROLS
CEMENTATEOUS MATERIAL AND CEMENTATEOUS AGGREGATES (BROKEN CONCRETE)	REMOVAL OF CONCRETE RIPRAP, CULVERT COMPONENTS, BRIDGE COMPONENTS, ETC.	THIS CONSTRUCTION WASTE SHALL BE PROPERLY DISPOSED OF IN ACCORDANCE WITH STATE AND LOCAL REGULATIONS. WHEN STORED ON SITE PRIOR TO DISPOSAL, IT SHALL BE CONTAINED SO AS TO ENSURE THAT IT CANNOT ENTER SURFACE RUNOFF.
MILLED ASPHALTIC CEMENT PAVEMENT (MILLINGS)	OBLITERATION OF ABANDONED ROAD AND PLANING OF ASPHALT	THIS CONSTRUCTION WASTE SHALL BE PROPERLY DISPOSED OF IN ACCORDANCE WITH STATE AND LOCAL REGULATIONS. WHEN STORED ON SITE PRIOR TO DISPOSAL, IT SHALL BE CONTAINED SO AS TO ENSURE THAT IT CANNOT ENTER SURFACE RUNOFF.
VIRGIN ASPHALTIC MATERIAL INCLUSIVE OF PRIME OILS, PRECOAT AGGREGATES, AND HOT MIX BITUMINOUS MIXTURES	APPLICATIONS OF PRIME COATS, SEAL COAT, AND PAVING OPERATIONS	THIS MATERIAL SHALL BE APPLIED AT APPROPRIATE RATES FOR CONSTRUCTION PURPOSES WHICH WILL PRECLUDE THESE MATERIALS FROM ENTERING RUNOFF. IN THE EVENT OF ANY UNINTENDED DISCHARGE, CONTROLS TO CONTAIN RUNOFF WILL BE IMMEDIATELY PLACED AND TCEQ WILL BE IMMEDIATELY NOTIFIED.
CONCRETE, REBAR, WIRE, WIRE FABRIC LUMBER, NAILS, STYROFOAM BLOCK, FIBERBOARD, CURING COMPOUND AND LINSEED OIL	CONSTRUCTION OF CONCRETE BRIDGE COMPONENTS SUCH AS DRILLED SHAFTS, CULVERTS, ABUTMENTS, BENTS, REINFORCED CONCRETE SLABS, RAIL, INLET, CONCRETE TRAFFIC BARRIERS, CURB AND GUTTER, RIPRAP AND SIGN FOUNDATIONS	THIS CONSTRUCTION WASTE SHALL BE PROPERLY DISPOSED OF IN ACCORDANCE WITH STATE AND LOCAL REGULATIONS. WHEN STORED ON SITE PRIOR TO DISPOSAL, IT SHALL BE CONTAINED SO AS TO ENSURE THAT IT CANNOT ENTER SURFACE RUNOFF. ANY TEMPORARY FILLS MUST BE REMOVED IN THEIR ENTIRETY AND THE AFFECTED AREAS RETURNED TO THEIR PREEXISTING CONDITION/ELEVATION.
MASONRY CONCRETE BLOCK, GEOGRID FABRIC, CARDBOARD, AND PLASTIC RAP	CONSTRUCTION OF MODULAR RETAINING WALL SYSTEMS	THIS CONSTRUCTION WASTE SHALL BE PROPERLY DISPOSED OF IN ACCORDANCE WITH STATE AND LOCAL REGULATIONS. WHEN STORED ON SITE PRIOR TO DISPOSAL, IT SHALL BE CONTAINED SO AS TO ENSURE THAT IT CANNOT ENTER SURFACE RUNOFF.
WOOD POSTS, STEEL POSTS, BARRELS, CONES, SIGN BOARDS (ALUMINUM AND PLYBOARD), FASTENERS, NUTS, BOLTS, AND WASHERS	PLACEMENT AND/OR REMOVAL OF BARRICADES, SIGNS AND TRAFFIC CONTROL DEVICES	THIS CONSTRUCTION WASTE SHALL BE PROPERLY DISPOSED OF IN ACCORDANCE WITH STATE AND LOCAL REGULATIONS. WHEN STORED ON SITE PRIOR TO DISPOSAL, IT SHALL BE CONTAINED SO AS TO ENSURE THAT IT CANNOT ENTER SURFACE RUNOFF.
WOOD POST, STEEL POST, STEEL FASTENERS, NUTS, BOLTS, AND WASHERS	CONSTRUCTION OF METAL BEAM GUARD FENCE	THIS CONSTRUCTION WASTE SHALL BE PROPERLY DISPOSED OF IN ACCORDANCE WITH STATE AND LOCAL REGULATIONS. WHEN STORED ON SITE PRIOR TO DISPOSAL, IT SHALL BE CONTAINED SO AS TO ENSURE THAT IT CANNOT ENTER SURFACE RUNOFF.
STRUCTURAL STEEL I-BEAM, SIGN BOARDS, AND CONCRETE FOUNDATIONS	REMOVAL OF ROADSIDE SIGN ASSEMBLIES LARGE AND SMALL	THIS CONSTRUCTION WASTE SHALL BE PROPERLY DISPOSED OF IN ACCORDANCE WITH STATE AND LOCAL REGULATIONS. WHEN STORED ON SITE PRIOR TO DISPOSAL, IT SHALL BE CONTAINED SO AS TO ENSURE THAT IT CANNOT ENTER SURFACE RUNOFF.
THERMOPLASTIC PAINT, GLASS BEADS, REFLECTIVE TABS, AND RAISED REFLECTIVE PAVEMENT MARKERS	APPLICATION OF PAVEMENT MARKINGS/MARKERS	THIS CONSTRUCTION WASTE SHALL BE PROPERLY DISPOSED OF IN ACCORDANCE WITH STATE AND LOCAL REGULATIONS. WHEN STORED ON SITE PRIOR TO DISPOSAL, IT SHALL BE CONTAINED SO AS TO ENSURE THAT IT CANNOT ENTER SURFACE RUNOFF.
PETROLEUM PRODUCTS (SMALL QUANTITIES INTRODUCED BY CONTRACTOR)	EQUIPMENT FAILURE, MAINTENANCE AND REPAIR	ALL EQUIPMENT AND VEHICLE MAINTENANCE SHALL BE PERFORMED IN A DESIGNATED AREA WITH APPROPRIATE MEASURES FOR CONTAINMENT AND PROPER DISPOSAL OF ALL WASTE MATERIALS INCLUDING HYDRAULIC OIL AND OTHER LIQUIDS IN ACCORDANCE STATE AND LOCAL WASTE MANAGEMENT REGULATIONS. ALL MATERIAL STORED PRIOR TO DISPOSAL SHALL BE CONTAINED IN A CONTAINER WITH A SECURE COVER MEETING ALL STATE AND LOCAL WASTE MANAGEMENT REGULATIONS.
ELIGIBLE NON-STORM WATER DISCHARGES INCLUDING BUT NOT LIMITED TO NON-POTABLE WATER AND NON-STORM WATER DISCHARGE	MOISTURE APPLICATIONS FOR DUST CONTROL, DENSITY, VEGETATION WATERING, NON-DETERGENT VEHICLE WASHING, AND AIR CONDITIONING CONDENSATE	THIS MATERIAL SHALL BE APPLIED AT APPROPRIATE RATES FOR CONSTRUCTION PURPOSES WHICH WILL PRECLUDE THESE MATERIALS FROM ENTERING RUNOFF. IN THE EVENT OF ANY UNINTENDED DISCHARGE, CONTROLS TO CONTAIN RUNOFF WILL BE IMMEDIATELY PLACED AND THE NON-POTABLE WATER WILL BE RECOVERED AND PROPERLY STORED FOR REUSE.
SURVEY STAKE, FLAGGING TAPE AND PAINT	SURVEY STAKING, ALIGNMENT ESTABLISHMENT	THIS CONSTRUCTION WASTE SHALL BE PROPERLY DISPOSED OF IN ACCORDANCE WITH STATE AND LOCAL REGULATIONS. WHEN STORED ON SITE PRIOR TO DISPOSAL, IT SHALL BE CONTAINED SO AS TO ENSURE THAT IT CANNOT ENTER SURFACE RUNOFF.
WASTEWATER	WASHOUT AND CLEANOUT OF STUCCO, PAINT, FORM RELEASE OILS, CURING COMPOUNDS AND OTHER CONSTRUCTION MATERIALS	THIS CONSTRUCTION WASTE SHALL BE PROPERLY DISPOSED OF IN ACCORDANCE WITH STATE AND LOCAL REGULATIONS. WHEN STORED ON SITE PRIOR TO DISPOSAL, IT SHALL BE CONTAINED SO AS TO ENSURE THAT IT CANNOT ENTER SURFACE RUNOFF.
SOAPS AND SOLVENTS	VEHICLE AND EQUIPMENT WASHING	THIS CONSTRUCTION WASTE SHALL BE PROPERLY DISPOSED OF IN ACCORDANCE WITH STATE AND LOCAL REGULATIONS. WHEN STORED ON SITE PRIOR TO DISPOSAL, IT SHALL BE CONTAINED SO AS TO ENSURE THAT IT CANNOT ENTER SURFACE RUNOFF.
UNSUITABLE FILL MATERIAL	EXCAVATION - ROADWAY, SPECIAL AND EROSION CONTROL	THIS CONSTRUCTION WASTE SHALL BE PROPERLY DISPOSED OF IN ACCORDANCE WITH STATE AND LOCAL REGULATIONS. WHEN STORED ON SITE PRIOR TO DISPOSAL, IT SHALL BE CONTAINED SO AS TO ENSURE THAT IT CANNOT ENTER SURFACE RUNOFF.

