CONT	SECT	JOB	HIGHWAY
0114	01	068	US290
DIST	COUNTY		SHEET NO.
AUS	TRAVIS		1

STATE OF TEXAS
DEPARTMENT OF TRANSPORTATION

PLANS OF PROPOSED
STATE HIGHWAY IMPROVEMENT

FEDERAL AID PROJECT NUMBER
BR 2024(495)
CSJ 0114-01-068

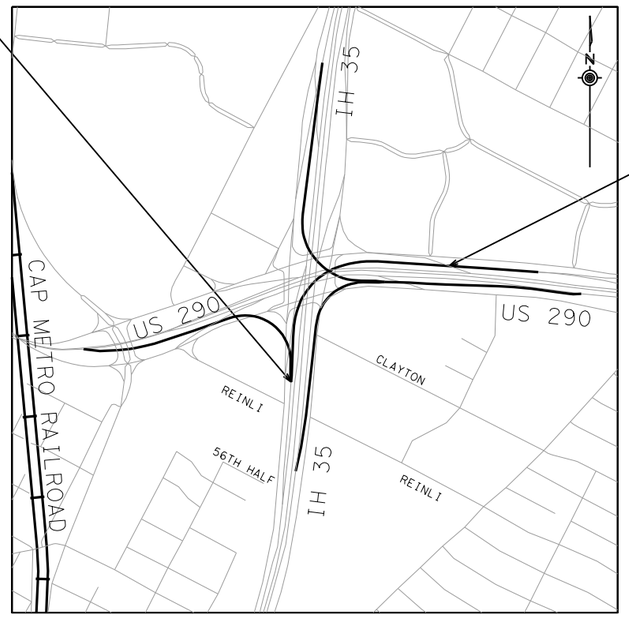
NET LENGTH OF PROJECT = 438.24 FEET = 0.083 MILES
- ROADWAY = 0.00 FEET = 0.00 MILES
- BRIDGE = 438.24 FEET = 0.083 MILES

TRAVIS COUNTY
US 290

FROM: AT IH 35
TO: -

FOR THE CONSTRUCTION OF BRIDGE MAINTENANCE CONSISTING OF RAIL REPAIR, CONCRETE STRUCTURE REPAIR, JOINT REPAIR, BEARING REPLACEMENT, CLEANING/ SEALING EXPANSION JOINTS AND INSTALL SHEAR KEY, DOWNSPOUT CLEANING

BEGIN PROJECT
CSJ: 0114-01-068
MILE PT: 2.325
DFO: 1.309



END PROJECT
CSJ: 0114-01-068
MILE PT: 2.499
DFO: 125.275

LOCATION MAP NOT TO SCALE

EXCEPTIONS: NONE
EQUATIONS: NONE
RAILROAD CROSSINGS: CAPMETRO - MP 1.740

DESIGN SPEED

MAIN LANES: N/A
FRONTAGE ROADS: N/A
RAMPS: N/A

A.D.T.

2022: 67,581 VPD
2042: 94,613 VPD

FINAL PLANS

DATE OF LETTING: _____

DATE WORK BEGAN: _____

DATE WORK COMPLETED AND ACCEPTED: _____

FINAL CONTRACT COST: $_____

CONTRACTOR: _____

LIST OF APPROVED CHANGE ORDERS:

I CERTIFY THAT THIS PROJECT WAS CONSTRUCTED IN SUBSTANTIAL COMPLIANCE WITH THE FINAL AS-BUILT PLANS AND SPECIFICATIONS.

_____ P.E.
AREA ENGINEER

_____
DATE

STATE OF TEXAS
EDUARDO GARCIA
116865
LICENSED
PROFESSIONAL ENGINEER

9/18/2024

DocuSigned by:
Eduardo Garcia
2CD511274A5948C...

SPECIFICATIONS ADOPTED BY THE TEXAS DEPARTMENT OF TRANSPORTATION ON 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, OCTOBER 23, 2023).

Texas Department of Transportation

RECOMMENDED FOR LETTING: 10/2/2024

DocuSigned by:
Susana Ceballos P.E.
E18161B2B6C3414...
DISTRICT DESIGN ENGINEER

SUBMITTED FOR LETTING: 10/2/2024

DocuSigned by:
Daniel Fleischman
C884DFBBE7254DF...
AREA ENGINEER

APPROVED FOR LETTING: 10/2/2024

DocuSigned by:
Heather Ashley-Nguyen
8912AE19E454416...
DIRECTOR OF TRANSPORTATION PLANNING & DEVELOPMENT

FILE: pw://txdot.projectwiseonline.com:TxDOT4/Documents/14 - AUS/Design Projects/0114010684 - Design/Plan Set/1. General/US290*IH35*TITLE*SHEET.dgn
DATE: 9/17/2024 7:18:38 PM

DN: | CK: | DW: | CK:

DATE: 8/30/2023 11:14:29 AM
FILE: pw://txdot.projectwiseonline.com:TxDOT4/Documents/14 - AUS/Design Projects/0114010684 - Design/Plan Set/1. General/US290_INDEX SHEET.dgn

GENERAL

TRAFFIC CONTROL PLAN

TRAFFIC CONTROL PLAN STANDARDS

BRIDGE

SIGNING

SIGNING STANDARDS

ENVIRONMENTAL ISSUES

ENVIRONMENTAL ISSUES STANDARDS

RAILROAD

>> THE STANDARD SHEETS SPECIFICALLY IDENTIFIED ABOVE HAVE BEEN SELECTED BY ME OR UNDER MY SUPERVISION AND ARE APPLICABLE TO THIS PROJECT.

DocuSigned by: Eduardo Garcia 2CD511274A5948C... P.E. 9/19/2023

EDUARDO GARCIA, P.E. DATE

STATE OF TEXAS
EDUARDO GARCIA
116865
LICENSED
PROFESSIONAL ENGINEER

DocuSigned by: Eduardo Garcia 2CD511274A5948C...

024

Texas Department of Transportation

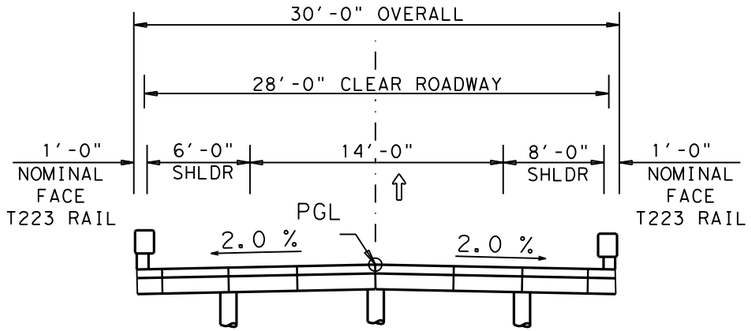
US 290

INDEX OF SHEETS

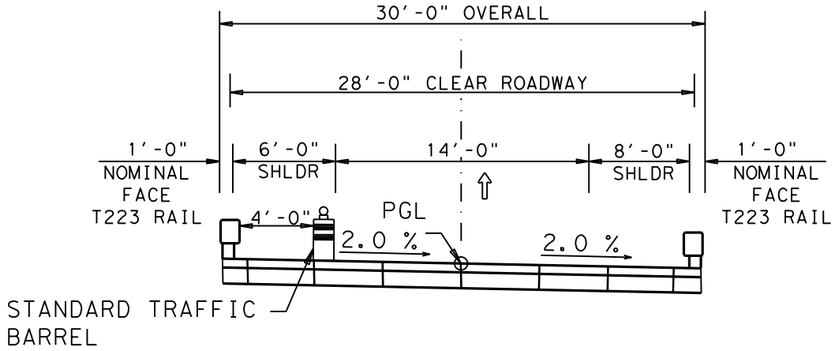
SHEET 1 OF 1

CONT	SECT	JOB	HIGHWAY
0114	01	068	US 290

DIST	COUNTY	SHEET NO.
AUS	TRAVIS	2



TYPICAL SECTION
EXISTING DIRECT CONNECTOR



TYPICAL SECTION
IH 35 SOUTHBOUND EXIT RAMP

STATE OF TEXAS
EDUARDO GARCIA
116865
LICENSED
PROFESSIONAL ENGINEER

DocuSigned by:
Eduardo Garcia
2CD511274A5948C...
8/7/2023

Texas Department of Transportation

US 290

TYPICAL SECTION

SHEET 1 OF 1

CONT	SECT	JOB	HIGHWAY
0114	01	068	US 290
DIST	COUNTY		SHEET NO.
AUS	TRAVIS		3

DATE: 8/1/2023 12:09:19 PM
FILE: pw://txdot.projectwiseonline.com:TxDOT4/Documents/14 - AUS/Design Projects/0114010684 - Design/Plan Set/1. General/US290 TYPICAL SECTION.dgn

GENERAL NOTES: Version: September 5, 2024

GENERAL
Contractor questions and requests for documents on this project are to be addressed to the following individual(s):

North Austin Matthew.Kelly@txdot.gov
North Austin Kevin.Mackan@txdot.gov

Questions and requests for documents will be accepted via the Letting Pre-Bid Q&A web page. All questions and any corresponding responses that are generated will be posted through the same Letting Pre-Bid Q&A web page. This webpage can be accessed from the Notice to Contractors dashboard located at the following Address:
https://tableau.txdot.gov/views/ProjectInformationDashboard/NoticetoContractors

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

References to manufacturer's trade name or catalog numbers are for the purpose of identification only. Similar materials from other manufacturers are permitted if they are of equal quality, comply with the specifications for this project, and are approved.

If work is performed at Contractor's option, when inclement weather is impending, and the work is damaged by subsequent precipitation, the Contractor is responsible for all costs associated with replacing the work, if required.

The roadbed will be free of organic material prior to placing any section of the pavement structure.

Contact the supervisor for the passenger facility at Capital Metro and request the relocation of Capital Metro signs. Contact the supervisor at (512) 385-0190.

Equip all construction equipment used in roadway work with highly visible omnidirectional flashing warning lights.

Intelligent Transportation Systems (ITS) Infrastructure may exist within the limits of this project and that the system must remain operational throughout construction. The exact location of ITS Infrastructure is not known. Contact the TxDOT Area Engineer's or Inspection Team's Office for the location(s) at least 72 hours before commencing any work that might affect present ITS Infrastructure. In the event of system damage, notify TxDOT/CTECC at (512) 974-0883 within one hour of occurrence. Refer to Item 6000 for additional details.

Provide a smooth, clean sawcut along the existing asphalt or concrete pavement structure, as directed. Consider subsidiary to the pertinent Items.

Supply litter barrels in enough numbers at locations as directed to control litter within the project. Consider subsidiary to pertinent Items.

Keep the roadway free of debris and sediment caused by construction activities. Dispose of all material in accordance with federal, state, and local regulations. This work is subsidiary.

All locations used for storing construction equipment, materials, and stockpiles of any type, within the right of way, will be as directed. Use of right of way for these purposes will be restricted to those locations where driver sight distance to businesses and side street intersections is not obstructed and at other locations where an unsightly appearance will not exist. The Contractor will not have exclusive use of right of way but will cooperate in the use of the right of way with the city/county and various public utility companies as required.

Coordinate and obtain approval for all bridgework over existing roadways.

Bridge Vertical Clearance and Traffic Handling.
Notify TxDOT project staff and the local bridge engineer 10 business days prior to the following: change in vertical clearance, placing beams/girders over traffic, opening or removing traffic from a bridge or portion of a bridge, and completion of bridge work. This requirement includes bridge class culverts. Provide vertical clearance for all structures (including signal mast arms, span wires, and overhead sign bridge structures) within the project limit. Submit information and notices to local bridge engineer at AUS_BRG_Notify@txdot.gov.

During evacuation periods for Hurricane events the Contractor will cooperate with Department for the restricting of Lane Closures and arranging for Traffic Control to facilitate Coastal Evacuation Efforts.

ITEM 2 – INSTRUCTIONS TO BIDDERS
This Contract includes non-site specific work. Multiple work orders will be used to procure work of the type identified in the Contract at locations that have not yet been determined.

ITEM 5 – CONTROL OF THE WORK
Place construction or silt fence 2 ft. inside TxDOT ROW along the Railroad ROW. If work is to be performed inside the Railroad ROW, then the Contractor will coordinate with the Railroad for a Railroad Flagger. This work is subsidiary.

Obtain and maintain compliance with additional training requested by UPRR "Property Access Training".

Place construction stakes at intervals of no more than 100 ft. This work is subsidiary.

Provide a 72 hour advance email notice to AUS_Locate@TxDOT.gov to request illumination, traffic signal, ITS, or toll equipment utility locates. Provide AUS_Locate@TxDOT.gov an

electronic pdf of as-builts within 21 calendar days of illumination, traffic signal, ITS, or toll equipment being placed into operation. As-built shall include GPS coordinates of manholes and junction boxes. Include final version of RFI's and revised plan sheets.

Precast Alternate Proposals.
When a precast or cast-in-place concrete element is included in the plans, a precast concrete alternate may be submitted in accordance with "Standard Operating Procedure for Alternate Precast Proposal Submission" found online at Alternate Precast Proposal Submission (txdot.gov). 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.

Electronic Shop Drawing Submittals.
Submit electronic shop drawing submittals according to the current Guide to Electronic Shop Drawing Submittal which can be found online at,
https://www.txdot.gov/business/resources/highway/bridge/shop-drawing-submittal-cycle.html.

Pre-approved producers can be found online at,
https://www.txdot.gov/business/resources/materials/material-producer-list.html.

Use the following contact list for all submittals that are not required to be sent to Bridge Division and to copy the Engineer for all submittals to the Bridge Division.

Submittal Contact List

North Austin	Matthew.Kelly@txdot.gov	AUS_NA-ShopReview@txdot.gov

ITEM 6 - CONTROL OF MATERIALS
Give a minimum of 1 business day notice for materials, which require inspection at the Plant.

For structures with paint containing hazardous materials, provide locations of material removal 60 days prior to begin removal. For metal elements to be removed, mechanical shear or unbolting for removal and disposal does not require paint abatement but requires 60-day advance notice.

For Federally Funded Contracts, comply with the latest provisions of Build America, Buy America Act (BABA Act) of the Bipartisan Infrastructure Law, by submitting an 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, located at the following link, for clarification on material categorization Buy America material classification sheet (txdot.gov)

Storage of Material Near Structures
Do not store equipment or flammable material within 100 ft. of bridges, culverts, or near their openings (portals). Flammable materials include all material that is not metal or aluminum.

ITEM 7 – LEGAL RELATIONS AND RESPONSIBILITIES
Roadway closures during key dates, significant traffic generators, and/or special events are prohibited. See notes for Item 502 for the key dates and/or special events.

Refer to the Environmental Permits, Issues and Commitments (EPIC) plan sheets for additional requirements and permits.

Perform maintenance of vehicles or equipment at designated maintenance sites. Keep a spill kit on-site during fueling and maintenance. This work is subsidiary.

Suspend all activities near any significant recharge features, such as sinkholes, caves, or any other subterranean openings that are discovered during construction or core sampling. Do not proceed until the designated Geologist or TCEQ representative is present to evaluate and approve remedial action.

Locate aboveground storage tanks kept on-site for construction purposes in a contained area as to not allow any exposure to soils. The containment will be sized to capture 150% of the total capacity of the storage tanks.

DSHS Asbestos and Demolition Notification.
Complete and provide the Texas Department of State Health Services (DSHS) notification form to the Engineer and email to AUS_BRG_Notify@txdot.gov at least 30 calendar days prior to bridge removal or renovation for each phase or step of work. Notify the Engineer via email of any changes to the work start and end dates.

Tree and Brush Trimming and Removal.
Work will be conducted September 16 thru February 28. Work conducted outside this timeframe will require a bird survey. Submit a survey request to TxDOT 30 business days prior to begin work.

If within the removal time period, removal work may be conducted during delayed start period using proper traffic control per TCP standards.

Upon begin removal operations, all removal work for the project must be completed within 21 calendar days. Completion of removal includes removing from ROW or mulching of all debris.

No extension of time or compensation will be granted for a delay or suspension due to the above bird, bat, and tree/brush requirements.

Law Enforcement Personnel.
Submit charge summary and invoices using the Department forms.

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.

No payment will be made for law enforcement personnel needed for moving equipment or payment for drive time to/from the event site. A minimum number of hours is not guaranteed. Payment is for work performed. If the Contractor has a field office, provide an office location for a supervisory officer when event requires a supervising officer. This work is subsidiary.

A maximum combined rate of $85 per hour for the law enforcement personnel and the patrol vehicle will be allowed. Any scheduling fee is subsidiary per Standard Specification 502.4.2.

Cancel law enforcement personnel when the event is canceled. Cancellation, minimums or "show up" fees will not be paid when cancellation is made 12 hours prior to beginning of the event. Failure to cancel within 12 hours will not be cause for payment for cancellation, minimums, or "show up" time. Payment of actual "show up" time to the event site due to cancellation will be on a case-by-case basis at a maximum of 2 hours per officer.

Alterations to the cancellation and maximum rate must be approved by the Engineer or pre-determined by official policy of the officer's governing authority.

Back Up Alarm.
For hours 9 P to 5 A, utilize a non-intrusive, self-adjusting noise level reverse signal alarm. This is not applicable to hotmix or seal coat operations. This is subsidiary.

ITEM 8 – PROSECUTION AND PROGRESS
The sequence of work shown on the plans demonstrates a volume of work available in each phase of construction that will ensure the Contractor is not impacted by the unclear ROW, railroad, and utilities. Work in concurrent phases or a deviation from the sequence of work shown on the plans must be approved by the Engineer.

Electronic versions of schedules will be saved in Primavera P6 format.

Working days will be charged in accordance with 8.3.1.4, "Standard Workweek."

A CPM schedule in Primavera format and a PSSR is required. Use software fully compatible with Primavera P6.

ITEM 100 - PREPARING RIGHT OF WAY
Prep ROW must not begin until accessible trees designated for preservation have been protected, items listed in the EPIC have been addressed, and SW3P controls installed in accessible areas.

Backfill material will be Type B Embankment using ordinary compaction.

Follow Item 752.4 Work Methods and Item 752 general notes when removing or working on or near trees and brush.

Unless shown otherwise in the plans or a designated non-mow area, perform trimming or removal for areas within 30 ft. of edge of pavement under construction. Trim or remove to provide minimum of 5 ft. of horizontal clearance and 7 ft. of vertical clearance for the following: sidewalks, paths, guard fence, rails, signs, object markers, and structures. Trim to provide a minimum of 14 ft. vertical clearance under all trees. This work is subsidiary.

ITEM 400 - EXCAVATION AND BACKFILL FOR STRUCTURES
Unless otherwise shown on the plans, for cutting and restoring pavement use the AUS District Flexible Pavement Details found at www.txdot.gov/about/districts/austin-district/district-standards.html.

Saw-cut the pavement at the edge of the excavation. This work is subsidiary.

Backfill the bridge ends in accordance with the limits shown on TxDOT "CSAB" Standard. Use material in accordance with "CSAB" or Item 423, Type BS. The "CSAB" optional bond breaker materials are allowed. This work is subsidiary.

ITEMS 420, 425, 441, & 462 - STRUCTURES
Bridge Vertical Clearance and Traffic Handling.
Notify TxDOT project staff and the local bridge engineer 10 business days prior to the following: change in vertical clearance, placing beams/girders over traffic, opening, or removing traffic from a bridge or portion of a bridge, and completion of bridge work. This

requirement includes bridge class culverts. Provide vertical clearance for all structures (including signal mast arms, span wires, and overhead sign bridge structures) within the project limit. Submit information and notices to local bridge engineer at AUS_BRG_Notify@txdot.gov.

ITEM 420 – CONCRETE SUBSTRUCTURES
Do not use PMDF in areas where a "Free Joint" is indicated in the plans.

Check the sign plans for locations of clearance signs and brackets on structures, which will require inserts in the pre-stressed beams.

Where Retaining Walls are integral parts of the abutment header, do not place the abutment cap prior to backfilling the wall and the abutment area up to the elevation of the bottom of the abutment cap.

Mass placements are defined as placements with a least dimension greater than or equal to 5 ft. or designated elsewhere on the plans.
The "H" values shown on Bridge Layouts are estimated column heights. Calculate the actual column heights based on field conditions.

Perform work during good weather unless otherwise directed. If work is performed at Contractor's option, when inclement weather is impending, and the work is damaged by the weather, the Contractor is responsible for all costs associated with repairs/replacement.

Upon completion of the structure, stencil the National Bridge Inventory (NBI) number (structure number) using black paint and 4 in. tall numbers at 4 locations designated by TxDOT. This work is subsidiary.

Bonding agents are required at construction joints. Do not use membrane curing for structural concrete as defined in Item 421, Table 8.

Remove all loose Formwork and other Materials from the floodplain or drainage areas daily.

ITEM 424 - PRECAST CONCRETE STRUCTURAL MEMBERS (FABRICATION)
Submit shop drawings for the following non-stressed members:

ITEM 427 - SURFACE FINISHES FOR CONCRETE
Provide a rub finish to Surface Area I.

Color coatings may be applied using concrete paint or opaque sealer.

ITEM 429 - CONCRETE STRUCTURE REPAIR
Use the following types of repair materials:
Horizontal and Vertical

ITEM 434 - BRIDGE BEARINGS
Fabricate bearings (or special components) in accordance with Item **4002**.

ITEM 454 - BRIDGE EXPANSION JOINTS
Apply protection System II in accordance with Item 446 to armor joint.
For Header-Type Expansion Joints, go to the following TxDOT website for approved systems:
https://www.txdot.gov/inside-txdot/division/bridge/approved-systems/expansion-joints.html
http://ftp.dot.state.tx.us/pub/txdot-info/cmd/mpl/polyconc.pdf

For Asphalt-Plug Expansion Joints, go to the following TxDOT website for approved systems:
https://www.txdot.gov/inside-txdot/division/bridge/approved-systems/expansion-joints.html

http://ftp.dot.state.tx.us/pub/txdot-info/cmd/mpl/jtsealrs.pdf

ITEM 502 - BARRICADES, SIGNS, AND TRAFFIC HANDLING

Table 1

Roadway	Limits	Allowable Closure Time
IH 35	All (1 lane closed)	9 P to 5 A
IH 35	All (2 lanes closed, see allowable work below)	9 P to 5 A
IH 35	All (2 lanes closed, all work)	11 P to 5 A
US 290 E	IH 35 to SH 95	8 P to 5 A
All	Within 200' of a signalized intersection	9 P to 5 A
All	All (Full Closure, see allowable work below)	11 P to 4 A
DC K	IH 35 SB to US 290 EB DC	8 P to 7 A
DC M	US 290 WB to IH 35 SB DC	8 P to 6 A
DC Y	IH 35 NB to US 290 EB DC	9 P to 7 A
DC Z	US 290 EB to IH 35 SB DC	8 P to 6 A
All DC's		FRI 9 P to SAT 10 A
All DC's		SAT 9 P to SUN 11 A

Table 3 (Mobile Operations)

Roadway	Allowable Sun Night thru Fri Noon	Allowable Sat thru Sun Morn
Within Austin City Limits	10 A to 2 P and 7 P to 6 A	7 P to 10 A
Outside Austin City Limits	9 A to 3 P and 7 P to 7 A	6 P to 11 A
IH 35 main lanes	10 P to 5 A	9 P to 9 A
AADT over 50,000	8 P to 6 A	8 P to 10 A

For roadways without defined allowable closure times, nighttime lane closures will be allowed from 8 P to 6 A.

Work shall not be permitted over live traffic.

Daytime or Friday night lane closures will not be allowed unless otherwise shown on the plans. One lane in each direction will remain open at all times for all roadways unless otherwise shown on the plans.

No closures will be allowed on the weekends, working day prior, and working day after the National Holidays defined in the Standard Specifications, Good Friday, and Easter weekend.

No closures will be allowed 1 P.M. to 11 P.M. the Sunday of the Super Bowl.

Time charges will not be suspended during the large and special events listed below. These events are provided in the contract to allow scheduling of work around these lane closure restrictions.

All lanes will be open by noon of the day before the large events listed in below table. No closures will be allowed on Friday and the weekends for projects within 20 miles of these large events:

Table 4 (Large Events)

Event	City	Dates
Formula 1 @ COTA	Austin	Annually (See Event Website)
Moto GP @ COTA	Austin	Annually (See Event Website)
ACL Fest	Austin	Annually (See Event Website)
SXSW	Austin	Annually (See Event Website)
ROT Rally	Bastrop	Annually (See Event Website)
UT Football Games	Austin	Annually (See Event Website)
Sales Tax Holiday	All	Annually (See Event Website)
Rodeo Austin	Austin	Annually (See Event Website)

All lanes will be open by noon of the day before the special events listed in below table. No closures will be allowed on Friday and the weekends for projects within 10 miles of these special events:

Table 5 (Special Events)

Event	City	Dates
Eaker BBQ Competition	Fredericksburg	March 10, 2024
Sherwood Forest Faire	McDade / Paige	Weekends in March and April
Smithville Jamboree	Smithville	April 4-6, 2024
Two Step Inn	Georgetown	April 20-24, 2024
Wiener Dog Races	Buda	April 27-28, 2024
Founders Day Festival	Dripping Springs	April 26-28, 2024
Red Poppy Festival	Georgetown	April 26-28, 2024
Crawfish Open	Llano	3rd Friday and Saturday in April
Fair and Rodeo	Liberty Hill	May 18, 2023
Founders Day Ceremony	Fredericksburg	2nd Weekend in May
Crawfish Festival	Fredericksburg	Saturday before Memorial Day
Lakefest Boat Races	Marble Falls	June 10-11, 2023
Watermelon Thump	Luling	Last Full Weekend in June
Pie in the Sky	Kyle	Sept 1-2, 2023
Wine and Music Festival	Georgetown	Last Saturday of September
Deer Season Opening Weekend	All Counties in Burnet Area Office	1st Friday and Saturday of Season
Christmas Nights of FBG Lights	Fredericksburg	Nov 21, 2023
Christmas on Mercer	Dripping Springs	Dec 2, 2023
Lady of Guadalupe Procession	Fredericksburg	Dec 12, 2023
Texas State Graduation Fall	San Marcos	TBD
Texas State Graduation Spring	San Marcos	TBD

All the large and special events listed in the above tables occur annually. Coordinate with the Department and review the city/event website to plan around the future events.

To account for directional traffic volumes, begin and end times of closures may be shifted equally by the Engineer. The closure duration will remain. Added compensation is not allowed. One-way traffic control, including work performed under Item 510, must be set up to provide a maximum of 20 minutes of delay to the traveling public.

Submit an emailed request for a lane closure (LCN) to TxDOT. The email will be submitted in the format provided. Receive concurrence prior to implementation. Submit a cancellation of lane closures a minimum of 18 hours prior to implementation. Blanket requests for extended periods are not allowed. Max duration of a request is 2 weeks prior to requiring resubmittal. Provide 2-hour notice prior to implementation and immediately upon removal of the closure.

For roadways listed in Table 1: Submit the request 96 hours prior to implementation.

For roadways not listed in Table 1: Submit the request a minimum of 48 hours prior to the closure and by the following deadline immediately prior to the closure: 11A on Tuesday or 11A on Friday.

For all roadways: Submit request for traffic detours and full roadway closures 168 hours prior to implementation. Submit request for nighttime work 96 hours to implementation date.

Cancellations of accepted closures (not applicable to full closures or detours) due to weather will not require resubmission in accordance with the above restrictions if the work is completed during the next allowable closure time.

Closures that conflict with adjacent contractor will be prioritized according to critical path work per latest schedule. Conflicting critical path or non-critical work will be approved for first LCN submitted. Denial of a closure due to prioritization or other reasons will not be reason for time suspension, delay, overhead, etc.

Meet with the Engineer prior to lane closures to ensure that sufficient equipment, materials, devices, and workers will be used. Take immediate action to modify current and future traffic control, if at any time the queue becomes greater than 20 minutes.

Consider inclement weather prior to implementing the lane closures. Do not set up traffic control when the pavement is wet.

Cover, relocate, or remove existing small, large, and overhead signs that conflict with traffic control. Cover large and overhead signs to remain using latest standard TS-CD. This work is subsidiary.

Install all permanent signs, delineation, and object markers required for the operation of the roadway before opening to traffic. Use of temporary mounts is allowed or may be required until the permanent mounts are installed or not impacted by construction. Maintain the temporary mounts. This work is subsidiary.

Place a 28-inch cone, meeting requirements of BC (10) and Ty III barricades, on top of foundations that have protruding studs. This work is subsidiary.

Vertical panels used on roadways with speed limit 55mph or greater must be round in shape or have a self-righting mechanism. The “flat” or “oblong” shaped vertical panels are not allowed.

A series of sequential flashing warning lights, per BC(7), must be installed in a merging taper for long term stationary TCP. This includes all TCP setups, such as those shown on the plans or TCP setups per the standards.

Edge condition treatment types must be in accordance with the TxDOT standard. Installation and removal of a safety slope is subsidiary.

To determine a speed limit or an advisory speed limit, submit a request to TxDOT 60 business days prior to manufacture of the sign.

For non-site-specific signal projects, 2 months of barricades will be paid per work order location.

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.

ITEM 506 - TEMPORARY EROSION, SEDIMENTATION, AND ENV CONTROLS
If SW3P plan sheets are not provided, place the control measures as directed.

Install, maintain, remove control measures in areas of the right of way utilized by the Contractor that are outside the limits of disturbance required for construction. Permanently stabilize the area. This work is subsidiary.

Erosion control measures must be initiated immediately in areas where construction activities have ceased and will not resume for a period exceeding 14 calendar days. Vertical track all exposed soil, stockpiles, and slopes. Re-track after each rain event or every 14 days, whichever occurs first. Sheep foot roller is allowed for vertical tracking. This work is subsidiary.

For routine or anticipated dewatering, notify the engineer 72 hours before beginning dewatering. Notify the Engineer within 1 hour of beginning emergency or recent rainfall dewatering. Water located within the ROW that will leave the ROW must appear free of pollutants such as suspended sediment, oil sheen, floating solids, etc. Dirty water must pass thru adequate BMPs prior to leaving the ROW to prevent discharge of dirty water. Bypass pumping of water found in a navigable waterway that enters from outside the ROW and is discharged downstream of the ROW will not require the use of BMPs. Dewatering BMPs will be paid for in conformance with the applicable bid items. However, if the necessary BMP item is not included in the Contract, payment for the BMP will be in accordance with Article 9.7., “Payment for Extra Work and Force Account Method.” The act of dewatering and the equipment used to dewater will not be paid for directly but will be subsidiary to pertinent bid items.

Unless a specific pay item is provided in the plans, the installation of the 6:1 or flatter for RFD side slopes in the safety zone will be subsidiary to pertinent bid items.

Cover small waste containers (100 gallons or less) at all times. This work is subsidiary. Large waste containers (more than 100 gallons) must have a secondary discharge containment system around the container using erosion control logs. Installation of the log for each container location will be paid using existing bid items. Repair, remove, or replace of the log will not be paid. Revisions, repairs, remove or replace of the log during exchange of empty/full containers at the same location will not be paid.

Portable restrooms must be located more than 50 ft. from a waterway. Tie or stake down portable restrooms to prevent tipping due to vandalism or weather. This work is subsidiary.

Provide a designated location for disposal when excess and waste, including waste generated from cleaning of all equipment used for mixing, hauling, and transfer concrete is disposed in the ROW or PSL. Manufactured disposal containers must be metal or a plastic material with

minimum 10 mil thickness. Paper, earthen berms, or pits must be lined with minimum 10 mill thickness polyethylene sheeting. Disposal locations must be located a minimum of 50 ft. from a waterway, tree, or sensitive feature. The disposal location must have a minimum height of 6 in. Maintain a minimum 4 in. of freeboard at all times. Disposal locations are not required for cleaning of small hand tools. Hardened concrete waste may be used as embankment if placed in accordance with Item 132.

Dust Control
Stockpiles that will be inactive for greater than 14 days must be treated to contain dust by covering with chemical dust suppressant, soil blanket, vertical tracking, or method other than sprinkling with water. Stockpiles that are actively being used must be treated to contain dust by vertical tracking or a method determined by the Contractor. This work is subsidiary.

Provide designated construction traffic routes when feasible. Construction site traffic must be directed to use designated routes.

ITEMS 600s & 6000s – ITS, TOLLING, LIGHTING, SIGNING, MARKINGS, AND SIGNALS

Meet the requirements of the NEC, Texas MUTCD, TxDOT standards, and TxDOT Standard Specifications. Notify the Engineer if existing elements to remain do not meet code or specification.

Provide all service, equipment and material required to provide a functional item and interface with existing equipment and software.

For signals and illumination contact Robert Bolin (Robert.Bolin@txdot.gov) and Kevin Plumlee (Kevin.Plumlee@txdot.gov).

For ITS contact Doug Turner (Douglas.L.Turner@txdot.gov) and Kevin Plumlee (Kevin.Plumlee@txdot.gov).

Use the TxDOT provided form to submit an electrical, illumination, and signal checklist prior to request for signal activation or a punch list.

Provide a 14-day advance email notice to the Engineer to request illumination or traffic signal punch list inspection.

All items must be completed per the plans prior to traffic signal activation including deficiencies found in the punch list.

Provide a 14-day advance notice prior to planned traffic signal activation. Send notice by email to Kevin.Plumlee@txdot.gov, Robert.Bolin@txdot.gov, Rick.Thomas@txdot.gov, Gabriela.Perales@txdot.gov, and the Project Engineer.

The contractor must have a qualified technician and a representative from the controller and detection supplier on the project site to place the traffic signals in operation.

For existing traffic signals, provide a 14-day advance email notice to the Engineer with Contractor signal technician contact information and signal locations prior to working or assuming operations of illumination or traffic signal.

Provide a 60-day advance email notice to the Engineer to request signal timing if timing is not provided in the plans.

Provide a 180-day advance email notice to the Engineer for equipment to be provided by TxDOT.

Provide equipment that requires TxDOT programming, etc. to TxDOT 180 days in advance.

Prior to relief of maintenance, a Test Period is required for signals and ITS equipment in accordance with Item 680.3.1.7. Response time to reported trouble calls shall be less than 2 hours.

Complete repairs within 24 hours. Notify the Engineer and maintain a logbook in the controller cabinet of each trouble call. Do not clear the error log in the conflict monitor without approval.

Maintain the existing ITS equipment and keep HUB buildings operational during construction. ITS downtime is allowed from 12A to 4A and must be approved in advance by the Engineer. Submit the request 7 days prior to planned outage. Downtime is restricted to one time per HUB or equipment.

Definitions of abbreviations used to designate ITS equipment, material, etc. can be provided by the Engineer.

Provide email notice to TxDOT and toll road owner 60 business days prior to begin work that impacts tolling equipment. Attend a pre-construction meeting with TxDOT and toll road owner prior to begin work.

Coordinate with toll road owner during construction that impacts or installs tolling equipment. Toll owner will assist with inspection to ensure tolling equipment will operate correctly. Provide email notice to TxDOT and toll road owner 30 business days in advance of completion of toll equipment work. Once toll equipment work is complete, allow 60 calendar days for toll road owner to complete their portion of the work and testing.

Stakes or other physical method shall be installed to hold down conduit prior to placement of concrete/flow fill encasement.

Minimum distance between HDPE joints will be 200 ft.

For conduit mounted to bridges in hangers, fiberglass can be substituted for RMC only when the height between the conduit and ground is greater than 8 feet. Furnish and install per Special Specification 6xxx.

ITEM 618 - CONDUIT
Shift the locations of conduit and ground boxes to accommodate field conditions. Install conduit not exceeding 2 feet in any direction from a straight line. Install conduit at a minimum depth of 2 ft. below finished grade. Installation of the conduit by jacking or boring method will be at a depth of at least 1 ft. below subgrade.

Install a high tension, non-metallic pull rope in all empty conduit runs. This work is subsidiary. Use a coring device, not a hammer drill, when drilling holes through concrete structures.

Structurally mounted junction boxes will be as shown on the plans. When used for traffic signal installations, these boxes will be 12" x 12" x 8". This work is subsidiary.

For underground conduit, smooth wall schedule 40 equivalent HDPE can be substituted for schedule 40 PVC. For SCH 80 bore conduits, a schedule 40 equivalent HDPE carrier pipe of adequate size to carry the proposed conduits can be used as substitute. HDPE must transition to RMC/PVC per ED (11)-14.

When using existing conduit, ensure that all conduits have bushings and cleaned of dirt, mud, grease, and other debris. Re-strap existing or relocated conduit per the specification. This work is subsidiary.

Abandoned underground conduit must have all conductors removed.

ITEM 644 – SMALL ROADSIDE SIGN ASSEMBLIES
Triangular slip base must be the clamp style to secure the post to the slip base. Set screw style slip base will not be allowed.

ITEM 752 – TREE AND BRUSH REMOVAL
Follow Item 752.4 Work Methods and Item 752 general notes when removing or working on or near trees and brush even if Item 752 is not included as a pay item.

Flailing equipment is not allowed. Burning brush is not allowed in urban areas or on ROW. Use hand methods or other means of removal if doing work by mechanical methods is impractical.

Prior to begin tree pruning, send email confirmation to the Engineer that training and demonstration of work methods has been provided to the employees. This work is subsidiary.

Shredded vegetation may be blended, at a rate not to exceed 15 percent by volume, with Item 160 if the maximum dimension is not greater than 2 in.

ITEM 6001 – PORTABLE CHANGEABLE MESSAGE SIGN
Provide 3 PCMS. Provide a replacement within 12 hours. PCMS will be available for traffic control, event notices, roadway conditions, service announcements, etc.
Place PCMS 10 calendar days prior to begin work stating “Road Work Begin Soon, Contact 832-7000 For Info”.
Place PCMS at time of LCN request. Place the PCMS at the expected end of queue caused by the closure. When the closure is active, revise the message to reflect the actual condition during the closure, such as “RIGHT LN CLOSED XXX FT”.

ITEM 6185 – TRUCK MOUNTED ATTENUATOR AND TRAILER ATTENUATOR
The TMA/TA used for installation/removal of traffic control for a work area will be subsidiary to the TMA/TA used to perform the work.
The contractor will be responsible for determining if one or more operations will be ongoing at the same time to determine the total number of TMA/TA required for the work. TMA/TAs paid by the day is full compensation for all worksite locations during an entire day.
TMA/TAs used to protect damaged attenuators will be paid by the day using the force account item for the repair.

Estimate & Quantity Sheet

CONTROLLING PROJECT ID 0114-01-068 **DISTRICT** Austin **COUNTY** Travis
HIGHWAY US 290

			CONTROL SECTION JOB		**0114-01-068**	TOTAL EST.	TOTAL FINAL
			PROJECT ID		**A00197898**		
			COUNTY		**Travis**		
			HIGHWAY		**US 290**		
ALT	**BID CODE**	**DESCRIPTION**	**UNIT**	EST.	FINAL		
	100-6001	PREPARING ROW	AC	0.150		0.150	
	422-6023	SHEAR KEY	CY	1.000		1.000	
	427-6005	BLAST FINISH	SF	3,600.000		3,600.000	
	427-6008	SURFACE WATERPROOFING FINISH	SF	11,060.000		11,060.000	
	428-6001	PENETRATING CONCRETE SURFACE TREATMENT	SY	1,350.000		1,350.000	
	429-6007	CONC STR REPAIR (VERTICAL & OVERHEAD)	SF	23.000		23.000	
	429-6014	CONC STR REPR(REMOVE AND REPL PEDESTAL)	CY	1.000		1.000	
	500-6001	MOBILIZATION	LS	1.000		1.000	
	502-6001	BARRICADES, SIGNS AND TRAFFIC HANDLING	MO	3.000		3.000	
	506-6042	BIODEG EROSN CONT LOGS (INSTL) (18")	LF	1,000.000		1,000.000	
	506-6043	BIODEG EROSN CONT LOGS (REMOVE)	LF	1,000.000		1,000.000	
	618-6062	CONDT (RM) (3/4")	LF	1.000		1.000	
	644-6004	IN SM RD SN SUP&AM TY10BWG(1)SA(T)	EA	1.000		1.000	
	644-6065	IN BRIDGE MNT CLEARANCE SGN ASSM(TY S)	EA	1.000		1.000	
	740-6001	GRAFFITI REMOVAL (BLAST CLEANING)	SF	360.000		360.000	
	764-6001	DRAIN INLET CLEANING	EA	18.000		18.000	
	764-6004	DOWNSPOUT CLEANING	EA	18.000		18.000	
	778-6001	CONCRETE RAIL REPAIR (IN-KIND)	LF	18.000		18.000	
	778-6002	CONCRETE RAIL REPAIR (MISC)	LF	3.000		3.000	
	778-6075	CONC RAIL REPAIR(REMOVE AND REPL RAIL)	LF	15.000		15.000	
	784-6033	REP STL BRIDGE MEMBER (TIGHTEN MEMBER)	EA	3.000		3.000	
	784-6072	REP STL BRDG MEMB (WELD REPAIR)	EA	1.000		1.000	
	785-6005	BRIDGE JOINT REPAIR (SEJ)	LF	116.000		116.000	
	4002-6001	REPLACE ELASTOMERIC BEARING PADS	EA	19.000		19.000	
	4002-6002	REPLACE ELASTOMERIC BEARING PADS (LARGE	EA	4.000		4.000	
	6001-6002	PORTABLE CHANGEABLE MESSAGE SIGN	EA	4.000		4.000	
	6185-6002	TMA (STATIONARY)	DAY	76.000		76.000	
	6185-6005	TMA (MOBILE OPERATION)	DAY	76.000		76.000	
	18	EROSION CONTROL MAINTENANCE: CONTRACTOR FORCE ACCOUNT WORK (PART)	LS	1.000		1.000	
		LAW ENFORCEMENT: CONTRACTOR FORCE ACCOUNT WORK (PARTICIPATING)	LS	1.000		1.000	
		SAFETY CONTINGENCY: CONTRACTOR FORCE ACCOUNT WORK (PARTICIPATING)	LS	1.000		1.000	
		RAILROAD FLAGGING: CONTRACTOR FORCE ACCOUNT WORK (PARTICIPATING)	LS	1.000		1.000	

SUMMARY OF MOBILIZATION ITEMS					
LOCATION	100 6001	502 6001	6001 6002	6185 6002	6185 6005
	PREPARING ROW	BARRICADES, SIGNS AND TRAFFIC HANDLING	PORTABLE CHANGEABLE MESSAGE SIGN	TMA (STATIONARY)	TMA (MOBILE OPERATION)
	AC	MO	EA	DAY	DAY
	0.15	3.0	4	76	76
PROJECT TOTALS	0.15	3.0	4	76	76

SUMMARY OF EROSION CONTROL ITEMS		
LOCATION	506 6042	506 6043
	BIODEG EROSN CONT LOGS (INSTL)(18")	BIODEG EROSN CONT LOGS (REMOVE)
	LF	LF
US 290 WB TO IH 35 SB DIRECT CONNECTOR	1000	1000
IH 35 SB TO US 290 EB DIRECT CONNECTORS	300	300
IH 35 NB TO US 290 EB DIRECT CONNECTORS	480	480
US 290 EB TO IH 35 SB DIRECT CONNECTOR	300	300
PROJECT TOTALS	1000*	1000*

* EROSION CONTROL LOGS CAN BE REUSED AND MOVED AROUND TO CONSTRUCTION LOCATIONS.

SUMMARY OF SIGNING ITEMS		
LOCATION	644 6004	644 6065
	IN SM RD SN SUP&AM TY10BWG(1)SA(T)	IN BRIDGE MNT CLEARANCE SGN ASSM(TY S)
	EA	EA
	1	1
PROJECT TOTALS	1	1

Texas Department of Transportation

US 290

SUMMARY OF QUANTITIES

CONT	SECT	JOB	HIGHWAY
0114	01	068	US 290
DIST	COUNTY		SHEET NO.
AUS	TRAVIS		7

SEQUENCE OF WORK

Contractor will be responsible for providing security for the safety of employees and control of the work at the site from properly licensed organization/personnel, this shall be subsidiary to the contract. TxDOT is not responsible for any equipment or material stolen or damaged. It is encouraged that prospective bidders perform a field inspection of the site before bidding on the project. Use a concrete design that will provide concrete strength as shown on the plans prior to opening to traffic. Open to traffic in accordance to the time as shown on the plans. Direct Connectors to be closed starting Friday 9 pm thru Monday 6 am for weekend work.

Phase 0

Install erosion control devices as directed by the Engineer.

Install work zone signs.

Phase 1

Week-end closure of IH35 SB to US290 EB is allowed for full direct connector repair.

Install traffic control devices and PCMS according to the TxDOT Traffic Control Standards prior to closure of the direct connector exit ramp. Detour traffic will exit at IH 35 North ramp. Detour signs to be placed directing IH 35 SB traffic to turn left at IH 35/US 290 intersection. Traffic will head south and enter IH 35 SB south of E. 51st St.

Remove section of concrete rail if needed as directed by the Engineer.

Remove vegetation to provide access beneath the bridge

Concrete Work

Power wash beams

Remove damaged concrete from beams

Concrete rail repair

Clean and Seal Joints

Downspout cleaning bents 10M repair

Repair steel bridge member

Clean and seal joints on bridge deck

Phase 2

Week-end closure of US290 WB DC to IH35 SB DC is allowed for full direct connector repair.

Install traffic control devices and PCMS according to the TxDOT Traffic Control Standards prior to closure of the direct connector exit ramp. Detour traffic will exit at Airport Blvd exit ramp. Detour signs to be placed directing IH 35 SB traffic to continue thru the Airport Intersection on to IH 35/US 290 intersection, and turn right at the intersection. Traffic will head south and enter IH 35 SB south of E. 51st St. IH 35 SB exit ramp (51st Exit Ramp) traffic to be shifted according to the IH 35 SB exit ramp typical section.

Remove section of concrete rail if needed as directed by the Engineer.

Concrete Work

Concrete rail repair (IN -KIND)

Concrete structure repair

Repair steel bridge member

Infill beam ends with UHPC

Replace Elastomeric bearings pads

Clean and Seal Joints

Power wash beams

Clean and seal joints on bridge deck

Phase 3

Week-end closure of IH35 NB FR to US290 EB is allowed for full direct connector repair.

Install traffic control devices and PCMS according to the TxDOT Traffic Control Standards prior to closure of the direct connector exit ramp. Detour traffic will exit at the RM 2222 West exit ramp. Detour signs to be placed directing US 290 EB traffic to continue thru the IH 35 NBFR to the IH 35/US 290 intersection, and turn right at the intersection. Detour traffic will continue heading east along the US 290 frontage road past the Cameron Rd. and Berkman Dr. intersections and enter US 290 EB east of the Berkman Dr. intersection.

Remove section of concrete rail if needed as directed by the Engineer.

Concrete Work

Concrete rail repair (IN -KIND)

Concrete structure repair

Repair steel bridge member

Infill beam ends with UHPC

Replace Elastomeric bearings pads

Clean and Seal Joints

Clean and seal joints on bridge deck

Install shear key

Phase 4

Week-end closure of US290 EB DC to IH35 SB DC is allowed for full direct connector repair.

Install traffic control devices and PCMS according to the TxDOT Traffic Control Standards prior to closure of the direct connector exit ramp. Detour traffic will exit at the US 290 East/RM 2222 West and exit the RM 2222 ramp, and proceed to the IH 35/US 290 intersection. Detour traffic will turn left at the intersection and proceed on the US 290 EB frontage road past the Cameron Rd. and Berkman Dr. intersections and enter US 290 EB east of the Berkman Dr. intersection.

Remove section of concrete rail if needed as directed by the Engineer.

Concrete Work

Concrete rail repair (IN -KIND)

STATE OF TEXAS
EDUARDO GARCIA
116865
LICENSED
PROFESSIONAL ENGINEER

DocuSigned by:
Eduardo Garcia
2CD511274A5948C...

