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STATE OF TEXAS
DEPARTMENT OF TRANSPORTATION

PLANS OF PROPOSED
STATE HIGHWAY IMPROVEMENT

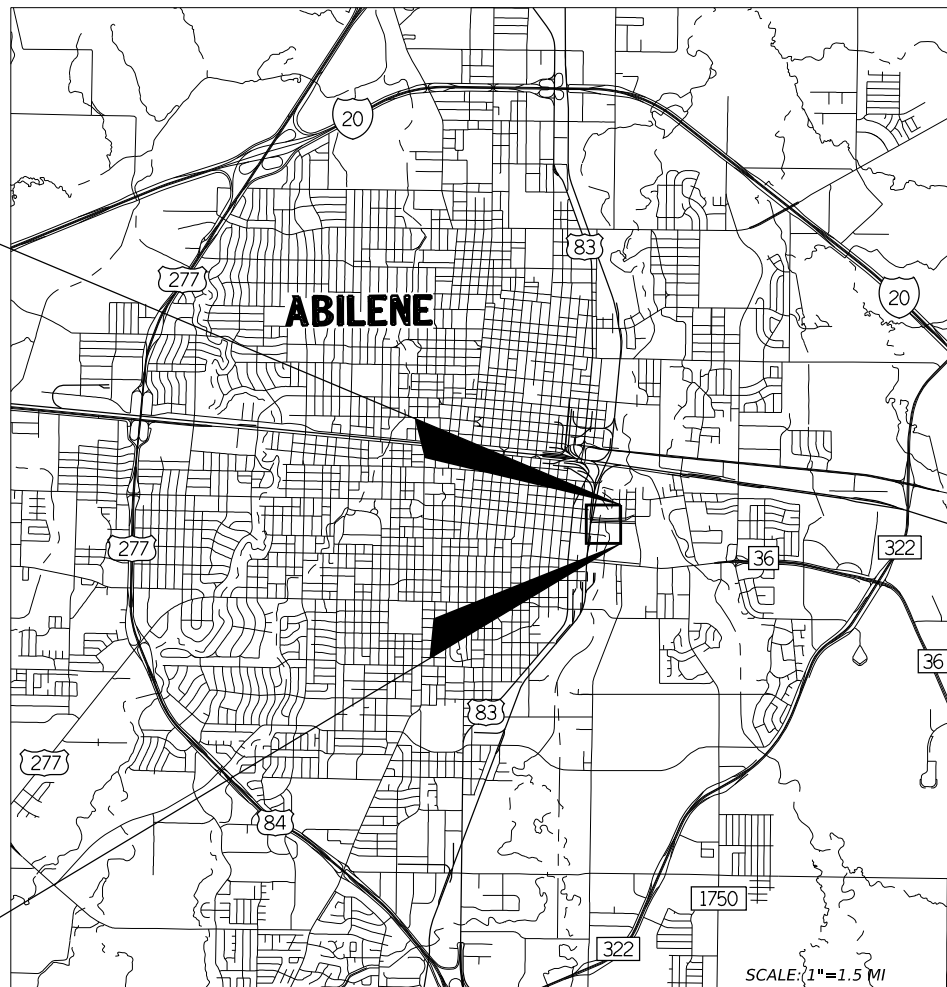
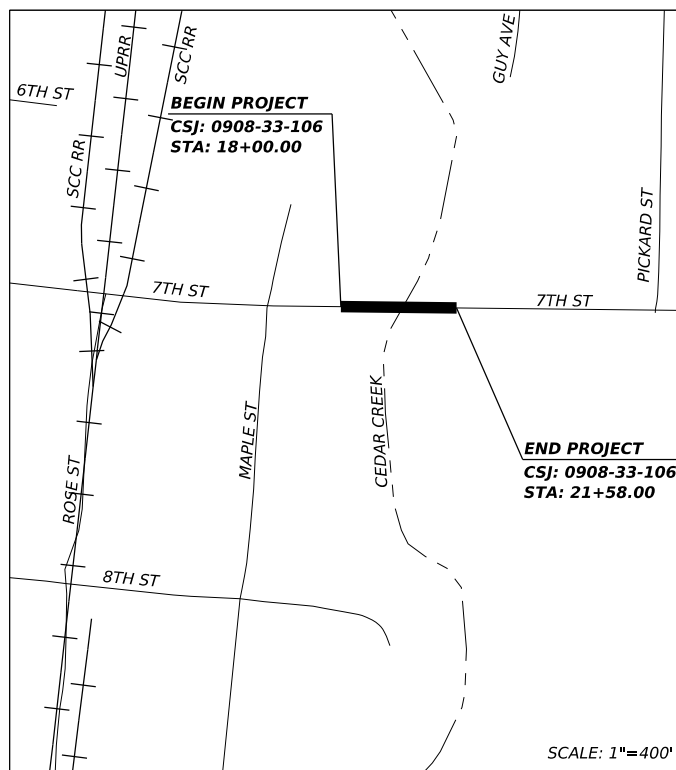
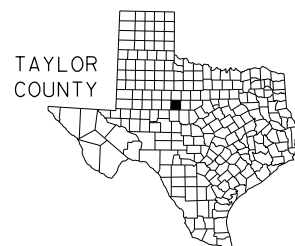
FEDERAL AID PROJECT NO. BR 2022(944)

EAST S 7TH STREET
TAYLOR COUNTY

NET LENGTH OF ROADWAY = 238 FT. = .05 MILES
NET LENGTH OF BRIDGE = 120 FT. = .02 MILES
NET LENGTH OF PROJECT = 358 FT. = .07 MILES

LIMITS: EAST S. 7TH STREET AT CEDAR CREEK

FOR THE CONSTRUCTION OF BRIDGE REPLACEMENT



EXCEPTIONS: N/A
EQUATIONS: N/A
RAILROAD CROSSINGS: N/A

DESIGN SPEED = 30 MPH
Functional Classification = Urban-Major Collector
A.D.T. (2020)= 522
A.D.T. (2041)= 731

Table with columns: FEDERAL AID PROJECT NO., BR 2022(944), DIST, COUNTY, SHEET NO., ABL, TAYLOR, 1

FINAL PLANS

LETTING DATE: MAY 2023
DATE CONTRACTOR BEGAN WORK:
DATE WORK WAS COMPLETED & 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

REGISTERED ACCESSIBILITY SPECIALIST (RAS)
INSPECTION REQUIRED.
TDLR NO. TABS2023007641

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, 2/21/2023, DATE

TranSystems logo and address: 500 W. 7th ST. SUITE 1100, FORT WORTH, TX 76102

Texas Department of Transportation logo and copyright notice

CONCURRENCE: 2/20/2023
DocuSigned by: Robert Hanna, ROBERT HANNA, CITY MANAGER

SUBMITTED FOR LETTING: 02/08/2023
DocuSigned by: Kevin M. Arft, P.E., TRANSYSTEMS PROJECT MANAGER

RECOMMENDED FOR LETTING: 2/21/2023
DocuSigned by: Natalie Cox, NATALIE COX, PROJECT MANAGER

RECOMMENDED FOR LETTING: 2/23/2023
DocuSigned by: Michael A. Turentine, P.E., AREA ENGINEER

RECOMMENDED FOR LETTING: 2/24/2023
DocuSigned by: Michael A. Haithcock, P.E., DISTRICT DIRECTOR OF TRANSPORTATION PLANNING AND DEVELOPMENT

APPROVED FOR LETTING: 2/24/2023
DocuSigned by: Thomas G. Allbritton, P.E., DISTRICT ENGINEER

SPECIFICATIONS ADOPTED BY THE TEXAS DEPARTMENT OF TRANSPORTATION, NOVEMBER 1, 2014 AND SPECIFICATION ITEMS LISTED AND DATED AS FOLLOWS, SHALL GOVERN ON THIS PROJECT: REQUIRED CONTRACT PROVISIONS FOR ALL FEDERAL-AID CONSTRUCTION CONTRACTS (FORM FHWA 1273, JULY 5, 2022)

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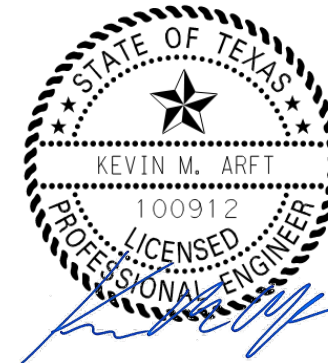
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THE STANDARD SHEETS SPECIFICALLY IDENTIFIED ON THIS SHEET WITH A "##" HAVE BEEN SELECTED BY ME OR UNDER MY RESPONSIBLE SUPERVISION AS BEING APPLICABLE TO THIS PROJECT.

Kevin M. Arft, P.E. 2/7/2023
NAME DATE



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

Brandon M. Gaumont, P.E. 2/7/2023
NAME DATE

REV NO.	DATE	BY	REVISION

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FORT WORTH, TX 76102
(817) 339-8950
FIRM REG. #: 3557

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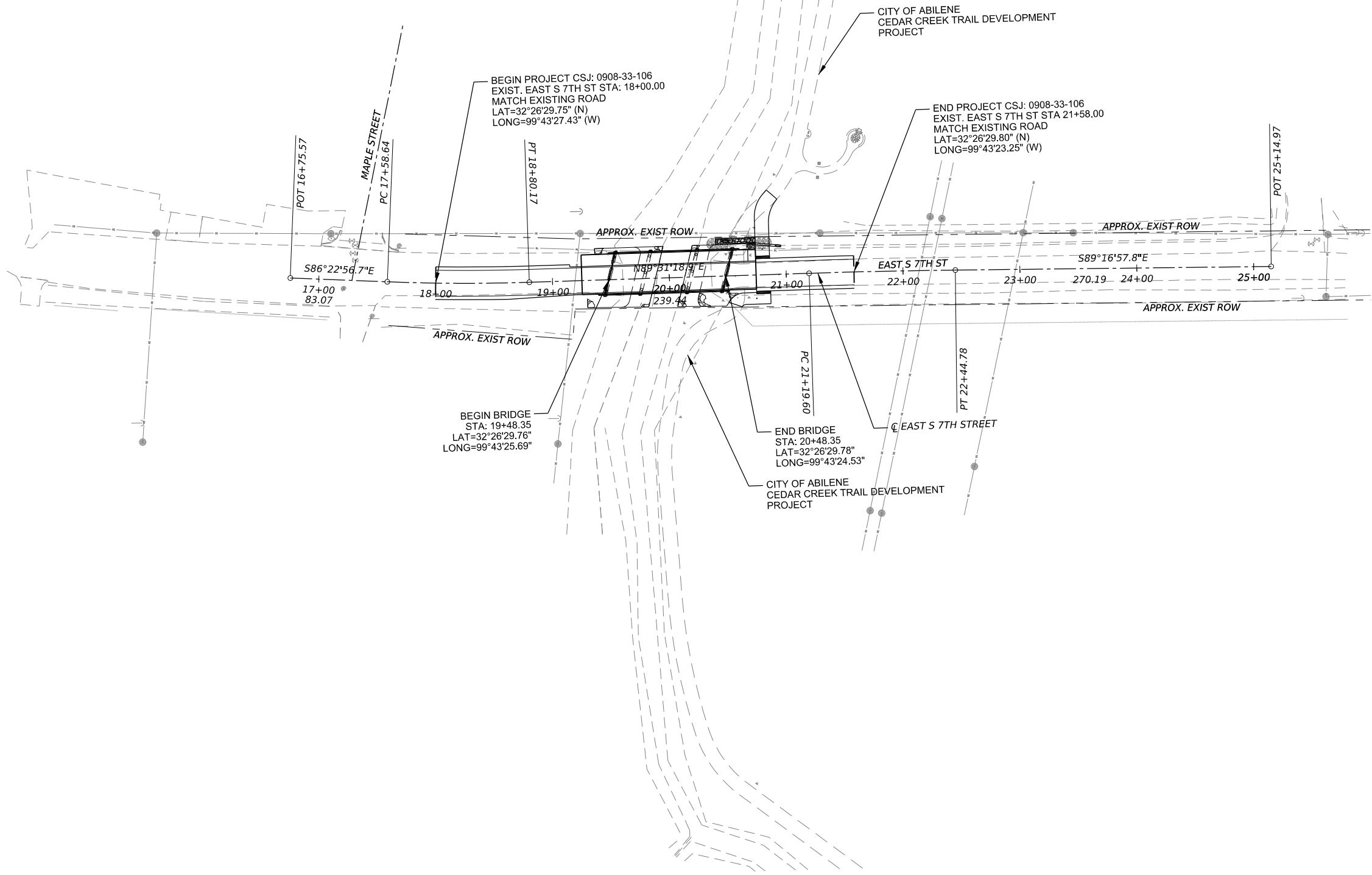
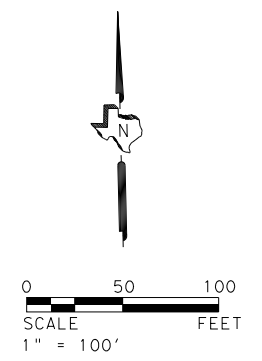
EAST S 7TH STREET

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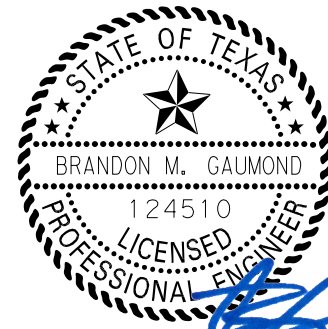
SHEET 1 OF 1

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DIST	COUNTY	SHEET NO.	
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REV NO.	DATE	BY	REVISION



[Signature]
 2/8/2023

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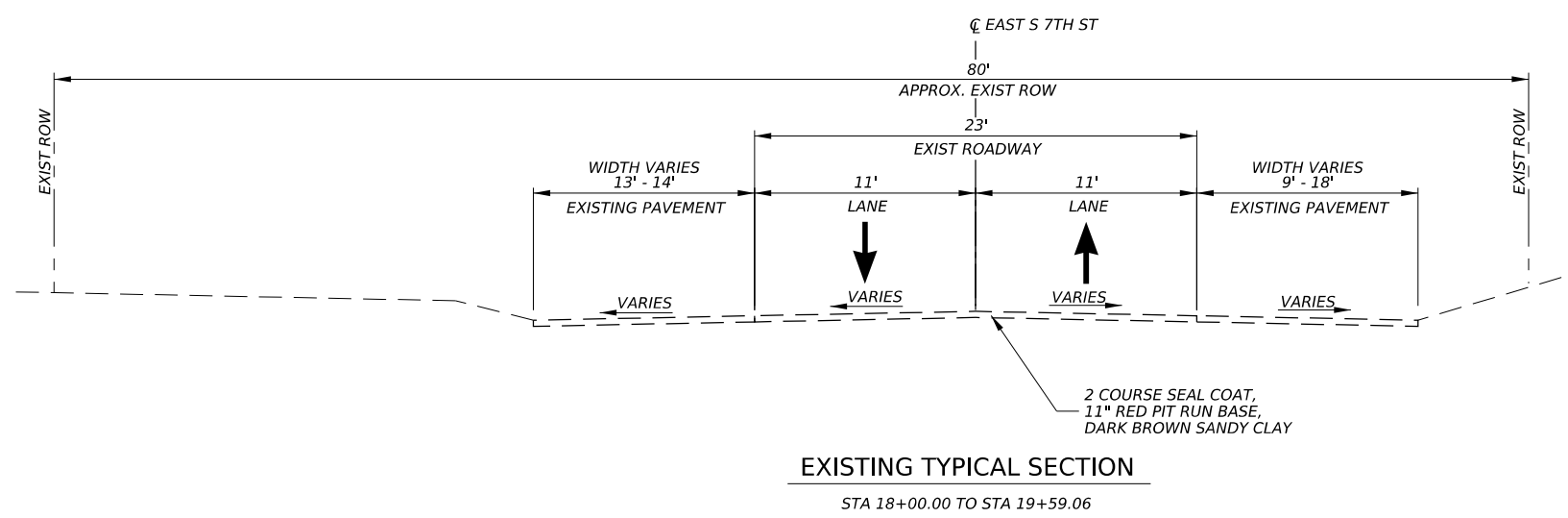
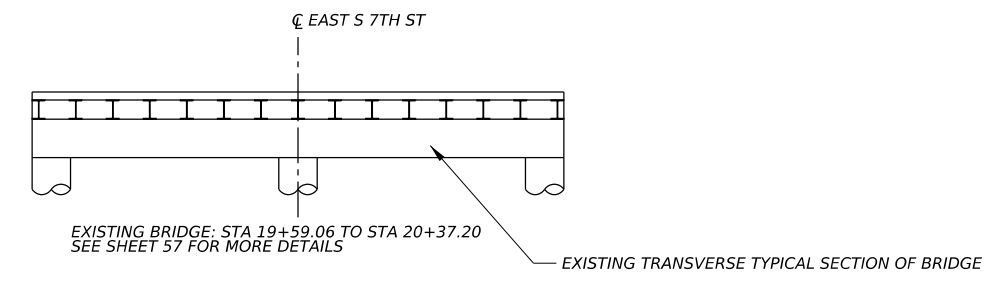
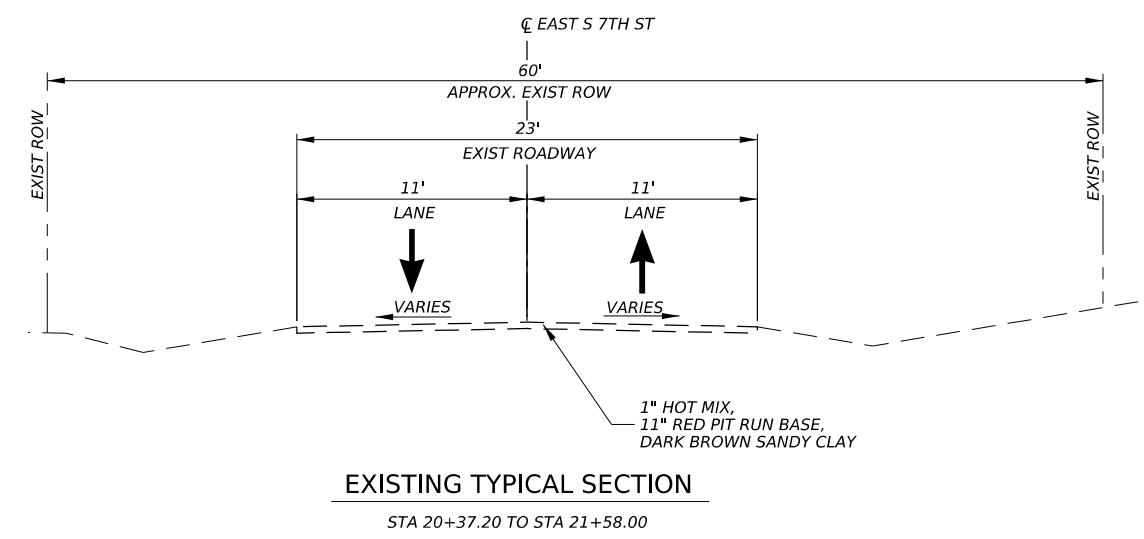
EAST S 7TH STREET
PROJECT LAYOUT

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DIST	COUNTY	SHEET NO.	
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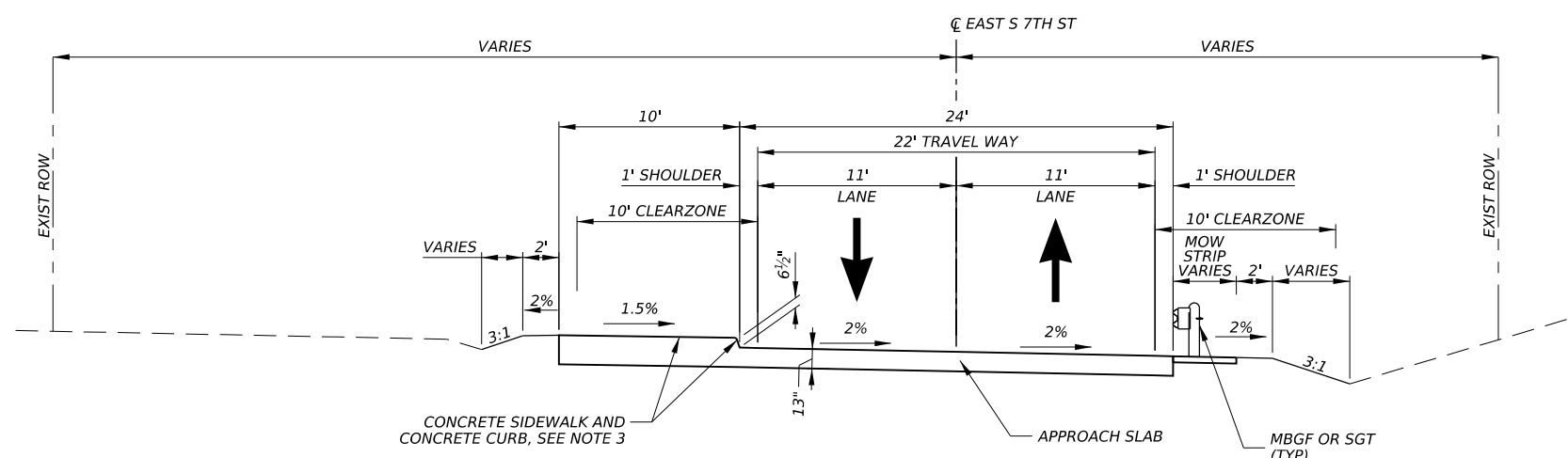
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EAST S 7TH STREET
 EXISTING
 TYPICAL SECTIONS

SHEET 1 OF 1

CONT	SECT	JOB	HIGHWAY
0908	33	106	EAST S 7TH ST
DIST	COUNTY	SHEET NO.	
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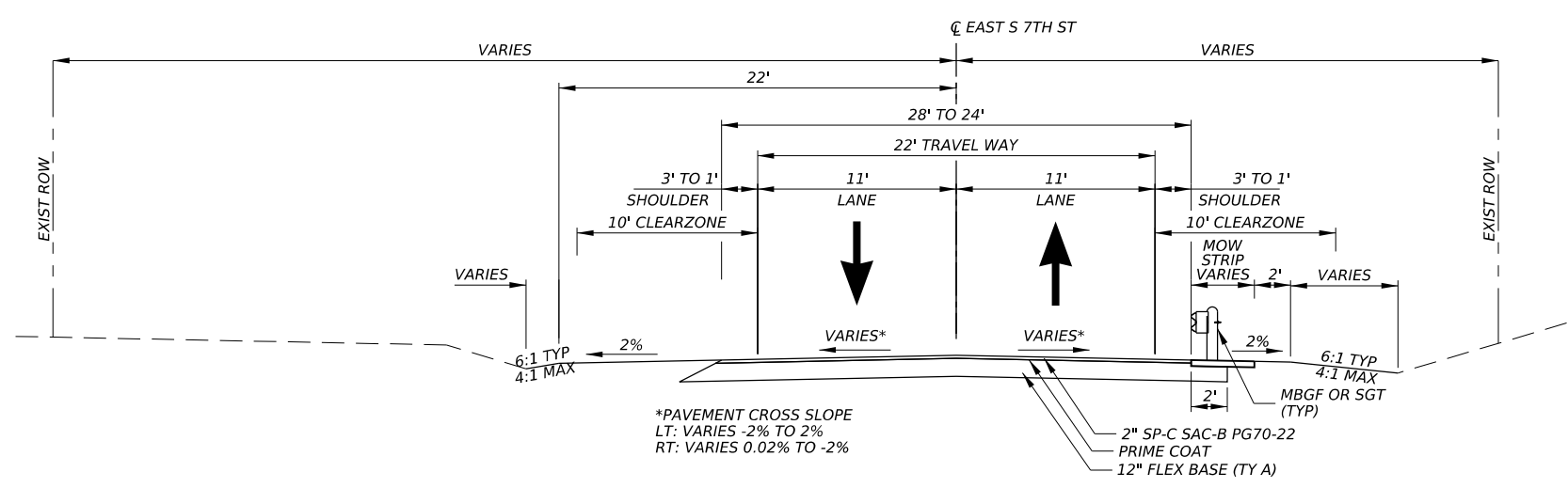


PROPOSED TYPICAL SECTION

PROPOSED WEST APPROACH SLAB: STA 19+25.13 TO STA 19+48.35

NOTES:

1. REFER TO BRIDGE LAYOUT SHEETS FOR BRIDGE TYPICAL SECTION.
2. REFER TO PLAN AND PROFILE SHEETS FOR RAIL TRANSITION AND METAL BEAM GUARD FENCE LIMITS.
3. USE BRSM STANDARD FOR RAISED SIDEWALK REINFORCEMENT ON APPROACH SLAB. SIDEWALK ON APPROACH SLAB PAID FOR UNDER CY OF APPROACH SLAB CONCRETE.



PROPOSED TYPICAL SECTION

PROPOSED ROADWAY: STA 18+00.00 TO STA 19+25.13

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EAST S 7TH STREET

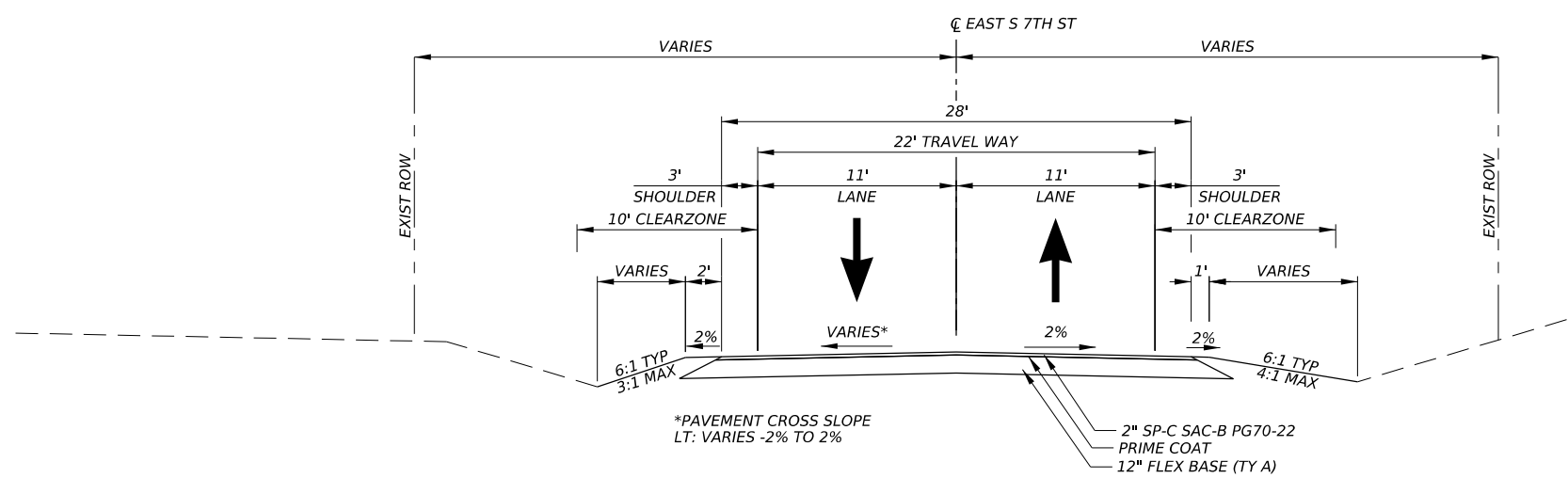
PROPOSED TYPICAL SECTIONS

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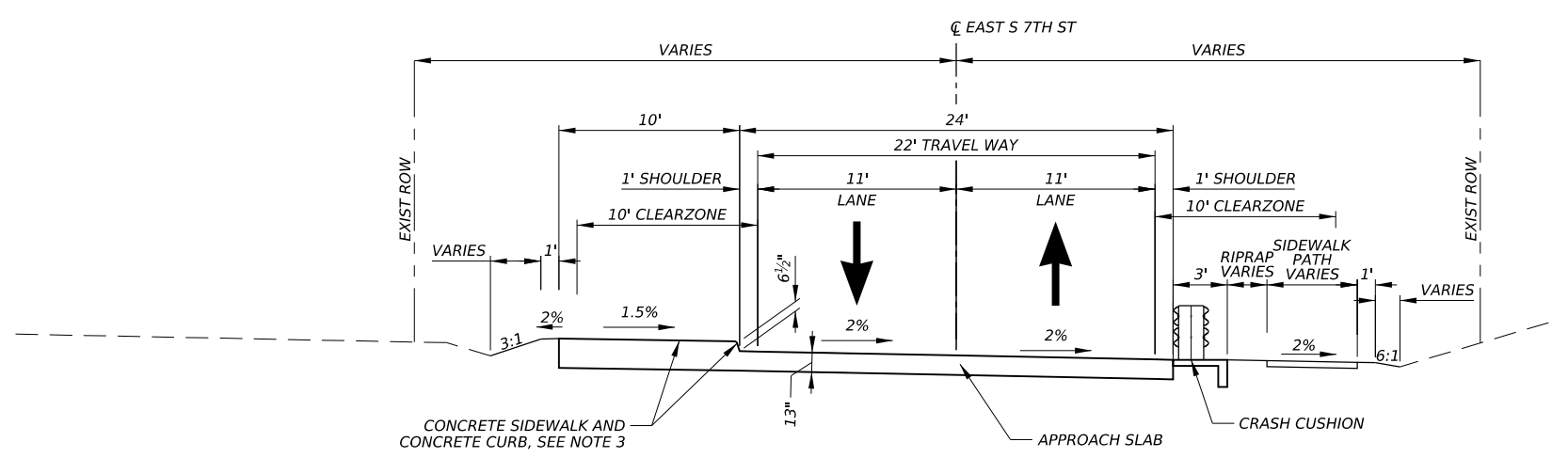
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PROPOSED TYPICAL SECTION

PROPOSED ROADWAY: STA 20+86.25 TO STA 21+58.00

- NOTES:
1. REFER TO BRIDGE LAYOUT SHEETS FOR BRIDGE TYPICAL SECTION.
 2. REFER TO PLAN AND PROFILE SHEETS FOR RAIL TRANSITION AND METAL BEAM GUARD FENCE LIMITS.
 3. USE BRSM STANDARD FOR RAISED SIDEWALK REINFORCEMENT ON APPROACH SLAB. SIDEWALK ON APPROACH SLAB PAID FOR UNDER CY OF APPROACH SLAB CONCRETE.



PROPOSED TYPICAL SECTION

PROPOSED EAST APPROACH SLAB: STA 20+48.35 TO STA 20+74.25

PROPOSED BRIDGE: STA 19+48.35 TO STA 20+48.35

REV NO.	DATE	BY	REVISION



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2/8/2023

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EAST S 7TH STREET

**PROPOSED
TYPICAL SECTIONS**

SHEET 2 OF 2

COUNT	SECT	JOB	HIGHWAY
0908	33	106	EAST S 7TH ST
DIST	COUNTY	SHEET NO.	
ABL	TAYLOR	6	

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CCSJ: 0908-33-106
County: Taylor
Highway: East S. 7th Street

ABILENE DISTRICT GENERAL NOTES 2014 SPECIFICATIONS

General

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

Bryce Turentine, P.E. / Phone: 325-690-9821 / Bryce.Turentine@txdot.gov
Chad Carter, P.E. / Phone: 325-676-6850 / Chad.W.Carter@txdot.gov
(Abilene Area Office)

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

For Q&A's on Proposals navigate to <https://tableau.txdot.gov/views/ProjectInformationDashboard/NoticetoContractors>. Use the dashboard to navigate to the project you are interested in by scrolling or filtering the dashboard using the controls on the left. Hover over the blue hyperlink for the project you want to view the Q&A for and click on the link in the window that pops up.

All relevant project documentation including contract time, cross sections, etc will be posted on the districts FTP website. <https://ftp.dot.state.tx.us/pub/txdot-info/Pre-Letting%20Responses/>

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

Sheet A

CCSJ: 0908-33-106
County: Taylor
Highway: East S. 7th Street

Environmental

Endangered and Protected Species

1. Migratory Birds

- a. **Bird nesting season is typically 15 Feb through 15 Sep 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. 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.
- 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.

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"**

Sheet B

GENERAL NOTES



SHEET 1 OF 6											
CONT	SECT	JOB	HIGHWAY	DIST	COUNTY	SHEET NO.					
0908	33	106	EAST S 7TH ST	ABL	TAYLOR	7					

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CCSJ: 0908-33-106
County: Taylor
Highway: East S. 7th Street

Provide notification to the District 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.

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

Item 6, "Control of Materials"

The use of flame or saw-cutting to dismantle the steel beams will not be allowed. Unbolting, shearing or other method approved by the Engineer will be allowed.

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

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

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

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

Item 7, "Legal Relations and Responsibilities"

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

Sheet C

CCSJ: 0908-33-106
County: Taylor
Highway: East S. 7th Street

activities, including project specific locations (PSLs) that have not been previously evaluated by the USACE. Provide the department with a copy of all consultation(s) or approval(s) from the USACE prior to initiating activities.

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

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

(1) Restricted Use of Materials for the Previously Evaluated Permit Areas.

Document both the project specific location (PSL) and their authorization. Maintain copies for review by the department or any regulatory agency. When an area within the project limits has been evaluated by the USACE as part of the permit process for this project:

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

(2) Contractor Materials from Areas Other than Previously Evaluated Areas.

Provide the department with a copy of all USACE coordination or approval(s) prior to initiating any activities for an area within the project limits that has not been evaluated by the USACE or for any off right of way locations used for the following, but not limited to, haul roads, equipment staging areas, borrow and disposal sites:

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

The total area disturbed for this project is 0.73 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

Sheet D



GENERAL NOTES



SHEET 2 OF 6

CONT	SECT	JOB	HIGHWAY	DIST	COUNTY	SHEET NO.
0908	33	106	EAST S 7TH ST	ABL	TAYLOR	8

CC: DW: CC: DW:

CCSJ: 0908-33-106
County: Taylor
Highway: East S. 7th Street

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.

Patrol vehicles must be clearly marked to correspond with the officer's agency and equipped with appropriate lights to identify them as law enforcement. For patrol vehicles not owned by a law enforcement agency, markings will be retroreflective and legible from 100 ft. from both sides and the rear of the vehicle. Lights will be high intensity and visible from all angles.

LIGHTING STANDARDS FOR HIGHWAY MAINTENANCE OR CONSTRUCTION VEHICLES AND SERVICE VEHICLES

VEHICLE LIGHTING SUMMARY

Vehicle Color of Flashing Lights Transportation Code
Police Vehicles Red/Blue/White/Amber 547.305 & 547.702
Fire/EMS Vehicles Red/Blue/White/Amber 547.305 & 547.702
Volunteer Fire/EMS Red/Blue/White/Amber 547.305 & 547.702
School Bus Red/White (rooftop)/Amber 547.305 & 547.701
Highway Maintenance or Construction Vehicles1 and Service Vehicles2 Amber/Blue 547.105 & TxDOT

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.

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

Begin work 90 calendar days after the authorization date to begin work. Do not begin work before or after this period unless authorized in writing by the Engineer. The delay is needed to allow for shop drawing review and fabrication of bridge prestressed slab beams.

Sheet E

CCSJ: 0908-33-106
County: Taylor
Highway: East S. 7th Street

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"

No burning is permitted in the City of Abilene.

Item 134, "Backfilling"

Backfill pavement edges no later than 2 weeks after the construction of the final surface. Provide material meeting the requirements of Article 160.2

Item 204, "Sprinkling for Dust Control"

Sprinkle for dust control as directed. Payment for this item will be subsidiary to the various bid items.

Item 216, "Proof Rolling"

Perform proof rolling only as directed. Payment for this item will be made only when proof rolling is performed as directed.

Item 416, "Drilled Shaft Foundations"

All soil, water, and slurry removed from drilled shafts shall be captured and disposed of properly. No discharge of these materials into, or in close proximity to, the surrounding water will be allowed.

Item 420, "Concrete Substructures"

In addition to the elements shown in table 1, the following elements are Plans Quantity Elements.

- Abutment Concrete
- Bent Concrete

Item 421, "Hydraulic Cement Concrete"

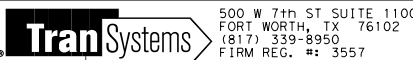
Use a cement meeting the requirements of Ty II when Mix Design Option 7 is selected for cast in place concrete.

Class C fly ash and Type I cement will not be allowed for any mix unless approved by the Engineer.

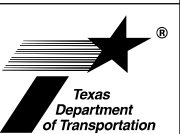
As a minimum, curing facility includes concrete curing tank, heater and a concrete recording thermometer. Provide a recorder with the capability to chart temperatures for 24 hours, 7 days and 30 day periods of time.

Sheet F

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GENERAL NOTES



SHEET 3 OF 6						CONT	SECT	JOB	HIGHWAY	DIST	COUNTY	SHEET NO.
0908	33	106	EAST S 7TH ST	ABL	TAYLOR							9

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Air Entrainment requirements are waived with exception to bridge deck concrete, and rails, top slabs of direct traffic culverts and approach slabs. Air Entrainment is required for all slip formed concrete (bridge rail, concrete traffic barrier, pavement, etc.).

Item 422, "Concrete Superstructures"

Saw-cut grooves are not required.

Provide either a carpet drag or broom finish for micro-texture to deck and approach slabs.

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 440, "Reinforcement for Concrete"

Provide epoxy coated reinforcement for all reinforcement in abutment caps, wingwalls, and backwalls (drilled shaft reinforcement excluded); interior bent caps (column and drilled shaft reinforcement excluded); cast-in-place portions of bridge deck (PCP reinforcement and bridge girder reinforcement excluded); bridge railing; and approach slab.

Item 496, "Removing Structures"

The contractor will be required to provide a demo plan for bridge structures to be approved by the engineer.

Item 502, "Barricades, Signs and Traffic Handling"

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.

Sheet G

CCSJ: 0908-33-106
County: Taylor
Highway: East S. 7th Street

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.

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. 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. This work shall be 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 506, "Temporary Erosion, Sedimentation, and Environmental Controls"

On site concrete washout shall not be allowed on this project.

Sheet H

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CCSJ: 0908-33-106
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Highway: East S. 7th Street

Item 531, "Sidewalks"

Provide reinforcement as shown in Article 432.3.1 or as detailed elsewhere in plans.

Item 540, "Metal Beam Guard Fence"

Steel posts for metal beam guard fence may be field cut to proper rail height with a power saw when approved by the engineer.

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 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 City of Abilene.

Item 658, "Delineator and Object Marker Assemblies"

Delineators and object marker assemblies will use winged channel posts. The winged channel posts will be 1.12 lb/ft and 6.5 ft in length.

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 666, "Retro reflectorized Pavement Markings"

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

Sheet I

CCSJ: 0908-33-106
County: Taylor
Highway: East S. 7th Street

Establish a true and correct alignment with a method approved by the Engineer. 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 3077, "Superpave Mixtures"

Furnish aggregate for final surfaces with a minimum surface aggregate classification of "B".

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.

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 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.

Provide PG 64-22 tack coat at a rate of 0.10 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.

Sheet J

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CCSJ: 0908-33-106
County: Taylor
Highway: East S. 7th Street

Tack all vertical joints unless otherwise directed.

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

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.

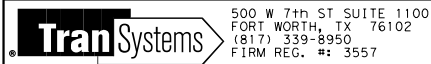
TMA,s will only be paid while workers are present or to protect a blunt object.

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.

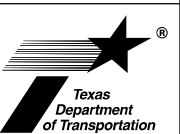
If a TMA is used for both mobile and stationary traffic control on the same day, it will be paid for as stationary for that day.

Basis of Estimate for Mobile TMAs				
		TMA (Mobile)		
Phase	Standard	Required	Additional	TOTAL
Striping	TCP(3-1)-13	1	-	1

Sheet K



GENERAL NOTES



SHEET 6 OF 6

CONT	SECT	JOB	HIGHWAY	DIST	COUNTY	SHEET NO.
0908	33	106	EAST S 7TH ST	ABL	TAYLOR	12



Estimate & Quantity Sheet

CONTROLLING PROJECT ID 0908-33-106

DISTRICT Abilene

COUNTY Taylor

HIGHWAY 7TH ST

CONTROL SECTION JOB				0908-33-106		TOTAL EST.	TOTAL FINAL
PROJECT ID				A00184881			
COUNTY				Taylor			
HIGHWAY				7TH ST			
ALT	BID CODE	DESCRIPTION	UNIT	EST.	FINAL		
	100-6001	PREPARING ROW	AC	0.250		0.250	
	104-6009	REMOVING CONC (RIPRAP)	SY	224.000		224.000	
	104-6015	REMOVING CONC (SIDEWALKS)	SY	120.000		120.000	
	105-6014	REMOVING STAB BASE & ASPH PAV (7"-12")	SY	1,162.000		1,162.000	
	110-6001	EXCAVATION (ROADWAY)	CY	307.200		307.200	
	132-6004	EMBANKMENT (FINAL)(DENS CONT)(TY B)	CY	114.800		114.800	
	164-6007	BROADCAST SEED (PERM) (URBAN) (CLAY)	SY	1,184.000		1,184.000	
	247-6041	FL BS (CMP IN PLC)(TYA GR1-2)(FNAL POS)	CY	238.000		238.000	
	310-6009	PRIME COAT (MC-30)	GAL	132.000		132.000	
	360-6027	CURB (TYPE II)	LF	10.000		10.000	
	400-6005	CEM STABIL BKFL	CY	42.000		42.000	
	403-6001	TEMPORARY SPL SHORING	SF	660.000		660.000	
	416-6002	DRILL SHAFT (24 IN)	LF	380.000		380.000	
	420-6014	CL C CONC (ABUT)(HPC)	CY	23.800		23.800	
	420-6030	CL C CONC (CAP)(HPC)	CY	18.800		18.800	
	420-6038	CL C CONC (COLUMN)(HPC)	CY	4.500		4.500	
	422-6008	REINF CONC SLAB (SLAB BEAM)(HPC)	SF	3,600.000		3,600.000	
	422-6014	BRIDGE SIDEWALK (HPC)	SF	1,100.000		1,100.000	
	422-6016	APPROACH SLAB (HPC)	CY	76.300		76.300	
	425-6010	PRESTR CONC SLAB BEAM (5SB12)	LF	689.390		689.390	
	427-6004	SILICONE RESIN PAINT FINISH	SF	410.000		410.000	
	432-6031	RIPRAP (STONE PROTECTION)(12 IN)	CY	3.000		3.000	
	432-6033	RIPRAP (STONE PROTECTION)(18 IN)	CY	578.200		578.200	
	432-6045	RIPRAP (MOW STRIP)(4 IN)	CY	6.000		6.000	
	442-6007	STR STEEL (MISC NON - BRIDGE)	LB	283.000		283.000	
	450-6007	RAIL (TY T223)(HPC)	LF	112.000		112.000	
	450-6033	RAIL (TY C223)(HPC)	LF	112.000		112.000	
	454-6021	TYPE A JOINT	LF	74.000		74.000	
	464-6017	RC PIPE (CL IV)(18 IN)	LF	50.000		50.000	
	467-6357	SET (TY II) (18 IN) (RCP) (3: 1) (P)	EA	2.000		2.000	
	496-6007	REMOV STR (PIPE)	LF	150.000		150.000	
	496-6009	REMOV STR (BRIDGE 0 - 99 FT LENGTH)	EA	1.000		1.000	
	496-6051	REMOV STR (PIPE GATE)	LF	26.000		26.000	
	500-6001	MOBILIZATION	LS	1.000		1.000	
	502-6001	BARRICADES, SIGNS AND TRAFFIC HANDLING	MO	8.000		8.000	
	506-6020	CONSTRUCTION EXITS (INSTALL) (TY 1)	SY	120.000		120.000	
	506-6024	CONSTRUCTION EXITS (REMOVE)	SY	120.000		120.000	

DISTRICT	COUNTY	CCSJ	SHEET
Abilene	Taylor	0908-33-106	13



CONTROLLING PROJECT ID 0908-33-106

DISTRICT Abilene
HIGHWAY 7TH ST

COUNTY Taylor

Estimate & Quantity Sheet

CONTROL SECTION JOB				0908-33-106		TOTAL EST.	TOTAL FINAL
PROJECT ID				A00184881			
COUNTY				Taylor			
HIGHWAY				7TH ST			
ALT	BID CODE	DESCRIPTION	UNIT	EST.	FINAL		
	506-6038	TEMP SEDMT CONT FENCE (INSTALL)	LF	110.000		110.000	
	506-6039	TEMP SEDMT CONT FENCE (REMOVE)	LF	110.000		110.000	
	506-6042	BIODEG EROSN CONT LOGS (INSTL) (18")	LF	372.000		372.000	
	506-6043	BIODEG EROSN CONT LOGS (REMOVE)	LF	372.000		372.000	
	531-6001	CONC SIDEWALKS (4")	SY	110.000		110.000	
	531-6041	CURB RAMPS (SPECIAL)	SY	8.000		8.000	
	540-6001	MTL W-BEAM GD FEN (TIM POST)	LF	25.000		25.000	
	540-6007	MTL BEAM GD FEN TRANS (TL2)	EA	1.000		1.000	
	544-6001	GUARDRAIL END TREATMENT (INSTALL)	EA	1.000		1.000	
	545-6007	CRASH CUSH ATTEN (INSTL)(L)(N)(TL3)	EA	1.000		1.000	
	644-6004	IN SM RD SN SUP&AM TY10BWG(1)SA(T)	EA	2.000		2.000	
	644-6060	IN SM RD SN SUP&AM TYTWT(1)WS(P)	EA	2.000		2.000	
	644-6061	IN SM RD SN SUP&AM TYTWT(1)WS(T)	EA	4.000		4.000	
	644-6068	RELOCATE SM RD SN SUP&AM TY 10BWG	EA	2.000		2.000	
	644-6076	REMOVE SM RD SN SUP&AM	EA	2.000		2.000	
	658-6010	INSTL DEL ASSM (D-SW)SZ 2(WC)GND	EA	9.000		9.000	
	658-6011	INSTL DEL ASSM (D-SW)SZ 2(WC)GND(BI)	EA	2.000		2.000	
	658-6014	INSTL DEL ASSM (D-SW)SZ (BRF)CTB (BI)	EA	9.000		9.000	
	658-6047	INSTL OM ASSM (OM-2Y)(WC)GND	EA	1.000		1.000	
	658-6053	INSTL OM ASSM (OM-3L)(TWT)GND	EA	1.000		1.000	
	658-6057	INSTL OM ASSM (OM-3R)(TWT)GND	EA	1.000		1.000	
	666-6224	PAVEMENT SEALER 4"	LF	682.000		682.000	
	666-6303	RE PM W/RET REQ TY I (W)4"(SLD)(100MIL)	LF	718.000		718.000	
	666-6315	RE PM W/RET REQ TY I (Y)4"(SLD)(100MIL)	LF	804.000		804.000	
	668-6076	PREFAB PAV MRK TY C (W) (24") (SLD)	LF	60.000		60.000	
	668-6091	PREFAB PAV MRK TY C (W) (18")(YLD TRI)	EA	10.000		10.000	
	672-6009	REFL PAV MRKR TY II-A-A	EA	9.000		9.000	
	3077-6023	SP MIXESSP-CSAC-B PG70-22	TON	72.000		72.000	
	6185-6005	TMA (MOBILE OPERATION)	DAY	1.000		1.000	
18		SAFETY CONTINGENCY: CONTRACTOR FORCE ACCOUNT WORK (PARTICIPATING)	LS	1.000		1.000	
		EROSION CONTROL MAINTENANCE: CONTRACTOR FORCE ACCOUNT WORK (PART)	LS	1.000		1.000	

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SUMMARY OF ROADWAY QUANTITIES																									
ITEM	Length	100	104	104	105	164	247*				310*		3077*		360	432	432	464	467	496	496	531	531		
		6001	6009	6015	6014	6007	6041								6027	6031	6045	6017	6357	6007	6051	6001	6041		
		PREPARING ROW	REMOVING CONC (RIPRAP)	REMOVING CONC (SIDEWALKS)	REMOVING STAB BASE & ASPH PAV (7"-12")	BROADCAST SEED (PERM) (URBAN) (CLAY)	WIDTH	DEPTH	ADDITIONAL SECTION UNDER MOW STRIP AND CURBS		FL BS (CMP IN PLC) (TYA GR1-2) (FNAL POS)	WIDTH	PRIME COAT (MC-30)	WIDTH	SP MIXES SP-C SAC-B PG70-22	CURB (TYPE II)	RIPRAP (STONE PROTECTION) (12 IN)	RIPRAP (MOW STRIP) (4 IN)	RC PIPE (CL IV)(18 IN)	SET (TY II) (18 IN) (RCP) (3: 1) (P)	REMOV STR (PIPE)	REMOV STR (PIPE GATE)	CONC SIDEWALKS (4')	CURB RAMPS (SPECIAL)	
	LF	AC	SY	SY	SY	SY	LF	IN	LF	IN	CY	LF	SY	LF	SY	LF	CY	CY	LF	EA	LF	LF	SY	SY	
CSJ: 0908-33-106																									
PROJECT WIDE		0.25	224	120	1162	1184										3	6	50	2	150	26				
STA 18+00.00 TO 18+22.96	22.96						30.67	12			26	28.67	73	28.33	73										
STA 18+22.96 TO 19+15.13	92.17						29.33	12	2	10	106	28.33	290	28.17	288										
STA 19+15.13 TO 19+25.13	10.00						26.67	12	2	10	11	24.00	27	24.00	27	10									
STA 19+25.13 TO 20+74.25	149.12																								
STA 20+74.25 TO 20+86.25	12.00						28.00	12	4	10	14	28.00	37	28.00	37									8	
STA 20+86.25 TO 21+58.00	71.75						30.67	12			81	28.67	229	28.33	226										
MULTIUSE PATH																							110		
PROJECT TOTALS		358.00	0.25	224	120	1162					238		656		651	10	3	6	50	2	150	26	110	8	

SUMMARY OF MBGF QUANTITIES				
ITEM	540	540	544	545
	6001	6007	6001	6007
ITEM DESCRIPTION	MTL W-BEAM GD FEN (TIM POST)	MTL BEAM GD FEN TRANS (TL2)	GUARDRAIL END TREATMENT (INSTALL)	CRASH CUSH ATTN (INSTL)(R) (N)(TL2)
	LF	EA	EA	EA
CSJ: 0908-33-106				
STA 18+22.96 TO 19+39.00 RT	25	1	1	
STA 20+80.00 RT				1
PROJECT TOTALS	25	1	1	1

SUMMARY OF EROSION CONTROL QUANTITIES						
ITEM	506	506	506	506	506	506
	6020	6024	6038	6039	6042	6043
ITEM DESCRIPTION	CONSTRUCTION EXITS (INSTALL) (TY 1)	CONSTRUCTION EXITS (REMOVE)	TEMP SEDMT CONT FENCE (INSTALL)	TEMP SEDMT CONT FENCE (REMOVE)	BIODEG EROSN CONT LOGS (INSTL) (18")	BIODEG EROSN CONT LOGS (REMOVE)
	SY	SY	LF	LF	LF	LF
CSJ: 0908-33-106						
PROJECT WIDE	120	120				
STA 18+00 TO 21+58.00			110	110	372	372
PROJECT TOTALS	120	120	110	110	372	372


EARTHWORK SUMMARIES - EAST S 7TH STREET				
ITEM	110-6001	132-6004		
DESCRIPTION	EXCAVATION (ROADWAY)	EMBANKMENT (FINAL) (DENS CONT)(TY B)		
UNT	CY	CY		
EAST S 7TH ST AT CEDAR CREEK				
TOTAL	STATION	TO	STATION	
	18+00	TO	19+00	129.420
	19+00	TO	19+84	30.640
	19+84	TO	20+00	21.740
	20+00	TO	20+48	25.100
	20+48	TO	21+00	31.630
	21+00	TO	21+58	68.710
	TOTAL			307.2
				114.8

SUMMARY OF PAVEMENT MARKINGS QUANTITIES						
ITEM	666	666	666	668	668	672
	6224	6303	6315	6076	6091	6009
ITEM DESCRIPTION	PAVEMENT SEALER 4"	RE PM W/RET REQ TY I (W)4"(SLD) (100ML) (W) 4" (SLD)	RE PM W/RET REQ TY I (Y)4"(SLD) (100ML) (Y) 4" (SLD)	PREFAB PAV MRK TY C (W) (24") (SLD)	PREFAB PAV MRK TY C (W) (18")(YLD TRI)	REFL PAV MRKR TY II-A-A
	LF	LF	LF	LF	EA	EA
CSJ: 0908-33-106						
STA 18+00 TO 19+25.13		250	250			4
STA 19+25.13 TO 20+74.25 (BRIDGE and APPROACH SLABS)	596	299	299		5	3
STA 20+74.25 TO 21+58.00		169	169	60	5	2
MULTIUSE PATH	86		86			
PROJECT TOTALS	682	718	804	60	10	9

BASIS OF ESTIMATE							
ITEM	DESCRIPTION	RATE	AREA	VOLUME	THICKNESS	QUANTITY	UNIT
310-6009	PRIME COAT (MC-30)	20 GAL/SY	656 SY	-	-	132	GAL
3077-6023	SP MIXES SP-C SAC-B PG70-22	110 LB/SY/IN	651 SY	-	2 IN	72	TON

NOTES:
 * DENOTES FOR CONTRACTOR INFORMATION ONLY, NOT TO BE PAID DIRECTLY.

REV NO.	DATE	BY	REVISION



500 W 7th ST SUITE 1100
 FORT WORTH, TX 76102
 (817) 339-8950
 FIRM REG. #: 3557

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 Texas Department of Transportation

EAST S 7TH STREET

SUMMARY OF QUANTITIES

SHEET 1 OF 3

CONT	SECT	JOB	HIGHWAY
0908	33	106	EAST S 7TH ST
DIST	COUNTY	SHEET NO.	
ABL	TAYLOR	15	

DATE: 2/7/2023 3:07:36 PM
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Ck:
 DW:
 CK:
 DN:

SUMMARY OF DELINEATORS & OBJECT MARKERS QUANTITIES						
ITEM	658 6010	658 6011	658 6014	658 6047	658 6053	658 6057
ITEM DESCRIPTION	IN STL DEL ASSM (D-SW) SZ 2(WC)GND EA	IN STL DEL ASSM (D-SW) SZ 2(WC)GND(BI) EA	IN STL DEL ASSM (D-SW) SZ (BRF)CTB (BI) EA	IN STL OM ASSM (OM-2Y) (WC)GND EA	IN STL OM ASSM (OM-3L) (TWT)GND EA	IN STL OM ASSM (OM-3R) (TWT)GND EA
CSJ: 0908-33-106						
STA 18+00.00 TO 21+58.00	9	2	9	1	1	1
PROJECT TOTALS	9	2	9	1	1	1

SUMMARY OF SIGNS QUANTITIES					
ITEM	644 6004	644 6060	644 6061	644 6068	644 6076
ITEM DESCRIPTION	IN SM RD SN SUP&AM TY10BWG(1)SA(T) EA	IN SM RD SN SUP&AM TYTWT(1)WS(P) EA	IN SM RD SN SUP&AM TYTWT(1)WS(T) EA	RELOCATE SM RD SN SUP&AM TY 10BWG EA	REMOVE SM RD SN SUP&AM EA
CSJ: 0908-33-106					
PROJECT WIDE	2	2	4	2	2
PROJECT TOTALS	2	2	4	2	2

REV NO.	DATE	BY	REVISION

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EAST S 7TH STREET
SUMMARY OF QUANTITIES

SHEET 2 OF 3

COUNT	SECT	JOB	HIGHWAY
0908	33	106	EAST S 7TH ST
DIST	COUNTY	SHEET NO.	
ABL	TAYLOR	16	


SUMMARY OF BRIDGES

CSJ	PLAN PROFILE SHEET	BRIDGE NBI #		DESIGN		BRIDGE LOCATION	STATION		LENGTH	CLEAR RDWY WIDTH	LOADING	400-6005	403-6001	416-6002	420-6014
		EXISTING	PROPOSED	EXISTING	PROPOSED		BEGIN	END				FT	FT	CEM STABIL BKFL	TEMPORARY SPL SHORING
0908-33-106		08-221-0-B214-29-001	08-221-0-B214-29-002	1955 - UNKNOWN	2022 AASHTO LRFD, 9TH EDITION	EAST S. 7TH STREET OVER CEDAR CREEK	19+48.35	20+48.35	100'	24'	HL-93	42.0	660	380	23.8
TOTALS												42.0	660	380	23.8


CSJ (CONT'D FROM ABOVE)	420-6030 CL C CONC (CAP) (HPC)	420-6038 CL C CONC (COLUMN) (HPC)	422-6008 REINF CONC SLAB (SLAB BEAM) (HPC)	422-6014 BRIDGE SIDEWALK (HPC)	422-6016 APPROACH SLAB (HPC)	425-6010 PRESTR CONC SLAB BEAM (5SB12)	427-6004 SILICONE RESIN PAINT FINISH	432-6033 RIPRAP (STONE PROTECTION) (18 IN)	442-6007 STR STEEL (MISC NON-BRIDGE)	450-6007 RAIL (TY T223) (HPC)	450-6033 RAIL (TY C223) (HPC)	454-6021 TYPE A JOINT	496-6009 REMOV STR (BRIDGE 0 - 99 FT LENGTH)
	CY	CY	SF	SF	CY	LF	SF	CY	LB	LF	LF	LF	EA
0908-33-106	18.8	4.5	3600	1100	76.3	689.39	410	578.2	283	112	112	74	1
TOTALS	18.8	4.5	3600	1100	76.3	689.39	410	578.2	283	112	112	74	1

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EAST S 7TH STREET

SUMMARY OF QUANTITIES

SHEET 3 OF 3

CONT	SECT	JOB	HIGHWAY
0908	33	106	EAST S 7TH ST
DIST	COUNTY	SHEET NO.	
ABL	TAYLOR	17	

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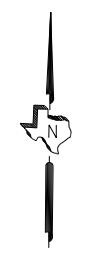
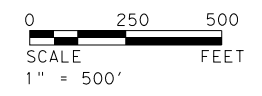
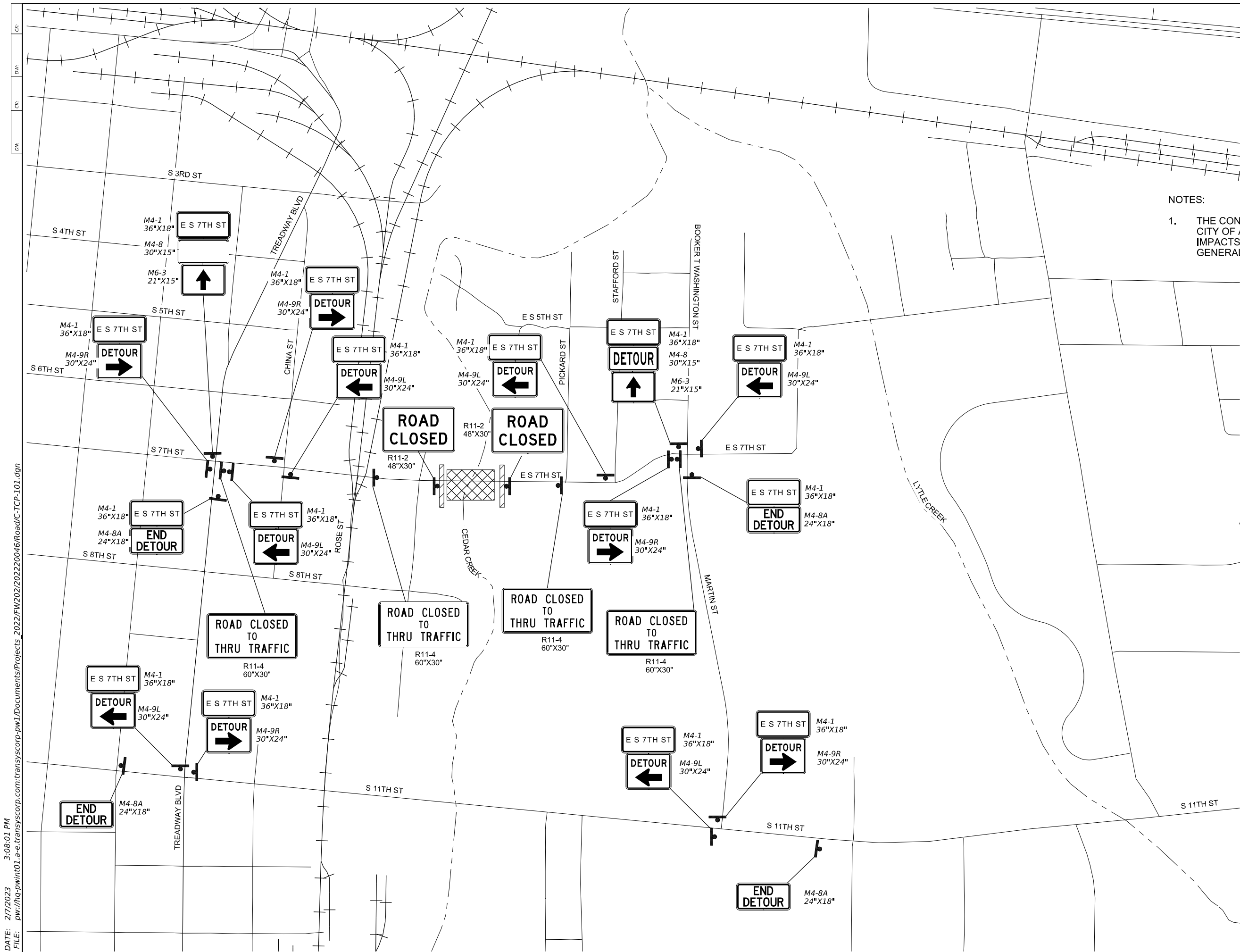
LOC NO.	TCP PHASE	PLAN SHEET NUMBER	LOCATION	STA	TEST LEVEL	DIRECTION OF TRAFFIC (UNI/BI)	FOUNDATION PAD		BACKUP SUPPORT			AVAILABLE SITE LENGTH	CRASH CUSHION														
							PROPOSED MATERIAL	PROPOSED THICKNESS	DESCRIPTION	WIDTH	HEIGHT		INSTALL	REMOVE	MOVE / RESET		L	L	R	R	S	S					
															MOVE/RESET	FROM LOC. #							N	W	N	W	N
1	N/A	32	EAST BRIDGE ABUTMENT	20+51.00	TL2	BI	CONC	4"	T223	24"	32"	36"	X														
												TOTALS		1													

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

CRASH CUSHION SUMMARY SHEET


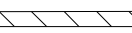

FOR DEFINITIONS SEE THE "CRASH CUSHION CATEGORIZATION CHART.PDF" AT THE DESIGN DIVISION (ROADWAY STANDARDS) WEBSITE. USE QUICK LINKS TO ACCESS ATTENUATORS / CRASH CUSHIONS SECTION.
<http://www.dot.state.tx.us/insdot/orgchart/cmd/cserve/standard/rdwylse.htm>

FILE: ccss.dgn	DN: TxDOT	CK: []	CK: []
© TxDOT 2023	CONT 0908	SECT 33	JOB 106
REVISIONS	DIST ABL	COUNTY TAYLOR	HIGHWAY EAST 5 7TH ST
	FEDERAL AID PROJECT	SHEET NO. 18	

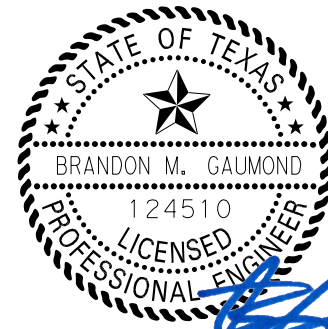


NOTES:
 1. THE CONTRACTOR SHALL COORDINATE WITH THE CITY OF ABILENE REGARDING TEMPORARY IMPACTS TO THE CEDAR BIKE TRAIL. SEE THE GENERAL NOTES FOR ADDITIONAL INFORMATION.

LEGEND

-  WORK AREA
-  TYPE III BARRICADE (WITH FLASHING LIGHT)
-  WORK ZONE SIGN

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EAST S 7TH STREET
TCP DETOUR
PLAN LAYOUT

SHEET 1 OF 1

COUNT	SECT	JOB	HIGHWAY
0908	33	106	EAST S 7TH ST
DIST	COUNTY	SHEET NO.	
ABL	TAYLOR	19	

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BARRICADE AND CONSTRUCTION (BC) STANDARD SHEETS GENERAL NOTES:

1. The Barricade and Construction Standard Sheets (BC sheets) are intended to show typical examples for placement of temporary traffic control devices, construction pavement markings, and typical work zone signs. The information contained in these sheets meet or exceed the requirements shown in the "Texas Manual on Uniform Traffic Control Devices" (TMUTCD).
2. The development and design of the Traffic Control Plan (TCP) is the responsibility of the Engineer.
3. The Contractor may propose changes to the TCP that are signed and sealed by a licensed professional engineer for approval. The Engineer may develop, sign and seal Contractor proposed changes.
4. The Contractor is responsible for installing and maintaining the traffic control devices as shown in the plans. The Contractor may not move or change the approximate location of any device without the approval of the Engineer.
5. Geometric design of lane shifts and detours should, when possible, meet the applicable design criteria contained in manuals such as the American Association of State Highway and Transportation Officials (AASHTO), "A Policy on Geometric Design of Highways and Streets," the TxDOT "Roadway Design Manual" or engineering judgment.
6. When projects abut, the Engineer(s) may omit the END ROAD WORK, TRAFFIC FINES DOUBLE, and other advance warning signs if the signing would be redundant and the work areas appear continuous to the motorists. If the adjacent project is completed first, the Contractor shall erect the necessary warning signs as shown on these sheets, the TCP sheets or as directed by the Engineer. The BEGIN ROAD WORK NEXT X MILES sign shall be revised to show appropriate work zone distance.
7. The Engineer may require duplicate warning signs on the median side of divided highways where median width will permit and traffic volumes justify the signing.
8. All signs shall be constructed in accordance with the details found in the "Standard Highway Sign Designs for Texas," latest edition. Sign details not shown in this manual shall be shown in the plans or the Engineer shall provide a detail to the Contractor before the sign is manufactured.
9. The temporary traffic control devices shown in the illustrations of the BC sheets are examples. As necessary, the Engineer will determine the most appropriate traffic control devices to be used.
10. Where highway construction or maintenance work is being undertaken, other than mobile operations as defined by the Texas Manual on Uniform Traffic Control Devices, CSJ limit signs are required. CSJ limit signs are shown on BC(2). The OBEY WARNING SIGNS STATE LAW sign, STAY ALERT TALK OR TEXT LATER and the WORK ZONE TRAFFIC FINES DOUBLE sign with plaque shall be erected in advance of the CSJ limits. The BEGIN ROAD WORK NEXT X MILES, CONTRACTOR and END ROAD WORK signs shall be erected at or near the CSJ limits. For mobile operations, CSJ limit signs are not required.
11. Traffic control devices should be in place only while work is actually in progress or a definite need exists.
12. The Engineer has the final decision on the location of all traffic control devices.
13. Inactive equipment and work vehicles, including workers' private vehicles must be parked away from travel lanes. They should be as close to the right-of-way line as possible, or located behind a barrier or guardrail, or as approved by the Engineer.

WORKER SAFETY NOTES:



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

COMPLIANT WORKZONE TRAFFIC CONTROL DEVICES

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

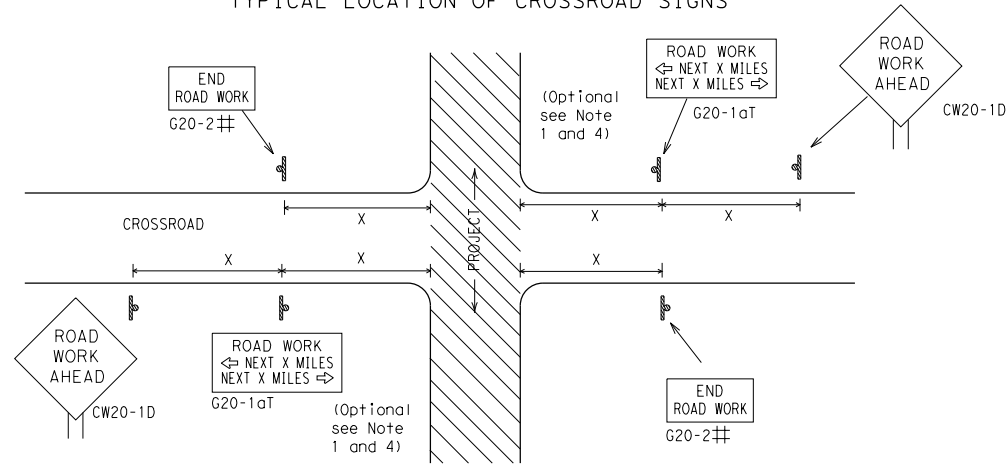
THE DOCUMENTS BELOW CAN BE FOUND ON-LINE AT http://www.txdot.gov
COMPLIANT WORK ZONE TRAFFIC CONTROL DEVICES LIST (CWZTCD)
DEPARTMENTAL MATERIAL SPECIFICATIONS (DMS)
MATERIAL PRODUCER LIST (MPL)
ROADWAY DESIGN MANUAL - SEE "MANUALS (ONLINE MANUALS)"
STANDARD HIGHWAY SIGN DESIGNS FOR TEXAS (SHSD)
TEXAS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

SHEET 1 OF 12

		
BARRICADE AND CONSTRUCTION GENERAL NOTES AND REQUIREMENTS		
BC (1) - 21		
FILE:	bc-21.dgn	DN: TxDOT
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REVISIONS	CONT SECT	JOB HIGHWAY
4-03 7-13	0908 33	106 EAST S 7TH ST
9-07 8-14	DIST	COUNTY SHEET NO.
5-10 5-21	ABL	TAYLOR 20
95		

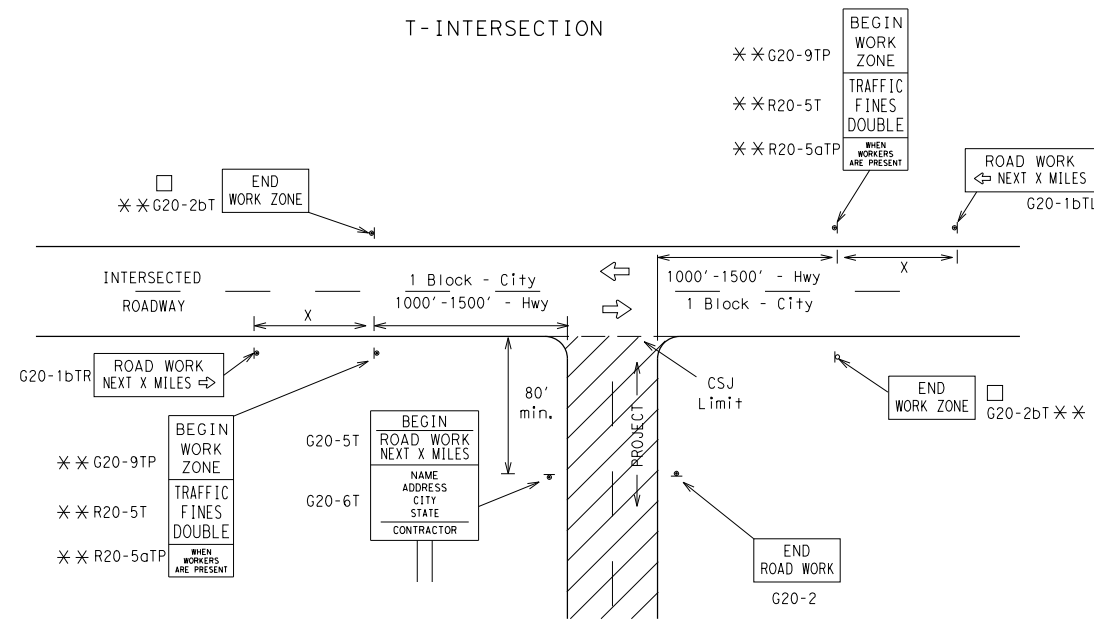
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TYPICAL LOCATION OF CROSSROAD SIGNS



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

T-INTERSECTION



CSJ LIMITS AT T-INTERSECTION

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

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

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

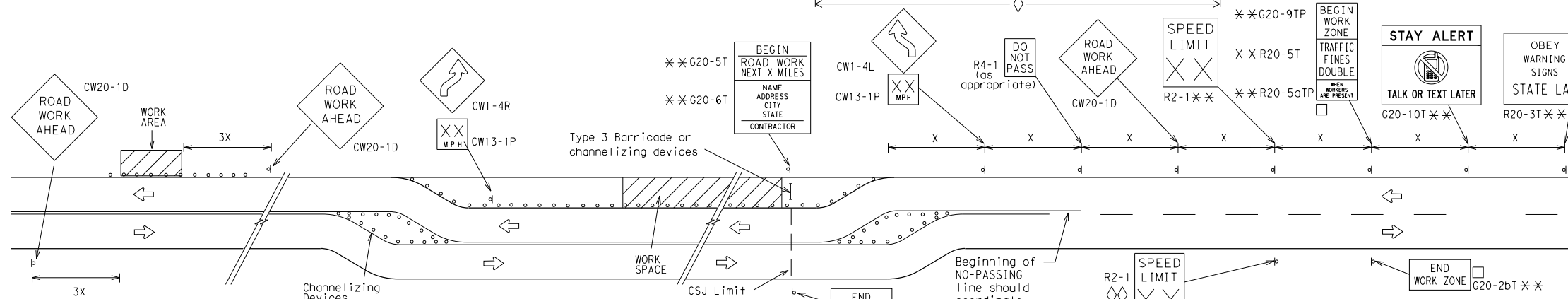
* For typical sign spacings on divided highways, expressways and freeways, see Part 6 of the "Texas Manual on Uniform Traffic Control Devices" (TMUTCD) typical application diagrams or TCP Standard Sheets.

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

GENERAL NOTES

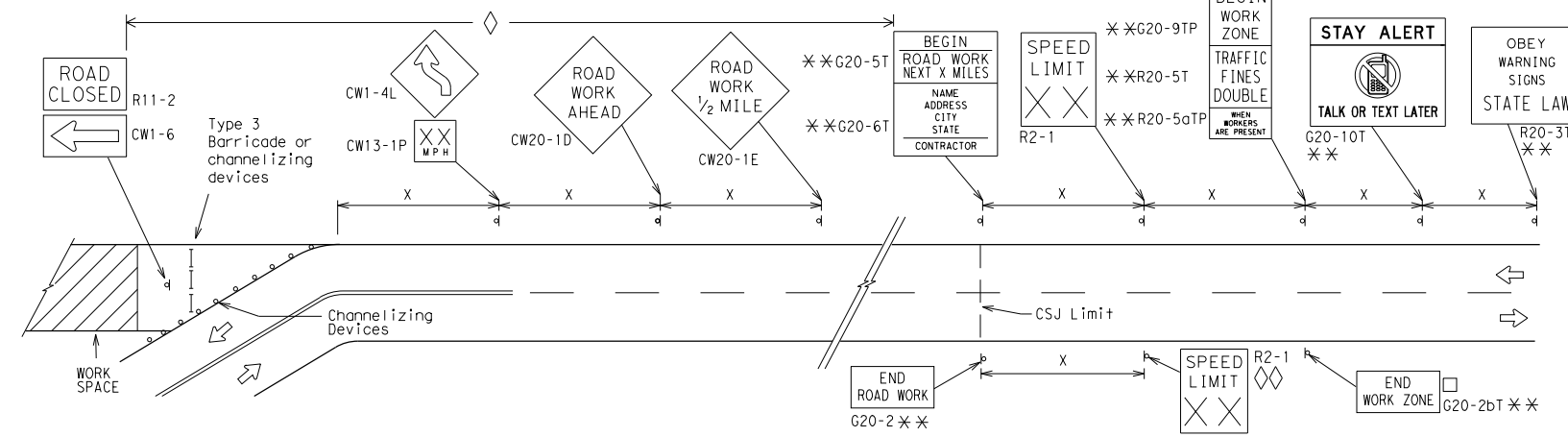
- Special or larger size signs may be used as necessary.
- Distance between signs should be increased as required to have 1500 feet advance warning.
- Distance between signs should be increased as required to have 1/2 mile or more advance warning.
- 36" x 36" "ROAD WORK AHEAD" (CW20-1D) signs may be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

WORK AREAS IN MULTIPLE LOCATIONS WITHIN CSJ LIMITS

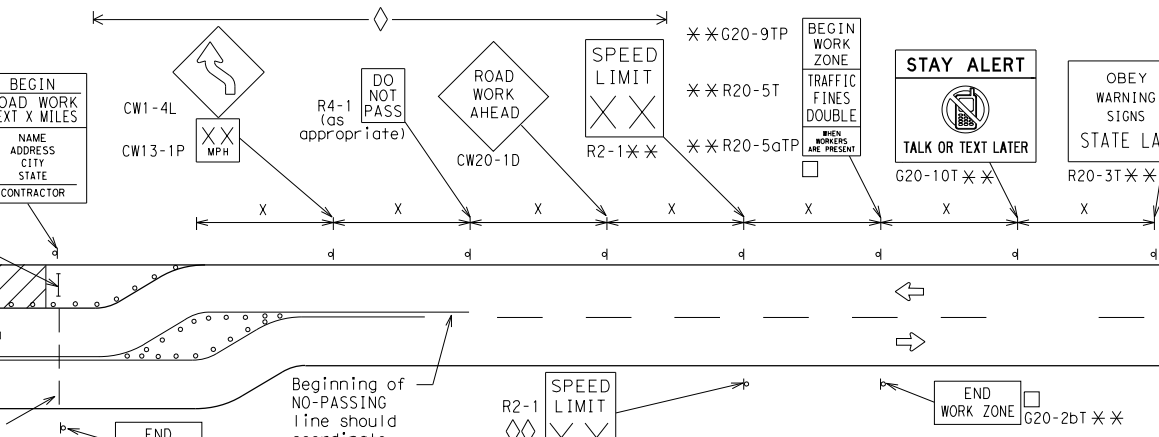


When extended distances occur between minimal work spaces, the Engineer/Inspector should ensure additional "ROAD WORK AHEAD" (CW20-1D) signs are placed in advance of these work areas to remind drivers they are still within the project limits. See the applicable TCP sheets for exact location and spacing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

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



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.

SHEET 2 OF 12



BARRICADE AND CONSTRUCTION PROJECT LIMIT

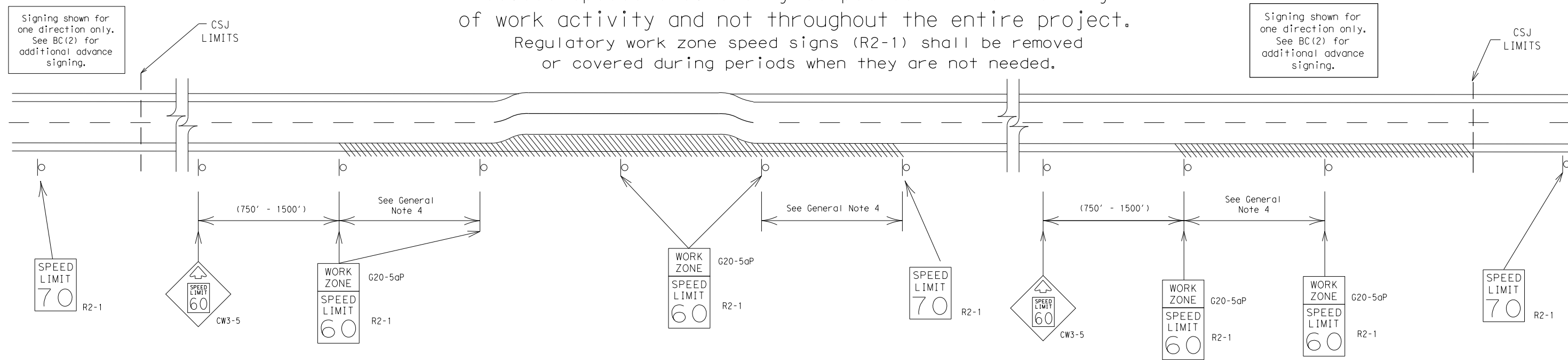
BC(2)-21

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©TxDOT November 2002	CONT	SECT	JOB	HIGHWAY
REVISIONS	0908	33	106	EAST 5 7TH ST
9-07 8-14	DIST	COUNTY		SHEET NO.
7-13 5-21	ABL	TAYLOR		21

TYPICAL APPLICATION OF WORK ZONE SPEED LIMIT SIGNS

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

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



GUIDANCE FOR USE:

LONG/INTERMEDIATE TERM WORK ZONE SPEED LIMITS

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

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

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

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

SHORT TERM WORK ZONE SPEED LIMITS

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

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

GENERAL NOTES

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

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

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SHEET 3 OF 12



BARRICADE AND CONSTRUCTION WORK ZONE SPEED LIMIT

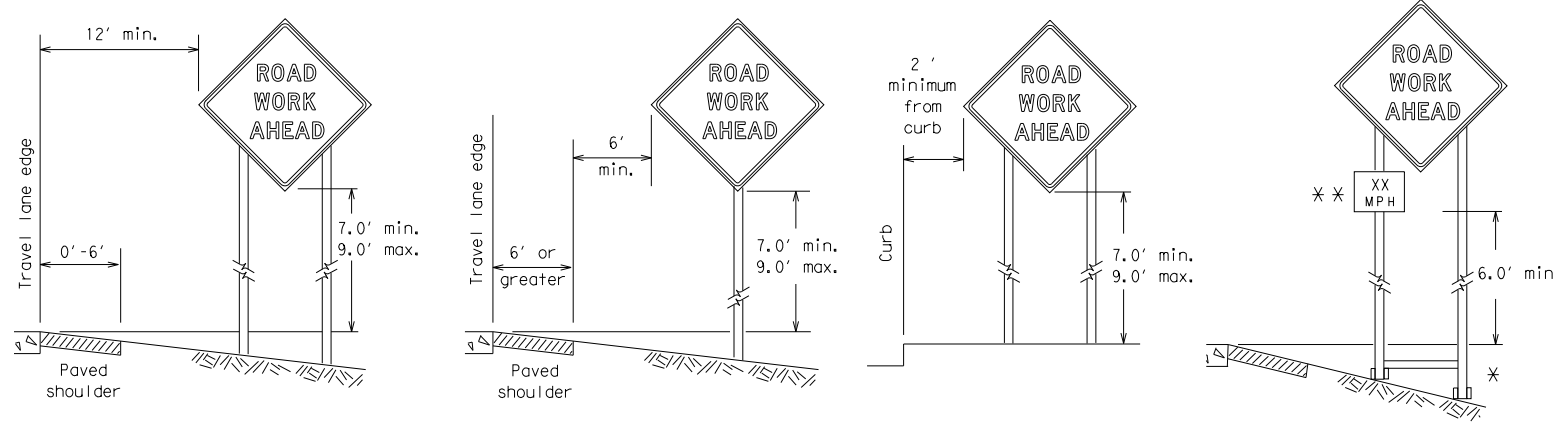
BC (3) - 21

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© TxDOT	November 2002	CONT	SECT	JOB	HIGHWAY
REVISIONS		0908	33	106	EAST S 7TH ST
9-07	8-14	DIST	COUNTY		SHEET NO.
7-13	5-21	ABL	TAYLOR		22

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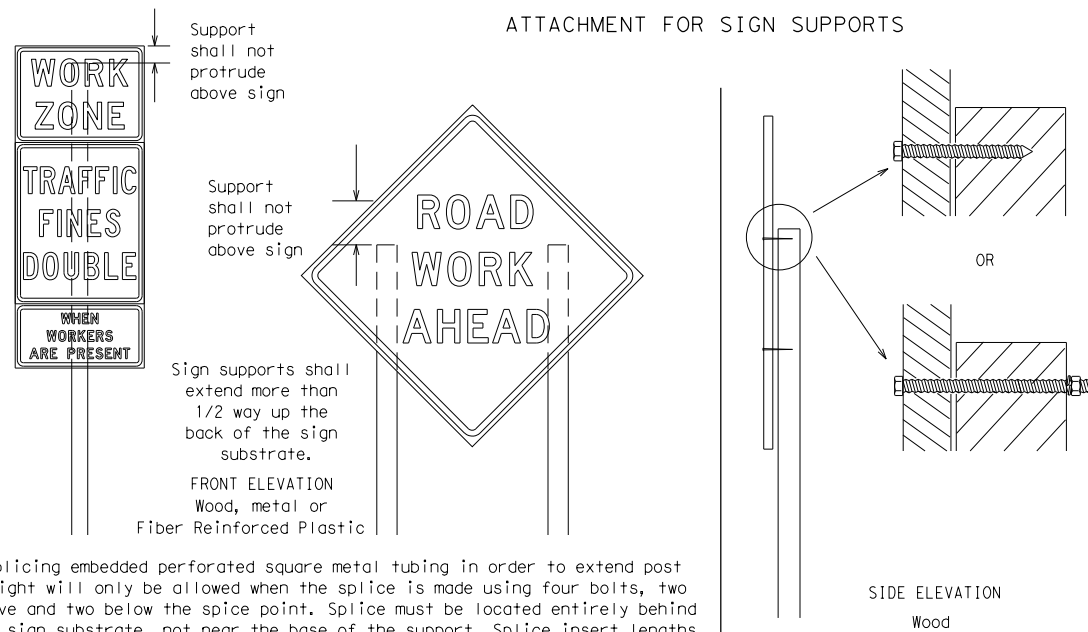
TYPICAL MINIMUM CLEARANCES FOR LONG TERM AND INTERMEDIATE TERM SIGNS



* 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



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

GENERAL NOTES FOR WORK ZONE SIGNS

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

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

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

SIGN MOUNTING HEIGHT

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

SIZE OF SIGNS

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

SIGN SUBSTRATES

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

REFLECTIVE SHEETING

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

SIGN LETTERS

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

REMOVING OR COVERING

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

SIGN SUPPORT WEIGHTS

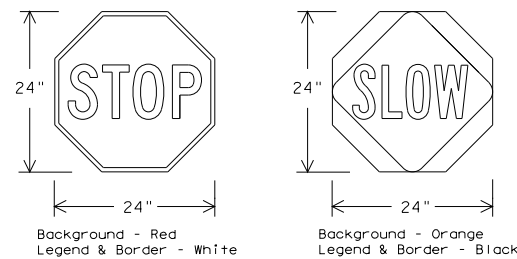
- Where sign supports require the use of weights to keep from turning over, the use of sandbags with dry, cohesionless sand should be used.
- The sandbags will be tied shut to keep the sand from spilling and to maintain a constant weight.
- Rock, concrete, iron, steel or other solid objects shall not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

FLAGS ON SIGNS

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

STOP/SLOW PADDLES


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



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

CONTRACTOR REQUIREMENTS FOR MAINTAINING PERMANENT SIGNS WITHIN THE PROJECT LIMITS

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



Texas Department of Transportation

Traffic Safety Division Standard

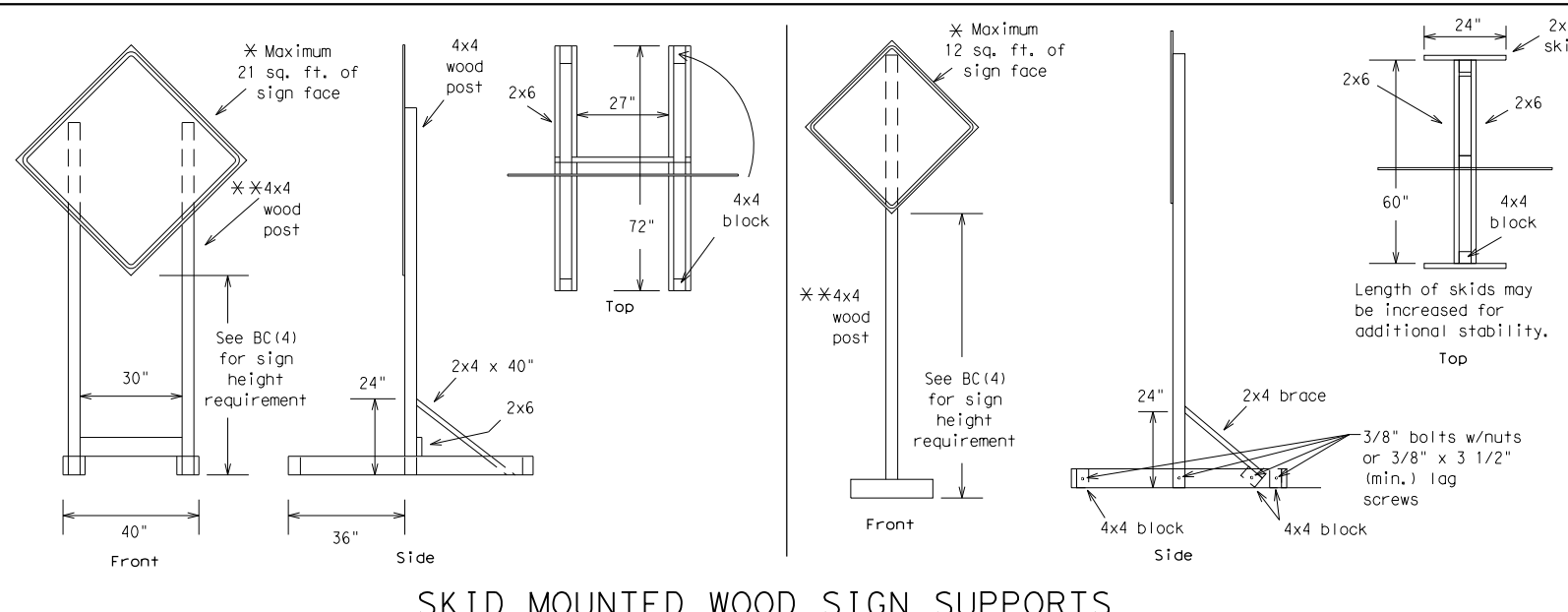
BARRICADE AND CONSTRUCTION TEMPORARY SIGN NOTES

BC (4) - 21

FILE: bc-21.dgn	DN: TxDOT	CK: TxDOT	OW: 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	TAYLOR	23	

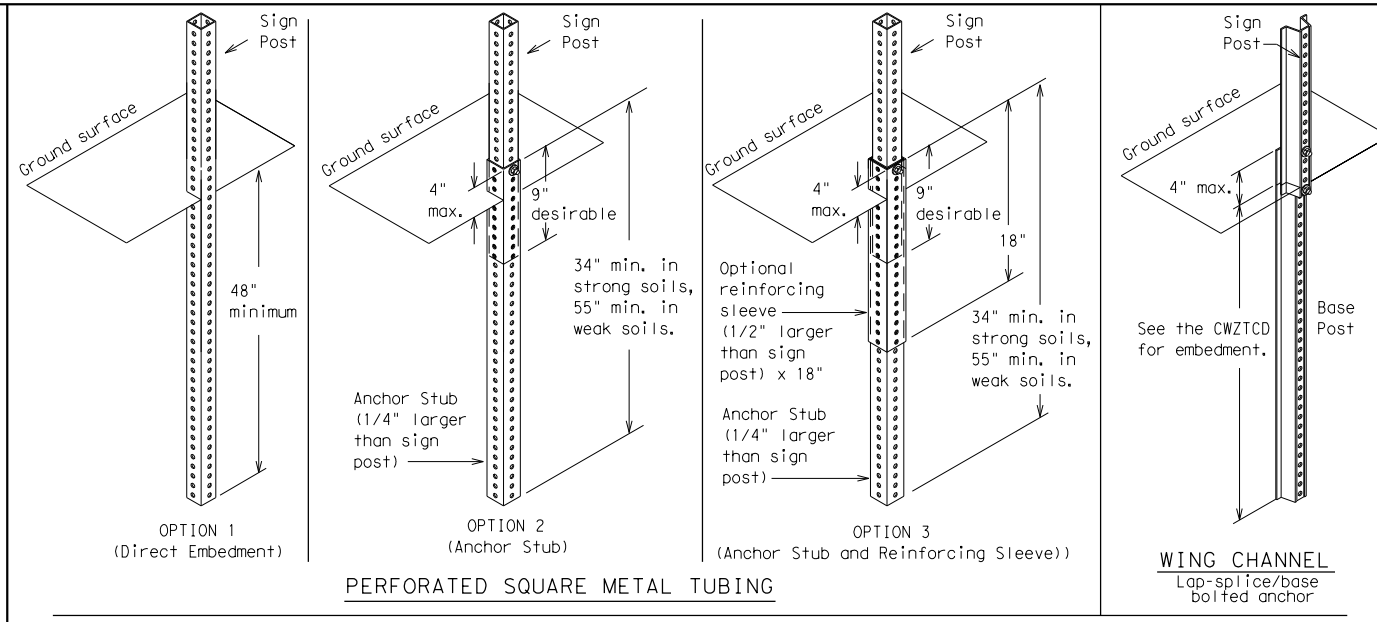
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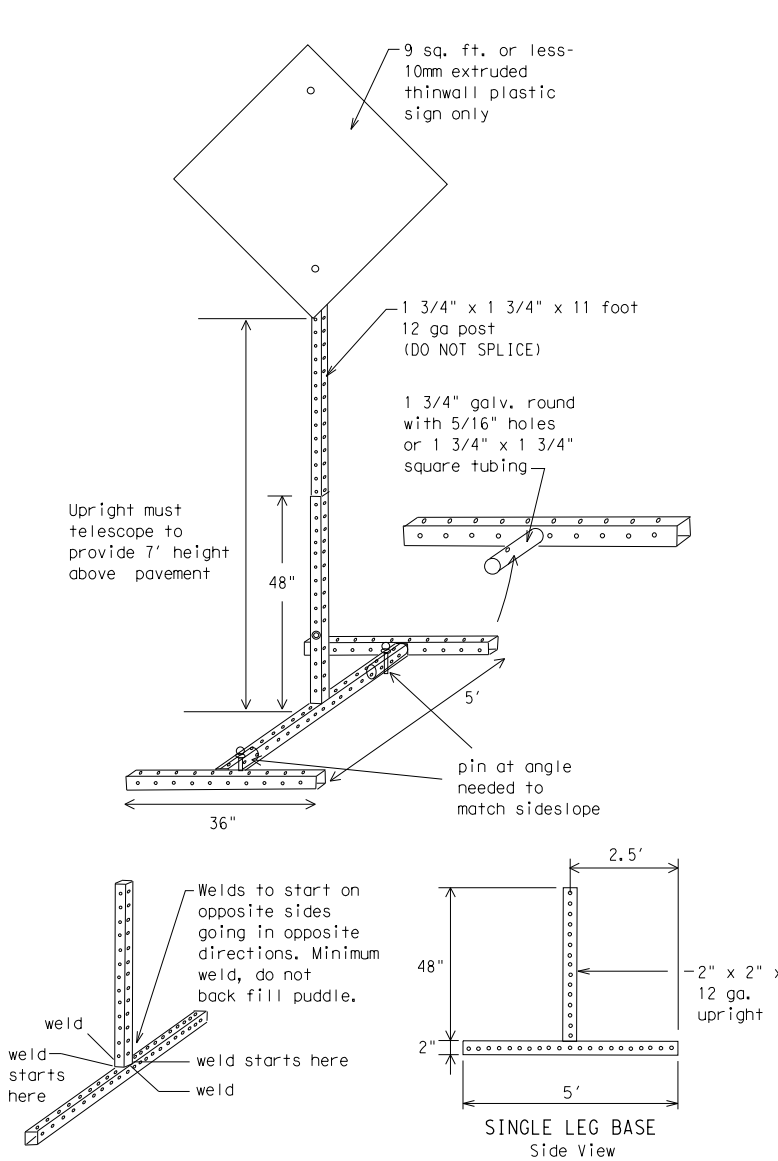
SKID MOUNTED WOOD SIGN SUPPORTS

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



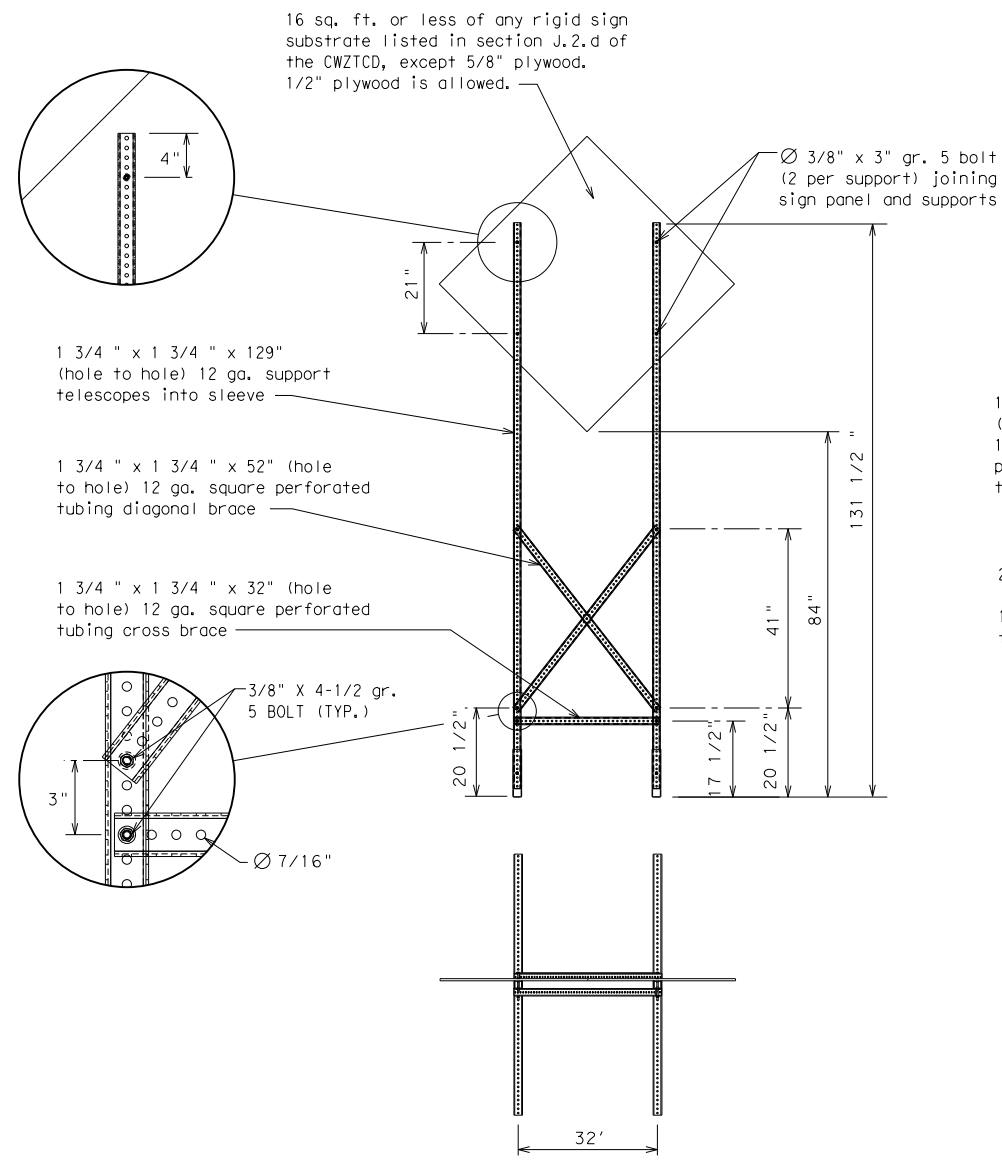
GROUND MOUNTED SIGN SUPPORTS

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

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

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

SHEET 5 OF 12



BARRICADE AND CONSTRUCTION TYPICAL SIGN SUPPORT

BC(5) - 21

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© TxDOT	November 2002	CONT	SECT	JOB	HIGHWAY				
REVISIONS		0908	33	106	EAST 5 TH ST				
9-07	8-14	DIST	COUNTY	SHEET NO.					
7-13	5-21	ABL	TAYLOR	24					

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

RECOMMENDED PHASES AND FORMATS FOR PCMS MESSAGES DURING ROADWORK ACTIVITIES

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

PORTABLE CHANGEABLE MESSAGE SIGNS

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

Phase 1: Condition Lists

Road/Lane/Ramp Closure List

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

Warning List

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

** Advance Notice List

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

** See Application Guidelines Note 6.

APPLICATION GUIDELINES

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

WORDING ALTERNATIVES

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

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

FULL MATRIX PCMS SIGNS

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

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

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



BARRICADE AND CONSTRUCTION PORTABLE CHANGEABLE MESSAGE SIGN (PCMS)

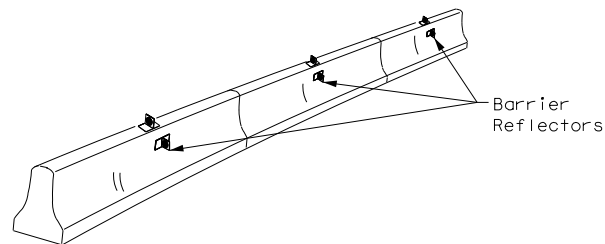
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7-13	5-21	ABL	TAYLOR	25					

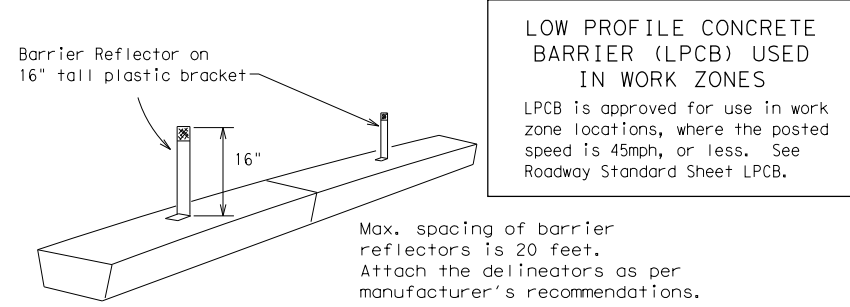
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- Barrier Reflectors shall be pre-qualified, and conform to the color and reflectivity requirements of DMS-8600. A list of prequalified Barrier Reflectors can be found at the Material Producer List web address shown on BC(1).
- Color of Barrier Reflectors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



CONCRETE TRAFFIC BARRIER (CTB)

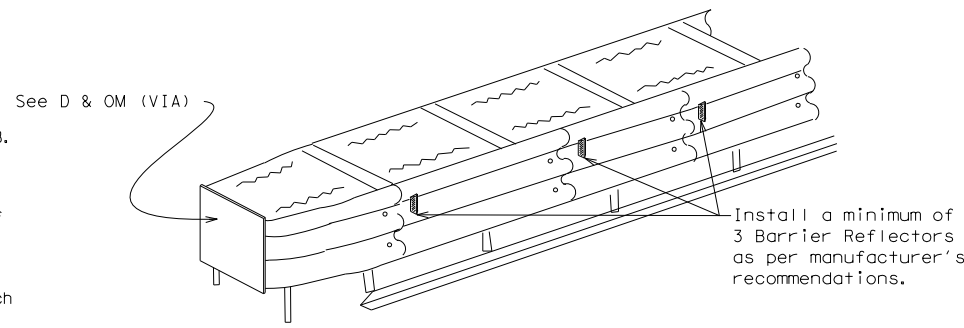


LOW PROFILE CONCRETE BARRIER (LPCB) USED IN WORK ZONES

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

LOW PROFILE CONCRETE BARRIER (LPCB)

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

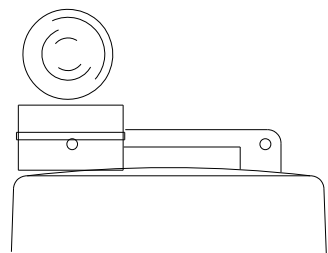


DELINEATION OF END TREATMENTS

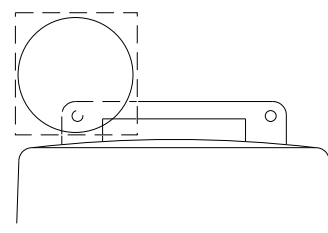
END TREATMENTS FOR CTB'S USED IN WORK ZONES

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

BARRIER REFLECTORS FOR CONCRETE TRAFFIC BARRIER AND ATTENUATORS



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

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

WARNING LIGHTS MOUNTED ON PLASTIC DRUMS

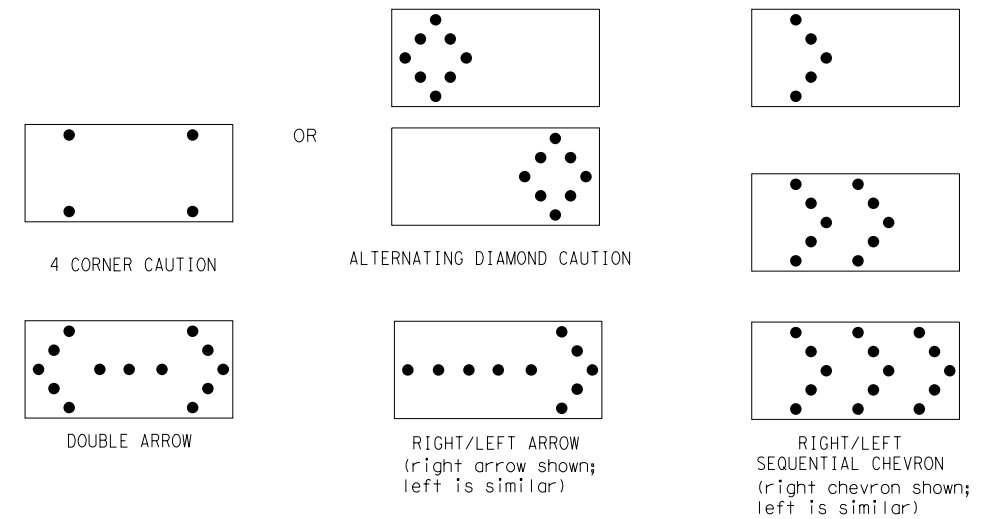
- Type A flashing warning lights are intended to warn drivers that they are approaching or are in a potentially hazardous area.
- Type A random flashing warning lights are not intended for delineation and shall not be used in a series.
- A series of sequential flashing warning lights placed on channelizing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

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

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

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

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



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

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

ATTENTION
 Flashing Arrow Boards shall be equipped with automatic dimming devices.

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

FLASHING ARROW BOARDS

SHEET 7 OF 12

TRUCK-MOUNTED ATTENUATORS

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



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

BC (7) - 21

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©TxDOT	November 2002	CONT	SECT	JOB	HIGHWAY				
REVISIONS		0908	33	106	EAST S 7TH ST				
9-07	8-14	DIST	COUNTY	SHEET NO.					
7-13	5-21	ABL	TAYLOR	26					

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GENERAL NOTES

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

GENERAL DESIGN REQUIREMENTS

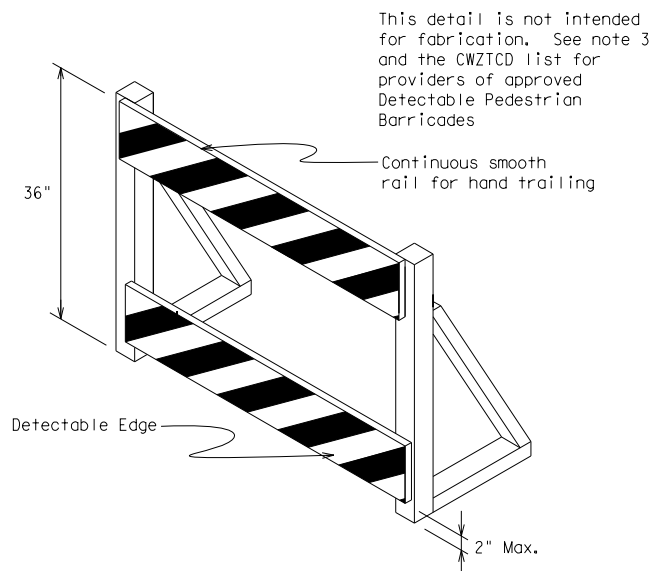
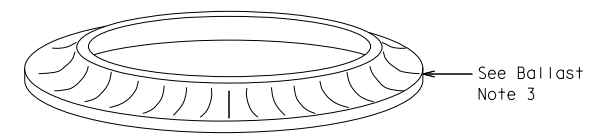
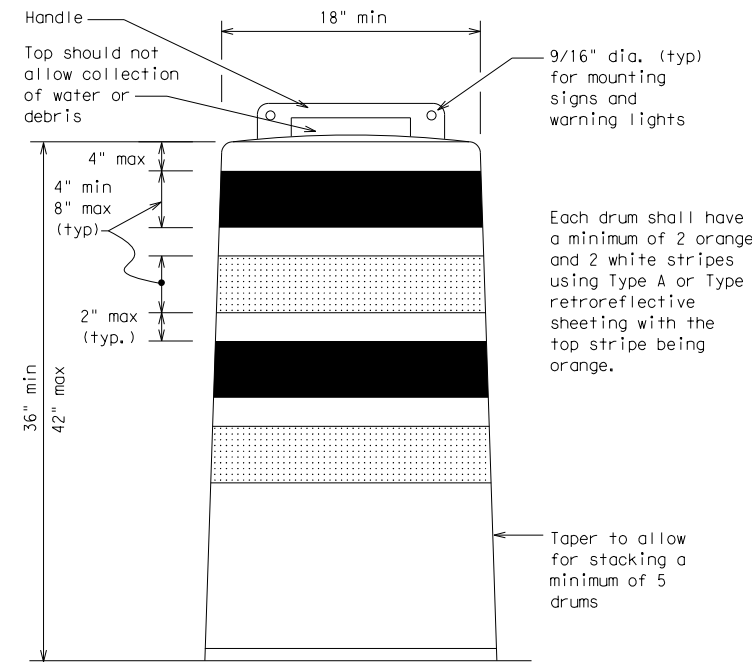
- Pre-qualified plastic drums shall meet the following requirements:
- Plastic drums shall be a two-piece design; the "body" of the drum shall be the top portion and the "base" shall be the bottom.
 - The body and base shall lock together in such a manner that the body separates from the base when impacted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

RETROREFLECTIVE SHEETING

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

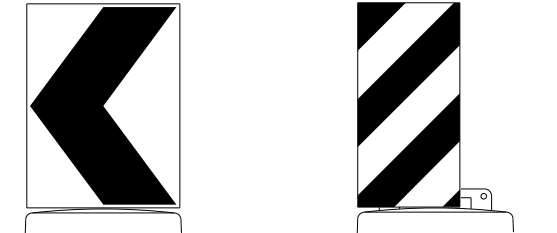
BALLAST

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



DETECTABLE PEDESTRIAN BARRICADES

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



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

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

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

SIGNS, CHEVRONS, AND VERTICAL PANELS MOUNTED ON PLASTIC DRUMS

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

SHEET 8 OF 12



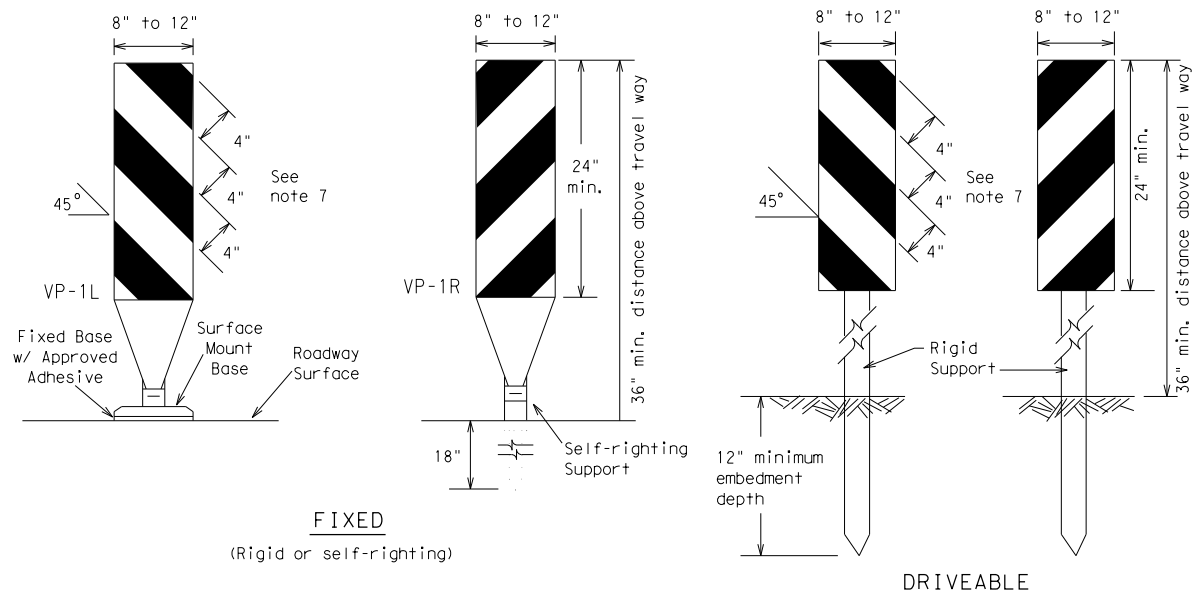
BARRICADE AND CONSTRUCTION CHANNELIZING DEVICES

BC (8) - 21

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© TxDOT	November 2002	CONT	SECT	JOB	HIGHWAY				
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4-03	8-14	DIST	COUNTY		SHEET NO.				
9-07	5-21	ABL	TAYLOR		27				
7-13									

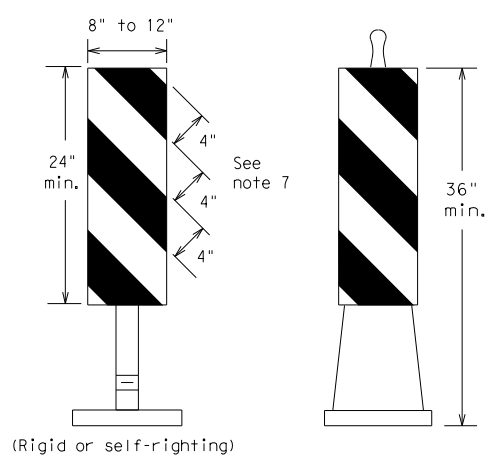
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FIXED
(Rigid or self-righting)

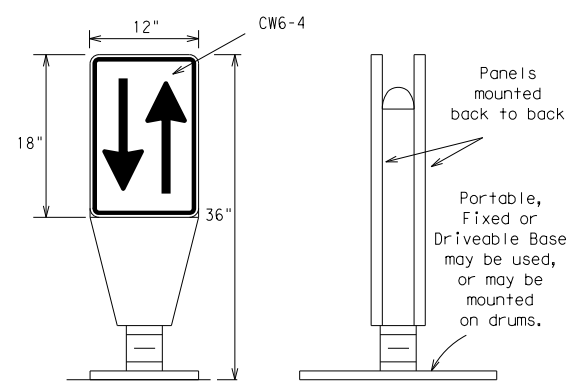
DRIVEABLE



PORTABLE

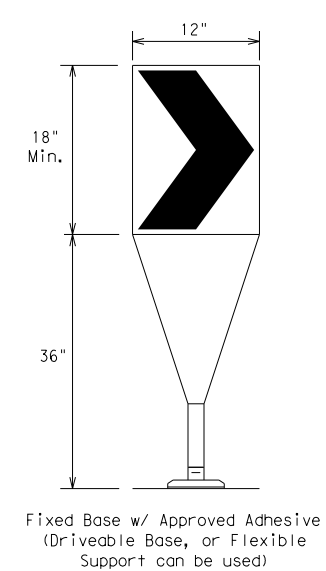
VERTICAL PANELS (VPs)

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



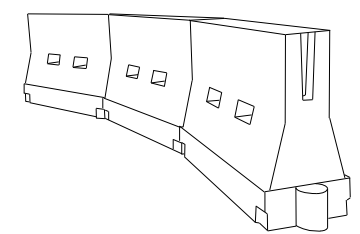
OPPOSING TRAFFIC LANE DIVIDERS (OTLD)

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



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

CHEVRONS



LONGITUDINAL CHANNELIZING DEVICES (LCD)

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

WATER BALLASTED SYSTEMS USED AS BARRIERS

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

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

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

GENERAL NOTES

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

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

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

SUGGESTED MAXIMUM SPACING OF CHANNELIZING DEVICES AND MINIMUM DESIRABLE TAPER LENGTHS

SHEET 9 OF 12



BARRICADE AND CONSTRUCTION CHANNELIZING DEVICES

BC (9) - 21

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9-07 8-14	DIST	COUNTY	SHEET NO.	
7-13 5-21	ABL	TAYLOR	28	

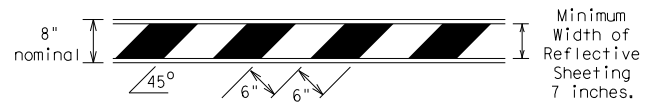
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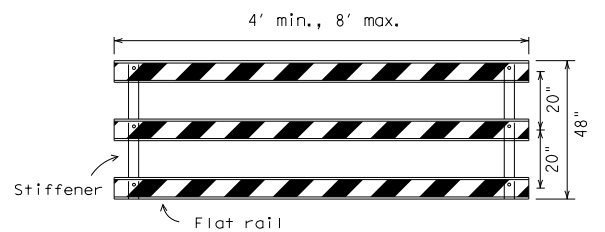
TYPE 3 BARRICADES

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.