STATE OF TEXAS
JENELLE N. ROMERO
97940
LICENSED
PROFESSIONAL ENGINEER
4/28/2022

Texas Department of Transportation

TxDOT STORM WATER POLLUTION PREVENTION PLAN (SW3P)

REV. DATE: 02/27/2014

NO SCALE

FHWA DIVISION	PROJECT NO.		HIGHWAY NO.
6	SEE TITLE SHEET		US 380
STATE	COUNTY		SHEET NO.
TEXAS	STONEWALL		172
DISTRICT	CONTROL	SECTION	JOB
ABL	0106	04	036

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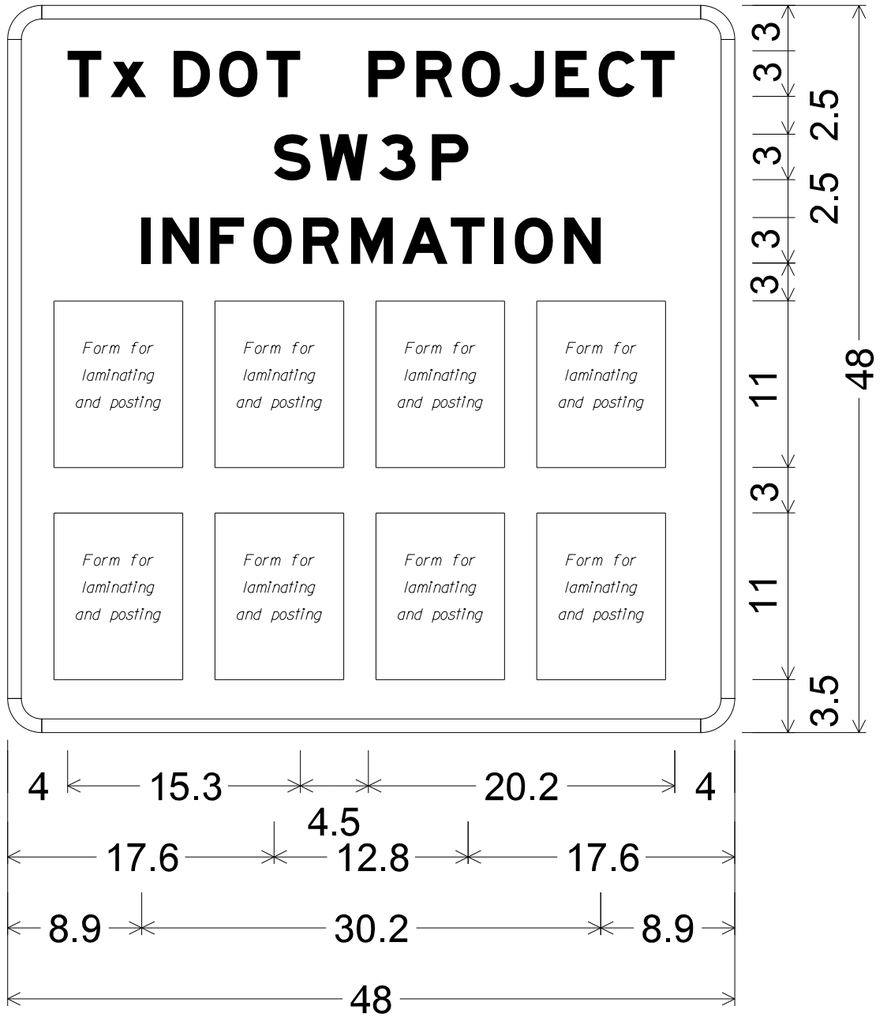
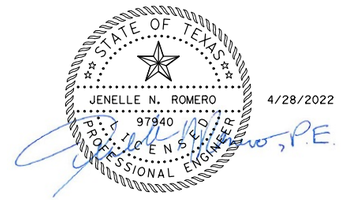


2.3" Radius, 0.9" Border, White on Blue;
[TxDOT PROJECT] E Mod;
[SW3P] E Mod;
[INFORMATION] E Mod;

NOTE:

The Forms needed for laminating and posting to the SW3P Notification Board will be provided by the Engineer. The total number of forms may vary. Notification Boards are to be constructed from Plywood, ½ or ⅝-inch thick, in accordance with TxDOT Departmental Material Specification (DMS)-7100. 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 sign will be placed at a location within the right-of-way but outside the clear zone as directed by the Engineer. This work will not be paid for directly, but will be considered subsidiary to other items.



SW3P NOTIFICATION BOARD DETAIL

Texas Department of Transportation

NO SCALE SHEET 1 OF 1

FHWA DIVISION	PROJECT NO.		HIGHWAY NO.
6	SEE TITLE SHEET		US 380
STATE	COUNTY		SHEET NO.
TEXAS	STONEWALL		173
DISTRICT	CONTROL	SECTION	JOB
ABL	0106	04	036

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PREPARED BY (NAME OF DESIGNER)
DATE: 4/29/2022
FILE: c:\pw*work\atknatx01\rome2243\dms57963\EPIC.dgn

REV. DATE: 02/2015

I. STORM WATER POLLUTION PREVENTION-CLEAN WATER ACT SECTION 402

TPDES TXR 150000: Storm water 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.

☐ No Action Required ☒ Required Action

Action No.

1. The project disturbs more than one acre but less than five acres of surface area. The contractor is responsible for the PSL as defined in the Standard Specifications for Construction and Maintenance of Highways, Streets, and Bridges (2014 Edition, Section 7.6., Page 44). The total disturbed acreage is the combined acreage to be disturbed on the project and the contractors PSL.
2. Prevent storm water pollution by controlling erosion and sedimentation in accordance with TPDES Permit TXR 150000
3. Comply with the SW3P and revise when necessary to control pollution or required by the Engineer.
4. Post Construction Site Notice (CSN) with SW3P information on or near the site, accessible to the public and TCEQ, EPA or other inspectors.
5. 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, WATER BODIES AND WETLANDS CLEAN WATER ACT SECTIONS 401 AND 404

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

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

☐ No Permit Required

☒ Nationwide Permit 14 - PCN not Required (less than 1/10th acre waters or wetlands affected)

☐ Nationwide Permit 14 - PCN Required (1/10 to <1/2 acre, 1/3 in tidal waters)

☐ Individual 404 Permit Required

☐ Other Nationwide Permit Required: NWP# _____

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

1.

2.

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

Best Management Practices:

Erosion	Sedimentation	Post-Construction TSS
☐ Temporary Vegetation	☒ Silt Fence	☐ Vegetative Filter Strips
☐ Blankets/Matting	☒ Rock Berm	☐ Retention/Irrigation Systems
☐ Mulch	☐ Triangular Filter Dike	☐ Sedimentation Basin
☐ Sodding	☐ Sand Bag Berm	☐ Constructed Wetlands
☐ Interceptor Swale	☐ Straw & Hay Bale Dike	☐ Wet Basin
☐ Diversion Dike	☐ Brush Berms	☐ Erosion Control Compost & Mulch
☐ Erosion Control Compost	☐ Erosion Control Compost	☐ Compost Filter Berm and Socks
☐ Compost Filter Berm and Socks	☐ Compost Filter Berm and Socks	☐ Sand Filter Systems
☒ Temporary Erosion Control Logs (BIOLOGS)	☒ Temporary Erosion Control Logs (BIOLOGS)	☒ Temporary Erosion Control Logs (BIOLOGS)
☒ Preservation of Natural Resources	☐ Sediment Traps	☒ Permanent Vegetation (Planting, Sodding, or Seeding)
☒ Construction Exits	☐ Sediment Basins	☐ Grassy Swales

III. CULTURAL RESOURCES

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

☒ No Action Required ☐ Required Action

Action No.

1.

2.

3.

4.

IV. VEGETATION RESOURCES

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

☐ No Action Required ☒ Required Action

Action No.

1. Minimize impacts to vegetation by removing/altering only what is necessary to construct the project.
2. Re-seeding per District standard seed mix.

3.

4.

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

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.

☐ No Action Required ☒ Required Action

Action No.

1. Migratory birds are present at the project site, including on the bridge.
2. State and Federally protected aquatic species are present in the water at the project site. Limitations to project activities are prescribed by the Biological Opinion and Texas Parks and Wildlife coordination. See General Notes for limitations.
3. Designated Critical Habitat is present in the project area. Work in Critical Habitat will be minimized.
4. State listed protected terrestrial species may occur in the project area. Best Management Practices for protected species will be implemented.
5. Refer to General Notes for details.