8/7/2023

Texas Department of Transportation

US 290

SEQUENCE OF WORK

CONT	SECT	JOB	HIGHWAY
0114	01	068	US 290
DIST	COUNTY		SHEET NO.
AUS	TRAVIS		8

DATE: 8/1/2023 1:23:12 PM
FILE: pw://txdot.projectwiseonline.com:TxDOT4/Documents/14 - AUS/Design Projects/0114010068/4 - Design/Plan Set/2. TCP/US290 TCP SOW.dgn

DATE: 7/27/2023 1:26:19 PM
FILE: pw://txdot.projectwiseonline.com:TXDOT4/Documents/14 - AUS/Design Projects/0114010684 - Design/Plan Set/2. TCP/BC-21.dgn

BARRICADE AND CONSTRUCTION (BC) STANDARD SHEETS GENERAL NOTES:

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

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

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

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

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

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

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

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

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

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

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

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

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

WORKER SAFETY NOTES:

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

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

COMPLIANT WORKZONE TRAFFIC CONTROL DEVICES

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

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

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

Texas Department of Transportation — Traffic Safety Division Standard

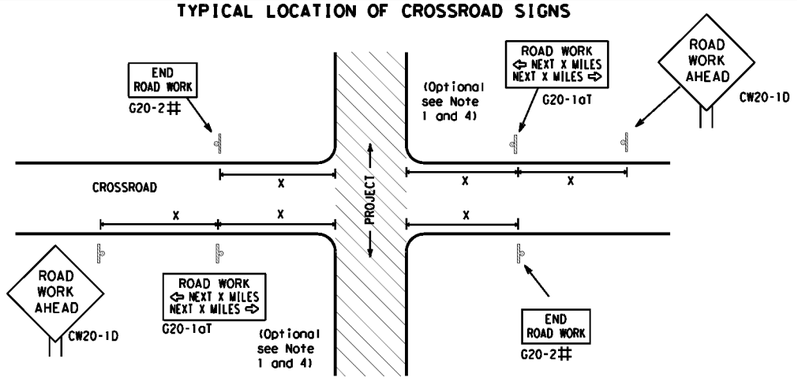
BARRICADE AND CONSTRUCTION GENERAL NOTES AND REQUIREMENTS

BC(1)-21

FILE: bc-21.dgn	DN: TxDOT	CK: TxDOT	DW: TxDOT	CK: TxDOT
©TxDOT November 2002	CONT	SECT	JOB	HIGHWAY
REVISIONS	0114	01	068	US 290
4-03 7-13	DIST	COUNTY		SHEET NO.
9-07 8-14	AUS	TRAVIS		9
5-10 5-21				

DATE: 7/27/2023 1:26:20 PM
FILE: pw://txdot.projectwiseonline.com:TXDOT4/Documents/14 - AUS/Design Projects/0114006824 - Design/Plan Set/2. TCP/BC-21.dgn

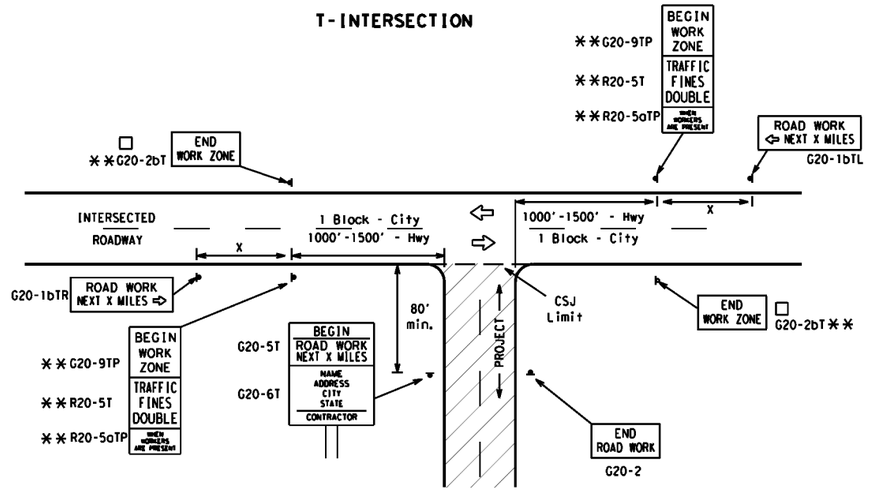
TYPICAL LOCATION OF CROSSROAD SIGNS



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

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

T-INTERSECTION



CSJ LIMITS AT T-INTERSECTION

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

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

SIZE

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

SPACING

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

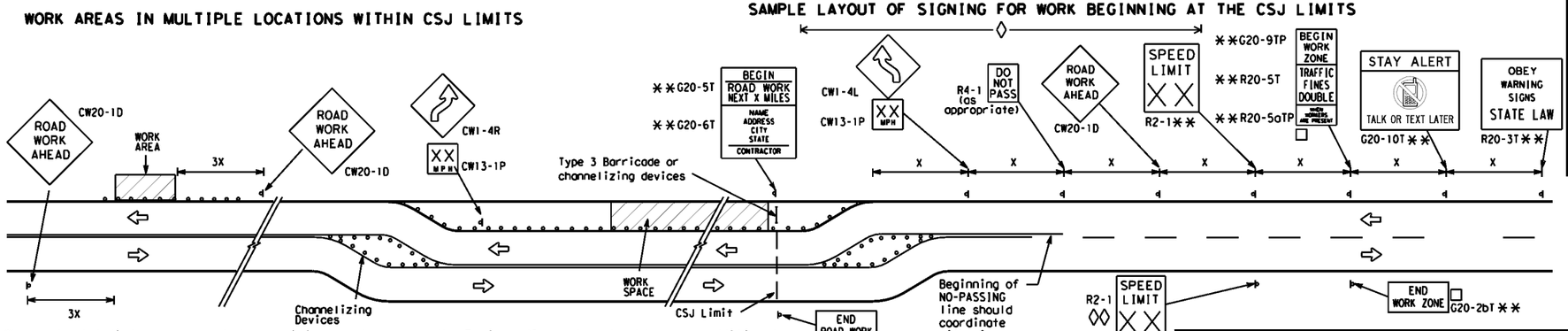
* For typical sign spacings on divided highways, expressways and freeways, see Part 6 of the "Texas Manual on Uniform Traffic Control Devices" (TMUTCD) typical application diagrams or TCP Standard Sheets.

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

GENERAL NOTES

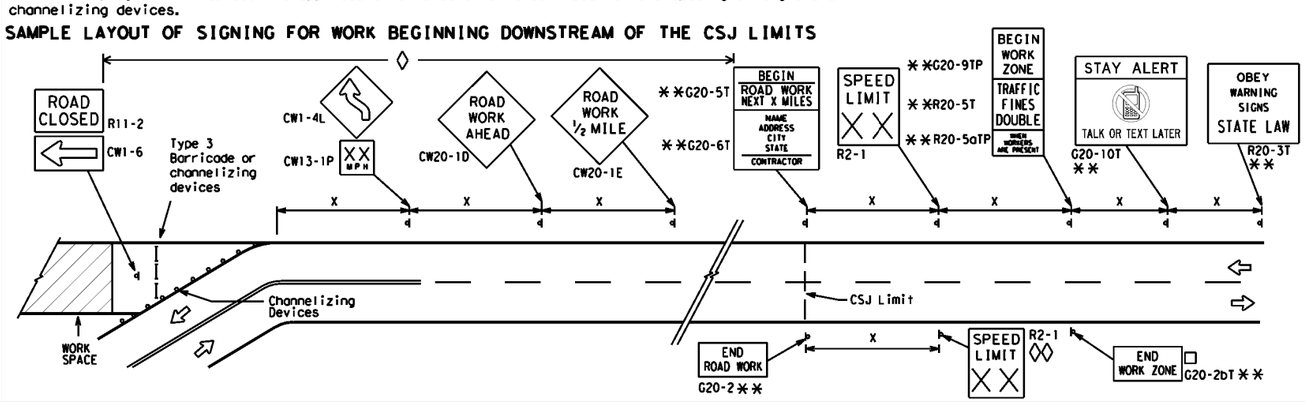
1. Special or larger size signs may be used as necessary.
2. Distance between signs should be increased as required to have 1500 feet advance warning.
3. Distance between signs should be increased as required to have 1/2 mile or more advance warning.
4. 36" x 36" "ROAD WORK AHEAD" (CW20-1D)signs may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

WORK AREAS IN MULTIPLE LOCATIONS WITHIN CSJ LIMITS



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

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



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

Texas Department of Transportation — Traffic Safety Division Standard

BARRICADE AND CONSTRUCTION PROJECT LIMIT

BC(2)-21

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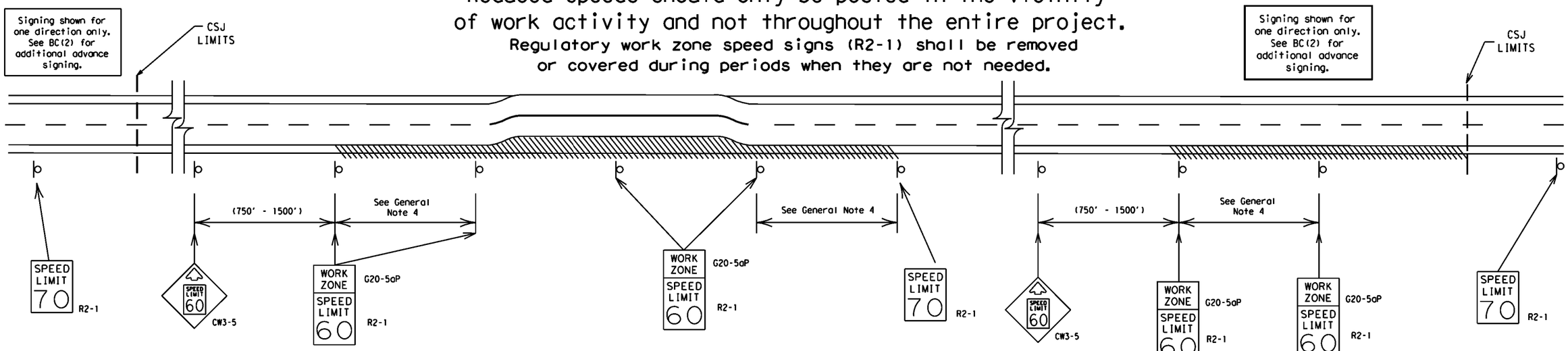
TYPICAL APPLICATION OF WORK ZONE SPEED LIMIT SIGNS

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

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

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



GUIDANCE FOR USE:

LONG/INTERMEDIATE TERM WORK ZONE SPEED LIMITS

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

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

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

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

SHORT TERM WORK ZONE SPEED LIMITS

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

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

GENERAL NOTES

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

Texas Department of Transportation

Traffic Safety Division Standard

BARRICADE AND CONSTRUCTION WORK ZONE SPEED LIMIT

BC(3)-21

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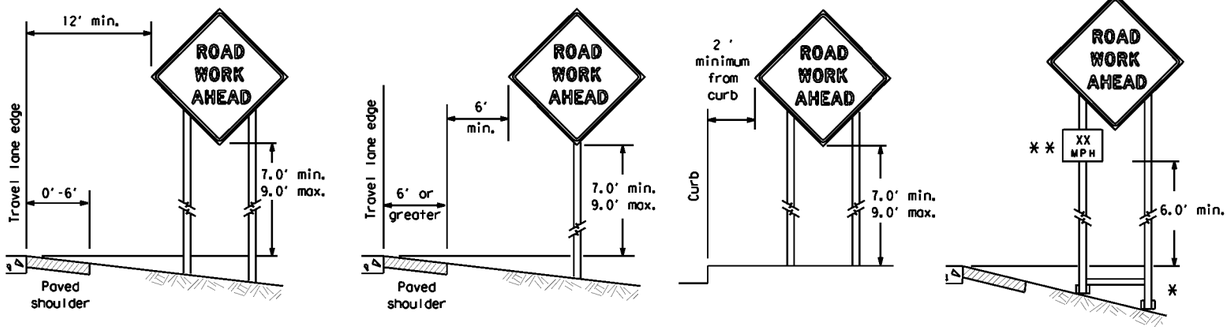
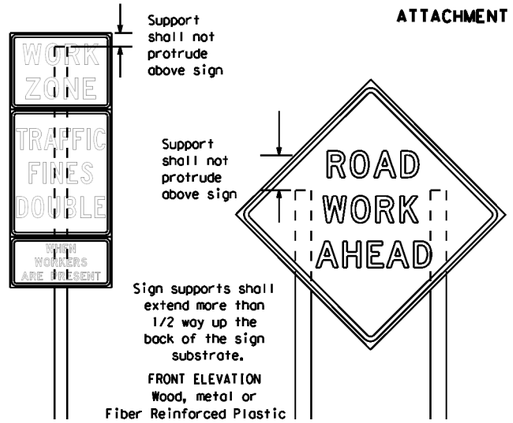
TYPICAL MINIMUM CLEARANCES FOR LONG TERM AND INTERMEDIATE TERM SIGNS

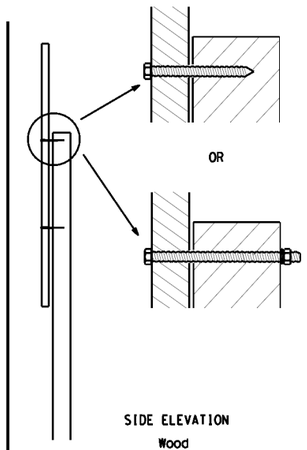


* When placing skid supports on unlevel ground, the leg post lengths must be adjusted so the sign appears straight and plumb. Objects shall NOT be placed under skids as a means of leveling.

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

ATTACHMENT FOR SIGN SUPPORTS





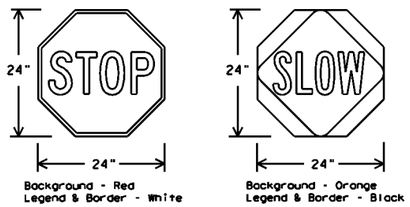
Attachment to wooden supports will be by bolts and nuts or screws. Use TxDOT's or manufacturer's recommended procedures for attaching sign substrates to other types of sign supports

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

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

STOP/SLOW PADDLES

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



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

CONTRACTOR REQUIREMENTS FOR MAINTAINING PERMANENT SIGNS WITHIN THE PROJECT LIMITS

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

GENERAL NOTES FOR WORK ZONE SIGNS

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

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

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

SIGN MOUNTING HEIGHT

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

SIZE OF SIGNS

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

SIGN SUBSTRATES

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

REFLECTIVE SHEETING

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

SIGN LETTERS

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

REMOVING OR COVERING

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

SIGN SUPPORT WEIGHTS

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

FLAGS ON SIGNS

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

Texas Department of Transportation | Traffic Safety Division Standard

BARRICADE AND CONSTRUCTION TEMPORARY SIGN NOTES

BC(4)-21

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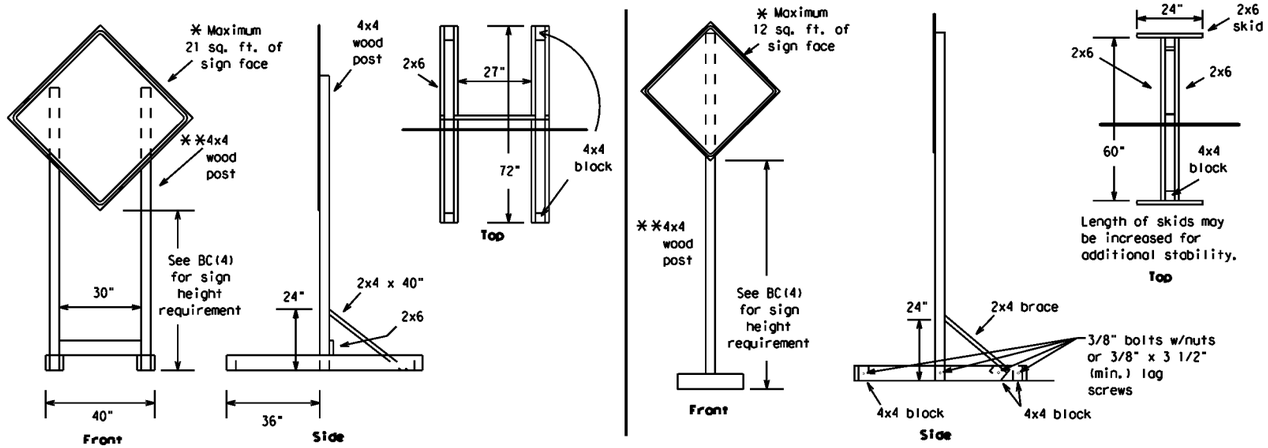
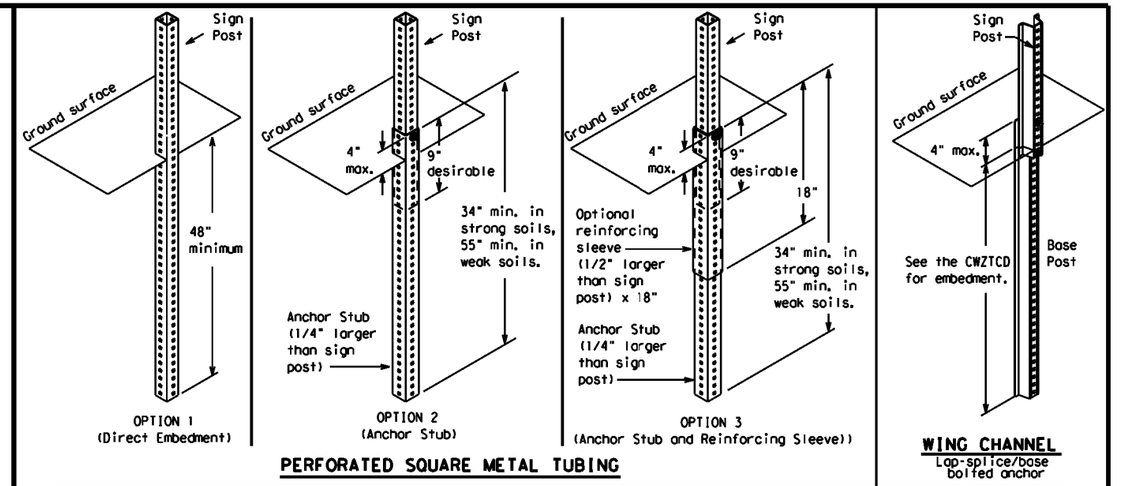


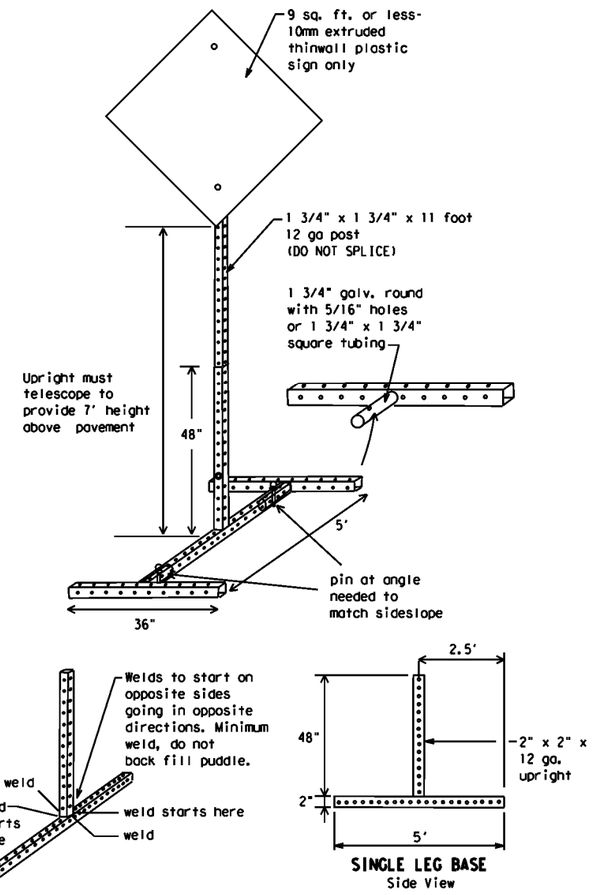
SKID MOUNTED WOOD SIGN SUPPORTS

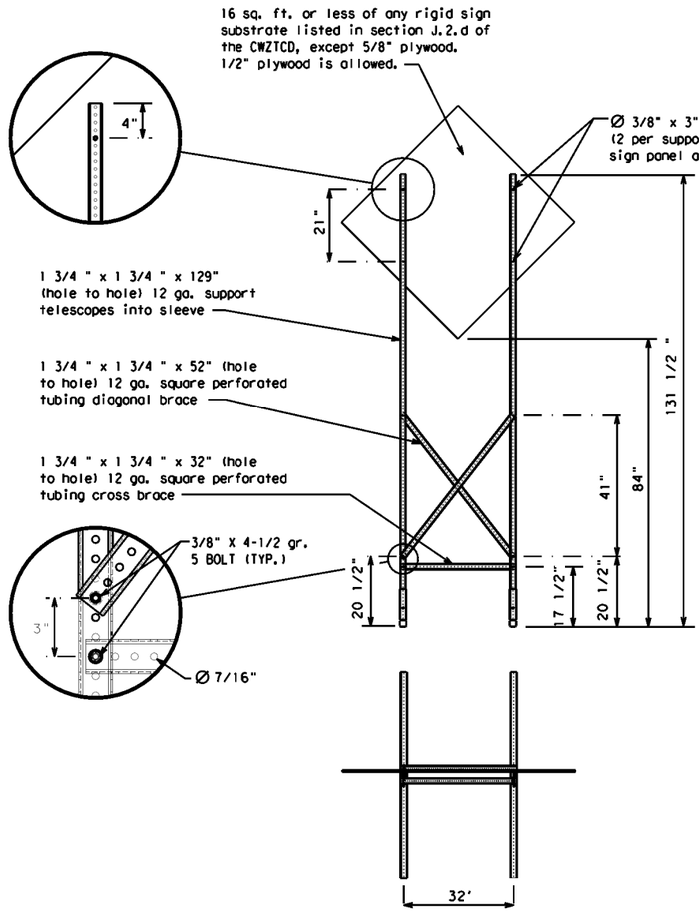
*** LONG/INTERMEDIATE TERM STATIONARY - PORTABLE SKID MOUNTED SIGN SUPPORTS**

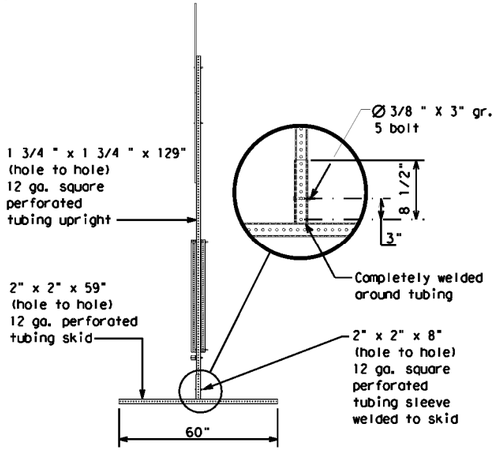


GROUND MOUNTED SIGN SUPPORTS

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







SKID MOUNTED PERFORATED SQUARE STEEL TUBING SIGN SUPPORTS

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

WEDGE ANCHORS

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

OTHER DESIGNS

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

GENERAL NOTES

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

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

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

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

Texas Department of Transportation | Traffic Safety Division Standard

BARRICADE AND CONSTRUCTION TYPICAL SIGN SUPPORT

BC(5)-21

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

PORTABLE CHANGEABLE MESSAGE SIGNS

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

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

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

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

RECOMMENDED PHASES AND FORMATS FOR PCMS MESSAGES DURING ROADWORK ACTIVITIES

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

Phase 1: Condition Lists

Road/Lane/Ramp Closure List

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

Other Condition List

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

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

Phase 2: Possible Component Lists

Action to Take/Effect on Travel List

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

Location List

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

Warning List

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

** Advance Notice List

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

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

** See Application Guidelines Note 6.

APPLICATION GUIDELINES

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

WORDING ALTERNATIVES

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

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

FULL MATRIX PCMS SIGNS

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

Texas Department of Transportation

Traffic Safety Division Standard

BARRICADE AND CONSTRUCTION PORTABLE CHANGEABLE MESSAGE SIGN (PCMS)

BC(6)-21

FILE:	bc-21.dgn	DN: TxDOT	CK: TxDOT	DW: TxDOT	CK: TxDOT
©TxDOT	November 2002	CONT	SECT	JOB	HIGHWAY
REVISIONS		0114	01	068	US 290
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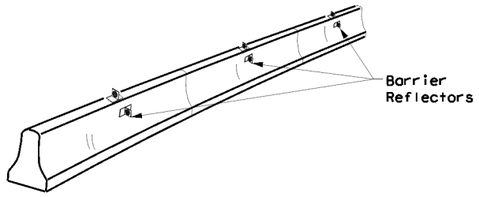
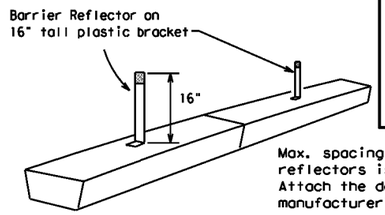
1. Barrier Reflectors shall be pre-qualified, and conform to the color and reflectivity requirements of DMS-8600. A list of prequalified Barrier Reflectors can be found at the Material Producer List web address shown on BC(1).
2. Color of Barrier Reflectors shall be as specified in the TMUTCD. The cost of the reflectors shall be considered subsidiary to Item 512.



CONCRETE TRAFFIC BARRIER (CTB)

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

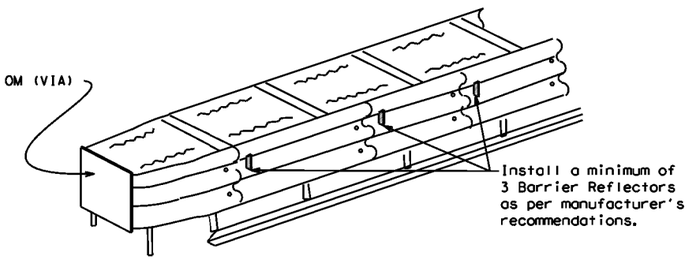


Max. spacing of barrier reflectors is 20 feet. Attach the delineators as per manufacturer's recommendations.

LOW PROFILE CONCRETE BARRIER (LPCB) USED IN WORK ZONES

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

LOW PROFILE CONCRETE BARRIER (LPCB)

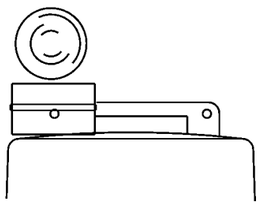


DELINEATION OF END TREATMENTS

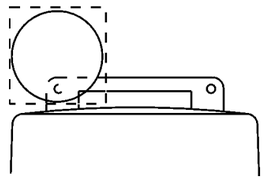
END TREATMENTS FOR CTB'S USED IN WORK ZONES

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

BARRIER REFLECTORS FOR CONCRETE TRAFFIC BARRIER AND ATTENUATORS



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



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

WARNING LIGHTS

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

WARNING LIGHTS MOUNTED ON PLASTIC DRUMS

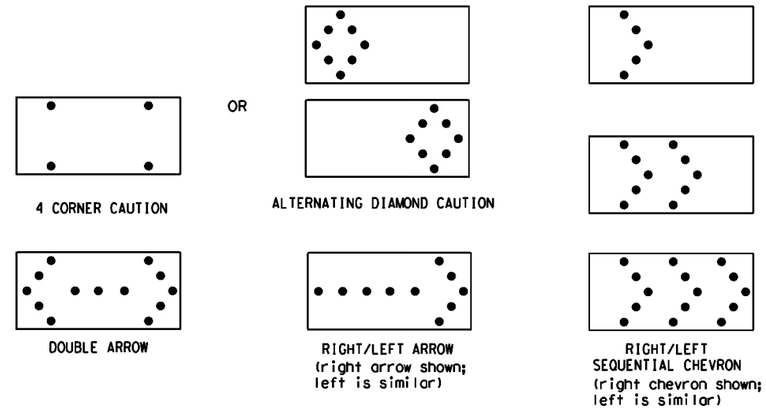
1. Type A flashing warning lights are intended to warn drivers that they are approaching or are in a potentially hazardous area.
2. Type A random flashing warning lights are not intended for delineation and shall not be used in a series.
3. A series of sequential flashing warning lights placed on channelizing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

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

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

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

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



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

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

ATTENTION

Flashing Arrow Boards shall be equipped with automatic dimming devices.

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

FLASHING ARROW BOARDS

TRUCK-MOUNTED ATTENUATORS

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

Texas Department of Transportation — Traffic Safety Division Standard

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

BC(7)-21

FILE: bc-21.dgn	DN: TxDOT	CK: TxDOT	DW: TxDOT	CK: TxDOT
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REVISIONS	0114	01	068	US 290
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GENERAL NOTES

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

GENERAL DESIGN REQUIREMENTS

Pre-qualified plastic drums shall meet the following requirements:

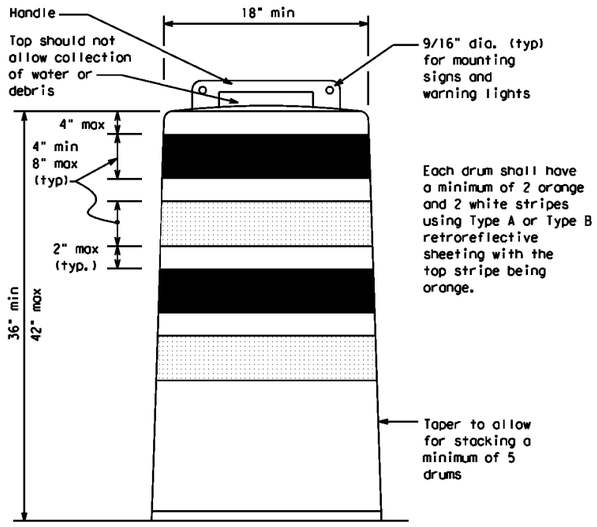
1. Plastic drums shall be a two-piece design; the "body" of the drum shall be the top portion and the "base" shall be the bottom.
2. The body and base shall lock together in such a manner that the body separates from the base when impacted by a vehicle traveling at a speed of 20 MPH or greater but prevents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

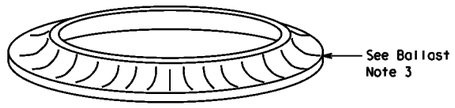
RETROREFLECTIVE SHEETING

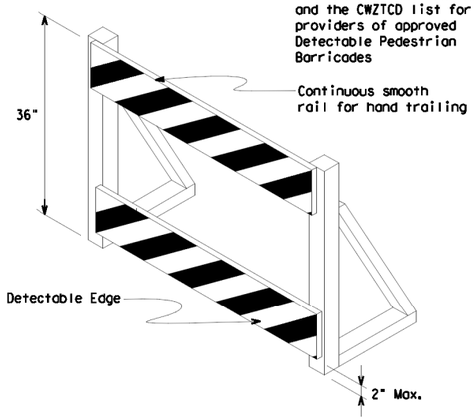
1. The stripes used on drums shall be constructed of sheeting meeting the color and retroreflectivity requirements of Departmental Materials Specification DMS-8300, "Sign Face Materials," Type A or Type B reflective sheeting shall be supplied unless otherwise specified in the plans.
2. The sheeting shall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

BALLAST

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

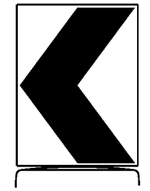




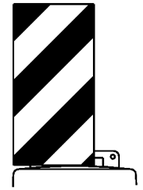


DETECTABLE PEDESTRIAN BARRICADES

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



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



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

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

SIGNS, CHEVRONS, AND VERTICAL PANELS MOUNTED ON PLASTIC DRUMS

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

Texas Department of Transportation | Traffic Safety Division Standard

BARRICADE AND CONSTRUCTION CHANNELIZING DEVICES

BC(8)-21

FILE: bc-21.dgn	DN: TxDOT	CK: TxDOT	DW: TxDOT	CK: TxDOT
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4-03 8-14	DIST	COUNTY		SHEET NO.
9-07 5-21	AUS	TRAVIS		16
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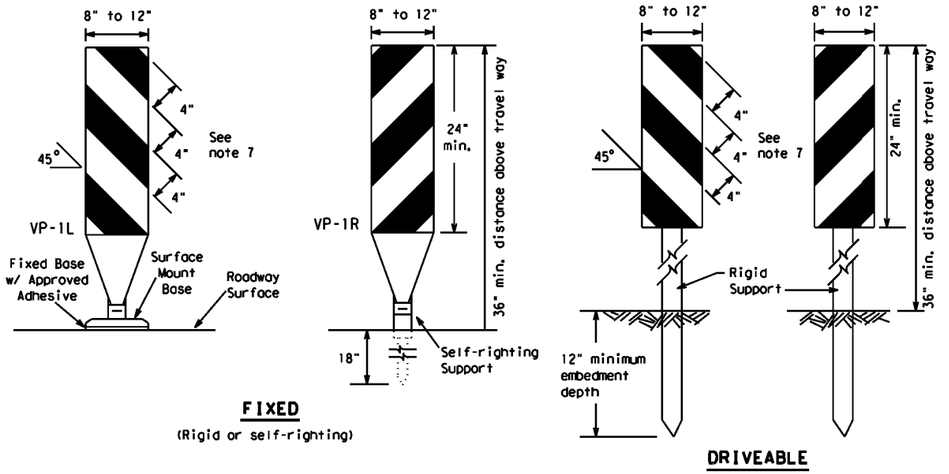
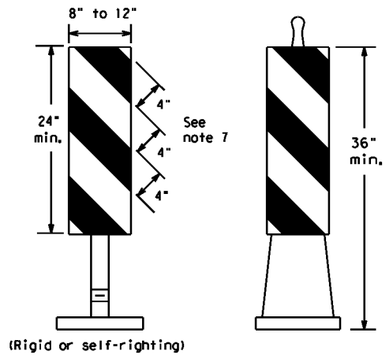


FIXED
(Rigid or self-righting)

DRIVEABLE

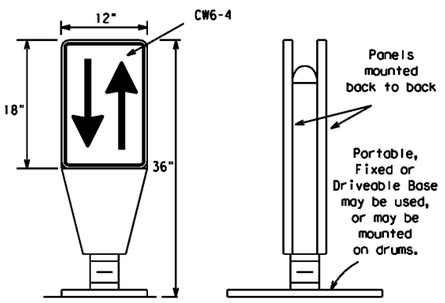


(Rigid or self-righting)

PORTABLE

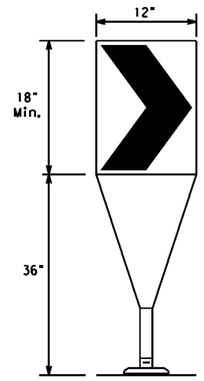
VERTICAL PANELS (VPs)

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



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

OPPOSING TRAFFIC LANE DIVIDERS (OTLD)



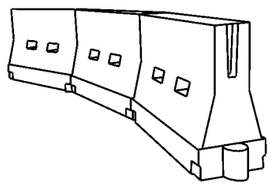
Fixed Base w/ Approved Adhesive (Driveable Base, or Flexible Support can be used)

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

CHEVRONS

GENERAL NOTES

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



LONGITUDINAL CHANNELIZING DEVICES (LCD)

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

WATER BALLASTED SYSTEMS USED AS BARRIERS

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

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

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

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

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

SUGGESTED MAXIMUM SPACING OF CHANNELIZING DEVICES AND MINIMUM DESIRABLE TAPER LENGTHS

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Texas Department of Transportation | Traffic Safety Division Standard

BARRICADE AND CONSTRUCTION CHANNELIZING DEVICES

BC(9)-21

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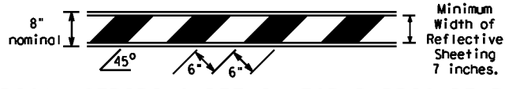
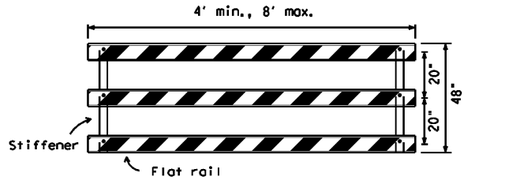
TYPE 3 BARRICADES

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 stocked in a manner that covers any portion of a barricade rails reflective sheeting. Rock, concrete, iron, steel or other solid objects will NOT be permitted. Sandbags should weigh a minimum of 35 lbs and a maximum of 50 lbs. Sandbags shall be made of a durable material that tears upon vehicular impact. Rubber (such as tire inner tubes) shall not be used for sandbags. Sandbags shall only be placed along or upon the base supports of the device and shall not be suspended above ground level or hung with rope, wire, chains or other fasteners.
9. Sheeting for barricades shall be retroreflective Type A or Type B conforming to Departmental Material Specification DMS-8300 unless otherwise noted.

Barricades shall NOT be used as a sign support.



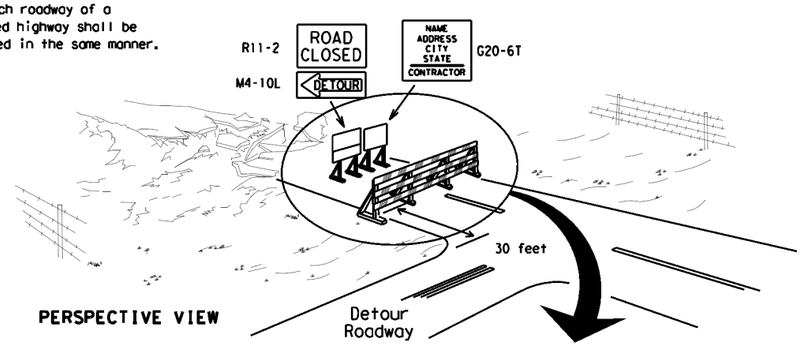
TYPICAL STRIPING DETAIL FOR BARRICADE RAIL



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

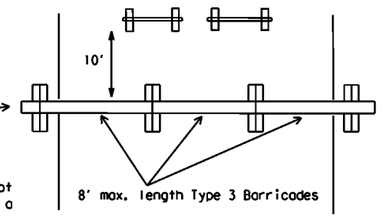
TYPICAL PANEL DETAIL FOR SKID OR POST TYPE BARRICADES

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



PERSPECTIVE VIEW

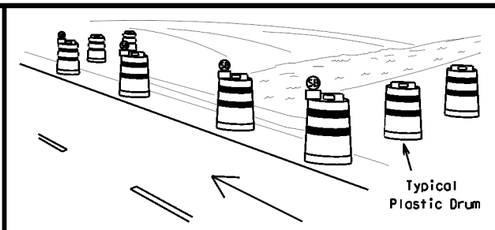
The three rails on Type 3 barricades shall be reflectorized orange and reflective white stripes on one side facing one-way traffic and both sides for two-way traffic.
Barricade striping should slant downward in the direction of detour.



PLAN VIEW

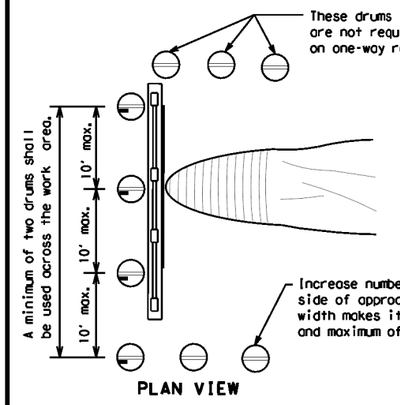
1. Signs should be mounted on independent supports at a 7 foot mounting height in center of roadway. The signs should be a minimum of 10 feet behind Type 3 Barricades.
2. Advance signing shall be as specified elsewhere in the plans.

TYPE 3 BARRICADE (POST AND SKID) TYPICAL APPLICATION



PERSPECTIVE VIEW

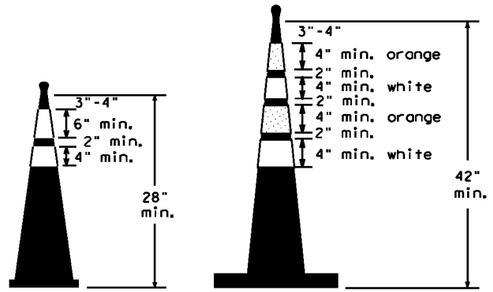
1. Where positive redirectional capability is provided, drums may be omitted.
2. Plastic construction fencing may be used with drums for safety as required in the plans.
3. Vertical Panels on flexible support may be substituted for drums when the shoulder width is less than 4 feet.
4. When the shoulder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



PLAN VIEW

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

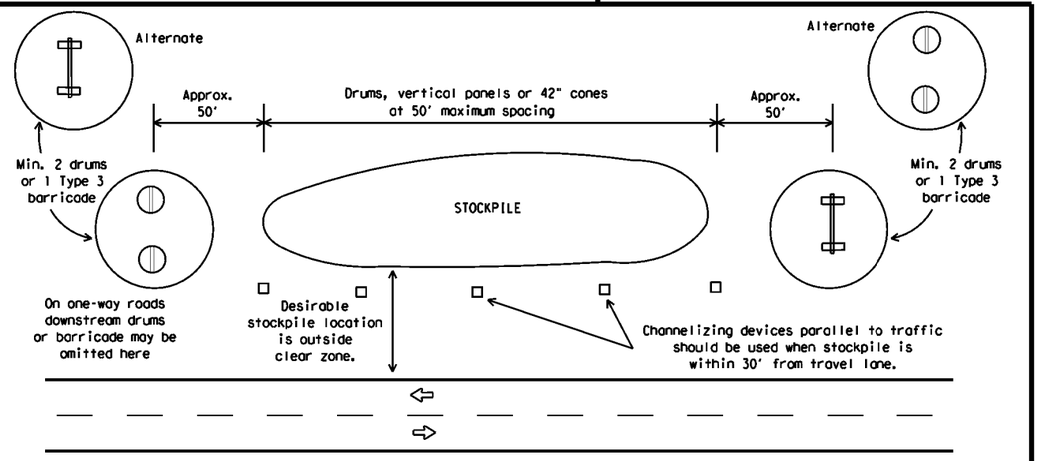
CULVERT WIDENING OR OTHER ISOLATED WORK WITHIN THE PROJECT LIMITS



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

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

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



TRAFFIC CONTROL FOR MATERIAL STOCKPILES

SHEET 10 OF 12

Texas Department of Transportation

Traffic Safety Division Standard

BARRICADE AND CONSTRUCTION CHANNELIZING DEVICES

BC(10)-21

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© TxDOT November 2002	CONT	SECT	JOB	HIGHWAY
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	DIST	COUNTY		SHEET NO.
	AUS	TRAVIS		18

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WORK ZONE PAVEMENT MARKINGS

GENERAL

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

RAISED PAVEMENT MARKERS

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

PREFABRICATED PAVEMENT MARKINGS

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

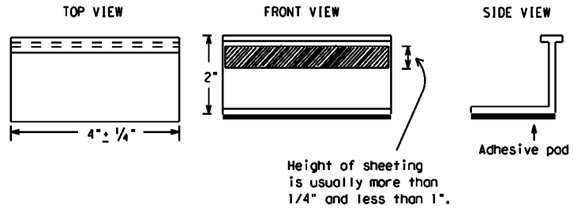
MAINTAINING WORK ZONE PAVEMENT MARKINGS

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

REMOVAL OF PAVEMENT MARKINGS

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

Temporary Flexible-Reflective Roadway Marker Tabs



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

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

RAISED PAVEMENT MARKERS USED AS GUIDEMARKS

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

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

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

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

Texas Department of Transportation

Traffic Safety Division Standard

BARRICADE AND CONSTRUCTION PAVEMENT MARKINGS

BC(11)-21

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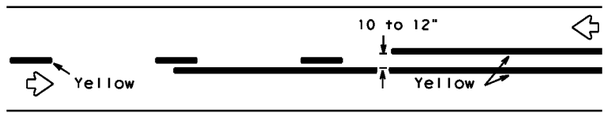
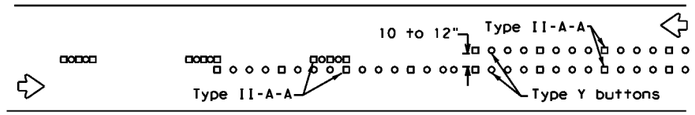
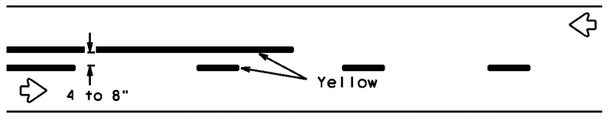
PAVEMENT MARKING PATTERNS



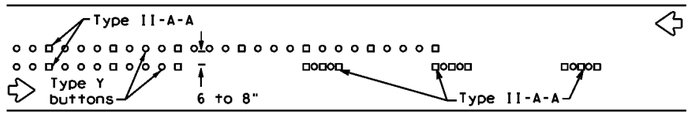
REFLECTORIZED PAVEMENT MARKINGS - PATTERN A



RAISED PAVEMENT MARKERS - PATTERN A



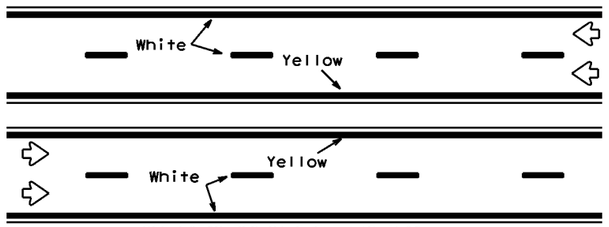
REFLECTORIZED PAVEMENT MARKINGS - PATTERN B



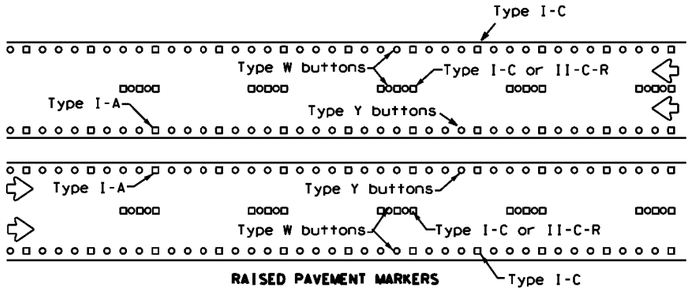
RAISED PAVEMENT MARKERS - PATTERN B

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

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



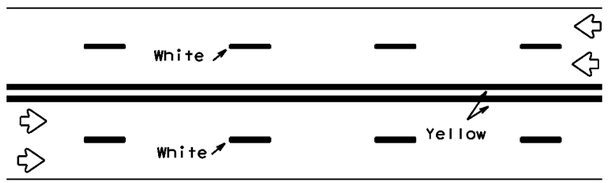
REFLECTORIZED PAVEMENT MARKINGS



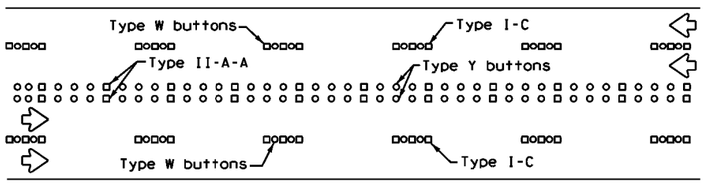
RAISED PAVEMENT MARKERS

Prefabricated markings may be substituted for reflectorized pavement markings.

EDGE & LANE LINES FOR DIVIDED HIGHWAY



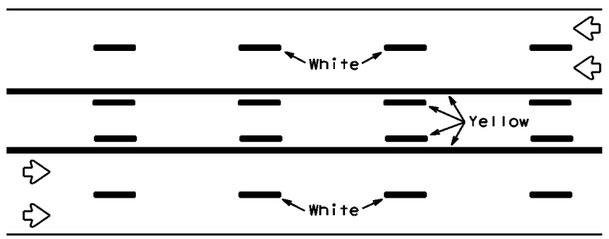
REFLECTORIZED PAVEMENT MARKINGS



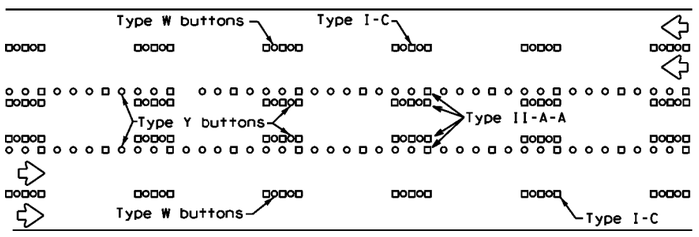
RAISED PAVEMENT MARKERS

Prefabricated markings may be substituted for reflectorized pavement markings.

