FEDERAL AID PROJECT NO.			
BR 2018(804), ETC.			
CONT	SECT	JOB	HIGHWAY
0902	90	019, ETC.	CS
DIST	COUNTY		SHEET NO.
FTW	TARRANT		1

FUNCTIONAL CLASS: URBAN MAJOR COLLECTOR
DESIGN SPEED: 35 MPH

AADT 2019: 21,344
AADT 2042: 32,016

STATE OF TEXAS
DEPARTMENT OF TRANSPORTATION

PLANS OF PROPOSED
STATE HIGHWAY IMPROVEMENT

FEDERAL-AID PROJECT NO. BR 2018(804), ETC.

CS (RIVERSIDE DR)

TARRANT COUNTY

CSJ	HWY	LIMITS	ROADWAY LENGTH		BRIDGE LENGTH		PROJECT LENGTH	
			FEET	MILES	FEET	MILES	FEET	MILES
0902-90-019	RIVERSIDE DRIVE SB	AT WEST FORK OF TRINITY RIVER IN FORT WORTH	614.00	0.117	292.00	0.055	906.00	0.172
0902-90-298	RIVERSIDE DRIVE SB	AT WEST FORK OF TRINITY RIVER IN FORT WORTH	0.00	0.000	0.00	0.000	0.00	0.000

TOTAL PROJECT LENGTH = 0.172 MILES

FOR THE CONSTRUCTION OF BRIDGE REHABILITATION
CONSISTING OF PAVEMENT, STRUCTURE, AND PAVEMENT MARKINGS

INDEX OF SHEETS

SHEET NO.	DESCRIPTION
1	TITLE SHEET
2	INDEX OF SHEETS

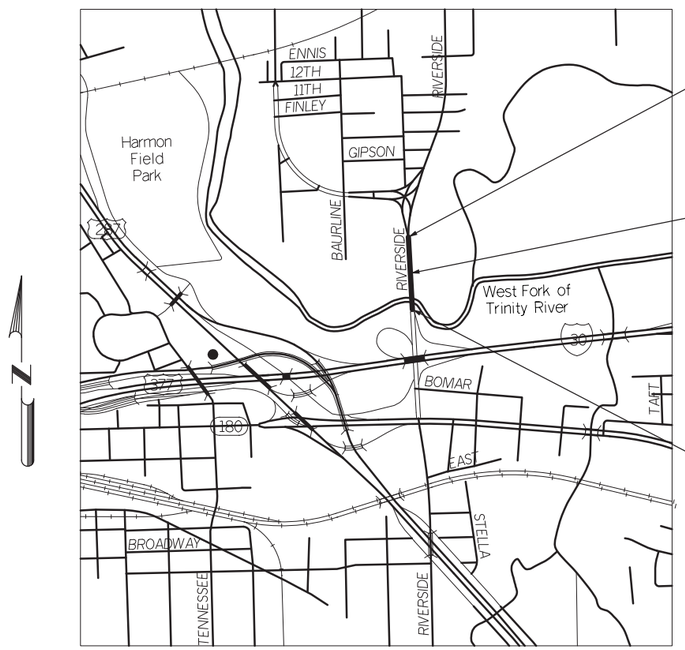
OMEGA ENGINEERS, INC.
8200 N. MOPAC EXPRESSWAY, STE #280
AUSTIN, TEXAS 78759
OMEGAENGINEERS.COM
TX PE Firm Reg. No. F-2147
P:512 575 2288 F:281 647 9184

STATE OF TEXAS
JASON PATRICK BERRY
138339
LICENSED
PROFESSIONAL ENGINEER

Jason Berry, P.E. 03/07/2024
DATE

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

SPECIFICATIONS ADOPTED BY THE TEXAS DEPARTMENT OF TRANSPORTATION, NOVEMBER 1, 2014 AND SPECIFICATION ITEMS LISTED AND DATED AS FOLLOWS, SHALL GOVERN ON THIS PROJECT:
REQUIRED CONTRACT PROVISIONS, FEDERAL-AID CONSTRUCTION CONTRACTS (FORM FHWA 1273, OCTOBER 2023)



NOT TO SCALE

END PROJECT
CSJ: 0902-90-019
CSJ: 0902-90-298
STA 119+20.45

BRIDGE
NBI: 02-220-0-ZR50-50-001

BEGIN PROJECT
CSJ: 0902-90-019
CSJ: 0902-90-298
STA 110+14.45

EQUATIONS : NONE
RAILROAD : NONE
EXCEPTIONS : NONE
NO TDLR REQUIRED

LETTING DATE:
CONTRACTOR:

WORK BEGAN:
WORK COMPLETED:
WORK ACCEPTED:
CHANGE ORDERS:

Texas Department of Transportation

SUBMITTED FOR LETTING: 3/8/2024
DocuSigned by:
7B89CC87CF28477...
AREA ENGINEER

RECOMMENDED FOR LETTING: 3/21/2024
DocuSigned by:
7879B0B92E5D403...
DIRECTOR, TP&D

APPROVED FOR LETTING: 3/21/2024
DocuSigned by:
David M Salazar, P.E.
B741E64FAD82411...
DISTRICT ENGINEER

THE CITY-STATE CONSTRUCTION, MAINTENANCE AND OPERATION RESPONSIBILITIES SHALL BE AS HERETOFORE AGREED TO, ACCEPTED, AND SPECIFIED IN THE AGREEMENT TO WHICH THESE PLANS ARE MADE A PART.

INDEX OF SHEETS

STATE OF TEXAS
ALEX I. GARCIA
107317
LICENSED
PROFESSIONAL ENGINEER

THE STANDARD SHEETS SPECIFICALLY IDENTIFIED ABOVE BY A O HAVE BEEN ISSUED BY ME AND ARE APPLICABLE TO THIS PROJECT.

P.E. 03/20/2024
DATE

STATE OF TEXAS
GODWIN A. ARTHUR
127220
LICENSED
PROFESSIONAL ENGINEER

THE STANDARD SHEETS SPECIFICALLY IDENTIFIED ABOVE BY A X HAVE BEEN ISSUED BY ME AND ARE APPLICABLE TO THIS PROJECT.

P.E. 03/20/2024
DATE

REV	BY	DESCRIPTION	DATE

OMEGA ENGINEERS, INC.
8200 N. MOPAC EXPRESSWAY, STE #280
AUSTIN, TEXAS 78759
OMEGAENGINEERS.COM
TX PE Firm Reg. No. F-2147
P:512 575 2288 F:281 647 9184

Texas Department of Transportation

RIVERSIDE DR SB

INDEX OF SHEETS

FED. RD. DIV. NO.	PROJECT NO.		HIGHWAY NO.
6	SEE TITLE SHEET		CS
STATE	DISTRICT	COUNTY	SHEET NO.
TEXAS	FTW	TARRANT	2
CONTROL	SECTION NO.	JOB	
0902	90	019, ETC.	

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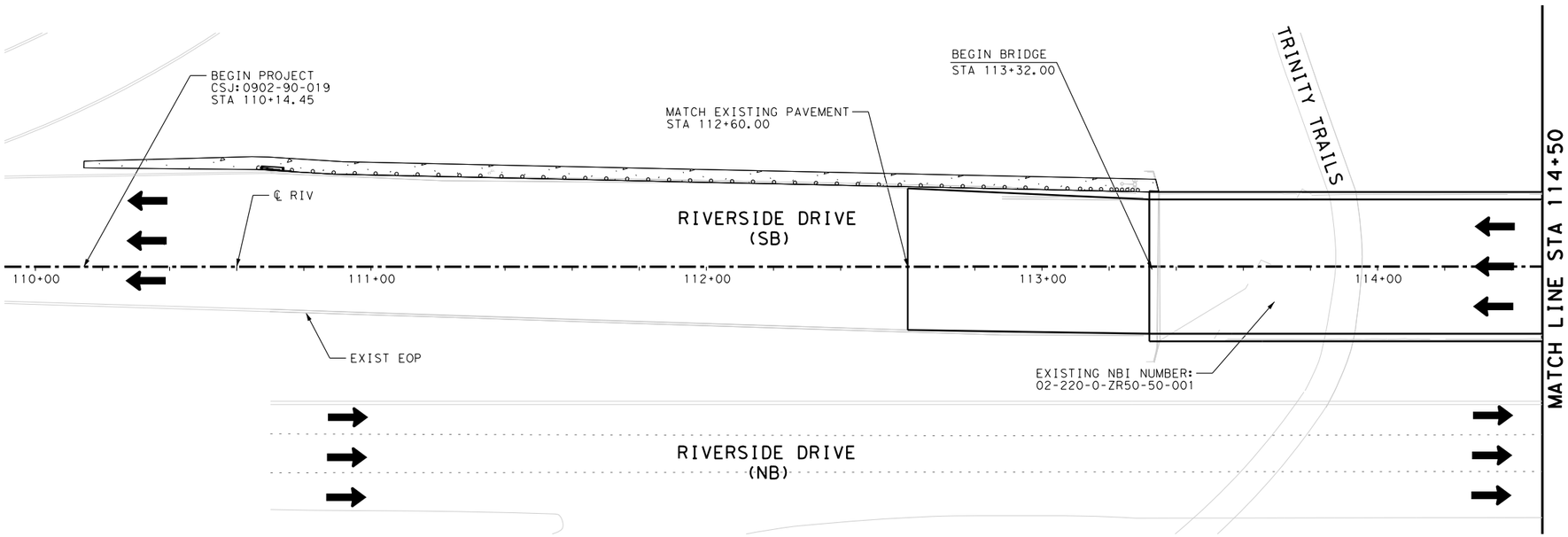

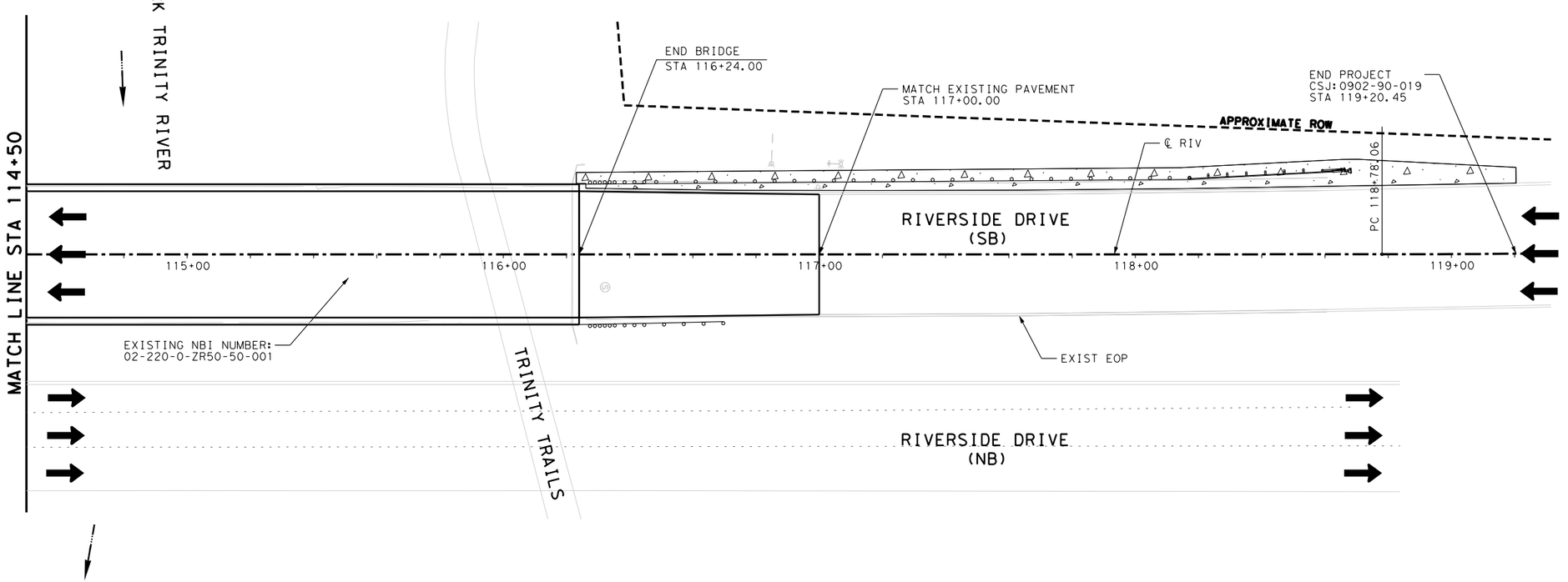

0 20′ 40′

SCALE: 1" = 40′

STATE OF TEXAS
ALEX I. GARCIA
107317
LICENSED
PROFESSIONAL ENGINEER

04/12/2024

REV	BY	DESCRIPTION	DATE

AGUIRRE & FIELDS
ENGINEERING INNOVATORS
TBPE FIRM REGISTRATION •739

Texas Department of Transportation

RIVERSIDE DR SB

PROJECT LAYOUT

FED.RD. DIV.NO.	PROJECT NO.		HIGHWAY NO.
6	SEE TITLE SHEET		CS
STATE	DISTRICT	COUNTY	SHEET NO.
TEXAS	FTW	TARRANT	3
CONTROL	SECTION NO.	JOB	
0902	90	019, ETC	

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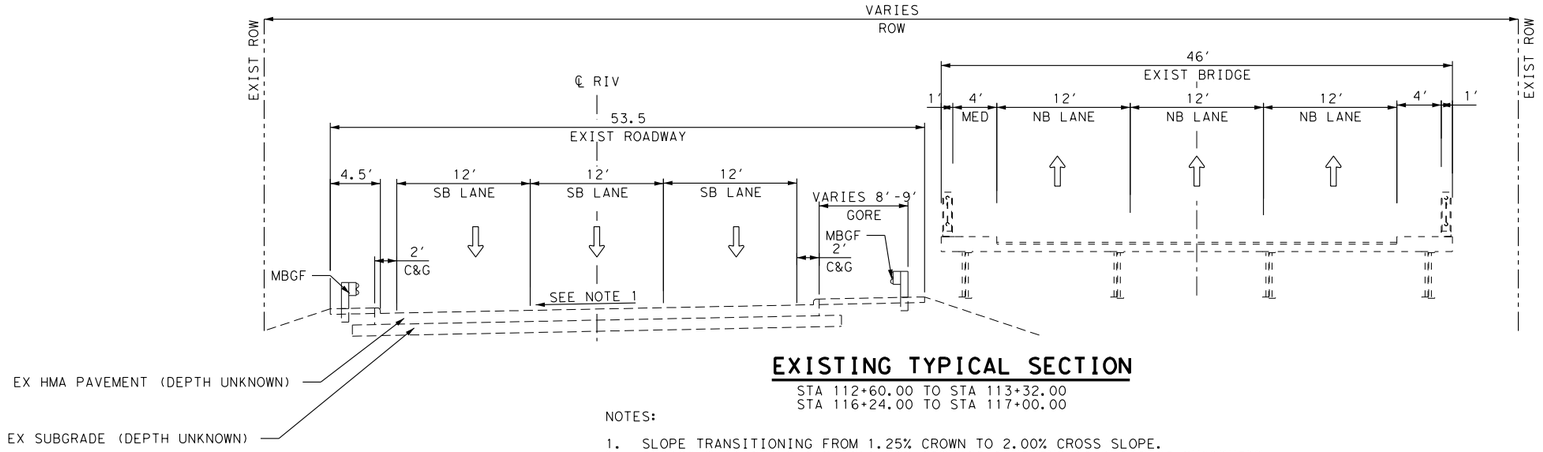
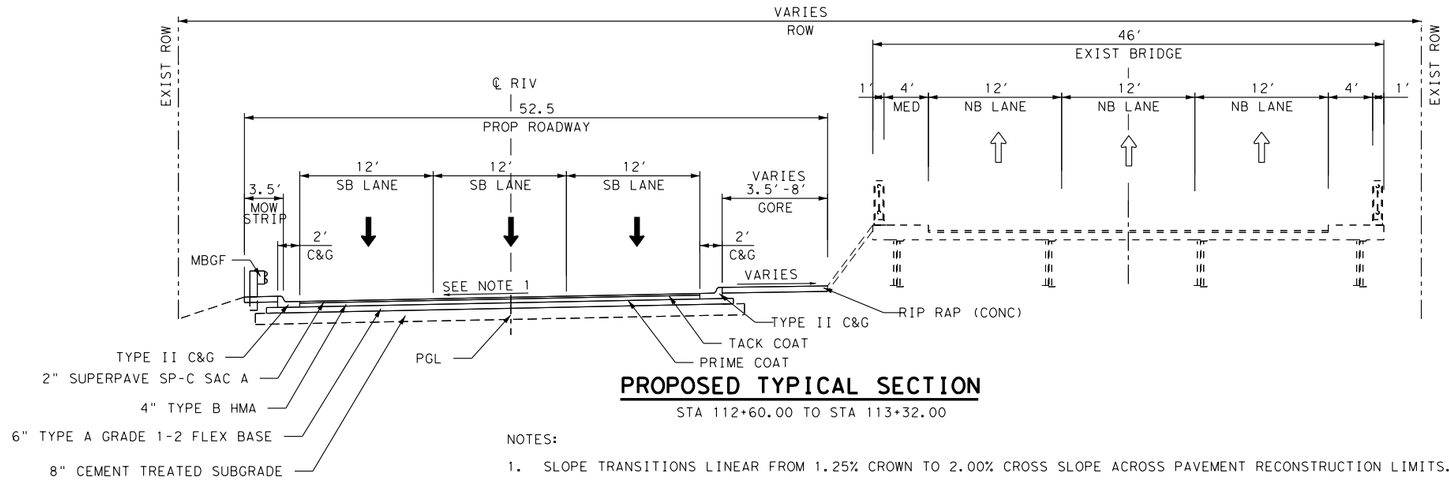


EXISTING TYPICAL SECTION

STA 112+60.00 TO STA 113+32.00
STA 116+24.00 TO STA 117+00.00

NOTES:

1. SLOPE TRANSITIONING FROM 1.25% CROWN TO 2.00% CROSS SLOPE.
2. EXISTING AS-BUILT DATA DID NOT PROVIDE PAVEMENT OR SUBGRADE THICKNESS.

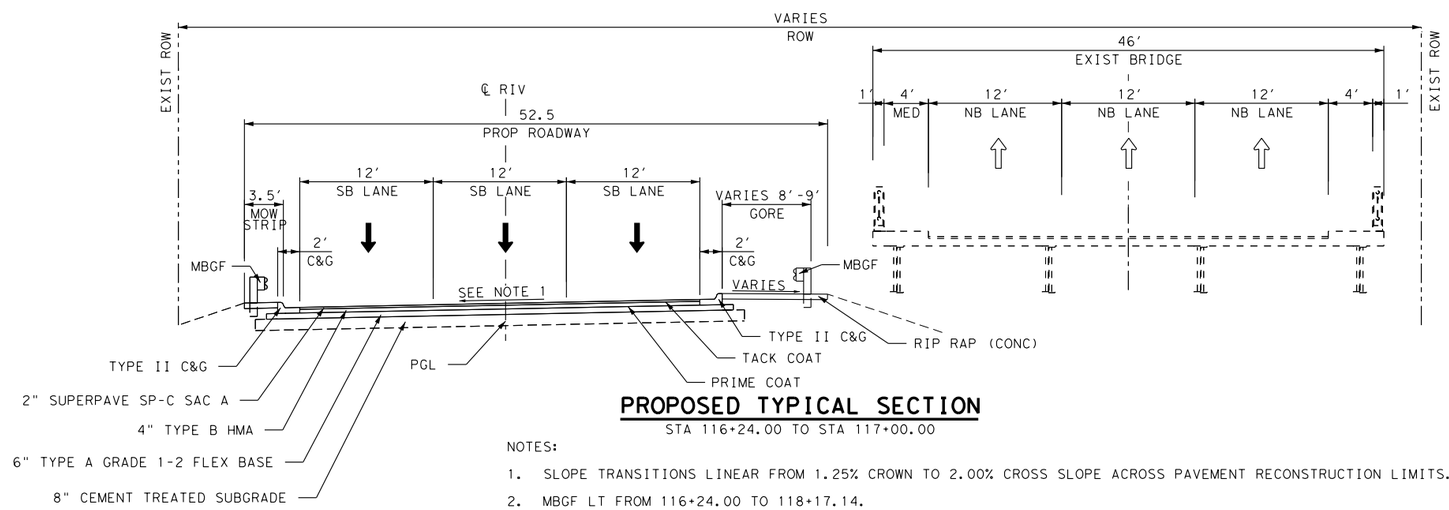


PROPOSED TYPICAL SECTION

STA 112+60.00 TO STA 113+32.00

NOTES:

1. SLOPE TRANSITIONS LINEAR FROM 1.25% CROWN TO 2.00% CROSS SLOPE ACROSS PAVEMENT RECONSTRUCTION LIMITS.
2. MBGF LT FROM STA 110+66.51 TO STA 113+32.00



PROPOSED TYPICAL SECTION

STA 116+24.00 TO STA 117+00.00

NOTES:

1. SLOPE TRANSITIONS LINEAR FROM 1.25% CROWN TO 2.00% CROSS SLOPE ACROSS PAVEMENT RECONSTRUCTION LIMITS.
2. MBGF LT FROM 116+24.00 TO 118+17.14.
3. MBGF RT FROM STA 116+24.00 TO STA 116+69.63.

NOTES:

1. SEE BRIDGE TYPICAL SECTIONS FOR BRIDGE DETAILS.

STATE OF TEXAS
ALEX I. GARCIA
107317
LICENSED
PROFESSIONAL ENGINEER

04/12/2024

REV	BY	DESCRIPTION	DATE

AGUIRRE & FIELDS
ENGINEERING INNOVATORS
TBPE FIRM REGISTRATION #739

Texas Department of Transportation

RIVERSIDE DR SB

TYPICAL SECTIONS

FED.RD. DIV.NO.	PROJECT NO.		HIGHWAY NO.
6	SEE TITLE SHEET		CS
STATE	DISTRICT	COUNTY	SHEET NO.
TEXAS	FTW	TARRANT	4
CONTROL	SECTION NO.	JOB	
0902	90	019, ETC	

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Specification Data

Basis of Estimate

Item	Description	Rate	Unit
168	Vegetative Watering	169,400 gal./acre	1,000 gal.
275	Cement (Existing Flexible Base)(Road-Mixed) (For Type A, Gr. 41-2)	125 lb./cu. yd.	ton
310	Asph Mat'l (MC-30, EC-30, or CBSMS-1S) (Cement Treated Base)	0.20 gal./sq. yd.*	gal.
3076	Hot Mix (All Types)	115 lb./sq. yd.-in.	ton
3077	Hot Mix (All Types)	115 lb./sq. yd.-in.	ton
3077	Tack Coat - Trackless Tack	0.15-0.22 gal./sq. yd.	gal.

* Based On 50% Asphalt Residue.

Compaction Requirements for Base Courses

Item	Material	Course	Min. Density
247	Flex Base	All	100 %
275	Cement Treat.	All	95 %

(Minimum Density is the percentage of density required based on results of Tex-113-E, Tex-114-E, Tex-120-E, and/or Tex-121-E)

Special Notes

Electronic files containing answered pre-letting questions and other project related design information will be placed in the following FTP site periodically.

Check this site for new information. Notices of new postings will not be sent out by the Engineer.

The data located in these files is for non-construction purposes only and can be found at

TxDOT's public FTP site at https://ftp.dot.state.tx.us/pub/txdot-info/Pre-Letting Responses/.

Access is read-only.

All files in the FTP site are subject to the License Agreement shown on the FTP site.
To obtain a copy of the project plans free of charge, submit a request from the following site:
http://www.txdot.gov/business/letting-bids/plans-online.html

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

Area Engineer's Email: Minh.Tran@txdot.gov
Assistant Area Engineer's Email: Alfredo.Luera@txdot.gov
Design Manager's Email: Sam.Yacoub@txdot.gov

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

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

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

Single lane closures, except as otherwise shown in the plans, will be restricted to off-peak hours as defined in the following table:

Peak Hours		Off-Peak Hours	
6 to 9 AM Monday through Friday	3 to 7 PM Monday through Friday	9 AM to 3 PM and 7 PM to 6 AM Monday through Friday	All day Saturday and Sunday

Work that requires closure of multiple travel lanes in the same direction, except as otherwise shown in the plans, are restricted to night hours between 9 PM and 6 AM.

Existing storm sewers and utilities are shown from the best available information. Verify the location of all underground facilities prior to starting work.

For dimensions of right-of-way not shown on the plans, see right-of-way map on file at the TxDOT District Office.

Modifications to Lane Closure / Work Restrictions:

Submit a request in writing for approval by the Engineer a minimum of 10 days in advance of implementing a change to lane closure restrictions.

When deemed necessary, the Engineer will lengthen, shorten, or otherwise modify lane closure restrictions as traffic conditions warrant.

When deemed necessary, the Engineer will modify the list of major events when new events develop, existing events are rescheduled, or when warranted.

Special Events/ Special Situations will be handled on a case-by-case basis. No work restricting lane closures is allowed from 3 PM a day before to 9 AM the day after the Special Event or Special Situation.

The Contractor's attention is directed to the following information:

This is a joint bid project for waterline abandonment for the City of Fort Worth

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

Where necessary, the governing slopes indicated herein may be varied from the limits shown, to the extent approved.

Locations and lengths of all private entrances are approximate only. The actual locations, lengths, lines and grades are to be determined by the Engineer and shall conform to the regulations of The City of Fort Worth.

Do not discolor or damage existing curb and gutter during construction operations. In the event of discoloration or damage, clean or repair as directed.

Remove the grass from the crown of shoulders or pavement edges by blading or other approved methods. Payment for this work will not be made directly, but will be subsidiary to the various items of the contract.

Locations shown for drainage structures refer to the control points of structures as follows:

1) Manholes, Inlets, and Junction Boxes—Locations are at the centroid of the structure; when two structure types are specified, location is at the centroid of the top structure. Bottom structure may be positioned as required to align with top structure, storm drain pipes and other adjacent structures.

Plugging of pipes or culverts will not be paid for directly, but will be subsidiary to the various bid items, unless otherwise shown on the plans.

Provide temporary drain openings at all low points or other drainage structures, as required, at the Contractor's expense.

Remove any obstructions to existing drainage due to the contractor's operations, as required, at the Contractor's expense.

Apply all erosion control measures as shown on the plans or as directed.

The following standard detail sheets have been modified: BD-2, C411

Item 4 – Scope of Work

Reimbursement for project overhead will not be considered until project completion has extended beyond the original Contract Time.

Item 5. Control of the Work

When supplementary bridge plans, shop drawings, shop details, erection drawings, working drawings, forming plans, or other drawings are required, prepare and submit drawings on sheets 8-1/2 by 11 inches, 17 by 22 inches, or full size drawings reduced to half scale if completely legible. If, in the opinion of the Engineer, the drawings are not completely legible, prepare and submit on sheets 22 by 34 inches, with a 1-1/2 inch left margin, and 1/2 inch top, right, and bottom margins.

Submit all sheets with a title in the lower right hand corner. The title must include the sheet index data shown on the lower right corner of the project plans, name of the structure or element or stream, sheet numbering for the shop drawings, name of the fabricator and the name of the Contractor.

Standard Operating Procedure for Alternate Precast Proposal Submission" found online at https://www.txdot.gov/inside-txdot/forms-publications/consultants-contractors/publications/bridge.html#design. Acceptance or denial of an alternate is at the sole discretion of the Engineer. Impacts to the project schedule and any additional costs resulting from the use of alternates are the sole responsibility of the Contractor.

Item 6. Control of Materials

To comply with the latest provisions of Build America, Buy America Act (BABA Act) of the Bipartisan Infrastructure Law, the contractor must submit 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 for clarification on material categorization.

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

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

Item 7. Legal Relations and Responsibilities

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

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

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

(1) Restricted Use of Materials for Previously Evaluated Permit Areas. Document both the project specific location (PSL) and its authorization. Maintain copies for review by the Department or any regulatory agency. When an area within the project limits has been evaluated by the USACE as part of the permit process for this project:

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

(2) Contractor Materials from Areas Other than Previously Evaluated Areas. Provide the Department with a copy of all USACE coordination or approvals prior to initiating any activities for an area within the project limits that has not been evaluated by the USACE or for any off right of way locations used for the following, but not limited to haul roads, equipment staging areas, borrow and disposal sites:

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

The total area disturbed for this project is 0.72 acres. The disturbed area in this project, all project locations in the Contract, and the Contractor project specific locations (PSLs), within 1 mile of the project limits, for the Contract will further establish the authorization requirements for storm water discharges. The Department will obtain an authorization to discharge storm water from the Texas Commission on Environmental Quality (TCEQ) for the construction activities shown on the plans. The Contractor is to obtain required authorization from the TCEQ for Contractor PSLs for construction support activities on or off the right of way. When the total area disturbed in the Contract and PSLs within 1 mile of the project limits exceeds 5 acres, provide a copy of the Contractor NOI for PSLs on the right of way to the Engineer and to the local government that operates a separate storm sewer system.

When a bridge deck is milled, seal coated and overlaid, remove excess material. Do not just broom to the sides of the bridge, under guardrail, etc. Cover or protect all sealed expansion joints and rails on bridges. Clean and repair all of these features if they weren't properly protected at contractor's expense. This work is subsidiary work to applicable bid items.

Prevention of Migratory Bird Nesting

It is anticipated that migratory birds, a protected group of species, may try to nest on bridges, culverts, vegetation, or gravel substrate, at any time of the year. The preferred nesting season for migratory birds is from February 15 through October 1. When practicable, schedule construction operations outside of the preferred nesting season. Otherwise, avoid nests containing migratory birds and perform no work in the nesting areas until the young birds have fledged.

Structures
Do not begin bridge and culvert construction operations until swallow nesting prevention is implemented, until after October 1 if it's determined that swallow nesting is actively occurring, or until it's determined swallow nests have been abandoned. If the State installed nesting deterrent on the bridges and culverts, maintain the existing nesting deterrent to prevent swallow nesting until October 1 or completion of the bridge and culvert work, whichever occurs earlier. If new nests are built and occupied after the beginning of the work, do not perform work that can interfere with or discourage swallows from returning to their nests. Prevention of swallow nesting can be performed by one of the following methods:

1. By February 15 begin the removal of any existing mud nests and all other mud placed by swallows for the construction of nests on any portion of the bridge and culverts. The Engineer will inspect the bridges and culverts for nest building activity. If swallows begin nest building, scrape or wash down all nest sites. Perform these activities daily unless the Engineer determines the need to do this work more frequently. Remove nests and mud through October 1 or until bridge and culvert construction operations are completed.

2. By February 15 place a nesting deterrent (which prevents access to the bridge and culvert by swallows) on the entire bridge (except deck and railing) and culverts.

No extension of time or compensation payment will be granted for a delay or suspension of work caused by nesting swallows. This work is subsidiary to the various bid items.

The following Holiday/Event lane closure restriction requirements apply to this project:
No work that restricts or interferes with traffic shall be allowed between 3 PM on the day preceding a Holiday or Event and 9 AM on the day after the Holiday or Event.

Holiday Lane Closure Restrictions	
New Year's Eve and New Year's Day (December 31 through January 1)	3 PM December 29 through 9 AM January 2
Easter Holiday Weekend (Friday through Sunday)	3PM Thursday through 9 AM Monday
Memorial Day Weekend (Friday through Monday)	3 PM Thursday through 9 AM Tuesday
Independence Day (July 3 through July 5)	3 PM July 2 through 9 AM July 6
Labor Day Weekend (Friday through Monday)	3 PM Thursday through 9 AM Tuesday
Thanksgiving Holiday (Wednesday through Sunday)	3 PM Tuesday through 9 AM Monday
Christmas Holiday (December 23 through December 26)	3 PM December 22 through 9 AM December 27

Plan work schedules around the appropriate dates above to ensure productive work is performed without lane closures.

Item 8. Prosecution and Progress

Working days will be computed and charged in accordance with Section 8.3.1.1, 'Five-Day Workweek.'

Use a Critical Path Method (CPM) schedule in P6 format for this project. Submit baseline schedule with XER file and obtain approval prior to beginning construction.

Item 104. Removing Concrete

When associated with a structure to be removed, removal of riprap as required, approach slabs, and shoulder drains are to be included in the unit price bid for Item 496, "Removing Structures."

Item 105. Removing Treated and Untreated Base and Asphalt Pavement

Cement, lime, and/or lime fly-ash treated base material removed on this project will become the property of the Contractor.

Item 110. Excavation

Review proposed waste sites to determine if any site is located in a "Base Floodplain" or "Floodway" as defined by the Federal Emergency Management Agency (FEMA).
If waste material from this project is placed in a base floodplain as defined by FEMA, obtain a permit from the local community responsible for enforcing National Flood Insurance Program (NFIP) regulations. Ensure that the owner of the property receiving the waste has obtained the necessary permit.

Items 110 and 132. Excavation and Embankment

Sulfate-laden subgrade material that is to be treated with either lime or cement, including material up to one foot outside the proposed treatment limits, is susceptible to sulfate heave.

Moderate sulfate levels are those defined from 3,001 PPM to 7,000 PPM. Treat these soils with lime at the full 150 lb./cu. yd. rate or cement at the full 125 lb./cu. yd. rate. Do not split the rates to ensure complete reaction and mitigation of sulfate heaves. Allow the mixture to mellow for 7 days to provide for complete reaction.

High sulfate levels are not allowed within the treatment and surrounding areas as defined above. Test soils for soluble sulfates in accordance with Test Method Tex-145 and Tex-146-E.

Treat moderate sulfate or excavate high sulfate areas identified above and other subgrade areas that may be identified during construction as having moderate to high sulfate concentrations to a depth of one foot below and laterally to one foot outside the proposed treatment limits. Treatment of the moderate level material will be paid for under Item 260, “Lime Treatment (Road Mixed)” or Item 275, “Cement Treatment (Road Mixed).” Removal of the high level material will be measured and paid for in accordance with Item 110, “Excavation” and replacement with suitable material will be measured and paid for in accordance with Item 132, “Embankment.”

Any excavated sulfate-laden material will be acceptable for use in fill areas. Do not place within previously specified section boundaries of subgrade to be treated with either lime or cement.

Off-Site Borrow Sources. In addition to meeting pertinent specification requirements, test off-site borrow sources for sulfate content. Test soils for soluble sulfates in accordance with Test Method Tex-145 and Tex-146-E and provide documentation that supports compliance with previously stated requirements. The Engineer will perform additional testing for sulfates of this material upon delivery to the project. Only material that is placed within one foot vertically or laterally of subgrade treatment will require testing for sulfates. Remove and replace failing material (sulfate concentrations >7,000 PPM by dry weight).

Item 132. Embankment

Furnish test results per Test Procedures Tex-104, 105, and 106-E (PIs), Tex-113 or 114-E (M-D Curves), and Tex-145 and/or Tex-146-E (Sulfates) for each material sample provided by the Engineer. Perform field density tests (Tex-115-E, Part I) at a frequency for each worked section to produce passing results prior to testing by the Engineer per Tex-115-E, Part I.

When embankment is placed as a bridge header bank, test each lift for compliance with density requirements, near the center of each travel lane at the following locations:

1. At the “beginning of bridge” or “end of bridge” station (if abutment is on retaining wall, location may be adjusted by not more than 5 feet.)
2. At 25-foot intervals for a distance of 150 feet in advance of the “beginning of bridge” station.
3. At 25-foot intervals for a distance of 150 feet after the “end of bridge” station.

Density tests must be conducted by a department-certified independent testing laboratory. Results of tests will be furnished to TxDOT within 24 hours after testing; a final copy of all test reports must be signed and sealed by a Professional Engineer in the State of Texas and furnished within five (5) working days after testing. Areas which do not meet minimum density requirements will be removed, re-compacted, and re-tested for compliance at the contractor’s entire expense. Testing and reporting of test results will not be paid for directly, but will be subsidiary to this item.

Construct embankments for bridge header banks to final subgrade elevation prior to excavation for abutment caps and placement of foundation course at approach slabs. Payment for structural excavation and/or excavation for placement of foundation course will not be paid for directly, but will be subsidiary to the pertinent bid items.

At all locations where guardrail is shown to flare, widen the embankment as necessary to accommodate the guardrail.

Item 161. Compost

Place approximately 4" of compost manufactured topsoil (CMT) on all cut and fill slopes (except drainage channels where flexible channel liners are indicated), at other locations shown on the plans, or as directed.

Where “blended on-site” CMT is specified, produce the compost manufactured topsoil by incorporating 1" of compost with 3" of furnished topsoil as shown on the plans.

Where “pre-blended” CMT is specified, amend suitable soil material, as directed, with 25% compost, by volume, to produce the compost manufactured topsoil. Place the compost manufactured topsoil in a loose layer approximately 4" thick, as shown on the plans.

Item 162. Sodding for Erosion Control

Furnish and place Bermudagrass sod.

Item 164. Seeding for Erosion Control

Apply seeding required between December 1 and January 31 using seed types and mixtures as shown in Item 164.2.1, Table 3. If, in the opinion of the Engineer, this does not provide an effective vegetative cover, apply “straw or hay mulch” as specified in Article 164.3.2, “Straw or Hay Mulch Seeding” as soon as possible. After February 1, apply warm season seeding in order to establish a permanent protective vegetative cover.

Item 168. Vegetative Watering

Furnish and install an approved rain gauge at the project site, as directed. Furnishing and installation of the rain gauge will not be paid for directly, but will be subsidiary to Item 168.

Apply vegetative watering for an establishment period of thirteen weeks following application of seed or installation of sod, at a rate of 1/2 inch of water depth per week (approximately 13,030 gallons per acre). During the first four weeks after seeding, apply water twice per week, on non-consecutive days, each at half the weekly application rate. For the remainder of the establishment period, apply vegetative watering once per week during the months of January

through June or September through December, at the weekly application rate; apply watering twice per week, on non-consecutive days during the months of July and August, each at one-half the weekly application rate.

Average weekly rainfall rates for the District are:

January—0.39"	April—0.86"	July—0.48"	October—0.68"
February—0.46"	May—1.00"	August—0.47"	November—0.46"
March—0.48"	June—0.63"	September—0.74"	December—0.37"

Item 247. Flexible Base

(TY A, GR 1-2) Furnish aggregate conforming to the following requirements:

Gradation:

Retained on Sieve Size	Percent (%) by Weight
1-3/4 in.	0–10
No. 4	45–75
No. 40	65–90

Plasticity Index (PI)	10 max.
Liquid Limit	40 max.
Wet Ball Mill	40 max.
Wet Ball Mill, % (Increase Passing the No. 40)	20 max.

Place material in two or more equal lifts unless otherwise directed.

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

Cement treat in accordance with Item 275.

Item 275. Cement Treatment (Road-Mixed)

Apply cement for subgrade treatment by the “slurry placement” method.

Treat base or subgrade material with a maximum 4% cement by weight. The 7-day compressive strength of treated material will be 250 psi.

Item 301. Asphalt Antistripping Agent

Furnish a liquid antistripping agent unless otherwise directed.

Item 310. Prime Coat

Provide an MC-30, EC-30, or CBSMS-1S for this Item. MC-30 is restricted to usage from September 16 through April 15.