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 Storm water Sewer System	TPWD:	Texas Parks and Wildlife Department
MBTA:	Migratory Bird Treaty Act	TxDOT:	Texas Department of Transportation
NOT:	Notice of Termination	T&E:	Threatened and Endangered Species
NWP:	Nationwide Permit	USACE:	U.S. Army Corps of Engineers
NOI:	Notice of Intent	USFWS:	U.S. Fish and Wildlife Service

VI. HAZARDOUS MATERIALS OR CONTAMINATION ISSUES

General (applies to all projects):

Comply with the Hazard Communication Act (the Act) for personnel who will be working with hazardous materials by conducting safety meetings prior to beginning construction and making workers aware of potential hazards in the workplace. Ensure that all workers are provided with personal protective equipment appropriate for any hazardous materials used.

Obtain and keep on-site Material Safety Data Sheets (MSDS) for all hazardous products used on the project, which may include, but are not limited to the following categories: Paints, acids, solvents, asphalt products, chemical additives, fuels and concrete curing compounds or additives. Provide protected storage, off bare ground and covered, for products which may be hazardous. Maintain product labelling as required by the Act.

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

Contact the Engineer if any of the following are detected:
* Dead or distressed vegetation (not identified as normal)
* Trash piles, drums, canister, barrels, etc.
* Undesirable smells or odors
* Evidence of leaching or seepage of substances

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

☐ Yes ☐ No

If "No", then no further action is required.
If "Yes", then TxDOT is responsible for completing asbestos assessment/inspection.

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

☐ Yes ☐ No

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

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

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

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

☐ No Action Required ☐ Required Action

Action No.

1.

2.

3.

VII. OTHER ENVIRONMENTAL ISSUES

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

☐ No Action Required ☐ Required Action

Action No.

1.

2.

3.

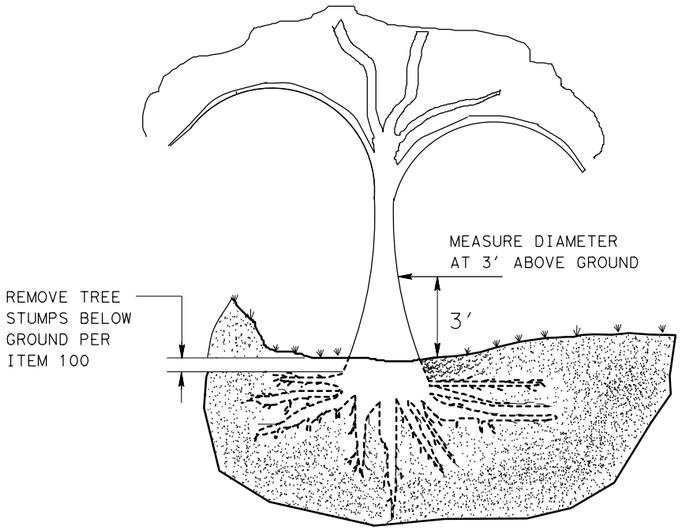
STATE OF TEXAS
JENELLE N. ROMERO
97940
LICENSED
PROFESSIONAL ENGINEER
4/29/2022

US 380
ENVIRONMENTAL PERMITS, ISSUES AND COMMITMENTS
EPIC

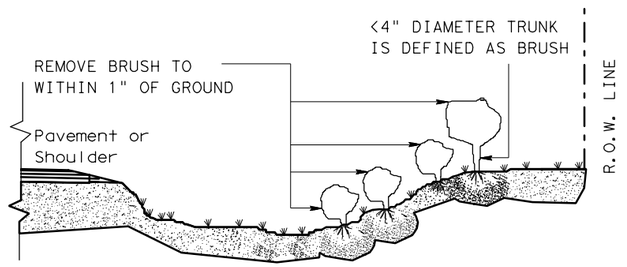
Texas Department of Transportation

NO SCALE SHEET 1 OF 1

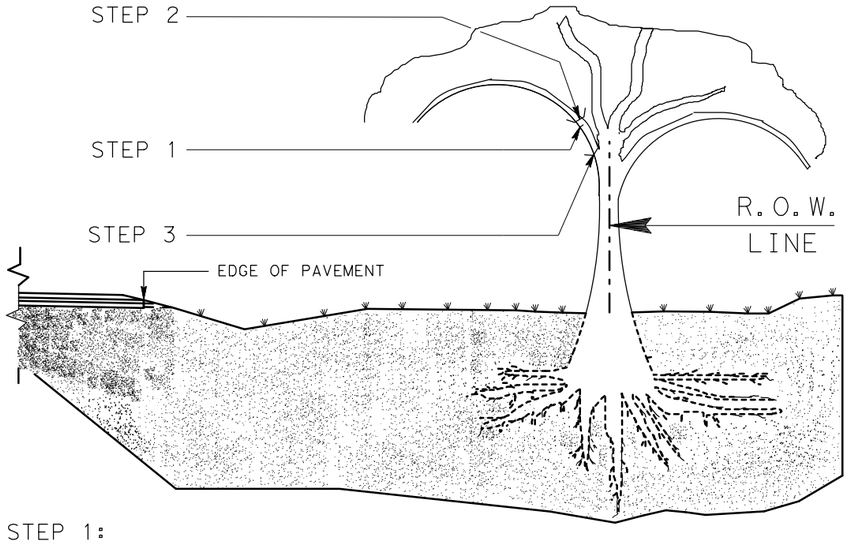
FHWA DIVISION	PROJECT NO.		HIGHWAY NO.
6	SEE TITLE SHEET		US 380
STATE	COUNTY		SHEET NO.
TEXAS	STONEWALL		174
DISTRICT	CONTROL	SECTION	JOB
ABL	0106	04	036



TREE REMOVAL



BRUSH REMOVAL



STEP 1:

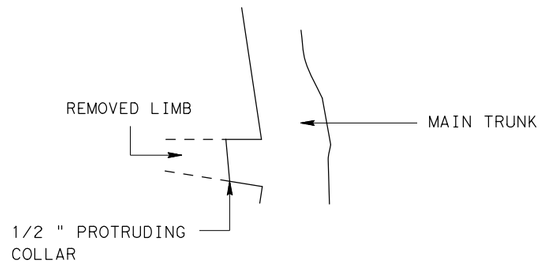
CUT 1/3 WAY THROUGH BOTTOM OF LIMB 8" TO 12" ABOVE MAIN STEM (OR TRUNK).

STEP 2:

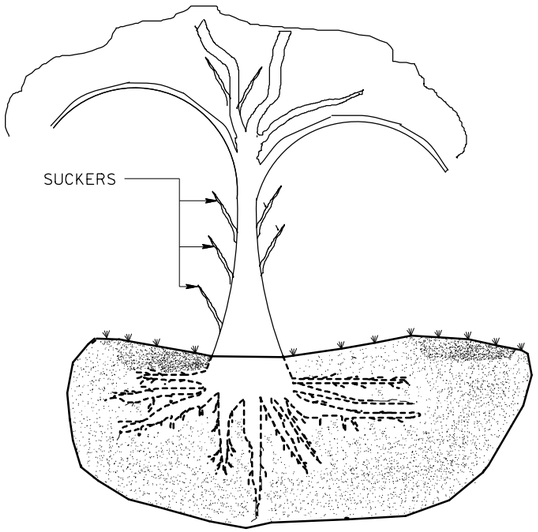
REMOVE LIMB 4" TO 6" BEYOND THE FIRST CUT

STEP 3:

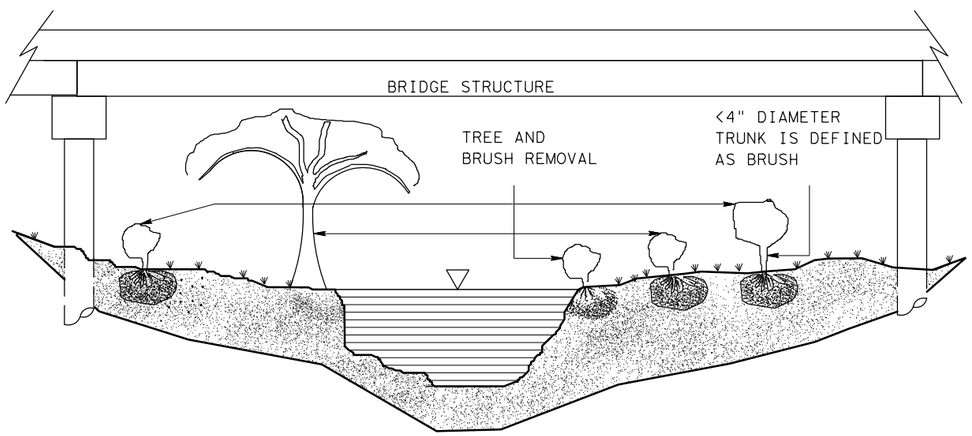
REMOVE STUB WITH A SMOOTH CUT SO THAT TRACE COLLAR OF THE REMOVED LIMB PROTRUDES APPROXIMATELY 1/2 " FROM THE MAIN STEM



TREE TRIMMING ON THE RIGHT OF WAY LINE



NOTE: SUCKERS ARE SMALL BRANCHES, LESS THAN 2" IN DIAMETER, THAT OCCUR BENEATH MAIN BRANCHES. REMOVE SUCKERS TO THE HEIGHT OF THE LOWEST MAIN BRANCH. STEPS 1,2 AND 3 APPLY TO MAIN BRANCHES (2" IN DIAMETER OR LARGER).