LANE & CENTER LINES FOR MULTILANE UNDIVIDED HIGHWAYS



REFLECTORIZED PAVEMENT MARKINGS



RAISED PAVEMENT MARKERS

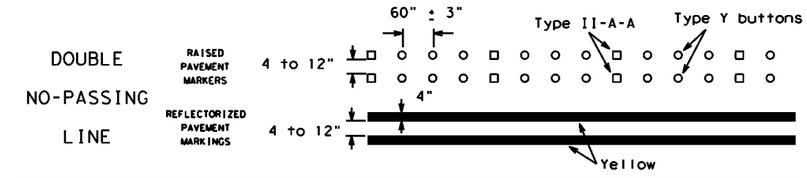
Prefabricated markings may be substituted for reflectorized pavement markings.

TWO-WAY LEFT TURN LANE

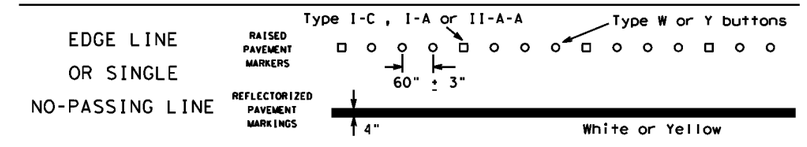
STANDARD WORK ZONE PAVEMENT MARKINGS DETAILS

SOLID LINES

DOUBLE NO-PASSING LINE

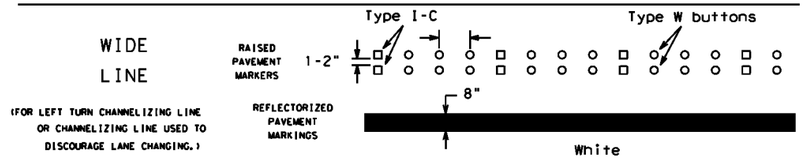


EDGE LINE OR SINGLE NO-PASSING LINE



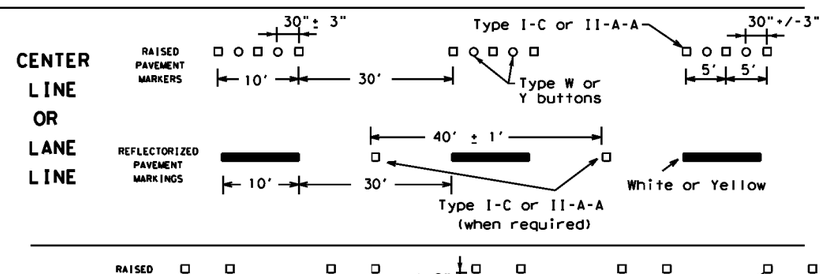
WIDE LINE

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

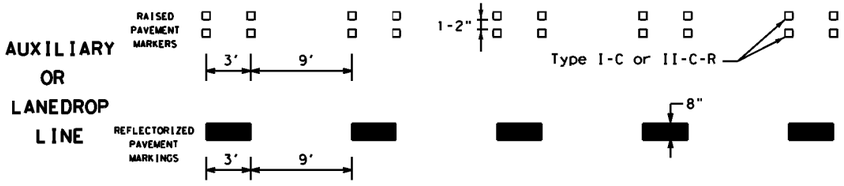


BROKEN LINES

CENTER LINE OR LANE LINE

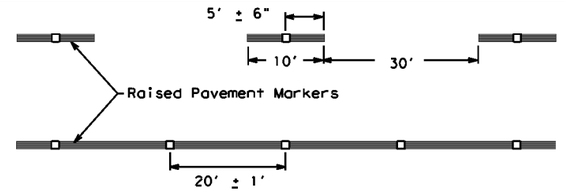


AUXILIARY OR LANEDROP LINE



REMOVABLE MARKINGS WITH RAISED PAVEMENT MARKERS

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



Centerline only - not to be used on edge lines

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

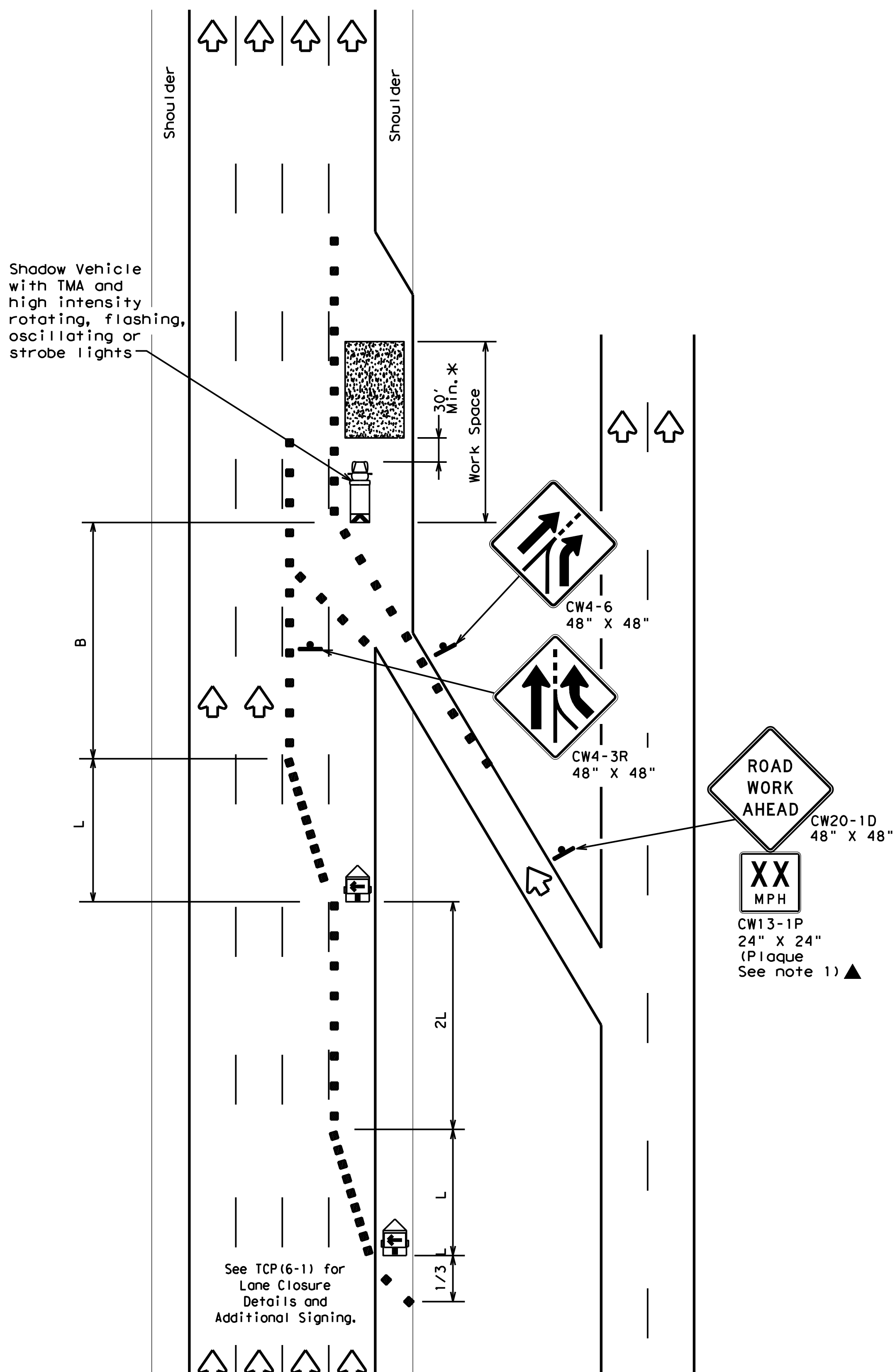
Texas Department of Transportation

Traffic Safety Division Standard

BARRICADE AND CONSTRUCTION PAVEMENT MARKING PATTERNS

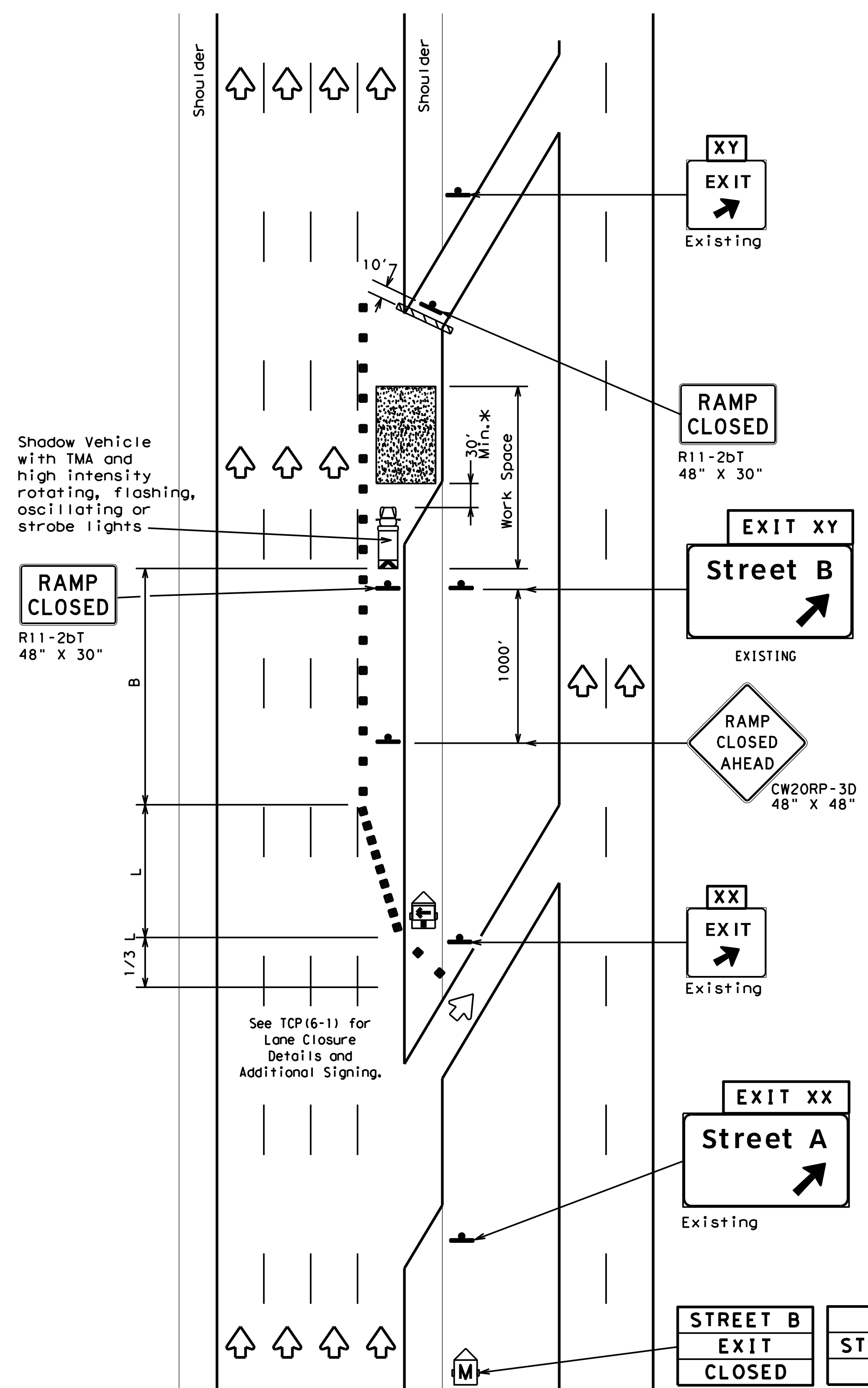
BC(12)-21

FILE: bc-21.dgn	DN: TxDOT	CK: TxDOT	DW: TxDOT	CK: TxDOT
© TxDOT February 1998	CONT	SECT	JOB	HIGHWAY
REVISIONS	0114	01	068	US 290
1-97 9-07 5-21	DIST	COUNTY		SHEET NO.
2-98 7-13	AUS	TRAVIS		20
11-02 8-14				



TCP (6-3a)

ENTRANCE RAMP OPEN



STREET B EXIT CLOSED	USE STREET A EXIT

Or, as an option when exits are numbered

EXIT XY CLOSED	USE EXIT XX

Place 1 mile (approx.) in advance of Street A exit.

TCP (6-3b)

EXIT RAMP CLOSED

TRAFFIC EXITS PRIOR TO CLOSED RAMP

LEGEND

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

Posted Speed	Formula	Minimum Desirable Taper Lengths "L" **			Suggested Maximum Spacing of Channelizing Devices		Suggested Longitudinal Buffer Space "B"
		10' Offset	11' Offset	12' Offset	On a Taper	On a Tangent	
45	L=WS	450'	495'	540'	45'	90'	195'
50		500'	550'	600'	50'	100'	240'
55		550'	605'	660'	55'	110'	295'
60		600'	660'	720'	60'	120'	350'
65		650'	715'	780'	65'	130'	410'
70		700'	770'	840'	70'	140'	475'
75		750'	825'	900'	75'	150'	540'
80		800'	880'	960'	80'	160'	615'

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

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

GENERAL NOTES:

1. All traffic control devices illustrated are REQUIRED. Devices denoted with the triangle symbol may be omitted when stated elsewhere in the plans.

*A shadow vehicle equipped with a Truck Mounted Attenuator is typically required. A shadow vehicle equipped with a TMA shall be used if it can be positioned 30' to 100' in advance of the area of crew exposure without adversely affecting the work performance.

Additional requirements for lane closures and advance signing shall be as shown on TCP (6-1) or as directed by the Engineer.

Texas Department of Transportation
Traffic Operations Division Standard

TRAFFIC CONTROL PLAN WORK AREA BEYOND RAMP

TCP(6-3)-12

FILE: tcp6-3.dgn	DN: TxDOT	CK: TxDOT	DW: TxDOT	CK: TxDOT	
©TxDOT February 1994	CONT	SECT	JOB	HIGHWAY	
REVISIONS 1-97 8-98 4-98 8-12	0114	01	068	US 290	
	DIST	COUNTY		SHEET NO.	
	AUS	TRAVIS		21	

203

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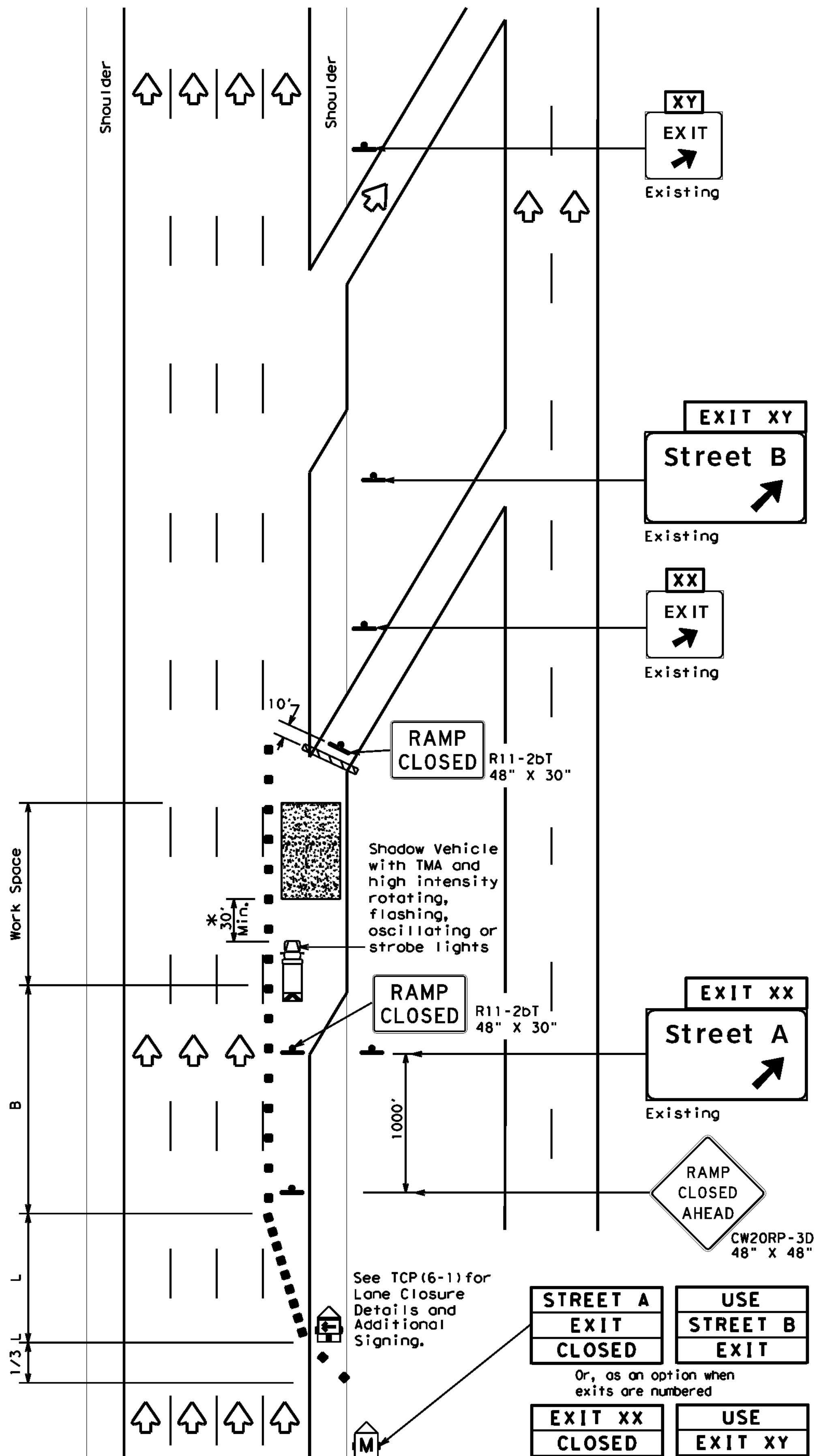
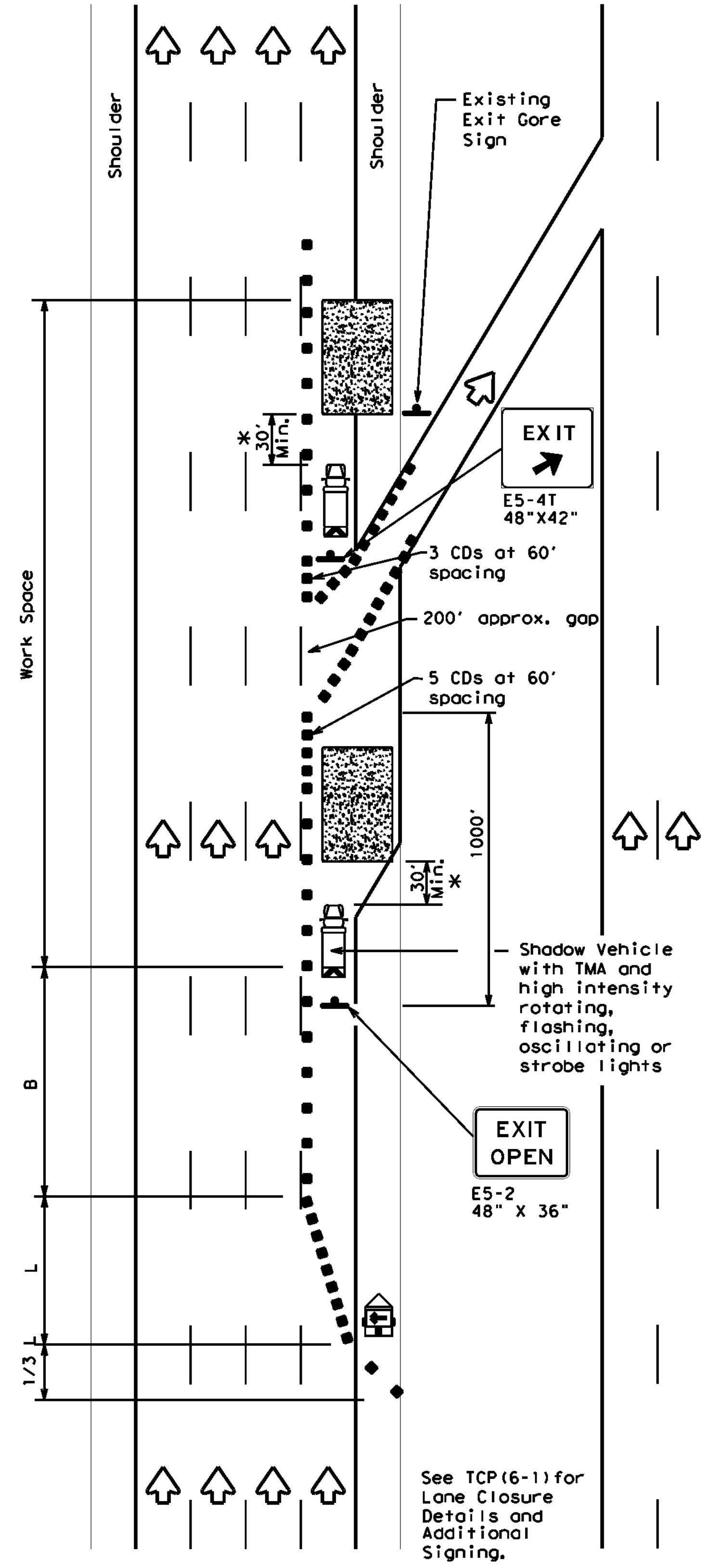


TCP (6-4a)

EXIT RAMP CLOSED

TRAFFIC EXITS PAST CLOSED RAMP



TCP (6-4b)

EXIT RAMP OPEN

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

Posted Speed	Formula	Minimum Desirable Taper Lengths "L" ** 10' Offset	11' Offset	12' Offset	Suggested Maximum Spacing of Channelizing Devices On a Taper	On a Tangent	Suggested Longitudinal Buffer Space "B"
45	L=WS	450'	495'	540'	45'	90'	195'
50		500'	550'	600'	50'	100'	240'
55		550'	605'	660'	55'	110'	295'
60		600'	660'	720'	60'	120'	350'
65		650'	715'	780'	65'	130'	410'
70		700'	770'	840'	70'	140'	475'
75		750'	825'	900'	75'	150'	540'
80		800'	880'	960'	80'	160'	615'

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

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

GENERAL NOTES

1. All traffic control devices illustrated are REQUIRED. Devices denoted with the triangle symbol may be omitted when stated elsewhere in the plans.
2. See BC Standards for sign details.

* A shadow vehicle equipped with a Truck Mounted Attenuator is typically required. A shadow vehicle equipped with a TMA shall be used if it can be positioned 30' to 100' in advance of the area of crew exposure without adversely affecting the work performance.

Additional requirements for lane closures and advance signing shall be as shown on TCP (6-1) or as directed by the Engineer.

Texas Department of Transportation
Traffic Operations Division Standard

TRAFFIC CONTROL PLAN WORK AREA AT EXIT RAMP

TCP(6-4)-12

FILE: tcp6-4.dgn	DN: TxDOT	CK: TxDOT	DW: TxDOT	CK: TxDOT
©TxDOT Feburary 1994	CONT 0114	SECT 01	JOB 068	HIGHWAY US 290
REVISIONS 1-97 8-98 4-98 8-12	DIST AUS		COUNTY TRAVIS	SHEET NO. 22

204

SUMMARY OF BRIDGE ITEMS

DESCRIPTION	ITEM 422	ITEM 427	ITEM 427	ITEM 428	ITEM 429	ITEM 618	ITEM 740	ITEM 764	ITEM 764	ITEM 778
	422 6023	427 6005	427 6008	428 6001	429 6007	618 6062	740 6001	764 6001	764 6004	778 6001
	SHEAR KEY	BLAST FINISH	SPL PROT COAT	PENETRATING CONCRETE SURFACE TREATMENT	CONC STR REPAIR (VERTICAL & OVERHEAD)	CONDT (RM) (3/4")	GRAFFITI REMOVAL (BLAST CLEANING)	DRAIN INLET CLEANING	DOWNSPOUT CLEANING	CONCRETE RAIL REPAIR (IN-KIND)
	CY	SF	SF	SY	SF	LF	SF	EA	EA	LF
CSJ: 0114-01-068 IH 35 SB to US 290 EB (NBI: 14-227-0-0015-13-449)		1200		1350			60	17	17	
CSJ: 0114-01-068 US 290 WB to IH 35 SB (NBI: 14-227-0-0015-13-450)		1500	(1) 7120		23	1	90			5
CSJ: 0114-01-068 IH 35 NB to US 290 EB (NBI: 14-227-0-0015-13-451)	1.0		1150 (2)				80	1	1	8
CSJ: 0114-01-068 US 290 EB to IH 35 SB (NBI: 14-227-0-0015-13-452)		900	(2) 2790				130			5
PROJECT TOTAL	1.0	3600	11060	1350	23	1	360	18	18	18

(1) PORE SHEILD

(2) ALCHEMCO BRIDGEDECK

(3) FOR DETAILS SEE BEAM RESTRAINT DETAIL

SUMMARY OF BRIDGE ITEMS

DESCRIPTION	ITEM 778	ITEM 778	ITEM 784	ITEM 784	ITEM 785	ITEM 4002	ITEM 4002	ITEM 0429
	778 6002	778 6075	784 6033	784 6072	785 6005	4002 6001	4002 6002	0429 6014
	CONCRETE RAIL REPAIR (MISC)	CONC RAIL REPAIR(REMOVE AND REPL RAIL)	REP STL BRIDGE MEMBER (TIGHTEN MEMBER)	REP STL BRDG MEMB (WELD REPAIR)	BRIDGE JOINT REPAIR (SEJ)	REPLACE ELASTOMERIC BEARING PADS	REPLACE ELASTOMERIC BEARING PADS (LARGE)	(3) CONC STR REPR(REMOVE AND REPL PEDESTAL)
	LF	LF	EA	EA	LF	EA	EA	CY
CSJ: 0114-01-068 IH 35 SB to US 290 EB (NBI: 14-227-0-0015-13-449)		15	1					
CSJ: 0114-01-068 US 290 WB to IH 35 SB (NBI: 14-227-0-0015-13-450)				1	56	19		1
CSJ: 0114-01-068 IH 35 NB to US 290 EB (NBI: 14-227-0-0015-13-451)	3		2		32		4	
CSJ: 0114-01-068 US 290 EB to IH 35 SB (NBI: 14-227-0-0015-13-452)					28			
PROJECT TOTAL	3	15	3	1	116	19	4	1

NO.	REVISION	BY	DATE

HDR
Firm Registration No. F-754
17111 Preston Road, Suite 300
Dallas, Texas 75248-1229
972.960.4400

Texas Department of Transportation

IH 35 / US 290
DIRECT CONNECTORS
BRIDGE ESTIMATED QUANTITIES

SHEET 1 OF 1

DESIGN	FED.RD. DIV.NO.	FEDERAL PROJECT NO.		HIGHWAY NO.
JA	6			IH 35
GRAPHICS JH	STATE	DISTRICT	COUNTY	SHEET NO.
CHECK ALL	TEXAS	AUS	TRAVIS	23
CHECK ALL	CONTROL	SECTION	JOB	
	0114	01	068	

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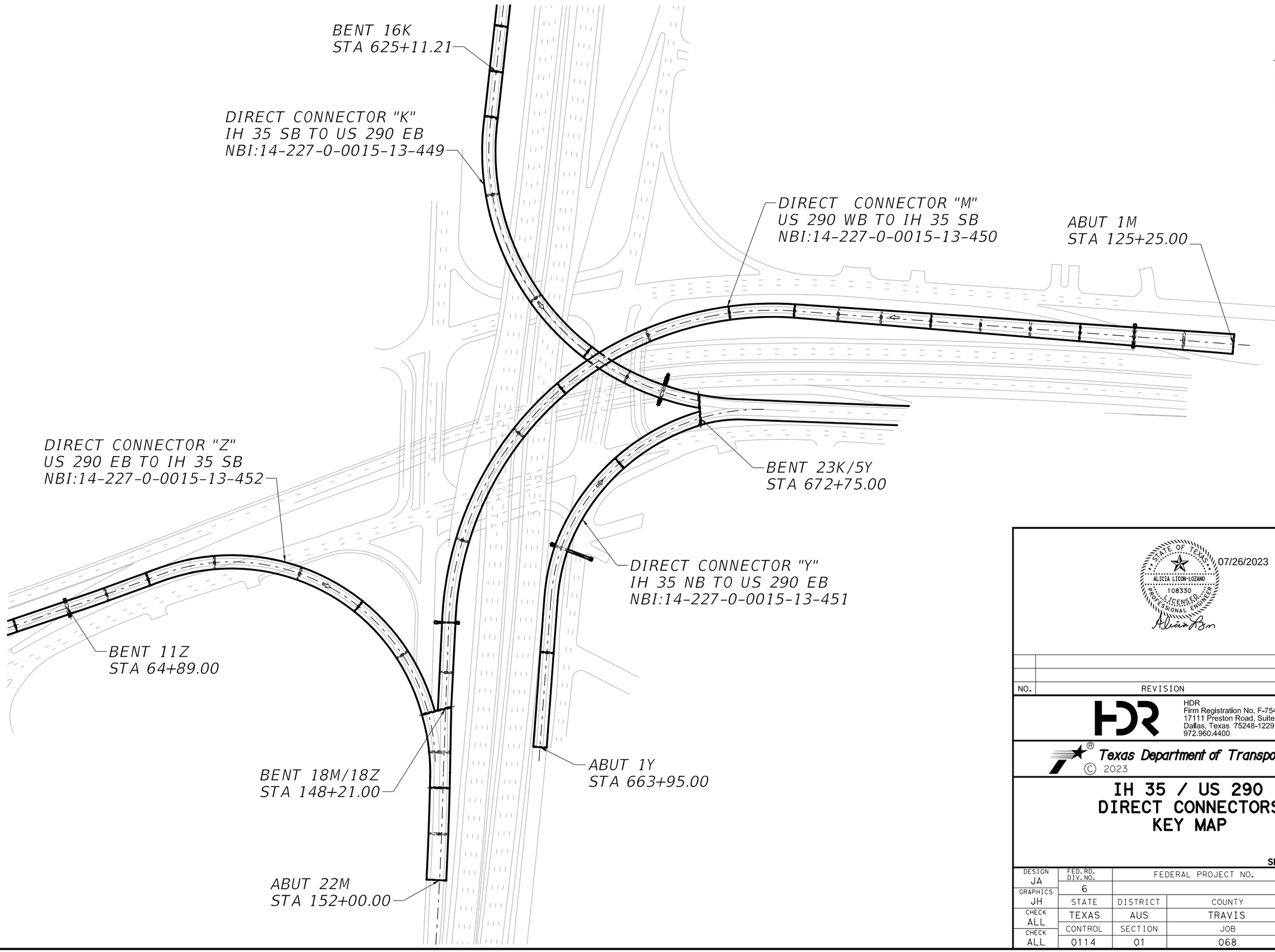

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PENTABLE: 10347533-Travis.tbl

STATE OF TEXAS
ALICIA LICON-LOZANO
108330
LICENSED
PROFESSIONAL ENGINEER
07/26/2023

NO.	REVISION	BY	DATE

HDR
Firm Registration No. F-754
17111 Preston Road, Suite 300
Dallas, Texas 75248-1229
972.960.4400

Texas Department of Transportation

IH 35 / US 290
DIRECT CONNECTORS
KEY MAP

SHEET 1 OF 1

DESIGN	FED. RD. DIV. NO.	FEDERAL PROJECT NO.		HIGHWAY NO.
JA	6			IH 35
GRAPHICS	STATE	DISTRICT	COUNTY	SHEET NO.
JH	TEXAS	AUS	TRAVIS	24
CHECK	CONTROL	SECTION	JOB	
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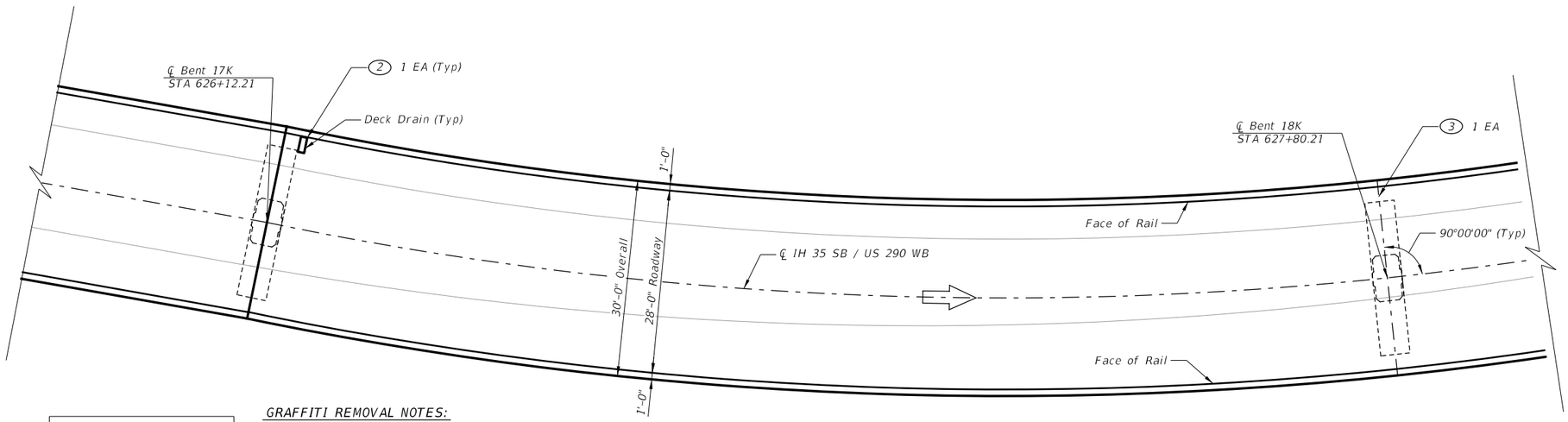
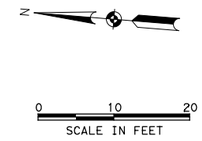
ALL				



PLAN



GENERAL NOTES:

1. See the Table of Repairs for scope of rehabilitation.
2. Existing plans are available upon request from the Area Engineer.
3. Stationing is based on As-built drawings and is for reference only. Beams are labeled from left to right looking in the direction of increasing station.
4. Locations indicated in plans and details are for visual aids and all locations shall be approved by the Engineer prior to beginning repair work.

REPAIR CALL-OUT LEGEND

(6)

Graffiti Removal (740-6001)	
Bent No.	Area, SF
26K	20
29K	40

GRAFFITI REMOVAL NOTES:

1. Verify repair location with the Engineer. The final concrete surface to be treated shall be approved by the Engineer.
2. Remove paint from concrete to expose bare concrete using allowed chemical strippers in combination with either water or abrasive blasting.
3. Provide finished surface resembles surrounding concrete.

TABLE OF REPAIRS

REPAIR NO.	REPAIR DESCRIPTION/LOCATION	ITEM	BID ITEM DESCRIPTION	QUANTITY	UNIT	DETAILS/NOTES
(1)	Remove and replace rail near to Bent 20K. See plan view for locations.	778 6075	CONC RAIL REPAIR(REMOVE AND REPL RAIL)	15	LF	See Rail Replacement Details for procedure and notes.
(2)	Clean all deck drain inlets and corresponding downspout systems. See plan view for a typical location at Bent 17K.	764 6001	DRAIN INLET CLEANING	17	EA	Perform hydraulic cleaning, vacuum removal and disposal of debris in deck drains, and downspout systems according to Item 764. See Inlet and Downspout Cleaning Notes for process. There are 17 deck drains to be cleaned based on As-builts.
		764 6004	DOWNSPOUT CLEANING	17	EA	
(3)	Tighten anchor rod nut in steel Girder 1 of span 17 at Bent 18K. See plan view for location.	784 6033	REP STL BRIDGE MEMBER (TIGHTEN MEMBER)	1	EA	See Tighten Anchor Rod Nut Notes for procedure.
(4)	Finish concrete surface on Bent Nos. 23K/5Y, 24K, and 28K. See plans for Table of Quantities per bent.	427 6005	BLAST FINISH	1,200	SF	See Conc. Surface Finishes Notes for procedure.
(5)	Provide penetrating surface treatment to Bents 6K, 22K, 23K/5Y and 28K. See plans for Table of Quanties per bent.	428 6001	PENETRATING CONCRETE SURFACE TREATMENT	1,350	SY	See Penetrating Conc. Surface Treatment Notes for work method.
(6)	Remove paint from concrete surface on Bent Nos. 26K and 29K. See plans for Table of Quantities per bent.	740 6001	GRAFFITI REMOVAL (BLAST CLEANING)	60	SF	See Graffiti Removal Notes for work method.

(3) TIGHTEN ANCHOR ROD NUT NOTES:

1. Identify the repair location as shown on picture. Verify repair location with the Engineer.
2. Remove debris around the anchor rod and nut.
3. Inspect the anchor rod and nut state.
4. Tight the anchor rod nut to a full snug-tight condition preventing the removal of the nut without the use of a wrench.

(2) INLET AND DOWNSPOUT CLEANING NOTES:

1. Remove debris from drain inlets and upper pipes above bent cap (DRAIN INLET CLEANING).
2. Verify that system allows free draining and is not overflowing and staining the entry point on the cap. Water testing subsidiary to "DRAIN INLET CLEANING".
3. If system is not draining, remove clog or debris from all pipe systems to allow free water drainage (DOWNSPOUT CLEANING).
4. Perform hydraulic cleaning per Item 764 to fully clean the surface of systems.

NO.	REVISION	BY	DATE

HDR
Firm Registration No. F-754
17111 Preston Road, Suite 300
Dallas, Texas 75248-1229
972.960.4400

IH 35 SB TO US 290 EB DIRECT CONNECTOR LOCATION REPAIR PLAN

NBI # 14-227-0-0015-13-449

SCALE: 1"=20' SHEET 1 OF 2

DESIGN	FED. RD. DIV. NO.	FEDERAL PROJECT NO.		HIGHWAY NO.
JA	6			IH 35
GRAPHICS JH	STATE	DISTRICT	COUNTY	SHEET NO.
CHECK ALL	TEXAS	AUS	TRAVIS	25
CHECK ALL	CONTROL 0114	SECTION 01	JOB 068	

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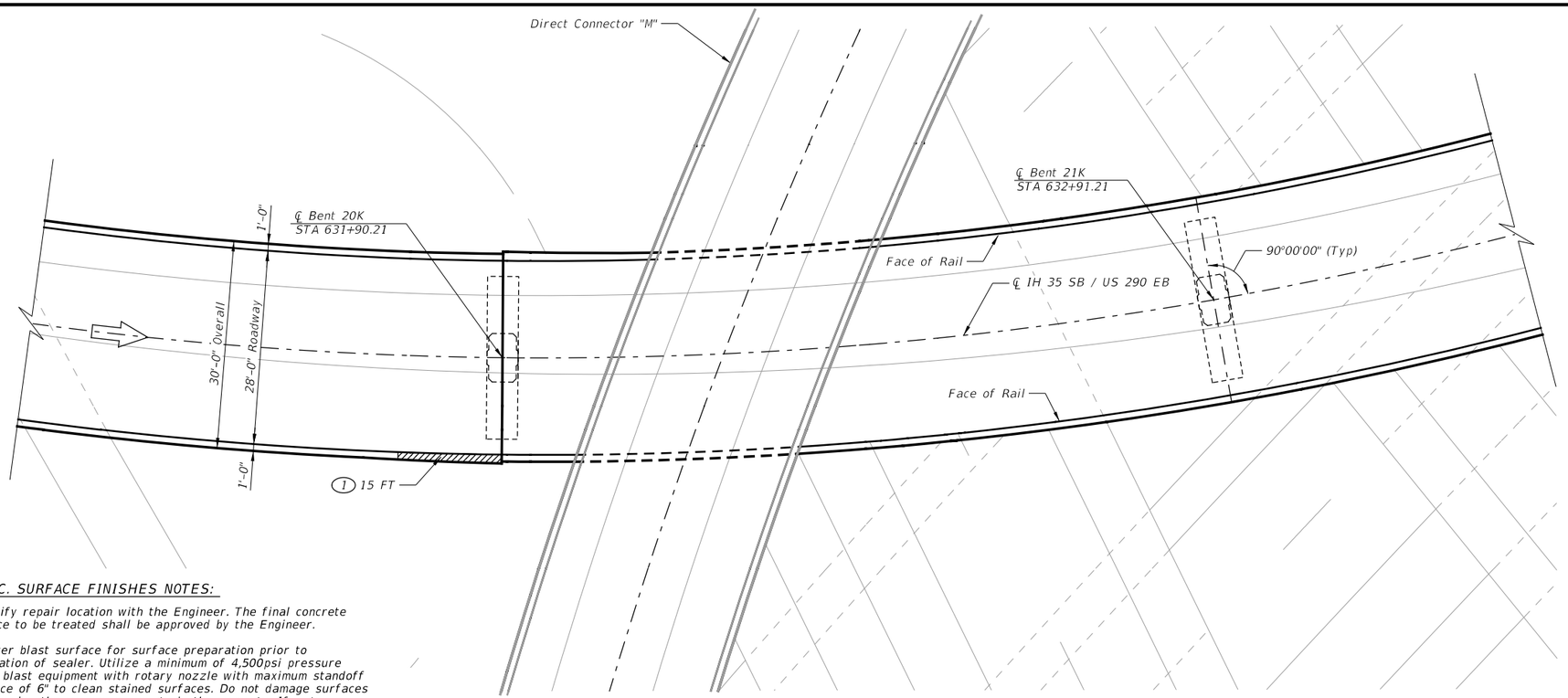
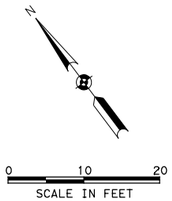


PLAN



GENERAL NOTES:

1. See the Table of Repairs for scope of rehabilitation.
2. Existing plans are available upon request from the Area Engineer.
3. Stationing is based on As-built drawings and is for reference only. Beams are labeled from left to right looking in the direction of increasing station.
4. Locations indicated in plans and details are for visual aids and all locations shall be approved by the Engineer prior to beginning repair work.

REPAIR CALL-OUT LEGEND

(4) CONC. SURFACE FINISHES NOTES:

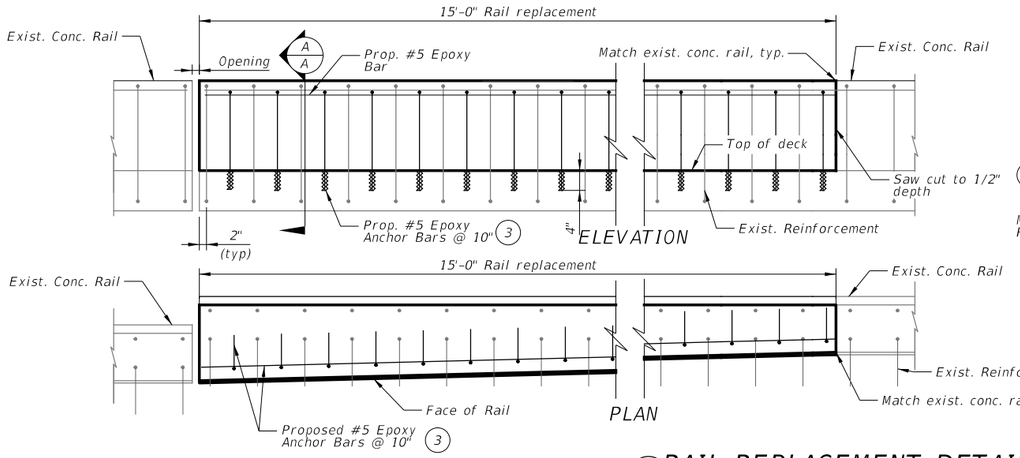
1. Verify repair location with the Engineer. The final concrete surface to be treated shall be approved by the Engineer.

2. Water blast surface for surface preparation prior to application of sealer. Utilize a minimum of 4,500psi pressure water blast equipment with rotary nozzle with maximum standoff distance of 6" to clean stained surfaces. Do not damage surfaces by exposing the coarse aggregate in the concrete. If water blasting with minimum 4,500psi pressure water cannot remove the dark staining from the concrete surface, provide a "Blast Finish" surface utilizing abrasive blasting.

Conc. Surface Finishes (427-6005)	
Bent No.	SF
23K/5Y	500
24K	100
28K	600

CONTRACTOR GENERAL NOTES (ITEM 427 6005):

1. When a "Blast Finish" surface finish is required, lightly abrasive blast dark stained areas on surface to blend the area with surrounding surfaces. Do not expose course aggregate by abrasive blasting.



(1) RAIL REPLACEMENT DETAILS

NOT TO SCALE

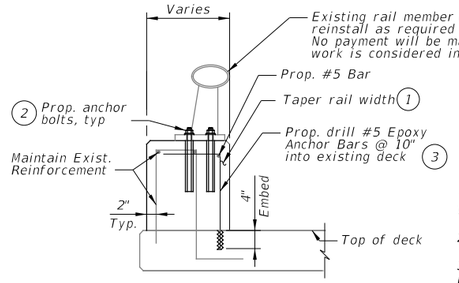
(5) PENETRATING CONC. SURFACE TREATMENT NOTES:

1. Verify repair location with the Engineer. The final concrete surface to be treated shall be approved by the Engineer.

2. Clean concrete surfaces using shot or abrasive blasting to remove the dark staining without damaging surfaces to the point the course aggregate is exposed.

3.Apply penetrating sealant to clean concrete surfaces.

Conc. Surface Treated (428-6001)	
Bent No.	Area, SY
6K	200
22K	490
23K/5Y	400
28K	260



SECTION A-A

1. Taper rail width to align the front face of rail with the adjacent rail on each end of rail replacement limits.
2. Placement of prop. anchor bolts should match the hole pattern on exist. steel plate.
3. Embed bar into concrete with a Type III (Class C, D, E or F) epoxy meeting requirements of DMS-6100, "Epoxy and Adhesives". Follow manufacturer's direction for installation of the epoxy anchor bars. Anchor adhesive chosen must be able to achieve a basic bond strength in tension, of 10 kips.

RAIL REPLACEMENT NOTES:

1. Provide Class C concrete (f'c = 3,600 psi).
2. Provide Grade 60 Reinforcing steel.
3. Avoid damaging existing bars in concrete removal process. If bar is damaged replace vertical with epoxy bars in-kind with 4" embedment. Replace horizontal bars as required provideing laps to existing reinforcing per Item 440.
3. Provide new anchor bolts at all locations within the repair limits.
4. Existing rail plans are included for additional details and notes.