Item 421. Hydraulic Cement Concrete

For Class P (Item 360) and S (Item 421) Concrete Only: For concrete plants equipped with 2 aggregate bins or no calibrated metering system, blend manufactured and natural sand at the aggregate source only. For concrete plants equipped with a minimum of 3 bins and a calibrated metering system, blending of the separate sands on-site is permitted to meet gradation and AIR requirements.

Strength/cylinder testing equipment must be equipped with a printer for an electronic print out of all test results.

Air entrainment requirements are waived for all classes of concrete except all Class S and all Class P concrete.

Concrete will not be rejected for low air content. Adjustment to the dosage of air entrainment will be as directed or allowed by the Engineer.

Include the approved mix design number on each delivery ticket.

Item 428. Penetrating Concrete Surface Treatment

Provide a Class I Seal Coat to the following elements: deck of the concrete beam spans, abutments, bents, piers, and exterior and bottom surface of concrete beams.

Item 432. Riprap

The quantities for riprap at the location indicated may be varied to the extent necessary to ensure proper functioning for the purpose intended.

All concrete riprap will be 5" (.42') in thickness, unless otherwise shown on the plans, and must be reinforced.

Item 440. Reinforcement for Concrete

Top and bottom layers of slab reinforcing steel shall be epoxy coated.

Item 446. Field Cleaning And Painting Steel

The existing coating to be removed may contain lead or other hazardous materials.

Item 454. Bridge Expansion Joints

For header-type expansion joints refer to the following TxDOT website for the approved systems:

http://www.txdot.gov/inside-txdot/division/bridge/approved-systems/expansion-joints.html

Item 496. Removing Structures

When required by the plans, partial or complete removal of a structure for staged construction shall be accomplished in a manner which does not cause damage to the remainder of the structure or its supporting members. The Contractor shall submit a demolition plan for all structures to be replaced and/or removed in accordance with Item 496. Submit the procedure for removal of superstructure or substructure in writing or plan drawing for approval prior to implementation.

Notify the Texas Department of State Health Services (DSHS) prior to demolition or renovation of bridges or other structures, using DSHS Form APB#5, “Demolition/Renovation Notification Form”. The form and instructions may be found on the DSHS Asbestos Programs Branch web page at http://www.dshs.state.tx.us/asbestos/notification.shtm. The DSHS notification form must be hand-delivered or mailed to (received at) the DSHS Austin office at least ten working days (10) days prior to commencing demolition or renovation. Fax or e-mail notifications will not be accepted. For projects with multiple bridges, a single notification, with a listing of all bridges or structures to be demolished or renovated and the expected start dates of their demolition or renovation (the start date is defined as the first date of visible demolition activities). Notify the DSHS Regional or Local inspector of all start date changes. The expected project completion date may be used as the “end” date.

Item 502. Barricades, Signs, and Traffic Handling

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 typically 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.

Permanent signs may be installed when construction in an area is complete and they will not conflict with the traffic control plan for the remainder of the job.

Existing signs are to remain as long as they do not interfere with construction and they do not conflict with the traffic control plan.

Any sign not detailed in the plans but called for in the layout will be as shown in the current "Standard Highway Sign Designs for Texas”.

When traffic is obstructed, arrange warning devices in accordance with the latest edition of the "Texas Manual on Uniform Traffic Control Devices".

Cover or remove any work zone signs when work or condition referenced is not occurring.

Do not place barricades, signs, or any other traffic control devices where they interfere with sight distance at driveways or side streets. Provide access to all driveways during all phases of construction unless otherwise noted in the plans or as directed.

Item 504. Field Office and Laboratory

Furnish the following structures for this project:

Type	No.
Field Lab (Ty. A)	1
Field Office (Ty. C)	1

Field office will require at least a 3' by 3' landing on the outside of each exit door and a concrete landing at the bottom of exit stairs. The concrete landing will be the width of the stairs and extend at least 4’ in front of the bottom step.

Furnish the following for the Field Office structure:

Item	No.
Desktop Computer	1
Laptop Computer	1
Printer	1
Internet Service	1

Provide Laptop computers with an Intel i5 (2.8 GHz) processor, or greater.

Integrated printer/copier/scanner/fax units will be permitted.

Item 506. Temporary Erosion, Sedimentation, and Environmental Controls

Remove accumulated sediment or replace SW3P controls when the capacity has been reduced by 50% or when the depth of sediment at the control structure exceeds one foot.

Item 512. Portable Concrete Traffic Barrier

"*Furnish and Install*" barrier in compliance with Low Profile Concrete Barrier (LPCB) standards as shown on the plans.

Furnish Class H Concrete with a minimum 28 day compressive strength of 3,600 psi.

Provide the hardware assemblies to join barrier sections.

Provide (2) 1-1/4" x 2'2" threaded rods, (4) standard USS washers, grade 5, (4) 1-1/4" hex nuts, and (2) 5" x 10" x 3/8" plate washers for each section of LPCB.

Delineate all barriers in accordance with Barricade and Construction (BC) Standard sheets. Barrier delineation will not be paid for directly, but will be subsidiary to Item 512,"Portable Concrete Traffic Barrier".

Remove and replace traffic barrier damaged by the traveling public and no longer serviceable as directed. Additional payment will be provided as compensation to remove and replace the traffic barrier damaged by the traveling public in accordance with Item 512.

Item 540. Metal Beam Guard Fence

The locations and lengths of guard fence shown on the plans are approximate. Actual lengths and locations are to be determined in the field.

The tops of timber posts will be domed. Beveled tops will not be permitted for timber or steel posts.

When holes for timber posts are drilled below bottom of proposed grade, backfill the excessive depth with an acceptable sand. The furnishing and installation of the sand backfill will not be paid for directly but will be subsidiary to this Item.

When guardrail posts are placed in a finished surface, backfill the top 4 inches with an asphaltic material, domed to carry water away from the posts or as shown on the plans. The furnishing and installation of the asphaltic material backfill will not be paid for directly but will be subsidiary to this Item.

When connecting a Thrie-Beam to a concrete wingwall, bridge rail, CTB, etc., drill the holes for bolt placement using rotary or core type equipment. Use a core type drill when reinforcing steel is encountered. Do not use percussion or impact drilling. Repair damage to the concrete and spalls exceeding ½" from the edge of the hole.

Item 542. Removing Metal Beam Guard Fence

Remove existing metal beam guard fence only when authorized.

Item 585. Ride Quality for Pavement Surfaces

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

Item 666. Reflectorized Pavement Markings with Retroreflective Requirements

Collection of retroreflectivity readings using a mobile retroreflectometer is the preferred method. If retroreflectivity readings are collected using a portable or handheld unit, then measurement is defined as a collective average of at least 20 readings taken along a 200-foot test section. A minimum of three measurements will be required per mile of roadway. Measurements collected on a centerline stripe will be averaged separately for stripe in each direction of travel. A TxDOT inspector must witness the calibration and collection of all retro-reflectivity data.

Item 3076. Dense-Graded Hot-Mix Asphalt

Provide aggregate with a Surface Aggregate Classification (SAC) value of A for the travel lanes and shoulders.

No blending, of the material retained on the No. 4 sieve, to meet SAC A will be allowed for surface mixes.

Natural (field) sands are not allowed.

Warm Mix Asphalt (WMA) is not permitted in any mix type on this project.

RAP and RAS are not permitted in any surface and levelup mixes on this project.

Grade substitution is not allowed.

Item 3077. Superpave Mixtures

Provide aggregate with a Surface Aggregate Classification (SAC) value of A for the travel lanes and shoulders.

No blending, of the material retained on the No. 4 sieve, to meet SAC A will be allowed for surface mixes.

County: TARRANT

Highway: CS (RIVERSIDE DR)

Natural (field) sands are not allowed.

A trackless tack can be used.
Warm Mix Asphalt (WMA) is not permitted in any mix type on this project.

RAP and RAS are not permitted in any surface and levelup mixes on this project.

Grade substitution is not allowed.

Provide a mix design with the gradation curve below the restricted zone.

Item 6001. Portable Changeable Message Signs

Provide all portable changeable message signs and arrow panels with a photoelectric device to allow for automatic dimming of operations to approximately 50% of their normal brightness when ambient light drops to approximately five footcandles, and then increase back again for daytime operations.

Three electronic portable changeable message sign unit(s) will be required. Individual or collective use of signs will be required by the Engineer when deemed necessary to supplement the traffic control plan.

Each sign must have programmed in its permanent memory the following 15 messages:

1. Exit Closed Ahead
2. Use Other Routes
3. Right Lane
4. Left Lane
5. Closed Ahead
6. Two Lane
7. Detour Ahead
8. Thru Traffic
9. Prepare To Stop
10. Merging Traffic
11. Expect 15 Minute Delay
12. Max Speed ** MPH
13. Merge Right
14. Merge Left
15. No Exit Next ** Miles

County: TARRANT

Highway: CS (RIVERSIDE DR)

Item 6185. Truck Mounted Attenuator (TMA) and Trailer Attenuator (TA)

In addition to the shadow vehicles with truck mounted attenuator (TMA) that are specified as being required on the traffic control plan for this project, provide two additional shadow vehicle(s) with TMA for TCP (3-3)-14 as detailed on General Note of this standard sheet.

Therefore, two total shadow vehicles with TMA will be required for this type of work. Determine if one or more of these operations will be ongoing at the same time to determine the total number of TMAs needed for the project.

Estimate & Quantity Sheet

CONTROLLING PROJECT ID 0902-90-019 **DISTRICT** Fort Worth **COUNTY** Tarrant
HIGHWAY RIVERSIDE DR

				0902-90-019		0902-90-298		0902-90-306		TOTAL EST.	TOTAL FINAL
		CONTROL SECTION JOB									
		PROJECT ID		A00037343		A00195815		R00013499			
		COUNTY		Tarrant		Tarrant					
		HIGHWAY		RIVERSIDE DR		RIVERSIDE DR					
ALT	**BID CODE**	**DESCRIPTION**	**UNIT**	EST.	FINAL	EST.	FINAL	EST.	FINAL		
	104-6009	REMOVING CONC (RIPRAP)	SY	33.000						33.000	
	104-6011	REMOVING CONC (MEDIANS)	SY	404.000						404.000	
	105-6043	REMOVING STAB BASE & ASPH PAV (0-6")	SY	985.000						985.000	
	110-6003	EXCAVATION (SPECIAL)	CY	30.000						30.000	
	132-6007	EMBANKMENT (FINAL)(ORD COMP)(TY D)	CY	15.000						15.000	
	134-6011	BACKFILLING PAVEMENT EDGES	CY	46.000						46.000	
	161-6022	GENERAL USE COMPOST (4")	SY	1,146.000						1,146.000	
	162-6002	BLOCK SODDING	SY	1,146.000						1,146.000	
	164-6009	BROADCAST SEED (TEMP) (WARM)	SY	1,146.000						1,146.000	
	164-6011	BROADCAST SEED (TEMP) (COOL)	SY	1,146.000						1,146.000	
	168-6001	VEGETATIVE WATERING	MG	171.000						171.000	
	247-6061	FL BS (CMP IN PLC)(TYA GR1-2) (6")	SY	659.000						659.000	
	275-6001	CEMENT	TON	12.000						12.000	
	275-6011	CEMENT TREAT(EXIST MATL)(8")	SY	739.000						739.000	
	305-6011	SALV, HAUL & STKPL RCL APH PV (0 TO 6")	SY	659.000						659.000	
	310-6001	PRIME COAT (MULTI OPTION)	GAL	132.000						132.000	
	422-6002	REINF CONC SLAB (HPC)	SF	10,102.000						10,102.000	
	428-6001	PENETRATING CONCRETE SURFACE TREATMENT	SY	1,968.000						1,968.000	
	429-6007	CONC STR REPAIR (VERTICAL & OVERHEAD)	SF	354.000						354.000	
	432-6001	RIPRAP (CONC)(4 IN)	CY	11.000						11.000	
	432-6002	RIPRAP (CONC)(5 IN)	CY	3.000						3.000	
	432-6045	RIPRAP (MOW STRIP)(4 IN)	CY	40.000						40.000	
	442-6010	STR STEEL (SHEAR CONNECTOR)	LB	4,689.000						4,689.000	
	446-6002	CLEAN & PAINT EXIST STR (SYSTEM II)	LS	1.000						1.000	
	450-6036	RAIL (TY C411)	LF	450.000						450.000	
	451-6037	RETROFIT RAIL (TY C411)	LF	134.000						134.000	
	454-6007	HEADER TYPE EXPANSION JOINT	LF	90.000						90.000	
	454-6020	SEALED EXPANSION JOINT (4 IN) (SEJ - B)	LF	102.000						102.000	
	479-6002	ADJUSTING INLETS	EA	1.000						1.000	
	481-6014	PIPE (PVC) (SCH 40) (8 IN)	LF	600.000						600.000	
	481-6016	PIPE (PVC) (SCH 40) (12 IN)	LF	200.000						200.000	
	496-6013	REMOV STR (BRIDGE SLAB)	EA	1.000						1.000	
	500-6001	MOBILIZATION	LS	0.934		0.066				1.000	
	502-6001	BARRICADES, SIGNS AND TRAFFIC HANDLING	MO	5.000						5.000	
	506-6002	ROCK FILTER DAMS (INSTALL) (TY 2)	LF	72.000						72.000	
	506-6011	ROCK FILTER DAMS (REMOVE)	LF	72.000						72.000	
	506-6020	CONSTRUCTION EXITS (INSTALL) (TY 1)	SY	156.000						156.000	

Estimate & Quantity Sheet

CONTROLLING PROJECT ID 0902-90-019 **DISTRICT** Fort Worth **COUNTY** Tarrant
HIGHWAY RIVERSIDE DR

				0902-90-019		0902-90-298		0902-90-306		TOTAL EST.	TOTAL FINAL
		CONTROL SECTION JOB									
		PROJECT ID		A00037343		A00195815		R00013499			
		COUNTY		Tarrant		Tarrant					
		HIGHWAY		RIVERSIDE DR		RIVERSIDE DR					
ALT	**BID CODE**	**DESCRIPTION**	**UNIT**	EST.	FINAL	EST.	FINAL	EST.	FINAL		
	506-6024	CONSTRUCTION EXITS (REMOVE)	SY	156.000						156.000	
	506-6038	TEMP SEDMT CONT FENCE (INSTALL)	LF	1,632.000						1,632.000	
	506-6039	TEMP SEDMT CONT FENCE (REMOVE)	LF	1,632.000						1,632.000	
	508-6001	CONSTRUCTING DETOURS	SY	404.000						404.000	
	512-6009	PORT CTB (FUR & INST)(LOW PROF)(TY 1)	LF	1,600.000						1,600.000	
	512-6010	PORT CTB (FUR & INST)(LOW PROF)(TY 2)	LF	40.000						40.000	
	512-6057	PORT CTB (REMOVE)(LOW PROF)(TY 1)	LF	1,600.000						1,600.000	
	512-6058	PORT CTB (REMOVE)(LOW PROF)(TY 2)	LF	40.000						40.000	
	529-6008	CONC CURB & GUTTER (TY II)	LF	296.000						296.000	
	529-6036	CONCRETE CURB (SPECIAL)	LF	450.000						450.000	
	536-6002	CONC MEDIAN	SY	404.000						404.000	
	540-6002	MTL W-BEAM GD FEN (STEEL POST)	LF	413.000						413.000	
	540-6005	TERMINAL ANCHOR SECTION	EA	1.000						1.000	
	540-6006	MTL BEAM GD FEN TRANS (THRIE-BEAM)	EA	3.000						3.000	
	540-6016	DOWNSTREAM ANCHOR TERMINAL SECTION	EA	1.000						1.000	
	542-6001	REMOVE METAL BEAM GUARD FENCE	LF	517.000						517.000	
	544-6001	GUARDRAIL END TREATMENT (INSTALL)	EA	1.000						1.000	
	658-6061	INSTL DEL ASSM (D-SW)SZ 1(BRF)GF2	EA	10.000						10.000	
	662-6063	WK ZN PAV MRK REMOV (W)4"(SLD)	LF	2,342.000						2,342.000	
	662-6093	WK ZN PAV MRK REMOV (Y)4"(BRK)	LF	28.000						28.000	
	662-6095	WK ZN PAV MRK REMOV (Y)4"(SLD)	LF	4,065.000						4,065.000	
	662-6109	WK ZN PAV MRK SHT TERM (TAB)TY W	EA	116.000						116.000	
	662-6110	WK ZN PAV MRK SHT TERM (TAB)TY Y	EA	200.000						200.000	
	666-6036	REFL PAV MRK TY I (W)8"(SLD)(100MIL)	LF	2,889.000						2,889.000	
	666-6042	REFL PAV MRK TY I (W)12"(SLD)(100MIL)	LF	890.000						890.000	
	666-6048	REFL PAV MRK TY I (W)24"(SLD)(100MIL)	LF	169.000						169.000	
	666-6054	REFL PAV MRK TY I (W)(ARROW)(100MIL)	EA	3.000						3.000	
	666-6078	REFL PAV MRK TY I (W)(WORD)(100MIL)	EA	3.000						3.000	
	666-6171	REFL PAV MRK TY II (W) 6" (BRK)	LF	3,380.000						3,380.000	
	666-6174	REFL PAV MRK TY II (W) 6" (SLD)	LF	637.000						637.000	
	666-6178	REFL PAV MRK TY II (W) 8" (SLD)	LF	2,889.000						2,889.000	
	666-6180	REFL PAV MRK TY II (W) 12" (SLD)	LF	922.000						922.000	
	666-6182	REFL PAV MRK TY II (W) 24" (SLD)	LF	169.000						169.000	
	666-6184	REFL PAV MRK TY II (W) (ARROW)	EA	3.000						3.000	
	666-6192	REFL PAV MRK TY II (W) (WORD)	EA	3.000						3.000	
	666-6210	REFL PAV MRK TY II (Y) 6" (SLD)	LF	421.000						421.000	
	666-6306	RE PM W/RET REQ TY I (W)6"(BRK)(100MIL)	LF	3,380.000						3,380.000	

Estimate & Quantity Sheet

CONTROLLING PROJECT ID 0902-90-019 **DISTRICT** Fort Worth **COUNTY** Tarrant
HIGHWAY RIVERSIDE DR

				0902-90-019		0902-90-298		0902-90-306		TOTAL EST.	TOTAL FINAL
		CONTROL SECTION JOB									
		PROJECT ID		A00037343		A00195815		R00013499			
		COUNTY		Tarrant		Tarrant					
		HIGHWAY		RIVERSIDE DR		RIVERSIDE DR					
ALT	**BID CODE**	**DESCRIPTION**	**UNIT**	EST.	FINAL	EST.	FINAL	EST.	FINAL		
	666-6309	RE PM W/RET REQ TY I (W)6"(SLD)(100MIL)	LF	637.000						637.000	
	666-6321	RE PM W/RET REQ TY I (Y)6"(SLD)(100MIL)	LF	421.000						421.000	
	672-6007	REFL PAV MRKR TY I-C	EA	189.000						189.000	
	677-6001	ELIM EXT PAV MRK & MRKS (4")	LF	8,051.000						8,051.000	
	678-6002	PAV SURF PREP FOR MRK (6")	LF	4,017.000						4,017.000	
	780-6002	CNC CRACK REPAIR (DISCRETE)(INJECT)	LF	173.000						173.000	
	3076-6001	D-GR HMA TY-B PG64-22	TON	152.000						152.000	
	3077-6027	SP MIXES SP-C SAC-A PG70-28	TON	76.000						76.000	
	3077-6075	TACK COAT	GAL	146.000						146.000	
	6001-6002	PORTABLE CHANGEABLE MESSAGE SIGN	EA	3.000						3.000	
	6037-6012	REFL PAV MRKR TY II A-A	EA	22.000						22.000	
	6072-6001	MODULAR GLARE SCREENS (FURN & INSTALL)	LF	1,640.000						1,640.000	
	6072-6002	MODULAR GLARE SCREENS (REMOVE)	LF	1,640.000						1,640.000	
	6185-6002	TMA (STATIONARY)	DAY	186.000						186.000	
	7320-6011	WATER LINE GROUTING	CY					30.000		30.000	
	7320-6012	4"-12" WATER ABANDONMENT PLUG	EA					4.000		4.000	
	7320-6016	REMOVE 12" WATER VALVE	EA					3.000		3.000	
	7320-6021	12' WIDE ACP REPAIR, ARTERIAL	LF					60.000		60.000	
	7320-6022	6" CONC CURB AND GUTTER*	LF					60.000		60.000	
	7320-6024	6" CONC PVMT	SY					70.000		70.000	
	7320-6027	TRENCH SAFETY	LF					65.000		65.000	
	7320-6030	CONSTRUCTION STAKING	EA					1.000		1.000	
	7320-6031	AS-BUILT SURVEY	EA					1.000		1.000	
	7320-6032	TRAFFIC CONTROL	MO					2.000		2.000	
	7320-6033	REMOVE 12" CI WATER PIPE FROM BRIDGE	LF					282.000		282.000	
	7320-6034	WATER CONSTRUCTION ALLOWANCE	LS					1.000		1.000	
	18	EROSION CONTROL MAINTENANCE: CONTRACTOR FORCE ACCOUNT WORK (PART)	LS	1.000						1.000	
		SAFETY CONTINGENCY: CONTRACTOR FORCE ACCOUNT WORK (PARTICIPATING)	LS	1.000						1.000	

SUMMARY OF WORKZONE TRAFFIC CONTROL ITEMS

LOCATION	500 6001 MOBILIZATION	502 6001 BARRICADES, SIGNS AND TRAFFIC HANDLING	508 6001 CONSTRUCTING DETOURS	512 6009 PORT CTB (FUR & INST) (LOW PROF) (TY 1)	512 6010 PORT CTB (FUR & INST) (LOW PROF) (TY 2)	512 6057 PORT CTB (REMOVE) (LOW PROF) (TY 1)	512 6058 PORT CTB (REMOVE) (LOW PROF) (TY 2)	662 6063 WK ZN PAV MRK REMOV (W) 4" (SLD)	662 6093 WK ZN PAV MRK REMOV (Y) 4" (BRK)	662 6095 WK ZN PAV MRK REMOV (Y) 4" (SLD)	662 6109 WK ZN PAV MRK SHT TERM (TAB) TY W	662 6110 WK ZN PAV MRK SHT TERM (TAB) TY Y	677 6001 ELIM EXT PAV MRK & MRKS (4")	6001 6002 PORTABLE CHANGEABLE MESSAGE SIGN	6072 6001 MODULAR GLARE SCREENS (FURN & INSTALL)	6072 6002 MODULAR GLARE SCREENS (REMOVE)	6185 6002 TMA (STATIONARY)
	LS	MO	SY	LF	LF	LF	LF	LF	LF	LF	EA	EA	LF	EA	LF	LF	DAY
TRAFFIC CONTROL PLAN	1	5															186
SHEET 1 OF 4										288		15	1,179	1			
SHEET 2 OF 4			404	1,600	40	1,600	40	345	28	3,777	17	185	2,584		1,640	1,640	
SHEET 3 OF 4								1,442			71		4,061	1			
SHEET 4 OF 4								555			28		227	1			
PROJECT TOTALS	1	5	404	1,600	40	1,600	40	2,342	28	4,065	116	200	8,051	3	1,640	1,640	186

SUMMARY OF REMOVAL ITEMS

LOCATION	104 6009 REMOVING CONC (RIPRAP)	104 6011 REMOVING CONC (MEDIANS)	105 6043 REMOVING STAB BASE & ASPH PAV (0-6")	305 6011 SALV, HAUL & STKPL RCL APH PV (0 TO 6")	542 6001 REMOVE METAL BEAM GUARD FENCE
	SY	SY	SY	SY	LF
PLAN AND PROFILE					
SHEET 1 OF 2	3	316	494	329	258
SHEET 2 OF 2	8	88	491	330	259
PROJECT TOTALS	11	404	985	659	517

SUMMARY OF ROADWAY ITEMS

LOCATION	134 6011 BACKFILLING PAVEMENT EDGES	247 6061 FL BS (CMP IN PLC) (TYA GR1-2) (6")	275 6001 CEMENT	275 6011 CEMENT TREAT (EXIST MATL) (8")	310 6001 PRIME COAT (MULTI OPTION)	432 6001 RIPRAP (CONC) (4 IN)	432 6045 RIPRAP (MOW STRIP) (4 IN)	529 6008 CONC CURB & GUTTER (TY II)	536 6002 CONC MEDIAN	540 6002 MTL W-BEAM GD FEN (STEEL POST)	540 6005 TERMINAL ANCHOR SECTION	540 6006 MTL BEAM GD FEN TRANS (THRIE-BEAM)	540 6016 DOWNSTREAM ANCHOR TERMINAL SECTION	544 6001 GUARDRAIL END TREATMENT (INSTALL)	3076 6001 D-GR HMA TY-B PG64-22	3077 6027 SP MIXES SP-C SAC-A PG70-28	3077 6075 TACK COAT
	CY	SY	TON	SY	GAL	CY	CY	LF	SY	LF	EA	EA	EA	EA	TON	TON	GAL
PLAN AND PROFILE																	
SHEET 1 OF 2	23	329	6	369	66	3	15	144	316	213		1	1		76	38	73
SHEET 2 OF 2	23	330	6	370	66	8	25	152	88	200	1	2		1	76	38	73
PROJECT TOTALS	46	659	12	739	132	11	40	296	404	413	1	3	1	1	152	76	146

SUMMARY OF UTILITY ITEMS

LOCATION	7320 6011 WATER LINE GROUTING	7320 6012 4"-12" WATER ABANDONMENT PLUG	7320 6016 REMOVE 12" WATER VALVE	7320 6021 12' WIDE ASPHALT PVMT REPAIR, ARTERIAL	7320 6022 6" CONC CURB AND GUTTER	7320 6024 6" CONC PVMT	7320 6027 TRENCH SAFETY	7320 6030 CONSTRUCTION STAKING	7320 6031 AS-BUILT SURVEY	7320 6032 TRAFFIC CONTROL	7320 6033 REMOVE 12" CAST IRON WATER PIPE FROM BRIDGE DECK	7320 6034 WATER CONSTRUCTION ALLOWANCE
	CY	EA	EA	LF	LF	SY	LF	EA	EA	MO	LF	LS
RIVERSIDE DR. SB	30	4	3	60	60	70	65	1	1	2	282	1
PROJECT TOTALS	30	4	3	60	60	70	65	1	1	2	282	1

REV	BY	DESCRIPTION	DATE

OMEGA ENGINEERS, INC.
8200 N. MOPAC EXPRESSWAY, STE #280
AUSTIN, TEXAS 78759
OMEGAENGINEERS.COM
TX PE Firm Reg. No. F-2147
P:512 575 2288 F:281 647 9184

Texas Department of Transportation

RIVERSIDE DR SB

PROJECT SUMMARY

SHEET 1 OF 2

FED.RD. DIV. NO.	PROJECT NO.		HIGHWAY NO.
6	SEE TITLE SHEET		CS
STATE	DISTRICT	COUNTY	SHEET NO.
TEXAS	FTW	TARRANT	7
CONTROL	SECTION NO.	JOB	
0902	90	019, ETC.	

Plotted on: 4/15/2024 12:00:41 PM
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SUMMARY OF BRIDGE ITEMS

LOCATION	104 6009	110 6003	132 6007	422 6002	428 6001	429 6007	432 6002	442 6010	446 6002	450 6036	451 6037	454 6007	454 6020	479 6002	481 6014	481 6016	496 6013	529 6036	780 6002
	REMOVING CONC (RIPRAP)	EXCAVATION (SPECIAL)	EMBANKMENT (FINAL) (ORD COMP) (TY D)	REINF CONC SLAB (HPC)	PENETRATING CONCRETE SURFACE TREATMENT	CONC STR REPAIR (VERTICAL & OVERHEAD)	RIPRAP (CONC) (5 IN)	STR STEEL (SHEAR CONNECTOR)	CLEAN & PAINT EXIST STR (SYSTEM II)	RAIL (TY C411)	RETROFIT RAIL (TY C411)	HEADER TYPE EXPANSION JOINT	SEALED EXPANSION JOINT (4 IN) (SEJ - B)	ADJUSTING INLETS	PIPE (PVC) (SCH 40) (8 IN)	PIPE (PVC) (SCH 40) (12 IN)	REMOV STR (BRIDGE SLAB)	CONCRETE CURB (SPECIAL)	CNC CRACK REPAIR (DISCRETE) (INJECT)
	SY	CY	CY	SF	SY	SF	CY	LB	LS	LF	LF	LF	LF	EA	LF	LF	EA	LF	LF
RIVERSIDE DR. SB	22	30	15	10,102	1,968	354	3	4,689	1	450	134	90	102	1	600	200	1	450	173
PROJECT TOTALS	22	30	15	10,102	1,968	354	3	4,689	1	450	134	90	102	1	600	200	1	450	173

SUMMARY OF PAVEMENT MARKING ITEMS

LOCATION	658 6061	666 6036	666 6042	666 6048	666 6054	666 6078	666 6171	666 6174	666 6178	666 6180	666 6182	666 6184	666 6192	666 6210	666 6306	666 6309	666 6321	672 6007	678 6002	6037 6012
	INSTL DEL ASSM (D-SW)SZ 1(BRF)GF2	REFL PAV MRK TY I (W)8"(SLD) (100MIL)	REFL PAV MRK TY I (W)12"(SLD) (100MIL)	REFL PAV MRK TY I (W)24"(SLD) (100MIL)	REFL PAV MRK TY I (W)(ARROW) (100MIL)	REFL PAV MRK TY I (W)(WORD) (100MIL)	REFL PAV MRK TY II (W) 6" (BRK)	REFL PAV MRK TY II (W) 6" (SLD)	REFL PAV MRK TY II (W) 8" (SLD)	REFL PAV MRK TY II (W) 12" (SLD)	REFL PAV MRK TY II (W) 24" (SLD)	REFL PAV MRK TY II (W) (ARROW)	REFL PAV MRK TY II (W) (WORD)	REFL PAV MRK TY II (Y) 6" (SLD)	RE PM W/RET REQ TY I (W)6"(BRK) (100MIL)	RE PM W/RET REQ TY I (W)6"(SLD) (100MIL)	RE PM W/RET REQ TY I (Y)6"(SLD) (100MIL)	REFL PAV MRKR TY I-C	PAV SURF PREP FOR MRK (6")	REFL PAV MRKR TY II A-A
	EA	LF	LF	LF	EA	EA	LF	LF	LF	LF	LF	EA	EA	LF	LF	LF	LF	EA	LF	EA
SIGNING AND PAVEMENT MARKING PLAN																				
SHEET 1 OF 4		256		55	3	3	230	85	256		55	3	3	421	230	85	421	31	315	22
SHEET 2 OF 4	10	383					2,002	552	383	32					2,002	552		100	2,554	
SHEET 3 OF 4		2,183	885	114			995		2,183	885	114				995			50	995	
SHEET 4 OF 4		67	5				153		67	5					153			8	153	
PROJECT TOTALS		2,889	890	169	3	3	3,380	637	2,889	922	169	3	3	421	3,380	637	421	189	4,017	22

SUMMARY OF EROSION CONTROL ITEMS

LOCATION	161 6022	162 6002	164 6009	164 6011	168 6001	506 6002	506 6011	506 6020	506 6024	506 6038	506 6039
	GENERAL USE COMPOST (4")	BLOCK SODDING	BROADCAST SEED (TEMP) (WARM)	BROADCAST SEED (TEMP) (COOL)	VEGETATIVE WATERING	ROCK FILTER DAMS (INSTALL) (TY 2)	ROCK FILTER DAMS (REMOVE)	CONSTRUCTION EXITS (INSTALL) (TY 1)	CONSTRUCTION EXITS (REMOVE)	TEMP SEDMT CONT FENCE (INSTALL)	TEMP SEDMT CONT FENCE (REMOVE)
	SY	SY	SY	SY	MG	LF	LF	SY	SY	LF	LF
SWP3 LAYOUT	1,146	1,146	1,146	1,146	171	72	72	156	156	1,632	1,632
PROJECT TOTALS	1,146	1,146	1,146	1,146	171	72	72	156	156	1,632	1,632

REV	BY	DESCRIPTION	DATE

OMEGA ENGINEERS, INC.
8200 N. MOPAC EXPRESSWAY, STE #280
AUSTIN, TEXAS 78759
OMEGAENGINEERS.COM
TX PE Firm Reg. No. F-2147
P:512 575 2288 F:281 647 9184

Texas Department of Transportation

RIVERSIDE DR SB

PROJECT SUMMARY

SHEET 2 OF 2

FED. RD. DIV. NO.	PROJECT NO.		HIGHWAY NO.
6	SEE TITLE SHEET		CS
STATE	DISTRICT	COUNTY	SHEET NO.
TEXAS	FTW	TARRANT	7A
CONTROL	SECTION NO.	JOB	
0902	90	019, ETC.	

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TCP GENERAL NOTES

1. ALL DETOURS, HORIZONTAL TRAFFIC MOVEMENTS, LPCB, DRAINAGE, ETC. ARE DIRECTLY RELATED TO THE SEQUENCE OF OPERATIONS IN CONFORMITY WITH THE DETAILS SHOWN ON THE PLANS. THE CONTRACTOR MAY PROPOSE MODIFICATIONS TO THE SEQUENCE OF WORK FOR CONSIDERATION BY THE ENGINEER. IN THE EVENT THAT THE CONTRACTOR MAKES CHANGES, AS DEEMED BY THE FIELD ENGINEER, TO THE TCP PHASING, ALL CHANGES TO THE VARIOUS PAY ITEMS, IMPACT TO TRAFFIC, EFFECT TO OVERALL PROJECT IN TIME AND COST, ETC. MUST BE PROVIDED BY THE CONTRACTOR.
2. IF ANY ALTERNATIVE PROPOSAL IS TO BE IMPLEMENTED, THE CONTRACTOR WILL BE RESPONSIBLE FOR DEVELOPING DETAILED PLAN SHEETS SEALED BY A TEXAS LICENSED PROFESSIONAL ENGINEER FOR INCLUSION WITH THE CHANGE ORDER. THE CONTRACTOR SHALL NOT PROCEED WITH ANY CONSTRUCTION OPERATIONS BASED ON A REVISED PHASE/SEQUENCE UNTIL HE/SHE OBTAINS WRITTEN APPROVAL FROM THE ENGINEER.
3. TRAFFIC MUST BE MAINTAINED OVER THE PROJECT AREA DURING CONSTRUCTION. ALL WORK AND MATERIALS REQUIRED FOR HANDLING TRAFFIC SHALL NOT BE PAID FOR DIRECTLY, BUT SHALL BE CONSIDERED SUBSIDIARY TO ITEM 502, "BARRICADES, SIGNS, AND TRAFFIC HANDLING" UNLESS NOTED OTHERWISE IN THE PLANS.
4. THE PROVISIONS FOR ROUTING TRAFFIC DURING CONSTRUCTION AND THE SEQUENCE OF CONSTRUCTION OPERATIONS SHALL BE IN GENERAL CONFORMITY WITH THE DETAILS SHOWN ON THE PLANS. ALL TRAFFIC HANDLING SHALL BE IN ACCORDANCE WITH THE LATEST VERSION OF THE TMUTCD AND APPLICABLE TXDOT TCP AND WORK ZONE STANDARDS THROUGHOUT THE DURATION OF THE CONSTRUCTION OF EACH PROJECT LOCATION.
5. ALL LANE CLOSURES SHALL BE SCHEDULED IN AT LEAST TWO WEEKS ADVANCE AND APPROVED BY THE ENGINEER.
6. BY THE END OF EACH WORKDAY SUFFICIENT BACKFILL WILL BE PLACED TO PROVIDE A 3:1 SAFETY WEDGE ON ALL DROPOFFS 2" OR GREATER ADJACENT TO THE ROADWAY. THE BACKFILL SHALL BE EXISTING PAVEMENT MATERIAL OR ANOTHER APPROVED MATERIAL.
7. PROVIDE ACCESS TO ADJACENT PROPERTIES AT ALL TIMES THROUGHOUT CONSTRUCTION. THIS WORK WILL NOT BE PAID FOR DIRECTLY BUT WILL BE SUBSIDIARY TO THE PROJECT.
8. COVER OR REMOVE ALL CONFLICTING SIGNS.
9. THE CONTRACTOR IS REQUIRED TO PROVIDE AND MAINTAIN POSITIVE DRAINAGE THROUGHOUT THE PROJECT PHASING, INCLUDING REMOVING DEBRIS.
10. DO NOT LEAVE CONSTRUCTION WARNING SIGNS ON ANY AREA WHICH CONSTRUCTION OPERATIONS ARE NOT BEING CARRIED OUT.
11. NO EQUIPMENT, STOCKPILED MATERIAL, ETC. SHALL BE PERMITTED TO REMAIN IN THE CLEAR ZONE AFTER WORKING HOURS.
12. THE CONTRACTOR MAY INSTALL FINAL SIGNS IN ACCORDANCE WITH THE SIGNING LAYOUT WHERE TRAFFIC IS TO BE ROUTED ON SECTIONS OF NEW ROADWAY OR PROVIDE TEMPORARY SIGNING ACCORDINGLY.

TCP NARRATIVE

PHASE 1

1. COMPLETE CITY WATER LINE ABANDONMENT PRIOR TO COMMENCEMENT OF BRIDGE WORK.

PHASE 2 STEP 1

1. INSTALL ADVANCE WARNING SIGNS IN ACCORDANCE WITH BC AND WZ STANDARDS.
2. REMOVE MEDIANS AND CONSTRUCT TEMPORARY PAVING FOR MEDIAN CROSSOVERS. UTILIZE STANDARD TCP(2-5)-18.

PHASE 2 STEP 2

1. SHIFT ADVANCE WARNING SIGNS AS SHOWN IN THE PLANS AND IN ACCORDANCE WITH BC AND WZ STANDARDS.
2. INSTALL TRAIL DETOUR IN ACCORDANCE WITH TRAIL DETOURING SHEET AND BRIDGE WORK LOCATION.
3. INSTALL SW3P FEATURES AS SHOWN IN THE PLANS OR AS DIRECTED BY THE ENGINEER.
4. CLOSE SOUTHBOUND RIVERSIDE BRIDGE TO THRU TRAFFIC AND ROUTE TRAFFIC PER TRAFFIC CONTROL PLAN.
5. DEMOLISH EXISTING SOUTHBOUND RIVERSIDE DECK.
6. CONSTRUCT NEW DECK IN ACCORDANCE WITH THE PLANS. CONTRACTOR TO START WORK EITHER ON SOUTH OR NORTH SIDE OF THE BRIDGE TO AVOID CONFLICTS WITH TRINITY TRAILS SYSTEM.
7. RECONSTRUCT MEDIANS
8. INSTALL PERMANENT STRIPING PER TCP(3-2) AND TCP(3-3).
9. REMOVE ALL SW3P ITEMS AS DIRECTED WHEN PERMANENT COVER IS ESTABLISHED.
10. OPEN SOUTHBOUND RIVERSIDE TO THROUGH TRAFFIC.
11. REMOVE ALL ADVANCED WARNING SIGNS.