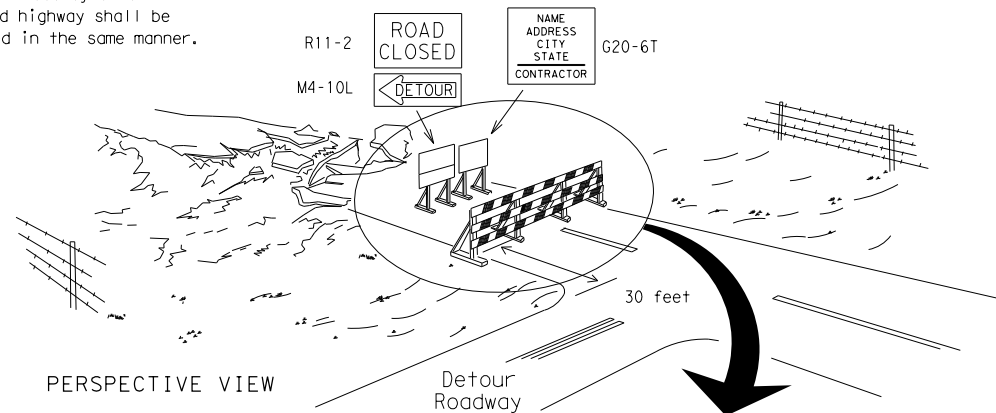


TYPICAL STRIPING DETAIL FOR BARRICADE RAIL



TYPICAL PANEL DETAIL FOR SKID OR POST TYPE BARRICADES

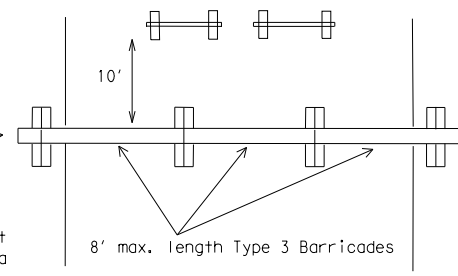
Each roadway of a divided highway shall be barricaded in the same manner.



PERSPECTIVE VIEW

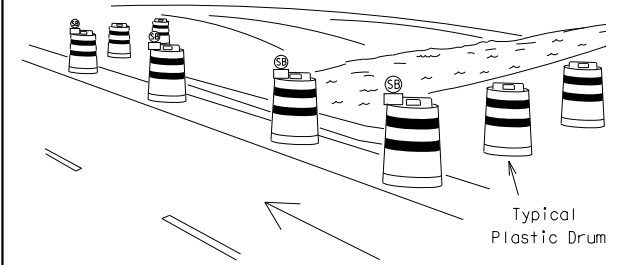
The three rails on Type 3 barricades shall be reflectorized orange and reflective white stripes on one side facing one-way traffic and both sides for two-way traffic. Barricade striping should slant downward in the direction of detour.

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.

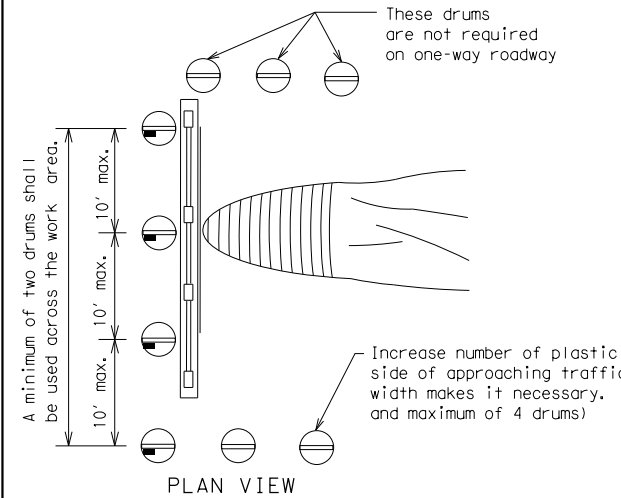


PLAN VIEW

TYPE 3 BARRICADE (POST AND SKID) TYPICAL APPLICATION



PERSPECTIVE VIEW

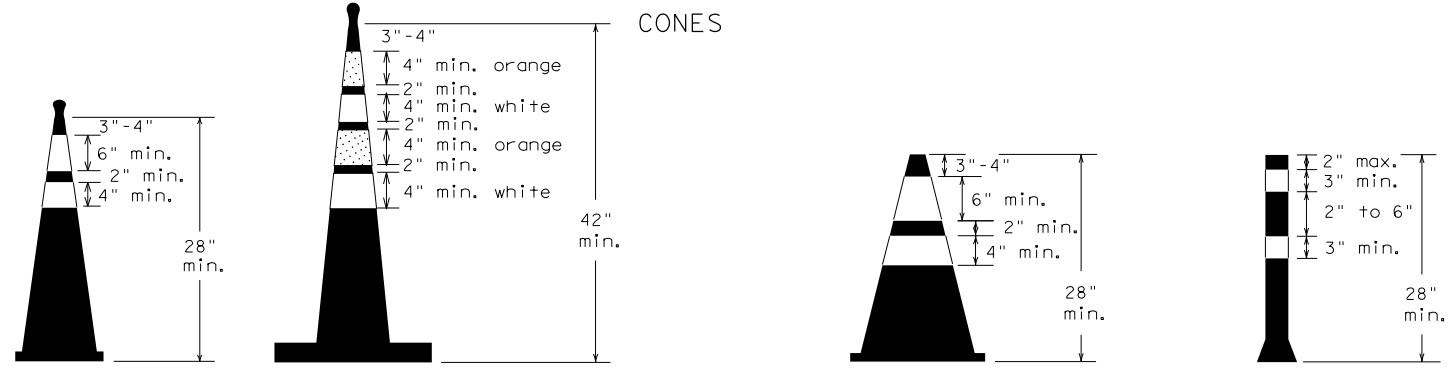


PLAN VIEW

CULVERT WIDENING OR OTHER ISOLATED WORK WITHIN THE PROJECT LIMITS

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

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

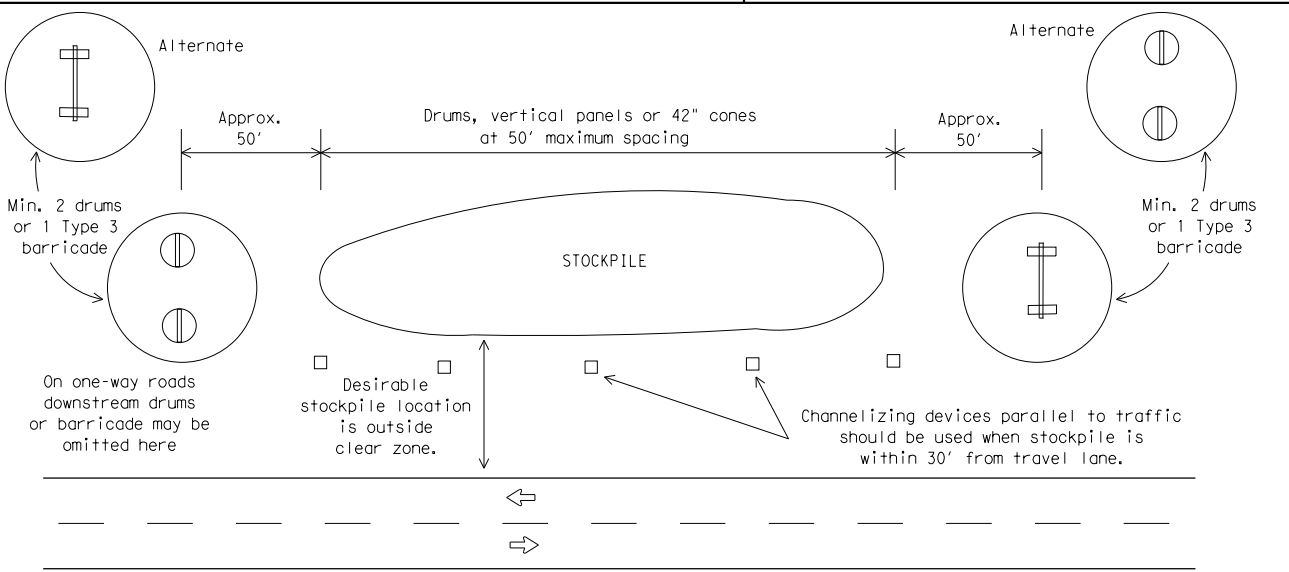


Two-Piece cones

One-Piece cones

Tubular Marker

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



TRAFFIC CONTROL FOR MATERIAL STOCKPILES

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



BARRICADE AND CONSTRUCTION CHANNELIZING DEVICES

BC (10) - 21

FILE: bc-21.dgn	DN: TxDOT	CK: TxDOT	DW: TxDOT	CK: TxDOT
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9-07 8-14	DIST	COUNTY	SHEET NO.	
7-13 5-21	ABL	TAYLOR	29	

WORK ZONE PAVEMENT MARKINGS

GENERAL

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

RAISED PAVEMENT MARKERS

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

PREFABRICATED PAVEMENT MARKINGS

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

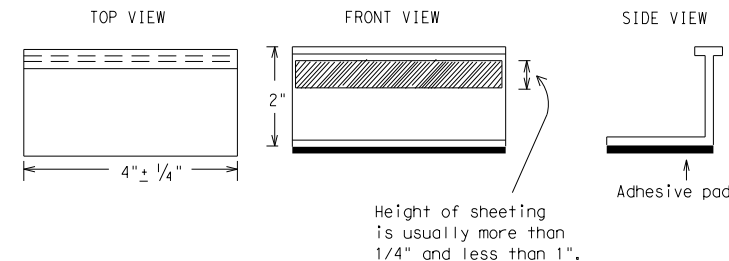
MAINTAINING WORK ZONE PAVEMENT MARKINGS

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

REMOVAL OF PAVEMENT MARKINGS

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

Temporary Flexible-Reflective Roadway Marker Tabs



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

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

RAISED PAVEMENT MARKERS USED AS GUIDEMARKS

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

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

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

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

SHEET 11 OF 12



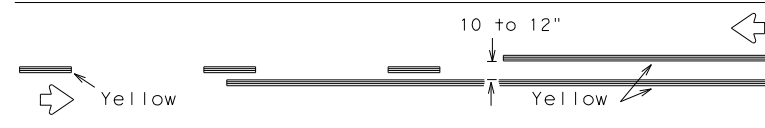
BARRICADE AND CONSTRUCTION PAVEMENT MARKINGS

BC(11)-21

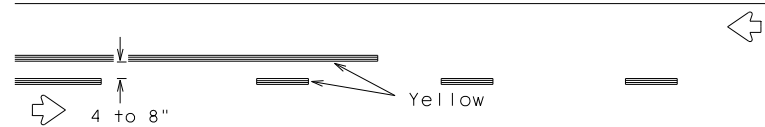
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1-02 7-13	ABL	TAYLOR	30	
11-02 8-14				

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PAVEMENT MARKING PATTERNS

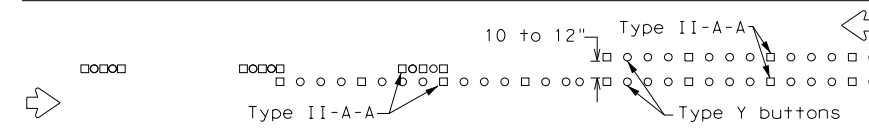


REFLECTORIZED PAVEMENT MARKINGS - PATTERN A

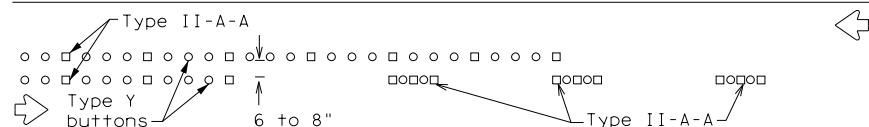


REFLECTORIZED PAVEMENT MARKINGS - PATTERN B

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

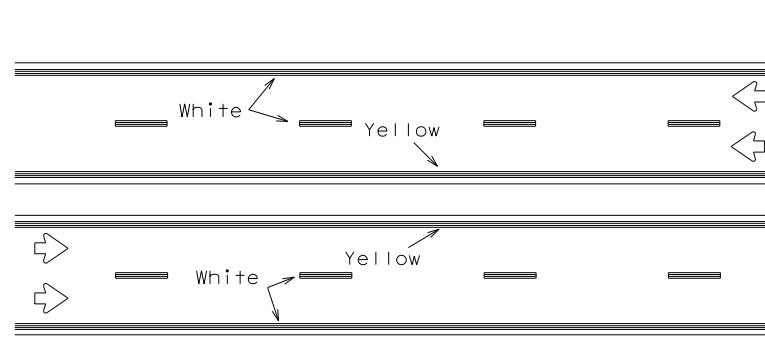


RAISED PAVEMENT MARKERS - PATTERN A



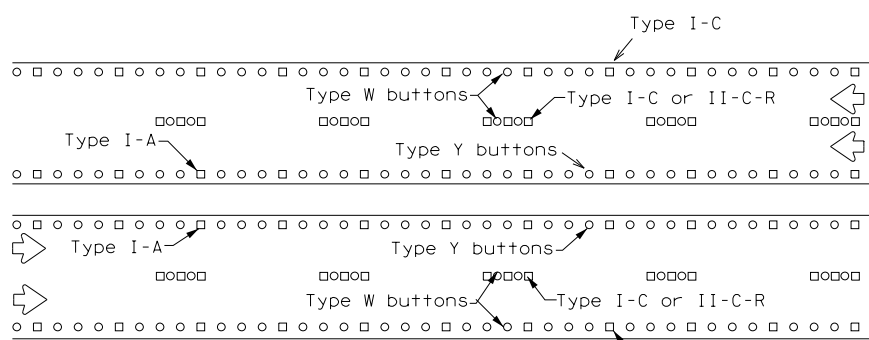
RAISED PAVEMENT MARKERS - PATTERN B

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



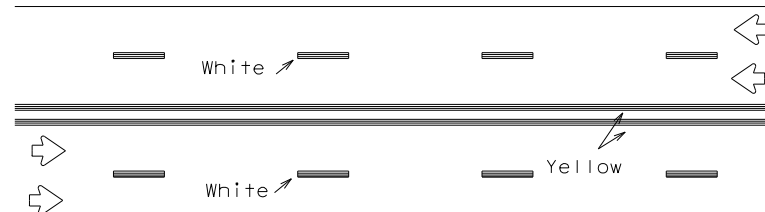
REFLECTORIZED PAVEMENT MARKINGS

Prefabricated markings may be substituted for reflectORIZED pavement markings.



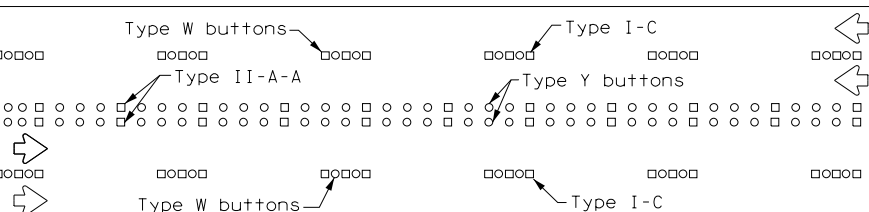
RAISED PAVEMENT MARKERS

EDGE & LANE LINES FOR DIVIDED HIGHWAY



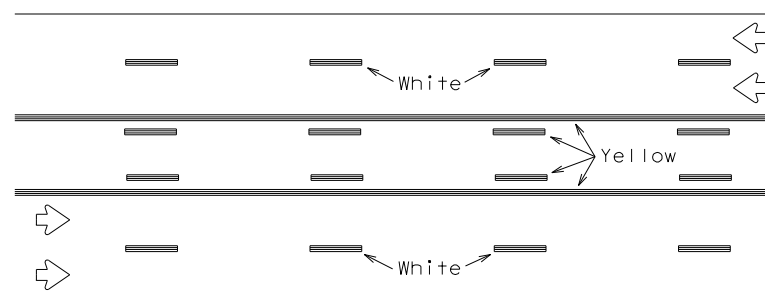
REFLECTORIZED PAVEMENT MARKINGS

Prefabricated markings may be substituted for reflectORIZED pavement markings.



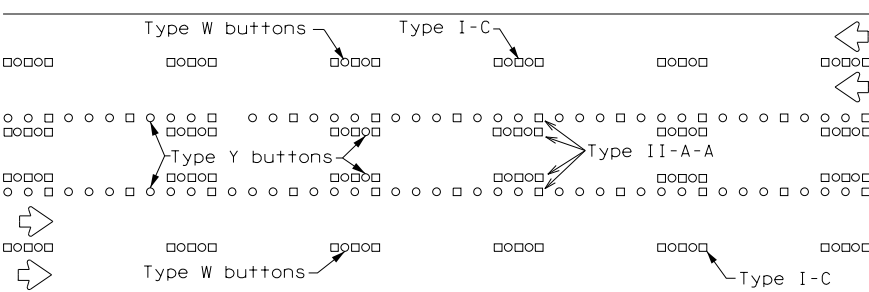
RAISED PAVEMENT MARKERS

LANE & CENTER LINES FOR MULTILANE UNDIVIDED HIGHWAYS



REFLECTORIZED PAVEMENT MARKINGS

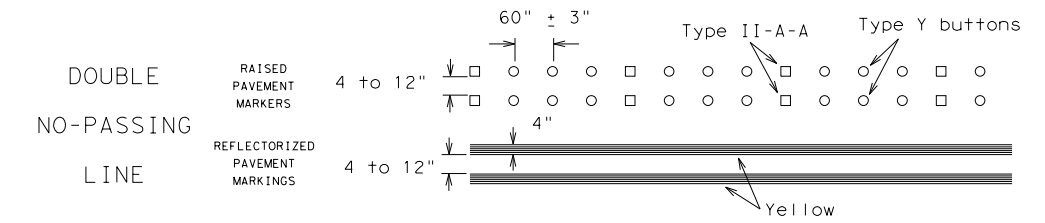
Prefabricated markings may be substituted for reflectORIZED pavement markings.



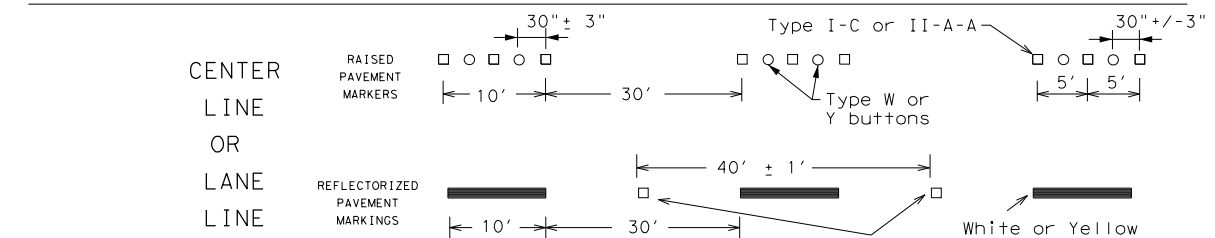
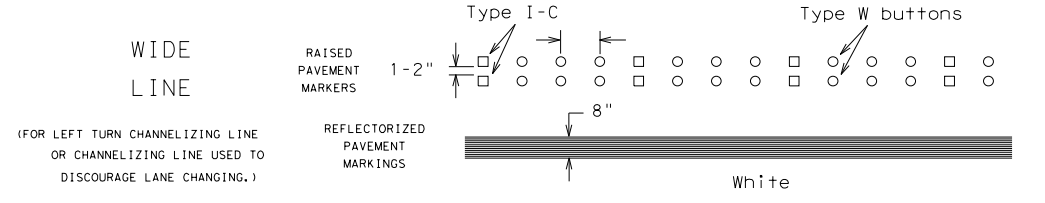
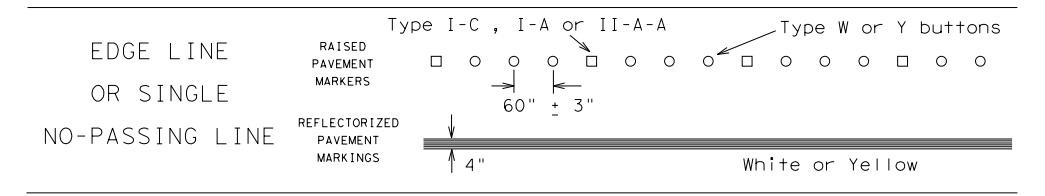
RAISED PAVEMENT MARKERS

TWO-WAY LEFT TURN LANE

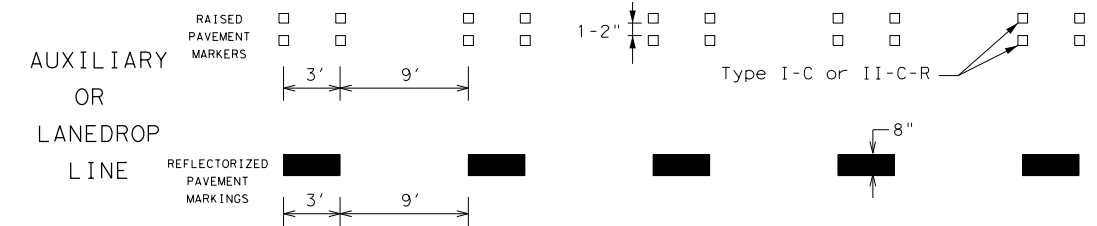
STANDARD WORK ZONE PAVEMENT MARKINGS DETAILS



SOLID LINES

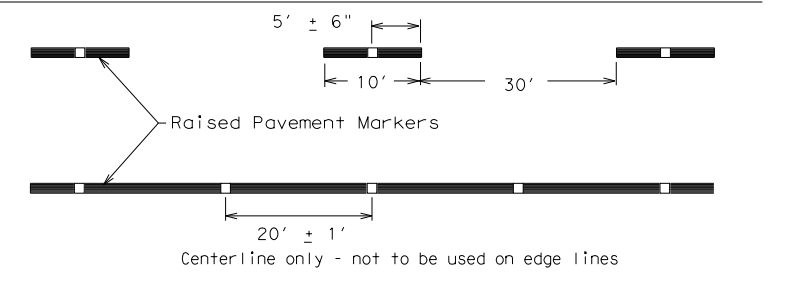


BROKEN LINES



REMOVABLE MARKINGS WITH RAISED PAVEMENT MARKERS

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



SHEET 12 OF 12



BARRICADE AND CONSTRUCTION PAVEMENT MARKING PATTERNS

BC (12) - 21

FILE: bc-21.dgn	DN: TxDOT	CK: TxDOT	DW: TxDOT	CK: TxDOT
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REVISIONS	0908	33	106	EAST S 7TH ST
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11-02 8-14	ABL	TAYLOR		31

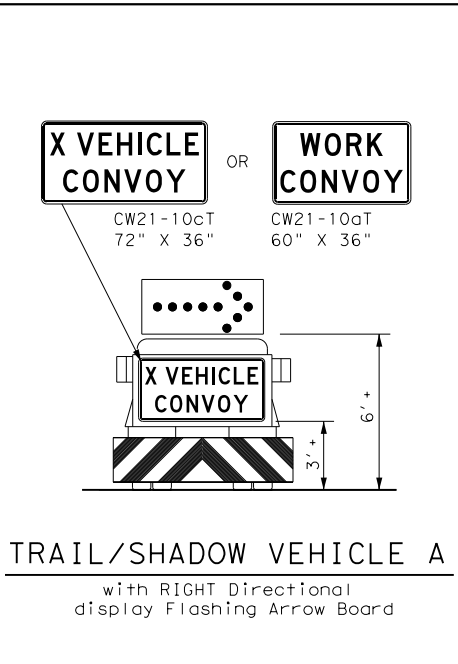
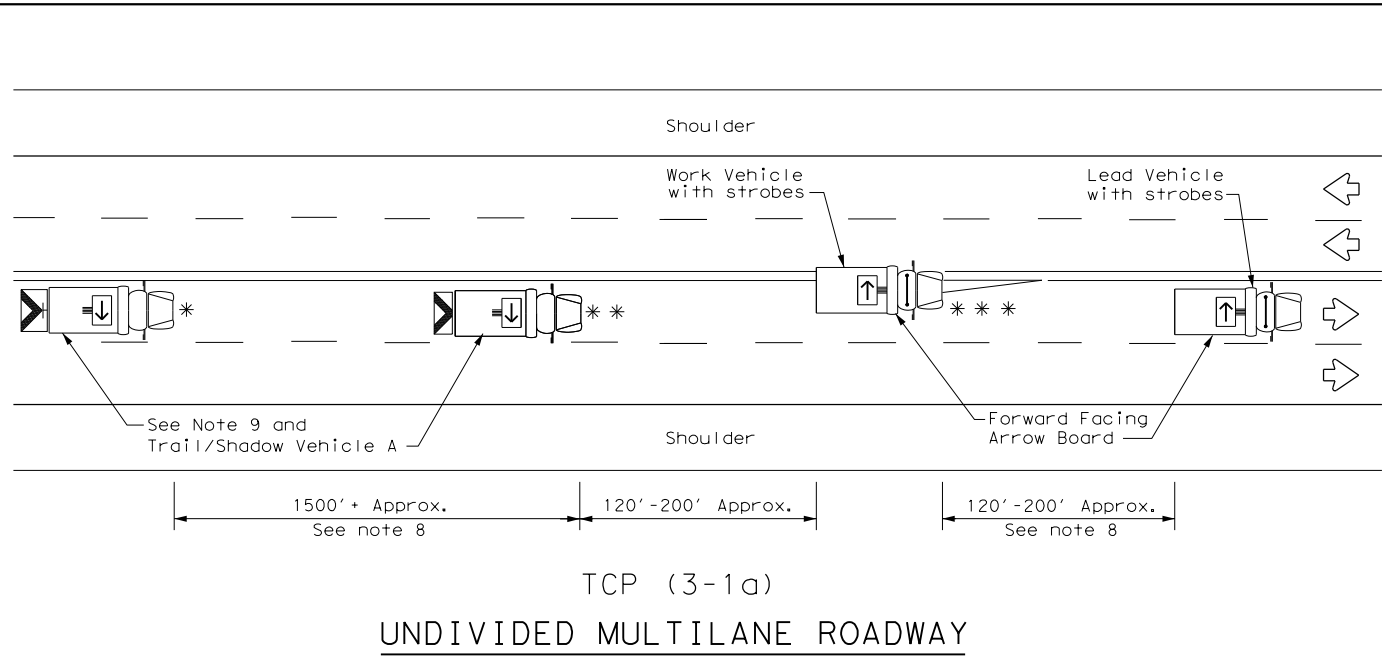
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Raised pavement markers used as standard pavement markings shall be from the approved products list and meet the requirements of Item 672 "RAISED PAVEMENT MARKERS."

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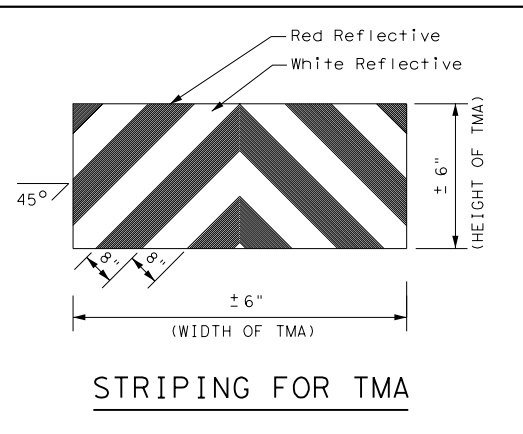
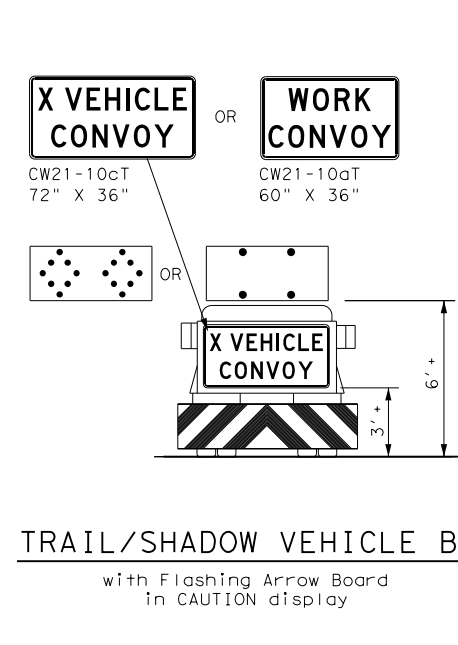
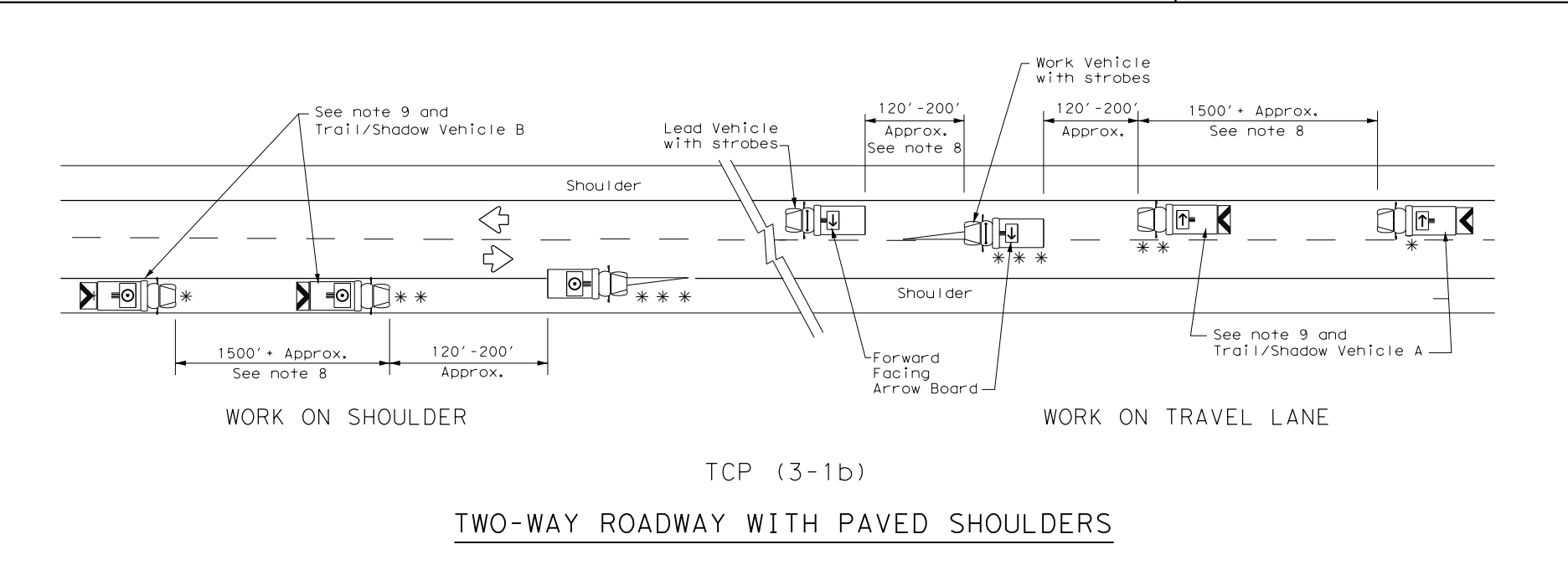


LEGEND				
*	Trail Vehicle	ARROW BOARD DISPLAY		
**	Shadow Vehicle			
***	Work Vehicle		RIGHT Directional	
	Heavy Work Vehicle		LEFT Directional	
	Truck Mounted Attenuator (TMA)		Double Arrow	
	Traffic Flow		CAUTION (Alternating Diamond or 4 Corner Flash)	

TYPICAL USAGE				
MOBILE	SHORT DURATION	SHORT TERM STATIONARY	INTERMEDIATE TERM STATIONARY	LONG TERM STATIONARY
<input checked="" type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>

GENERAL NOTES

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



Traffic Operations Division Standard

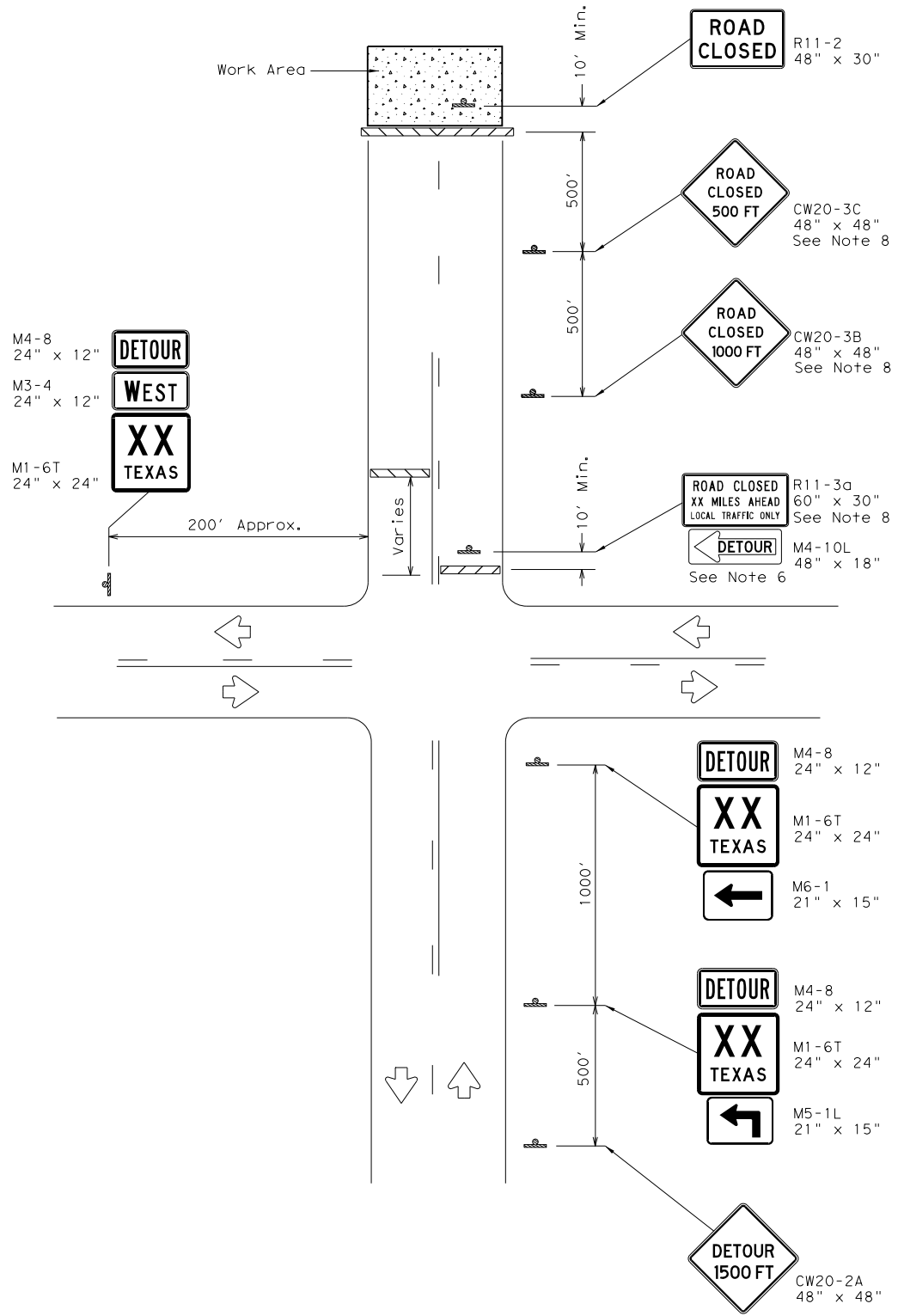
TRAFFIC CONTROL PLAN
MOBILE OPERATIONS
UNDIVIDED HIGHWAYS

TCP (3-1) - 13

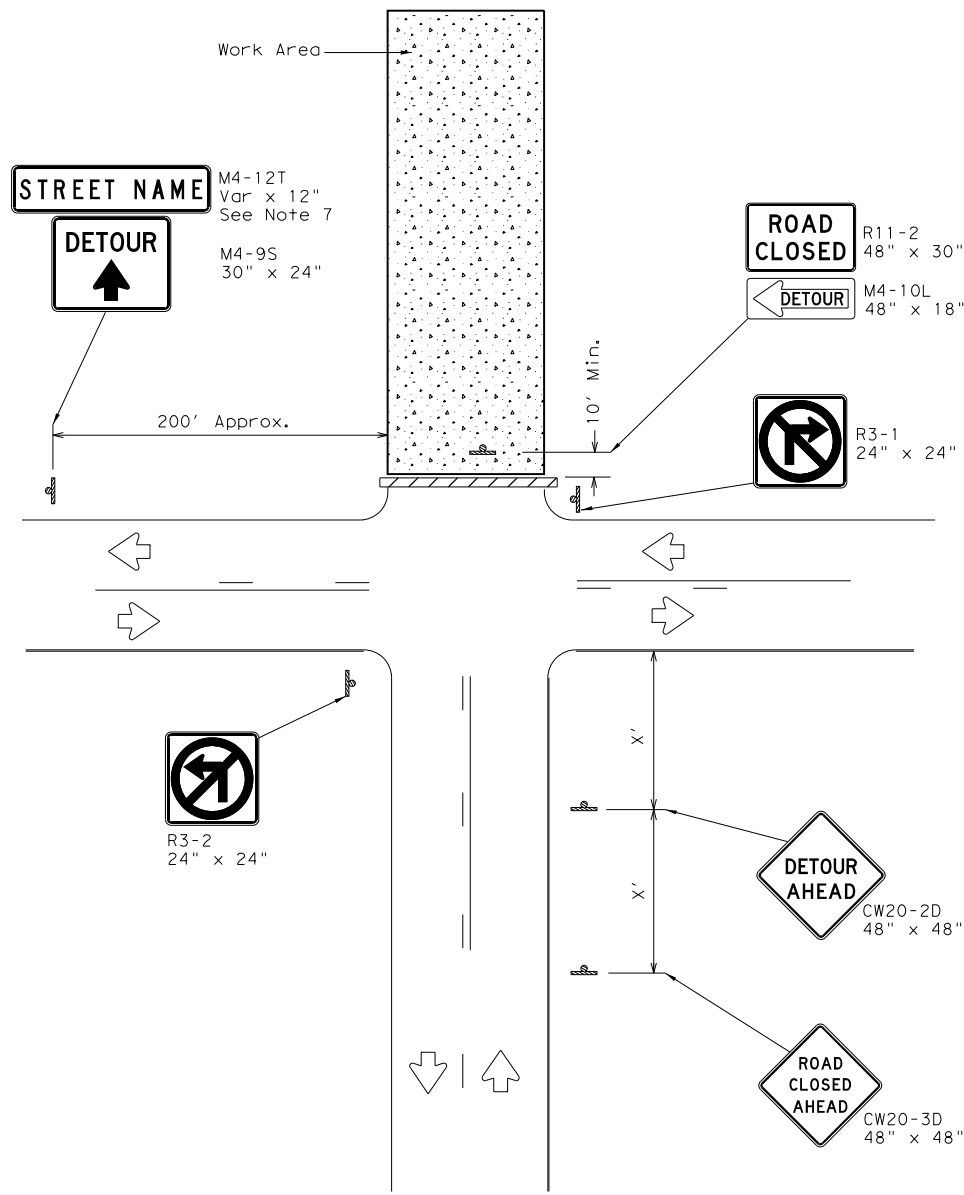
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ABL	TAYLOR			SHEET NO. 32

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ROAD CLOSURE BEYOND THE INTERSECTION
 Signing for a Numbered Route with an Off-Site Detour



ROAD CLOSURE AT THE INTERSECTION
 Signing for an Un-numbered Route with an Off-Site Detour

LEGEND	
	Type 3 Barricade
	Sign

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

* Conventional Roads Only

GENERAL NOTES

- This sheet is intended to provide details for temporary work zone road closures. For permanent road closure details see the D&OM standards.
- Barricades used shall meet the requirements shown on Barricade and Construction Standard BC(10) and listed on the Compliant Work Zone Traffic Control Devices List (CWZTCD).
- Stockpiled materials shall not be placed on the traffic side of barricades.
- Barricades at the road closure should extend from pavement edge to pavement edge.
- Detour signing shown is intended to illustrate the type of signing that is appropriate for numbered routes or un-numbered routes as labeled. It does not indicate the full extent of detour signing required. Detour routes should be signed as shown elsewhere in the plans.
- If the road is open for a significant distance beyond the intersection or there are significant origin/destination points beyond the intersection, the signs and barricades at this location should be located at the edge of the traveled way.
- The Street Name (M4-12T) sign is to be placed above the DETOUR (M4-9S) sign.
- For urban areas where there is a shorter distance between the intersection and the actual closure location, the ROAD CLOSED XX MILES AHEAD (R11-3a) sign may be replaced with a ROAD CLOSED TO THRU TRAFFIC (R11-4) sign. If adequate space does not exist between the intersection and the closure a single ROAD CLOSED AHEAD (CW20-3D) sign spaced as per the table above may replace the ROAD CLOSED 1000 FT (CW20-3B) and ROAD CLOSED 500 FT (CW20-3C) signs.
- Signs and barricades shown shall be subsidiary to Item 502. Locations where these details will be required shall be as shown elsewhere in the plans.



WORK ZONE ROAD CLOSURE DETAILS

WZ (RCD) - 13

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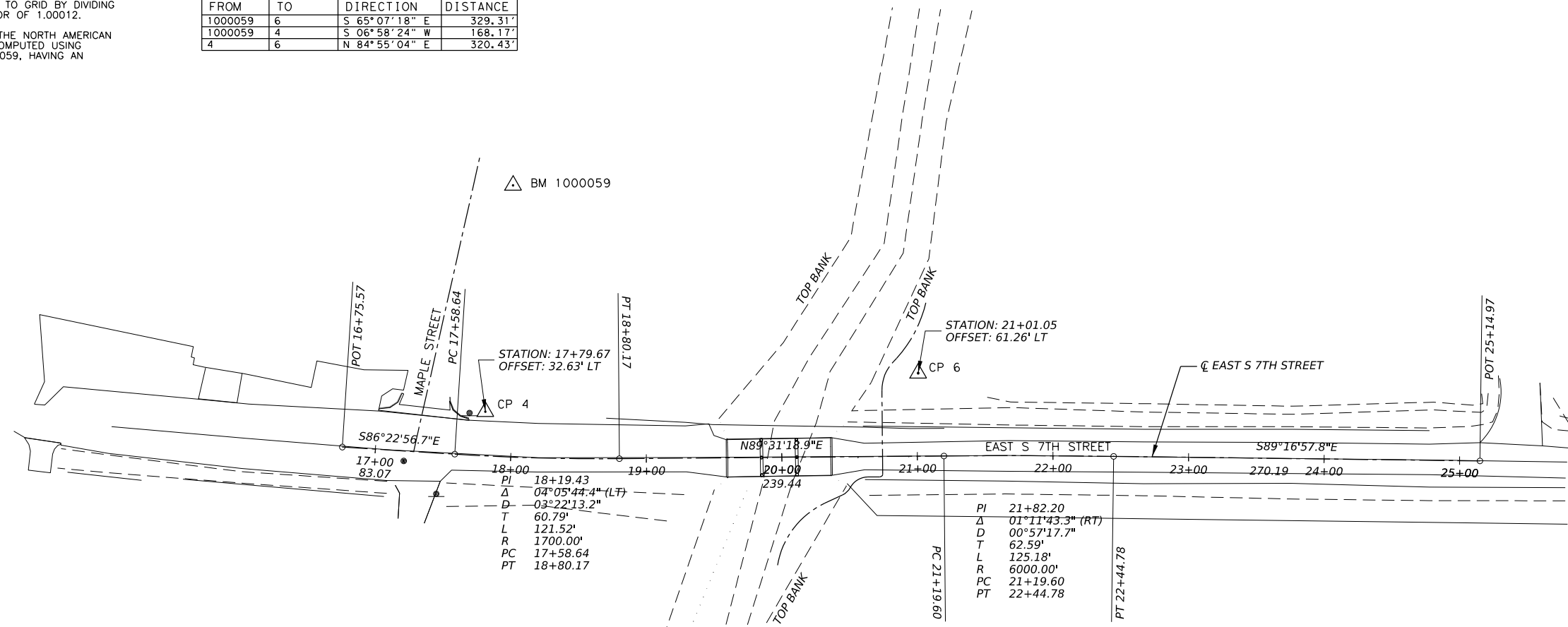
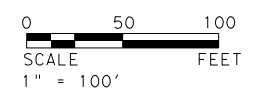
ALL BEARINGS AND COORDINATES ARE REFERENCED TO THE TEXAS COORDINATE SYSTEM, NORTH CENTRAL ZONE (4202), NORTH AMERICAN DATUM OF 1983 (NAD83) (2011), EPOCH 2010.0000, ESTABLISHED HOLDING BENCHMARK 1000059 HAVING GRID COORDINATES OF NORTHING: 6845999.06 EASTING: 1590819.36 USING BASE STATION RTK METHOD.

COORDINATES ARE SURFACE VALUES EXPRESSED IN US SURVEY FEET AND MAY BE CONVERTED TO GRID BY DIVIDING BY THE COMBINED ADJUSTMENT FACTOR OF 1.00012.

ALL ELEVATIONS ARE REFERENCED TO THE NORTH AMERICAN VERTICAL DATUM OF 1988 (NAVD88) COMPUTED USING GEOID18, BASED ON BENCHMARK 1000059, HAVING AN ELEVATION OF 1698.84'.

NUMBER	NORTHING (SURFACE)	EASTING (SURFACE)	ELEV.	DESCRIPTION
1000059	6,846,820.58	1,591,010.26	1,698.84	1/2" IRON ROD (NO CAP)
4	6,846,653.66	1,590,989.84	1,700.37	5/8" IRON ROD WITH RED CAP
6	6,846,682.04	1,591,309.01	1,695.65	5/8" IRON ROD WITH RED CAP

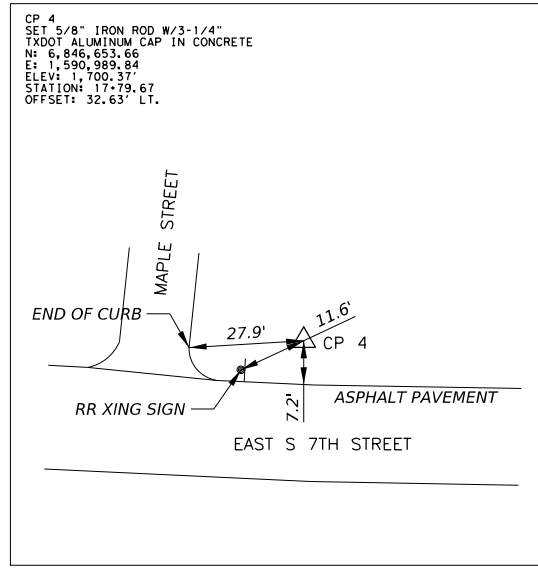
FROM	TO	DIRECTION	DISTANCE
1000059	6	S 65° 07' 18" E	329.31'
1000059	4	S 06° 58' 24" W	168.17'
4	6	N 84° 55' 04" E	320.43'



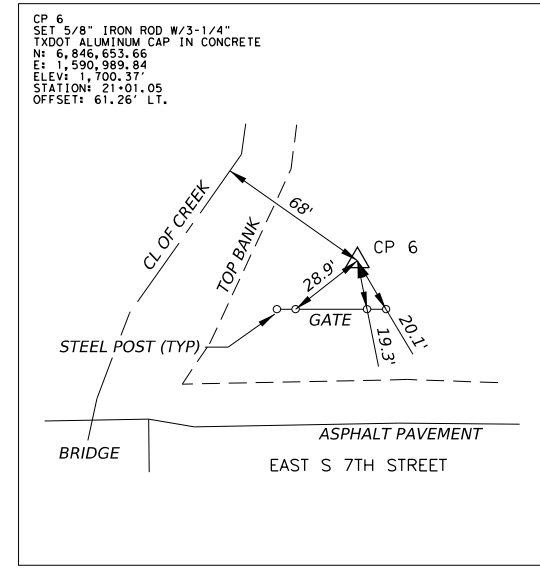
PI	18+19.43
Δ	04° 05' 44.4" (LT)
D	03° 22' 13.2"
T	60.79'
L	121.52'
R	1700.00'
PC	17+58.64
PT	18+80.17

PI	21+82.20
Δ	01° 11' 43.3" (RT)
D	00° 57' 17.7"
T	62.59'
L	125.18'
R	6000.00'
PC	21+19.60
PT	22+44.78

DATE: 2/7/2023 3:08:36 PM
 FILE: pw://hq-pwint01.a-e.transyscorp.com/transyscorp-pw1/Documents/Projects_2022/FW20220220046/Survey/V-CONT-INDEX.dgn



CP 4
 SET 5/8" IRON ROD W/3-1/4" TXDOT ALUMINUM CAP IN CONCRETE
 N: 6,846,653.66
 E: 1,590,989.84
 ELEV: 1,700.37
 STATION: 17+79.67
 OFFSET: 32.63' LT.



CP 6
 SET 5/8" IRON ROD W/3-1/4" TXDOT ALUMINUM CAP IN CONCRETE
 N: 6,846,653.66
 E: 1,590,989.84
 ELEV: 1,700.37
 STATION: 21+01.05
 OFFSET: 61.26' LT.

THIS SURVEY WAS PERFORMED ON THE GROUND UNDER MY SUPERVISION AND REPRESENTS AN UPDATE TO THE PREVIOUSLY ESTABLISHED CONTROL ALONG WITH ADDITIONAL CONTROL SET, ESTABLISHED BY TRANSYSTEMS.

Michael B. Szurgot 1/11/23

MICHAEL B. SZURGOT
 REGISTERED PROFESSIONAL LAND SURVEYOR
 TEXAS REGISTRATION NO. 4418
 SURVEY DATE: 09/2022

REV NO.	DATE	BY	REVISION



TranSystems 500 W 7th ST SUITE 1100
 FORT WORTH, TX 76102
 (817) 339-8950
 FIRM REG. #: 3557

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**EAST S 7TH STREET
 SURVEY CONTROL LAYOUT**

SHEET 1 OF 1

CONT	SECT	JOB	HIGHWAY
0908	33	106	EAST S 7TH ST
DIST	COUNTY	SHEET NO.	
ABL	TAYLOR	34	

DATE: 2/7/2023 3:08:44 PM
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HORIZONTAL ALIGNMENT REPORT
 Alignment name: CL 7th Street
 Alignment description:

	STATION	X	Y
POT	1675.574 R1	1590884.285	6846627.507
PC	1758.644 R1	1590967.191	6846622.266
Tangential Direction:	S86.382°E		
Tangential Length:	83.071		
PC	1758.644 R1	1590967.191	6846622.266
PI	1819.431 R1	1591027.856	6846618.430
CC	1591074.455	1591074.455	6848318.878
PT	1880.165 R1	1591088.640	6846618.938
Radius:	1700.000		
Delta:	4.096° Left		
Degree of Curvature(Arc):	3.370°		
Length:	121.521		
Tangent:	60.786		
Chord:	121.495		
Middle Ordinate:	1.086		
External:	1.086		
Tangent Back Direction:	S86.382°E		
Radial Direction:	S3.618°W		
Chord Direction:	S88.430°E		
Radial Direction:	S0.478°E		
Tangent Ahead Direction:	N89.522°E		
PT	1880.165 R1	1591088.640	6846618.938
PC	2119.605 R1	1591328.071	6846620.936
Tangential Direction:	N89.522°E		
Tangential Length:	239.440		
PC	2119.605 R1	1591328.071	6846620.936
PI	2182.196 R1	1591390.660	6846621.458
CC	1591378.136	1591378.136	6840621.144
PT	2244.782 R1	1591453.246	6846620.674
Radius:	6000.000		
Delta:	1.195° Right		
Degree of Curvature(Arc):	0.955°		
Length:	125.177		
Tangent:	62.591		
Chord:	125.175		
Middle Ordinate:	0.326		
External:	0.326		
Tangent Back Direction:	N89.522°E		
Radial Direction:	S0.478°E		
Chord Direction:	S89.880°E		
Radial Direction:	S0.717°W		
Tangent Ahead Direction:	S89.283°E		
PT	2244.782 R1	1591453.246	6846620.674
POT	2514.970 R1	1591723.413	6846617.292
Tangential Direction:	S89.283°E		
Tangential Length:	270.188		

CROSS SLOPE & SUPERELEVATION RATES			
STATION	CROSS SLOPE (%)		POINT TYPE
	WB LANES (LT)	EB LANES (RT)	
18+00.00	-2.00%	0.02%	MATCH EXIST
18+35.00	-2.00%	-2.00%	NORMAL CROWN OUT
18+55.00	-2.00%	-2.00%	NORMAL CROWN IN
19+25.00	2.00%	-2.00%	REVERSE CROWN IN
20+88.00	2.00%	-2.00%	REVERSE CROWN OUT
21+58.00	-2.00%	-2.00%	NORMAL CROWN OUT, MATCH EXIST

REV NO.	DATE	BY	REVISION

STATE OF TEXAS
 BRANDON M. GAUMOND
 124510
 LICENSED PROFESSIONAL ENGINEER
 2/8/2023

500 W 7th ST SUITE 1100
 FORT WORTH, TX 76102
 (817) 339-8950
 FIRM REG. #: 3557

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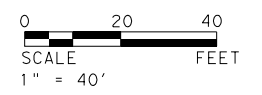
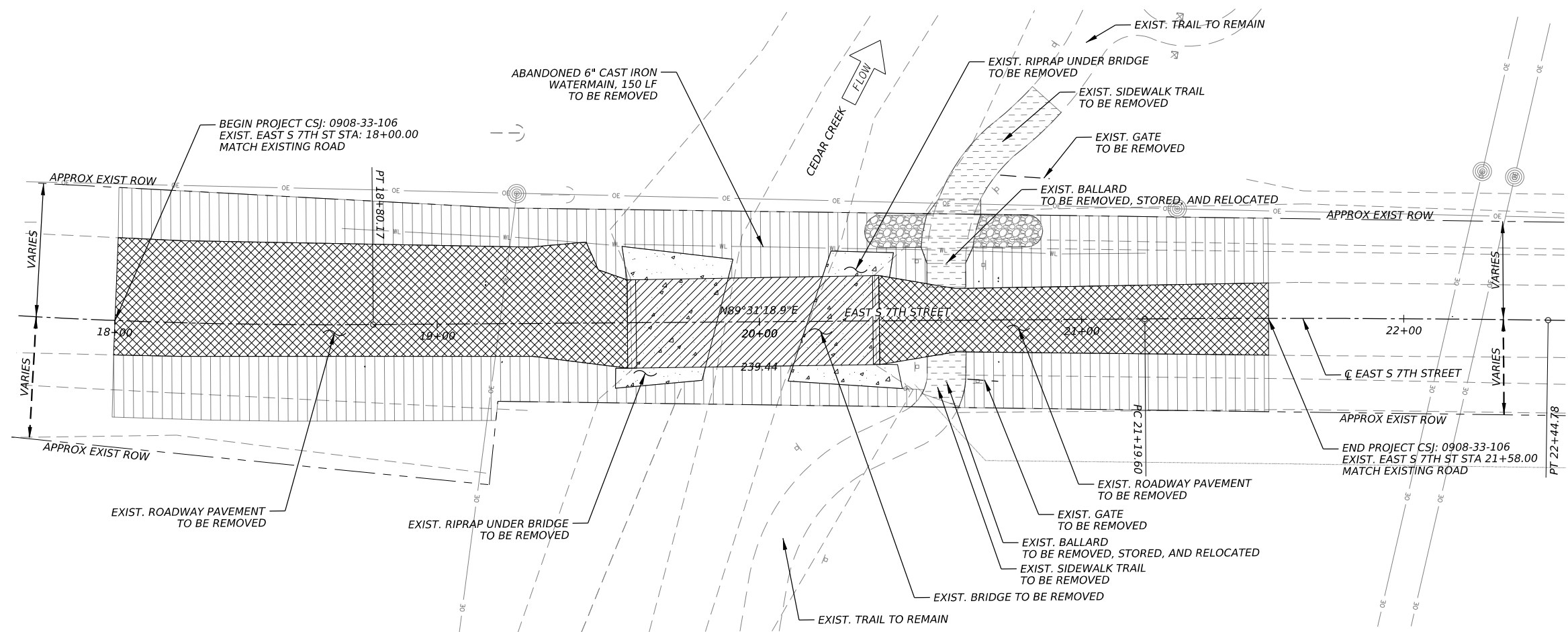
EAST S 7TH STREET

ROADWAY HORIZONTAL CONTROL DATA

SHEET 1 OF 1

CONT	SECT	JOB	HIGHWAY
0908	33	106	EAST S 7TH ST
DIST	COUNTY	SHEET NO.	
ABL	TAYLOR	35	

DATE: 2/7/2023 3:08:54 PM
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LEGEND

- EXIST. CONC. RIPRAP TO BE REMOVED
- REMOVE STAB BASE & ASPHALT PAVEMENT (7"-12")
- EXIST. BRIDGE TO BE REMOVED
- PREPARE ROW
- EXISTING CONC. PATH TO BE REMOVED

REV NO.	DATE	BY	REVISION



[Signature]
 2/8/2023

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 (817) 339-8950
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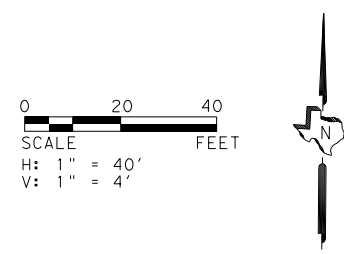
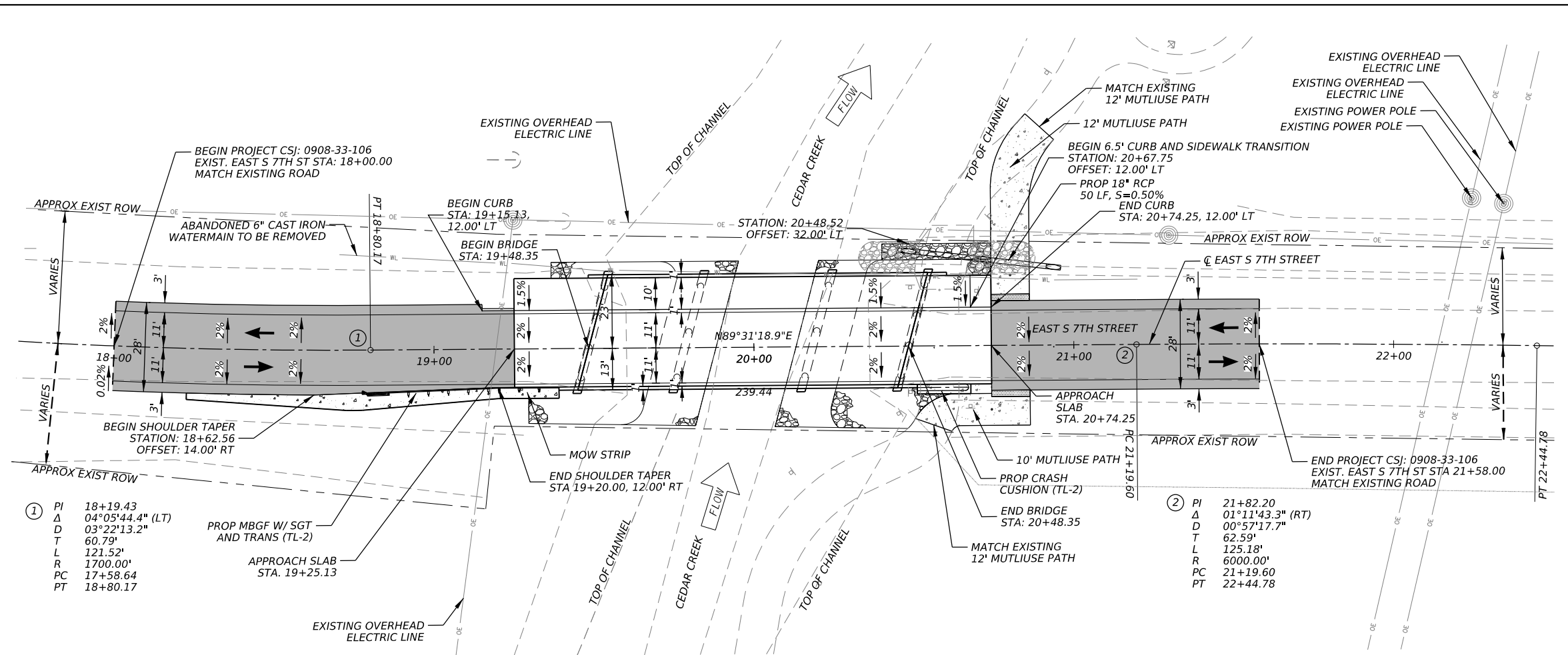
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EAST S 7TH STREET
REMOVAL PLAN
 STA 18+00.00 TO 21+58.00

SHEET 1 OF 1

CONT	SECT	JOB	HIGHWAY
0908	33	106	EAST S 7TH ST
DIST	COUNTY	SHEET NO.	
ABL	TAYLOR	36	

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LEGEND

- PROP. PAVEMENT
- PROP. CONC. MOW STRIP OR CONC. SIDEWALK

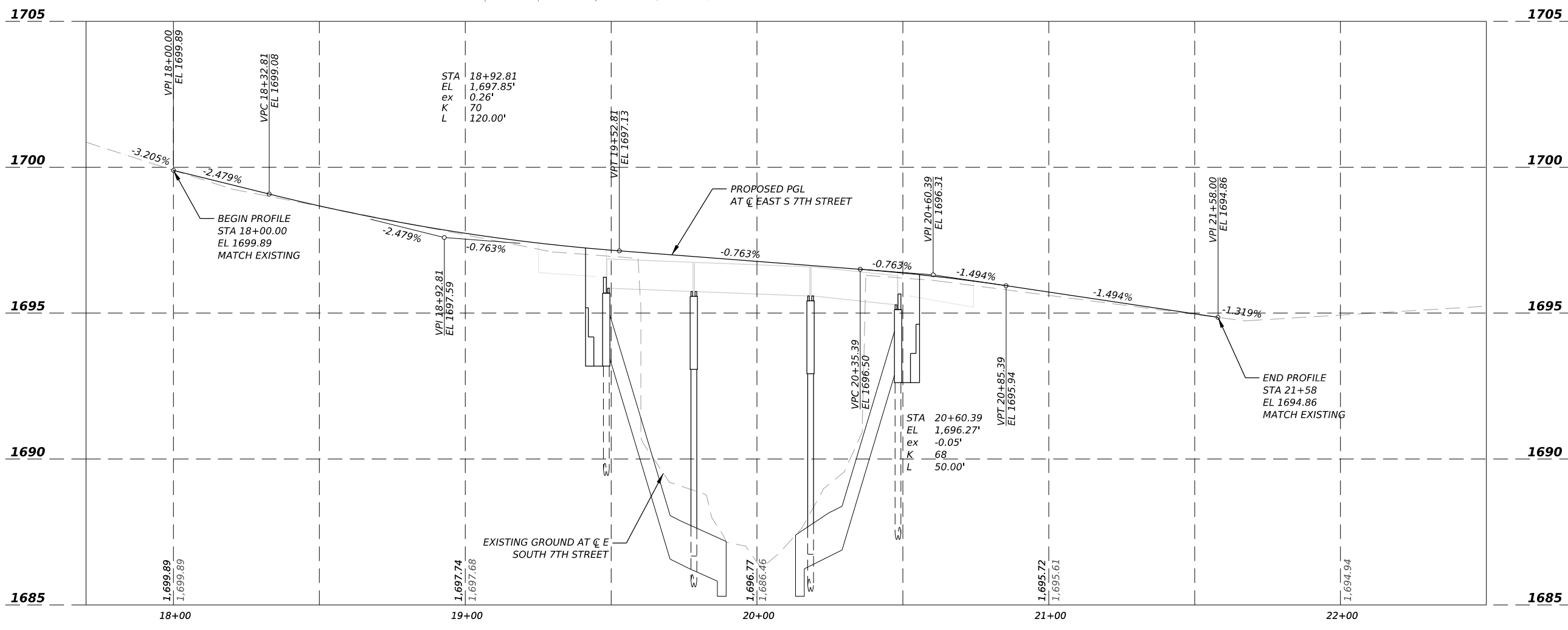
- NOTES:
1. REFER TO ROADWAY CONTROL DATA SHEET FOR ADDITIONAL INFORMATION.
 2. THE CONTRACTOR SHALL NOTIFY UTILITY OWNERS AND VERIFY THE EXACT LOCATIONS OF ALL UTILITIES PRIOR TO CONSTRUCTION.
 3. REFER TO BRIDGE LAYOUT FOR ADDITIONAL INFORMATION.

①

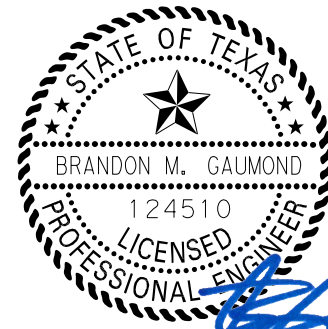
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Δ	04°05'44.4" (LT)
D	03°22'13.2"
T	60.79'
L	121.52'
R	1700.00'
PC	17+58.64
PT	18+80.17

②

PI	21+82.20
Δ	01°11'43.3" (RT)
D	00°57'17.7"
T	62.59'
L	125.18'
R	6000.00'
PC	21+19.60
PT	22+44.78



REV. NO.	DATE	BY	REVISION



2/8/2023

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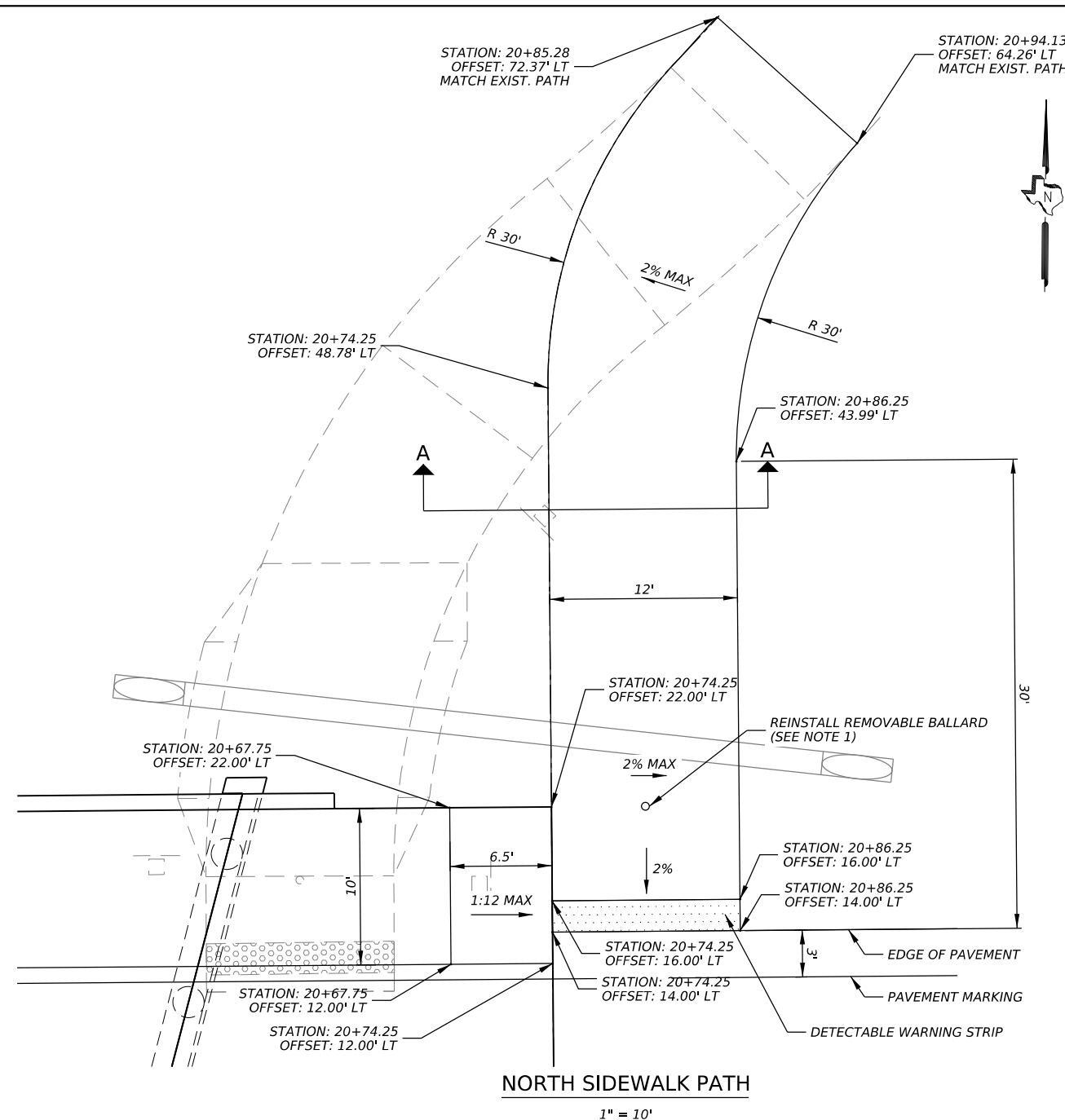
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EAST S 7TH STREET
 ROADWAY PLAN & PROFILE
 STA 18+00 TO 22+15

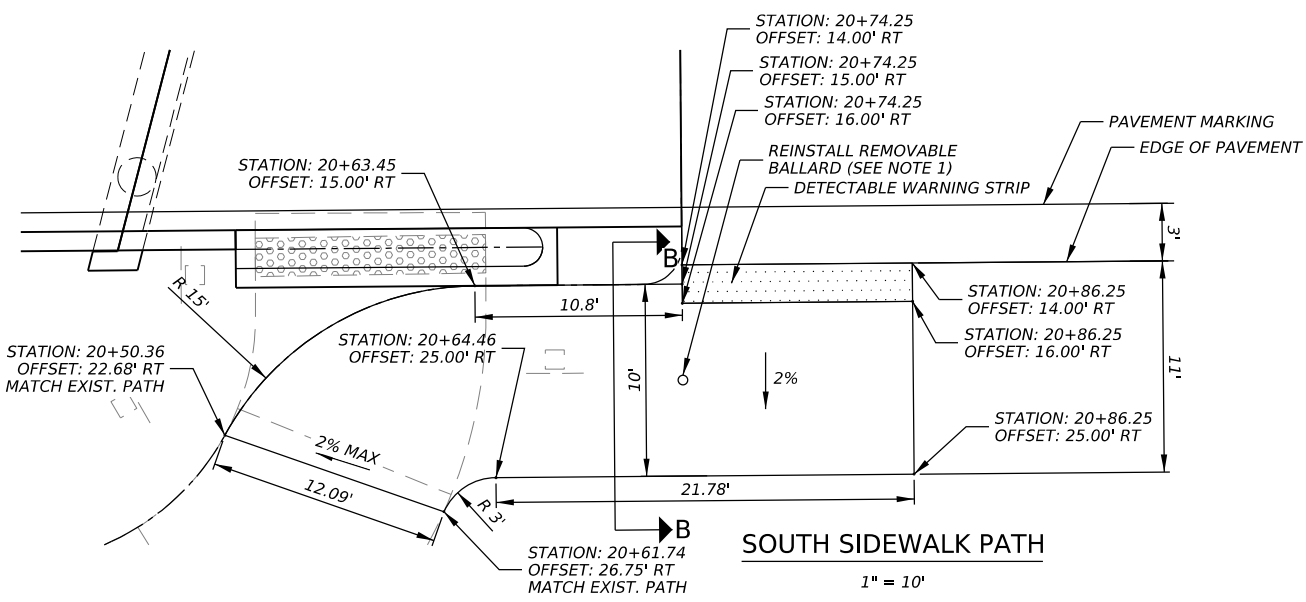
SHEET 1 OF 1

CONT	SECT	JOB	HIGHWAY
0908	33	106	EAST S 7TH ST
DIST	COUNTY	SHEET NO.	
ABL	TAYLOR	37	

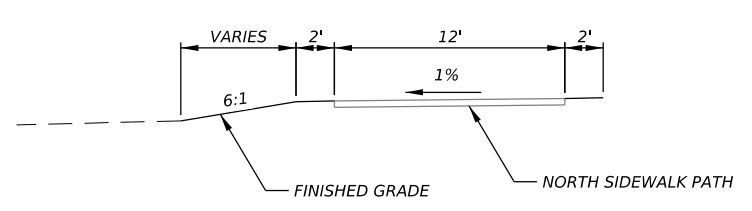
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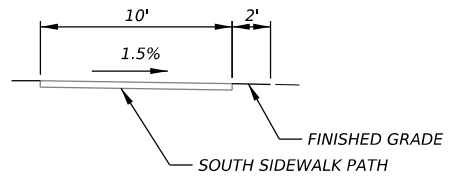
NORTH SIDEWALK PATH
 1" = 10'



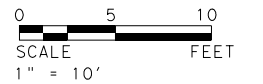
SOUTH SIDEWALK PATH
 1" = 10'



DETAIL A-A
 1" = 10'



DETAIL B-B
 1" = 10'



- NOTE:
- REMOVAL, STORAGE, AND INSTALLATION OF EXISTING PATH BALLARDS SHALL BE SUBSIDIARY TO THE COST OF THE PATH.

REV NO.	DATE	BY	REVISION



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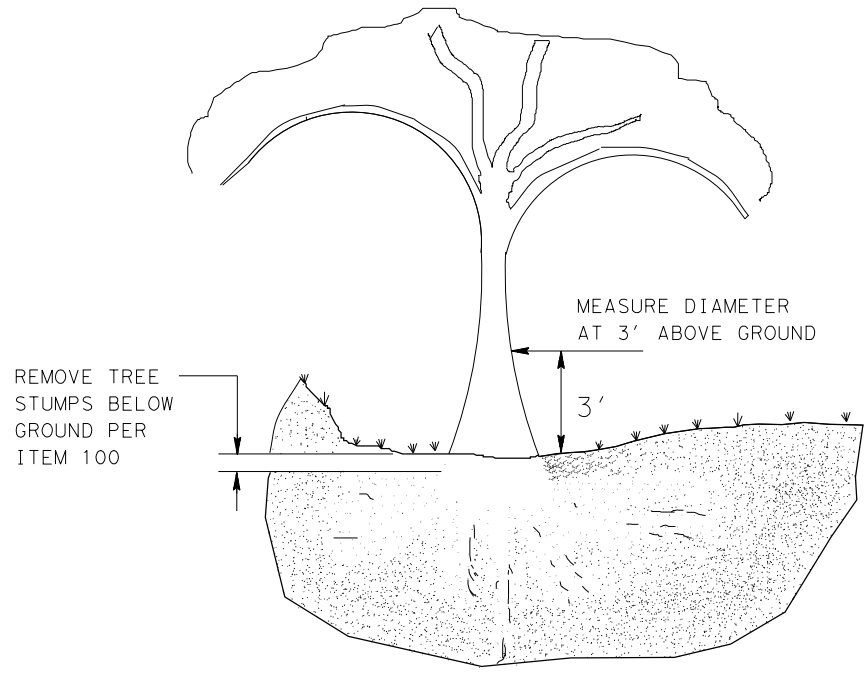
EAST S 7TH STREET

**DETAIL SHEET
 SIDEWALK PATH**

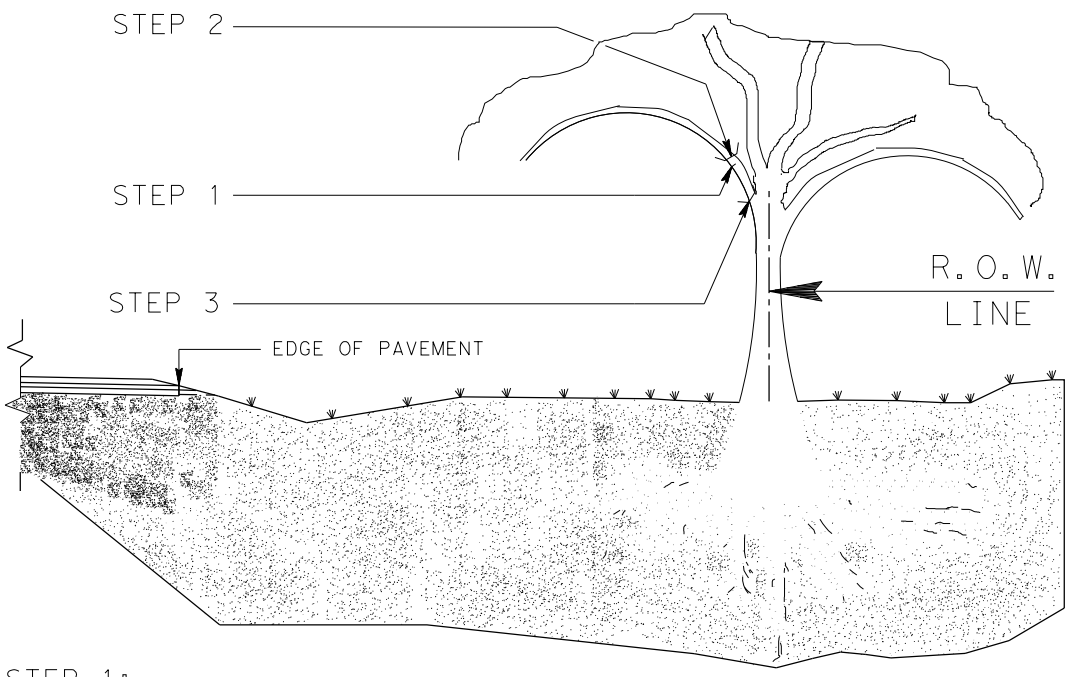
SHEET 1 OF 1

COUNT	SECT	JOB	HIGHWAY
0908	33	106	EAST S 7TH ST
DIST	COUNTY	SHEET NO.	
ABL	TAYLOR	38	

pw: //hq-pw\int01_a-e.transyscorp.com:transyscorp-pw1/Documents/Projects*2022\FW20220046/Road/ABILENE DISTRICT TREE AND BRUSH REMOVAL*Revision*7
2/7/2023 3:09:24 PM



TREE REMOVAL



STEP 1:

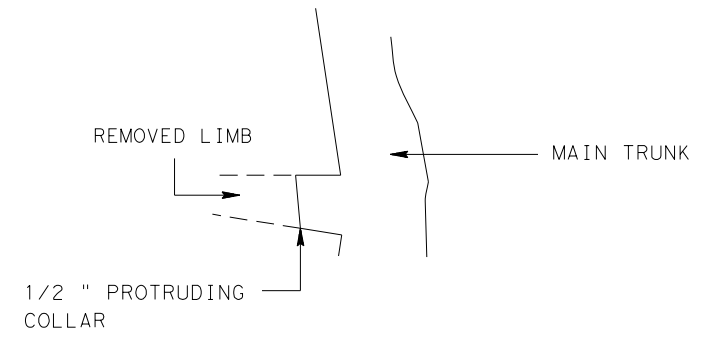
CUT 1/3 WAY THROUGH BOTTOM OF LIMB 8" TO 12" ABOVE MAIN STEM (OR TRUNK).

STEP 2:

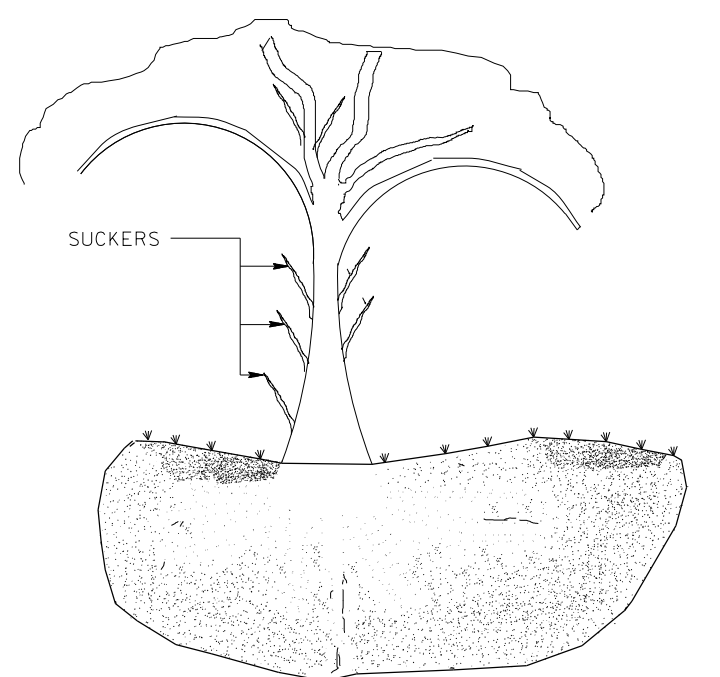
REMOVE LIMB 4" TO 6" BEYOND THE FIRST CUT

STEP 3:

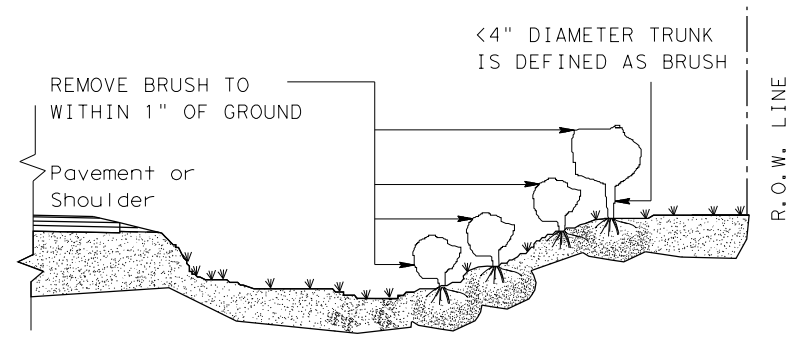
REMOVE STUB WITH A SMOOTH CUT SO THAT TRACE COLLAR OF THE REMOVED LIMB PROTRUDES APPROXIMATELY 1/2" FROM THE MAIN STEM



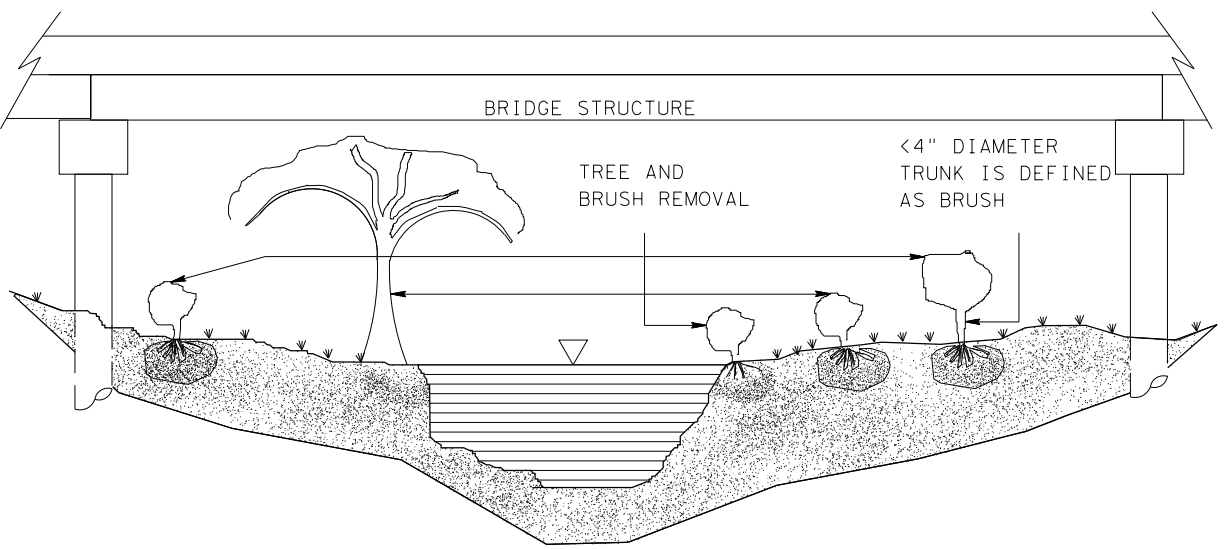
TREE TRIMMING ON THE RIGHT OF WAY LINE



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).



BRUSH REMOVAL



TREE AND BRUSH REMOVAL UNDER BRIDGES AND IN CHANNELS

GENERAL NOTES:

TREE AND BRUSH REMOVAL AND TREE TRIMMING

- 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.
- TREES WITH TRUNKS FULLY CONTAINED WITHIN THE R.O.W. SHALL BE REMOVED UNLESS OTHERWISE SHOWN IN THE PLANS.
- 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.
- 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.
- 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.



2/8/2023

TranSystems
500 W 7th ST SUITE 1100
FORT WORTH, TX 76102
(817) 339-8950
FIRM REG. #: 3557

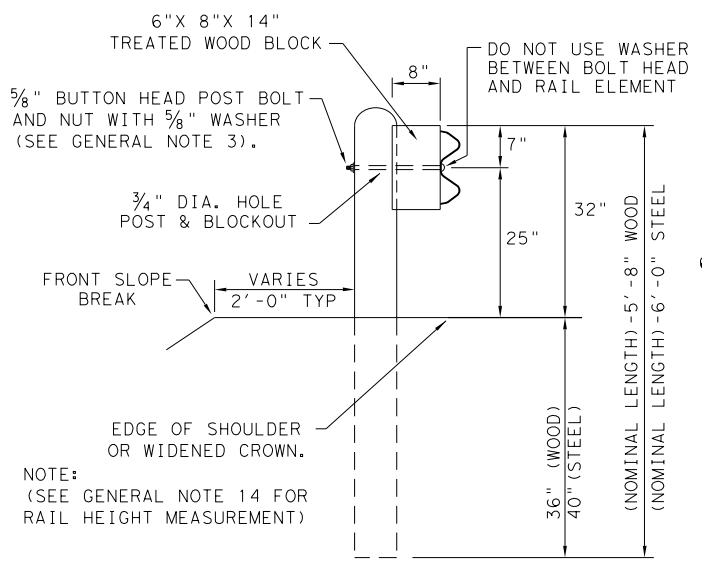
ABILENE DISTRICT
TREE AND BRUSH REMOVAL



NOT TO SCALE SHEET 1 OF 1

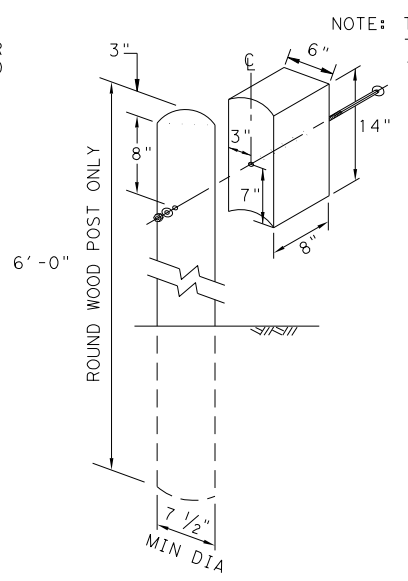
FHWA DIVISION	PROJECT NO.	HIGHWAY NO.	
6	SEE TITLE SHEET	EAST S 7TH ST	
STATE	COUNTY	SHEET NO.	
TEXAS	TAYLOR	39	
DISTRICT	CONTROL	SECTION	JOB
ABL	0908	33	106

DATE: 2/7/2023
 FILE: pw://hq-pw\int01.o-e.transyscorp.com:transyscorp-pw1/Documents/Projects_2022\FW202\202220046/Road/Standard Sheets/gf3119.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.

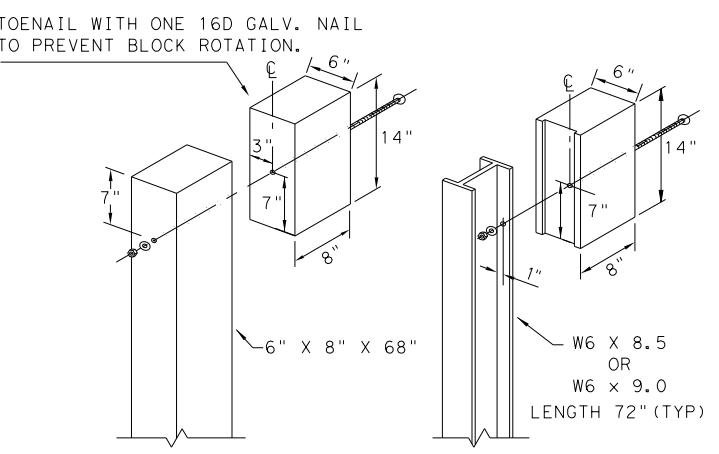


NOTE:
(SEE GENERAL NOTE 14 FOR RAIL HEIGHT MEASUREMENT)

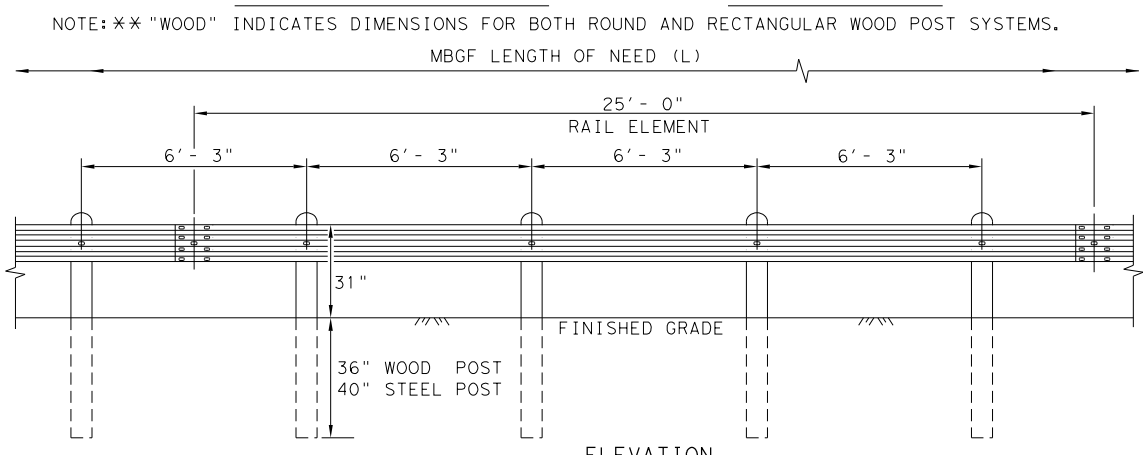
TYPICAL POST PLACEMENT



WOOD BLOCK TO ROUND WOOD POST

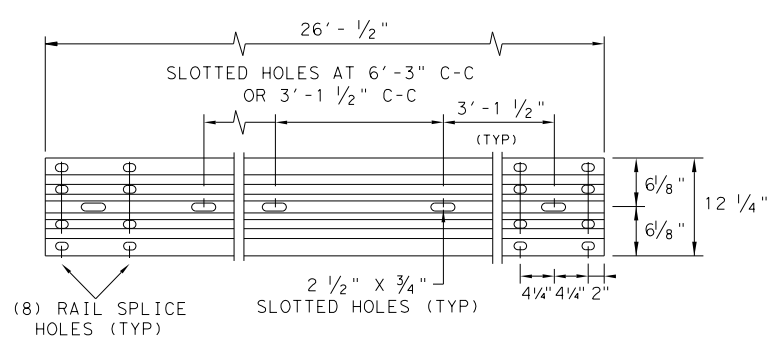


WOOD BLOCK TO RECTANGULAR WOOD POST
ROUTED WOOD BLOCK TO I-BEAM STEEL POST



ELEVATION MID-SPAN RAIL SPLICE

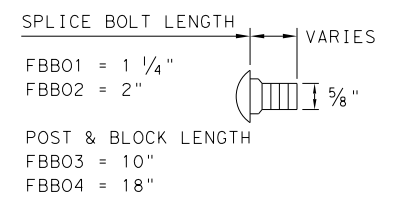
SHOWING A 25' - 0" SECTION OF W-BEAM RAIL. (SEE GENERAL NOTE 2)



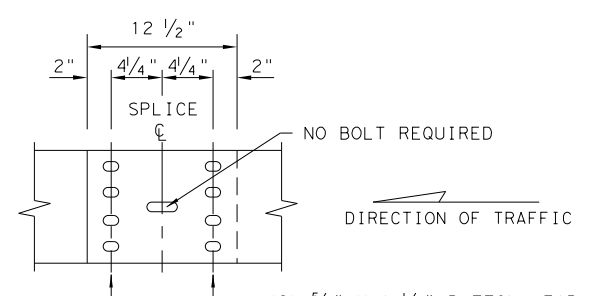
ELEVATION 25' - 0" (NOM.) W-BEAM SECTION

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

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



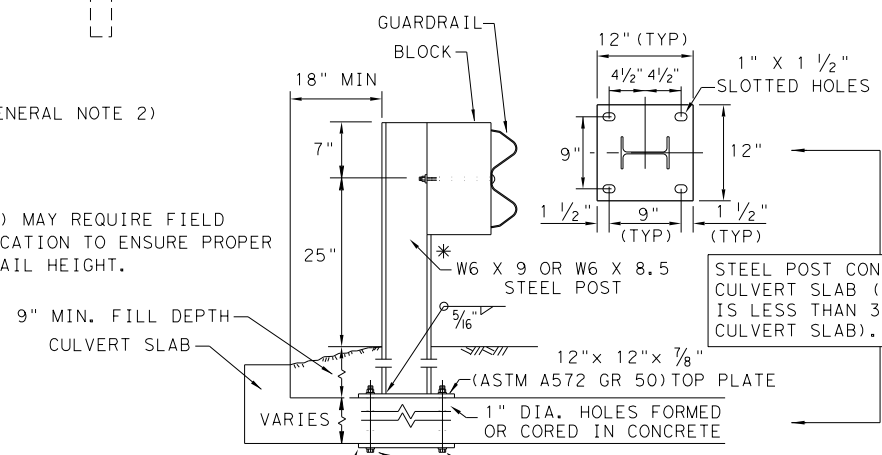
BUTTON HEAD BOLT



MID-SPAN RAIL SPLICE DETAIL

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

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



LOW FILL CULVERT POST

- BOLT-THROUGH OPTION:** REQUIRES A 6" MIN. SLAB THICKNESS. 7/8" DIA (ASTM A449) HEAVY HEX BOLTS WITH TWO HARDENED WASHER EACH AND HEAVY HEX NUTS. NOTE: BOLT LENGTH = SLAB PLUS 2 1/4" MIN.
- EPOXY ANCHOR OPTION:** THIS OPTION MAY ONLY BE USED IF THE CULVERT SLAB IS 9" MIN. THICK. THREADED ANCHOR RODS MUST BE 7/8" DIA. ASTM A449 OR A193 GRADE B7 WITH HEAVY HEX NUT, AND ONE HARDENED WASHER EACH. EMBED ANCHOR RODS 6" WITH HILTI HIT RE 500 EPOXY ADHESIVE. OTHER TYPE III CLASS C EPOXY ADHESIVES MEETING THE REQUIREMENTS OF DMS-6100, "EPOXIES AND ADHESIVES", MAY BE USED IF IT CAN BE DEMONSTRATED THAT THEY MEET OR EXCEED THE STRENGTH OF HILTI HIT RE 500 WITH THE SAME EMBEDMENT DEPTH AND THREADED ROD DIA. FOLLOW THE MANUFACTURER'S REQUIREMENTS FOR INSTALLING EPOXIED THREADED RODS. EXTEND RODS 1/4" MIN. BEYOND NUT.

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

GENERAL NOTES

- THE TYPE OF POST (ROUND WOOD POST, RECTANGULAR WOOD POST, OR STEEL POST) WILL BE AS SHOWN IN THE PLANS. THE EXACT POSITION OF MBGF SHALL BE SHOWN IN THE PLANS OR AS DIRECTED BY THE ENGINEER. STEEL POSTS TO BE GALVANIZED IN ACCORDANCE WITH ITEM 445, "GALVANIZING."
- RAIL ELEMENTS SHALL MEET THE REQUIREMENTS OF ITEM 540, "METAL BEAM GUARD FENCE" EXCEPT AS MODIFIED IN THE PLANS. THE CONTRACTOR MAY FURNISH RAIL ELEMENTS OF 25' - 0", OR 12' - 6" (NOM.) LENGTHS. RAIL ELEMENTS MAY HAVE SLOTTED HOLES AT 3'-1 1/2" C-C OR 6'-3" C-C. A SPECIAL LENGTH OF RAIL MAY BE MANUFACTURED TO ACCOMMODATE THE DOWNSTREAM ANCHOR TERMINAL (DAT) AND THE TRANSITION SECTIONS OF GUARDRAIL.
- BUTTON HEAD "POST BOLTS & NUTS" SHALL MEET THE REQUIREMENTS OF (ASTM A307), AND SHALL BE OF SUFFICIENT LENGTH TO EXTEND THROUGH THE FULL THICKNESS OF THE NUT AND 5/8" WASHER (FWC16g) AND NOT MORE THAN 1" BEYOND IT. TRIM REMAINING BOLT LENGTH TO MEET REQUIRED LENGTH.
- FITTINGS (BOLTS, NUTS, AND WASHERS) SHALL BE GALVANIZED IN ACCORDANCE WITH ITEM 445, "GALVANIZING." FITTINGS SHALL BE SUBSIDIARY TO THE BID ITEM.
- CROWN SHALL BE WIDENED TO ACCOMMODATE THE METAL BEAM GUARD FENCE.
- THE LATERAL APPROACH TO THE GUARD FENCE, SHALL HAVE A MAXIMUM SLOPE OF 1V:10H.
- 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.
- 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.
- 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.
- POSTS SHALL NOT BE SET IN CONCRETE, OF ANY DEPTH.
- SPECIAL FABRICATION WILL BE REQUIRED AT INSTALLATION LOCATIONS HAVING A CURVATURE OF LESS THAN 150 FT. RADIUS.
- 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.
- 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.
- GUARDRAIL HEIGHT MEASUREMENT: WHEN THE GUARDRAIL IS LOCATED ABOVE PAVEMENT, MEASURE THE HEIGHT FROM THE PAVEMENT TO THE TOP OF THE W-BEAM RAIL. WHEN THE GUARDRAIL IS LOCATED UP TO 2 FT. OFF OF THE EDGE OF PAVEMENT OR FOR A PAVEMENT OVERLAY, USE A 10-FOOT STRAIGHTEDGE TO EXTEND THE PAVEMENT/SHOULDER SLOPE TO THE BACK OF RAIL, MEASURE FROM THE BOTTOM OF STRAIGHTEDGE TO THE TOP OF RAIL. FOR GUARDRAIL LOCATED DOWN A 10:1 SLOPE, MEASURE FROM THE NOMINAL TERRAIN.

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

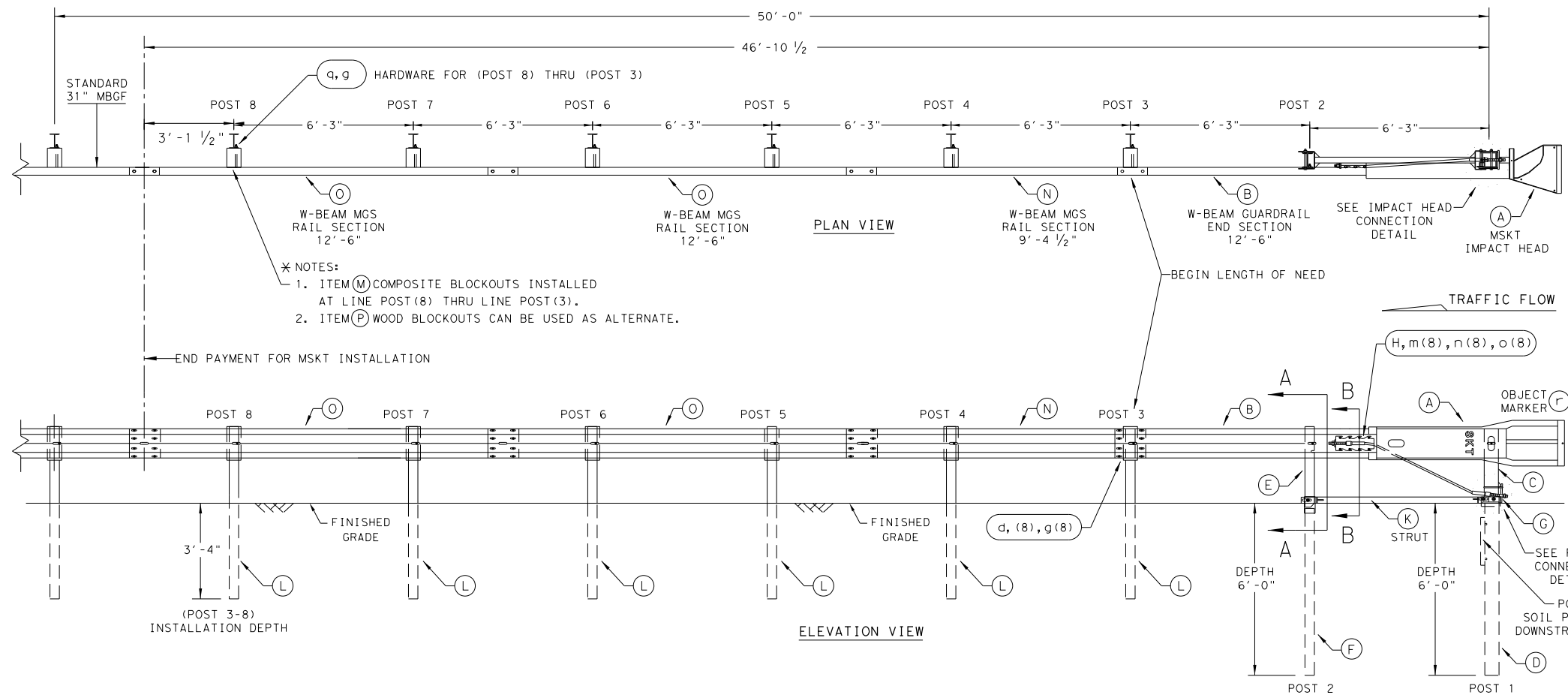


METAL BEAM GUARD FENCE
TL-3 MASH COMPLIANT
GF(31)-19

FILE: gf3119.dgn	DN: TXDOT	CK: KM	DW: VP	CK: CGL/AG
© TXDOT: NOVEMBER 2019	CONT	SECT	JOB	HIGHWAY
REVISIONS	0908	33	106	EAST S 7TH ST
	DIST	COUNTY		SHEET NO.
	ABL	TAYLOR		40

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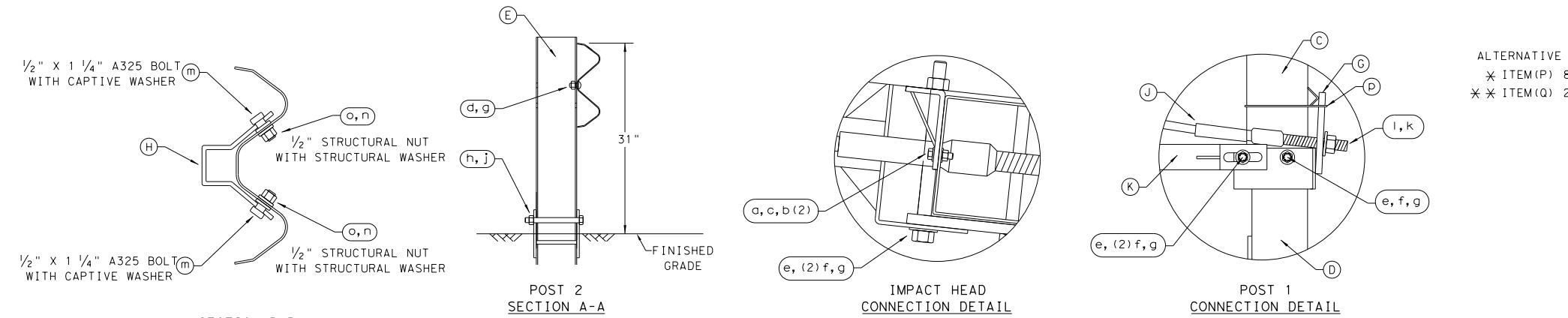
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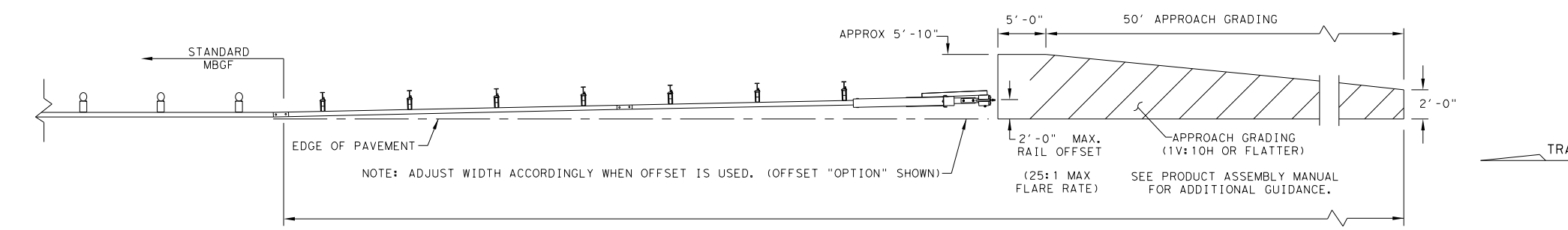
- * NOTES:
- ITEM (M) COMPOSITE BLOCKOUTS INSTALLED AT LINE POST (8) THRU LINE POST (3).
 - ITEM (P) WOOD BLOCKOUTS CAN BE USED AS ALTERNATE.

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

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



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



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

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

Texas Department of Transportation
 Design Division Standard

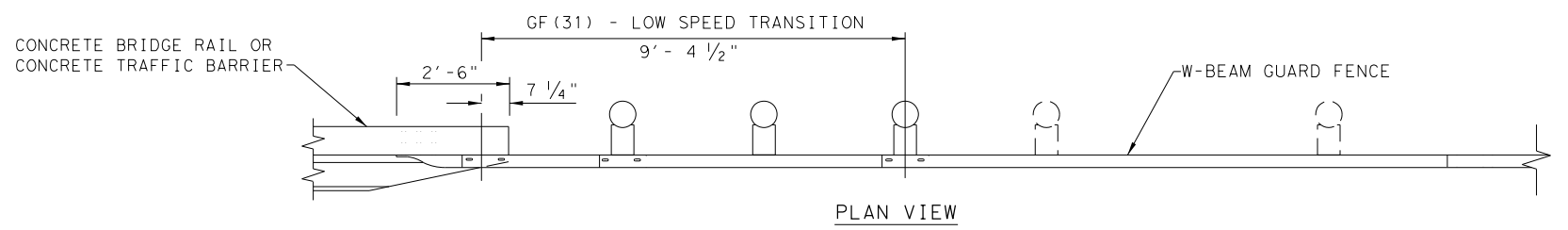
SINGLE GUARDRAIL TERMINAL

MSKT-MASH-TL-3

SGT (12S) 31-18

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© TXDOT: APRIL 2018	CONT SECT	JOB	HIGHWAY	
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	DIST	COUNTY	SHEET NO.	
	ABL	TAYLOR	41	

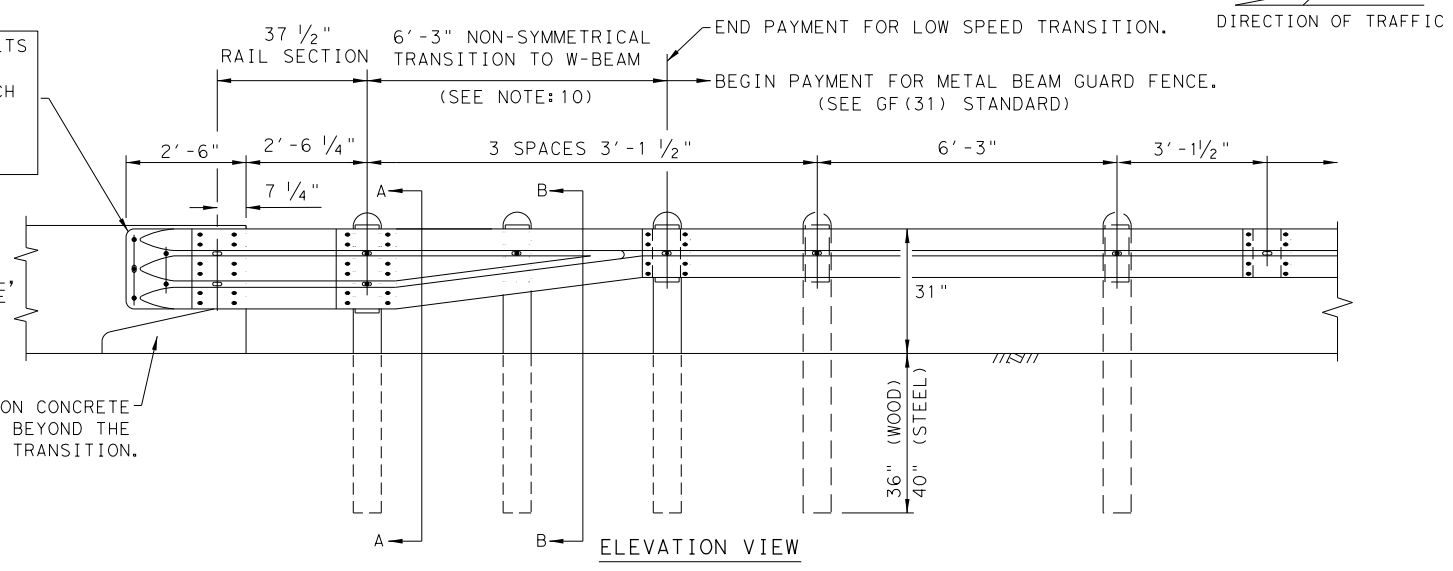
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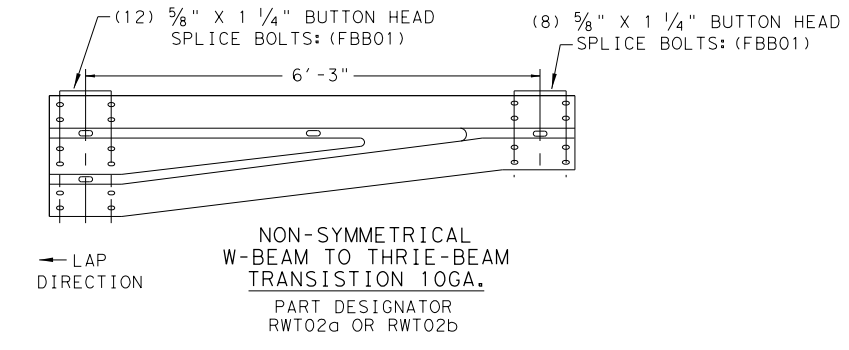
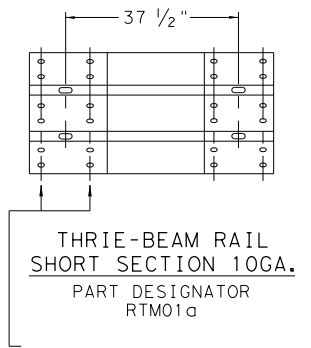
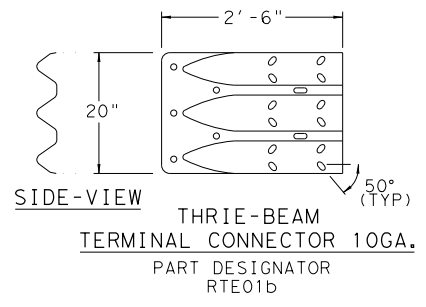
- (5) 7/8" DIA. HEAVY HEX HEAD BOLTS (ASTM A325 OR A449)
 - (10) 1 3/4" O.D. WASHER UNDER EACH HEX BOLT HEAD AND NUT.
 - (5) 7/8" DIA. HEAVY HEX NUTS (ASTM A194 OR A563)
- THRIE-BEAM CONNECTOR TO CONCRETE RAIL

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

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



- GENERAL NOTES**
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 TRANSITIONS SHALL BE AS SHOWN IN THE PLANS OR AS DIRECTED BY THE ENGINEER. REFER TO GF(31) STANDARD SHEET.
 2. RAIL ELEMENT SHALL MEET THE REQUIREMENTS OF ITEM 540, "METAL BEAM GUARD FENCE" EXCEPT AS MODIFIED IN THE PLANS.
 3. FITTINGS (BOLTS, NUTS, AND WASHERS) SHALL BE GALVANIZED IN ACCORDANCE WITH ITEM 445, "GALVANIZING." FITTINGS SHALL BE SUBSIDIARY TO THE BID ITEM REQUIRING CONSTRUCTION OF THE TRANSITION.
 4. BUTTON HEAD "POST BOLTS & NUTS" SHALL MEET THE REQUIREMENTS OF (ASTM A307), AND SHALL BE OF SUFFICIENT LENGTH TO EXTEND THROUGH THE FULL THICKNESS OF THE NUT AND 5/8" WASHER (FWC16a) AND NOT MORE THAN 1" BEYOND IT. TRIM BOLT LENGTH TO MEET REQUIRED LENGTH.
 5. POSTS SHALL NOT BE SET IN CONCRETE, OF ANY DEPTH.
 6. CROWN SHALL BE WIDENED TO ACCOMMODATE TRANSITIONS.
 7. WHERE SOLID ROCK IS ENCOUNTERED, CONTACT THE DESIGN DIVISION FOR ADDITIONAL GUIDANCE. (512) 416-2678
 8. UNLESS OTHERWISE SHOWN IN THE PLANS, A COMPOSITE MATERIAL BLOCK THAT MEETS THE REQUIREMENTS OF DMS-7210, "COMPOSITE MATERIAL POSTS AND BLOCKS FOR METAL BEAM GUARD FENCE" MAY BE SUBSTITUTED FOR BLOCKS OF SIMILAR DIMENSIONS. THE CONSTRUCTION DIVISION, TxDOT, MAINTAINS A MATERIAL PRODUCER LIST (MPL) FOR PRODUCERS OF MATERIALS CONFORMING TO DMS-7210. ONLY PRODUCERS ON THE MPL CAN FURNISH COMPOSITE MATERIAL BLOCKS.
 9. REFER TO GF(31) STANDARD SHEET & BRIDGE RAILING DETAILS FOR ADDITIONAL DETAILS.
 10. FOR ROUND WOOD POSTS SYSTEMS, ALL ROUND WOOD POSTS SHALL BE 7 1/2" DIA. MINIMUM THROUGHOUT THE TRANSITION.