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IH 35 SB TO US 290 EB DIRECT CONNECTOR LOCATION REPAIR PLAN

NBI # 14-227-0-0015-13-449

SCALE: 1"=20'

SHEET 2 OF 2

DESIGN	FED. RD. DIV. NO.	FEDERAL PROJECT NO.		HIGHWAY NO.
JA	6			IH 35
GRAPHICS JH	STATE	DISTRICT	COUNTY	SHEET NO.
CHECK ALL	TEXAS	AUS	TRAVIS	26
CHECK ALL	CONTROL	SECTION	JOB	
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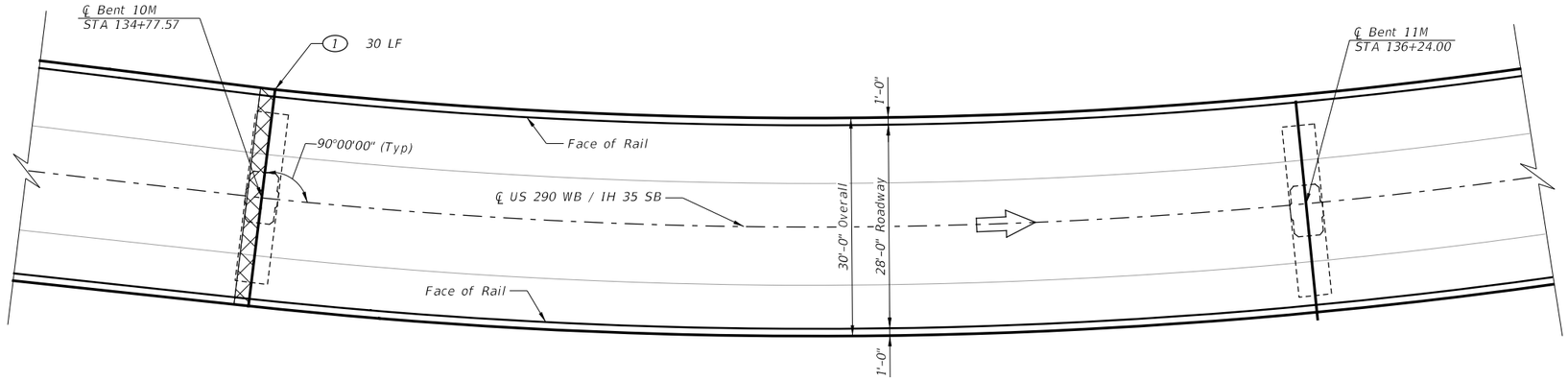

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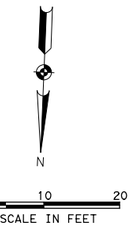

GENERAL NOTES:

1. See the Table of Repairs for scope of rehabilitation.
2. Existing plans are available upon request from the Area Engineer.
3. Stationing is based on As-built drawings and is for reference only. Beams are labeled from left to right looking in the direction of increasing station.
4. Locations indicated in plans and details are for visual aids and all locations shall be approved by the Engineer prior to beginning repair work.

(8) GRAFFITI REMOVAL NOTES:

1. Verify repair location with the Engineer. The final concrete surface to be treated shall be approved by the Engineer.
2. Remove paint from concrete to expose bare concrete using allowed chemical strippers in combination with either water or abrasive blasting.
3. Provide finished surface resembles surrounding concrete.

Graffiti Removal (740-6001)	
Bent No.	Area, SF
3M	10
21M	80

REPAIR CALL-OUT LEGEND

TABLE OF REPAIRS

REPAIR NO.	REPAIR DESCRIPTION/LOCATION	ITEM	BID ITEM DESCRIPTION	QUANTITY	UNIT	DETAILS/NOTES
(1)	Remove and replace deck, rail and joints full width on only one side at bents 10M and 16M. The concrete deck and rail shall be constructed full-depth. See plan view for locations.	785 6005	BRIDGE JOINT REPAIR (SEJ)	56	LF	See US 290 WB to IH 35 SB Bridge Repair Details for procedure and notes
		778 6001	CONCRETE RAIL REPAIR (IN-KIND)	5	LF	
(2)	Repair the spalls on coping at Abutment 22M and slab. See plan view and coping repair detail for locations.	429 6007	CONC STR REPAIR (VERTICAL & OVERHEAD)	17	SF	Repair as Intermediate Spall per TxDOT Concrete Repair Manual Chapter 3, Section 2. See US 290 WB to IH 35 SB Bridge Repair Details for repair approximate dimensions.
(3)	Repair the spalls on Girder 2 bearing pedestal at Bent 13M and on West Rail at Span 16M. See plan views for locations and spall repair details.	429 6007	CONC STR REPAIR (VERTICAL & OVERHEAD)	6	SF	Repair as Intermediate Spall per TxDOT Concrete Repair Manual Chapter 3, Section 2. See US 290 WB to IH 35 SB Bridge Repair Details for spall repair details and approximate pedestal dimensions.
(4)	Repair cracked weld in Bay 5 of Girder 2 in Span 13M.	784 6072	REP STL BRDG MEMB (WELD REPAIR)	1	EA	See US 290 WB to IH 35 SB Bridge Repair Details for weld repair procedure and notes.
(5)	Remove and replace 6"x6"x2" electrical junction box on top of cap at Bent 14M.	618 6062	CONDT (RM) (3/4")	1	LF	Remove an existing electrical junction box and replace it with a new box that meets the requirements in accordance with Item 628.
(6)	Remove and replace all bearing pads on Bents 16M - 21M only on the forward spans. See plan view for locations.	4002 6001	REPLACE ELASTOMERIC BEARING PADS	19	EA	See US 290 WB to IH 35 SB Bridge Repair Details for Laminated Elastomeric Bearing Pad Detail.
(7)	Finish concrete surface on Bent Nos. 3M, 16M, and 18M/18Z. See plans for Table of Quantities per bent.	427 6005	BLAST FINISH	1500	SF	See Conc. Surface Finishes Notes for procedure. Refer to manufacturer Pore Sheild guide for recommendations, notes and details not shown.
		427 6008	SPL PROT COAT	7120	SF	
(8)	Remove paint from concrete surface on Bent Nos. 3M and 21M. See plans for Table of Quantities per bent.	740 6001	GRAFFITI REMOVAL (BLAST CLEANING)	90	SF	See Graffiti Removal Notes for work method.
(9)	Place two restraints between end of the beam and backwall at Abutment 22M. See plan view and detail for locations.	0429 6014	CONC STR REPR(REMOVE AND REPL PEDESTAL)	1	CY	See US 290 WB to IH 35 SB Bridge Repair Details for Beam Restraint Detail.

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US 290 WB TO IH 35 SB DIRECT CONNECTOR LOCATION REPAIR PLAN

NBI # 14-227-0-0015-13-450

SCALE: 1"=20' SHEET 1 OF 3

DESIGN	FED.RD. DIV.NO.	FEDERAL PROJECT NO.		HIGHWAY NO.
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GRAPHICS	STATE	DISTRICT	COUNTY	SHEET NO.
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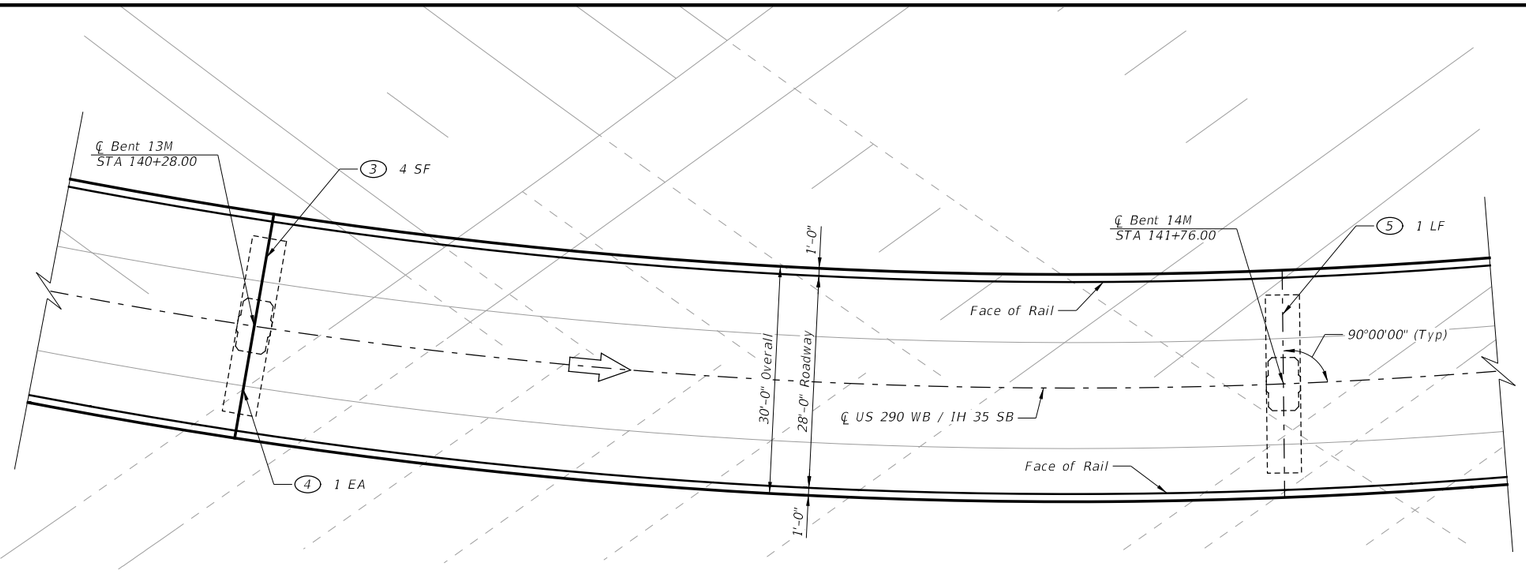

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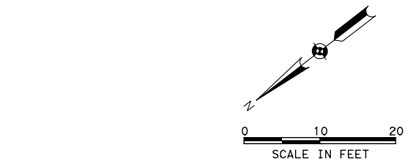


GENERAL NOTES:

1. See the Table of Repairs for scope of rehabilitation.
2. Existing plans are available upon request from the Area Engineer.
3. Stationing is based on As-built drawings and is for reference only. Beams are labeled from left to right looking in the direction of increasing station.
4. Locations indicated in plans and details are for visual aids and all locations shall be approved by the Engineer prior to beginning repair work.

(7) CONC. SURFACE FINISHES NOTES:

1. Verify repair location with the Engineer. The final concrete surface to be treated shall be approved by the Engineer.

2. Water blast surface for surface preparation prior to application of sealer. Utilize a minimum of 4,500psi pressure water blast equipment with rotary nozzle with maximum standoff distance of 6" to clean stained surfaces. Do not damage surfaces by exposing the coarse aggregate in the concrete. If water blasting with minimum 4,500psi pressure water cannot remove the dark staining from the concrete surface, provide a "Blast Finish" surface utilizing abrasive blasting.

Conc. Surface Finishes Per Item		
Bent No.	427-6005 SF	427-6008 SF
3M	250	2260
16M	750	2670
18M/18Z	500	2190

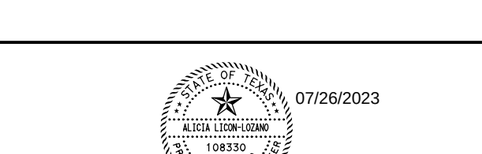
CONTRACTOR GENERAL NOTES FOR ITEM 427:

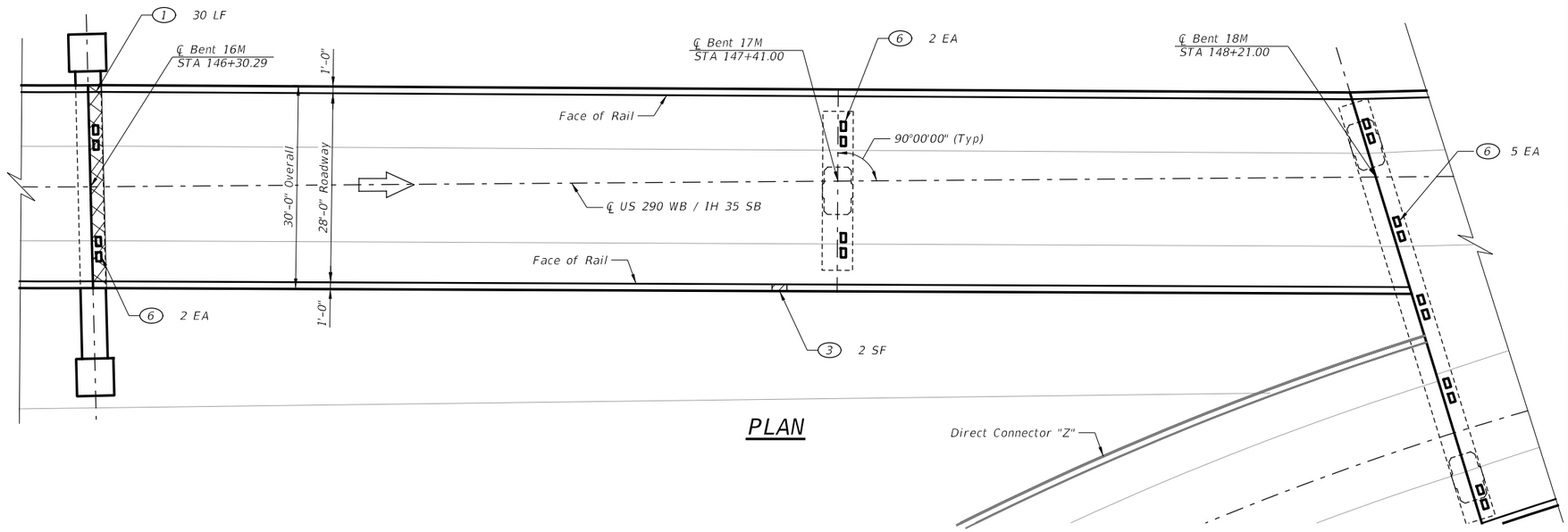
1. When a "Blast Finish" surface finish is required, lightly abrasive blast dark stained areas on surface to blend the area with surrounding surfaces. Do not expose course aggregate by abrasive blasting.

2. Provide Pore Sheild by Crafco sealer for Special Protective Coat.

3. Apply Pore Sheild on bent surfaces at a rate not to exceed 180 to 200 SF/Gal.

REPAIR CALL-OUT LEGEND





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US 290 WB TO IH 35 SB DIRECT CONNECTOR LOCATION REPAIR PLAN
NBI # 14-227-0-0015-13-450

SCALE: 1"=20' SHEET 2 OF 3

DESIGN	FED. RD. DIV. NO.	FEDERAL PROJECT NO.		HIGHWAY NO.
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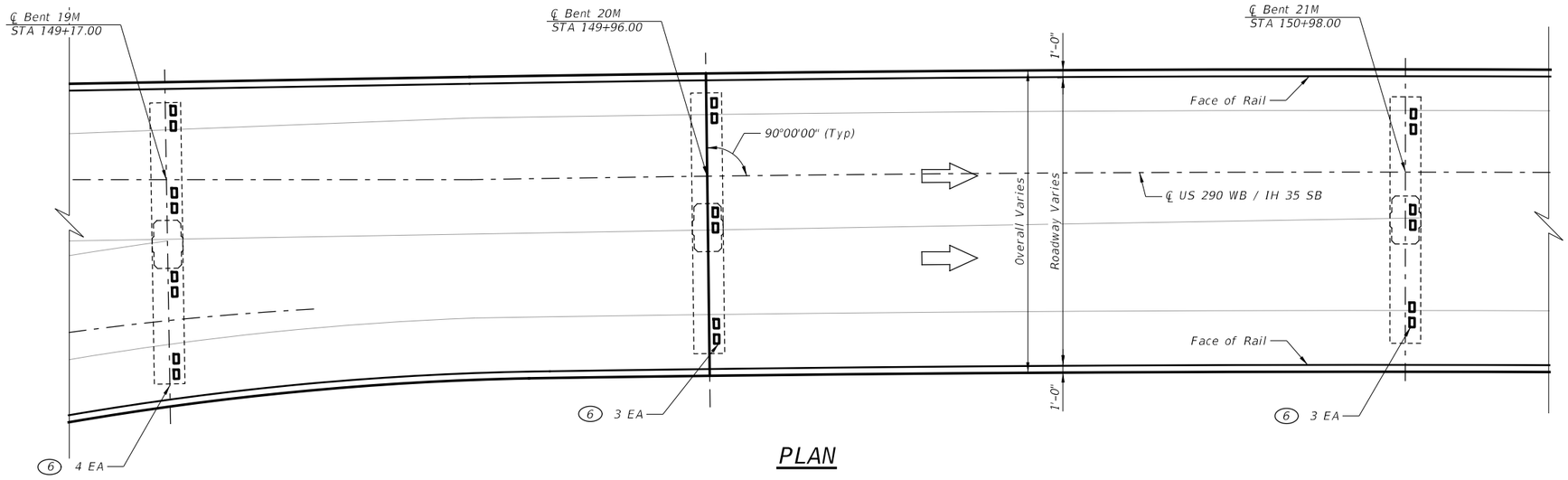

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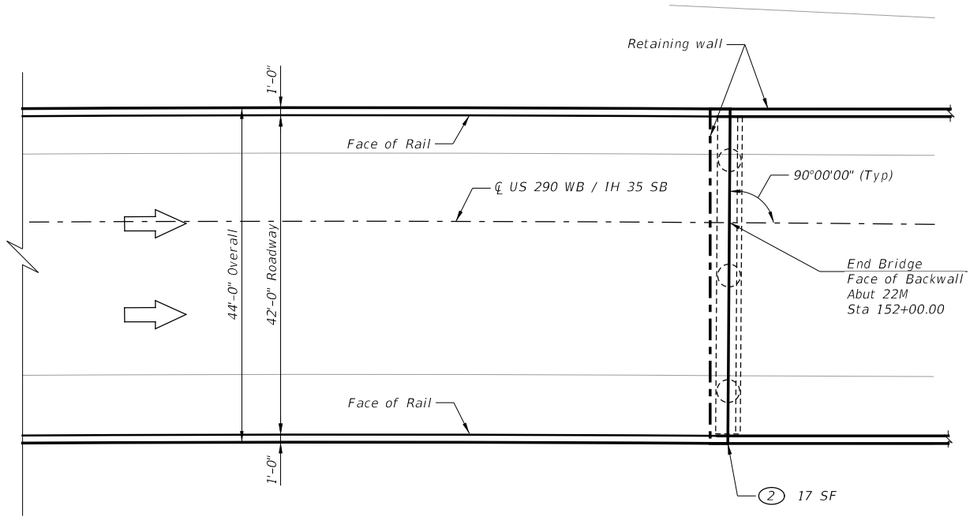

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GENERAL NOTES:

1. See the Table of Repairs for scope of rehabilitation.
2. Existing plans are available upon request from the Area Engineer.
3. Stationing is based on As-built drawings and is for reference only. Beams are labeled from left to right looking in the direction of increasing station.
4. Locations indicated in plans and details are for visual aids and all locations shall be approved by the Engineer prior to beginning repair work.

REPAIR CALL-OUT LEGEND

XX XX
- Repair Quantity Unit
- Estimated Repair Quantity At Each Location
- Repair No. - See Table of Repairs
- Bearing Pad Replacement

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PROFESSIONAL ENGINEER
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US 290 WB TO IH 35 SB DIRECT CONNECTOR LOCATION REPAIR PLAN

NBI # 14-227-0-0015-13-450

SCALE: 1"=20' SHEET 3 OF 3

DESIGN	FED. RD. DIV. NO.	FEDERAL PROJECT NO.		HIGHWAY NO.
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GRAPHICS JH	STATE	DISTRICT	COUNTY	SHEET NO.
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(3) SPALL REPAIR DETAIL

Pedestail dimensions shown

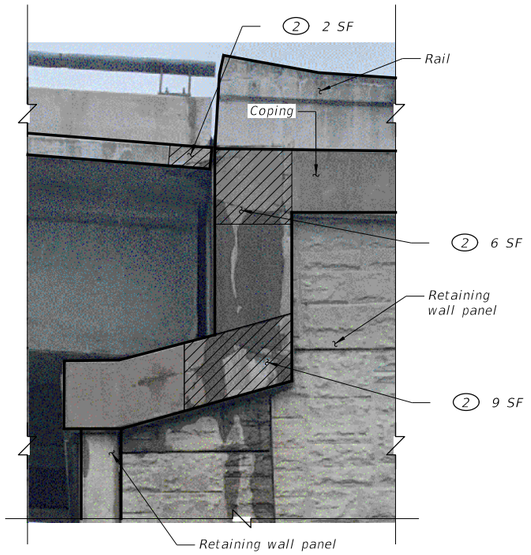
Identify and mark repair location prior to beginning work. Verify areas and quantities with the Engineer.

Dimensions are based on 2020 Fracture Critical Report and are for reference only. Contractor to field verify all dimensions prior to construction.

Avoid damaging existing bridge members during concrete removal process.

Repair as Intermediate Spall per TxDOT Concrete Repair Manual Chapter 3, Section 3. Provide Class K concrete, with f'c = 3,600 psi, rapid repair for service within 24 hours.

Repair will be paid for under Item 429, "Concrete Structure Repair".



(2) COPING REPAIR DETAIL

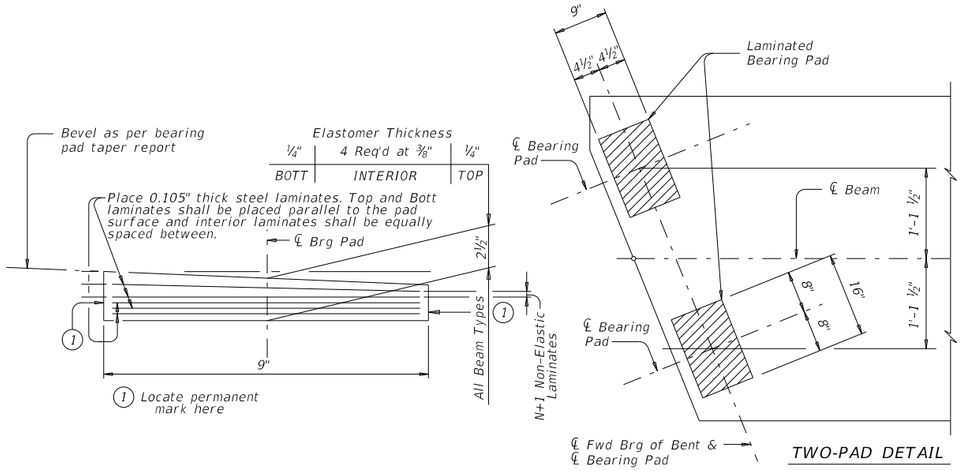
Identify and mark repair location prior to beginning work. Verify areas and quantities with the Engineer.

Dimensions are based on 2020 Fracture Critical Report and are for reference only. Contractor to field verify all dimensions prior to construction.

Avoid damaging existing bridge members during concrete removal process.

Repair as Intermediate Spall per TxDOT Concrete Repair Manual Chapter 3, Section 3. Provide Class C concrete, with f'c = 3,400 psi, rapid repair for service within 24 hours.

Repair will be paid for under Item 429, "Concrete Structure Repair".



(6) LAMINATED ELASTOMERIC BEARING PAD DETAILS

(50 DUROMETER)

SUPERSTRUCTURE JACKING NOTES:

Superstructure jacking will be performed in accordance with item 495, "Raising Existing Structure"

Hydraulic jacks should have adequate capacity to support 2 times the unfactored dead and live load. Apply required jacking force in a balanced and controlled manner. The beam reaction at bearings is 155,000 lbs unfactored dead load and 131,000 lbs unfactored live load.

Place jack below each girder on falsework supported at ground level. Provide temporary foundation as required to support loads.

Contractor may submit alternative jacking plan or sequence for Engineer approval.

ELASTOMERIC BEARING PAD NOTES:

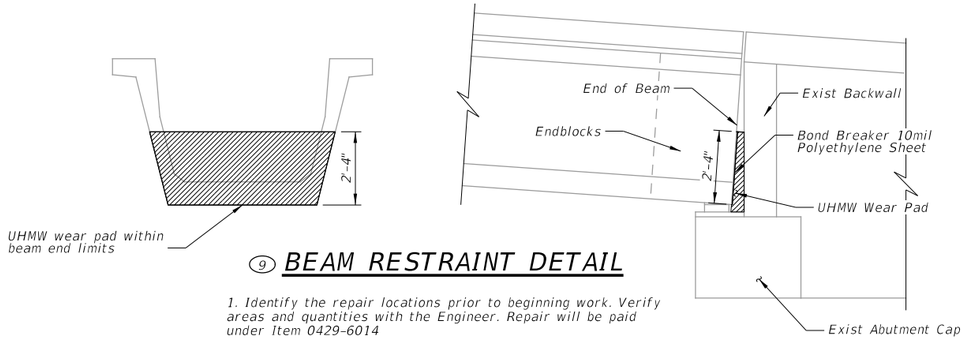
Replace existing bearing per Special Specification 4002, "Elastomeric Bearing Pads".

Raise the existing span in accordance with Item 495. "Raising Existing Structures", as required to remove bearings. The bearing shall be removed without damaging existing bridge members.

New bearing pads shall be 50 Durometer. Existing plans with bearing pad taper report are included.

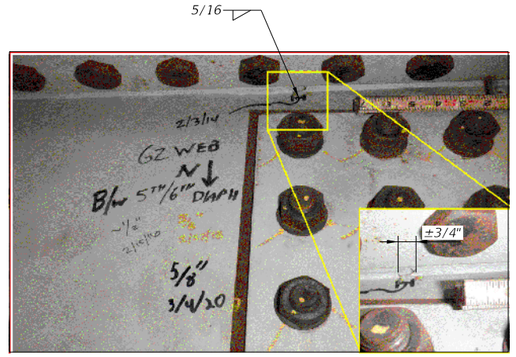
SUGGESTED CONSTRUCTION SEQUENCE:

1. *Jacking may occur under full live load.*
2. *Raise structure approximately ½" to facilitate bearing replacement.*
3. *Remove existing bearing pad.*
4. *Install new elastomeric bearing pads. The forward bearing of bent shall have two pads unless noted otherwise by Engineer.*
5. *Lower superstructure until fully supported on new bearings.*
6. *Remove jacks.*



(9) BEAM RESTRAINT DETAIL

1. *Identify the repair locations prior to beginning work. Verify areas and quantities with the Engineer. Repair will be paid under Item 0429-6014*
2. *Remove debris from top of abutment cap.*
3. *Apply a bond breaker sheet to the end face of the two beams as shown.*
4. *Form the Ultra High Molecular Weight (UHMW) Polyethylene Wear Pad within the beam limits as shown. Contractor to field verify required pad thickness.*



(4) WELD REPAIR DETAIL

Identify and mark repair location prior to beginning work. Verify areas and quantities with the Engineer.

Dimensions are based on 2020 Fracture Critical Report and are for reference only. Contractor to field verify all dimensions prior to construction.

Repair will be paid for under Item 448, "Structural Field Welding".

WELD PROCEDURE NOTES:

1. *Clean and remove paint on surface within 2" each side of the crack.*
2. *Grind/gouge 1 defective full length of fillet weld to sound metal and avoid damaging existing steel members.*
3. *Clean the surface thoroughly and reweld full length.*
4. *Clean new weld area and coat with enamel spray paint.*

NOT TO SCALE

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Texas Department of Transportation

US 290 WB TO IH 35 SB DIRECT CONNECTOR BRIDGE REPAIR DETAILS

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

DESIGN	FED.RD. DIV.NO.	FEDERAL PROJECT NO.		HIGHWAY NO.
JA	6			IH 35
GRAPHICS JH	STATE	DISTRICT	COUNTY	SHEET NO.
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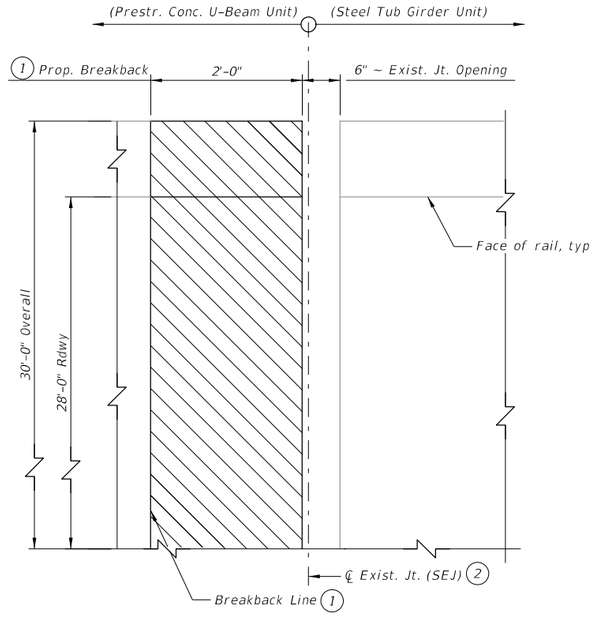
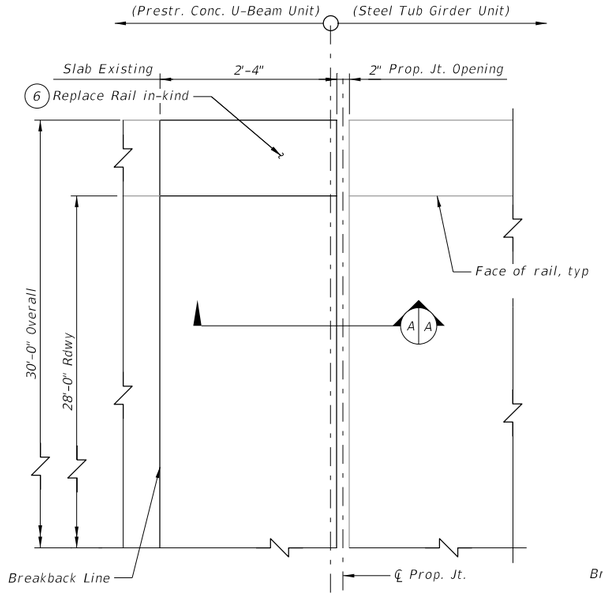
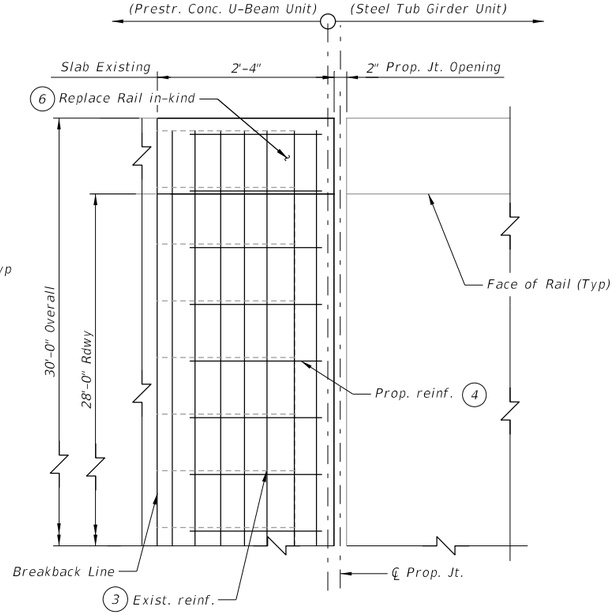


PARTIAL PLAN EXISTING CONDITION



PARTIAL PLAN PROPOSED CONDITION



REINFORCING LAYOUT PROPOSED CONDITION

1. *Remove hatched portion of existing structure and rail as shown in accordance with Item 785, "Bridge Joint Repair or Replacement." Shallow saw cut at breakline to a depth of 1/2" prior to breaking back slab. Avoid damaging existing reinforcement during concrete removal.*
2. *Remove joint seal. Existing SEJ to be removed from Prest. Conc. U-Beam Unit side only.*
3. *Place #4 longitudinal bars between existing reinf, top and bottom. Spacing may vary. Refer to provided UBMS standard for more information.*
4. *See UBTS standard for anticipated reinforcing in Thickened Slab End.*
5. *Slab thickness varies from 8" between flanges of U-Beams to approximately 14" at Thickened Slab End. Additional reinforcing steel not shown here may be present.*
6. *Remove and replace rail in-kind. Place #5 V-bar at 6" spacing. Traffic Rail Type T4(S) Standard is included for additional details and notes.*
7. *See SEJ-M standard for details and notes. Blast clean existing SEJ to a near white condition prior to placing joint seal. Provide material compatible with joint sealant.*
8. *Field verify existing SEJ type and shape of the steel section removed. Proposed SEJ type and shape shall be compatible with the existing.*
9. *Grout fill any anchor holes from removal of steel plate currently in place on the side of the joint where the deck is not replaced.*
10. *Open to traffic in accordance with Item 422.4.1.9 and when Class S concrete for slab and Class C concrete for rail has attained 4,000 psi.*

GENERAL NOTES:

1. Provide Class S concrete (Slab) (f'c = 4,000 psi) and Class C concrete (Rail) (f'c = 3,600 psi).

2. Provide Grade 60 Reinforcing steel.

3. Allow traffic on structure only after concrete has attained 3,600 psi.

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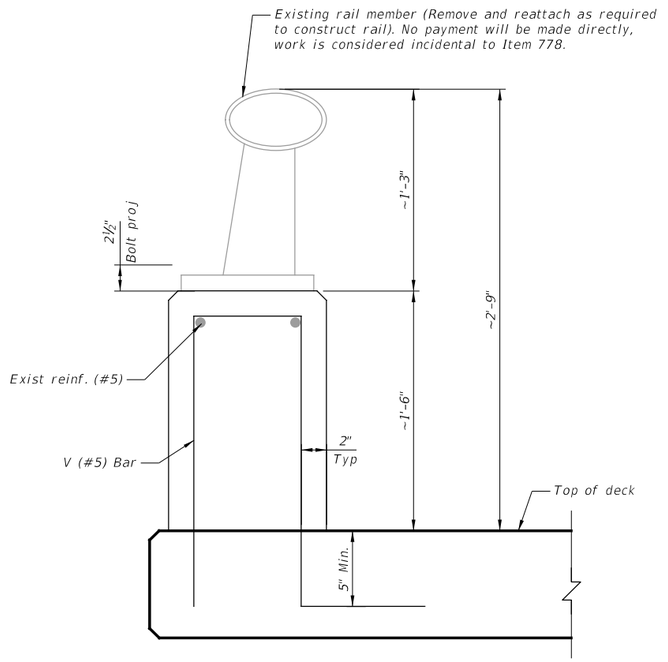
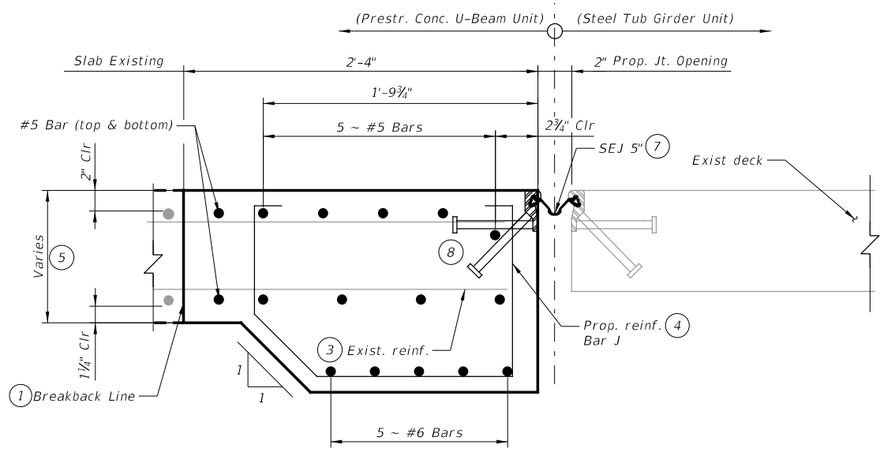
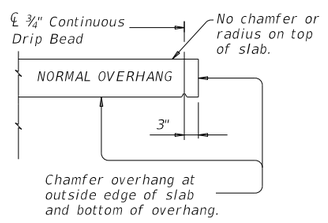


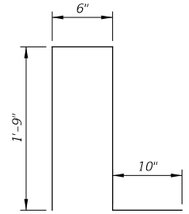
SECTION THRU RAIL AT BRIDGE SLAB



SECTION A-A



CHAMFER AND DRIP BEAD DETAIL



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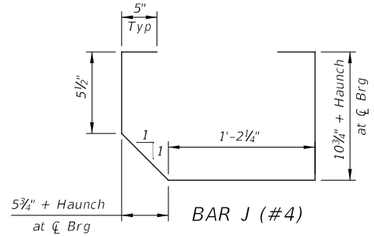

BAR J (#4)

07/26/2023

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STATE OF TEXAS

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US 290 WB TO IH 35 SB DIRECT CONNECTOR BRIDGE REPAIR DETAILS

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

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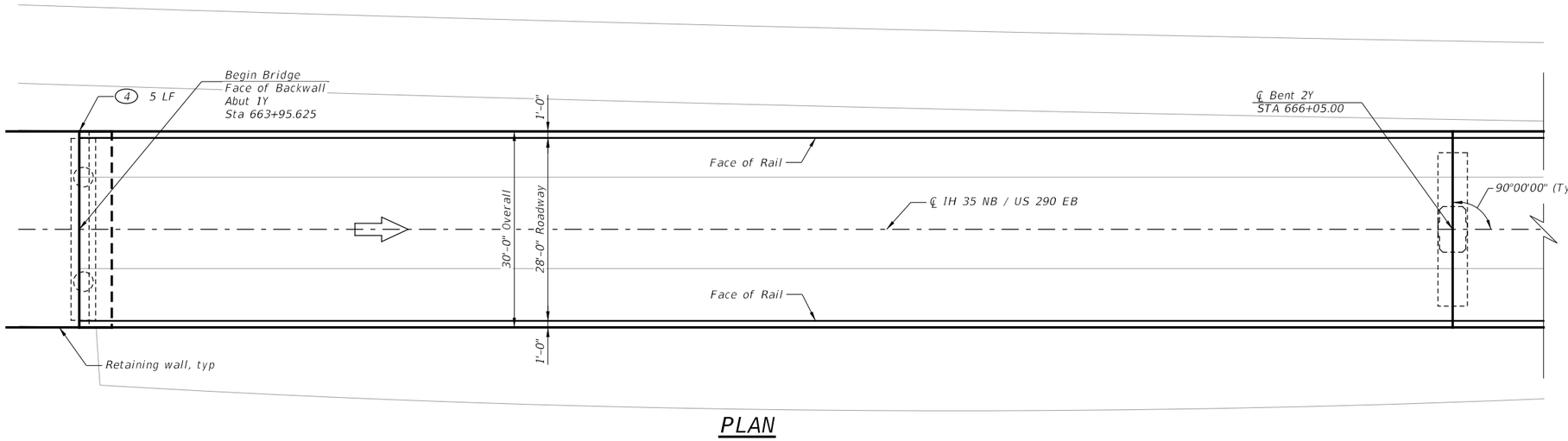

PLAN

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SCALE IN FEET

GENERAL NOTES:

1. See the Table of Repairs for scope of rehabilitation.
2. Existing plans are available upon request from the Area Engineer.
3. Stationing is based on As-built drawings and is for reference only. Beams are labeled from left to right looking in the direction of increasing station.
4. Locations indicated in plans and details are for visual aids and all locations shall be approved by the Engineer prior to beginning repair work.

REPAIR CALL-OUT LEGEND

(XX) XX XX
- XX XX — Repair Quantity Unit
- Estimated Repair Quantity At Each Location
- (XX) — Repair No. – See Table of Repairs

TABLE OF REPAIRS

REPAIR NO.	REPAIR DESCRIPTION/LOCATION	ITEM	BID ITEM DESCRIPTION	QUANTITY	UNIT	DETAILS/NOTES
(1)	Remove and replace bearing pads at Bents 4Y and 5Y supporting trapezoidal steel box girders. See plan view for locations.	4002 6002	REPLACE ELASTOMERIC BEARING PADS (LARGE)	4	EA	See Bridge Repair Details sheet 2 of 4 for Jacking and Bearing Pad Replacement details and notes.
(2)	Construct a concrete shear key with an embedded steel plate at Bent 5Y. See plan view for location.	422 6023	SHEAR KEY	1	CY	See Bridge Repair Details sheet 3 of 4 for Shear Key details and notes.
(3)	Remove and replace deck, rail, rail termination, and joints full width on only one side at Bents 5Y. The concrete deck and rail shall be constructed full-depth. See plan view for locations.	778 6002	CONCRETE RAIL REPAIR (MISC)	3	LF	See Bridge Repair Details sheet 1 of 4 for Rail Termination Repair details and notes and see Bridge Repair Details sheet 4 of 4 for Bridge Joint Repair details and notes.
		785 6005	BRIDGE JOINT REPAIR (SEJ)	32	LF	
		778 6001	CONCRETE RAIL REPAIR (IN-KIND)	3	LF	Cleaning and sealing of header-type joints will be similar to the described procedure on the Cleaning and Sealing Existing Bridge Joints Sheet.
(4)	Remove and replace approach rail near to Abutment 1Y. See plan view for locations.	778 6001	CONCRETE RAIL REPAIR (IN-KIND)	5	LF	See Bridge Repair Details sheet 1 or 4 for Approaching Rail Replacement details and notes.
(5)	Clean deck drain inlet and corresponding downspout system near to Bent 5Y. See plan view for location.	764 6001	DRAIN INLET CLEANING	1	EA	Perform hydraulic cleaning, vacuum removal and disposal of debris in deck drains, and downspout systems according to Item 764. See Inlet and Downspout Cleaning Notes for process.
		764 6004	DOWNSPOUT CLEANING	1	EA	
(6)	Tighten anchor rod nuts in box cap connections to Columns 1 and 2 at Bent 3Y. See plan view for locations	784 6033	REP STL BRIDGE MEMBER (TIGHTEN MEMBER)	2	EA	See Tighten Anchor Rod Nut Notes for procedure.
(7)	Finish concrete surface on Bent Nos. 3Y & 4Y. See plans for Table of Quantities per bent.	427 6008	SPL PROT COAT	1150	SF	See Conc. Surface Finishes Notes for procedure. Refer to manufacturer Alchemco BridgeDECK guide for recommendations, notes and details not shown.
(8)	Remove paint from concrete surface on Bent Nos. 3Y and 4Y. See plans for Table of Quantities per bent.	740 6001	GRAFFITI REMOVAL (BLAST CLEANING)	80	SF	See Graffiti Removal Notes for work method.

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IH 35 NB TO US 290 EB DIRECT CONNECTOR LOCATION REPAIR PLAN NBI # 14-227-0-0015-13-451

SCALE: 1"=20' SHEET 1 OF 2

DESIGN	FED.RD. DIV.NO.	FEDERAL PROJECT NO.		HIGHWAY NO.
	6			IH 35
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CHECK	TEXAS	AUS	TRAVIS	32
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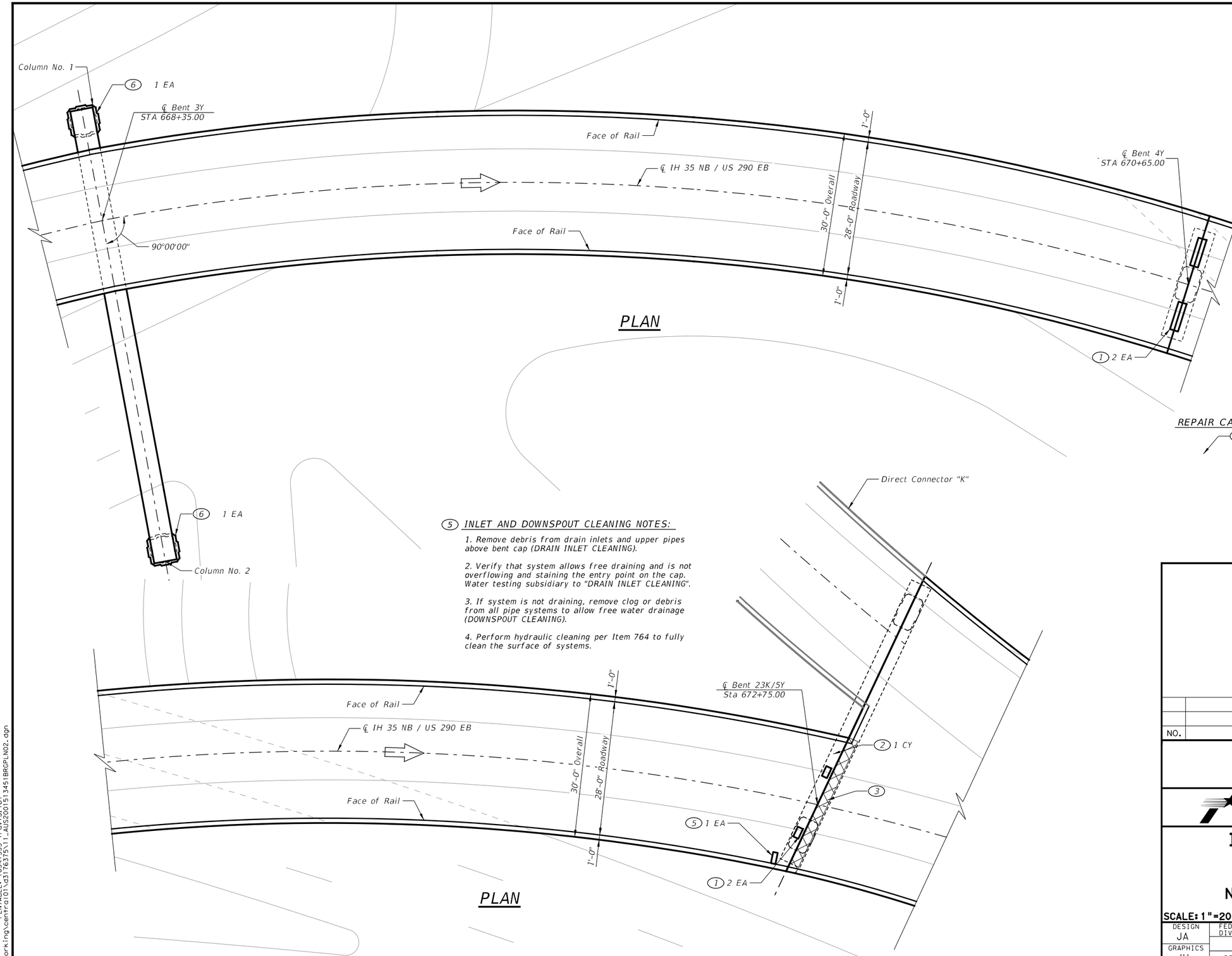

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SCALE IN FEET

GENERAL NOTES:

1. See the Table of Repairs for scope of rehabilitation.
2. Existing plans are available upon request from the Area Engineer.
3. Stationing is based on As-built drawings and is for reference only. Beams are labeled from left to right looking in the direction of increasing station.
4. Locations indicated in plans and details are for visual aids and all locations shall be approved by the Engineer prior to beginning repair work.

REPAIR CALL-OUT LEGEND

- (XX) XX XX
  - Repair Quantity Unit
  - Estimated Repair Quantity At Each Location
  - Repair No. - See Table of Repairs
- Joint Repair
- Bearing Pad Replacement

(5) INLET AND DOWNSPOUT CLEANING NOTES:

1. Remove debris from drain inlets and upper pipes above bent cap (DRAIN INLET CLEANING).
2. Verify that system allows free draining and is not overflowing and staining the entry point on the cap. Water testing subsidiary to "DRAIN INLET CLEANING".
3. If system is not draining, remove clog or debris from all pipe systems to allow free water drainage (DOWNSPOUT CLEANING).
4. Perform hydraulic cleaning per Item 764 to fully clean the surface of systems.

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IH 35 NB TO US 290 EB DIRECT CONNECTOR LOCATION REPAIR PLAN
NBI # 14-227-0-0015-13-451

SCALE: 1"=20' SHEET 2 OF 2

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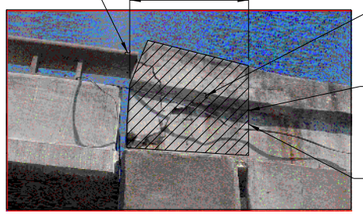

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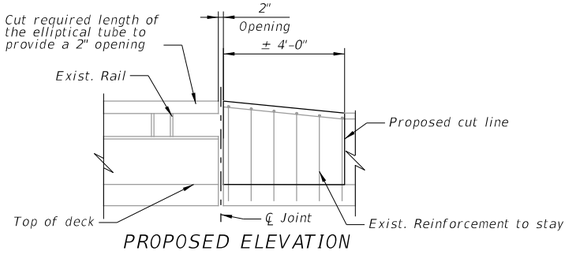


PROPOSED ELEVATION

④ APPROACHING RAIL REPAIR NOTES:

Identify and mark all repair locations prior to beginning work. Verify areas and quantities with the Engineer.