STATE OF TEXAS
ALEX I. GARCIA
107317
PROFESSIONAL LICENSED ENGINEER

04/12/2024

REV	BY	DESCRIPTION	DATE

AGUIRRE & FIELDS
ENGINEERING INNOVATORS
TBPE FIRM REGISTRATION #739

RIVERSIDE DR SB

TRAFFIC CONTROL PLAN GENERAL NOTES AND NARRATIVE

FED.RD. DIV.NO.	PROJECT NO.		HIGHWAY NO.
6	SEE TITLE SHEET		CS
STATE	DISTRICT	COUNTY	SHEET NO.
TEXAS	FTW	TARRANT	8
CONTROL	SECTION NO.	JOB	
0902	90	019, ETC	

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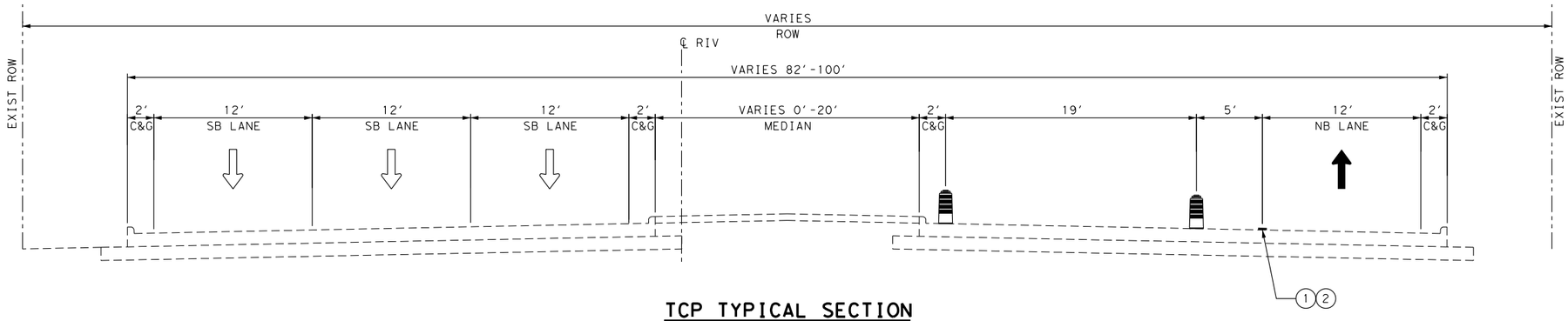
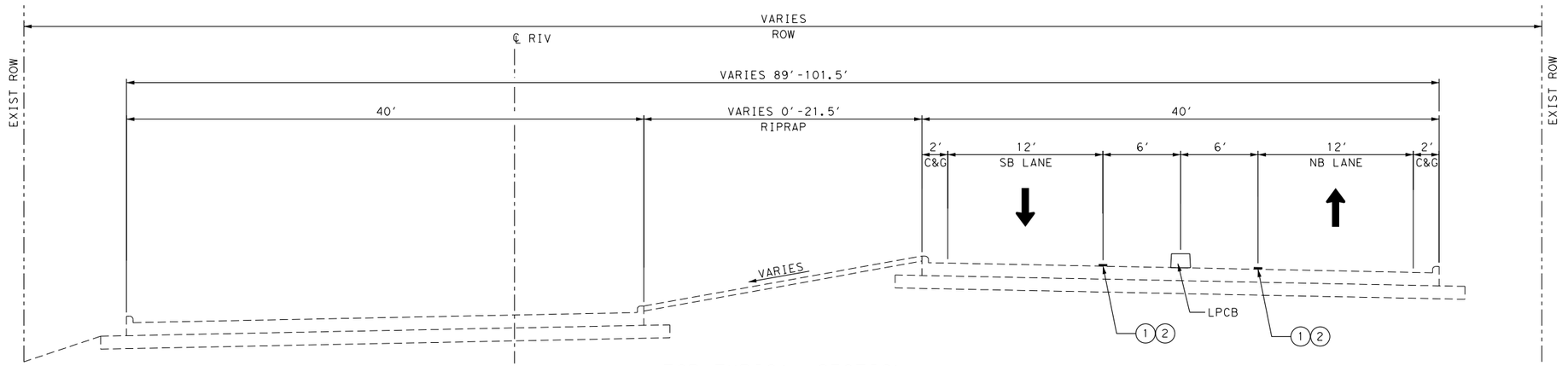


TCP TYPICAL SECTION

STA 100+11.34 TO STA 103+94.88

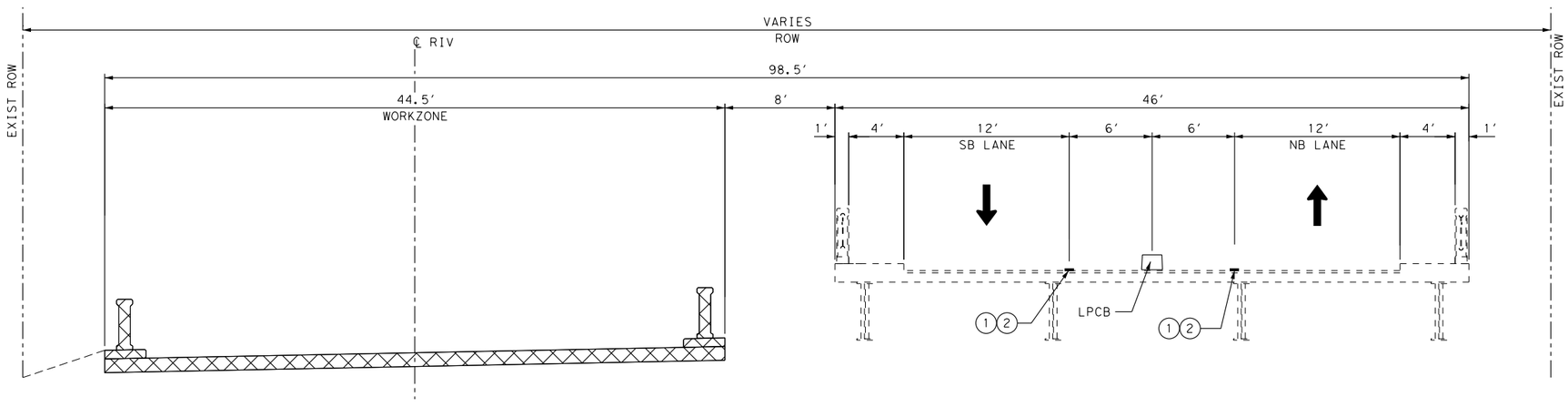
STA 95+15.38 TO STA 100+11.34. SEE TCP FOR MORE DETAILS
SHIFTING TAPER FROM STA 103+94.88 TO STA 105+91.56. SEE TCP FOR MORE DETAILS



TCP TYPICAL SECTION

STA 105+91.56 TO STA 113+30.36
STA 116+25.51 TO STA 120+71.34

SHIFTING TAPER FROM STA 120+71.34 TO STA 122+31.35. SEE TCP FOR MORE DETAILS



TCP TYPICAL SECTION

STA 113+30.36 TO STA 116+25.51

LEGEND

- PROP WORKZONE
- (1) WK ZN PAV MRK REMOV (Y) 4" (SLD)
- (2) WZ (Y) PAV MRK TAB

STATE OF TEXAS
ALEX I. GARCIA
107317
PROFESSIONAL LICENSED ENGINEER

04/12/2024

REV	BY	DESCRIPTION	DATE

AGUIRRE & FIELDS
ENGINEERING INNOVATORS
TBPE FIRM REGISTRATION #739

Texas Department of Transportation

RIVERSIDE DR SB

TRAFFIC CONTROL PLAN
TYPICAL SECTIONS

FED. RD. DIV. NO.	PROJECT NO.		HIGHWAY NO.
6	SEE TITLE SHEET		CS
STATE	DISTRICT	COUNTY	SHEET NO.
TEXAS	FTW	TARRANT	9
CONTROL	SECTION NO.	JOB	
0902	90	019, ETC	

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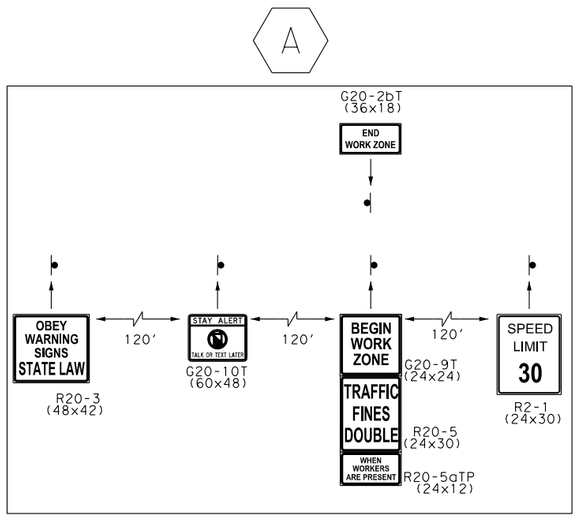
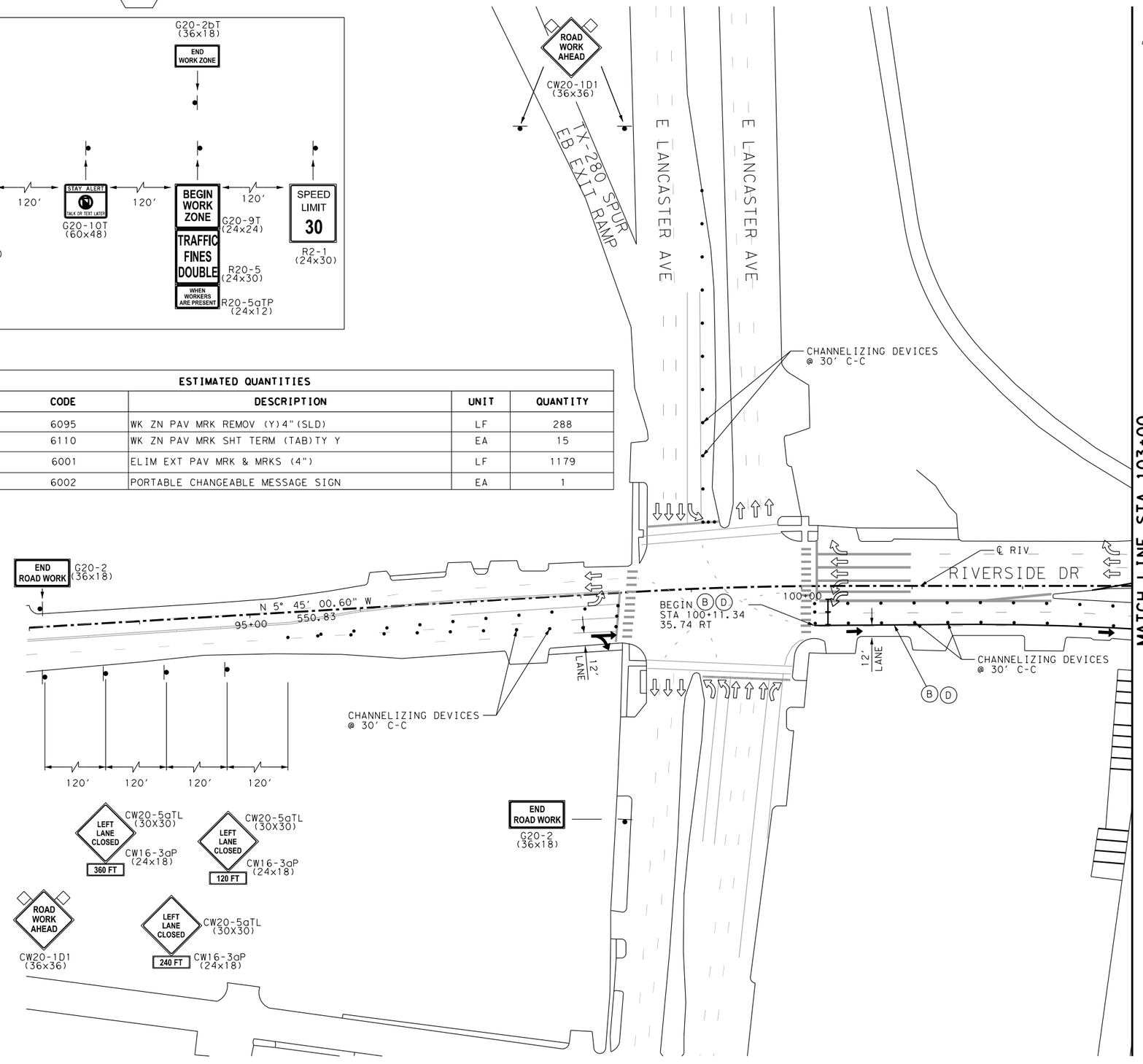


ESTIMATED QUANTITIES				
ITEM	CODE	DESCRIPTION	UNIT	QUANTITY
662	6095	WK ZN PAV MRK REMOV (Y)4"(SLD)	LF	288
662	6110	WK ZN PAV MRK SHT TERM (TAB)TY Y	EA	15
677	6001	ELIM EXT PAV MRK & MRKS (4")	LF	1179
6001	6002	PORTABLE CHANGEABLE MESSAGE SIGN	EA	1



LEGEND:

- LOW PROFILE CONCRETE BARRIER
- CHANNELIZING DEVICES
- SIGN POST
- TYP III BARRICADE
- PROPOSED TRAFFIC FLOW
- EXISTING TRAFFIC FLOW
- WORKZONE
- TEMPORARY PAVING
  - 2" TYPE C
  - 3" TYPE B
  - 6" FLEX BASE
- (A) 4" WZ (W) SLD REMOVABLE
- (B) 4" WZ (Y) DBL SLD REMOVABLE
- (C) WZ (W) PAV MRK TAB
- (D) WZ (Y) PAV MRK TAB

NOTES:

FOR ADVANCED WARNING SIGNS LAYOUT REFER TO STANDARD BC(2)-21.

0 50' 100'

SCALE: 1" = 100'

STATE OF TEXAS
ALEX I. GARCIA
107317
PROFESSIONAL ENGINEER
LICENSED

04/12/2024

REV	BY	DESCRIPTION	DATE

AGUIRRE & FIELDS
ENGINEERING INNOVATORS
TBPE FIRM REGISTRATION #739

Texas Department of Transportation

RIVERSIDE DR SB

TRAFFIC CONTROL PLAN

BEGIN TO STA 103+00

SHEET 1 OF 4

FED.RD. DIV.NO.	PROJECT NO.		HIGHWAY NO.
6	SEE TITLE SHEET		CS
STATE	DISTRICT	COUNTY	SHEET NO.
TEXAS	FTW	TARRANT	10
CONTROL	SECTION NO.	JOB	
0902	90	019, ETC	

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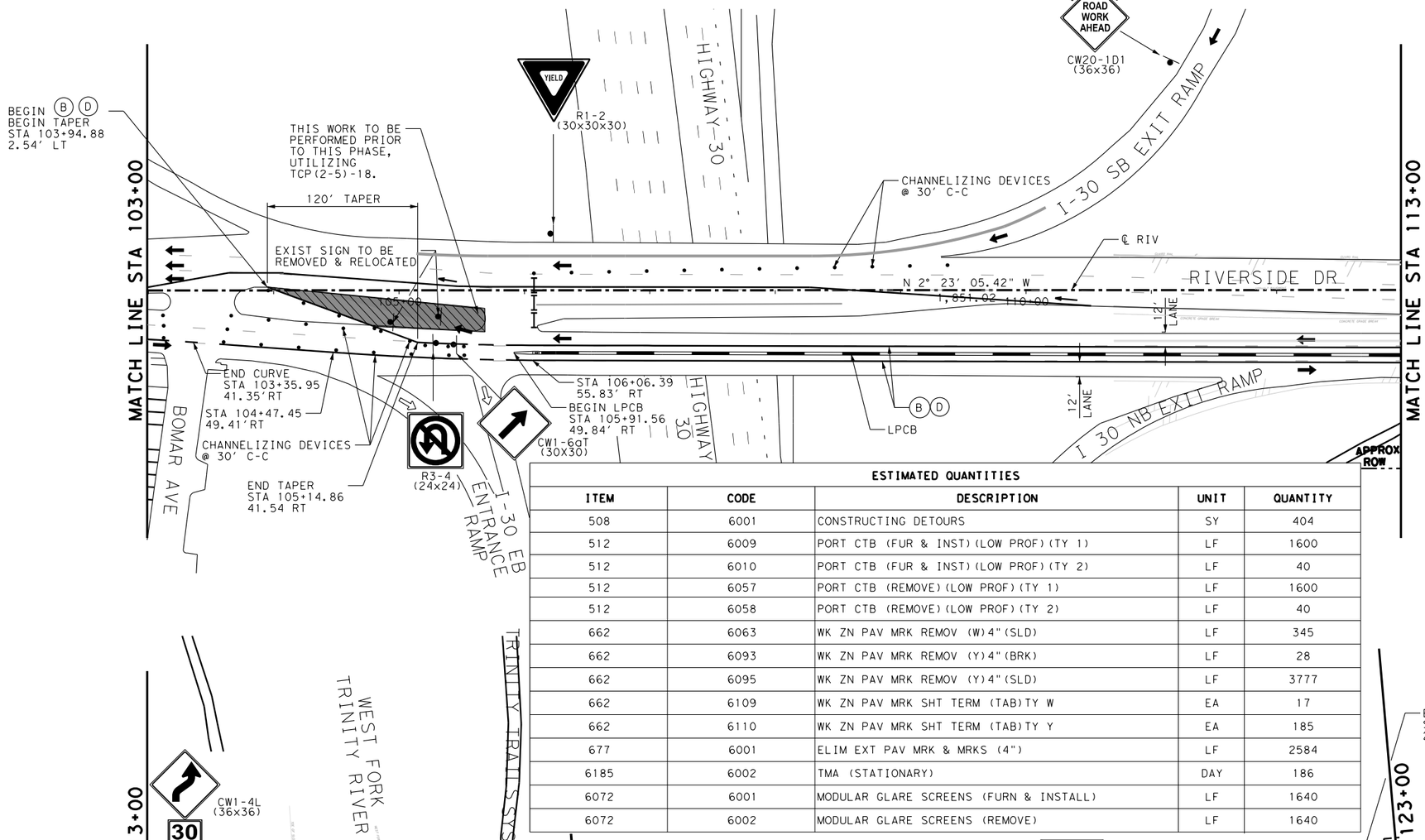

ESTIMATED QUANTITIES

ITEM	CODE	DESCRIPTION	UNIT	QUANTITY
508	6001	CONSTRUCTING DETOURS	SY	404
512	6009	PORT CTB (FUR & INST)(LOW PROF)(TY 1)	LF	1600
512	6010	PORT CTB (FUR & INST)(LOW PROF)(TY 2)	LF	40
512	6057	PORT CTB (REMOVE)(LOW PROF)(TY 1)	LF	1600
512	6058	PORT CTB (REMOVE)(LOW PROF)(TY 2)	LF	40
662	6063	WK ZN PAV MRK REMOV (W)4"(SLD)	LF	345
662	6093	WK ZN PAV MRK REMOV (Y)4"(BRK)	LF	28
662	6095	WK ZN PAV MRK REMOV (Y)4"(SLD)	LF	3777
662	6109	WK ZN PAV MRK SHT TERM (TAB)TY W	EA	17
662	6110	WK ZN PAV MRK SHT TERM (TAB)TY Y	EA	185
677	6001	ELIM EXT PAV MRK & MRKS (4")	LF	2584
6185	6002	TMA (STATIONARY)	DAY	186
6072	6001	MODULAR GLARE SCREENS (FURN & INSTALL)	LF	1640
6072	6002	MODULAR GLARE SCREENS (REMOVE)	LF	1640

ESTIMATED QUANTITIES

ITEM	CODE	DESCRIPTION	UNIT	QUANTITY
104	6009	REMOVING CONC (RIPRAP)	SY	11
104	6011	REMOVING CONC (MEDIANS)	SY	404
105	6043	REMOVING STAB BASE & ASPH PAV (0-6")	SY	985
305	6011	SALV, HAUL & STKPL RCL APH PV (0 TO 6")	SY	659
542	6001	REMOVE METAL BEAM GUARD FENCE	LF	517

LEGEND:

- LOW PROFILE CONCRETE BARRIER
- CHANNELIZING DEVICES
- SIGN POST
- TYP III BARRICADE
- PROPOSED TRAFFIC FLOW
- EXISTING TRAFFIC FLOW
- WORKZONE
- TEMPORARY PAVING
  - 2" TYPE C
  - 3" TYPE B
  - 6" FLEX BASE
- (A) 4" WZ (W) SLD REMOVABLE
- (B) 4" WZ (Y) DBL SLD REMOVABLE
- (C) WZ (W) PAV MRK TAB
- (D) WZ (Y) PAV MRK TAB

NOTES:

FOR ADVANCED WARNING SIGNS LAYOUT REFER TO STANDARD BC(2)-21.

0 50' 100'

SCALE: 1" = 100'

STATE OF TEXAS
ALEX I. GARCIA
107317
PROFESSIONAL LICENSED ENGINEER

04/15/2024

REV	BY	DESCRIPTION	DATE

AGUIRRE & FIELDS
ENGINEERING INNOVATORS
TBPE FIRM REGISTRATION #739

Texas Department of Transportation

RIVERSIDE DR SB

TRAFFIC CONTROL PLAN

STA 103+00 TO STA 123+00

SHEET 2 OF 4

FED.RD. DIV.NO.	PROJECT NO.	HIGHWAY NO.
6	SEE TITLE SHEET	CS

STATE	DISTRICT	COUNTY	SHEET NO.
TEXAS	FTW	TARRANT	11

CONTROL	SECTION NO.	JOB
0902	90	019, ETC

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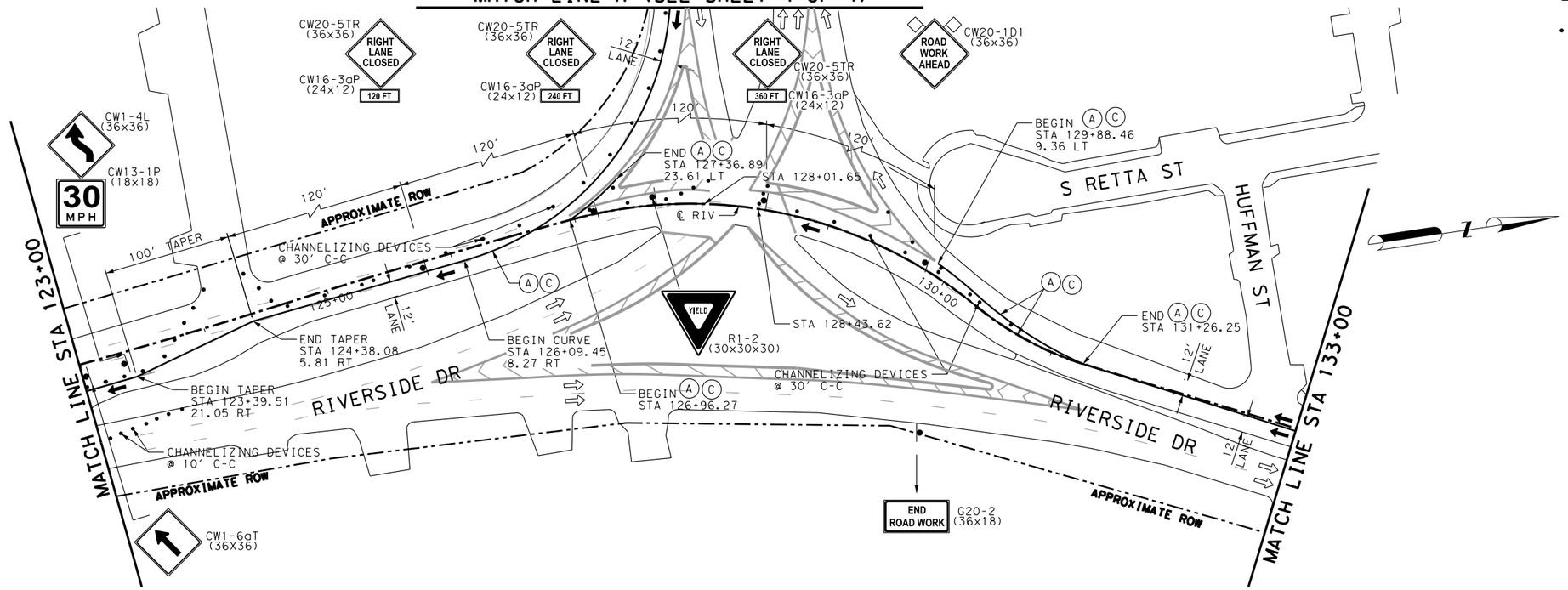

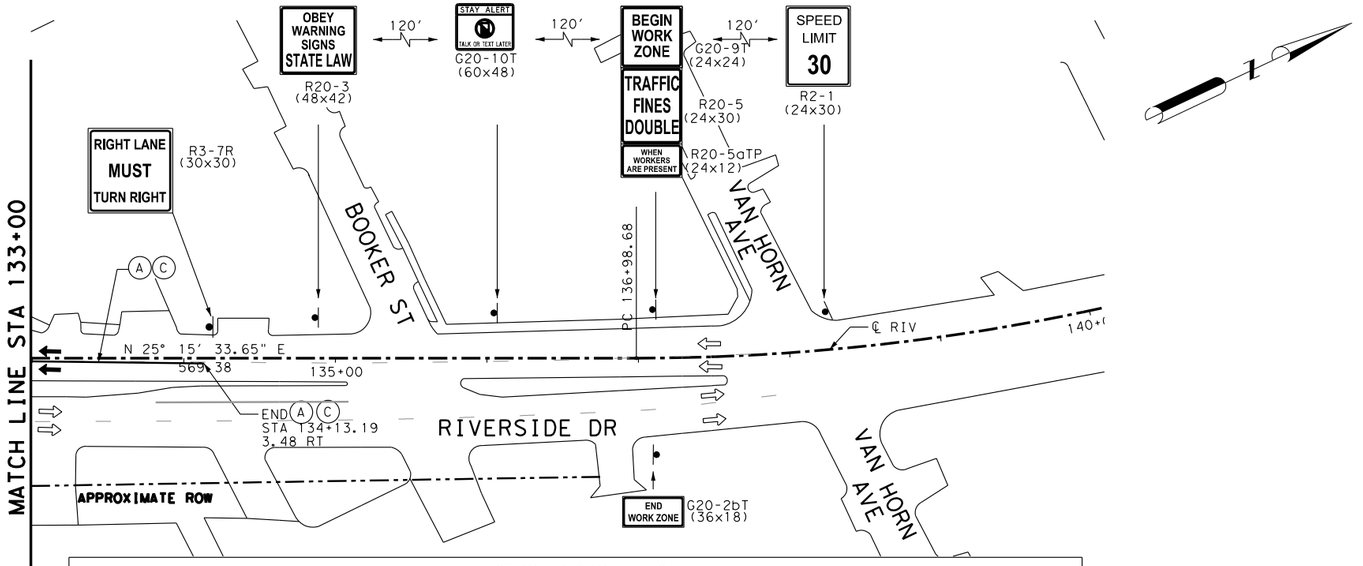

ESTIMATED QUANTITIES				
ITEM	CODE	DESCRIPTION	UNIT	QUANTITY
662	6063	WK ZN PAV MRK REMOV (W)4"(SLD)	LF	1442
662	6109	WK ZN PAV MRK SHT TERM (TAB)TY W	EA	71
677	6001	ELIM EXT PAV MRK & MRKS (4")	LF	4061
6001	6002	PORTABLE CHANGEABLE MESSAGE SIGN	EA	1

LEGEND:

- LOW PROFILE CONCRETE BARRIER
- CHANNELIZING DEVICES
- SIGN POST
- TYP III BARRICADE
- PROPOSED TRAFFIC FLOW
- EXISTING TRAFFIC FLOW
- WORKZONE
- TEMPORARY PAVING
  - 2" TYPE C
  - 3" TYPE B
  - 6" FLEX BASE
- (A) 4" WZ (W) SLD REMOVABLE
- (B) 4" WZ (Y) DBL SLD REMOVABLE
- (C) WZ (W) PAV MRK TAB
- (D) WZ (Y) PAV MRK TAB

NOTES:

FOR ADVANCED WARNING SIGNS LAYOUT REFER TO STANDARD BC(2)-21.

0 50' 100'

SCALE: 1" = 100'

STATE OF TEXAS
ALEX I. GARCIA
107317
PROFESSIONAL ENGINEER

04/12/2024

REV	BY	DESCRIPTION	DATE

AGUIRRE & FIELDS
ENGINEERING INNOVATORS
TBPE FIRM REGISTRATION #739

Texas Department of Transportation

RIVERSIDE DR SB

TRAFFIC CONTROL PLAN

STA 123+00 TO END

SHEET 3 OF 4

FED.RD. DIV.NO.	PROJECT NO.	HIGHWAY NO.
6	SEE TITLE SHEET	CS
STATE	DISTRICT / COUNTY	SHEET NO.
TEXAS	FTW / TARRANT	12
CONTROL	SECTION NO. / JOB	
0902	90 / 019, ETC	

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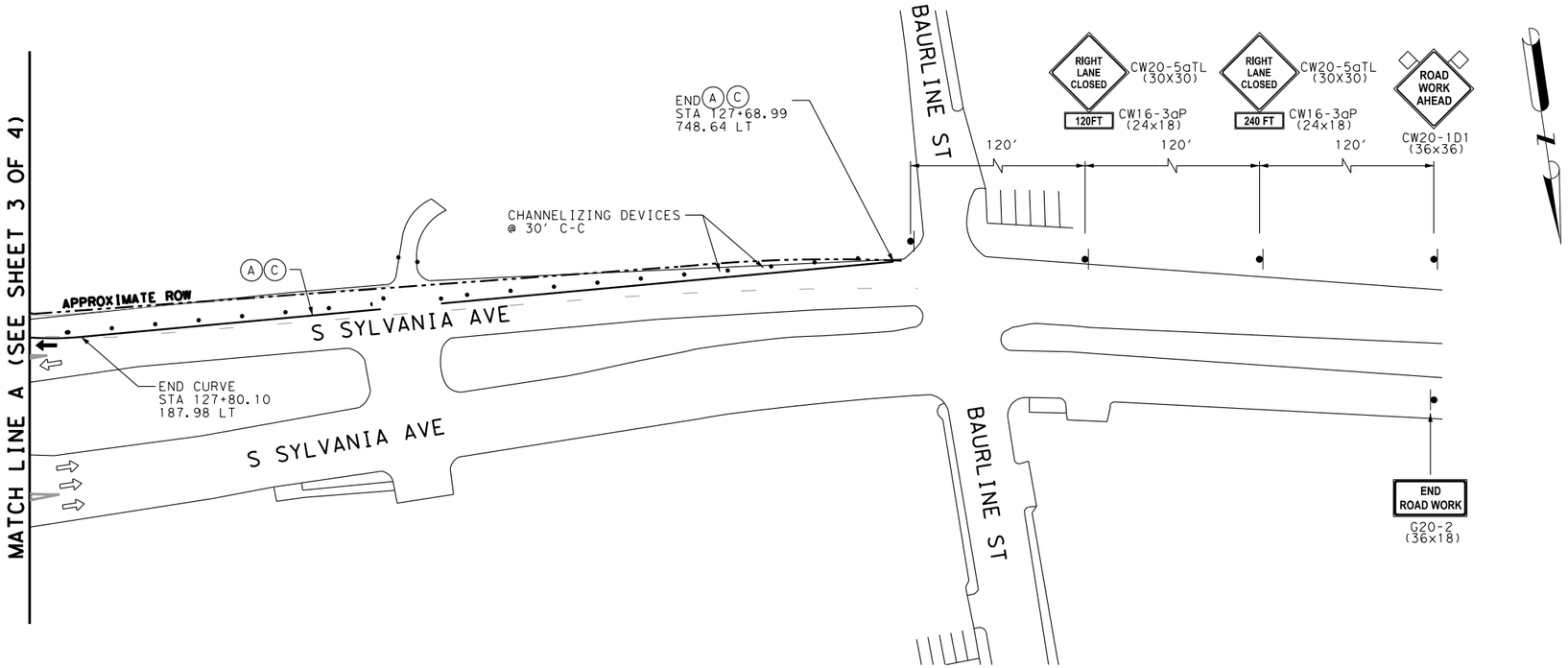

ESTIMATED QUANTITIES				
ITEM	CODE	DESCRIPTION	UNIT	QUANTITY
662	6063	WK ZN PAV MRK REMOV (W)4"(SLD)	LF	555
662	6109	WK ZN PAV MRK SHT TERM (TAB)TY W	EA	28
677	6001	ELIM EXT PAV MRK & MRKS (4")	LF	227
6001	6002	PORTABLE CHANGEABLE MESSAGE SIGN	EA	1

LEGEND:

- LOW PROFILE CONCRETE BARRIER
- CHANNELIZING DEVICES
- SIGN POST
- TYP III BARRICADE
- PROPOSED TRAFFIC FLOW
- EXISTING TRAFFIC FLOW
- WORKZONE
- TEMPORARY PAVING
  - 2" TYPE C
  - 3" TYPE B
  - 6" FLEX BASE
- (A) 4" WZ (W) SLD REMOVABLE
- (B) 4" WZ (Y) DBL SLD REMOVABLE
- (C) WZ (W) PAV MRK TAB
- (D) WZ (Y) PAV MRK TAB

NOTES:

FOR ADVANCED WARNING SIGNS LAYOUT REFER TO STANDARD BC(2)-21.

0 50' 100'

SCALE: 1" = 100'

STATE OF TEXAS
ALEX I. GARCIA
107317
LICENSED PROFESSIONAL ENGINEER

04/12/2024

REV	BY	DESCRIPTION	DATE

AGUIRRE & FIELDS
ENGINEERING INNOVATORS
TBPE FIRM REGISTRATION #739

Texas Department of Transportation

RIVERSIDE DR SB

TRAFFIC CONTROL PLAN

MATCHLINE A TO END

SHEET 4 OF 4

FED.RD. DIV.NO.	PROJECT NO.		HIGHWAY NO.
6	SEE TITLE SHEET		CS
STATE	DISTRICT	COUNTY	SHEET NO.
TEXAS	FTW	TARRANT	13
CONTROL	SECTION NO.	JOB	
0902	90	019, ETC	

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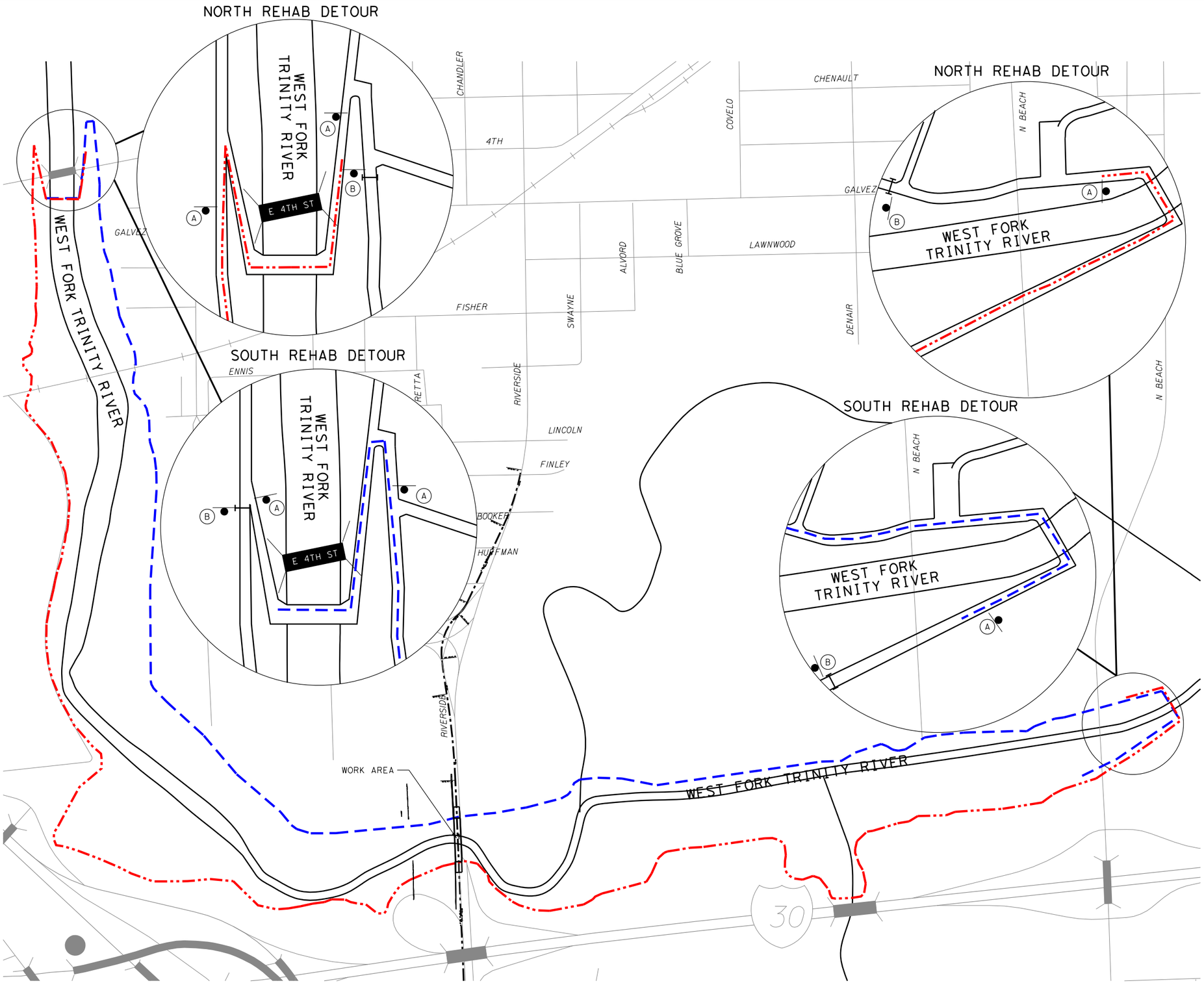

N. T. S.

STATE OF TEXAS
ALEX I. GARCIA
107317
LICENSED PROFESSIONAL ENGINEER

04/12/2024

REV	BY	DESCRIPTION	DATE

AGUIRRE & FIELDS
ENGINEERING INNOVATORS
TBPE FIRM REGISTRATION •739

Texas Department of Transportation

RIVERSIDE DR SB

TRAIL DETOURING

SHEET 1 OF 1

FED.RD. DIV.NO.	PROJECT NO.		HIGHWAY NO.
6	SEE TITLE SHEET		CS
STATE	DISTRICT	COUNTY	SHEET NO.
TEXAS	FTW	TARRANT	14
CONTROL	SECTION NO.	JOB	
0902	90	019, ETC	

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BARRICADE AND CONSTRUCTION (BC) STANDARD SHEETS GENERAL NOTES:

1. THE BARRICADE AND CONSTRUCTION STANDARD SHEETS (BC SHEETS) ARE INTENDED TO SHOW TYPICAL EXAMPLES FOR PLACEMENT OF TEMPORARY TRAFFIC CONTROL DEVICES, CONSTRUCTION PAVEMENT MARKINGS, AND TYPICAL WORK ZONE SIGNS. THE INFORMATION CONTAINED IN THESE SHEETS MEET OR EXCEED THE REQUIREMENTS SHOWN IN THE "TEXAS MANUAL ON UNIFORM TRAFFIC CONTROL DEVICES" (TMUTCD).