TREE AND BRUSH REMOVAL UNDER BRIDGES AND IN CHANNELS

GENERAL NOTES:

TREE AND BRUSH REMOVAL AND TREE TRIMMING

1. FOR TREES ON THE R.O.W. LINE, TRIM AND REMOVE ALL LIMBS ON THE PAVEMENT SIDE OF THE TRUNK 18' ABOVE THE PAVEMENT UNLESS OTHERWISE SHOWN ON THE PLANS.

2. TREES WITH TRUNKS FULLY CONTAINED WITHIN THE R.O.W. SHALL BE REMOVED UNLESS OTHERWISE SHOWN IN THE PLANS.

3. THE DIAMETER SHALL BE DETERMINED BY MEASUREMENT OF THE TRUNK CIRCUMFERENCE 3' ABOVE THE GROUND. TREES WITH TRUNKS OF LESS THAN 4" DIAMETER ARE CONSIDERED TO BE BRUSH. TREES WITH MULTIPLE TRUNKS AT THE POINT OF MEASUREMENT ARE MEASURED SEPARATELY.

4. PREP ROW (ITEM 100) BY THE STATION INCLUDES ALL TREE AND BRUSH REMOVAL AND TREE TRIMMING IN THE RIGHT OF WAY ON BOTH SIDES OF THE HIGHWAY. FOR DIVIDED HIGHWAYS THE MEDIAN IS INCLUDED. FOR HIGHWAYS WITH FRONTAGE ROADS, THE AREAS BETWEEN THE FRONTAGE ROADS AND MAIN LANES, AND THE AREAS OUTSIDE OF THE FRONTAGE ROADS ARE INCLUDED.

5. TREE AND BRUSH REMOVAL AND TRIMMING UNDER BRIDGES, IN AND ALONG CHANNELS, AND WITHIN TxDOT EASEMENTS SPECIFIED IN THE PLANS SHALL BE INCLUDED FOR PAYMENT UNDER ITEM 100 BY THE STATION. PRIOR TO PERFORMING THIS WORK, THE ENGINEER'S APPROVAL SHALL BE REQUIRED FOR METHOD AND EXTENT OF THIS REMOVAL. SOME LOCATIONS, SUCH AS SPECIAL AQUATIC SITES, SPRINGS, WETLANDS, AND OTHER LOCATIONS SCPECIFIED ELSEWHERE IN THE PLANS, MAY BE EXCLUDED.

STATE OF TEXAS
JENELLE N. ROMERO
97940
LICENSED
PROFESSIONAL ENGINEER
4/28/2022
Jenelle N. Romero, P.E.

ABILENE DISTRICT
TREE AND BRUSH REMOVAL

Texas Department of Transportation

NOT TO SCALE SHEET 1 OF 1

FHWA DIVISION	PROJECT NO.		HIGHWAY NO.
6	SEE TITLE SHEET		US 380
STATE	COUNTY		SHEET NO.
TEXAS	STONEWALL		175
DISTRICT	CONTROL	SECTION	JOB
ABL	0106	04	036

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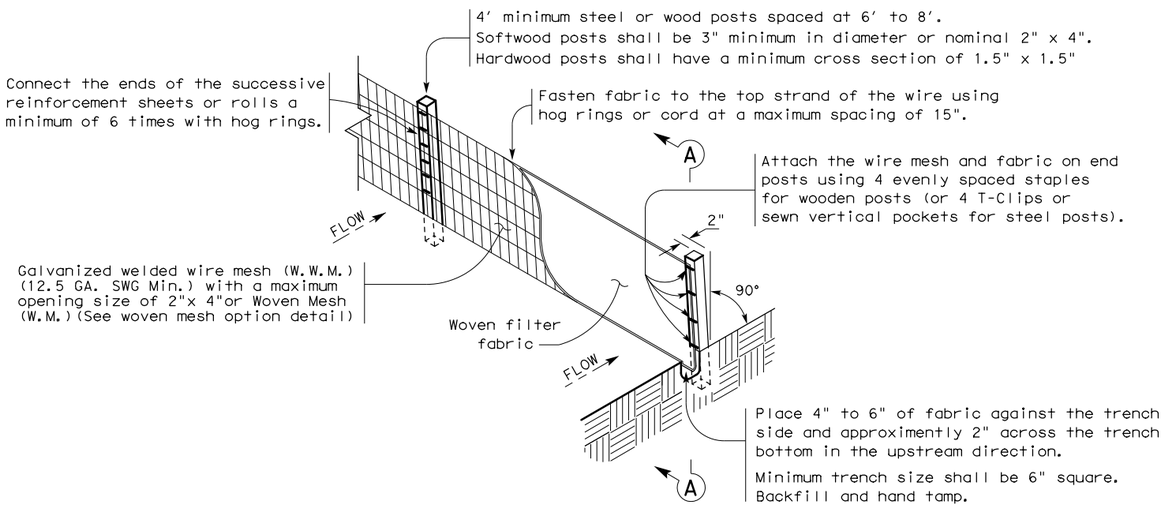
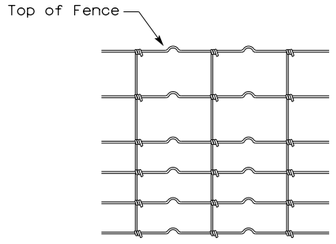
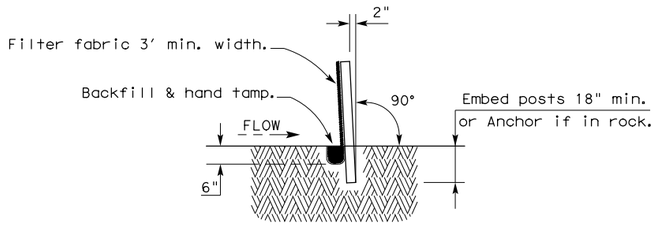


TEMPORARY SEDIMENT CONTROL FENCE

SCF





SECTION A-A

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/FT^2. Sediment control fence is not recommended to control erosion from a drainage area larger than 2 acres.

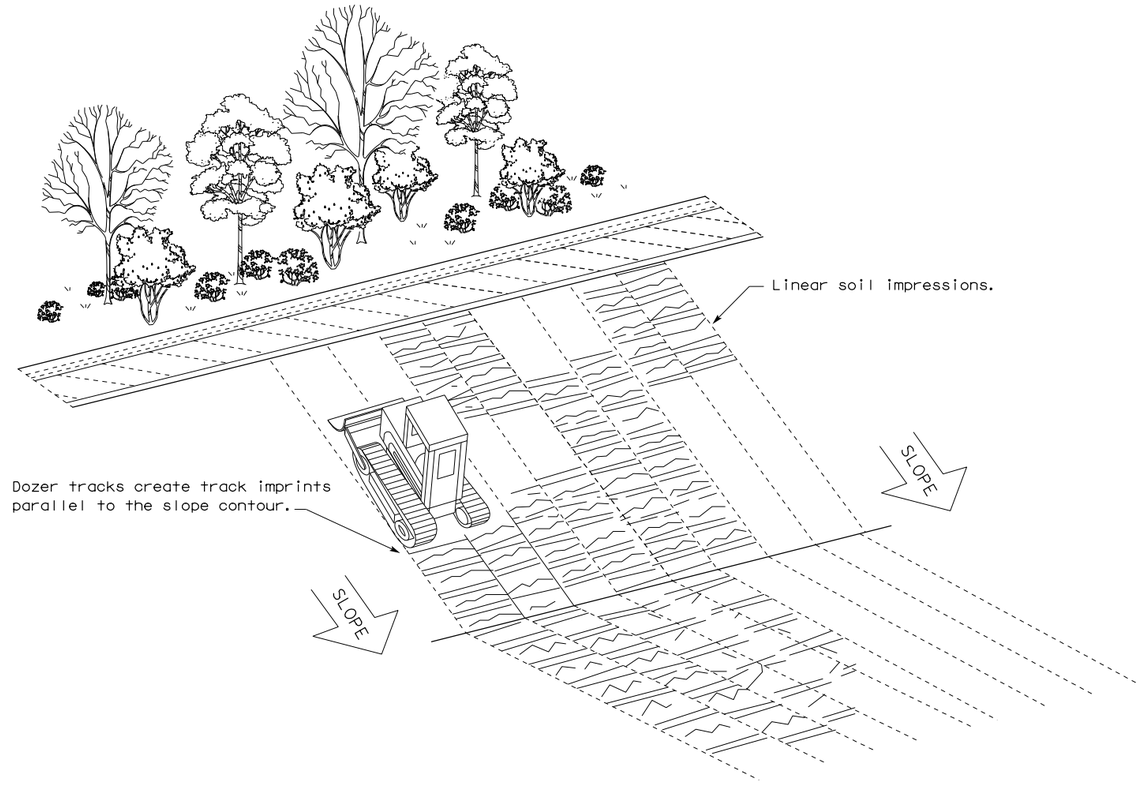
LEGEND

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 continous linear track impressions where the minimum 12" length impressions are perpendicular to the slope or direction of water flow.