Avoid damaging existing rebar during the concrete removal process. If a rebar gets damaged, then replace the damaged rebar as directed by the Engineer.

Dimensions are based on As-built drawings and are for reference only. Contractor to field verify all dimensions prior to construction.

Repairs are paid for as item 778 6002 "CONC RAIL REPAIR (IN-KIND)". Removal of existing rail is subsidiary to this item.

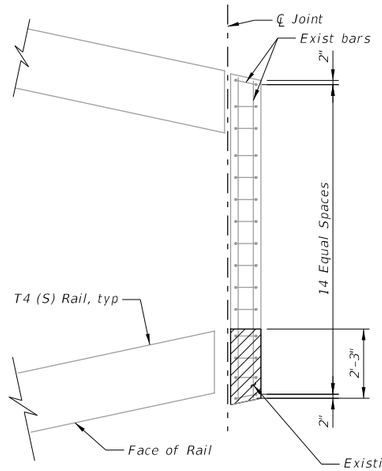
⑥ TIGHTEN ANCHOR ROD NUT NOTES:

1. Identify the repair location as shown on picture. Verify repair location with the Engineer.

2. Remove debris around the anchor rod and nut.

3. Inspect the anchor rod and nut state.

4. Tight the anchor rod nut to a full snug-tight condition preventing the removal of the nut without the use of a wrench.



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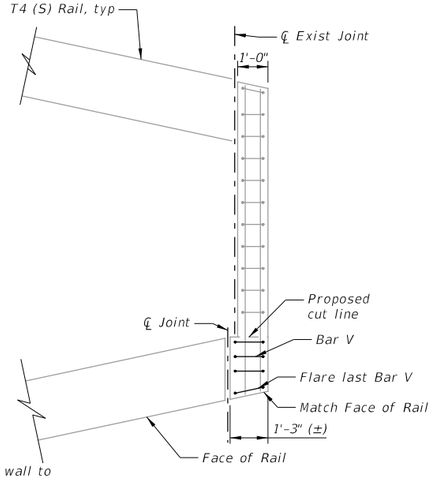

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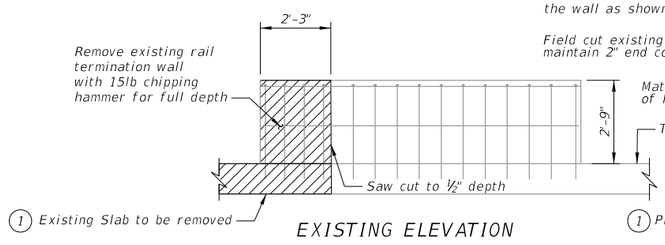

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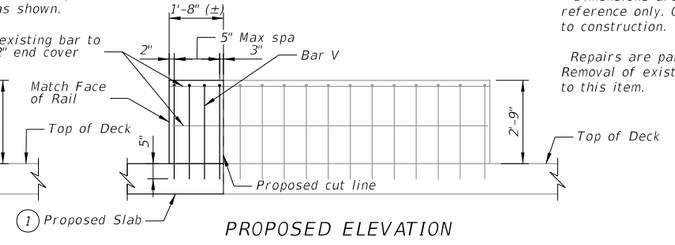


PROPOSED ELEVATION

③ RAIL TERMINATION REPAIR DETAIL

⑦ CONC. SURFACE FINISHES NOTES:

1. Verify repair location with the Engineer. The final concrete surface to be treated shall be approved by the Engineer.

2. Water blast surface for surface preparation prior to application of sealer. Utilize a minimum of 4,500psi pressure water blast equipment with rotary nozzle with maximum standoff distance of 6" to clean stained surfaces. Do not damage surfaces by exposing the coarse aggregate in the concrete. If water blasting with minimum 4,500psi pressure water cannot remove the dark staining from the concrete surface, provide a "Blast Finish" surface utilizing abrasive blasting.

Conc. Surface Finishes (427-6008)	
Bent No.	SF
3Y	1150

CONTRACTOR GENERAL NOTES FOR ITEM 427:

1. When a "Blast Finish" surface finish is required, lightly abrasive blast dark stained areas on surface to blend the area with surrounding surfaces. Do not expose course aggregate by abrasive blasting.

2. Provide Alchemco BridgeDECK sealer for Special Protective Coat.

3. Apply Alchemco BridgeDECK to bent surfaces at a rate not to exceed 180 to 200 SF/Gal.

4. Wait a minimum of 1 hour and until surface appears dry but not to exceed 5 hours and then thoroughly wet surface (low pressure) with potable water.

⑧ GRAFFITI REMOVAL NOTES:

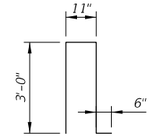
1. Verify repair location with the Engineer. The final concrete surface to be treated shall be approved by the Engineer.

2. Remove paint from concrete to expose bare concrete using allowed chemical strippers in combination with either water or abrasive blasting.

3. Provide finished surface resembles surrounding concrete.

Graffiti Removal (740-6001)	
Bent No.	Area, SF
3Y	50
4Y	30

(1) For slab removal limits and slab proposed details, see Direct Connector Bridge Repair Details sheet 4 of 4.



Bar V

RAIL TERMINATION REPAIR NOTES:

Identify and mark all repair locations prior to beginning work. Verify areas and quantities with the Engineer.

Avoid damaging existing horizontal rebar during the concrete removal process. If a rebar gets damaged, then replace the damaged rebar as directed by the Engineer.

Dimensions are based on As-built drawings and are for reference only. Contractor to field verify all dimensions prior to construction.

Repairs are paid for as item 0778 6002 "CONC RAIL REPAIR". Removal of existing rail wall, dowels and rebar are subsidiary to this item.

NOT TO SCALE

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IH 35 NB TO US 290 EB DIRECT CONNECTOR BRIDGE REPAIR DETAILS

SCALE: N. T. S

SHEET 1 OF 4

DESIGN	FED. RD. DIV. NO.	FEDERAL PROJECT NO.		HIGHWAY NO.
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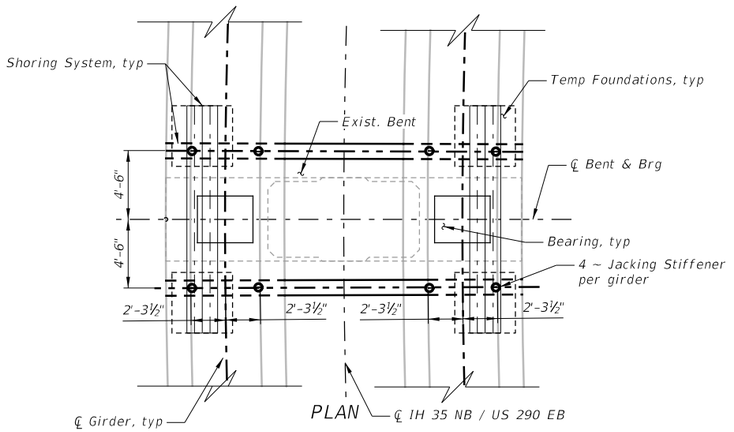

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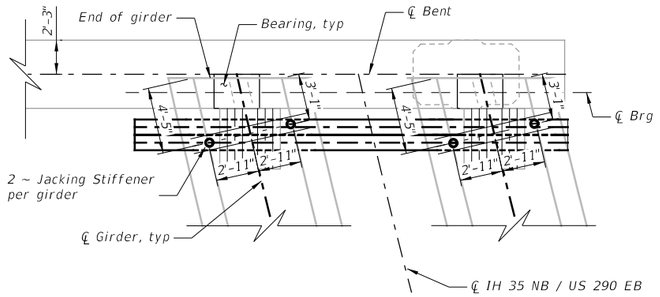

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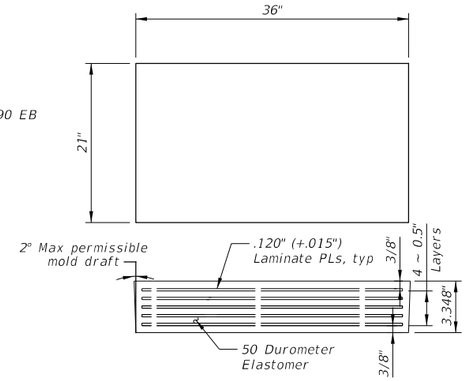
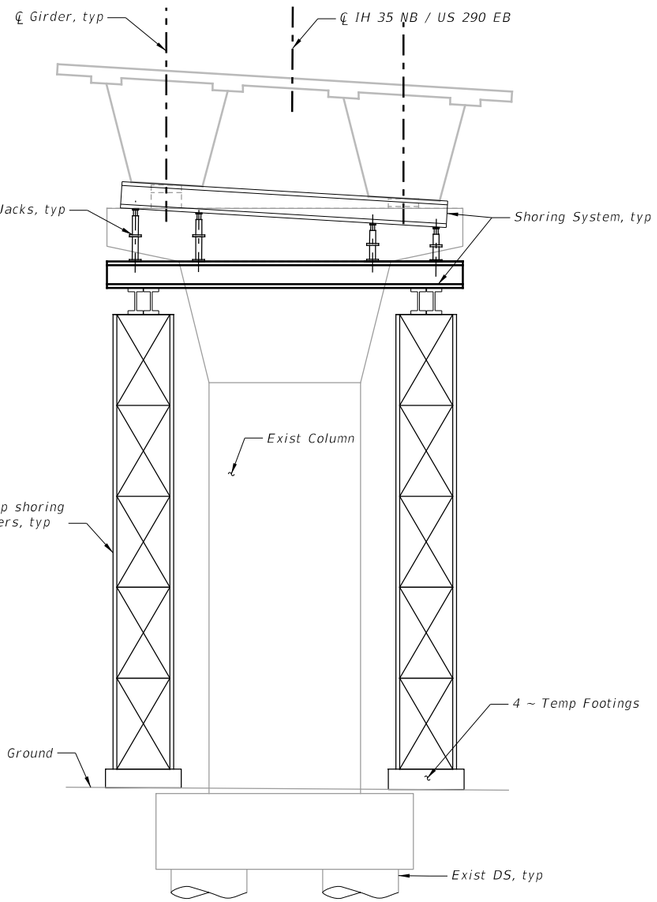
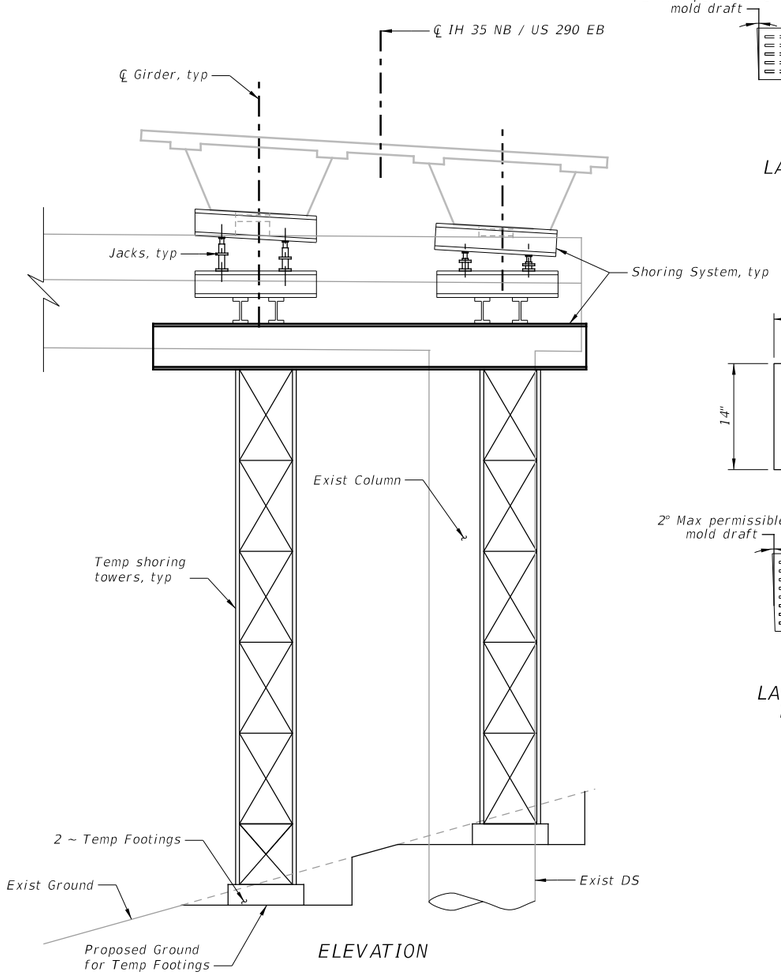


LAMINATED BEARING PAD DETAIL FOR BENT 4Y



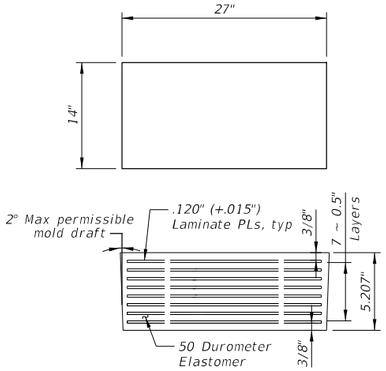
ELEVATION

① BENT 4Y



ELEVATION

① BENT 23K/5Y



LAMINATED BEARING PAD DETAIL FOR BENT 5Y

SUPERSTRUCTURE JACKING NOTES:

Superstructure jacking will be performed in accordance with Item 495, "Raising Existing Structures"

Hydraulic jacks should have adequate capacity to support 2 times the unfactored dead load per Item 495.3.2. Apply required jacking force in a balanced and controlled manner. Required unfactored dead loads to be supported at each jack are thefollowing:

Bent	Unfactored DL per BRG
4Y	949,000 lbs
5Y	373,000 lbs

Place jack as indicated on plans. Provide temporary foundations as required to support loads.

Contractors may submit alternative jacking plan or sequence for Engineer approval.

Contractor shall secure the superstructure of sliding and side-swaying during the jacking process and submit signed and sealed calculations and detailed plans to raise superstructure in accordance with Item 495.

SUGGESTED CONSTRUCTION SEQUENCE:

1. Close bridge to traffic. Jacking should occur only under dead load and construction loads.
2. Raise structure approximately ½" to facilitate bearing replacement.
3. Remove existing bearing pads.
4. Install proposed elastomeric bearing pads.
5. Lower structure until fully supported on new bearings and remove jacks.
6. Restore traffic to bridge.

BEARING PAD REPLACEMENT NOTES:

Raise the existing structure in accordance with Item 495, "Raising Existing Structures" as required to remove bearings.

Remove existing bearing and place new bearing per Item 434, "Bridge Bearings".

New bearing pads shall be 50 Durometer elastomer.

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Texas Department of Transportation

IH 35 NB TO US 290 EB DIRECT CONNECTOR BRIDGE REPAIR DETAILS

SCALE: N.T.S SHEET 2 OF 4

DESIGN	FED. RD. DIV. NO.	FEDERAL PROJECT NO.		HIGHWAY NO.
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GRAPHICS	STATE	DISTRICT	COUNTY	SHEET NO.
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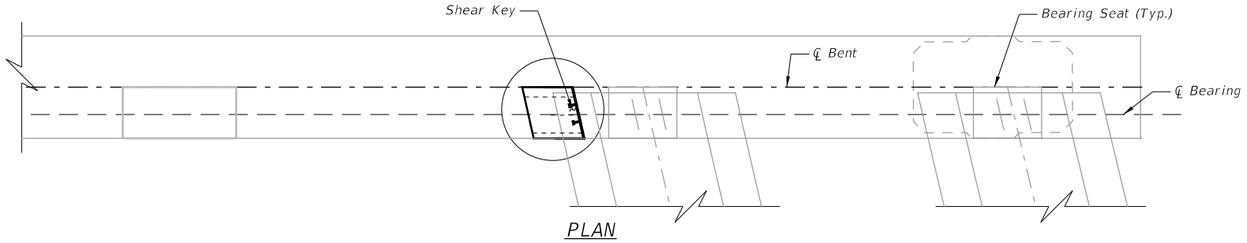

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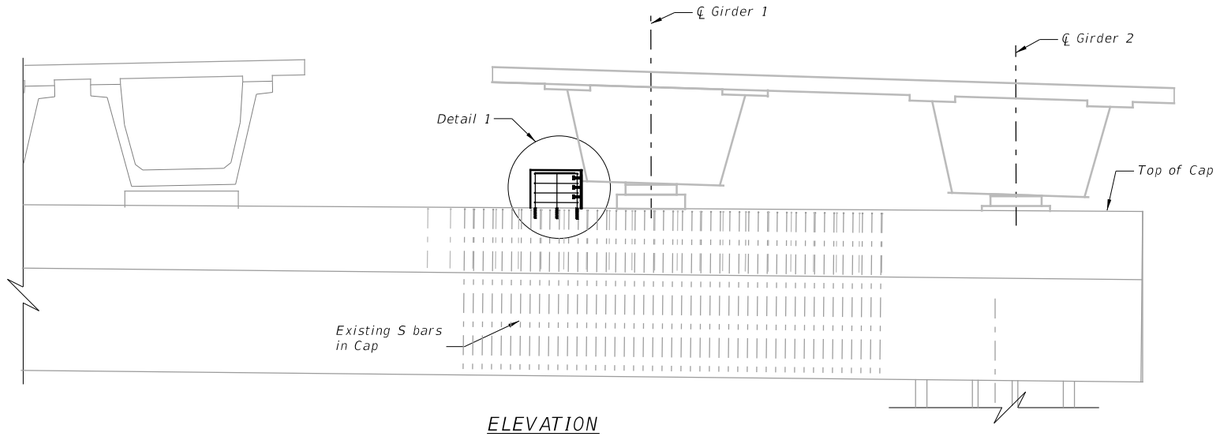

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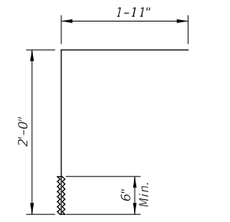

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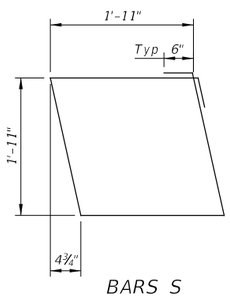

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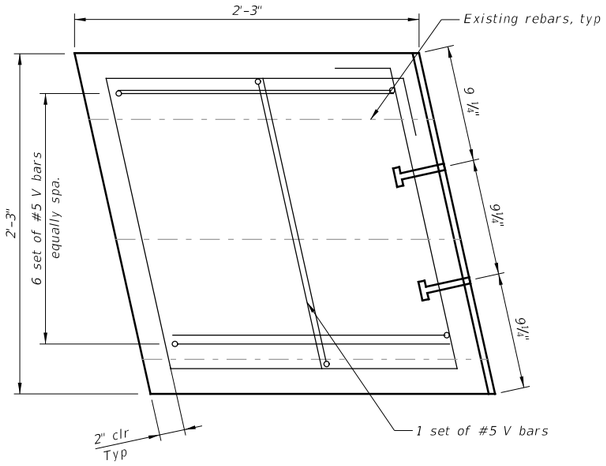
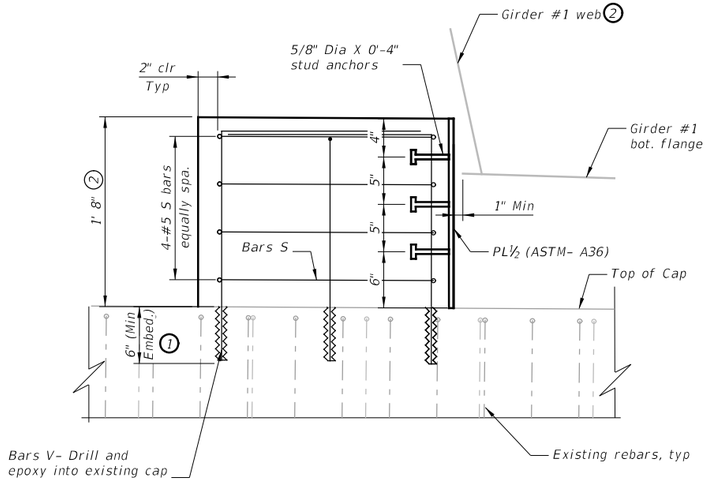


SHEAR KEY PLAN



DETAIL 1

GENERAL NOTES:

Identify and mark all repair locations prior to beginning work. Verify areas and quantities with the Engineer.

Avoid damaging existing rebar during the concrete removal process. If a rebar gets damaged, then replace the damaged rebar as directed by the Engineer.

Dimensions are based on As-built drawings and are for reference only. Existing Rebar not shown for clarity. Contractor to field verify all dimensions prior to construction.

Repairs are paid for as item 422 6023 "SHEAR KEY". Required anchor bolts, steel plate and rebar are subsidiary to this item.

1. Provide Class C Concrete with (f'c = 3,600 psi).

2. Provide Grade 60 Reinforcing steel.

3. Field verify all dimensions and clearances before construction.

(1) Embed bar into concrete with a Type III (Class C) epoxy adhesive. Minimum bar embedment depth is 6". The adhesive chosen must be able to achieve a basic bond strength of 20 kips in tension. Follow manufacturer's direction for installation of the bars.

(2) The shear key height should at least be 3" taller than the girder bottom flange. Maintain at least 1" clearance from top of shear key to the girder.

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Texas Department of Transportation

IH 35 NB TO US 290 EB DIRECT CONNECTOR BRIDGE REPAIR DETAILS

SCALE: N.T.S

SHEET 3 OF 4

DESIGN	FED.RD. DIV.NO.	FEDERAL PROJECT NO.		HIGHWAY NO.
JA	6			IH 35
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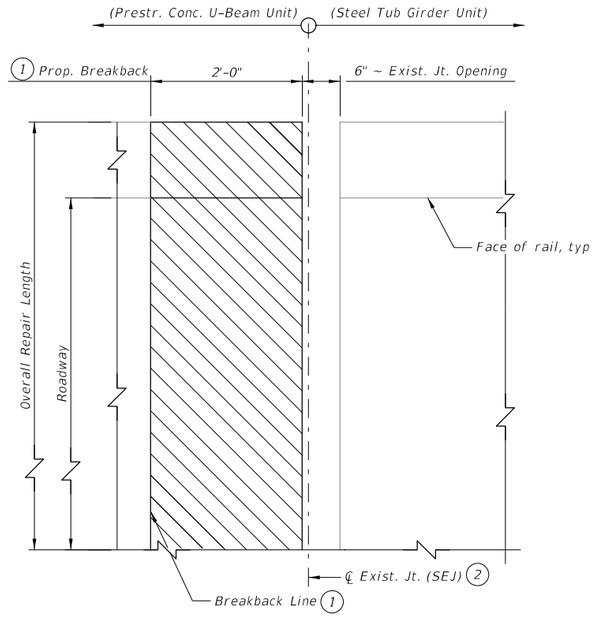

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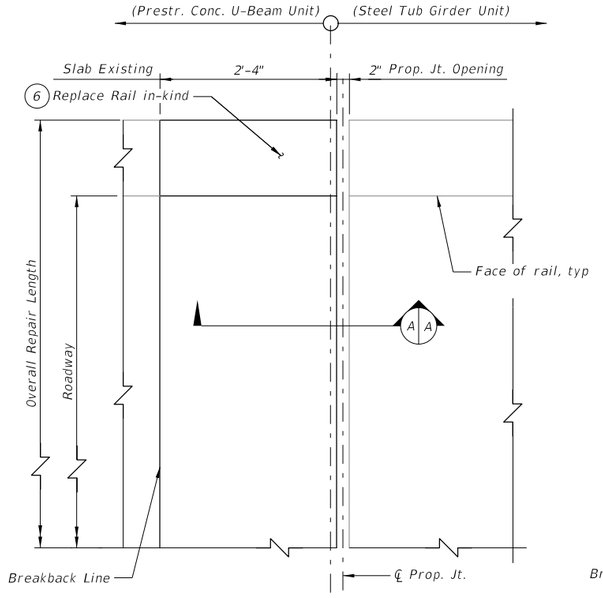
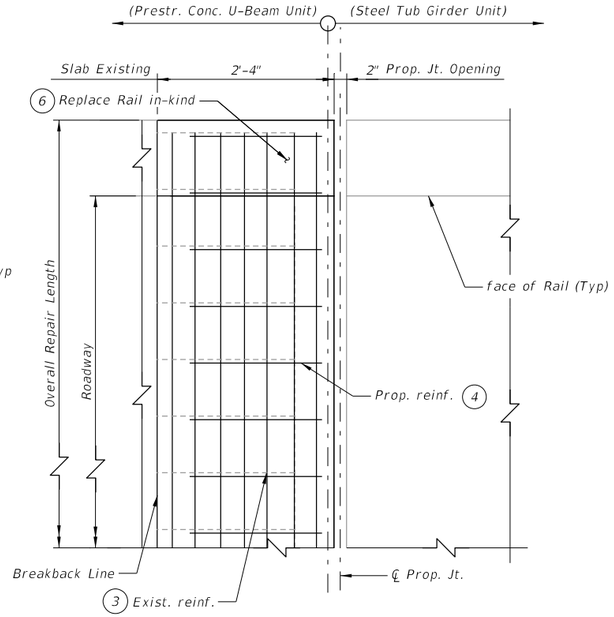


PARTIAL PLAN PROPOSED CONDITION



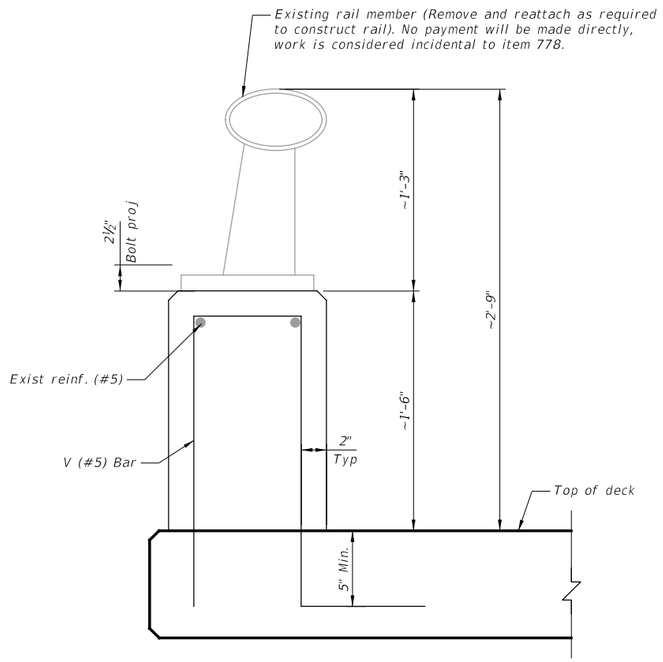
REINFORCING LAYOUT PROPOSED CONDITION

1. Remove hatched portion of existing structure and rail as shown in accordance with Item 785, "Bridge Joint Repair or Replacement." Shallow saw cut at breakline to a depth of 1/2" prior to breaking back slab. Avoid damaging existing reinforcement during concrete removal.
2. Remove joint seal. Existing SEJ to be removed from Prest. Conc. U-Beam Unit side only.
3. Place #4 longitudinal bars between existing reinf, top and bottom. Spacing may vary. Refer to provided UBMS standard for more information.
4. See UBTS standard for anticipated reinforcing in Thickened Slab End.
5. Slab thickness varies from 8" between flanges of U-Beams to approximately 14" at Thickened Slab End. Additional reinforcing steel not shown here may be present.
6. Remove and replace rail in-kind. Place #5 V-bar at 6" spacing. Traffic Rail Type T4 Standard is included for additional details and notes.
7. See SEJ-M standard for details and notes. Blast clean existing SEJ to a near white condition prior to placing joint seal. Provide material compatible with joint sealant.
8. Field verify existing SEJ type and shape of the steel section removed. Proposed SEJ type and shape shall be compatible with the existing.
9. Open to traffic in accordance with Item 422.4.1.9 and when Class S concrete for slab and Class C concrete for rail has attained 4,000 psi.

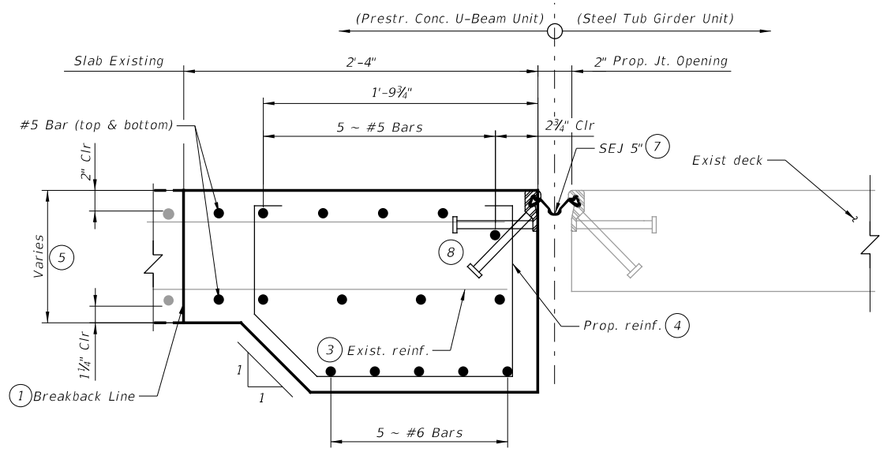
GENERAL NOTES:

1. Provide Class S concrete (Slab) (f'c = 4,000 psi) and Class C concrete (Rail) (f'c = 3,600 psi).
2. Provide Grade 60 Reinforcing steel.
3. Allow traffic on structure only after concrete has attained 3,600 psi.

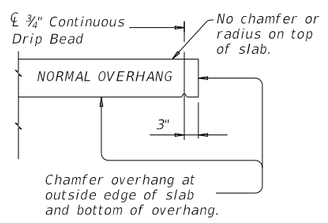
NOT TO SCALE



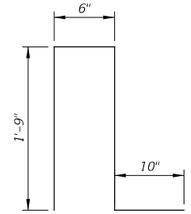
SECTION THRU RAIL AT BRIDGE SLAB



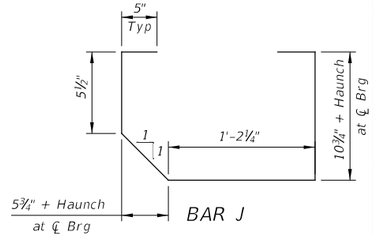
SECTION A-A



CHAMFER AND DRIP BEAD DETAIL



BAR V



BAR J

HDR
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IH 35 NB TO US 290 EB DIRECT CONNECTOR BRIDGE REPAIR DETAILS

NO.	REVISION	BY	DATE

SCALE: N.T.S **SHEET 4 OF 4**

DESIGN	FED.RD. DIV.NO.	FEDERAL PROJECT NO.		HIGHWAY NO.
JA	6			IH 35
GRAPHICS	STATE	DISTRICT	COUNTY	SHEET NO.
RA	TEXAS	AUS	TRAVIS	37
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ALL	0114	01	068	
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ALL				

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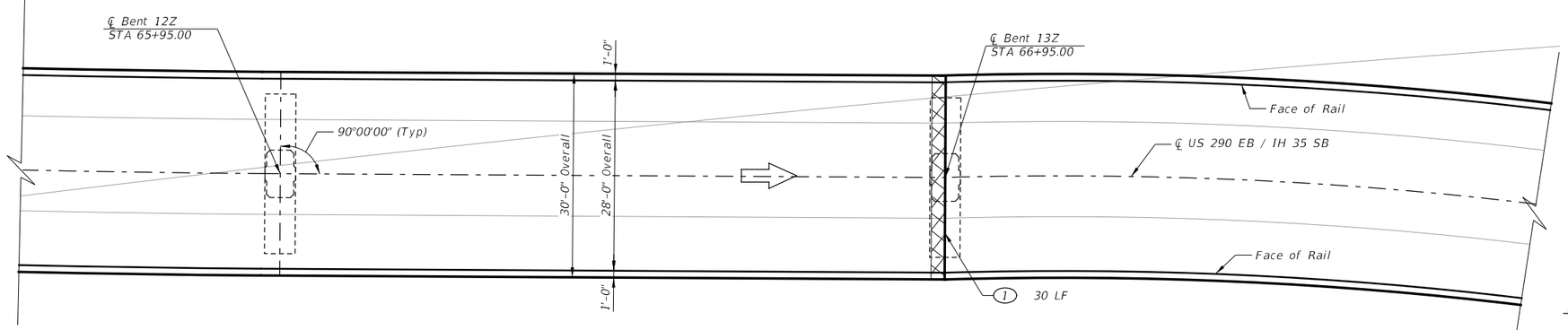

PLAN

0 10 20
SCALE IN FEET

GENERAL NOTES:

1. See the Table of Repairs for scope of rehabilitation.
2. Existing plans are available upon request from the Area Engineer.
3. Stationing is based on As-built drawings and is for reference only. Beams are labeled from left to right looking in the direction of increasing station.
4. Locations indicated in plans and details are for visual aids and all locations shall be approved by the Engineer prior to beginning repair work.

REPAIR CALL-OUT LEGEND

(2) CONC. SURFACE FINISHES NOTES:

1. Verify repair location with the Engineer. The final concrete surface to be treated shall be approved by the Engineer.

2. Water blast surface for surface preparation prior to application of sealer. Utilize a minimum of 4,500psi pressure water blast equipment with rotary nozzle with maximum standoff distance of 6" to clean stained surfaces. Do not damage surfaces by exposing the coarse aggregate in the concrete. If water blasting with minimum 4,500psi pressure water cannot remove the dark staining from the concrete surface, provide a "Blast Finish" surface utilizing abrasive blasting.

Conc. Surface Finishes Per Item		
Bent No.	427-6005 SF	427-6008 SF
2Z	100	
11Z	400	2790
12Z	400	

CONTRACTOR GENERAL NOTES FOR ITEM 427:

1. When a "Blast Finish" surface finish is required, lightly abrasive blast dark stained areas on surface to blend the area with surrounding surfaces. Do not expose course aggregate by abrasive blasting.

2.Provide Alchemco BridgeDECK sealer for Special Protective Coat.

3.Apply Alchemco BridgeDECK to bent surfaces at a uniform rate of 180 SF/200 Gal.

4.Wait a minimum of 1 hour and until surface appears dry but not to exceed 5 hours and then thoroughly wet surface (low pressure) with potable water.

(3) GRAFFITI REMOVAL NOTES:

1. Verify repair location with the Engineer. The final concrete surface to be treated shall be approved by the Engineer.

2. Remove paint from concrete to expose bare concrete using allowed chemical strippers in combination with either water or abrasive blasting.

3. Provide finished surface resembles surrounding concrete.

Graffiti Removal (740-6001)	
Bent No.	Area, SF
15Z	30
17Z	100

TABLE OF REPAIRS

REPAIR NO.	REPAIR DESCRIPTION/LOCATION	ITEM	BID ITEM DESCRIPTION	QUANTITY	UNIT	DETAILS/NOTES
(1)	Remove and replace deck, rail and joints full width on only one side at bent 13. The concrete deck and rail shall be constructed full-depth. See plan view for locations	778 6001	CONCRETE RAIL REPAIR (IN-KIND)	5	LF	See US 290 EB to IH 35 SB Bridge Repair Details for procedure and notes.
		785 6005	BRIDGE JOINT REPAIR (SEJ)	28	LF	
(2)	Finish concrete surface on Bent Nos. 2Z, 11Z and 12Z. See plans for Table of Quantities per bent.	427 6005	BLAST FINISH	900	SF	See Conc. Surface Finishes Notes for procedure. Refer to manufacturer Alchemco BridgeDECK guide for recommendations, notes and details not shown.
		427 6008	SPL PROT COAT	2,790	SF	
(3)	Remove paint from concrete surface on Bent Nos. 15Z and 17Z. See plans for Table of Quantities per bent.	740 6001	GRAFFITI REMOVAL (BLAST CLEANING)	130	SF	See Graffiti Removal Notes for work method.

STATE OF TEXAS
ALICIA LICON-LOZANO
108330
LICENSED PROFESSIONAL ENGINEER
07/26/2023

NO.	REVISION	BY	DATE

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Texas Department of Transportation

US 290 EB TO IH 35 SB DIRECT CONNECTOR LOCATION REPAIR PLAN
NBI # 14-227-0-0015-13-452

SCALE: 1"=20' SHEET 1 OF 1

DESIGN	FED.RD. DIV.NO.	FEDERAL PROJECT NO.		HIGHWAY NO.
JA	6			IH 35
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CHECK ALL	CONTROL	SECTION	JOB	
	0114	01	068	

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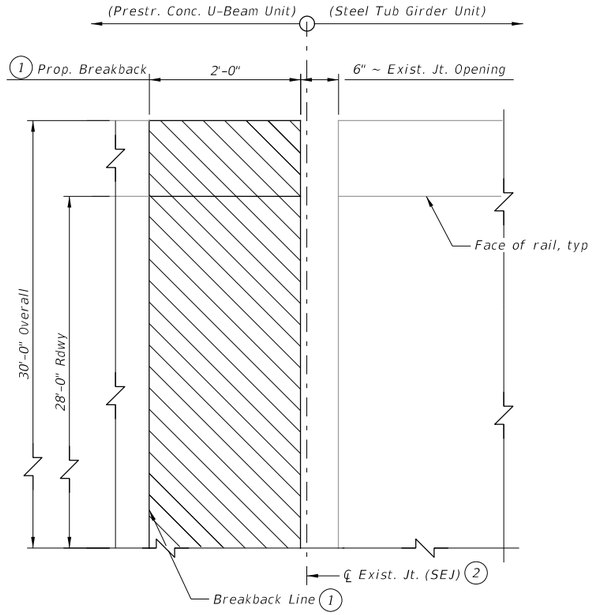
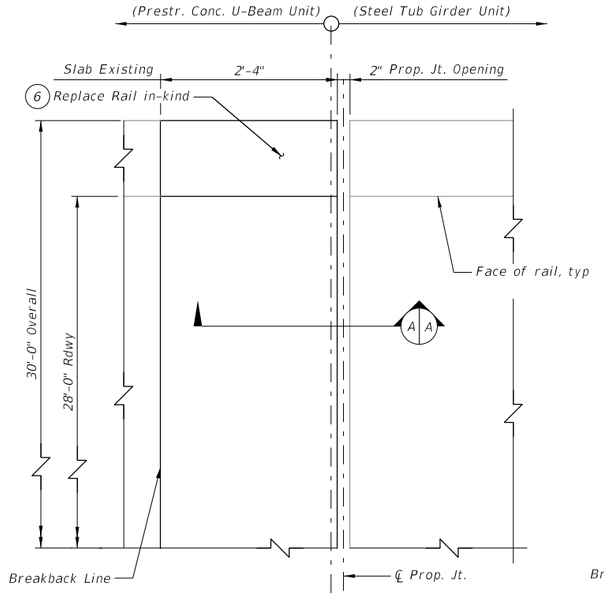
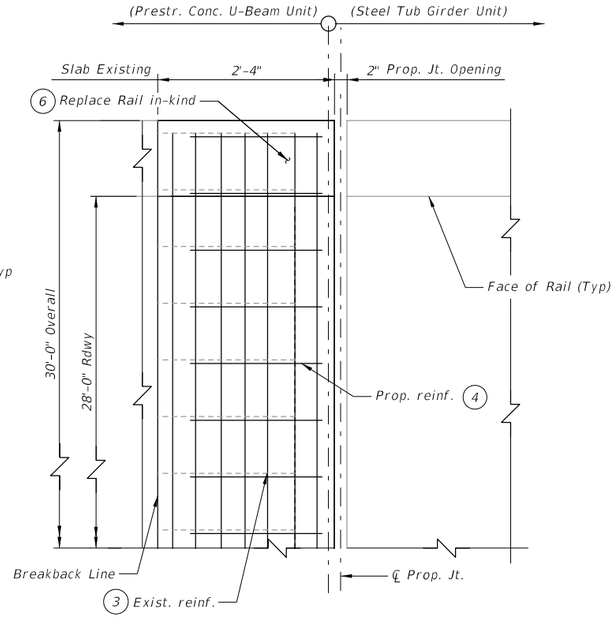


PARTIAL PLAN EXISTING CONDITION



PARTIAL PLAN PROPOSED CONDITION

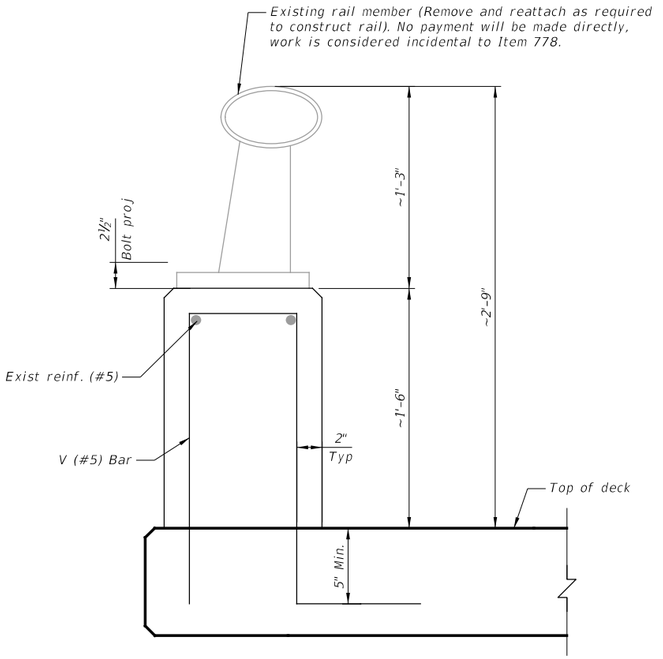


REINFORCING LAYOUT PROPOSED CONDITION

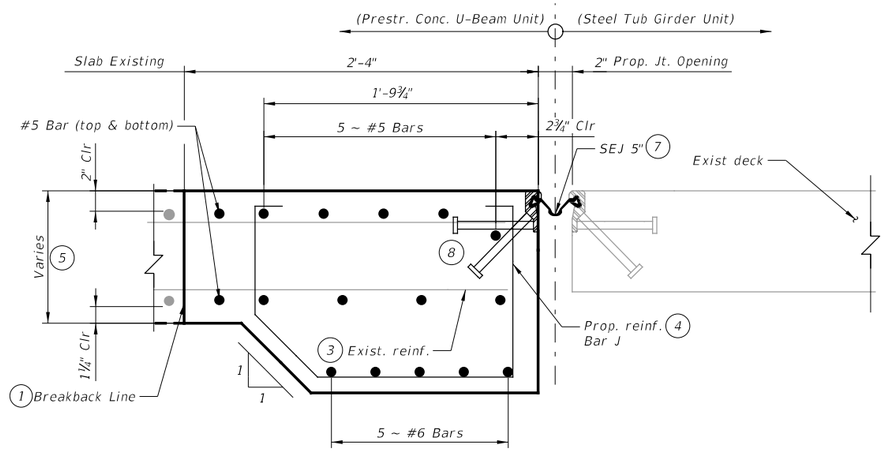
1. Remove hatched portion of existing structure and rail as shown in accordance with Item 785, "Bridge Joint Repair or Replacement." Shallow saw cut at breakline to a depth of 1/2" prior to breaking back slab. Avoid damaging existing reinforcement during concrete removal.
2. Remove joint seal. Existing SEJ to be removed from Prest. Conc. U-Beam Unit side only.
3. Place #4 longitudinal bars between existing reinf, top and bottom. Spacing may vary. Refer to provided UBMS standard for more information.
4. See UBTS standard for anticipated reinforcing in Thickened Slab End.
5. Slab thickness varies from 8" between flanges of U-Beams to approximately 14" at Thickened Slab End. Additional reinforcing steel not shown here may be present.
6. Remove and replace rail in-kind. Place #5 V-bar at 6" spacing. Traffic Rail Type T4(S) Standard is included for additional details and notes.
7. See SEJ-M standard for details and notes. Blast clean existing SEJ to a near white condition prior to placing joint seal. Provide material compatible with joint sealant.
8. Field verify existing SEJ type and shape of the steel section removed. Proposed SEJ type and shape shall be compatible with the existing.
9. Open to traffic in accordance with Item 422.4.1.9 and when Class S concrete for slab and Class C concrete for rail has attained 4,000 psi.

GENERAL NOTES:

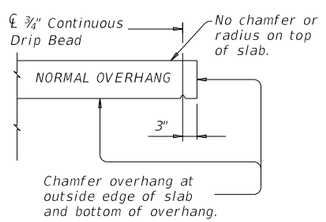
1. Provide Class S concrete (Slab) (f'c = 4,000 psi) and Class C concrete (Rail) (f'c = 3,600 psi).
2. Provide Grade 60 Reinforcing steel.
3. Allow traffic on structure only after concrete has attained 3,600 psi.



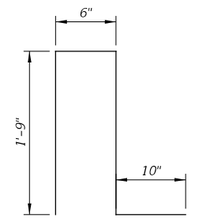
SECTION THRU RAIL AT BRIDGE SLAB



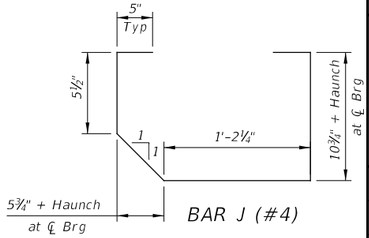
SECTION A-A



CHAMFER AND DRIP BEAD DETAIL



BAR V (#5)



BAR J (#4)

NOT TO SCALE

STATE OF TEXAS
ALICIA LICON-LOZANO
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07/26/2023

NO.	REVISION	BY	DATE

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Texas Department of Transportation

US 290 EB TO IH 35 SB DIRECT CONNECTOR BRIDGE REPAIR DETAILS

SCALE: N.T.S SHEET 1 OF 1

DESIGN	FED.RD. DIV.NO.	FEDERAL PROJECT NO.		HIGHWAY NO.
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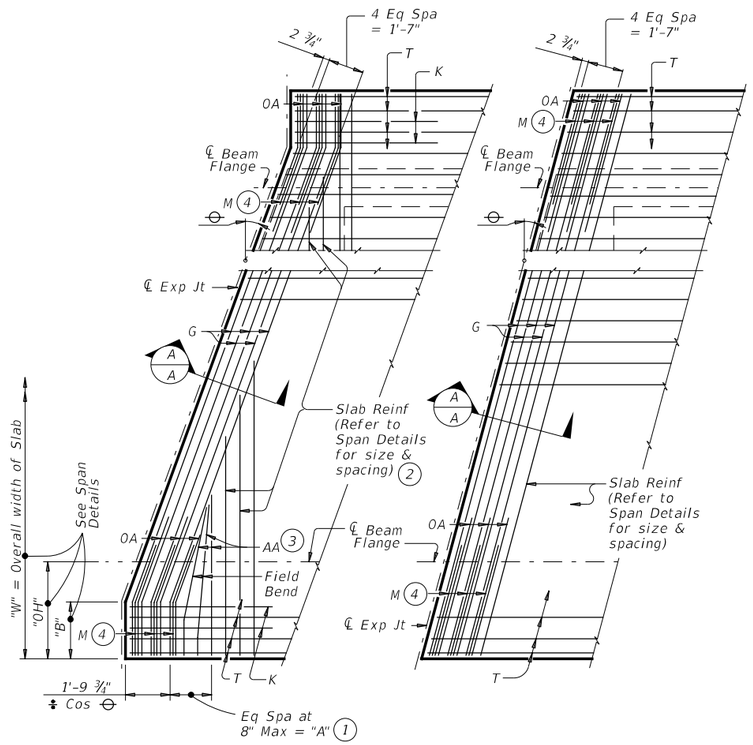
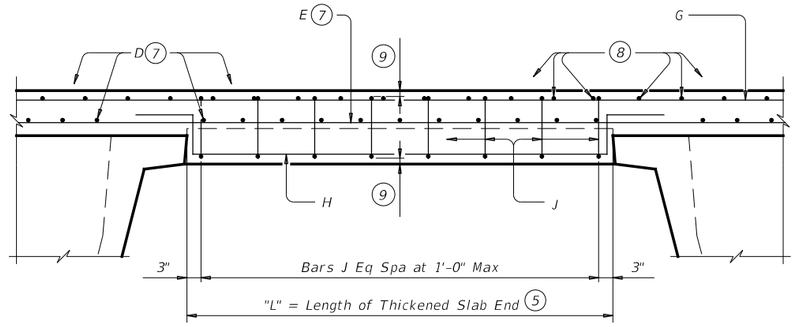


WITH BREAKBACK

WITHOUT BREAKBACK

PARTIAL PLAN

(Showing top reinforcing steel only unless noted otherwise)



TYPICAL TRANSVERSE SECTION

(1) "A"= ("OH" + 2.125' + $\frac{0.052'}{\sin \ominus}$ -"B") x Tan ⊖

(2) End the top transverse reinforcement steel at inside Bar G. End the bottom transverse reinforcement steel 1'-0" beyond inside Bar G.