2. THE DEVELOPMENT AND DESIGN OF THE TRAFFIC CONTROL PLAN (TCP)IS THE RESPONSIBILITY OF THE ENGINEER.

3. THE CONTRACTOR MAY PROPOSE CHANGES TO THE TCP THAT ARE SIGNED AND SEALED BY A LICENSED PROFESSIONAL ENGINEER FOR APPROVAL. THE ENGINEER MAY DEVELOP, SIGN AND SEAL CONTRACTOR PROPOSED CHANGES.

4. THE CONTRACTOR IS RESPONSIBLE FOR INSTALLING AND MAINTAINING THE TRAFFIC CONTROL DEVICES AS SHOWN IN THE PLANS. THE CONTRACTOR MAY NOT MOVE OR CHANGE THE APPROXIMATE LOCATION OF ANY DEVICE WITHOUT THE APPROVAL OF THE ENGINEER.

5. GEOMETRIC DESIGN OF LANE SHIFTS AND DETOURS SHOULD, WHEN POSSIBLE, MEET THE APPLICABLE DESIGN CRITERIA CONTAINED IN MANUALS SUCH AS THE AMERICAN ASSOCIATION OF STATE HIGHWAY AND TRANSPORTATION OFFICIALS (AASHTO), "A POLICY ON GEOMETRIC DESIGN OF HIGHWAYS AND STREETS," THE TXDOT "ROADWAY DESIGN MANUAL" OR ENGINEERING JUDGMENT.

6. WHEN PROJECTS ABUT, THE ENGINEER(S) MAY OMIT THE END ROAD WORK, TRAFFIC FINES DOUBLE, AND OTHER ADVANCE WARNING SIGNS IF THE SIGNING WOULD BE REDUNDANT AND THE WORK AREAS APPEAR CONTINUOUS TO THE MOTORISTS. IF THE ADJACENT PROJECT IS COMPLETED FIRST, THE CONTRACTOR SHALL ERECT THE NECESSARY WARNING SIGNS AS SHOWN ON THESE SHEETS, THE TCP SHEETS OR AS DIRECTED BY THE ENGINEER. THE BEGIN ROAD WORK NEXT X MILES SIGN SHALL BE REVISED TO SHOW APPROPRIATE WORK ZONE DISTANCE.

7. THE ENGINEER MAY REQUIRE DUPLICATE WARNING SIGNS ON THE MEDIAN SIDE OF DIVIDED HIGHWAYS WHERE MEDIAN WIDTH WILL PERMIT AND TRAFFIC VOLUMES JUSTIFY THE SIGNING.

8. ALL SIGNS SHALL BE CONSTRUCTED IN ACCORDANCE WITH THE DETAILS FOUND IN THE "STANDARD HIGHWAY SIGN DESIGNS FOR TEXAS," LATEST EDITION. SIGN DETAILS NOT SHOWN IN THIS MANUAL SHALL BE SHOWN IN THE PLANS OR THE ENGINEER SHALL PROVIDE A DETAIL TO THE CONTRACTOR BEFORE THE SIGN IS MANUFACTURED.

9. THE TEMPORARY TRAFFIC CONTROL DEVICES SHOWN IN THE ILLUSTRATIONS OF THE BC SHEETS ARE EXAMPLES. AS NECESSARY, THE ENGINEER WILL DETERMINE THE MOST APPROPRIATE TRAFFIC CONTROL DEVICES TO BE USED.

10. WHERE HIGHWAY CONSTRUCTION OR MAINTENANCE WORK IS BEING UNDERTAKEN, OTHER THAN MOBILE OPERATIONS AS DEFINED BY THE TEXAS MANUAL ON UNIFORM TRAFFIC CONTROL DEVICES, CSJ LIMIT SIGNS ARE REQUIRED. CSJ LIMIT SIGNS ARE SHOWN ON BC(2). THE OBEY WARNING SIGNS STATE LAW SIGN, STAY ALERT TALK OR TEXT LATER AND THE WORK ZONE TRAFFIC FINES DOUBLE SIGN WITH PLAQUE SHALL BE ERECTED IN ADVANCE OF THE CSJ LIMITS. THE BEGIN ROAD WORK NEXT X MILES, CONTRACTOR AND END ROAD WORK SIGNS SHALL BE ERECTED AT OR NEAR THE CSJ LIMITS. FOR MOBILE OPERATIONS, CSJ LIMIT SIGNS ARE NOT REQUIRED.

11. TRAFFIC CONTROL DEVICES SHOULD BE IN PLACE ONLY WHILE WORK IS ACTUALLY IN PROGRESS OR A DEFINITE NEED EXISTS.

12. THE ENGINEER HAS THE FINAL DECISION ON THE LOCATION OF ALL TRAFFIC CONTROL DEVICES.

13. INACTIVE EQUIPMENT AND WORK VEHICLES, INCLUDING WORKERS' PRIVATE VEHICLES MUST BE PARKED AWAY FROM TRAVEL LANES. THEY SHOULD BE AS CLOSE TO THE RIGHT-OF-WAY LINE AS POSSIBLE, OR LOCATED BEHIND A BARRIER OR GUARDRAIL, OR AS APPROVED BY THE ENGINEER.

WORKER SAFETY NOTES:

1. WORKERS ON FOOT WHO ARE EXPOSED TO TRAFFIC OR TO CONSTRUCTION EQUIPMENT WITHIN THE RIGHT-OF-WAY SHALL WEAR HIGH-VISIBILITY SAFETY APPAREL MEETING THE REQUIREMENTS OF ISEA "AMERICAN NATIONAL STANDARD FOR HIGH-VISIBILITY APPAREL," OR EQUIVALENT REVISIONS, AND LABELED AS ANSI 107-2004 STANDARD PERFORMANCE FOR CLASS 2 OR 3 RISK EXPOSURE. CLASS 3 GARMENTS SHOULD BE CONSIDERED FOR HIGH TRAFFIC VOLUME WORK AREAS OR NIGHT TIME WORK.

2. EXCEPT IN EMERGENCY SITUATIONS, FLAGGER STATIONS SHALL BE ILLUMINATED WHEN FLAGGING IS USED AT NIGHT.

COMPLIANT WORKZONE TRAFFIC CONTROL DEVICES

1. ONLY PRE-QUALIFIED PRODUCTS SHALL BE USED. THE "COMPLIANT WORK ZONE TRAFFIC CONTROL DEVICES LIST" (CWZTCD) DESCRIBES PRE-QUALIFIED PRODUCTS AND THEIR SOURCES.

2. WORK ZONE TRAFFIC CONTROL DEVICES SHALL BE COMPLIANT WITH THE MANUAL FOR ASSESSING SAFETY HARDWARE (MASH).

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

SHEET 1 OF 12

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
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4-03 7-13	DIST	COUNTY		SHEET NO.
9-07 8-14	FTW	TARRANT		15
5-10 5-21				

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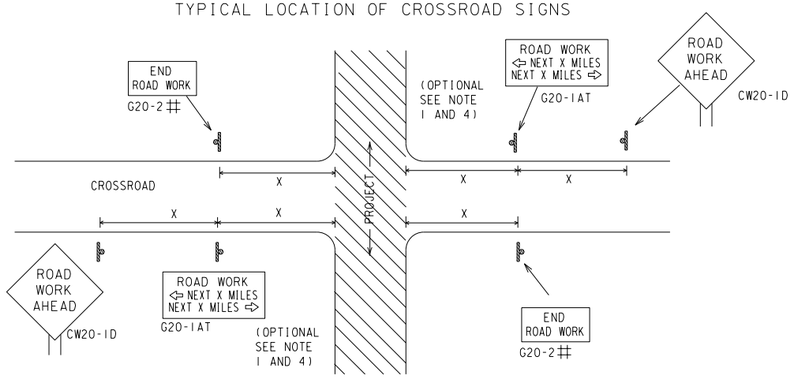
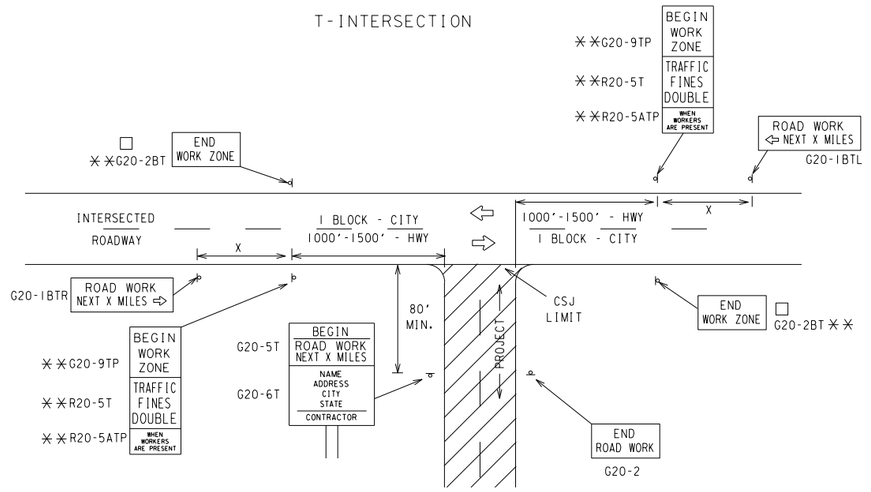
TYPICAL LOCATION OF CROSSROAD SIGNS



MAY BE MOUNTED ON BACK OF "ROAD WORK AHEAD"(CW20-1D) SIGN WITH APPROVAL OF ENGINEER. (SEE NOTE 2 BELOW)

1. THE TYPICAL MINIMUM SIGNING ON A CROSSROAD APPROACH SHOULD BE A "ROAD WORK AHEAD" (CW20-1D)SIGN AND A (G20-2) "END ROAD WORK" SIGN, UNLESS NOTED OTHERWISE IN PLANS.
2. THE ENGINEER MAY USE THE REDUCED SIZE 36" X 36" ROAD WORK AHEAD (CW20-1D) SIGN MOUNTED BACK TO BACK WITH THE REDUCED SIZE 36" X 18" "END ROAD WORK"(G20-2) SIGN ON LOW VOLUME CROSSROADS (SEE NOTE 4 UNDER "TYPICAL CONSTRUCTION WARNING SIGN SIZE AND SPACING"). SEE THE "STANDARD HIGHWAY SIGN DESIGNS FOR TEXAS" MANUAL FOR SIGN DETAILS. THE ENGINEER MAY OMIT THE ADVANCE WARNING SIGNS ON LOW VOLUME CROSSROADS. THE ENGINEER WILL DETERMINE WHETHER A ROAD IS LOW VOLUME AS PER TMUTCD PART 5. THIS INFORMATION SHALL BE SHOWN IN THE PLANS.
3. BASED ON EXISTING FIELD CONDITIONS, THE ENGINEER/INSPECTOR MAY REQUIRE ADDITIONAL SIGNS SUCH AS FLAGGER AHEAD, LOOSE GRAVEL, OR OTHER APPROPRIATE SIGNS. WHEN ADDITIONAL SIGNS ARE REQUIRED, THESE SIGNS WILL BE CONSIDERED PART OF THE MINIMUM REQUIREMENTS. THE ENGINEER/INSPECTOR WILL DETERMINE THE PROPER LOCATION AND SPACING OF ANY SIGN NOT SHOWN ON THE BC SHEETS, TRAFFIC CONTROL PLAN SHEETS OR THE WORK ZONE STANDARD SHEETS.
4. THE "ROAD WORK NEXT X MILES"(G20-1AT)SIGN SHALL BE REQUIRED AT HIGH VOLUME CROSSROADS TO ADVISE MOTORISTS OF THE LENGTH OF CONSTRUCTION IN EITHER DIRECTION FROM THE INTERSECTION. THE ENGINEER WILL DETERMINE WHETHER A ROADWAY IS CONSIDERED HIGH VOLUME.
5. ADDITIONAL TRAFFIC CONTROL DEVICES MAY BE SHOWN ELSEWHERE IN THE PLANS FOR HIGHER VOLUME CROSSROADS.
6. WHEN WORK OCCURS IN THE INTERSECTION AREA, APPROPRIATE TRAFFIC CONTROL DEVICES, AS SHOWN ELSEWHERE IN THE PLANS OR AS DETERMINED BY THE ENGINEER/INSPECTOR, SHALL BE IN PLACE.

T-INTERSECTION



CSJ LIMITS AT T-INTERSECTION

1. THE ENGINEER WILL DETERMINE THE TYPES AND LOCATION OF ANY ADDITIONAL TRAFFIC CONTROL DEVICES, SUCH AS A FLAGGER AND ACCOMPANYING SIGNS, OR OTHER SIGNS, THAT SHOULD BE USED WHEN WORK IS BEING PERFORMED AT OR NEAR AN INTERSECTION.
2. IF CONSTRUCTION CLOSES THE ROAD AT A T-INTERSECTION, THE CONTRACTOR SHALL PLACE THE "CONTRACTOR NAME"(G20-6T) SIGN BEHIND THE TYPE 3 BARRICADES FOR THE ROAD CLOSURE (SEE BC(10) ALSO). THE "ROAD WORK NEXT X MILES" LEFT ARROW(G20-1BTL) AND "ROAD WORK NEXT X MILES" RIGHT ARROW (G20-1BTR)" SIGNS SHALL BE REPLACED BY THE DETOUR SIGNING CALLED FOR IN THE PLANS.

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

SIZE			SPACING	
SIGN NUMBER OR SERIES	CONVENTIONAL ROAD	EXPRESSWAY / FREEWAY	POSTED SPEED	SIGN △ SPACING "X"
			MPH	FEET (APPRX.)
CW20*, CW21, CW22, CW23, CW25	48" X 48"	48" X 48"	30	120
			35	160
			40	240
CW1, CW2, CW7, CW8, CW9, CW11, CW14	36" X 36"	48" X 48"	45	320
			50	400
			55	500 *
			60	600 *
CW3, CW4, CW5, CW6, CW8-3, CW10, CW12	48" X 48"	48" X 48"	65	700 *
			70	800 *
			75	900 *
			80	1000 *
			*	* 3

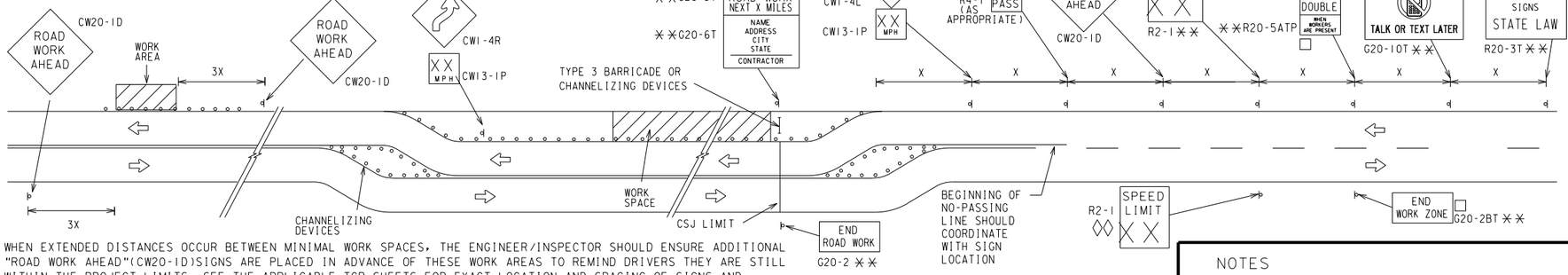
* FOR TYPICAL SIGN SPACINGS ON DIVIDED HIGHWAYS, EXPRESSWAYS AND FREEWAYS, SEE PART 6 OF THE "TEXAS MANUAL ON UNIFORM TRAFFIC CONTROL DEVICES" (TMUTCD) TYPICAL APPLICATION DIAGRAMS OR TCP STANDARD SHEETS.

△ MINIMUM DISTANCE FROM WORK AREA TO FIRST ADVANCE WARNING SIGN NEAREST THE WORK AREA AND/OR DISTANCE BETWEEN EACH ADDITIONAL SIGN.

GENERAL NOTES

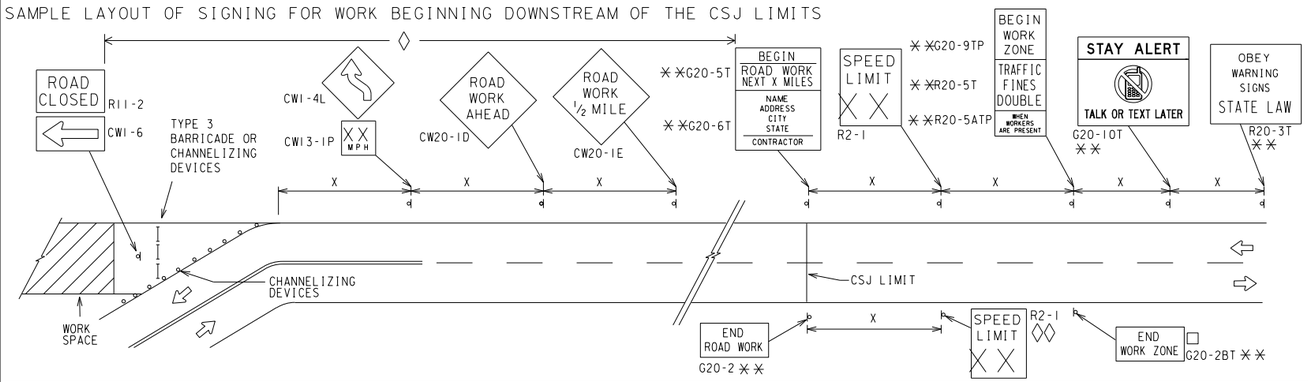
1. SPECIAL OR LARGER SIZE SIGNS MAY BE USED AS NECESSARY.
2. DISTANCE BETWEEN SIGNS SHOULD BE INCREASED AS REQUIRED TO HAVE 1500 FEET ADVANCE WARNING.
3. DISTANCE BETWEEN SIGNS SHOULD BE INCREASED AS REQUIRED TO HAVE 1/2 MILE OR MORE ADVANCE WARNING.
4. 36" X 36" "ROAD WORK AHEAD" (CW20-1D)SIGNS MAY 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.

Texas Department of Transportation

Traffic Safety Division Standard

BARRICADE AND CONSTRUCTION PROJECT LIMIT

BC(2)-21

FILE: BC-21.DGN	DN: TXDOT	CK: TXDOT	DW: TXDOT	CK: TXDOT
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REVISIONS	0902	90	019,ETC	CS
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7-13 5-21	FTW	TARRANT		16

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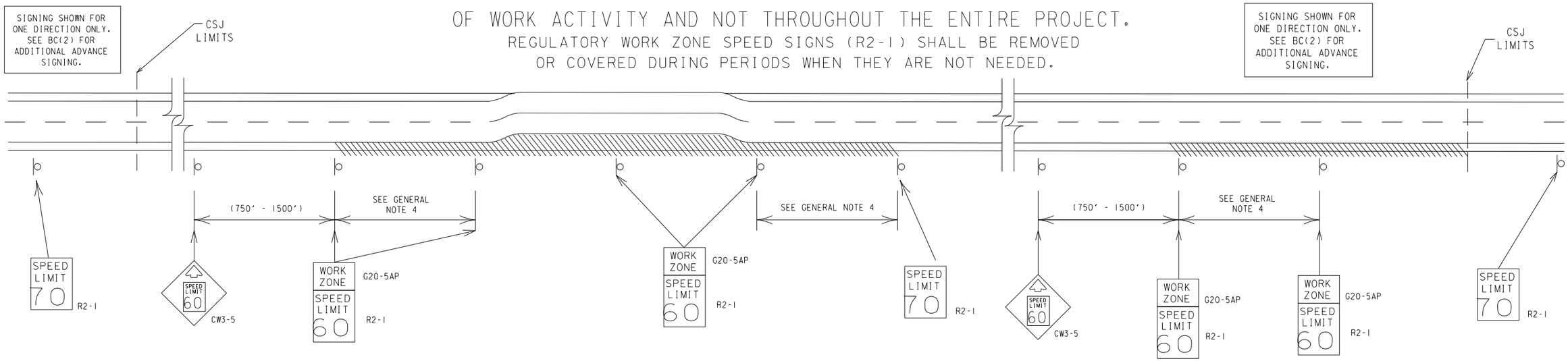
TYPICAL APPLICATION OF WORK ZONE SPEED LIMIT SIGNS

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[8]

LONG/INTERMEDIATE TERM WORK ZONE SPEED LIMITS

THIS TYPE OF WORK ZONE SPEED LIMIT SHOULD BE INCLUDED ON THE DESIGN OF THE TRAFFIC CONTROL PLANS WHEN RESTRICTED GEOMETRICS WITH A LOWER DESIGN SPEED ARE PRESENT IN THE WORK ZONE AND MODIFICATION OF THE GEOMETRICS TO A HIGHER DESIGN SPEED IS NOT FEASIBLE.

LONG/INTERMEDIATE TERM WORK ZONE SPEED LIMIT SIGNS, WHEN APPROVED AS DESCRIBED ABOVE, SHOULD BE POSTED AND VISIBLE TO THE MOTORIST WHEN WORK ACTIVITY IS PRESENT. WORK ACTIVITY MAY ALSO BE DEFINED AS A CHANGE IN THE ROADWAY THAT REQUIRES A REDUCED SPEED FOR MOTORISTS TO SAFELY NEGOTIATE THE WORK AREA, INCLUDING,

A) ROUGH ROAD OR DAMAGED PAVEMENT SURFACE
B) SUBSTANTIAL ALTERATION OF ROADWAY GEOMETRICS (DIVERSIONS)
C) CONSTRUCTION DETOURS
D) GRADE
E) WIDTH
F) OTHER CONDITIONS READILY APPARENT TO THE DRIVER

AS LONG AS ANY OF THESE CONDITIONS EXIST, THE WORK ZONE SPEED LIMIT SIGNS SHOULD REMAIN IN PLACE.

SHORT TERM WORK ZONE SPEED LIMITS

THIS TYPE OF WORK ZONE SPEED LIMIT MAY BE INCLUDED ON THE DESIGN OF THE TRAFFIC CONTROL PLANS WHEN WORKERS OR EQUIPMENT ARE NOT BEHIND CONCRETE BARRIER, WHEN WORK ACTIVITY IS WITHIN 10 FEET OF THE TRAVELED WAY OR ACTUALLY IN THE TRAVELED WAY.

SHORT TERM WORK ZONE SPEED LIMIT SIGNS SHOULD BE POSTED AND VISIBLE TO THE MOTORISTS ONLY WHEN WORK ACTIVITY IS PRESENT. WHEN WORK ACTIVITY IS NOT PRESENT, SIGNS SHALL BE REMOVED OR COVERED.
(SEE REMOVING OR COVERING ON BC(4)).

GENERAL NOTES

1. REGULATORY WORK ZONE SPEED LIMITS SHOULD BE USED ONLY FOR SECTIONS OF CONSTRUCTION PROJECTS WHERE SPEED CONTROL IS OF MAJOR IMPORTANCE.
2. REGULATORY WORK ZONE SPEED LIMIT SIGNS SHALL BE PLACED ON SUPPORTS AT A 7 FOOT MINIMUM MOUNTING HEIGHT.
3. SPEED ZONE SIGNS ARE ILLUSTRATED FOR ONE DIRECTION OF TRAVEL AND ARE NORMALLY POSTED FOR EACH DIRECTION OF TRAVEL.
4. FREQUENCY OF WORK ZONE SPEED LIMIT SIGNS SHOULD BE:
   40 MPH AND GREATER 0.2 TO 2 MILES
   35 MPH AND LESS 0.2 TO 1 MILE
5. REGULATORY SPEED LIMIT SIGNS SHALL HAVE BLACK LEGEND AND BORDER ON A WHITE REFLECTIVE BACKGROUND (SEE "REFLECTIVE SHEETING" ON BC(4)).
6. FABRICATION, ERECTION AND MAINTENANCE OF THE"ADVANCE SPEED LIMIT"(CW3-5)SIGN, "WORK ZONE"(G20-5AP) PLAQUE AND THE "SPEED LIMIT"(R2-1)SIGNS SHALL NOT BE PAID FOR DIRECTLY, BUT SHALL BE CONSIDERED SUBSIDIARY TO ITEM 502.
7. TURNING SIGNS FROM VIEW, LAYING SIGNS OVER OR DOWN WILL NOT BE ALLOWED, UNLESS AS OTHERWISE NOTED UNDER "REMOVING OR COVERING" ON BC(4).
8. TECHNIQUES THAT MAY HELP REDUCE TRAFFIC SPEEDS INCLUDE BUT ARE NOT LIMITED TO:
   A. LAW ENFORCEMENT.
   B. FLAGGER STATIONED NEXT TO SIGN.
   C. PORTABLE CHANGEABLE MESSAGE SIGN (PCMS).
   D. LOW-POWER (DRONE) RADAR TRANSMITTER.
   E. SPEED MONITOR TRAILERS OR SIGNS.
9. SPEEDS SHOWN ON DETAILS ABOVE ARE FOR ILLUSTRATION ONLY. WORK ZONE SPEED LIMITS SHOULD ONLY BE POSTED AS APPROVED FOR EACH PROJECT.
10. FOR MORE SPECIFIC GUIDANCE CONCERNING THE TYPE OF WORK, WORK ZONE CONDITIONS AND FACTORS IMPACTING ALLOWABLE REGULATORY CONSTRUCTION SPEED ZONE REDUCTION SEE TXDOT FORM 1204 IN THE TXDOT E-FORM SYSTEM.

Texas Department of Transportation

Traffic Safety Division Standard

BARRICADE AND CONSTRUCTION WORK ZONE SPEED LIMIT

BC(3)-21

FILE: BC-21.DGN	DN: TXDOT	CK: TXDOT	DW: TXDOT	CK: TXDOT
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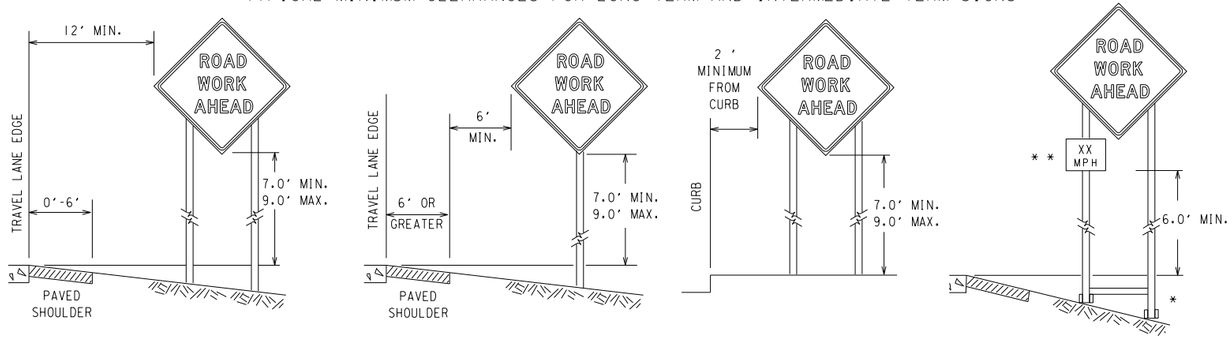
REVISIONS 9-07 8-14 7-13 5-21	0902	90	019,ETC	CS
	DIST	COUNTY		SHEET NO.
	FTW	TARRANT		17

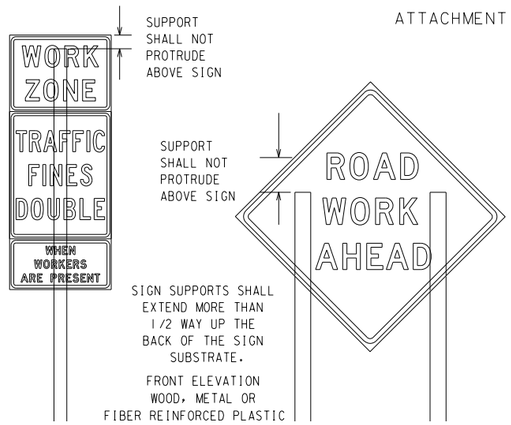
TYPICAL MINIMUM CLEARANCES FOR LONG TERM AND INTERMEDIATE TERM SIGNS

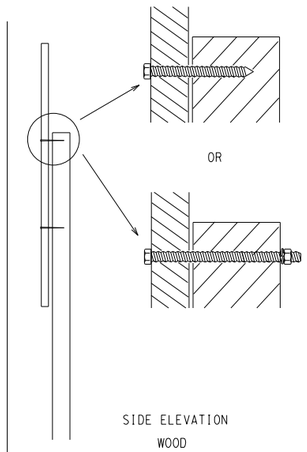


* WHEN PLACING SKID SUPPORTS ON UNLEVEL GROUND, THE LEG POST LENGTHS MUST BE ADJUSTED SO THE SIGN APPEARS STRAIGHT AND PLUMB. OBJECTS SHALL NOT BE PLACED UNDER SKIDS AS A MEANS OF LEVELING.

* * WHEN PLAQUES ARE PLACED ON DUAL-LEG SUPPORTS, THEY SHOULD BE ATTACHED TO THE UPRIGHT NEAREST THE TRAVEL LANE. SUPPLEMENTAL PLAQUES (ADVISORY OR DISTANCE) SHOULD NOT COVER THE SURFACE OF THE PARENT SIGN.

ATTACHMENT FOR SIGN SUPPORTS





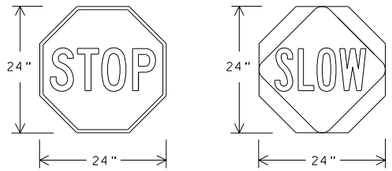
ATTACHMENT TO WOODEN SUPPORTS WILL BE BY BOLTS AND NUTS OR SCREWS. USE TXDOT'S OR MANUFACTURER'S RECOMMENDED PROCEDURES FOR ATTACHING SIGN SUBSTRATES TO OTHER TYPES OF SIGN SUPPORTS

NAILS SHALL NOT BE ALLOWED. EACH SIGN SHALL BE ATTACHED DIRECTLY TO THE SIGN SUPPORT. MULTIPLE SIGNS SHALL NOT BE JOINED OR SPLICED BY ANY MEANS. WOOD SUPPORTS SHALL NOT BE EXTENDED OR REPAIRED BY SPLICING OR OTHER MEANS.

SPLICING EMBEDDED PERFORATED SQUARE METAL TUBING IN ORDER TO EXTEND POST HEIGHT WILL ONLY BE ALLOWED WHEN THE SPLICE IS MADE USING FOUR BOLTS, TWO ABOVE AND TWO BELOW THE SPICE POINT. SPLICE MUST BE LOCATED ENTIRELY BEHIND THE SIGN SUBSTRATE, NOT NEAR THE BASE OF THE SUPPORT. SPLICE INSERT LENGTHS SHOULD BE AT LEAST 5 TIMES NOMINAL POST SIZE, CENTERED ON THE SPLICE AND OF AT LEAST THE SAME GAUGE MATERIAL.

STOP/SLOW PADDLES

1. STOP/SLOW PADDLES ARE THE PRIMARY METHOD TO CONTROL TRAFFIC BY FLAGGERS. THE STOP/SLOW PADDLE SIZE SHOULD BE 24" X 24".
2. STOP/SLOW PADDLES SHALL BE RETROREFLECTORIZED WHEN USED AT NIGHT.
3. STOP/SLOW PADDLES MAY BE ATTACHED TO A STAFF WITH A MINIMUM LENGTH OF 6' TO THE BOTTOM OF THE SIGN.
4. ANY LIGHTS INCORPORATED INTO THE STOP OR SLOW PADDLE FACES SHALL ONLY BE AS SPECIFICALLY DESCRIBED IN SECTION 6E.03 HAND SIGNALING DEVICES IN THE TMUTCD.



BACKGROUND - RED
LEGEND & BORDER - WHITE

BACKGROUND - ORANGE
LEGEND & BORDER - BLACK

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

CONTRACTOR REQUIREMENTS FOR MAINTAINING PERMANENT SIGNS WITHIN THE PROJECT LIMITS

1. PERMANENT SIGNS ARE USED TO GIVE NOTICE OF TRAFFIC LAWS OR REGULATIONS, CALL ATTENTION TO CONDITIONS THAT ARE POTENTIALLY HAZARDOUS TO TRAFFIC OPERATIONS, SHOW ROUTE DESIGNATIONS, DESTINATIONS, DIRECTIONS, DISTANCES, SERVICES, POINTS OF INTEREST, AND OTHER GEOGRAPHICAL, RECREATIONAL, SPECIFIC SERVICE (LOGO), OR CULTURAL INFORMATION. DRIVERS PROCEEDING THROUGH A WORK ZONE NEED THE SAME, IF NOT BETTER ROUTE GUIDANCE AS NORMALLY INSTALLED ON A ROADWAY WITHOUT CONSTRUCTION.
2. WHEN PERMANENT REGULATORY OR WARNING SIGNS CONFLICT WITH WORK ZONE CONDITIONS, REMOVE OR COVER THE PERMANENT SIGNS UNTIL THE PERMANENT SIGN MESSAGE MATCHES THE ROADWAY CONDITION. FOR DETAILS FOR COVERING LARGE GUIDE SIGNS SEE THE TS-CD STANDARD.
3. WHEN EXISTING PERMANENT SIGNS ARE MOVED AND RELOCATED DUE TO CONSTRUCTION PURPOSES, THEY SHALL BE VISIBLE TO MOTORISTS AT ALL TIMES.
4. IF EXISTING SIGNS ARE TO BE RELOCATED ON THEIR ORIGINAL SUPPORTS, THEY SHALL BE INSTALLED ON CRASHWORTHY BASES AS SHOWN ON THE SMD STANDARD SHEETS. THE SIGNS SHALL MEET THE REQUIRED MOUNTING HEIGHTS SHOWN ON THE BC SHEETS OR THE SMD STANDARDS. THIS WORK SHOULD BE PAID FOR UNDER THE APPROPRIATE PAY ITEM FOR RELOCATING EXISTING SIGNS.
5. IF PERMANENT SIGNS ARE TO BE REMOVED AND RELOCATED USING TEMPORARY SUPPORTS, THE CONTRACTOR SHALL USE CRASHWORTHY SUPPORTS AS SHOWN ON THE BC STANDARD SHEETS, TLRS STANDARD SHEETS OR THE CWZTCD LIST. THE SIGNS SHALL MEET THE REQUIRED MOUNTING HEIGHTS SHOWN ON THE BC, OR THE SMD STANDARD SHEETS DURING CONSTRUCTION. THIS WORK SHOULD BE PAID FOR UNDER THE APPROPRIATE PAY ITEM FOR RELOCATING EXISTING SIGNS.
6. ANY SIGN OR TRAFFIC CONTROL DEVICE THAT IS STRUCK OR DAMAGED BY THE CONTRACTOR OR HIS/HER CONSTRUCTION EQUIPMENT SHALL BE REPLACED AS SOON AS POSSIBLE BY THE CONTRACTOR TO ENSURE PROPER GUIDANCE FOR THE MOTORISTS. THIS WILL BE SUBSIDIARY TO ITEM 502.

GENERAL NOTES FOR WORK ZONE SIGNS

1. CONTRACTOR SHALL INSTALL AND MAINTAIN SIGNS IN A STRAIGHT AND PLUMB CONDITION AND/OR AS DIRECTED BY THE ENGINEER.
2. WOODEN SIGN POSTS SHALL BE PAINTED WHITE.
3. BARRICADES SHALL NOT BE USED AS SIGN SUPPORTS.
4. ALL SIGNS SHALL BE INSTALLED IN ACCORDANCE WITH THE PLANS OR AS DIRECTED BY THE ENGINEER. SIGNS SHALL BE USED TO REGULATE, WARN, AND GUIDE THE TRAVELING PUBLIC SAFELY THROUGH THE WORK ZONE.
5. THE CONTRACTOR MAY FURNISH EITHER THE SIGN DESIGN SHOWN IN THE PLANS OR IN THE "STANDARD HIGHWAY SIGN DESIGNS FOR TEXAS" (SHSD). THE ENGINEER/INSPECTOR MAY REQUIRE THE CONTRACTOR TO FURNISH OTHER WORK ZONE SIGNS THAT ARE SHOWN IN THE TMUTCD BUT MAY HAVE BEEN OMITTED FROM THE PLANS. ANY VARIATION IN THE PLANS SHALL BE DOCUMENTED BY WRITTEN AGREEMENT BETWEEN THE ENGINEER AND THE CONTRACTOR'S RESPONSIBLE PERSON. ALL CHANGES MUST BE DOCUMENTED IN WRITING BEFORE BEING IMPLEMENTED. THIS CAN INCLUDE DOCUMENTING THE CHANGES IN THE INSPECTOR'S TXDOT DIARY AND HAVING BOTH THE INSPECTOR AND CONTRACTOR INITIAL AND DATE THE AGREED UPON CHANGES.
6. THE CONTRACTOR SHALL FURNISH SIGN SUPPORTS LISTED IN THE "COMPLIANT WORK ZONE TRAFFIC CONTROL DEVICE LIST" (CWZTCD) FOR SMALL ROADSIDE SIGNS. SUPPORTS FOR TEMPORARY LARGE ROADSIDE SIGNS SHALL MEET THE REQUIREMENTS DETAILED ON THE TEMPORARY LARGE ROADSIDE SIGNS (TLRS) STANDARD SHEETS.THE CONTRACTOR SHALL INSTALL THE SIGN SUPPORT IN ACCORDANCE WITH THE MANUFACTURER'S RECOMMENDATIONS. IF THERE IS A QUESTION REGARDING INSTALLATION PROCEDURES, THE CONTRACTOR SHALL FURNISH THE ENGINEER A COPY OF THE MANUFACTURER'S INSTALLATION RECOMMENDATIONS SO THE ENGINEER CAN VERIFY THE CORRECT PROCEDURES ARE BEING FOLLOWED.
7. THE CONTRACTOR IS RESPONSIBLE FOR INSTALLING SIGNS ON APPROVED SUPPORTS AND REPLACING SIGNS WITH DAMAGED OR CRACKED SUBSTRATES AND/OR DAMAGED OR MARRED REFLECTIVE SHEETING AS DIRECTED BY THE ENGINEER/INSPECTOR.
8. IDENTIFICATION MARKINGS MAY BE SHOWN ONLY ON THE BACK OF THE SIGN SUBSTRATE. THE MAXIMUM HEIGHT OF LETTERS AND/OR COMPANY LOGOS USED FOR IDENTIFICATION SHALL BE 1 INCH.
9. THE CONTRACTOR SHALL REPLACE DAMAGED WOOD POSTS. NEW OR DAMAGED WOOD SIGN POSTS SHALL NOT BE SPLICED.