VERTICAL TRACKING

Texas Department of Transportation

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	0106	04	036	US 380
	DIST	COUNTY		SHEET NO.
	ABL	STONEWALL		176

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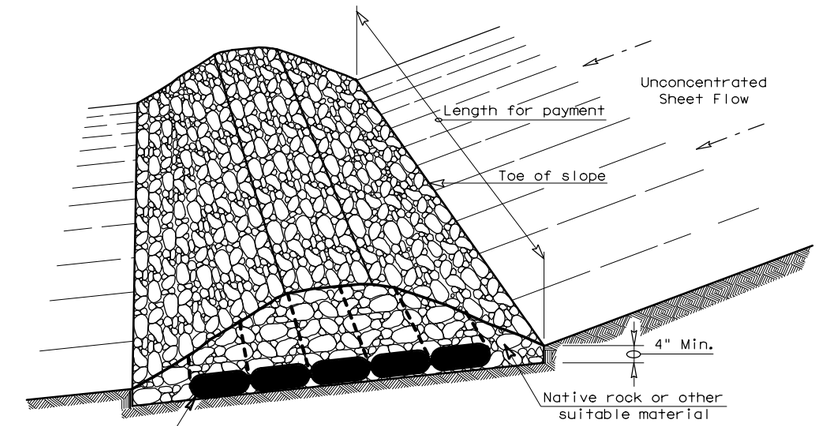
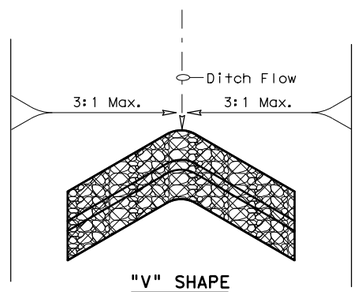
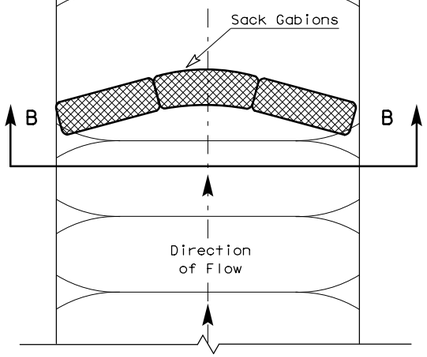


FILTER DAM AT TOE OF SLOPE

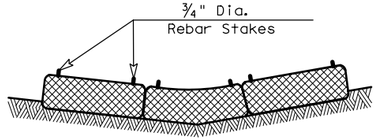
RFD1



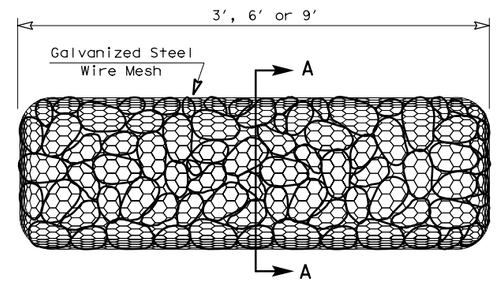
"V" SHAPE
PLAN VIEW



PLAN VIEW

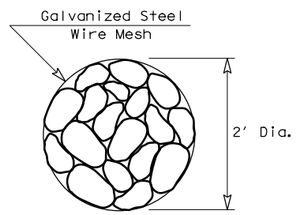


SECTION B-B

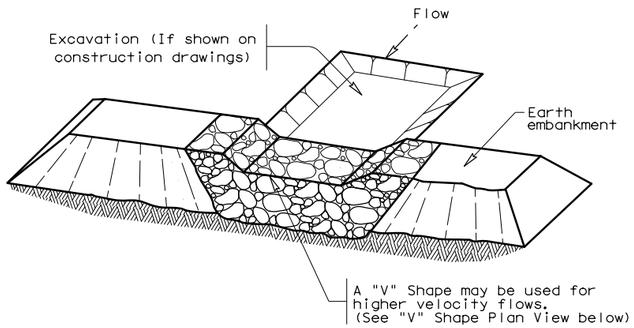


TYPE 4 (SACK GABIONS)

RFD4

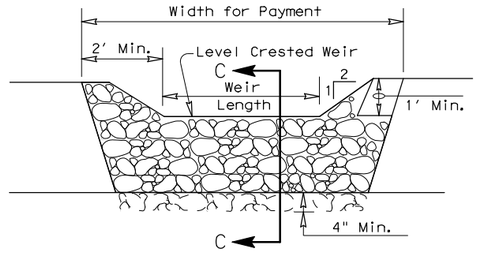


SECTION A-A

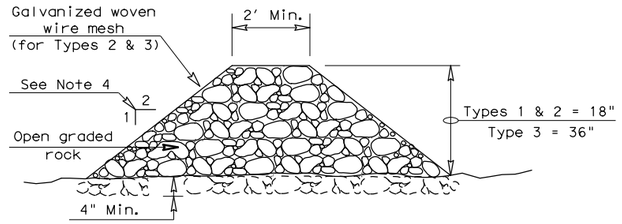


FILTER DAM AT SEDIMENT TRAP

RFD1 — OR — RFD2



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/FT^2 of cross sectional area. A 2 year storm frequency may be used to calculate the flow rate.

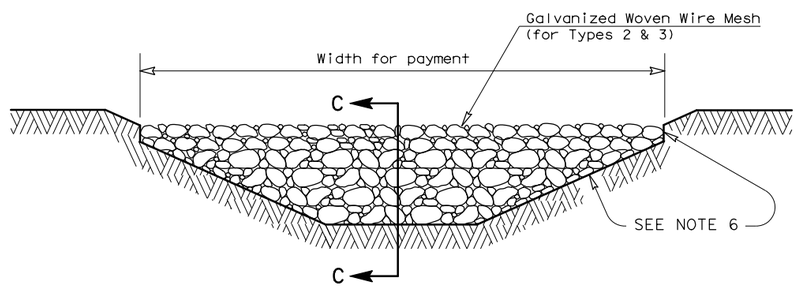
Type 1 (18" high with no wire mesh) (3" to 6" aggregate): Type 1 may be used at the toe of slopes, around inlets, in small ditches, and at dike or swale outlets. This type of dam is recommended to control erosion from a drainage area of 5 acres or less. Type 1 may not be used in concentrated high velocity flows (approximently 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.



FILTER DAM AT CHANNEL SECTIONS

RFD1 — OR — RFD2 — OR — RFD3

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 ¾" dia. rebar stakes, and have a double-twisted hexagonal weave with a nominal mesh opening of 2 ½" x 3 ¼"
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

Texas Department of Transportation

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	DN/CK: LS
© TxDOT: JULY 2016	CONT	SECT	JOB	HIGHWAY
REVISIONS	0106	04	036	US 380
	DIST	COUNTY		SHEET NO.
	ABL	STONEWALL		177

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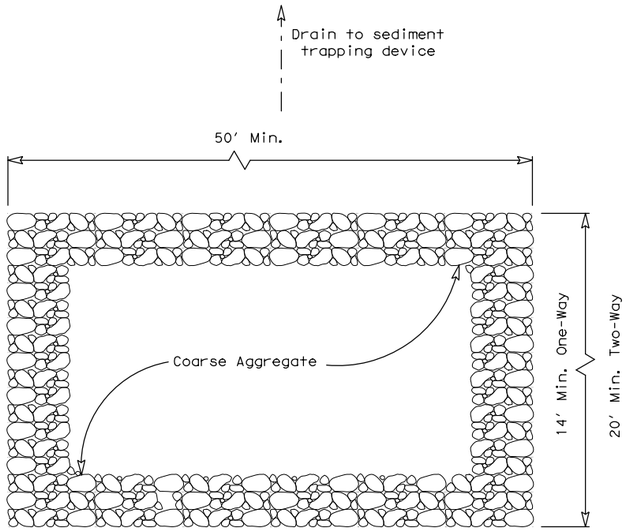
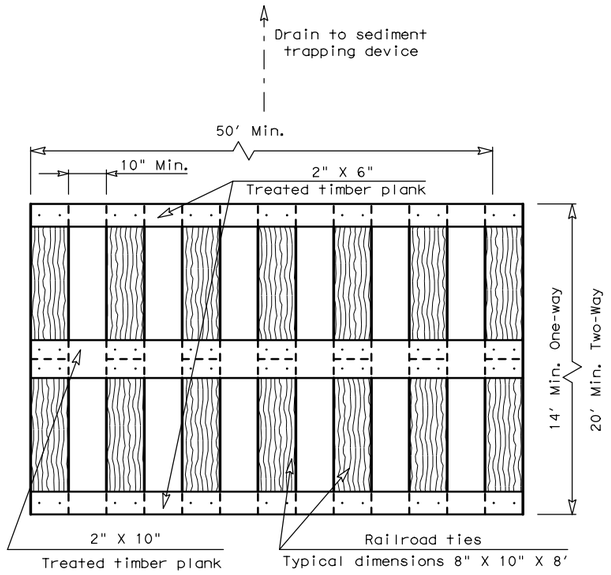