(3) Bars AA (Top & Bott)

(4) Place 3 Bars M (Bott) at 10" Max. Field bend as necessary. Substitute Bars Z1 for Bars M when sloped overhangs are required. Bars Z1 are shown on standard PCP.

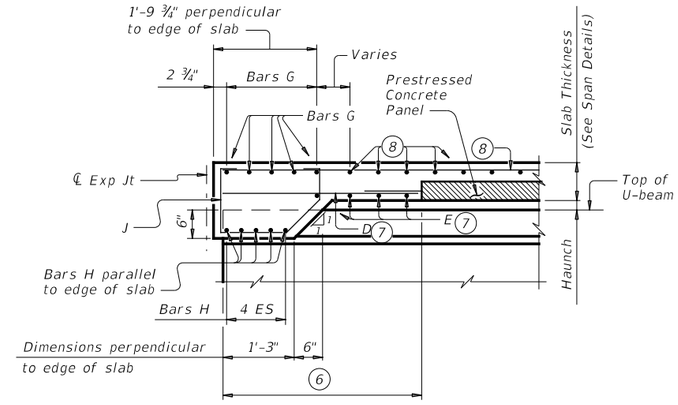
(5) Thickened slab end not required for lengths less than 1'-6".

(6) See standard PCP for panel placement.

(7) See standard PCP for Bars D and E.

(8) See Span Details for reinforcement size and spacing.

(9) Provide clear cover as shown on Span Details.



SECTION A-A

GENERAL NOTES:

Designed according to AASHTO LRFD Bridge Design Specifications.

Use these details in conjunction with the Span Details and standard PCP (if prestressed concrete panels are used).

When Option 2 from standard PCP is used, provide Bars AA, G, K and OA in the slab.

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

CONSTRUCTION NOTES:

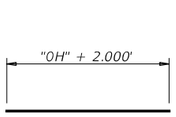
Provide Grade 60 reinforcing steel.

If slab reinforcing steel is shown on the Span Details to be epoxy coated, then Bars AA, G, K, H, J and M must be epoxy coated.

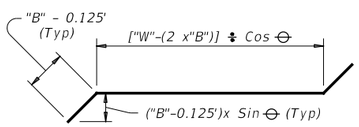
Provide bar laps, where required, as follows:

Uncoated ~ #4 = 1'-5"

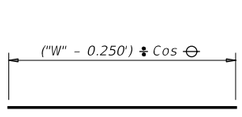
Epoxy Coated ~ #4 = 2'-1"



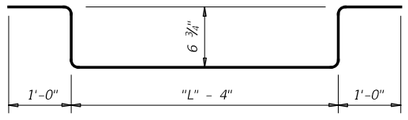
BARS AA (#5)



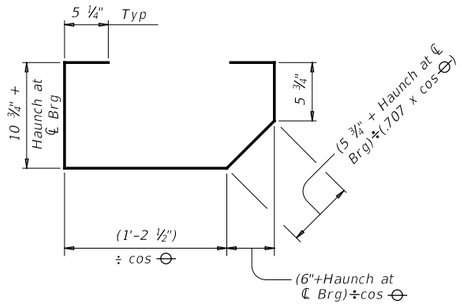
BARS G (#4)
(For Slabs With Breakbacks)



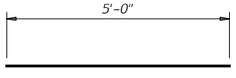
BARS G (#4)
(For Slabs Without Breakbacks)



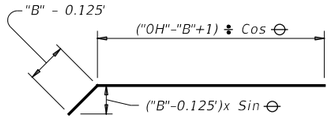
BARS H (#6)



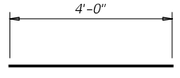
BARS J (#4)



BARS K (#4)



BARS M (#4)
(For Slabs With Breakbacks)



BARS M (#4)
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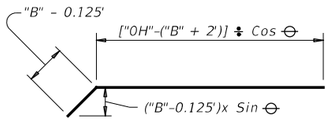
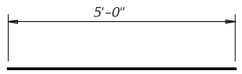


BARS OA (#5)
(For Slabs With Breakbacks)



BARS OA (#5)
(For Slabs Without Breakbacks)

HL93 LOADING

Texas Department of Transportation

Bridge Division Standard

THICKENED SLAB END DETAILS

PRESTR CONC U-BEAM SPANS

UBTS

FILE: ubstde05.dgn	DN: TxDOT	CK: TxDOT	DW: TxDOT	CK: TxDOT
©TxDOT July 2014	CONT	SECT	JOB	HIGHWAY
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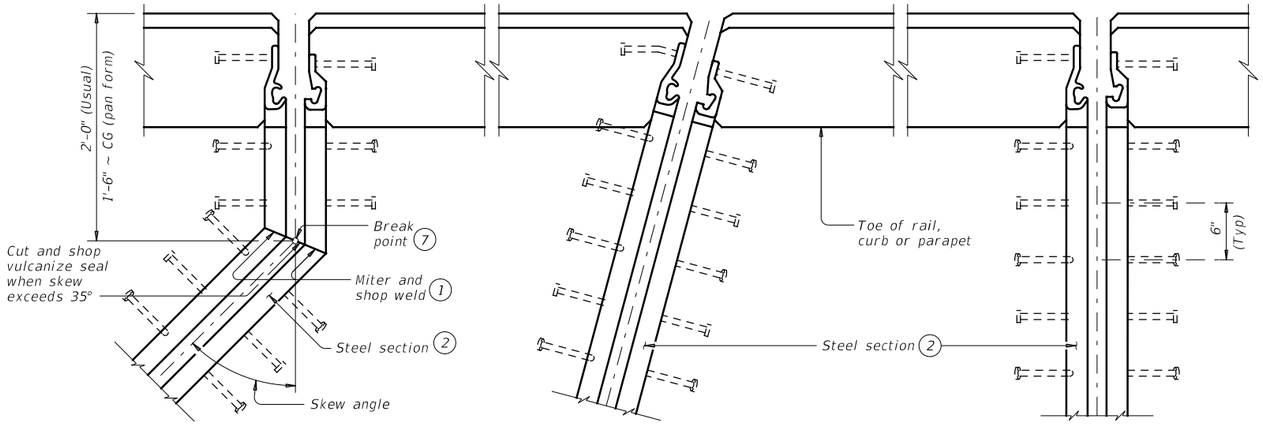
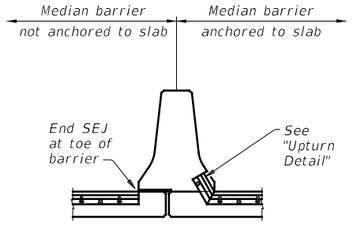


SHOWING SKEWS WITH SLAB BREAKBACKS

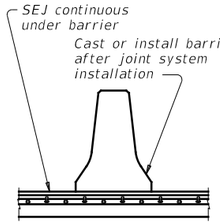
SHOWING SKEWS WITHOUT SLAB BREAKBACKS

SHOWING WITHOUT SKEWS AND SLAB BREAKBACKS

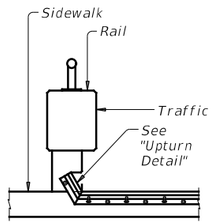
PLANS OF END CONDITIONS



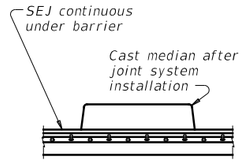
WITH OPEN DECK JOINT BELOW MEDIAN BARRIER



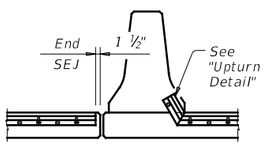
AT MEDIAN BARRIER



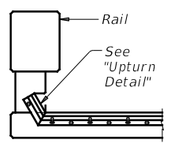
AT SIDEWALK BEHIND BRIDGE RAIL



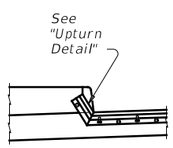
AT RAISED MEDIAN



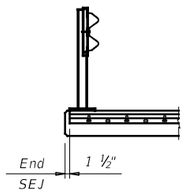
WITH OPEN DECK JOINT ADJACENT TO MEDIAN BARRIER



AT CONCRETE BRIDGE RAIL

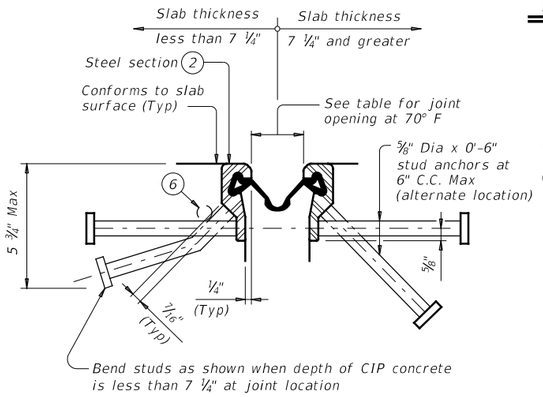


AT SIDEWALK

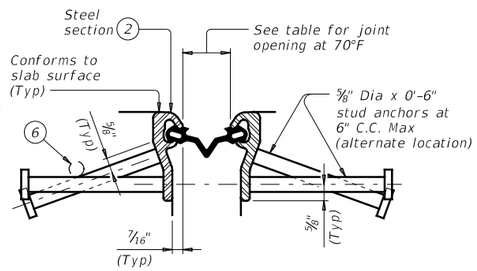


AT STEEL POST BRIDGE RAIL

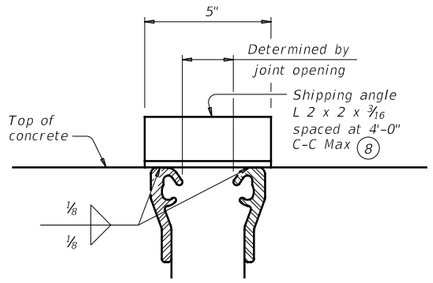
TYPICAL SECTIONS (5)



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



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



SHOWING D.S. BROWN (Ty SSCM2)
(All joints are similar.) (Studs are not shown for clarity.)

SHIPPING ANGLE

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

TABLE OF SEALED EXPANSION JOINT INFORMATION

MANUFACTURER	STEEL SECTION (2)	STRIP SEAL			
		4" JOINT		5" JOINT	
		Seal Type	Joint Opening (3)	Seal Type	Joint Opening (3)
D.S. Brown	Type SSCM2	A2R-400	1 ¾"	A2R-XTRA	2"
Watson Bowman Acme	Type R	SE-400	1 ¾"	SE-500	2"

REDUCED LONGITUDINAL MOVEMENT RANGE

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

DESIGN NOTES:

Joints installed on a skew have reduced ability to accommodate longitudinal movement. Use table values to determine the correct joint size for skewed installations.

For other skews over 25 degrees, calculate reduced movement range by multiplying joint size by cosine (skew).

(1) Remove all burrs which will be in contact with seal prior to making splice.

(2) Shape of steel section shown is typical. Variations in sections must be approved by the Engineer.

(3) These openings are also the recommended minimum installation openings.

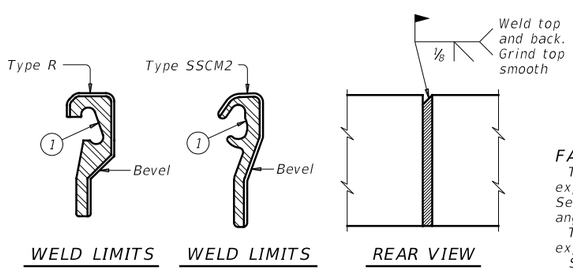
(4) Reduce for sidewalk or parapet heights less than 6".

(5) Other conditions affecting the joint profile should be noted elsewhere.

(6) Move transverse bars that are in conflict with SEJ studs, in either the bridge slab or approach slab, to rest at the junction of the studs.

(7) See Span details for location of break point.

(8) Align shipping angle perpendicular to joint.



WELD LIMITS WELD LIMITS REAR VIEW

FIELD SPLICE DETAIL

FABRICATION NOTES:

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

The seal must be continuous and included in the price bid for sealed expansion joint.

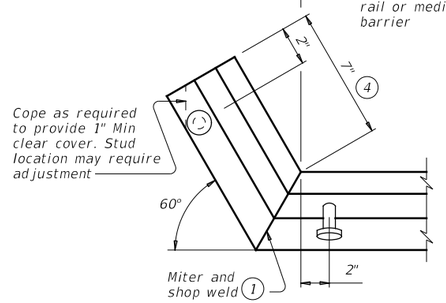
Ship steel sections in convenient lengths of 10'-0" Min and 24'-0" Max unless necessary for staged construction or widenings. One shop splice is permitted in each shipping length provided no piece is less than 2'-0" long and sufficient studs are added to limit the stud to shop splice distance to 2" Min and 4" Max.

Weld studs in accordance with AWS D1.1.

Butt weld all shop and field splices and grind smooth areas in contact with seal. Make all necessary field splice joint preparations in the shop.

Paint the entire steel section with System II or IV primer in accordance with Item 446, "Field Cleaning and Painting Steel", unless required to galvanize when shown in the plans. Provide galvanizing in accordance with Item 445, "Galvanizing". Provide paints in accordance with Item 446.2. Prepare steel and apply paint in accordance with Item 446.4.7.3 and 446.4.7.4.

Shop drawings for the fabrication of sealed expansion joints will not require the Engineer's approval if fabrication is in accordance with the details shown on this standard.



UPTURN DETAIL

CONSTRUCTION NOTES:

Secure the sealed expansion joint in position and place to the proper grade and alignment by welding braces to adjacent reinforcing steel, to prestressed beam stirrups, or to anchors cast in concrete diaphragms. Include cost of temporary bracing in the price bid for sealed expansion joint.

Remove shipping angle immediately after each joint half is secured in place. Grind smooth, and touch up with organic zinc-rich paint.

Clean and prepare seal cavity for seal installation as per the Manufacturer's installation procedures.

GENERAL NOTES:

Provide sealed expansion joints in the size and at locations shown on the plans.

Minimum slab and overhang thickness required for the use of SEJ-M is 6 ½".

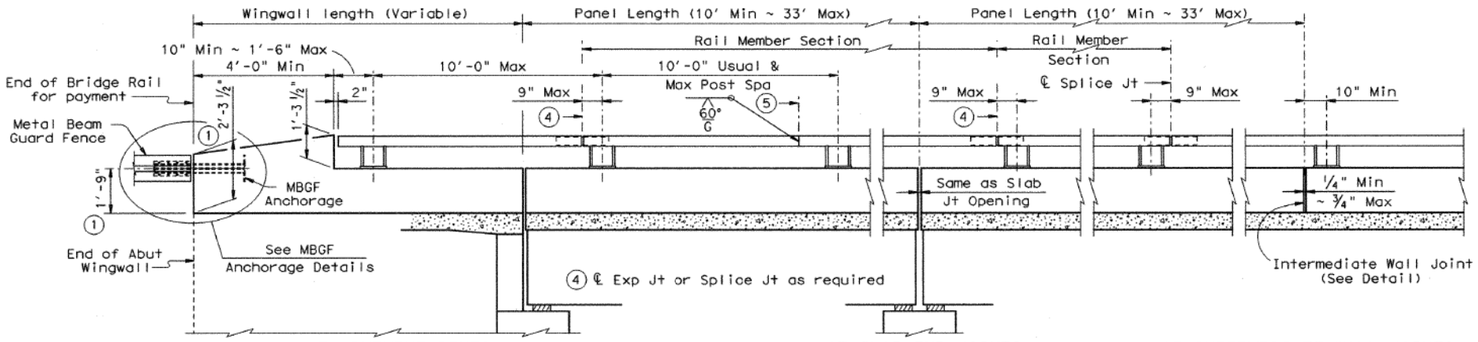
Texas Department of Transportation

Bridge Division Standard

SEALED EXPANSION JOINT TYPE M WITHOUT OVERLAY

SEJ-M

FILE: sejmste1-19.dgn	DN: TxDOT	CK: TxDOT	DW: JTR	CK: JMH
©TxDOT April 2019 REVISIONS	CONT	SECT	JOB	HIGHWAY
	0114	01	068	IH 35
	DIST	COUNTY		SHEET NO.
	AUS	TRAVIS		41

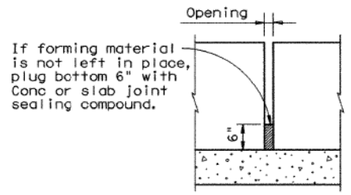


AT ABUTMENT BENTS | AT SLAB EXP JOINTS | AT INTERMEDIATE WALL JOINTS

ROADWAY ELEVATION OF RAIL

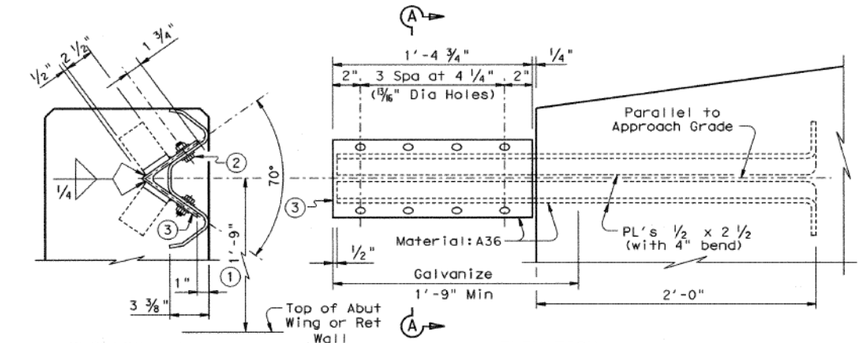
NOTE: Metal Beam Guard Fence must be attached to the Abutment Wing and extended along the embankment unless shown otherwise on the plans. See Plan Sheet for details and length for payment.

⑤ One shop splice per panel is permitted with minimum 85 percent penetration. The weld may be square groove, or single vee groove. Grind smooth.



INTERMEDIATE WALL JOINT DETAIL

Note: Provide intermediate wall joints over all slab construction joints, over interior supports on continuous units, and at equal intervals in between as necessary to maintain a 33' maximum length of unbroken wall. Material used in forming joint may be left in place if it is compressible and light in color such as the following materials: polystyrene, molded cork granules, sponge rubber sheet, etc.



SECTION A-A

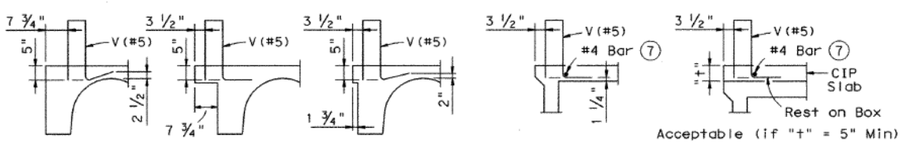
② 8 ~ ⅝" Dia Hex Head Bolts with ⅜" x 2" x 0'-4" PL Washers

ELEVATION

③ L 6 x 6 x ⅝ bent to 70°, or 2 PL's ⅝ x 6 welded to 70°.

METAL BEAM GUARD FENCE ANCHORAGE DETAILS

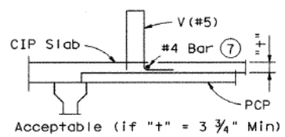
NOTE: Provide 4 additional shop or field holes in guard fence for this connection. (Use 8 bolts)



CG (PAN FORM)

BOX BEAM

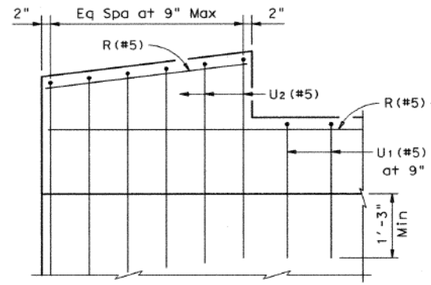
⑦ Place additional longitudinal bar (included as part of railing reinforcement) when V bars are embedded less than 5".



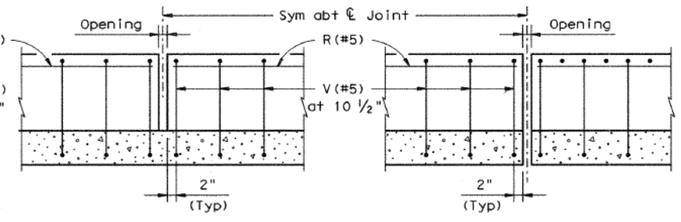
OVER PRESTR CONC PANELS

Note: This railing should not be placed on an elevated sidewalk, (Design speed 40 mph or less). When used as a separator barrier, anchorage to the slab must be with the standard Bars V at 10 ½". If the railing falls over a PCP with dimension "t" being equal to or greater than 3 ¾", then Bars V at 8" spacing with an additional longitudinal #4 bar may be placed in CIP Slab as shown.

TYPICAL REINFORCEMENT PLACEMENT DETAILS

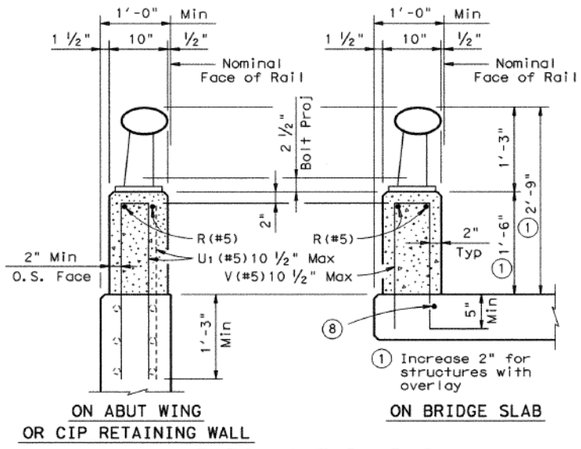


AT ABUTMENT WINGWALL



AT INTERMEDIATE WALL JOINT | AT SLAB EXPANSION JOINT

ELEVATION SHOWING TYPICAL REINFORCING PLACEMENT



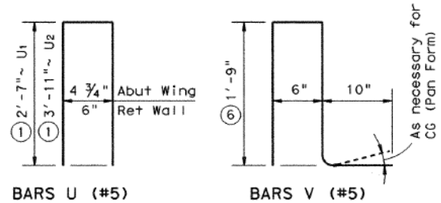
ON ABUT WING OR CIP RETAINING WALL

① Increase 2" for structures with overlay

ON BRIDGE SLAB

SECTIONS THRU RAIL

⑧ Top longitudinal slab bar may be adjusted laterally 3" ± to tie reinforcing.



BARS U (#5) | BARS V (#5)

⑥ Length shown for 5" bar embedment with no overlay. Adjust as required.

PROVIDED FOR CONTRACTOR'S INFORMATION ONLY

Texas Department of Transportation

IH 35 NB TO US 290 EB
EXISTING PLANS
TRAFFIC RAIL - TYPE T4(S)

SHEET 1 OF 2

DESIGN	FED.RD. DIV.NO.	FEDERAL PROJECT NO.		HIGHWAY NO.
N/A	6			IH 35
GRAPHICS JA	STATE	DISTRICT	COUNTY	SHEET NO.
CHECK N/A	TEXAS	AUS	TRAVIS	
CHECK	CONTROL	SECTION	JOB	42
ALL	0114	01	068	

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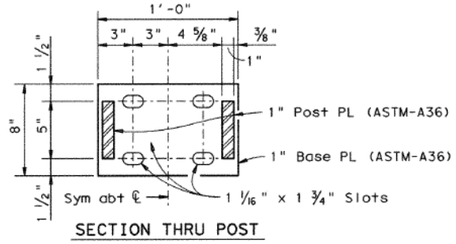
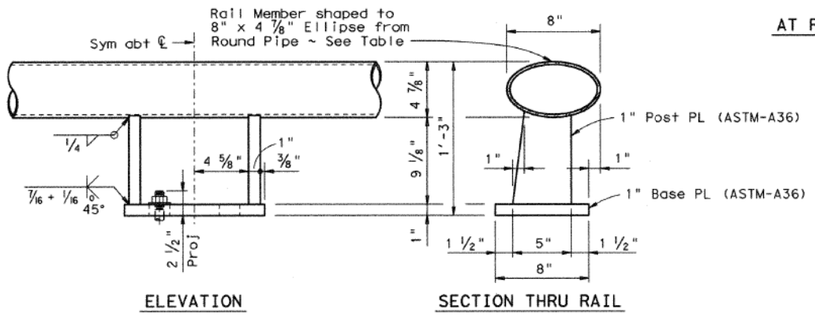
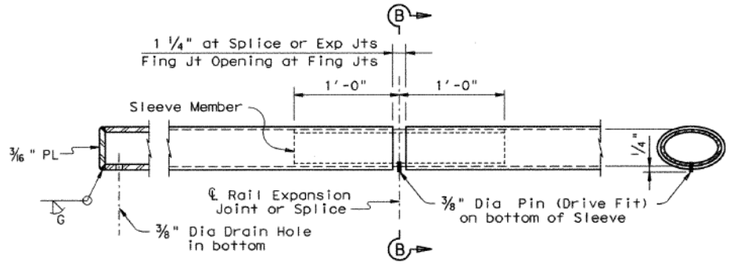


SECTION THRU POST



ELEVATION SECTION THRU RAIL

RAIL POST & ANCHORAGE DETAILS



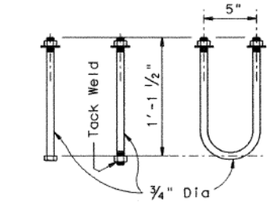
AT RAIL ENDS AT SPLICE OR EXP JTS SECTION B-B

TUBE FABRICATION DETAILS

TUBE & SLEEVE MEMBERS		
8" x 4 7/8" Ellipse	Sleeve Member	
Material	Material	Thickness
6"Dia Std Pipe ASTM-A53 (E or S Gr B)	ASTM-A53 Gr B	.353"
	ASTM-A36 or A500 Gr B	.339"
	API-5LX52	.224"
6 5/8"O.D. Pipe x .188" API-5LX52	ASTM-A53 Gr B	.339"
	ASTM-A36 or A500 Gr B	.325"
	API-5LX52	.216"

Notes: Other sections of equal or greater strength are acceptable for sleeves.

The major and minor diameters of the rail member may vary +/- 0.1875 inches from plan dimension. However, the difference between the outside diameters of the sleeve and the inside diameters of the rail shall not exceed 0.125 inches along the major or minor axis. Gaps exceeding this amount up to 0.25 inches are permissible along the 45° axes of the sleeves.



ANCHOR BOLT OPTIONS

RAIL DATA FOR HORIZONTAL CURVES

	RADIUS TO FACE OF RAIL	MAX CHORD LENGTH	CONSTRUCT OR FABRICATE
Rail Members	Over 2800'	29'-0"	Straight rail sections
	Over 1400' thru 2800'	14'-6"	(9) To required radius or to chords shown
	Over 700' thru 1400'	7'-3"	
	Thru 700'	Zero	(9) To required radius

(9) Shop drawings required (may be submitted as 11"x 17" prints provided they are clearly legible).

For railing not requiring shop drawings, erection drawings showing rail member section lengths, post spacing, and anchor bolt setting shall be submitted to the Area Engineer for approval. If rail member requires shop and erection drawings, these drawings shall be submitted to the Bridge Engineer for approval.

GENERAL NOTES:

This rail has been successfully evaluated to exceed the strength of a railing with like geometry which has been crash tested to NCHRP Report 230 SL-2 criteria.

Rail Type T4(S) is comprised of the following parts: concrete parapet and wing terminal wall, all reinforcing shown, including that embedded in the slab or wingwalls, MBGF connections, rail member, posts, and all anchorage provisions including bolts, nuts and washers. All these parts are included in price bid per linear foot of rail.

All open ends of the rail shall be capped.

All steel components except reinforcing shall be galvanized unless otherwise shown on plans.

Anchor bolts shall be 3/4" Dia ASTM A325 bolts (or A321 threaded rods with one tack welded nex nut each) with one hex nut and one 2" O.D. washer (0.153" Min thick) plus one 1 1/2" O.D. hardened steel washer (0.122" Min thick) at each bolt. Optionally use rectangular 3/8" x 2 x 0'-3" A36 plate with 7/8" Dia hole. Threaded rods may be 0.670" minimum diameter with rolled threads. Nuts shall conform to A563 requirements. The untapped blanks shall be galvanized prior to cutting the threads. Threads for bolts and nuts shall have Class 2A and 2B fit tolerances in accordance with ANSI B1.1.

All concrete shall be Class C. Chamfer all exposed corners.

Epoxy coat Bars V and U if slab bars are epoxy coated.

All reinforcing shall be grade 60.

Face of rail, posts and parapet shall be vertical transversely unless otherwise approved by the Engineer. Rail posts shall be perpendicular to top of adjacent concrete parapet grade. Grout may be used under rail post base plates if necessary.

Rail member sections shall include not less than two posts nor more than four (except at Abutments).

Exposed edges of rail members and rail posts shall be rounded or chamfered to approximately 1/16" by grinding.

Average weight of railing: 187 plf (Conc)
25 plf (Steel).

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5342md02.dgn
(LV=1,2 for English; 1,3 for Metric)

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IH 35 NB TO US 290 EB
EXISTING PLANS
TRAFFIC RAIL - TYPE T4(S)

DESIGN	FED.RD. DIV.NO.	FEDERAL PROJECT NO.		HIGHWAY NO.
N/A	6			IH 35
GRAPHICS JA	STATE	DISTRICT	COUNTY	SHEET NO.
CHECK N/A	TEXAS	AUS	TRAVIS	43
CHECK	CONTROL	SECTION	JOB	
ALL	0114	01	068	

BEARING PAD TAPER REPORT

BEARING PAD TAPER -- FABRICATOR'S REPORT
PERPENDICULAR TO THE CENTERLINE OF BEARING.
SUMMATION OF BEARING PAD TAPER DUE TO CROSS-SLOPE, GRADE, AND SKEW, MEASURED IN IN/IN.
A POSITIVE TAPER INDICATES INCREASING PAD THICKNESS IN DIRECTION OF INCREASING STATIONS.
A NEGATIVE TAPER INDICATES DECREASING PAD THICKNESS IN DIRECTION OF INCREASING STATIONS.

		BEAM 1	BEAM 2	BEAM 3	BEAM 4	BEAM 5
BENT 1	(FWD)	.03680	.03680	.03680		
BENT 2	(BK)	.03680	.03680	.03680		
	(FWD)	.03825	.03825	.03825		
BENT 3	(BK)	.03825	.03825	.03825		
	(FWD)	.03933	.03934	.03934		
BENT 4	(BK)	.03933	.03934	.03934		
	(FWD)	.03939	.03939	.03939		
BENT 5	(BK)	.03939	.03939	.03939		
	(FWD)	.03938	.03938	.03939		
BENT 6	(BK)	.03938	.03938	.03939		
	(FWD)	.03938	.03938	.03938		
BENT 7	(BK)	.03938	.03938	.03938		
	(FWD)	.03939	.03938	.03938		
BENT 8	(BK)	.03939	.03938	.03938		
BENT 8	(FWD)	.03798	.04079			
BENT 9	(BK)	.03798	.04079			
	(FWD)	.03798	.04079			
BENT 10	(BK)	.03798	.04079			
BENT 16	(FWD)	-.06747	-.07098			
BENT 17	(BK)	-.06747	-.07099			
	(FWD)	-.06748	-.07094			
BENT 18	(BK)	-.05930	-.06255			
BENT 18	(FWD)	-.05850	-.05848	-.05797	-.05527	-.05412
BENT 19	(BK)	-.06919	-.06928	-.06993	-.07062	-.06955
BENT 19	(FWD)	-.06917	-.06922	-.06865	-.06753	
BENT 20	(BK)	-.06928	-.06933	-.06878	-.06766	
BENT 20	(FWD)	-.06899	-.06912	-.06926		
BENT 21	(BK)	-.06933	-.06945	-.06959		
	(FWD)	-.06899	-.06912	-.06926		
BENT 22	(BK)	-.06933	-.06945	-.06959		

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Texas Department of Transportation

IH 35 NB TO US 290 EB
EXISTING PLANS
BEARING PAD TAPER REPORT

SHEET 1 OF 1

DESIGN	FED. RD. DIV. NO.	FEDERAL PROJECT NO.		HIGHWAY NO.
N/A	6			IH 35
GRAPHICS JA	STATE	DISTRICT	COUNTY	SHEET NO.
CHECK N/A	TEXAS	AUS	TRAVIS	44
CHECK ALL	CONTROL 0114	SECTION 01	JOB 068	

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SUMMARY OF SMALL SIGNS

							SMA RD SGN ASSM TY XXXXX (X) XX (X-XXXX)					BRIDGE MOUNT CLEARANCE SIGNS
							Post Type		Anchor Type	Mounting Designation		
PLAN SHEET NO.	SIGN NO.	SIGN DESIGNATION	SIGN CONTENT	SIGN DIMENSIONS (See above Note)	ALUMINUM TYPE A	ALUMINUM TYPE G	FRP = Fiberglass TWT = Thin-wall 10BWG = 10 BWG S80 = Sched 80	Posts (1 or 2)	UA = Univer-Conc UB = Univer-Bolt SA = Slip-Conc SB = Slip-Bolt WS = Wedge Steel	P = Prefb."Plain" T = Prefab. "T" U = Prefab. "U"	1EXT or 2EXT = # of Ext. BM = Extruded Beam WC = 1.12 #/ft Wing Chan. EXAL = Extruded Alum. Signs	TY N = Type N TY S = Type S
	1	W12-2	SYMBOL - LOW CLEARANCE (FT)-(IN)	36 x 36	X		10BWG	1	SA	T		
	2	W12-2a	(FEET) FT (INCHES) IN	84 x 24	X		TWT					TY S

STATE OF TEXAS
EDUARDO GARCIA
116865
LICENSED
PROFESSIONAL ENGINEER

DocuSigned by:
Eduardo Garcia
2CD511274A5948C...
9/25/2023

Texas Department of Transportation

US 290

SUMMARY OF SMALL SIGNS

SOSS

SHEET 1 OF 1

CONT	SECT	JOB	HIGHWAY
0114	01	068	US 290
DIST	COUNTY		SHEET NO.
AUS	TRAVIS		45

DATE: 9/25/2023 11:26:13 AM
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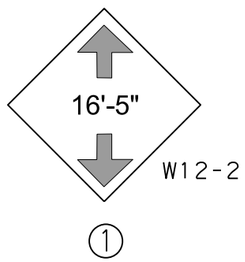

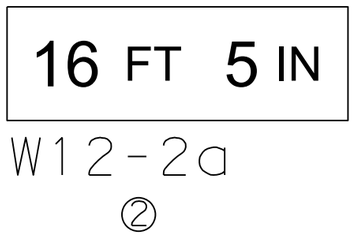

The 16ft. 5in clerance shown should be the actual minimim clerance minus 3 inches

Use W12-2 sign in advance of the obstruction and W12-2a sign on the overhead obstruction

STATE OF TEXAS
EDUARDO GARCIA
116865
LICENSED PROFESSIONAL ENGINEER

DocuSigned by:
Eduardo Garcia
2CD511274A5948C...
8/7/2023

Texas Department of Transportation

US 290

SMALL SIGN LAYOUT

SHEET 1 OF $5D$

CONT	SECT	JOB	HIGHWAY
0114	01	068	US 290
DIST	COUNTY		SHEET NO.
AUS	TRAVIS		46

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DATE: 7/27/2023 1:28:15 PM
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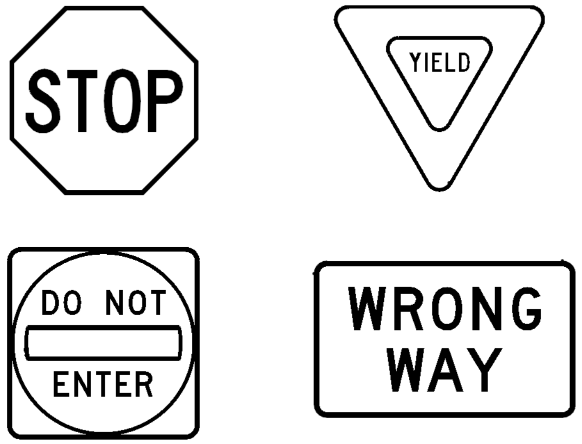
REQUIREMENTS FOR RED BACKGROUND REGULATORY SIGNS
(STOP, YIELD, DO NOT ENTER AND WRONG WAY SIGNS)



REQUIREMENTS FOR FOUR SPECIFIC SIGNS ONLY

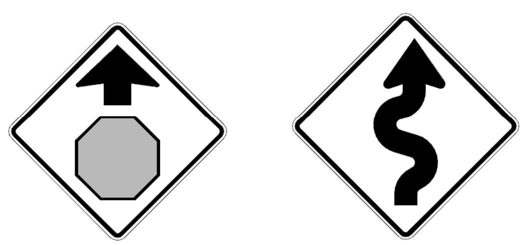
SHEETING REQUIREMENTS		
USAGE	COLOR	SIGN FACE MATERIAL
BACKGROUND	RED	TYPE B OR C SHEETING
BACKGROUND	WHITE	TYPE B OR C SHEETING
LEGEND & BORDERS	WHITE	TYPE B OR C SHEETING
LEGEND	RED	TYPE B OR C SHEETING

REQUIREMENTS FOR WHITE BACKGROUND REGULATORY SIGNS
(EXCLUDING STOP, YIELD, DO NOT ENTER AND WRONG WAY SIGNS)

TYPICAL EXAMPLES

SHEETING REQUIREMENTS		
USAGE	COLOR	SIGN FACE MATERIAL
BACKGROUND	WHITE	TYPE A SHEETING
BACKGROUND	ALL OTHERS	TYPE B OR C SHEETING
LEGEND, BORDERS AND SYMBOLS	BLACK	ACRYLIC NON-REFLECTIVE FILM
LEGEND, BORDERS AND SYMBOLS	ALL OTHER	TYPE B OR C SHEETING

REQUIREMENTS FOR WARNING SIGNS



TYPICAL EXAMPLES

SHEETING REQUIREMENTS		
USAGE	COLOR	SIGN FACE MATERIAL
BACKGROUND	FLOURESCENT YELLOW	TYPE B_{FL} OR C_{FL} SHEETING
LEGEND & BORDERS	BLACK	ACRYLIC NON-REFLECTIVE FILM
LEGEND & SYMBOLS	ALL OTHER	TYPE B OR C SHEETING

REQUIREMENTS FOR SCHOOL SIGNS

TYPICAL EXAMPLES

SHEETING REQUIREMENTS		
USAGE	COLOR	SIGN FACE MATERIAL
BACKGROUND	WHITE	TYPE A SHEETING
BACKGROUND	FLOURESCENT YELLOW GREEN	TYPE B_{FL} OR C_{FL} SHEETING
LEGEND, BORDERS AND SYMBOLS	BLACK	ACRYLIC NON-REFLECTIVE FILM
SYMBOLS	RED	TYPE B OR C SHEETING

GENERAL NOTES

1. Signs to be furnished shall be as detailed elsewhere in the plans and/or as shown on sign tabulation sheet. Standard sign designs and arrow dimensions can be found in the "Standard Highway Sign Designs for Texas" (SHSD).
2. Sign legend shall use the Federal Highway Administration (FHWA) Standard Highway Alphabets (B, C, D, E, Emod or F).
3. Lateral spacing between letters and numerals shall conform with the SHSD, and any approved changes thereto. Lateral spacing of legend shall provide a balanced appearance when spacing is not shown.
4. Black legend and borders shall be applied by screening process or cut-out acrylic non-reflective black film to background sheeting, or combination thereof.
5. White legend and borders shall be applied by screening process with transparent colored ink, transparent colored overlay film to white background sheeting or cut-out white sheeting to colored background sheeting, or combination thereof.
6. Colored legend shall be applied by screening process with transparent colored ink, transparent colored overlay film or colored sheeting to background sheeting, or combination thereof.
7. Sign substrate shall be any material that meets the Departmental Material Specification requirements of DMS-7110 or approved alternative.
8. Mounting details for roadside mounted signs are shown in the "SMD series" Standard Plan Sheets.

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

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

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

Texas Department of Transportation

Traffic Operations Division Standard

TYPICAL SIGN REQUIREMENTS

TSR(4)-13

FILE: tsr4-13.dgn	DN: TxDOT	CK: TxDOT	DW: TxDOT	CK: TxDOT			
©TxDOT October 2003	CONT	SECT	JOB	HIGHWAY			
REVISIONS 12-03 7-13 9-08	0114	01	068	US 290			
	DIST	COUNTY		SHEET NO.			
	AUS	TRAVIS		47			

DATE:7/27/2023 1:28:22 PM
FILE:D:\rtxdot.projectwiseonline.com\TXDOT4\Documents\14 - AUS\Design Projects\0114010681\4 - Design\Design\Plan Set\8. Traffic\snsgn.dgn

SIGN SUPPORT DESCRIPTIVE CODES

(Descriptive Codes correspond to project estimate and quantities sheets)

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

Post Type

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

Number of Posts (1 or 2)

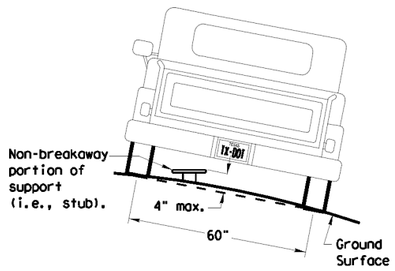
Anchor Type

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

Sign Mounting Designation

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

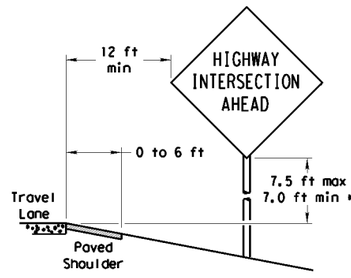
REQUIRED CLEARANCE FOR BREAKAWAY SUPPORT



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).

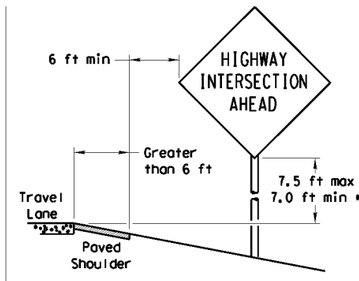
SIGN LOCATION

PAVED SHOULDERS



LESS THAN 6 FT. WIDE

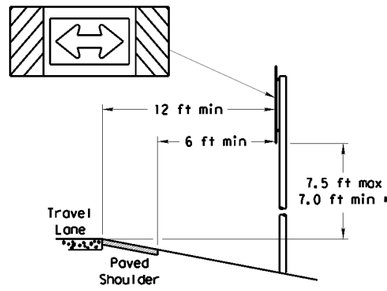
When the shoulder is 6 ft. or less in width, the sign must be placed at least 12 ft. from the edge of the travel lane.



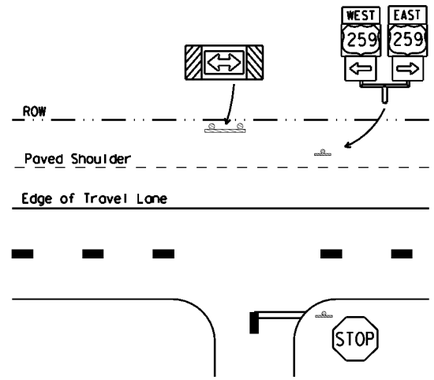
GREATER THAN 6 FT. WIDE

When the shoulder is greater than 6 ft in width, the sign must be placed at least 6 ft. from the edge of the shoulder.

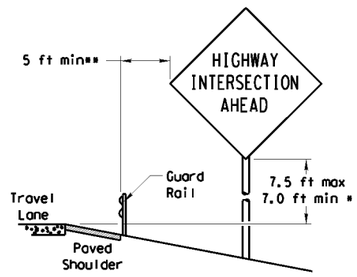
T-INTERSECTION



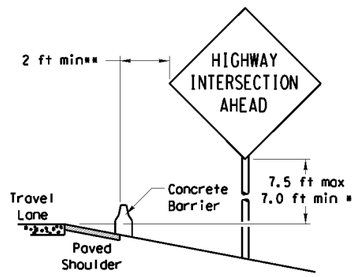
When this sign is needed at the end of a two-lane, two way roadway, the right edge of the sign should be in line with the centerline of the roadway. Place as close to ROW as practical.



BEHIND BARRIER



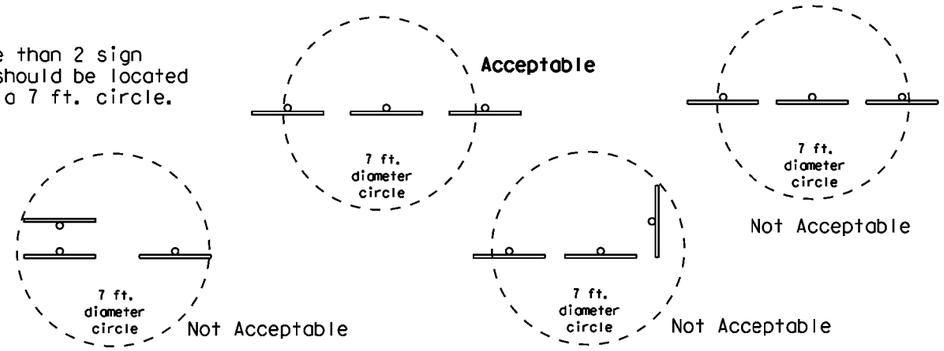
BEHIND GUARDRAIL



BEHIND CONCRETE BARRIER

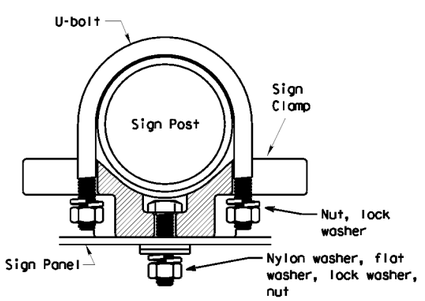
**Sign clearance based on distance required for proper guard rail or concrete barrier performance.

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



TYPICAL SIGN ATTACHMENT DETAIL

Single Signs

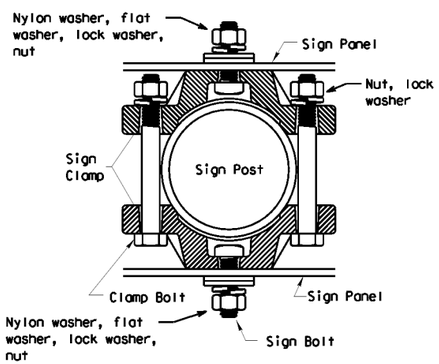


Bolts used to mount sign panels to the clamp are 5/16-18 UNC galvanized square head with nut, nylon washer, flat washer and lock washer. The bolt length is 1 inch for aluminum.

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

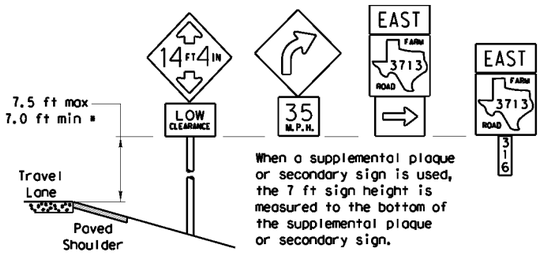
Sign clamps may be either the specific size clamp or the universal clamp.