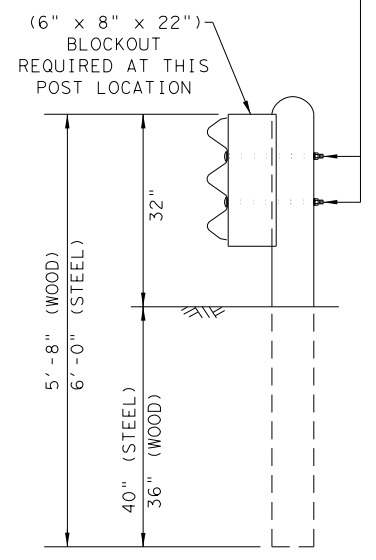
- (2) 5/8" BUTTON HEAD POST BOLTS & NUTS: (FBB04)
- (1) 5/8" FLAT WASHER: (FWC14a) UNDER EACH NUT

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

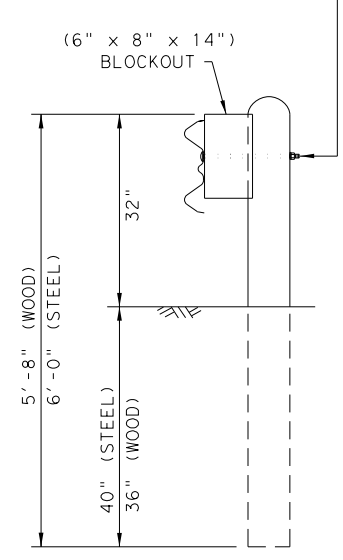
PLATE WASHER INSTRUCTIONS

BRIDGE APPROACH - UPSTREAM: THE SHORT RAIL LAPS OVER THE TERMINAL CONNECTOR. PLATE WASHERS ARE INSTALLED UNDER THE SPLICE NUTS AGAINST INSIDE OF CONNECTOR.

BRIDGE EXIT - DOWNSTREAM: THE TERMINAL CONNECTOR LAPS OVER THE NESTED RAIL. PLATE WASHERS ARE INSTALLED UNDER THE BOLT HEAD AGAINST OUTSIDE OF CONNECTOR.

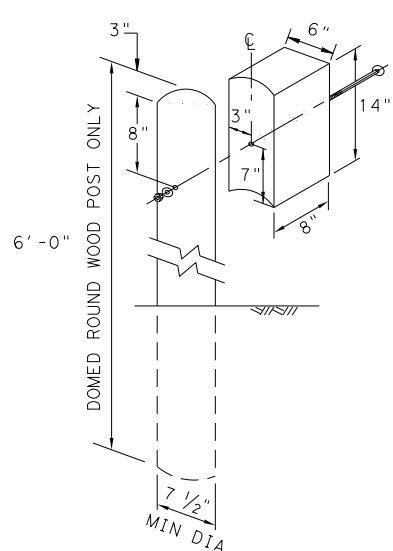


SECTION A-A

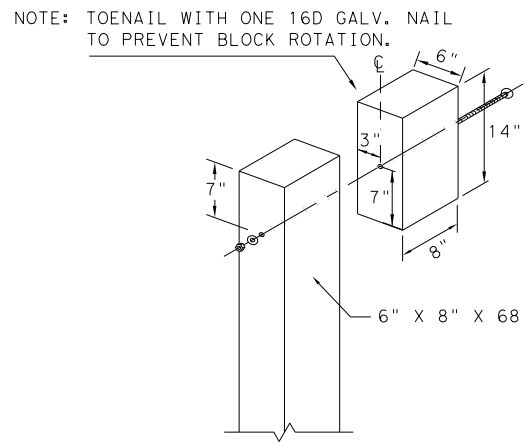


SECTION B-B

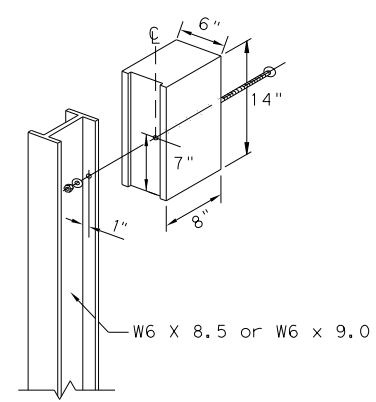
NOTE: * "WOOD" INDICATES DIMENSIONS FOR BOTH ROUND AND RECTANGULAR WOOD POST SYSTEMS.



WOOD BLOCK TO ROUND WOOD POST



WOOD BLOCK TO RECTANGULAR WOOD POST



ROUTED WOOD BLOCK TO I-BEAM STEEL POST

LOW-SPEED TRANSITION

Design Division Standard

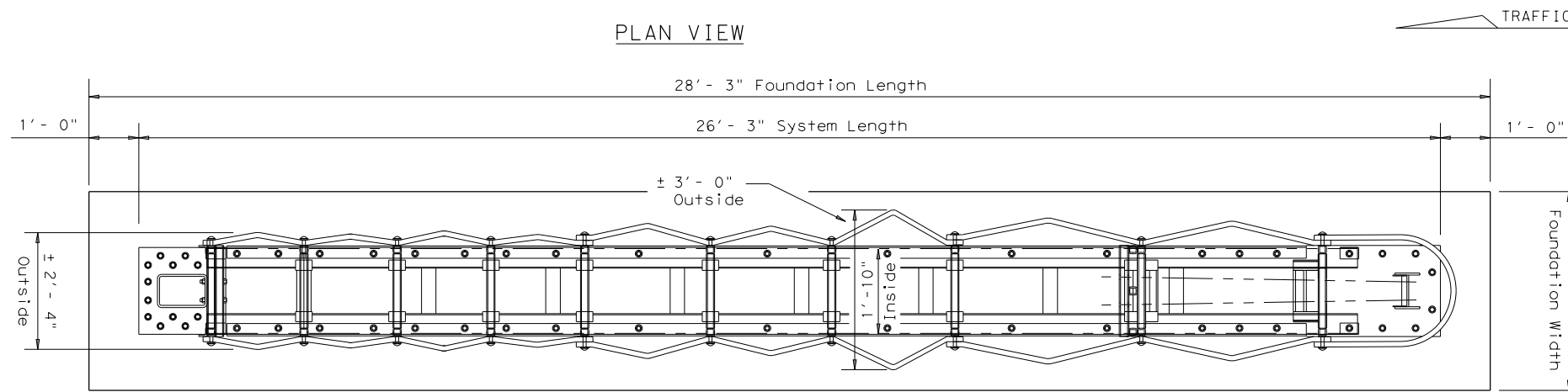
METAL BEAM GUARD FENCE
THRIE-BEAM TRANSITION
TL-2 MASH COMPLIANT
GF(31)TR TL2-19

FILE: gf31tr+1219.dgn	DN: TxDOT	CK: KM	DW: VP	CK: CGL/AG
© TxDOT: NOVEMBER 2019	CONT	SECT	JOB	HIGHWAY
REVISIONS	0908	33	106	EAST S 7TH ST
	DIST	COUNTY		SHEET NO.
	ABL	TAYLOR		42

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PLAN VIEW



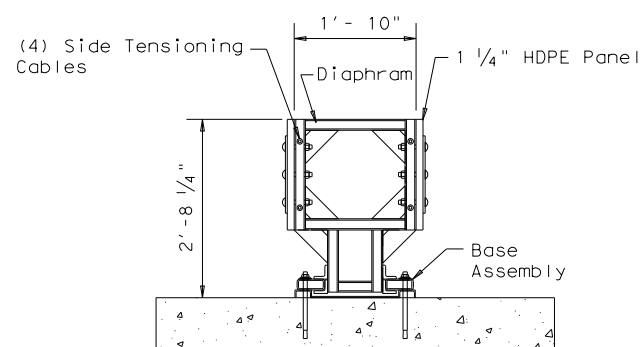
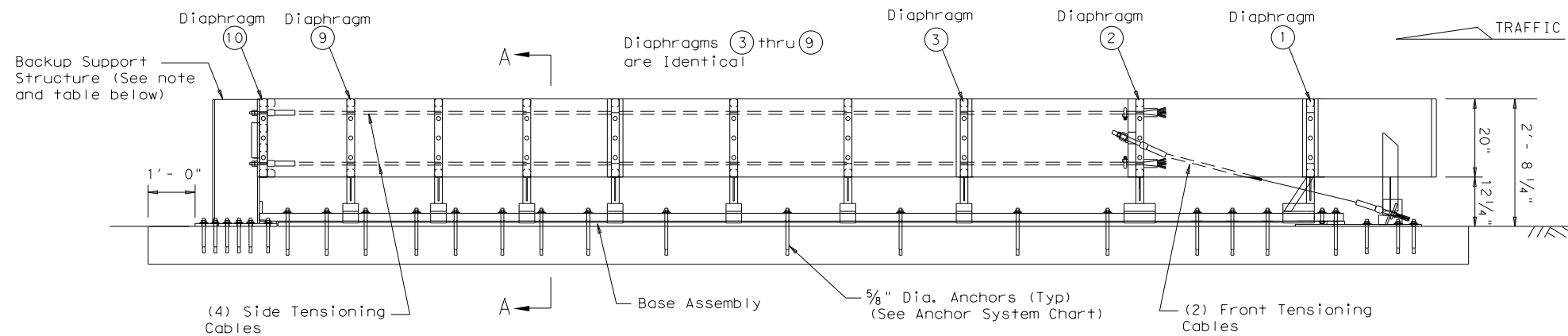
NOTE:
 BACKUP SUPPORT SHOWN IS THE STEEL POST OPTION. THE HEART SYSTEM MAY BE CONNECTED WITH RECTANGULAR CROSS SECTIONS SUCH AS: PIERS, PARAPETS AND CONCRETE TRAFFIC BARRIERS.

SYSTEM SHOWN IS HEART (TL-3) WITH UNI-DIRECTIONAL TRAFFIC

GENERAL NOTES

- For specific information regarding installation and technical guidance of the system, contact: Trinity Highway at 1(888)323-6374, 2525 N. Stemmons Freeway, Dallas, TX 75207
- For bi-directional traffic, appropriate transition panels will be required.
- Details of components for the HEART and backups and reinforcing details will be shown on the manufacturer's shop drawings furnished to the Engineer.
- Concrete shall be class "S" with a minimum compressive strength of 4,000 p.s.i.
- If the cross-slope varies more than 2% over the length of the system, the concrete pad will require levelling. Maximum permissible cross-slope is 8%.
- The installation area should be free from curbs, elevated objects, or depressions.
- The HEART system should be approximately parallel with the barrier or ϕ of merging barriers.

ELEVATION VIEW



SECTION A-A

HEART (NARROW) SYSTEM		
TEST LEVEL	SYSTEM LENGTH	PAD LENGTH
TL-2	13' - 9 1/2"	15' - 9 1/2"
TL-3	26' - 3"	28' - 3"
70	28' - 9"	30' - 9"

CONCRETE PAD LENGTH ON THE HEART SYSTEM DEPENDS ON BACKUP TYPE. (MINIMUM LENGTH SHOWN)

BACKUP SUPPORT OPTIONS	
Steel Post Backup (Shown)	
Rectangular Concrete Backup (18" Width Max.)	
Concrete Barrier (CTB) Backup	
Single Slope Concrete Barrier (SSCB)	
TRANSITION OPTIONS	
THE HEART SYSTEM IS APPROVED FOR USE AT BI-DIRECTIONAL SITES, ADDITIONAL HARDWARE IS REQUIRED. (SEE MANUFACTURER'S PRODUCT MANUAL)	

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

ANCHOR SYSTEM CHART	
On Concrete:	10" Bolts used on base rails, 7 1/2" Bolts used on base plates.
On Asphalt:	18" Bolts used on base rails and base plates.

FOUNDATION OPTIONS	
6" Reinforced Concrete	
8" Unreinforced Concrete	
8" Minimum Asphalt	
For asphalt overlays on concrete, contact the manufacturer.	

FOR STEEL PLACEMENT IN CONCRETE FOUNDATIONS (SEE MANUFACTURER'S PRODUCT MANUAL)

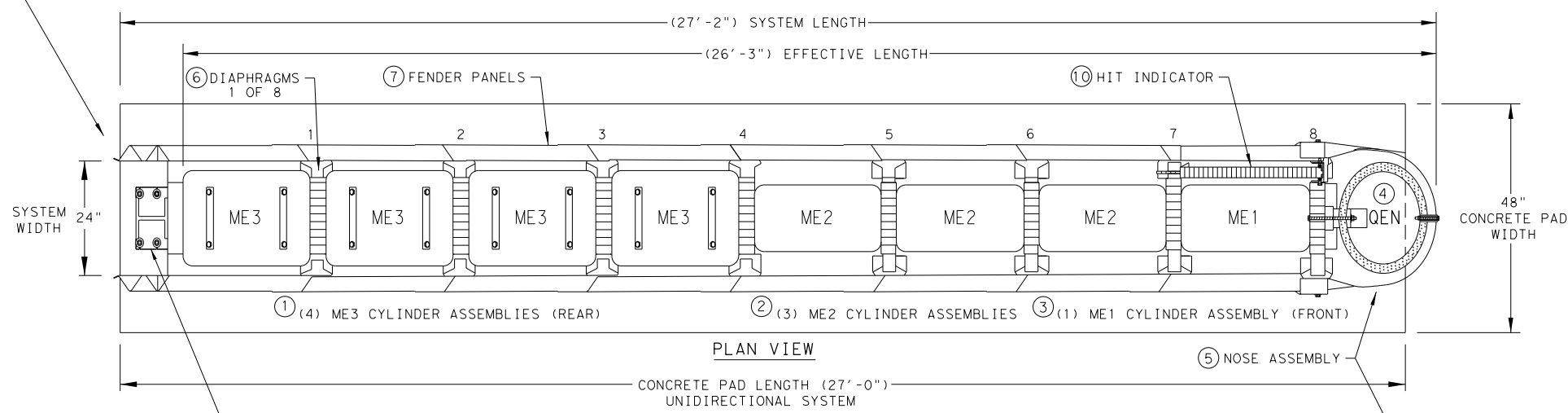
LOW MAINTENANCE

				Design Division Standard	
TRINITY HIGHWAY HEART HYBRID ENERGY ABSORBING TERMINAL HEART-16					
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© TxDOT: March 2010	CONT	SECT	JOB	HIGHWAY	
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REVISED 06, 2013 (VP)	DIST	COUNTY		SHEET NO.	
REVISED 03, 2016 (VP)	ABL	TAYLOR		43	

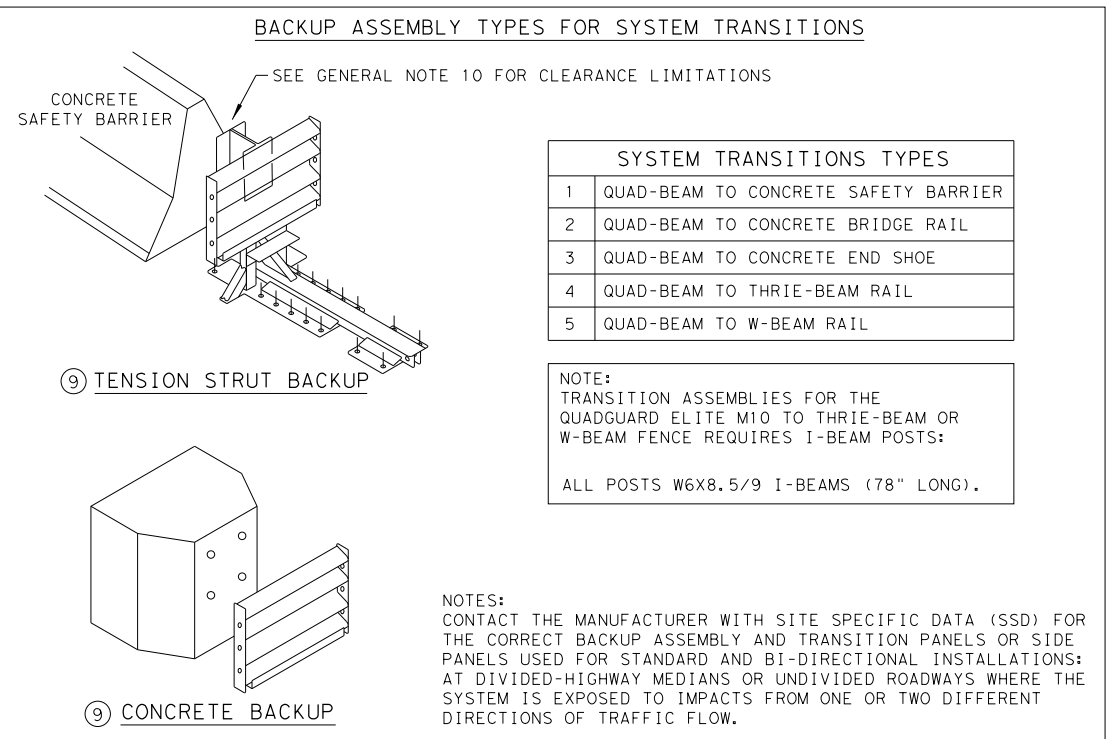
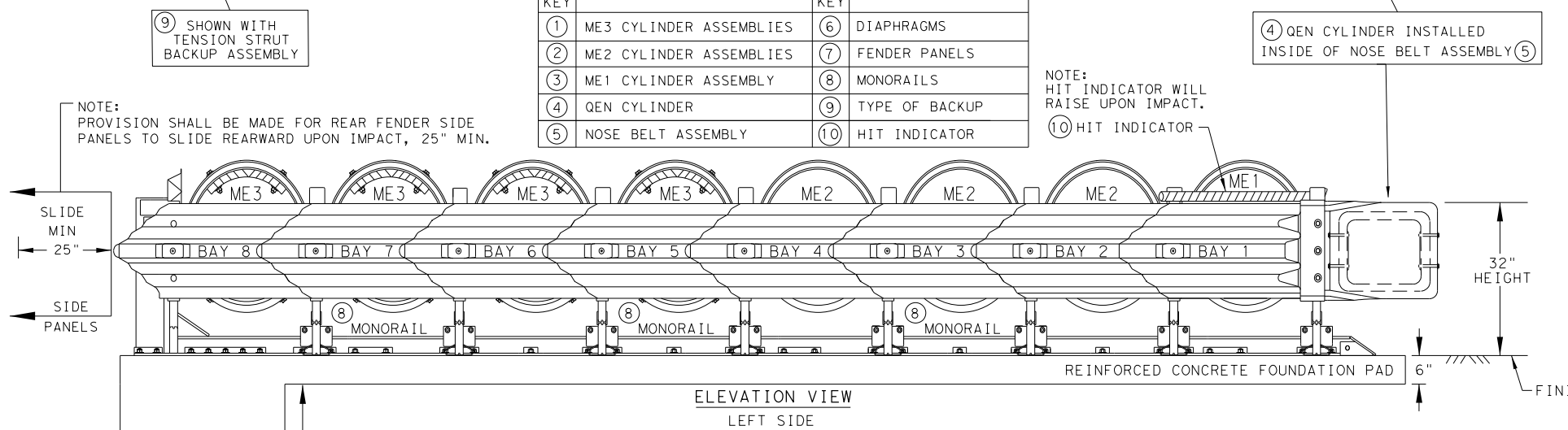
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NOTE:
A TRANSITION MAY BE REQUIRED TO INSTALL THE QUADGUARD ELITE M10 TO THE OBJECT BEING SHIELDED.

QUADGUARD ELITE M10 24" WIDE (8 BAY) SYSTEM



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



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

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

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

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

GENERAL NOTES

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

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

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

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

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

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

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

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

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

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

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

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

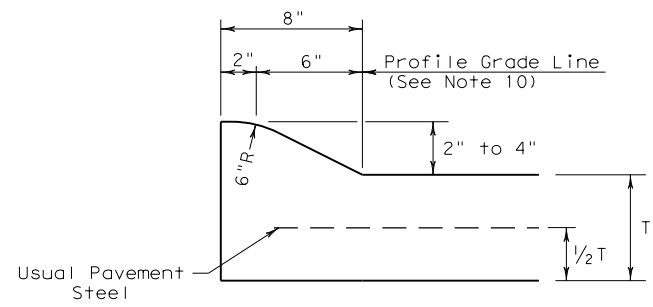
TL-3 MODEL #	QM10024E	CYLINDER TYPES IN BAYS			
BAYS	8	TYPE-ME3	TYPE-ME2	TYPE-ME1	TYPE-QEN
DIAPHRAGMS	8	4	3	1	1
WIDTH	24"	REAR	FRONT		NOSE

LOW MAINTENANCE

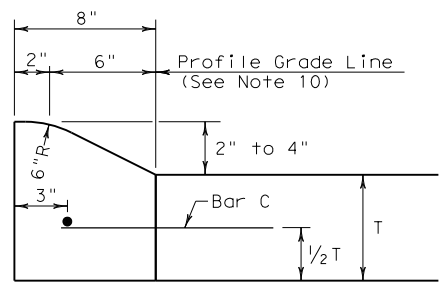
		Design Division Standard	
TRINITY HIGHWAY ENERGY ABSORPTION QUADGUARD ELITE M10 (MASH TL-3) QGELITE (M10) (N) -20			
FILE: qgelitem10n20.dgn	DN: TXDOT	CK: KM	DW: VP
© TXDOT: NOVEMBER 2020	CONT SECT	JOB	HIGHWAY
REVISIONS	0908 33	106	EAST S 7TH ST
	DIST	COUNTY	SHEET NO.
	ABL	TAYLOR	44

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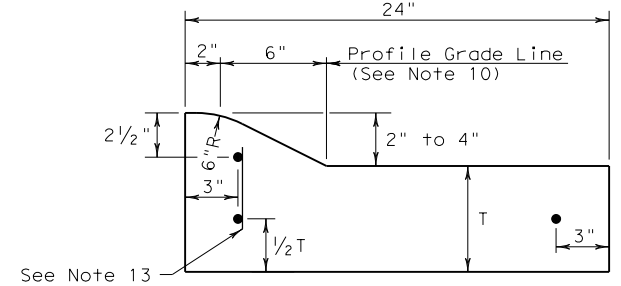
DATE: 2/7/2023
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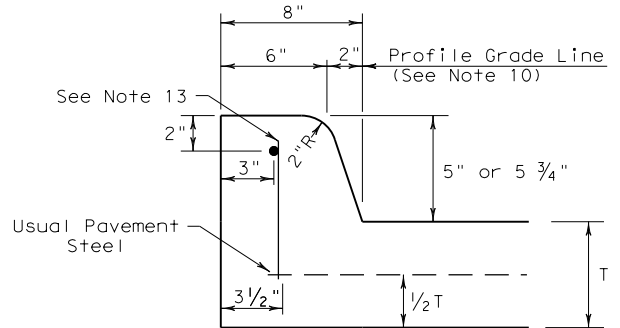
TYPE I CURB (MONOLITHIC)
 2" - 4" HEIGHT



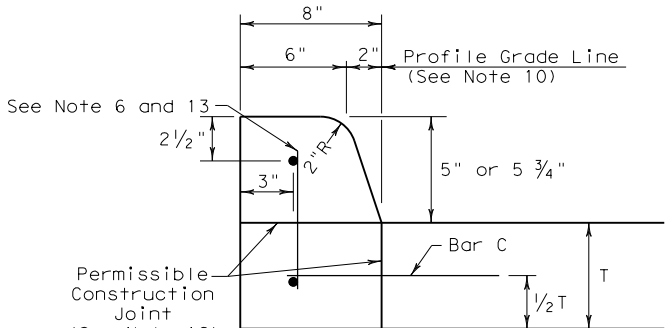
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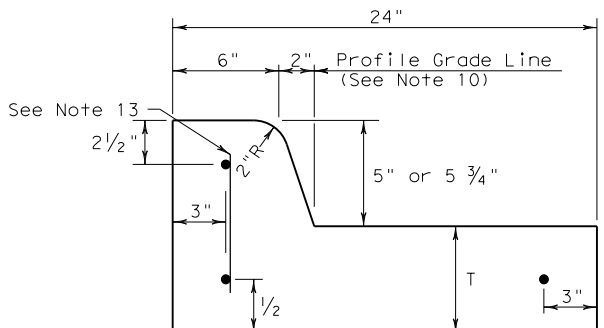
TYPE I CURB AND GUTTER
 2" - 4" HEIGHT



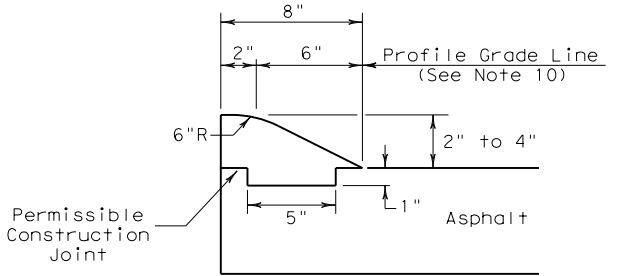
TYPE II CURB (MONOLITHIC)
 5" - 5 3/4" HEIGHT



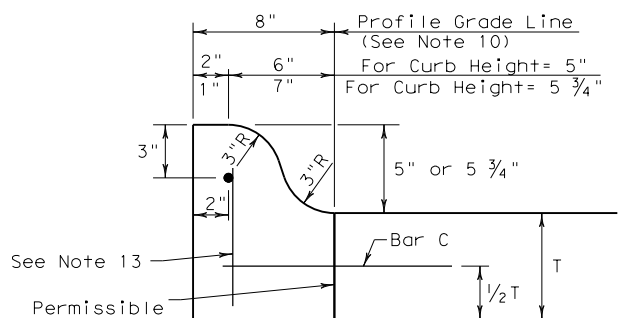
TYPE II CURB
 5" - 5 3/4" HEIGHT



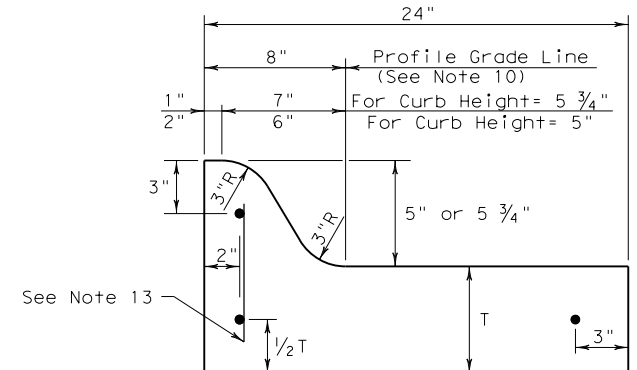
TYPE II CURB AND GUTTER
 5" - 5 3/4" HEIGHT



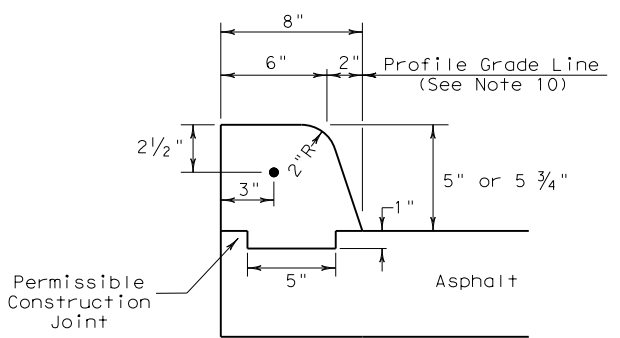
TYPE III CURB (KEYED)
 2" - 4" HEIGHT



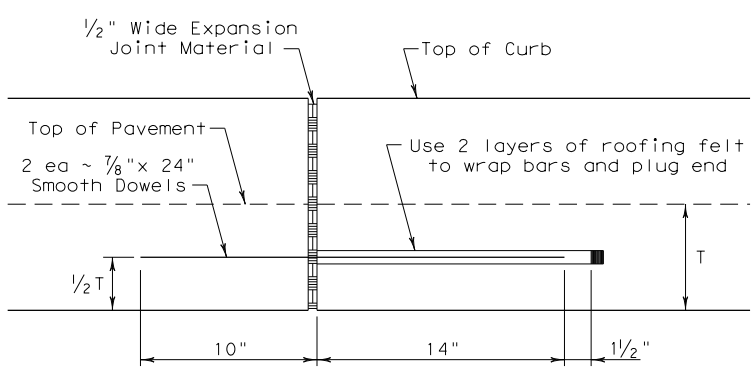
TYPE IIa CURB
 5" - 5 3/4" HEIGHT



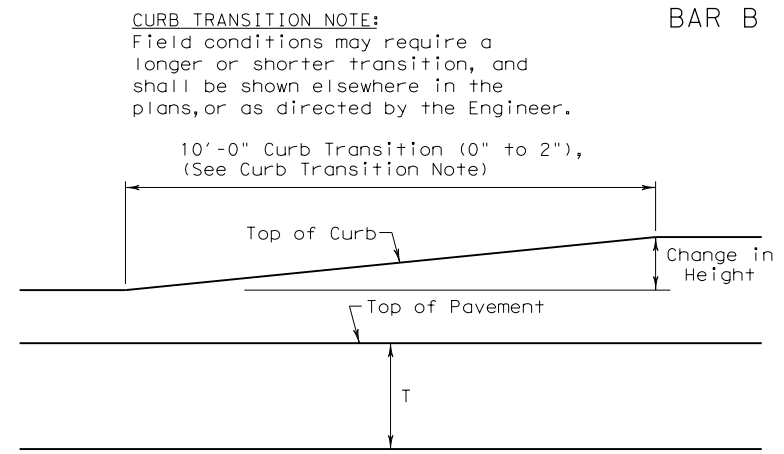
TYPE IIa CURB AND GUTTER
 5" - 5 3/4" HEIGHT



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



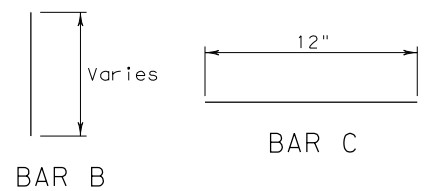
EXPANSION JOINT DETAIL



CURB TRANSITION
 Note: To be paid for as Highest Curb

GENERAL NOTES

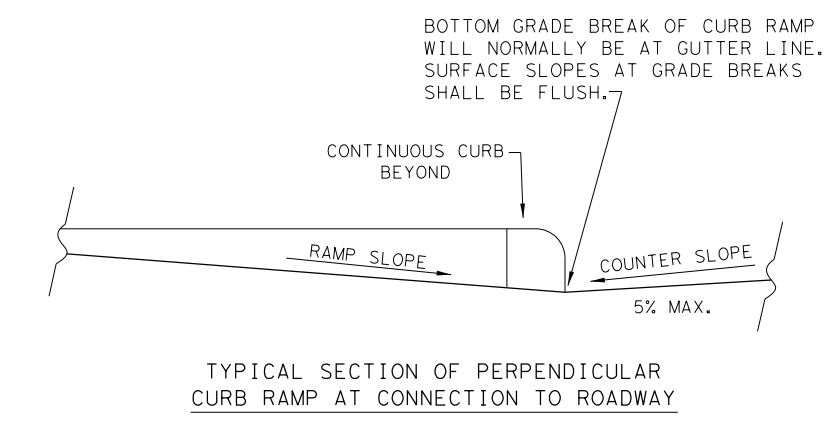
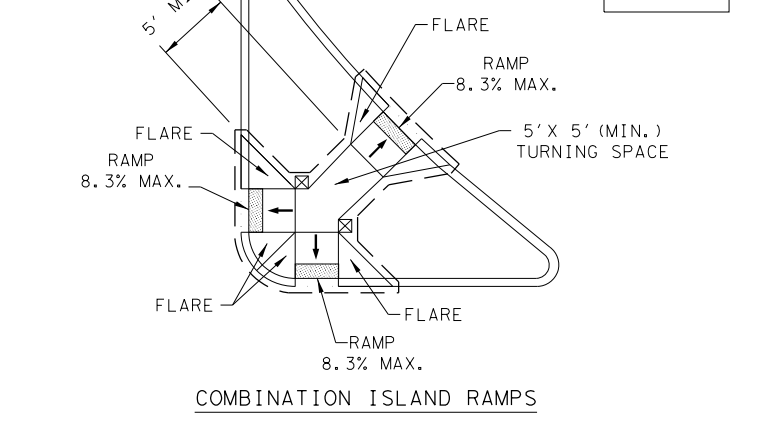
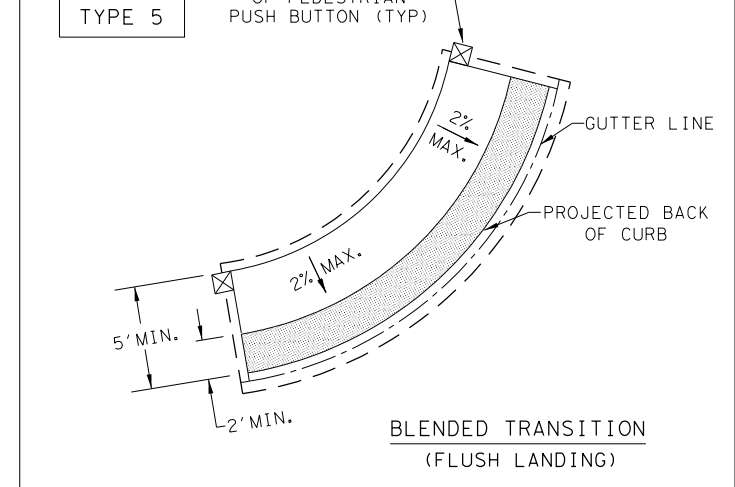
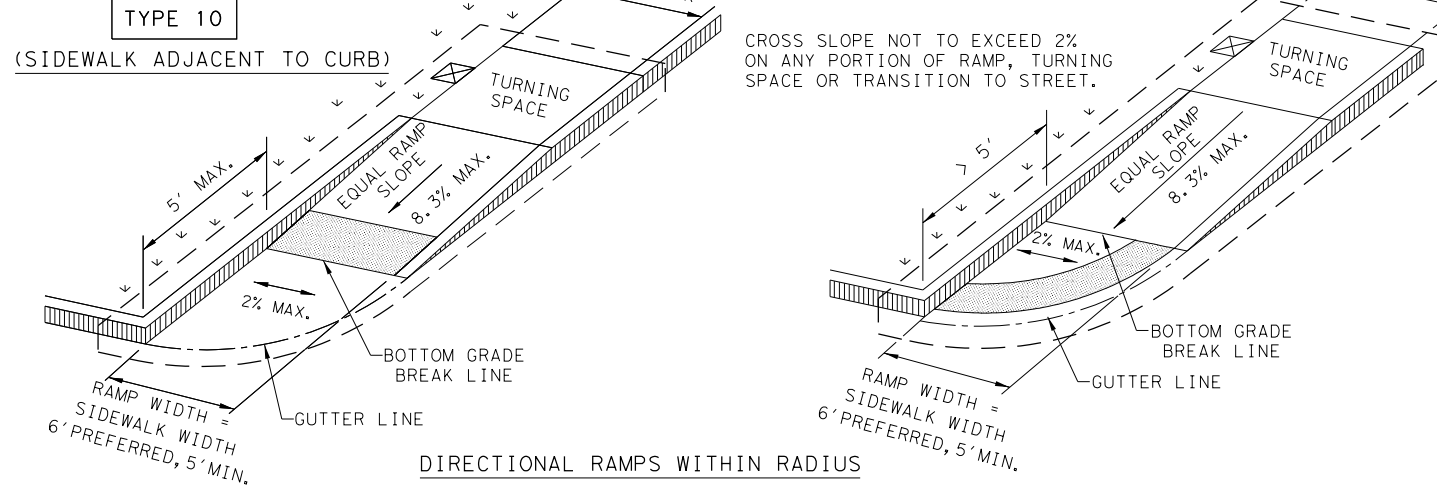
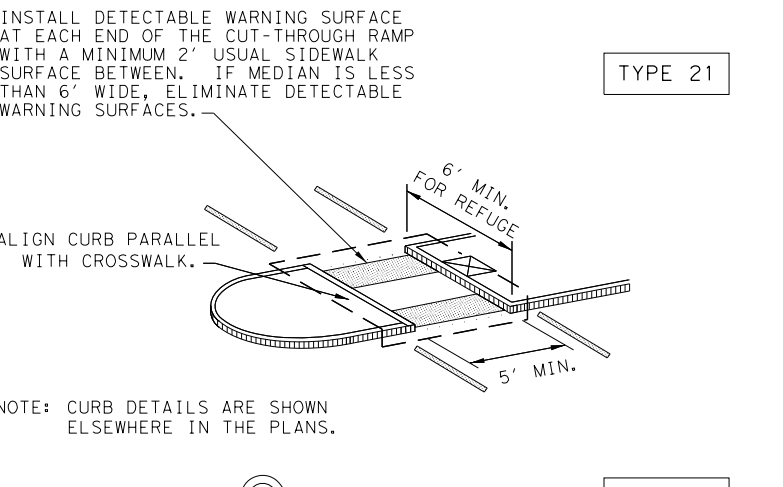
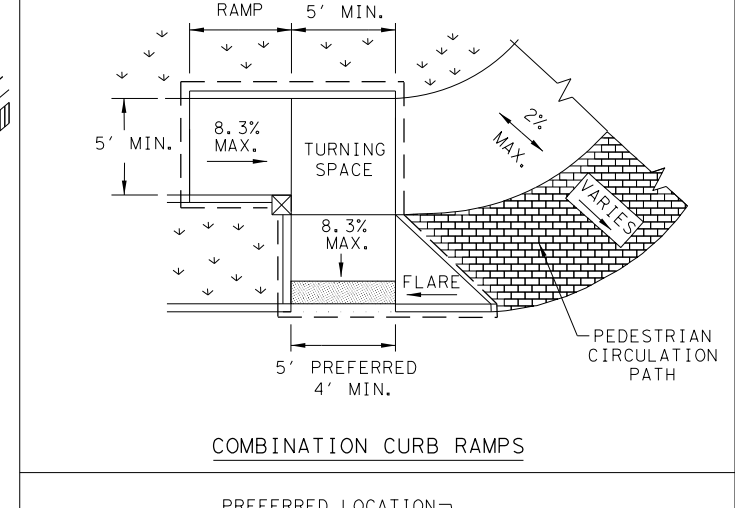
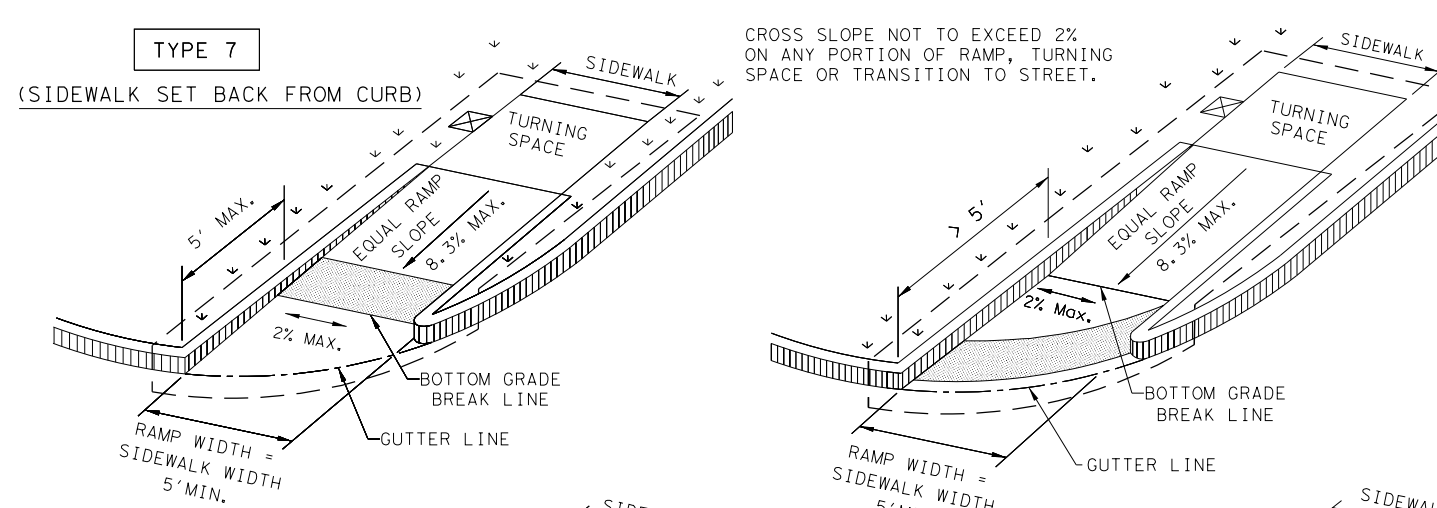
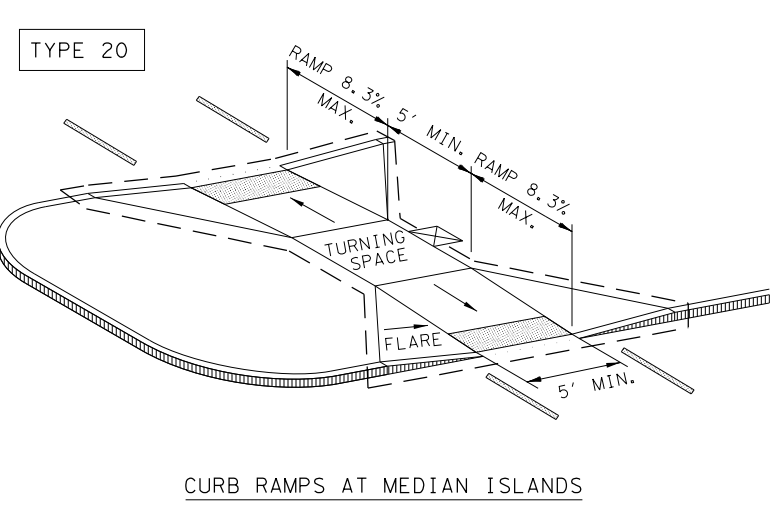
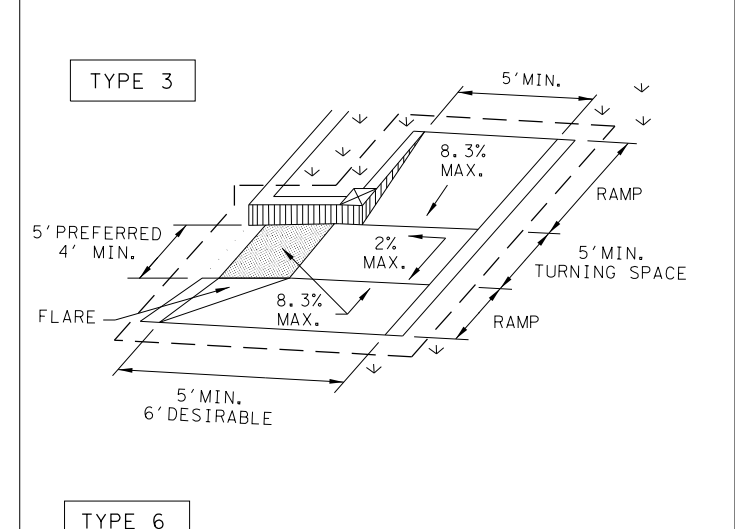
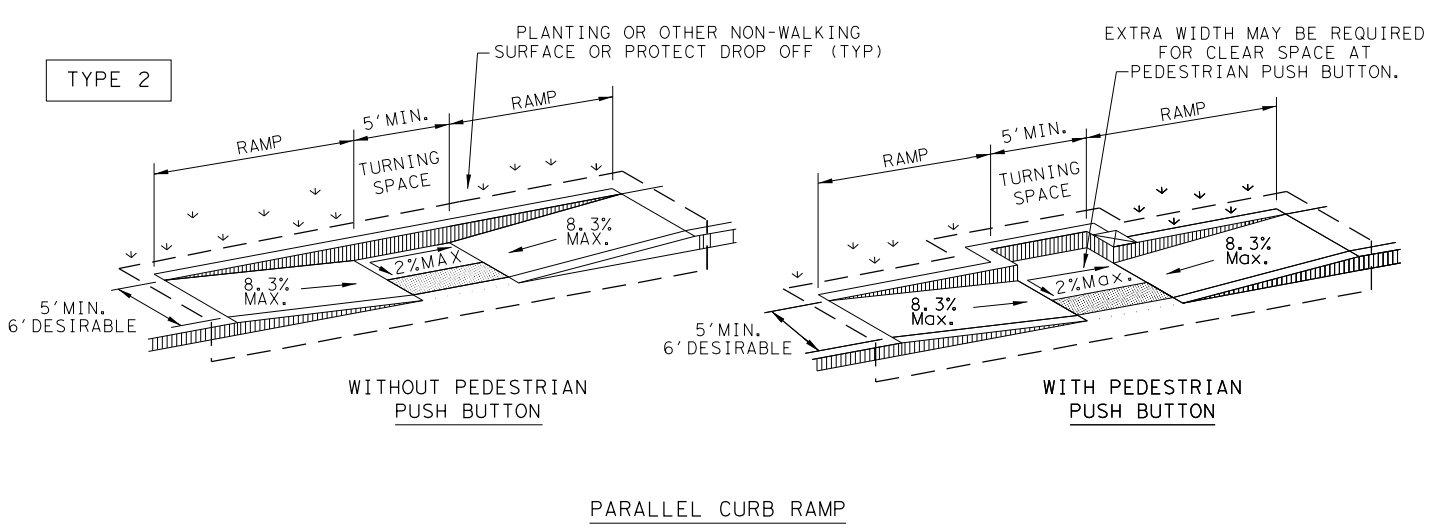
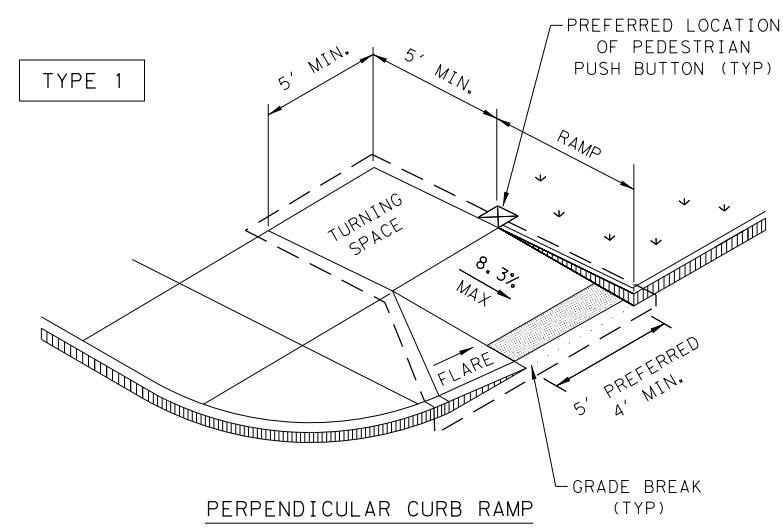
- All materials and construction shall be in accordance with Item 529, "Concrete Curb, Gutter, and Combined Curb and Gutter."
- Concrete shall be Class A.
- When reinforcing bars are used, they shall be No.4 unless otherwise shown. The use of fiber reinforced concrete in lieu of reinforcing steel is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



		Design Division Standard	
<h2>CONCRETE CURB AND GUTTER</h2>			
<h3>CCCG-22</h3>			
FILE: cccg21.dgn	DN: TxDOT	CK: AN	DW: CS
© TxDOT: JUNE 2022	CONT: 0908	SECT: 33	JOB: 106
REVISIONS		HIGHWAY: EAST S 7TH ST	
DIST: ABL	COUNTY: TAYLOR	SHEET NO. 45	

DATE: 2/7/2023
 FILE: pw://hq-pw\int01.a-e.transyscorp.com:transyscorp-pw1/Documents/Projects_2022\FW202\202220046\Road\Standard Sheets\ped18.dgn

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NOTES / LEGEND:
 SEE GENERAL NOTES ON SHEET 2 OF 4 FOR MORE INFORMATION.

DENOTES PLANTING OR NON-WALKING SURFACE NOT PART OF PEDESTRIAN CIRCULATION PATH.

 DETECTABLE WARNING SURFACE

 DENOTES PREFERRED LOCATION OF PEDESTRIAN PUSH BUTTON IF APPLICABLE.

 GUTTER LINE

 GRADE BREAK

 RAMP LIMITS OF PAYMENT

SHEET 1 OF 4

Design Division Standard

**PEDESTRIAN FACILITIES
 CURB RAMPS
 PED-18**

FILE: ped18	DN: TxDOT	DW: VP	CK: KM	CK: PK & JG
© TxDOT: MARCH, 2002	CONT	SECT	JOB	HIGHWAY
REVISIONS	0908	33	106	EAST S 7TH ST
REVISED 08, 2005	DIST	COUNTY		SHEET NO.
REVISED 06, 2012	ABL	TAYLOR		46
REVISED 01, 2018				

DATE: 2/7/2023
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GENERAL NOTES

CURB RAMP

1. Install a curb ramp or blended transition at each pedestrian street crossing.
2. All slopes shown are maximum allowable. Cross slopes of 1.5% and lesser running should be used. Adjust curb ramp length or grade of approach sidewalks as directed.
3. Maximum allowable cross slope on sidewalk and curb ramp surfaces is 2%.
4. The minimum sidewalk width is 5'. Where the sidewalk is adjacent to the back of curb, a 6' sidewalk width is desirable. Where a 5' sidewalk cannot be provided due to site constraints, sidewalk width may be reduced to 4' for short distances. 5' x 5' passing areas at intervals not to exceed 200' are required.
5. Turning Spaces shall be 5' x 5' minimum. Cross slope shall be maximum 2%.
6. Clear space at the bottom of curb ramps shall be a minimum of 4' x 4' wholly contained within the crosswalk and wholly outside the parallel vehicular travel path.
7. Provide flared sides where the pedestrian circulation path crosses the curb ramp. Flared sides shall be sloped at 10% maximum, measured parallel to the curb. Returned curbs may be used only where pedestrians would not normally walk across the ramp, either because the adjacent surface is planted, substantially obstructed, or otherwise protected.
8. Additional information on curb ramp location, design, light reflective value and texture may be found in the latest draft of the Proposed Guidelines for Pedestrian Facilities in the Public Right of Way (PROWAG) as published by the U.S. Architectural and Transportation Barriers Compliance Board (Access Board).
9. To serve as a pedestrian refuge area, the median should be a minimum of 6' wide, measured from back of curbs. Medians should be designed to provide accessible passage over or through them.
10. Small channelization islands, which do not provide a minimum 5' x 5' landing at the top of curb ramps, shall be cut through level with the surface of the street.
11. Crosswalk dimensions, crosswalk markings and stop bar locations shall be as shown elsewhere in the plans. At intersections where crosswalk markings are not required, curb ramps shall align with theoretical crosswalks unless otherwise directed.
12. Provide curb ramps to connect the pedestrian access route at each pedestrian street crossing. Handrails are not required on curb ramps.
13. Curb ramps and landings shall be constructed and paid for in accordance with Item 531 "Sidewalks".
14. Place concrete at a minimum depth of 5" for ramps, flares and landings, unless otherwise directed.
15. Furnish and install No. 3 reinforcing steel bars at 18" o.c. both ways, unless otherwise directed.
16. Provide a smooth transition where the curb ramps connect to the street.
17. Curbs shown on sheet 1 within the limits of payment are considered part of the curb ramp for payment, whether it is concrete curb, gutter, or combined curb and gutter.
18. Existing features that comply with applicable standards may remain in place unless otherwise shown on the plans.

DETECTABLE WARNING MATERIAL

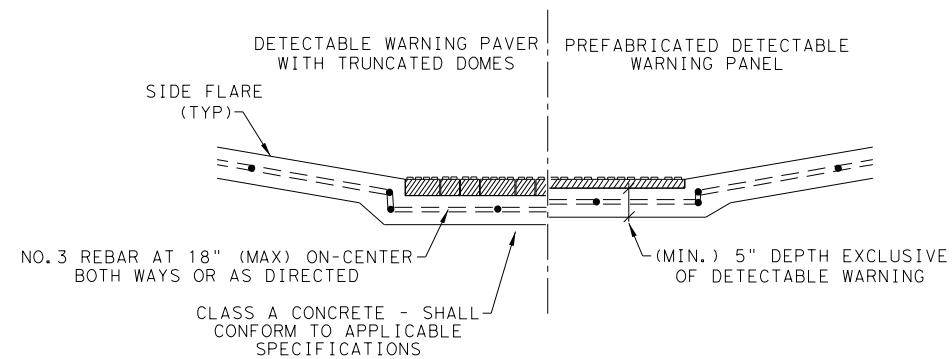
19. Curb ramps must contain a detectable warning surface that consists of raised truncated domes complying with PROWAG. The surface must contrast visually with adjoining surfaces, including side flares. Furnish and install an approved cast-in-place dark brown or dark red detectable warning surface material adjacent to uncolored concrete, unless specified elsewhere in the plans.
20. Detectable Warning Materials must meet TxDOT Departmental Materials Specification DMS 4350 and be listed on the Material Producer List. Install products in accordance with manufacturer's specifications.
21. Detectable warning surfaces must be firm, stable and slip resistant.
22. Detectable warning surfaces shall be a minimum of 24 inches in depth in the direction of pedestrian travel, and extend the full width of the curb ramp or landing where the pedestrian access route enters the street.
23. Detectable warning surfaces shall be located so that the edge nearest the curb line is at the back of curb and neither end of that edge is greater than 5 feet from the back of curb. Detectable warning surfaces may be curved along the corner radius.
24. Shaded areas on Sheet 1 of 4 indicate the approximate location for the detectable warning surface for each curb ramp type.

DETECTABLE WARNING PAVERS (IF USED)

25. Furnish detectable warning paver units meeting all requirements of ASTM C-936, C-33. Lay in a two by two unit basket weave pattern or as directed.
26. Lay full-size units first followed by closure units consisting of at least 25 percent (25%) of a full unit. Cut detectable warning paver units using a power saw.

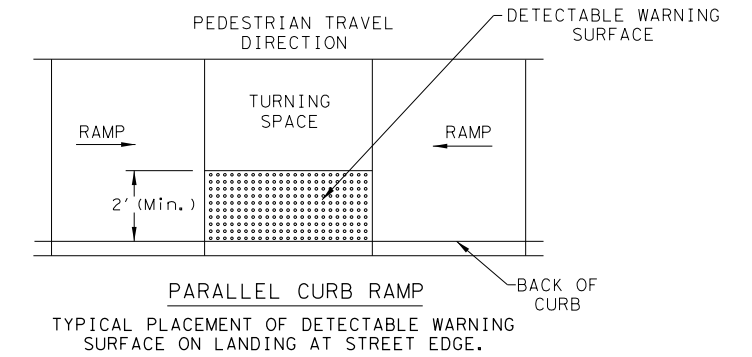
SIDEWALKS

27. Provide clear ground space at operable parts, including pedestrian push buttons. Operable parts shall be placed within unobstructed reach range specified in PROWAG section R406.
28. Place traffic signal or illumination poles, ground boxes, controller boxes, signs, drainage facilities and other items so as not to obstruct the pedestrian access route or clear ground space.
29. Street grades and cross slopes shall be as shown elsewhere in the plans.
30. Changes in level greater than 1/4 inch are not permitted.
31. The least possible grade should be used to maximize accessibility. The running slope of sidewalks and crosswalks within the public right of way may follow the grade of the parallel roadway. Where a continuous grade greater than five percent (5%) must be provided, handrails may be desirable to improve accessibility. Handrails may also be needed to protect pedestrians from potentially hazardous conditions. If provided, handrails shall comply with PROWAG R409.
32. Handrail extensions shall not protrude into the usable landing area or into intersecting pedestrian routes.
33. Driveways and turnouts shall be constructed and paid for in accordance with Item "Intersections, Driveways and Turnouts". Sidewalks shall be constructed and paid for in accordance with Item, "Sidewalks".
34. Sidewalk details are shown elsewhere in the plans.

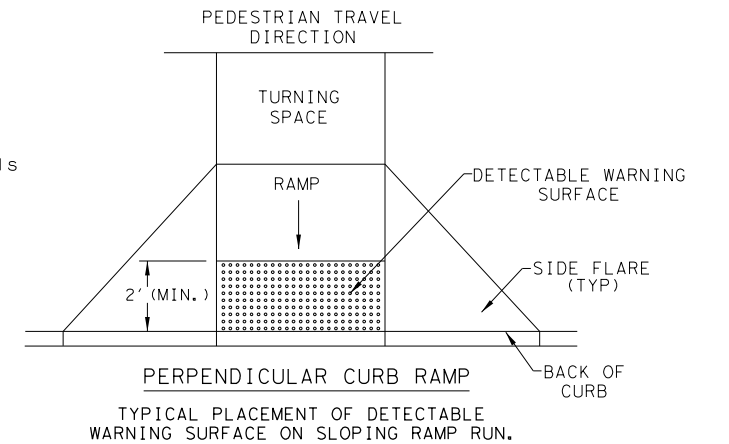


SECTION VIEW DETAIL
CURB RAMP AT DETECTIBLE WARNINGS

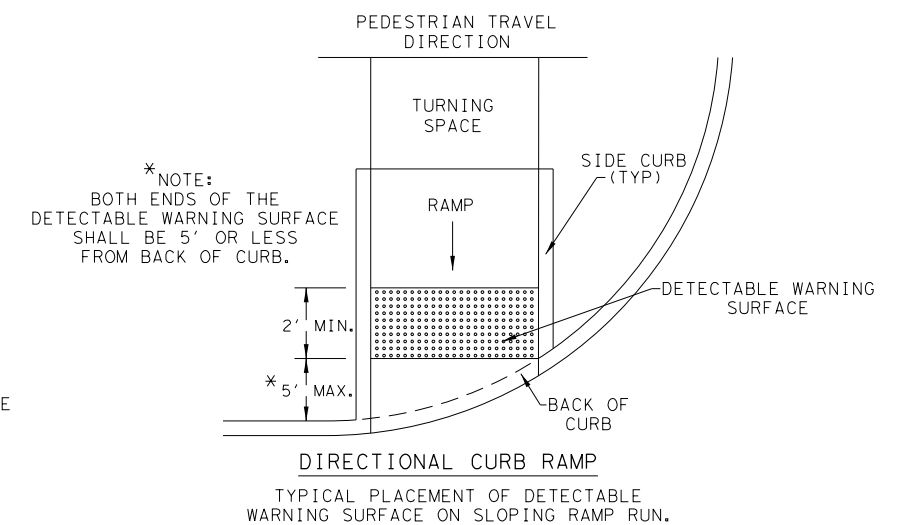
DETECTABLE WARNING SURFACE DETAILS



PARALLEL CURB RAMP
TYPICAL PLACEMENT OF DETECTABLE WARNING SURFACE ON LANDING AT STREET EDGE.



PERPENDICULAR CURB RAMP
TYPICAL PLACEMENT OF DETECTABLE WARNING SURFACE ON SLOPING RAMP RUN.



DIRECTIONAL CURB RAMP
TYPICAL PLACEMENT OF DETECTABLE WARNING SURFACE ON SLOPING RAMP RUN.

* NOTE:
BOTH ENDS OF THE
DETECTABLE WARNING SURFACE
SHALL BE 5' OR LESS
FROM BACK OF CURB.

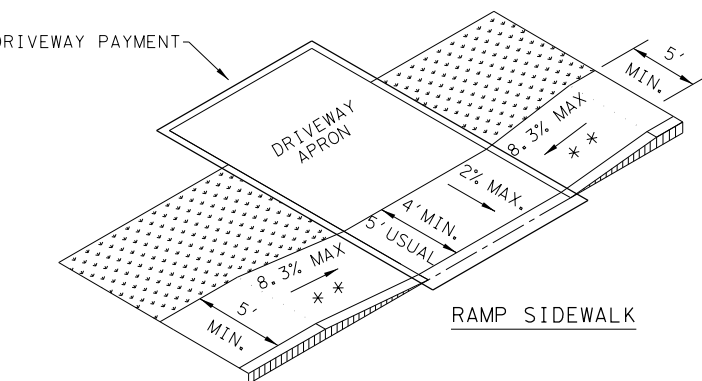
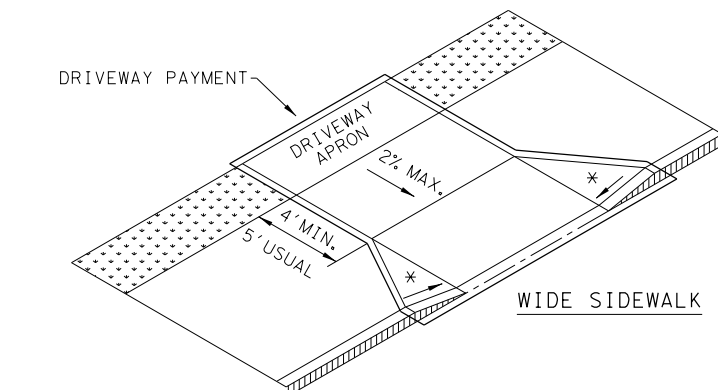
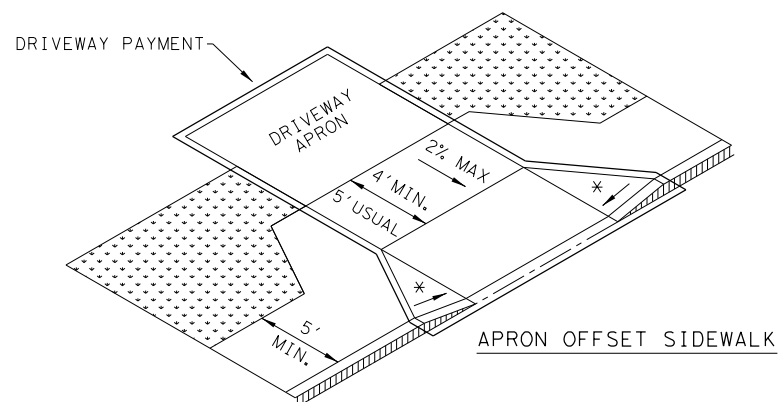
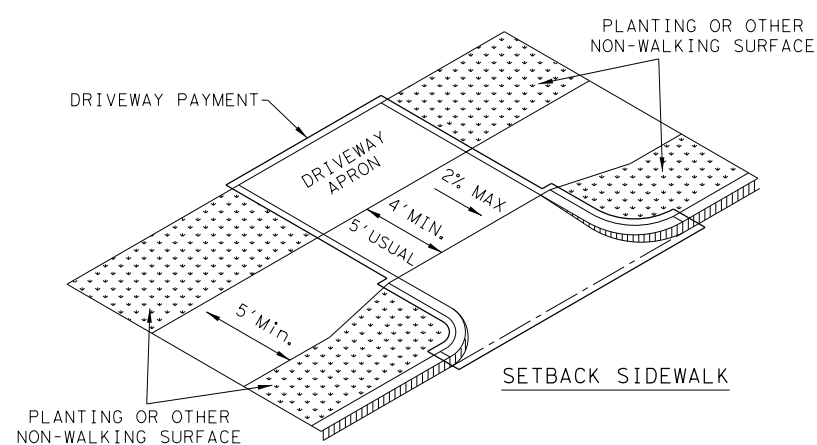
SHEET 2 OF 4

Texas Department of Transportation		Design Division Standard		
PEDESTRIAN FACILITIES CURB RAMPS PED-18				
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© TxDOT: MARCH, 2002	CONT	SECT	JOB	HIGHWAY
REVISIONS	0908	33	106	EAST S 7TH ST
REVISED 08, 2005	DIST	COUNTY	SHEET NO.	
REVISED 06, 2012	ABL	TAYLOR	47	
REVISED 01, 2018				

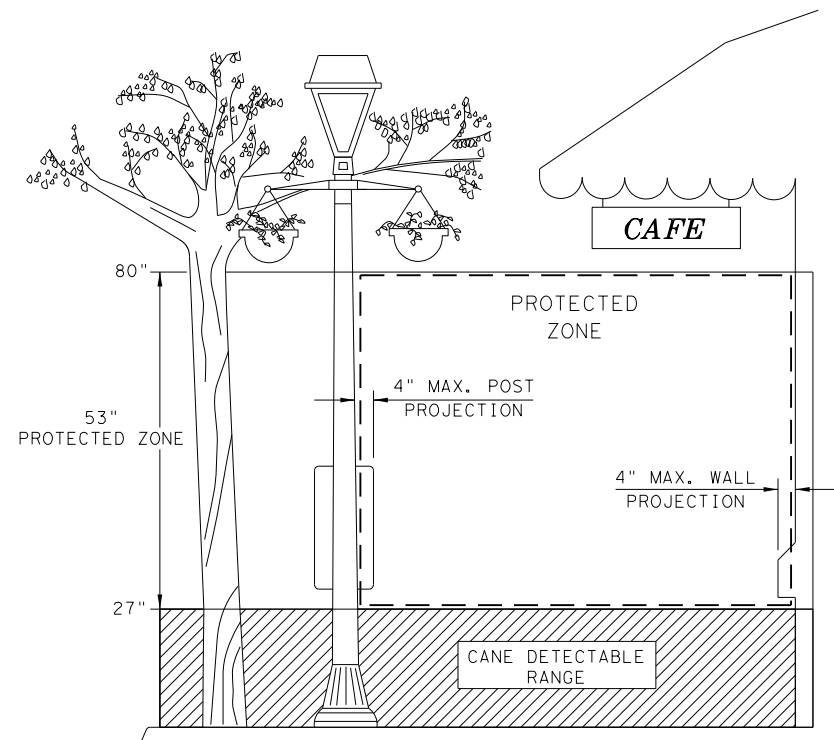
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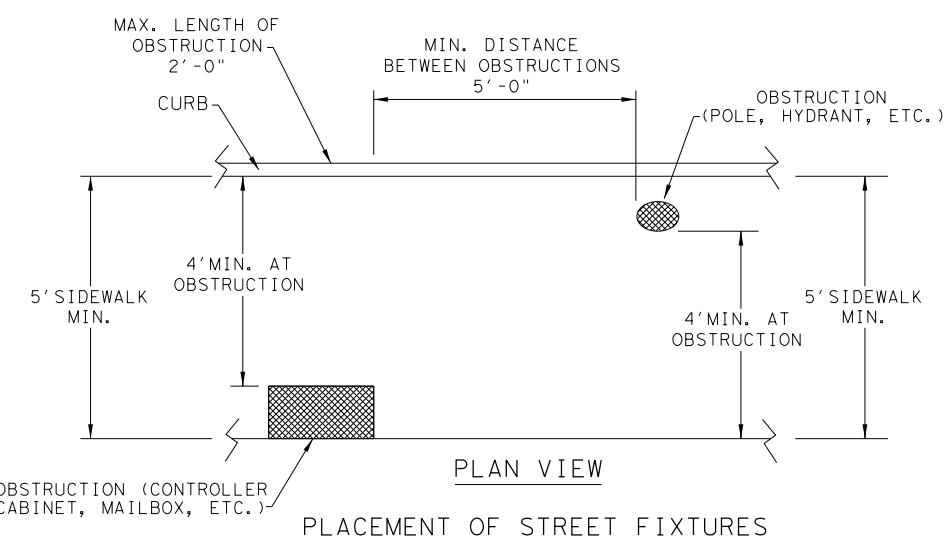
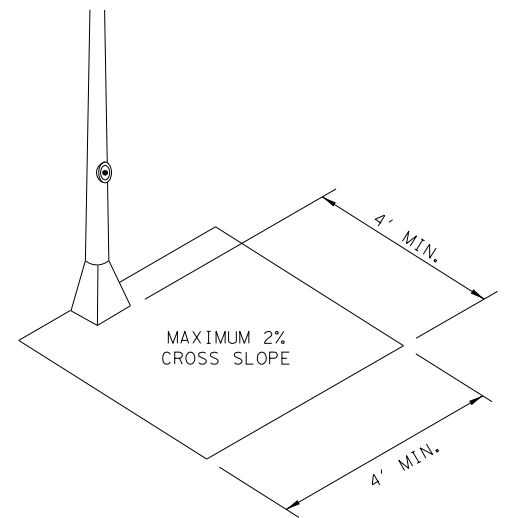
SIDEWALK TREATMENT AT DRIVEWAYS



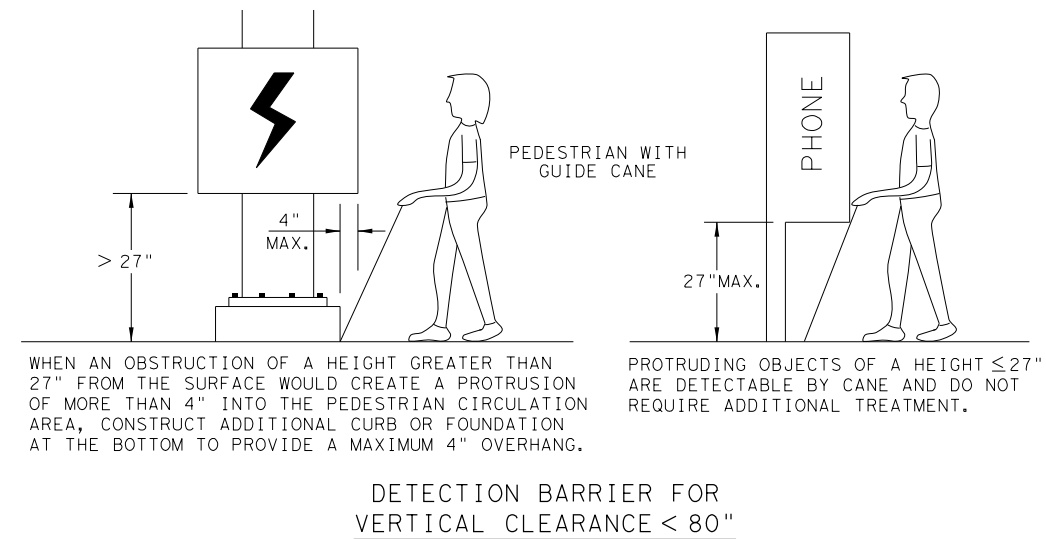
NOTES:
 * WHERE DRIVEWAYS CROSS THE PEDESTRIAN ROUTE, SIDES SHALL BE FLARED AT 10% MAX SLOPE.
 * * IF CURB HEIGHT IS GREATER THAN 6 INCHES, USE GRADE LESS THAN OR EQUAL TO 5%. HANDRAIL AND DETECTABLE WARNING ARE NOT REQUIRED.



NOTE: IN PEDESTRIAN CIRCULATION AREA, MAXIMUM 4" PROJECTION FOR POST OR WALL MOUNTED OBJECTS BETWEEN 27" AND 80" ABOVE THE SURFACE.



NOTE: ITEMS NOT INTENDED FOR PUBLIC USE. MINIMUM 4' X 4' CLEAR GROUND SPACE REQUIRED AT PUBLIC USE FIXTURES.



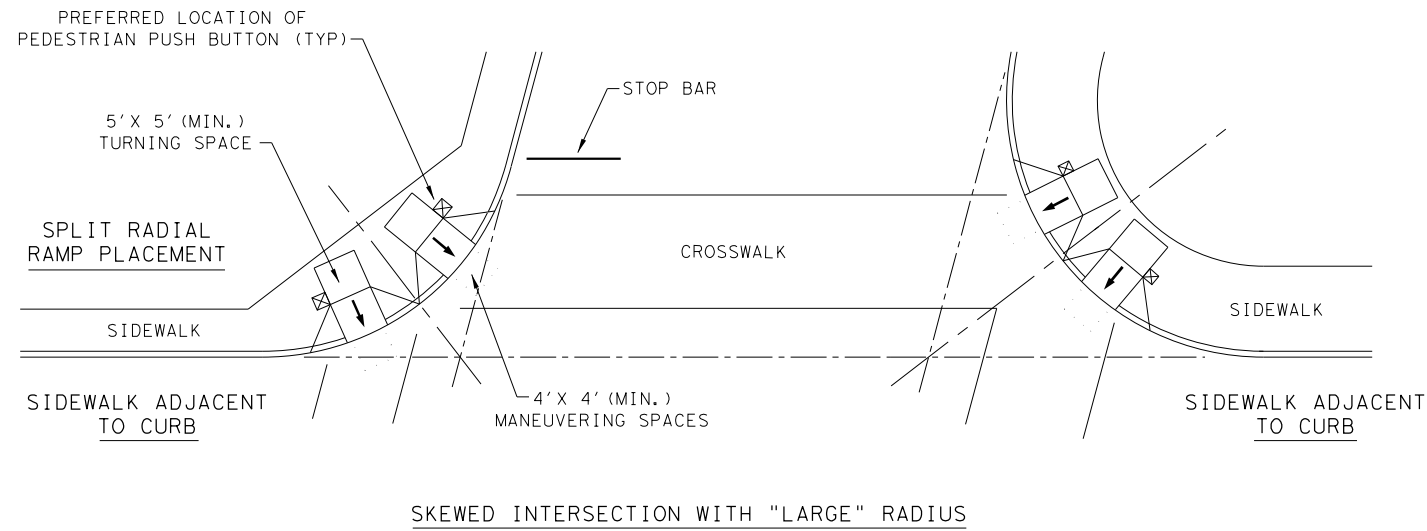
WHEN AN OBSTRUCTION OF A HEIGHT GREATER THAN 27" FROM THE SURFACE WOULD CREATE A PROTRUSION OF MORE THAN 4" INTO THE PEDESTRIAN CIRCULATION AREA, CONSTRUCT ADDITIONAL CURB OR FOUNDATION AT THE BOTTOM TO PROVIDE A MAXIMUM 4" OVERHANG.

PROTRUDING OBJECTS OF A HEIGHT ≤ 27" ARE DETECTABLE BY CANE AND DO NOT REQUIRE ADDITIONAL TREATMENT.

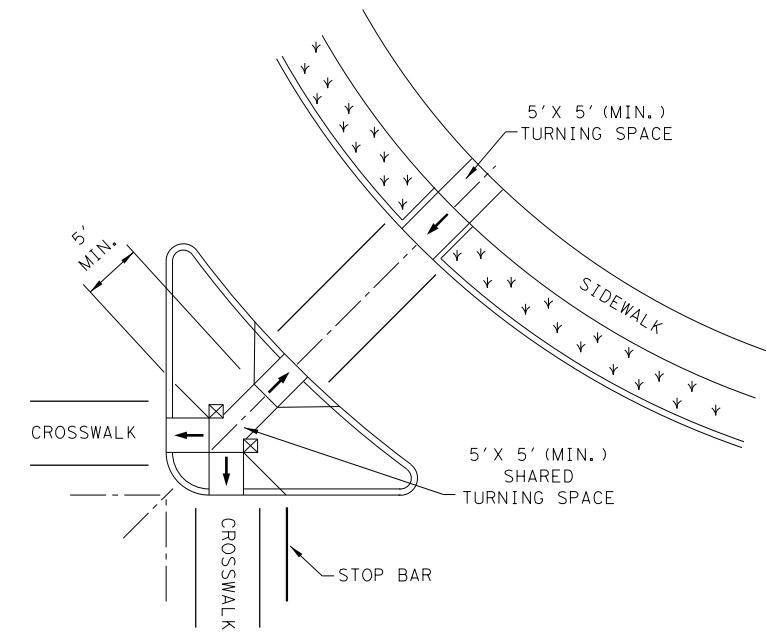
SHEET 3 OF 4

		Design Division Standard	
<h1>PEDESTRIAN FACILITIES</h1> <h2>CURB RAMPS</h2> <h3>PED-18</h3>			
FILE: ped18	DN: TxDOT	DW: VP	CK: KM
© TxDOT: MARCH, 2002	CONT	SECT	JOB
REVISIONS	0908	33	106
REVISOR	DIST	COUNTY	SHEET NO.
ABL	TAYLOR		48

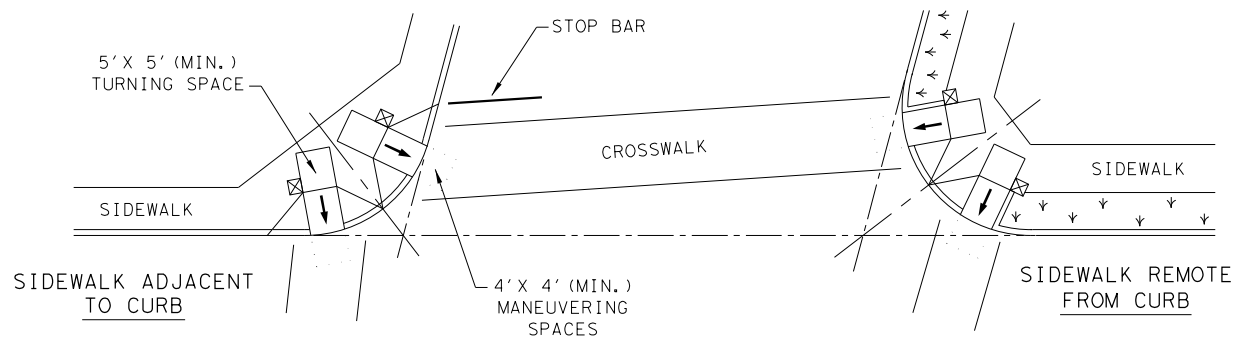
TYPICAL CROSSING LAYOUTS
SEE SHEET 1 OF 4 FOR DETAILS AND DIMENSIONS



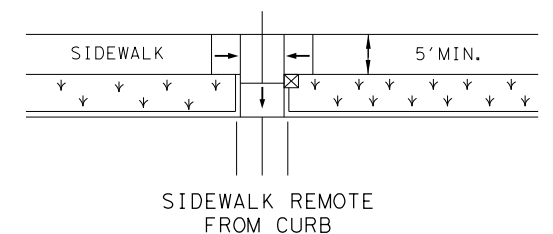
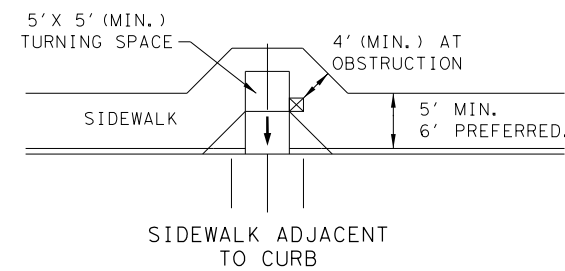
SKewed INTERSECTION WITH "LARGE" RADIUS



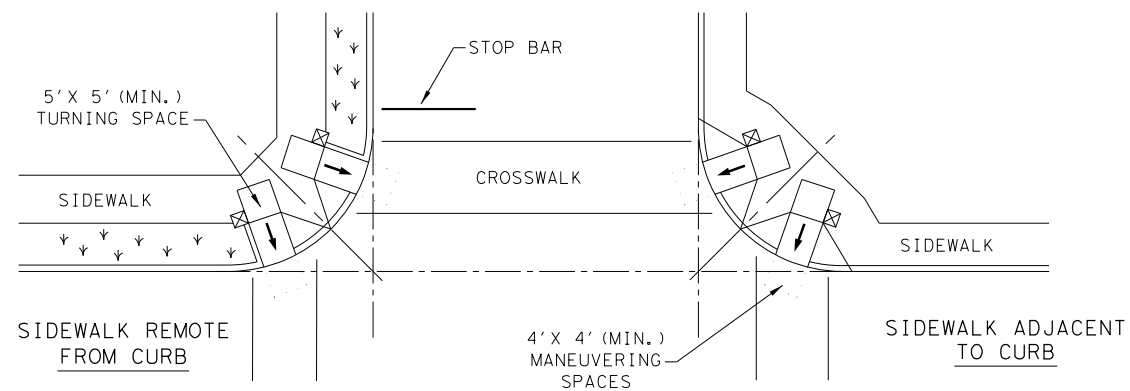
AT INTERSECTION
W/FREE RIGHT TURN & ISLAND



SKewed INTERSECTION WITH "SMALL" RADIUS



MID-BLOCK PLACEMENT
PERPENDICULAR RAMPS



NORMAL INTERSECTION WITH "SMALL" RADIUS

LEGEND:

SHOWS DOWNWARD SLOPE. →

DENOTES PREFERRED LOCATION OF PEDESTRIAN PUSH BUTTON (IF APPLICABLE). ☒

DENOTES PLANTING OR NON-WALKING SURFACE NOT PART OF PEDESTRIAN CIRCULATION PATH. ↙ ↘ ↙ ↘ ↙ ↘

SHEET 4 OF 4



PEDESTRIAN FACILITIES
CURB RAMPS

PED-18

FILE: ped18	DN: TxDOT	DW: VP	CK: KM	CK: PK & JG
© TxDOT: MARCH, 2002	CONT	SECT	JOB	HIGHWAY
REVISIONS	0908	33	106	EAST S 7TH ST
REVISED 08, 2005	DIST	COUNTY	SHEET NO.	
REVISED 06, 2012	ABL	TAYLOR	49	
REVISED 01, 2018				

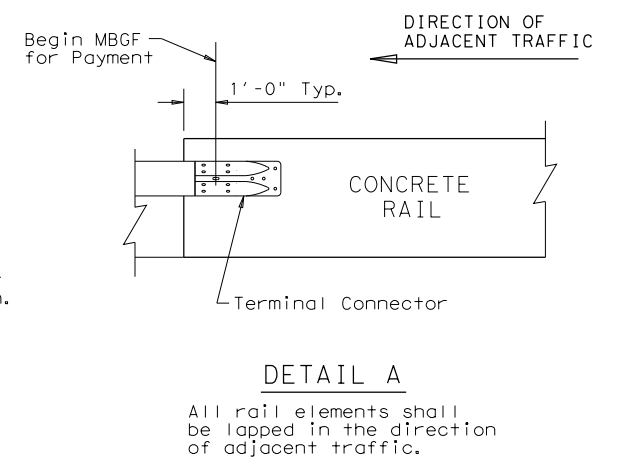
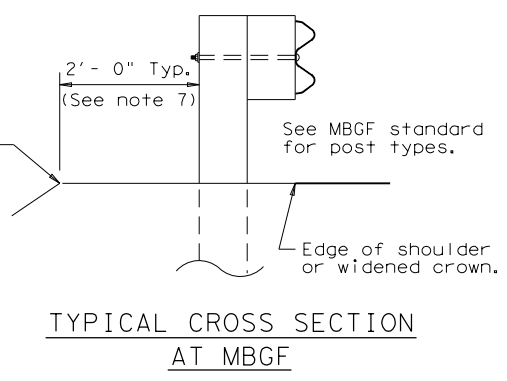
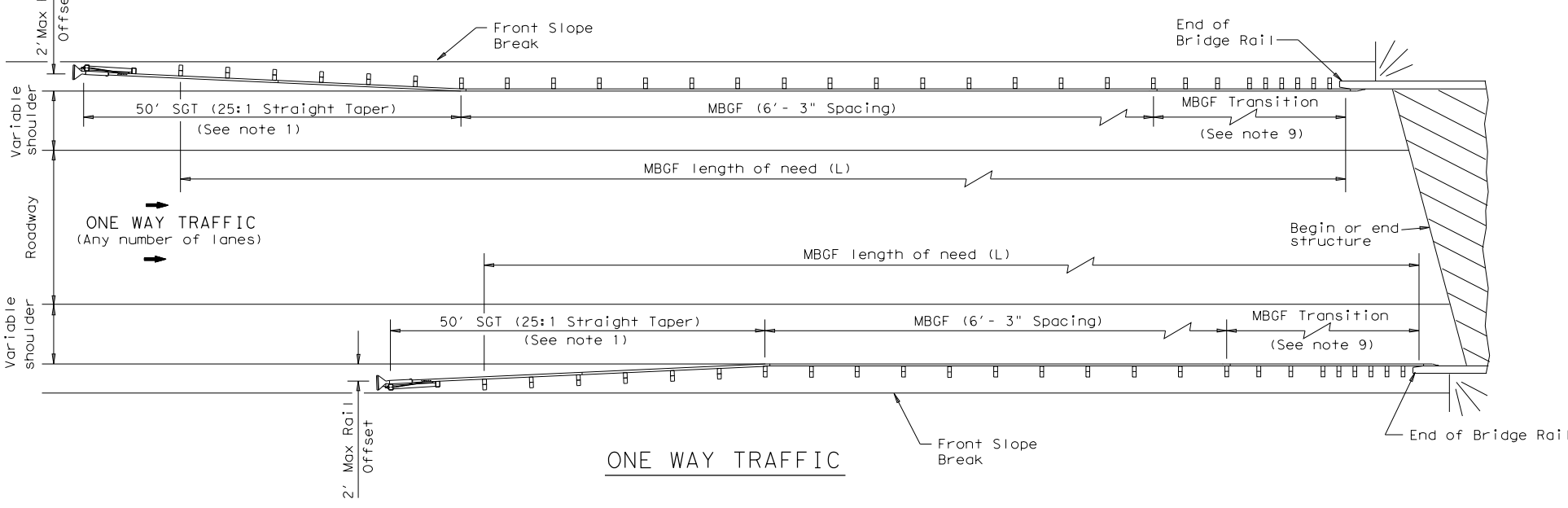
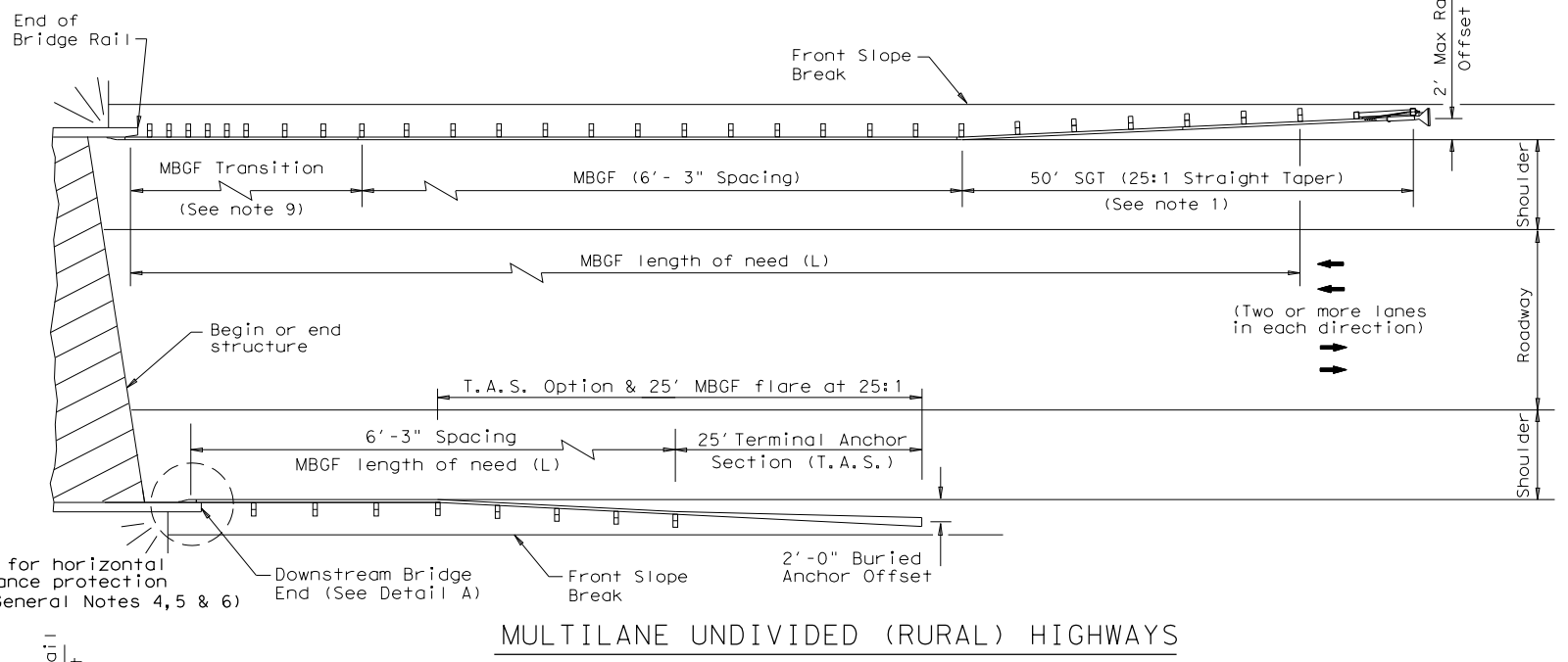
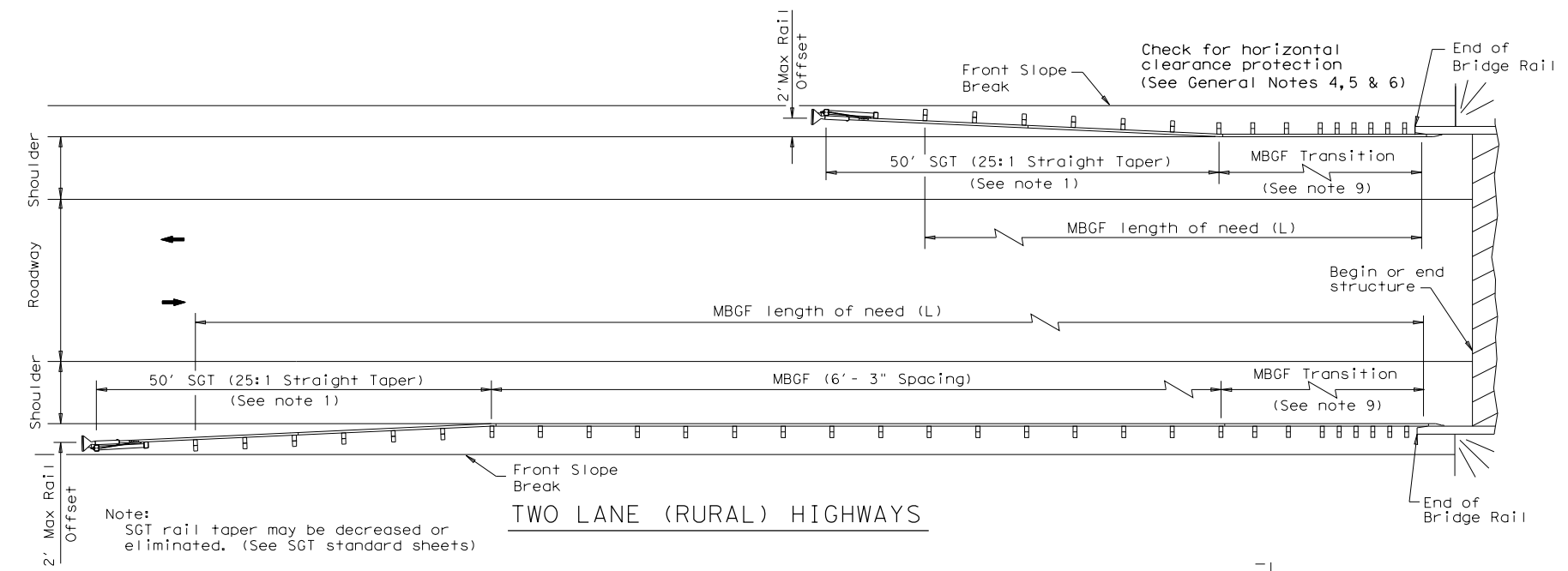
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GENERAL NOTES

1. For more detail: See MBGF, SGT, and MBGF Transition standard sheets.
2. Quantities of metal beam guard fence (MBGF) at individual bridge ends are shown elsewhere in 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. Terminal anchor sections (TAS) are only for downstream end anchorage use, outside the horizontal clearance area of opposing traffic.
6. Direct connection of MBGF (at 6'-3" post spacing without transition) to concrete rail are only for downstream rail connections outside the horizontal clearance area of opposing traffic. (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.
9. Transition length and post spacing will vary depending on the transition type. Transition type will be shown elsewhere in the plans.



ONLY FOR USE IN MAINTENANCE REPAIRS.

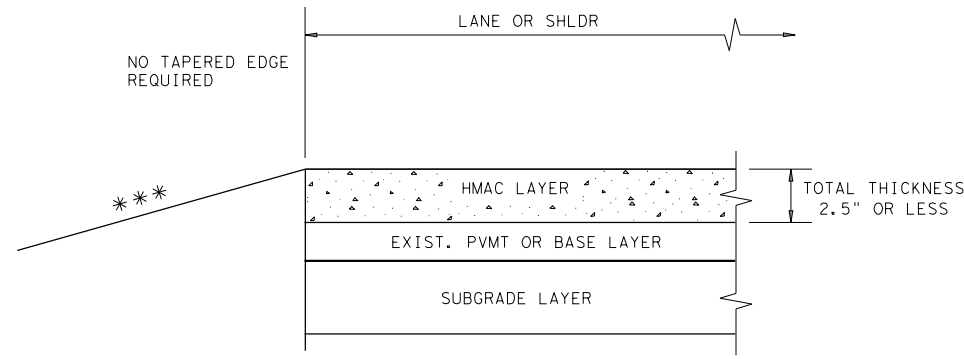


**BRIDGE END DETAILS
 (28" METAL BEAM GUARD FENCE
 APPLICATIONS TO RIGID RAILS)
 BED (28) - 19**

FILE: bed2819.dgn	DN: TXDOT	CK: KM	DW: BD	CK: VP
© TXDOT NOVEMBER 2019	CONT	SECT	JOB	HIGHWAY
REVISIONS	0908	33	106	EAST S 7TH ST
	DIST	COUNTY	SHEET NO.	
	ABL	TAYLOR	50	

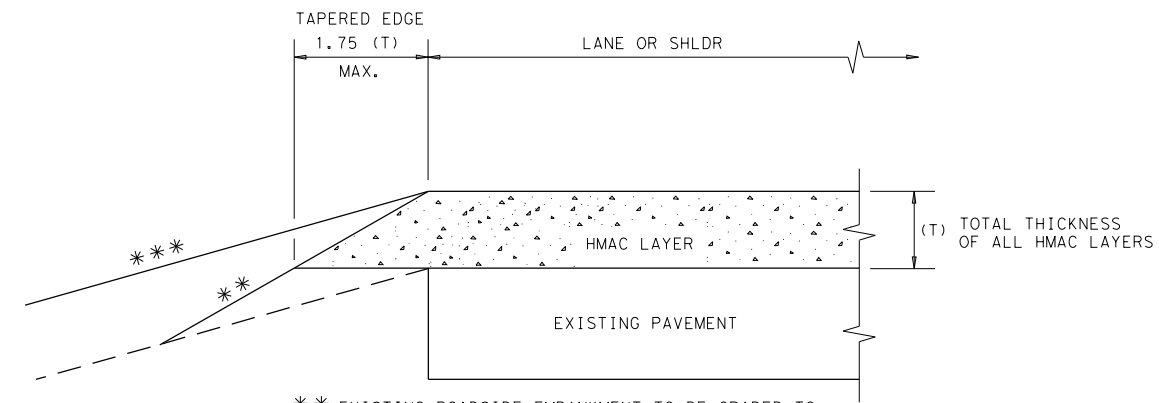
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 FILE: pw://hq-pw\int01.a-e.transyscorp.com:transyscorp-pw1/Documents/Projects/FW202/202220046/Road/Standard Sheets/tehmac11.dgn



*** SEE TYPICAL SECTION FOR ROADSIDE DETAILS

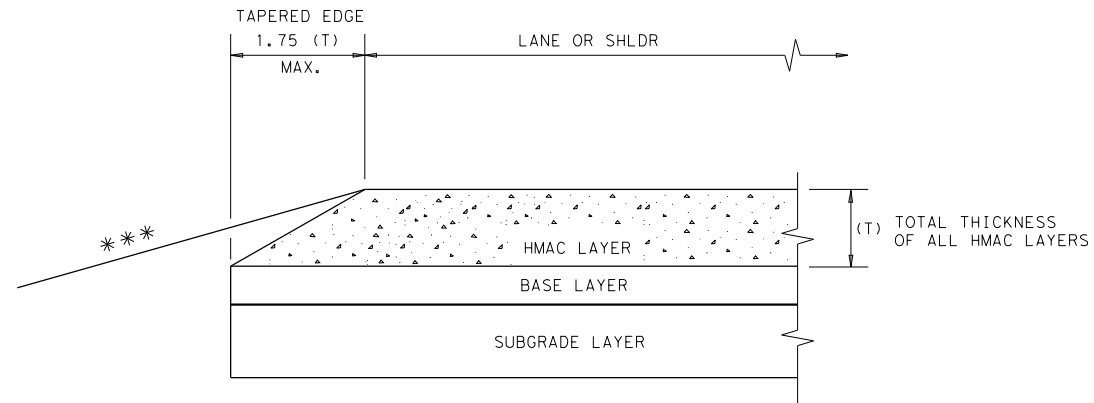
CONDITION - 1
 THIN HMAC SURFACES OR HMAC OVERLAY
 WITH THICKNESS OF 2.5" OR LESS



** 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.

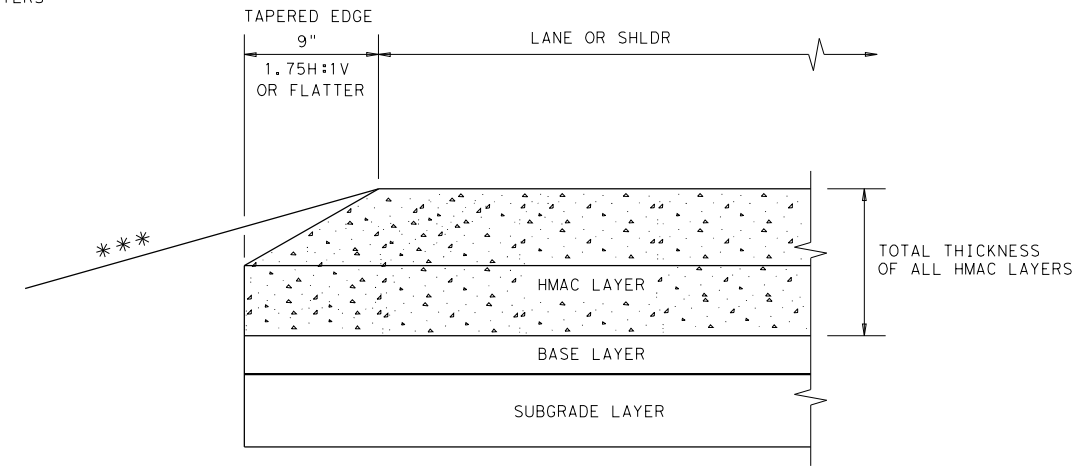
*** SEE TYPICAL SECTION FOR ROADSIDE DETAILS

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

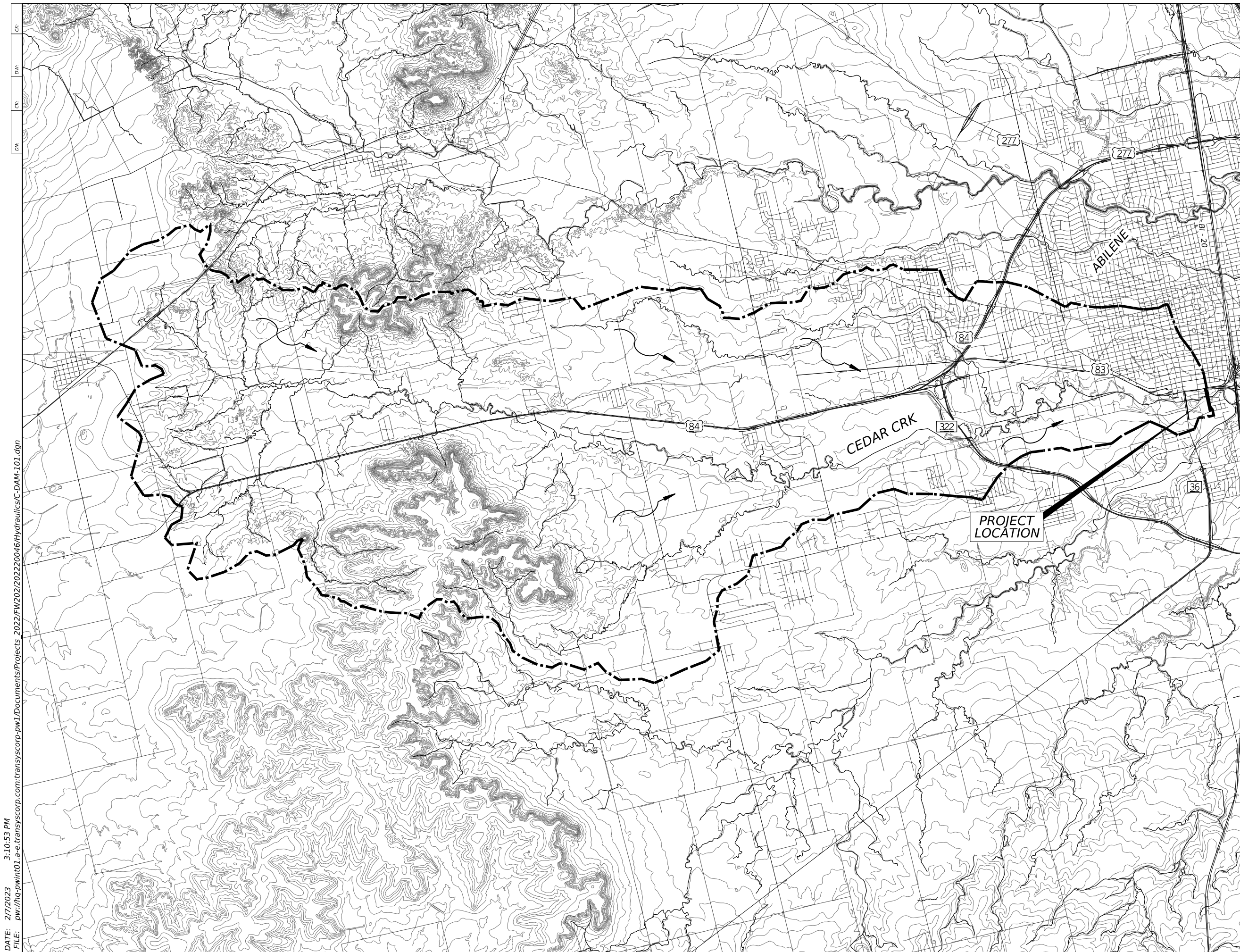
CONDITION - 4
 NEW OR RECONSTRUCTED PAVEMENT
 HMAC THICKNESS 5" OR GREATER

(NOT TO SCALE)

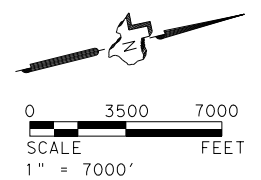
GENERAL NOTES

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.

					Design Division Standard				
TAPERED EDGE DETAILS HMAC PAVEMENT									
TE (HMAC) - 11									
FILE:	tehmac11.dgn	DN:	TxDOT	CK:	RL	DW:	KB	CK:	
© TxDOT	January 2011	CON:	0908	SECT:	33	JOB:	106	HIGHWAY:	EAST S 7TH ST
REVISIONS		DIST:	COUNTY:		SHEET NO.:				
		ABL	TAYLOR		51				



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 FILE: pw://hq-pwint01_a-e.transyscorp.com/transyscorp-pw1/Documents/Projects_2022/FW202/202220046/Hydraulics/C-DAM-101.dgn



- LEGEND**
- DRAINAGE AREA BOUNDARY
 - FLOW DIRECTION
 - STREAM

DRAINAGE AREA 60.61 Sq. Mi.

STORM FREQUENCY (YEAR)	PEAK FLOW (CFS)
10	2,000
50	7,600
100	12,400
500	20,000

- NOTES:**
- DISCHARGE FROM CURRENT FEMA FIS DATE JANUARY 6, 2012.
 - CEDAR CREEK AT EAST S 7TH STREET IS LOCATED IN FEMA ZONE AE.
 - CONTOURS ARE DERIVED FROM USGS 10 METER DEM.

REV. NO.	DATE	BY	REVISION



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 FORT WORTH, TX 76102
 (817) 339-8950
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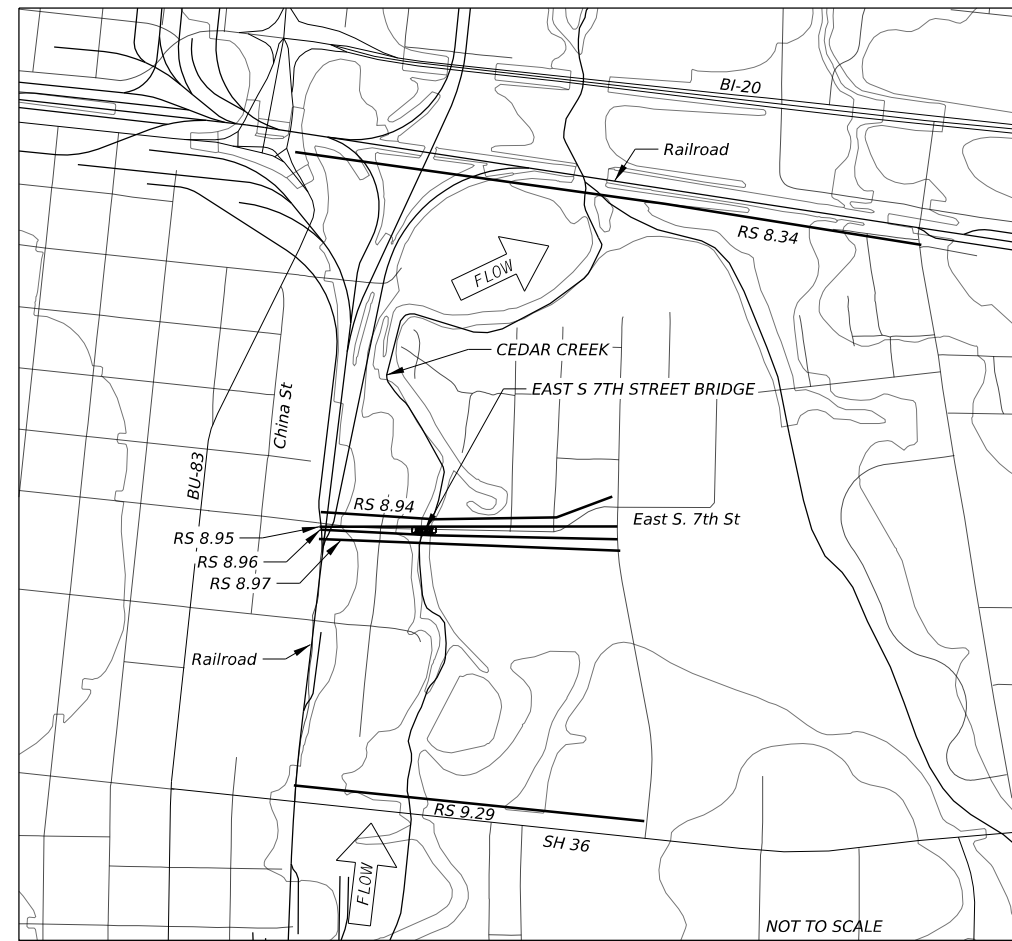
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**EAST S 7TH STREET
 DRAINAGE AREA MAP
 CEDAR CREEK BRIDGE**

SHEET 1 OF 1

CONT	SECT	JOB	HIGHWAY
0908	33	106	EAST S 7TH ST
DIST	COUNTY	SHEET NO.	
ABL	TAYLOR	52	

CK:
DW:
CK:
DW:



HEC-RAS CROSS SECTION LAYOUT MAP

HEC-RAS RIVER STATION	DOWNSTREAM REACH LENGTH (FT)	FLOW (CFS)	DESIGN FREQUENCY (50-YR)							DESIGN FREQUENCY (100-YR)							
			COMPUTED WATER SURFACE ELEVATION (FT)				CHANNEL VELOCITY (FT/S)			FLOW (CFS)	COMPUTED WATER SURFACE ELEVATION (FT)				CHANNEL VELOCITY (FT/S)		
			CURRENT EFFECTIVE	REVISED EFFECTIVE	PROPOSED	DIFF	CURRENT EFFECTIVE	REVISED EFFECTIVE	PROPOSED		CURRENT EFFECTIVE	REVISED EFFECTIVE	PROPOSED	DIFF	CURRENT EFFECTIVE	REVISED EFFECTIVE	PROPOSED
8.34	0	22100	1695.20	1695.20	1695.20	0.00	8.08	8.08	8.08	30960	1696.80	1696.80	1696.80	0.00	7.72	7.72	7.72
8.94	3168	8120	1699.16	1699.22	1699.22	0.00	1.87	1.80	1.80	12202	1700.34	1700.39	1700.39	0.00	2.17	2.10	2.10
8.95	50	8120	1699.17	1699.23	1699.23	0.00	1.18	1.17	1.14	12202	1700.36	1700.41	1700.41	0.00	1.33	1.33	1.31
8.951			S 7TH STREET BRIDGE														
8.96	50	8120	1699.18	1699.23	1699.23	0.00	1.18	1.18	1.17	12202	1700.37	1700.41	1700.41	0.00	1.33	1.34	1.33
8.97	50	8120	1699.18	1699.23	1699.23	0.00	1.82	1.88	1.88	12202	1700.36	1700.41	1700.41	0.00	2.09	2.16	2.16
9.29	1690	8120	1699.93	1699.97	1699.97	0.00	5.81	5.75	5.75	12202	1701.16	1701.20	1701.20	0.00	6.45	6.39	6.39

HYDRAULIC METHOD

HEC-RAS (V6.3.1) WAS USED TO COMPUTE THE REVISED EFFECTIVE AND PROPOSED CONDITION WATER SURFACE ELEVATIONS. THE DATA USED IN THE MODEL WAS FROM PRINTED HEC-2 DATA RECEIVED FROM FEMA. THE HEC-2 DATA WAS INPUT INTO HEC-RAS TO DEVELOP THE CURRENT EFFECTIVE MODEL. THE CONVERTED MODEL WAS REVISED WHERE NEEDED TO REFLECT THE EXISTING BRIDGE WITH UPSTREAM AND DOWNSTREAM CROSS SECTIONS. THIS UPDATED INFORMATION IS IN THE REVISED EFFECTIVE MODEL.

REVISED EFFECTIVE (EXISTING CONDITION) WATER SURFACE ELEVATIONS COMPUTED FROM HEC-RAS MODEL PLAN "EXISTING CONDITIONS" NAMED "CEDAR_57THST.P02".

PROPOSED CONDITION WATER SURFACE ELEVATIONS COMPUTED FROM HEC-RAS MODEL PLAN "PROPOSED CONDITIONS" NAMED "CEDAR_57THST.P03".

KNOWN WATER SURFACE WAS USED AS THE DOWNSTREAM BOUNDARY CONDITION FOR EXISTING AND PROPOSED CONDITIONS. THIS WAS OBTAINED FROM FIS STUDY FOR 50-YR AND 100-YR AT THE DOWNSTREAM.

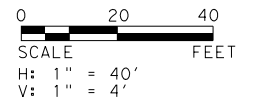
ALL HEC-RAS CROSS SECTIONS SHOWN ARE FROM ORIGINAL THE FEMA HEC-2 MODEL.