PLAN VIEW



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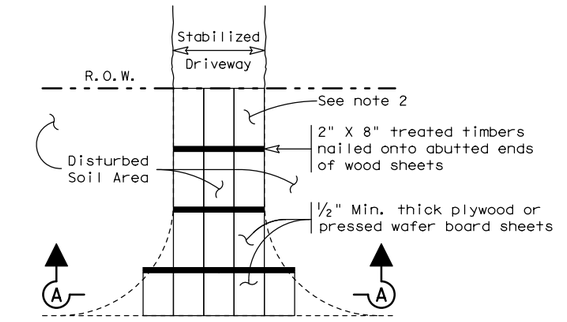

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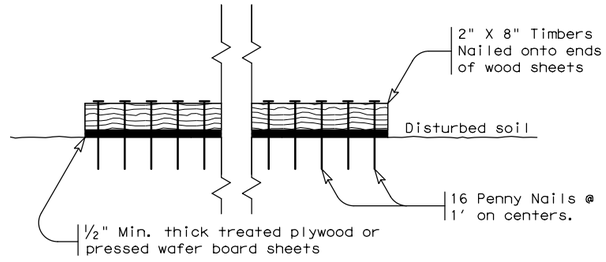
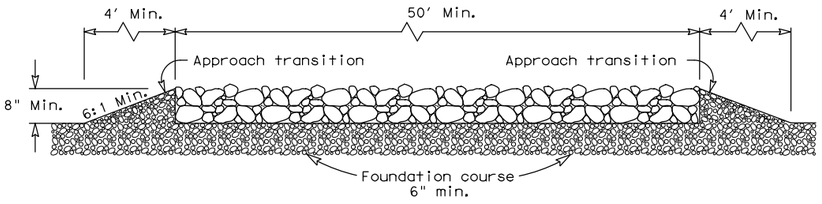


SECTION A-A

CONSTRUCTION EXIT (TYPE 3)

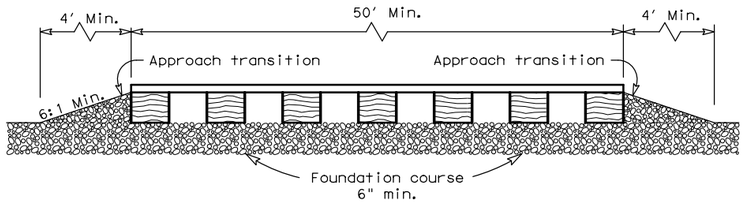
SHORT TERM



ELEVATION VIEW

CONSTRUCTION EXIT (TYPE 1)

ROCK CONSTRUCTION (LONG TERM)



ELEVATION VIEW

CONSTRUCTION EXIT (TYPE 2)

TIMBER CONSTRUCTION (LONG TERM)

GENERAL NOTES (TYPE 1)

1. The length of the type 1 construction exit shall be as indicated on the plans, but not less than 50′.
2. The coarse aggregate should be open graded with a size of 4" to 8".
3. The approach transitions should be no steeper than 6:1 and constructed as directed by the Engineer.
4. The construction exit foundation course shall be flexible base, bituminous concrete, portland cement concrete or other materialas approved by the Engineer.
5. The construction exit shall be graded to allow drainage to a sediment trapping device.
6. The guidelines shown hereon are suggestions only and may be modified by the Engineer.
7. Construct exits with a width of at least 14 ft. for one-way and 20 ft. for two-way traffic for the full width of the exit, or as directed by the engineer.

GENERAL NOTES (TYPE 2)

1. The length of the type 2 construction exit shall be as indicated on the plans, but not less than 50′.
2. The treated timber planks shall be attached to the railroad ties with ½"x 6" min. lag bolts. Other fasteners may be used as approved by the Engineer.
3. The treated timber planks shall be #2 grade min., and should be free from large and loose knots.
4. The approach transitions shall be no steeper than 6:1 and constructed as directed by the Engineer.
5. The construction exit foundation course shall be flexible base, bituminous concrete, portland cement concrete or other material as approved by the Engineer.
6. The construction exit should be graded to allow drainage to a sediment trapping device.
7. The guidelines shown hereon are suggestions only and may be modified by the Engineer.
8. Construct exits with a width of at least 14 ft. for one-way and 20 ft. for two-way traffic for the full width of the exit, or as directed by the engineer.

GENERAL NOTES (TYPE 3)

1. The length of the type 3 construction exit shall be as shown on the plans, or as directed by the Engineer.
2. The type 3 construction exit may be constructed from open graded crushed stone with a size of two to four inches spread a min. of 4" thick to the limits shown on the plans.
3. The treated timber planks shall be #2 grade min., and should be free from large and loose knots.
4. The guidelines shown hereon are suggestions only and may be modified by the Engineer.

Texas Department of Transportation

Design Division Standard

TEMPORARY EROSION, SEDIMENT AND WATER POLLUTION CONTROL MEASURES

CONSTRUCTION EXITS

EC(3)-16

FILE: ec316	DN: TxDOT	CK: KM	DW: VP	DN/CK: LS
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REVISIONS	0106	04	036	US 380
	DIST	COUNTY		SHEET NO.
	ABL	STONEWALL		178

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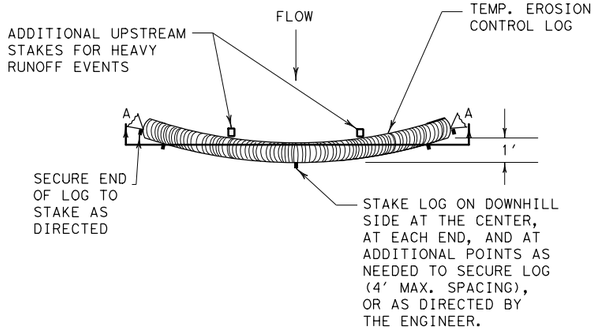
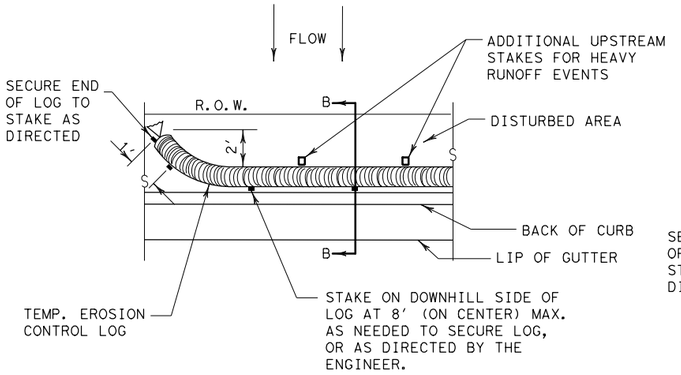


PLAN VIEW



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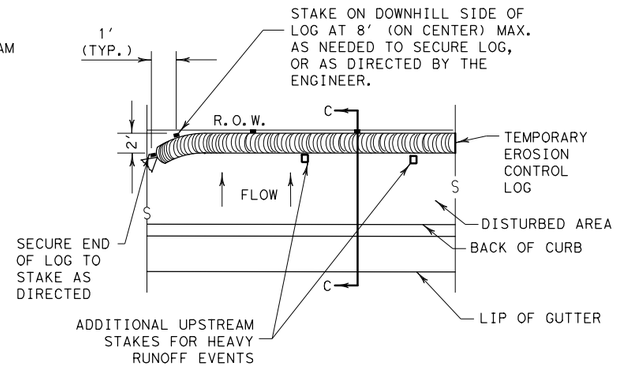
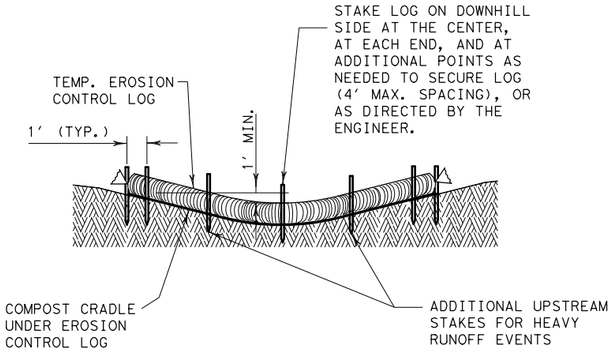