DURATION OF WORK (AS DEFINED BY THE "TEXAS MANUAL ON UNIFORM TRAFFIC CONTROL DEVICES" PART 6)

1. THE TYPES OF SIGN SUPPORTS, SIGN MOUNTING HEIGHT,THE SIZE OF SIGNS, AND THE TYPE OF SIGN SUBSTRATES CAN VARY BASED ON THE TYPE OF WORK BEING PERFORMED. THE ENGINEER IS RESPONSIBLE FOR SELECTING THE APPROPRIATE SIZE SIGN FOR THE TYPE OF WORK BEING PERFORMED. THE CONTRACTOR IS RESPONSIBLE FOR ENSURING THE SIGN SUPPORT, SIGN MOUNTING HEIGHT AND SUBSTRATE MEETS MANUFACTURER'S RECOMMENDATIONS IN REGARD TO CRASHWORTHINESS AND DURATION OF WORK REQUIREMENTS.
   A. LONG-TERM STATIONARY - WORK THAT OCCUPIES A LOCATION MORE THAN 3 DAYS.
   B. INTERMEDIATE-TERM STATIONARY - WORK THAT OCCUPIES A LOCATION MORE THAN ONE DAYLIGHT PERIOD UP TO 3 DAYS, OR NIGHTTIME WORK LASTING MORE THAN ONE HOUR.
   C. SHORT-TERM STATIONARY - DAYTIME WORK THAT OCCUPIES A LOCATION FOR MORE THAN 1 HOUR IN A SINGLE DAYLIGHT PERIOD.
   D. SHORT, DURATION - WORK THAT OCCUPIES A LOCATION UP TO 1 HOUR.
   E. MOBILE - WORK THAT MOVES CONTINUOUSLY OR INTERMITTENTLY (STOPPING FOR UP TO APPROXIMATELY 15 MINUTES.)

SIGN MOUNTING HEIGHT

1. THE BOTTOM OF LONG-TERM/INTERMEDIATE-TERM SIGNS SHALL BE AT LEAST 7 FEET, BUT NOT MORE THAN 9 FEET, ABOVE THE PAVED SURFACE, EXCEPT AS SHOWN FOR SUPPLEMENTAL PLAQUES MOUNTED BELOW OTHER SIGNS.
2. THE BOTTOM OF SHORT-TERM/SHORT DURATION SIGNS SHALL BE A MINIMUM OF 1 FOOT ABOVE THE PAVEMENT SURFACE BUT NO MORE THAN 2 FEET ABOVE THE GROUND.
3. LONG-TERM/INTERMEDIATE-TERM SIGNS MAY BE USED IN LIEU OF SHORT-TERM/SHORT DURATION SIGNING.
4. SHORT-TERM/SHORT DURATION SIGNS SHALL BE USED ONLY DURING DAYLIGHT AND SHALL BE REMOVED AT THE END OF THE WORKDAY OR RAISED TO APPROPRIATE LONG-TERM/INTERMEDIATE SIGN HEIGHT.
5. REGULATORY SIGNS SHALL BE MOUNTED AT LEAST 7 FEET, BUT NOT MORE THAN 9 FEET, ABOVE THE PAVED SURFACE REGARDLESS OF WORK DURATION.

SIZE OF SIGNS

1. THE CONTRACTOR SHALL FURNISH THE SIGN SIZES SHOWN ON BC (2) UNLESS OTHERWISE SHOWN IN THE PLANS OR AS DIRECTED BY THE ENGINEER.

SIGN SUBSTRATES

1. THE CONTRACTOR SHALL ENSURE THE SIGN SUBSTRATE IS INSTALLED IN ACCORDANCE WITH THE MANUFACTURER'S RECOMMENDATIONS FOR THE TYPE OF SIGN SUPPORT THAT IS BEING USED. THE CWZTCD LISTS EACH SUBSTRATE THAT CAN BE USED ON THE DIFFERENT TYPES AND MODELS OF SIGN SUPPORTS.
2. "MESH" TYPE MATERIALS ARE NOT AN APPROVED SIGN SUBSTRATE, REGARDLESS OF THE TIGHTNESS OF THE WEAVE.
3. ALL WOODEN INDIVIDUAL SIGN PANELS FABRICATED FROM 2 OR MORE PIECES SHALL HAVE ONE OR MORE PLYWOOD CLEAT, 1/2" THICK BY 6" WIDE, FASTENED TO THE BACK OF THE SIGN AND EXTENDING FULLY ACROSS THE SIGN. THE CLEAT SHALL BE ATTACHED TO THE BACK OF THE SIGN USING WOOD SCREWS THAT DO NOT PENETRATE THE FACE OF THE SIGN PANEL. THE SCREWS SHALL BE PLACED ON BOTH SIDES OF THE SPLICE AND SPACED AT 6" CENTERS. THE ENGINEER MAY APPROVE OTHER METHODS OF SPLICING THE SIGN FACE.

REFLECTIVE SHEETING

1. ALL SIGNS SHALL BE RETROREFLECTIVE AND CONSTRUCTED OF SHEETING MEETING THE COLOR AND RETRO-REFLECTIVITY REQUIREMENTS OF DMS-8300 FOR RIGID SIGNS OR DMS-8310 FOR ROLL-UP SIGNS. THE WEB ADDRESS FOR DMS SPECIFICATIONS IS SHOWN ON BC(1).
2. WHITE SHEETING, MEETING THE REQUIREMENTS OF DMS-8300 TYPE A, SHALL BE USED FOR SIGNS WITH A WHITE BACKGROUND.
3. ORANGE SHEETING, MEETING THE REQUIREMENTS OF DMS-8300 TYPE B_{FL} OR TYPE C_{FL} , SHALL BE USED FOR RIGID SIGNS WITH ORANGE BACKGROUNDS.

SIGN LETTERS

1. ALL SIGN LETTERS AND NUMBERS SHALL BE CLEAR, AND OPEN ROUNDED TYPE UPPERCASE ALPHABET LETTERS AS APPROVED BY THE FEDERAL HIGHWAY ADMINISTRATION (FHWA) AND AS PUBLISHED IN THE "STANDARD HIGHWAY SIGN DESIGN FOR TEXAS" MANUAL. SIGNS, LETTERS AND NUMBERS SHALL BE OF FIRST CLASS WORKMANSHIP IN ACCORDANCE WITH DEPARTMENT STANDARDS AND SPECIFICATIONS.

REMOVING OR COVERING

1. WHEN SIGN MESSAGES MAY BE CONFUSING OR DO NOT APPLY, THE SIGNS SHALL BE REMOVED OR COMPLETELY COVERED.
2. LONG-TERM STATIONARY OR INTERMEDIATE STATIONARY SIGNS INSTALLED ON SQUARE METAL TUBING MAY BE TURNED AWAY FROM TRAFFIC 90 DEGREES WHEN THE SIGN MESSAGE IS NOT APPLICABLE. THIS TECHNIQUE MAY NOT BE USED FOR SIGNS INSTALLED IN THE MEDIAN OF DIVIDED HIGHWAYS OR NEAR ANY INTERSECTIONS WHERE THE SIGN MAY BE SEEN FROM APPROACHING TRAFFIC.
3. SIGNS INSTALLED ON WOODEN SKIDS SHALL NOT BE TURNED AT 90 DEGREE ANGLES TO THE ROADWAY. THESE SIGNS SHOULD BE REMOVED OR COMPLETELY COVERED WHEN NOT REQUIRED.
4. WHEN SIGNS ARE COVERED, THE MATERIAL USED SHALL BE OPAQUE, SUCH AS HEAVY MIL BLACK PLASTIC, OR OTHER MATERIALS WHICH WILL COVER THE ENTIRE SIGN FACE AND MAINTAIN THEIR OPAQUE PROPERTIES UNDER AUTOMOBILE HEADLIGHTS AT NIGHT, WITHOUT DAMAGING THE SIGN SHEETING.
5. BURLAP SHALL NOT BE USED TO COVER SIGNS.
6. DUCT TAPE OR OTHER ADHESIVE MATERIAL SHALL NOT BE AFFIXED TO A SIGN FACE.
7. SIGNS AND ANCHOR STUBS SHALL BE REMOVED AND HOLES BACKFILLED UPON COMPLETION OF WORK.

SIGN SUPPORT WEIGHTS

1. WHERE SIGN SUPPORTS REQUIRE THE USE OF WEIGHTS TO KEEP FROM TURNING OVER, THE USE OF SANDBAGS WITH DRY, COHESIONLESS SAND SHOULD BE USED.
2. THE SANDBAGS WILL BE TIED SHUT TO KEEP THE SAND FROM SPILLING AND TO MAINTAIN A CONSTANT WEIGHT.
3. ROCK, CONCRETE, IRON, STEEL OR OTHER SOLID OBJECTS SHALL NOT BE PERMITTED FOR USE AS SIGN SUPPORT WEIGHTS.
4. SANDBAGS SHOULD WEIGH A MINIMUM OF 35 LBS AND A MAXIMUM OF 50 LBS.
5. SANDBAGS SHALL BE MADE OF A DURABLE MATERIAL THAT TEARS UPON VEHICULAR IMPACT. RUBBER (SUCH AS TIRE INNER TUBES) SHALL NOT BE USED.
6. RUBBER BALLASTS DESIGNED FOR CHANNELIZING DEVICES SHOULD NOT BE USED FOR BALLAST ON PORTABLE SIGN SUPPORTS. SIGN SUPPORTS DESIGNED AND MANUFACTURED WITH RUBBER BASES MAY BE USED WHEN SHOWN ON THE CWZTCD LIST.
7. SANDBAGS SHALL ONLY BE PLACED ALONG OR LAID OVER THE BASE SUPPORTS OF THE TRAFFIC CONTROL DEVICE AND SHALL NOT BE SUSPENDED ABOVE GROUND LEVEL OR HUNG WITH ROPE, WIRE, CHAINS OR OTHER FASTENERS. SANDBAGS SHALL BE PLACED ALONG THE LENGTH OF THE SKIDS TO WEIGH DOWN THE SIGN SUPPORT.
8. SANDBAGS SHALL NOT BE PLACED UNDER THE SKID AND SHALL NOT BE USED TO LEVEL SIGN SUPPORTS PLACED ON SLOPES.

FLAGS ON SIGNS

1. FLAGS MAY BE USED TO DRAW ATTENTION TO WARNING SIGNS. WHEN USED, THE FLAG SHALL BE 16 INCHES SQUARE OR LARGER AND SHALL BE ORANGE OR FLUORESCENT RED-ORANGE IN COLOR. FLAGS SHALL NOT BE ALLOWED TO COVER ANY PORTION OF THE SIGN FACE.

Texas Department of Transportation

Traffic Safety Division Standard

BARRICADE AND CONSTRUCTION TEMPORARY SIGN NOTES

BC(4)-21

FILE: BC-21.DGN	DN: TXDOT	CK: TXDOT	DW: TXDOT	CK: TXDOT
©TXDOT NOVEMBER 2002	CONT	SECT	JOB	HIGHWAY
REVISIONS	0902	90	019,ETC	CS
9-07 8-14	DIST	COUNTY		SHEET NO.
7-13 5-21	FTW	TARRANT		18

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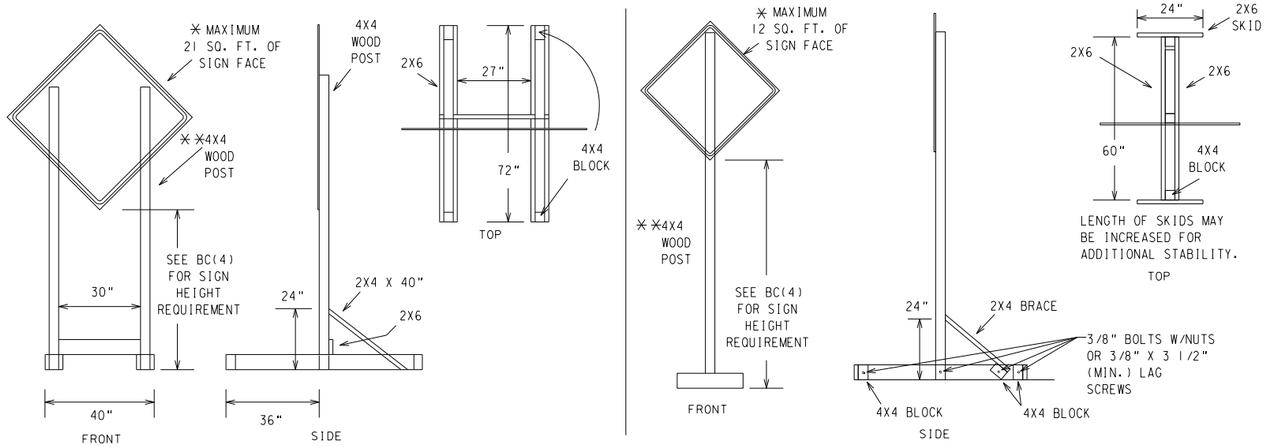
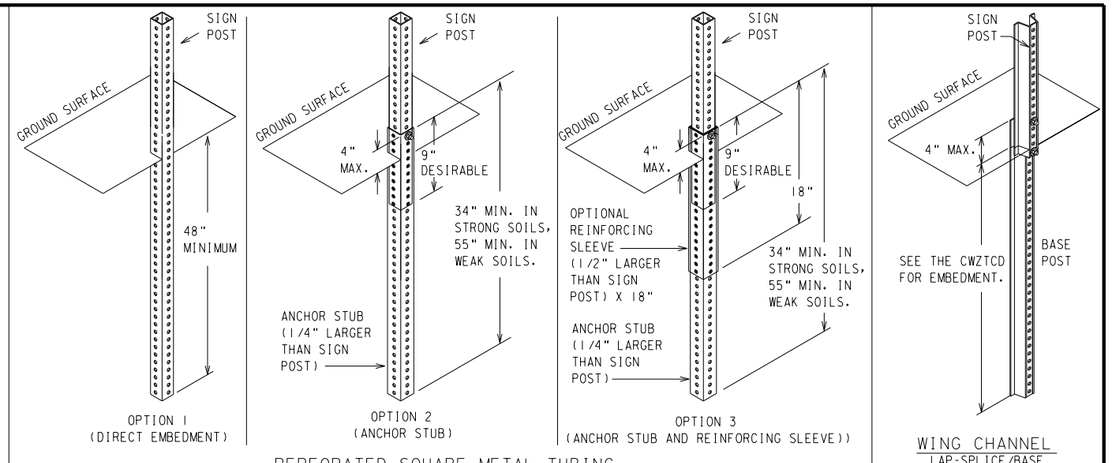


SKID MOUNTED WOOD SIGN SUPPORTS

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

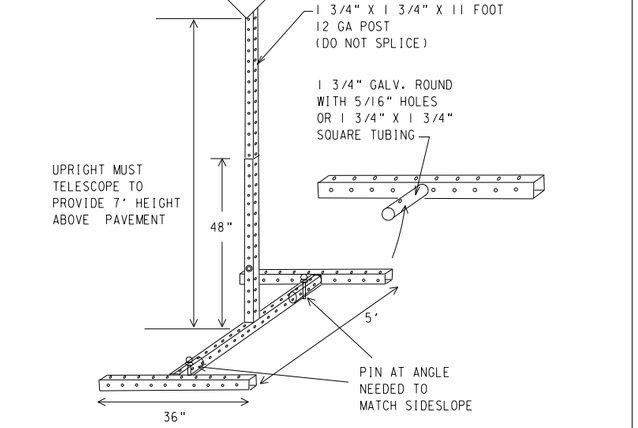


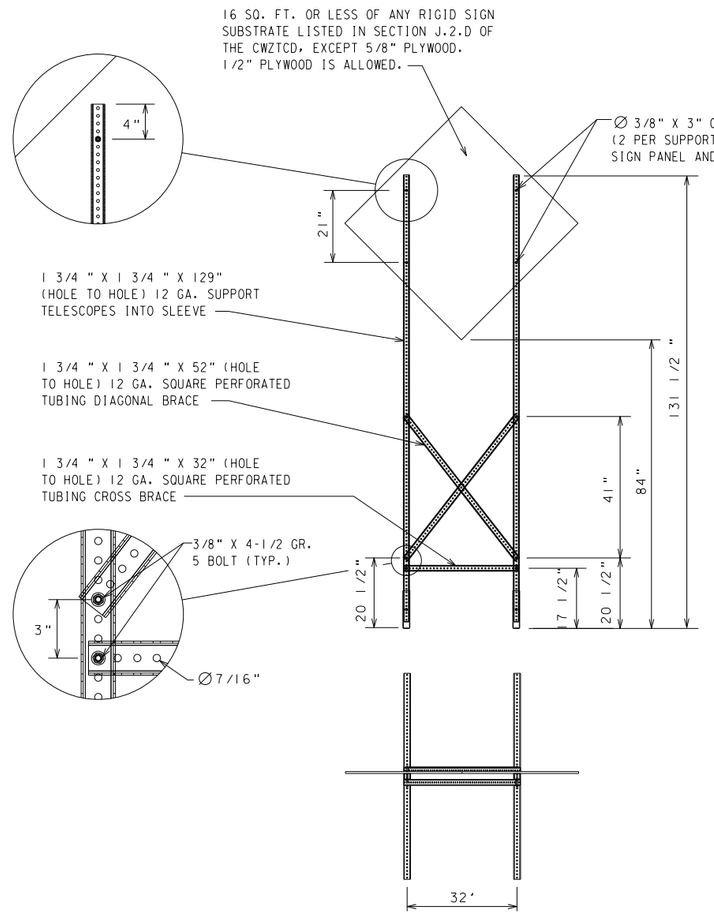
PERFORATED SQUARE METAL TUBING

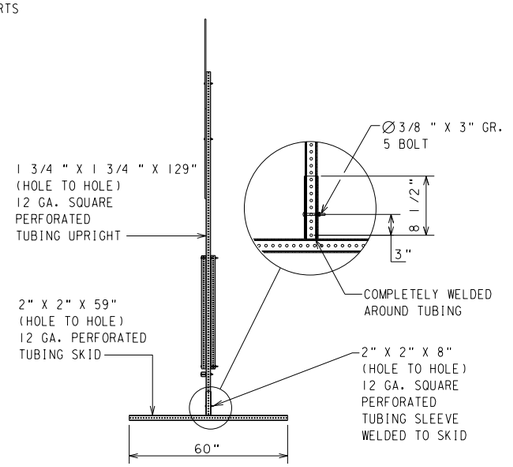
WING CHANNEL
LAP-SPLICE/BASE BOLTED ANCHOR

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.







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.

SKID MOUNTED PERFORATED SQUARE STEEL TUBING SIGN SUPPORTS

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

Texas Department of Transportation

Traffic Safety Division Standard

BARRICADE AND CONSTRUCTION TYPICAL SIGN SUPPORT

BC(5)-21

FILE: BC-21.DGN	DN: TXDOT	CK: TXDOT	DW: TXDOT	CK: TXDOT
©TXDOT NOVEMBER 2002	CONT	SECT	JOB	HIGHWAY
REVISIONS	0902	90	019,ETC	CS
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7-13 5-21	FTW	TARRANT		19

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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	0902	90	019,ETC	CS
9-07 8-14	DIST	COUNTY		SHEET NO.
7-13 5-21	FTW	TARRANT		20

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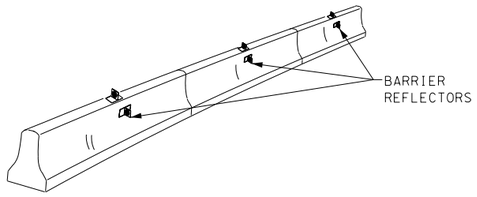
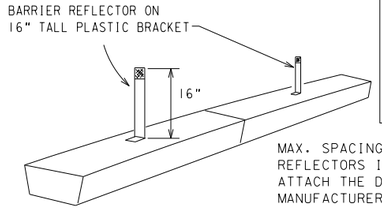
1. BARRIER REFLECTORS SHALL BE PRE-QUALIFIED, AND CONFORM TO THE COLOR AND REFLECTIVITY REQUIREMENTS OF DMS-8600. A LIST OF PREQUALIFIED BARRIER REFLECTORS CAN BE FOUND AT THE MATERIAL PRODUCER LIST WEB ADDRESS SHOWN ON BC(1).
2. COLOR OF BARRIER REFLECTORS SHALL BE AS SPECIFIED IN THE TMUTCD. THE COST OF THE REFLECTORS SHALL BE CONSIDERED SUBSIDIARY TO ITEM 512.



CONCRETE TRAFFIC BARRIER (CTB)

3. WHERE TRAFFIC IS ON ONE SIDE OF THE CTB, TWO (2) BARRIER REFLECTORS SHALL BE MOUNTED IN APPROXIMATELY THE MIDSECTION OF EACH SECTION OF CTB. AN ALTERNATE MOUNTING LOCATION IS UNIFORMLY SPACED AT ONE END OF EACH CTB. THIS WILL ALLOW FOR ATTACHMENT OF A BARRIER GRAPPLE WITHOUT DAMAGING THE REFLECTOR. THE BARRIER REFLECTOR MOUNTED ON THE SIDE OF THE CTB SHALL BE LOCATED DIRECTLY BELOW THE REFLECTOR MOUNTED ON TOP OF THE BARRIER, AS SHOWN IN THE DETAIL ABOVE.
4. WHERE CTB SEPARATES TWO-WAY TRAFFIC, THREE BARRIER REFLECTORS SHALL BE MOUNTED ON EACH SECTION OF CTB. THE REFLECTOR UNIT ON TOP SHALL HAVE TWO YELLOW REFLECTIVE FACES (BI-DIRECTIONAL)WHILE THE REFLECTORS ON EACH SIDE OF THE BARRIER SHALL HAVE ONE YELLOW REFLECTIVE FACE, AS SHOWN IN THE DETAIL ABOVE.
5. WHEN CTB SEPARATES TRAFFIC TRAVELING IN THE SAME DIRECTION, NO BARRIER REFLECTORS WILL BE REQUIRED ON TOP OF THE CTB.
6. BARRIER REFLECTOR UNITS SHALL BE YELLOW OR WHITE IN COLOR TO MATCH THE EDGELINE BEING SUPPLEMENTED.
7. MAXIMUM SPACING OF BARRIER REFLECTORS IS FORTY (40) FEET.
8. PAVEMENT MARKERS OR TEMPORARY FLEXIBLE-REFLECTIVE ROADWAY MARKER TABS SHALL NOT BE USED AS CTB DELINEATION.
9. ATTACHMENT OF BARRIER REFLECTORS TO CTB SHALL BE PER MANUFACTURER'S RECOMMENDATIONS.
10. MISSING OR DAMAGED BARRIER REFLECTORS SHALL BE REPLACED AS DIRECTED BY THE ENGINEER.
11. SINGLE SLOPE BARRIERS SHALL BE DELINEATED AS SHOWN ON THE ABOVE DETAIL.

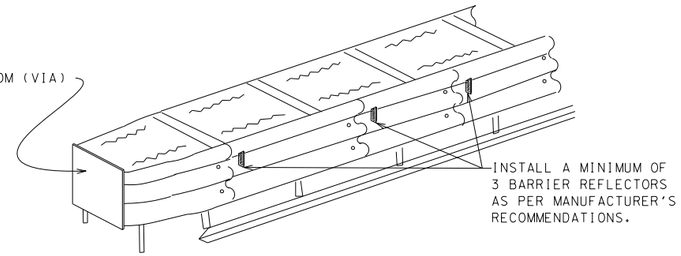


MAX. SPACING OF BARRIER REFLECTORS IS 20 FEET. ATTACH THE DELINEATORS AS PER MANUFACTURER'S RECOMMENDATIONS.

LOW PROFILE CONCRETE BARRIER (LPCB)

LOW PROFILE CONCRETE BARRIER (LPCB) USED IN WORK ZONES

LPCB IS APPROVED FOR USE IN WORK ZONE LOCATIONS, WHERE THE POSTED SPEED IS 45MPH, OR LESS. SEE ROADWAY STANDARD SHEET LPCB.

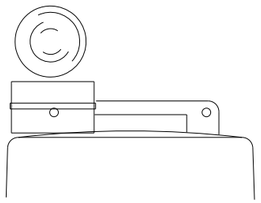


DELINEATION OF END TREATMENTS

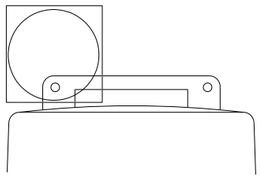
END TREATMENTS FOR CTB'S USED IN WORK ZONES

END TREATMENTS USED ON CTB'S IN WORK ZONES SHALL MEET THE APPPROPRIATE CRASHWORTHY STANDARDS AS DEFINED IN THE MANUAL FOR ASSESSING SAFETY HARDWARE (MASH). REFER TO THE CWZTCD LIST FOR APPROVED END TREATMENTS AND MANUFACTURERS.

BARRIER REFLECTORS FOR CONCRETE TRAFFIC BARRIER AND ATTENUATORS



TYPE C WARNING LIGHT OR APPROVED SUBSTITUTE MOUNTED ON A DRUM ADJACENT TO THE TRAVEL WAY.



WARNING REFLECTOR MAY BE ROUND OR SQUARE.MUST HAVE A YELLOW REFLECTIVE SURFACE AREA OF AT LEAST 30 SQUARE INCHES

WARNING LIGHTS

1. WARNING LIGHTS SHALL MEET THE REQUIREMENTS OF THE TMUTCD.
2. WARNING LIGHTS SHALL NOT BE INSTALLED ON BARRICADES.
3. TYPE A-LOW INTENSITY FLASHING WARNING LIGHTS ARE COMMONLY USED WITH DRUMS. THEY ARE INTENDED TO WARN OF OR MARK A POTENTIALLY HAZARDOUS AREA. THEIR USE SHALL BE AS INDICATED ON THIS SHEET AND/OR OTHER SHEETS OF THE PLANS BY THE DESIGNATION "FL". THE TYPE A WARNING LIGHTS SHALL NOT BE USED WITH SIGNS MANUFACTURED WITH TYPE B_{FL} OR C_{FL} SHEETING MEETING THE REQUIREMENTS OF DEPARTMENTAL MATERIAL SPECIFICATION DMS-8300.
4. TYPE-C AND TYPE D 360 DEGREE STEADY BURN LIGHTS ARE INTENDED TO BE USED IN A SERIES FOR DELINEATION TO SUPPLEMENT OTHER TRAFFIC CONTROL DEVICES. THEIR USE SHALL BE AS INDICATED ON THIS SHEET AND/OR OTHER SHEETS OF THE PLANS BY THE DESIGNATION "SB".
5. THE ENGINEER/INSPECTOR OR THE PLANS SHALL SPECIFY THE LOCATION AND TYPE OF WARNING LIGHTS TO BE INSTALLED ON THE TRAFFIC CONTROL DEVICES.
6. WHEN REQUIRED BY THE ENGINEER, THE CONTRACTOR SHALL FURNISH A COPY OF THE WARNING LIGHTS CERTIFICATION. THE WARNING LIGHT MANUFACTURER WILL CERTIFY THE WARNING LIGHTS MEET THE REQUIREMENTS OF THE LATEST ITE PURCHASE SPECIFICATIONS FOR FLASHING AND STEADY-BURN WARNING LIGHTS.
7. WHEN USED TO DELINEATE CURVES, TYPE-C AND TYPE D STEADY BURN LIGHTS SHOULD ONLY BE PLACED ON THE OUTSIDE OF THE CURVE, NOT THE INSIDE.
8. THE LOCATION OF WARNING LIGHTS AND WARNING REFLECTORS ON DRUMS SHALL BE AS SHOWN ELSEWHERE IN THE PLANS.

WARNING LIGHTS MOUNTED ON PLASTIC DRUMS

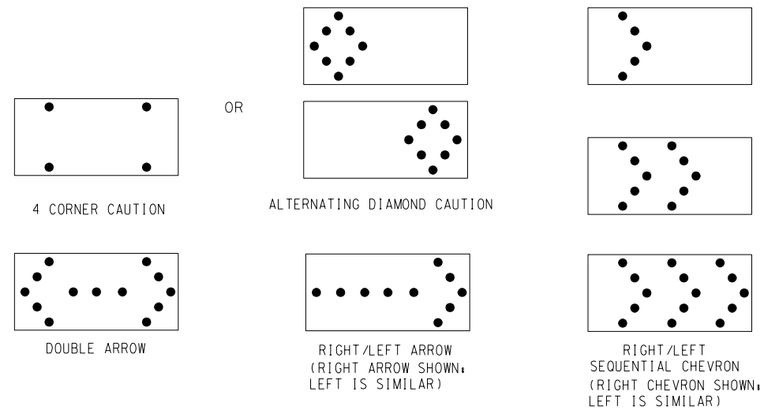
1. TYPE A FLASHING WARNING LIGHTS ARE INTENDED TO WARN DRIVERS THAT THEY ARE APPROACHING OR ARE IN A POTENTIALLY HAZARDOUS AREA.
2. TYPE A RANDOM FLASHING WARNING LIGHTS ARE NOT INTENDED FOR DELINEATION AND SHALL NOT BE USED IN A SERIES.
3. A SERIES OF SEQUENTIAL FLASHING WARNING LIGHTS PLACED ON CHANNELIZING DEVICES TO FORM A MERGING TAPER MAY BE USED FOR DELINEATION. IF USED, THE SUCCESSIVE FLASHING OF THE SEQUENTIAL WARNING LIGHTS SHOULD OCCUR FROM THE BEGINNING OF THE TAPER TO THE END OF THE MERGING TAPER IN ORDER TO IDENTIFY THE DESIRED VEHICLE PATH. THE RATE OF FLASHING FOR EACH LIGHT SHALL BE 65 FLASHES PER MINUTE, PLUS OR MINUS 10 FLASHES.
4. TYPE C AND D STEADY-BURN WARNING LIGHTS ARE INTENDED TO BE USED IN A SERIES TO DELINEATE THE EDGE OF THE TRAVEL LANE ON DETOURS, ON LANE CHANGES, ON LANE CLOSURES, AND ON OTHER SIMILAR CONDITIONS.
5. TYPE A, TYPE C AND TYPE D WARNING LIGHTS SHALL BE INSTALLED AT LOCATIONS AS DETAILED ON OTHER SHEETS IN THE PLANS.
6. WARNING LIGHTS SHALL NOT BE INSTALLED ON A DRUM THAT HAS A SIGN, CHEVRON OR VERTICAL PANEL.
7. THE MAXIMUM SPACING FOR WARNING LIGHTS ON DRUMS SHOULD BE IDENTICAL TO THE CHANNELIZING DEVICE SPACING.

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

1. A WARNING REFLECTOR OR APPROVED SUBSTITUTE MAY BE MOUNTED ON A PLASTIC DRUM AS A SUBSTITUTE FOR A TYPE C, STEADY BURN WARNING LIGHT AT THE DISCRETION OF THE CONTRACTOR UNLESS OTHERWISE NOTED IN THE PLANS.
2. THE WARNING REFLECTOR SHALL BE YELLOW IN COLOR AND SHALL BE MANUFACTURED USING A SIGN SUBSTRATE APPROVED FOR USE WITH PLASTIC DRUMS LISTED ON THE CWZTCD.
3. THE WARNING REFLECTOR SHALL HAVE A MINIMUM RETROREFLECTIVE SURFACE AREA (ONE-SIDE) OF 30 SQUARE INCHES.
4. ROUND REFLECTORS SHALL BE FULLY REFLECTORIZED, INCLUDING THE AREA WHERE ATTACHED TO THE DRUM.
5. SQUARE SUBSTRATES MUST HAVE A MINIMUM OF 30 SQUARE INCHES OF REFLECTORIZED SHEETING. THEY DO NOT HAVE TO BE REFLECTORIZED WHERE IT ATTACHES TO THE DRUM.
6. THE SIDE OF THE WARNING REFLECTOR FACING APPROACHING TRAFFIC SHALL HAVE SHEETING MEETING THE COLOR AND RETROREFLECTIVITY REQUIREMENTS FOR DMS 8300-TYPE B OR TYPE C.
7. WHEN USED NEAR TWO-WAY TRAFFIC, BOTH SIDES OF THE WARNING REFLECTOR SHALL BE REFLECTORIZED.
8. THE WARNING REFLECTOR SHOULD BE MOUNTED ON THE SIDE OF THE HANDLE NEAREST APPROACHING TRAFFIC.
9. THE MAXIMUM SPACING FOR WARNING REFLECTORS SHOULD BE IDENTICAL TO THE CHANNELIZING DEVICE SPACING REQUIREMENTS.

ARROW BOARDS MAY BE LOCATED BEHIND CHANNELIZING DEVICES IN PLACE FOR A SHOULDER TAPER OR MERGING TAPER, OTHERWISE THEY SHALL BE DELINEATED WITH FOUR (4) CHANNELIZING DEVICES PLACED PERPENDICULAR TO TRAFFIC ON THE UPSTREAM SIDE OF TRAFFIC.

1. THE FLASHING ARROW BOARD SHOULD BE USED FOR ALL LANE CLOSURES ON MULTI-LANE ROADWAYS, OR SLOW MOVING MAINTENANCE OR CONSTRUCTION ACTIVITIES ON THE TRAVEL LANES.
2. FLASHING ARROW BOARDS SHOULD NOT BE USED ON TWO-LANE, TWO-WAY ROADWAYS, DETOURS, DIVERSIONS OR WORK ON SHOULDERS UNLESS THE "CAUTION" DISPLAY (SEE DETAIL BELOW) IS USED.
3. THE ENGINEER/INSPECTOR SHALL CHOOSE ALL APPROPRIATE SIGNS, BARRICADES AND/OR OTHER TRAFFIC CONTROL DEVICES THAT SHOULD BE USED IN CONJUNCTION WITH THE FLASHING ARROW BOARD.
4. THE FLASHING ARROW BOARD SHOULD BE ABLE TO DISPLAY THE FOLLOWING SYMBOLS:



5. THE "CAUTION" DISPLAY CONSISTS OF FOUR CORNER LAMPS FLASHING SIMULTANEOUSLY, OR THE ALTERNATING DIAMOND CAUTION MODE AS SHOWN.
6. THE STRAIGHT LINE CAUTION DISPLAY IS NOT ALLOWED.
7. THE FLASHING ARROW BOARD SHALL BE CAPABLE OF MINIMUM 50 PERCENT DIMMING FROM RATED LAMP VOLTAGE. THE FLASHING RATE OF THE LAMPS SHALL NOT BE LESS THAN 25 NOR MORE THAN 40 FLASHES PER MINUTE.
8. MINIMUM LAMP "ON TIME" SHALL BE APPROXIMATELY 50 PERCENT FOR THE FLASHING ARROW AND EQUAL INTERVALS OF 25 PERCENT FOR EACH SEQUENTIAL PHASE OF THE FLASHING CHEVRON.
9. THE SEQUENTIAL ARROW DISPLAY IS NOT ALLOWED.
10. THE FLASHING ARROW DISPLAY IS THE TXDOT STANDARD; HOWEVER, THE SEQUENTIAL CHEVRON DISPLAY MAY BE USED DURING DAYLIGHT OPERATIONS.
11. THE FLASHING ARROW BOARD SHALL BE MOUNTED ON A VEHICLE, TRAILER OR OTHER SUITABLE SUPPORT.
12. A FLASHING ARROW BOARD SHALL NOT BE USED TO LATERALLY SHIFT TRAFFIC.
13. A FULL MATRIX PCMS MAY BE USED TO SIMULATE A FLASHING ARROW BOARD PROVIDED IT MEETS VISIBILITY, FLASH RATE AND DIMMING REQUIREMENTS ON THIS SHEET FOR THE SAME SIZE ARROW.
14. MINIMUM MOUNTING HEIGHT OF TRAILER MOUNTED ARROW BOARDS SHOULD BE 7 FEET FROM ROADWAY TO BOTTOM OF PANEL.

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

ATTENTION
FLASHING ARROW BOARDS SHALL BE EQUIPPED WITH AUTOMATIC DIMMING DEVICES.

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

FLASHING ARROW BOARDS

TRUCK-MOUNTED ATTENUATORS

1. TRUCK-MOUNTED ATTENUATORS (TMA) USED ON TXDOT FACILITIES MUST MEET THE REQUIREMENTS OUTLINED IN THE MANUAL FOR ASSESSING SAFETY HARDWARE (MASH).
2. REFER TO THE CWZTCD FOR THE REQUIREMENTS OF LEVEL 2 OR LEVEL 3 TMAS.
3. REFER TO THE CWZTCD FOR A LIST OF APPROVED TMAS.
4. TMAS ARE REQUIRED ON FREEWAYS UNLESS OTHERWISE NOTED IN THE PLANS.
5. A TMA SHOULD BE USED ANYTIME THAT IT CAN BE POSITIONED 30 TO 100 FEET IN ADVANCE OF THE AREA OF CREW EXPOSURE WITHOUT ADVERSELY AFFECTING THE WORK PERFORMANCE.
6. THE ONLY REASON A TMA SHOULD NOT BE REQUIRED IS WHEN A WORK AREA IS SPREAD DOWN THE ROADWAY AND THE WORK CREW IS AN EXTENDED DISTANCE FROM THE TMA.

Texas Department of Transportation — Traffic Safety Division Standard

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

BC(7)-21

FILE: BC-21.DGN	DN: TXDOT	CK: TXDOT	DW: TXDOT	CK: TXDOT
©TXDOT NOVEMBER 2002	CONT	SECT	JOB	HIGHWAY
REVISIONS	0902	90	019,ETC	CS
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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,

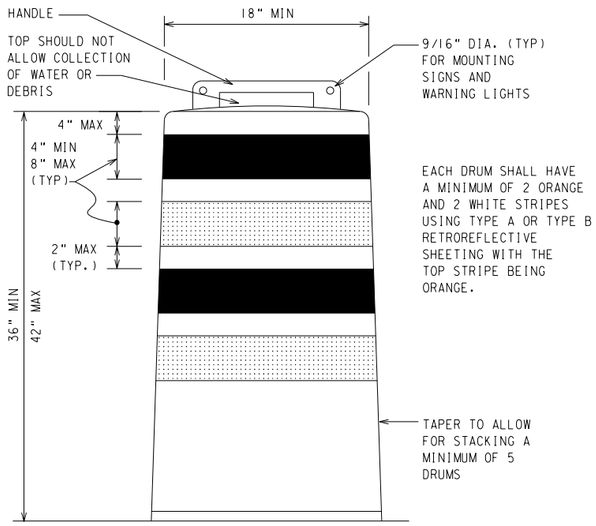
1. PLASTIC DRUMS SHALL BE A TWO-PIECE DESIGN, THE "BODY" OF THE DRUM SHALL BE THE TOP PORTION AND THE "BASE" SHALL BE THE BOTTOM.
2. THE BODY AND BASE SHALL LOCK TOGETHER IN SUCH A MANNER THAT THE BODY SEPARATES FROM THE BASE WHEN IMPACTED BY A VEHICLE TRAVELING AT A SPEED OF 20 MPH OR GREATER BUT PREVENTS 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.

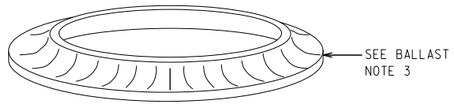
RETROREFLECTIVE SHEETING

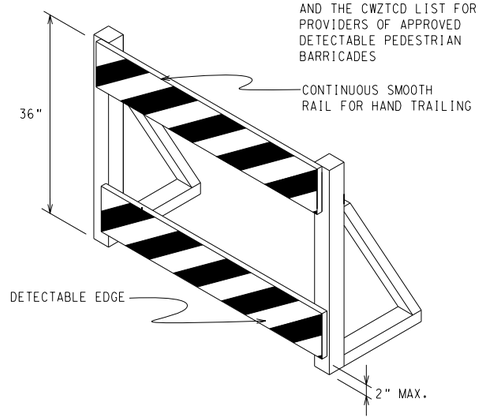
1. THE STRIPES USED ON DRUMS SHALL BE CONSTRUCTED OF SHEETING MEETING THE COLOR AND RETROREFLECTIVITY REQUIREMENTS OF DEPARTMENTAL MATERIALS SPECIFICATION DMS-8300, "SIGN FACE MATERIALS." TYPE A OR TYPE B REFLECTIVE SHEETING SHALL BE SUPPLIED UNLESS OTHERWISE SPECIFIED IN THE PLANS.
2. THE SHEETING SHALL 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.