HYDROLOGIC METHOD

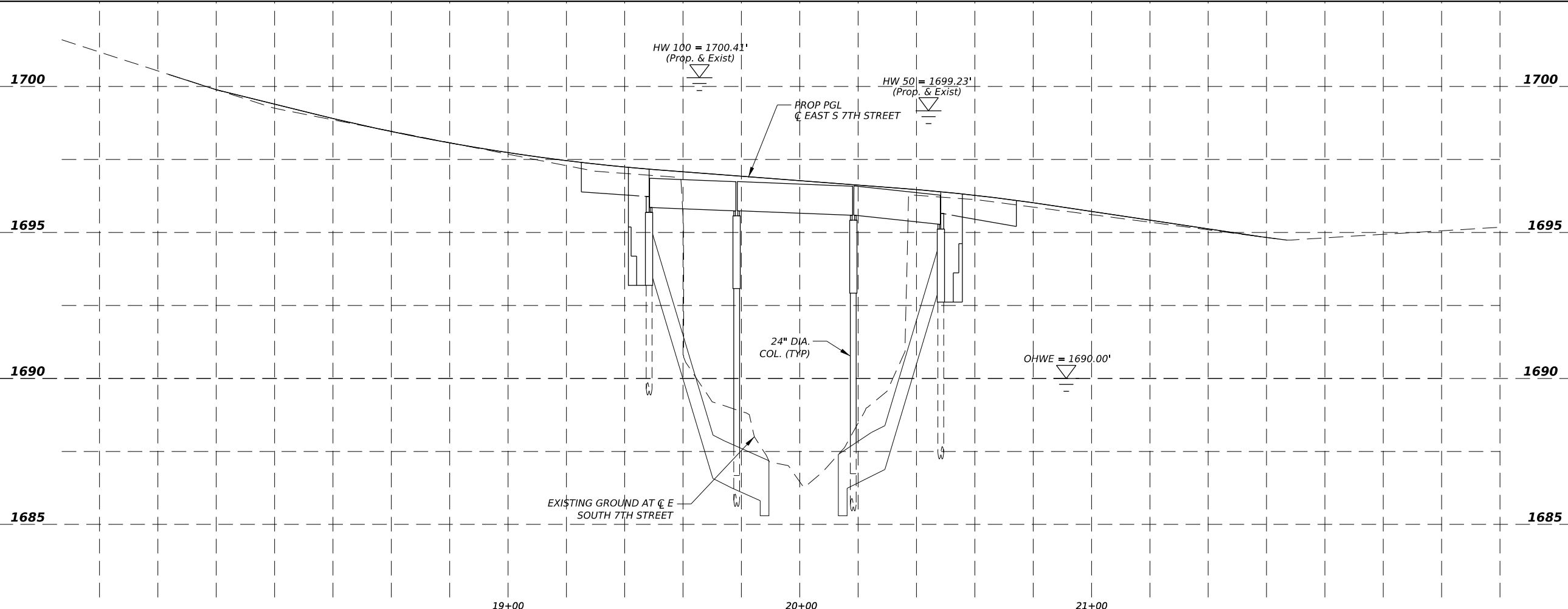
FLOWES WERE TAKEN FROM THE CURRENT FEMA HEC-2 MODEL. THE HYDROLOGIC METHOD USED FOR THE CALCULATIONS WAS NOT LISTED.

NOTES:

- PROPOSED BRIDGE IS LOCATED AT THE HEC-RAS STATION 8.95. UPSTREAM CROSS SECTION IS AT HEC-RAS STA 8.94 & DOWNSTREAM CROSS SECTION IS AT STA 8.96.
- PROPOSED BRIDGE WIDTH FOR MAIN CHANNEL INCLUDING SUP IS 36'.
- PROPOSED BRIDGE LENGTH FOR MAIN CHANNEL IS 100'.
- ALL ELEVATIONS PROVIDED ON HYDRAULIC DATA SHEET ARE REFERENCED TO NORTH AMERICA VERTICAL DATUM OF 1988 (NAVD 1988)
- EXISTING FEMA DESSIGNATION ZONE AE, FIRM PANNEL 48441C0228F, EFF. 1/6/2012
- HEC-2 MODEL WAS VERIFIED TO BE THE CURRENT FIS FLOODWAY MODEL BY FEMA RISKMAP CDS CONTRACTOR ON 10/20/2022.
- H&H DATA HAS BEEN SUBMITTED TO THE LOCAL FLOODPLAIN ADMINISTRATOR AND CITY OF ABILENE JANUARY 13, 2023.



DATE: 2/7/2023 3:11:07 PM
FILE: pw://hq-pwint01.a-e.transyscorp.com/transyscorp-pw1/Documents/Projects_2022/FW2022/202220046/Hydraulics/C-DDS-101.dgn



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STATE OF TEXAS
MICHAEL R. HOBBS
108644
PROFESSIONAL ENGINEER
02/08/2023

500 W 7th ST SUITE 1100
FORT WORTH, TX 76102
(817) 339-8950
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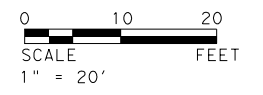
EAST S 7TH STREET

HYDRAULIC DATA SHEET

SHEET 1 OF 1

CONT	SECT	JOB	HIGHWAY
0908	33	106	EAST S 7TH ST
DIST	COUNTY	SHEET NO.	
ABL	TAYLOR	53	

CK:
DW:
CK:
DW:



SCOUR ANALYSIS - 100YR (SCOUR DESIGN)
 SCOUR ANALYSIS DETERMINED BY UTILIZING
 EQUATIONS FROM HEC-18 MANUAL, 5TH EDITION

CONTRACTION SCOUR:
 LIVE-BED CONTRACTION SCOUR EQUATIONS
 (EQNS. 6.1 & 6.2)
 D50 = 0.2 MM
 K1 = 0.69
 SCOUR DEPTH $\frac{V}{V_c}$ (CONTRACTION) = 0 FT

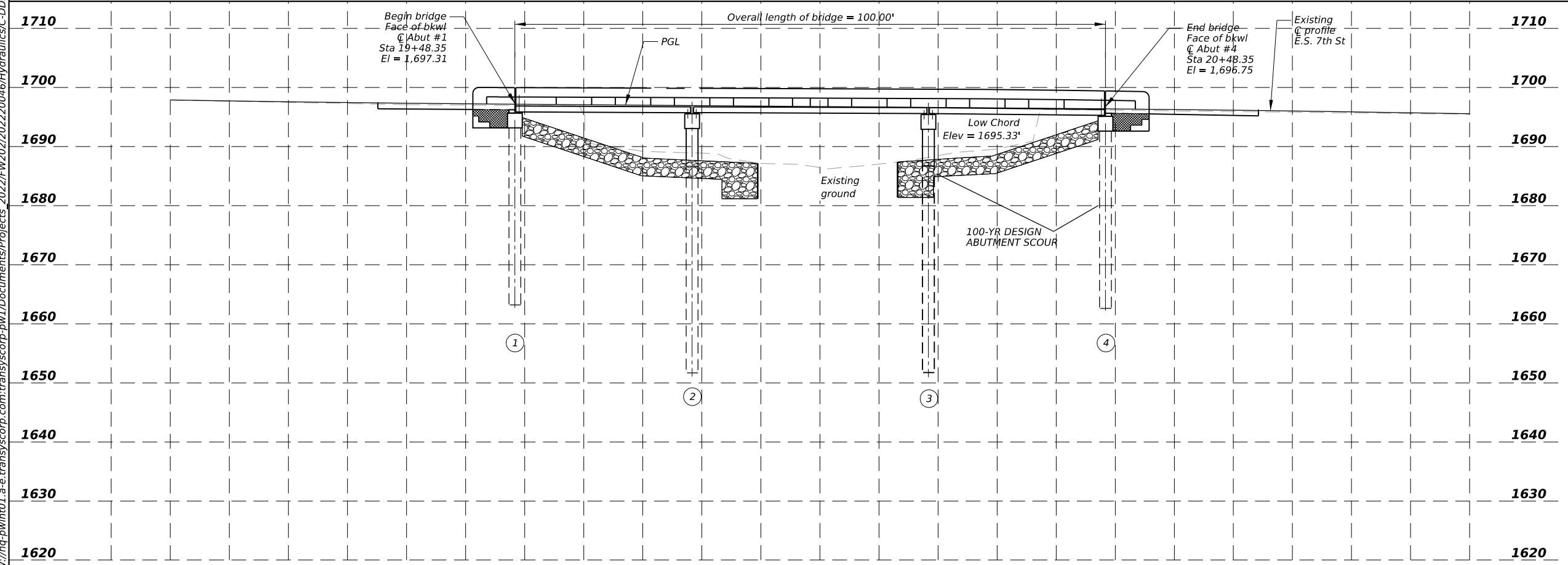
PIER SCOUR:
 APPROACH VELOCITY IS SMALLER THAN THE
 CRITICAL VELOCITY.
 NO PIER SCOUR
 SCOUR DEPTH $\frac{V}{V_c}$ (PIER) = 0 FT

ABUTMENT SCOUR:

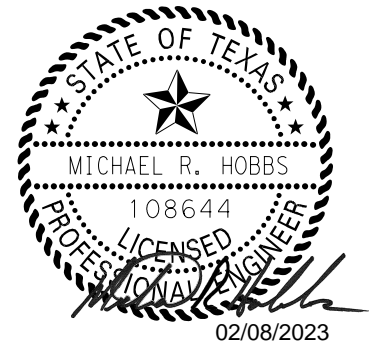
	LEFT	RIGHT
STATION AT TOE (FT):	2425.20	2525.20
TOE STA AT APPROACH (FT):	2360	2526
ABUTMENT LENGTH (FT):	0	3130.76
DEPTH AT TOE (FT):	4.52	5.08
SCOUR DEPTH $\frac{V}{V_c}$ (ABUTMENT)	0	16.39

- NOTES:
- REFER TO EAST S. 7TH STREET H&H DATA SHEET FOR CALCULATION NOTES.
 - SEE BRIDGE LAYOUT FOR DRILLED SHAFT DEPTHS.
 - SCOUR DEPTHS SHOWN ABOVE WERE CALCULATED WITH HEC-18 EQUATIONS IN HEC-RAS AND DO NOT ACCOUNT FOR POTENTIAL REDUCTIONS IN SCOUR DEPTHS ASSOCIATED WITH SHALLOW BEDROCK.
 - DETAILS OF SCOUR CALCULATIONS ARE PROVIDED IN THE DRAINAGE REPORT.
 - ABUTMENT SCOUR VALUE ASSUMES NO RIPRAP IN THE CHANNEL TO FIND THE LARGEST SCOUR VALUE.

SCOUR PROFILE



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EAST S 7TH STREET
HYDRAULIC DATA SHEET
BRIDGE SCOUR
DATA SHEET

SHEET 1 OF 1

COUNT	SECT	JOB	HIGHWAY
0908	33	106	EAST S 7TH ST
DIST	COUNTY	SHEET NO.	
ABL	TAYLOR	54	

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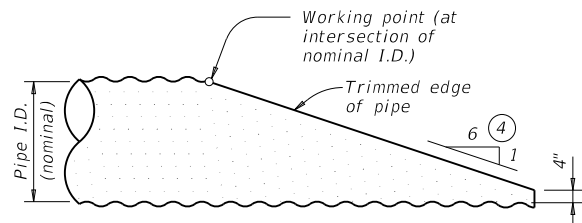
19+00

20+00

21+00

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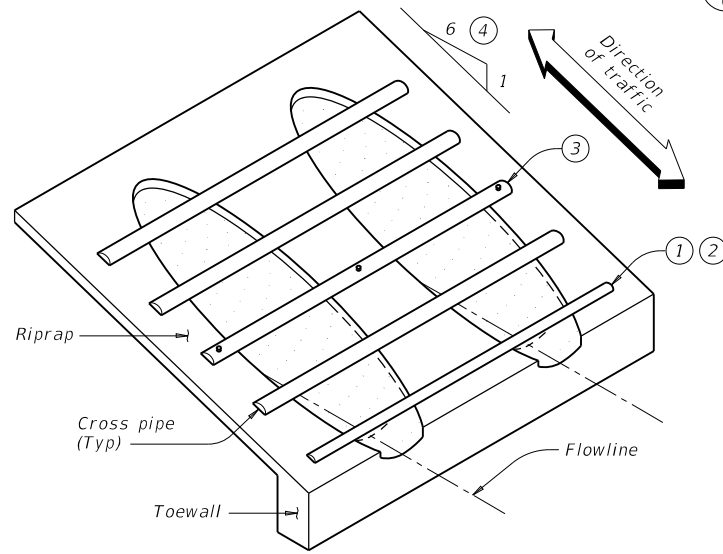
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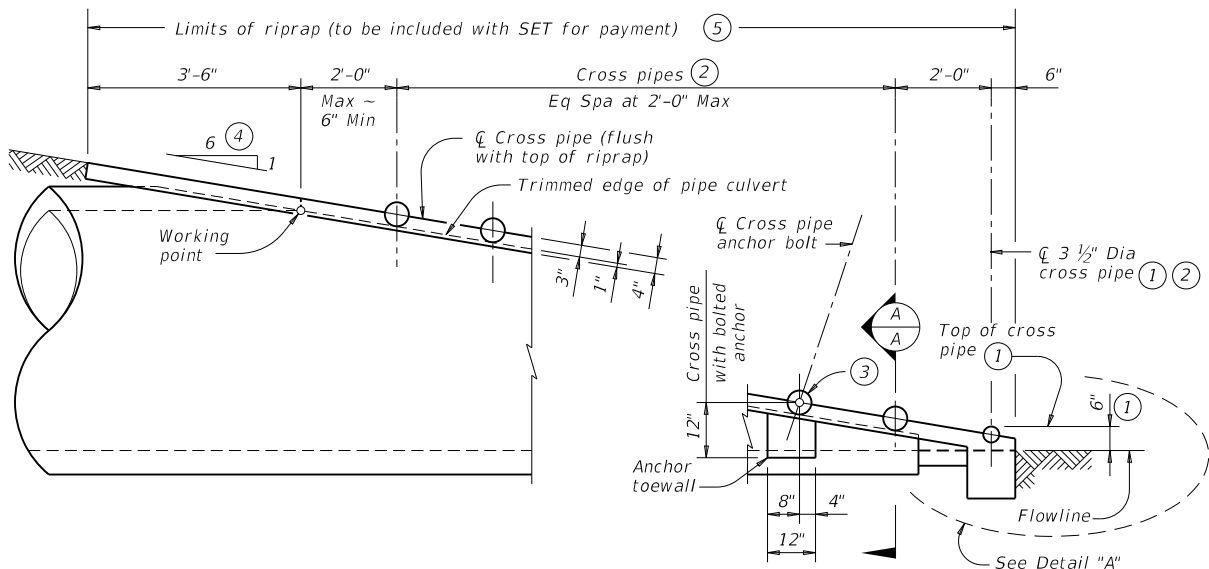
NOTE: All cross pipes, calculations, and dimensions are based on the pipe culverts mitered as shown in this detail. Alternate styles of mitered ends will require that appropriate adjustments be made to the values presented on this standard.

SIDE ELEVATION OF TYPICAL PIPE CULVERT MITER

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

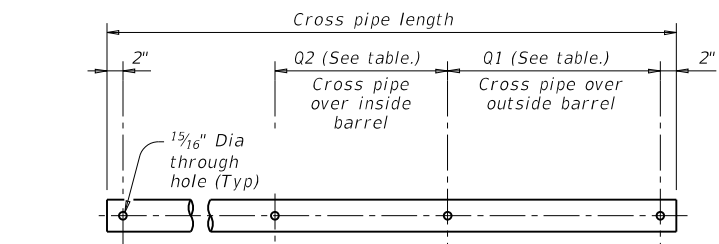


ISOMETRIC VIEW OF TYPICAL INSTALLATION

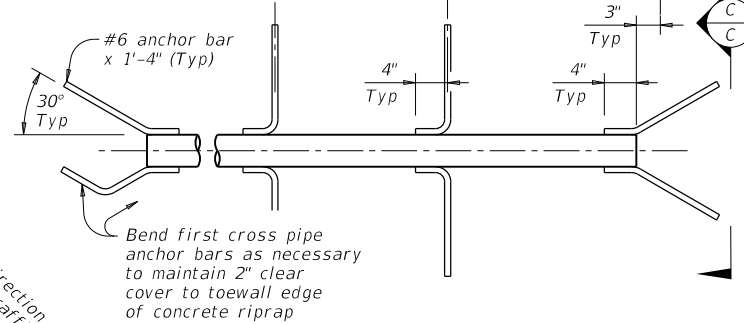


SIDE ELEVATION OF CAST-IN-PLACE CONCRETE

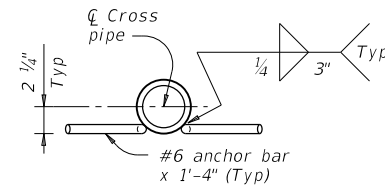
(Showing reinforced concrete pipe (RCP) culvert. Details at corrugated metal pipe (CMP) culvert are similar.)



PIPE WITH BOLTED ANCHOR

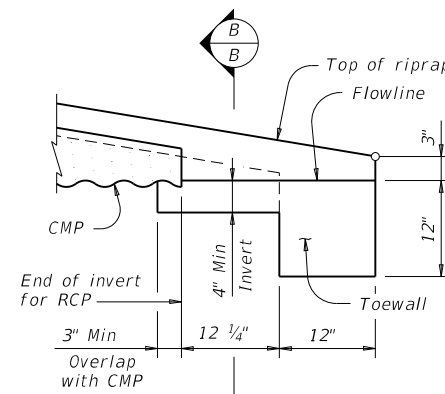


PIPE WITH ANCHOR BARS



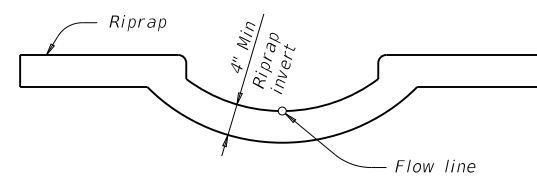
SECTION C-C

CROSS PIPE DETAILS



DETAIL "A"

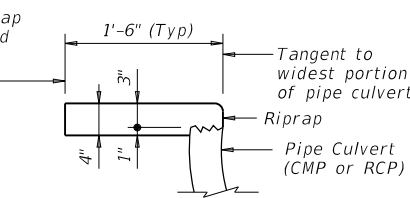
(Showing invert with corrugated metal pipe (CMP) culvert. Reinforced concrete pipe (RCP) culvert details are similar. Cross pipes not shown for clarity.)



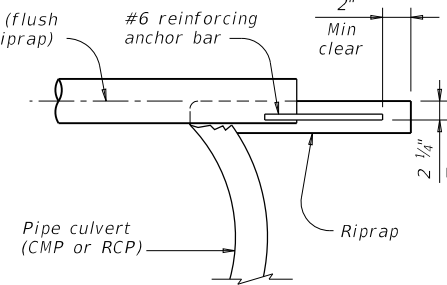
SECTION B-B

(Cross pipes not shown for clarity.)

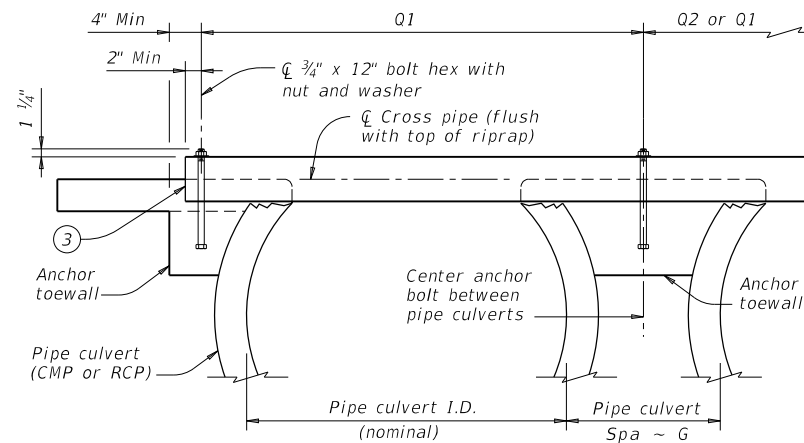
Limits of riprap (to be included with SET for payment) 5



SHOWING TYPICAL PIPE CULVERT AND RIPRAP



SHOWING CROSS PIPE WITH ANCHOR BAR



SHOWING CROSS PIPE WITH BOLTED ANCHOR

SECTION A-A

CROSS PIPE LENGTHS, REQUIRED PIPE SIZES, AND RIPRAP QUANTITIES

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

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

MATERIAL NOTES:

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

GENERAL NOTES:

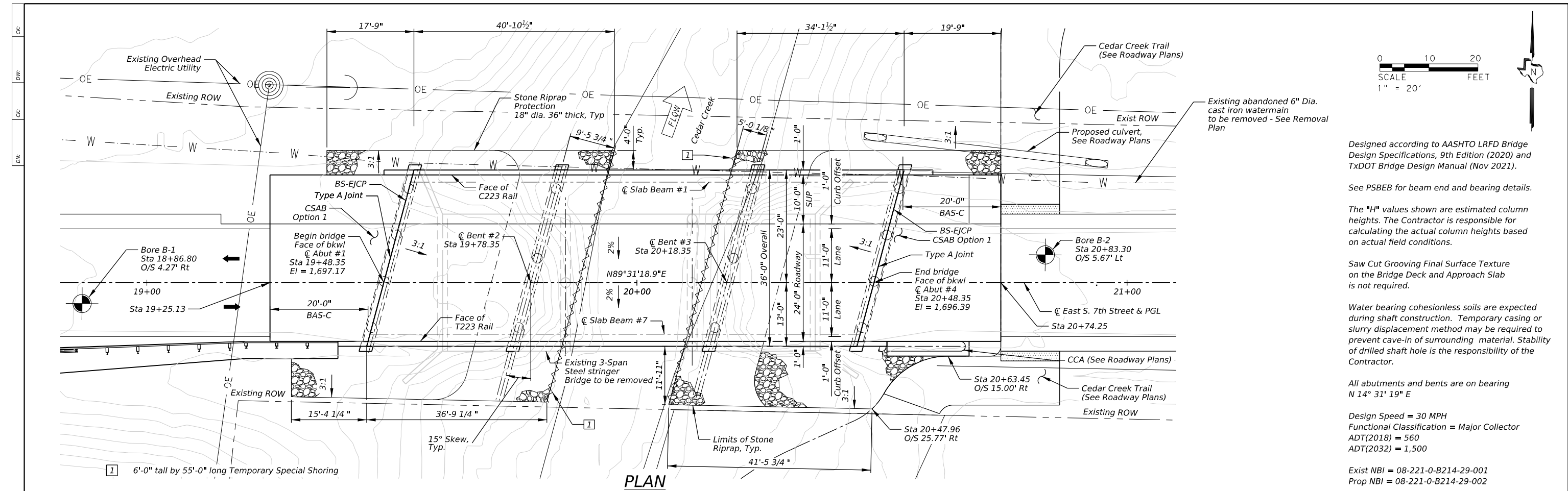
Cross pipes are designed for a traversing load of 10,000 pounds at yield as recommended by Research Report 280-2F, "Safety Treatment of Roadside Parallel-Drainage Structures", Texas Transportation Institute, March 1981. Safety end treatments (SET) shown herein are intended for use in those installations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

Texas Department of Transportation
 Bridge Division Standard

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

SETP-PD

FILE: setpdse-20.dgn	DN: GAF	CK: CAT	DW: JRP	CK: GAF
©TxDOT February 2020	CONTRACT NO: 0908	SECTION: 33	JOB NO: 106	HIGHWAY: EAST S 7TH ST
	DIST: ABL	COUNTY: TAYLOR	SHEET NO: 55	



Designed according to AASHTO LRFD Bridge Design Specifications, 9th Edition (2020) and TxDOT Bridge Design Manual (Nov 2021).

See PSBEB for beam end and bearing details.

The "H" values shown are estimated column heights. The Contractor is responsible for calculating the actual column heights based on actual field conditions.

Saw Cut Grooving Final Surface Texture on the Bridge Deck and Approach Slab is not required.

Water bearing cohesionless soils are expected during shaft construction. Temporary casing or slurry displacement method may be required to prevent cave-in of surrounding material. Stability of drilled shaft hole is the responsibility of the Contractor.

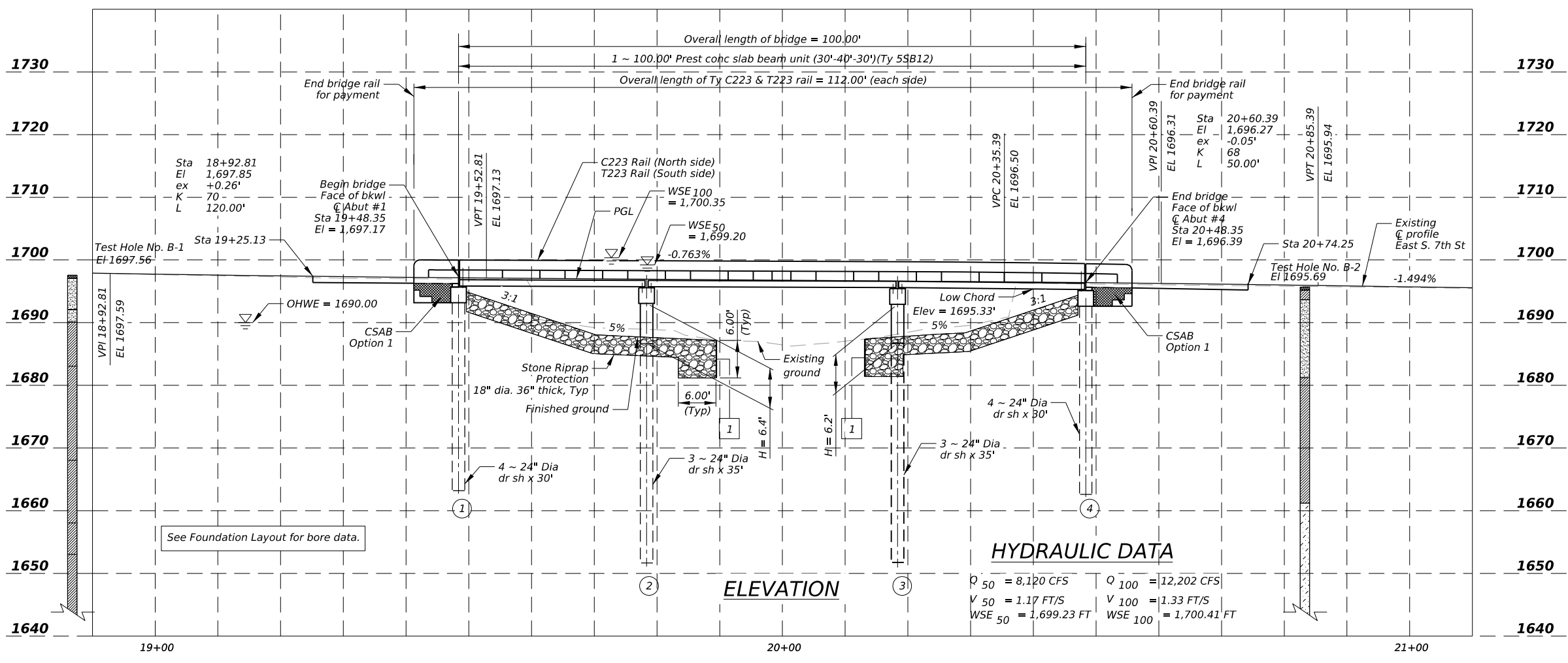
All abutments and bents are on bearing N 14° 31' 19" E

Design Speed = 30 MPH
 Functional Classification = Major Collector
 ADT(2018) = 560
 ADT(2032) = 1,500

Exist NBI = 08-221-0-B214-29-001
 Prop NBI = 08-221-0-B214-29-002

SUPERSTRUCTURE INV/OPR RATINGS: 1.00/1.30
HL 93 LOADING

DATE: 2/7/2023 3:11:37 PM
 FILE: pw://hq-pwint01.a-e.transyscorp.com/transyscorp-pw1/Documents/Projects_2022/FW20220220046/Bridge/C-BRL-101.dgn



HYDRAULIC DATA

Q ₅₀ = 8,120 CFS	Q ₁₀₀ = 12,202 CFS
V ₅₀ = 1.17 FT/S	V ₁₀₀ = 1.33 FT/S
WSE ₅₀ = 1,699.23 FT	WSE ₁₀₀ = 1,700.41 FT

REV NO.	DATE	BY	REVISION

TranSystems 500 W. 7th ST SUITE 1100 FORT WORTH, TX 76102 (817) 339-8950 FIRM REG. #: 3557

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EAST S 7TH STREET

BRIDGE LAYOUT

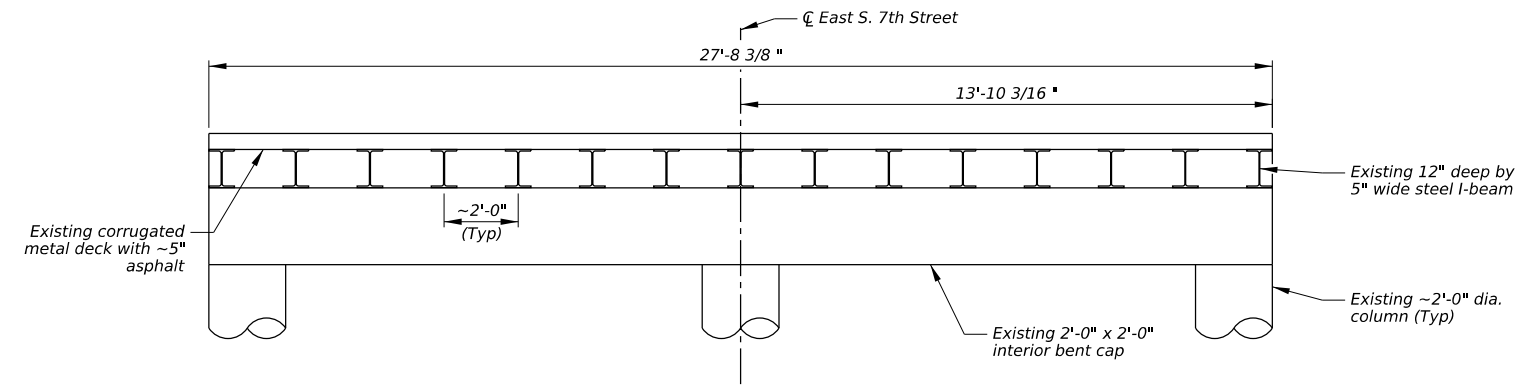
CEDAR CREEK BRIDGE

NBI NO. 08-221-0-B214-29-002

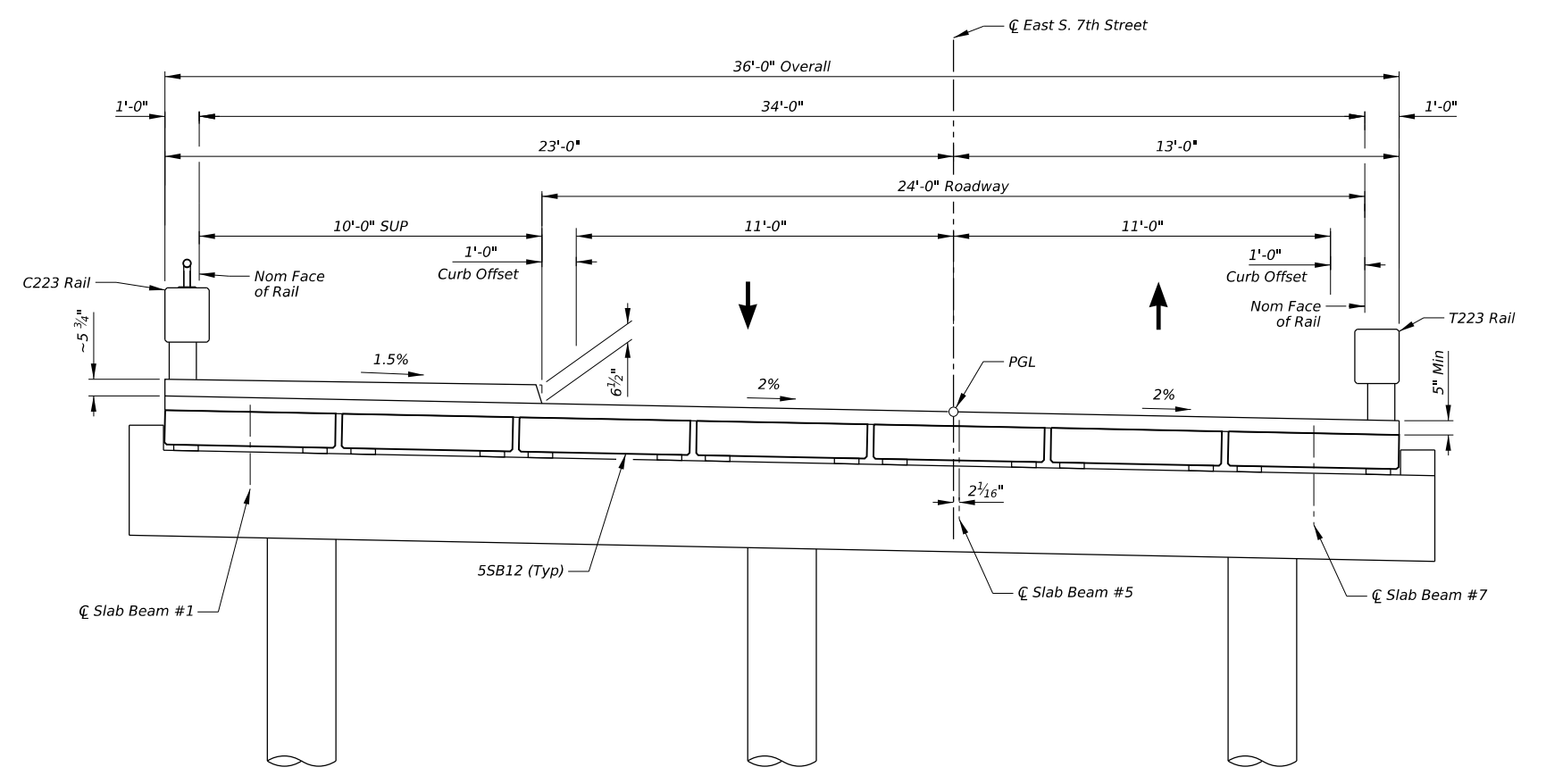
SHEET 1 OF 1

CONT	SECT	JOB	HIGHWAY
0908	33	106	EAST S 7TH ST
DIST	COUNTY	SHEET NO.	
ABL	TAYLOR	56	

CK:
DW:
CK:
DW:



EXISTING TRANSVERSE TYPICAL SECTION
(Shown at Interior Bent)



TRANSVERSE TYPICAL SECTION
(Shown at Interior Bent)

DATE: 2/7/2023 3:11:47 PM
FILE: pw://hq-pwint01.a-e.transyscorp.com:transyscorp-pw1/Documents/Projects_2022/FW20220220046/Bridge/C-BRG-TYP-101.dgn

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REV NO.	DATE	BY	REVISION



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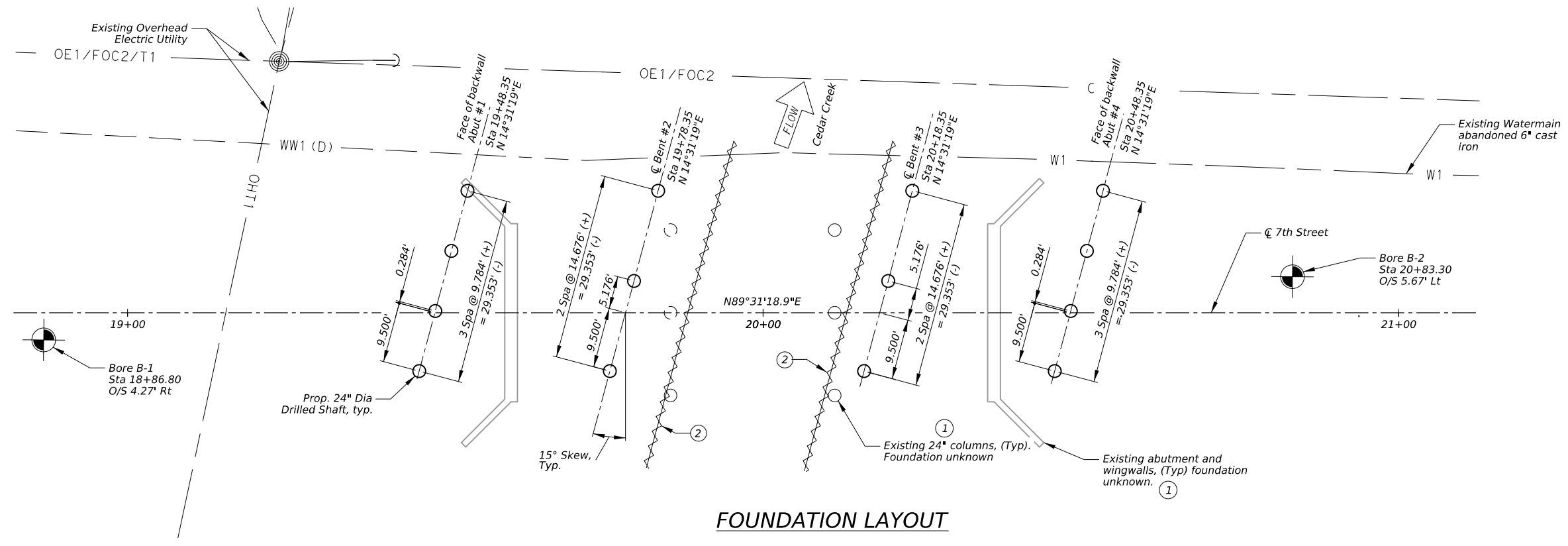
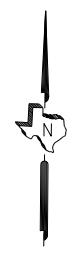
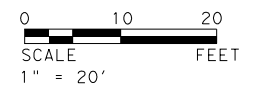
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EAST S 7TH STREET
BRIDGE TYPICAL SECTION
CEDAR CREEK BRIDGE

SHEET 1 OF 1

CONT	SECT	JOB	HIGHWAY
0908	33	106	EAST S 7TH ST
DIST	COUNTY	SHEET NO.	
ABL	TAYLOR	57	

CK:
DW:
CK:
DW:



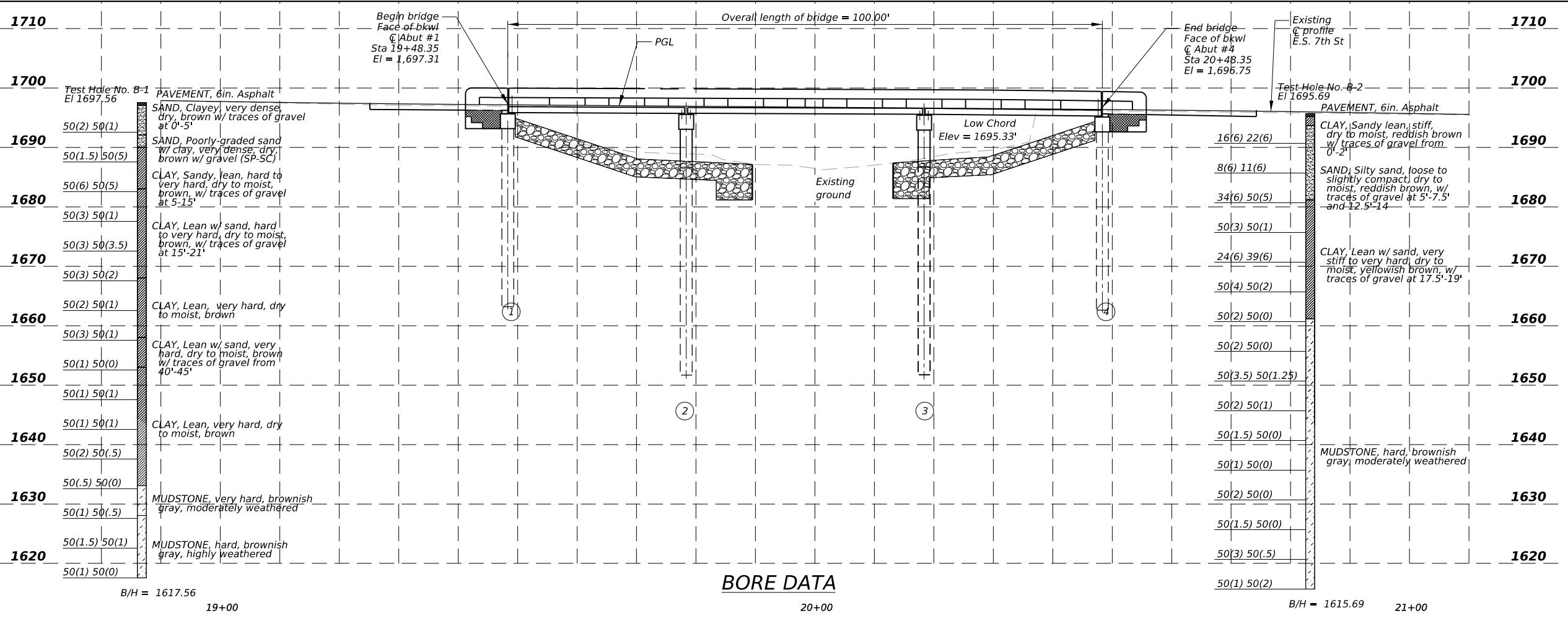
FOUNDATION LAYOUT

- ① Remove to 2'-0" below existing or proposed grade, whichever is lower, (Typ).
- ② See Bridge Layout. Adjust temporary shoring layout as needed to avoid existing bridge foundations.

GENERAL NOTES:
See Common Foundation Details (FD) standard sheet for all abutment foundation details and notes not shown.
See Bridge Layout for drilled shaft lengths and test hole data.

HL 93 LOADING

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BORE DATA

REV NO.	DATE	BY	REVISION

KEVIN M. ARFT
100912
LICENSED PROFESSIONAL ENGINEER
02/08/2023

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FORT WORTH, TX 76102
(817) 339-8950
FIRM REG. #: 3557

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**EAST S 7TH STREET
FOUNDATION LAYOUT &
BORE DATA
CEDAR CREEK BRIDGE**

SHEET 1 OF 1			
COUNT	SECT	JOB	HIGHWAY
0908	33	106	EAST S 7TH ST
DIST	COUNTY	SHEET NO.	
ABL	TAYLOR	58	

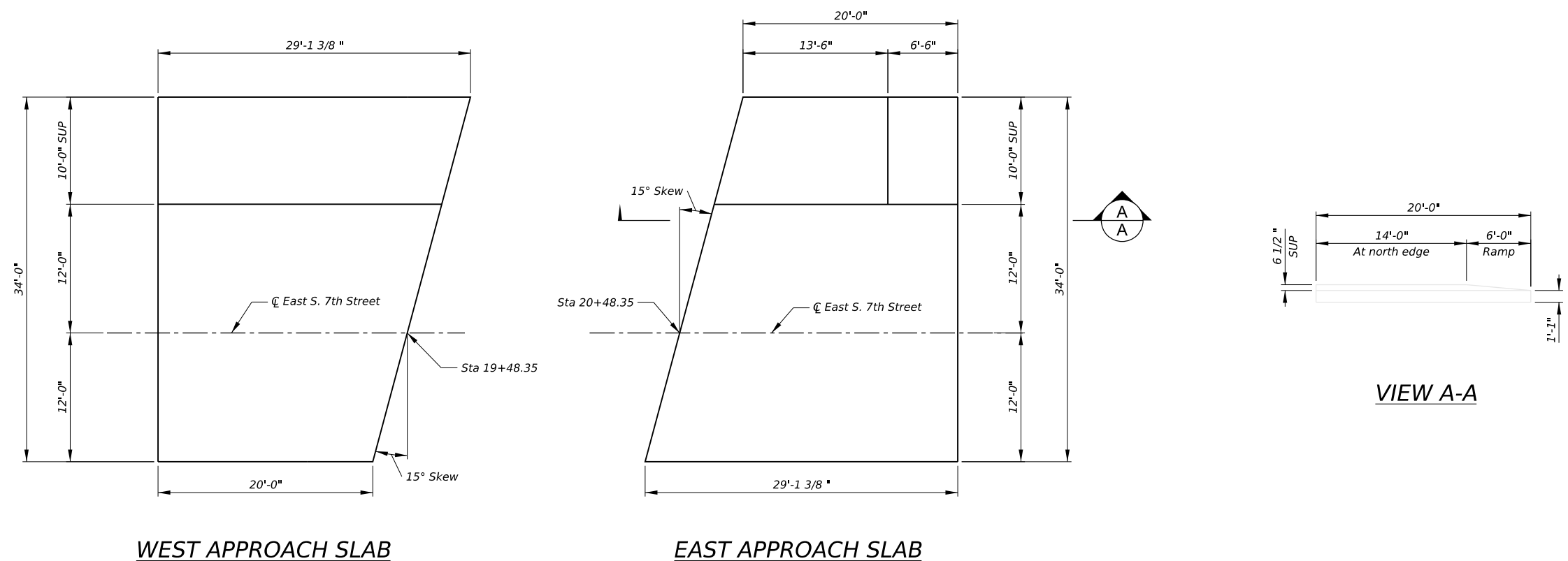
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CK: DW: CK: DW:

CSJ	400 CEM STABIL BKFL	403 TEMPORARY SPL SHORING	416 DRILL SHAFT (24 IN)	420 CL C CONC (ABUT) (HPC)	420 CL C CONC (CAP) (HPC)	420 CL C CONC (COLUMN) (HPC)	422 REINF CONC SLAB (SLAB BEAM) (HPC)	422 BRIDGE SIDEWALK (HPC)	422 APPROACH SLAB (HPC)	425 PRESTR CONC SLAB BEAM (5SB12)	427 SILICONE RESIN PAINT FINISH	432 RIPRAP (STONE PROTECTION) (18 IN)	442 STR STEEL (MISC NON-BRIDGE)
	CY	SF	LF	CY	CY	CY	SF	SF	CY	LF	SF	CY	LB
0908-33-106	42.0	660	380	23.8	18.8	4.5	3600	1100	76.3	689.39	410	578.2	283
TOTALS	42.0	660	380	23.8	18.8	4.5	3600	1100	76.3	689.39	410	578.2	283

CSJ	450 RAIL (TY T223) (HPC)	450 RAIL (TY C223) (HPC)	454 TYPE A JOINT	496 REMOV STR (BRIDGE 0 - 99 FT LENGTH)
	LF	LF	LF	EA
0908-33-106	112	112	74	1
TOTALS	112	112	74	1

ESTIMATED QUANTITIES



WEST APPROACH SLAB

EAST APPROACH SLAB

APPROACH SLAB LAYOUT
 See Typical Sections for additional information

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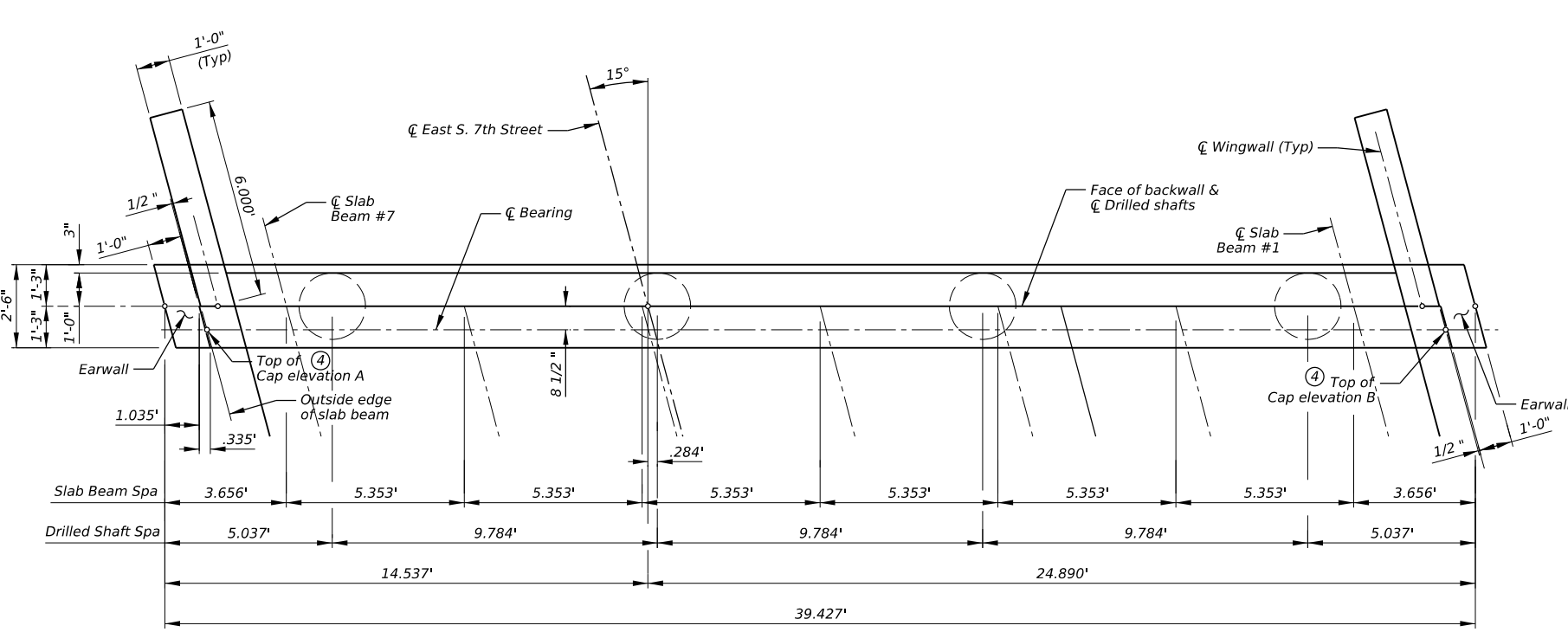
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**EAST S 7TH STREET
 ESTIMATED BRIDGE
 QUANTITIES
 CEDAR CREEK BRIDGE**

SHEET 1 OF 1

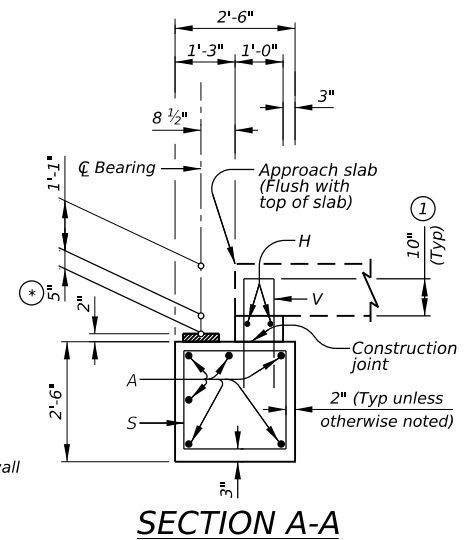
COUNT	SECT	JOB	HIGHWAY
0908	33	106	EAST S 7TH ST
DIST	COUNTY	SHEET NO.	
ABL	TAYLOR	59	

CK: DW: CK: DN:



TOP OF CAP ELEVATIONS		
	A	B
Abut #1	1695.27	1695.91
Abut #4	1695.15	1694.53

PLAN
Abutment #1 shown, Abutment #4 similar by rotation, except for the wingwall height at the SUP. See ⑤

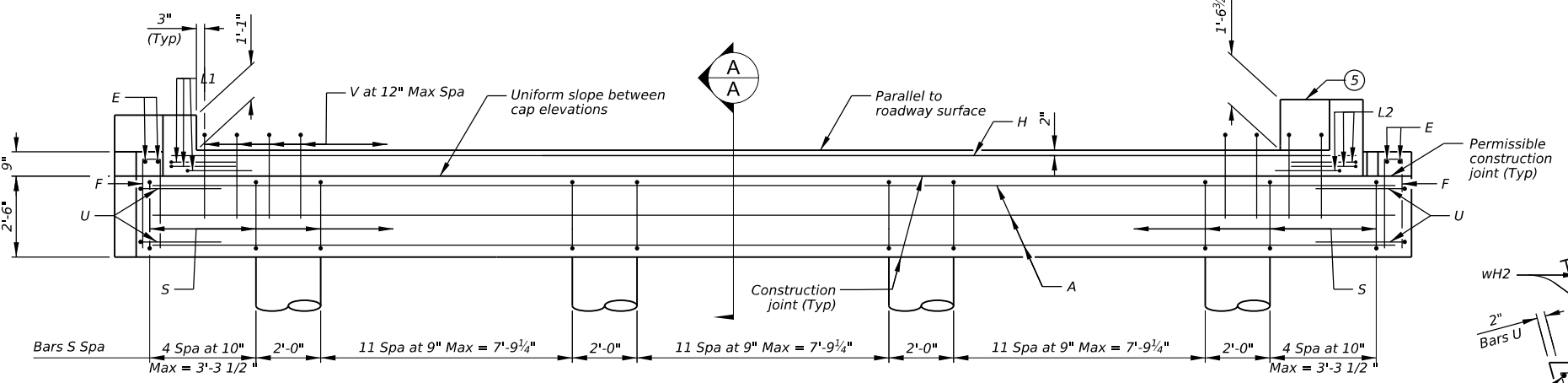


SECTION A-A
Note: At Contractor's option, backwall may be cast with approach slab.

GENERAL NOTES:
Designed according to AASHTO LRFD Bridge Design Specifications.
Designed for a normal embankment header slope of 3:1.
See Bridge Layout for header slope.
See Common Foundation Details (FD) standard sheet for all foundation details and notes.
See Stone Riprap (SRR) standard sheet for riprap attachment details.
See Ty T223 and C223 rail standards for rail anchorage in wingwalls.
Calculated drilled shaft foundation load = 45 tons per shaft.

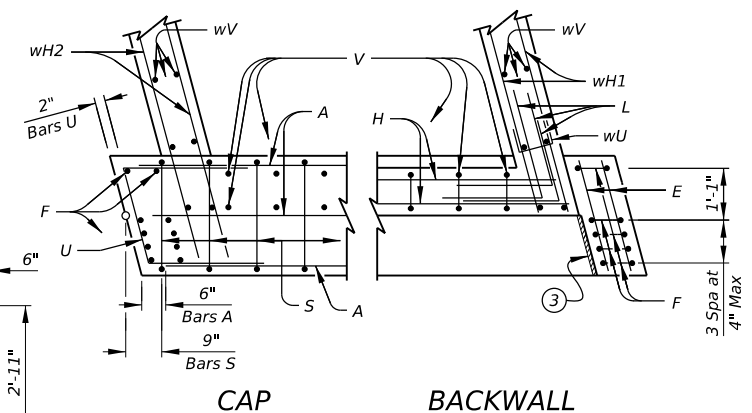
- ① Increase as required to maintain 3" from finished grade.
 - ② Quantities shown are for one abutment only.
 - ③ 1/2" preformed bituminous fiber material between slab beam and earwall. Bond to earwall with an approved adhesive. Cast inside face of earwall perpendicular to cap. (Typ)
 - ④ Top of cap elevations are based on section depths shown on span details.
 - ⑤ Flush with top of SUP on approach slab.
- * For Contractor's information only.

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

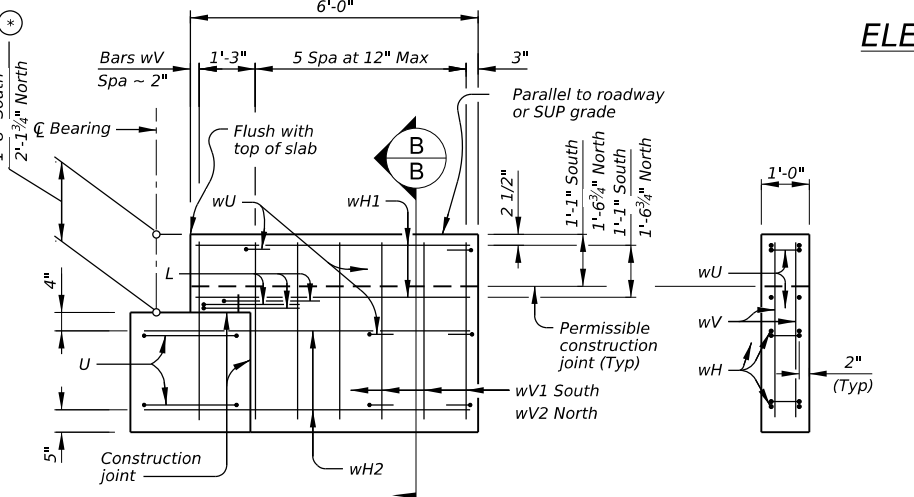
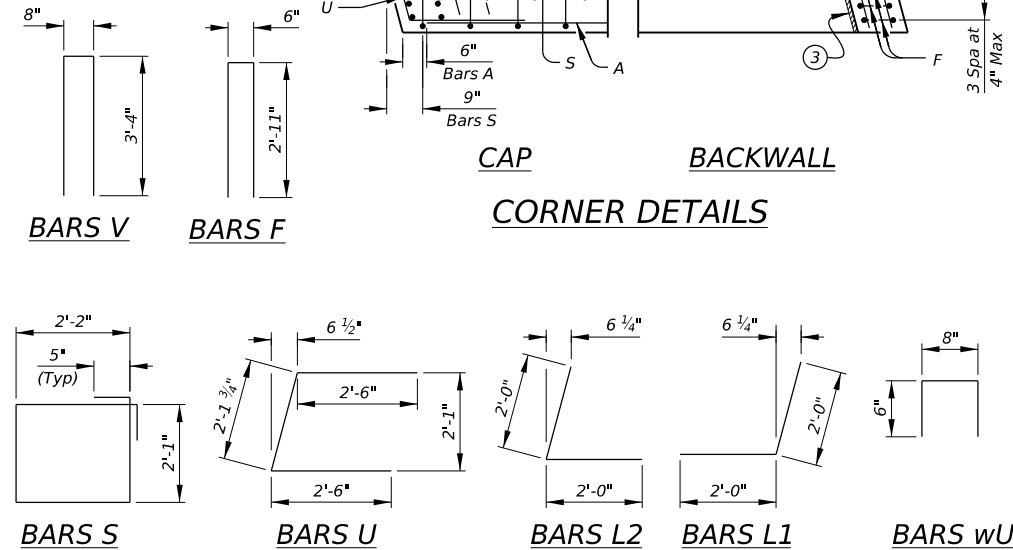


ELEVATION

MATERIAL NOTES:
Provide Class C (HPC) concrete ($f'_c = 3,600$ psi).
Provide Grade 60 epoxy coated reinforcing steel.



CORNER DETAILS



WINGWALL ELEVATION

SECTION B-B

* Dimensions shown are for Abutment #1. For Abutment #4, reduce these dimensions 1/4".

TABLE OF ESTIMATED QUANTITIES ②				
Bar	No.	Size	Length	Weight
A	6	#11	38'-5"	1,225
E	4	#4	2'-3"	6
F	10	#4	6'-4"	43
H	2	#5	36'-11"	77
L1	3	#6	4'-0"	18
L2	3	#6	4'-0"	18
S	36	#4	9'-4"	287
U	4	#6	7'-2"	43
V	46	#5	7'-4"	275
wH1	8	#6	5'-8"	68
wH2	8	#6	6'-11"	83
wU	12	#4	1'-8"	14
wV1	14	#5	3'-10"	56
wV2	14	#5	4'-3 1/2"	63
Reinforcing Steel *			Lb	2,276
CI "C" Conc (Abut)			CY	11.7

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**EAST S 7TH STREET
ABUTMENT
CEDAR CREEK BRIDGE**

SHEET 1 OF 1

CONT	SECT	JOB	HIGHWAY
0908	33	106	EAST S 7TH ST
DIST	COUNTY	SHEET NO.	
ABL	TAYLOR	60	

DATE: 2/7/2023 3:12:15 PM
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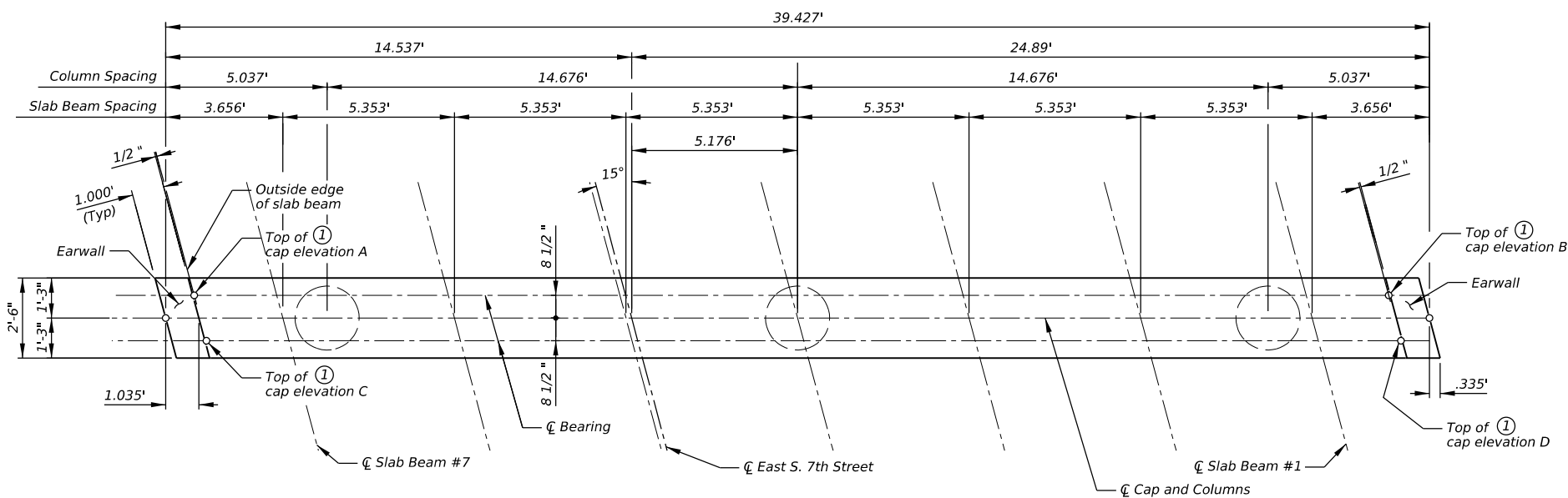


TABLE OF ESTIMATED QUANTITIES

Bar	No.	Size	Length	Weight	
A	8	#11	39'-1"	1,661	
E	4	#4	2'-3"	6	
F	14	#4	6'-4"	61	
S	70	#5	9'-8"	706	
T	4	#5	39'-1"	163	
V	24	#7	8'-7½"	423	
Z	3	#3	75'-0"	85	
Reinforcing Steel				Lb	3,105
CI "C" Conc (Cap)				CY	9.3
CI "C" Conc (Column) - Bent 2				CY	2.2
CI "C" Conc (Column) - Bent 3				CY	2.1

GENERAL NOTES:

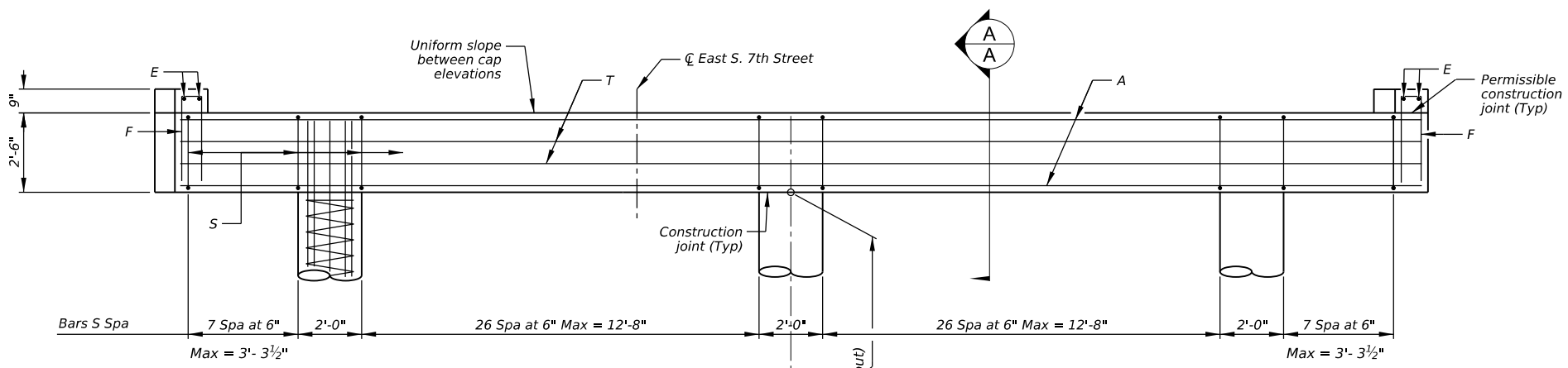
Designed according to AASHTO LRFD Bridge Design Specifications. See Bridge Layout for foundation type, size, and length. See Common Foundation Details (FD) standard sheet for all foundation details and notes. Calculated drilled shaft foundation load = 95 tons per shaft.

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

MATERIAL NOTES:

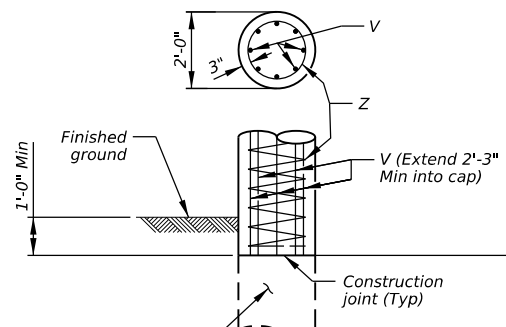
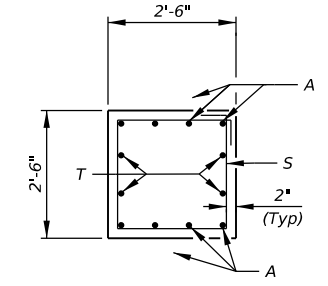
Provide Class C (HPC) concrete ($f_c = 3,600$ psi). Provide Grade 60 epoxy coated reinforcing steel.

- ① Top of cap elevations are based on section depths shown on Span Details.
- ② 1/2" preformed bituminous fiber material between slab beam and earwall. Bond to earwall with an approved adhesive. Cast inside face of earwall perpendicular to cap. (Typ)
- ③ Quantities shown are for one bent only, unless noted otherwise.

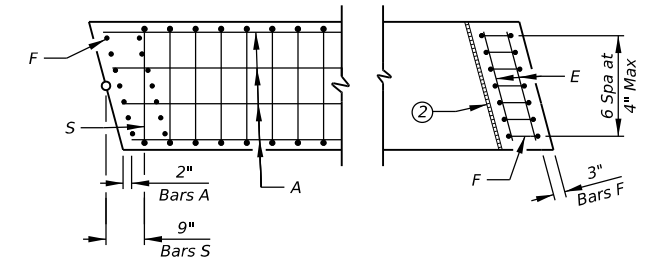
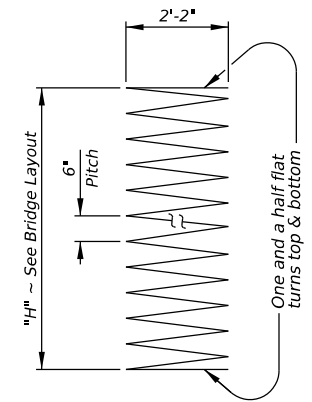
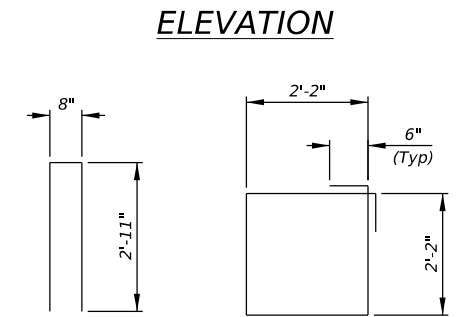


TOP OF CAP ELEVATIONS

	A	B	C	D
Bent #2	1695.04	1695.69	1694.91	1695.55
Bent #3	1694.61	1695.26	1694.75	1695.40



See Bridge Layout for foundation type. See FD sheet for details.



REV. NO. DATE BY REVISION

STATE OF TEXAS
KEVIN M. ARFT
100912
LICENSED PROFESSIONAL ENGINEER
02/08/2023

TranSystems 500 W 7th ST SUITE 1100 FORT WORTH, TX 76102 (817) 339-8950 FIRM REG. #: 3557

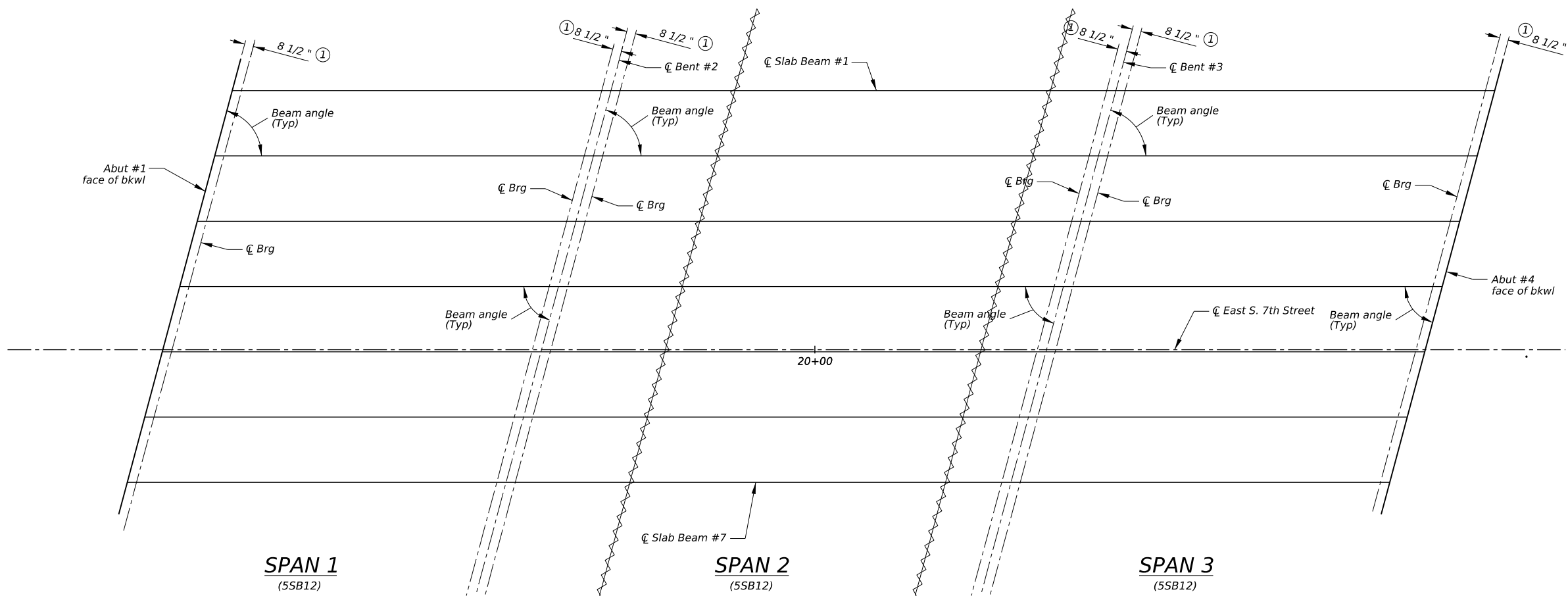
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EAST S 7TH STREET INTERIOR BENT CEDAR CREEK BRIDGE

SHEET 1 OF 1

CONT	SECT	JOB	HIGHWAY
0908	33	106	EAST S 7TH ST
DIST	COUNTY	SHEET NO.	
ABL	TAYLOR	61	

DATE: 2/7/2023 3:12:35 PM
FILE: pw://hq-pwint01.a-e.transyscorp.com/transyscorp-pw1/Documents/Projects_2022/FW20220220046/Bridge/C-BRG-BNT-101.dgn



- ① See Slab Beam Elastomeric Bearings Details (PSBEB) standard sheet for orientation of dimensions.
- ② Beam lengths shown are bottom beam lengths with adjustments made for beam slope.

FRAMING PLAN

BENT REPORT

ABUT NO. 1 (N 14° 31' 19" E)					BENT NO. 3 (N 14° 31' 19" E)				
DISTANCE BETWEEN STATION LINE AND STEP LINE 1, 21.2339					DISTANCE BETWEEN STATION LINE AND STEP LINE 1, 21.2339				
STEP SPAC. (CL BENT)	BEAM ANGLE				STEP SPAC. (CL BENT)	BEAM ANGLE			
	D	M	S			D	M	S	
SPAN 1	0.0000	75	0	0.00	SPAN 2	0.0000	75	0	0.00
BEAM 1	5.3525	75	0	0.00	BEAM 1	5.3525	75	0	0.00
BEAM 2	5.3525	75	0	0.00	BEAM 2	5.3525	75	0	0.00
BEAM 3	5.3525	75	0	0.00	BEAM 3	5.3525	75	0	0.00
BEAM 4	5.3525	75	0	0.00	BEAM 4	5.3525	75	0	0.00
BEAM 5	5.3525	75	0	0.00	BEAM 5	5.3525	75	0	0.00
BEAM 6	5.3525	75	0	0.00	BEAM 6	5.3525	75	0	0.00
BEAM 7	5.3525	75	0	0.00	BEAM 7	5.3525	75	0	0.00
TOTAL	32.1151				TOTAL	32.1151			

BENT NO. 2 (N 14° 31' 19" E)					BENT NO. 3 (N 14° 31' 19" E)				
DISTANCE BETWEEN STATION LINE AND STEP LINE 1, 21.2339					DISTANCE BETWEEN STATION LINE AND STEP LINE 1, 21.2339				
STEP SPAC. (CL BENT)	BEAM ANGLE				STEP SPAC. (CL BENT)	BEAM ANGLE			
	D	M	S			D	M	S	
SPAN 1	0.0000	75	0	0.00	SPAN 3	0.0000	75	0	0.00
BEAM 1	5.3525	75	0	0.00	BEAM 1	5.3525	75	0	0.00
BEAM 2	5.3525	75	0	0.00	BEAM 2	5.3525	75	0	0.00
BEAM 3	5.3525	75	0	0.00	BEAM 3	5.3525	75	0	0.00
BEAM 4	5.3525	75	0	0.00	BEAM 4	5.3525	75	0	0.00
BEAM 5	5.3525	75	0	0.00	BEAM 5	5.3525	75	0	0.00
BEAM 6	5.3525	75	0	0.00	BEAM 6	5.3525	75	0	0.00
BEAM 7	5.3525	75	0	0.00	BEAM 7	5.3525	75	0	0.00
TOTAL	32.1151				TOTAL	32.1151			

BENT NO. 2 (N 14° 31' 19" E)					ABUT NO. 4 (N 14° 31' 19" E)				
DISTANCE BETWEEN STATION LINE AND STEP LINE 1, 21.2339					DISTANCE BETWEEN STATION LINE AND STEP LINE 1, 21.2339				
STEP SPAC. (CL BENT)	BEAM ANGLE				STEP SPAC. (CL BENT)	BEAM ANGLE			
	D	M	S			D	M	S	
SPAN 2	0.0000	75	0	0.00	SPAN 3	0.0000	75	0	0.00
BEAM 1	5.3525	75	0	0.00	BEAM 1	5.3525	75	0	0.00
BEAM 2	5.3525	75	0	0.00	BEAM 2	5.3525	75	0	0.00
BEAM 3	5.3525	75	0	0.00	BEAM 3	5.3525	75	0	0.00
BEAM 4	5.3525	75	0	0.00	BEAM 4	5.3525	75	0	0.00
BEAM 5	5.3525	75	0	0.00	BEAM 5	5.3525	75	0	0.00
BEAM 6	5.3525	75	0	0.00	BEAM 6	5.3525	75	0	0.00
BEAM 7	5.3525	75	0	0.00	BEAM 7	5.3525	75	0	0.00
TOTAL	32.1151				TOTAL	32.1151			

BEAM REPORT

BEAM REPORT AT CENTER OF SLAB BEAM, SPAN 1				
HORIZONTAL DISTANCE		TRUE DISTANCE		
C-C BENT	C-C BRG.	BOT. BM. FLG. ②		BEAM SLOPE
BEAM 1	30.000	28.533	29.491	-0.0038
BEAM 2	30.000	28.533	29.491	-0.0038
BEAM 3	30.000	28.533	29.491	-0.0038
BEAM 4	30.000	28.533	29.491	-0.0038
BEAM 5	30.000	28.533	29.491	-0.0038
BEAM 6	30.000	28.533	29.491	-0.0038
BEAM 7	30.000	28.533	29.491	-0.0038

BEAM REPORT AT CENTER OF SLAB BEAM, SPAN 2				
HORIZONTAL DISTANCE		TRUE DISTANCE		
C-C BENT	C-C BRG.	BOT. BM. FLG. ②		BEAM SLOPE
BEAM 1	40.000	38.533	39.500	-0.0038
BEAM 2	40.000	38.533	39.500	-0.0038
BEAM 3	40.000	38.533	39.500	-0.0038
BEAM 4	40.000	38.533	39.500	-0.0038
BEAM 5	40.000	38.533	39.500	-0.0038
BEAM 6	40.000	38.533	39.500	-0.0038
BEAM 7	40.000	38.533	39.500	-0.0038

BEAM REPORT AT CENTER OF SLAB BEAM, SPAN 3				
HORIZONTAL DISTANCE		TRUE DISTANCE		
C-C BENT	C-C BRG.	BOT. BM. FLG. ②		BEAM SLOPE
BEAM 1	30.000	28.533	29.493	-0.0125
BEAM 2	30.000	28.533	29.493	-0.0118
BEAM 3	30.000	28.533	29.493	-0.0112
BEAM 4	30.000	28.533	29.493	-0.0105
BEAM 5	30.000	28.533	29.493	-0.0099
BEAM 6	30.000	28.533	29.492	-0.0092
BEAM 7	30.000	28.533	29.492	-0.0086

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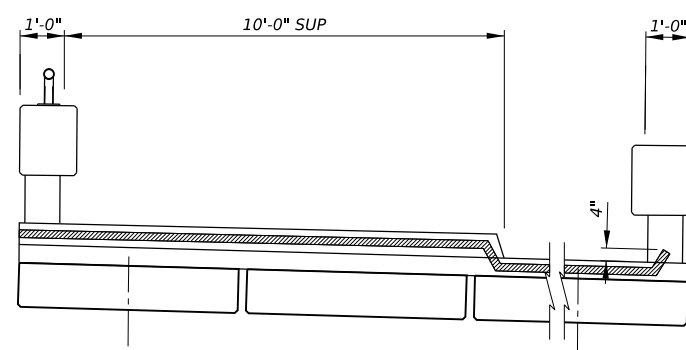
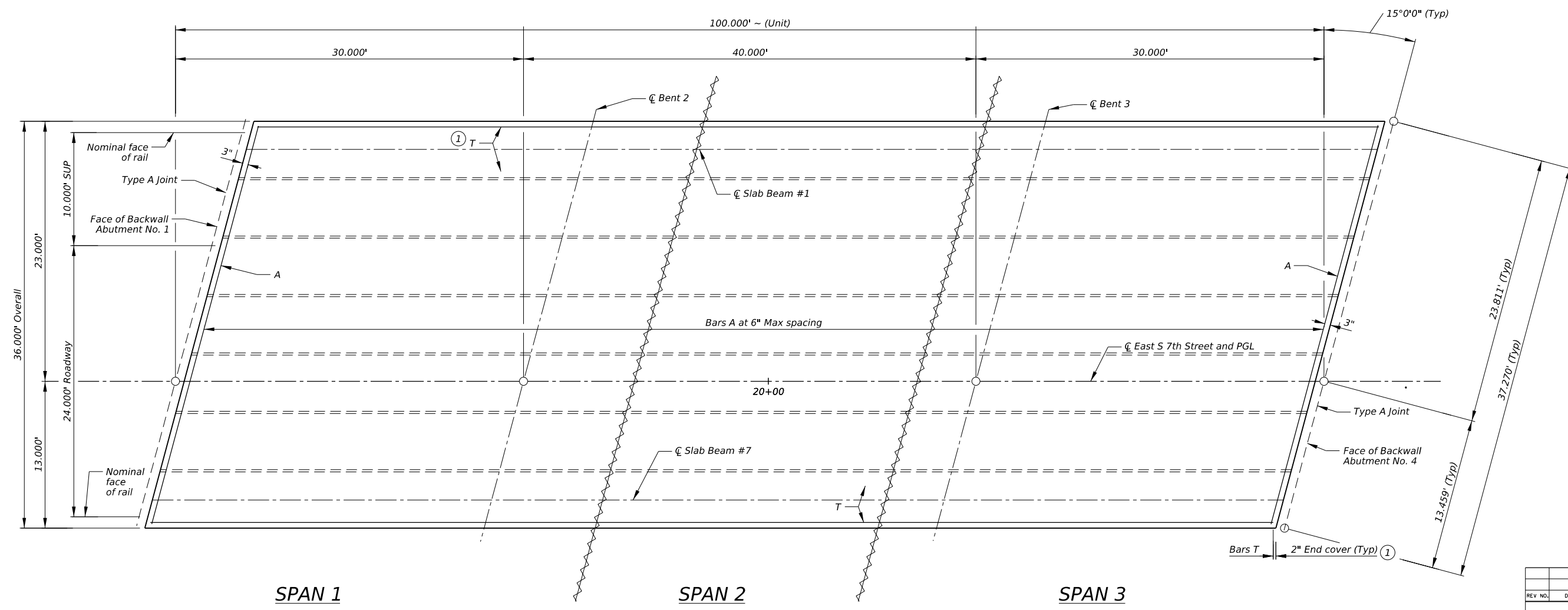
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EAST S 7TH STREET
FRAMING PLAN
CEDAR CREEK BRIDGE

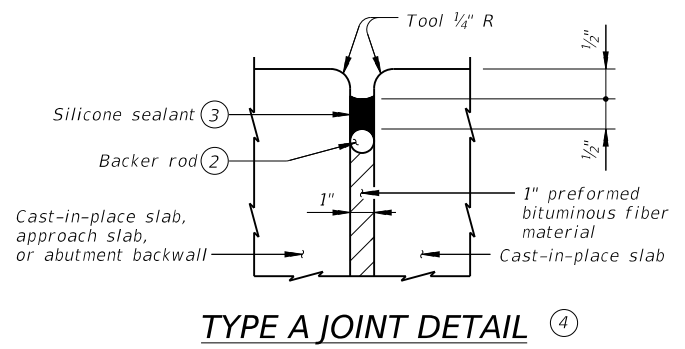
SHEET 1 OF 1

CONT	SECT	JOB	HIGHWAY
0908	33	106	EAST S 7TH ST
DIST	COUNTY	SHEET NO.	
ABL	TAYLOR	62	

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TYPE A JOINT PROFILE AT SUP & RAIL
 See Bridge Transverse Typical Section for additional information.



- ① Where slab is continuous over the interior bents, bars T are continuous through joint. See "Continuous Slab Detail".
- ② 1 1/4" backer rod must be compatible with joint sealant. Use of multiple pieces to create a backer rod cross section is not permitted. Top of backer rod must be convex as shown.
- ③ 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.
- ④ See Bridge Layout for expansion joint locations.

HL 93 LOADING

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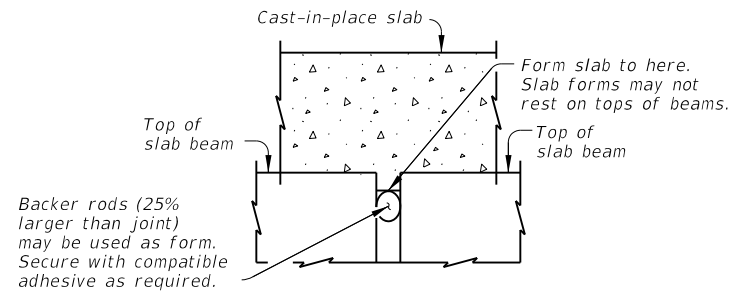
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EAST S 7TH STREET
100' PRESTRESSED
CONCRETE SLAB BEAM
CEDAR CREEK BRIDGE

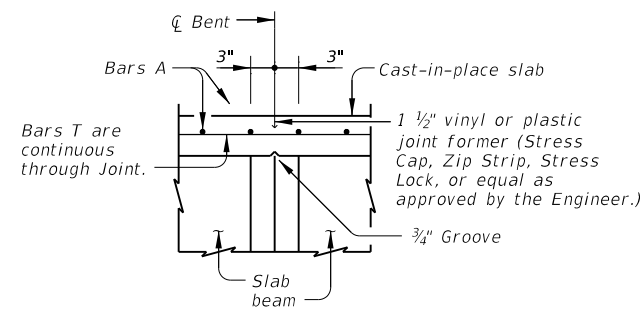
SHEET 1 OF 2

CONT	SECT	JOB	HIGHWAY
0908	33	106	EAST S 7TH ST
DIST	COUNTY	SHEET NO.	
ABL	TAYLOR	63	

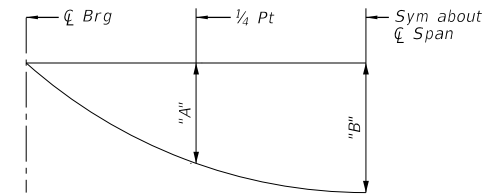
BAR TABLE	
BAR	SIZE
A	#5
T	#4



DETAIL "A"



CONTINUOUS SLAB DETAIL



DEAD LOAD DEFLECTION DIAGRAM

Note:
Deflections shown are due to concrete slab only ($E_c = 5000$ KSI). Calculated deflection shown are theoretical and actual dimensions may vary. Adjust based on field verification.

TABLE OF VARIABLE VALUES

SPAN	BEAM	DEAD LOAD DEFLECTION		SECTION DEPTHS ⁽²⁾	
		"A"	"B"	"X"	"Y"
		FT	FT	IN	FT/IN
1	1-7	0.007	0.009	6.00	1'-6"
2	1-7	0.022	0.031	7.5	1'-7 ¹ / ₂ "
3	1-7	0.007	0.009	5.75	1'-5 ³ / ₄ "

- (1) Reinforcing steel weight is calculated using an approximate factor of 2.8 lbs/sf.
- (2) Based on theoretical beam camber, dead load deflections of 5" Cast-In-Place concrete slab.

TABLE OF ESTIMATED QUANTITIES

SPAN	REINF CONCRETE SLAB (SLAB BEAM)	PRESTR CONC SLAB BEAM (5SB12)	TOTAL REINF STEEL ⁽¹⁾
	SF	LF	LB
1	1,080	206.44	3,024
2	1,440	276.50	4,032
3	1,080	206.45	3,024

GENERAL NOTES:
Designed according to AASHTO LRFD Bridge Design Specifications.
See Ty T223 and Ty C223 rail Standards for rail anchorage in slab.
See Standard BRSM for raised sidewalk reinforcement.

Cover dimensions are clear dimensions, unless noted otherwise.

MATERIAL NOTES:
Provide Class S (HPC) concrete ($f'_c = 4,000$ psi).
Provide Grade 60 epoxy coated reinforcing steel.
Provide bar laps, where required, as follows:
Epoxy coated ~ #4 = 2'-5"
~ #5 = 3'-0"
Deformed welded wire reinforcement (WWR) (ASTM A1064) of equal size and spacing may be substituted for Bars A or T unless noted otherwise.

HL93 LOADING

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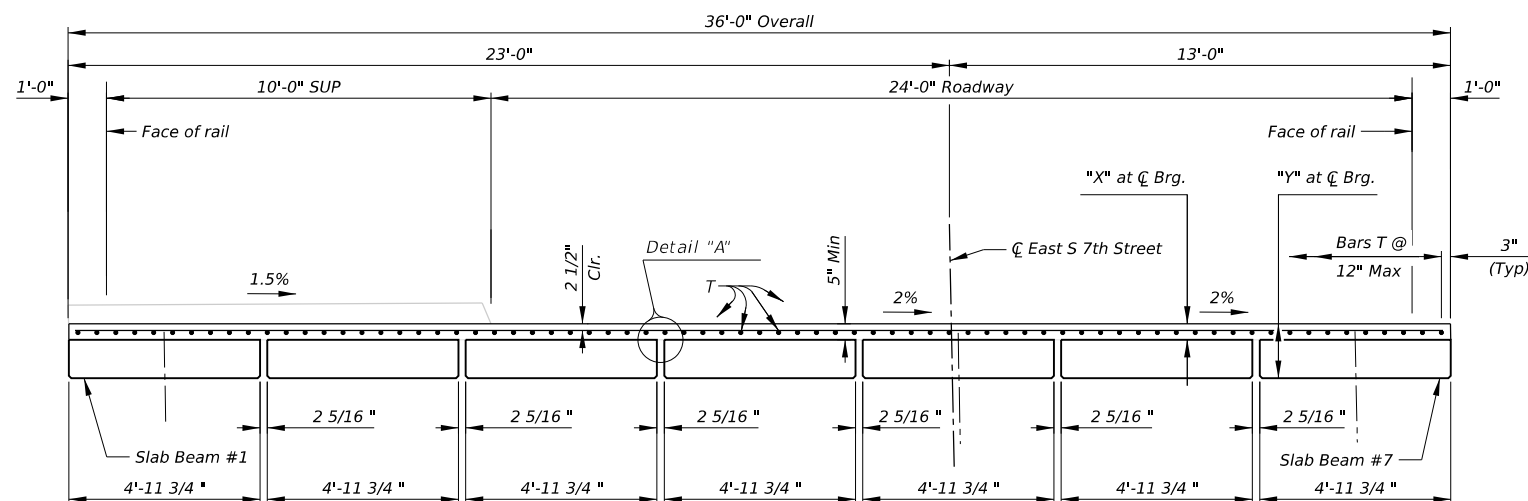
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**EAST S 7TH STREET
100' PRESTRESSED
CONCRETE SLAB BEAM
CEDAR CREEK BRIDGE**

SHEET 2 OF 2

CONT	SECT	JOB	HIGHWAY
0908	33	106	EAST S 7TH ST
DIST	COUNTY	SHEET NO.	
ABL	TAYLOR	64	

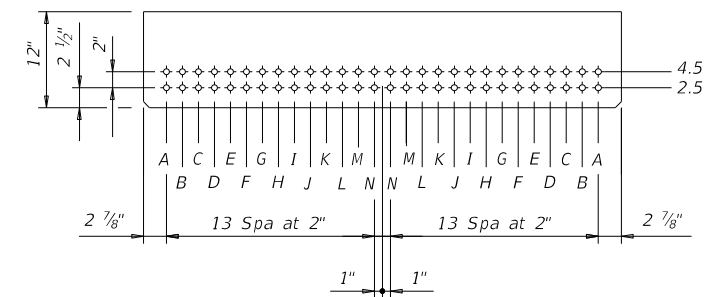


TYPICAL TRANSVERSE SECTION

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STRUCTURE	DESIGNED BEAMS (STRAIGHT STRANDS)																OPTIONAL DESIGN					LOAD RATING FACTORS			NON-STANDARD STRAND PATTERNS					
	SPAN NO.	BEAM NO.	BEAM TYPE	PRESTRESSING STRANDS						DEBONDED STRANDS PER ROW						CONCRETE		DESIGN LOAD COMP STRESS (TOP ϵ) (SERVICE I)	DESIGN LOAD TENSILE STRESS (BOTT ϵ) (SERVICE III)	REQUIRED MINIMUM ULTIMATE MOMENT CAPACITY (STRENGTH I)	LIVE LOAD DISTRIBUTION FACTOR		STRENGTH I SERVICE III			PATTERN	STRAND ARRANGEMENT AT ϵ OF BEAM			
				NON-STD STRAND PATTERN	TOTAL NO.	SIZE (in)	STRGTH (ksi)	"e" ϵ (in)	"e" END (in)	TOT NO. DEB	DIST FROM BOTTOM (in)	NO. OF STRANDS		NUMBER OF STRANDS DEBONDED TO (ft from end)							RELEASE STRGTH ϵ (ksi)	MINIMUM 28 DAY COMP STRGTH (ksi)	Moment	Shear	Inv			Opr	Inv	
												TOTAL	DE-BONDED	3	6	9	12				15	f'_{ci} (ksi)								f'_c (ksi)
East S. 7th	1	1-3	5SB12		14	0.6	270	3.50	3.50	-	-	-	-	-	-	-	-	4.000	5.000	1.477	-2.055	698	0.613	0.613	1.25	1.35	1.35			
	1	4-7	5SB12		12	0.6	270	3.50	3.50	-	-	-	-	-	-	-	-	4.000	5.000	1.428	-1.931	660	0.613	0.613	1.13	1.47	1.22			
	2	1-3	5SB12		28	0.6	270	3.50	3.50	8	2.50	8	8	0	0	0	0	5.700	6.700	2.543	-3.429	1094	0.613	0.613	1.00	1.30	1.52			
	2	4-7	5SB12		22	0.6	270	3.50	3.50	4	2.50	22	4	4	0	0	0	5.700	6.700	2.493	-3.243	1032	0.613	0.613	1.02	1.32	1.08			
	3	1-3	5SB12		14	0.6	270	3.50	3.50	-	-	-	-	-	-	-	-	4.000	5.000	1.500	-2.080	701	0.613	0.613	1.24	1.61	1.32			
	3	4-7	5SB12		12	0.6	270	3.50	3.50	-	-	-	-	-	-	-	-	4.000	5.000	1.451	-1.956	664	0.613	0.613	1.13	1.46	1.19			

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.



TxDOT 5SB12 SLAB BEAM

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

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

HL 93 LOADING

REV NO.	DATE	BY	REVISION



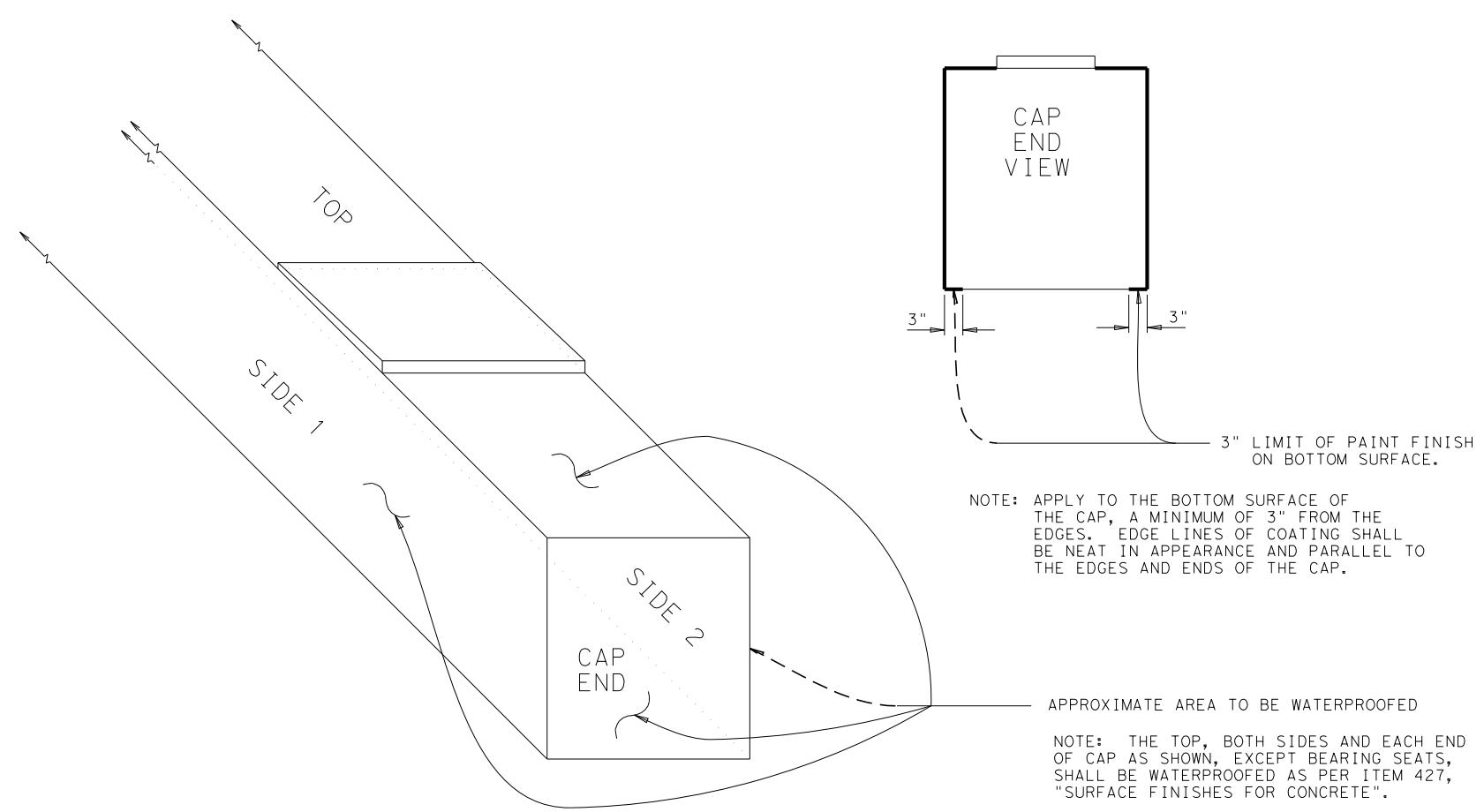
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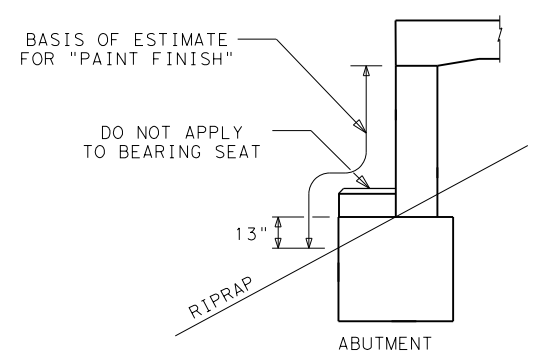
**EAST S 7TH STREET
 PRESTRESSED
 CONCRETE SLAB BEAM
 DESIGNS
 CEDAR CREEK BRIDGE
 (NON-STANDARD SPANS)**

SHEET		OF	
CONT	SECT	JOB	HIGHWAY
0908	33	106	EAST S 7TH ST
DIST		COUNTY	SHEET NO.
ABL		TAYLOR	65

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TYPICAL WATERPROOFING DETAIL OF INTERIOR BENTS AT EXPANSION JOINTS
NO BENTS AT EXPANSION JOINTS THIS PROJECT



NOTE: THE FACE OF BACKWALL AND THE TOP, FRONT AND ENDS OF THE CAP AS SHOWN, EXCEPT BEARING SEATS, SHALL BE WATERPROOFED AS PER ITEM 427, "SURFACE FINISHES FOR CONCRETE".

TYPICAL WATERPROOFING DETAIL AT ABUTMENTS



CONCRETE WATERPROOFING
DETAILS
CWD-15

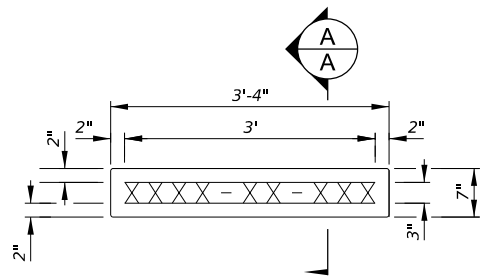


NO SCALE SHEET 1 OF 1

FHWA DIVISION	PROJECT NO.		HIGHWAY NO.	
6	SEE TITLE SHEET		EAST S 7TH ST	
STATE	COUNTY		SHEET NO.	
TEXAS	TAYLOR		66	
DISTRICT	CONTROL	SECTION		JOB
ABL	0908	33		106

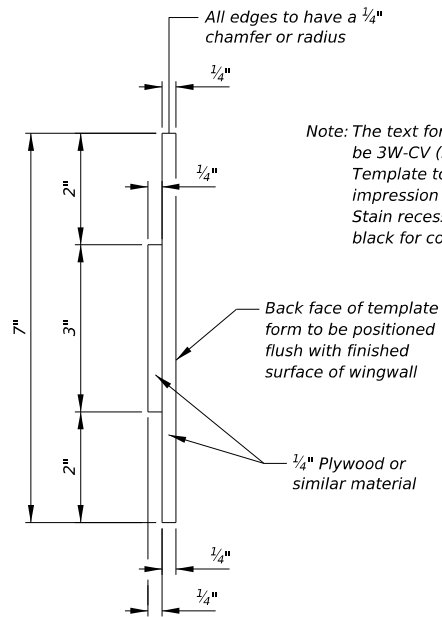
CK: DW: CK: DW:

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.

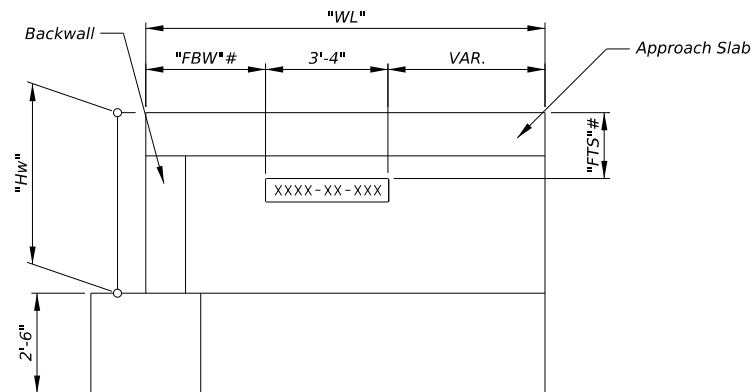


Note: The text for all templates should be 3W-CV (3") clear view font. Template to provide a recessed impression into cast concrete. Stain recessed numeral surfaces black for contrast.

SECTION A-A

STRUCTURE ID TEMPLATE NUMBERS

NBI NUMBER	LOCATION	STRUCTURE NUMBER	"WL"	"Hw"	"FBW"#	"FTS"#
08-221-0-B214-29-002	East S. 7TH Street over Cedar Creek	B214-29-002	6'-0"	1'-7½" South 2'-1¼" North	Varies	Varies



WINGWALL ELEVATION

Field locate to avoid conflict with reinforcement and riprap. The Engineer shall approve installation location prior to placement.

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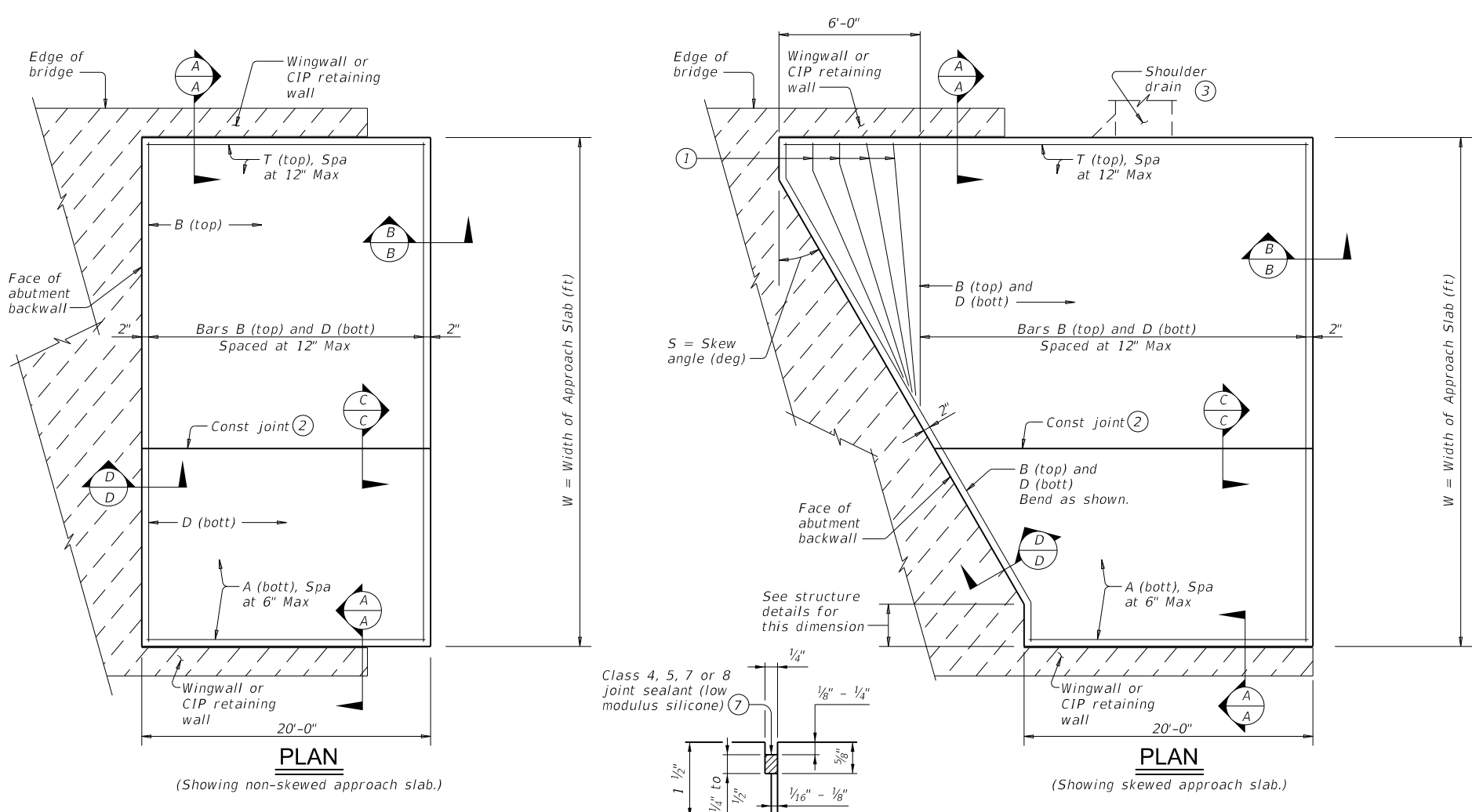
EAST S 7TH STREET
STRUCTURE ID DETAILS

SHEET 1 OF 1

CONT	SECT	JOB	HIGHWAY
0908	33	106	EAST S 7TH ST
DIST	COUNTY	SHEET NO.	
ABL	TAYLOR	67	

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DATE: 2/7/2023 3:13:50 PM
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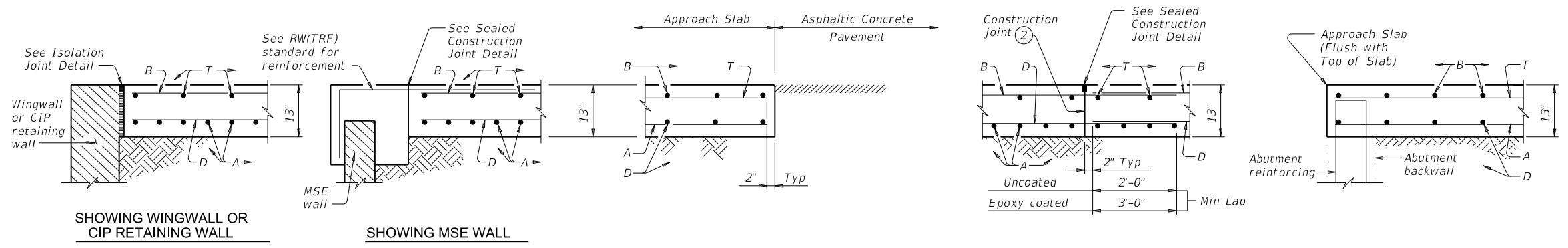


BAR	SIZE
A	#8
B	#5
D	#5
T	#5

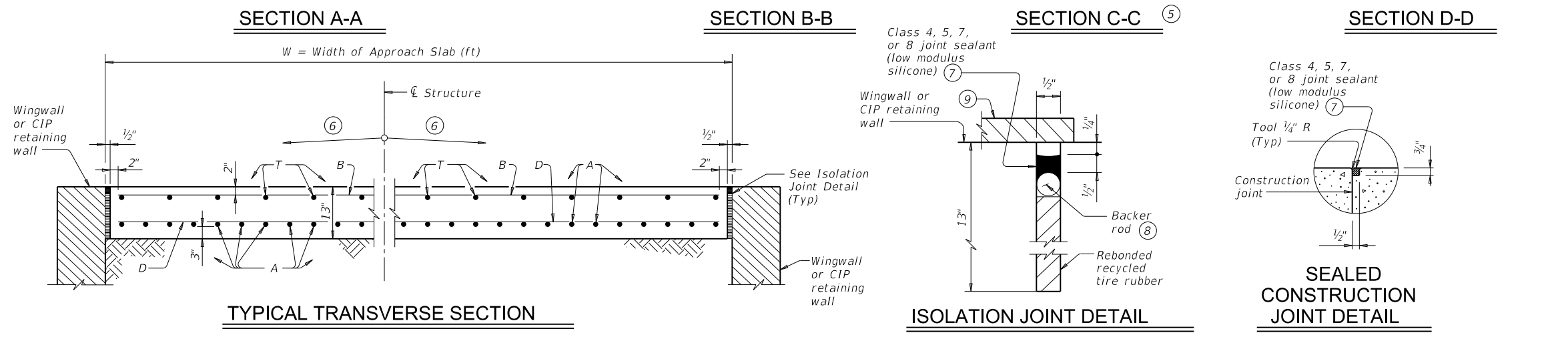
Reinf steel weight = 8.5 Lbs/SF of Approach Slab			
Volume of Appr Slab Conc (CY) = 0.802W + 0.02W ² Tan S			
W = Width of Approach Slab (ft)			
S = Skew Angle (deg)			

- 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.
- 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.
- See details elsewhere in plans for shoulder drain location and details.
- For Contractor's information only. Quantities shown are for one approach slab.
- Multiple piece tie bars are acceptable at longitudinal construction joints provided minimum laps shown are achieved.
- See details elsewhere in plans for required cross-slope.
- Place in accordance with Item 438.
- Provide backer rod that is 25% larger than joint opening and compatible with the sealant.
- If bridge rail is present at the wingwall or CIP retaining wall, place 1/2" rebonded recycled tire rubber between concrete railing and top of approach slab as shown when concrete railing projects over the approach slab.

LONGITUDINAL SAW CUT JOINT DETAIL



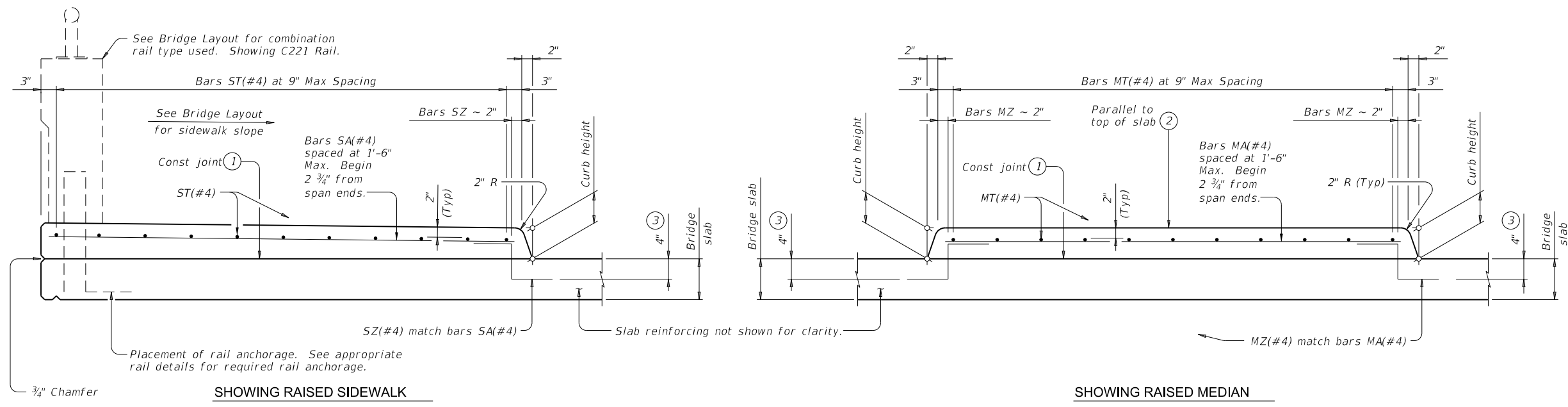
GENERAL NOTES:
Construct approach slab in accordance with Item 422.
Provide Class "S" concrete with a minimum compressive strength of 4,000 psi.
Provide Grade 60 reinforcing steel.
Provide longitudinal joints as shown on the Longitudinal Saw Cut Joint Detail at lane lines and shoulders when width between 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 1/2" and seal in accordance with Item 438. Alternately, provide a controlled joint consisting of 1 1/2" 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.



		Bridge Division Standard	
BRIDGE APPROACH SLAB ASPHALTIC CONCRETE PAVEMENT			
BAS-A			
FILE: basaste1-20.dgn	DN: TxDOT	CK: TxDOT	DW: TxDOT
©TxDOT April 2019	CONTRACT NO: 0908	SECTION: 33	JOB NO: 106
REVISIONS			EAST S 7TH ST
02-20: Removed stress relieving pad.	DIST: ABL	COUNTY: TAYLOR	SHEET NO: 68

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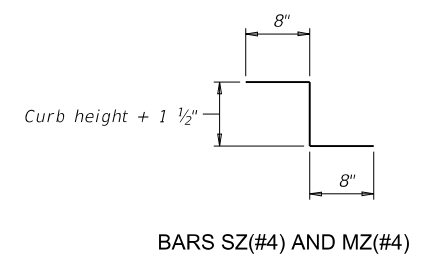
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TYPICAL TRANSVERSE SECTIONS

See Span Details for dimensions not shown.

- ① Provide broom finish to top of bridge slab where raised sidewalk or raised median area is defined.
- ② Unless noted otherwise on the span details.
- ③ Bars may rest on top of PCPs.



BARS SZ(#4) AND MZ(#4)

APPROVED SLIP RESISTANT PLATE	
Product	Manufacturer Website
Algrip™, Steel	www.algrip.com
Mebac® #3, Steel	www.harscoikg.com
SlipNOT® Grade 2, Steel	www.slipnot.com

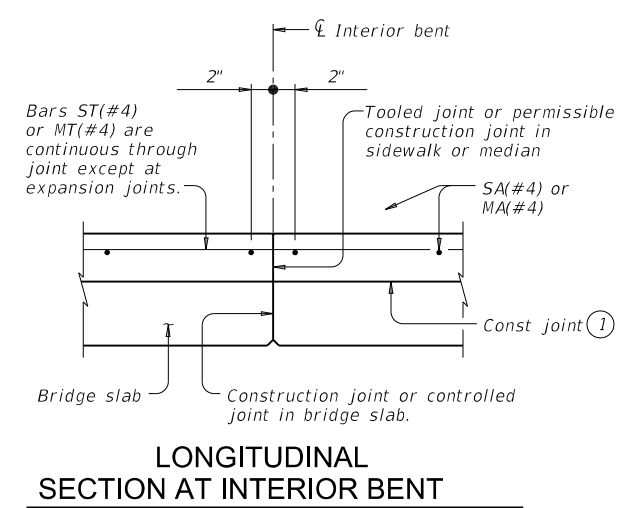
Provide drain cover plates fabricated with a product from this list. No exceptions are permitted.

MATERIAL NOTES:
Provide the same concrete required for the bridge deck, Class S or Class S (HPC) concrete.
Provide Grade 60 reinforcing steel. Deformed welded wire reinforcement (WWR) meeting ASTM A1064 of equivalent size and spacing may be substituted for bars SA, ST, MA, and MT.
Provide epoxy coat or galvanize reinforcement if bridge deck reinforcement is required to be epoxy coated or galvanized.
Provide hot-dip galvanize slip resistant steel plate after fabrication in accordance with Item 445, "Galvanizing".
Chamfer or round edges approximately 1/16" prior to galvanizing.

GENERAL NOTES:
Designed according to AASHTO LRFD Bridge Design Specifications.
Provide the following bar or wire lap lengths when required:
Uncoated, 1'-7" Min
Coated, 2'-5" Min
Submittal and approval of drain cover plate shop drawings is not required if fabrication is accordance with these details.
Raised sidewalks will be paid under Item 422 by the SF of Bridge Sidewalk or Bridge Sidewalk (HPC). Raised medians will be paid under Item 422 by the SF of Bridge Median or Bridge Median (HPC).
Payment for drain cover plates will be by the pound of "Structural Steel (Misc Non-Bridge)" as per Item 442, "Metal for Structures". Weight of one drain cover plate is 48 plf.