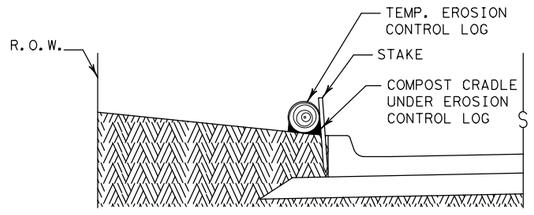
PLAN VIEW



SECTION A-A

EROSION CONTROL LOG DAM

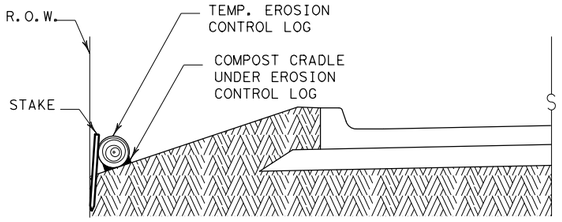
CL-D



SECTION B-B

EROSION CONTROL LOG AT BACK OF CURB

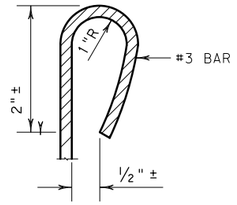
CL-BOC



SECTION C-C

EROSION CONTROL LOG AT EDGE OF RIGHT-OF-WAY

CL-ROW



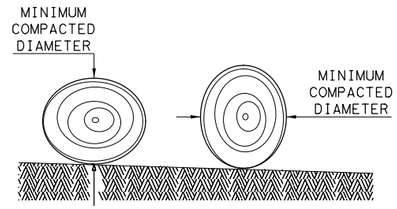
REBAR STAKE DETAIL

LEGEND

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

GENERAL NOTES:

1. EROSION CONTROL LOGS SHALL BE INSTALLED IN ACCORDANCE WITH MANFACTURER'S RECOMMENDATIONS, OR AS DIRECTED BY THE ENGINEER.
2. LENGTHS OF EROSION CONTROL LOGS SHALL BE IN ACCORDANCE WITH MANUFACTURER'S RECOMMENDATIONS AND AS REQUIRED FOR THE PURPOSE INTENDED.
3. UNLESS OTHERWISE DIRECTED, USE BIODEGRADABLE OR PHOTODEGRADABLE CONTAINMENT MESH ONLY WHERE LOG WILL REMAIN IN PLACE AS PART OF A VEGETATIVE SYSTEM. FOR TEMPORARY INSTALLATIONS, USE RECYCLABLE CONTAINMENT MESH.
4. FILL LOGS WITH SUFFICIENT FILTER MATERIAL TO ACHIEVE THE MINIMUM COMPACTED DIAMETER SPECIFIED IN THE PLANS WITHOUT EXCESSIVE DEFORMATION.
5. STAKES SHALL BE 2" X 2" WOOD OR #3 REBAR, 2'-4' LONG, EMBEDDED SUCH THAT 2" PROTRUDES ABOVE LOG, OR AS DIRECTED BY THE ENGINEER.
6. DO NOT PLACE STAKES THROUGH CONTAINMENT MESH.
7. COMPOST CRADLE MATERIAL IS INCIDENTAL & WILL NOT BE PAID FOR SEPARATELY.
8. SANDBAGS USED AS ANCHORS SHALL BE PLACED ON TOP OF LOGS & SHALL BE OF SUFFICIENT SIZE TO HOLD LOGS IN PLACE.
9. TURN THE ENDS OF EACH ROW OF LOGS UPSLOPE TO PREVENT RUNOFF FROM FLOWING AROUND THE LOG.
10. FOR HEAVY RUNOFF EVENTS, ADDITIONAL UPSTREAM STAKES MAY BE NECESSARY TO KEEP LOG FROM FOLDING IN ON ITSELF.



DIAMETER MEASUREMENTS OF EROSION CONTROL LOGS SPECIFIED IN PLANS

SEDIMENT BASIN & TRAP USAGE GUIDELINES

An erosion control log sediment trap may be used to filter sediment out of runoff draining from an unstabilized area.

Log Traps: The drainage area for a sediment trap should not exceed 5 acres. The trap capacity should be 1800 CF/Acre (0.5" over the drainage area).

Control logs should be placed in the following locations:

1. Within drainage ditches spaced as needed or min. 500' on center
2. Immediately preceding ditch inlets or drain inlets
3. Just before the drainage enters a water course
4. Just before the drainage leaves the right of way
5. Just before the drainage leaves the construction limits where drainage flows away from the project.

The logs should be cleaned when the sediment has accumulated to a depth of 1/2 the log diameter.

Cleaning and removal of accumulated sediment deposits is incidental and will not be paid for separately.

Texas Department of Transportation

Design Division Standard

TEMPORARY EROSION, SEDIMENT AND WATER POLLUTION CONTROL MEASURES

EROSION CONTROL LOG

EC(9)-16

FILE: ec916	DN: TxDOT		CK: KM		DW: LS/PT		CK: LS
© TxDOT: JULY 2016	CONT	SECT	JOB		HIGHWAY		
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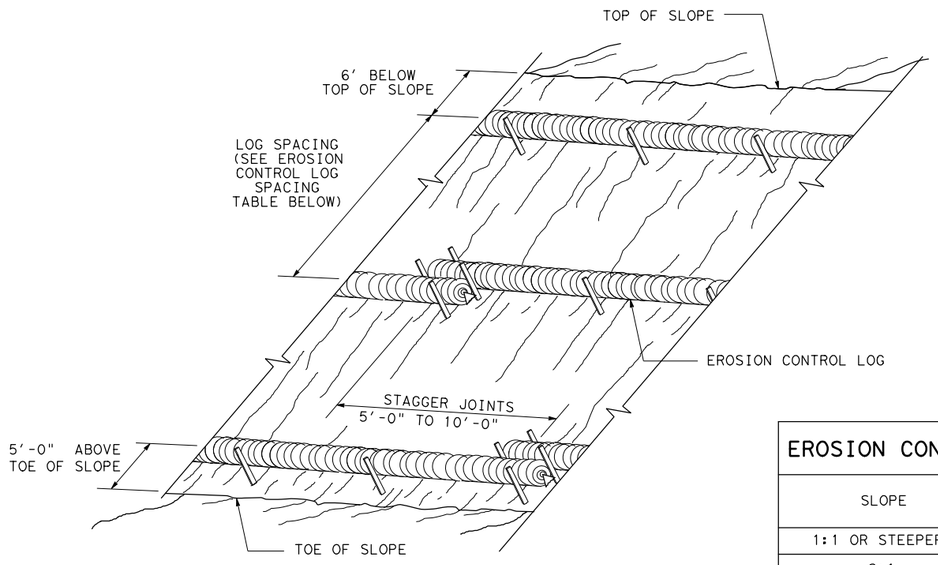
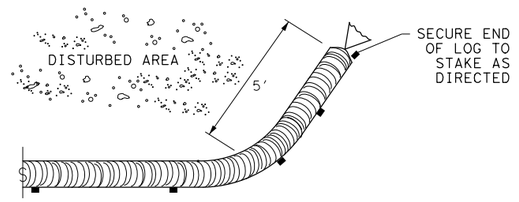


EROSION CONTROL LOGS ON SLOPES
STAKE AND TRENCHING ANCHORING

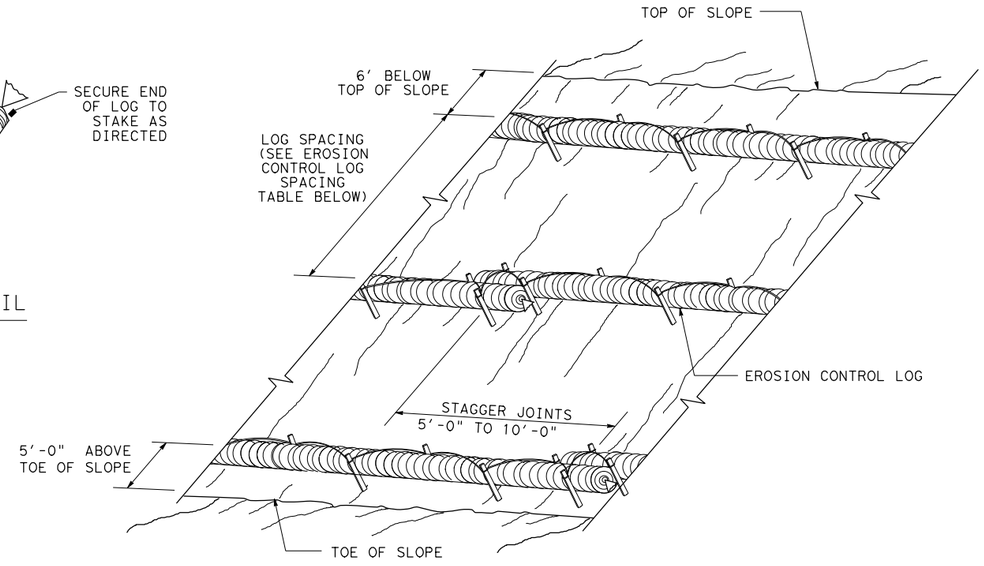
CL-SST



END SECTION RAP DETAIL

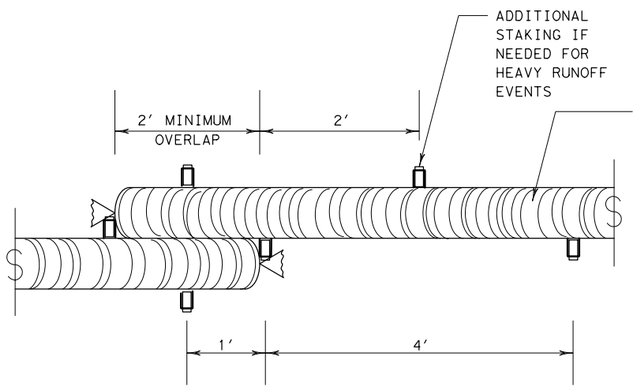
EROSION CONTROL LOG SPACING TABLE				
SLOPE	LOG DIAMETER			
	6"	8"	12"	18"
1:1 OR STEEPER	5′	10′	15′	20′
2:1	10′	20′	30′	40′
3:1	15′	30′	45′	60′
4:1 OR FLATTER	20′	40′	60′	80′