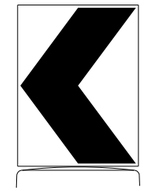




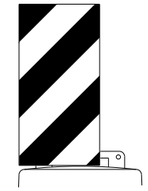


DETECTABLE PEDESTRIAN BARRICADES

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 CWI-8, OPPOSING TRAFFIC LANE DIVIDER, DRIVEWAY SIGN D70A, KEEP RIGHT R4 SERIES OR OTHER SIGNS AS APPROVED BY ENGINEER



12" X 24"
VERTICAL PANEL
MOUNT WITH DIAGONALS SLOPING DOWN TOWARDS TRAVEL WAY

PLYWOOD, ALUMINUM OR METAL SIGN SUBSTRATES SHALL NOT BE USED ON PLASTIC DRUMS

SIGNS, CHEVRONS, AND VERTICAL PANELS MOUNTED ON PLASTIC DRUMS

1. SIGNS USED ON PLASTIC DRUMS SHALL BE MANUFACTURED USING SUBSTRATES LISTED ON THE CWZTCD.
2. CHEVRONS AND OTHER WORK ZONE SIGNS WITH AN ORANGE BACKGROUND SHALL BE MANUFACTURED WITH TYPE B_{FL} OR TYPE C_{FL} ORANGE SHEETING MEETING THE COLOR AND RETROREFLECTIVITY REQUIREMENTS OF DMS-8300, "SIGN FACE MATERIAL," UNLESS OTHERWISE SPECIFIED IN THE PLANS.
3. VERTICAL PANELS SHALL BE MANUFACTURED WITH ORANGE AND WHITE SHEETING MEETING THE REQUIREMENTS OF DMS-8300 TYPE A OR TYPE B. DIAGONAL STRIPES ON VERTICAL PANELS SHALL SLOPE DOWN TOWARD THE INTENDED TRAVELED LANE.
4. OTHER SIGN MESSAGES (TEXT OR SYMBOLIC) MAY BE USED AS APPROVED BY THE ENGINEER. SIGN DIMENSIONS SHALL NOT EXCEED 18 INCHES IN WIDTH OR 24 INCHES IN HEIGHT, EXCEPT FOR THE R9 SERIES SIGNS DISCUSSED IN NOTE 8 BELOW.
5. SIGNS SHALL BE INSTALLED USING A 1/2 INCH BOLT (NOMINAL) AND NUT, TWO WASHERS, AND ONE LOCKING WASHER FOR EACH CONNECTION.
6. MOUNTING BOLTS AND NUTS SHALL BE FULLY ENGAGED AND ADEQUATELY TORQUED. BOLTS SHOULD NOT EXTEND MORE THAN 1/2 INCH BEYOND NUTS.
7. CHEVRONS MAY BE PLACED ON DRUMS ON THE OUTSIDE OF CURVES, ON MERGING TAPERS OR ON SHIFTING TAPERS. WHEN USED IN THESE LOCATIONS, THEY MAY BE PLACED ON EVERY DRUM OR SPACED NOT MORE THAN ON EVERY THIRD DRUM. A MINIMUM OF THREE (3) SHOULD BE USED AT EACH LOCATION CALLED FOR IN THE PLANS.
8. R9-9, R9-10, R9-11 AND R9-11A SIDEWALK CLOSED SIGNS WHICH ARE 24 INCHES WIDE MAY BE MOUNTED ON PLASTIC DRUMS, WITH APPROVAL OF THE ENGINEER.

Texas Department of Transportation

Traffic Safety Division Standard

BARRICADE AND CONSTRUCTION CHANNELIZING DEVICES

BC(8)-21

FILE: BC-21.DGN	DN: TXDOT	CK: TXDOT	DW: TXDOT	CK: TXDOT
©TXDOT NOVEMBER 2002	CONT	SECT	JOB	HIGHWAY
REVISIONS	0902	90	019,ETC	CS
4-03 8-14	DIST	COUNTY		SHEET NO.
9-07 5-21	FTW	TARRANT		22
7-13				

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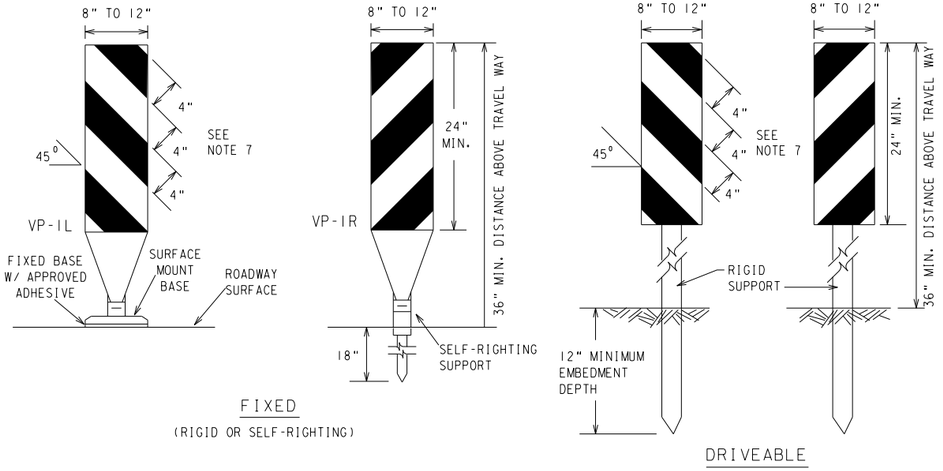
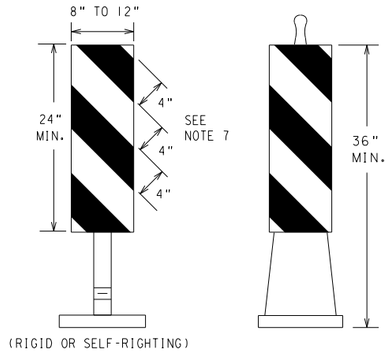


FIXED

(RIGID OR SELF-RIGHTING)

DRIVEABLE

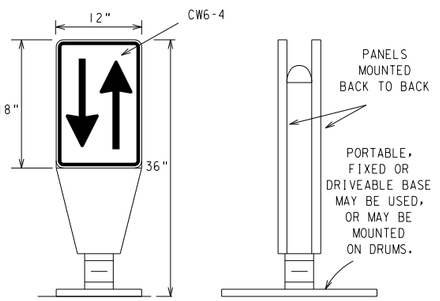


(RIGID OR SELF-RIGHTING)

PORTABLE

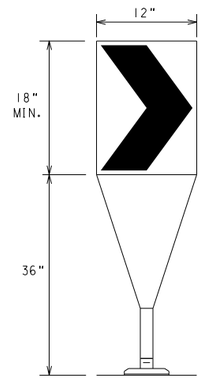
1. VERTICAL PANELS (VP'S) ARE NORMALLY USED TO CHANNELIZE TRAFFIC OR DIVIDE OPPOSING LANES OF TRAFFIC.
2. VP'S MAY BE USED IN DAYTIME OR NIGHTTIME SITUATIONS. THEY MAY BE USED AT THE EDGE OF SHOULDER DROP-OFFS AND OTHER AREAS SUCH AS LANE TRANSITIONS WHERE POSITIVE DAYTIME AND NIGHTTIME DELINEATION IS REQUIRED. THE ENGINEER/INSPECTOR SHALL REFER TO THE ROADWAY DESIGN MANUAL FOR ADDITIONAL REQUIREMENTS ON THE USE VP'S FOR DROP-OFFS.
3. VP'S SHOULD BE MOUNTED BACK TO BACK IF USED AT THE EDGE OF CUTS ADJACENT TO TWO-WAY TWO LANE ROADWAYS. STRIPES ARE TO BE REFLECTIVE ORANGE AND REFLECTIVE WHITE AND SHOULD ALWAYS SLOPE DOWNWARD TOWARD THE TRAVEL LANE.
4. VP'S USED ON EXPRESSWAYS AND FREEWAYS OR OTHER HIGH SPEED ROADWAYS, MAY HAVE MORE THAN 270 SQUARE INCHES OF RETROREFLECTIVE AREA FACING TRAFFIC.
5. SELF-RIGHTING SUPPORTS ARE AVAILABLE WITH PORTABLE BASE. SEE "COMPLIANT WORK ZONE TRAFFIC CONTROL DEVICES LIST" (CWZTCD).
6. SHEETING FOR THE VP'S SHALL BE RETROREFLECTIVE TYPE A OR TYPE B CONFORMING TO DEPARTMENTAL MATERIAL SPECIFICATION DMS-8300, UNLESS NOTED OTHERWISE.
7. WHERE THE HEIGHT OF REFLECTIVE MATERIAL ON THE VERTICAL PANEL IS 36 INCHES OR GREATER, A PANEL STRIPE OF 6 INCHES SHALL BE USED.

VERTICAL PANELS (VPS)



1. OPPOSING TRAFFIC LANE DIVIDERS (OTLD) ARE DELINEATION DEVICES DESIGNED TO CONVERT A NORMAL ONE-WAY ROADWAY SECTION TO TWO-WAY OPERATION. OTLD'S ARE USED ON TEMPORARY CENTERLINES. THE UPWARD AND DOWNWARD ARROWS ON THE SIGN'S FACE INDICATE THE DIRECTION OF TRAFFIC ON EITHER SIDE OF THE DIVIDER. THE BASE IS SECURED TO THE PAVEMENT WITH AN ADHESIVE OR RUBBER WEIGHT TO MINIMIZE MOVEMENT CAUSED BY A VEHICLE IMPACT OR WIND GUST.
2. THE OTLD MAY BE USED IN COMBINATION WITH 42" CONES OR VPS.
3. SPACING BETWEEN THE OTLD SHALL NOT EXCEED 500 FEET. 42" CONES OR VPS PLACED BETWEEN THE OTLD'S SHOULD NOT EXCEED 100 FOOT SPACING.
4. THE OTLD SHALL BE ORANGE WITH A BLACK NON-REFLECTIVE LEGEND. SHEETING FOR THE OTLD SHALL BE RETROREFLECTIVE TYPE B_{FL} OR TYPE C_{FL} CONFORMING TO DEPARTMENTAL MATERIAL SPECIFICATION DMS-8300, UNLESS NOTED OTHERWISE. THE LEGEND SHALL MEET THE REQUIREMENTS OF DMS-8300.

OPPOSING TRAFFIC LANE DIVIDERS (OTLD)



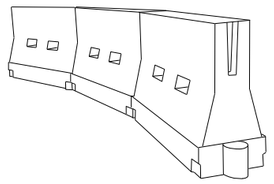
FIXED BASE W/ APPROVED ADHESIVE (DRIVEABLE BASE, OR FLEXIBLE SUPPORT CAN BE USED)

1. THE CHEVRON SHALL BE A VERTICAL RECTANGLE WITH A MINIMUM SIZE OF 12 BY 18 INCHES.
2. CHEVRONS ARE INTENDED TO GIVE NOTICE OF A SHARP CHANGE OF ALIGNMENT WITH THE DIRECTION OF TRAVEL AND PROVIDE ADDITIONAL EMPHASIS AND GUIDANCE FOR VEHICLE OPERATORS WITH REGARD TO CHANGES IN HORIZONTAL ALIGNMENT OF THE ROADWAY.
3. CHEVRONS, WHEN USED, SHALL BE ERECTED ON THE OUTSIDE OF A SHARP CURVE OR TURN, OR ON THE FAR SIDE OF AN INTERSECTION. THEY SHALL BE IN LINE WITH AND AT RIGHT ANGLES TO APPROACHING TRAFFIC. SPACING SHOULD BE SUCH THAT THE MOTORIST ALWAYS HAS THREE IN VIEW, UNTIL THE CHANGE IN ALIGNMENT ELIMINATES ITS NEED.
4. TO BE EFFECTIVE, THE CHEVRON SHOULD BE VISIBLE FOR AT LEAST 500 FEET.
5. CHEVRONS SHALL BE ORANGE WITH A BLACK NONREFLECTIVE LEGEND. SHEETING FOR THE CHEVRON SHALL BE RETROREFLECTIVE TYPE B_{FL} OR TYPE C_{FL} CONFORMING TO DEPARTMENTAL MATERIAL SPECIFICATION DMS-8300, UNLESS NOTED OTHERWISE. THE LEGEND SHALL MEET THE REQUIREMENTS OF DMS-8300.
6. FOR LONG TERM STATIONARY USE ON TAPERS OR TRANSITIONS ON FREEWAYS AND DIVIDED HIGHWAYS, SELF-RIGHTING CHEVRONS MAY BE USED TO SUPPLEMENT PLASTIC DRUMS BUT NOT TO REPLACE PLASTIC DRUMS.

CHEVRONS

GENERAL NOTES

1. WORK ZONE CHANNELIZING DEVICES ILLUSTRATED ON THIS SHEET MAY BE INSTALLED IN CLOSE PROXIMITY TO TRAFFIC AND ARE SUITABLE FOR USE ON HIGH OR LOW SPEED ROADWAYS. THE ENGINEER/INSPECTOR SHALL ENSURE THAT SPACING AND PLACEMENT IS UNIFORM AND IN ACCORDANCE WITH THE "TEXAS MANUAL ON UNIFORM TRAFFIC CONTROL DEVICES" (TMUTCD).
2. CHANNELIZING DEVICES SHOWN ON THIS SHEET MAY HAVE A DRIVEABLE, FIXED OR PORTABLE BASE. THE REQUIREMENT FOR SELF-RIGHTING CHANNELIZING DEVICES MUST BE SPECIFIED IN THE GENERAL NOTES OR OTHER PLAN SHEETS.
3. CHANNELIZING DEVICES ON SELF-RIGHTING SUPPORTS SHOULD BE USED IN WORK ZONE AREAS WHERE CHANNELIZING DEVICES ARE FREQUENTLY IMPACTED BY ERRANT VEHICLES OR VEHICLE RELATED WIND GUSTS MAKING ALIGNMENT OF THE CHANNELIZING DEVICES DIFFICULT TO MAINTAIN. LOCATIONS OF THESE DEVICES SHALL BE DETAILED ELSEWHERE IN THE PLANS. THESE DEVICES SHALL CONFORM TO THE TMUTCD AND THE "COMPLIANT WORK ZONE TRAFFIC CONTROL DEVICES LIST" (CWZTCD).
4. THE CONTRACTOR SHALL MAINTAIN DEVICES IN A CLEAN CONDITION AND REPLACE DAMAGED, NONREFLECTIVE, FADED, OR BROKEN DEVICES AND BASES AS REQUIRED BY THE ENGINEER/INSPECTOR. THE CONTRACTOR SHALL BE REQUIRED TO MAINTAIN PROPER DEVICE SPACING AND ALIGNMENT.
5. PORTABLE BASES SHALL BE FABRICATED FROM VIRGIN AND/OR RECYCLED RUBBER. THE PORTABLE BASES SHALL WEIGH A MINIMUM OF 30 LBS.
6. PAVEMENT SURFACES SHALL BE PREPARED IN A MANNER THAT ENSURES PROPER BONDING BETWEEN THE ADHESIVES, THE FIXED MOUNT BASES AND THE PAVEMENT SURFACE. ADHESIVES SHALL BE PREPARED AND APPLIED ACCORDING TO THE MANUFACTURER'S RECOMMENDATIONS.
7. THE INSTALLATION AND REMOVAL OF CHANNELIZING DEVICES SHALL NOT CAUSE DETRIMENTAL EFFECTS TO THE FINAL PAVEMENT SURFACES, INCLUDING PAVEMENT SURFACE DISCOLORATION OR SURFACE INTEGRITY. DRIVEABLE BASES SHALL NOT BE PERMITTED ON FINAL PAVEMENT SURFACES. THE ENGINEER/INSPECTOR SHALL APPROVE ALL APPLICATION AND REMOVAL PROCEDURES OF FIXED BASES.



LONGITUDINAL CHANNELIZING DEVICES (LCD)

1. LCDS ARE CRASHWORTHY, LIGHTWEIGHT, DEFORMABLE DEVICES THAT ARE HIGHLY VISIBLE, HAVE GOOD TARGET VALUE AND CAN BE CONNECTED TOGETHER. THEY ARE NOT DESIGNED TO CONTAIN OR REDIRECT A VEHICLE ON IMPACT.
2. LCDS MAY BE USED INSTEAD OF A LINE OF CONES OR DRUMS.
3. LCDS SHALL BE PLACED IN ACCORDANCE TO APPLICATION AND INSTALLATION REQUIREMENTS SPECIFIC TO THE DEVICE, AND USED ONLY WHEN SHOWN ON THE CWZTCD LIST.
4. LCDS SHOULD NOT BE USED TO PROVIDE POSITIVE PROTECTION FOR OBSTACLES, PEDESTRIANS OR WORKERS.
5. LCDS SHALL BE SUPPLEMENTED WITH RETROREFLECTIVE DELINEATION AS REQUIRED FOR TEMPORARY BARRIERS ON BC(7) WHEN PLACED ROUGHLY PARALLEL TO THE TRAVEL LANES.
6. LCDS USED AS BARRICADES PLACED PERPENDICULAR TO TRAFFIC SHOULD HAVE AT LEAST ONE ROW OF REFLECTIVE SHEETING MEETING THE REQUIREMENTS FOR BARRICADE RAILS AS SHOWN ON BC(10). PLACE REFLECTIVE SHEETING NEAR THE TOP OF THE LCD ALONG THE FULL LENGTH OF THE DEVICE.

WATER BALLASTED SYSTEMS USED AS BARRIERS

1. WATER BALLASTED SYSTEMS USED AS BARRIERS SHALL NOT BE USED SOLELY TO CHANNELIZE ROAD USERS, BUT ALSO TO PROTECT THE WORK SPACE PER THE APPROPRIATE MANUAL FOR ASSESSING SAFETY HARDWARE (MASH) CRASHWORTHINESS REQUIREMENTS BASED ON ROADWAY SPEED AND BARRIER APPLICATION.
2. WATER BALLASTED SYSTEMS USED TO CHANNELIZE VEHICULAR TRAFFIC SHALL BE SUPPLEMENTED WITH RETROREFLECTIVE DELINEATION OR CHANNELIZING DEVICES TO IMPROVE DAYTIME/NIGHTTIME VISIBILITY. THEY MAY ALSO BE SUPPLEMENTED WITH PAVEMENT MARKINGS.
3. WATER BALLASTED SYSTEMS USED AS BARRIERS SHALL BE PLACED IN ACCORDANCE TO APPLICATION AND INSTALLATION REQUIREMENTS SPECIFIC TO THE DEVICE, AND USED ONLY WHEN SHOWN ON THE CWZTCD LIST.
4. WATER BALLASTED SYSTEMS USED AS BARRIERS SHOULD NOT BE USED FOR A MERGING TAPER EXCEPT IN LOW SPEED (LESS THAN 45 MPH) URBAN AREAS. WHEN USED ON A TAPER IN A LOW SPEED URBAN AREA, THE TAPER SHALL BE DELINEATED AND THE TAPER LENGTH SHOULD BE DESIGNED TO OPTIMIZE ROAD USER OPERATIONS CONSIDERING THE AVAILABLE GEOMETRIC CONDITIONS.
5. WHEN WATER BALLASTED SYSTEMS USED AS BARRIERS HAVE BLUNT ENDS EXPOSED TO TRAFFIC, THEY SHOULD BE ATTENUATED AS PER MANUFACTURER RECOMMENDATIONS OR FLARED TO A POINT OUTSIDE THE CLEAR ZONE.

IF USED TO CHANNELIZE PEDESTRIANS, LONGITUDINAL CHANNELIZING DEVICES OR WATER BALLASTED SYSTEMS MUST HAVE A CONTINUOUS DETECTABLE BOTTOM FOR USERS OF LONG CANES AND THE TOP OF THE UNIT SHALL NOT BE LESS THAN 32 INCHES IN HEIGHT.

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

POSTED SPEED	FORMULA	MINIMUM DESIRABLE TAPER LENGTHS ** 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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BARRICADE AND CONSTRUCTION CHANNELIZING DEVICES

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FILE: BC-21.DGN	DN: TXDOT	CK: TXDOT	DW: TXDOT	CK: TXDOT
©TXDOT NOVEMBER 2002	CONT	SECT	JOB	HIGHWAY
REVISIONS	0902	90	019,ETC	CS
9-07 8-14	DIST	COUNTY		SHEET NO.
7-13 5-21	FTW	TARRANT		23

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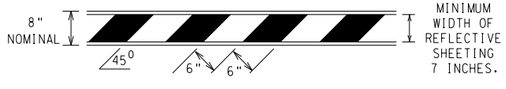
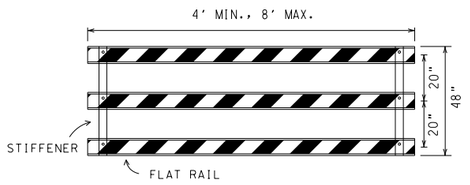
TYPE 3 BARRICADES

1. REFER TO THE COMPLIANT WORK ZONE TRAFFIC CONTROL DEVICES LIST (CWZTCD) FOR DETAILS OF THE TYPE 3 BARRICADES AND A LIST OF ALL MATERIALS USED IN THE CONSTRUCTION OF TYPE 3 BARRICADES.
2. TYPE 3 BARRICADES SHALL BE USED AT EACH END OF CONSTRUCTION PROJECTS CLOSED TO ALL TRAFFIC.
3. BARRICADES EXTENDING ACROSS A ROADWAY SHOULD HAVE STRIPES THAT SLOPE DOWNWARD IN THE DIRECTION TOWARD WHICH TRAFFIC MUST TURN IN DETOURING. WHEN BOTH RIGHT AND LEFT TURNS ARE PROVIDED, THE CHEVRON STRIPING MAY SLOPE DOWNWARD IN BOTH DIRECTIONS FROM THE CENTER OF THE BARRICADE. WHERE NO TURNS ARE PROVIDED AT A CLOSED ROAD, STRIPING SHOULD SLOPE DOWNWARD IN BOTH DIRECTIONS TOWARD THE CENTER OF ROADWAY.
4. STRIPING OF RAILS, FOR THE RIGHT SIDE OF THE ROADWAY, SHOULD SLOPE DOWNWARD TO THE LEFT. FOR THE LEFT SIDE OF THE ROADWAY, STRIPING SHOULD SLOPE DOWNWARD TO THE RIGHT.
5. IDENTIFICATION MARKINGS MAY BE SHOWN ONLY ON THE BACK OF THE BARRICADE RAILS. THE MAXIMUM HEIGHT OF LETTERS AND/OR COMPANY LOGOS USED FOR IDENTIFICATION SHALL BE 1".
6. BARRICADES SHALL NOT BE PLACED PARALLEL TO TRAFFIC UNLESS AN ADEQUATE CLEAR ZONE IS PROVIDED.
7. WARNING LIGHTS SHALL NOT BE INSTALLED ON BARRICADES.
8. WHERE BARRICADES REQUIRE THE USE OF WEIGHTS TO KEEP FROM TURNING OVER, THE USE OF SANDBAGS WITH DRY, COHESIONLESS SAND IS RECOMMENDED. THE SANDBAGS WILL BE TIED SHUT TO KEEP THE SAND FROM SPILLING AND TO MAINTAIN A CONSTANT WEIGHT. SAND BAGS SHALL NOT BE STACKED IN A MANNER THAT COVERS ANY PORTION OF A BARRICADE RAILS REFLECTIVE SHEETING. ROCK, CONCRETE, IRON, STEEL OR OTHER SOLID OBJECTS WILL NOT BE PERMITTED. SANDBAGS SHOULD WEIGH A MINIMUM OF 35 LBS AND A MAXIMUM OF 50 LBS. SANDBAGS SHALL BE MADE OF A DURABLE MATERIAL THAT TEARS UPON VEHICULAR IMPACT. RUBBER (SUCH AS TIRE INNER TUBES) SHALL NOT BE USED FOR SANDBAGS. SANDBAGS SHALL ONLY BE PLACED ALONG OR UPON THE BASE SUPPORTS OF THE DEVICE AND SHALL NOT BE SUSPENDED ABOVE GROUND LEVEL OR HUNG WITH ROPE, WIRE, CHAINS OR OTHER FASTENERS.
9. SHEETING FOR BARRICADES SHALL BE RETROREFLECTIVE TYPE A OR TYPE B CONFORMING TO DEPARTMENTAL MATERIAL SPECIFICATION DMS-8300 UNLESS OTHERWISE NOTED.

BARRICADES SHALL NOT BE USED AS A SIGN SUPPORT.



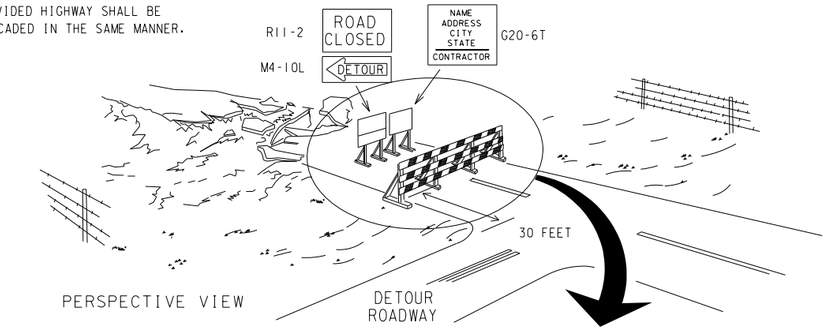
TYPICAL STRIPING DETAIL FOR BARRICADE RAIL



STIFFENER MAY BE INSIDE OR OUTSIDE OF SUPPORT, BUT NO MORE THAN 2 STIFFENERS SHALL BE ALLOWED ON ONE BARRICADE.

TYPICAL PANEL DETAIL
FOR SKID OR POST TYPE BARRICADES

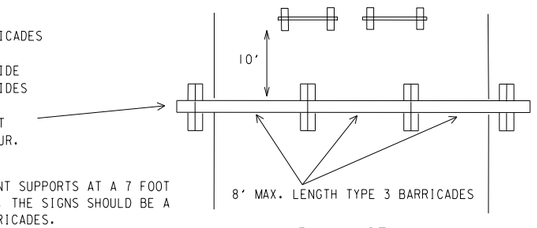
EACH ROADWAY OF A DIVIDED HIGHWAY SHALL BE BARRICADED IN THE SAME MANNER.



PERSPECTIVE VIEW

THE THREE RAILS ON TYPE 3 BARRICADES SHALL BE REFLECTORIZED ORANGE AND REFLECTIVE WHITE STRIPES ON ONE SIDE FACING ONE-WAY TRAFFIC AND BOTH SIDES FOR TWO-WAY TRAFFIC.

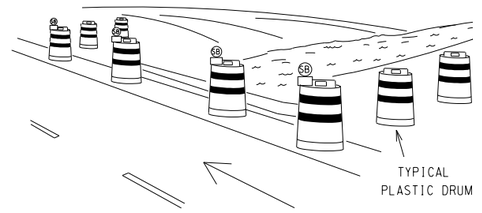
BARRICADE STRIPING SHOULD SLANT DOWNWARD IN THE DIRECTION OF DETOUR.



PLAN VIEW

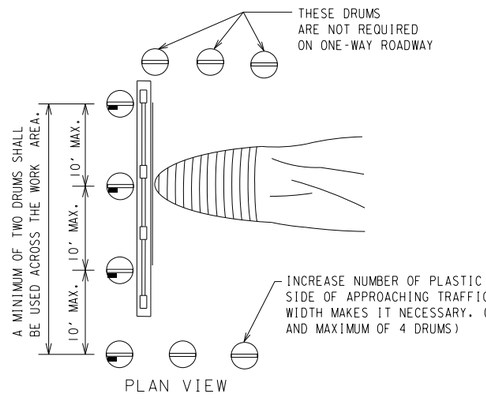
1. SIGNS SHOULD BE MOUNTED ON INDEPENDENT SUPPORTS AT A 7 FOOT MOUNTING HEIGHT IN CENTER OF ROADWAY. THE SIGNS SHOULD BE A MINIMUM OF 10 FEET BEHIND TYPE 3 BARRICADES.
2. ADVANCE SIGNING SHALL BE AS SPECIFIED ELSEWHERE IN THE PLANS.

TYPE 3 BARRICADE (POST AND SKID) TYPICAL APPLICATION



PERSPECTIVE VIEW

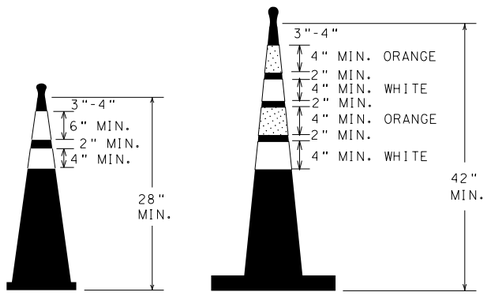
1. WHERE POSITIVE REDIRECTIONAL CAPABILITY IS PROVIDED, DRUMS MAY BE OMITTED.
2. PLASTIC CONSTRUCTION FENCING MAY BE USED WITH DRUMS FOR SAFETY AS REQUIRED IN THE PLANS.
3. VERTICAL PANELS ON FLEXIBLE SUPPORT MAY BE SUBSTITUTED FOR DRUMS WHEN THE SHOULDER WIDTH IS LESS THAN 4 FEET.
4. WHEN THE SHOULDER WIDTH IS GREATER THAN 12 FEET, STEADY-BURN LIGHTS MAY BE OMITTED IF DRUMS ARE USED.
5. DRUMS MUST EXTEND THE LENGTH OF THE CULVERT WIDENING.



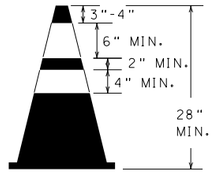
LEGEND	
	PLASTIC DRUM
	PLASTIC DRUM WITH STEADY BURN LIGHT OR YELLOW WARNING REFLECTOR
SB	STEADY BURN WARNING LIGHT OR YELLOW WARNING REFLECTOR

PLAN VIEW

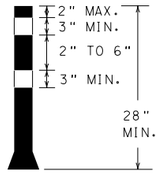
CULVERT WIDENING OR OTHER ISOLATED WORK WITHIN THE PROJECT LIMITS



TWO-PIECE CONES



ONE-PIECE CONES

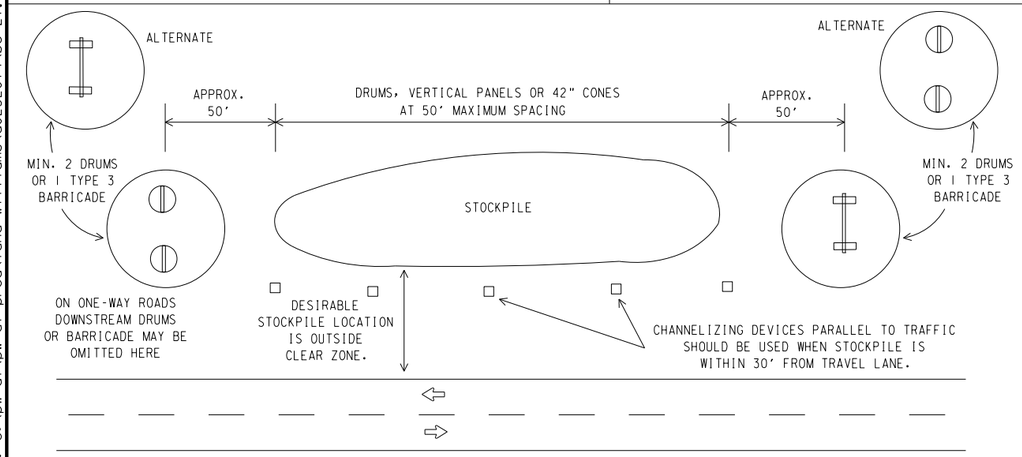


TUBULAR MARKER

28" CONES SHALL HAVE A MINIMUM WEIGHT OF 9 1/2 LBS.

42" 2-PIECE CONES SHALL HAVE A MINIMUM WEIGHT OF 30 LBS. INCLUDING BASE.

1. TRAFFIC CONES AND TUBULAR MARKERS SHALL BE PREDOMINANTLY ORANGE, AND MEET THE HEIGHT AND WEIGHT REQUIREMENTS SHOWN ABOVE.
2. ONE-PIECE CONES HAVE THE BODY AND BASE OF THE CONE MOLDED IN ONE CONSOLIDATED UNIT. TWO-PIECE CONES HAVE A CONE SHAPED BODY AND A SEPARATE RUBBER BASE, OR BALLAST, THAT IS ADDED TO KEEP THE DEVICE UPRIGHT AND IN PLACE.
3. TWO-PIECE CONES MAY HAVE A HANDLE OR LOOP EXTENDING UP TO 8" ABOVE THE MINIMUM HEIGHT SHOWN, IN ORDER TO AID IN RETRIEVING THE DEVICE.
4. CONES OR TUBULAR MARKERS SHALL HAVE WHITE OR WHITE AND ORANGE REFLECTIVE BANDS AS SHOWN ABOVE. THE REFLECTIVE BANDS SHALL HAVE A SMOOTH, SEALED OUTER SURFACE AND MEET THE REQUIREMENTS OF DEPARTMENTAL MATERIAL SPECIFICATION DMS-8300 TYPE A OR TYPE B.
5. 28" CONES AND TUBULAR MARKERS ARE GENERALLY SUITABLE FOR SHORT DURATION AND SHORT-TERM STATIONARY WORK AS DEFINED ON BC(4). THESE SHOULD NOT BE USED FOR INTERMEDIATE-TERM OR LONG-TERM STATIONARY WORK UNLESS PERSONNEL IS ON-SITE TO MAINTAIN THEM IN THEIR PROPER UPRIGHT POSITION.
6. 42" TWO-PIECE CONES, VERTICAL PANELS OR DRUMS ARE SUITABLE FOR ALL WORK ZONE DURATIONS.
7. CONES OR TUBULAR MARKERS USED ON EACH PROJECT SHOULD BE OF THE SAME SIZE AND SHAPE.



TRAFFIC CONTROL FOR MATERIAL STOCKPILES

SHEET 10 OF 12

Texas Department of Transportation

Traffic Safety Division Standard

BARRICADE AND CONSTRUCTION CHANNELIZING DEVICES

BC(10)-21

FILE: BC-21.DGN	DN: TXDOT	CK: TXDOT	DW: TXDOT	CK: TXDOT
©TXDOT NOVEMBER 2002	CONT	SECT	JOB	HIGHWAY
REVISIONS	0902	90	019,ETC	CS
9-07 8-14	DIST	COUNTY		SHEET NO.
7-13 5-21	FTW	TARRANT		24

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DATE: 4/12/2024 12:58:49 PM
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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.

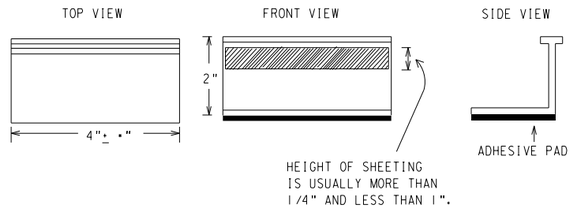
MAINTAINING WORK ZONE PAVEMENT MARKINGS

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

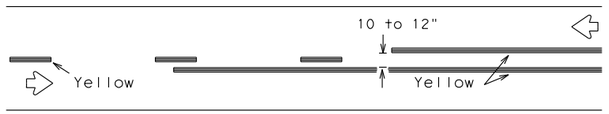
Traffic Safety Division Standard

BARRICADE AND CONSTRUCTION PAVEMENT MARKINGS

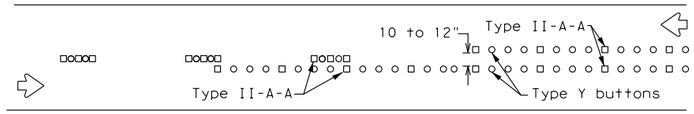
BC(11)-21

FILE: BC-21.DGN	DN: TXDOT	CK: TXDOT	DW: TXDOT	CK: TXDOT
©TXDOT FEBRUARY 1998	CONT	SECT	JOB	HIGHWAY
REVISIONS 2-98 9-07 5-21 1-02 7-13 11-02 8-14	0902	90	019,ETC	CS
	DIST	COUNTY		SHEET NO.
	FTW	TARRANT		25

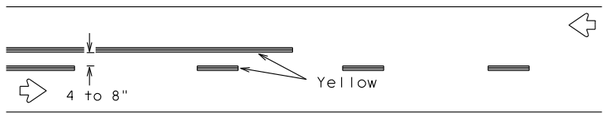
PAVEMENT MARKING PATTERNS



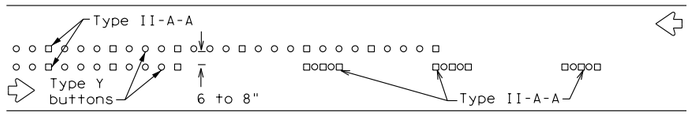
REFLECTORIZED PAVEMENT MARKINGS - PATTERN A



RAISED PAVEMENT MARKERS - PATTERN A



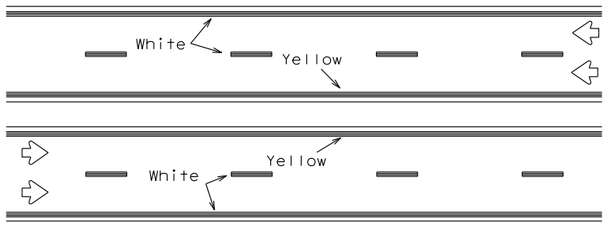
REFLECTORIZED PAVEMENT MARKINGS - PATTERN B



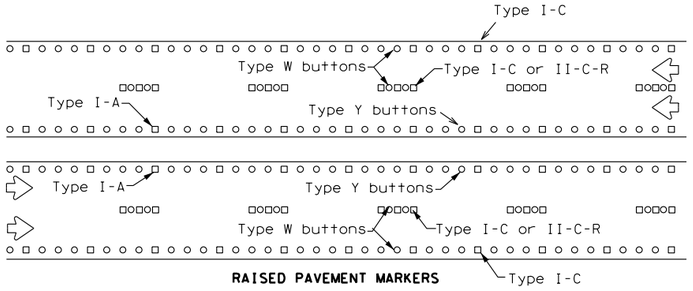
RAISED PAVEMENT MARKERS - PATTERN B

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

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



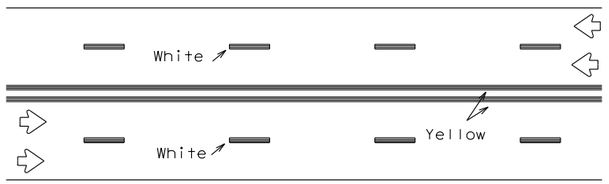
REFLECTORIZED PAVEMENT MARKINGS



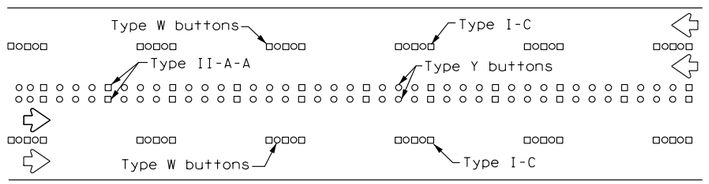
RAISED PAVEMENT MARKERS

Prefabricated markings may be substituted for reflectorized pavement markings.