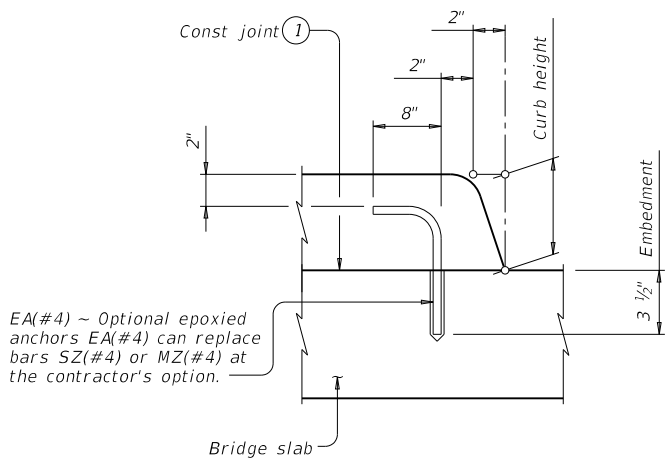
DESIGNER NOTES:
These details do not apply for longitudinal grades exceeding 5 percent.

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



LONGITUDINAL SECTION AT INTERIOR BENT

At bents with expansion joints, provide an open joint in the sidewalk/median matching the deck's joint width.



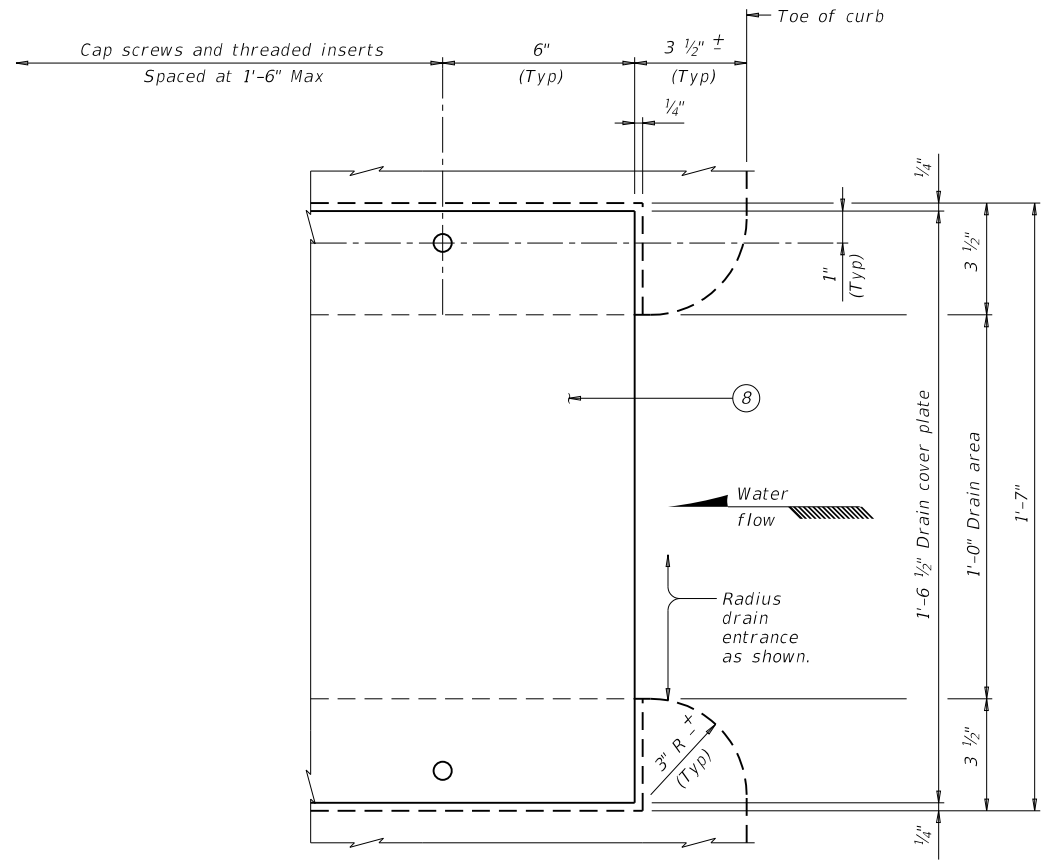
OPTIONAL EPOXY ANCHORS

Embed EA(#4) bar into concrete with a Type III (Class C, D, E, or F) epoxy meeting the requirements of DMS-6100, "Epoxyes and Adhesives". Follow manufacturer's directions for installing the epoxied anchor bars.

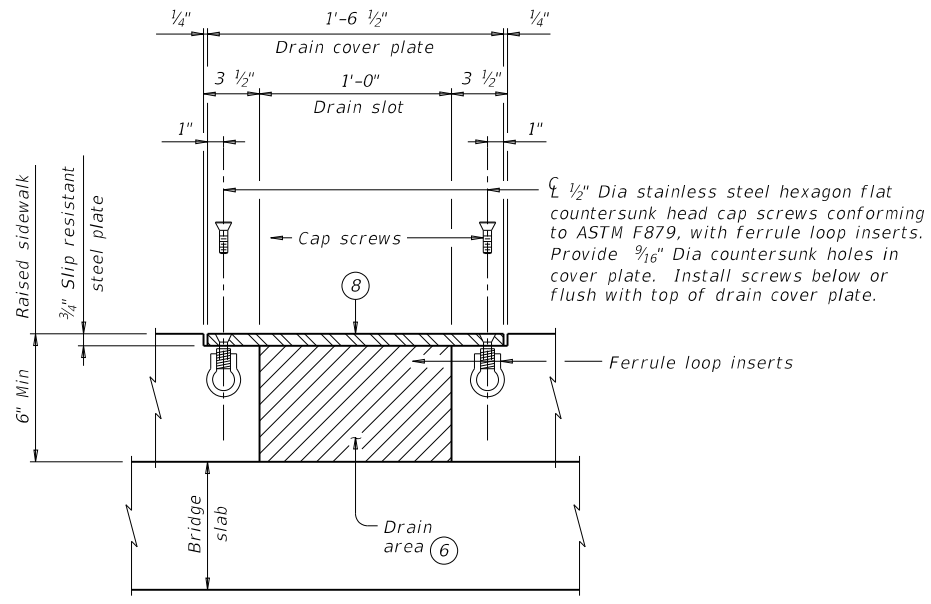
		Bridge Division Standard	
BRIDGE RAISED SIDEWALK AND MEDIAN DETAILS			
BRSM			
FILE: brsmste1-19.dgn	DN: JMH	CK: TxDOT	DW: JTR
©TxDOT April 2019	CONT	SECT	JOB
REVISIONS	0908	33	106
	DIST	COUNTY	SHEET NO.
	ABL	TAYLOR	69

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DATE: 2/7/2023 3:13:58 PM
 FILE: pw://hq-pw\int01.a-e.transyscorp.com:transyscorp-pw1/Documents/Projects/2022200047 BRSM/090833/090833.dwg



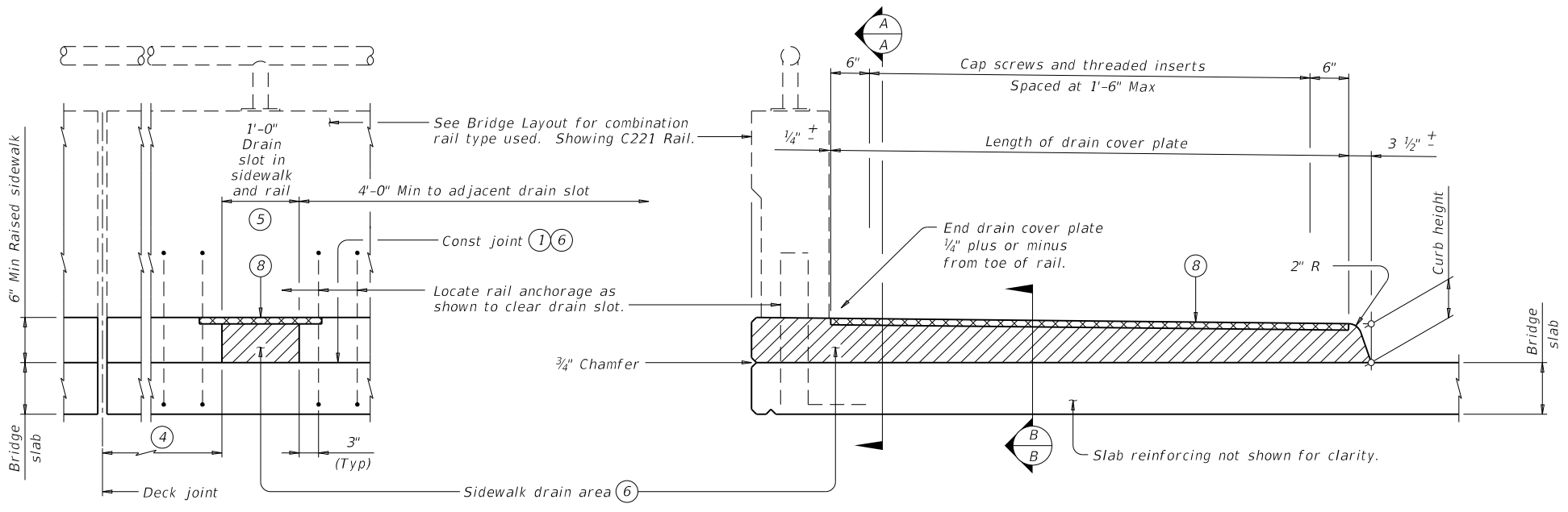
PARTIAL PLAN CURB DRAIN



SECTION B-B

Reinforcing not shown for clarity.

- ① Provide broom finish to top of bridge slab where raised sidewalk or raised median area is defined.
- ④ 3'-0" Min at deck expansion joints, deck construction joints or controlled joints, rail intermediate wall joints or from face of substructure.
- ⑤ For rail Type C1W, center drain slots between posts.
- ⑥ Steel trowel top surface of bridge deck in drain locations.
- ⑦ Provide sidewalk drains where shown elsewhere on the plans or as directed by the Engineer. Do not place drains over railroad tracks, lower roadways, or sidewalks. Place drain and cover plate perpendicular to toe of rail.
- ⑧ Drain cover plate (PL 3/4 x 18 1/2 slip resistant steel plate). Install flush with top of sidewalk.



SECTION A-A

OPTIONAL DRAIN DETAILS

SHOWING RAISED SIDEWALK WITH DRAIN SLOT

⑦

SHEET 2 OF 2



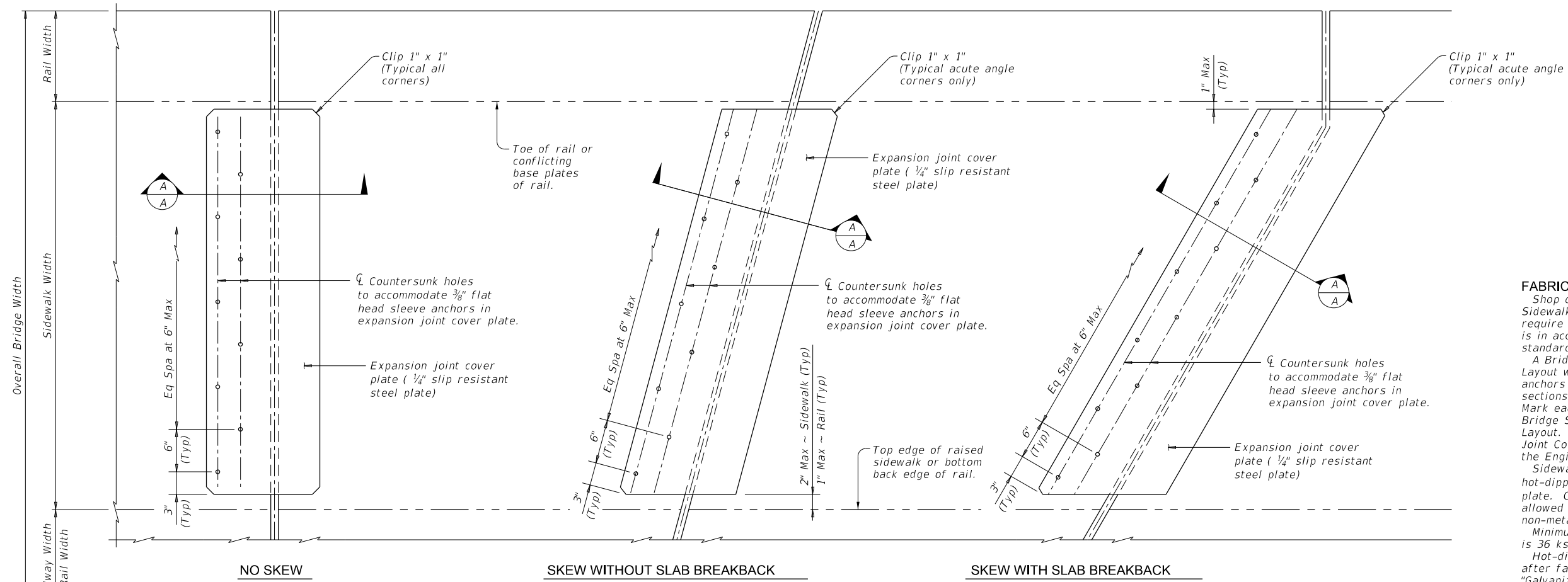
BRIDGE RAISED SIDEWALK AND MEDIAN DETAILS

BRSM

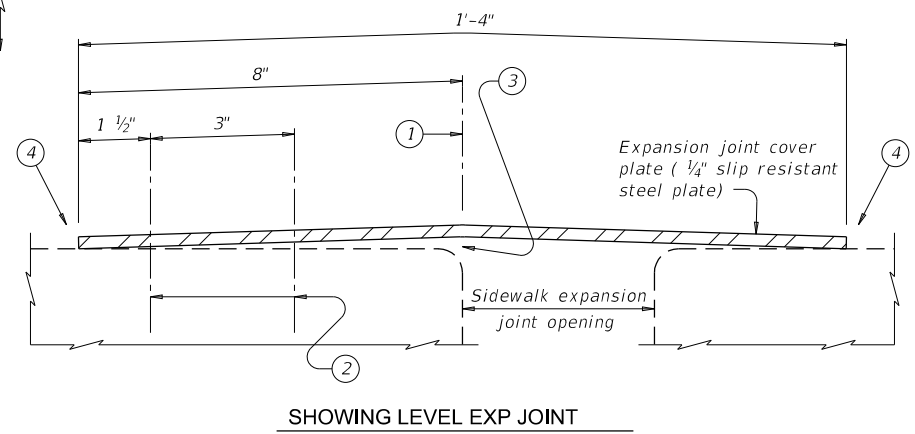
FILE: brsmste1-19.dgn	DN: JMH	CK: TxDOT	DW: JTR	CK: TxDOT
©TxDOT April 2019	CONT	SECT	JOB	HIGHWAY
REVISIONS	0908	33	106	EAST S 7TH ST
	DIST	COUNTY	SHEET NO.	
	ABL	TAYLOR	70	

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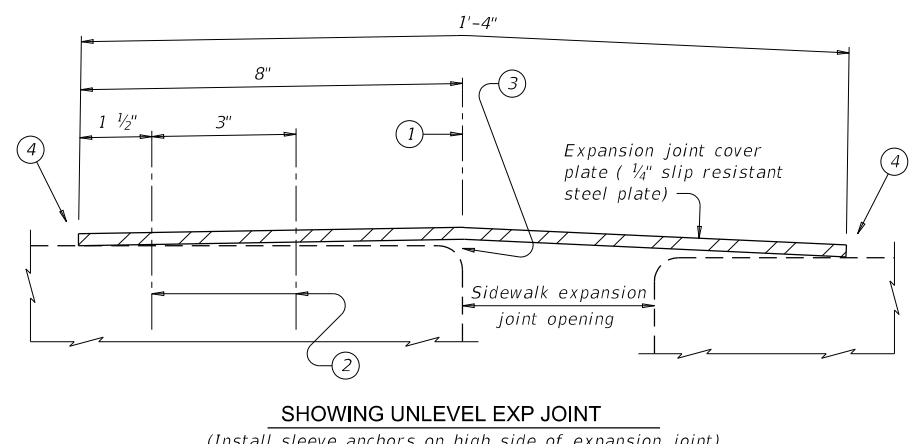
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PLAN

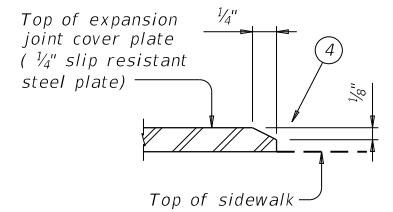


SHOWING LEVEL EXP JOINT



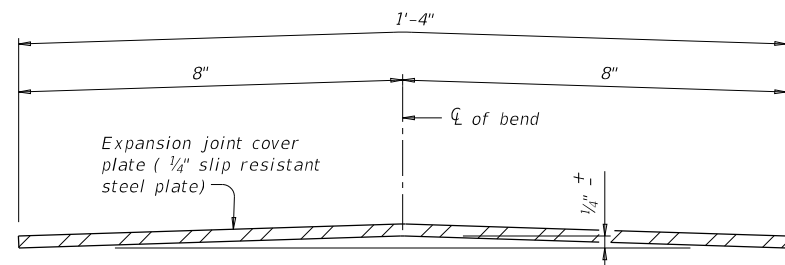
SHOWING UNLEVEL EXP JOINT
(Install sleeve anchors on high side of expansion joint)

SECTION A-A



EXP JOINT COVER PLATE BEVEL DETAIL

Bevel all plate edges as shown.



BENDING DIAGRAM OF EXP JOINT COVER PLATE

- ① Expansion joint cover plate and edge of expansion joint.
- ② 3/8" x 2 1/2" Min, Flat Head Sleeve Anchors, Stainless Steel. Countersink Flat Head Sleeve Anchors in 1/4" Slip Resistant Steel Plate.
- ③ It is not necessary to remove plate crown provided the plate is firmly secured to the sidewalk.
- ④ Transverse edges must be in contact with sidewalk surface after installation.

APPROVED SLIP RESISTANT PLATE	
Product	Manufacturer Website
Algrip™, Steel	www.algrip.com
Mebac® #3, Steel	www.harscoikg.com
SlipNOT® Grade 2, Steel	www.slipnot.com

Provide cover plates fabricated with a product from this list. No exceptions are permitted.

FABRICATION NOTES:

Shop drawings for the fabrication of Bridge Sidewalk Expansion Joint Cover Plate will not require the Engineer's approval if fabrication is in accordance with the details shown on this standard.
A Bridge Sidewalk Expansion Joint Cover Plate Layout which identifies location side of sleeve anchors and orientation of all cover plate sections must be developed by the fabricator. Mark each steel section in accordance with the Bridge Sidewalk Expansion Joint Cover Plate Layout. A copy of the Bridge Sidewalk Expansion Joint Cover Plate Layout is to be provided to the Engineer.
Sidewalk expansion joint cover plates must be hot-dipped galvanized 1/4" slip resistant steel plate. Checker plate or diamond plate is not allowed nor are slip resistant tapes, films and non-metallic coatings.
Minimum required yield strength of steel plate is 36 ksi.
Hot-dip galvanize slip resistant steel plate after fabrication in accordance with Item 445, "Galvanizing".
Provide stainless steel flat head sleeve anchors meeting the requirements of ASTM F 593, Group 1, Alloy 304. Countersink holes in slip-resistant plate for sleeve anchors. Drill holes in sidewalk as per sleeve anchor manufacturer's recommendations. Install sleeve anchors flush with, or slightly recessed below, top surface of sidewalk expansion joint cover plate.

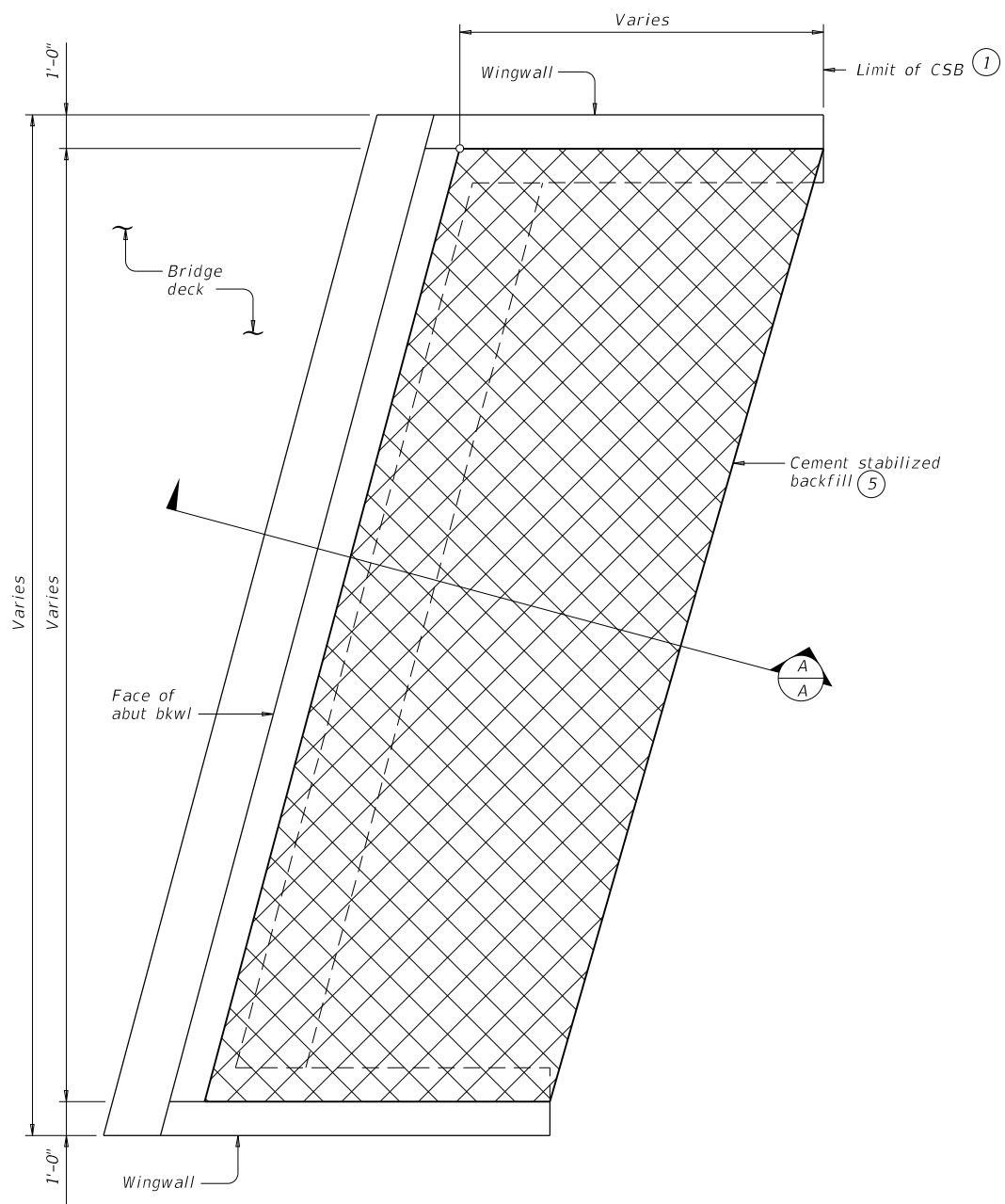
GENERAL NOTES:

Sidewalk expansion joint cover plates can only accommodate up to a 7" maximum expansion joint opening.
Details provided are applicable to concrete walkway surfaces only.
Payment for sidewalk expansion joint cover plates are by the pound of "Structural Steel (Misc Non-Bridge)" as per Item 442, "Metal for Structures".
Estimated weight of one sidewalk expansion joint cover plate is 14 plf.

BRIDGE SIDEWALK EXPANSION JOINT COVER PLATE (ALL SKEWS)			
BS-EJCP			
FILE: bsejste1-20.dgn	DN: TxDOT	CK: TxDOT	DW: TxDOT
©TxDOT April 2019	CONTRACT	SECTION	JOB
REVISIONS	0908	33	106
8-20: Closer tolerances on cover plate.	DIST	COUNTY	SHEET NO.
	ABL	TAYLOR	71

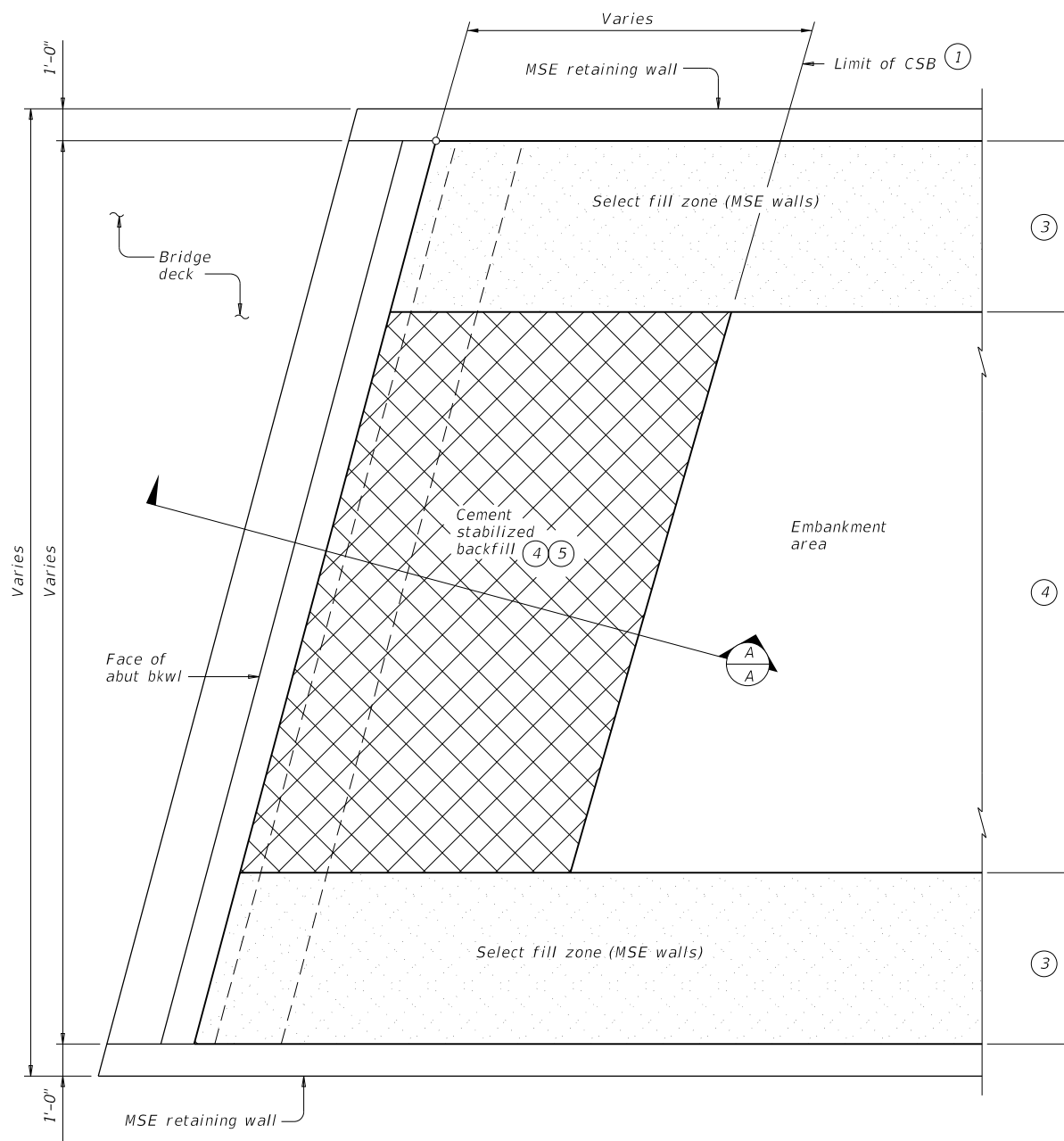
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OPTION 1 ~ PLAN WITH WINGWALLS

Cast-in-place retaining walls similar.

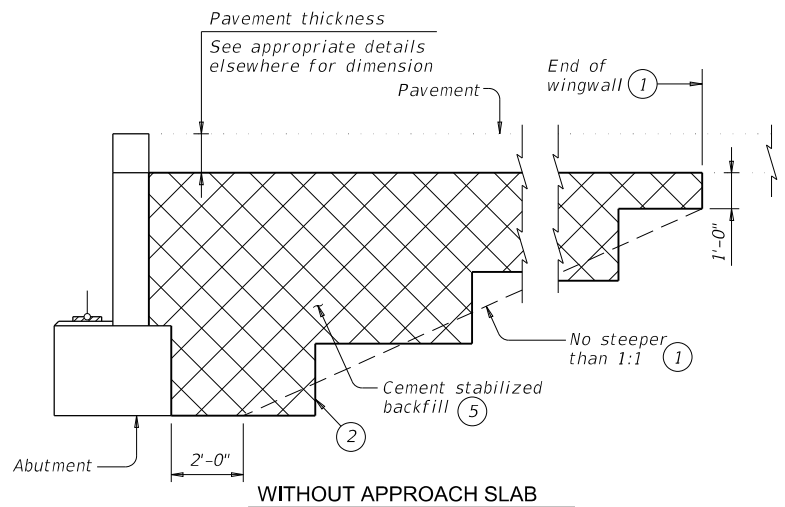


OPTION 1 ~ PLAN WITH MSE RETAINING WALLS

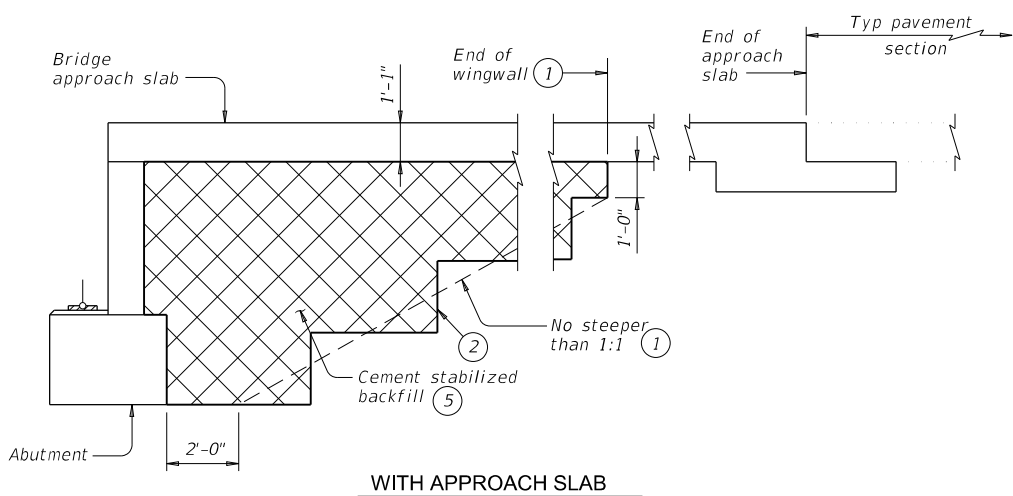
- ① Usual limit of Cement Stabilized Backfill is at end of wingwall. Extend CSB limits as required to maintain a slope no steeper than 1:1 at bottom of backfill.
- ② Bench backfill as shown with 12" (approximate) bench depths.
- ③ Where MSE retaining walls are present, adjust CSB limits to accommodate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

GENERAL NOTES:

See the Bridge Layout for selected Option. Option 2 is intended for new construction requiring high plasticity embankment fill with a plasticity index (PI) greater than 30 or pavement built in poor native soil. Poor soils are defined as high plasticity clays or expansive clays. Option 1 is intended for construction only requiring PI controlled embankment fill or excavation in competent soils/rocks in order to construct the abutment.
Provide Cement Stabilized Backfill (CSB) meeting the requirements of Item 400, "Excavation and Backfill for Structures", to the limits shown at bridge abutments.
If required elsewhere in the plans, provide Flowable Backfill meeting the requirements of Item 401, "Flowable Backfill", to the limits shown at bridge abutments.
Details are drawn showing left forward skew. See Bridge Layout for actual skew direction.
These details do not apply when Concrete Block retaining walls are used in lieu of wingwalls.



WITHOUT APPROACH SLAB



SECTION A-A

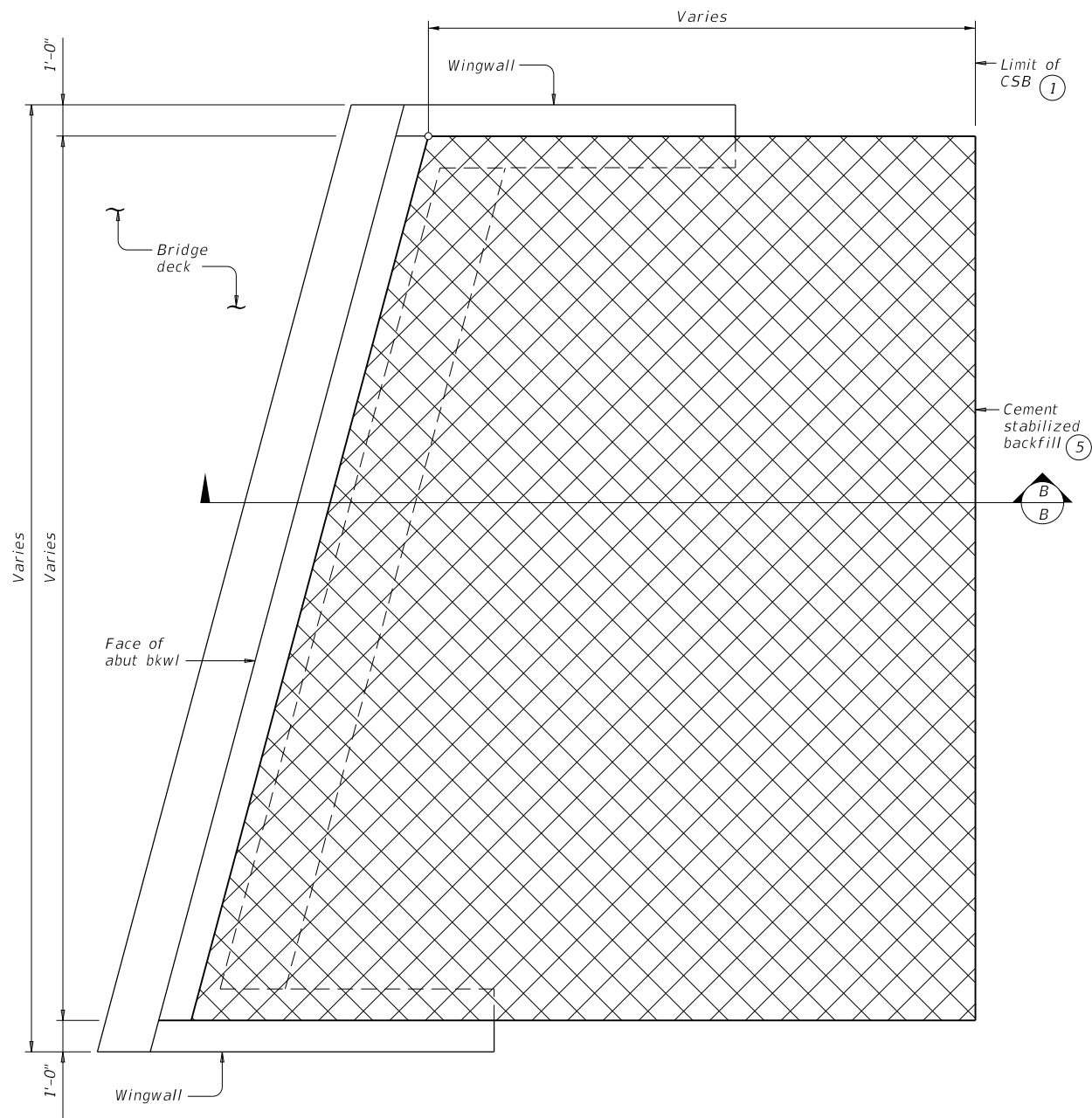
WITH APPROACH SLAB
(Showing BAS-C, BAS-A similar.)

SHEET 1 OF 2

				Bridge Division Standard	
CEMENT STABILIZED ABUTMENT BACKFILL BRIDGE ABUTMENT					
CSAB					
FILE: csabste1-20.dgn	DN: TxDOT	CK: TxDOT	DW: TxDOT	CK: TxDOT	
©TxDOT	April 2019	CONV	SECT	JOB	HIGHWAY
	REVISIONS	0908	33	106	EAST S 7TH ST
02-20: Added Option 2.		DIST	COUNTY	SHEET NO.	
		ABL	TAYLOR	72	

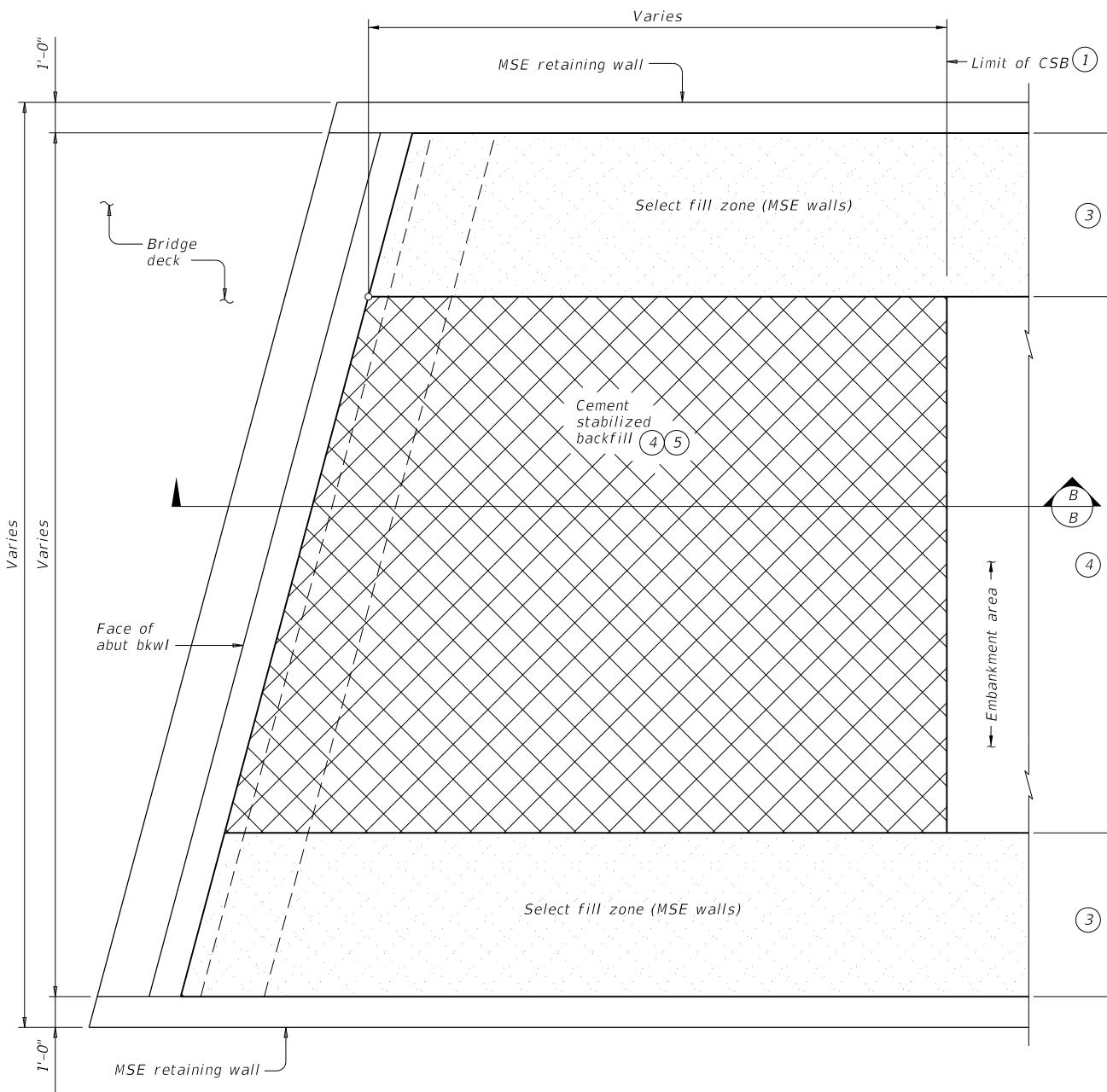
DISCLAIMER: The use of this standard is governed by the "Texas Engineering Practice Act". No warranty of any kind is made by TxDOT for any purpose whatsoever. TxDOT assumes no responsibility for the conversion of units of measurements. This standard was last revised on 04/19/2019.

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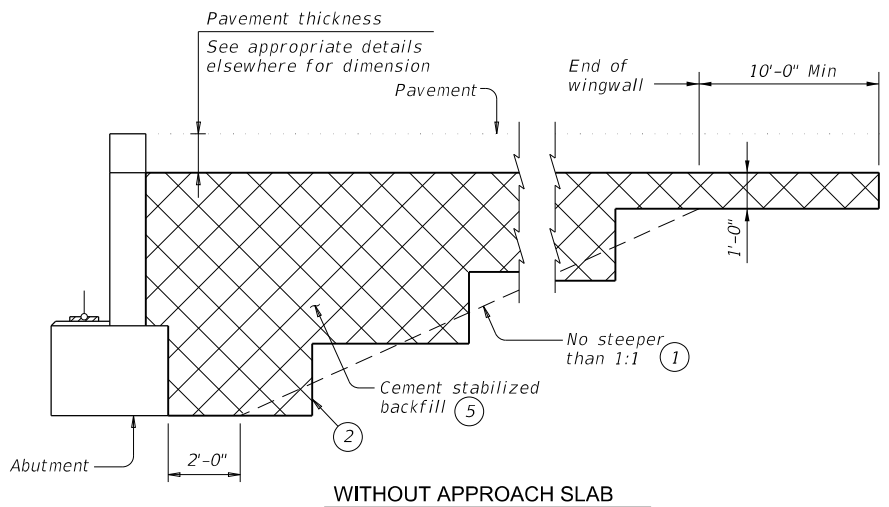
OPTION 2 ~ PLAN WITH WINGWALLS

Cast-in-place retaining walls similar.

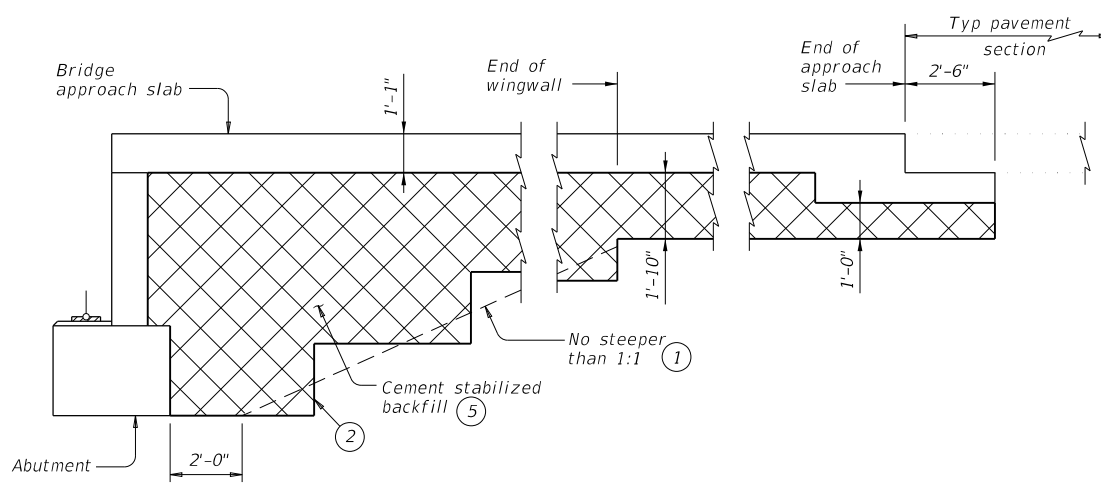


OPTION 2 ~ PLAN WITH MSE RETAINING WALLS

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



WITHOUT APPROACH SLAB



SECTION B-B

WITH APPROACH SLAB

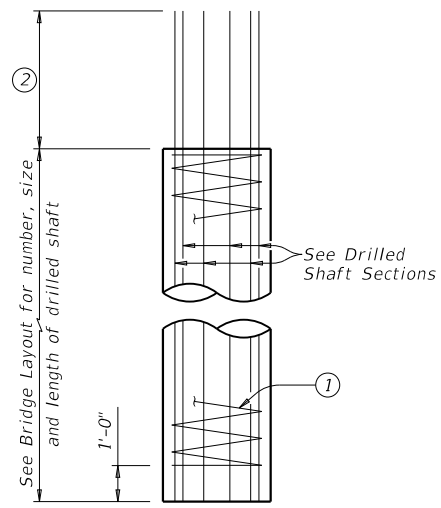
(Showing BAS-C, BAS-A similar.)

SHEET 2 OF 2

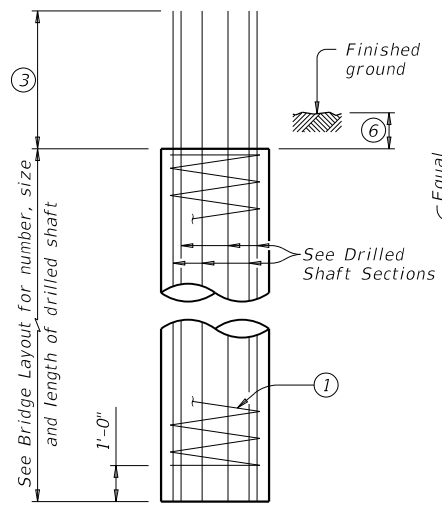
		Bridge Division Standard	
CEMENT STABILIZED ABUTMENT BACKFILL BRIDGE ABUTMENT			
CSAB			
FILE: csabste1-20.dgn	DN: TxDOT	CK: TxDOT	DW: TxDOT
©TxDOT April 2019	CONTRACT NO. 0908	SECTION NO. 33	JOB NO. 106
REVISIONS	COUNTY		HIGHWAY
02-20: Added Option 2.	TAYLOR		EAST S 7TH ST
DIST.		COUNTY	SHEET NO.
ABL		TAYLOR	73

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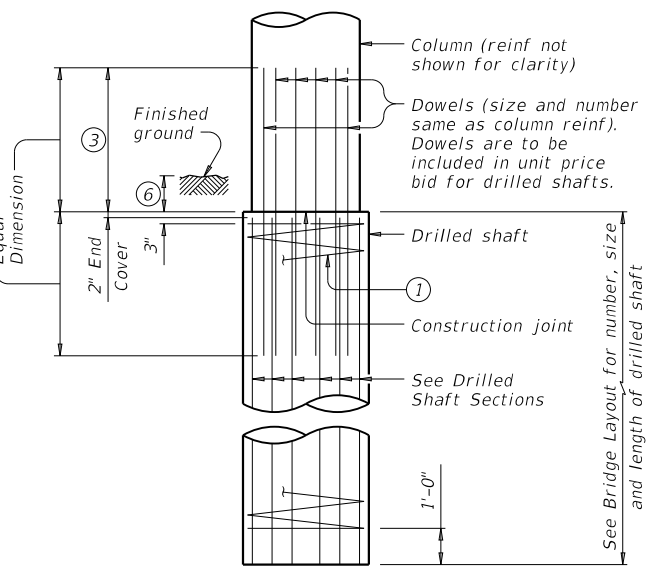
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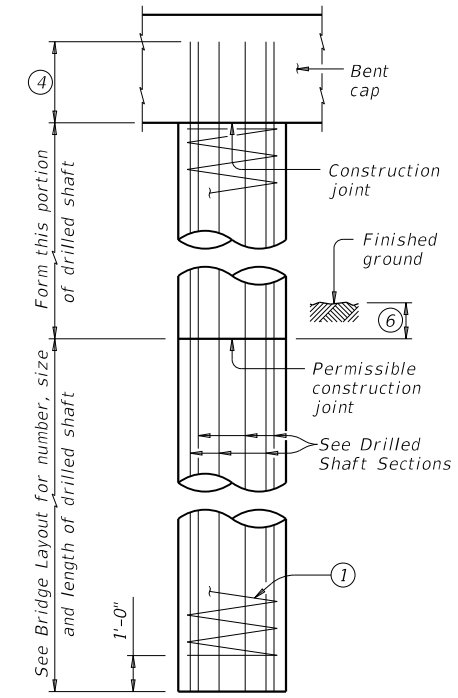
ABUTMENTS, WINGWALLS AND MULTI-DRILLED SHAFT FOOTINGS



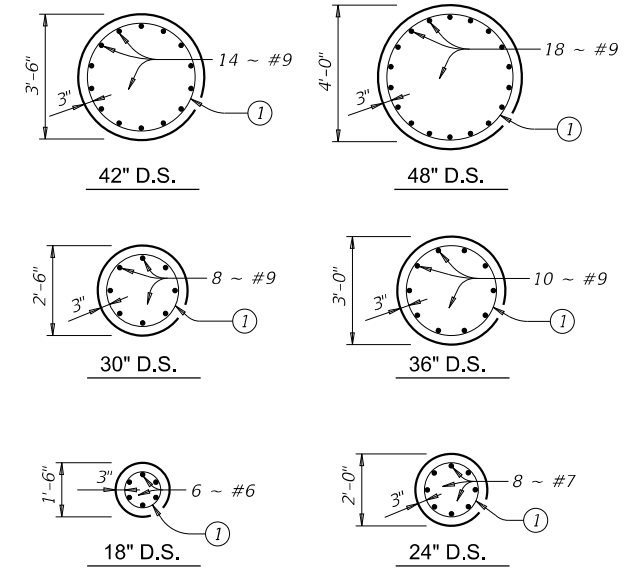
INTERIOR BENTS DRILLED SHAFT DIA EQUAL TO COLUMN DIA



INTERIOR BENTS DRILLED SHAFT DIA GREATER THAN COLUMN DIA



OPTIONAL INTERIOR BENT DRILLED SHAFT DETAIL ⑤

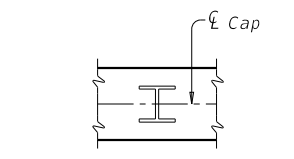


DRILLED SHAFT SECTIONS

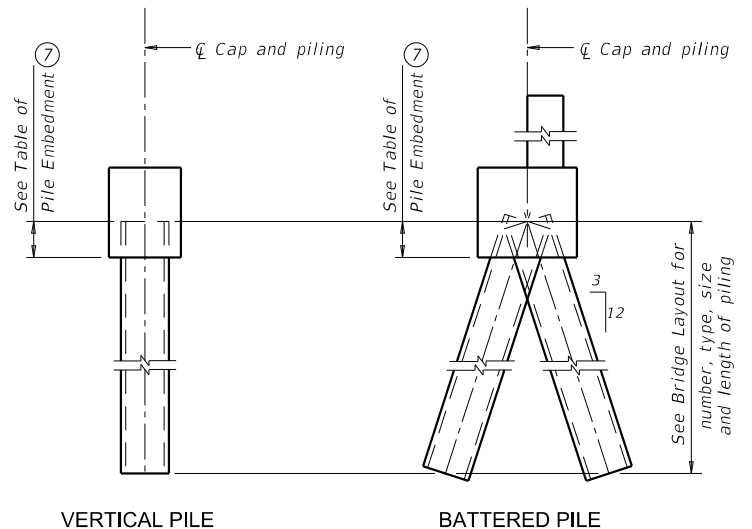
DRILLED SHAFT DETAILS

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.

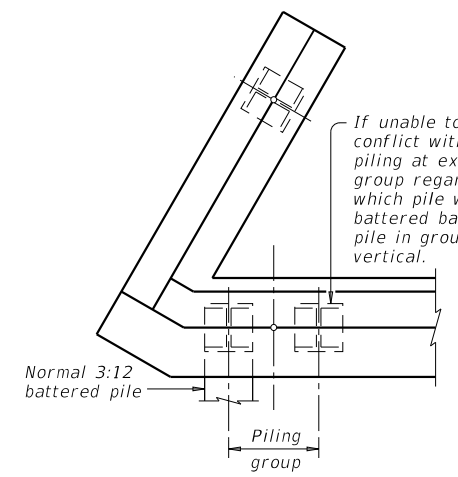


ORIENTATION OF STEEL H-PILING



PILING DETAILS

(Concrete or steel H)

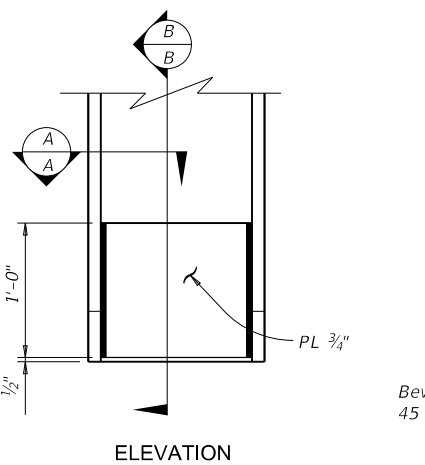


DETAIL "A"

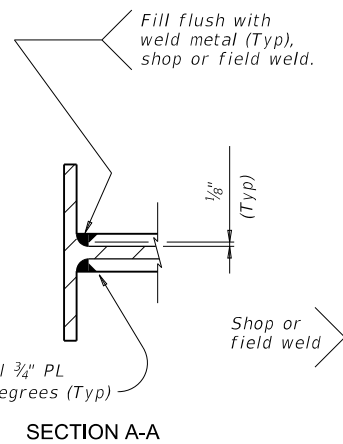
(Showing plan view of a 30° skewed abutment)

- 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.

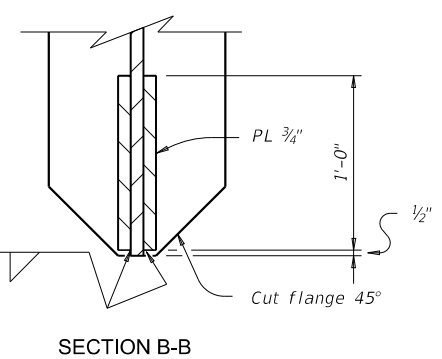
SHEET 1 OF 2



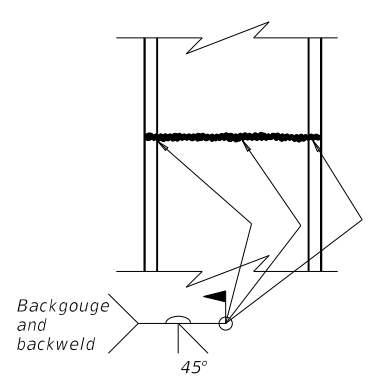
ELEVATION



SECTION A-A

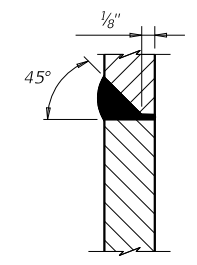


SECTION B-B



STEEL H-PILE SPLICE DETAIL

Use when required.



SECTION THRU FLANGE OR WEB

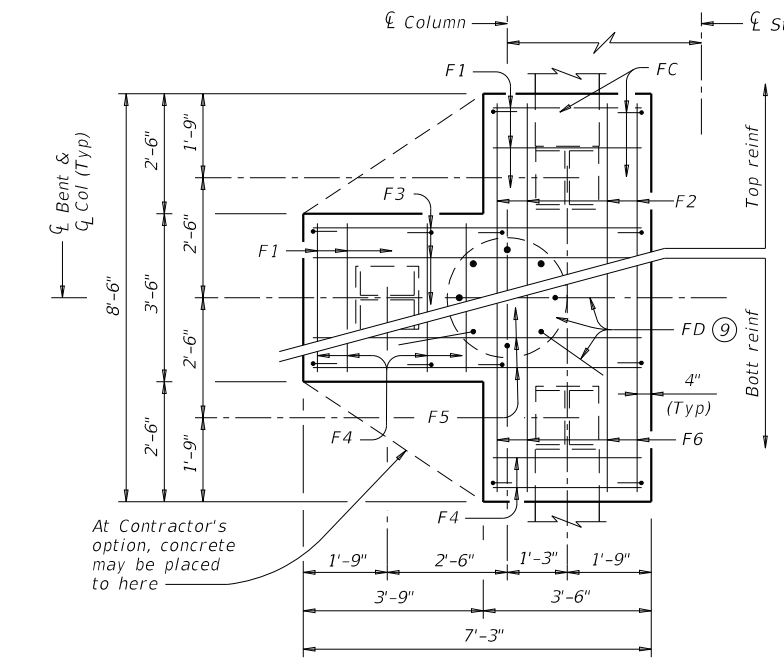
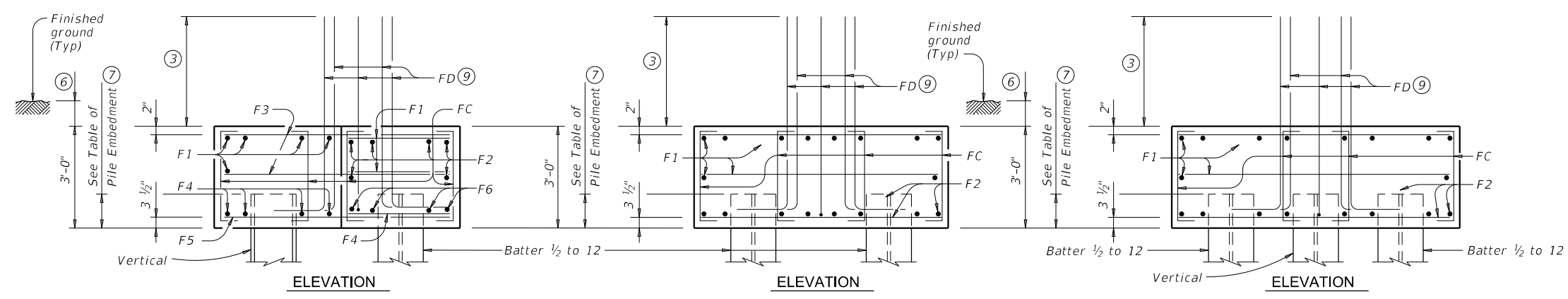
STEEL H-PILE TIP REINFORCEMENT

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

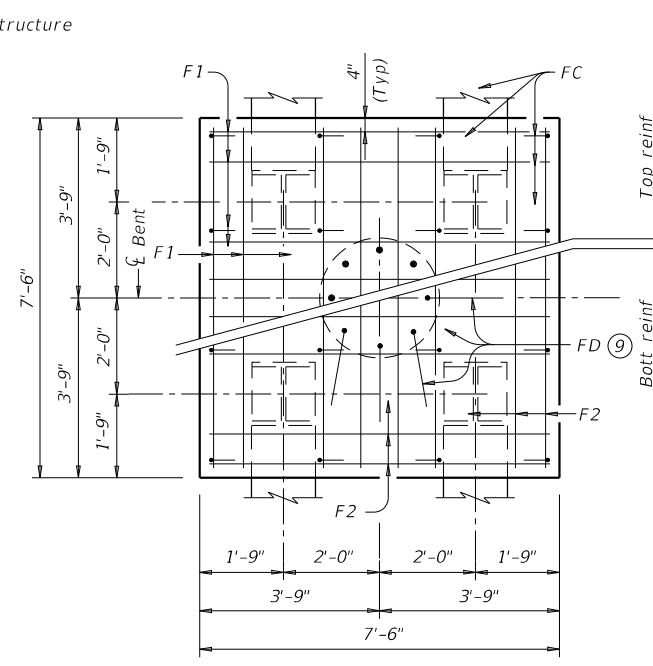
				Bridge Division Standard	
<h3>COMMON FOUNDATION DETAILS</h3>					
FD					
FILE: fdstd01-20.dgn	DN: TxDOT	CK: TxDOT	DW: TxDOT	CR: TxDOT	
©TxDOT April 2019	CONTRACT	SECTION	JOB	HIGHWAY	
	0908	33	106	EAST S 7TH ST	
01-20: Added #11 bars to the FD bars.		DISTRICT	COUNTY	SHEET NO.	
		ABL	TAYLOR	74	

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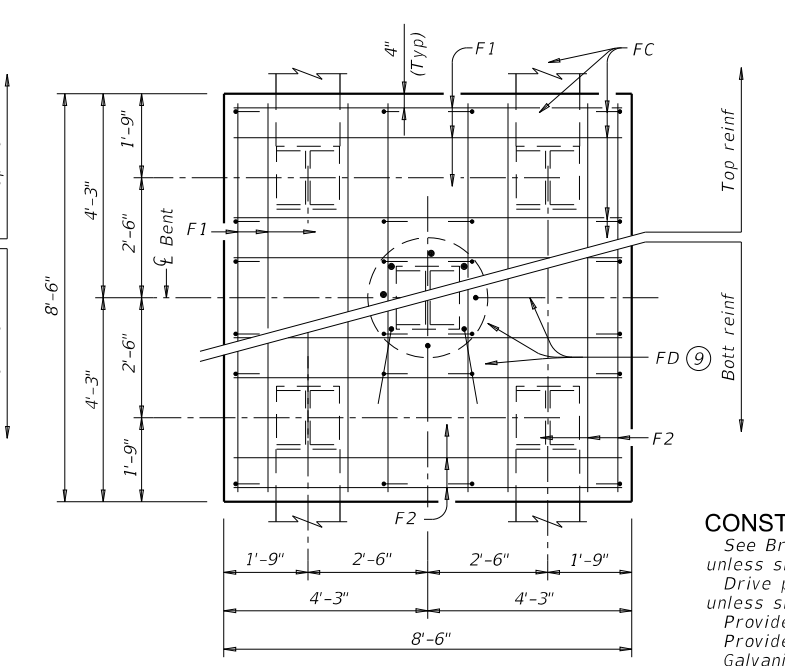
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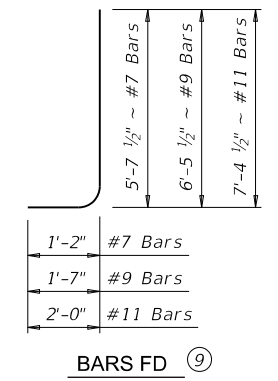
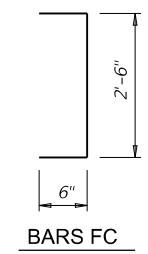
THREE PILE FOOTING (8)
 For 36" Dia and smaller columns.



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



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



- (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

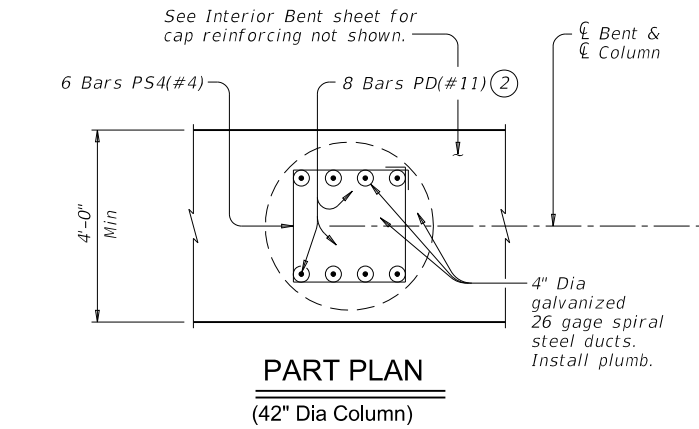
COMMON FOUNDATION DETAILS

FD

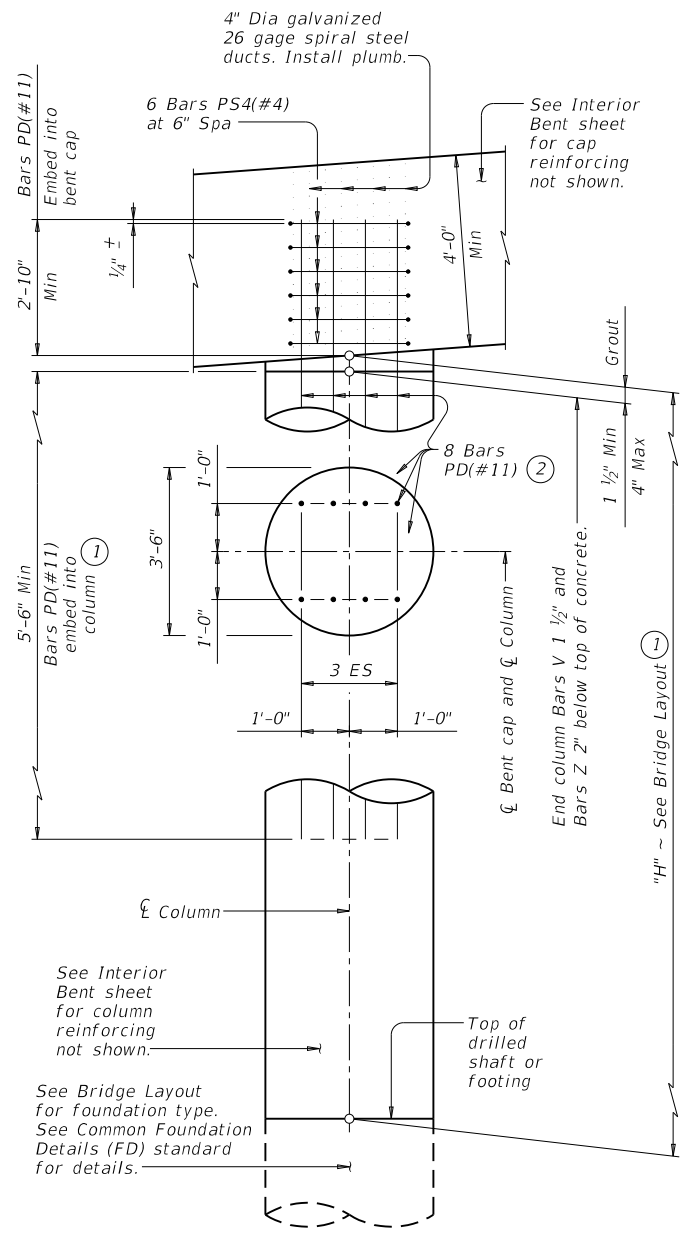
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©TxDOT April 2019	CONTRACT	SECTION	JOB	HIGHWAY
REVISIONS	0908	33	106	EAST S 7TH ST
01-20: Added #11 bars to the FD bars.	DIST	COUNTY	SHEET NO.	
	ABL	TAYLOR	75	

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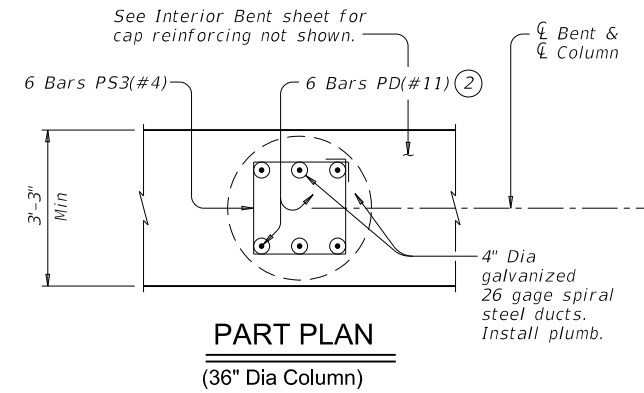
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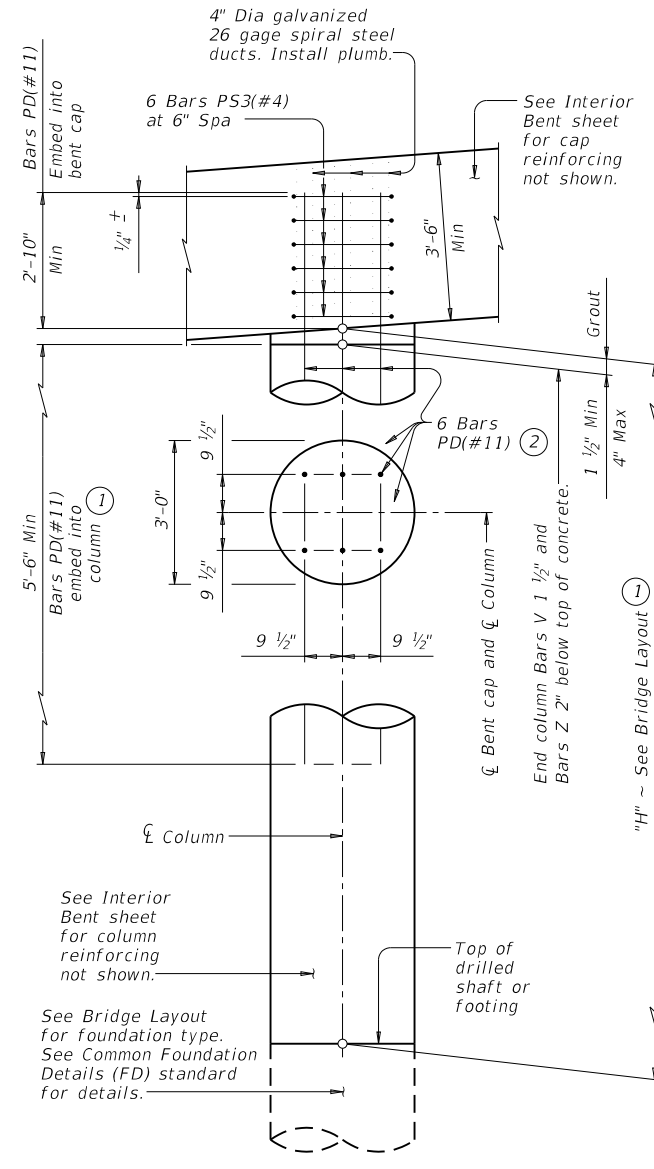
PART PLAN
(42" Dia Column)



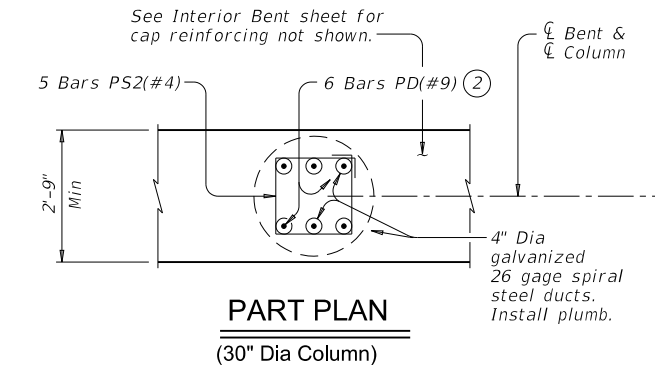
PART ELEVATION
(42" Dia Column)



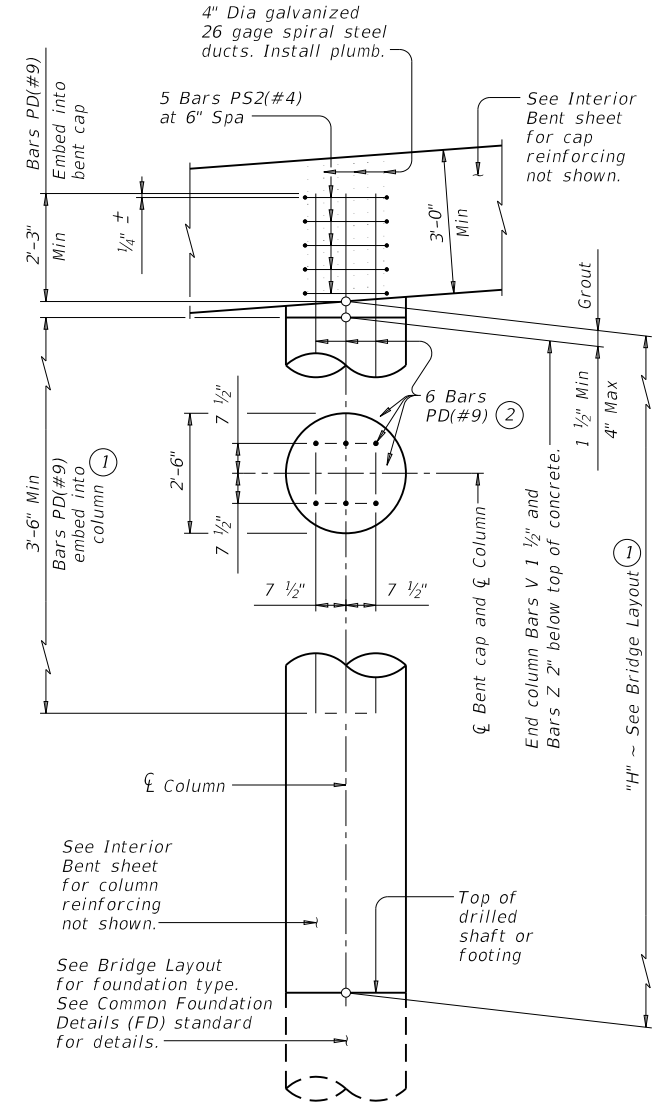
PART PLAN
(36" Dia Column)



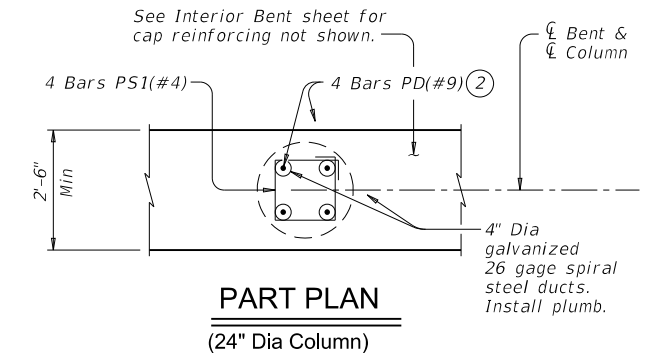
PART ELEVATION
(36" Dia Column)



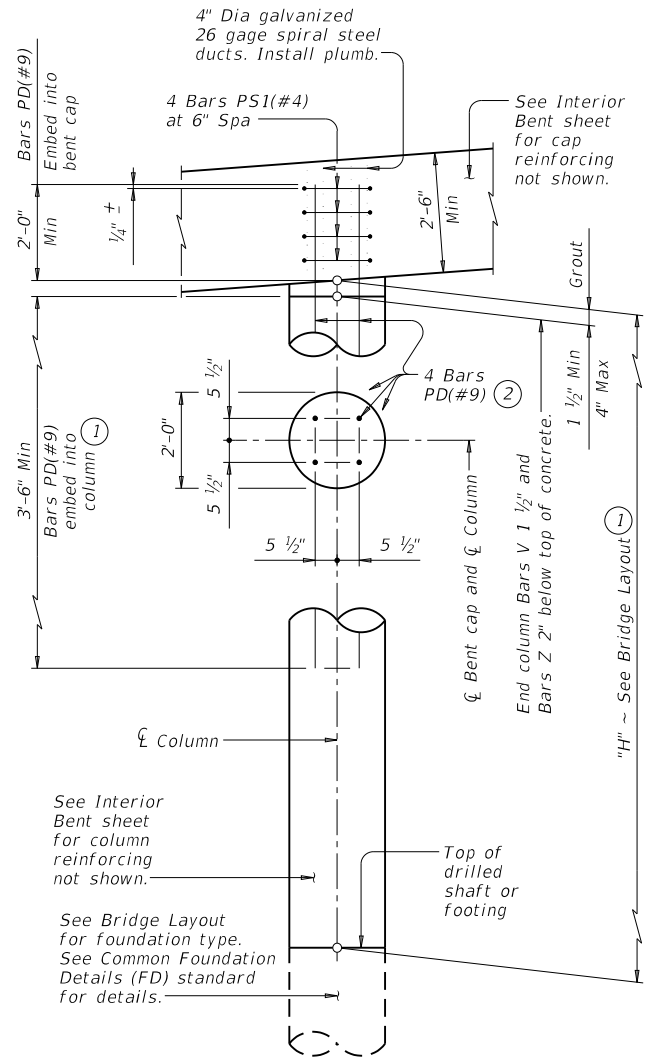
PART PLAN
(30" Dia Column)



PART ELEVATION
(30" Dia Column)



PART PLAN
(24" Dia Column)



PART ELEVATION
(24" Dia Column)

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

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

BARS PS (#4)

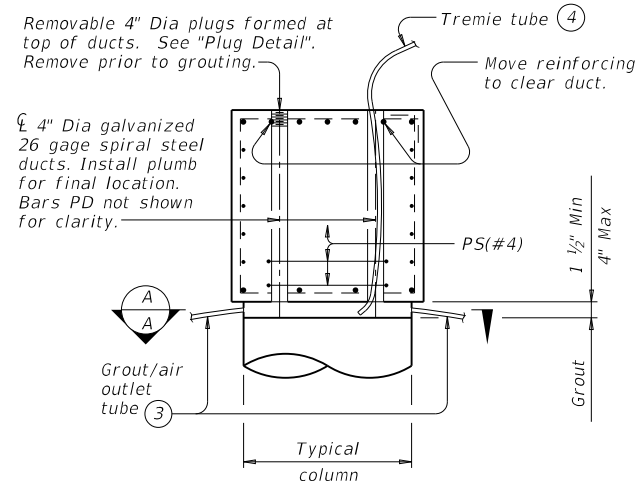
- ① Bars PD may need to be embedded in footing or drilled shaft for short columns.
- ② Location tolerance of dowels in columns/drilled shafts is 1/4" from plan location, transversely and longitudinally.

HL93 LOADING SHEET 1 OF 2

		Bridge Division Standard	
<h2>PRECAST CONCRETE BENT CAP OPTION FOR ROUND COLUMNS</h2>			
<h3>PBC-RC</h3>			
FILE: pbcst01-21.dgn	DN: TxDOT	CK: JMH	DW: JTR
©TxDOT April 2019	CONTRACT	SECTION	JOB
12-21: General Notes	0908	33	106
	DIST	COUNTY	SHEET NO.
	ABL	TAYLOR	76

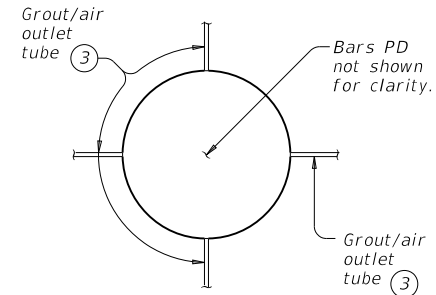
DISCLAIMER: The use of this standard is governed by the "Texas Engineering Practice Act". No warranty of any kind is made by TxDOT for any purpose whatsoever. TxDOT assumes no responsibility for the conversion of units in the drawings. The use of this standard is governed by the "Texas Engineering Practice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

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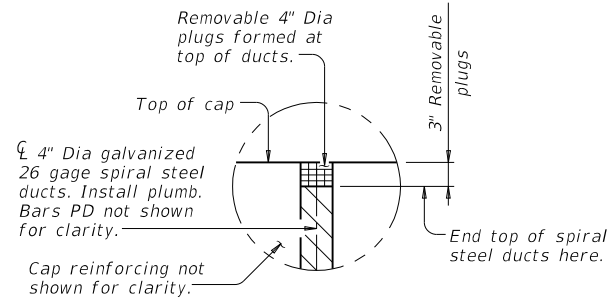


TYPICAL SECTION THRU CAP

(Showing example of ducts and cap reinforcing.)



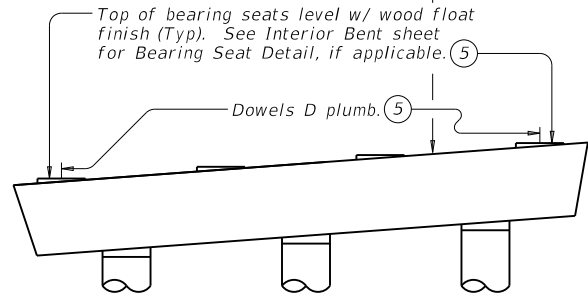
SECTION A-A



PLUG DETAIL

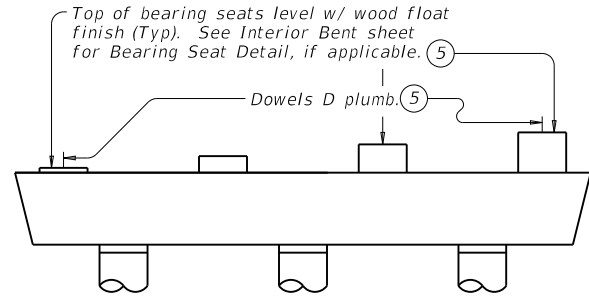
(Plug is used to keep concrete out of ducts during concrete placement. Remove prior to grouting)

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



CAP SET AT SLOPE

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



CAP SET LEVEL

EXAMPLES OF PRECAST BENTS WITH DOWELS D

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

CONSTRUCTION NOTES:

Cap Fabrication:
Construct and cure cap in accordance with Item 420, "Concrete Substructures". If fabricated at an offsite location, construct and cure cap in accordance with Item 424, "Precast Concrete Structural Members (Fabrication)". Secure ducts to prevent their movement during concrete placement. Location tolerance of ducts is 1/4" from plan location, transversely and longitudinally. Seal ducts to prevent intrusion of concrete.
Bearing seats may be precast with the cap. Bearing seats over 3" in height must be reinforced as per Item 420.4.9. Do not locate lift points at bearing seats if bearing seats are precast.
Cap concrete must achieve a compressive strength of 2,500 psi prior to lifting. Limit flexural stress in cap to 250 psi during handling and storage. Store and handle caps in accordance with Item 424, "Precast Concrete Structural Members (Fabrication)". Do not stack caps. Caps that become cracked or otherwise damaged may be rejected.

Cap-to-Column Connection:

Make a trial batch of grout using the same material, equipment and personnel to be used for actual grouting operations and grout a mock-up of the connection at least one week before grouting and in the presence of the Engineer. This mock-up test must demonstrate the reliability of the Contractor's grouting procedures to provide a connection free of voids. Field test the trial batch grout to the same level required for the actual grouting.
Caps may be placed on columns/drilled shafts after column/drilled shaft concrete has achieved a flexural stress of 355 psi (or 2,500 psi compressive strength). Use plastic shims or friction collars to support the cap at the proper elevation prior to grouting. Total area of plastic shims used on top of each column may not exceed 6 percent of the column area. Column/drilled shaft curing may be interrupted a maximum of 2 hours for placement of plastic shims or friction collars and cap placement.
Surfaces in contact with grout must be clean and in a saturated, surface-dry condition, immediately prior to grouting. Provide water tight forms. Fill the forms with water and drain just prior to grouting. Ponding or free-standing water is not permitted. Use compressed air to blow out excess water.
Mix grout in accordance with the manufacturer's directions. Evidence of frothing, foaming, or segregation is cause for rejection. Transport grout from mixer to final location by wheel barrow, bucket or pumping.
Perform sampling and testing of grout by trained personnel at the Contractor's expense and while witnessed by the Engineer. Grouted connections must be free of voids.
Trowel finish top surface of cap anchorage ducts flush with top of cap. Wet mat cure these locations for at least 48 hours. Recess lifting loops 1-inch minimum using exothermic cutting rods. Do not overheat or damage the surrounding concrete. Abrade the concrete surfaces of excavation and end of the lifting loop to remove all slag with a needle gun, steel brush, or other suitable means. Coat the inside of the recessed area, including the lifting loops, with 10 mils (minimum) of neat, Type VIII epoxy and patch the recess with epoxy mortar.
Friction collars may be removed, if used, and beams placed on the cap after the grout obtains a compressive strength of 2,500 psi. Subsequent loading can occur when the grout reaches its final required 28 day compressive strength.

MATERIAL NOTES:

Provide a pre-qualified grout from TxDOT's Material Producer List "Cementitious Grouts and Mortars for Miscellaneous Applications", conforming to DMS-4675.
Provide semi-rigid spirally crimped, corrugated duct of galvanized, cold rolled steel conforming to ASTM A653. Corrugations must have a minimum amplitude of 0.094".
Grout tubes and forms must be approved prior to grouting.
Provide Grade 60 reinforcing steel. Epoxy coat or galvanize all reinforcement if column reinforcement is epoxy coated or galvanized.

GENERAL NOTES:

Designed in accordance with AASHTO LRFD Bridge Design Specifications.
The Contractor has the option to provide precast bent caps in accordance with the details shown. No additional payment will be made if the Contractor uses precast caps.
Submit shop drawings of precast caps for approval prior to construction. Indicate lifting attachments and locations on the shop drawings.
Precast Concrete Bent Cap Option shown on this standard may require modification for select structure types. See appropriate details elsewhere in plans for these modifications.
See Interior Bent sheet for details and notes not shown.

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



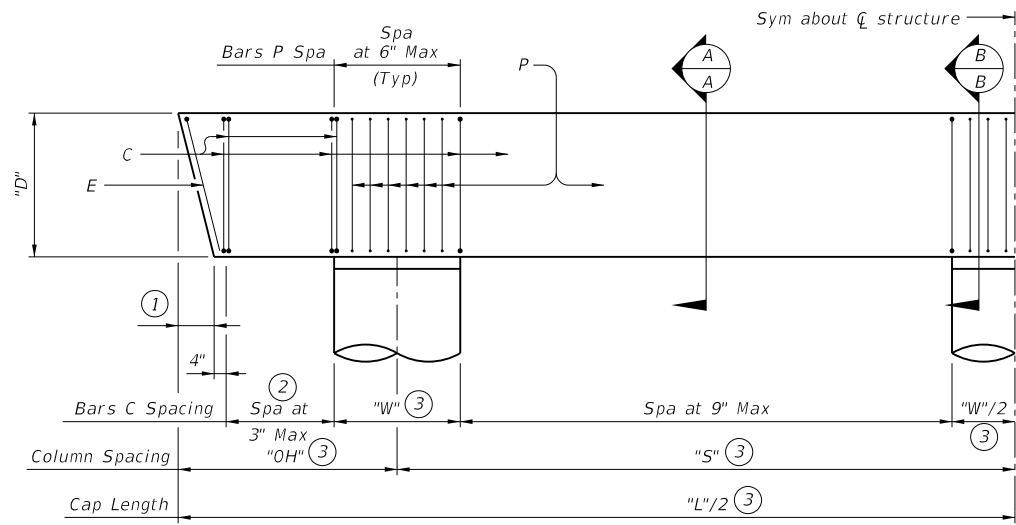
**PRECAST CONCRETE
BENT CAP OPTION
FOR ROUND COLUMNS**

PBC-RC

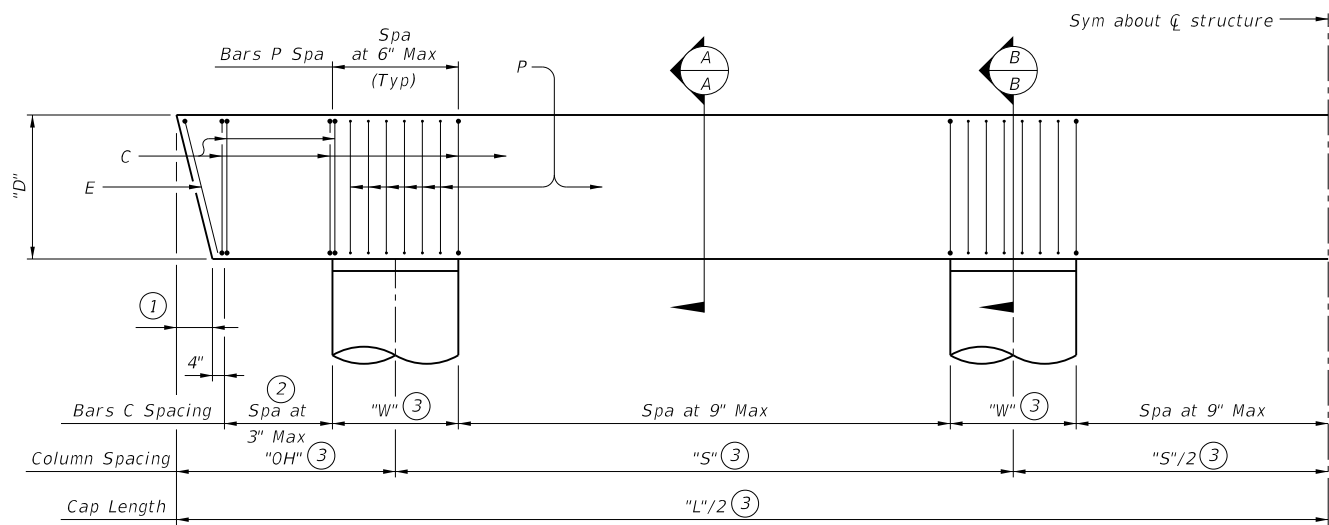
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©TxDOT 12-21: General Notes	CONTRACT	SECTION	JOB	HIGHWAY
	0908	33	106	EAST S 7TH ST
	DIST	COUNTY	SHEET NO.	
	ABL	TAYLOR	77	

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DATE: 2/7/2023 3:14:40 PM
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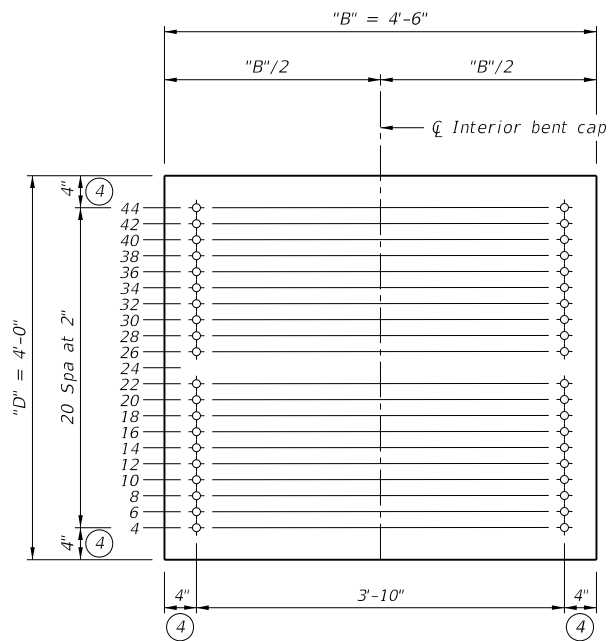
SHOWING 3 COLUMN BENT



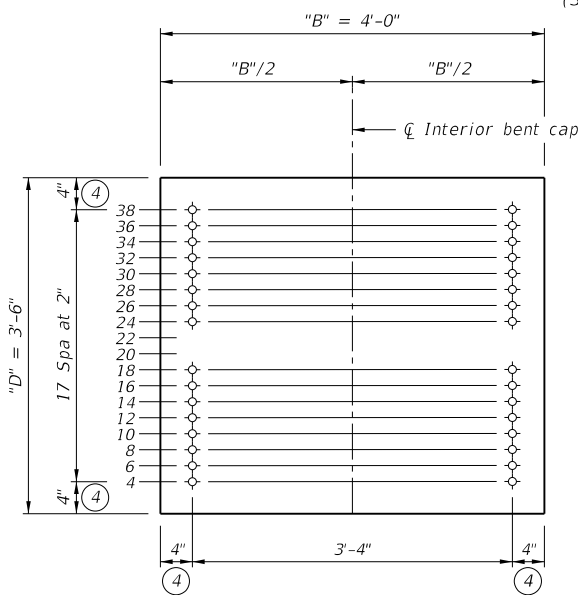
SHOWING 4 COLUMN BENT

INTERIOR BENT HALF ELEVATION

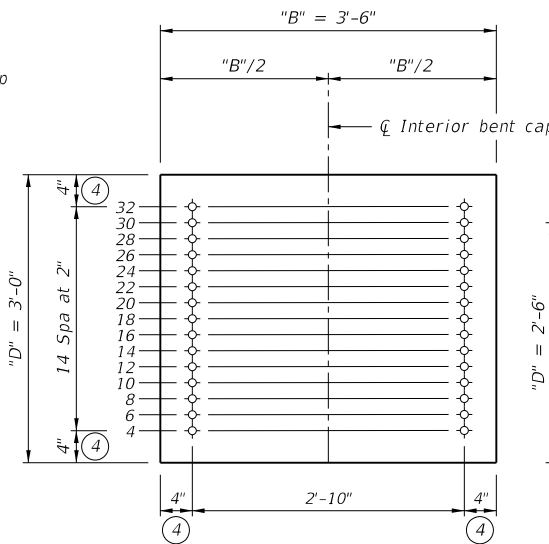
(Strands not shown for clarity.)



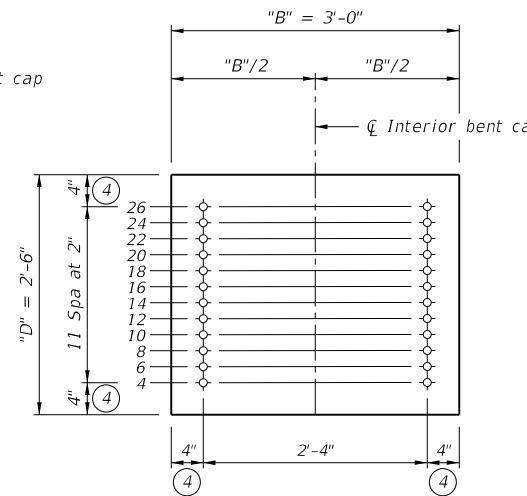
4'-6" x 4'-0" CAP
 Used with I-girders (Tx62)



4'-0" x 3'-6" CAP
 Used with I-girders (Tx28-Tx54) and X-beams



3'-6" x 3'-0" CAP
 Used with decked slab beams and box beams



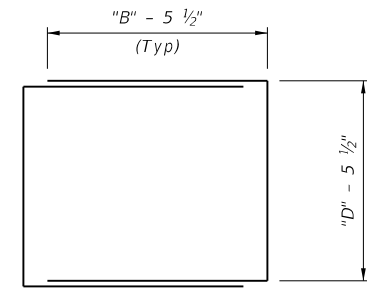
3'-0" x 2'-6" CAP
 Used with slab beams

INTERIOR BENT CAP SECTIONS

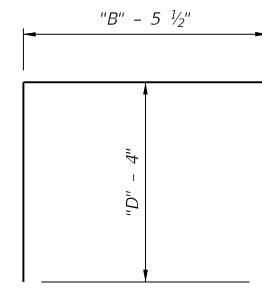
(Showing strands only.)

TABLE OF CAP DESIGNS

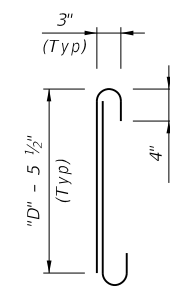
SUPERSTRUCTURE TYPE	CAP DIMENSIONS			CONCRETE		PRESTRESSING STRANDS			REQUIRED MINIMUM ULTIMATE MOMENT CAPACITY (STRENGTH I) (ft-kips)	
	CAP WIDTH "B" (ft-in)	CAP DEPTH "D" (ft-in)	CORRUGATED PIPE INSIDE DIAMETER (ft-in)	RELEASE STRENGTH f'_{ci} (ksi)	MINIMUM 28 DAY COMP STRENGTH f'_c (ksi)	LAYERS OF PS STRANDS	TOTAL NO. PS STRANDS	SIZE (in)		STRENGTH (ksi)
Slab Beams	3'-0"	2'-6"	1'-6"	4.0	5.0	12	24	0.6	270	1,201
Decked Slab Beams	3'-6"	3'-0"	2'-0"	4.0	5.0	15	30	0.6	270	1,886
Box Beams	3'-6"	3'-0"	2'-0"	4.0	5.0	15	30	0.6	270	1,886
X-Beams	4'-0"	3'-6"	2'-6"	5.2	6.5	16	32	0.6	270	2,671
I-Girders (Tx28-Tx54)	4'-0"	3'-6"	2'-6"	4.0	5.0	16	32	0.6	270	2,484
I-Girders (Tx62)	4'-6"	4'-0"	3'-0"	4.0	5.0	20	40	0.6	270	3,634



BARS C(#5)
 Showing one complete bar.

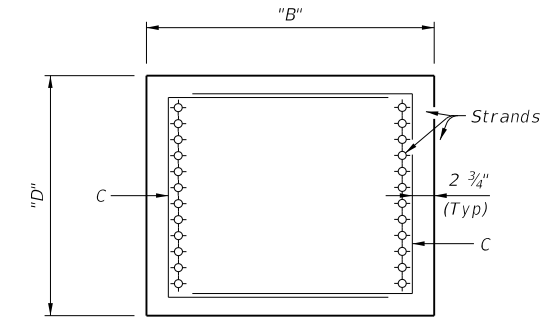


BARS E(#5)

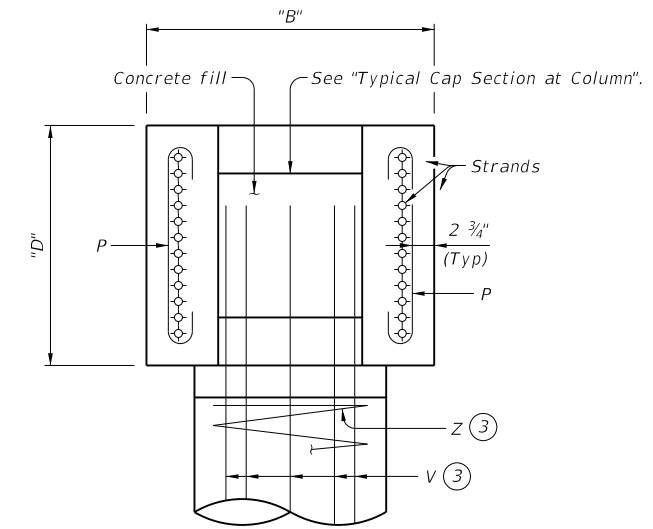


BARS P(#3)
 Showing one complete bar.

- ① Variable. See Interior Bents sheet for dimension. When dimension is 0", omit Bars E and reduce end cover to Bars C to 3". Measured parallel to top of cap cross-slope.
- ② Double Bars C. (Typ)
- ③ See Interior Bents sheet for details not shown.
- ④ Dimensioned to center of strand.



SECTION A-A



SECTION B-B

HL93 LOADING SHEET 1 OF 2



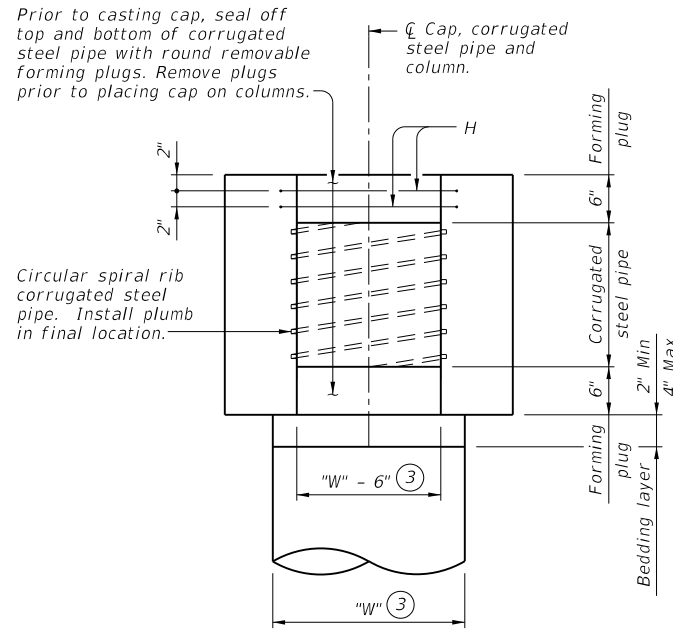
PRESTRESSED, PRECAST BENT CAP OPTION FOR ROUND COLUMNS

PPBC-RC

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©TxDOT April 2019	CONV	SECT	JOB	HIGHWAY
12-21: General Notes	0908	33	106	EAST S 7TH ST
	DIST	COUNTY	SHEET NO.	
	ABL	TAYLOR	78	

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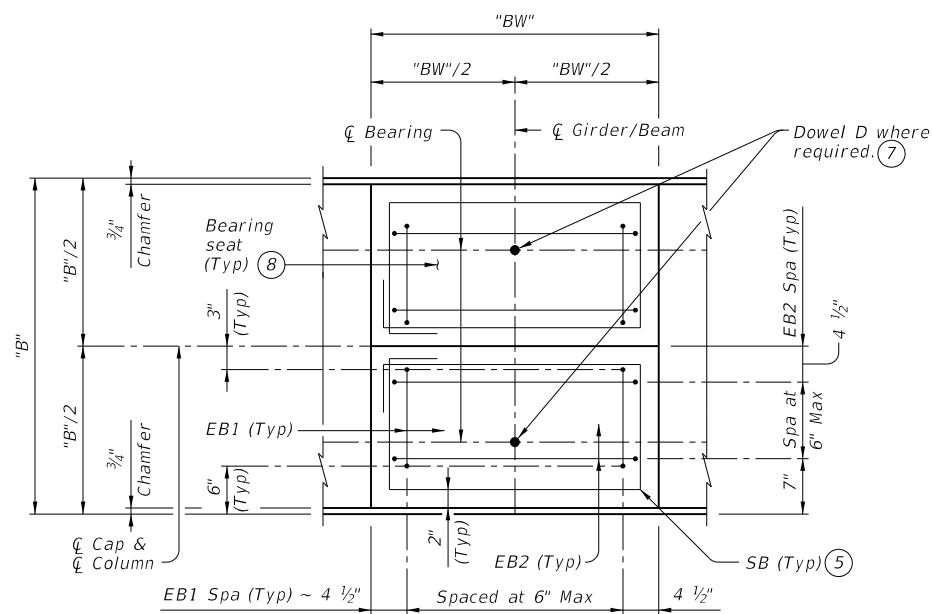
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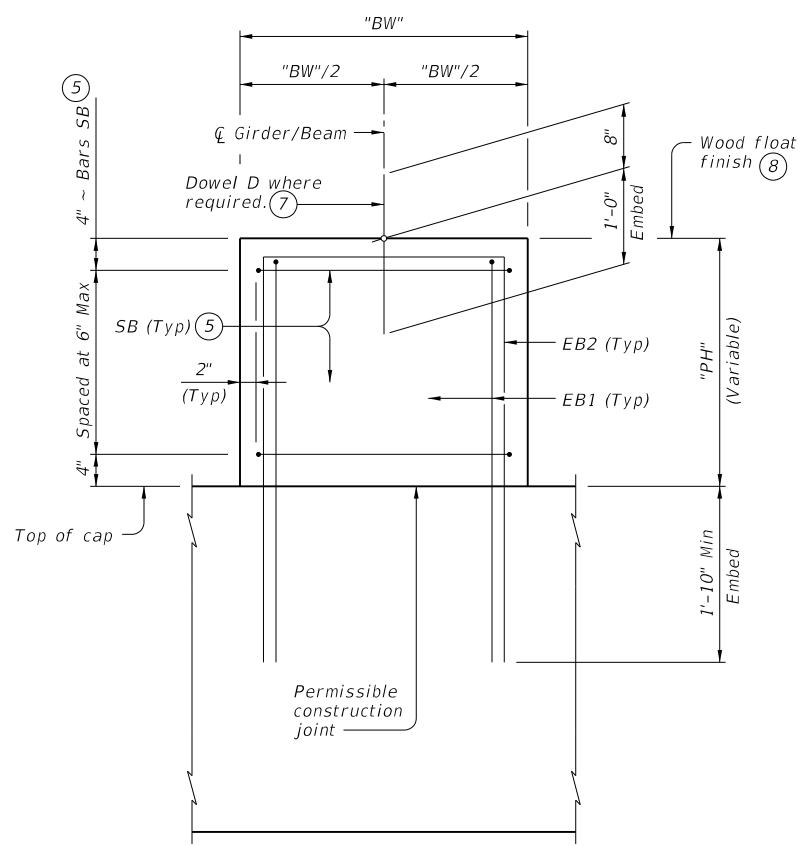
TYPICAL CAP SECTION AT COLUMN

Showing example of cap and corrugated steel pipe at column. Cap and column reinforcing not shown for clarity.

SUPERSTRUCTURE TYPE	BEARING DIMENSIONS
	"BW" (ft-in)
X-Beams	6'-0"
I-Girders (Tx28-Tx54)	3'-0"
I-Girders (Tx62)	3'-0"



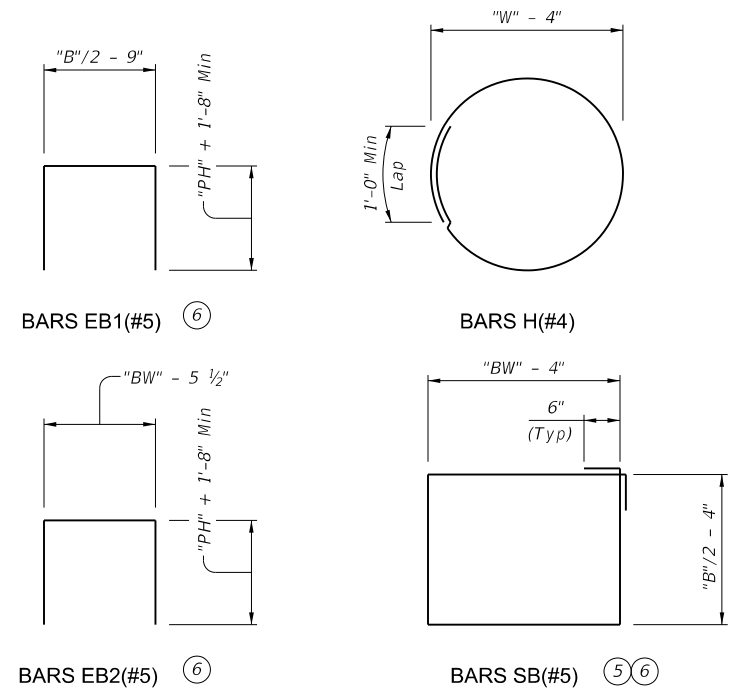
PLAN



PEDESTAL DETAILS

Clean bearing surface and all loose material before placing bearing pad. Reinforce bearing seats/pedestals over 3" in height as shown.

- (3) See Interior Bents sheet for details not shown.
- (5) Omit Bars SB for pedestal heights ("PH") under 1'-0".
- (6) Shown for structures without skew. Details are for "PH" heights greater than 3" and less than 18". Details are shown for standard X-Beams and I-Girders. Submit details as part of the shop drawing submittal for skewed structures and for pedestals greater than 18" in height.
- (7) See Interior Bents sheet for placement of dowels. Place dowels plumb.
- (8) See Interior Bents sheet, Bearing Seat Detail for slope.



CONSTRUCTION NOTES:

Cap Fabrication:
 Fabricate in accordance with Item 424, "Precast Concrete Structural Members (Fabrication)". Secure corrugated metal pipes to prevent their movement during concrete placement. Location tolerance of pipes is 1/4" from plan location, transversely and longitudinally. Seal pipes to prevent intrusion of concrete.
 Chamfer or round all exposed corners 3/4".
 Repair cracks exceeding 0.005 in. in width as directed. The fabricator must take approved corrective actions if cracks greater than 0.005 in. form. All work, material, and engineering related to these cracks will be at the Contractor's expense.
 Caps can be set level or at grade. If required or needed, build bearing seats/pedestals to achieve final grade. Bearing seats/pedestals may be precast with the initial cast. Bearing seats/pedestals that conflict with column locations may not be precast with cap. Do not locate lift points at bearing seats/pedestals if bearing seats/pedestals are precast. If bearing seats/pedestals are not precast, cast in accordance with Item 420.4.9, "Treatment and Finishing of Horizontal Surfaces". Do not slope the top of caps between bearing areas from the center slightly towards the edge. If pedestal reinforcement is not present, drill and epoxy anchor Bars EB1 and EB2 into top of cap in accordance with Item 420.4.7.10, "Installation of Dowels and Anchor Bolts".
 If earwalls are required, see Interior Bents sheet for details.
 If shear keys are required elsewhere in plans, submit details. Shear keys may not be precast. Drill and epoxy shear key anchor reinforcement into top of cap in accordance with Item 420.4.7.10 "Installation of Dowels and Anchor Bolts".
 Limit flexural stress in cap to 250 psi during handling and storage. Store and handle caps in accordance with Item 424, "Precast Concrete Structural Members (Fabrication)". Do not stack caps.

Cap-to-Column Connection:

Construct a mock-up of the column-to-cap connection that must demonstrate the ability of the Contractor to provide a connection free of voids. In the presence of the Engineer, use trial batch of concrete fill using the same material, equipment, and personnel to be used for actual concrete operations and fill the mock-up at least one week before casting concrete. Field test the trial batch of concrete fill to the same levels required for the actual concrete fill depth.
 Caps may be placed on columns/drilled shafts after column/drilled shaft concrete has achieved a flexural stress of 355 psi (or 2,500 psi compressive strength). Use plastic shims or friction collars to support the cap at the proper elevation prior to concrete fill depth. Total area of plastic shims used on top of each column may not exceed 6 percent of the column area. Column/drilled shaft curing may be interrupted a maximum of 2 hours for placement of plastic shims or friction collars and cap placement.
 Provide mortar tight forms. Ensure the top of the column is in a saturated surface dry (SSD) condition just before placing concrete fill. Deposit concrete such that all voids in the bedding layer and bent cap are completely filled. Deposit concrete through the top opening of the cap pocket in a manner that deposits concrete from the bedding layer on the bottom of the connection upward. Vibrate concrete in the pocket in accordance with Item 420.4.7.9, "Consolidation". Trowel finish top surface of cap pockets flush with top of cap. Wet mat cure these locations for at least 48 hours. Recess lifting loops 1-inch minimum using exothermic cutting rods. Do not overheat or damage the surrounding concrete. Abrade the concrete surfaces of excavation and end of the lifting loop to remove all slag with a needle gun, steel brush, or other suitable means. Coat the inside of the recessed area, including the lifting loops, with 10 mils (minimum) of neat, Type VIII epoxy and patch the recess with epoxy mortar.

MATERIAL NOTES:

Provide 12 gage, Type 1, lock-seam, helical corrugated pipe conforming to Item 460, "Corrugated Metal Pipe".
 Provide Grade 60 reinforcing steel. Do not epoxy coat reinforcement even if column reinforcement is epoxy coated.
 Provide Class "H" (HPC) concrete for cap concrete.
 Provide Class "C" or "S" concrete for cap-to-column connection concrete fill.
 Use low relaxation strands, each pretensioned to 75% of f_{pu} .

GENERAL NOTES:

Designed in accordance with AASHTO LRFD Bridge Design Specifications.
 Prestress loss calculated according to Research Report FHWA/TX-12/0-6374-2 Table 6.6 using a relative humidity of 60 percent.
 The Contractor has the option to provide prestressed, precast bent caps in accordance with the details shown. No additional payment will be made if the Contractor uses prestressed, precast bent caps.
 Submit shop drawings of prestressed, precast bent caps for approval prior to construction. Indicate lifting attachments and locations on the shop drawings.
 Corrugated pipe and concrete fill are subsidiary to Item 420, "Concrete Substructures" or Item 425, "Precast Prestressed Concrete Structural Members", whichever is designated as the bid item.
 See standard Interior Bents sheet for details and notes not shown.

These details can only be used as an alternate to standard Interior Bents with round columns for slab beams, decked slab beams, box beams, X-beams, and I-girder standard designed structures.

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

HL93 LOADING SHEET 2 OF 2

Bridge Division Standard

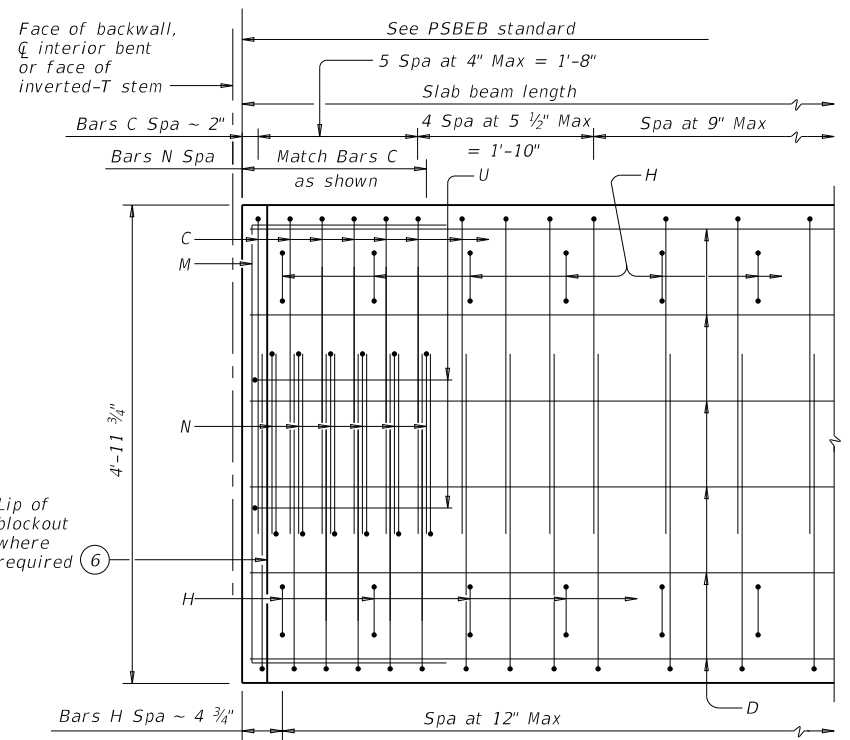
PRESTRESSED, PRECAST BENT CAP OPTION FOR ROUND COLUMNS

PPBC-RC

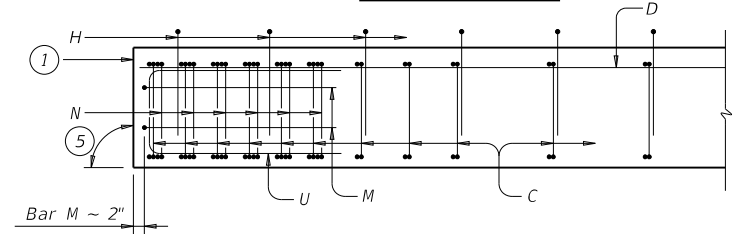
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©TxDOT April 2019	CONTRACT	SECTION	JOB	HIGHWAY
12-21: General Notes	0908	33	106	EAST S 7TH ST
	DIST	COUNTY	SHEET NO.	
	ABL	TAYLOR	79	

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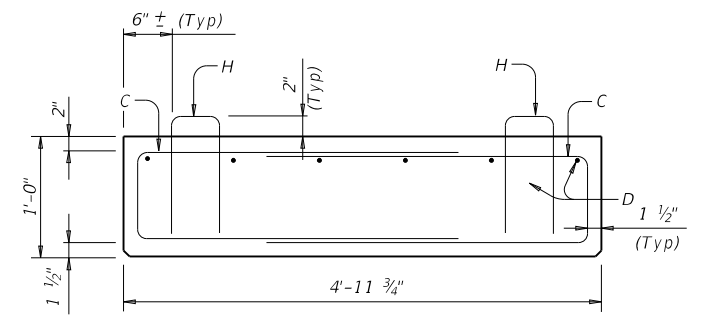
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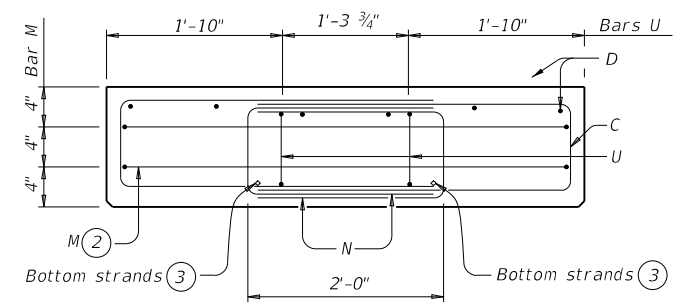
PART PLAN



ELEVATION

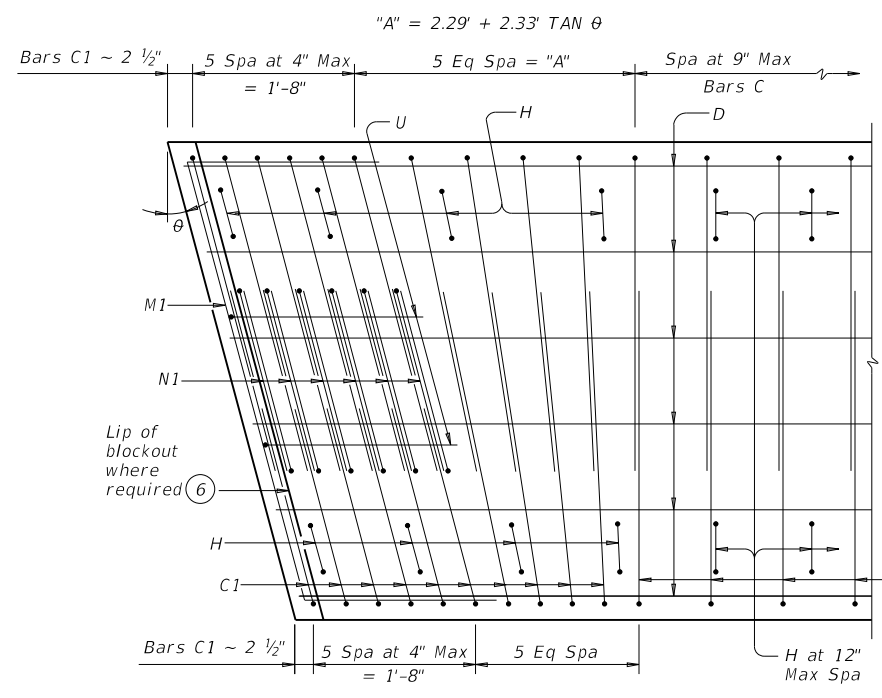


SECTION



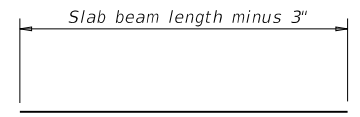
END MAT REINFORCING

Bars H not shown for clarity.