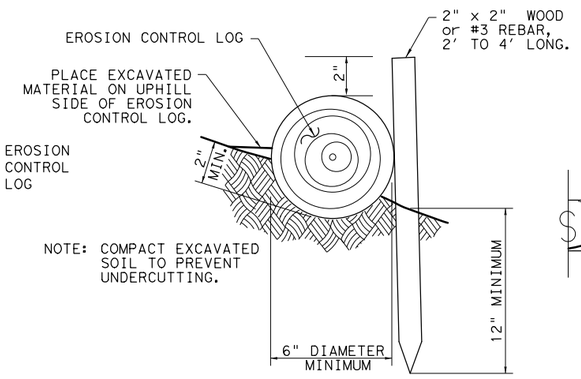
* ADJUSTMENTS CAN BE MADE FOR SOIL TYPE:
SOFT, LOAMY SOILS-ADJUST ROWS CLOSER TOGETHER;
HARD, ROCKY SOILS- ADJUST ROWS FARTHER APART



EROSION CONTROL LOGS ON SLOPES
STAKE AND LASHING ANCHORING

CL-SSL

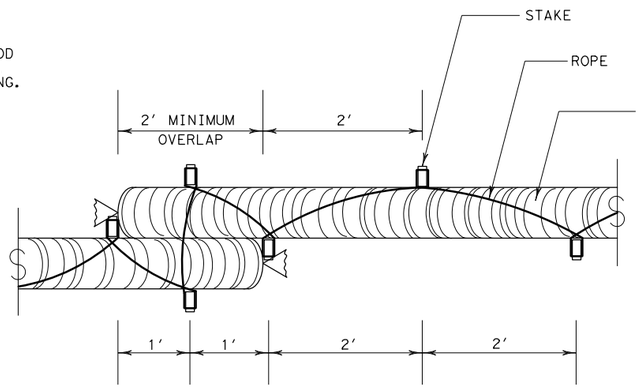


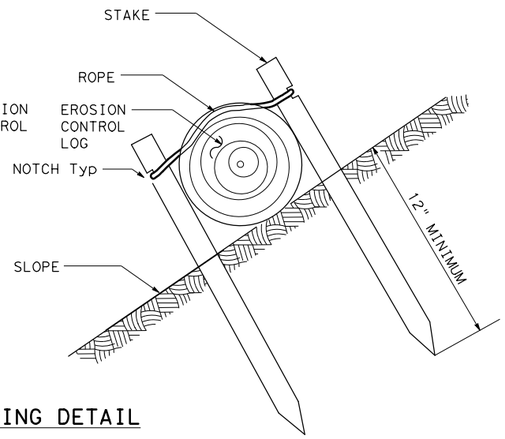


STAKE AND TRENCHING ANCHORING DETAIL

CL-SST

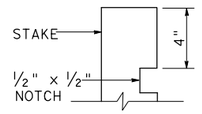
TRENCH DEPTH TABLE	
LOG DIAMETER	DEPTH
6"	2"
8"	3"
12"	4"
18"	5"





STAKE AND LASHING ANCHORING DETAIL

CL-SSL



STAKE NOTCH DETAIL

Texas Department of Transportation — Design Division Standard

TEMPORARY EROSION, SEDIMENT AND WATER POLLUTION CONTROL MEASURES
EROSION CONTROL LOG
EC(9)-16

FILE: ec116	DN: TxDOT	CK: KM	DW: LS/PT	CK: LS	
© TxDOT: JULY 2016	CONT	SECT	JOB	HIGHWAY	
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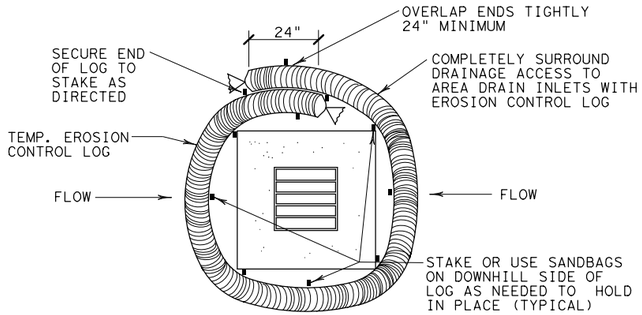
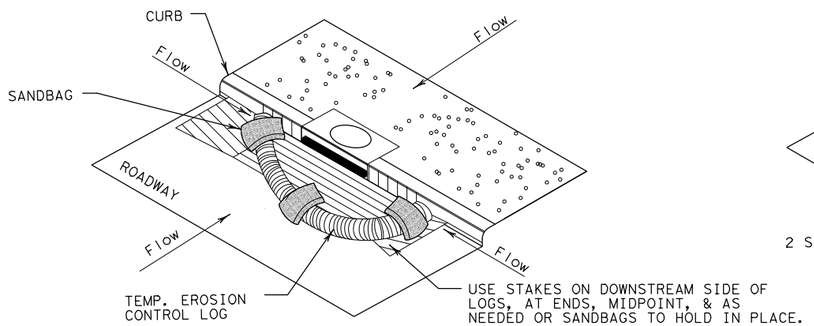


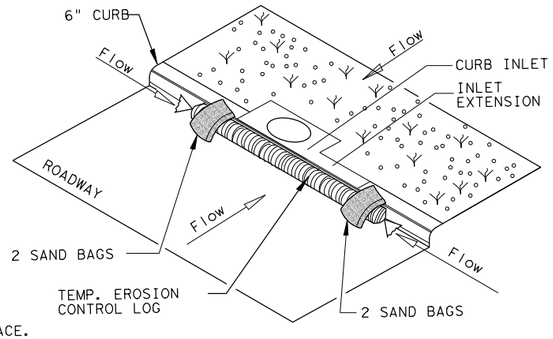
EROSION CONTROL LOG AT DROP INLET

CL-DI



EROSION CONTROL LOG AT CURB INLET

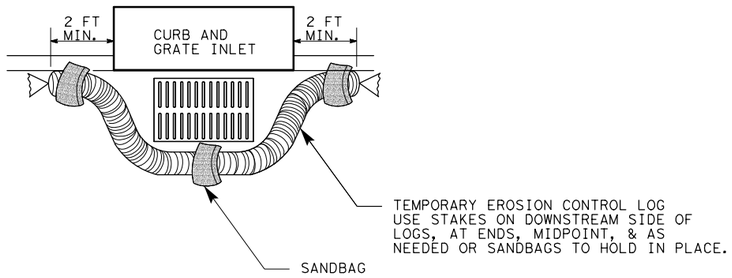
CL-CI



EROSION CONTROL LOG AT CURB INLET

CL-CI

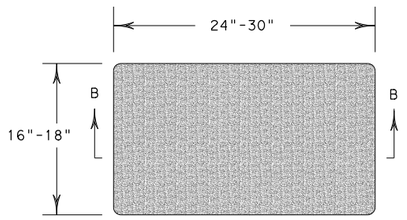
NOTE:
EROSION CONTROL LOGS USED AT CURB INLETS SHOULD ONLY BE USED IF THEY WILL NOT IMPEDE TRAFFIC OR FLOOD THE ROADWAY OR WHEN THE STORM SEWER SYSTEM IS NOT FULLY FUNCTIONAL.



EROSION CONTROL LOG AT CURB & GRADE INLET

CL-GI

SECTION B-B



SANDBAG DETAIL

SHEET 3 OF 3

Texas Department of Transportation | Design Division Standard

TEMPORARY EROSION, SEDIMENT AND WATER POLLUTION CONTROL MEASURES

EROSION CONTROL LOG

EC(9)-16

FILE: ec916	DN: TxDOT		CK: KM		DW: LS/PT		CK: LS
© TxDOT: JULY 2016	CONT	SECT	JOB		HIGHWAY		
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