EDGE & LANE LINES FOR DIVIDED HIGHWAY



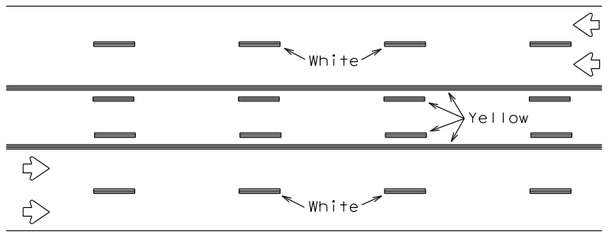
REFLECTORIZED PAVEMENT MARKINGS



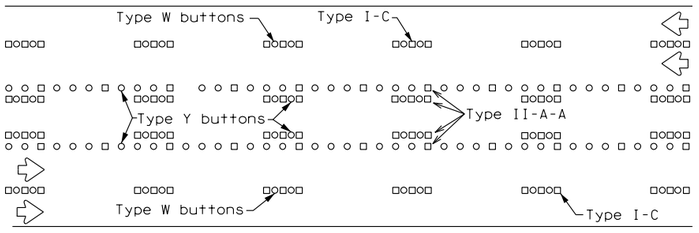
RAISED PAVEMENT MARKERS

Prefabricated markings may be substituted for reflectorized pavement markings.

LANE & CENTER LINES FOR MULTILANE UNDIVIDED HIGHWAYS



REFLECTORIZED PAVEMENT MARKINGS



RAISED PAVEMENT MARKERS

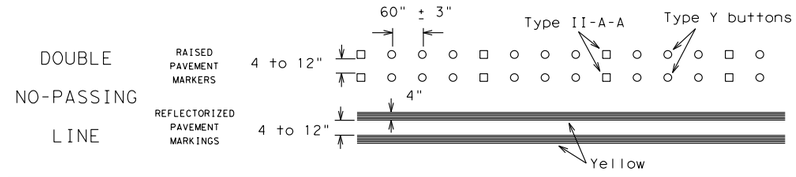
Prefabricated markings may be substituted for reflectorized pavement markings.

TWO-WAY LEFT TURN LANE

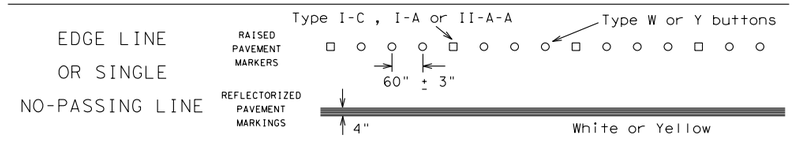
STANDARD WORK ZONE PAVEMENT MARKINGS DETAILS

SOLID LINES

DOUBLE NO-PASSING LINE

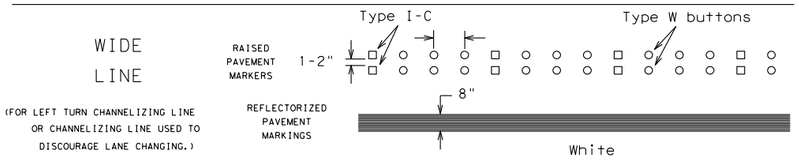


EDGE LINE OR SINGLE NO-PASSING LINE



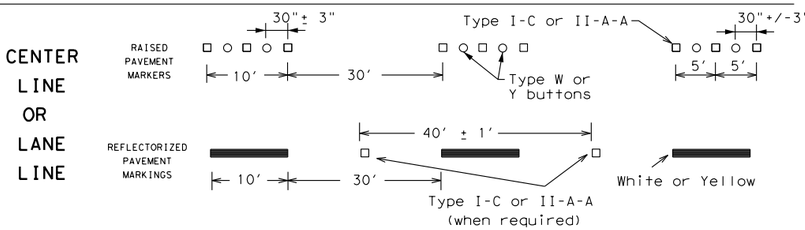
WIDE LINE

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

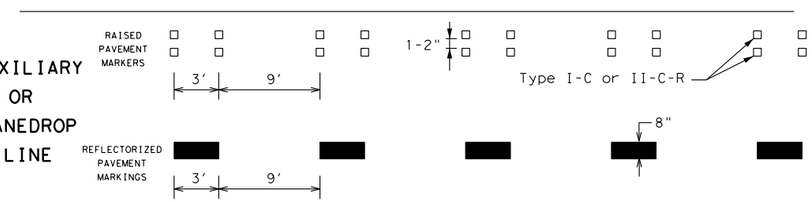


BROKEN LINES

CENTER LINE OR LANE LINE

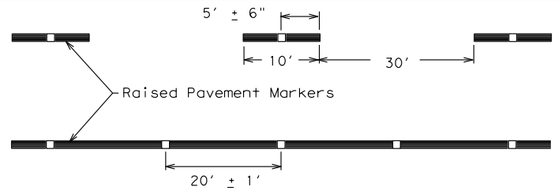


AUXILIARY OR LANEDROP LINE



REMOVABLE MARKINGS WITH RAISED PAVEMENT MARKERS

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



Centerline only - not to be used on edge lines

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

Texas Department of Transportation

Traffic Safety Division Standard

BARRICADE AND CONSTRUCTION PAVEMENT MARKING PATTERNS

BC(12)-21

FILE: bc-21.dgn	DN: TxDOT	CK: TxDOT	DW: TxDOT	CK: TxDOT
©TxDOT February 1998	CONT	SECT	JOB	HIGHWAY
REVISIONS 1-97 9-07 5-21 2-98 7-13 11-02 8-14	0902	90	019,ETC	CS
	DIST	COUNTY		SHEET NO.
	FTW	TARRANT		26

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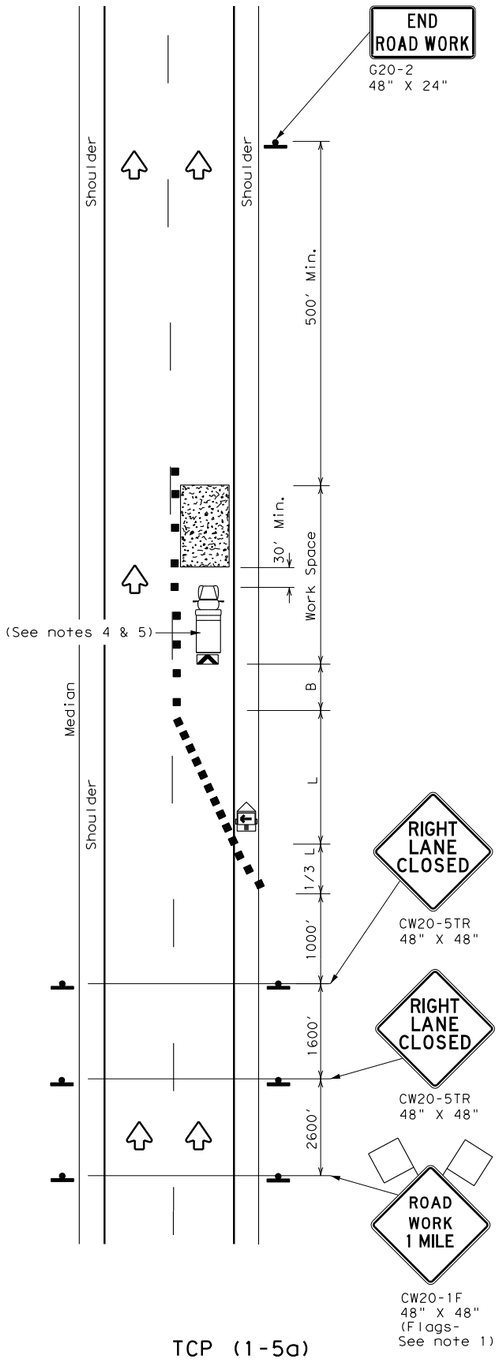
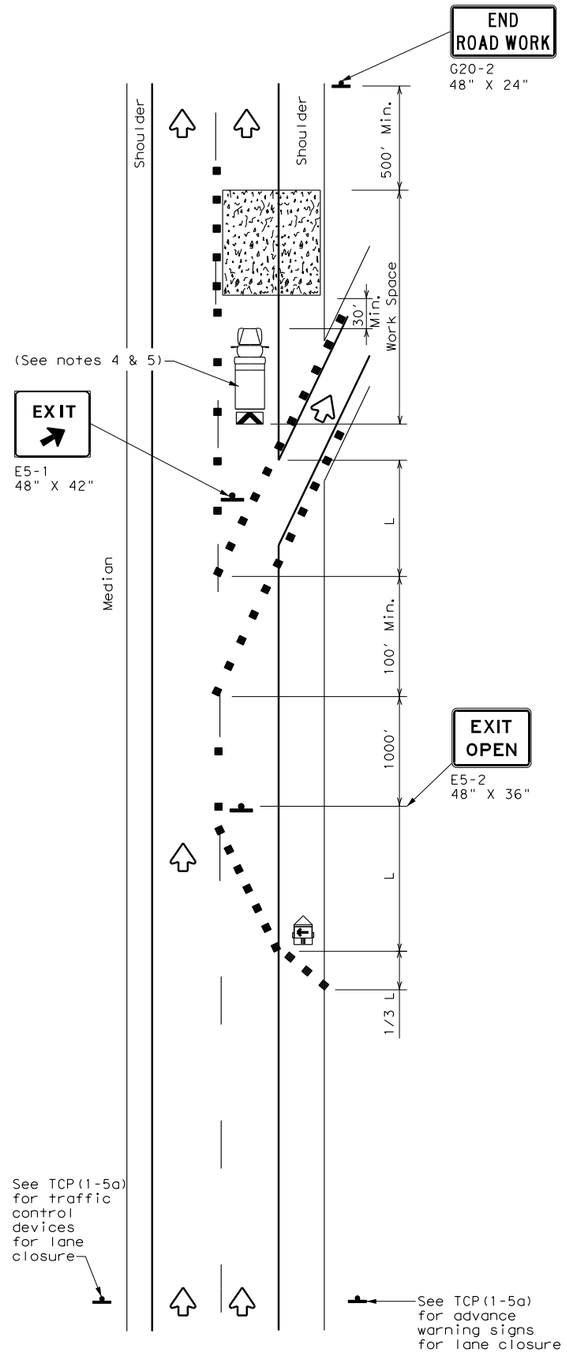


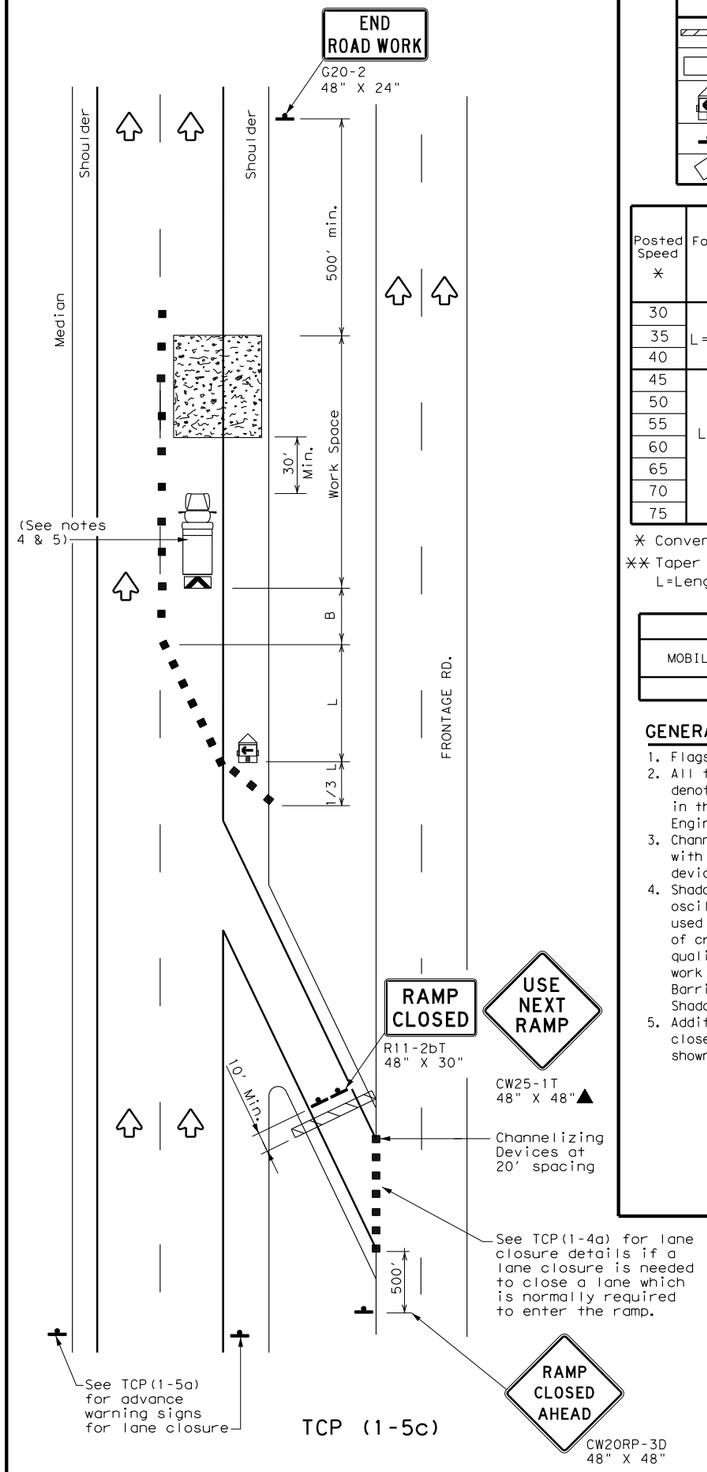
TCP (1-5a)

ONE LANE CLOSURE



TCP (1-5b)

LANE CLOSURE NEAR EXIT RAMPS



TCP (1-5c)

LANE CLOSURE NEAR ENTRANCE RAMPS

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

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

* Conventional Roads Only

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

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

GENERAL NOTES

1. Flags attached to signs where shown, are REQUIRED.
2. All traffic control devices illustrated are REQUIRED, except those denoted with the triangle symbol may be omitted when stated elsewhere in the plans, or for routine maintenance work, when approved by the Engineer.
3. Channelizing devices used to close lanes may be supplemented with the Chevron Alignment Sign placed on every other channelizing device. Chevrons may be attached to plastic drums as per BC Standards.
4. Shadow Vehicle with TMA and high intensity rotating, flashing, oscillating or strobe lights. A Shadow Vehicle with a TMA should be used anytime it can be positioned 30 to 100 feet in advance of the area of crew exposure without adversely affecting the performance or quality of the work. If workers are no longer present but road or work conditions require the traffic control to remain in place, Type 3 Barricades or other channelizing devices may be substituted for the Shadow Vehicle and TMA.
5. Additional Shadow Vehicles with TMAs may be positioned in each closed lane, on the shoulder or off the paved surface, next to those shown in order to protect a wider work space.

Texas Department of Transportation

Traffic Operations Division Standard

TRAFFIC CONTROL PLAN LANE CLOSURES FOR DIVIDED HIGHWAYS

TCP(1-5)-18

FILE: tcp1-5-18.dgn	DN:	CK:	DW:	CK:
©TxDOT February 2012	CONT	SECT	JOB	HIGHWAY
REVISIONS 2-18	0902	90	019,ETC	CS
	DIST	COUNTY		SHEET NO.
	FTW	TARRANT		27

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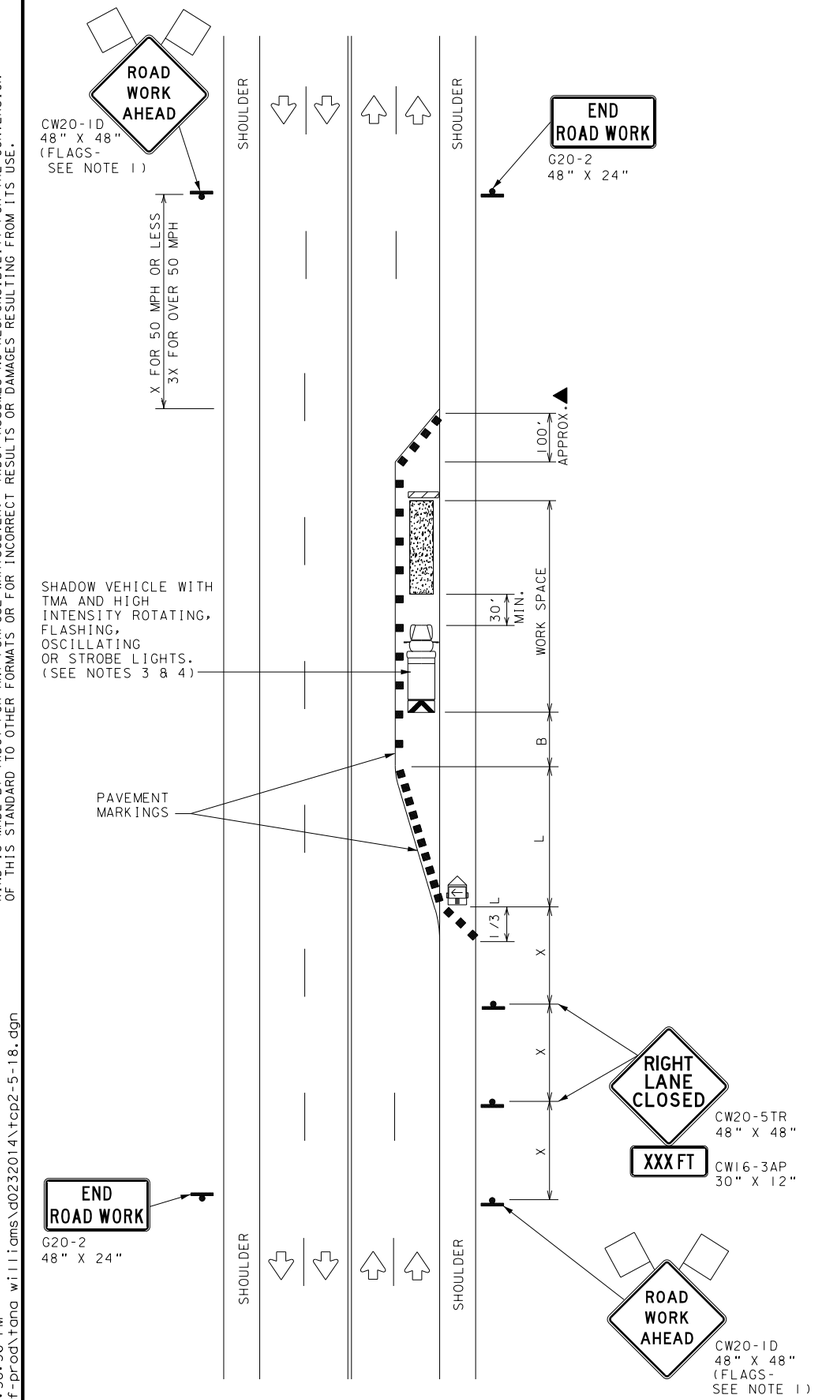
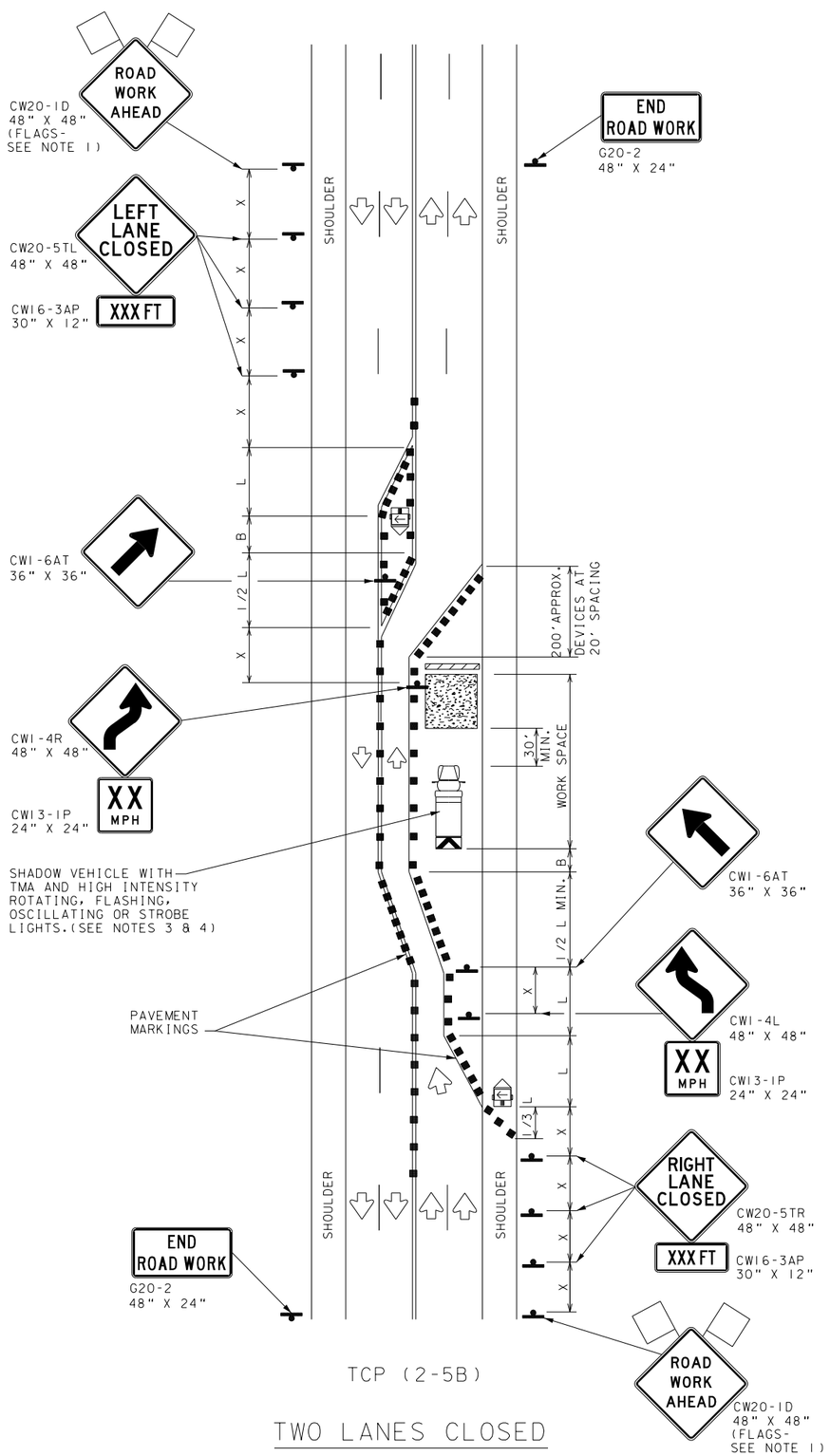


TCP (2-5A)

ONE LANE CLOSED



TCP (2-5B)

TWO LANES CLOSED

LEGEND			
	TYPE 3 BARRICADE		CHANNELIZING DEVICES
	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 **			SUGGESTED MAXIMUM SPACING OF CHANNELIZING DEVICES		MINIMUM SIGN SPACING "X" DISTANCE	SUGGESTED LONGITUDINAL BUFFER SPACE "B"
		10' OFFSET	11' OFFSET	12' OFFSET	ON A TAPER	ON A TANGENT		
30	$L = \frac{WS^2}{60}$	150'	165'	180'	30'	60'	120'	90'
35		205'	225'	245'	35'	70'	160'	120'
40		265'	295'	320'	40'	80'	240'	155'
45	L = WS	450'	495'	540'	45'	90'	320'	195'
50		500'	550'	600'	50'	100'	400'	240'
55		550'	605'	660'	55'	110'	500'	295'
60		600'	660'	720'	60'	120'	600'	350'
65		650'	715'	780'	65'	130'	700'	410'
70		700'	770'	840'	70'	140'	800'	475'
75		750'	825'	900'	75'	150'	900'	540'

* CONVENTIONAL ROADS ONLY

** TAPER LENGTHS HAVE BEEN ROUNDED OFF.
L=LENGTH OF TAPER(FT) W=WIDTH OF OFFSET(FT) S=POSTED SPEED(MPH)

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

GENERAL NOTES

1. FLAGS ATTACHED TO SIGNS WHERE SHOWN, ARE REQUIRED.
2. ALL TRAFFIC CONTROL DEVICES ILLUSTRATED ARE REQUIRED, EXCEPT THOSE DENOTED WITH THE TRIANGLE SYMBOL MAY BE OMITTED WHEN STATED ELSEWHERE IN THE PLANS, OR FOR ROUTINE MAINTENANCE WORK, WHEN APPROVED BY THE ENGINEER.
3. A SHADOW VEHICLE WITH A TMA SHOULD BE USED ANYTIME IT CAN BE POSITIONED 30 TO 100 FEET IN ADVANCE OF THE AREA OF CREW EPOSURE WITHOUT ADVERSELY AFFECTING THE PERFORMANCE OR QUALITY OF THE WORK. IF WORKERS ARE NO LONGER PRESENT BUT ROAD OR WORK CONDITIONS REQUIRE THE TRAFFIC CONTROL TO REMAIN IN PLACE, TYPE 3 BARRICADES OR OTHER CHANNELIZING DEVICES MAY BE SUBSTITUTUED FOR THE SHADOW VEHICLE AND TMA.
4. ADDITIONAL SHADOW VEHICLES WITH TMAS MAY BE POSITIONED IN EACH CLOSED LANE, ON THE SHOULDER OR OFF THE PAVED SURFACE, NEXT TO THOSE SHOWN IN ORDER TO PROTECT A WIDER WORK SPACE.
5. THE DOWNSTREAM TAPER IS OPTIONAL. WHEN USED, IT SHOULD BE 100 FEET APPROXIMATELY PER LANE, WITH CHANNELIZING DEVICES SPACED AT 20 FEET.

TCP (2-5A)

6. IF THIS TCP IS USED FOR A LEFT LANE CLOSURE, CW20-5TL "LEFT LANE CLOSED" SIGNS SHALL BE USED AND CHANNELIZING DEVICES SHALL BE PLACED ON THE CENTERLINE TO PROTECT THE WORK SPACE FROM OPPOSING TRAFFIC, WITH THE ARROW BOARD PLACED IN THE CLOSED LANE NEAR THE END OF THE MERGING TAPER.

TCP (2-5B)

7. CONFLICTING PAVEMENT MARKINGS SHALL BE REMOVED FOR LONG-TERM PROJECTS.

Texas Department of Transportation

Traffic Operations Division Standard

TRAFFIC CONTROL PLAN LONG TERM LANE CLOSURES MULTILANE CONVENTIONAL RDS.

TCP(2-5)-18

FILE: TCP2-5-18.DGN	DN:	CK:	DW:	CK:
©TXDOT DECEMBER 1985	CONT	SECT	JOB	HIGHWAY
REVISIONS 8-95 2-12	0902	90	019,ETC	CS
1-97 3-03	DIST	COUNTY		SHEET NO.
4-98 2-18	FTW	TARRANT		28

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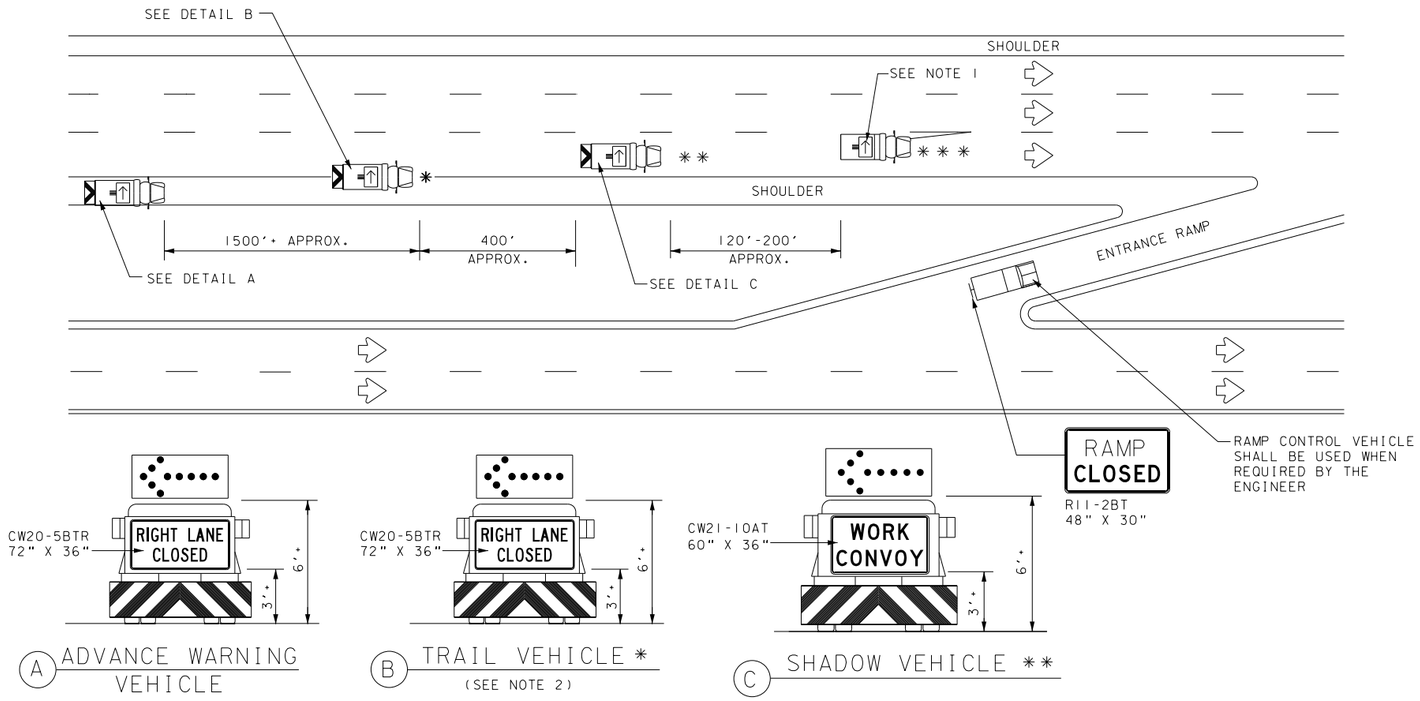
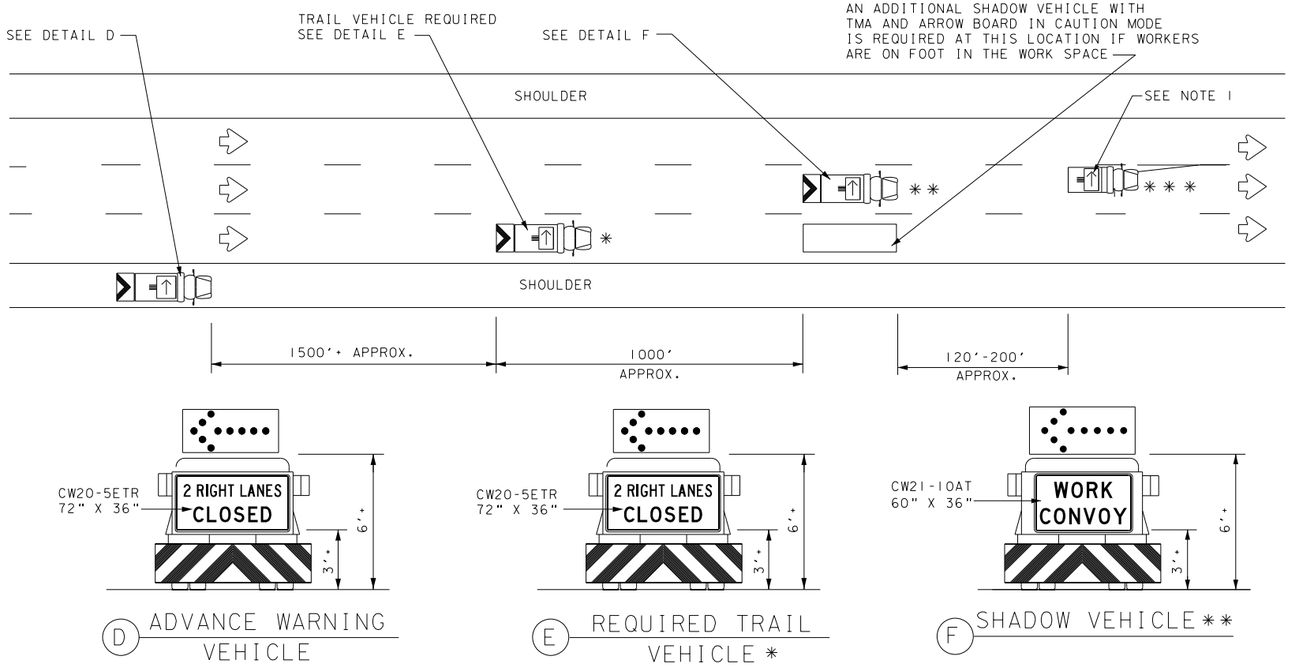


RIGHT LANE CLOSURE ON DIVIDED HIGHWAY - TCP(3-2A)



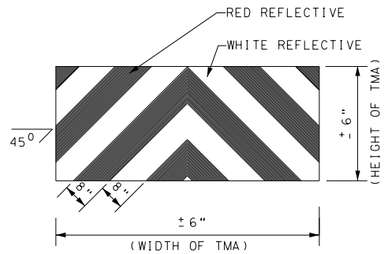
INTERIOR LANE CLOSURE ON MULTI-LANE DIVIDED HIGHWAY - TCP(3-2B)

LEGEND			
*	TRAIL VEHICLE	ARROW BOARD DISPLAY	
**	SHADOW VEHICLE		
***	WORK VEHICLE		RIGHT DIRECTIONAL
	HEAVY WORK VEHICLE		LEFT DIRECTIONAL
	TRUCK MOUNTED ATTENUATOR (TMA)		DOUBLE ARROW
	TRAFFIC FLOW		CAUTION (ALTERNATING DIAMOND OR 4 CORNER FLASH)

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

GENERAL NOTES

1. ADVANCE WARNING, TRAIL AND SHADOW VEHICLES SHALL BE EQUIPPED WITH TYPE B OR TYPE C FLASHING ARROW BOARDS AS PER THE BARRICADE AND CONSTRUCTION (BC) STANDARDS. ARROW BOARDS ON WORK VEHICLES WILL BE OPTIONAL BASED ON THE TYPE OF WORK BEING PERFORMED. THE ARROW BOARDS SHALL BE OPERATED FROM INSIDE THE VEHICLE.
2. FOR TCP(3-2A) THE ENGINEER WILL DETERMINE IF THE TRAIL VEHICLE IS REQUIRED BASED ON PREVAILING ROADWAY CONDITIONS, TRAFFIC VOLUME, AND SIGHT DISTANCE RESTRICTIONS. ALL OTHER VEHICLES SHOWN FOR BOTH TCP(3-2A) AND TCP(3-2B) ARE REQUIRED.
3. THE USE OF AMBER HIGH INTENSITY ROTATING, FLASHING, OSCILLATING, OR STROBE LIGHTS ON VEHICLES ARE REQUIRED. BLUE HIGH INTENSITY ROTATING, FLASHING, OSCILLATING OR STROBE LIGHTS WHEN MOUNTED ON THE DRIVER'S SIDE OF THE VEHICLE MAY BE OPERATED SIMULTANEOUSLY WITH THE AMBER BEACONS OR STROBE LIGHTS.
4. THE USE OF TRUCK MOUNTED ATTENUATORS (TMA) ON THE ADVANCE WARNING, SHADOW, AND TRAIL VEHICLES ARE REQUIRED.
5. REFLECTIVE SHEETING ON THE REAR OF THE TMA SHALL MEET OR EXCEED THE REFLECTIVITY AND COLOR REQUIREMENTS OF DMS 8300, TYPE A.
6. EACH VEHICLE SHALL HAVE TWO-WAY RADIO COMMUNICATION CAPABILITY.
7. WHEN WORK CONVOYS MUST CHANGE LANES, THE TRAIL VEHICLE SHOULD CHANGE LANES FIRST TO SHADOW THE OTHER CONVOY VEHICLES.
8. VEHICLE SPACING BETWEEN THE TRAIL VEHICLE AND THE SHADOW VEHICLE WILL VARY DEPENDING ON SIGHT DISTANCE RESTRICTIONS. MOTORISTS APPROACHING THE WORK CONVOY SHOULD BE ABLE TO SEE THE TRAIL VEHICLE IN TIME TO SLOW DOWN AND/OR CHANGE LANES AS THEY APPROACH THE TRAIL VEHICLE. VEHICLE SPACING BETWEEN THE WORK VEHICLE AND SHADOW VEHICLE MAY VARY ACCORDING TO TERRAIN, WORK ACTIVITY AND OTHER FACTORS.
9. STANDARD 48" X 48" DIAMOND SHAPED WARNING SIGNS WITH THE SAME MESSAGE AS THOSE SHOWN MAY BE USED WHERE ADEQUATE MOUNTING SPACE EXISTS.
10. THE SIGNS SHOWN SHOULD BE USED ON THE ADVANCE WARNING VEHICLE. AS AN OPTION, A PORTABLE CHANGEABLE MESSAGE SIGN (PCMS) OR A TRUCK MOUNTED CHANGEABLE MESSAGE SIGN (TMCMS) WITH A MINIMUM CHARACTER HEIGHT OF 12", AND DISPLAYING THE SAME LEGEND MAY BE SUBSTITUTED FOR THESE SIGNS. AN APPROPRIATE DIRECTIONAL ARROW DISPLAY, SIMULATING THE SIZE AND LEGIBILITY OF THE FLASHING ARROW BOARD, MUST BE USED IN THE SECOND PHASE OF THE PCMS/TMCMS MESSAGE. WHEN THIS IS DONE, THE ARROW BOARD WILL NOT BE REQUIRED ON THE ADVANCE WARNING VEHICLE.
11. STANDARD DIAMOND SHAPE VERSIONS OF THE CW20-5 SERIES SIGNS MAY BE USED AS AN OPTION IF THE RECTANGULAR SIGNS SHOWN ARE NOT AVAILABLE.
12. THE PRINCIPLES ON THIS SHEET MAY BE USED TO CLOSE LANES FROM THE LEFT SIDE OF THE ROADWAY CONSIDERING THE NUMBER OF LANES, SHOULDER WIDTH, SIGHT DISTANCE, AND RAMP FREQUENCY.
13. SIGNS AND FLASHING ARROW BOARD MODES SHALL BE APPROPRIATELY ALTERED WHEN IMPLEMENTING LEFT LANE CLOSURES OR INTERIOR CLOSURES WHICH CLOSE THE LEFT LANES.
14. THE ADVANCE WARNING VEHICLE MAY STRADDLE THE EDGELINE WHEN SHOULDER WIDTH MAKES IT NECESSARY.