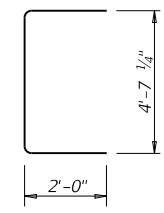


PART SKEW PLAN

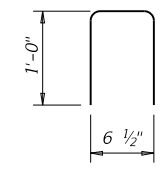
(Showing θ over 0° to 15° Skew)



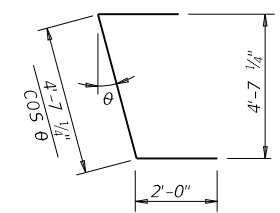
BARS D(#6)



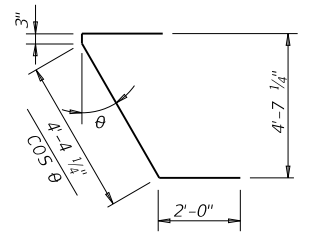
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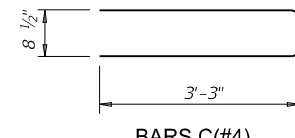
BARS H(#4)



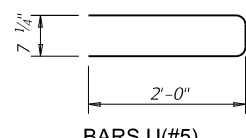
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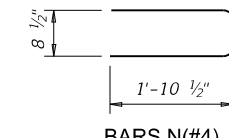
BARS M2(#4)



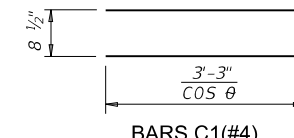
BARS C(#4)



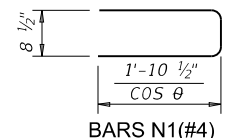
BARS U(#5)



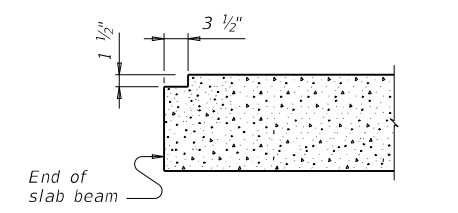
BARS N(#4)



BARS C1(#4)



BARS N1(#4)



ELEVATION OF BLOCKOUT

BEAM PROPERTIES		
Area	in ²	717.0
Y top	in	6.00
Y bott	in	6.00
I	in ⁴	8,604
Weight	lb/ft	747

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

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

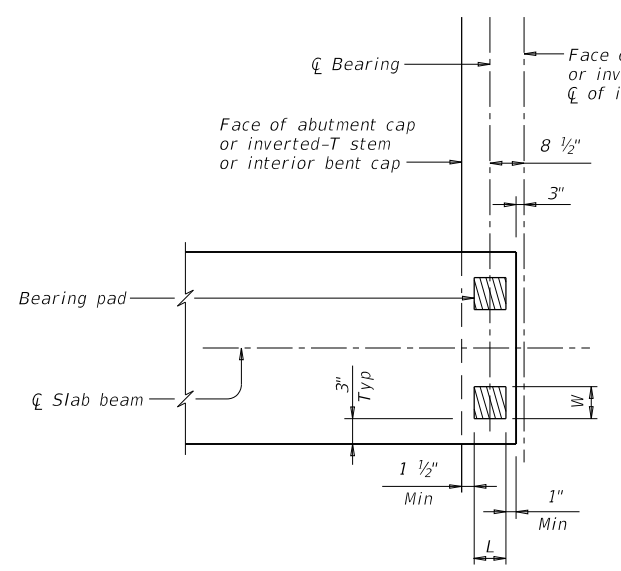
- See End Mat Reinforcing detail.
- Adjust bars M vertically to avoid strands.
- See sheet PSBND or PSBSD for strand locations.
- Assumes 150 pcf weight density of concrete.
- 90° at conventional interior bents. End of beam must be vertical at abutment backwall and inverted-T stem.
- Blockout required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

HL93 LOADING

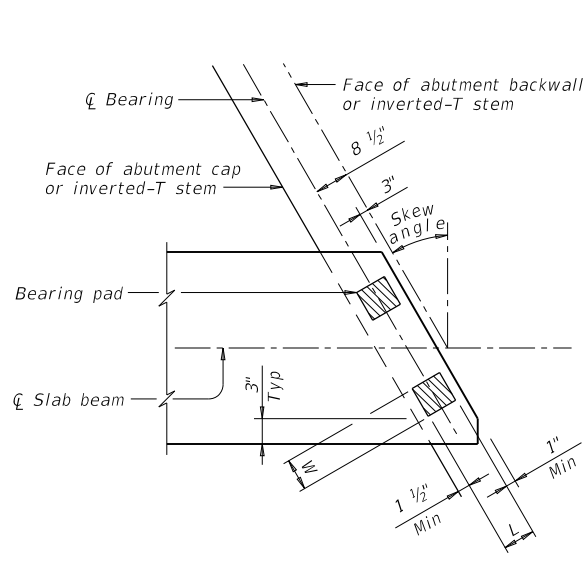
		Bridge Division Standard	
PRESTRESSED CONCRETE SLAB BEAM DETAILS (TYPE 5SB12)			
PSB-5SB12			
FILE: psbsts03-17.dgn	DN: TxDOT	CK: TxDOT	DW: TxDOT
©TxDOT January 2017	CONV	SECT	JOB
REVISIONS	0908	33	106
	DIST	COUNTY	SHEET NO.
	ABL	TAYLOR	80

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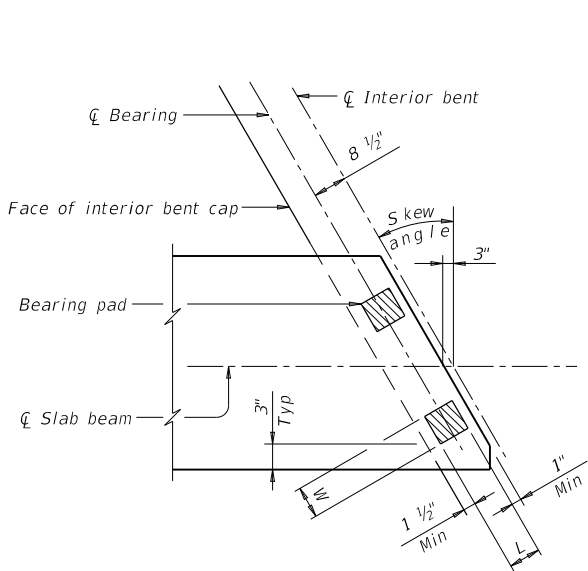
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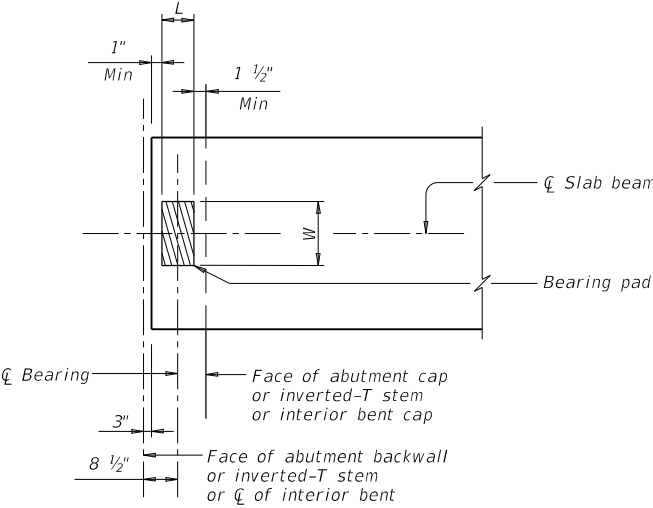
TWO-PAD DETAIL PLAN
 (At abutment or inverted-T cap or at interior bent)



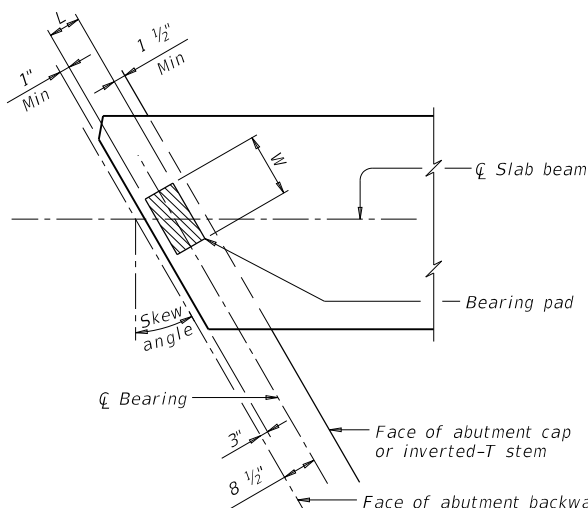
TWO-PAD DETAIL SKEW PLAN
 (At abutment or inverted-T cap)



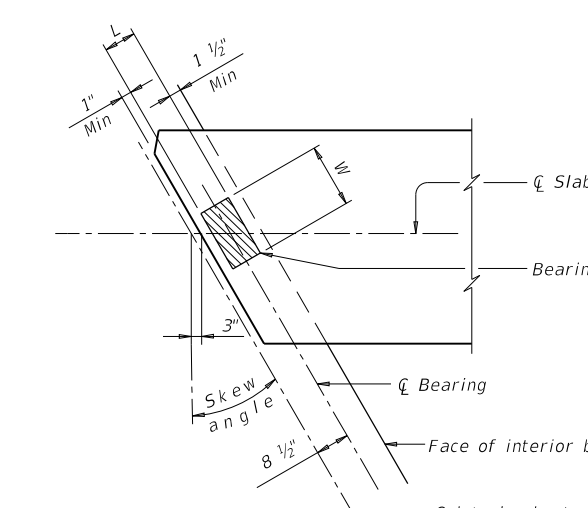
TWO-PAD DETAIL SKEW PLAN
 (At interior bent)



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



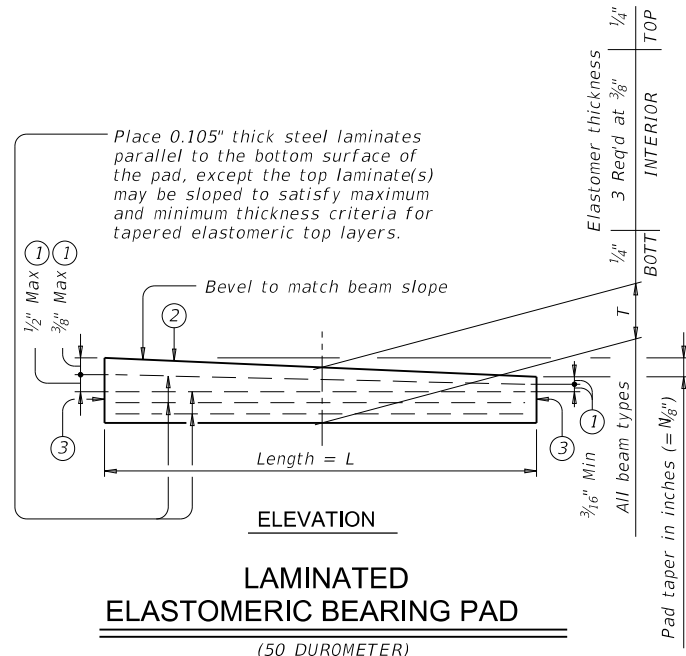
ONE-PAD DETAIL SKEW PLAN
 (At abutment or inverted-T cap)



ONE-PAD DETAIL SKEW PLAN
 (At interior bent)

ELASTOMERIC BEARING PAD PLACEMENT AND BEAM END DIAGRAMS

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



LAMINATED ELASTOMERIC BEARING PAD
 (50 DUROMETER)

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

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

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

Pad sizes shown are applicable for the following conditions:

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

GENERAL NOTES:

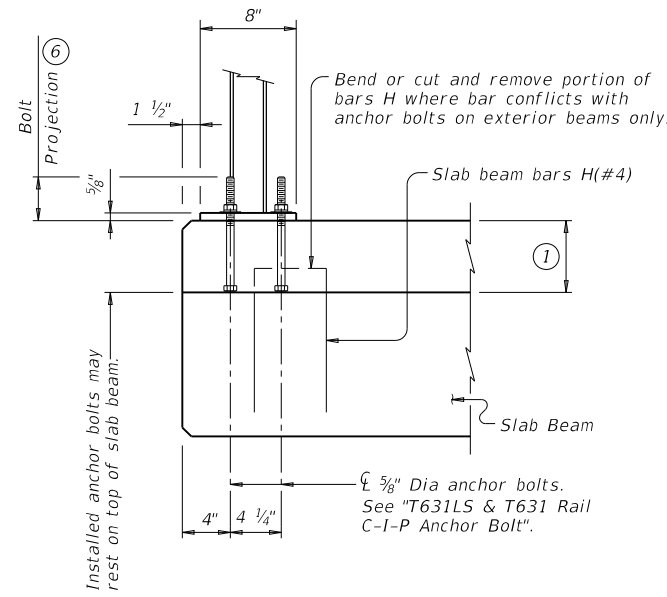
These details accommodate skew angles up to 30°. Shop drawings for approval are required. A bearing layout which identifies location and orientation of all bearings must be developed by the bearing fabricator. Permanently mark each bearing in accordance with the bearing layout. A copy of the bearing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

HL93 LOADING

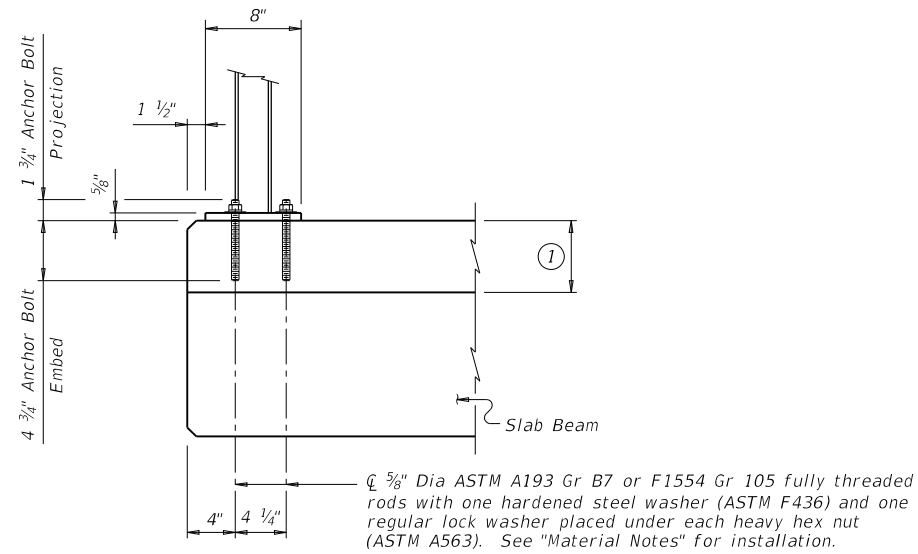
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ELASTOMERIC BEARING AND BEAM END DETAILS			
PRESTR CONCRETE SLAB BEAM			
PSBEB			
FILE: psbte06-17.dgn	DN: TxDOT	CK: TxDOT	DW: TxDOT
©TxDOT January 2017	CONTRACT	SECTION	JOB
REVISIONS	0908	33	106
	DIST	COUNTY	SHEET NO.
	ABL	TAYLOR	81

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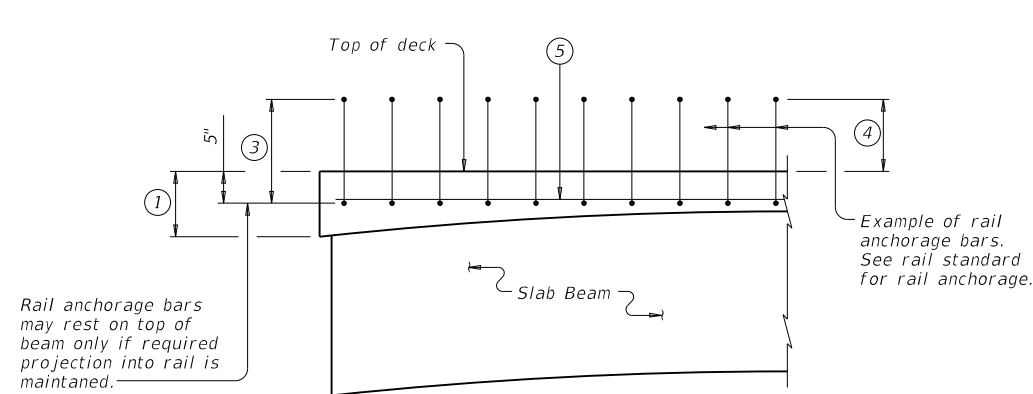


CAST-IN-PLACE ANCHORAGE OPTION

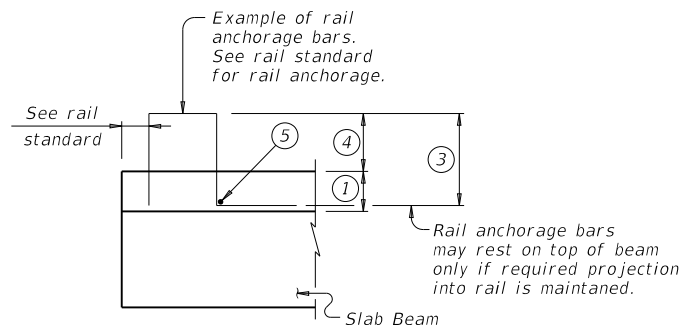


ADHESIVE ANCHORAGE OPTION

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



PART SPAN ELEVATION

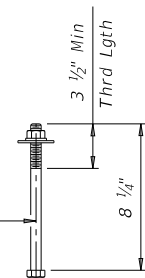


SECTION

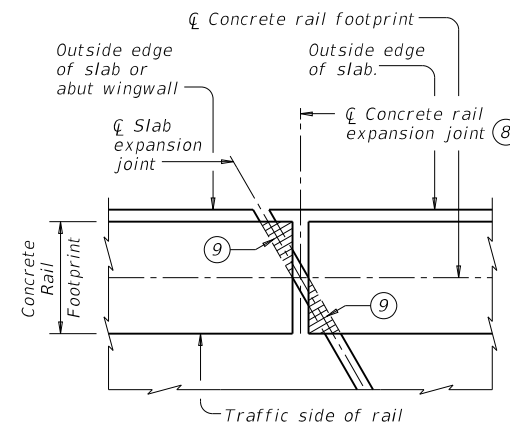
TYPICAL CONCRETE RAIL ANCHORAGE

(Showing typical concrete rail anchorage)

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



T631LS & T631 RAIL C-I-P ANCHOR BOLT



PLAN OF CONCRETE RAILS AT EXPANSION JOINTS

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

CONSTRUCTION NOTES:

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

MATERIAL NOTES:

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

GENERAL NOTES:

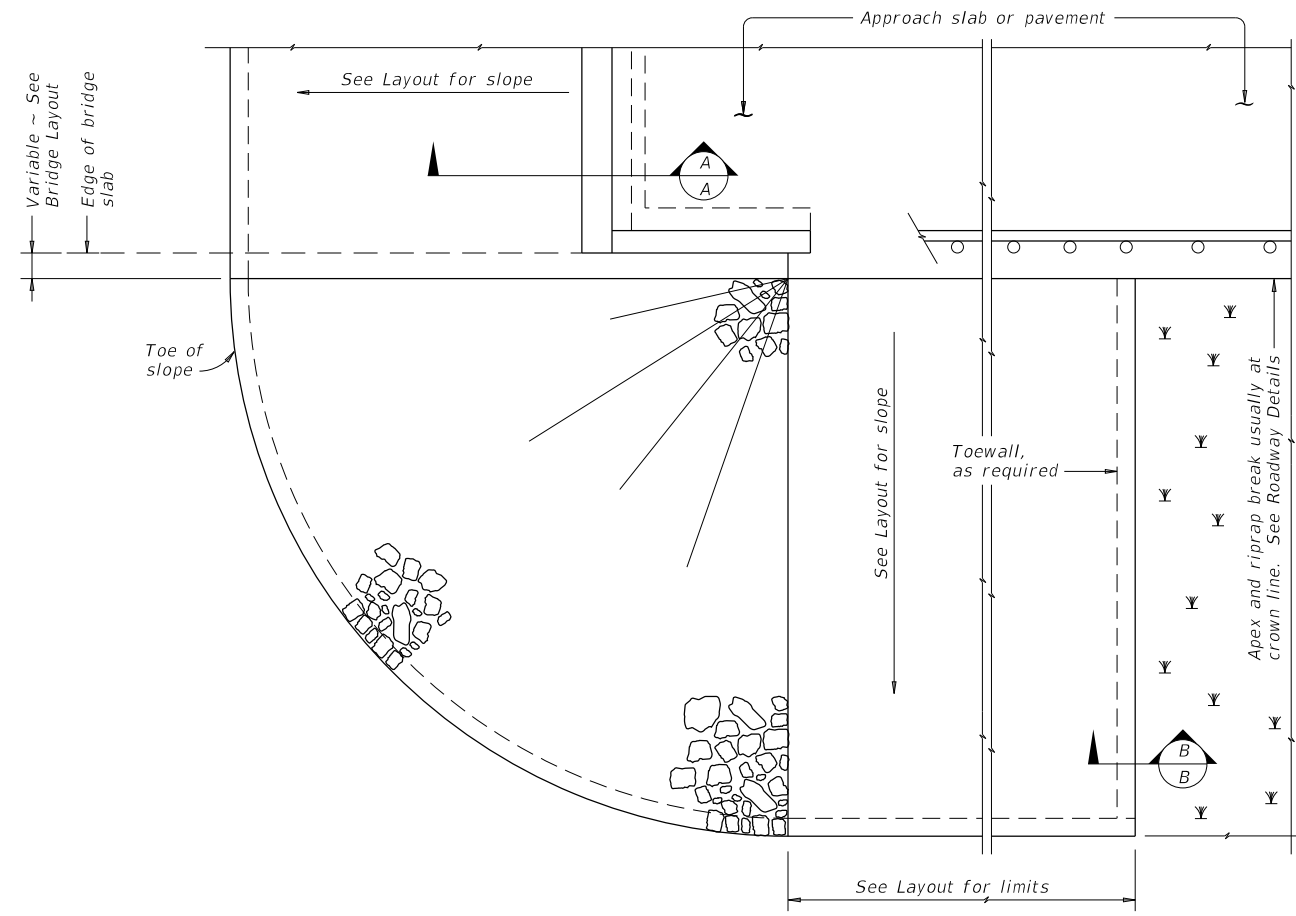
Designed in accordance with AASHTO LRFD Bridge Design Specifications. This standard is for use with structures with a 5" minimum cast-in-place concrete slab. This standard may require modification for interior rails. This standard does not apply to median barriers. This standard does not provide details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

Cover dimensions are clear dimensions, unless noted otherwise.

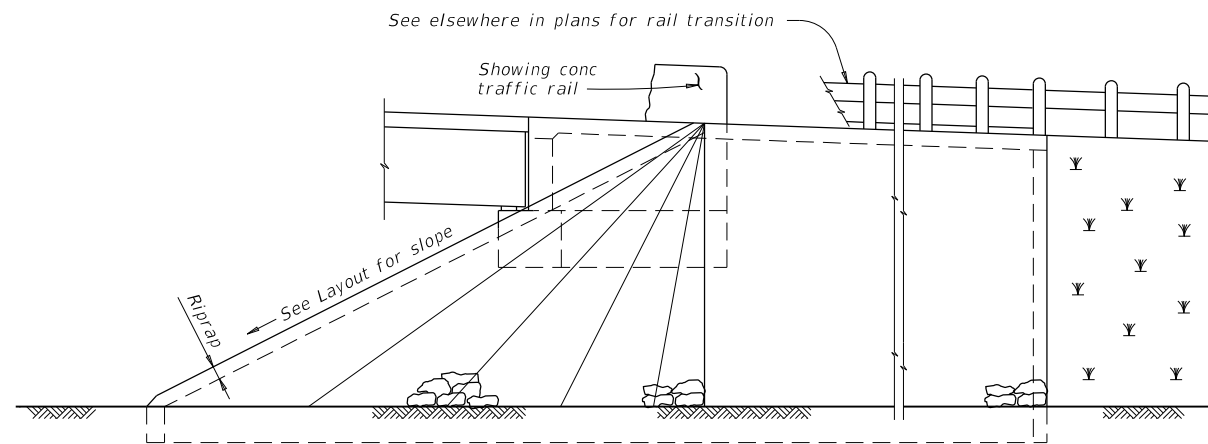
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<h2>RAIL ANCHORAGE DETAILS</h2>					
<h3>PRESTR CONCRETE SLAB BEAMS</h3>					
<h3>PSBRA</h3>					
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DN:	January 2017	CONV:	SECT:	JOB:	HIGHWAY:
REVISIONS:	0908	33	106	EAST S 7TH ST	
03-18: Updated adhesive anchor notes.	DIST:	COUNTY:	SHEET NO.		
ABL	TAYLOR		82		

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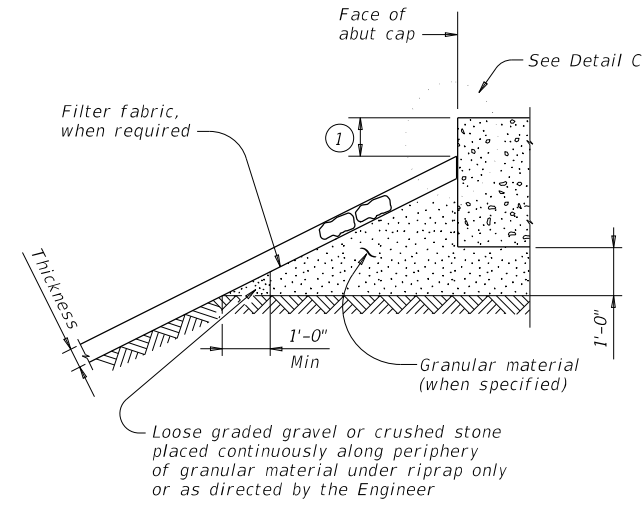
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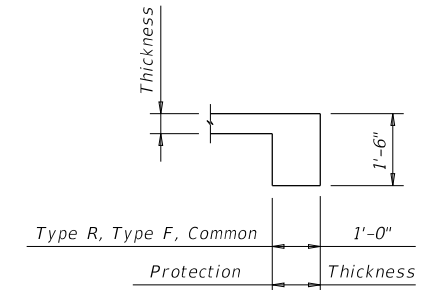
PLAN



ELEVATION

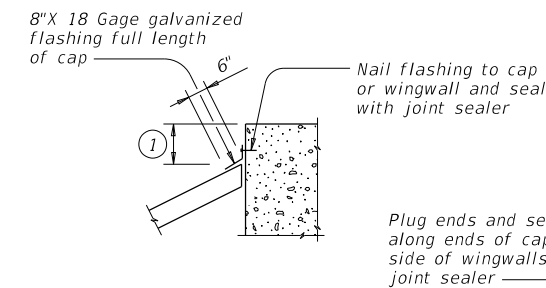


SECTION A-A AT CAP

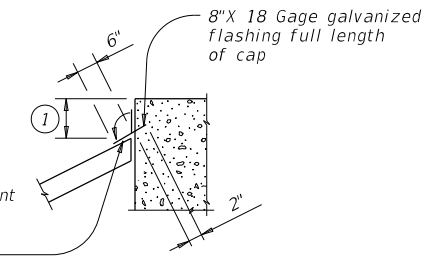


SECTION B-B

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



CAP OPTION A



CAP OPTION B

DETAIL C

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

GENERAL NOTES:

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

SHEET 1 OF 2

		Bridge Division Standard	
<h2>STONE RIPRAP</h2>			
<h3>SRR</h3>			
FILE: srrstd1-19.dgn	DN: AES	CK: JGD	DW: BWH
©TxDOT April 2019	CONT	SECT	JOB
REVISIONS	0908	33	106
	DIST	COUNTY	SHEET NO.
	ABL	TAYLOR	83

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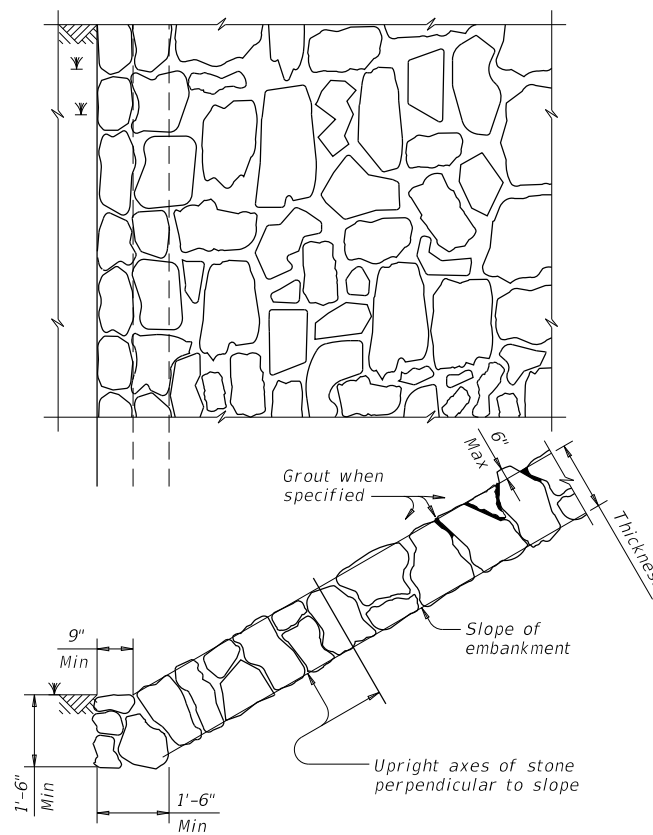


FIGURE 1 ~ TYPE R STONE RIPRAP
 dry or grouted

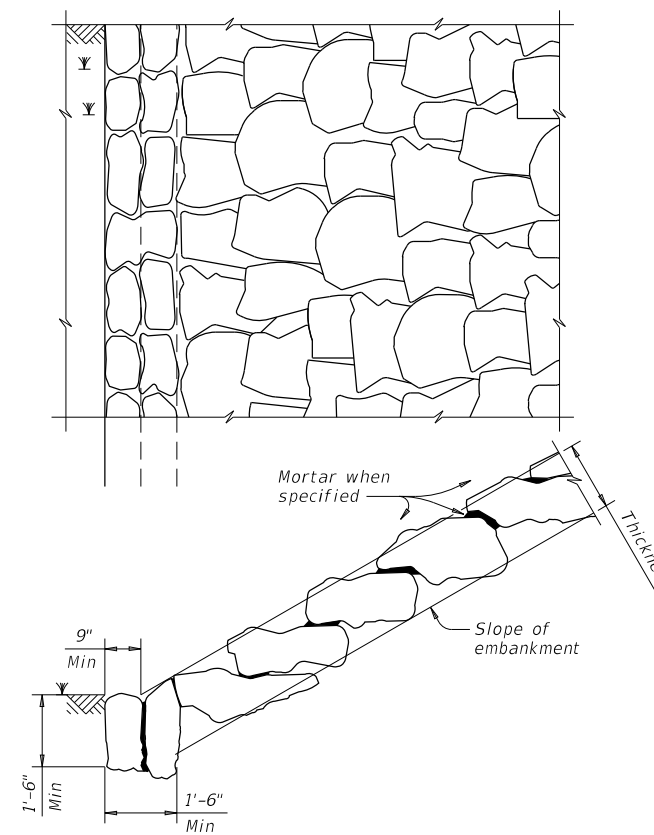


FIGURE 2 ~ TYPE F STONE RIPRAP
 dry or mortared

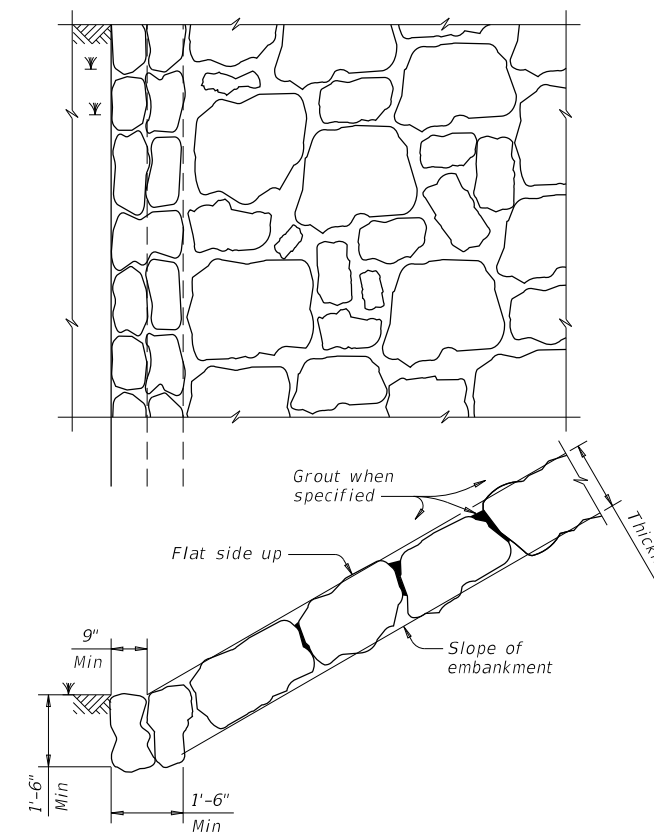


FIGURE 3 ~ TYPE F STONE RIPRAP
 grouted

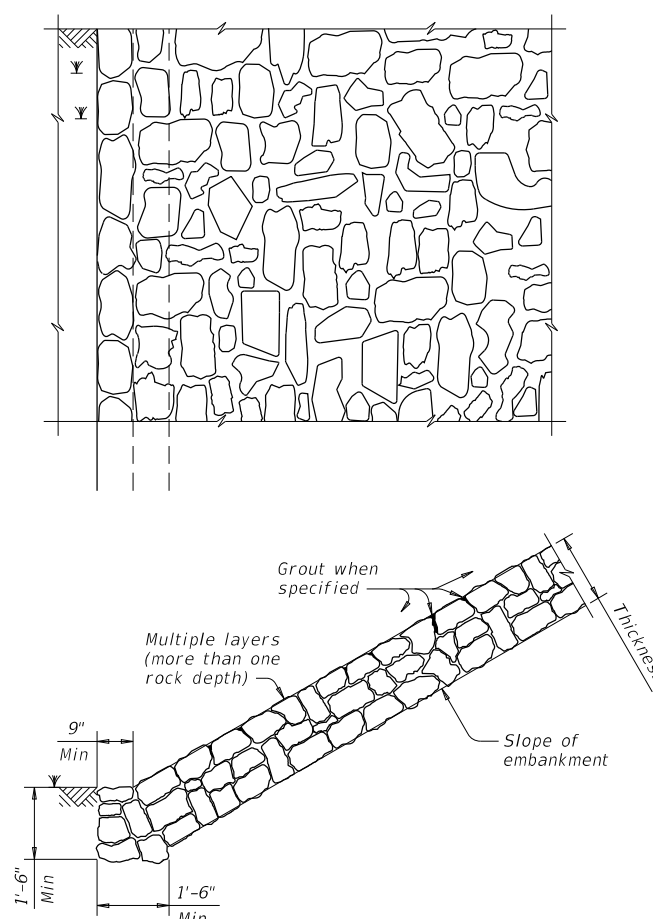


FIGURE 4 ~ COMMON STONE RIPRAP
 dry or grouted

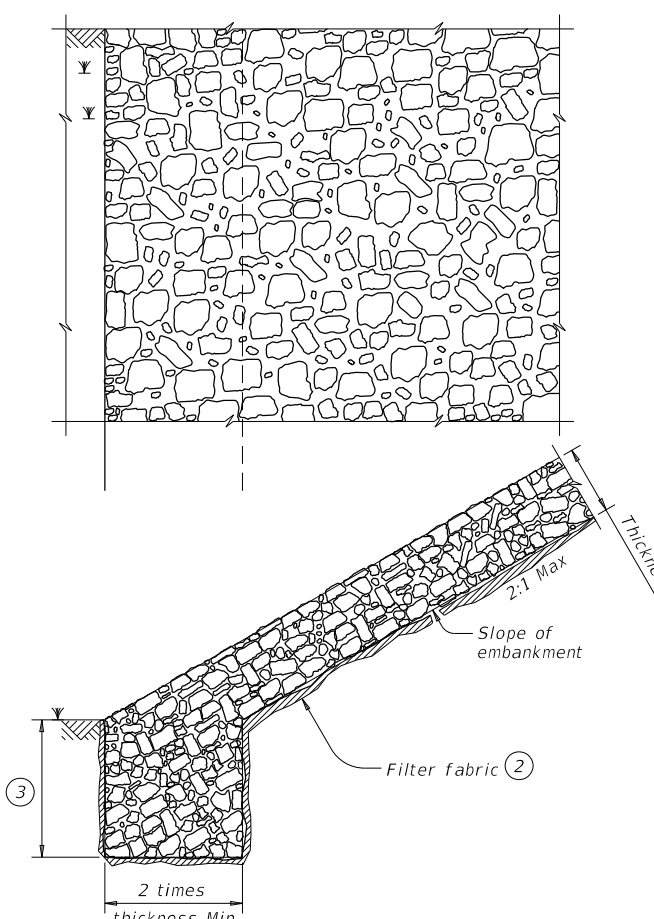
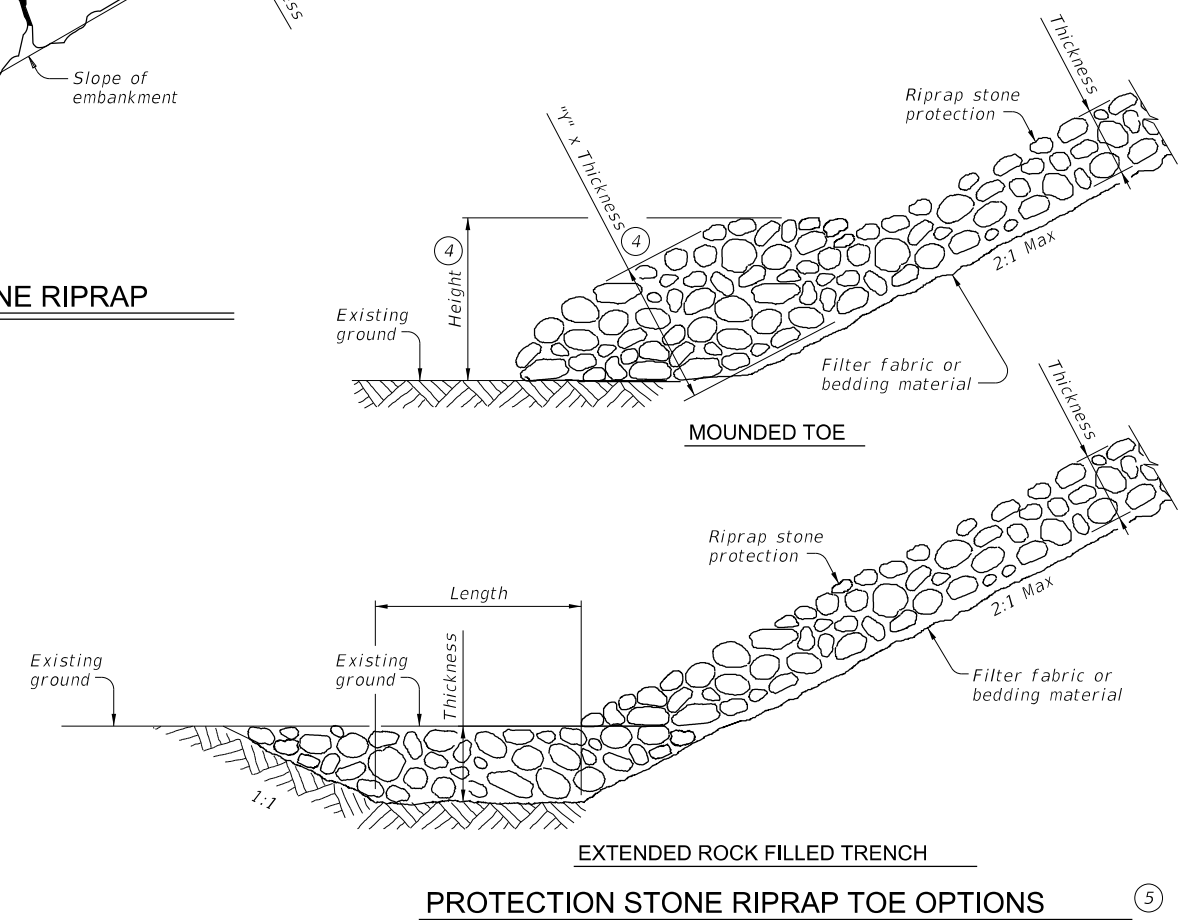


FIGURE 5 ~ PROTECTION STONE RIPRAP

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



PROTECTION STONE RIPRAP TOE OPTIONS

SHEET 2 OF 2



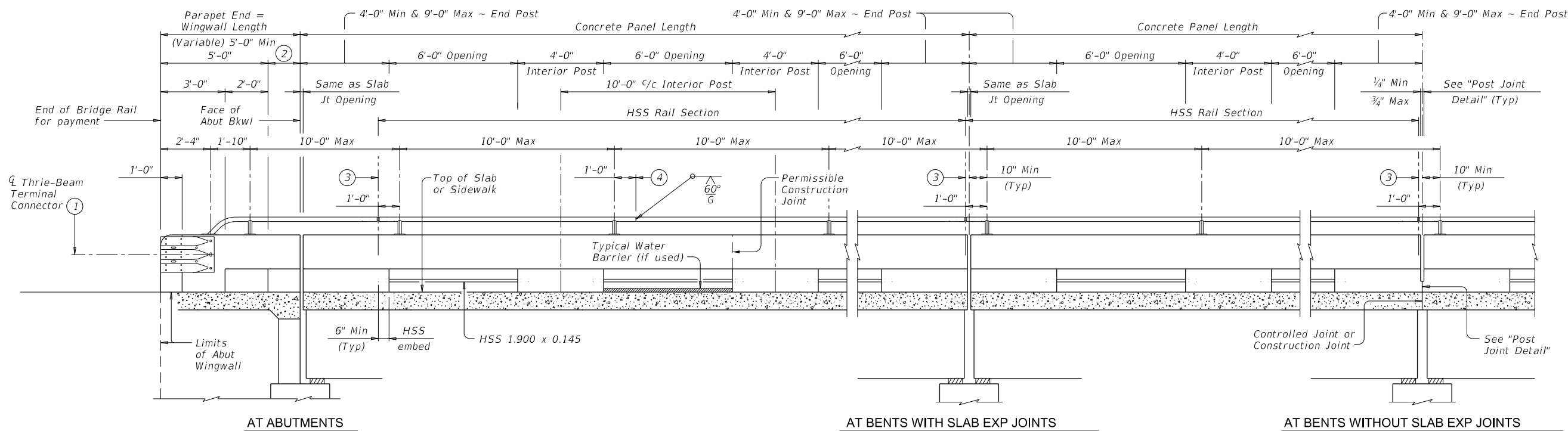
STONE RIPRAP

SRR

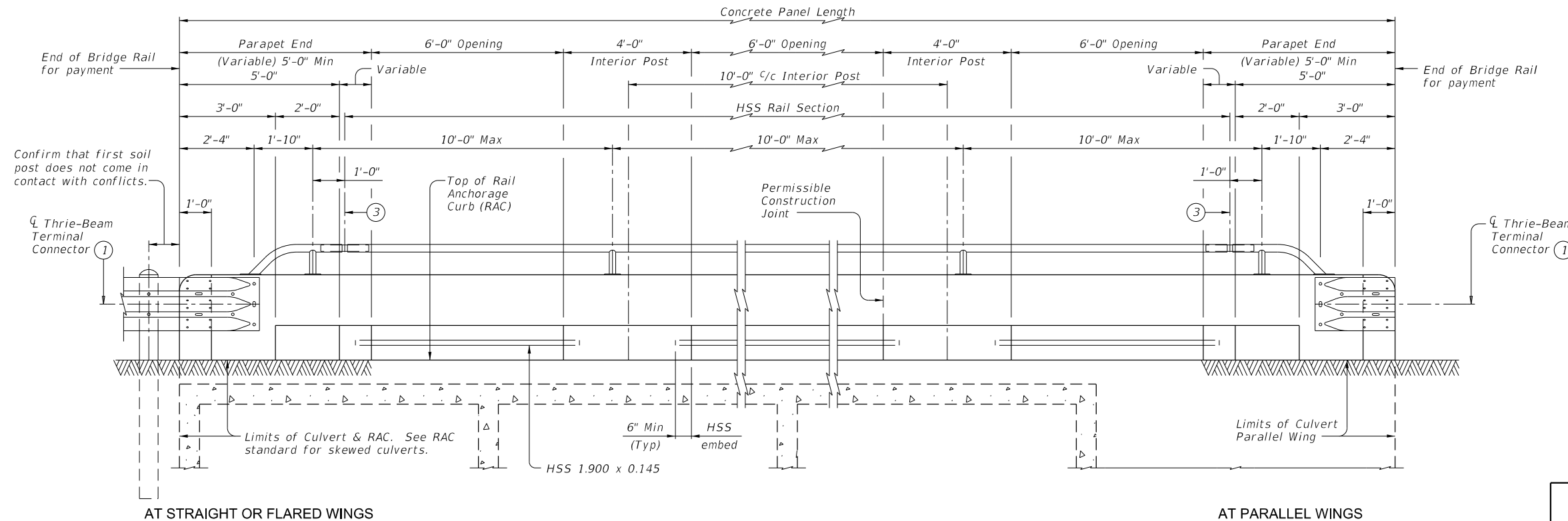
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©TxDOT April 2019	CONT	SECT	JOB	HIGHWAY
REVISIONS	0908	33	106	EAST S 7TH ST
	DIST	COUNTY	SHEET NO.	
	ABL	TAYLOR	84	

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DATE: 2/7/2023 3:15:20 PM
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ROADWAY ELEVATION OF RAIL ON BRIDGE
 (Showing without raised sidewalk)



ROADWAY ELEVATION OF RAIL ON BOX CULVERTS

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

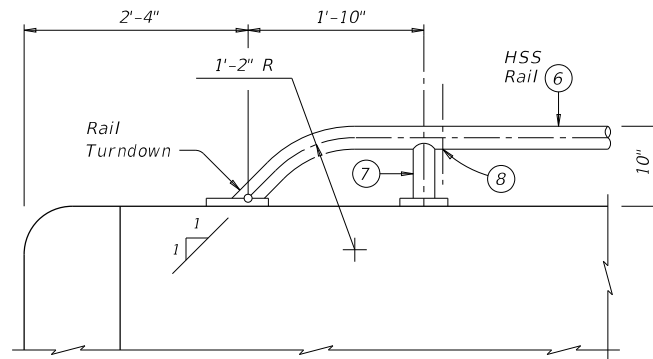
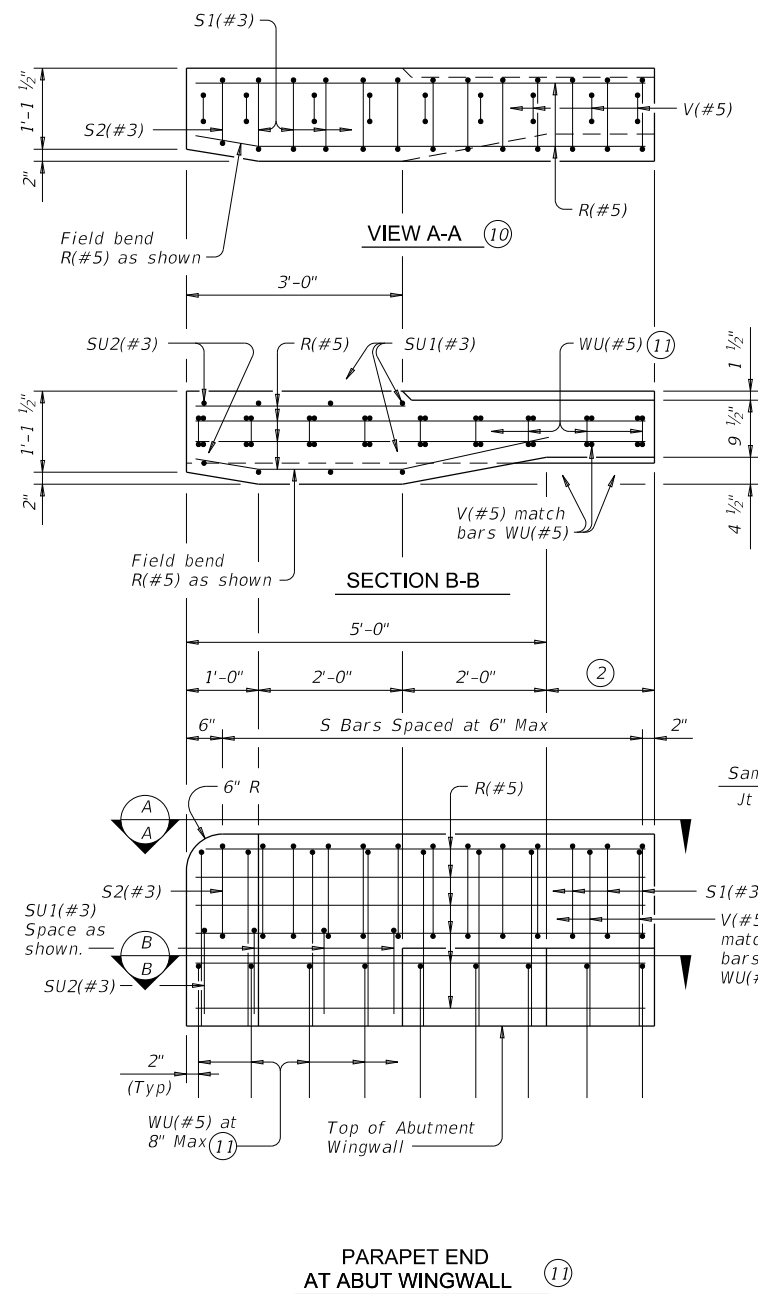
- ① Terminal Connectors and associated hardware are to be paid for under the Item "Metal Beam Guard Fence". Attach Metal Beam Guard Fence Transitions to the bridge rail and extend along the embankment unless otherwise shown in the plans.
- ② Wingwall Length minus 5'-0" (Varies)
- ③ Splice Jt or Exp Jt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

SHEET 1 OF 4

		Bridge Division Standard	
<h2>COMBINATION RAIL</h2>			
<h3>TYPE C223</h3>			
FILE: r1std019-19.dgn	DN: TxDOT	CK: TxDOT	DW: JTR
©TxDOT September 2019	CONT: 0908	SECT: 33	JOB: 106
REVISIONS	ABL	COUNTY: TAYLOR	SHEET NO.: 85

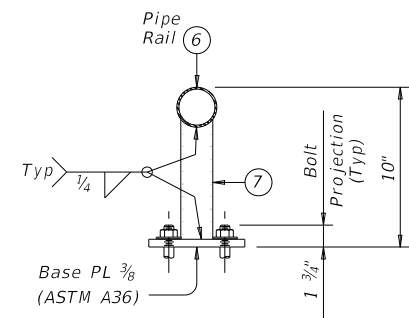
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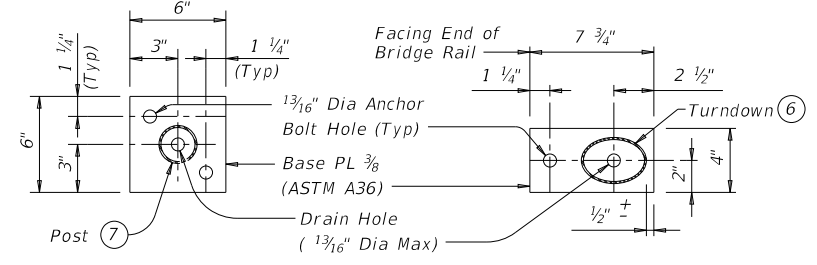


Note that at least two anchor points (as shown) are required for the Bridge Rail on the Abutment Wingwall. Longer Wingwalls may require more than two Rail anchorages.

HSS RAIL TERMINAL DETAIL



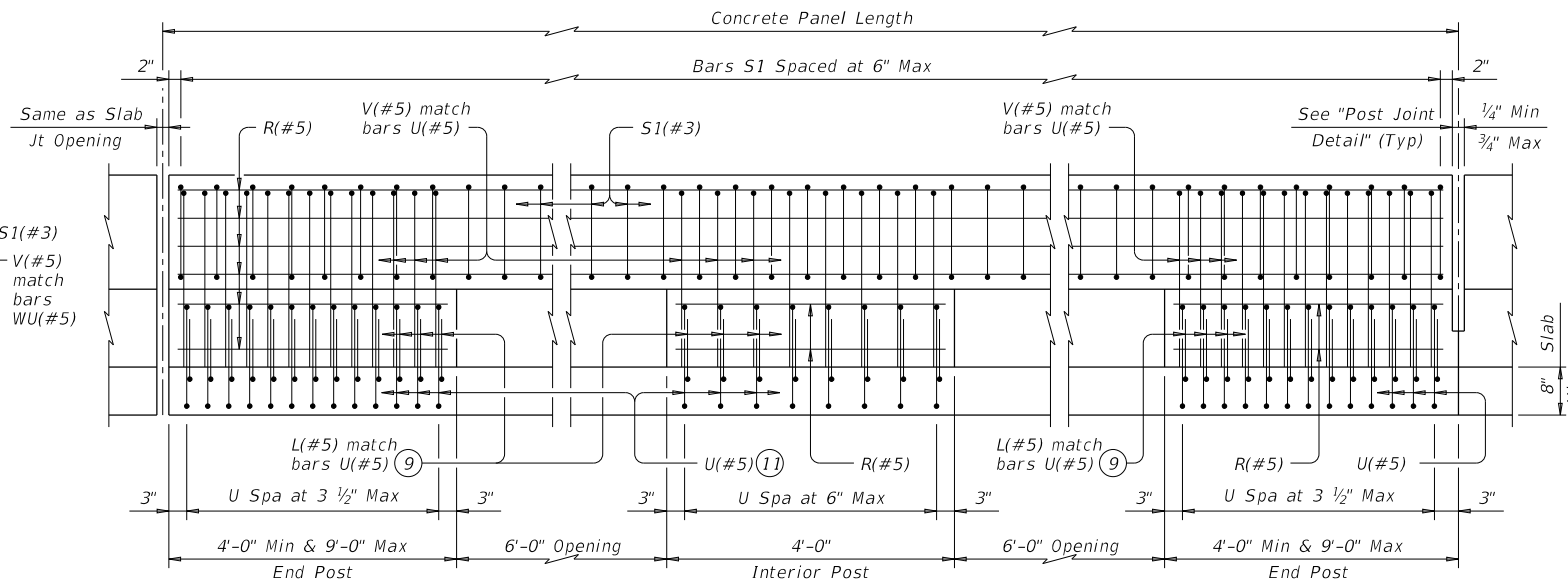
TRANSVERSE SECTION



POST BASE PLATE PLAN

RAIL TURNDOWN BASE PLATE PLAN

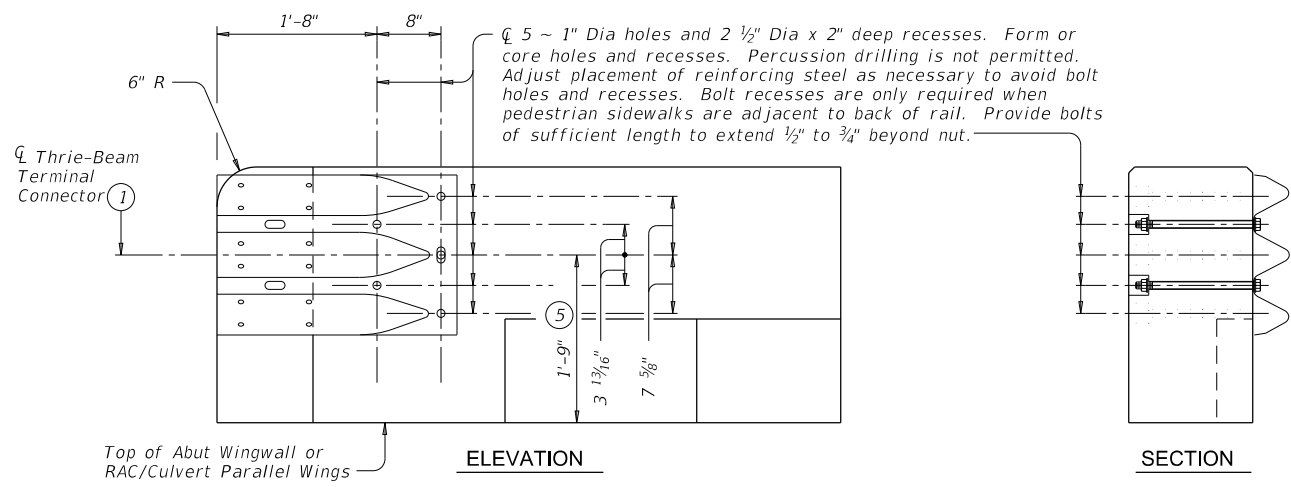
HSS RAIL DETAILS



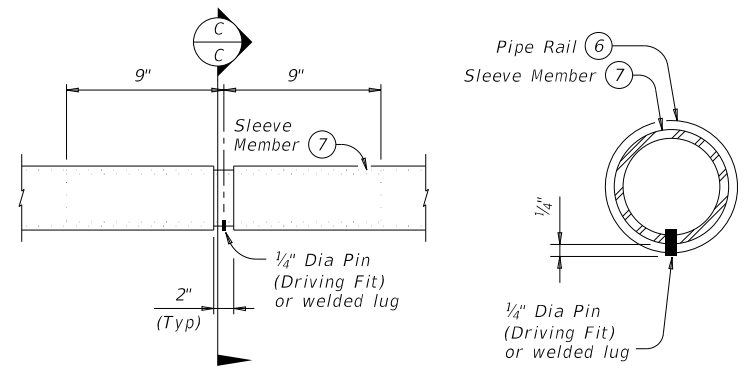
ELEVATION SHOWING TYPICAL REINFORCING PLACEMENT

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

- ① Terminal Connectors and associated hardware are to be paid for under the Item "Metal Beam Guard Fence". Attach Metal Beam Guard Fence Transitions to the bridge rail and extend along the embankment unless otherwise shown in the plans.
- ② Wingwall Length minus 5'-0" (Varies)
- ⑤ Increase 2" for structures with overlay.
- ⑥ HSS 2.875 x 0.203
- ⑦ HSS 2.375 x 0.154
- ⑧ 3/8" Dia Hole in bottom of HSS rail (Minimum 1 hole between posts ~ Typ)
- ⑨ Bars L(#5) are part of rail reinforcing and are included in unit price bid for railing. Space with Bars U. Bars L match slab bar cover. Bars L may be bundled with top slab reinforcing if spacing is equivalent.
- ⑩ Bars SU1(#3), SU2(#3) and WU(#5) not shown for clarity.
- ⑪ Substitute Bars U(#5) for Bars WU(#5) when parapet end is located on anchorage curb over culvert top slab. Use Bars WU(#5) in culvert parallel wings.



TERMINAL CONNECTION DETAILS



PIPE SPLICE DETAILS

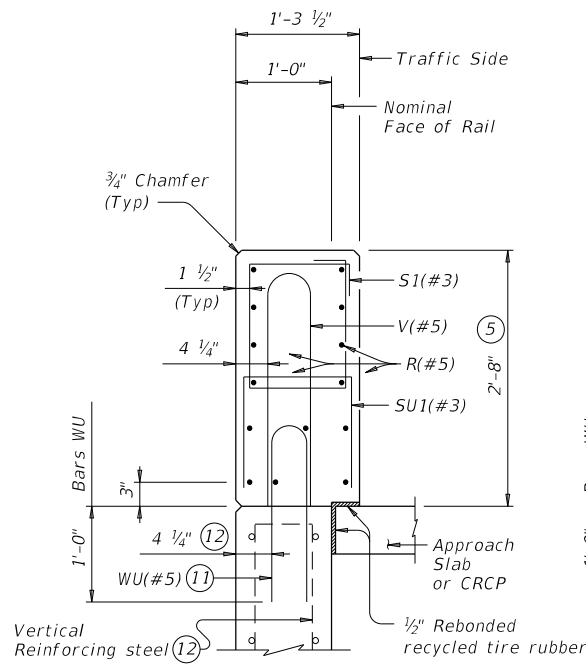
COMBINATION RAIL

TYPE C223

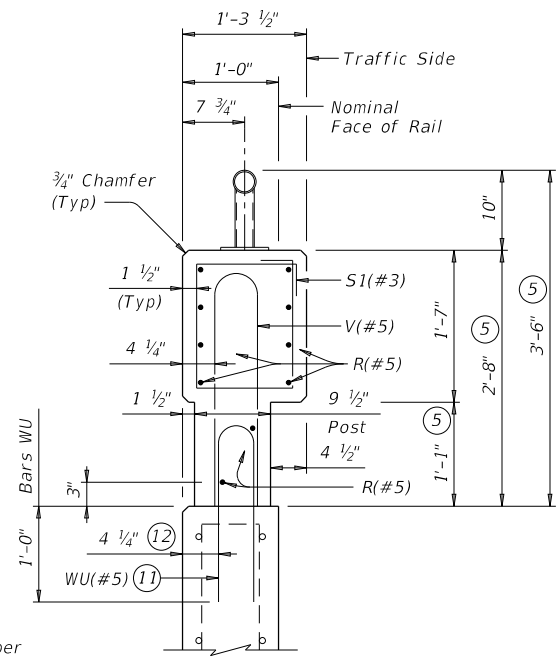
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©TxDOT September 2019	CONTRACT	SECTION	JOB	HIGHWAY
REVISIONS	0908	33	106	EAST S 7TH ST
DIST	COUNTY	SHEET NO.		
ABL	TAYLOR	86		

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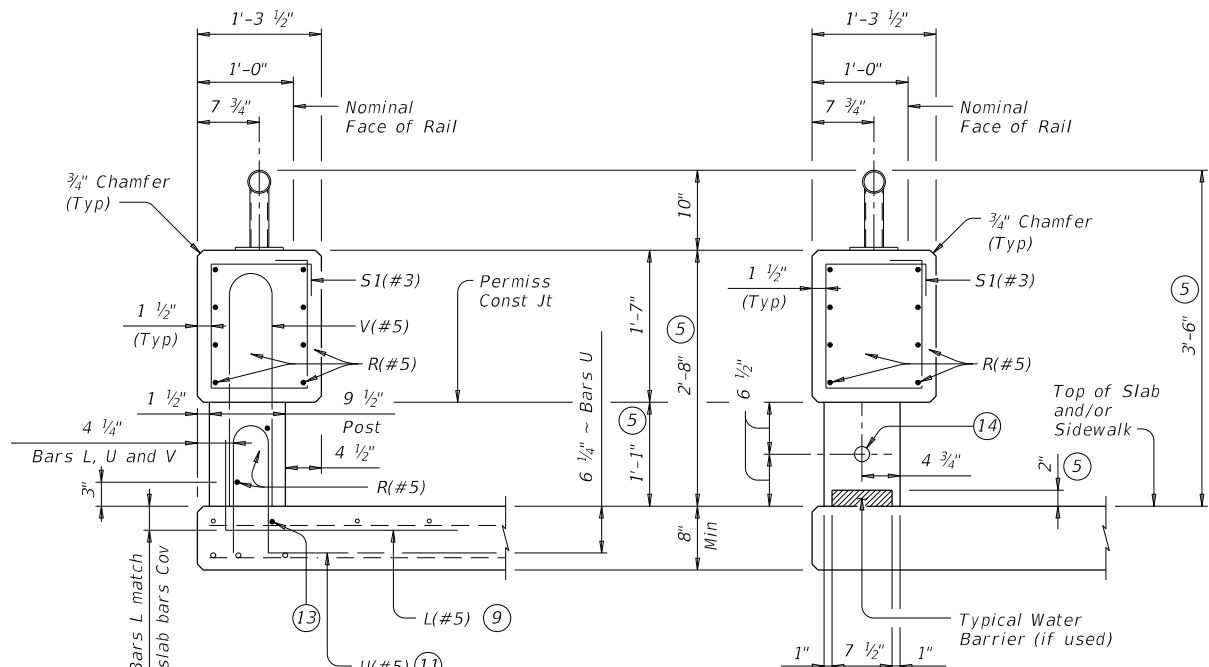
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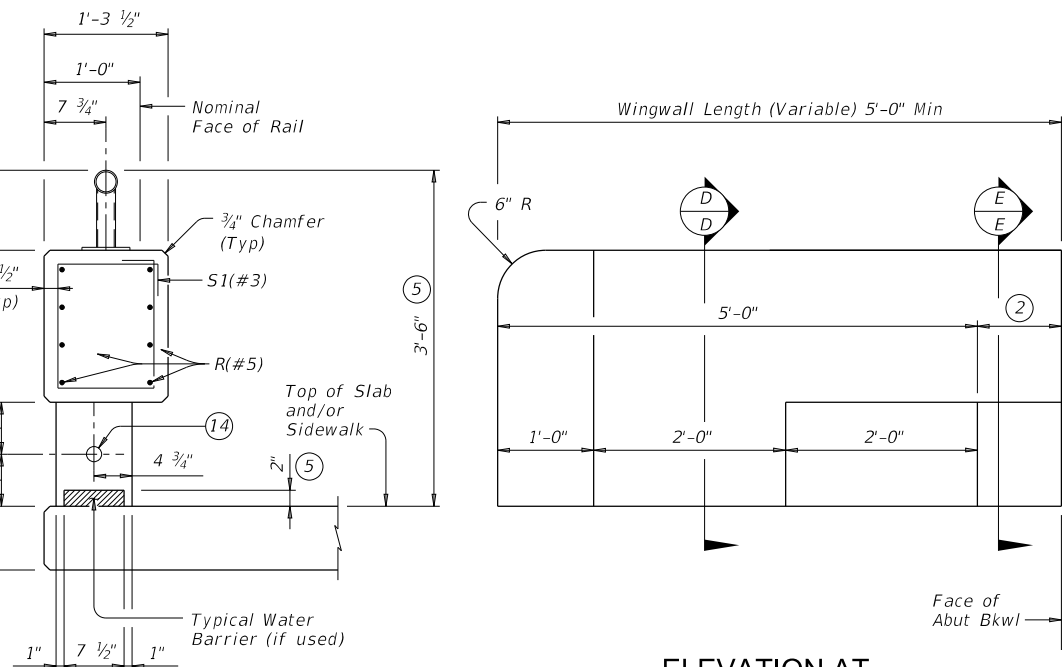
**SECTION D-D
ON ABUTMENT WINGWALLS
OR CIP RETAINING WALLS**



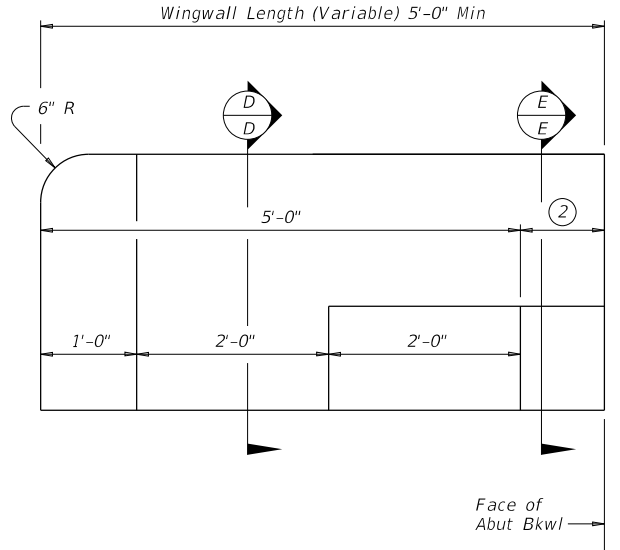
**SECTION E-E
ON ABUTMENT WINGWALLS
OR CIP RETAINING WALLS**



**AT POST
ON BRIDGE SLAB**



**AT OPENING
ON BRIDGE SLAB**

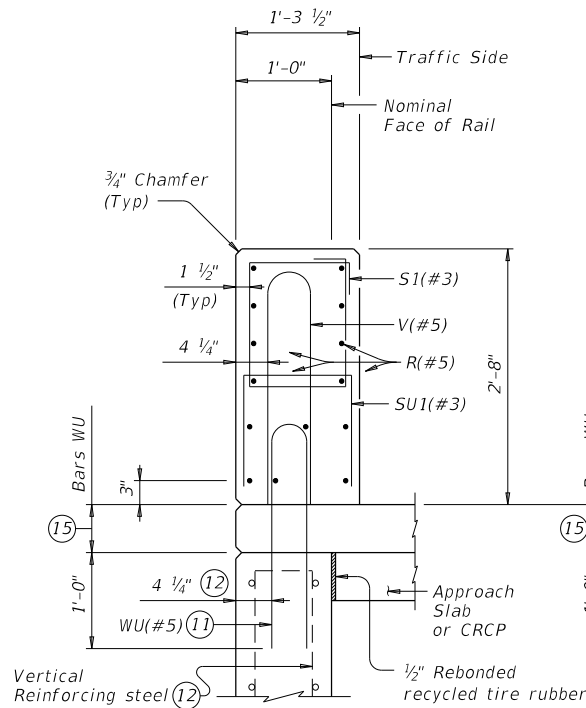


**ELEVATION AT
ABUTMENT WINGWALL**

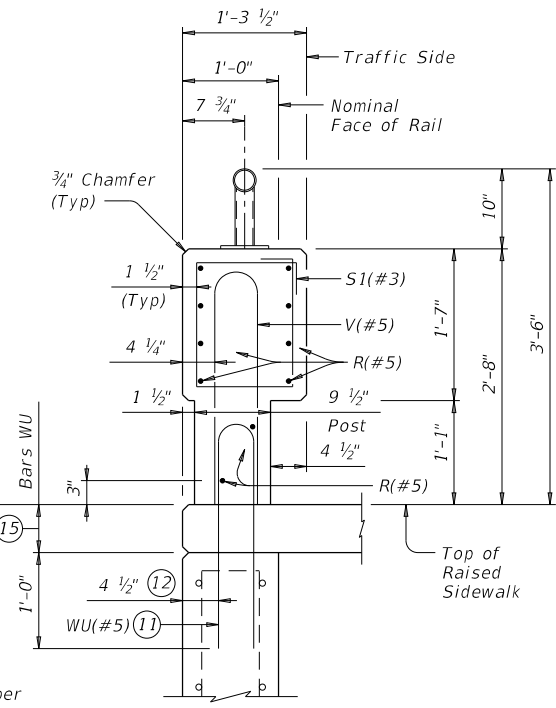
Box culvert parallel wings or rail anchorage curb similar.
HSS rail not shown for clarity.

SECTIONS THRU RAIL WITHOUT RAISED SIDEWALK

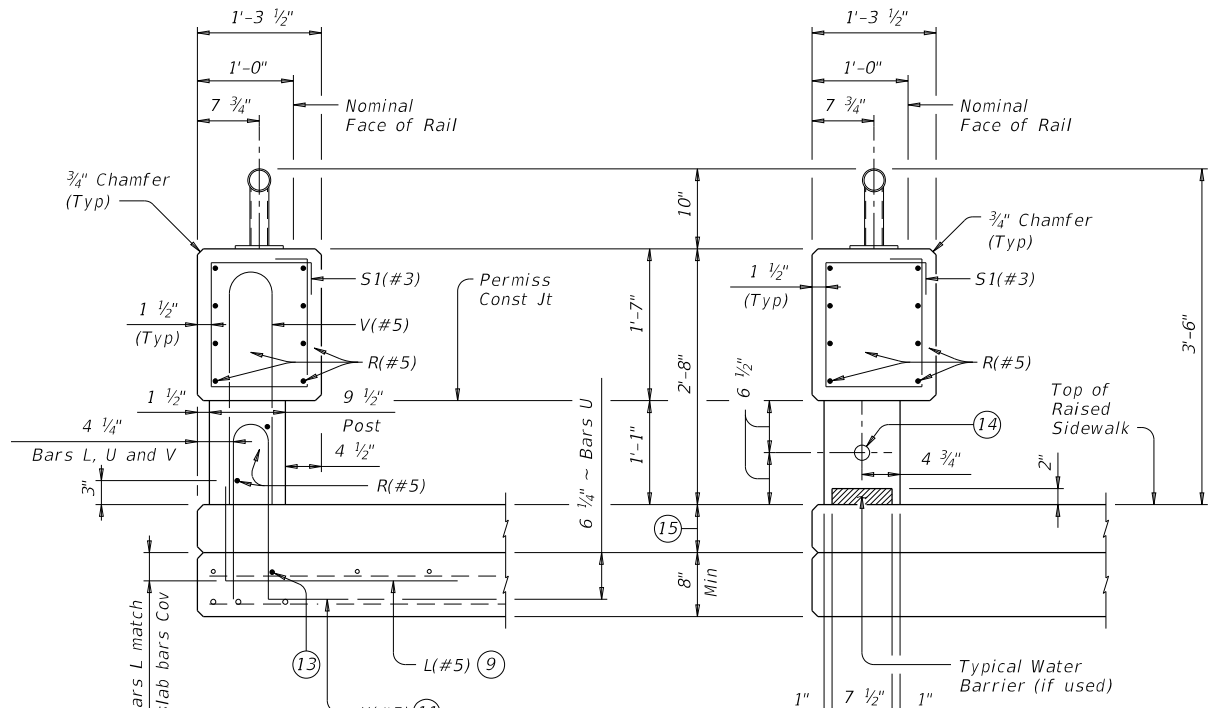
Sections on box culvert similar.



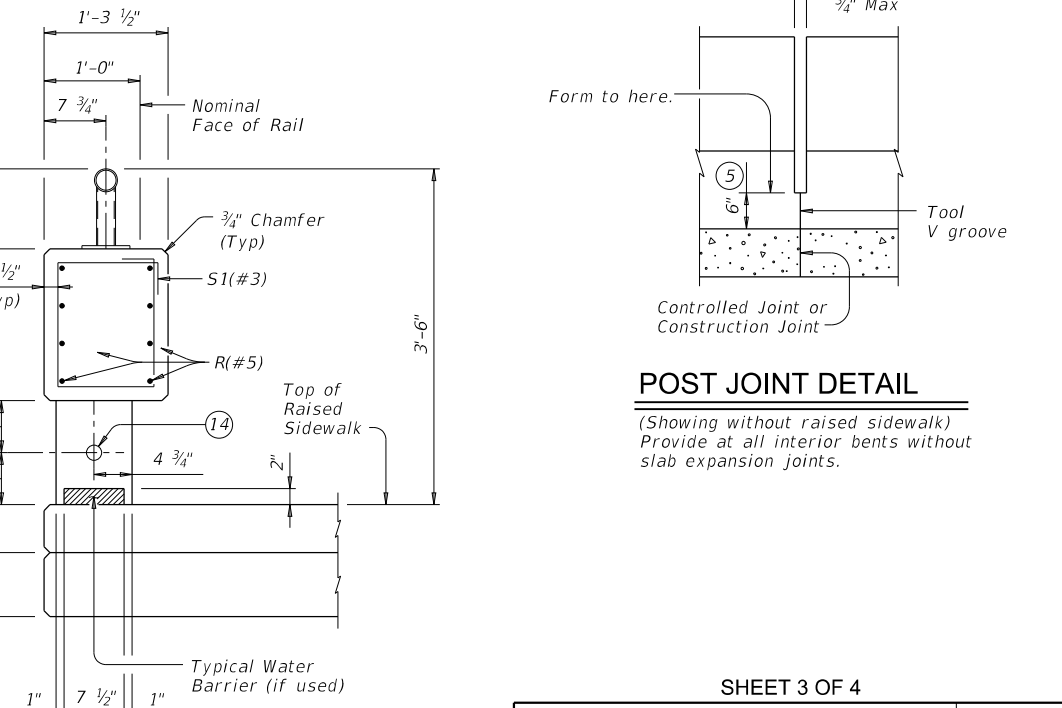
**SECTION D-D
ON ABUTMENT WINGWALLS
OR CIP RETAINING WALLS**



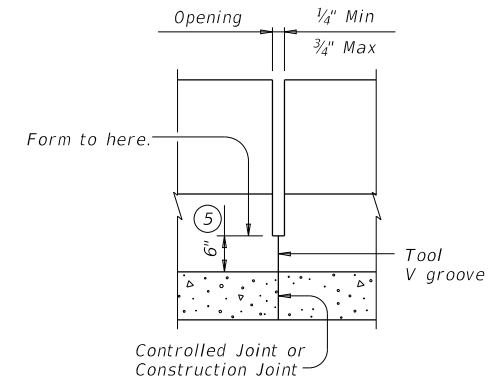
**SECTION E-E
ON ABUTMENT WINGWALLS
OR CIP RETAINING WALLS**



**AT POST
ON BRIDGE SLAB**



**AT OPENING
ON BRIDGE SLAB**



POST JOINT DETAIL

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

SECTIONS THRU RAIL WITH RAISED SIDEWALK

Sections on box culvert similar.

- ② Wingwall Length minus 5'-0" (Varies)
- ⑤ Increase 2" for structures with overlay.
- ⑨ Bars L(#5) are part of rail reinforcing and are included in unit price bid for railing. Space with Bars U. Bars L match slab bar cover. Bars L may be bundled with top slab reinforcing if spacing is equivalent.
- ⑩ Substitute Bars U(#5) for Bars WU(#5) when parapet end is located on anchorage curb over culvert top slab. Use Bars WU(#5) in culvert parallel wings.
- ⑫ When vertical reinforcing has closer clear cover over horizontal reinforcing in abutment wingwalls on traffic side of wall, move the horizontal wingwall/retaining wall reinforcing to the inside of Bars WU where bars conflict.
- ⑬ Top longitudinal slab bar may be adjusted laterally 3" plus or minus to tie reinforcing.
- ⑭ HSS 1.900 x 0.145
- ⑮ Raised Sidewalk.

SHEET 3 OF 4

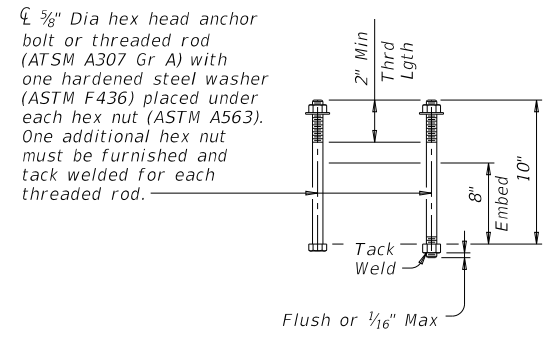


COMBINATION RAIL

TYPE C223

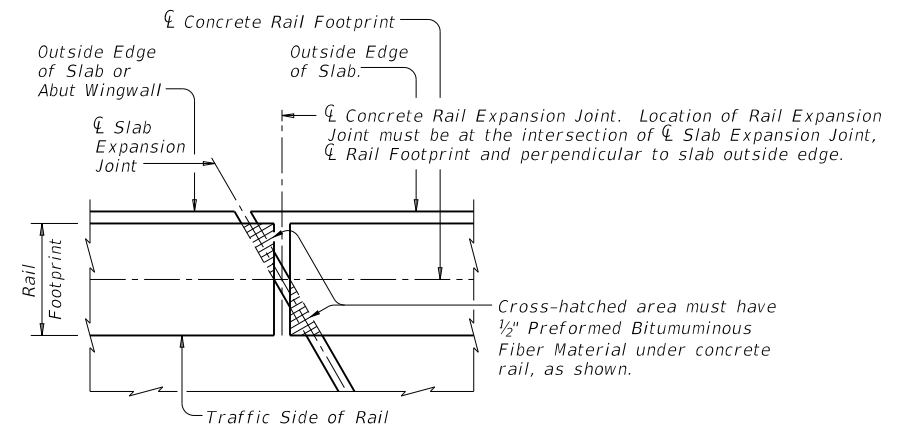
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©TxDOT September 2019	CONTRACT NO. 0908	SECTION 33	JOB NO. 106	HIGHWAY EAST S 7TH ST
REVISIONS	DIST. ABL	COUNTY TAYLOR	SHEET NO. 87	

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



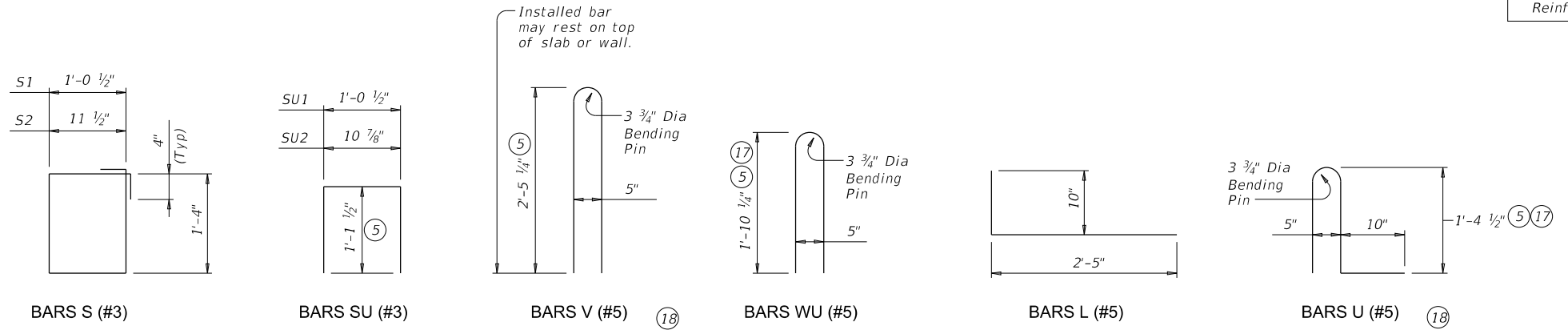
CAST-IN-PLACE ANCHOR BOLT OPTIONS ⑩

- ⑤ Increase 2" for structures with overlay.
- ⑩ See "Material Notes" for anchor bolt information.
- ⑰ For raised sidewalks, add sidewalk height to total bar height. Use sidewalk height at rail's location.
- ⑱ At the Contractor's option, Bars V may be replaced by extending Bars U to 2'-5 1/4" above the roadway/sidewalk surface without overlay.



PLAN OF RAIL AT EXPANSION JOINTS

Example showing Slab Expansion Joints without breakbacks.



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

CONSTRUCTION NOTES:

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

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

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

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

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

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

MATERIAL NOTES:

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

Provide Grade 60 reinforcing steel.

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

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

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

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

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

Optional cast-in-place anchor bolts must be 3/8" Dia ASTM A307 Gr A bolts (or threaded rods with one tack welded hex nut each) with one hex nut and one hardened steel washer (ASTM F436) at each bolt. Nuts must conform to ASTM A563 requirements.

Provide bar laps, where required, as follows: Uncoated or galvanized ~ #5 = 2'-0" Epoxy coated ~ #5 = 3'-0"

GENERAL NOTES:

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

Do not use this railing on bridges with expansion joints providing more than 5" movement. Rail anchorage details shown on this standard may require modification for select structure types. See appropriate details elsewhere in plans for these modifications.

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

Average weight of railing with no overlay:
370 plf total
358 plf (Conc)
12 plf (Steel)

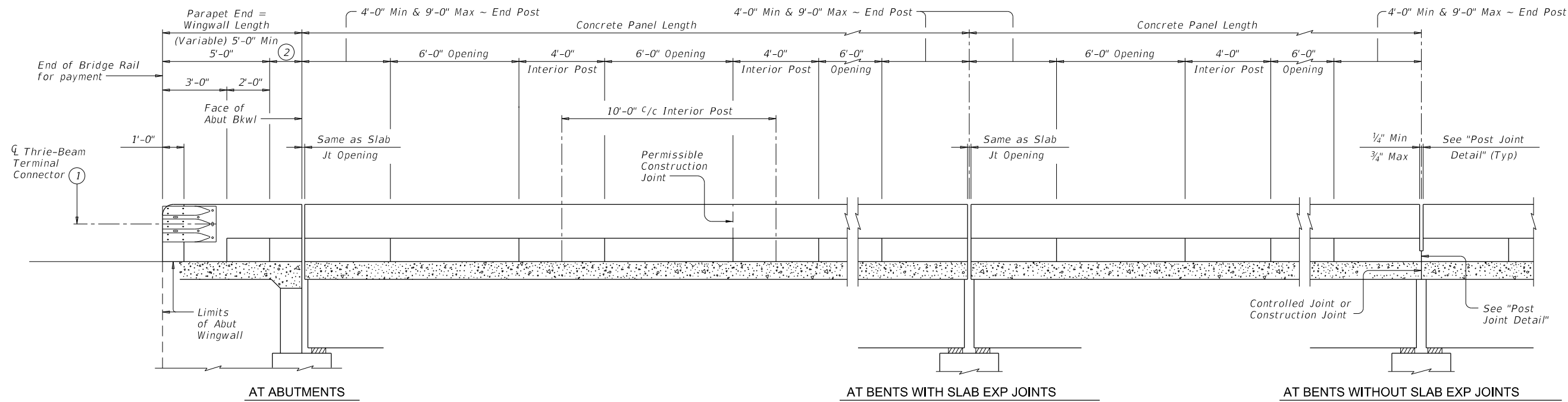
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<h2>TYPE C223</h2>			
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REVISIONS	0908	33	106
	DIST	COUNTY	SHEET NO.
	ABL	TAYLOR	88

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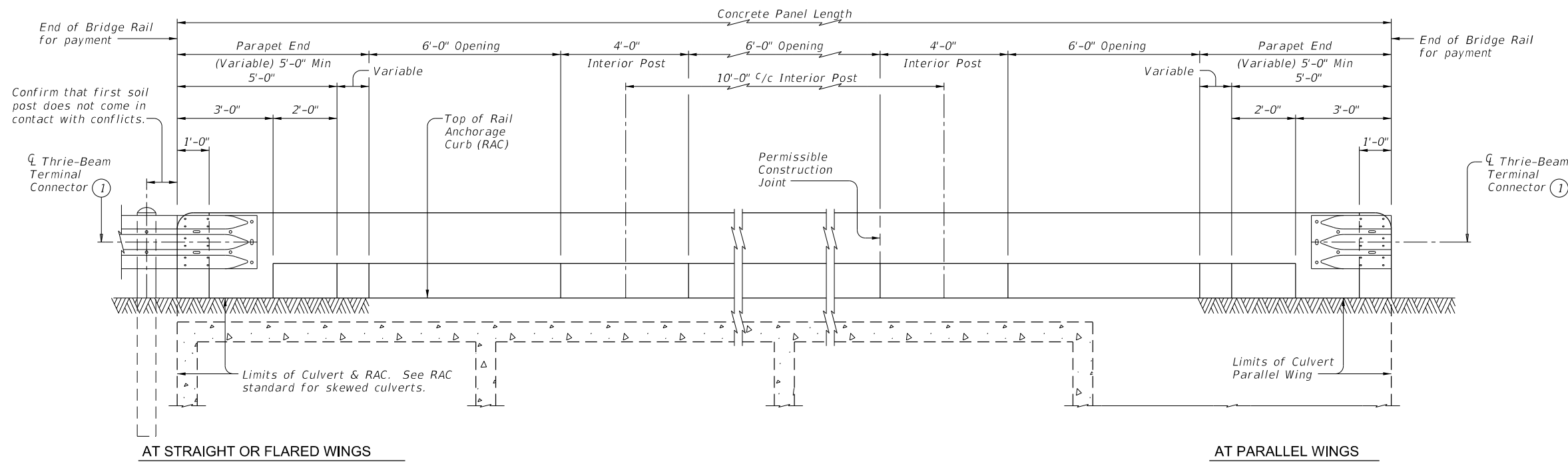
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ROADWAY ELEVATION OF RAIL ON BRIDGE



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.

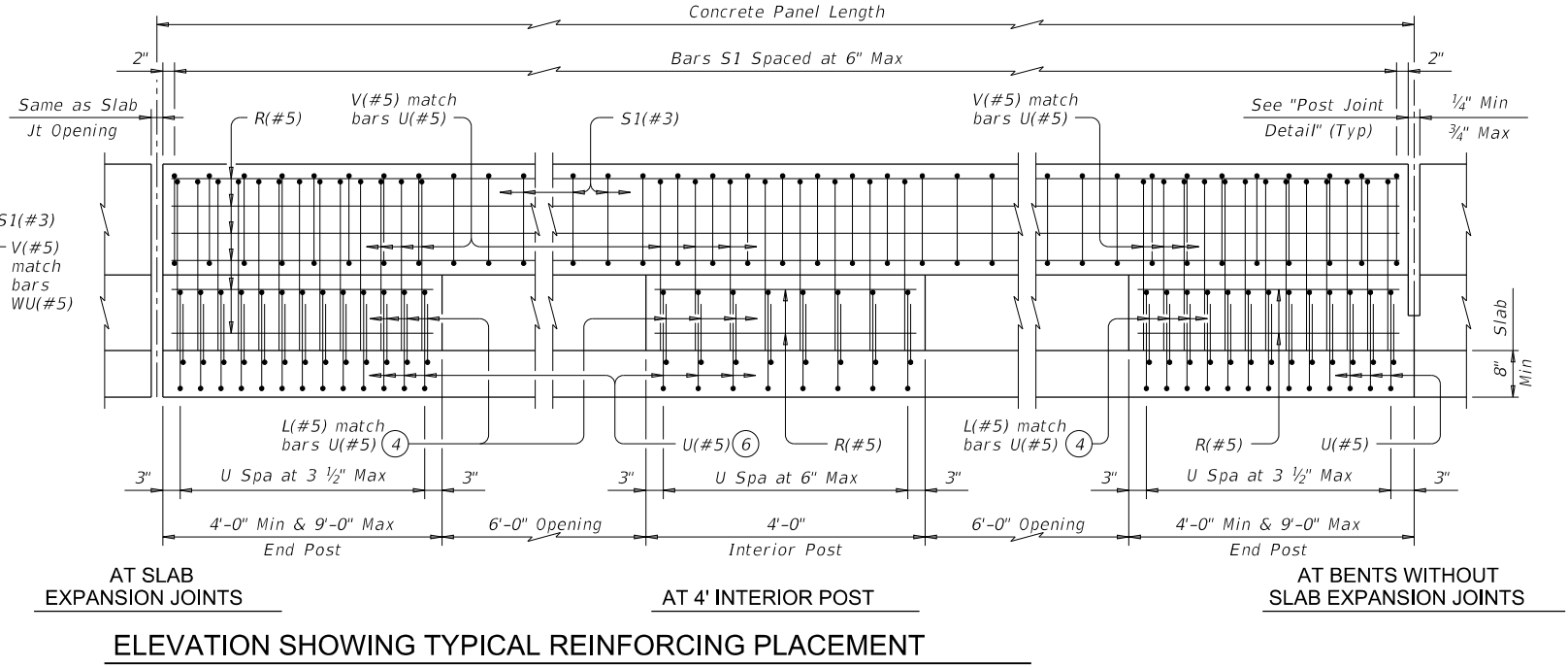
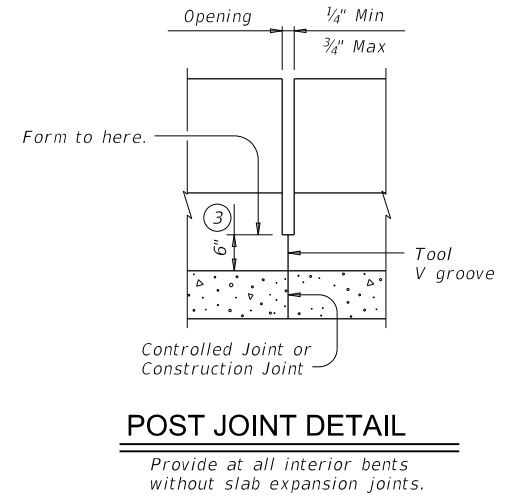
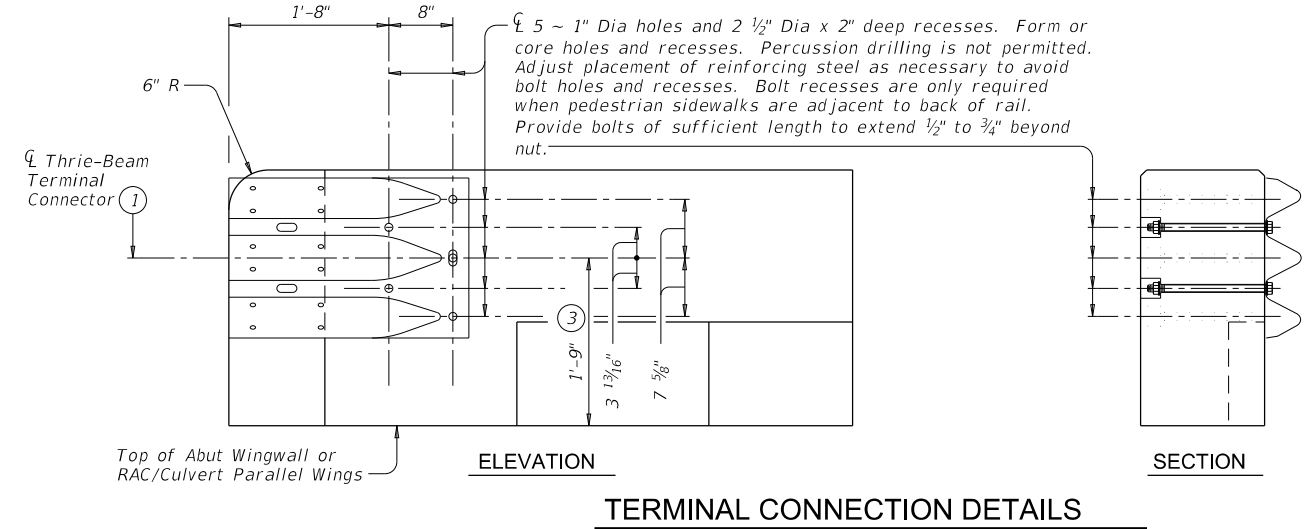
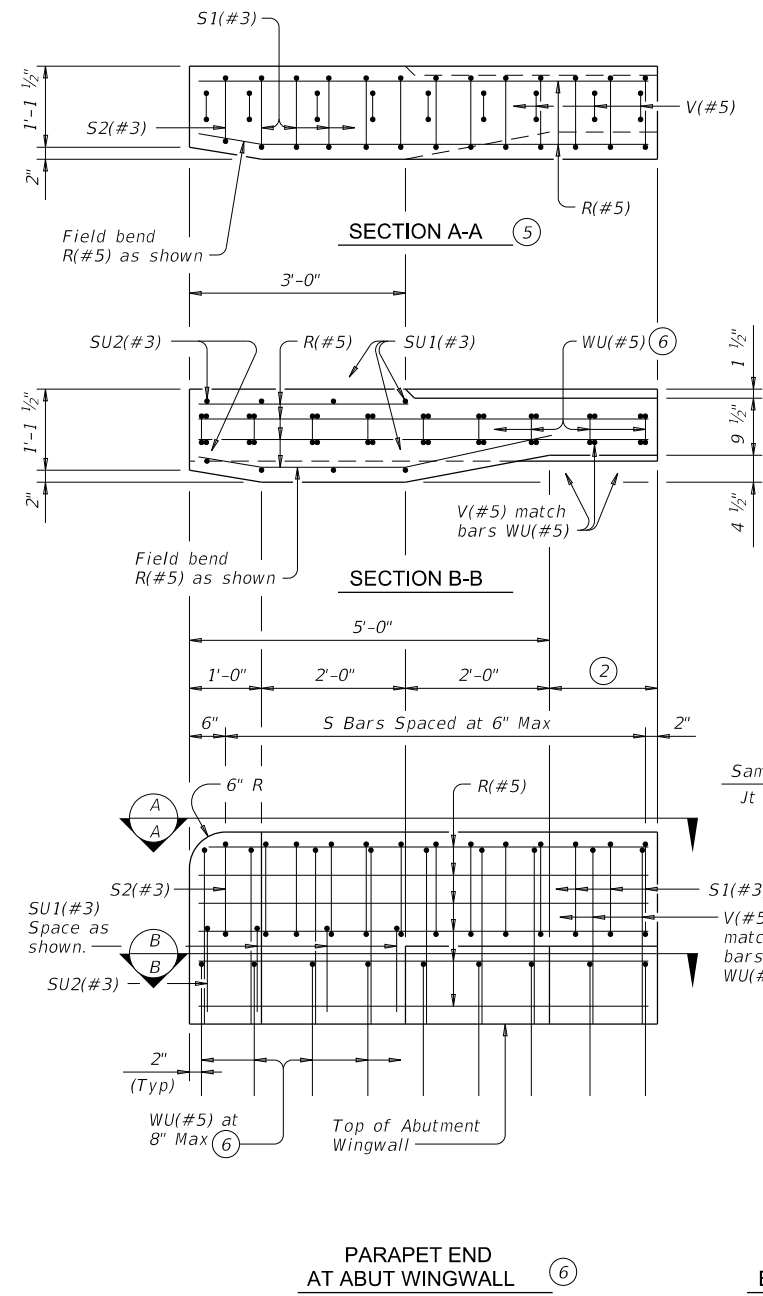
- ① Terminal Connectors and associated hardware are to be paid for under the Item "Metal Beam Guard Fence". Attach Metal Beam Guard Fence Transitions to the bridge rail and extend along the embankment unless otherwise shown in the plans.
- ② Wingwall Length minus 5'-0" (Varies)

SHEET 1 OF 3

				Bridge Division Standard	
<h2>TRAFFIC RAIL</h2>					
<h3>TYPE T223</h3>					
FILE: r1std005-19.dgn	DN: TxDOT	CK: TxDOT	DW: JTR	CK: AES	
©TxDOT September 2019	CONTRACT	SECTION	JOB	HIGHWAY	
	0908	33	106	EAST S 7TH ST	
	DIST	COUNTY	SHEET NO.		
	ABL	TAYLOR	89		

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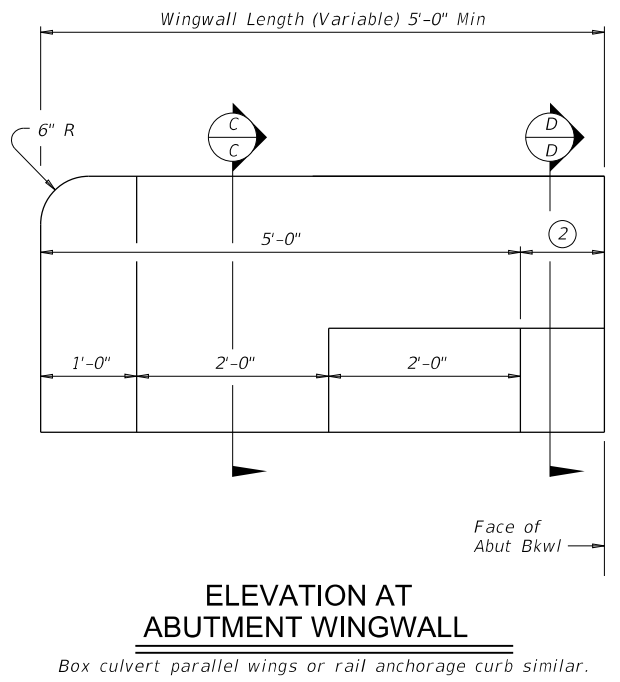
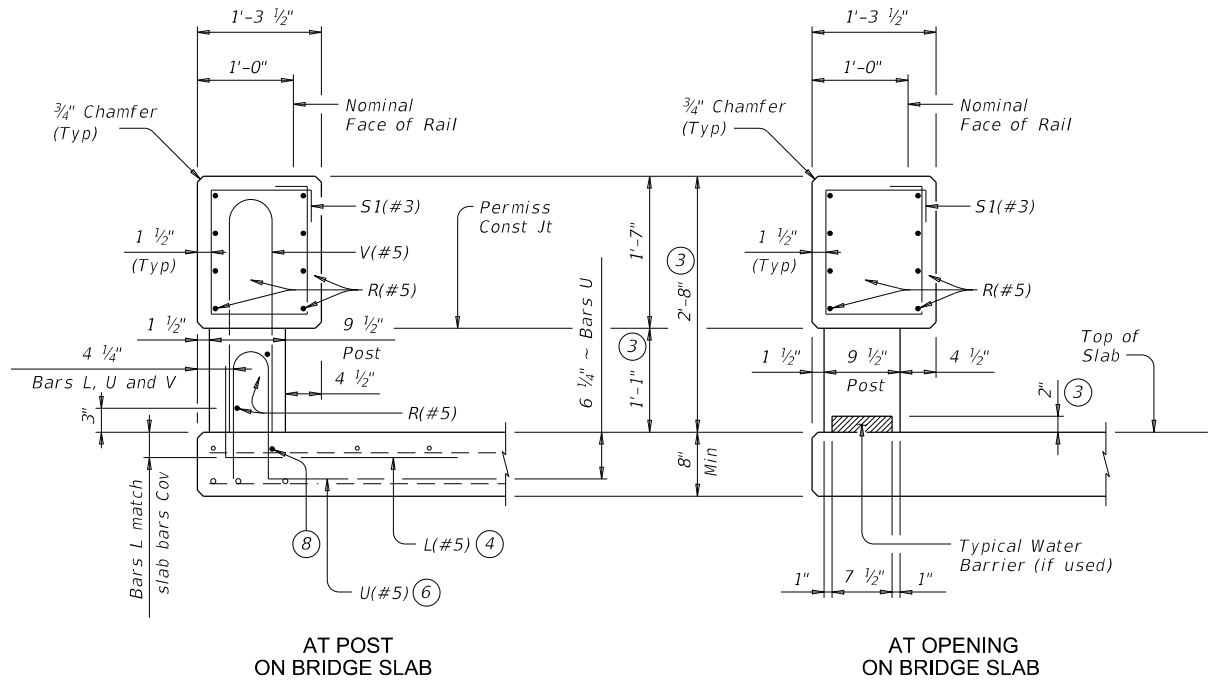
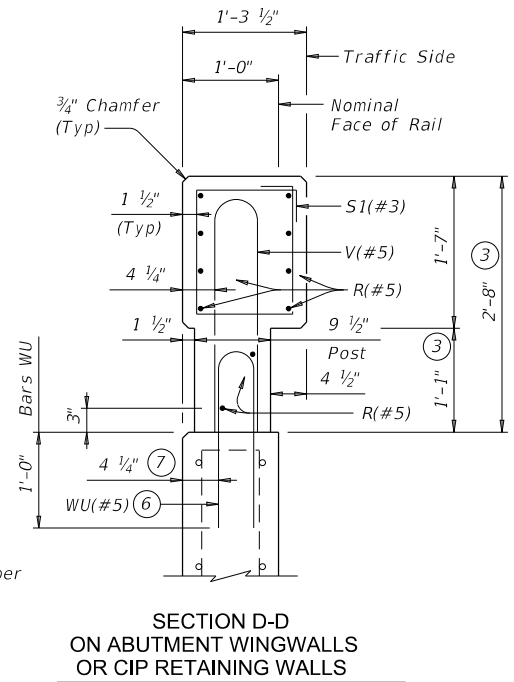
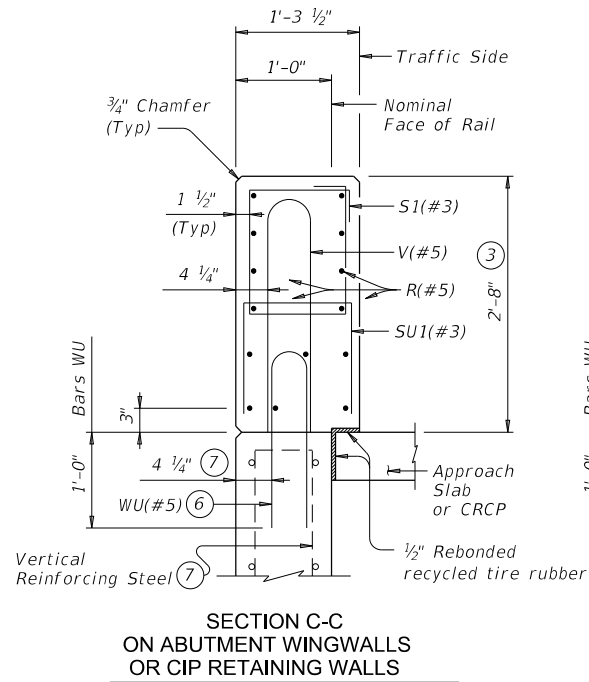
- ① Terminal Connectors and associated hardware are to be paid for under the Item "Metal Beam Guard Fence". Attach Metal Beam Guard Fence Transitions to the bridge rail and extend along the embankment unless otherwise shown in the plans.
- ② Wingwall Length minus 5'-0" (Varies)
- ③ Increase 2" for structures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

SHEET 2 OF 3

		Bridge Division Standard	
TRAFFIC RAIL			
TYPE T223			
FILE: r1std005-19.dgn	DN: TxDOT	CK: TxDOT	DW: JTR
©TxDOT September 2019	CONT	SECT	JOB
REVISIONS	0908	33	106 EAST S 7TH ST
	DIST	COUNTY	SHEET NO.
	ABL	TAYLOR	90

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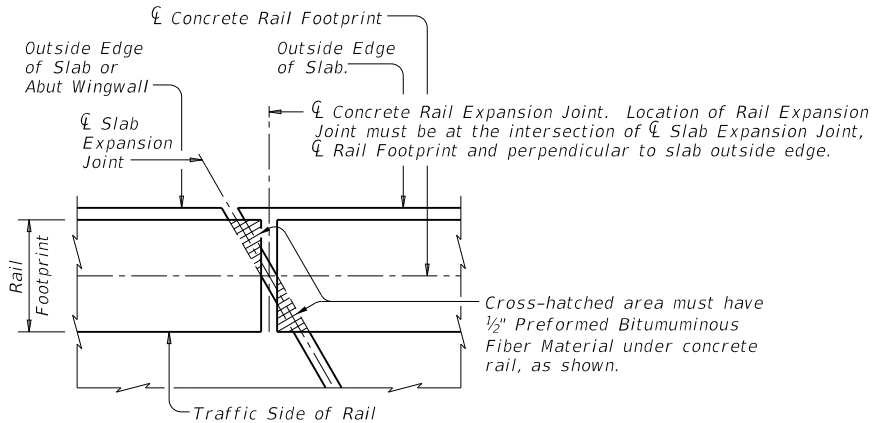
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SECTIONS THRU RAIL

Sections on box culverts similar.

- ② Wingwall Length minus 5'-0" (Varies)
- ③ Increase 2" for structures with overlay.
- ④ Bars L(#5) are part of rail reinforcing and are included in unit price bid for railing. Space with Bars U. Bars L match slab bar cover. Bars L may be bundled with top slab reinforcing if spacing is equivalent.
- ⑥ Substitute Bars U(#5) for Bars WU(#5) when parapet end is located on anchorage curb over culvert top slab. Use Bars WU(#5) in culvert parallel wings.
- ⑦ When vertical reinforcing has closer clear cover over horizontal reinforcing in abutment wingwalls on traffic side of wall, move the horizontal wingwall/retaining wall reinforcing to the inside of Bars WU where bars conflict.
- ⑧ Top longitudinal slab bar may be adjusted laterally 3" plus or minus to tie reinforcing.
- ⑨ At the Contractor's option, Bars V may be replaced by extending Bars U to 2'-5 1/4" above the roadway surface without overlay.



PLAN OF RAIL AT EXPANSION JOINTS

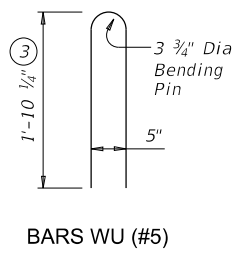
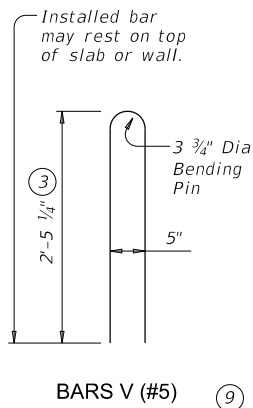
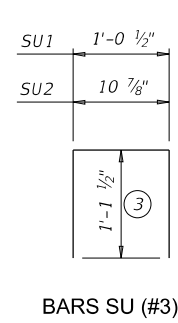
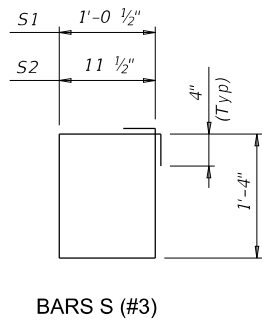
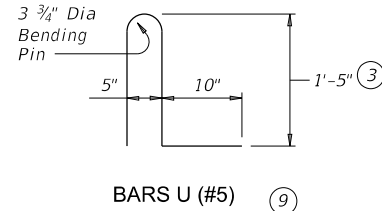
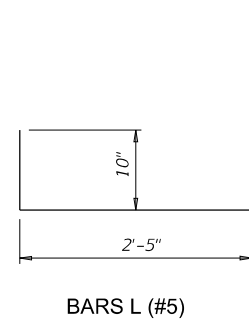
Example showing Slab Expansion Joints without breakbacks.

CONSTRUCTION NOTES:
 Face of rail and parapet must be vertical transversely unless otherwise shown in the plans or approved by the Engineer.
 Provide water barriers at openings draining onto undercrossing roadways and sidewalks. They may be cast-in-place or precast in convenient lengths and bonded to the bridge deck with an approved epoxy cement.
 Chamfer all exposed corners.

MATERIAL NOTES:
 Provide Class "C" concrete. Provide Class "C" (HPC) if required elsewhere.
 Provide Grade 60 reinforcing steel.
 Epoxy coat or galvanize all reinforcing steel if slab bars are epoxy coated or galvanized.
 Deformed Welded Wire Reinforcing (WWR) (ASTM A1064) of equal size and spacing may be substituted for Bars U, V, and WU unless noted otherwise. Provide the same laps as required for reinforcing bars.
 Provide bar laps, where required, as follows:
 Uncoated or galvanized ~ #5 = 2'-0"
 Epoxy coated ~ #5 = 3'-0"

GENERAL NOTES:
 This rail has been evaluated by full-scale crash test to meet MASH TL-3 criteria. This rail can be used for speeds of 50 mph and greater when a TL-3 rated guard fence transition is used. When a TL-2 rated guard fence transition is used, this rail can only be used for speeds of 45 mph and less.
 Do not use this railing on bridges with expansion joints providing more than 5" movement.
 Rail anchorage details shown on this standard may require modification for select structure types. See appropriate details elsewhere in plans for these modifications.
 Shop drawings are not required for this rail.
 Average weight of railing with no overlay is 358 plf.