Back-to-Back Signs



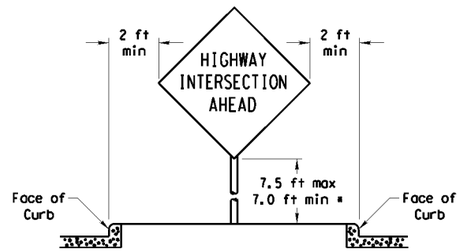
Pipe Diameter	Approximate Bolt Length	
	Specific Clamp	Universal Clamp
2" nominal	3"	3 or 3 1/2"
2 1/2" nominal	3 or 3 1/2"	3 1/2 or 4"
3" nominal	3 1/2 or 4"	4 1/2"

SIGNS WITH PLAQUES



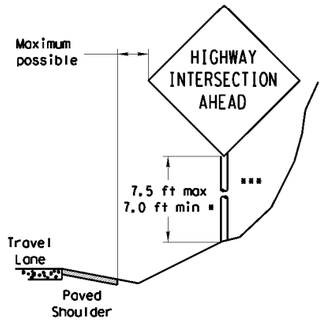
When a supplemental plaque or secondary sign is used, the 7 ft sign height is measured to the bottom of the supplemental plaque or secondary sign.

CURB & GUTTER OR RAISED ISLAND



RESTRICTED RIGHT-OF-WAY

(When 6 ft min. is not possible.)



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

In situations where a lateral restriction prevents the minimum horizontal clearance from the edge of the travel lane, signs should be placed as far from the travel lane as practical.

*** Post may be shorter if protected by guardrail or if Engineer determines the post could not be hit due to extreme slope.

* Signs shall be mounted using the following condition that results in the greatest sign elevation:

(1) a minimum of 7 to a maximum of 7.5 feet above the edge of the travel lane or

(2) a minimum of 7 to a maximum of 7.5 feet above the grade at the base of the support when sign is installed on the backslope.

The maximum values may be increased when directed by the Engineer.

See the Traffic Operations Division website for detailed drawings of sign clamps, Triangular Slipbase System components and Wedge Anchor System components.

The website address is:
http://www.txdot.gov/publications/traffic.htm

Texas Department of Transportation
Traffic Operations Division

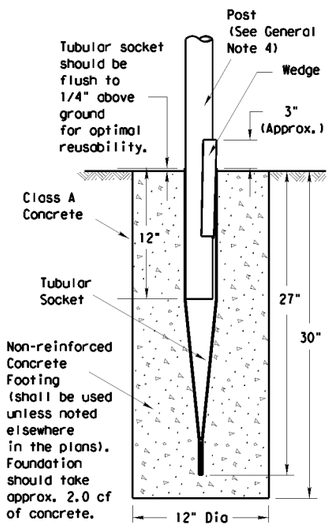
SIGN MOUNTING DETAILS SMALL ROADSIDE SIGNS GENERAL NOTES & DETAILS

SMD(GEN)-08

REVISIONS	DN: TXDOT	CK: TXDOT	DW: TXDOT	CK: TXDOT
9-08	CONT	SECT	JOB	HIGHWAY
	0114	01	068	US 290
	DIST	COUNTY		SHEET NO.
	AUS	TRAVIS		48

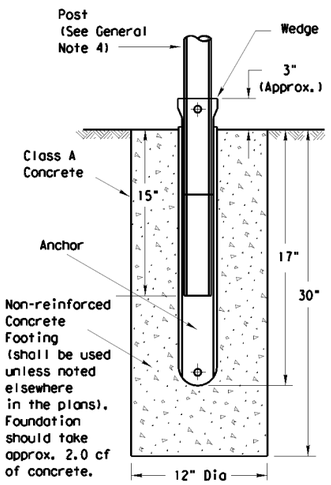
DATE: 7/27/2023 1:28:28 PM
FILE: pw://txdot.projectwiseonline.com:TXDOT4/Documents/14 - AUS/Design Projects/01140106/4 - Design/Plan Set/8. Traffic/smdtwr.dgn

Wedge Anchor Steel System



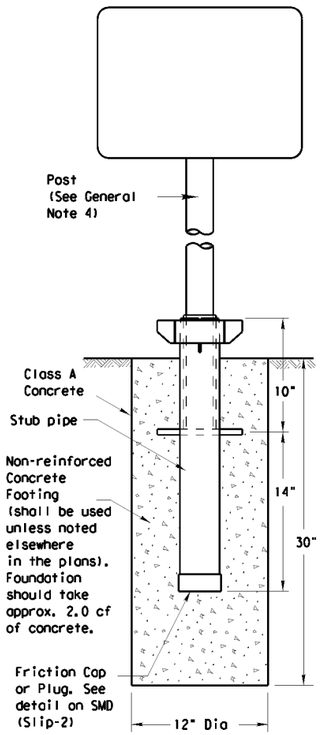
SM RD SGN ASSM TY TWT(X)WS(X)

Wedge Anchor High Density Polyethylene (HDPE) System

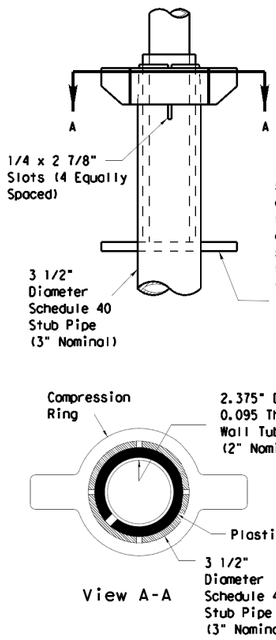


SMD RD SGN ASSM TY TWT(X)WP(X)

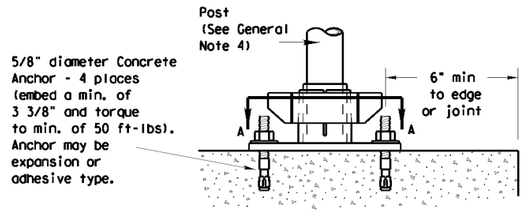
Universal Anchor System with Thin-Walled Tubing Post



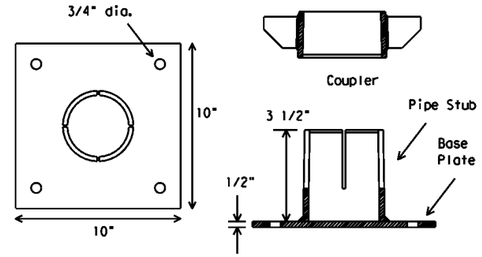
SM RD SGN ASSM TY TWT(X)UA(P)



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.

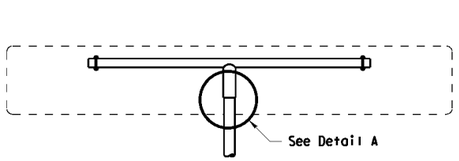


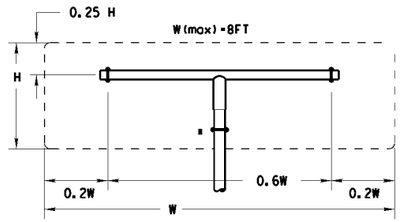
Concrete anchor consists of 5/8" diameter stud bolt with UNC series bolt threads on the upper end. A heavy hex nut per ASTM A563 and hardened washer per ASTM F436. The stud bolt shall have minimum yield and ultimate tensile strengths of 50 and 75 ksi, respectively. Nuts, bolts and washers shall be galvanized 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, "Epoxies and Adhesives." Adhesive anchors may be loaded after adequate epoxy cure time per the manufacturer's recommendations.



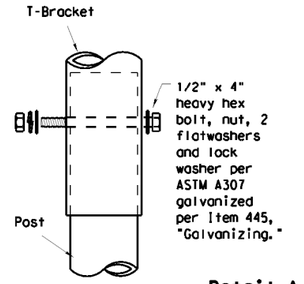
SM RD SGN ASSM TY TWT(X)UB(P)

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





SM RD SGN ASSM TY TWT(X)XX(T)
(* - See General Note 6)



Detail A

9/16" hole may need to be drilled through post to accommodate bolt.

NOTE

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

GENERAL NOTES:

1. 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.
2. 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.
3. 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
4. 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.
5. Sign blanks shall be the sizes and shapes shown on the plans.
6. Additional sign clamp required on the "T-bracket" post for 24" high signs. Place clamp at least 3" above bottom of sign when possible.
7. Sign supports shall not be spliced except where shown. Sign support posts shall not be spliced.
8. 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

1. 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.
2. The Engineer may permit batches of concrete less than 2 cubic yards to be mixed with a portable, motor driven concrete mixer. For small placements less than 0.5 cubic yards, hand mixing in a suitable container may be allowed by Engineer. Place concrete into hole until it is approximately flush with the ground. Concrete shall be Class A.
3. Insert tubular socket into concrete until top of socket is approximely 1/4 " above the concrete footing.
4. Plumb the socket. Allow a minimum 4 days for concrete to set, unless otherwise directed by Engineer..
5. Attach the sign to the sign post.
6. Insert the sign post into socket and align sign face with roadway.
7. Drive the wedge into the socket to secure post. This will leave approximately 3 inches of the wedge exposed.

UNIVERSAL ANCHOR SYSTEM INSTALLATION PROCEDURE

1. 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.
2. Insert base post in hole to depths shown and backfill hole with concrete.
3. 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.
4. Attach the sign to the sign post.
5. Install plastic insert around bottom of post.
6. Insert sign post into base post. Lower until the post comes to rest on steel rod.
7. Seat compression ring using a hammer. Typically, the top of compression ring will be approximately level with top of stub post when optimally installed.
8. Check sign post by hand to ensure it is unable to turn. If loose, increase the tightening of the compression ring.

Texas Department of Transportation
Traffic Operations Division

SIGN MOUNTING DETAILS SMALL ROADSIDE SIGNS WEDGE & UNIVERSAL ANCHOR WITH THIN WALL TUBING POST

SMD(TWT)-08

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

9-08 REVISIONS

CONT	SECT	JOB	HIGHWAY
0114	01	068	US 290

DIST	COUNTY	SHEET NO.
AUS	TRAVIS	49

26E

STORMWATER POLLUTION PRVENTION PLAN (SWP3):

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

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

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

1.0 SITE/PROJECT DESCRIPTION

1.1 PROJECT CONTROL SECTION JOB (CSJ):
0114-01-068

1.2 PROJECT LIMITS:
From: At IH 35

To: -

1.3 PROJECT COORDINATES:
BEGIN: (Lat) 30.3220497 ,(Long) -97.70676688

END: (Lat) . ,(Long)

1.4 TOTAL PROJECT AREA (Acres): 0.150

1.5 TOTAL AREA TO BE DISTURBED (Acres): 0.150

1.6 NATURE OF CONSTRUCTION ACTIVITY:
Rail repair, concrete structural repair, joint repair, bearing replacement, cleaning/sealing expansion joints, install shear key, downspout cleaning

1.7 MAJOR SOIL TYPES:

Soil Type	Description

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
☐ Discharges from concrete washout activities, runoff from concrete cutting activities, and other concrete related activities
☐ 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

* 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: _____
☐ Other: _____

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EDUARDO GARCIA
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LICENSED
PROFESSIONAL ENGINEER

9/18/2024

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

July 2023 Sheet 1 of 2

Texas Department of Transportation

FED. RD. DIV. NO.	PROJECT NO.		SHEET NO.
			50
STATE	STATE DIST.	COUNTY	
TEXAS	14	TRAVIS	
CONT.	SECT.	JOB	HIGHWAY NO.
0114	01	068	US 290

STORMWATER POLLUTION PRVENTION 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
- ☐ Daily street sweeping
- ☐ Other: _____
- ☐ Other: _____
- ☐ Other: _____
- ☐ Other: _____

2.5 POLLUTION PREVENTION MEASURES:

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

2.6 VEGETATED BUFFER ZONES:

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

Type	Stationing	
	From	To

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

2.7 ALLOWABLE NON-STORMWATER DISCHARGES:

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

2.8 DEWATERING:

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

2.9 INSPECTIONS:

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

2.10 MAINTENANCE:

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

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9/18/2024

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

July 2023 Sheet 2 of 2

Texas Department of Transportation

FED. RD. DIV. NO.	PROJECT NO.		SHEET NO.
			51
STATE	STATE DIST.	COUNTY	
TEXAS		TRAVIS	
CONT.	SECT.	JOB	HIGHWAY NO.
0114	01	068	US 290

DATE: 7/27/2023
FILE: pw://txdot.projectwiseonline.com:TXDOT4/Documents/14 - AUS/Design Projects/0114010068/4 - Design/Plan Set/9. Environmental/US290_ENV_EPIC.dgn

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.

1. Prevent stormwater pollution by controlling erosion and sedimentation in accordance with TPDES Permit TXR 150000

2. Comply with the SW3P and revise when necessary to control pollution or required by the Engineer.

3. Post Construction Site Notice (CSN) with SW3P information on or near the site, accessible to the public and TCEQ, EPA or other inspectors.

4. When Contractor project specific locations (PSL's) increase disturbed soil area to 5 acres or more, submit NOI to TCEQ and the Engineer.

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# 3(a)

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

1. Buttermilk Creek

2.

3.

4.

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

Best Management Practices:

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

III. CULTURAL RESOURCES

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

☑ No Action Required ☐ Required Action

Action No.

1.

2.

3.

4.

IV. VEGETATION RESOURCES

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

☑ No Action Required ☐ Required Action

Action No.

1.

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

☑ No Action Required ☐ Required Action

Action No.

1.

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

LIST OF ABBREVIATIONS

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

VI. HAZARDOUS MATERIALS OR CONTAMINATION ISSUES

General (applies to all projects):

Comply with the Hazard Communication Act (the Act) for personnel who will be working with hazardous materials by conducting safety meetings prior to beginning construction and making workers aware of potential hazards in the workplace. Ensure that all workers are provided with personal protective equipment appropriate for any hazardous materials used.

Obtain and keep on-site Material Safety Data Sheets (MSDS) for all hazardous products used on the project, which may include, but are not limited to the following categories: Paints, acids, solvents, asphalt products, chemical additives, fuels and concrete curing compounds or additives. Provide protected storage, off bare ground and covered, for products which may be hazardous. Maintain product labelling as required by the Act.

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

Contact the Engineer if any of the following are detected:

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

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

☑ Yes ☐ No

If "No", then no further action is required.
If "Yes", then TxDOT is responsible for completing asbestos assessment/inspection.

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

☐ Yes ☑ No

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

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

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

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

☑ No Action Required ☐ Required Action

Action No.

1.

2.

3.

VII. OTHER ENVIRONMENTAL ISSUES

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

☑ No Action Required ☐ Required Action

Action No.

1.

2.

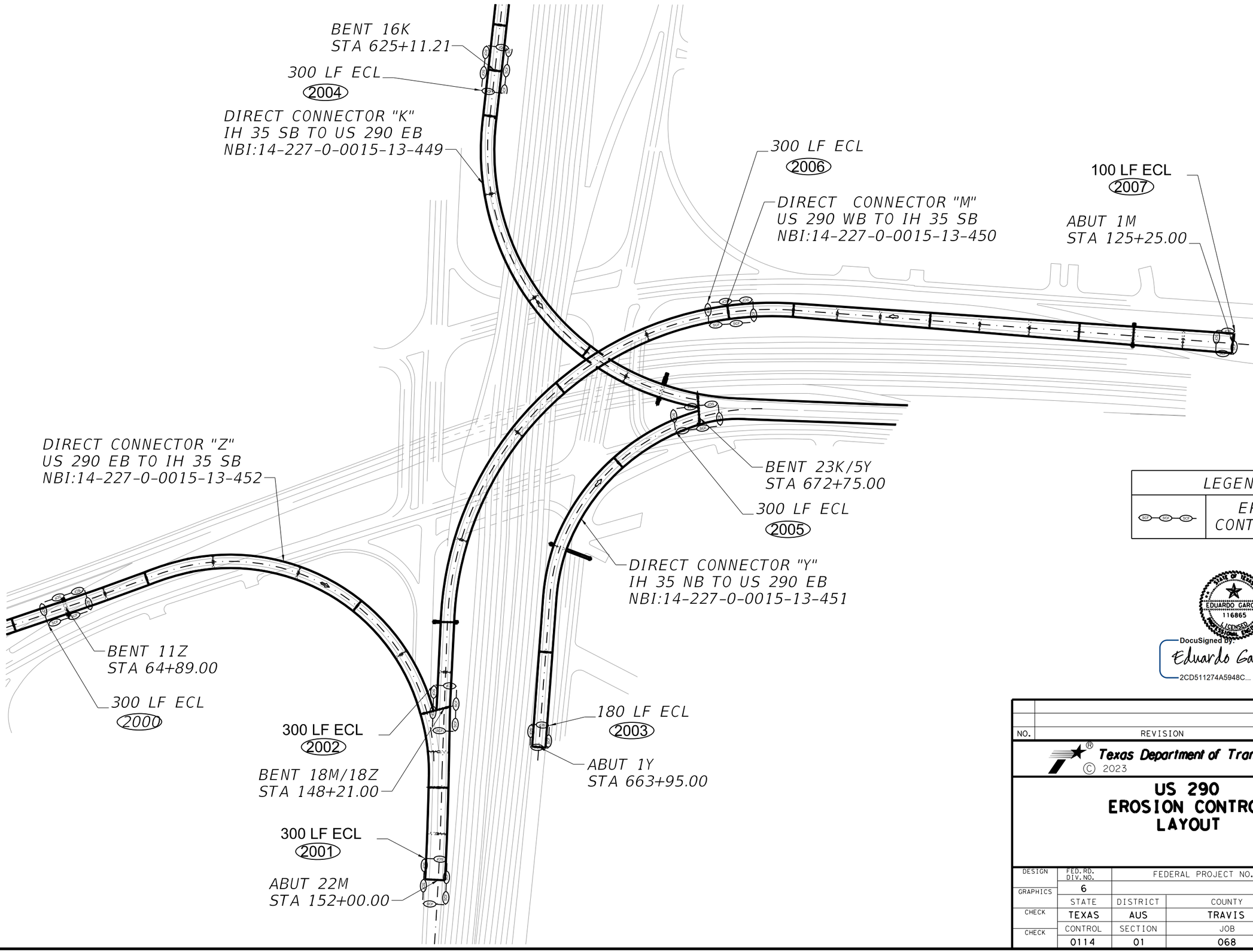
3.

Texas Department of Transportation — Design Division Standard

ENVIRONMENTAL PERMITS, ISSUES AND COMMITMENTS

EPIC

FILE: epic.dgn	DN: TxDOT	CK: RG	DW: VP	CK: AR
©TxDOT: February 2015	CONT	SECT	JOB	HIGHWAY
REVISIONS	0114	01	068	US 290
12-12-2011 (DS)	DIST	COUNTY		SHEET NO.
05-07-14 ADDED NOTE SECTION IV.	AUS	TRAVIS		52
01-23-2015 SECTION 1 (CHANGED ITEM 1122 TO ITEM 506, ADDED GRASSY SWALES.				



LEGEND	
	EROSION CONTROL LOGS

STATE OF TEXAS
EDUARDO CARCIA
116865
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PROFESSIONAL ENGINEER

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Eduardo Garcia
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9/9/2024

NO.	REVISION	BY	DATE

Texas Department of Transportation

US 290
EROSION CONTROL
LAYOUT

SHEET 1 OF 1

DESIGN	FED.RD. DIV.NO.	FEDERAL PROJECT NO.		HIGHWAY NO.
GRAPHICS	6			US 290, ETC.
	STATE	DISTRICT	COUNTY	SHEET NO.
CHECK	TEXAS	AUS	TRAVIS	53
CHECK	CONTROL	SECTION	JOB	
	0114	01	068	

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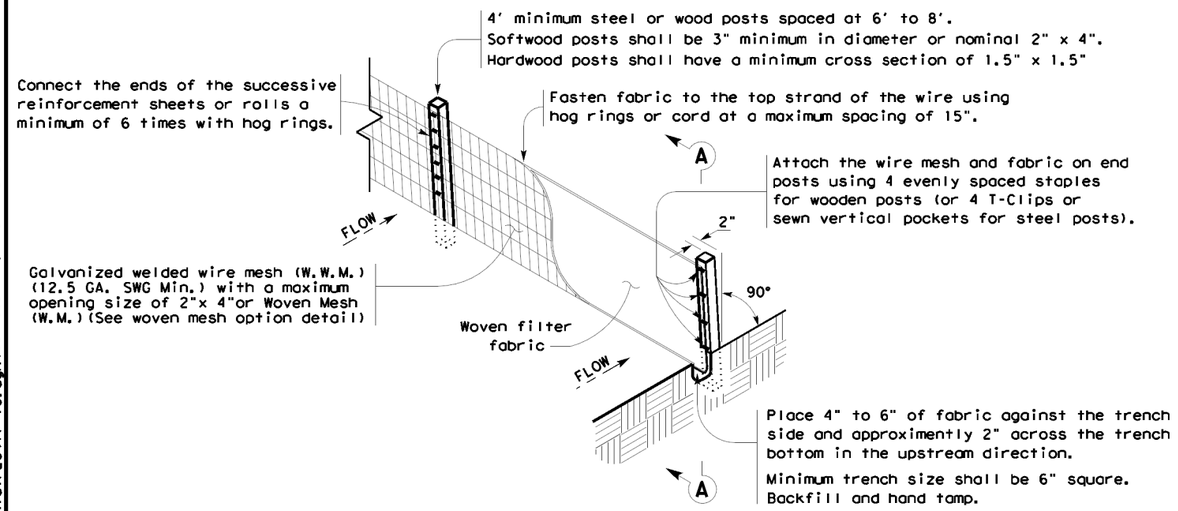
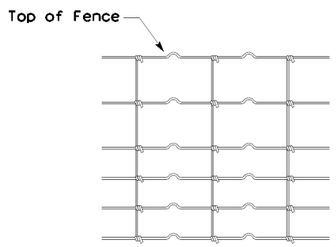
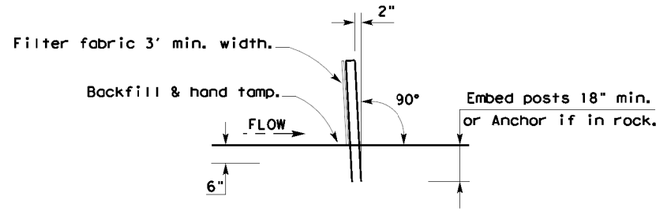


TEMPORARY SEDIMENT CONTROL FENCE

SCF





SECTION A-A

HINGE JOINT KNOT WOVEN MESH (OPTION) DETAIL

Galvanized hinge joint knot woven mesh (12.5 GA.SWG Min.) requires a minimum of five horizontal wires spaced at a maximum of 12 inches apart and all vertical wires spaced at a maximum of 12 inches apart.

SEDIMENT CONTROL FENCE USAGE GUIDELINES

A sediment control fence may be constructed near the downstream perimeter of a disturbed area along a contour to intercept sediment from overland runoff. A 2 year storm frequency may be used to calculate the flow rate to be filtered.

Sediment control fence should be sized to filter a maximum flow through rate of 100 GPM/FT^2. Sediment control fence is not recommended to control erosion from a drainage area larger than 2 acres.

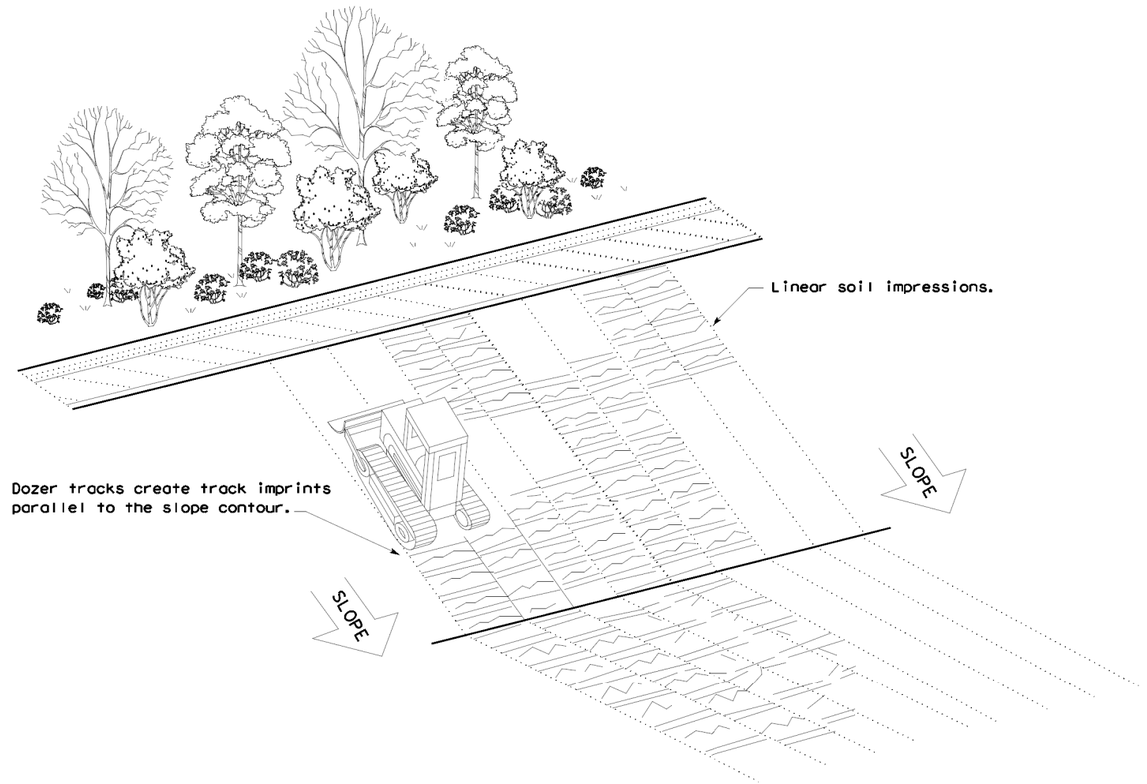
LEGEND

Sediment Control Fence

SCF

GENERAL NOTES

1. Vertical tracking is required on projects where soil distributing activities have occurred unless otherwise approved.
2. Perform vertical tracking on slopes to temporarily stabilize soil.
3. Provide equipment with a track undercarriage capable of producing linear soil impressions measuring a minimum of 12" in length by 2" to 4" in width by 1/2" to 2" in depth.
4. Do not exceed 12" between track impressions.
5. Install continous linear track impressions where the minimum 12" length impressions are perpendicular to the slope or direction of water flow.



VERTICAL TRACKING

Texas Department of Transportation

Design Division Standard

TEMPORARY EROSION, SEDIMENT AND WATER POLLUTION CONTROL MEASURES

FENCE & VERTICAL TRACKING

EC(1)-16

FILE: ec116	DN: TxDOT	CK: KM	DW: VP	DW/CK: LS
© 2024 JULY 2016	CONT	SECT	JOB	HIGHWAY
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	DIST	COUNTY		SHEET NO.
	AUS	TRAVIS		54

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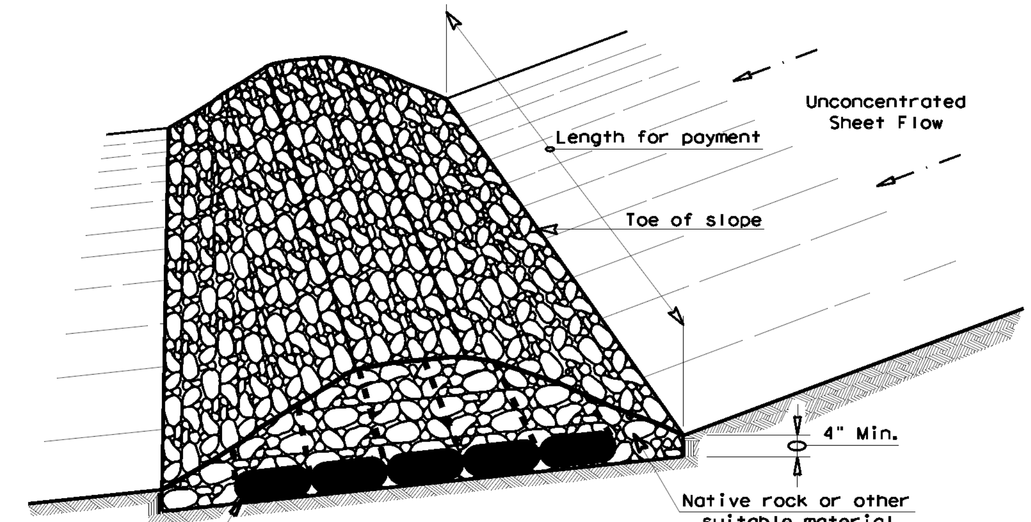
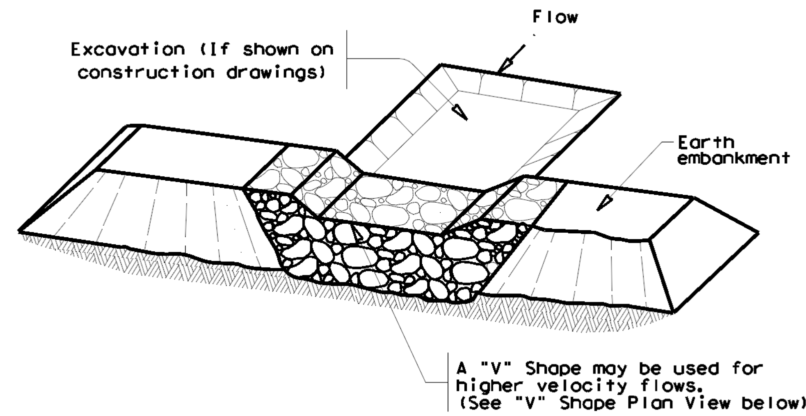


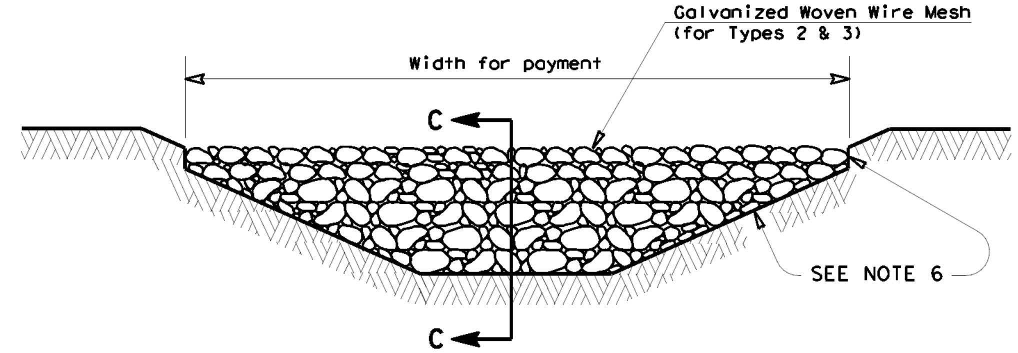
FILTER DAM AT TOE OF SLOPE

RFD1



FILTER DAM AT SEDIMENT TRAP

RFD1 OR RFD2

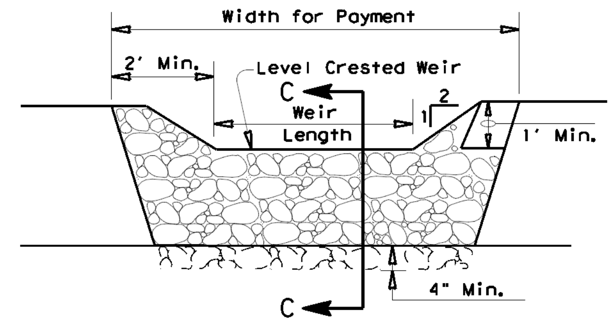


FILTER DAM AT CHANNEL SECTIONS

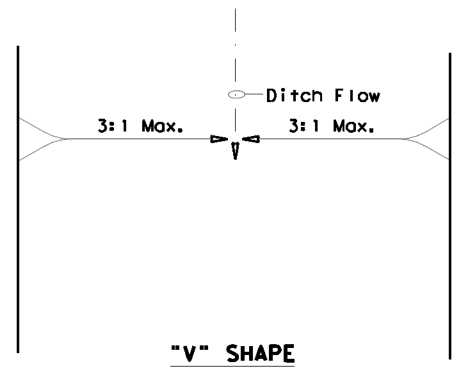
RFD1 OR RFD2 OR RFD3

GENERAL NOTES

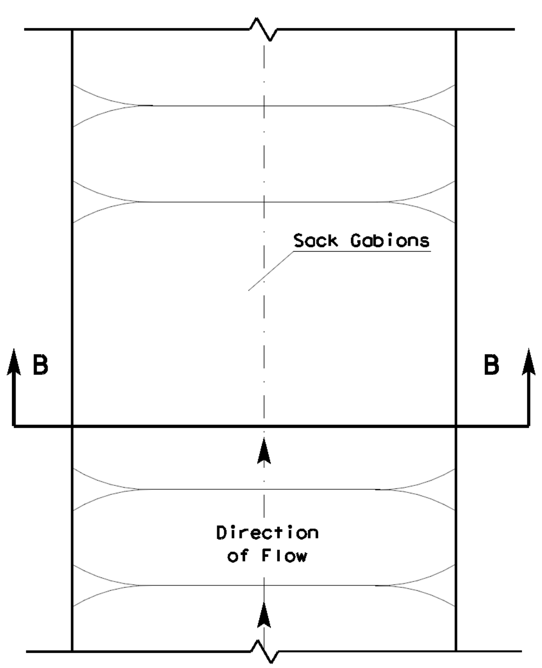
1. If shown on the plans or directed by the Engineer, filter dams should be placed near the toe of slopes where erosion is anticipated, upstream and/or downstream at drainage structures, and in roadway ditches and channels to collect sediment.
2. Materials (aggregate, wire mesh, sandbags, etc.) shall be as indicated by the specification for "Rock Filter Dams for Erosion and Sedimentation Control".
3. The rock filter dam dimensions shall be as indicated on the SW3P plans.
4. Side slopes should be 2:1 or flatter. Dams within the safety zone shall have sideslopes of 6:1 or flatter.
5. Maintain a minimum of 1' between top of rock filter dam weir and top of embankment for filter dams at sediment traps.
6. Filter dams should be embedded a minimum of 4" into existing ground.
7. The sediment trap for ponding of sediment laden runoff shall be of the dimensions shown on the plans.
8. Rock filter dam types 2 & 3 shall be secured with 20 gauge galvanized woven wire mesh with 1" diameter hexagonal openings. The aggregate shall be placed on the mesh to the height & slopes specified. The mesh shall be folded at the upstream side over the aggregate and tightly secured to itself on the downstream side using wire ties or hog rings. For in stream use, the mesh should be secured or staked to the stream bed prior to aggregate placement.
9. Sack Gabions should be staked down with ¾" dia. rebar stakes, and have a double-twisted hexagonal weave with a nominal mesh opening of 2 ½" x 3 ¼"
10. Flow outlet should be onto a stabilized area (vegetation, rock, etc.).
11. The guidelines shown hereon are suggestions only and may be modified by the Engineer.



PROFILE



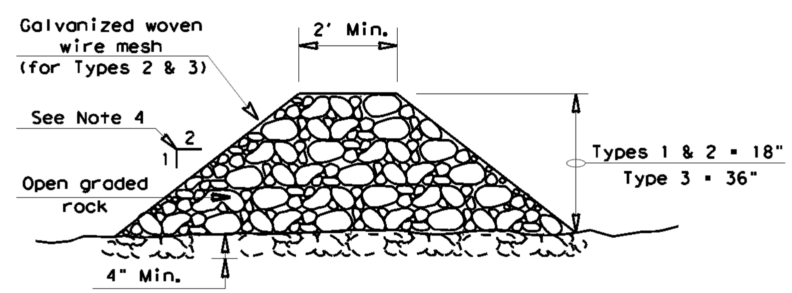
"V" SHAPE PLAN VIEW



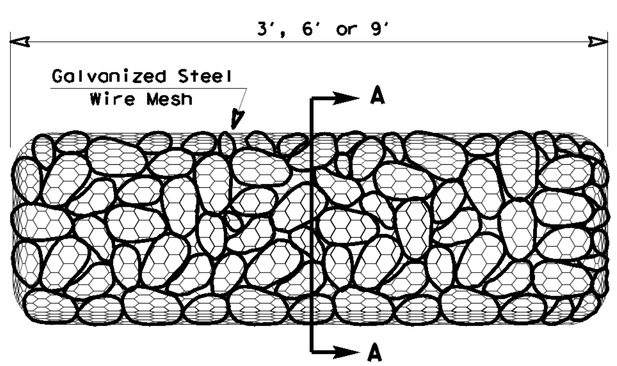
PLAN VIEW

¾" Dia.
Rebar Stakes

SECTION B-B

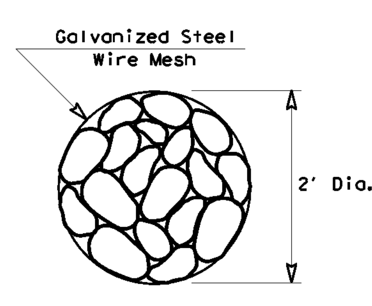


SECTION C-C



TYPE 4 (SACK GABIONS)

RFD4



SECTION A-A

ROCK FILTER DAM USAGE GUIDELINES

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

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

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

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

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

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

PLAN SHEET LEGEND

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

Texas Department of Transportation — Design Division Standard

TEMPORARY EROSION, SEDIMENT AND WATER POLLUTION CONTROL MEASURES

ROCK FILTER DAMS

EC(2)-16

FILE: ec216	DN: TxDOT	CK: KM	DW: VP	DN/CK: LS			
© 2024 JULY 2016	CONT	SECT	JOB	HIGHWAY			
REVISIONS	0114	01	068	US 290			
	DIST	COUNTY		SHEET NO.			
	AUS	TRAVIS		55			

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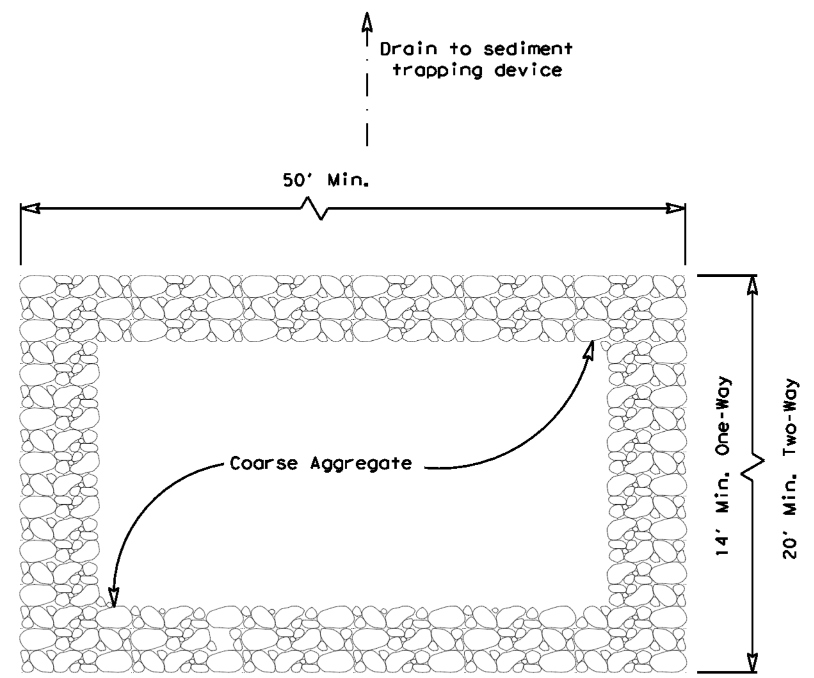
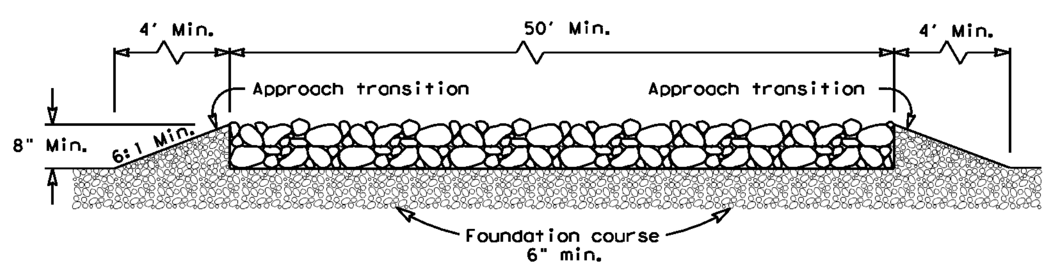


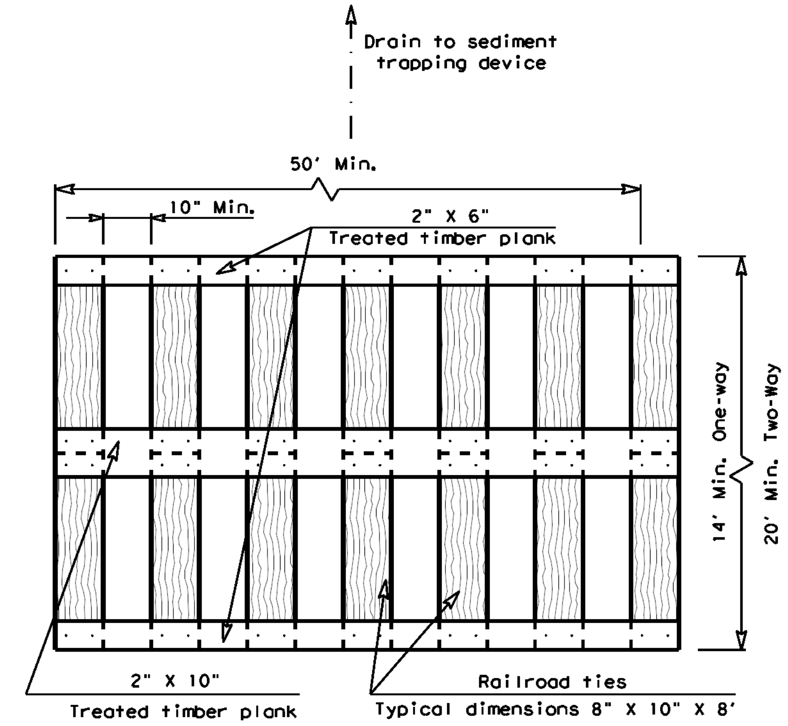
PLAN VIEW



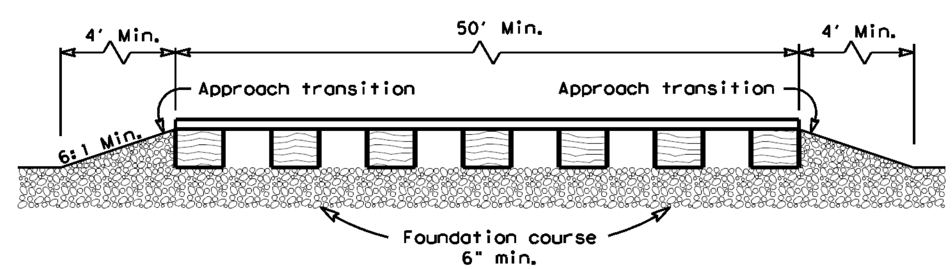
ELEVATION VIEW

CONSTRUCTION EXIT (TYPE 1)

ROCK CONSTRUCTION (LONG TERM)



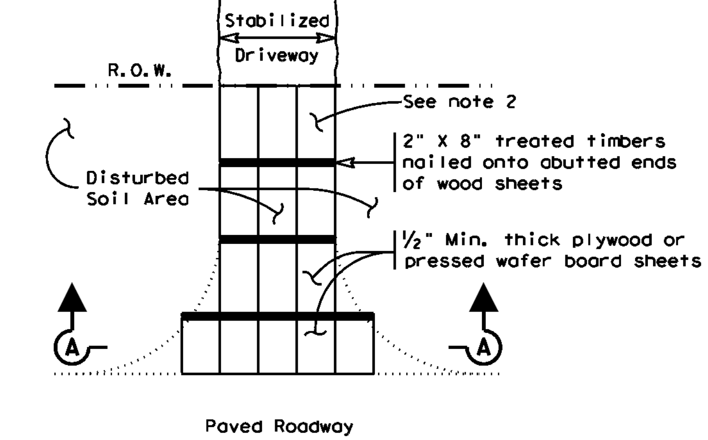
PLAN VIEW



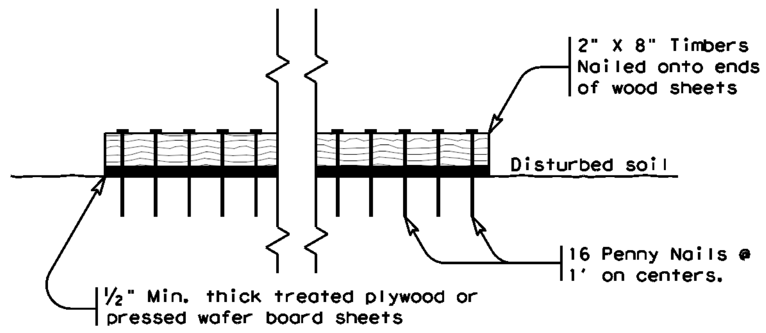
ELEVATION VIEW

CONSTRUCTION EXIT (TYPE 2)

TIMBER CONSTRUCTION (LONG TERM)



PLAN VIEW



SECTION A-A

CONSTRUCTION EXIT (TYPE 3)

SHORT TERM

GENERAL NOTES (TYPE 1)

1. The length of the type 1 construction exit shall be as indicated on the plans, but not less than 50'.
2. The coarse aggregate should be open graded with a size of 4" to 8".
3. The approach transitions should be no steeper than 6:1 and constructed as directed by the Engineer.
4. The construction exit foundation course shall be flexible base, bituminous concrete, portland cement concrete or other materialas approved by the Engineer.
5. The construction exit shall be graded to allow drainage to a sediment trapping device.
6. The guidelines shown hereon are suggestions only and may be modified by the Engineer.
7. Construct exits with a width of at least 14 ft. for one-way and 20 ft. for two-way traffic for the full width of the exit, or as directed by the engineer.

GENERAL NOTES (TYPE 2)

1. The length of the type 2 construction exit shall be as indicated on the plans, but not less than 50'.
2. The treated timber planks shall be attached to the railroad ties with ½"x 6" min. lag bolts. Other fasteners may be used as approved by the Engineer.
3. The treated timber planks shall be #2 grade min., and should be free from large and loose knots.
4. The approach transitions shall be no steeper than 6:1 and constructed as directed by the Engineer.
5. The construction exit foundation course shall be flexible base, bituminous concrete, portland cement concrete or other material as approved by the Engineer.
6. The construction exit should be graded to allow drainage to a sediment trapping device.
7. The guidelines shown hereon are suggestions only and may be modified by the Engineer.
8. Construct exits with a width of at least 14 ft. for one-way and 20 ft. for two-way traffic for the full width of the exit, or as directed by the engineer.

GENERAL NOTES (TYPE 3)

1. The length of the type 3 construction exit shall be as shown on the plans, or as directed by the Engineer.
2. The type 3 construction exit may be constructed from open graded crushed stone with a size of two to four inches spread a min. of 4" thick to the limits shown on the plans.
3. The treated timber planks shall be #2 grade min., and should be free from large and loose knots.
4. The guidelines shown hereon are suggestions only and may be modified by the Engineer.