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











		Bridge Division Standard	
<h1>TRAFFIC RAIL</h1>			
<h2>TYPE T223</h2>			
FILE: r1std005-19.dgn	DN: TxDOT	CK: TxDOT	DW: JTR
REV: 0908	SECT: 33	JOB: 106	HIGHWAY: EAST S 7TH ST
DIST: ABL	COUNTY: TAYLOR	SHEET NO. 91	

SUMMARY OF SMALL SIGNS

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PLAN SHEET NO.	SIGN NO.	SIGN NOMENCLATURE	SIGN	DIMENSIONS	FLAT ALUMINUM (TYPE A)	EXAL ALUMINUM (TYPE G)	SM RD SGN ASSM TY XXXXX (X) XX (X-XXXX)				BRIDGE MOUNT CLEARANCE SIGNS (See Note 2)
							POST TYPE	POSTS	ANCHOR TYPE	MOUNTING DESIGNATION	
							FRP = Fiberglass TWT = Thin-Wall 10BWG = 10 BWG S80 = Sch 80	1 or 2	UA=Universal Conc UB=Universal Bolt SA=Slipbase-Conc SB=Slipbase-Bolt WS=Wedge Steel WP=Wedge Plastic	PREFABRICATED P = "Plain" T = "T" U = "U"	
1	1	W11-15A		30X30			TWT	1	WS	T	
1	2	I-3		36X24			TWT	1	WS	T	
1	3	R1-5A		36X48			10BWG	1	SA	T	
1	4	I-3		36X24			TWT	1	WS	T	
1	5	R1-1		18X18			TWT	1	WS	P	
1	6	R1-1		18X18			TWT	1	WS	P	
1	7	R1-5A		36X48			10BWG	1	SA	T	
1	8	W11-15A		30X30			TWT	1	WS	T	

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

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

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

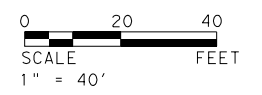
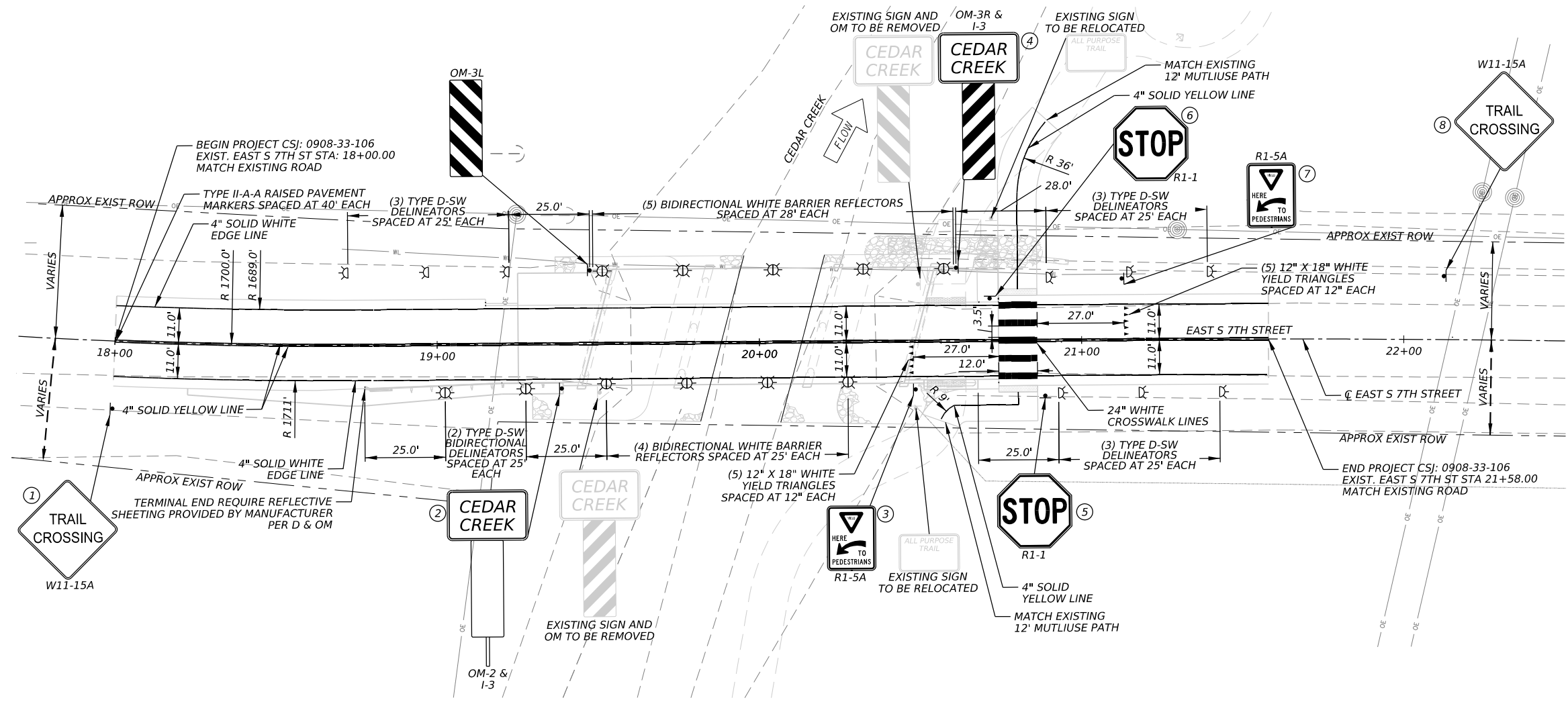


SUMMARY OF SMALL SIGNS

SOSS SHEET 1 OF 1

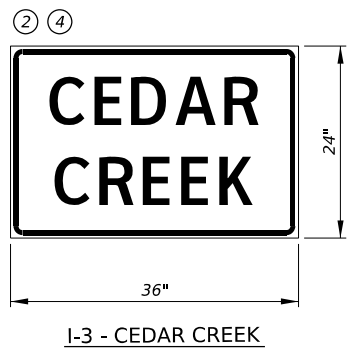
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© TxDOT May 1987	CONT	SECT	JOB	HIGHWAY
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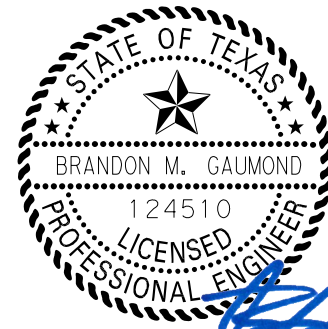


LEGEND

PROPOSED SIGN



REV. NO.	DATE	BY	REVISION



2/8/2023

TranSystems 500 W 7th ST SUITE 1100
 FORT WORTH, TX 76102
 (817) 339-8950
 FIRM REG. #: 3557

© 2023
 Texas Department of Transportation

EAST S 7TH STREET

SIGNING & PAVEMENT MARKING
 STA 18+00.00 TO 21+58.00

SHEET 1 OF 1

COUNT	SECT	JOB	HIGHWAY
0908	33	106	EAST S 7TH ST
DIST	COUNTY	SHEET NO.	
ABL	TAYLOR	93	

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SIGN SUPPORT DESCRIPTIVE CODES

(Descriptive Codes correspond to project estimate and quantities sheets)

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

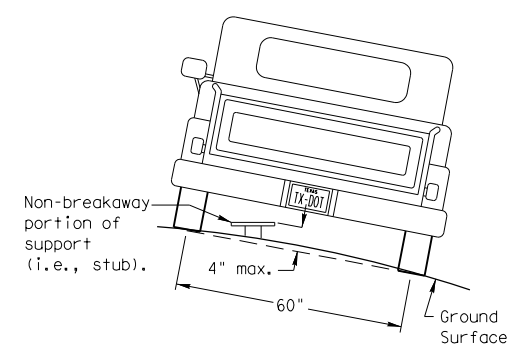
Post Type _____
 FRP = Fiberglass Reinforced Plastic Pipe (see SMD(FRP))
 TWT = Thin-Walled Tubing (see SMD(TWT))
 10BWG = 10 BWG Tubing (see SMD(SLIP-1) to (SLIP-3))
 S80 = Schedule 80 Pipe (see SMD(SLIP-1) to (SLIP-3))

Number of Posts (1 or 2) _____

Anchor Type _____
 UA = Universal Anchor - Concreted (see SMD(FRP) and (TWT))
 UB = Universal Anchor - Bolted down (see SMD(FRP) and (TWT))
 WS = Wedge Anchor Steel - (see SMD(TWT))
 WP = Wedge Anchor Plastic (see SMD(TWT))
 SA = Slipbase - Concreted (see SMD(SLIP-1) to (SLIP-3))
 SB = Slipbase - Bolted Down (see SMD(SLIP-1) to (SLIP-3))

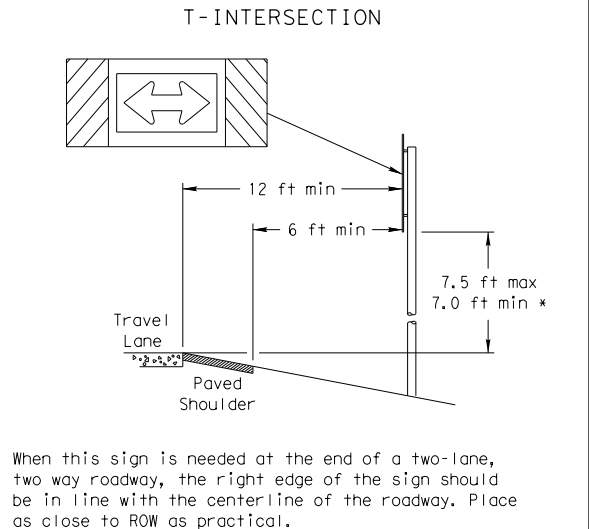
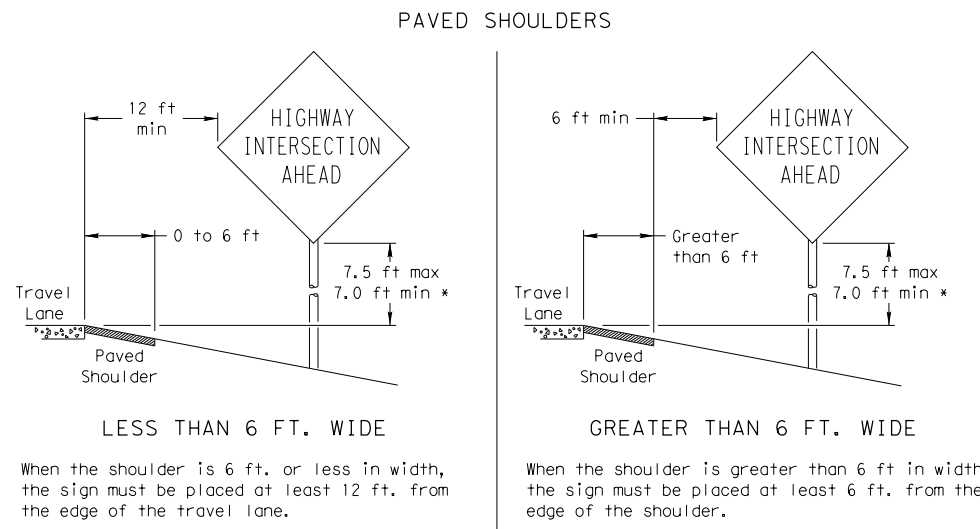
Sign Mounting Designation
 P = Prefab. "Plain" (see SMD(SLIP-1) to (SLIP-3), (TWT), (FRP))
 T = Prefab. "T" (see SMD(SLIP-1) to (SLIP-3), (TWT))
 U = Prefab. "U" (see SMD(SLIP-1) to (SLIP-3))
 IF REQUIRED
 1EXT or 2EXT = Number of Extensions (see SMD(SLIP-1) to (SLIP-3), (TWT))
 BM = Extruded Wind Beam (see SMD(SLIP-1) to (SLIP-3))
 WC = 1.12 #/ft Wing Channel (see SMD(SLIP-1) to (SLIP-3))
 EXAL = Extruded Aluminum Sign Panels (see SMD(SLIP-3))

REQUIRED CLEARANCE FOR BREAKAWAY SUPPORT

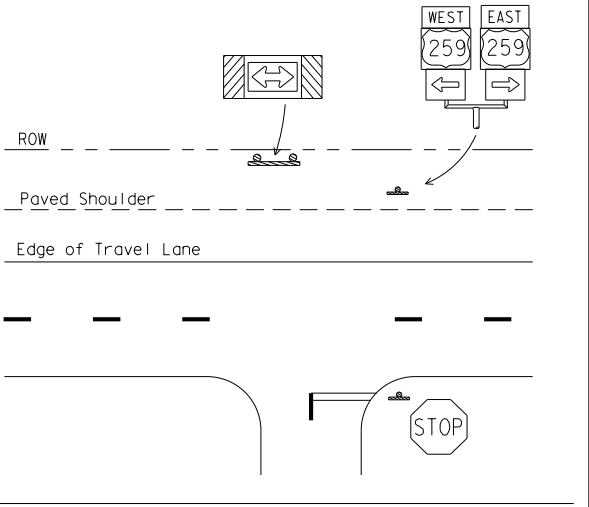
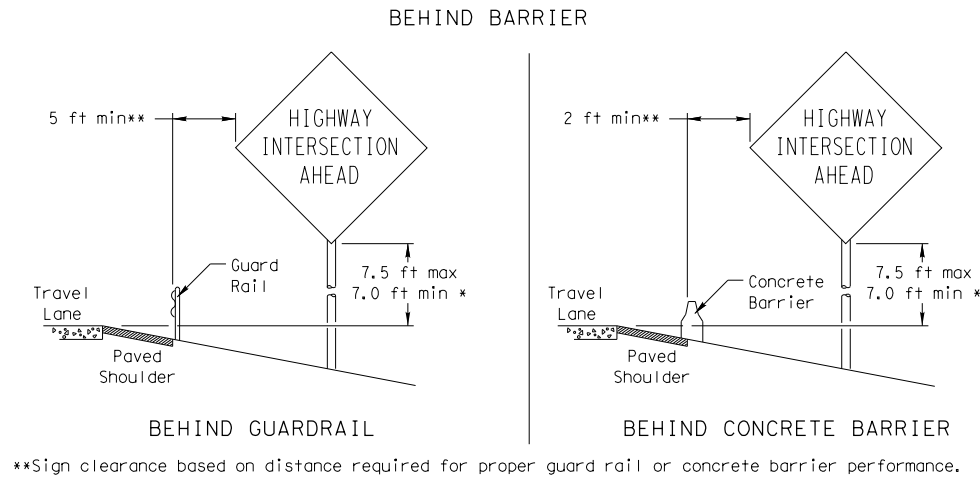
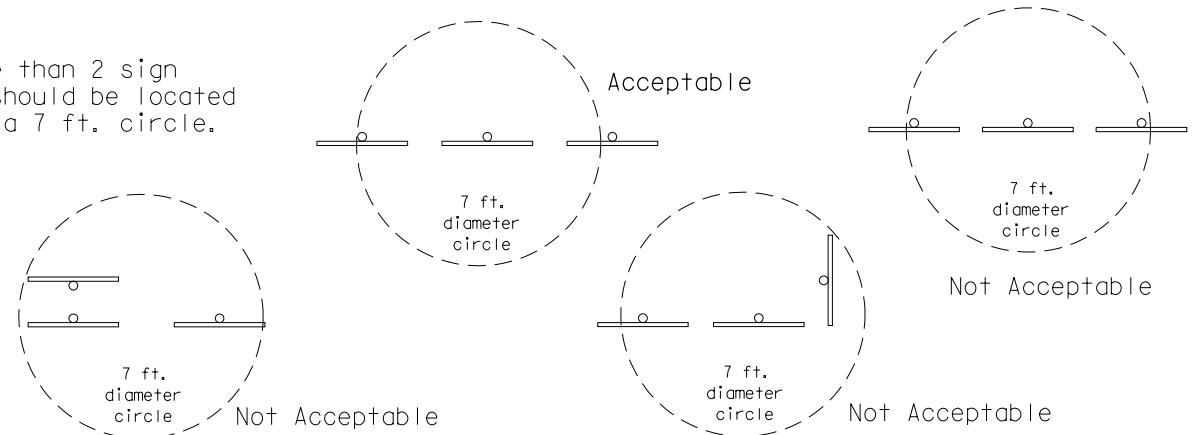


To avoid vehicle undercarriage snagging, any substantial remains of a breakaway support, when it is broken away, should not project more than 4 inches above a 60-inch chord (i.e., typical space between wheel paths).

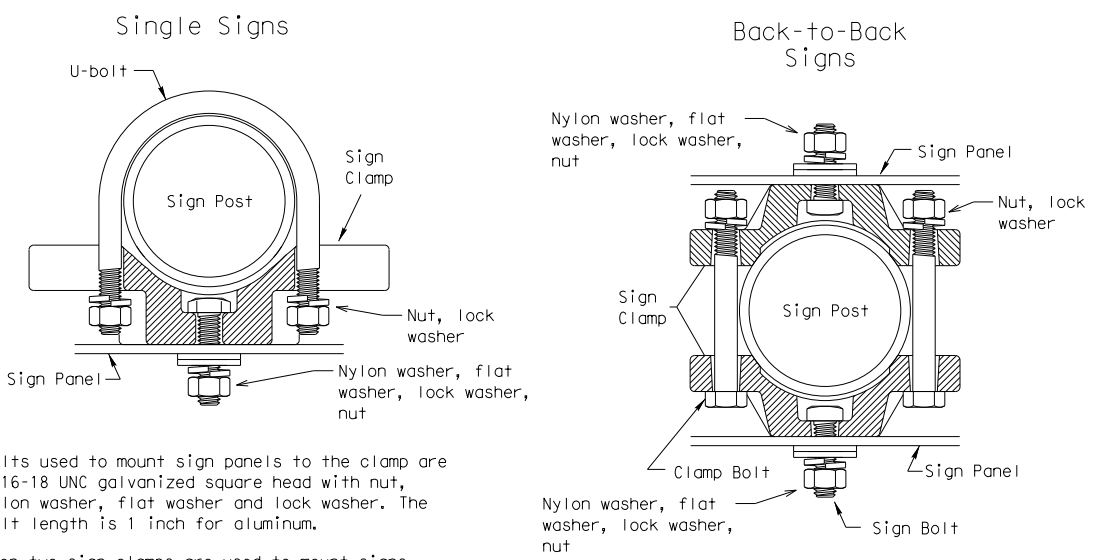
SIGN LOCATION



No more than 2 sign posts should be located within a 7 ft. circle.



TYPICAL SIGN ATTACHMENT DETAIL



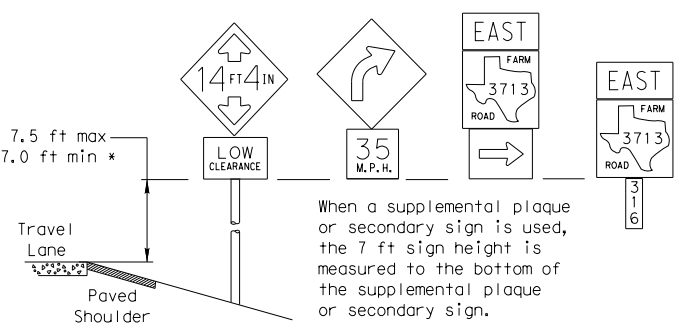
Bolts used to mount sign panels to the clamp are 5/16-18 UNC galvanized square head with nut, nylon washer, flat washer and lock washer. The bolt length is 1 inch for aluminum.

When two sign clamps are used to mount signs back-to-back, use a 5/16-18 UNC galvanized hex head per ASTM A307 with nut and helical-spring lock washer. The approximate bolt lengths for various post sizes and sign clamp types are given in the table at right. The bolt length may need to be adjusted depending upon field conditions.

Sign clamps may be either the specific size clamp or the universal clamp.

Pipe Diameter	Approximate Bolt Length	
	Specific Clamp	Universal Clamp
2" nominal	3"	3 or 3 1/2"
2 1/2" nominal	3 or 3 1/2"	3 1/2 or 4"
3" nominal	3 1/2 or 4"	4 1/2"

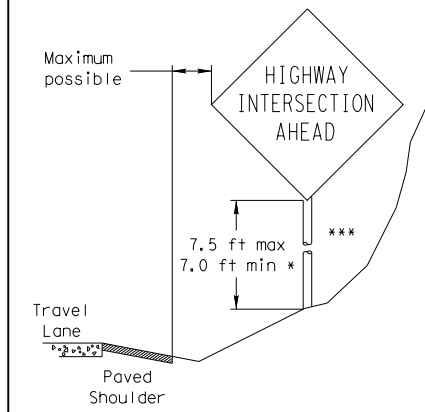
SIGNS WITH PLAQUES



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.

RESTRICTED RIGHT-OF-WAY

(When 6 ft min. is not possible.)

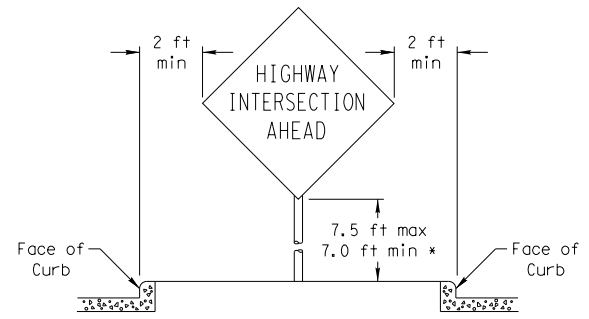


Right-of-way restrictions may be created by rocks, water, vegetation, forest, buildings, a narrow island, or other factors.

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.

CURB & GUTTER OR RAISED ISLAND



- * Signs shall be mounted using the following condition that results in the greatest sign elevation:
- (1) a minimum of 7 to a maximum of 7.5 feet above the edge of the travel lane or
 - (2) a minimum of 7 to a maximum of 7.5 feet above the grade at the base of the support when sign is installed on the backslope.
- The maximum values may be increased when directed by the Engineer.
- See the Traffic Operations Division website for detailed drawings of sign clamps, Triangular Slipbase System components and Wedge Anchor System components.
- The website address is:
<http://www.txdot.gov/publications/traffic.htm>



SIGN MOUNTING DETAILS SMALL ROADSIDE SIGNS GENERAL NOTES & DETAILS

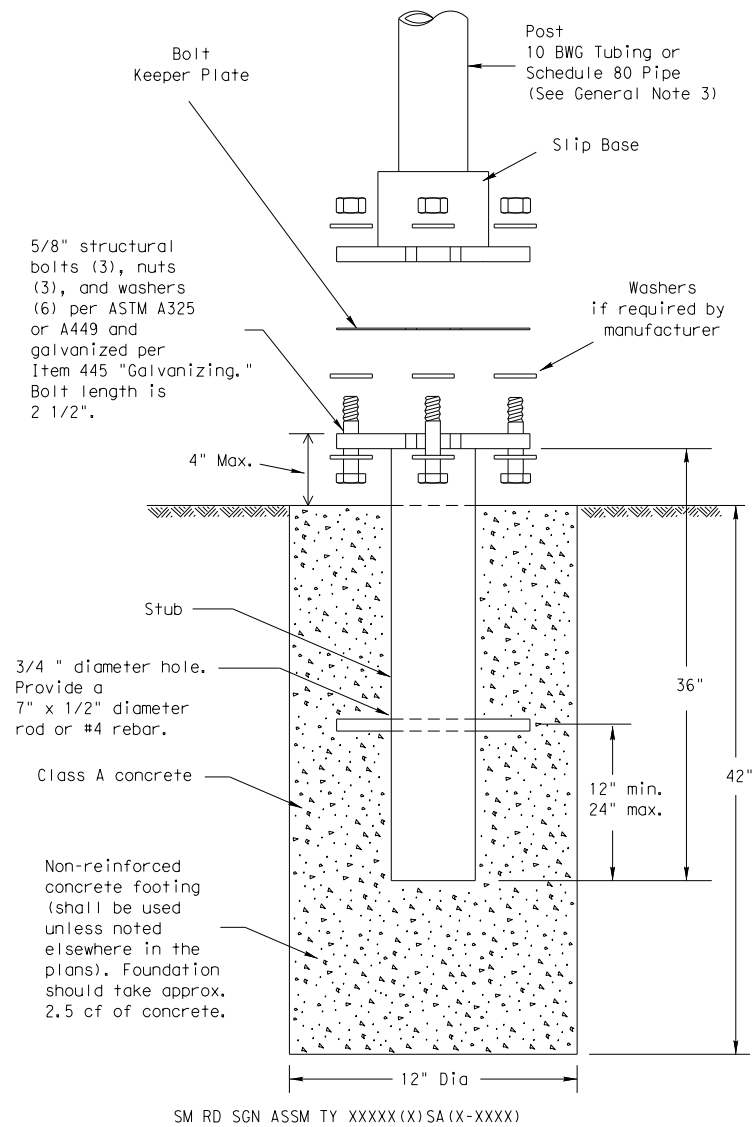
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TRIANGULAR SLIPBASE INSTALLATION GENERAL REQUIREMENTS



NOTE

There are various devices approved for the Triangular Slipbase System. Please reference the Material Producer List for approved slip base systems. http://www.txdot.gov/business/producer_list.htm
 The devices shall be installed per manufacturers' recommendations. Installation procedures shall be provided to the Engineer by Contractor.

GENERAL NOTES:

- Slip base shall be permanently marked to indicate manufacturer. Method, design, and location of marking are subject to approval of the TxDOT Traffic Standards Engineer.
- Material used as post with this system shall conform to the following specifications:
 - 10 BWG Tubing (2.875" outside diameter)
 - 0.134" nominal wall thickness
 - Seamless or electric-resistance welded steel tubing or pipe
 - Steel shall be HSLAS Gr 55 per ASTM A1011 or ASTM A1008
 - Other steels may be used if they meet the following:
 - 55,000 PSI minimum yield strength
 - 70,000 PSI minimum tensile strength
 - 20% minimum elongation in 2"
 - Wall thickness (uncoated) shall be within the range of 0.122" to 0.138"
 - Outside diameter (uncoated) shall be within the range of 2.867" to 2.883"
 - Galvanization per ASTM A123 or ASTM A653 G210. For precoated steel tubing (ASTM A653), recoat tube outside diameter weld seam by metallizing with zinc wire per ASTM B833.
 - Schedule 80 Pipe (2.875" outside diameter)
 - 0.276" nominal wall thickness
 - Steel tubing per ASTM A500 Gr C
 - Other seamless or electric-resistance welded steel tubing or pipe with equivalent outside diameter and wall thickness may be used if they meet the following:
 - 46,000 PSI minimum yield strength
 - 62,000 PSI minimum tensile strength
 - 21% minimum elongation in 2"
 - Wall thickness (uncoated) shall be within the range of 0.248" to 0.304"
 - Outside diameter (uncoated) shall be within the range of 2.855" to 2.895"
 - Galvanization per ASTM A123
- See the Traffic Operations Division website for detailed drawings of sign clamps and Texas Universal Triangular Slipbase System components. The website address is: <http://www.txdot.gov/publications/traffic.htm>
- Sign supports shall not be spliced except where shown. Sign support posts shall not be spliced.

ASSEMBLY PROCEDURE

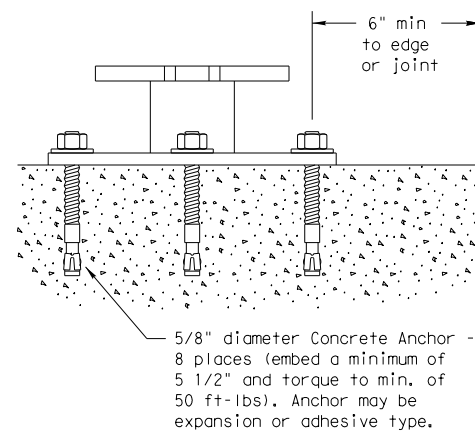
Foundation

- Prepare 12-inch diameter by 42-inch deep hole. If solid rock is encountered, the depth of the foundation may be reduced such that it is embedded a minimum of 18 inches into the solid rock.
- The Engineer may permit batches of concrete less than 2 cubic yards to be mixed with a portable, motor-driven concrete mixer. For small placements less than 0.5 cubic yards, hand mixing in a suitable container may be allowed by Engineer. Concrete shall be Class A.
- Push the pipe end of the slip base stub into the center of the concrete. Rotate the stub back and forth while pushing it down into the concrete to assure good contact between the concrete and stub. Continue to work the stub into the concrete until it is between 2 to 4 inches above the ground.
- Plumb the stub. Allow a minimum of 4 days to set, unless otherwise directed by the Engineer.
- The triangular slipbase system is multidirectional and is designed to release when struck from any direction.

Support

- Cut support so that the bottom of the sign will be 7 to 7.5 feet above the edge of the travelway (i.e., edge of the closest lane) when slip plate is below the edge of pavement or 7 to 7.5 feet above slip plate when the slip plate is above the edge of the travelway. The cut shall be plumb and straight.
- Attach sign to support using connections shown. When multiple signs are installed on the same support, ensure the minimum clearance between each sign is maintained. See SMD(SLIP-2) for clearances based on sign types.

CONCRETE ANCHOR



Concrete anchor consists of 5/8" diameter stud bolt with UNC series bolt threads on the upper end. Heavy hex nut per ASTM A563, and hardened washer per ASTM F436. The stud bolt shall have a minimum yield and ultimate tensile strength of 50 and 75 KSI, respectively. Nuts, bolts and washers shall be galvanized per Item 445, "Galvanizing." Adhesive type anchors shall have stud bolts installed with Type III epoxy per DMS-6100, "Epoxyes and Adhesives." Adhesive anchors may be loaded after adequate epoxy cure time per the manufacturer's recommendations. Top of bolt shall extend at least flush with top of the nut when installed. The anchor, when installed in 4000 psi normal-weight concrete with a 5 1/2" minimum embedment, shall have a minimum allowable tension and shear of 3900 and 3100 psi, respectively.



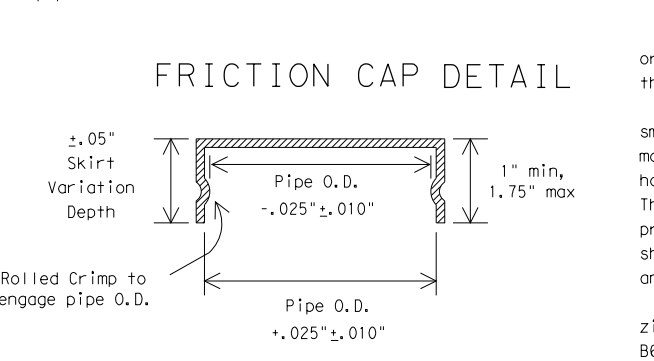
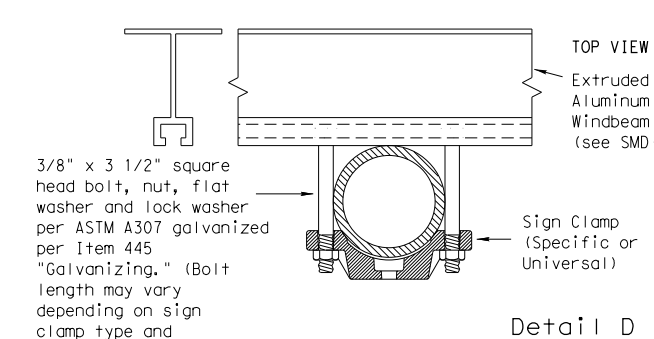
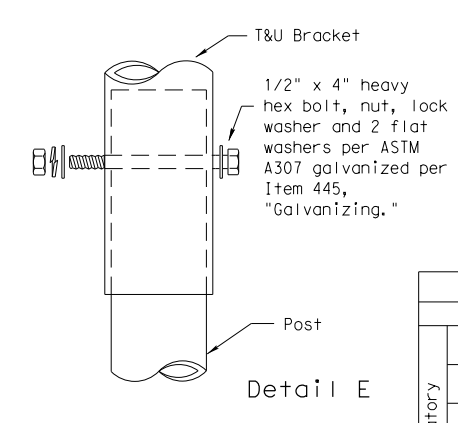
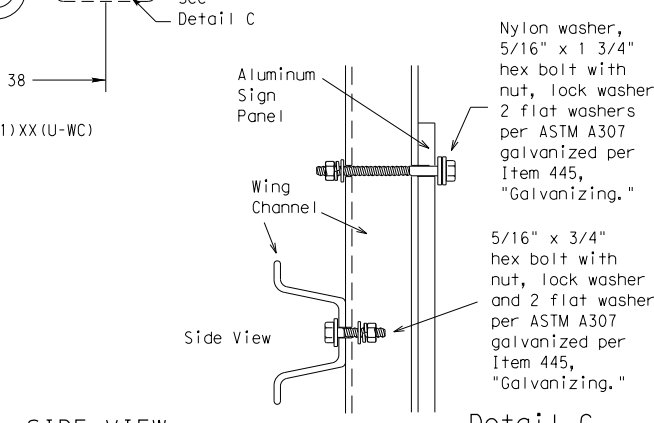
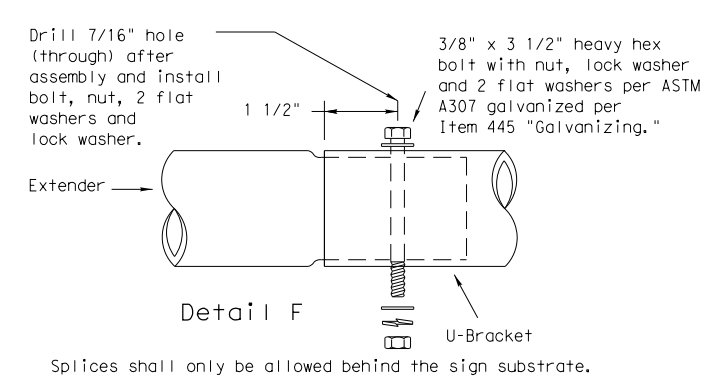
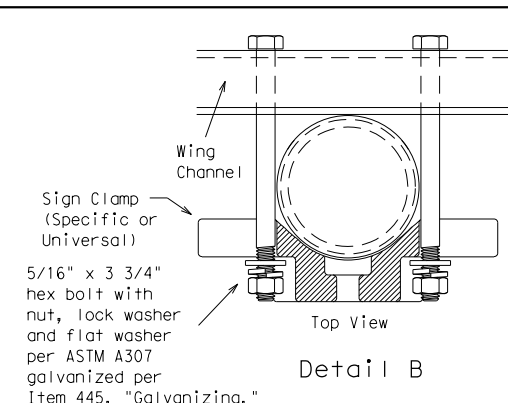
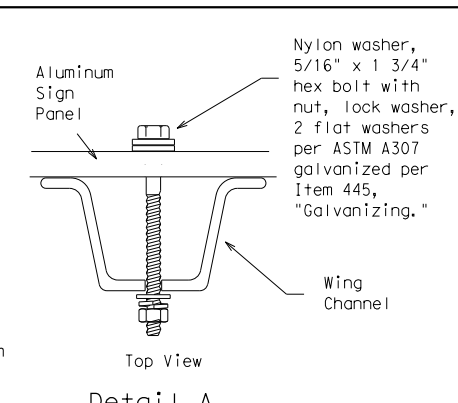
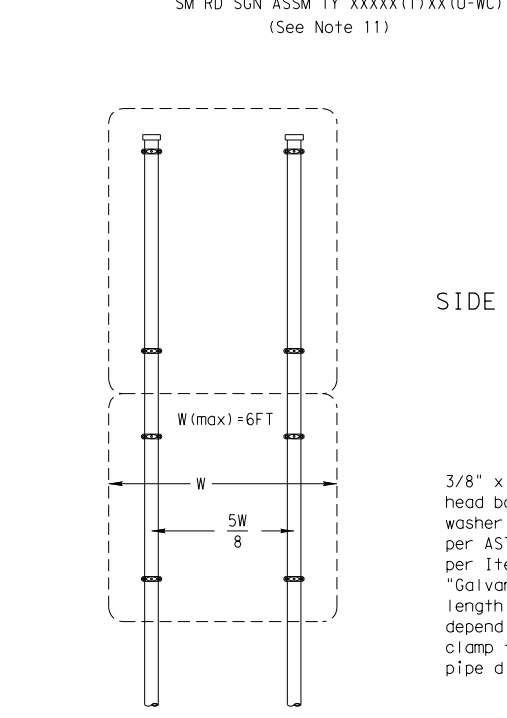
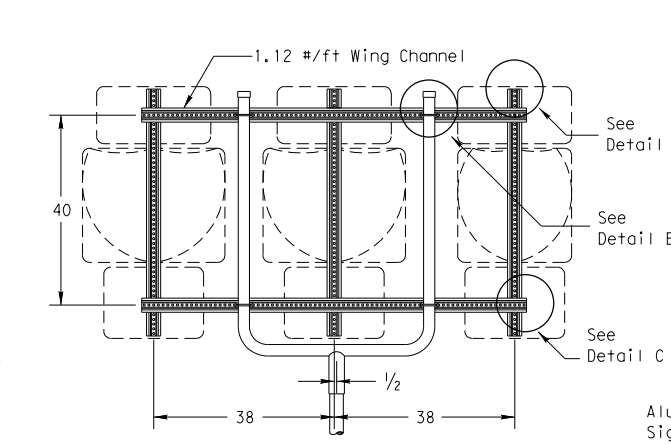
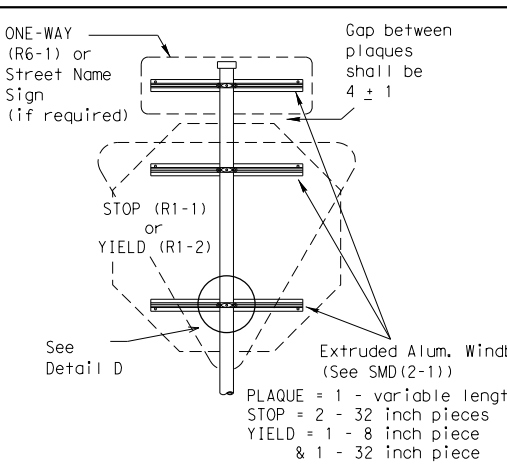
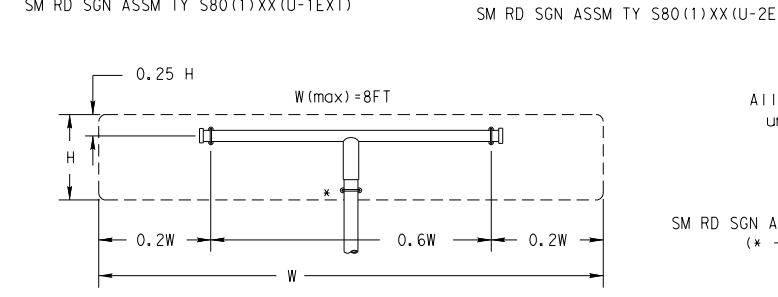
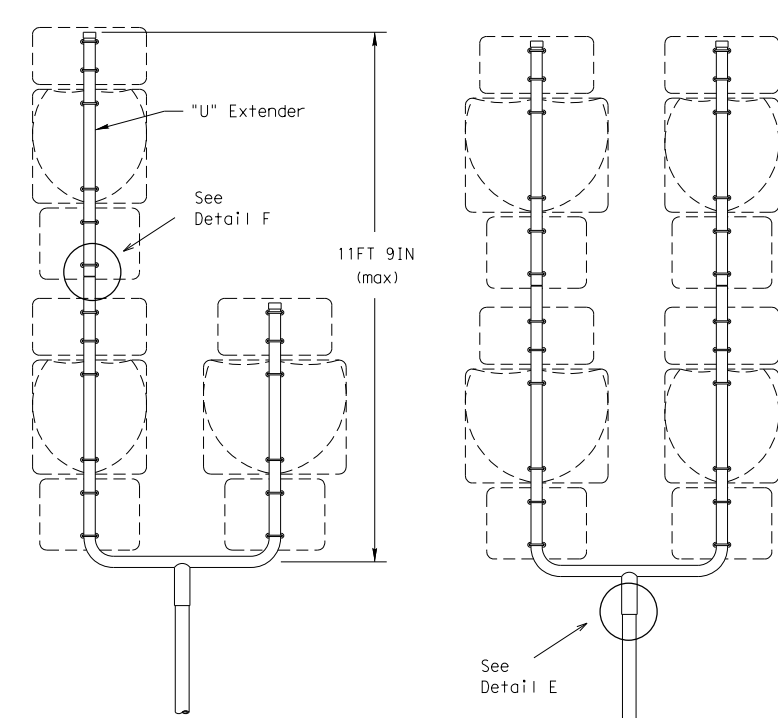
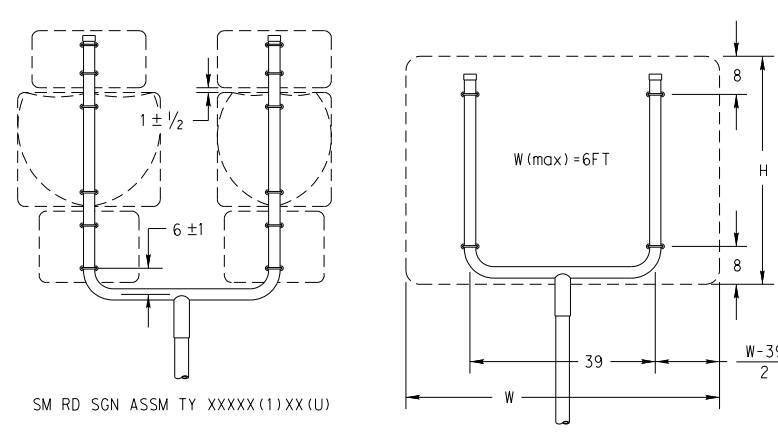
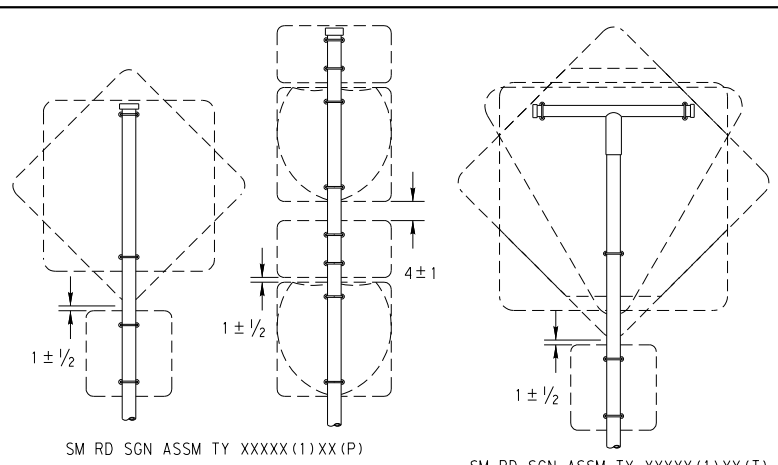
SIGN MOUNTING DETAILS SMALL ROADSIDE SIGNS TRIANGULAR SLIPBASE SYSTEM

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All dimensions are in english unless detailed otherwise.

SM RD SGN ASSM TY XXXXX(1)XX(T) (* - See Note 12)

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)
Warning	48x60-inch signs	TY S80(1)XX(T)
	48x48-inch signs (diamond or square)	TY 10BWG(1)XX(T)
	48x60-inch signs	TY S80(1)XX(T)
	48-inch Advance School X-ing sign (S1-1)	TY 10BWG(1)XX(T)
	48-inch School X-ing sign (S2-1)	TY 10BWG(1)XX(T)
	Large Arrow sign (W1-6 & W1-7)	TY 10BWG(1)XX(T)

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.

Texas Department of Transportation
 Traffic Operations Division

SIGN MOUNTING DETAILS SMALL ROADSIDE SIGNS TRIANGULAR SLIPBASE SYSTEM

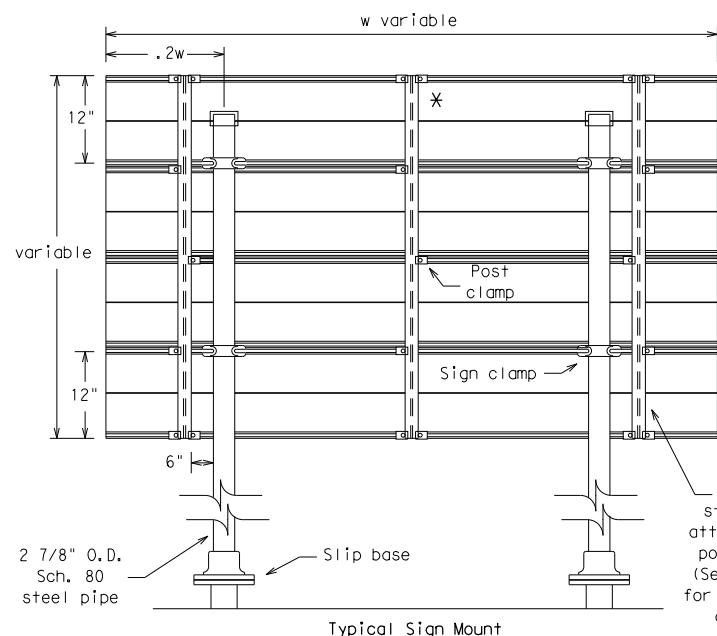
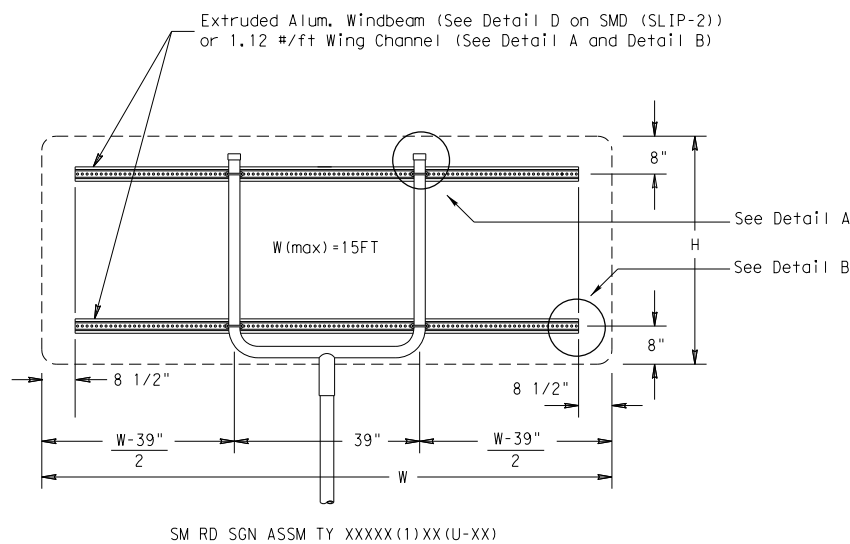
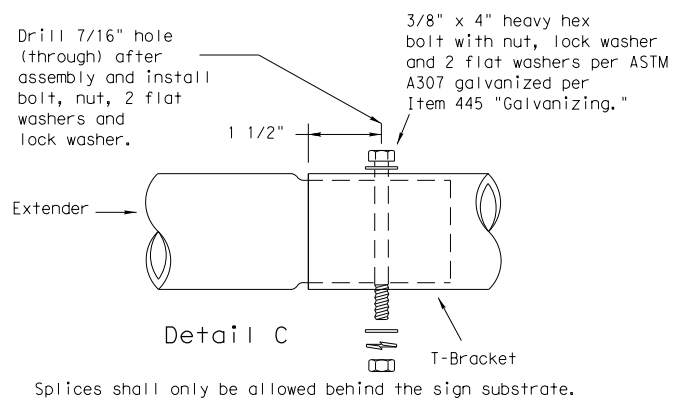
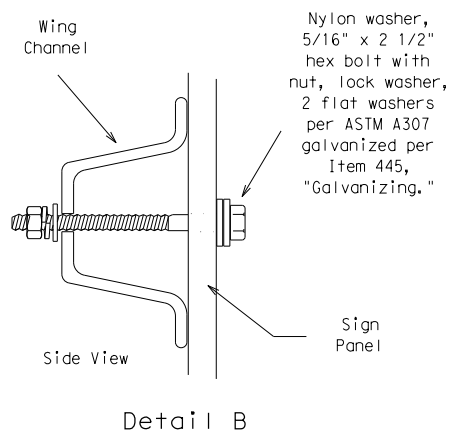
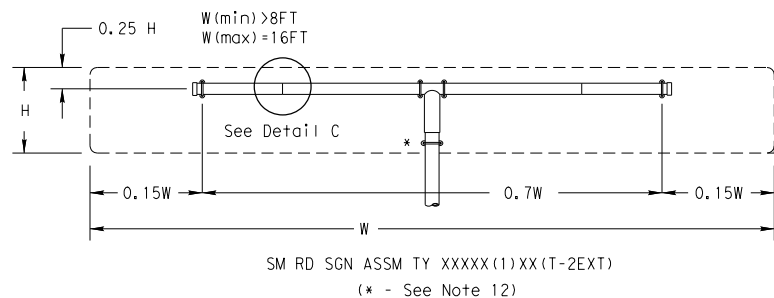
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		ABL	TAYLOR		96

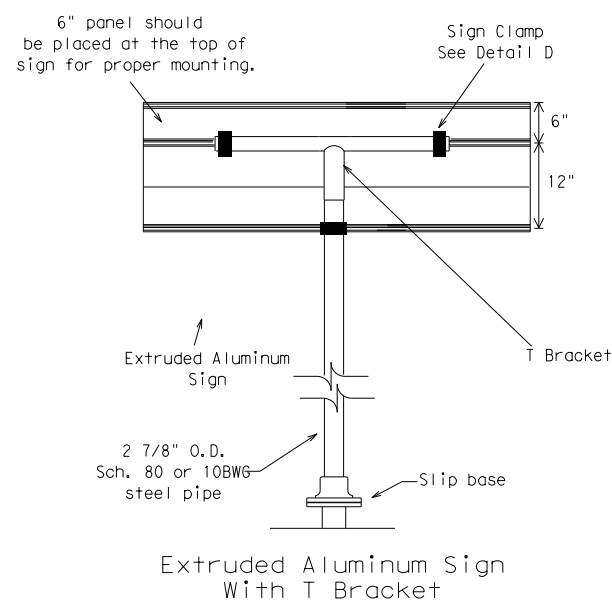
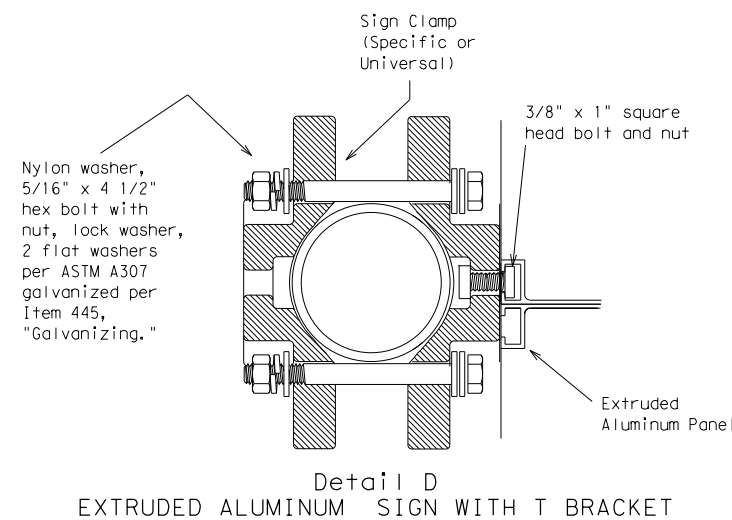
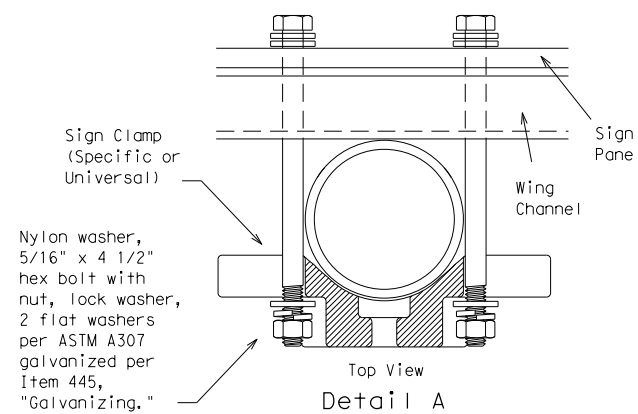
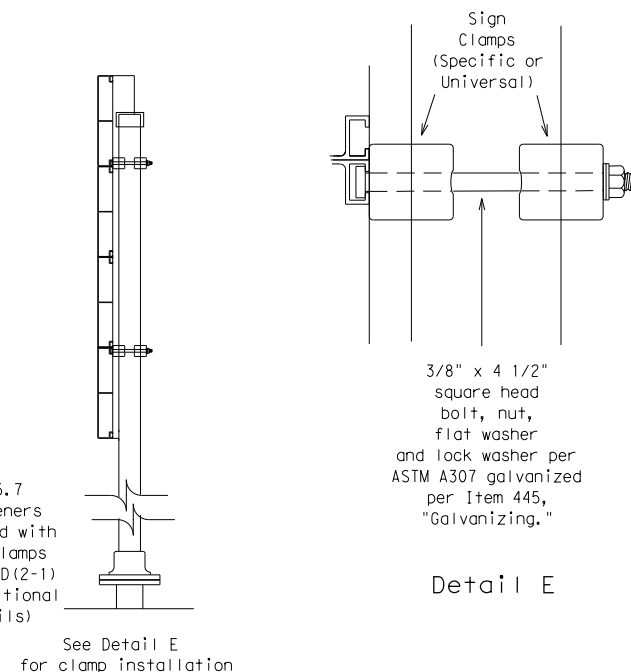
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* Additional stiffener placed at approximate center of signs when sign width is greater than 10'.



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 |
- The Engineer may require that a Schedule 80 post be used in place of a 10 BWG where a sign height is abnormally high due to a fill slope.
- Sign supports shall not be spliced except where shown. Sign support posts shall not be spliced.
- Aluminum sign blanks shall conform to Departmental Material Specifications DMS-7110 and shall have the following minimum thicknesses: 0.080 for signs less than 7.5 sq. ft., 0.100 for signs 7.5 to 15 sq. ft., and 0.125 for signs greater than 15 sq. ft.
- Signs that require specific supports due to reasons in addition to windloading are indicated on the "REQUIRED SUPPORT" table on this sheet.
- For horizontal rectangular signs fabricated from flat aluminum, T-brackets are used for signs 24 inches or less in height. U-brackets are used for signs of greater height.
- When two triangular slipbase supports are used to support a single sign, they shall not be "rigidly" connected to each other except through the sign panel. This will allow each support to act independently when impacted by an errant vehicle.
- Wing channel shall meet ASTM A 1011 SS Gr 50 and be galvanized per ASTM A 123.
- Excess pipe, wing channel, or windbeam shall be cut off so that it does not extend beyond the sign panel (i.e., excess support shall not be visible when the sign is viewed from the front.) Repair galvanized coating at cut support ends per Item 445, "Galvanizing."
- Sign blanks shall be the sizes and shapes shown on the plans.
- Additional sign clamp required on the "T-bracket" post for 24 inch high signs. Place the clamp 3 inches above bottom of sign when possible.
- Post open ends shall be fitted with Friction Caps.

REQUIRED SUPPORT

	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)

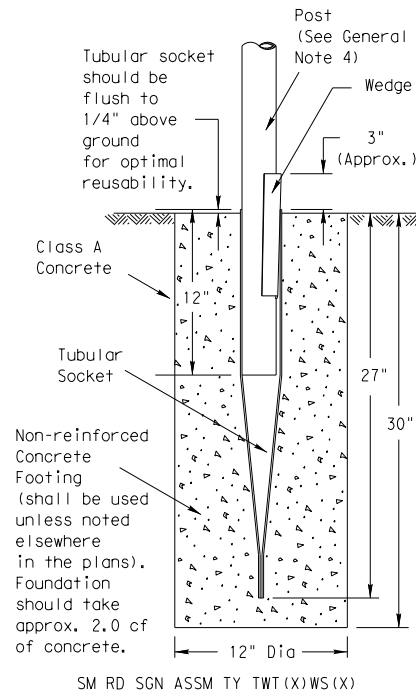
Texas Department of Transportation
Traffic Operations Division

SIGN MOUNTING DETAILS
SMALL ROADSIDE SIGNS
TRIANGULAR SLIPBASE SYSTEM
SMD(SLIP-3) -08

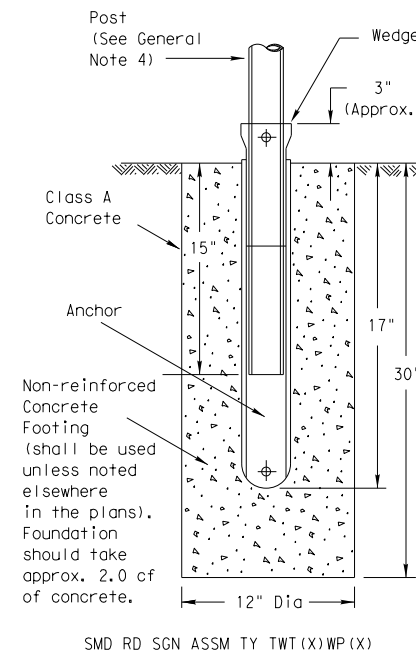
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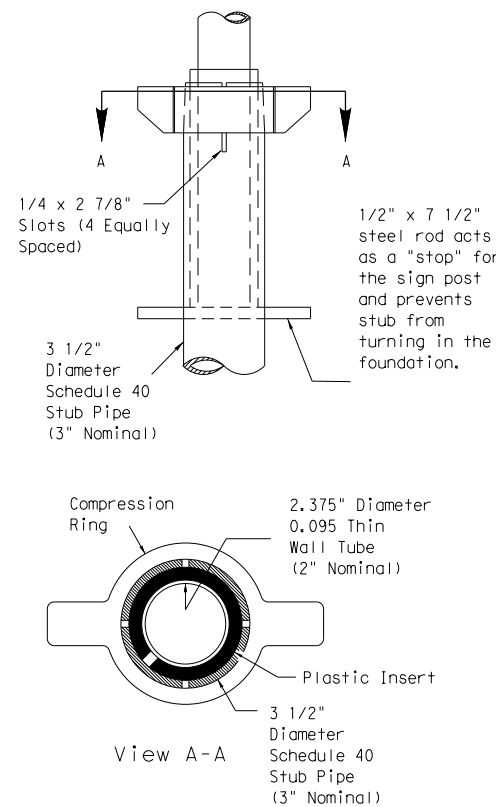
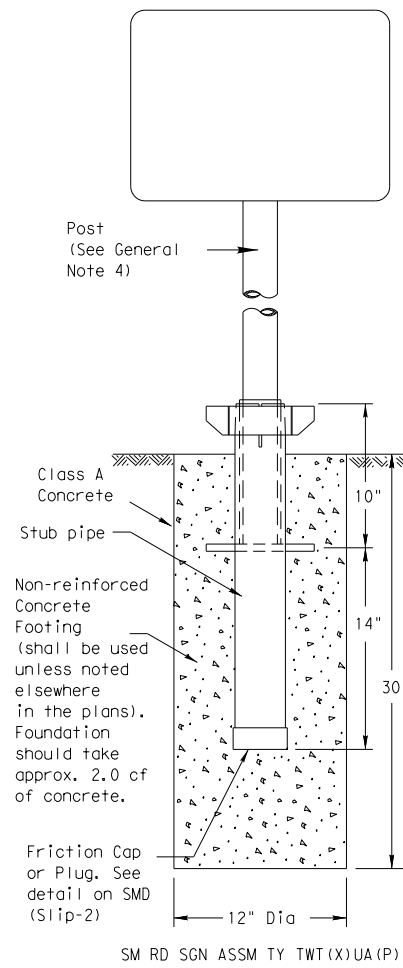
Wedge Anchor Steel System



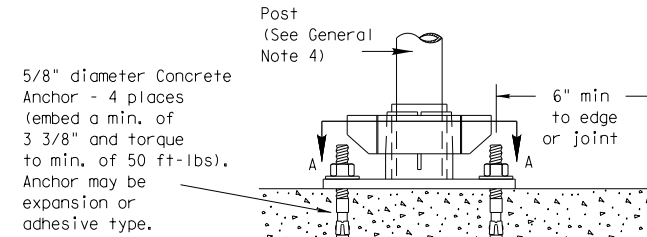
Wedge Anchor High Density Polyethylene (HDPE) System



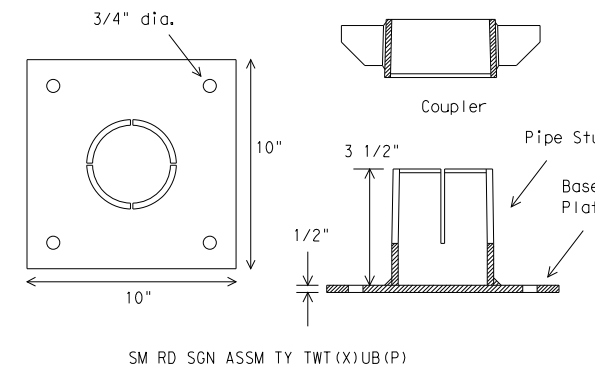
Universal Anchor System with Thin-Walled Tubing Post



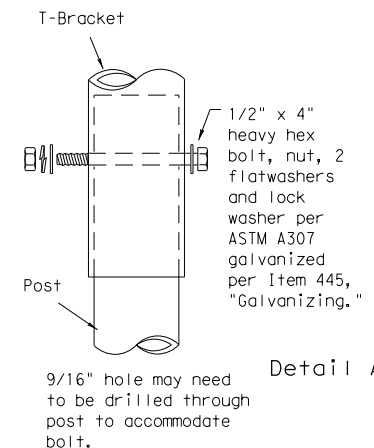
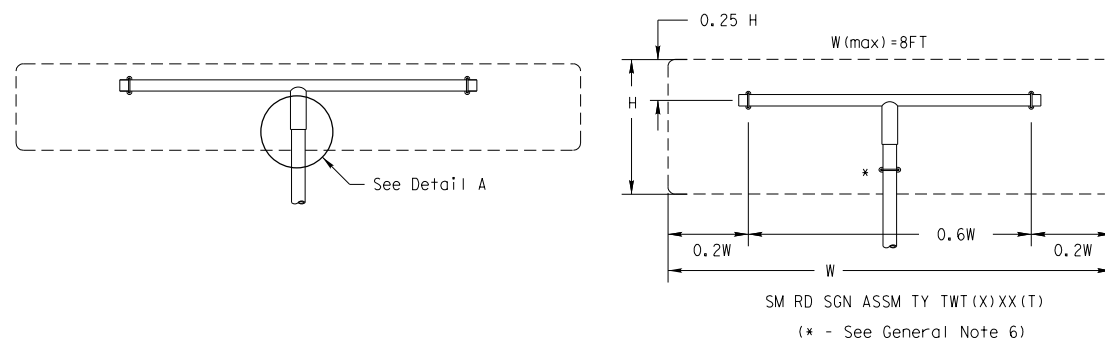
Plastic insert must be used when using the TWT with either the Universal Anchor System or the Bolt Down Universal Anchor System. The insert should be approx. 10" long and cover the tubing from just above the top of the stub pipe to the bottom of the sign post when using the Universal Anchor System. The insert should be cut to approx. 4 1/2" when used with the Bolt Down Universal Anchor System.



Concrete anchor consists of 5/8" diameter stud bolt with UNC series bolt threads on the upper end. A heavy hex nut per ASTM A563 and hardened washer per ASTM F436. The stud bolt shall have minimum yield and ultimate tensile strengths of 50 and 75 ksi, respectively. Nuts, bolts and washers shall be galvanized per Item 445, "Galvanizing." Top of bolt shall extend at least flush with top of nut when installed. The anchor, when installed in 4000 psi normal-weight concrete with a 3 3/8" minimum embedment, shall have a minimum allowable tension and shear of 2450 and 1525 psi, respectively. Adhesive type anchors shall have stud bolts installed with Type III epoxy per DMS-6100, "Epoxyes and Adhesives." Adhesive anchors may be loaded after adequate epoxy cure time per the manufacturer's recommendations.



Sign Installation Using a Prefabricated T-Bracket for Thin-Wall Tubing Post



NOTE
The devices shall be installed per manufacturer's recommendations. Installation procedures shall be provided to the Engineer by Contractor.

GENERAL NOTES:

- The Wedge Anchor System and the Universal Anchor System with thin wall tubing post may be used to support up to 10 square feet of sign area.
- The tubular socket, wedge and prefabricated T-bracket shall be permanently marked to indicate manufacturer. Method, design, and location of marking are subject to the approval of the TxDOT Traffic Standards Engineer.
- Except for posts (13 BWG Tubing), clamps, nuts and bolts, all components shall be prequalified. A list of prequalified vendors may be obtained from the Material Producer List web page. The website address is: http://www.txdot.gov/business/producer_list.htm
- Material used as post with this system shall conform to the following specifications:
 - 13 BWG Tubing (2.375" outside diameter) (TWT)
 - 0.095" nominal wall thickness
 - Seamless or electric-resistance welded steel tubing
 - Steel shall be 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
 - 18% minimum elongation in 2"
 - Wall thickness (uncoated) shall be within the range of .083" to .099"
 - Outside diameter (uncoated) shall be within the range of 2.369" to 2.381"
 - Galvanization per ASTM 123 or ASTM A653 G210. For precoated steel tubing (ASTM A653), recoat tube outside diameter weld seam by metallizing with zinc wire per ASTM B833.
- Sign blanks shall be the sizes and shapes shown on the plans.
- Additional sign clamp required on the "T-bracket" post for 24" high signs. Place clamp at least 3" above bottom of sign when possible.
- Sign supports shall not be spliced except where shown. Sign support posts shall not be spliced.
- See the Traffic Operations Division website for detailed drawings of sign clamps and Wedge Anchor System components. The website address is: <http://www.txdot.gov/publications/traffic.htm>

WEDGE ANCHOR SYSTEM INSTALLATION PROCEDURE

- Dig foundation hole. Where solid rock is encountered at ground level, the foundation shall be a minimum depth of 18". When solid rock is encountered below ground level, the foundation shall extend in the solid rock a minimum depth of 18" or provide a minimum foundation depth of 30". If solid rock is encountered, the socket/stub may be reduced in length as required to a minimum length of 18". Any material removed from the socket/stub shall be from the bottom and the clearance requirements given on SMD(GEN) must be followed. The inner surfaces of the socket/stub must remain free of concrete or other debris.
- The Engineer may permit batches of concrete less than 2 cubic yards to be mixed with a portable, motor driven concrete mixer. For small placements less than 0.5 cubic yards, hand mixing in a suitable container may be allowed by Engineer. Place concrete into hole until it is approximately flush with the ground. Concrete shall be Class A.
- Insert tubular socket into concrete until top of socket is approximately 1/4" above the concrete footing.
- Plumb the socket. Allow a minimum 4 days for concrete to set, unless otherwise directed by Engineer.
- Attach the sign to the sign post.
- Insert the sign post into socket and align sign face with roadway.
- Drive the wedge into the socket to secure post. This will leave approximately 3 inches of the wedge exposed.

UNIVERSAL ANCHOR SYSTEM INSTALLATION PROCEDURE

- Dig foundation hole. Where solid rock is encountered at ground level, the foundation shall be a minimum depth of 18". When solid rock is encountered below ground level, the foundation shall extend in the solid rock a minimum depth of 18" or provide a minimum foundation depth of 30". If solid rock is encountered, the socket/stub may be reduced in length as required to a minimum length of 18". Any material removed from the socket/stub shall be from the bottom and the clearance requirements given on SMD(GEN) must be followed. The inner surfaces of the socket/stub must remain free of concrete or other debris.
- Insert base post in hole to depths shown and backfill hole with concrete.
- Level and plumb the base post using a torpedo level and allow concrete adequate time to set. The bottom of the slots provided in the stub pipe shall remain above the top of the concrete foundation.
- Attach the sign to the sign post.
- Install plastic insert around bottom of post.
- Insert sign post into base post. Lower until the post comes to rest on steel rod.
- Seat compression ring using a hammer. Typically, the top of compression ring will be approximately level with top of stub post when optimally installed.
- Check sign post by hand to ensure it is unable to turn. If loose, increase the tightening of the compression ring.



SIGN MOUNTING DETAILS SMALL ROADSIDE SIGNS WEDGE & UNIVERSAL ANCHOR WITH THIN WALL TUBING POST SMD(TWT) - 08

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POST TYPE AND SUPPORT FOUNDATION DETAILS				TYPE OF BARRIER MOUNTS	
WING CHANNEL (WC)	FLEXIBLE POSTS (YFLX, WFLX)		WEDGE ANCHOR SYSTEMS		GUARD FENCE ATTACHMENT
GND	GND	SRF	WAS	WAP	GF1
	EMBEDDED	SURFACE MOUNT	STEEL	PLASTIC	GF2
<p>NOTES</p> <ol style="list-style-type: none"> 1. Embedded Wing Channel (WC) post option may be used for Type 2 Object Markers and Delineators only. 2. 1.12 lbs/ft steel per ASTM A 1011 SS Gr. 50, or ASTM A499. 	<p>NOTES</p> <ol style="list-style-type: none"> 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. 		<p>NOTE</p> <ol style="list-style-type: none"> 1. Install per manufacturer's recommendations. 		
CONCRETE TRAFFIC BARRIER (CTB)					
<p>GENERAL NOTES</p> <ol style="list-style-type: none"> 1. Place delineators on a section of roadway at a consistent distance from the edge of pavement. 2. Where a restriction prevents consistent placement from the pavement edge, place the affected object markers in line with the innermost edge of the obstruction. 3. When Type 2 object markers and delineators are more than 8'-0" from the edge of the pavement, it may not be possible to maintain a height of approximately 4'-0". If this is the case, place the object marker or delineator as close to the desired height as possible. 4. Install all delineators, object markers and barrier reflectors in accordance with the manufacturer's recommendation. 5. Barrier reflectors should be installed a minimum of 18 inches above the edge of the pavement surface. 6. Diagonal stripes on Type 3 object markers shall slope down toward the intended travel lane. 					
TYPES 1, 3, AND 4 OBJECT MARKERS AND CHEVRONS		CHEVRONS AND ONE DIRECTION LARGE ARROW SIGN		DELINEATORS AND TYPE 2 OBJECT MARKERS	
<p>NOTE</p> <p>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)</p>		<p>NOTE</p> <p>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.</p>		<p>See general notes 1, 2 and 3.</p>	
<p style="text-align: right;">Texas Department of Transportation Traffic Safety Division Standard</p>					
<h2 style="margin: 0;">DELINEATOR & OBJECT MARKER INSTALLATION</h2> <h3 style="margin: 0;">D & OM(2)-20</h3>					
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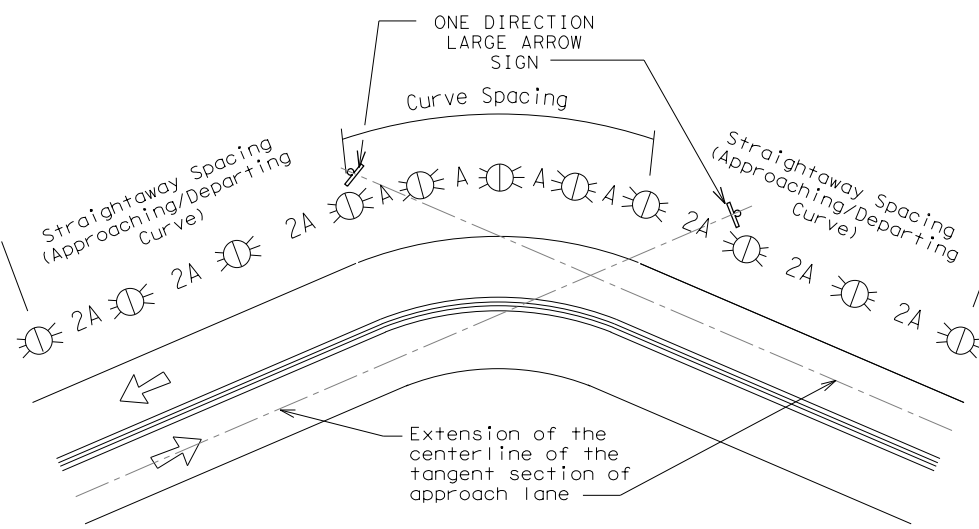
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MINIMUM WARNING DEVICES AT CURVES WITH ADVISORY SPEEDS

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

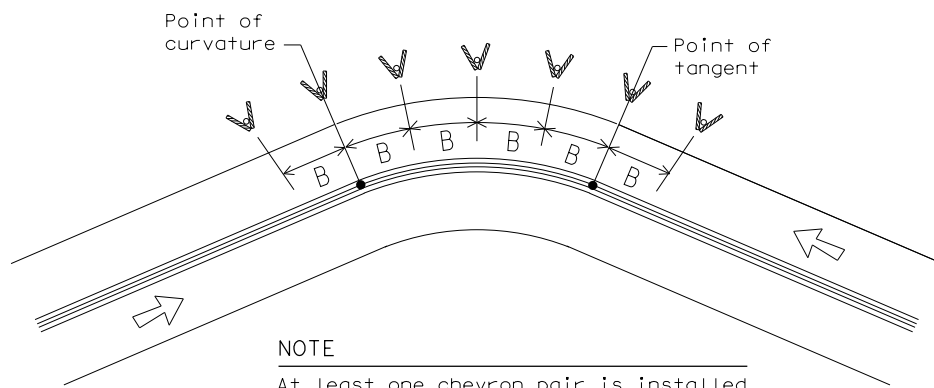
SUGGESTED SPACING FOR DELINEATORS ON HORIZONTAL CURVES



NOTE

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

SUGGESTED SPACING FOR CHEVRONS ON HORIZONTAL CURVES



NOTE

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

DELINEATOR AND CHEVRON SPACING

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

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

DELINEATOR AND CHEVRON SPACING

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

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

DELINEATOR AND OBJECT MARKER APPLICATION AND SPACING

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

NOTES

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

LEGEND	
	Bi-directional Delineator
	Delineator
	Sign



DELINEATOR & OBJECT MARKER PLACEMENT DETAILS

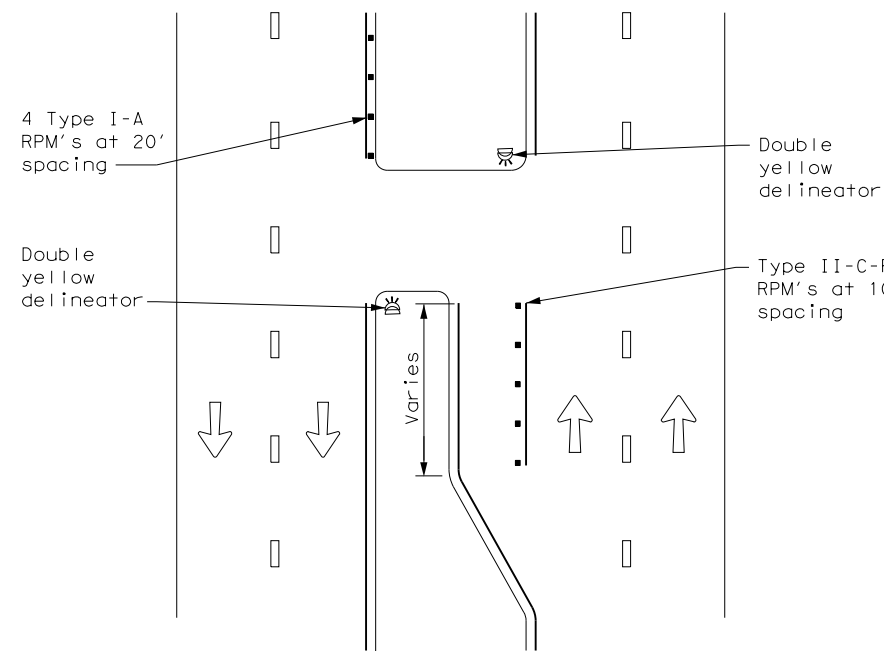
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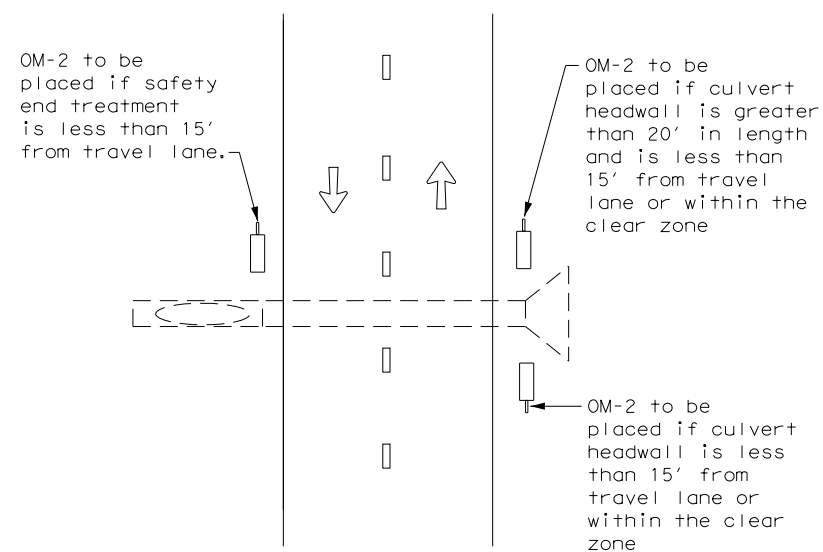
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CROSSOVERS



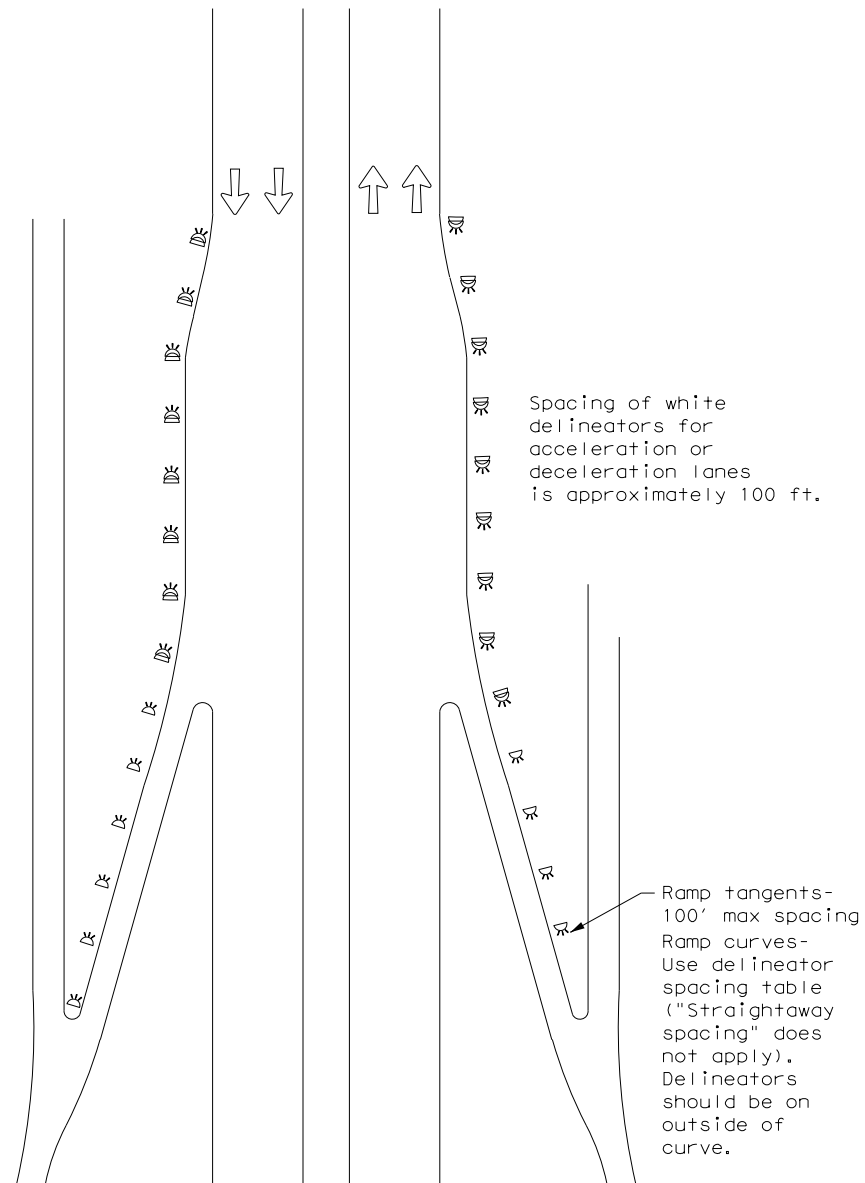
DETAIL 1

FOR CULVERTS WITHOUT MBGF



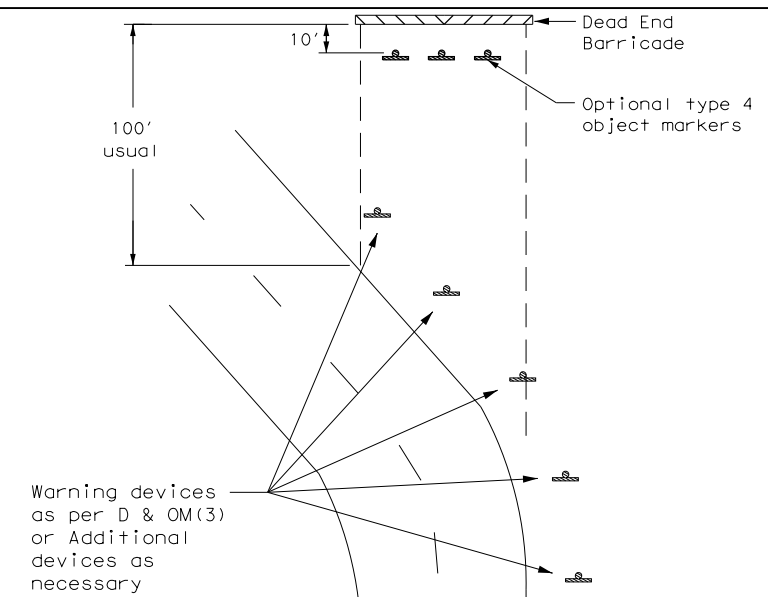
DETAIL 2

FREEWAY DELINEATION FOR RAMPS AND ACCELERATION/DECELERATION LANES



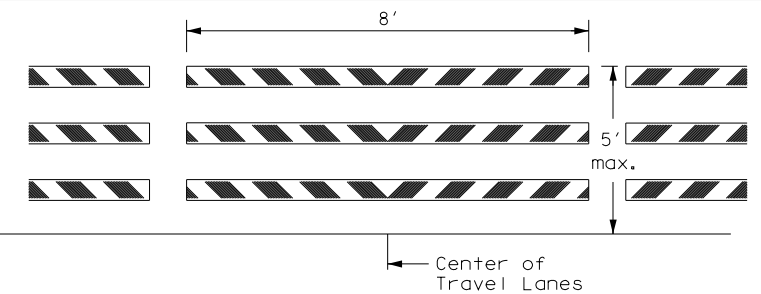
DETAIL 3

TYPICAL APPLICATION OF DEAD END BARRICADE



DETAIL 4

TYPICAL DEAD END BARRICADE INSTALLATION



NOTES

- Barricade striping shall be red and white reflective sheeting for all permanent road closures.
- Barricade striping is red and white sloping toward the center of the roadway.
- Type 3 Barricade Supports should be anchored to soil or pavement as described in compliant Work Zone Traffic Control Devices List, section D.2.f and D.2.g.

DETAIL 5

LEGEND	
	Bidirectional Delineator
	Delineator
	OM-3
	Barricade
	Sign
	OM-2
	Double Delineator

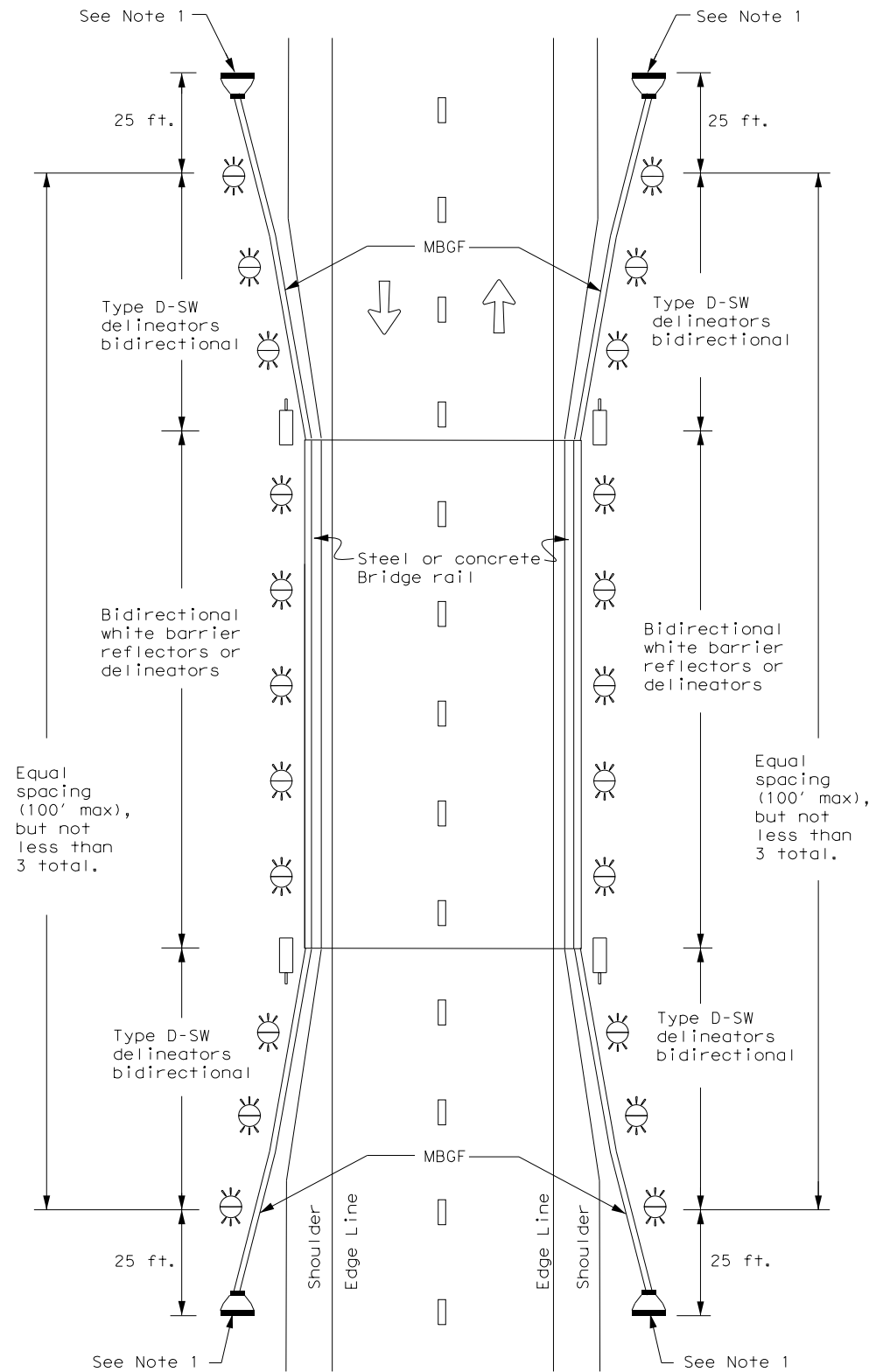


DELINEATOR & OBJECT MARKER PLACEMENT DETAILS

D & OM(4) - 20

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3-15	DIST	COUNTY	SHEET NO.	
7-20	ABL	TAYLOR	102	

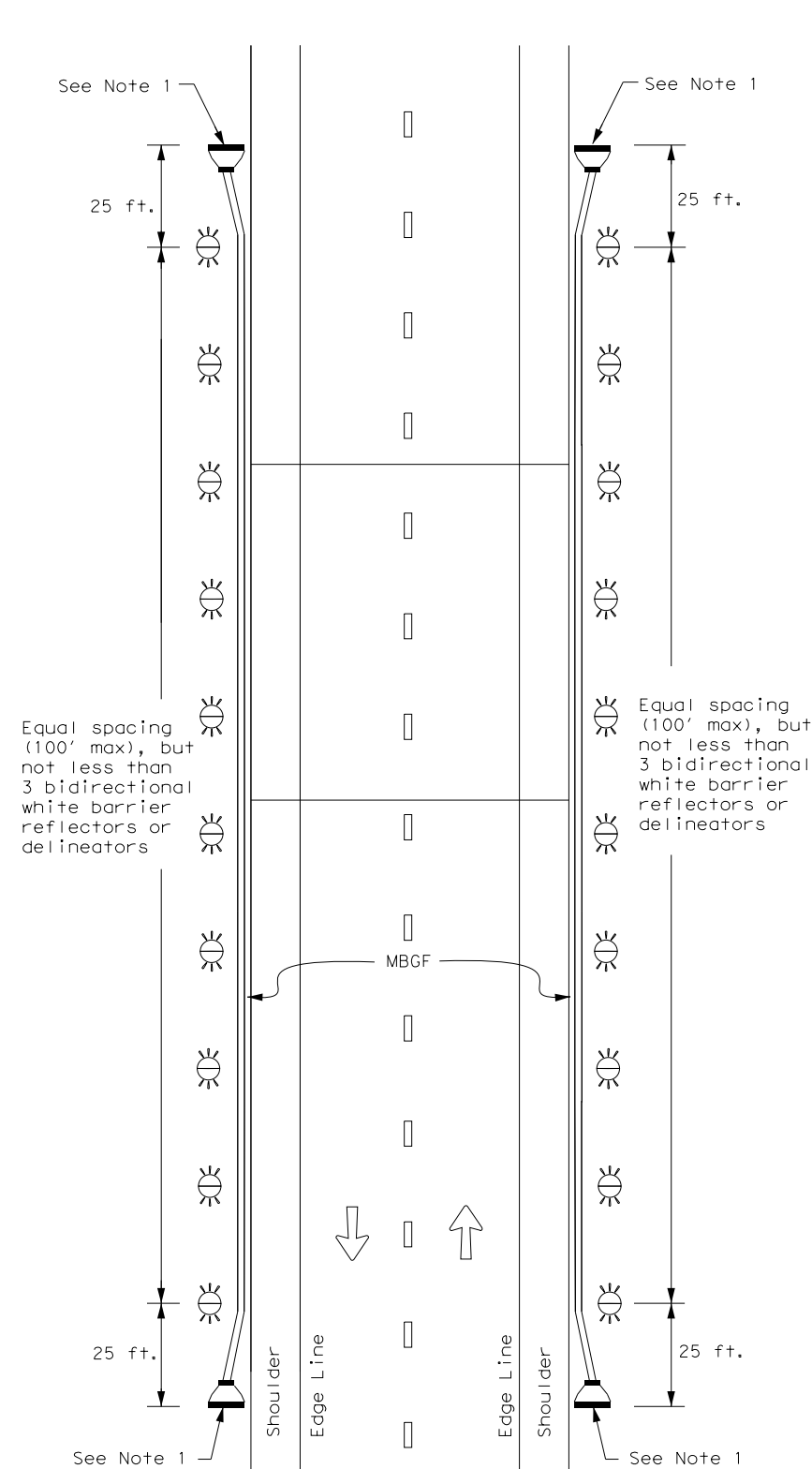
**TWO-WAY, TWO LANE ROADWAY
WITH REDUCED WIDTH APPROACH RAIL**



NOTE:

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

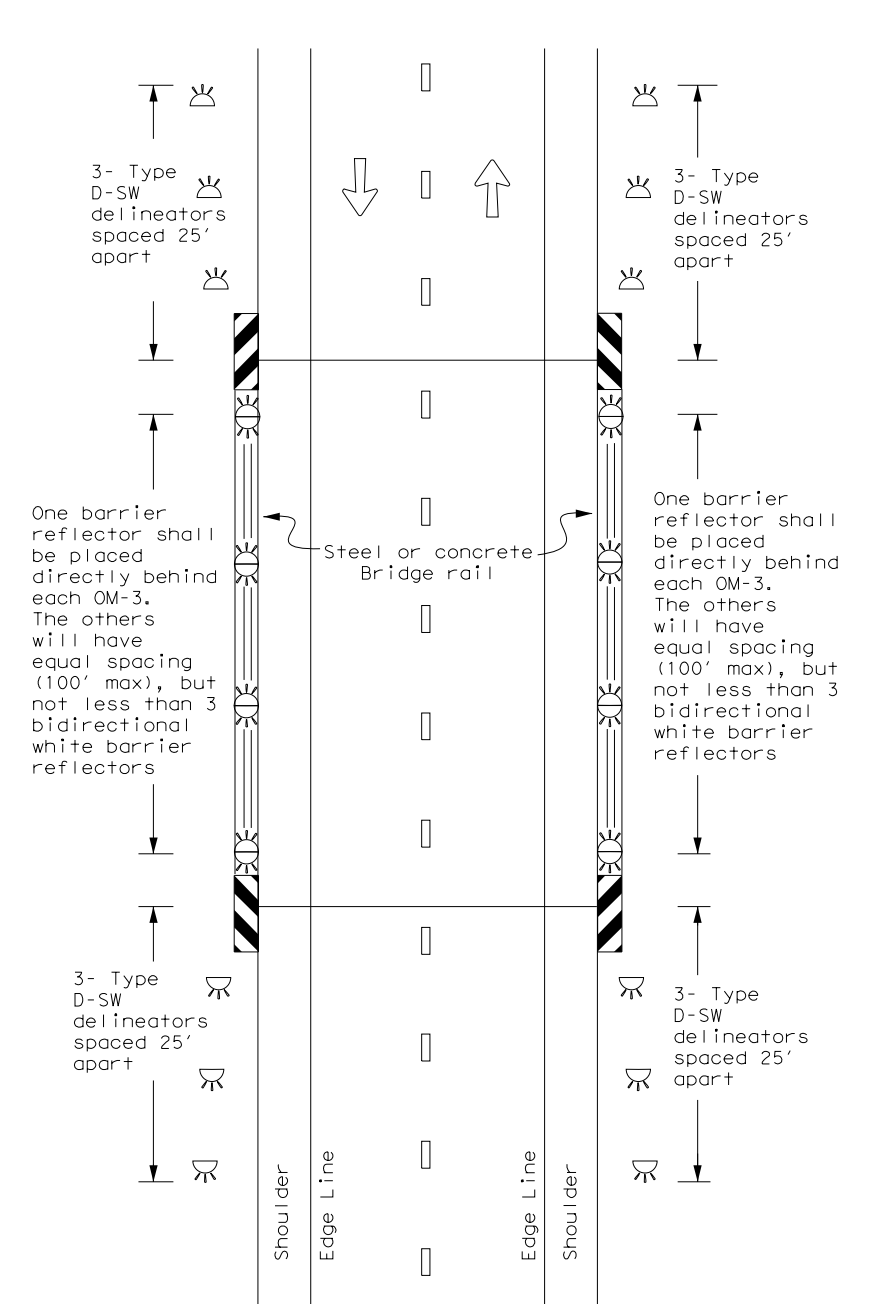
**TWO-WAY, TWO LANE ROADWAY
WITH METAL BEAM GUARD FENCE (MBGF)**



NOTE:

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

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



LEGEND

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



**DELINEATOR &
OBJECT MARKER
PLACEMENT DETAILS**

D & OM(5) - 20

FILE: dom5-20.dgn	DN: TxDOT	CK: TxDOT	DW: TxDOT	CK: TxDOT
©TxDOT August 2015	CONT	SECT	JOB	HIGHWAY
REVISIONS	0908	33	106	EAST S 7TH ST
7-20	DIST	COUNTY	SHEET NO.	
	ABL	TAYLOR	103	

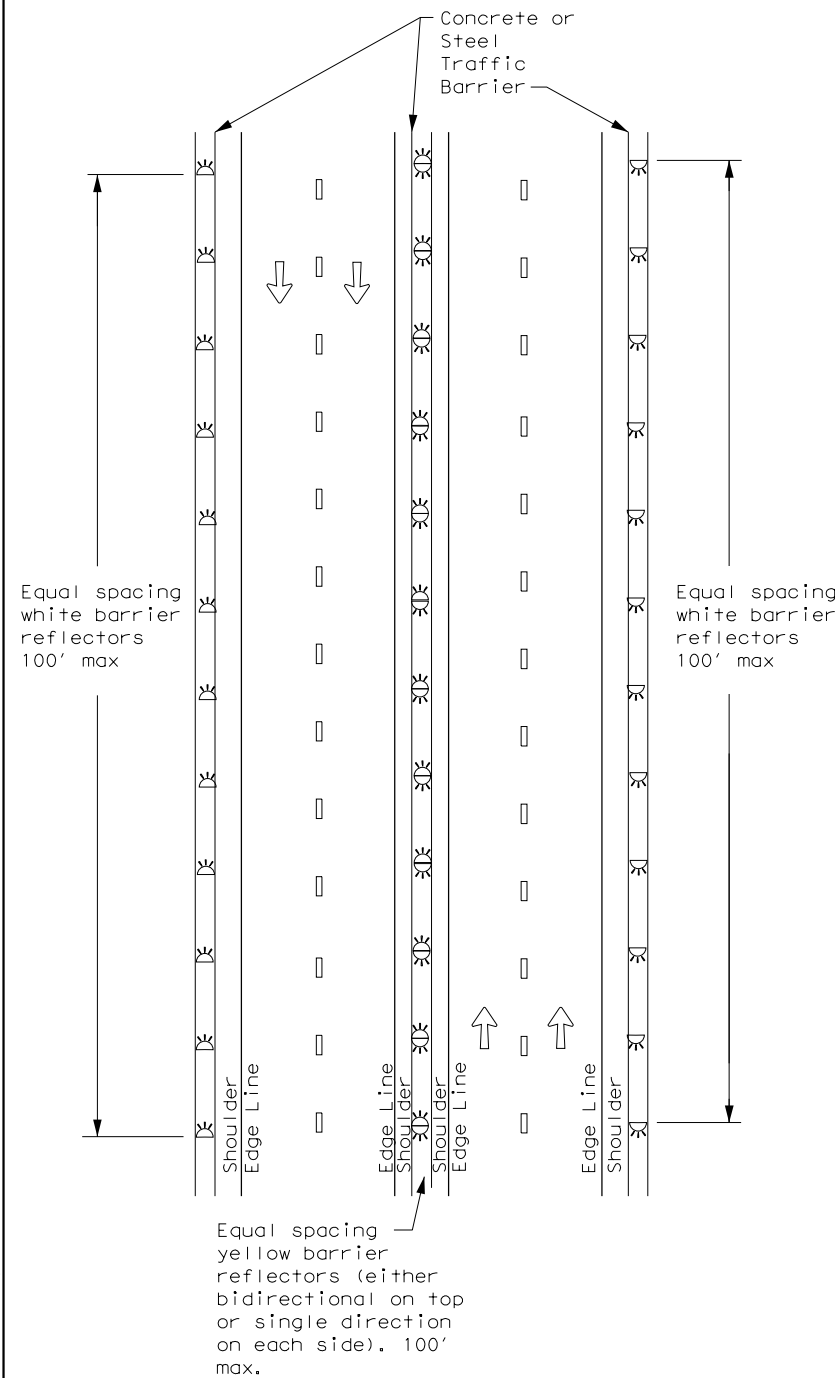
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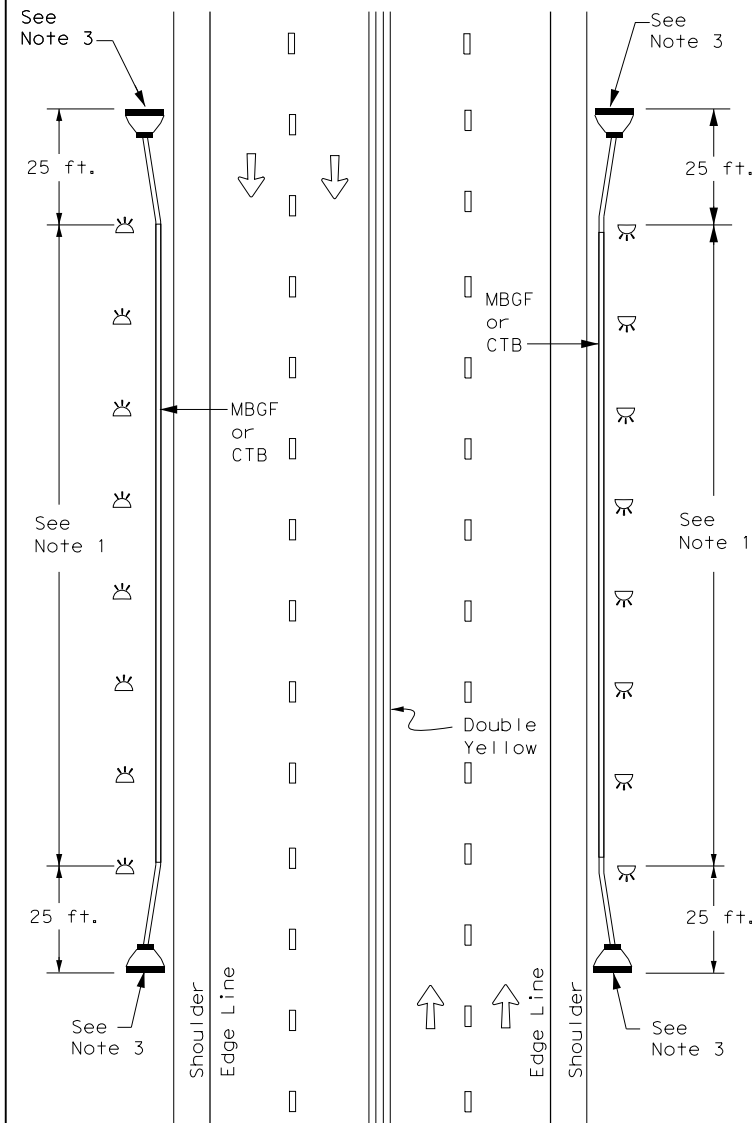
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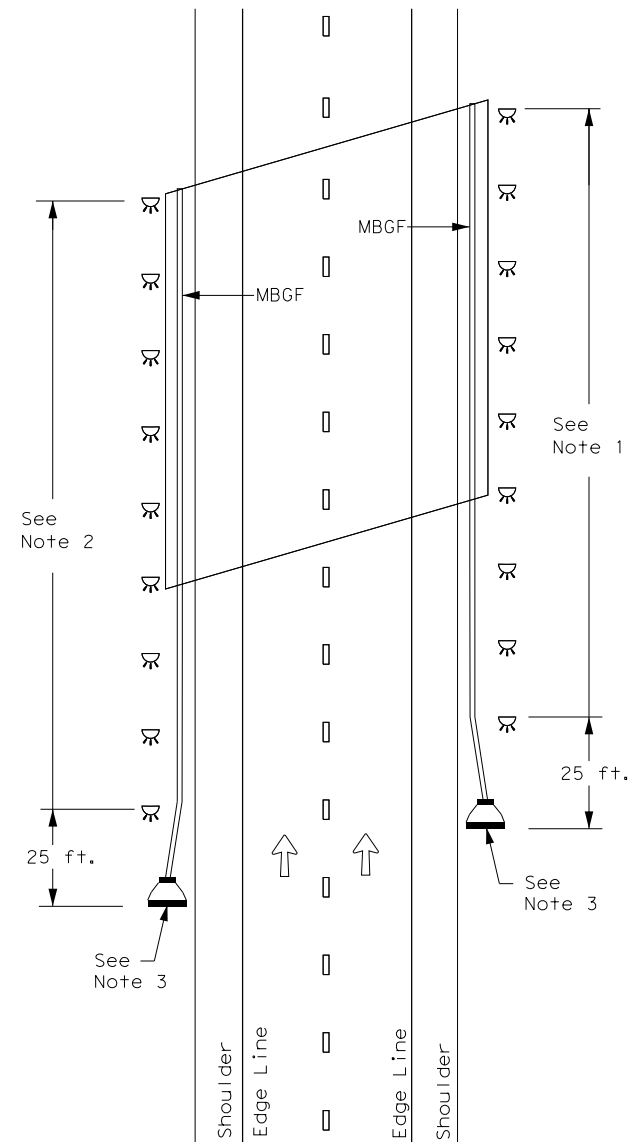
CONTINUOUS CONCRETE OR STEEL BARRIER



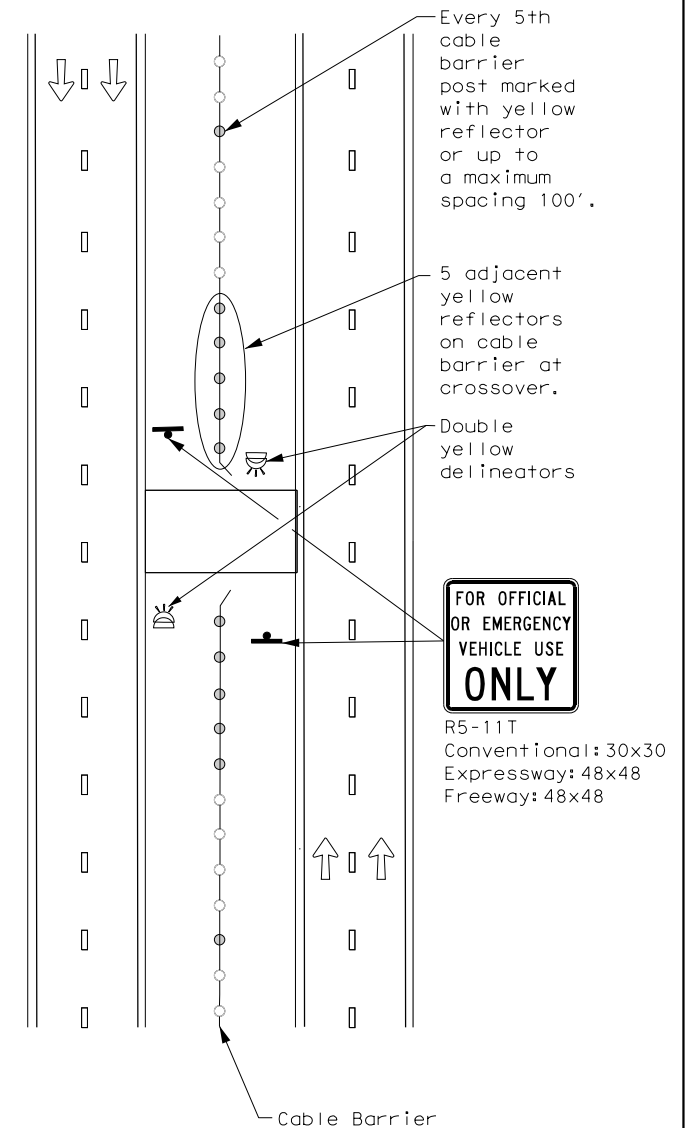
MULTI-LANE UNDIVIDED, TWO-WAY ROADWAY WITH METAL BEAM GUARD FENCE (MBGF)



DIVIDED ROADWAY WITH METAL BEAM GUARD FENCE (MBGF)



EMERGENCY CROSSOVER



NOTES

1. Equal spacing (100' max), but not less than 3 single directional white barrier reflectors or delineators. On Continuous Barrier, equal spacing (100' max.)
2. Equal spacing (100' max), but not less than 3 single directional yellow barrier reflectors or delineators.
3. Terminal ends require reflective sheeting provided by manufacturer per D & OM (VIA) or a Type 3 Object Marker (OM-3) in front of the terminal end.

LEGEND

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

Texas Department of Transportation
 Traffic Safety Division Standard

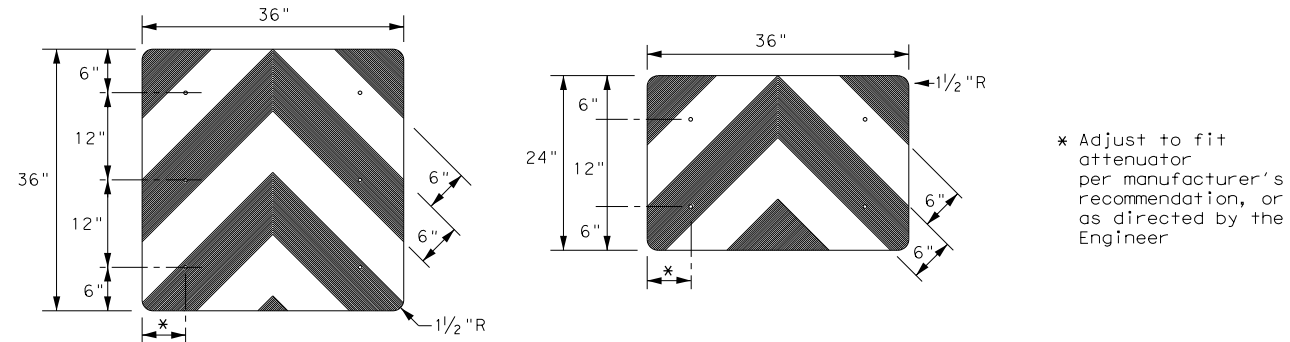
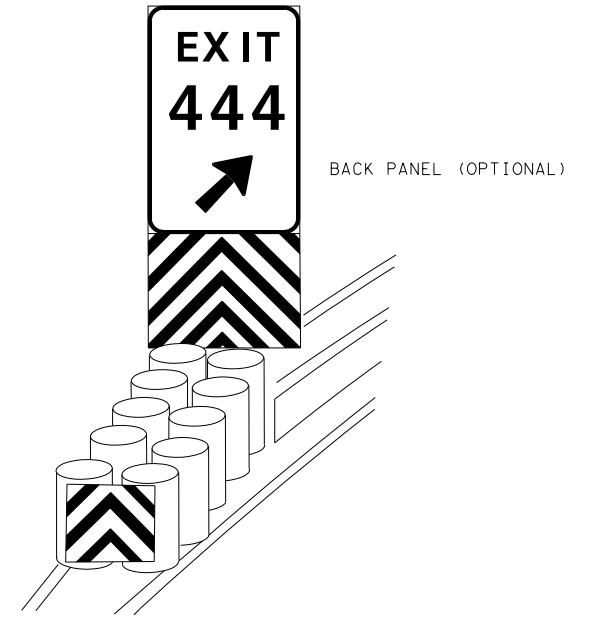
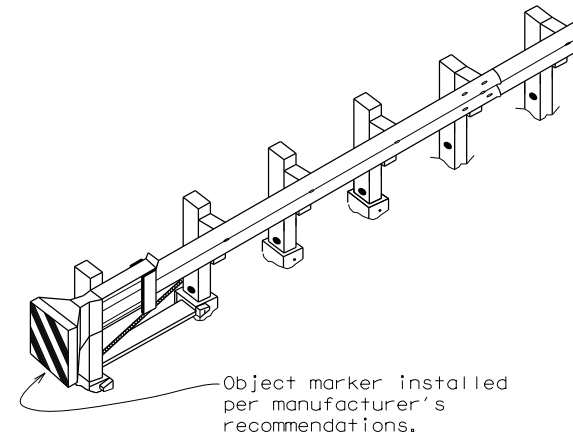
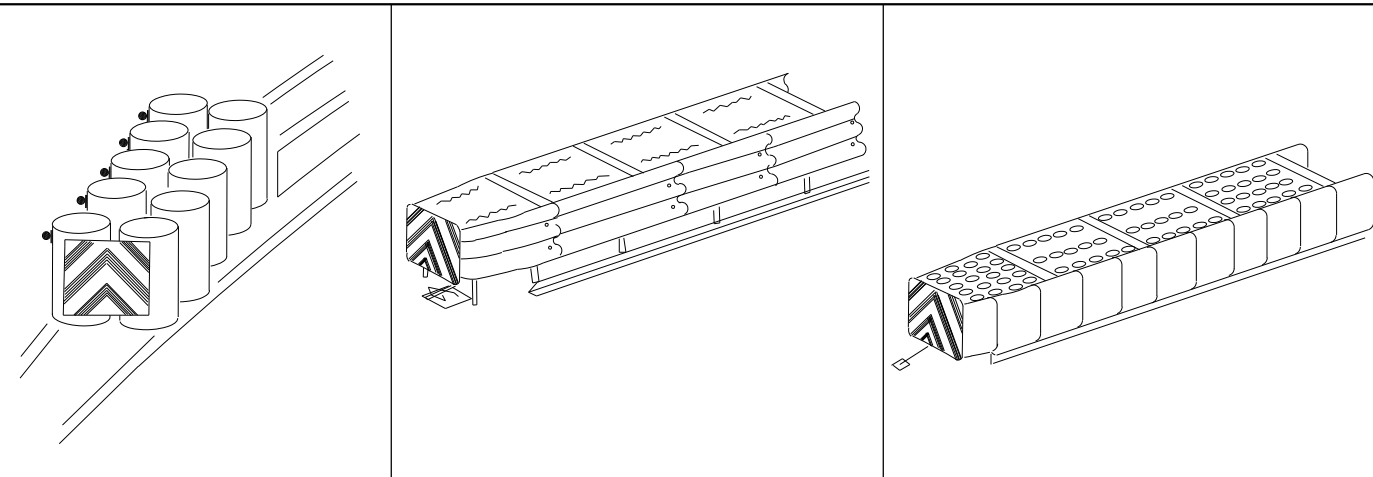
DELINEATOR & OBJECT MARKER PLACEMENT DETAILS

D & OM(6) - 20

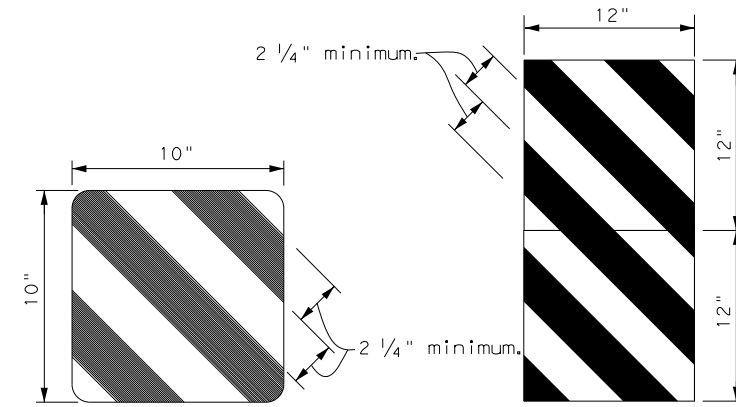
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©TxDOT August 2015	CONT	SECT	JOB	HIGHWAY
7-20	0908	33	106	EAST S 7TH ST
	DIST	COUNTY	SHEET NO.	
	ABL	TAYLOR	104	

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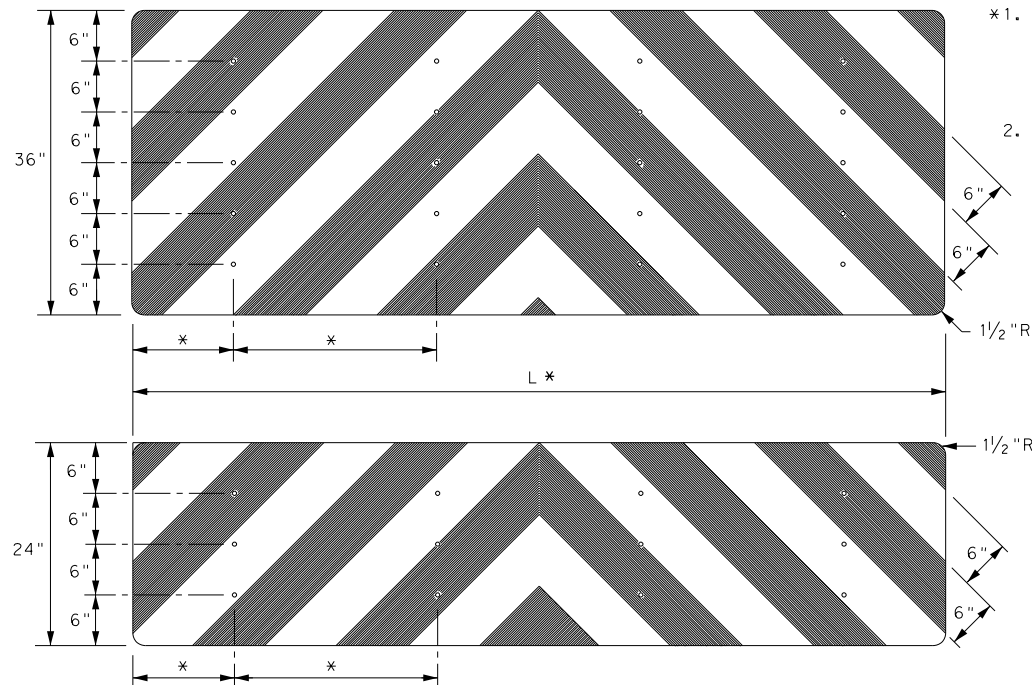
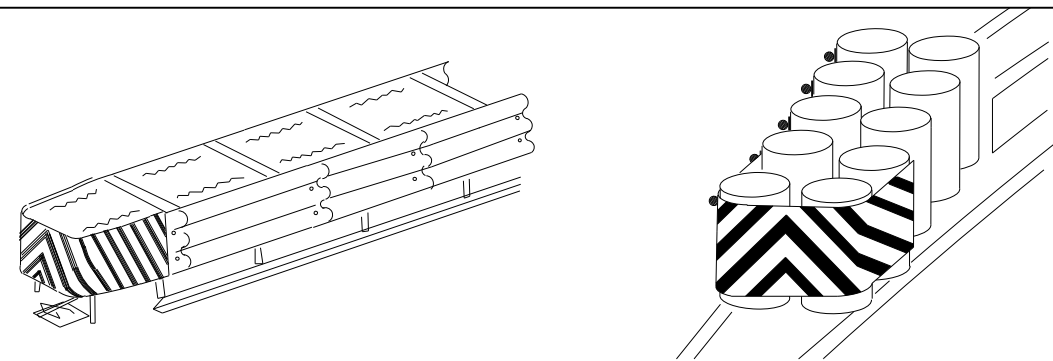
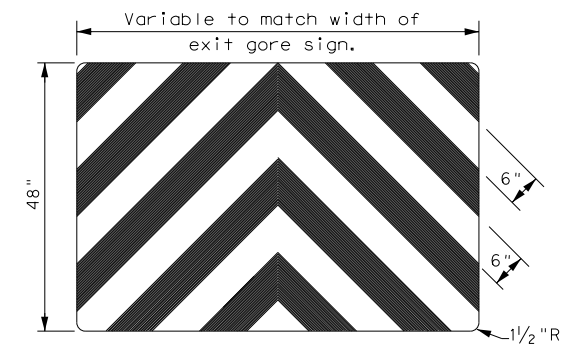
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* Adjust to fit attenuator per manufacturer's recommendation, or as directed by the Engineer



OBJECT MARKERS SMALLER THAN 3 FT²



NOTES

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

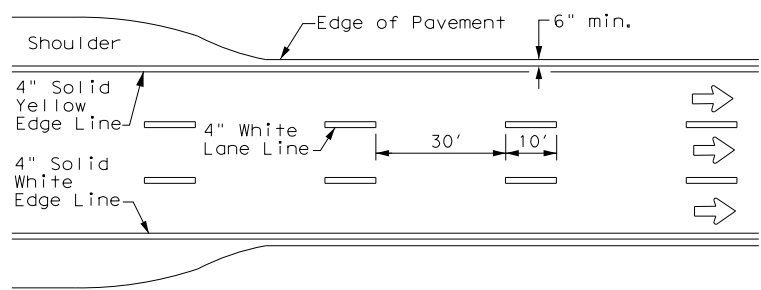
NOTES

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 1/4".
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.