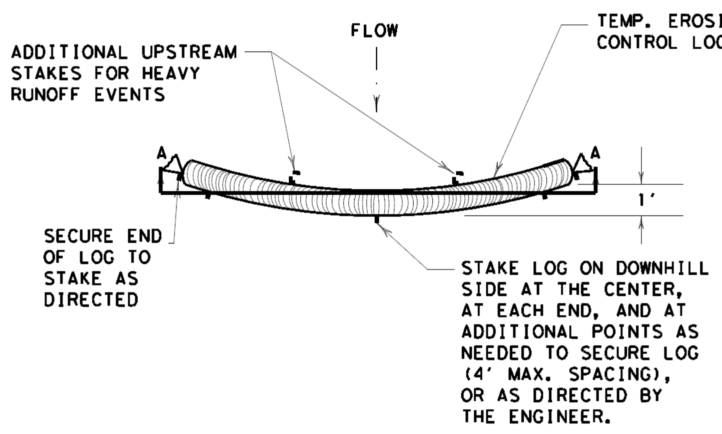
Texas Department of Transportation — Design Division Standard

TEMPORARY EROSION, SEDIMENT AND WATER POLLUTION CONTROL MEASURES

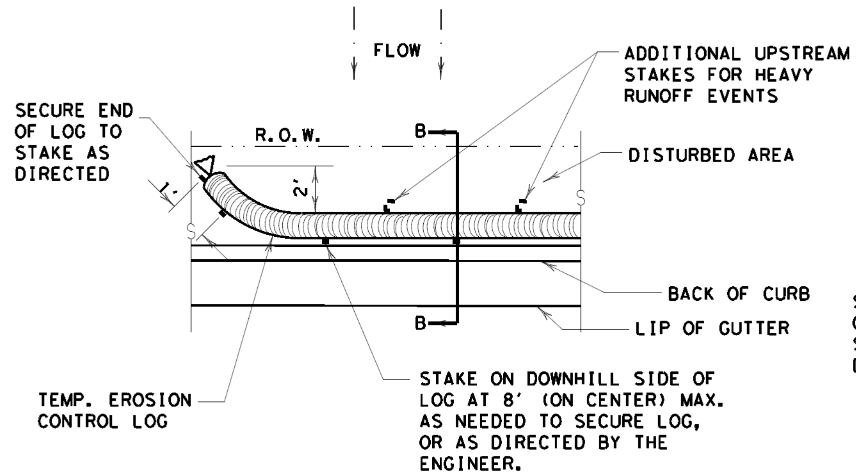
CONSTRUCTION EXITS

EC(3)-16

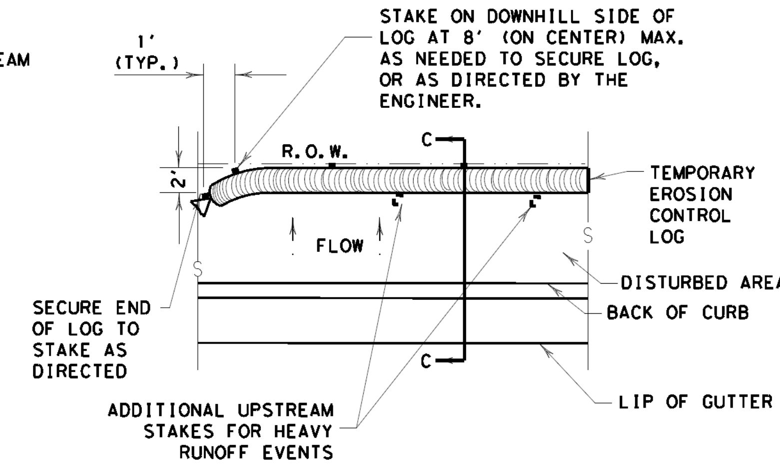
FILE: ec316	DN: TxDOT	CK: KM	DW: VP	DN/CK: LS
©TxDOT: JULY 2016	CONT	SECT	JOB	HIGHWAY
REVISIONS	0114	01	068	US 290
	DIST		COUNTY	SHEET NO.
	AUS		TRAVIS	56



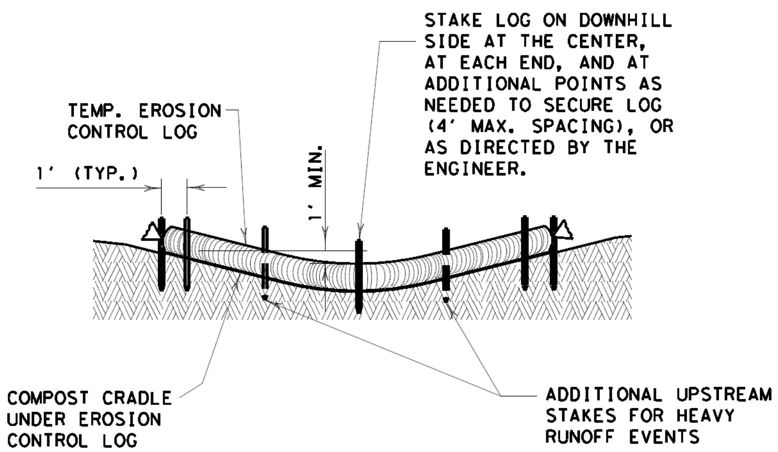
PLAN VIEW



PLAN VIEW



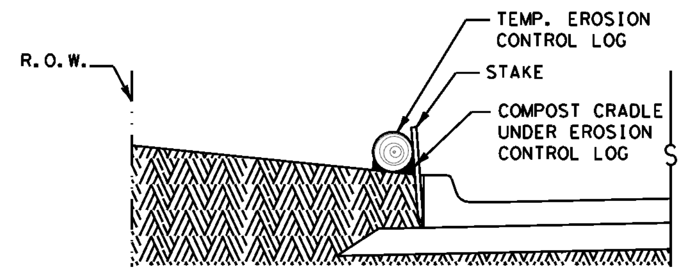
PLAN VIEW



SECTION A-A

EROSION CONTROL LOG DAM

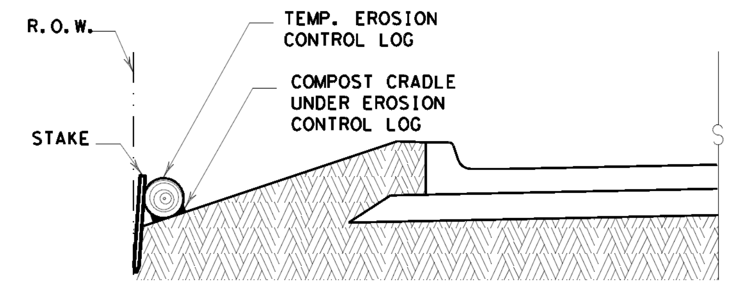
(CL-D)



SECTION B-B

EROSION CONTROL LOG AT BACK OF CURB

(CL-BOC)



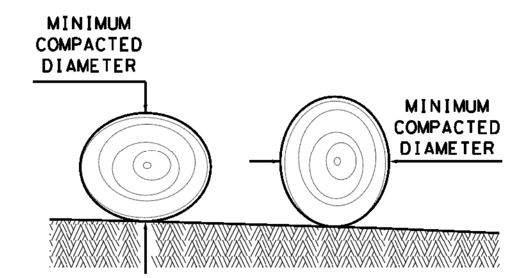
SECTION C-C

EROSION CONTROL LOG AT EDGE OF RIGHT-OF-WAY

(CL-ROW)

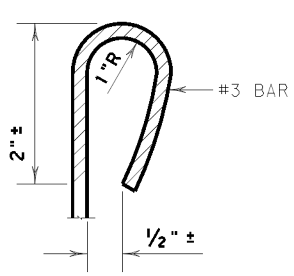
GENERAL NOTES:

1. EROSION CONTROL LOGS SHALL BE INSTALLED IN ACCORDANCE WITH MANFACTURER'S RECOMMENDATIONS, OR AS DIRECTED BY THE ENGINEER.
2. LENGTHS OF EROSION CONTROL LOGS SHALL BE IN ACCORDANCE WITH MANUFACTURER'S RECOMMENDATIONS AND AS REQUIRED FOR THE PURPOSE INTENDED.
3. UNLESS OTHERWISE DIRECTED, USE BIODEGRADABLE OR PHOTODEGRADABLE CONTAINMENT MESH ONLY WHERE LOG WILL REMAIN IN PLACE AS PART OF A VEGETATIVE SYSTEM. FOR TEMPORARY INSTALLATIONS, USE RECYCLABLE CONTAINMENT MESH.
4. FILL LOGS WITH SUFFICIENT FILTER MATERIAL TO ACHIEVE THE MINIMUM COMPACTED DIAMETER SPECIFIED IN THE PLANS WITHOUT EXCESSIVE DEFORMATION.
5. STAKES SHALL BE 2" X 2" WOOD OR #3 REBAR, 2'-4' LONG, EMBEDDED SUCH THAT 2" PROTRUDES ABOVE LOG, OR AS DIRECTED BY THE ENGINEER.
6. DO NOT PLACE STAKES THROUGH CONTAINMENT MESH.
7. COMPOST CRADLE MATERIAL IS INCIDENTAL & WILL NOT BE PAID FOR SEPARATELY.
8. SANDBAGS USED AS ANCHORS SHALL BE PLACED ON TOP OF LOGS & SHALL BE OF SUFFICIENT SIZE TO HOLD LOGS IN PLACE.
9. TURN THE ENDS OF EACH ROW OF LOGS UPSLOPE TO PREVENT RUNOFF FROM FLOWING AROUND THE LOG.
10. FOR HEAVY RUNOFF EVENTS, ADDITIONAL UPSTREAM STAKES MAY BE NECESSARY TO KEEP LOG FROM FOLDING IN ON ITSELF.



DIAMETER MEASUREMENTS OF EROSION CONTROL LOGS SPECIFIED IN PLANS

(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.

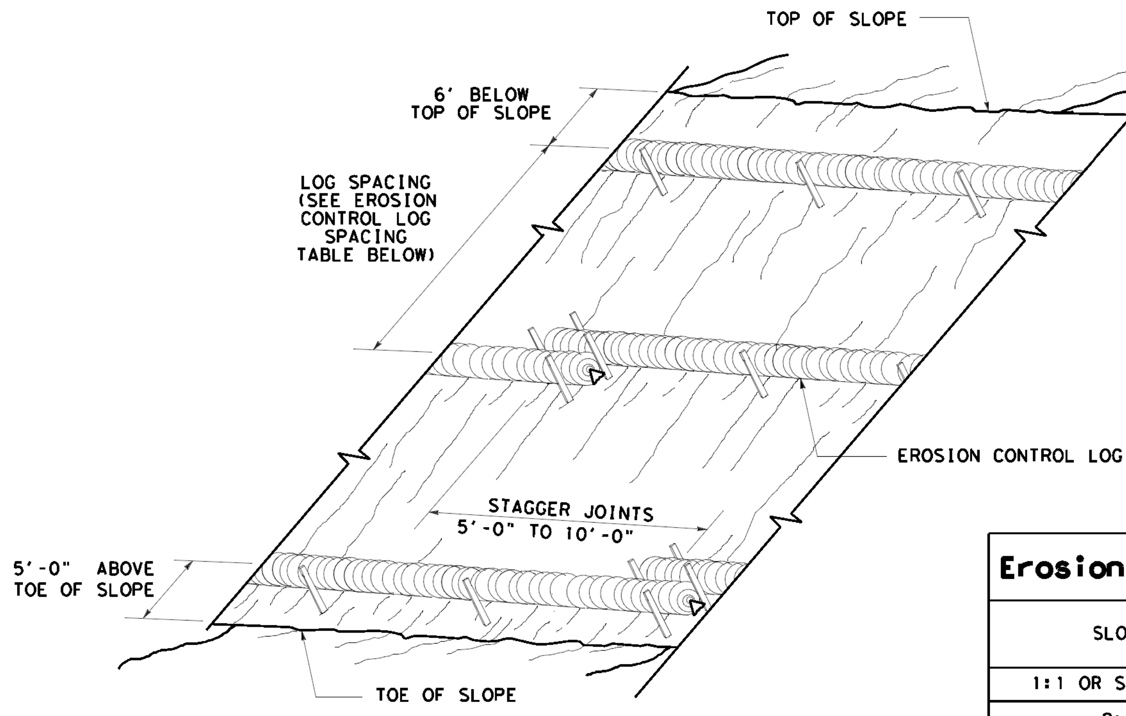
Texas Department of Transportation — Design Division Standard

TEMPORARY EROSION, SEDIMENT AND WATER POLLUTION CONTROL MEASURES

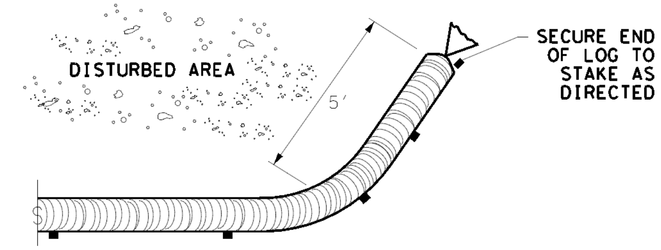
EROSION CONTROL LOG

EC(9)-16

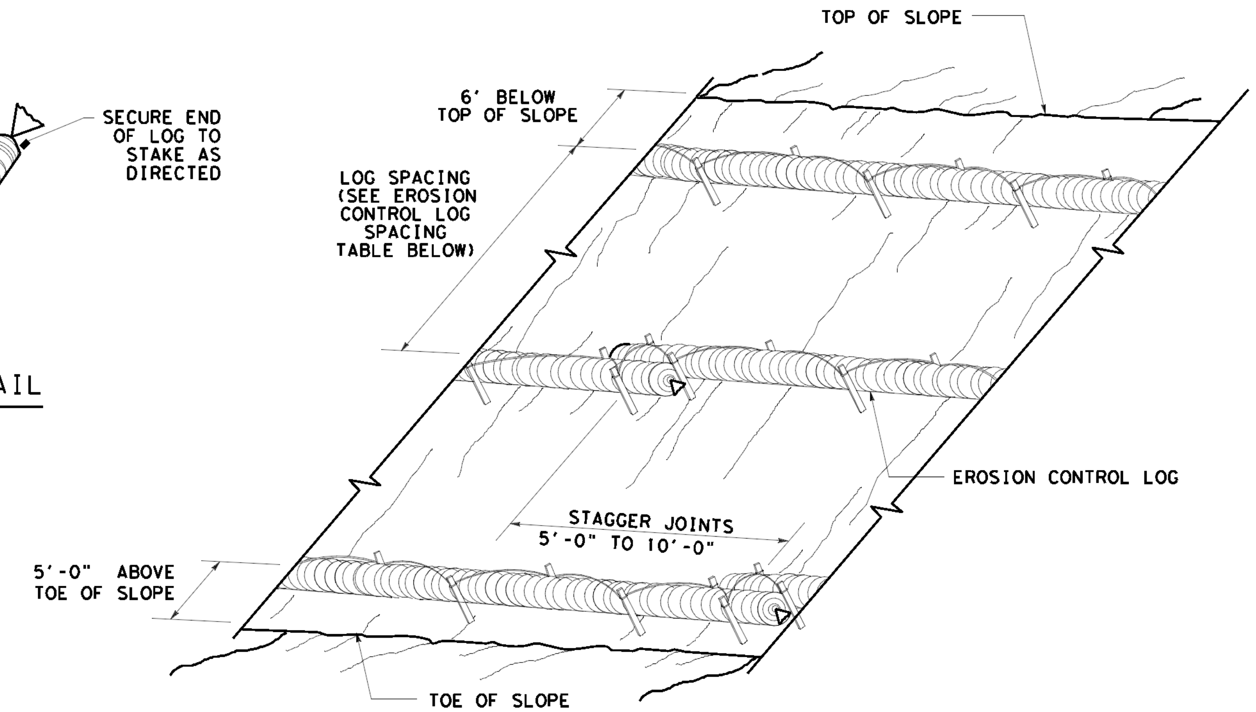
FILE: ec916	DN: TxDOT	CK: KM	DW: LS/PT	CK: LS
© TxDOT: JULY 2016	CONT 0114	SECT 01	JOB 068	HIGHWAY US 290
REVISIONS	DIST AUS		COUNTY TRAVIS	SHEET NO. 57



EROSION CONTROL LOGS ON SLOPES
STAKE AND TRENCHING ANCHORING
(CL-SST)



END SECTION RAP DETAIL

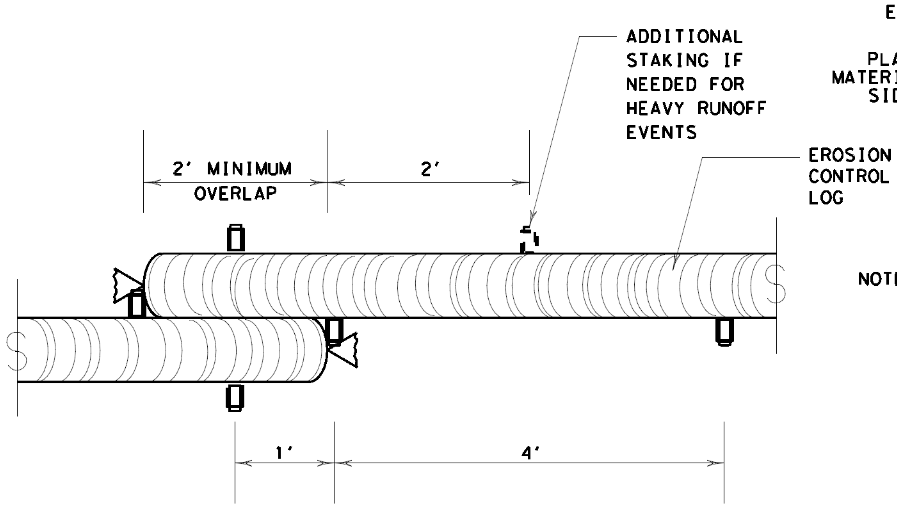


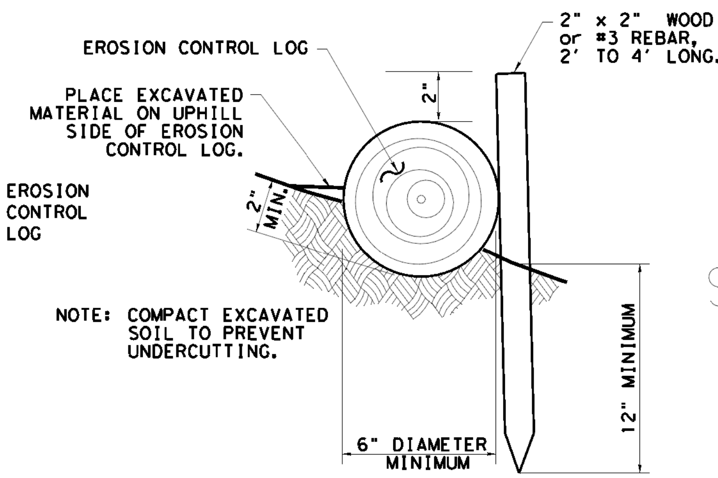
EROSION CONTROL LOGS ON SLOPES
STAKE AND LASHING ANCHORING
(CL-SSL)

Erosion Control Log Spacing Table

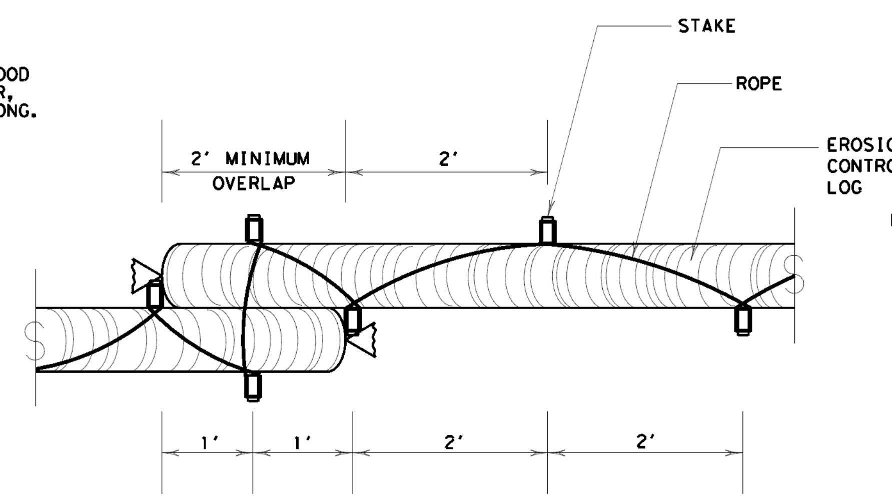
SLOPE	LOG DIAMETER 6"	8"	12"	18"
1:1 OR STEEPER	5'	10'	15'	20'
2:1	10'	20'	30'	40'
3:1	15'	30'	45'	60'
4:1 OR FLATTER	20'	40'	60'	80'

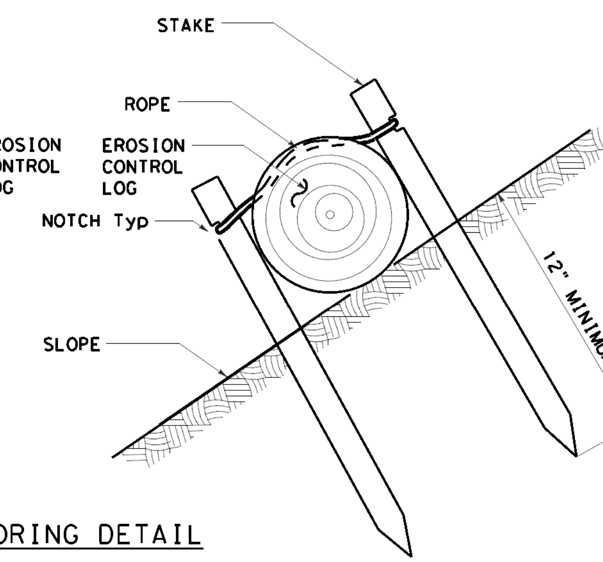
* ADJUSTMENTS CAN BE MADE FOR SOIL TYPE:
SOFT, LOAMY SOILS-ADJUST ROWS CLOSER TOGETHER;
HARD, ROCKY SOILS- ADJUST ROWS FARTHER APART



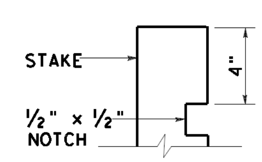


STAKE AND TRENCHING ANCHORING DETAIL
(CL-SST)





STAKE AND LASHING ANCHORING DETAIL
(CL-SSL)



STAKE NOTCH DETAIL

TRENCH DEPTH TABLE

LOG DIAMETER	DEPTH
6"	2"
8"	3"
12"	4"
18"	5"

Texas Department of Transportation — Design Division Standard

TEMPORARY EROSION, SEDIMENT AND WATER POLLUTION CONTROL MEASURES

EROSION CONTROL LOG

EC(9)-16

FILE: ec116	DN: TxDOT	CK: KM	DW: LS/PT	CK: LS
© TxDOT: JULY 2016	CONT 0114	SECT 01	JOB 068	HIGHWAY US 290
REVISIONS	DIST AUS	COUNTY TRAVIS		SHEET NO. 58

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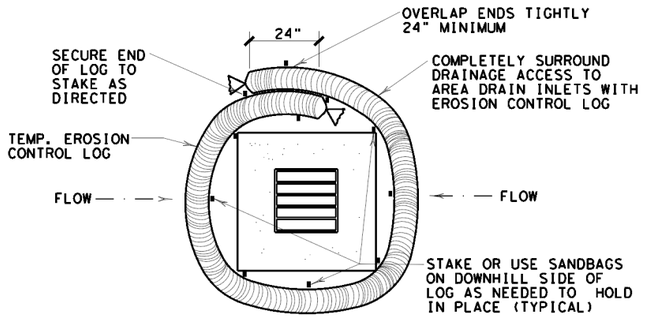
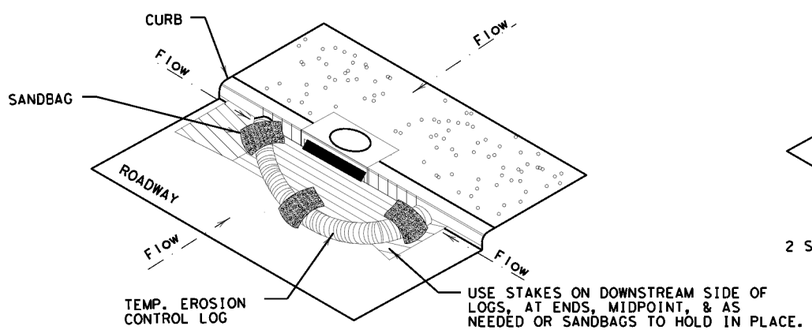


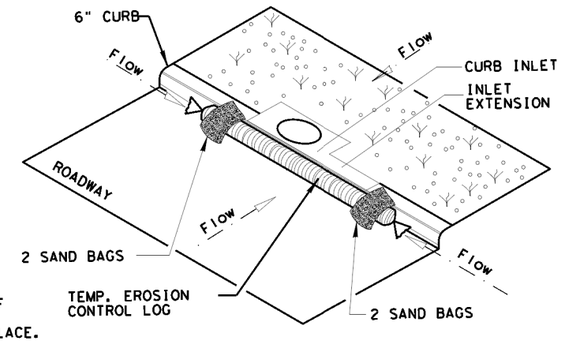
EROSION CONTROL LOG AT DROP INLET

CL-DI



EROSION CONTROL LOG AT CURB INLET

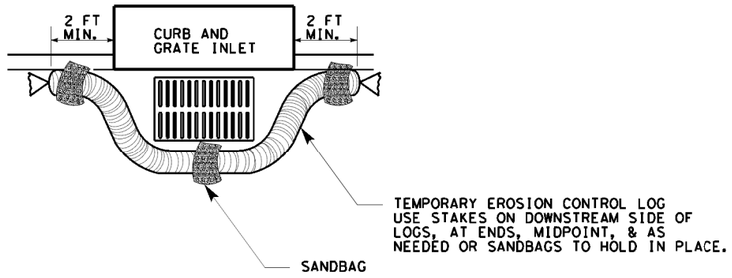
CL-CI



EROSION CONTROL LOG AT CURB INLET

CL-CI

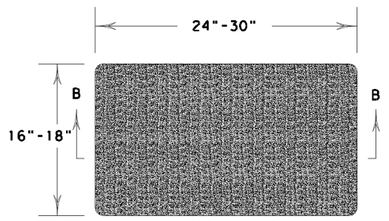
NOTE:
EROSION CONTROL LOGS USED AT CURB INLETS SHOULD ONLY BE USED IF THEY WILL NOT IMPEDE TRAFFIC OR FLOOD THE ROADWAY OR WHEN THE STORM SEWER SYSTEM IS NOT FULLY FUNCTIONAL.



EROSION CONTROL LOG AT CURB & GRADE INLET

CL-GI

SECTION B-B



SANDBAG DETAIL

SHEET 3 OF 3

Texas Department of Transportation

Design Division Standard

TEMPORARY EROSION, SEDIMENT AND WATER POLLUTION CONTROL MEASURES

EROSION CONTROL LOG

EC(9)-16

FILE: ec916	DN: TxDOT		CK: KM	DW: LS/PT		CK: LS	
© TxDOT: JULY 2016	CONT	SECT	JOB		HIGHWAY		
REVISIONS	0114	01	068		US 290		
	DIST	COUNTY				SHEET NO.	
	AUS	TRAVIS				59	

I. WORK AT CROSSING LOCATIONS (AT GRADE, HIGHWAY OVERPASS, HIGHWAY UNDERPASS, PEDESTRIAN, OR CLOSED/ABANDONED)

☐ This project is adjacent or parallel work, not within RR ROW:

DOT No.: 765805J
Crossing Type: AT GRADE
RR Company Operating Track at Crossing: CMTY
RR Company Owning Track at Crossing: CMTY
RR MP: 61.250
RR Subdivision: CENTRAL
City: AUSTIN
County: TRAVIS
CSJ at this Crossing: 0114-01-068
Latitude: 30.3206763
Longitude: -97.7159732

Scope of Work, including any TCP, to be performed by State Contractor:

TCP (LANE REDUCTION), FLAGGING

Scope of Work to be performed by Railroad Company:

NONE

II. FLAGGING & INSPECTION

No. of Days of Railroad Flagging Expected: 48

On this project, night or weekend flagging is:

☑ Expected
☐ Not Expected

Flagging services will be provided by:

☐ Railroad Company: 1) Txdot will pay flagging invoices. Flagging Agreement with railroad will be needed or, 2) Permitted crossing. Railroad company to provide flagging.
☑ Outside Party: Contractor will pay flagging invoices to be reimbursed by TxDOT

Contractor must incorporate flaggers into anticipated construction schedule. The Railroad requires a 30-day notice if their flaggers are to be utilized. If Contractor falls behind schedule due to their own negligence and is not ready for scheduled flaggers, any flagging charges will be paid by Contractor.

Contact Information for Flagging:

☐ **UPRR** UP.info@railpros.com
Call Center 877-315-0513, Select #1 for flagging
UP.request@nrssinc.net
Call Center 877-984-6777

☐ **BNSF** BNSFinfo@railprosfs.com
Call Center 877-315-0513, Select #1 for flagging

☐ **CPKCR** KCS.info@railpros.com
Call Center 877-315-0513, Select #1 for flagging
Bottom Line On-Track Safety Services
bottomline076@aol.com, 903-767-7630

☑ OTHERS:

CAP METRO: RAY KITE
(737) 268-3466
RAY.KITE@CAPMETRO.ORG

Contractor must incorporate railroad construction inspection into anticipated construction schedule.

☑ Not Required
☐ Required. Contact Information for Construction Inspection:

III. CONSTRUCTION WORK TO BE PERFORMED BY THE RAILROAD

☐ Required.
☑ Not Required

Railroad Point of Contact: _____

Coordinate with TxDOT for any work to be performed by the Railroad Company. TxDOT must issue a work order for any work done by the Railroad Company prior to the work being performed.

IV. RAILROAD INSURANCE REQUIREMENTS

The Contractor shall confirm the insurance requirements with the Railroad as the insurance limits are subject to change without notice.

Insurance policies and corresponding certificates of insurance must be issued by the contractor on behalf of the Railroad. Separate insurance policies and certificates are required when more than one Railroad Company is operating on the same right of way, or when several Railroad Companies are involved and operate on their own separate right of ways.

No direct compensation will be made to the Contractor for providing the insurance coverages shown below or any deductibles. These costs are incidental to the various bid items.

Escalated Limits

Type of Insurance	Amount of Coverage (Minimum)
Workers Compensation	$500,000 / $500,000 / $500,000
Commercial General Liability	$2,000,000 / $4,000,000
Business Automobile	$2,000,000

Railroad Protective Liability Limits

☐ Not Required	
☐ Non - Bridge/Typical Maintenance Projects. Includes repairs to overpass/underpass and culvert structures	$2,000,000 / $6,000,000
☐ Bridge Structure Projects. Includes new construction or replacement of overpass/ underpass structures	$5,000,000 / $10,000,000
☑ Other: $5,000,000 / $5,000,000	

V. CONTRACTOR'S RIGHT OF ENTRY (CROE)

☑ Not Required
☐ Required: UPRR Maintenance Consent Letter. TxDOT to assist
☐ Required: TxDOT to assist in obtaining the UPRR CROE
☐ Required: Contractor to obtain
- ☐ BNSF: _____
https://bnsf.railpermitting.com
- ☐ CPKCR
https://jllrpg.360works.com/fmi/webd/rpo_web_kcs.fmp12
- ☐ Other Railroads: _____

To view previously approved CROE templates agreed upon between the State and Railroad, see: https://www.txdot.gov/business/resources/railroad-highway-crossing/sample-right-of-entry-agreements.html

Approved CROE templates are not to be modified by the Contractor.

Contractor shall not operate within Railroad Right of Way without an executed Construction & Maintenance Agreement between the State and the Railroad and an executed CROE between the Contractor and the Railroad if required on project.

VI. RAILROAD COORDINATION MEETING

A Railroad Coordination Meeting is required. See item 5, Article 8.1, of the Standard Specifications for Construction and Maintenance of Highways, Streets and Bridges Manual for more details.

VII. RAILROAD SAFETY ORIENTATION

A. Complete the Railroad's course "Orientation for Contractor's Safety," and maintain registration prior to working on the Railroad's property. This course is required to be completed annually by Contractor and Subcontractor personnel working on site.

UPRR, BNSF, CPKCR will not accept on-track safety training certificates from other Railroads. Refer to each Railroad's specific contractor right of entry for training information.

Know and follow the Contractor's Right of Entry Agreement EXHIBIT D, MINIMUM SAFETY REQUIREMENTS regarding clothing, personal protective equipment, and general safety requirements.

VIII. SUBCONTRACTORS

Contractor shall not subcontract work without written consent of TxDOT. Subcontractors are subject to the same insurance requirements as the Prime Contractor.

IX. EMERGENCY NOTIFICATION

In Case of Railroad Emergency

Call: CAP METRO
Railroad Emergency Line at: 1-844-592-8046
Location: DOT 765805J
RR Milepost: 61.250
Subdivision: CNETRAL

RRD Review Only
Initials: _____
Date: 07/26/2023

Texas Department of Transportation — Rail Division

RAILROAD SCOPE OF WORK
PROJECT SPECIFIC DETAILS

FILE: rr-scope-of-work.pdf		DN: TxDOT	CK:	DW:		CK:	
© TxDOT June 2014		CONT	SECT	JOB		HIGHWAY	
REVISIONS		0114	01	068		RM 2222	
6/2023		DIST	COUNTY			SHEET NO.	
		AUS	TRAVIS			60	

PART 1 - GENERAL

1.01 DESCRIPTION

This project includes construction work within the right of way and/or properties of the Railroad and adjacent to its tracks, wire lines and other facilities. These sheets describe the minimum special requirements for coordination with the Railroad when working upon, over or under Railroad Right of Way or when impacting current or future Railroad operations. Coordinate with the Railroad while performing the work outlined herein, and afford the same cooperation with the Railroad as with TxDOT. Complete all submittals and work in accordance with TxDOT Standard Specifications, Railroad Guidelines and AREMA recommendations as modified by these minimum special requirements or as directed in writing by the Railroad Designated Representative.

For purposes of this project, the Railroad Designated Representative is the person or persons designated by the Railroad Manager of Industry and Public Projects to handle specific tasks related to the project.

1.02 REQUEST FOR INFORMATION / CLARIFICATION

Submit Requests for Information ("RFI") involving work within any Railroad Right of Way to the TxDOT Engineer. The TxDOT Engineer will submit the RFI to the Railroad Designated Representative for review and approval for RFI's corresponding to work within Railroad Right of Way. Allow six (6) weeks total time for review and approval, which includes four (4) weeks for review and approval by the Railroad.

1.03 PLANS / SPECIFICATIONS

TxDOT has received written Railroad approval of the plans and specifications for this project. Any revisions or changes in the plans after award of the Contract must have the approval of TxDOT and the Railroad.

PART 2 - UTILITIES AND FIBER OPTIC

Construct all utility installations in accordance with current AREMA recommendations, Railroad, TxDOT and owning utility specifications and requirements. Railroad general guidelines can be found on the Railroad website or by contacting the Railroad Designated Representative.

PART 3 - CONSTRUCTION

3.01 GENERAL

A. Perform all work in compliance with all applicable Railroad, Federal Railroad Administration (FRA), and TxDOT rules and regulations. Arrange and conduct work in a manner that does not endanger or interfere with the safe operation of the tracks and property of the Railroad and the traffic moving on such tracks, or the wires, signals and other property of the Railroad, its tenants or licensees, at or in the vicinity of the Work. The safe operation of railroad train movements takes precedence over any work to be performed by the Contractor. The Contractor is responsible for train delay cost and lost revenue claims due to any delays or interruption of train operations resulting from Contractor's construction or other activities.

B. Construction activities within 15 feet of the operational tracks will only be allowed if absolutely necessary and the Railroad's Designated Representative grants approval. Construction activities within 15 feet of the operational track(s) preferably allow the tracks to stay operational. In such cases, coordination and approval by the Railroad Track Manager is required with regard to schedule, flagging, and slow orders. See Sections 3.07 and 3.08 for additional information.

C. Provide track protection for all work equipment (including rubber tired equipment) operating within 25 feet from nearest rail. When not in use, keep Contractor machinery and materials at least 50 feet from the Railroad's nearest track.

D. Vehicular crossings of railroad track are allowed only at existing crossings, or haul road crossings developed with Railroad approval.

E. The Contractor is also advised that new railroad facilities within the project may be built by the Railroad. If applicable, these facilities are delineated in the plans. Be aware of the limits of responsibilities and coordinate efforts with the Railroad and TxDOT.

F. Railroad requirements do not allow work within 50 feet of track centers when a train passes the work site and all personnel must clear the area within 50 feet of the track centerline and secure all equipment. Additional allowances may be pursued as outlined in 3.02 and 3.03.

G. All permanent clearances shall be verified before project closing.

3.02 RAILROAD OPERATIONS

A. Trains and/or equipment are expected on any track, at any time, in either direction. Become familiar with the train schedules in this location and structure bid assuming intermittent track windows in this period, as defined in Paragraph B that follows.

B. All railroad tracks within and adjacent to the contract site are active, and rail traffic over these facilities shall be maintained throughout the Project. Activities may include both through moves and switching moves to local customers. railroad traffic and operations will occur continuously throughout the day and night on these tracks and shall be maintained at all times as defined herein. Coordinate and schedule the work so that construction activities do not interfere with railroad operations.

C. Coordinate work windows with TxDOT and the Railroad's Designated Representative. Types of work windows include Conditional Work Windows and Absolute Work Windows, as defined below:

1. Conditional Work Window: A Conditional Work Window is a period of time that railroad operations have priority over construction activities. When construction activities may occur on and/or adjacent to the railroad tracks within 25 feet of the nearest track, a railroad flag person will be required. At the direction of the railroad flag person, upon approach of a train, and when trains are present on the tracks, the tracks must be cleared (i.e., no construction equipment, materials or personnel within 25 feet, or as directed by the Railroad Designated Representative, from the tracks). Conditional Work Windows are available for the Project.

2. Absolute Work Window: An Absolute Work Window is a period of time that construction activities are given priority over railroad operations. During this time frame, the designated railroad track(s) will be inactive for train movements and may be fouled by the Contractor. At the end of an Absolute Work Window, the railroad tracks and/or signals must be completely operational for train operations and all Railroad, Public Utilities Commission (PUC) and FRA requirements, codes and regulations for operational tracks must be satisfied. In the situation where the operating tracks and/or signals have been affected, the Railroad will perform inspections of the work prior to placing that track back into service. Railroad flag persons will be required for construction activities requiring an Absolute Work Window. Absolute Work Windows will not generally be granted. Any request will require a detailed explanation for Railroad review.

3.03 RIGHT OF ENTRY, ADVANCE NOTICE AND WORK STOPPAGES

A. Do not perform any work within Railroad Right of Way without a valid executed Right of Entry Agreement if required on this project.

B. Give advance notice to the Railroad as required in the "Contractor's Right of Entry Agreement" before commencing work in connection with construction upon or over Railroad Right of Way and observe the Railroad's rules and regulations with respect thereto.

C. Perform all work upon Railroad Right of Way in a manner to avoid interference with or endanger the operations of the Railroad. Whenever work may affect the operations or safety of trains, submit the work method to the Railroad Designated Representative for approval. Approval does not relieve the Contractor from liability. Do not commence any work which requires flagging service or inspection service until the flagging protection required by the Railroad is available at the job site. See Section 3.15 for railroad flagging requirements.

D. Make requests in writing for both Absolute and Conditional Work Windows, at least 30 days in advance of any work. Include in the written request:
1. Exactly what the work entails.
2. The days and hours that work will be performed.
3. The exact location of work, and proximity to the tracks.
4. The type of window requested and the amount of time requested.
5. The designated contact person.

Provide a written confirmation notice to the Railroad at least 48 hours before commencing work in connection with approved work windows when work is within 25 feet of nearest rail. Perform all work in accordance with previously approved work plans.

E. Make provisions to protect operations and property of the Railroad should a condition arising from, or in connection with the work, require immediate and unusual action. If in the judgment of the Railroad Designated Representative such provisions are insufficient, the Railroad Designated Representative may require or provide such provisions as deemed necessary. In any event, such provisions shall be at the Contractor's expense and without cost to the Railroad or TxDOT. The Railroad or TxDOT shall have the right to order the Contractor to temporarily cease operations in the event of an emergency or, if in the opinion of the Railroad Designated Representative, the Contractor's operations could endanger railroad operations. In the event of such an order, immediately notify TxDOT of the order.

3.04 INSURANCE

Do not begin work upon or over Railroad Right of Way until furnishing the Railroad with the insurance policies, binders, certificates and endorsements required by the "Contractor's Right of Entry Agreement", and until the Railroad Designated Representative has advised TxDOT that such insurance is in accordance with the Agreement.

3.05 RAILROAD SAFETY ORIENTATION

A. Complete the railroad course "Orientation for Contractor's Safety", and maintain current registration prior to working on railroad property. This course is required to be completed annually by Contractor and Subcontractor personnel working on site.

"UPRR, BNSF, KCS/TEXMEX will not accept on-track safety training certificates from other railroads. Refer to Railroad specific contractor right of entry for training information."

B. Know and follow the "Contractor's Right of Entry Agreement" EXHIBIT D, MINIMUM SAFETY REQUIREMENTS regarding clothing, personal protective equipment, and general safety requirements.

3.06 COOPERATION

The Railroad will cooperate with Contractor so that work may be conducted in an efficient manner, and will cooperate with Contractor in enabling use of Railroad Right of Way in performing the work.

3.07 MINIMUM CONSTRUCTION CLEARANCES FOR FALSEWORK AND OTHER TEMPORARY STRUCTURES

Abide by the following minimum temporary clearances during the course of construction:
A. 15' - 0" (BNSF)(UPRR)and 14'-0" (KCS) horizontal from centerline of track
B. 22' (KCS) and 21' - 6" (UPRR & BNSF) vertically above top of rail.

For construction clearance less than listed above, obtain local Railroad Operating Unit review and approval.

3.08 APPROVAL OF REDUCED CLEARANCES

A. Maintain minimum track clearances during construction as specified in Section 3.07.

B. Submit any proposed infringement on the specified minimum clearances to the Railroad Designated Representative through TxDOT at least 30 days in advance of the work. Do not proceed with such infringement without written approval by the Railroad Designated Representative.

C. Do not commence work involving an approved infringement without receiving written assurance from the Railroad Designated Representative that arrangements have been made for any necessary flagging service.

Texas Department of Transportation — Rail Division

RAILROAD REQUIREMENTS FOR NON-BRIDGE CONSTRUCTION PROJECTS

FILE:	DN: TxDOT	CK: TxDOT	DW: TxDOT	CK: TxDOT
©TxDOT October 2018	CONT	SECT	JOB	HIGHWAY
REVISIONS March 2020	0114	01	068	US 290
	DIST	COUNTY		SHEET NO.
	AUS	TRAVIS		61

3.09 MAINTENANCE OF RAILROAD FACILITIES

A. Maintain all ditches and drainage structures free of silt or other obstructions resulting from Contractor's operations. Repair eroded areas and any other damage within Railroad Right of Way and repair any other damage to the property of the Railroad, or its tenants.

B. Perform all such maintenance and repair of damages due to the Contractors's operations at Contractor's expense.

C. Submit a proposed method of erosion control for review by the Railroad prior to beginning any grading on the project site. Comply with all applicable local, state and federal regulations when developing and implementing such erosion control.

3.10 SITE INSPECTIONS BY RAILROAD's DESIGNATED REPRESENTATIVE

A. In addition to the office reviews of construction submittals, site inspections may be performed by the Railroad Designated Representative at significant points during construction, including the following if applicable:
1. Pre-construction meetings.
2. Pile driving/drilling of caissons or drilled shafts.
3. Reinforcement and concrete placement for railroad bridge substructure and/or superstructure.
4. Erection of precast concrete or steel bridge superstructure.
5. Placement of waterproofing (prior to placing ballast on bridge deck).
6. Completion of the bridge structure.

B. Site inspection is not limited to the milestone events listed above. Site visits to check progress of the work may be performed at any time throughout the construction as deemed necessary by the Railroad.

C. Provide a detailed construction schedule, including the proposed temporary horizontal and vertical clearances and construction sequence for all work to TxDOT for submittal to the Railroad Designated Representative for review prior to commencement of work. Include the anticipated dates when the above listed events will occur. Update this schedule for the above listed events as necessary and each month at a minimum to allow the Railroad to schedule site inspections.

3.11 RAILROAD REPRESENTATIVES

Railroad representatives, conductors, flag person or watch person will be provided by the Railroad at expense of TxDOT to protect Railroad facilities, property and movements of its trains or engines. In general, the Railroad will furnish such personnel or other protective services as follows:

A. When any part of any equipment is standing or being operated within 25 feet, measured horizontally, from nearest rail of any track on which trains may operate, or when any object is off the ground and any dimension thereof could extend inside the 25 foot limit, or when any erection or construction activities are in progress within such limits, regardless of elevation above or below track.

B. For any excavation below elevation of track subgrade if, in the opinion of the Railroad Designated Representative, track or other railroad facilities may be subject to settlement or movement.

C. During any clearing, grubbing, excavation or grading in proximity to railroad facilities, which, in the opinion of the Railroad Designated Representative, may endanger railroad facilities or operations.

D. During any Contractor's operations when, in the opinion of the Railroad Designated Representative, railroad facilities, including, but not limited to, tracks, buildings, signals, wire lines, or pipe lines, may be endangered.

E. Arrange with the Railroad Designated Representative to provide the adequate number of flag persons to accomplish the work.

3.12 COMMUNICATIONS AND SIGNAL LINES

If required, the Railroad will rearrange its communications and signal lines, its grade crossing warning devices, train signals and tracks, and facilities that are in use and maintained by the Railroad's forces in connection with its operation at expense of TxDOT. This work by the Railroad will be done by its own forces and it is not a part of the Work under this Contract.

3.13 TRAFFIC CONTROL

Coordinate any operations that control traffic across or around railroad facilities with the Railroad Designated Representative.

3.14 CONSTRUCTION EXCAVATIONS AND BORING ACTIVITIES UNDER TRACK

A. Take special precaution and care in connection with excavating and shoring. Excavations for construction of footings, piers, columns, walls or other facilities that require shoring shall comply with requirements of TxDOT, OSHA, AREMA and Railroad "Guidelines for Temporary Shoring".

B. The project plans indicate whether there are fiber optic lines or other such telecommunications systems that require consideration. Regardless, contact the necessary call center to determine if such cable systems are present:

UPRR 1-800-336-9193
7:00 AM to 9:00 PM CST Monday-Friday except holidays,
staffed 24 hrs/day for emergencies
48 hrs notice required

BNSF 1-800-533-2891
24 hour number
5 working days notice required

KCS 1-800-344-8377
Texas One Call, a 24 hour number
48 hrs notice required, excluding weekends and holidays

If a telecommunications system is buried anywhere on or near railroad property, coordinate with TxDOT, the Railroad and the Telecommunication Company(ies) to arrange for relocation or protective measures prior to beginning work on or near railroad property. Refer to the project General Notes for additional information.

C. Projects involving a boring or jack and bore operation under track such as drainage pipes or culverts and utilities require an installation plan reviewed and approved by the Railroad and TxDOT prior to proceeding with such construction. A railroad inspector and contractor assisted monitoring of ground and track movement is required to maintain safe passage of rail traffic. Stop installation and do not allow passage of trains if movements in excess of $\frac{1}{4}$ inch vertical or horizontal is detected in the tracks. Immediately repair the damage to the satisfaction of TxDOT and the Railroad before proceeding.

3.15 RAILROAD FLAGGING

Per the Right of Entry Agreement for flagging, notify the Railroad Representative at least 10 working days in advance of Contractor's work and at least 30 working days in advance of any Contractor's work in which any person or equipment will be within 25 feet of nearest rail or as specified in the Contractor Right of Entry (CROE).

3.16 CLEANING OF RIGHT-OF-WAY

When work is complete, remove all tools, implements, and other materials brought into Railroad Right of Way and leave the right of Way in a clean and presentable condition to the satisfaction of TxDOT and the Railroad.

Texas Department of Transportation | Rail Division

RAILROAD REQUIREMENTS FOR NON-BRIDGE CONSTRUCTION PROJECTS

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© TxDOT October 2018	CONT	SECT	JOB	HIGHWAY
REVISIONS March 2020	0114	01	068	US 290
	DIST	COUNTY		SHEET NO.
	AUS	TRAVIS		62