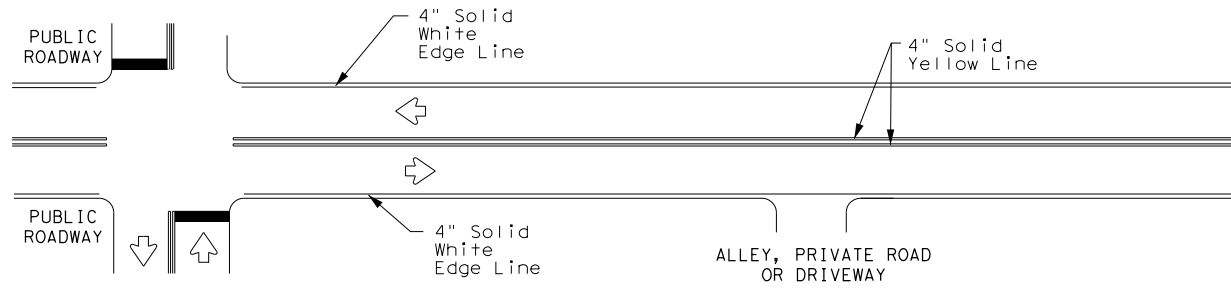
DELINEATOR & OBJECT MARKER FOR VEHICLE IMPACT ATTENUATORS D & OM(VIA) - 20			
FILE: domvia20.dgn	DN: TXDOT	CK: TXDOT	DW: TXDOT
© TXDOT December 1989	CONT	SECT	JOB
REVISIONS		0908 33	106 EAST S 7TH ST
4-92 8-04	DIST	COUNTY	SHEET NO.
8-95 3-15	ABL	TAYLOR	105
4-98 7-20			
20G			

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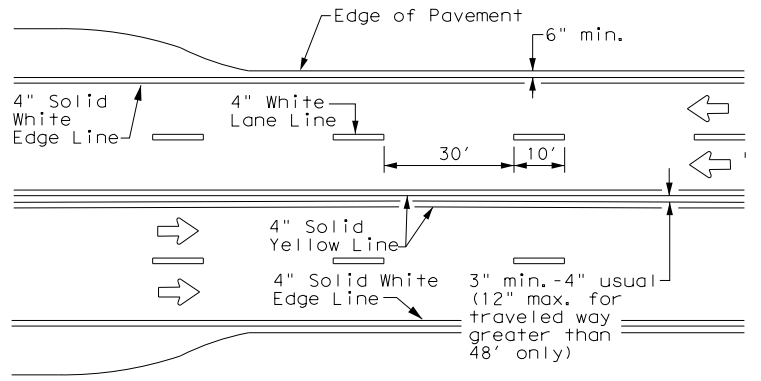
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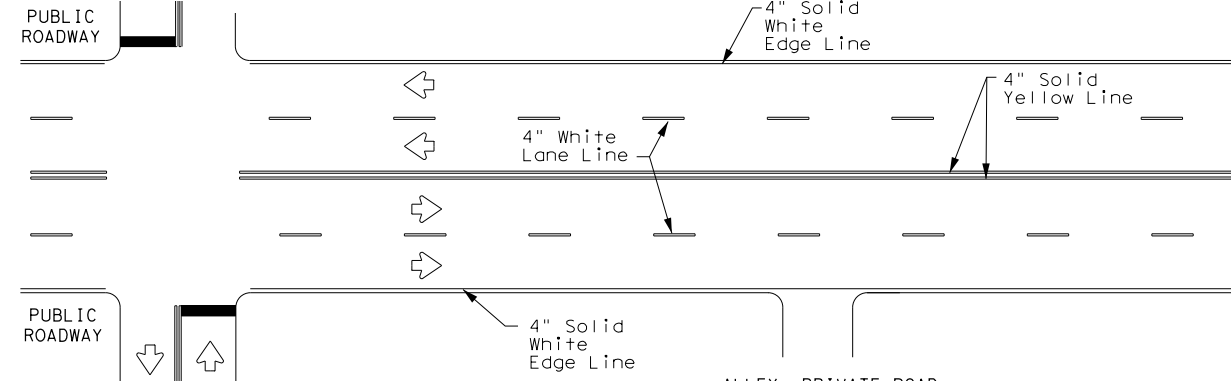
**EDGE LINE AND LANE LINES
ONE-WAY ROADWAY
WITH OR WITHOUT SHOULDERS**



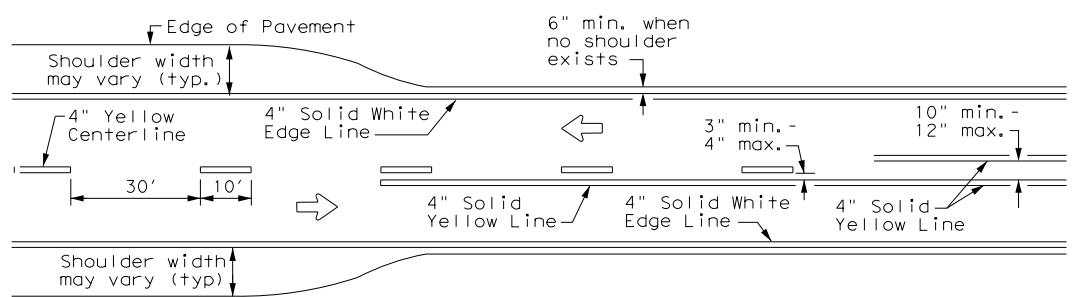
**TYPICAL TWO-LANE, TWO-WAY PAVEMENT
MARKINGS THROUGH INTERSECTIONS**



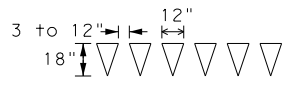
**CENTERLINE AND LANE LINES
FOUR LANE TWO-WAY ROADWAY
WITH OR WITHOUT SHOULDERS**



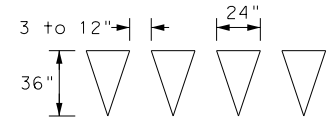
**TYPICAL MULTI-LANE, TWO-WAY PAVEMENT
MARKINGS THROUGH INTERSECTIONS**



**TWO LANE TWO-WAY ROADWAY
WITH OR WITHOUT SHOULDERS**

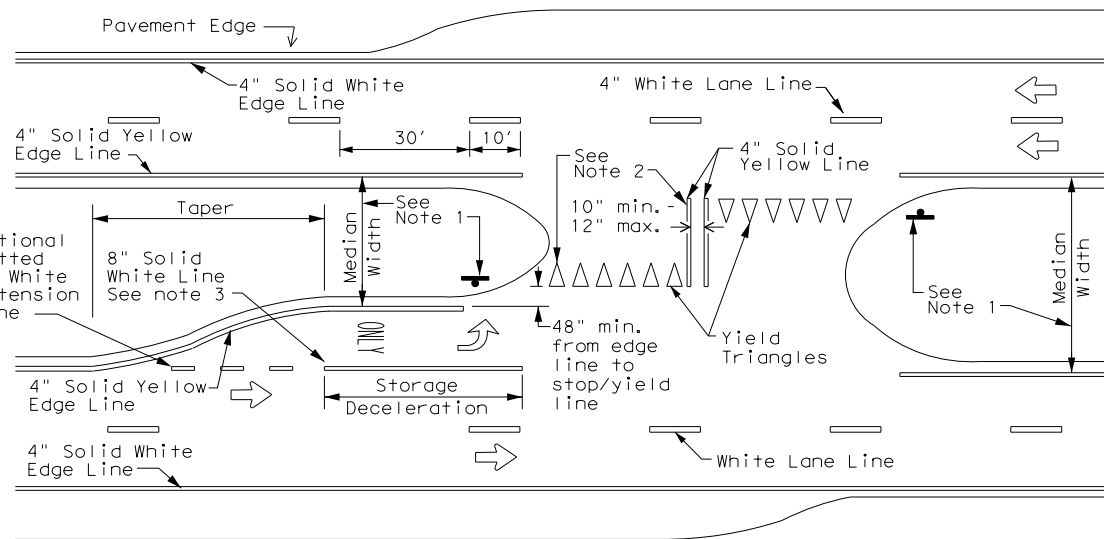


For posted speed on road being marked equal to or less than 40 MPH.



For posted speed on road being marked equal to or greater than 45 MPH.

YIELD LINES



FOUR LANE DIVIDED ROADWAY CROSSOVERS

NOTES

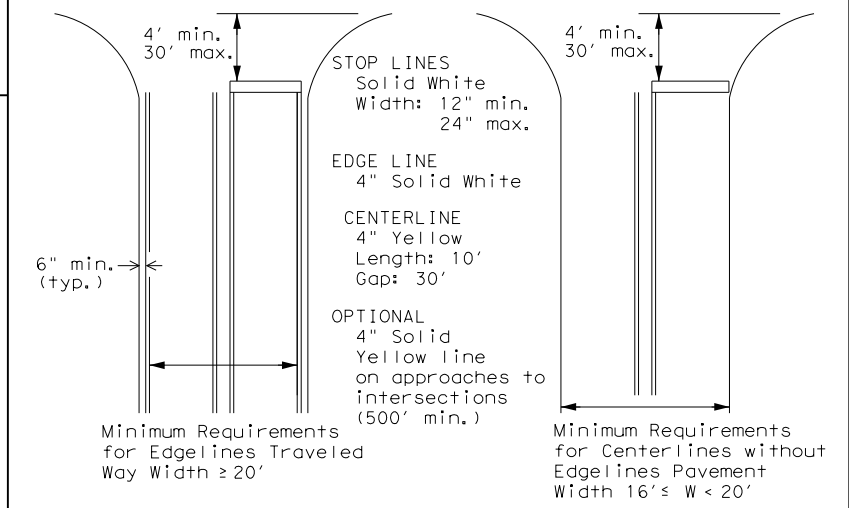
- Where divided highways are separated by median widths at the median opening itself of 30 feet or more, median openings shall be signed as two separate intersections. Each median opening has two width measurements, with one measurement for each approach. The narrow median width will be the controlling width to determine if signs are required. Yield signs are the typical intersection control. Stop signs are optional as determined by the Engineer.
- Install median striping (double yellow centerlines and stop bars/yield triangles) when a 50' or greater median centerline can be placed. Stop bars shall only be used with stop signs. Yield triangles shall only be used with yield signs.
- Length of turn bays, including taper, deceleration, and storage lengths shall be as shown in the plans or as directed by the Engineer.

GENERAL NOTES

- Edgeline striping shall be as shown in the plans or as directed by the Engineer. The edgeline should not be placed less than 6 inches from the edge of pavement. This distance may vary due to pavement raveling or other conditions. Edgelines are not required in curb and gutter sections of roadways.
- The traveled way includes only that portion of the roadway used for vehicular travel. It does not include the parking lanes, sidewalks, berms and shoulders. The traveled ways shall be measured from the inside of edgeline to the inside of edgeline of a two lane roadway.

MATERIAL SPECIFICATIONS	
PAVEMENT MARKERS (REFLECTORIZED)	DMS-4200
EPOXY AND ADHESIVES	DMS-6100
BITUMINOUS ADHESIVE FOR PAVEMENT MARKERS	DMS-6130
TRAFFIC PAINT	DMS-8200
HOT APPLIED THERMOPLASTIC	DMS-8220
PERMANENT PREFABRICATED PAVEMENT MARKINGS	DMS-8240

All pavement marking materials shall meet the required Departmental Material Specifications as specified by the plans.



**GUIDE FOR PLACEMENT OF STOP LINES,
EDGE LINE & CENTERLINE**

Based on Traveled Way and Pavement Widths for Undivided Highways



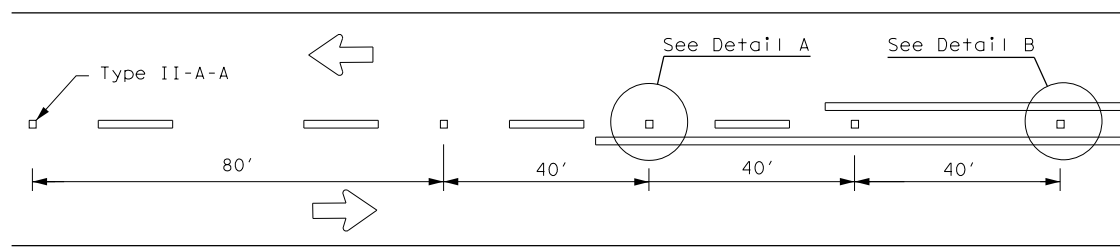
**TYPICAL STANDARD
PAVEMENT MARKINGS**

PM(1) - 20

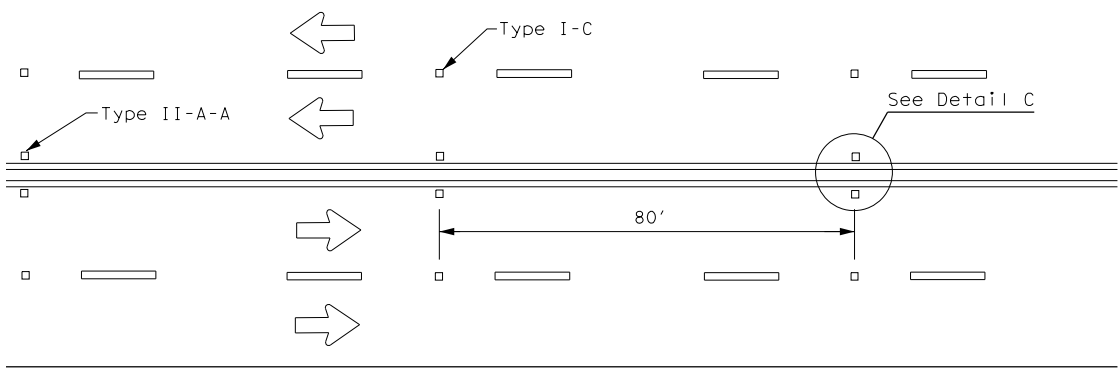
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© TxDOT November 1978	CONT	SECT	JOB	HIGHWAY
8-95 3-03 REVISIONS	0908	33	106	EAST S 7TH ST
5-00 2-12	DIST	COUNTY	SHEET NO.	
8-00 6-20	ABL	TAYLOR	106	

REFLECTIVE RAISED PAVEMENT MARKERS FOR VEHICLE POSITIONING GUIDANCE

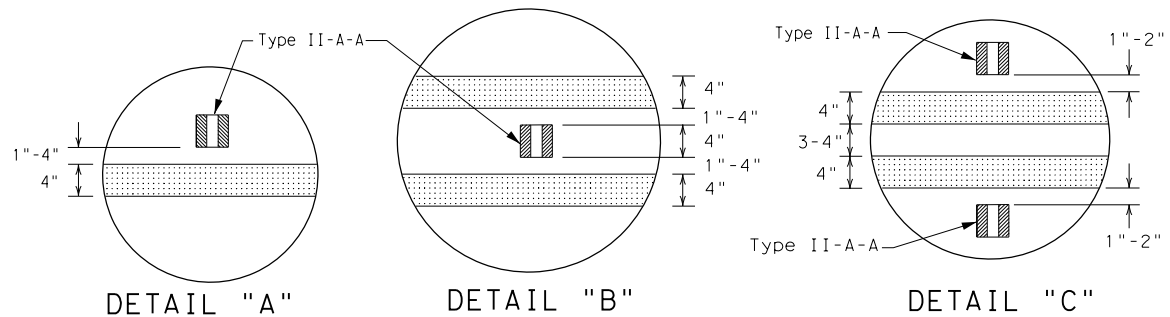
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CENTERLINE FOR ALL TWO LANE ROADWAYS



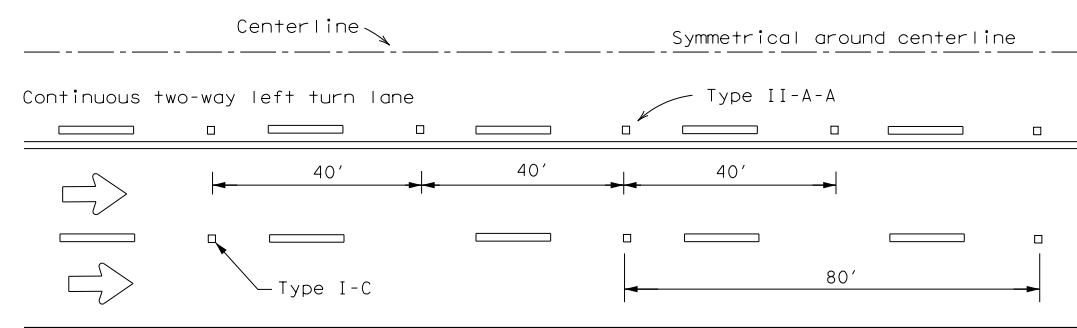
CENTERLINE & LANE LINES
FOR FOUR LANE TWO-WAY HIGHWAYS



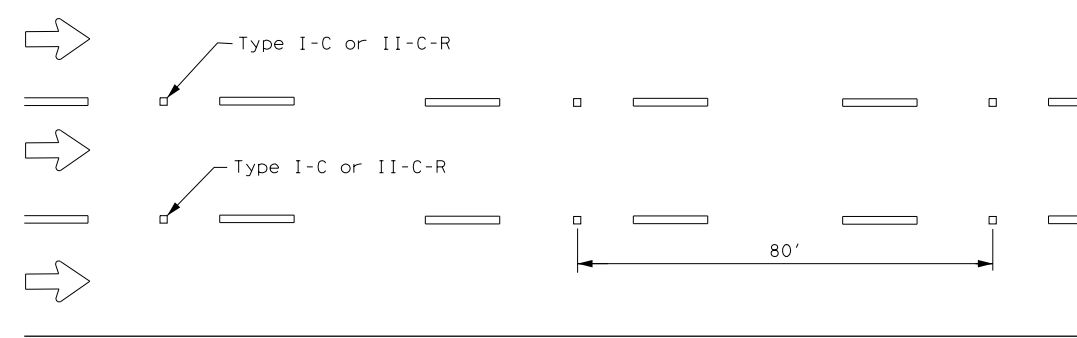
DETAIL "A"

DETAIL "B"

DETAIL "C"



CENTERLINE AND LANE LINES FOR TWO-WAY LEFT TURN LANE

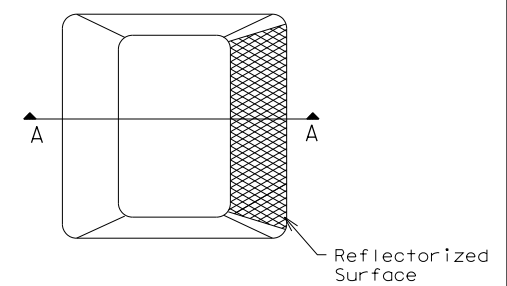


LANE LINES FOR ONE-WAY ROADWAY (NON-FREEWAY FACILITIES)

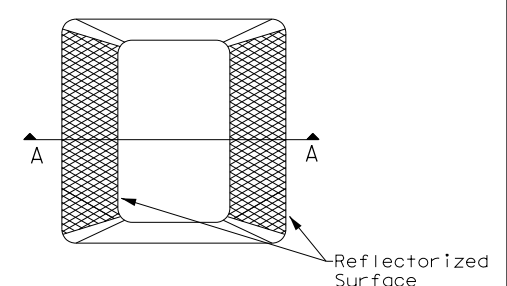
Raised pavement markers Type II-C-R shall have clear face toward normal traffic and red face toward wrong-way traffic.

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

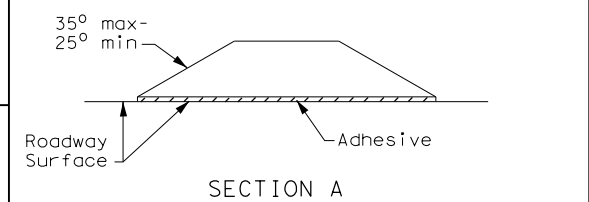
All pavement marking materials shall meet the required Departmental Material Specifications as specified by the plans.



Type I (Top View)



Type II (Top View)



RAISED PAVEMENT MARKERS

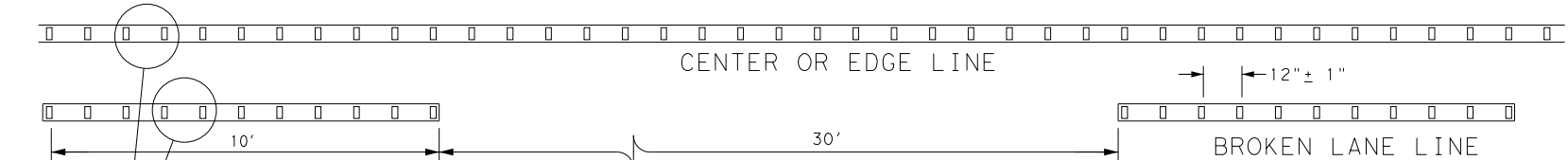


POSITION GUIDANCE USING RAISED MARKERS REFLECTORIZED PROFILE MARKINGS PM(2) - 20

FILE: pm2-20.dgn	DN:	CK:	DW:	CK:
© TxDOT April 1977	CONT	SECT	JOB	HIGHWAY
4-92 2-10	0908	33	106	EAST S 7TH ST
5-00 2-12	DIST	COUNTY	SHEET NO.	
8-00 6-20	ABL	TAYLOR	107	

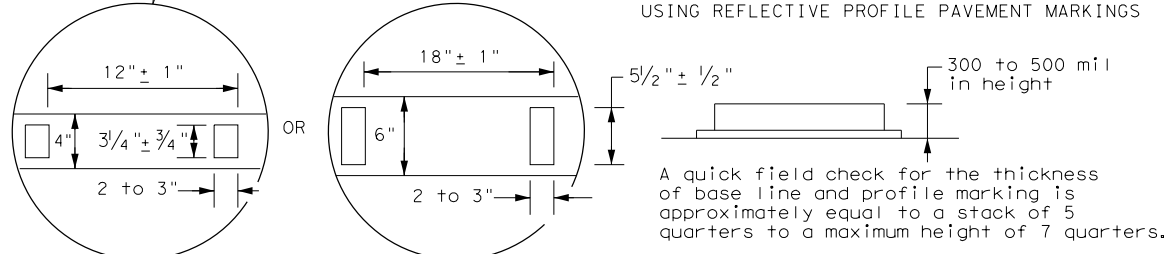
GENERAL NOTES

- All raised pavement markers placed in broken lines shall be placed in line with and midway between the stripes.
- On concrete pavements the raised pavement markers should be placed to one side of the longitudinal joints.



REFLECTORIZED PROFILE
PATTERN DETAIL

USING REFLECTIVE PROFILE PAVEMENT MARKINGS



4" EDGE LINE,
CENTER LINE
OR LANE LINE

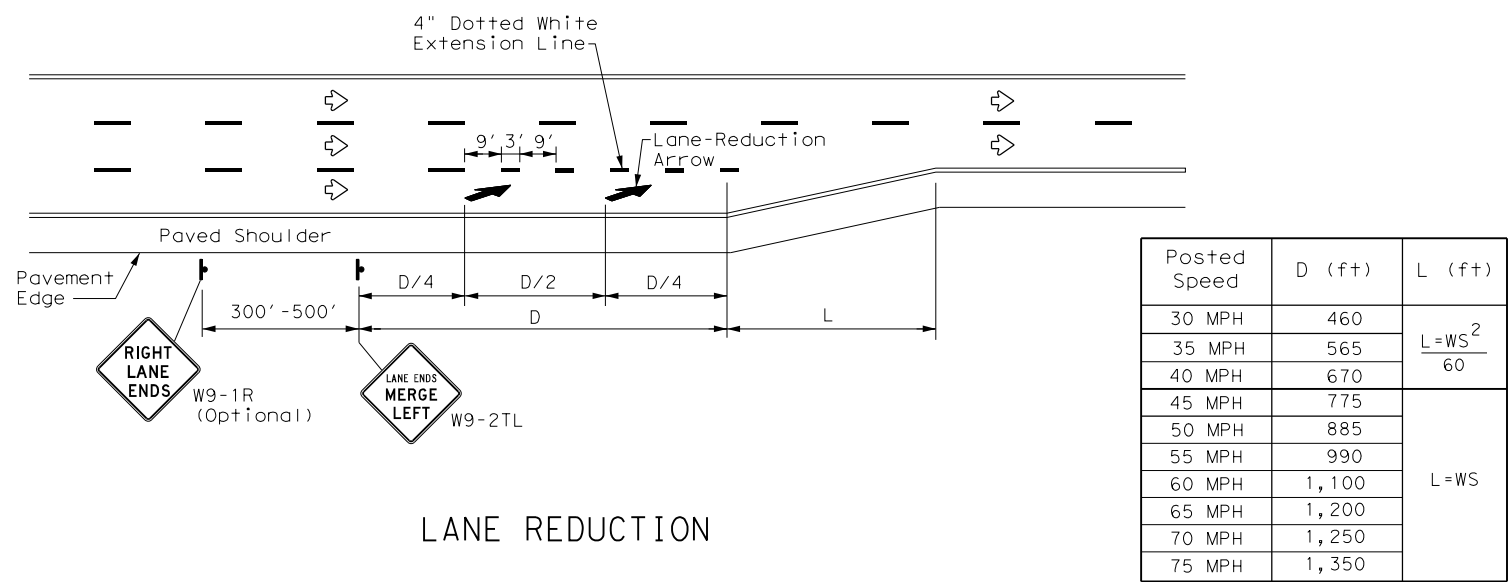
OPTIONAL 6" EDGE
LINE, CENTER LINE
OR LANE LINE

NOTE

Profile markings shall not be placed on roadways with a posted speed limit of 45 MPH or less.

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DATE: 2/7/2023 3:17:51 PM
 FILE: pm3-20.dgn



LANE REDUCTION

NOTES

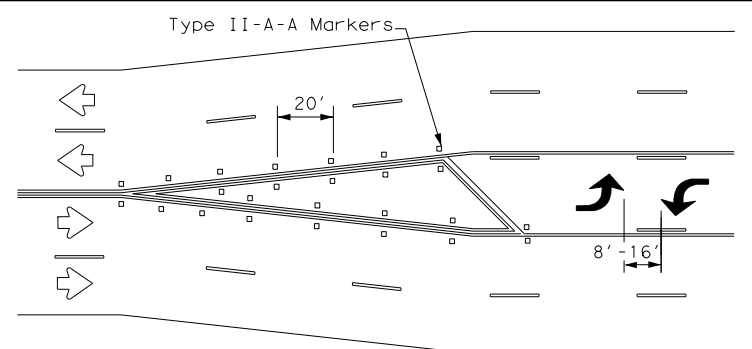
- Lane reduction pavement markings are used where the number of through lanes is reduced because of narrowing of the roadway or because of a section of on-street parking in what would otherwise be a through lane. For Texas Super 2 Passing Lanes, see TS2(PL) standard sheets.
- On divided highways, an additional W9-1R "RIGHT LANE ENDS" sign may be installed in the median aligned with the W9-1R sign on the right side of the highway.
- Lane reduction arrows are required for speeds of 45 mph or greater. An optional third lane reduction arrow may be added based on engineering judgement. If used, the optional third lane reduction arrow should be centered between the first and last lane reduction arrows.
- For lane reductions on Freeways and Expressways, signing shall conform to the TxDOT Freeway Signing Handbook.

GENERAL NOTES

- Lane use word and arrow markings shall be used where through lanes approaching an intersection become mandatory turn lanes. Lane use word and arrow markings should be used in auxiliary lanes of substantial length. Lane use arrow markings or word and arrow markings may be used in other lanes and turn bays for emphasis. Details for words and arrows are as shown in the Standard Highway Sign Designs for Texas.
- When lane-use words and arrow markings are used, two sets of arrows should be used if the length of the bay is greater than 180 feet. When a single lane use arrow or word and arrow marking is used for a short turn lane, it should be located at or near the upstream end of the full-width turn lane.
- Use raised pavement marker Type I-C with undivided highways, flush medians and two way left turn lanes. Use raised pavement marker Type II-C-R with divided highways and raised medians.
- Length of turn bays, including taper, deceleration, and storage lengths shall be as shown on the plans or as directed by the Engineer.

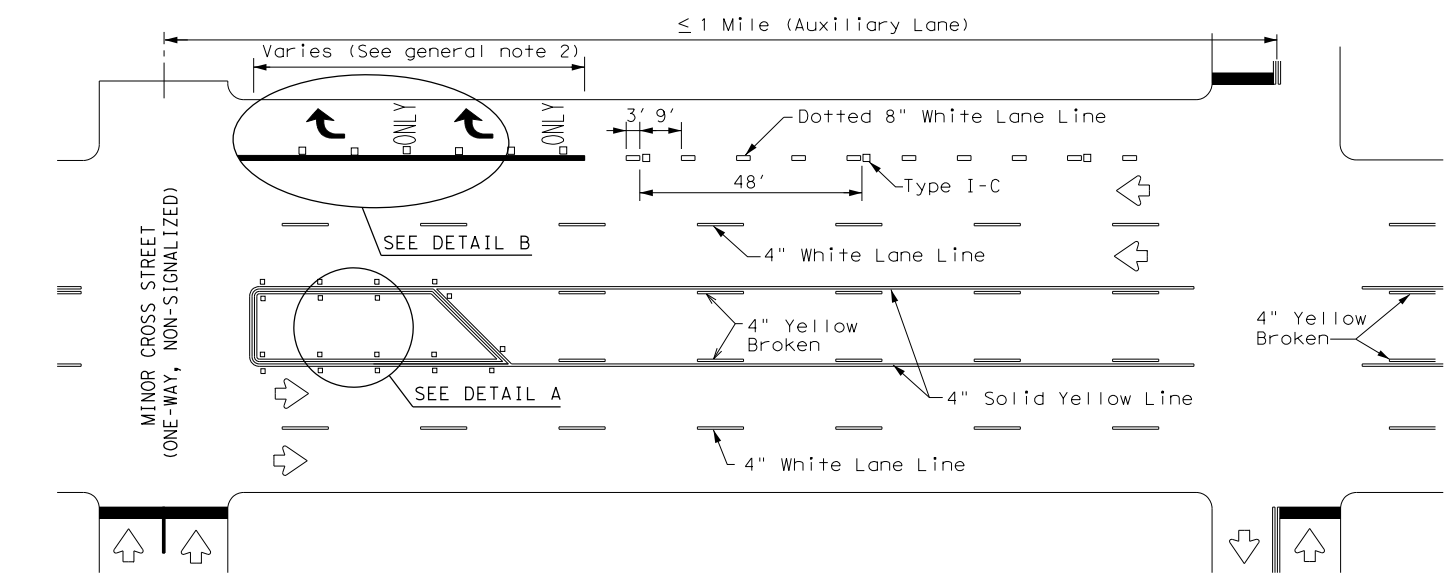
MATERIAL SPECIFICATIONS	
PAVEMENT MARKERS (REFLECTORIZED)	DMS-4200
EPOXY AND ADHESIVES	DMS-6100
BITUMINOUS ADHESIVE FOR PAVEMENT MARKERS	DMS-6130
TRAFFIC PAINT	DMS-8200
HOT APPLIED THERMOPLASTIC	DMS-8220
PERMANENT PREFABRICATED PAVEMENT MARKINGS	DMS-8240

All pavement marking materials shall meet the required Departmental Material Specifications as specified by the plans.

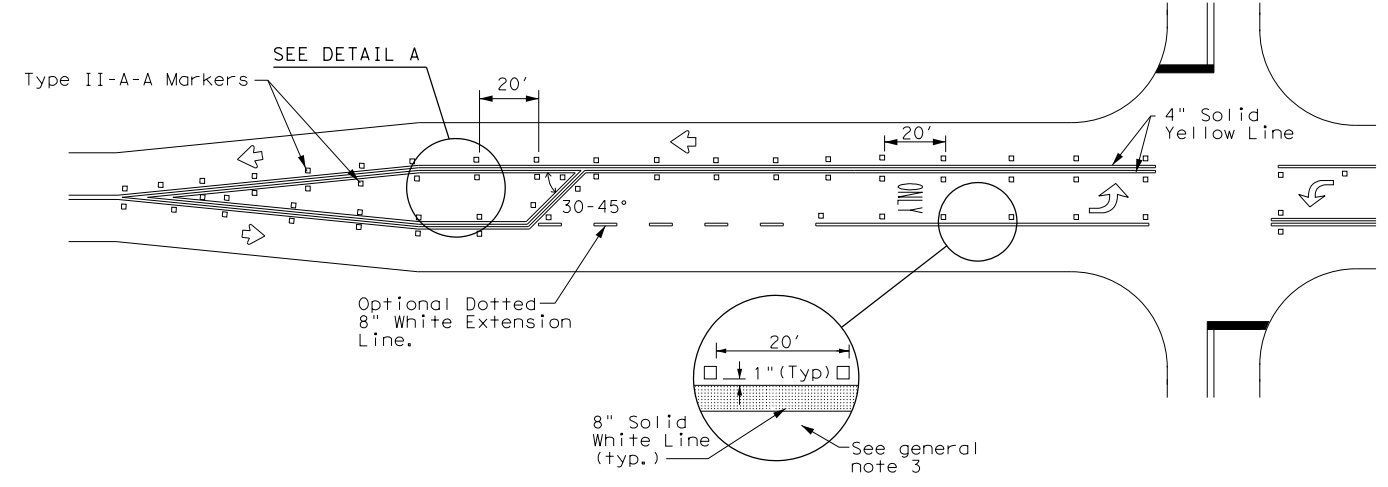


A two-way left-turn (TWLTL) lane-use arrow pavement marking should be used at or just downstream from the beginning of a two-way left-turn lane within a corridor. Repeating the marking after each intersection or dedicated turn bay is not required unless stated elsewhere in the plans.

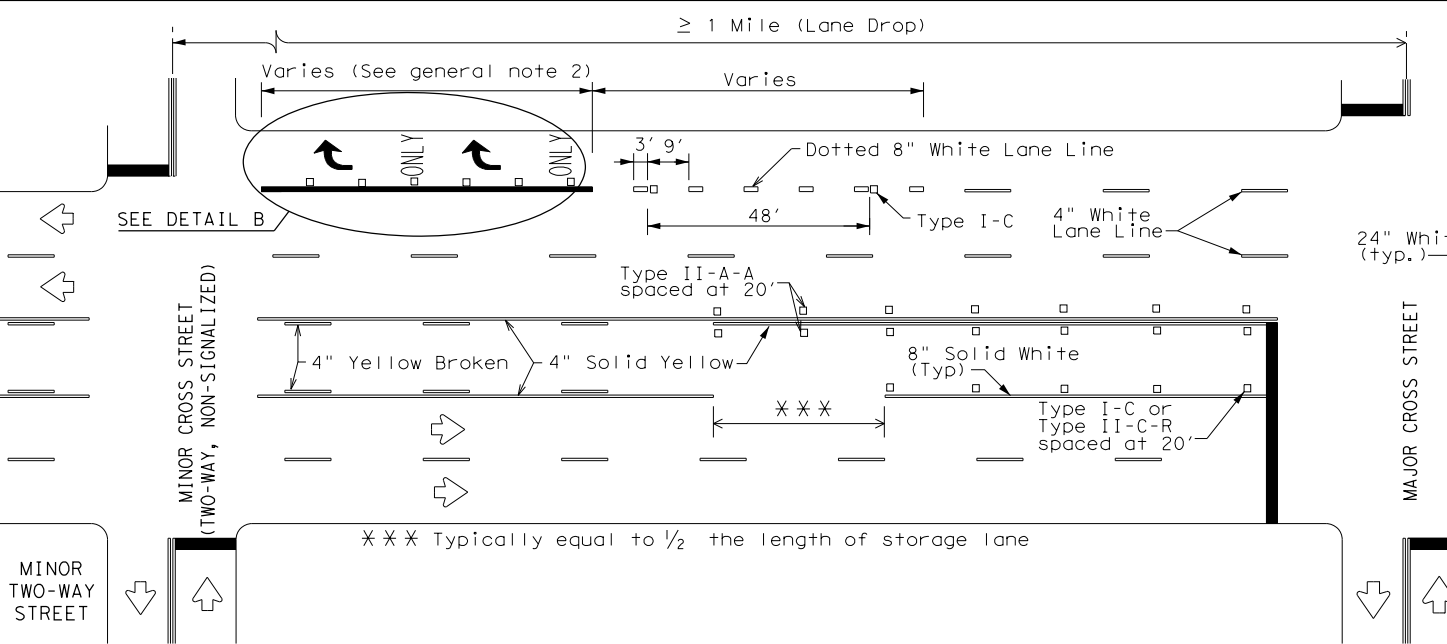
TYPICAL TRANSITION FOR TWLTL AND DIVIDED HIGHWAY



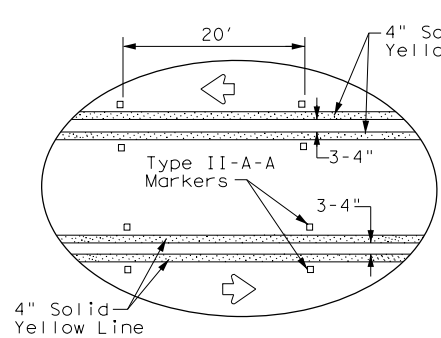
TYPICAL TWLTL AT ONE-WAY STREET AND RIGHT TURN AUXILIARY LANE



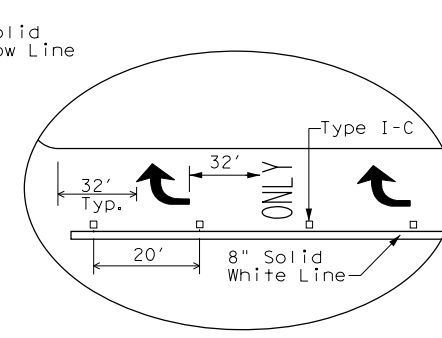
TYPICAL TWO-LANE HIGHWAY INTERSECTION WITH LEFT TURN BAYS



TYPICAL TWLTL AT TWO-WAY CROSS STREET AND RIGHT TURN LANE DROP



DETAIL A



DETAIL B

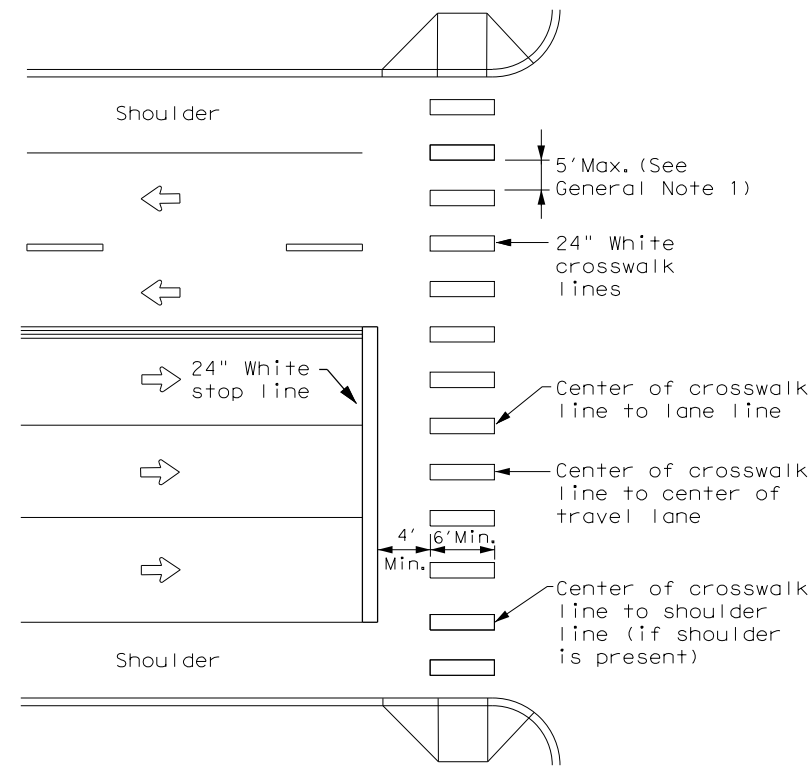


TWO-WAY LEFT TURN LANES, RURAL LEFT TURN BAYS, AND LANE REDUCTION PAVEMENT MARKINGS PM(3)-20

FILE: pm3-20.dgn	DN:	CK:	DW:	CK:
© TxDOT April 1998	CON	SECT	JOB	HIGHWAY
REVISIONS	0908	33	106	EAST S 7TH ST
5-00 2-10	DIST	COUNTY	SHEET NO.	
8-00 2-12	ABL	TAYLOR	108	
3-03 6-20				

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 FILE: //hq-pw\int01.a-e.transyscorp.com:transyscorp-pw1/Documents/Projects/2022-2023/090833/090833-106/EAST S 7TH ST



HIGH-VISIBILITY LONGITUDINAL CROSSWALK AT CONTROLLED APPROACH

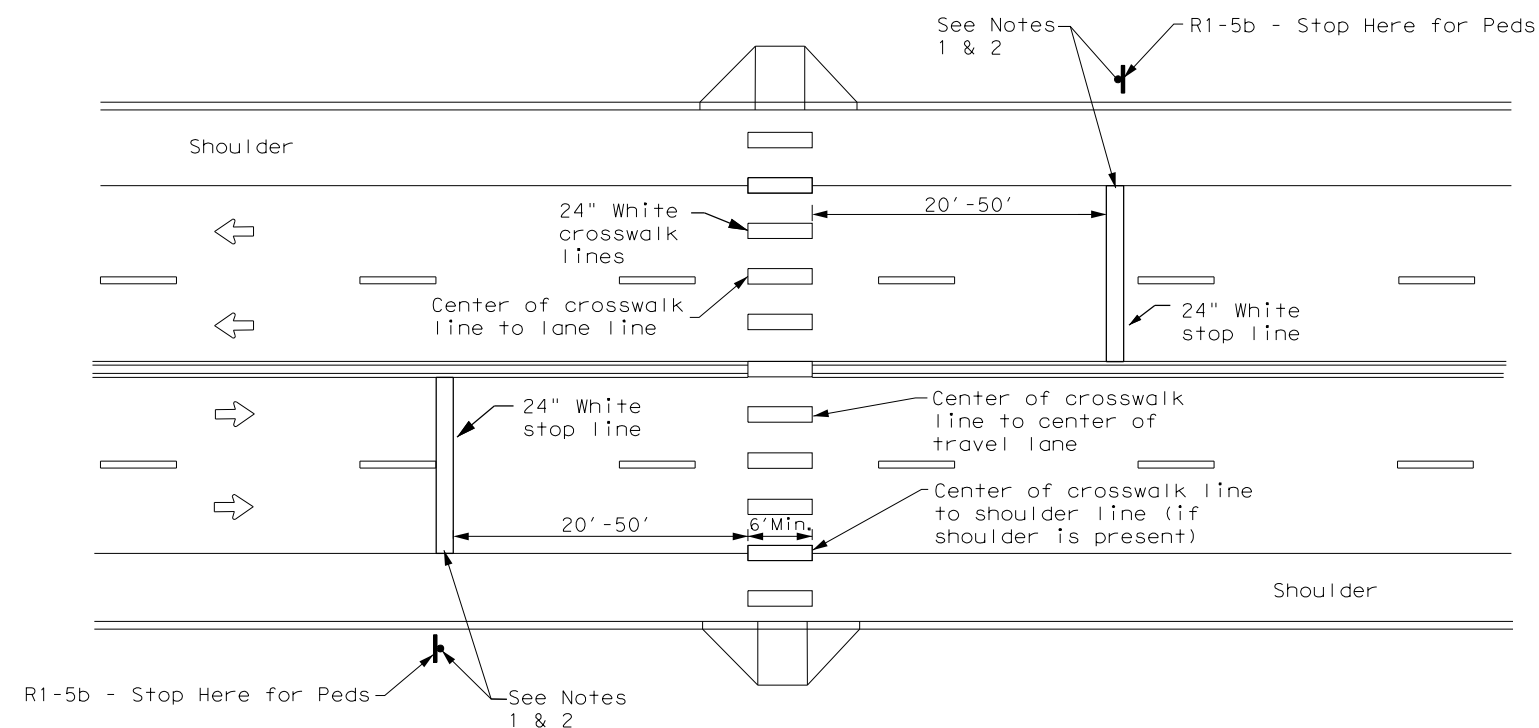
GENERAL NOTES

1. Longitudinal crosswalk lines should not be placed in the wheel path of vehicles. Center the crosswalk lines on travel lanes, lane lines, and shoulder lines (if present).
2. A minimum 6" clear distance shall be provided to the curb face. If the last crosswalk line falls into this distance it must be omitted.
3. For divided roadways, adjustments in spacing of the crosswalk lines should be made in the median so that the crosswalk lines are maintained in their proper location across the travel portion of the roadway.
4. At skewed crosswalks, the crosswalk lines are to remain parallel to the lane lines.
5. Each crosswalk shall be a minimum of 6' wide.
6. The High-Visibility Longitudinal Crosswalk is the preferred crosswalk pattern on State Highways. Other crosswalk patterns as shown in the "Texas Manual on Uniform Traffic Control Devices" may be used. All crosswalk designs and dimension shall comply with the "Texas Manual on Uniform Traffic Control Devices."
7. Final placement of Stop Bar and Crosswalk shall be approved by the Engineer in the field.

MATERIAL SPECIFICATIONS

PAVEMENT MARKERS (REFLECTORIZED)	DMS-4200
EPOXY AND ADHESIVES	DMS-6100
BITUMINOUS ADHESIVE FOR PAVEMENT MARKERS	DMS-6130
TRAFFIC PAINT	DMS-8200
HOT APPLIED THERMOPLASTIC	DMS-8220
PERMANENT PREFABRICATED PAVEMENT MARKINGS	DMS-8240

All pavement marking materials shall meet the required Departmental Material Specifications as specified by the plans.



UNSIGNALIZED MID BLOCK HIGH-VISIBILITY LONGITUDINAL CROSSWALK

NOTES:

1. Use stop bars with "Stop Here for Pedestrians" signs at unsignalized mid block crosswalks.
2. Use stop bars with "Stop Here on Red" signs at mid block crosswalks controlled by traffic signals or pedestrian hybrid beacons.



CROSSWALK PAVEMENT MARKINGS

PM(4) - 22

FILE: pm4-22.dgn	DN:	CK:	DW:	CK:
© TxDOT June 2020	CONT	SECT	JOB	HIGHWAY
3-22 REVISIONS	0908	33	106	EAST S 7TH ST
	DIST	COUNTY	SHEET NO.	
	ABL	TAYLOR	109	

STORMWATER POLLUTION PREVENTION PLAN (SWP3):

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

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

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

1.0 SITE/PROJECT DESCRIPTION

1.1 PROJECT CONTROL SECTION JOB (CSJ):

0908-33-106

1.2 PROJECT LIMITS:

From: _____

To: EAST S 7TH STREET AT CEDAR CREEK

1.3 PROJECT COORDINATES:

BEGIN: (Lat) 32°26'29.75" (N), (Long) 99°43'27.43" (W)

END: (Lat) 32°26'29.80" (N), (Long) 99°43'23.25" (W)

1.4 TOTAL PROJECT AREA (Acres): 0.73

1.5 TOTAL AREA TO BE DISTURBED (Acres): 0.73

1.6 NATURE OF CONSTRUCTION ACTIVITY:

CONSTRUCTION OF BRIDGE REPLACEMENT AND APPROACHES

1.7 MAJOR SOIL TYPES:

Soil Type	Description
SAND	SURFACE TO 5-15FT DEPTH
MOD STIFF CLAY	5FT TO 65FT DEPTH
WEAK ROCK	35FT TO 80FT DEPTH

1.8 PROJECT SPECIFIC LOCATIONS (PSLs):

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

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

Type	Sheet #s

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

1.9 CONSTRUCTION ACTIVITIES:

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

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

Other: _____

Other: _____

Other: _____

1.10 POTENTIAL POLLUTANTS AND SOURCES:

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

1.11 RECEIVING WATERS:

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

Tributaries	Classified Waterbody
CEDAR CREEK (WITHIN BRAZOS RIVER BASIN)	UNCLASSIFIED

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

1.12 ROLES AND RESPONSIBILITIES: TxDOT

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

Other: _____

Other: _____

1.13 ROLES AND RESPONSIBILITIES: CONTRACTOR

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

Other: _____

Other: _____

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



FED. RD. DIV. NO.	PROJECT NO.			SHEET NO.
	BR 2022(944)			110
STATE	STATE DIST.	COUNTY		
TEXAS	ABL	TAYLOR		
CONT.	SECT.	JOB	HIGHWAY NO.	
0908	33	106	EAST S 7TH ST	

STORMWATER POLLUTION PREVENTION PLAN (SWP3):

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

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

2.1 EROSION CONTROL AND SOIL STABILIZATION BMPs:

T / P

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

2.2 SEDIMENT CONTROL BMPs:

T / P

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

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

2.3 PERMANENT CONTROLS:

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

BMPs To Be Left In Place Post Construction:

Type	Stationing	
	From	To

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

2.4 OFFSITE VEHICLE TRACKING CONTROLS:

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

2.5 POLLUTION PREVENTION MEASURES:

- Chemical Management
- Concrete and Materials Waste Management
- Debris and Trash Management
- Dust Control
- Sanitary Facilities
- Other: CONCRETE WASHOUT WILL NOT BE ALLOWED ON SITE
- Other: _____
- Other: _____
- Other: _____

2.6 VEGETATED BUFFER ZONES:

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

Type	Stationing	
	From	To

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

2.7 ALLOWABLE NON-STORMWATER DISCHARGES:

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

2.8 INSPECTIONS:

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

2.9 MAINTENANCE:

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

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



FED. RD. DIV. NO.	PROJECT NO.			SHEET NO.
	BR 2022(944)			111
STATE	STATE DIST.	COUNTY		
TEXAS	ABL	TAYLOR		
CONT.	SECT.	JOB	HIGHWAY NO.	
0908	33	106	EAST S 7TH ST	

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I. STORMWATER POLLUTION PREVENTION-CLEAN WATER ACT SECTION 402

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

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

1.
2.
- No Action Required Required Action

Action No.

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

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

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

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

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

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.

- Cedar Creek
-
-
-

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

Best Management Practices:

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

III. CULTURAL RESOURCES

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

- No Action Required Required Action

Action No.

-
-
-
-

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.

- Comply with E.O. 13112 on use of native vegetation.
-
-
-

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

- No Action Required Required Action

Action No.

- Comply with Migratory Bird Treaty Act (MGBTA) on protection of Birds, their young, and nests.
-
-
-

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

LIST OF ABBREVIATIONS

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

VI. HAZARDOUS MATERIALS OR CONTAMINATION ISSUES

General (applies to all projects):

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

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

Contact the Engineer if any of the following are detected:

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

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

- Yes No

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

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

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

- Yes No

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

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

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

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

- No Action Required Required Action

Action No.

- There is Lead Containing Paint on this bridge. Proper abatement should be completed prior to demo if needed.
-
-


VII. OTHER ENVIRONMENTAL ISSUES

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

- No Action Required Required Action

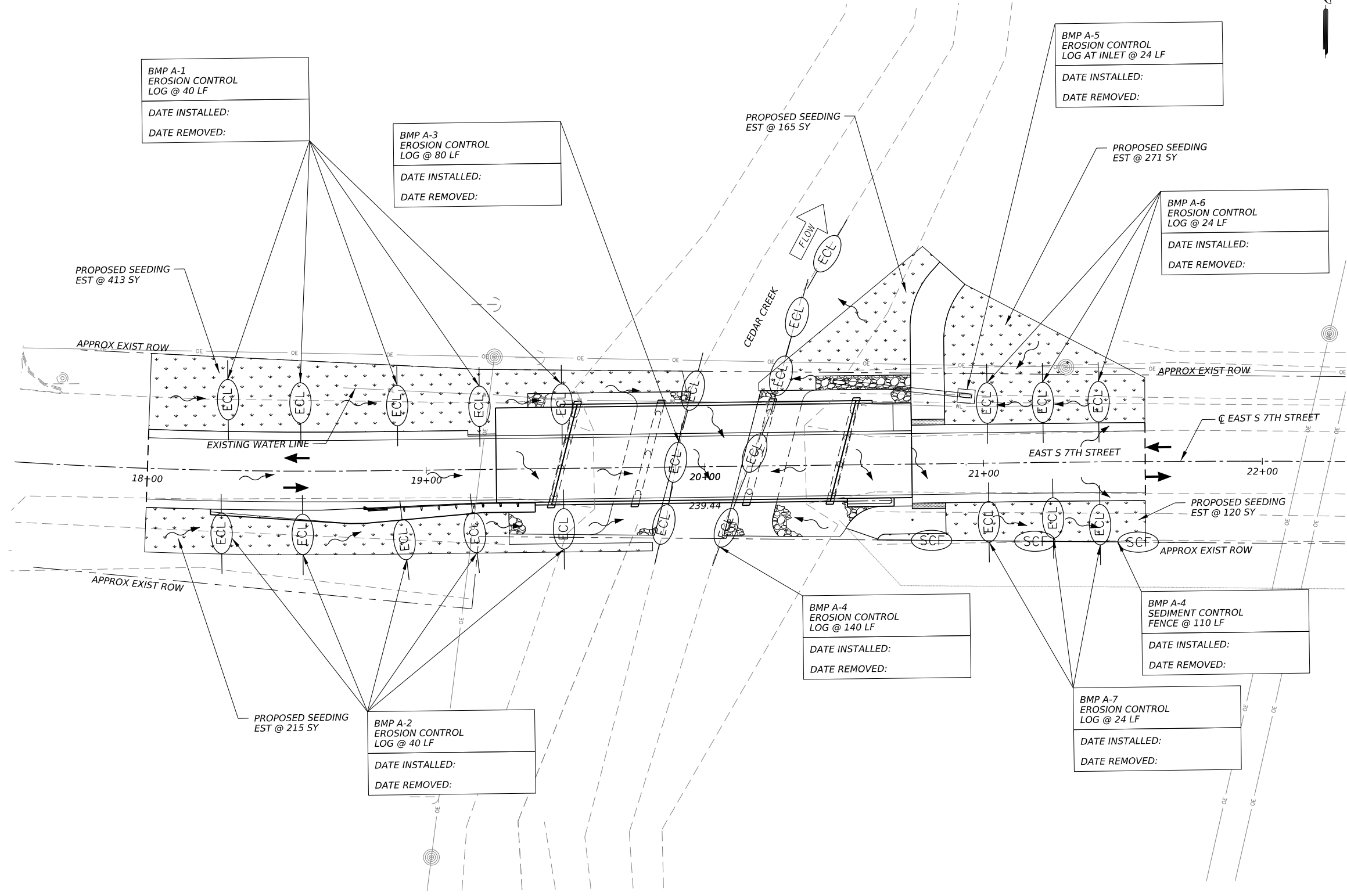
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		Design Division Standard		
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© TxDOT: February 2015	CONT	SECT	JOB	HIGHWAY
12-12-2011 IDS REVISIONS	0908	33	106	EAST S 7TH ST
05-07-14 ADDED NOTE SECTION IV.	DIST	COUNTY		SHEET NO.
01-23-2015 SECTION I (CHANGED ITEM 1122 TO ITEM 506, ADDED GRASSY SWALES.	ABL	TAYLOR		112

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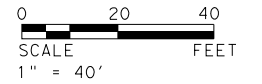


LEGEND

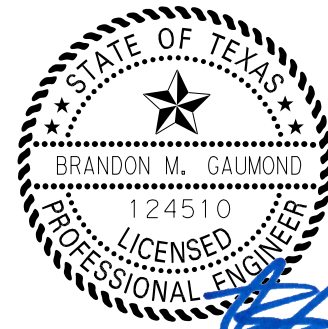
- DIRECTION OF FLOW
- SEDIMENT CONTROL FENCE
- EROSION CONTROL LOG
- TOPSOIL/SEEDING

NOTES:

1. CONTRACTOR IS RESPONSIBLE FOR MAINTAINING EROSION CONTROL DEVICES FROM PREVIOUS PHASE(S) THROUGHOUT DURATION OF PROJECT.
2. BMPs SHALL BE INSTALLED NO SOONER THAN TWO WEEKS PRIOR TO SOIL DISTURBING ACTIVITIES IN THEIR CONTROL AREA.
3. SEE DAILY WORK REPORTS FOR INITIAL STABILIZATION.
4. THE CONTRACTOR SHALL UTILIZE CONSTRUCTION EXITS FOR ENTERING AND LEAVING THE WORK AREA. CONSTRUCTION EXITS ARE TO BE PLACED AT UP TO TWO LOCATIONS, AS DIRECTED BY THE ENGINEER.



REV. NO.	DATE	BY	REVISION



2/8/2023

TranSystems 500 W 7th ST SUITE 1100
FORT WORTH, TX 76102
(817) 339-8950
FIRM REG. #: 3557

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Texas Department of Transportation

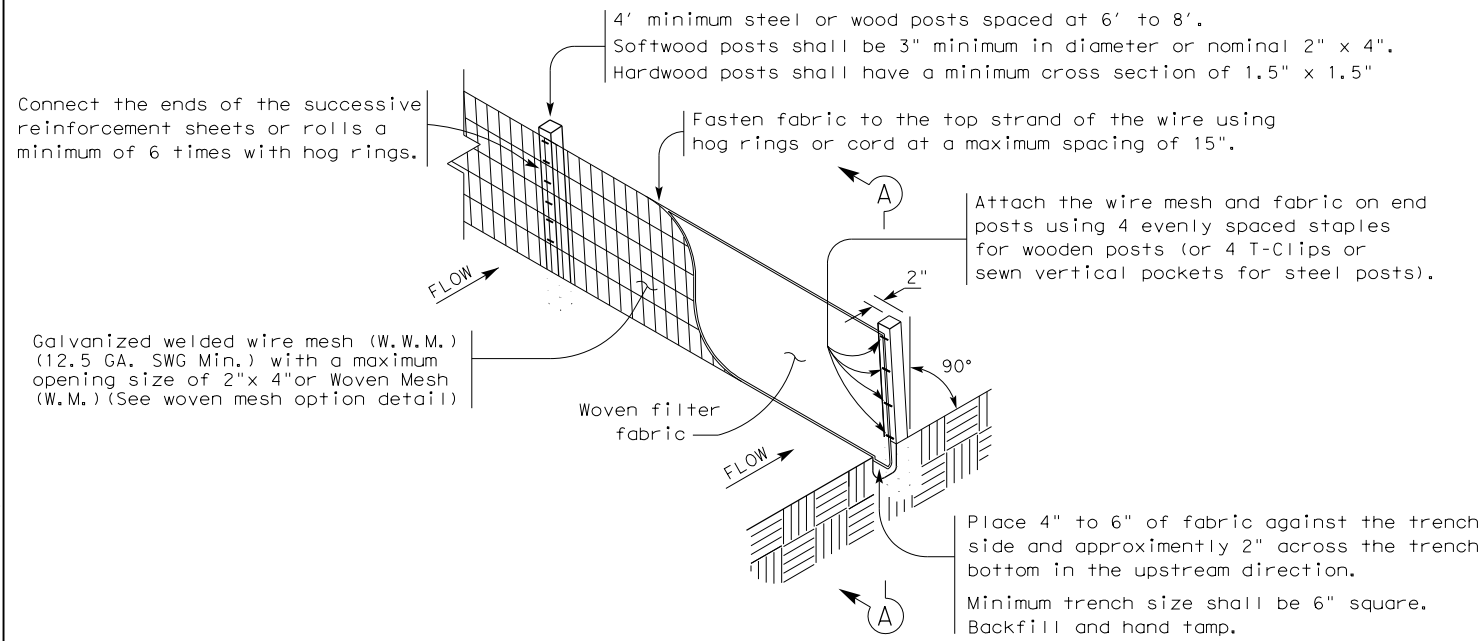
**EAST S 7TH STREET
ENVIRONMENTAL LAYOUT
SHEET**

SHEET 1 OF 1

CONT	SECT	JOB	HIGHWAY
0908	33	106	EAST S 7TH ST
DIST	COUNTY	SHEET NO.	
ABL	TAYLOR	113	

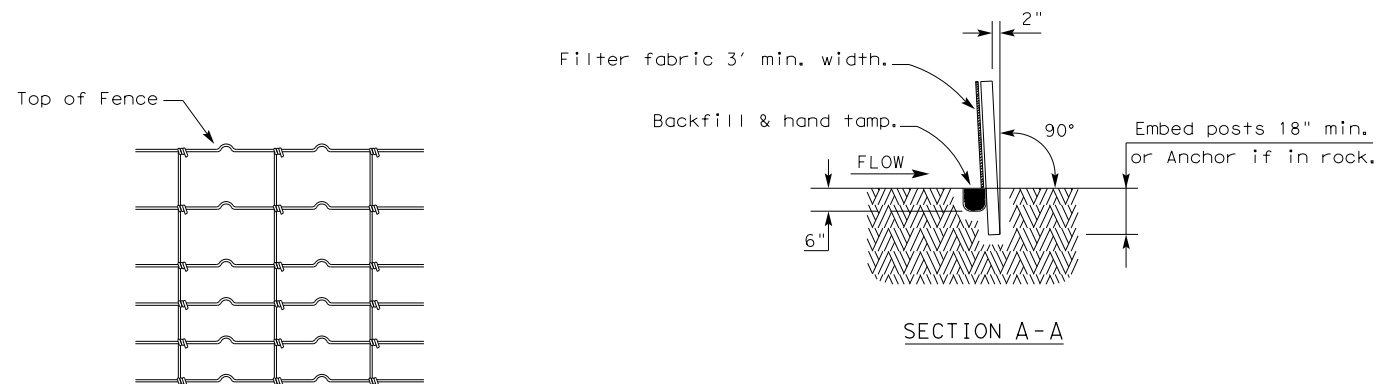
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TEMPORARY SEDIMENT CONTROL FENCE

SCF



HINGE JOINT KNOT WOVEN MESH (OPTION) DETAIL

Galvanized hinge joint knot woven mesh (12.5 GA. SWG Min.) requires a minimum of five horizontal wires spaced at a maximum of 12 inches apart and all vertical wires spaced at a maximum of 12 inches apart.

SEDIMENT CONTROL FENCE USAGE GUIDELINES

A sediment control fence may be constructed near the downstream perimeter of a disturbed area along a contour to intercept sediment from overland runoff. A 2 year storm frequency may be used to calculate the flow rate to be filtered.

Sediment control fence should be sized to filter a maximum flow through rate of 100 GPM/FT². Sediment control fence is not recommended to control erosion from a drainage area larger than 2 acres.

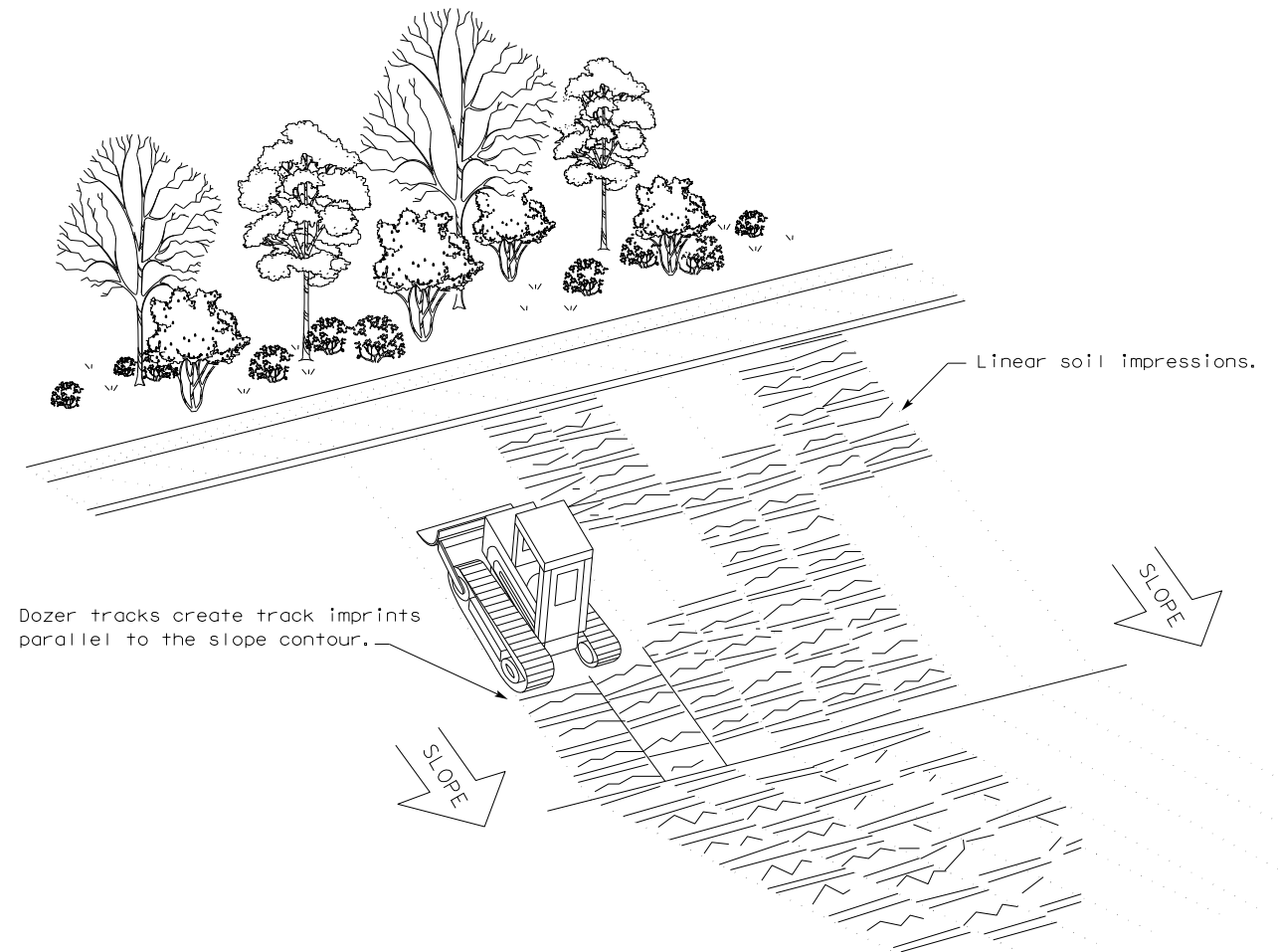
LEGEND

Sediment Control Fence

SCF

GENERAL NOTES

1. Vertical tracking is required on projects where soil distributing activities have occurred unless otherwise approved.
2. Perform vertical tracking on slopes to temporarily stabilize soil.
3. Provide equipment with a track undercarriage capable of producing linear soil impressions measuring a minimum of 12" in length by 2" to 4" in width by 1/2" to 2" in depth.
4. Do not exceed 12" between track impressions.
5. Install continuous linear track impressions where the minimum 12" length impressions are perpendicular to the slope or direction of water flow.

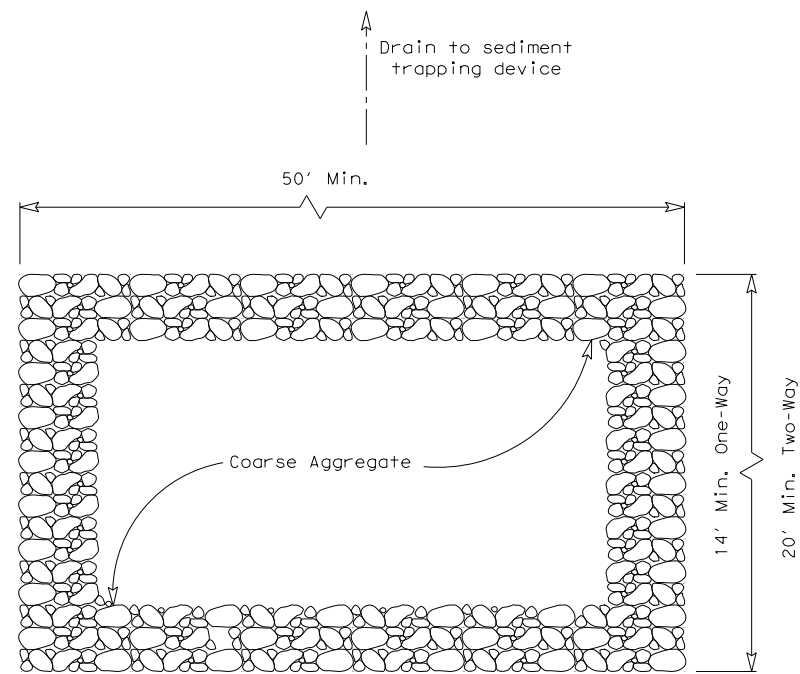


VERTICAL TRACKING

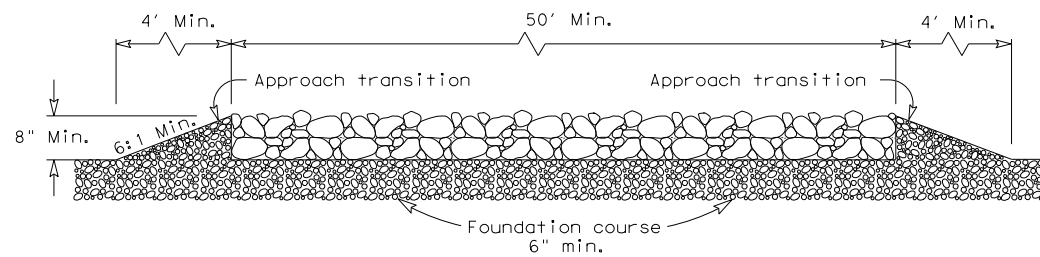
				Design Division Standard	
TEMPORARY EROSION, SEDIMENT AND WATER POLLUTION CONTROL MEASURES FENCE & VERTICAL TRACKING					
EC(1) - 16					
FILE: ec116	DN: TxDOT	CK: KM	DW: VP	DN/CK: LS	
© TxDOT: JULY 2016	CONT	SECT	JOB	HIGHWAY	
REVISIONS	0908	33	106	EAST S 7TH ST	
	DIST	COUNTY		SHEET NO.	
	ABL	TAYLOR		114	

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PLAN VIEW

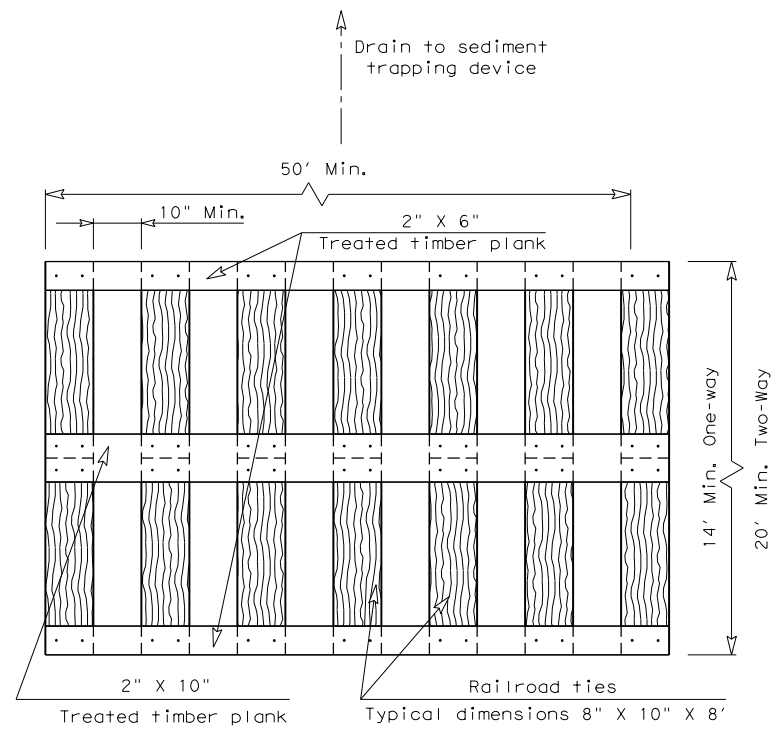


ELEVATION VIEW

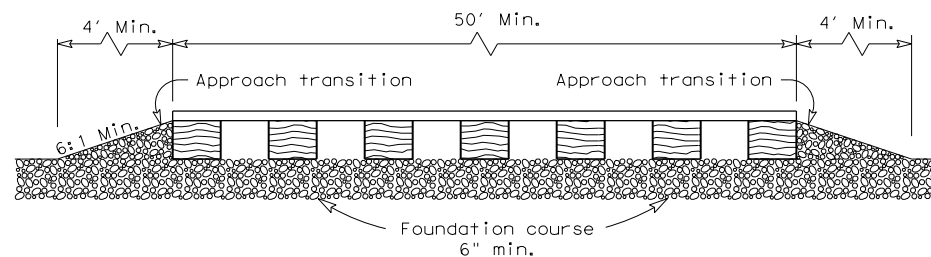
CONSTRUCTION EXIT (TYPE 1)
 ROCK CONSTRUCTION (LONG TERM)

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 materials 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.



PLAN VIEW

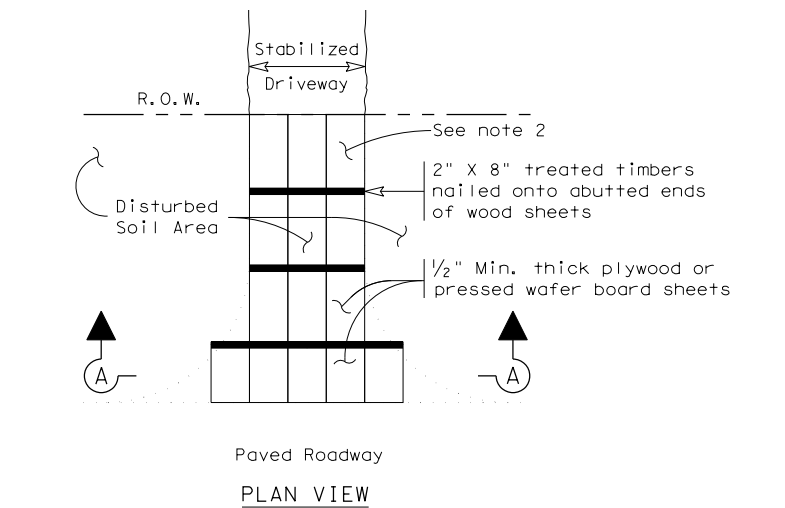


ELEVATION VIEW

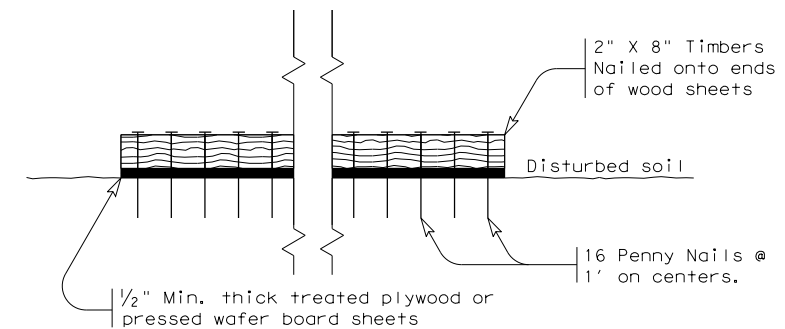
CONSTRUCTION EXIT (TYPE 2)
 TIMBER CONSTRUCTION (LONG TERM)

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 1/2" 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.



PLAN VIEW



SECTION A-A

CONSTRUCTION EXIT (TYPE 3)
 SHORT TERM

GENERAL NOTES (TYPE 3)

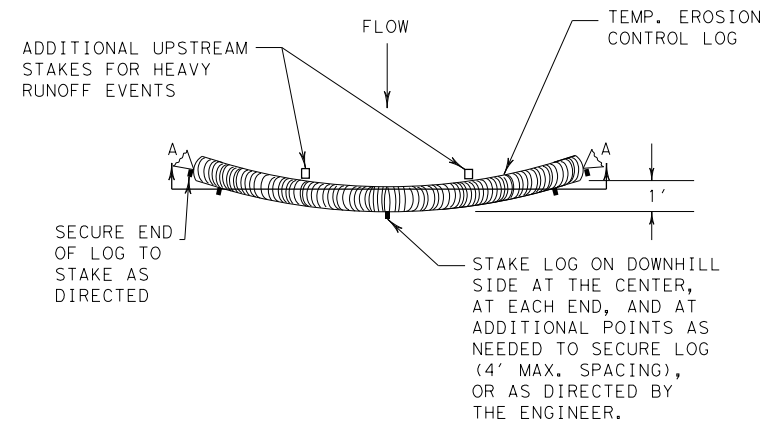
1. The length of the type 3 construction exit shall be as shown on the plans, or as directed by the Engineer.
2. The type 3 construction exit may be constructed from open graded crushed stone with a size of two to four inches spread a min. of 4" thick to the limits shown on the plans.
3. The treated 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.



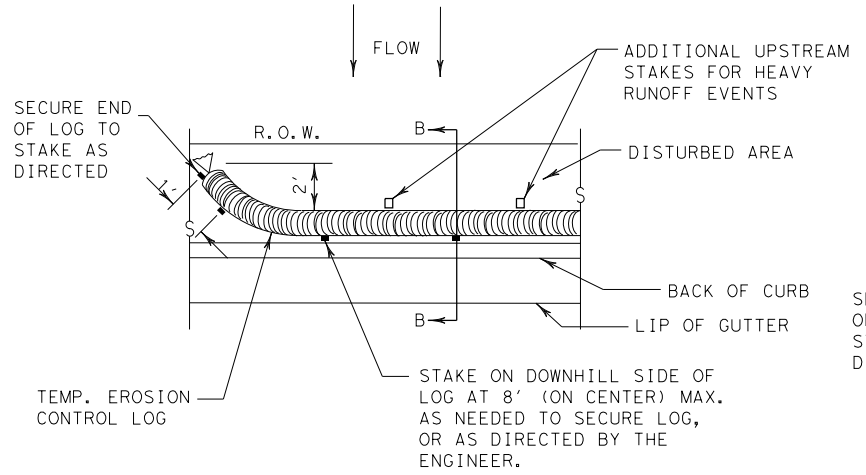
TEMPORARY EROSION,
 SEDIMENT AND WATER
 POLLUTION CONTROL MEASURES
 CONSTRUCTION EXITS
 EC(3)-16

FILE: ec316	DN: TxDOT	CK: KM	DW: VP	DN/CK: LS
© TxDOT: JULY 2016	CONT	SECT	JOB	HIGHWAY
REVISIONS	0908	33	106	EAST S 7TH ST
	DIST	COUNTY	SHEET NO.	
	ABL	TAYLOR	115	

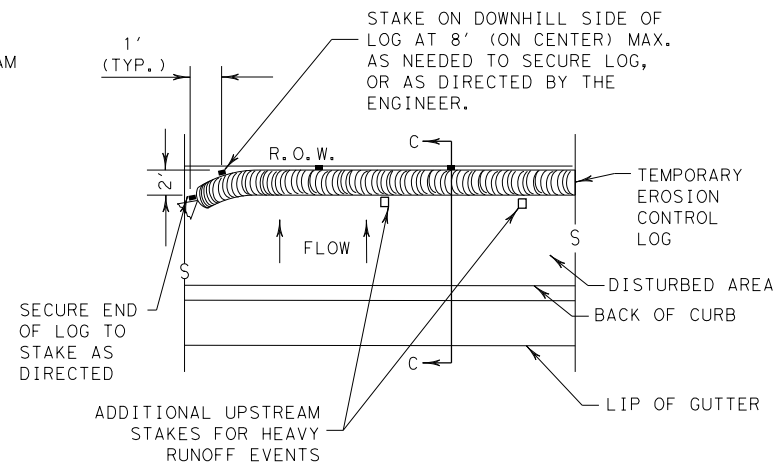
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 DATE: 2/7/2023
 FILE: pw://hq-pw\int01.a-e.transyscorp.com:transyscorp\p\w\Documents\Projects_2022\FW202/202220046/Environmental/Standard Sheets/ec916.dgn



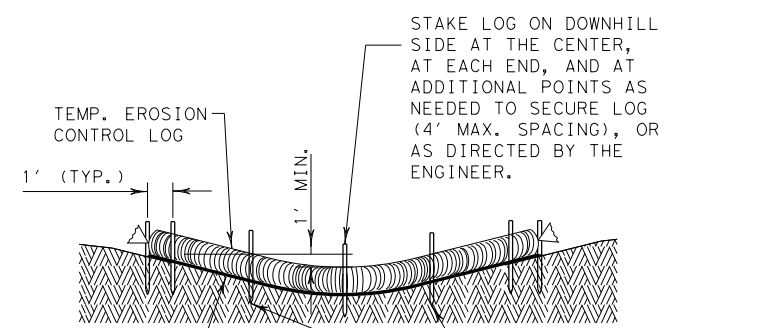
PLAN VIEW



PLAN VIEW



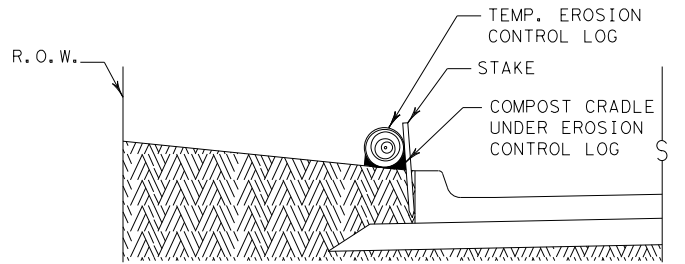
PLAN VIEW



SECTION A-A

EROSION CONTROL LOG DAM

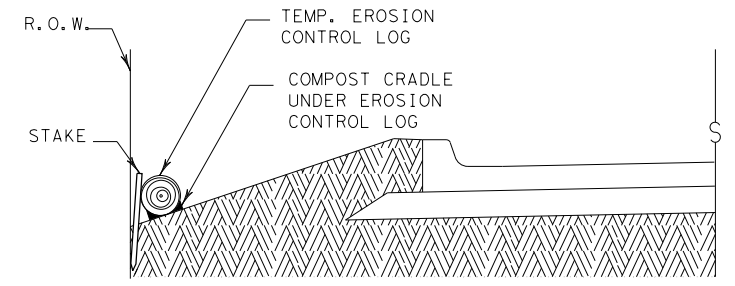
CL-D



SECTION B-B

EROSION CONTROL LOG AT BACK OF CURB

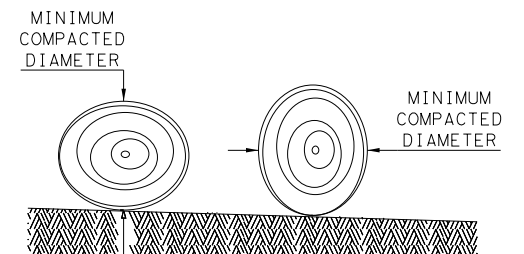
CL-BOC



SECTION C-C

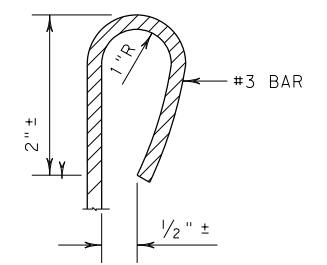
EROSION CONTROL LOG AT EDGE OF RIGHT-OF-WAY

CL-ROW



DIAMETER MEASUREMENTS OF EROSION CONTROL LOGS SPECIFIED IN PLANS

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



REBAR STAKE DETAIL

SEDIMENT BASIN & TRAP USAGE GUIDELINES

An erosion control log sediment trap may be used to filter sediment out of runoff draining from an unstabilized area.

Log Traps: The drainage area for a sediment trap should not exceed 5 acres. The trap capacity should be 1800 CF/Acre (0.5" over the drainage area).

Control logs should be placed in the following locations:

1. Within drainage ditches spaced as needed or min. 500' on center
2. Immediately preceding ditch inlets or drain inlets
3. Just before the drainage enters a water course
4. Just before the drainage leaves the right of way
5. Just before the drainage leaves the construction limits where drainage flows away from the project.

The logs should be cleaned when the sediment has accumulated to a depth of 1/2 the log diameter.

Cleaning and removal of accumulated sediment deposits is incidental and will not be paid for separately.

GENERAL NOTES:

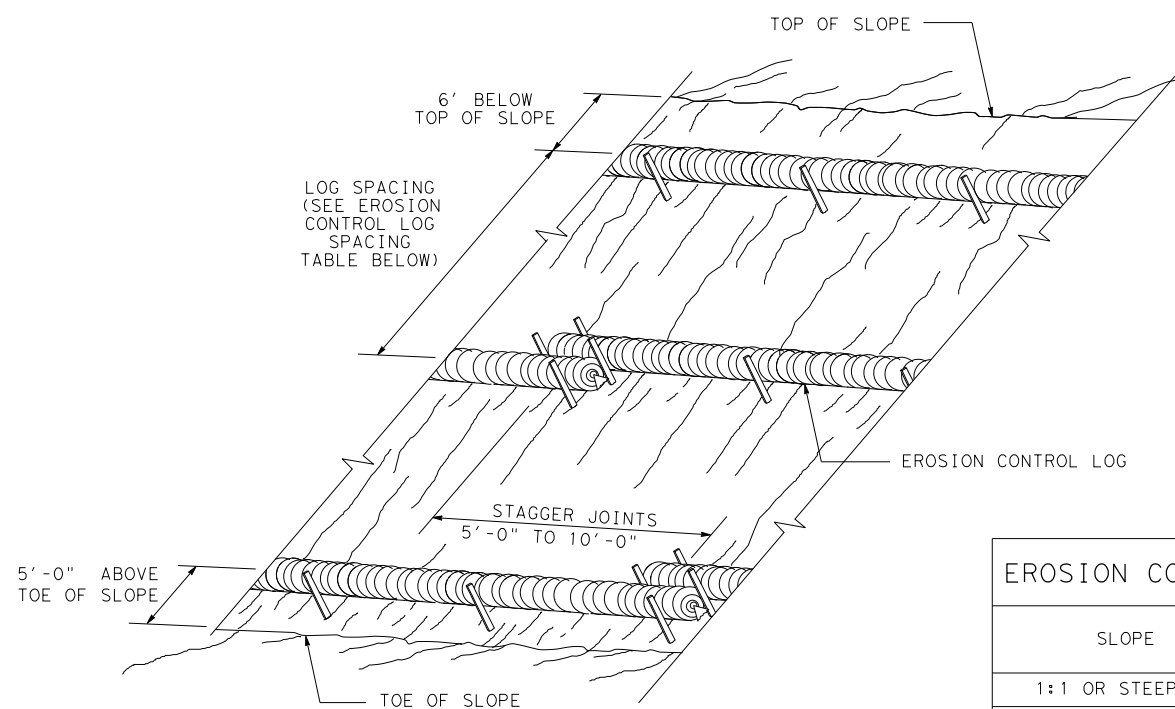
1. EROSION CONTROL LOGS SHALL BE INSTALLED IN ACCORDANCE WITH MANUFACTURER'S RECOMMENDATIONS, OR AS DIRECTED BY THE ENGINEER.
2. LENGTHS OF EROSION CONTROL LOGS SHALL BE IN ACCORDANCE WITH MANUFACTURER'S RECOMMENDATIONS AND AS REQUIRED FOR THE PURPOSE INTENDED.
3. UNLESS OTHERWISE DIRECTED, USE BIODEGRADABLE OR PHOTODEGRADABLE CONTAINMENT MESH ONLY WHERE LOG WILL REMAIN IN PLACE AS PART OF A VEGETATIVE SYSTEM. FOR TEMPORARY INSTALLATIONS, USE RECYCLABLE CONTAINMENT MESH.
4. FILL LOGS WITH SUFFICIENT FILTER MATERIAL TO ACHIEVE THE MINIMUM COMPACTED DIAMETER SPECIFIED IN THE PLANS WITHOUT EXCESSIVE DEFORMATION.
5. STAKES SHALL BE 2" X 2" WOOD OR #3 REBAR, 2'-4' LONG, EMBEDDED SUCH THAT 2" PROTRUDES ABOVE LOG, OR AS DIRECTED BY THE ENGINEER.
6. DO NOT PLACE STAKES THROUGH CONTAINMENT MESH.
7. COMPOST CRADLE MATERIAL IS INCIDENTAL & WILL NOT BE PAID FOR SEPARATELY.
8. SANDBAGS USED AS ANCHORS SHALL BE PLACED ON TOP OF LOGS & SHALL BE OF SUFFICIENT SIZE TO HOLD LOGS IN PLACE.
9. TURN THE ENDS OF EACH ROW OF LOGS UPSLOPE TO PREVENT RUNOFF FROM FLOWING AROUND THE LOG.
10. FOR HEAVY RUNOFF EVENTS, ADDITIONAL UPSTREAM STAKES MAY BE NECESSARY TO KEEP LOG FROM FOLDING IN ON ITSELF.

SHEET 1 OF 3

		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
© TxDOT: JULY 2016	CONT SECT	JOB	HIGHWAY
REVISIONS	0908 33	106	EAST S 7TH ST
	DIST	COUNTY	SHEET NO.
	ABL	TAYLOR	116

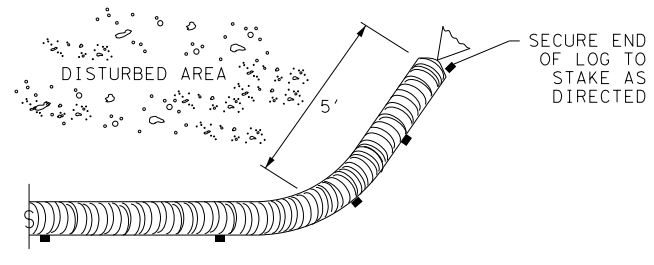
DATE: 2/7/2023
 FILE: pw://hq-pw\int01.a-e.transyscorp.com:transyscorp-pw\Documents\Projects\FW202\202220046\Environmental\Standard Sheets\ec916.dgn

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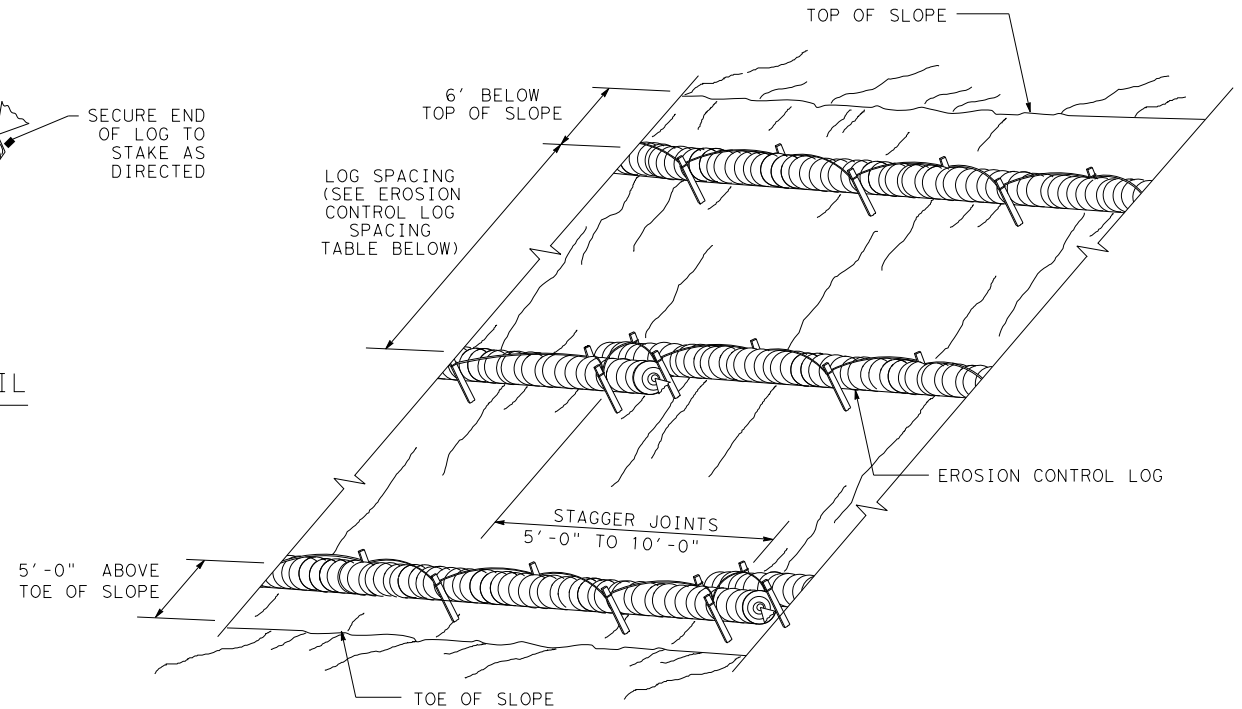


EROSION CONTROL LOGS ON SLOPES
 STAKE AND TRENCHING ANCHORING

CL-SST



END SECTION RAP DETAIL

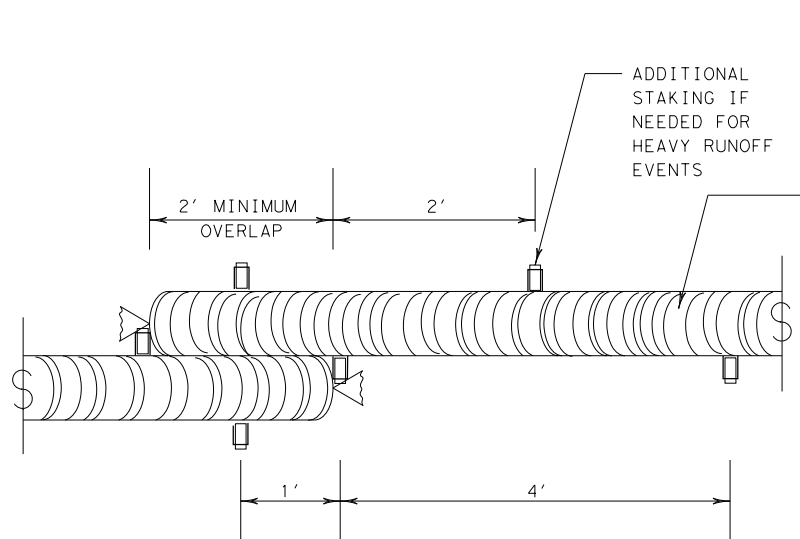


EROSION CONTROL LOGS ON SLOPES
 STAKE AND LASHING ANCHORING

CL-SSL

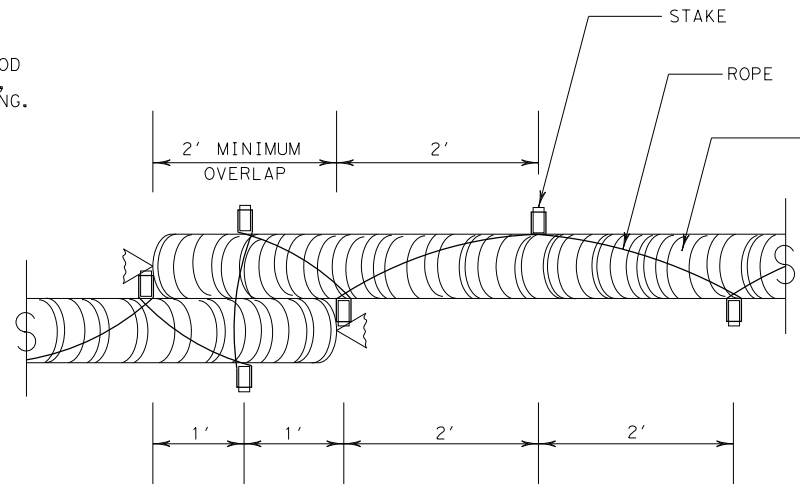
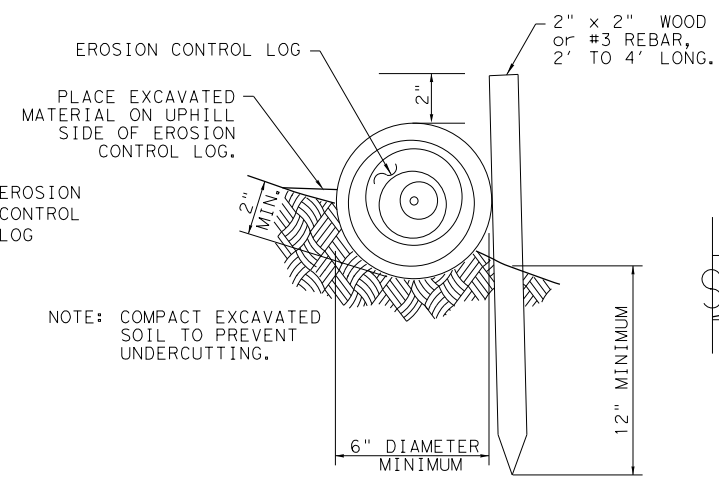
EROSION CONTROL LOG SPACING TABLE				
SLOPE	LOG DIAMETER			
	6"	8"	12"	18"
1:1 OR STEEPER	5'	10'	15'	20'
2:1	10'	20'	30'	40'
3:1	15'	30'	45'	60'
4:1 OR FLATTER	20'	40'	60'	80'

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



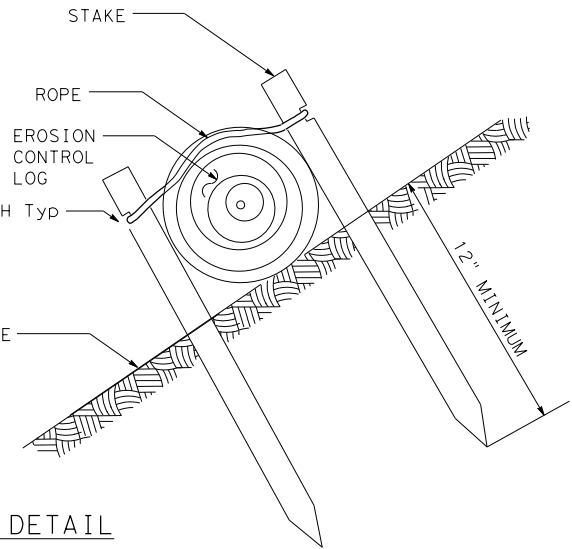
STAKE AND TRENCHING ANCHORING DETAIL

CL-SST

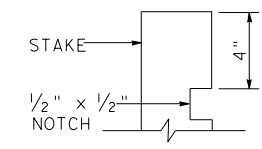


STAKE AND LASHING ANCHORING DETAIL

CL-SSL



TRENCH DEPTH TABLE	
LOG DIAMETER	DEPTH
6"	2"
8"	3"
12"	4"
18"	5"

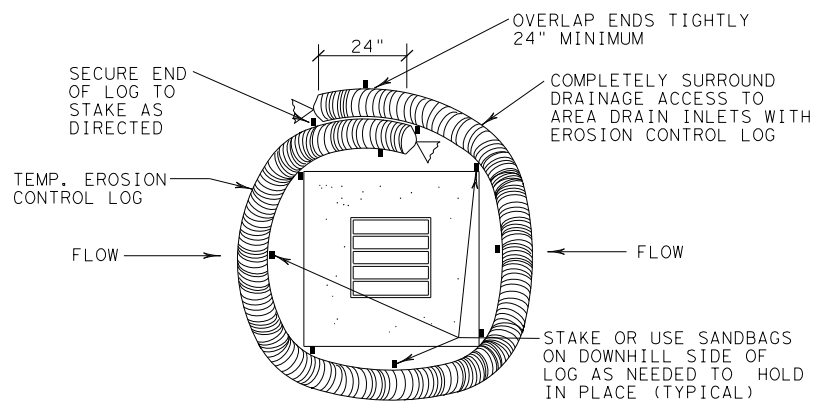


STAKE NOTCH DETAIL

SHEET 2 OF 3

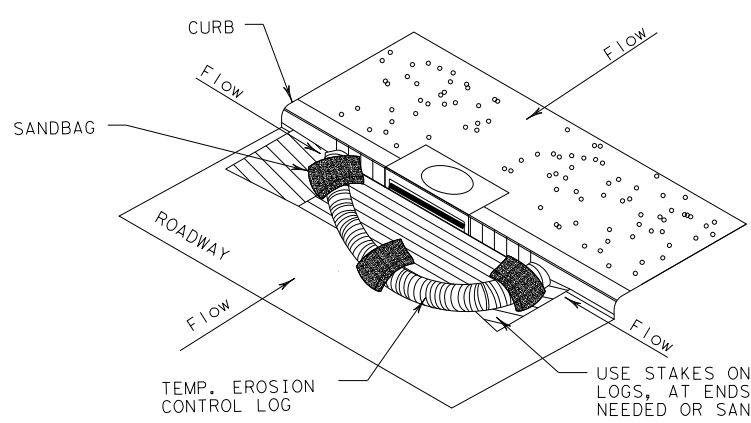
		Design Division Standard	
TEMPORARY EROSION, SEDIMENT AND WATER POLLUTION CONTROL MEASURES EROSION CONTROL LOG EC (9) - 16			
FILE: ec116	DN: TxDOT	CK: KM	DW: LS/PT
© TxDOT: JULY 2016	CONT	SECT	JOB
REVISIONS	0908	33	106
	DIST	COUNTY	SHEET NO.
	ABL	TAYLOR	117

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 DATE: 2/7/2023
 FILE: pw://hq-pw-int01.a-e.transyscorp.com:transyscorp-pw1/Documents/Projects_2022/FW202/202220046/Environmental/Standard Sheets/ec916.dgn



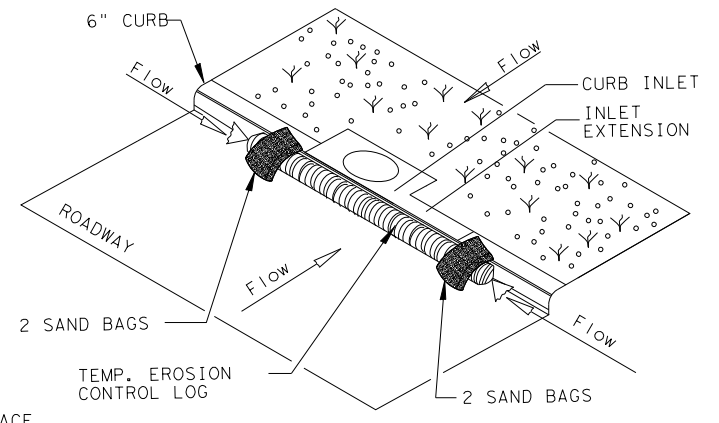
EROSION CONTROL LOG AT DROP INLET

CL-DI



EROSION CONTROL LOG AT CURB INLET

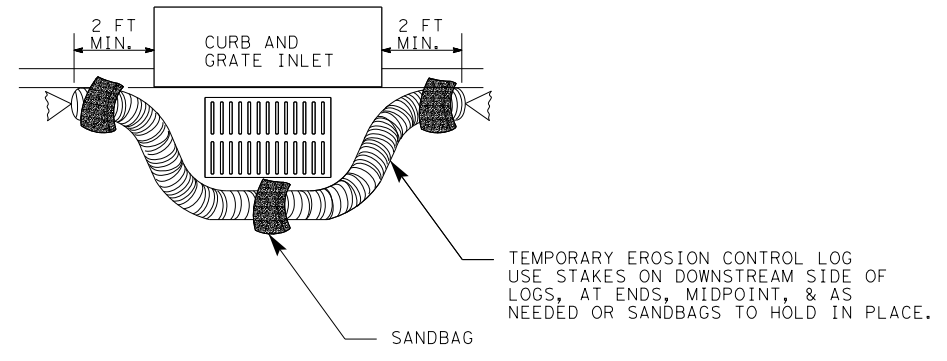
CL-CI



EROSION CONTROL LOG AT CURB INLET

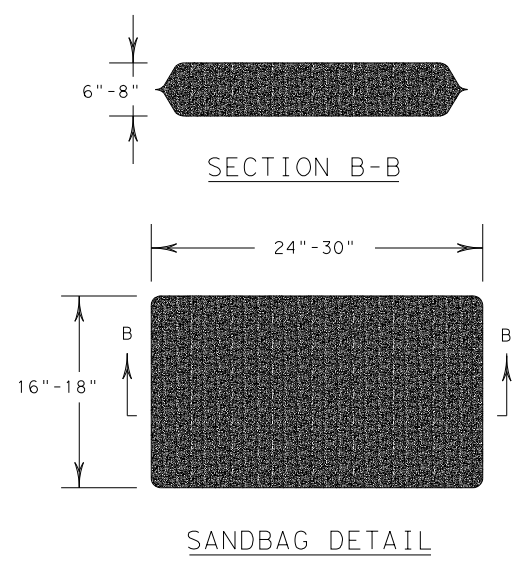
CL-CI

NOTE:
 EROSION CONTROL LOGS USED AT CURB INLETS SHOULD ONLY BE USED IF THEY WILL NOT IMPEDE TRAFFIC OR FLOOD THE ROADWAY OR WHEN THE STORM SEWER SYSTEM IS NOT FULLY FUNCTIONAL.



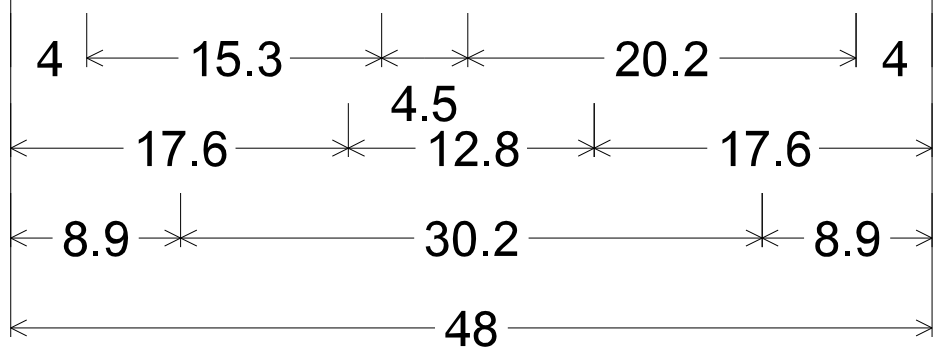
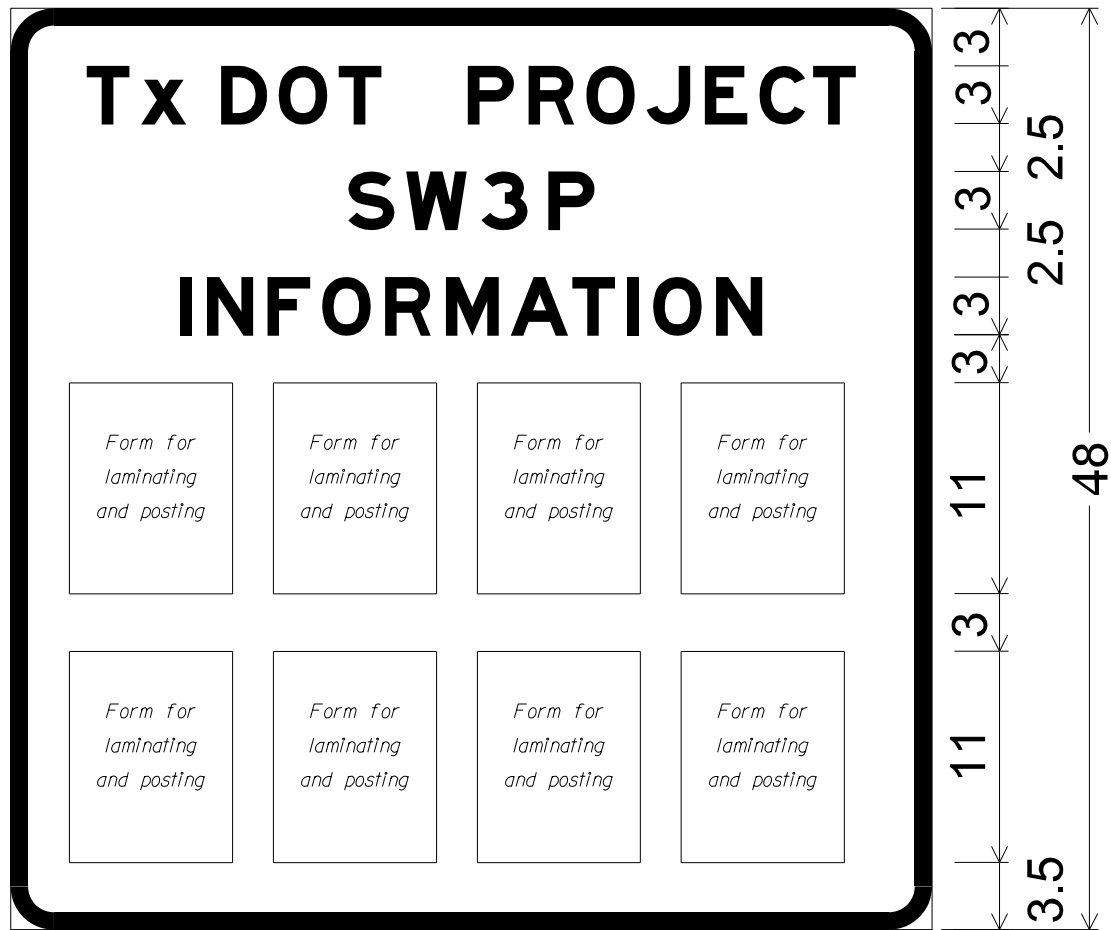
EROSION CONTROL LOG AT CURB & GRADE INLET

CL-GI



SHEET 3 OF 3

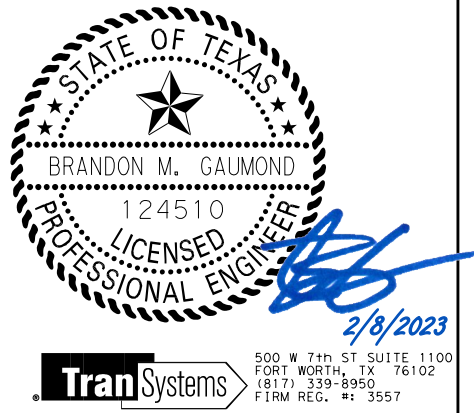
		Design Division Standard	
TEMPORARY EROSION, SEDIMENT AND WATER POLLUTION CONTROL MEASURES EROSION CONTROL LOG EC (9) - 16			
FILE: ec916	DN: TxDOT	CK: KM	DW: LS/PT
© TxDOT: JULY 2016	CONT	SECT	JOB
REVISIONS	0908	33	106
	DIST	COUNTY	SHEET NO.
	ABL	TAYLOR	118



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, 1/2 or 5/8-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



NO SCALE SHEET 1 OF 1

FHWA DIVISION	PROJECT NO.		HIGHWAY NO.
6	SEE TITLE SHEET		EAST S 7TH ST
STATE	COUNTY		SHEET NO.
TEXAS	TAYLOR		119
DISTRICT	CONTROL	SECTION	
ABL	0908	33	106