STRIPING FOR TMA

Texas Department of Transportation

Traffic Operations Division Standard

TRAFFIC CONTROL PLAN MOBILE OPERATIONS DIVIDED HIGHWAYS

TCP(3-2)-13

FILE: TCP3-2.DGN	DN: TXDOT	CK: TXDOT	DW: TXDOT	CK: TXDOT
©TXDOT DECEMBER 1985	CONT	SECT	JOB	HIGHWAY
REVISIONS	0902	90	019,ETC	CS
2-94 4-98	DIST	COUNTY		SHEET NO.
8-95 7-13	FTW	TARRANT		29
1-97				

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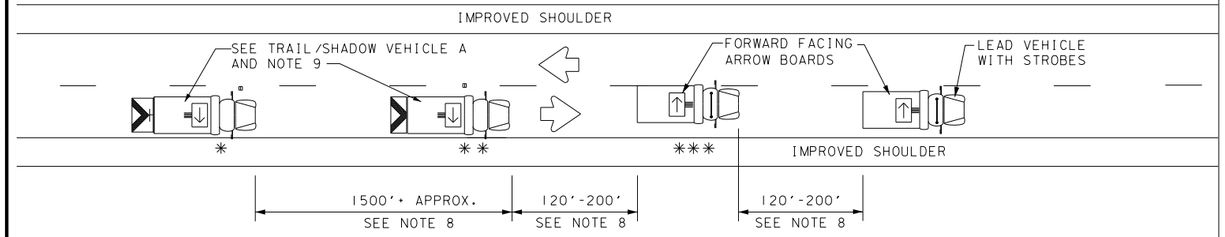
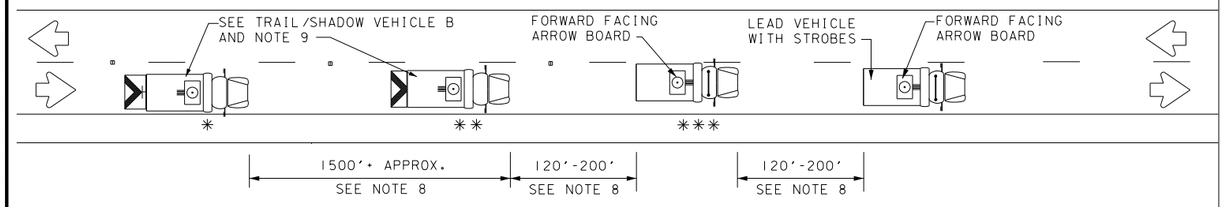


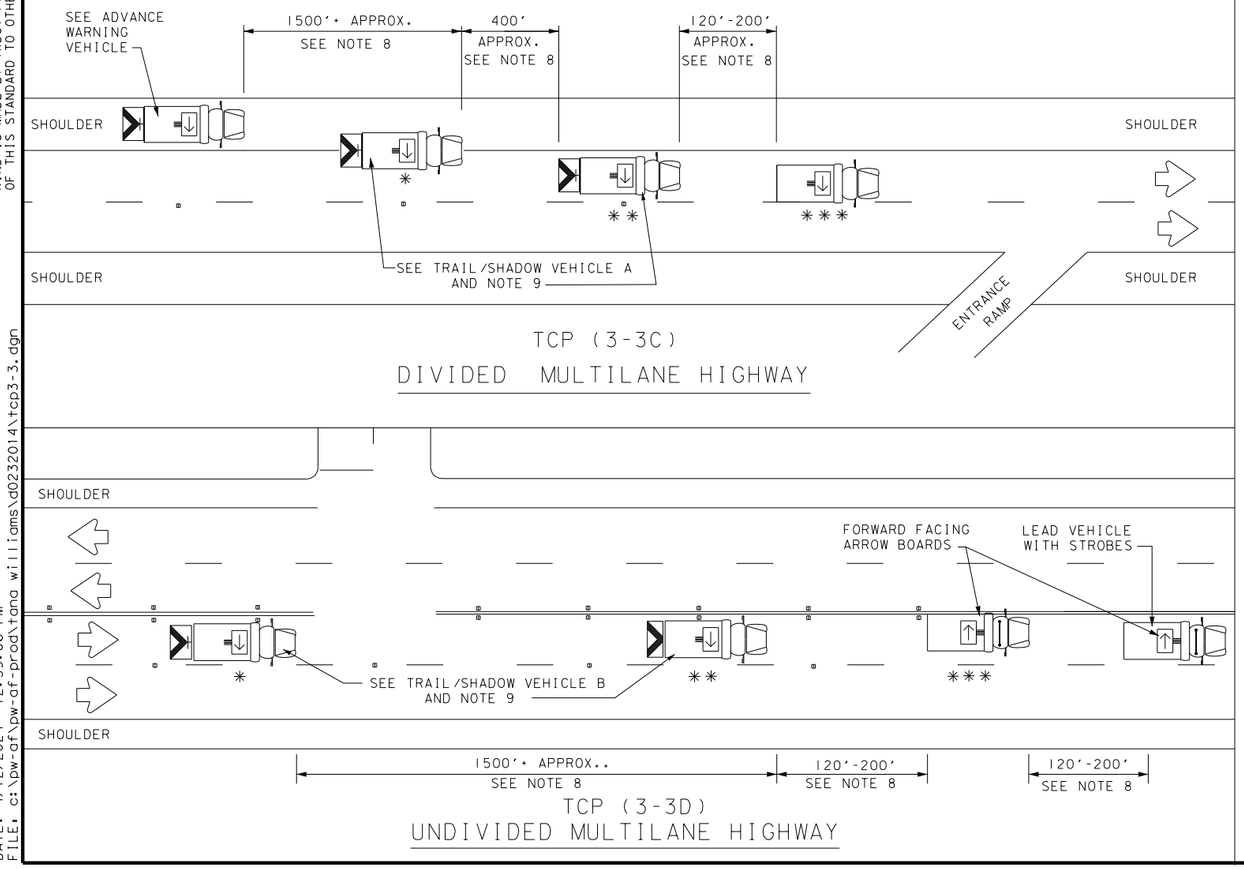
TCP (3-3A)

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



TCP (3-3B)

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

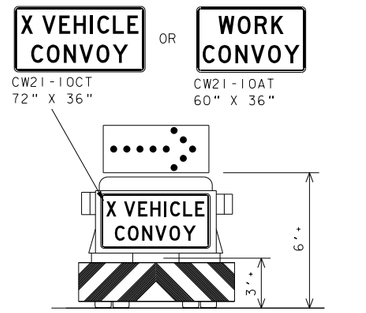


TCP (3-3C)

DIVIDED MULTILANE HIGHWAY

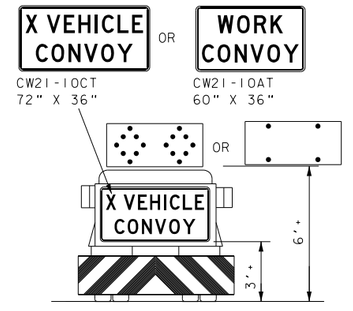
TCP (3-3D)

UNDIVIDED MULTILANE HIGHWAY



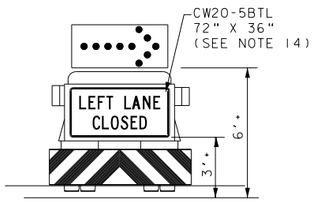
TRAIL/SHADOW VEHICLE A

WITH RIGHT DIRECTIONAL DISPLAY
FLASHING ARROW BOARD

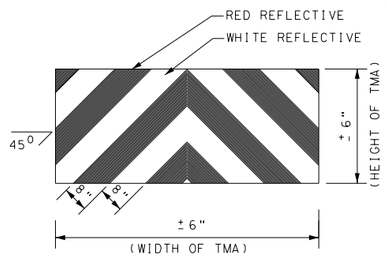


TRAIL/SHADOW VEHICLE B

WITH FLASHING ARROW BOARD
IN CAUTION MODE



ADVANCE WARNING VEHICLE



STRIPING FOR TMA

LEGEND			
*	TRAIL VEHICLE	ARROW BOARD DISPLAY	
**	SHADOW VEHICLE		
***	WORK VEHICLE		RIGHT DIRECTIONAL
	HEAVY WORK VEHICLE		LEFT DIRECTIONAL
	TRUCK MOUNTED ATTENUATOR (TMA)		DOUBLE ARROW
	TRAFFIC FLOW		CAUTION (ALTERNATING DIAMOND OR 4 CORNER FLASH)

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

GENERAL NOTES

1. TRAIL, SHADOW, AND LEAD VEHICLES SHALL BE EQUIPPED WITH ARROW BOARDS AS ILLUSTRATED. WHEN A LEAD VEHICLE IS NOT USED ON TWO WAY ROADS THE WORK VEHICLE MUST HAVE AN ARROW BOARD. FOR DIVIDED ROADWAYS, THE ARROW BOARD ON THE WORK VEHICLE IS OPTIONAL BASED ON THE TYPE OF WORK BEING PERFORMED. THE ENGINEER WILL DETERMINE IF THE LEAD VEHICLE AND/OR TRAIL VEHICLE ARE REQUIRED BASED ON PREVAILING ROADWAY CONDITIONS, TRAFFIC VOLUME, AND SIGHT DISTANCE RESTRICTIONS.
2. THE USE OF AMBER HIGH INTENSITY ROTATING, FLASHING, OSCILLATING, OR STROBE LIGHTS ON VEHICLES ARE REQUIRED. BLUE HIGH INTENSITY ROTATING, FLASHING, OSCILLATING, OR STROBE LIGHTS WHEN MOUNTED ON THE DRIVER'S SIDE OF THE VEHICLE MAY BE OPERATED SIMULTANEOUSLY WITH THE AMBER BEACONS OR STROBE LIGHTS.
3. THE USE OF TRUCK MOUNTED ATTENUATORS (TMA) ON THE SHADOW VEHICLE, ADVANCE WARNING AND TRAIL VEHICLE ARE REQUIRED.
4. REFLECTIVE SHEETING ON THE REAR OF THE TMA SHALL MEET OR EXCEED THE REFLECTIVITY AND COLOR REQUIREMENTS OF DEPARTMENTAL MATERIAL SPECIFICATION DMS 8300, TYPE A.
5. FLASHING ARROW BOARDS SHALL BE TYPE B OR TYPE C AS PER THE BARRICADE AND CONSTRUCTION (BC) STANDARDS. THE BOARD SHALL BE CONTROLLED FROM INSIDE THE VEHICLE.
6. EACH VEHICLE SHALL HAVE TWO-WAY RADIO COMMUNICATION CAPABILITY.
7. WHEN WORK CONVOYS MUST CHANGE LANES, THE TRAIL VEHICLE SHOULD CHANGE LANES FIRST TO SHADOW THE OTHER CONVOY VEHICLES.
8. VEHICLE SPACING BETWEEN THE TRAIL VEHICLE AND THE SHADOW VEHICLE WILL VARY DEPENDING ON SIGHT DISTANCE RESTRICTIONS. MOTORISTS APPROACHING THE CONVOY SHOULD BE ABLE TO SEE THE TRAIL VEHICLE IN TIME TO SLOW DOWN AND/OR CHANGE LANES AS THEY APPROACH THE TRAIL VEHICLE. VEHICLE SPACING BETWEEN THE WORK VEHICLE AND SHADOW VEHICLE AND VEHICLE SPACING BETWEEN WORK VEHICLE AND LEAD VEHICLE MAY VARY ACCORDING TO TERRAIN, WORK ACTIVITY AND OTHER FACTORS.
9. X VEHICLE CONVOY (CW21-10CT) OR WORK CONVOY (CW21-10AT) SIGNS SHALL BE USED ON TRAIL VEHICLES AND SHADOW VEHICLES AS SHOWN. AS AN OPTION 48" X 48" DIAMOND SHAPED WORK CONVOY (CW21-10T) OR X VEHICLE CONVOY (CW21-10BT) SIGNS MAY BE USED WHERE ADEQUATE MOUNTING SPACE EXISTS. WHEN USED, THE X VEHICLE CONVOY SIGN SHALL HAVE THE NUMBER OF THE CONVOY VEHICLES DISPLAYED ON THE SIGN IN THE NUMBER DESIGNATION "X" LOCATION. THE X VEHICLE CONVOY SIGN SHALL NOT BE USED ON THE SHADOW VEHICLE IF A TRAIL VEHICLE IS USED.
10. FOR DIVIDED HIGHWAYS WITH TWO OR THREE LANES IN ONE DIRECTION, THE APPROPRIATE LEFT LANE CLOSED (CW20-5BTL), RIGHT LANE CLOSED (CW20-5BTR), OR CENTER LANE CLOSED (CW20-5DT) SIGN SHOULD BE USED ON THE ADVANCE WARNING VEHICLE. AS AN OPTION, A PORTABLE CHANGEABLE MESSAGE SIGN (PCMS) OR TRUCK MOUNTED CHANGEABLE MESSAGE SIGN (TMCMS) WITH A MINIMUM CHARACTER HEIGHT OF 12", AND DISPLAYING THE SAME LEGEND MAY BE SUBSTITUTED FOR THESE SIGNS. AN APPROPRIATE DIRECTIONAL ARROW DISPLAY, SIMULATING THE SIZE AND LEGIBILITY OF THE FLASHING ARROW BOARD MAY BE USED IN THE SECOND PHASE OF THE PCMS/TMCMS MESSAGE. WHEN THIS IS DONE, THE ARROW BOARD WILL NOT BE REQUIRED ON THE ADVANCE WARNING VEHICLE.
11. A DOUBLE ARROW SHALL NOT BE DISPLAYED ON THE ARROW BOARD ON THE ADVANCE WARNING VEHICLE.
12. FOR DIVIDED HIGHWAYS WITH THREE OR FOUR LANES IN EACH DIRECTION, USE TCP(3-2).
13. STANDARD DIAMOND SHAPE VERSIONS OF THE CW20-5 SERIES SIGNS MAY BE USED AS AN OPTION IF THE RECTANGULAR SIGNS SHOWN ARE NOT AVAILABLE.
14. THE ADVANCE WARNING VEHICLE MAY STRADDLE THE EDGELINE WHEN SHOULDER WIDTH MAKES IT NECESSARY.
15. ON TWO-LANE TWO-WAY ROADWAYS, THE WORK AND PROTECTION VEHICLES SHOULD PULL OVER PERIODICALLY TO ALLOW MOTOR VEHICLE TRAFFIC TO PASS. IF MOTORISTS ARE NOT ALLOWED TO PASS THE WORK CONVOY, A DO NOT PASS (R4-1) SIGN SHOULD BE PLACED ON THE BACK OF THE REARMOST PROTECTION VEHICLE.

Texas Department of Transportation

Traffic Operations Division Standard

TRAFFIC CONTROL PLAN MOBILE OPERATIONS RAISED PAVEMENT MARKER INSTALLATION/ REMOVAL

TCP(3-3)-14

FILE: TCP3-3.DGN	DN: TXDOT	CK: TXDOT	DW: TXDOT	CK: TXDOT
©TXDOT SEPTEMBER 1987	CONT	SECT	JOB	HIGHWAY
REVISIONS	0902	90	019,ETC	CS
2-94 4-98	DIST	COUNTY		SHEET NO.
8-95 7-13	FTW	TARRANT		30
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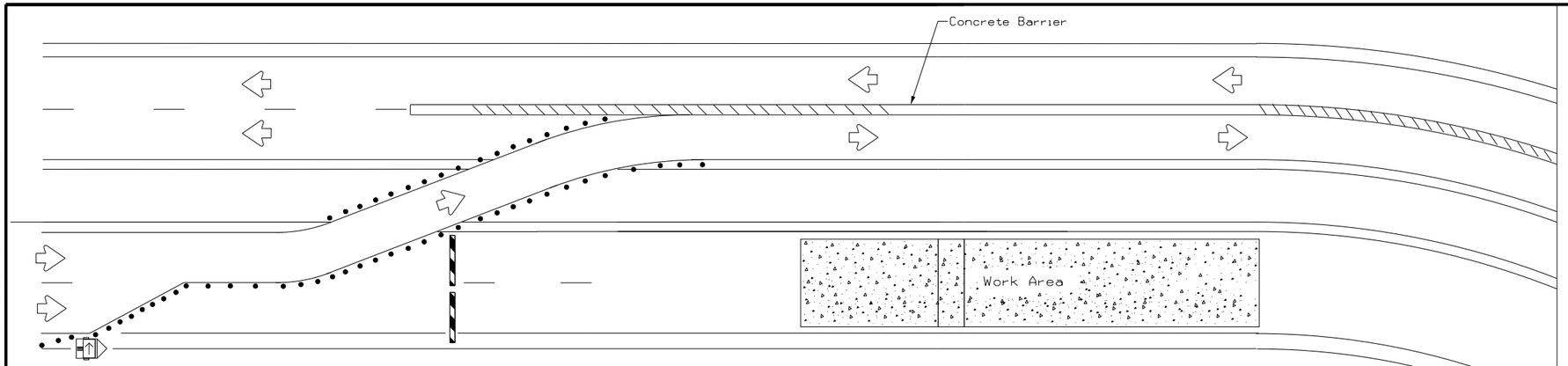


NOTES:

1. LENGTH OF SAFETY GLARE SCREEN WILL BE SPECIFIED ELSEWHERE IN THE PLANS.
2. THE CUMULATIVE NOMINAL LENGTH OF THE MODULAR SAFETY GLARE SCREEN UNITS SHALL EQUAL THE LENGTH OF THE INDIVIDUAL SECTIONS OF TEMPORARY CONCRETE TRAFFIC BARRIER ON WHICH THEY ARE INSTALLED SO THE JOINT BETWEEN BARRIER SECTIONS WILL NOT BE SPANNED BY ANY ONE SAFETY GLARE SCREEN UNIT.
3. SCREEN PANEL/BLADES WILL BE DESIGNED SUCH THAT REFLECTIVE SHEETING CONFORMING WITH DEPARTMENTAL MATERIAL SPECIFICATION DMS-8300, SIGN FACE MATERIALS, TYPE B OR C YELLOW, MINIMUM SIZE OF 2 INCHES BY 12 INCHES CAN BE ATTACHED TO THE EDGE OF THE PANEL/BLADE. THE SHEETING SHALL BE ATTACHED TO ONE GLARE SCREEN PANEL/BLADE PER SECTION OF CONCRETE BARRIER NOT TO EXCEED A SPACING OF 30 FEET. BARRIER REFLECTORS ARE NOT NECESSARY WHEN PANEL/BLADES ARE INSTALLED WITH REFLECTIVE SHEETING AS DESCRIBED.
4. PAYMENT FOR THESE DEVICES WILL BE UNDER STATEWIDE SPECIAL SPECIFICATION "MODULAR GLARE SCREENS FOR HEADLIGHT BARRIER."
5. THIS DETAIL IS ONLY INTENDED TO SHOW TYPES OF LOCATIONS WHERE GLARE SCREENS WOULD BE APPROPRIATE. REQUIRED SIGNING AND OTHER DEVICES SHALL BE AS SHOWN ELSEWHERE IN THE PLANS.

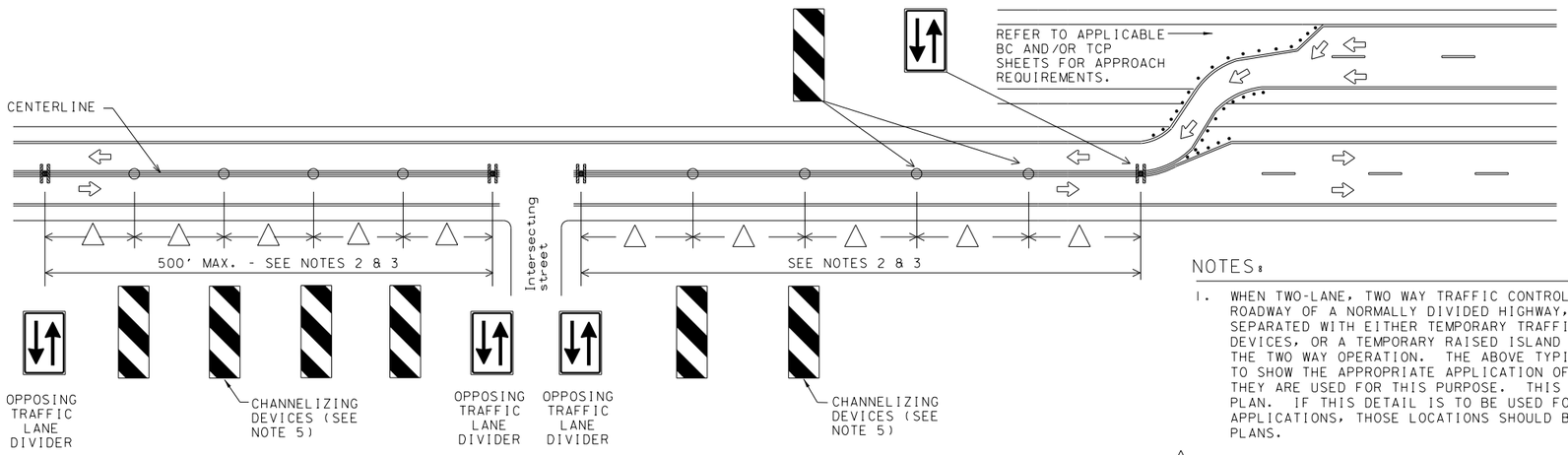
BARRIER DELINEATION WITH MODULAR GLARE SCREENS

LEGEND	
	TYPE 3 BARRICADE
• • •	CHANNELIZING DEVICES
	TRAILER MOUNTED FLASHING ARROW BOARD
	SIGN
\\\\	SAFETY GLARE SCREEN

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

ONLY PRE-QUALIFIED PRODUCTS SHALL BE USED. A COPY OF THE COMPLIANT WORK ZONE TRAFFIC CONTROL DEVICES LIST" CWZTCD)DESCRIBES PRE-QUALIFIED PRODUCTS AND THEIR SOURCES AND MAY BE FOUND AT THE FOLLOWING WEB ADDRESS:

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



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

NOTES:

1. WHEN TWO-LANE, TWO WAY TRAFFIC CONTROL MUST BE MAINTAINED ON ONE ROADWAY OF A NORMALLY DIVIDED HIGHWAY, OPPOSING TRAFFIC SHALL BE SEPARATED WITH EITHER TEMPORARY TRAFFIC BARRIERS, CHANNELIZING DEVICES, OR A TEMPORARY RAISED ISLAND THROUGHOUT THE LENGTH OF THE TWO WAY OPERATION. THE ABOVE TYPICAL APPLICATION IS INTENDED TO SHOW THE APPROPRIATE APPLICATION OF CHANNELIZING DEVICES WHEN THEY ARE USED FOR THIS PURPOSE. THIS IS NOT A TRAFFIC CONTROL PLAN. IF THIS DETAIL IS TO BE USED FOR OTHER TYPES OF ROADS OR APPLICATIONS, THOSE LOCATIONS SHOULD BE STATED ELSEWHERE IN THE PLANS.

△2. SPACE DEVICES ACCORDING TO THE TANGENT SPACING SHOWN ON THE DEVICE SPACING TABLE ON BC(9) BUT NOT EXCEEDING 100'.

3. EVERY FIFTH DEVICE SHOULD BE AN OTLD EXCEPT WHEN SPACED CLOSER TO ACCOMMODATE AN INTERSECTION. AN OTLD SHOULD BE THE FIRST DEVICE ON EACH SIDE OF INTERSECTING STREETS OR ROADS.

4. LOCATIONS WHERE SURFACE MOUNT BASES WITH ADHESIVES OR SELF-RIGHTING DEVICES WILL BE REQUIRED IN ORDER TO MAINTAIN THEM IN THEIR PROPER POSITION SHOULD BE NOTED ELSEWHERE IN THE PLANS.

5. CHANNELIZING DEVICES ARE TO BE VERTICAL PANELS, 42" CONES OR TUBULAR MARKERS THAT ARE AT LEAST 36" TALL. TUBULAR MARKERS USED TO SEPARATE TRAFFIC SHOULD HAVE A RUBBER BASE WEIGHING AT LEAST 30 POUNDS. TUBULAR MARKERS THAT ARE 42" TALL OR MORE SHALL HAVE FOUR BANDS OF REFLECTIVE MATERIAL AS DETAILED FOR 42" CONES ON BC(10). TUBULAR MARKERS LESS THAN 42" BUT AT LEAST 36" TALL SHALL HAVE THREE BANDS OF 3" WIDE WHITE REFLECTIVE MATERIAL SPACED 2" APART. REFLECTIVE MATERIAL SHALL MEET DMS-8300, TYPE A.

Texas Department of Transportation

Traffic Operations Division Standard

TRAFFIC CONTROL PLAN TYPICAL DETAILS

WZ(TD)-17

FILE: WZTD-17.DGN	DN: TXDOT	CK: TXDOT	DW: TXDOT	CK: TXDOT
©TXDOT FEBRUARY 1998	CONT	SECT	JOB	HIGHWAY
REVISIONS 4-98 2-17 3-03 7-13	0902	90	019,ETC	CS
	DIST	COUNTY		SHEET NO.
	FTW	TARRANT		31

110

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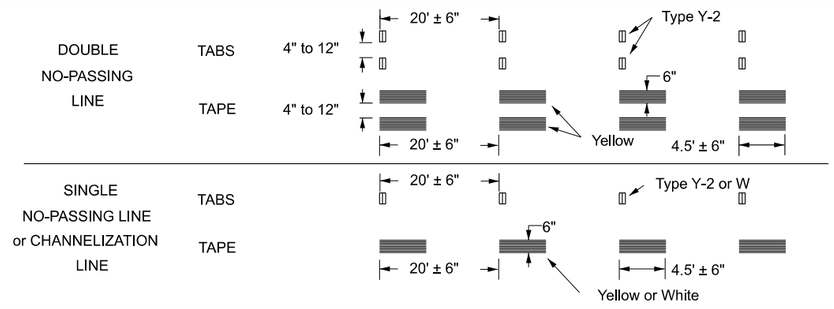
WORK ZONE SHORT TERM PAVEMENT MARKINGS DETAILS



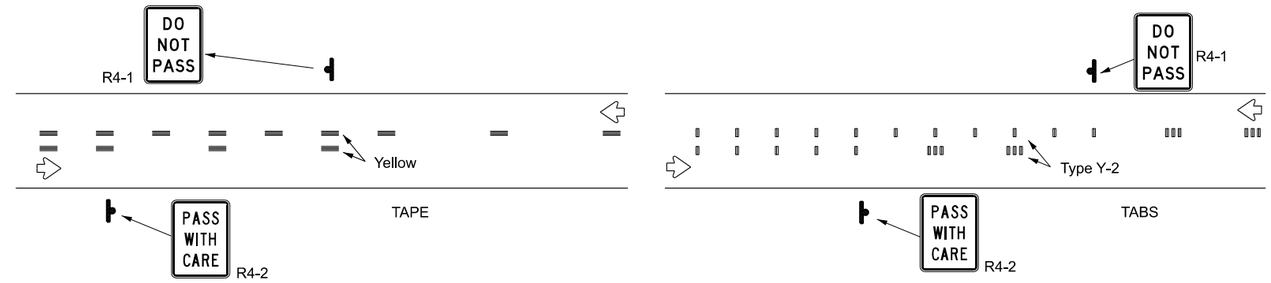
NOTES:

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

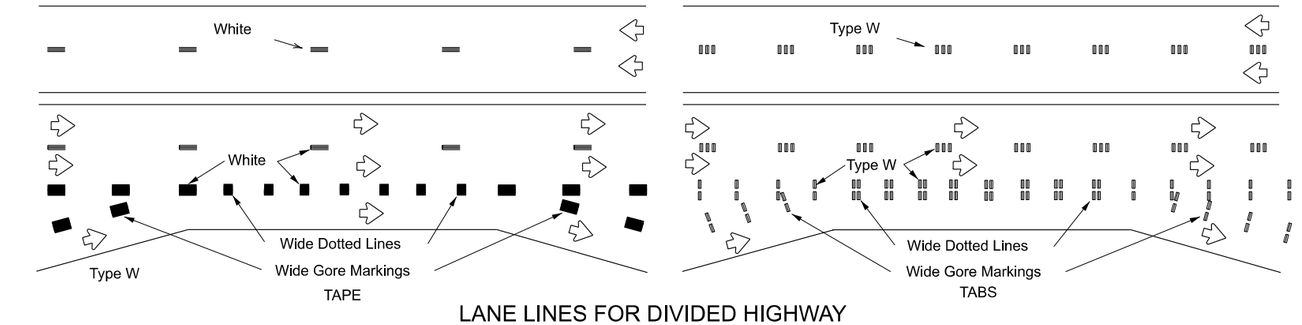
TEMPORARY FLEXIBLE, REFLECTIVE ROADWAY MARKER TABS (TABS)

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

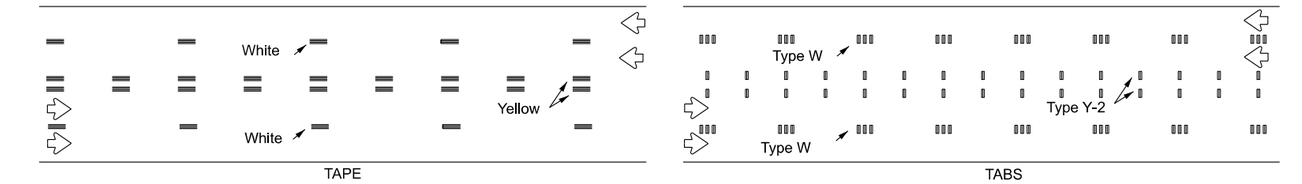
WORK ZONE SHORT TERM PAVEMENT MARKINGS PATTERNS



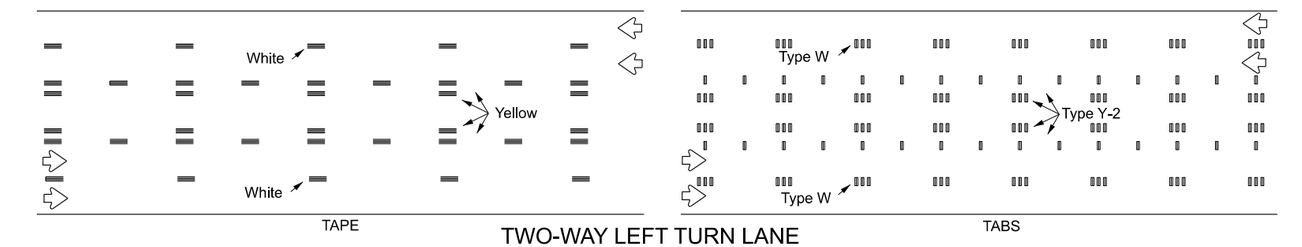
CENTER LINE & NO-PASSING ZONE BARRIER LINES FOR TWO LANE TWO-WAY HIGHWAYS



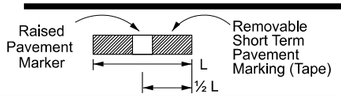
LANE LINES FOR DIVIDED HIGHWAY



LANE & CENTER LINES FOR MULTILANE UNDIVIDED HIGHWAYS



TWO-WAY LEFT TURN LANE



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

PREFABRICATED PAVEMENT MARKINGS

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

RAISED PAVEMENT MARKERS

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

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

1. DMSs referenced above can be found along with embedded links to their respective MPLs at the following website:

http://www.txdot.gov/business/contractors_consultants/material_specifications/default.htm

Texas Department of Transportation

Traffic Safety Division Standard

WORK ZONE SHORT TERM PAVEMENT MARKINGS

WZ(STPM)-23

FILE: wzstpm-23.dgn	DN:	CK:	DW:	CK:
©TxDOT February 2023	CONT	SECT	JOB	HIGHWAY
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4-92 7-13 1-97 2-23 3-03	DIST	COUNTY		SHEET NO.
	FTW	TARRANT		32

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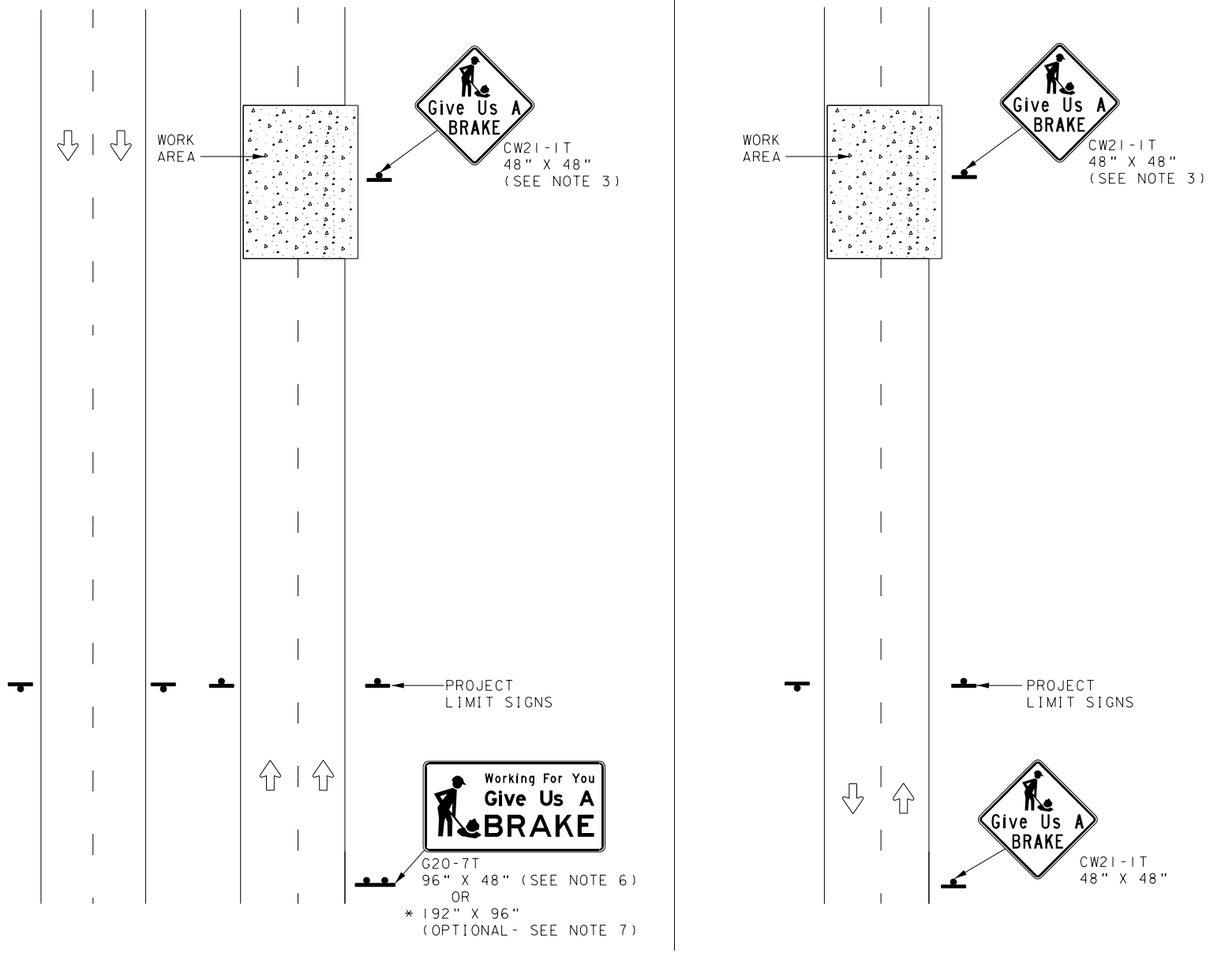

SIGNS ARE SHOWN FOR ONE DIRECTION OF TRAVEL

* WHEN THE OPTIONAL LARGER WORKING FOR YOU GIVE US A BRAKE (G20-7T) 192" X 96" SIGN IS REQUIRED, THE LOCATIONS SHALL BE NOTED ELSEWHERE IN THE PLANS.

SUMMARY OF LARGE SIGNS

BACKGROUND COLOR	SIGN DESIGNATION	SIGN	SIGN DIMENSIONS	REFLECTIVE SHEETING	SQ FT	GALVANIZED STRUCTURAL STEEL			DRILLED SHAFT 24" DIA. (LF)
						SIZE	(LF) ①	(LF) ②	
ORANGE	G20-7T	Working For You Give Us A BRAKE	96" X 48"	TYPE B_{FL} OR C_{FL}	32	▲	▲	▲	▲
ORANGE	G20-7T	Working For You Give Us A BRAKE	192" X 96"	TYPE B_{FL} OR C_{FL}	128	W8X18	16	17	12

▲ SEE NOTE 6 BELOW

LEGEND	
	SIGN
	LARGE SIGN
	TRAFFIC FLOW

DEPARTMENTAL MATERIAL SPECIFICATIONS

PLYWOOD SIGN BLANKS	DMS-7100
ALUMINUM SIGN BLANKS	DMS-7110
SIGN FACE MATERIALS	DMS-8300

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

GENERAL NOTES

1. SEE BC AND SMD SHEETS FOR ADDITIONAL SIGN SUPPORT DETAILS.

2. SIGN LOCATIONS SHALL BE APPROVED BY THE ENGINEER.

3. FOR PROJECTS MORE THAN TWO MILES IN LENGTH, GIVE US A BRAKE SIGNS SHOULD BE REPEATED HALFWAY THROUGH THE PROJECT. THE GIVE US A BRAKE (CW21-1T) MAY BE USED FOR THIS PURPOSE.

4. WORK ZONE SPEED LIMITS ARE SOMETIMES USED IN CONJUNCTION WITH GIVE US A BRAKE SIGNING. SEE BC(3) FOR LOCATION AND SPACING OF CONSTRUCTION SPEED ZONE SIGNING WHEN REQUIRED.

5. GIVE US A BRAKE (CW21-1T) SIGNS AND SUPPORTS SHALL BE CONSIDERED SUBSIDIARY TO ITEM 502, "BARRICADES, SIGNS AND TRAFFIC HANDLING."

6. THE 96" X 48" WORKING FOR YOU GIVE US A BRAKE (G20-7T) MAY USE A 1/2" OR 5/8" PLYWOOD SUBSTRATE OR 0.125" ALUMINUM SHEETING SUBSTRATE AND MAY BE SUPPORTED BY TWO 4" X 6" WOOD POSTS WITH DRILLED HOLES FOR BREAKAWAY AS PER BC(5) AND WILL BE SUBSIDIARY TO ITEM 502.

7. THE WORKING FOR YOU GIVE US A BRAKE (G20-7T) 192" X 96" SIGN SHALL BE PAID FOR UNDER THE FOLLOWING SPECIFICATION ITEMS:
   ITEM 636 - ALUMINUM SIGNS
   ITEM 647 - LARGE ROADSIDE SIGN SUPPORTS AND ASSEMBLIES.
   ITEM 416 - DRILLED SHAFT FOUNDATIONS

8. ALL SIGNS SHALL BE CONSTRUCTED IN ACCORDANCE WITH THE DETAILS FOUND IN THE "STANDARD HIGHWAY SIGN DESIGNS FOR TEXAS," LATEST EDITION. SIGN DETAILS NOT SHOWN IN THIS MANUAL SHALL BE SHOWN IN THE PLANS OR THE ENGINEER SHALL PROVIDE A DETAIL TO THE CONTRACTOR BEFORE THE SIGN IS MANUFACTURED.

Texas Department of Transportation

Traffic Operations Division Standard

WORK ZONE "GIVE US A BRAKE" SIGNS

WZ(BRK)-13

FILE: WZBRK-13.DGN	DN: TXDOT	CK: TXDOT	DW: TXDOT	CK: TXDOT
©TXDOT AUGUST 1995	CONT	SECT	JOB	HIGHWAY
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6-96 5-98 7-13	DIST	COUNTY		SHEET NO.
8-96 3-03	FTW	TARRANT		33

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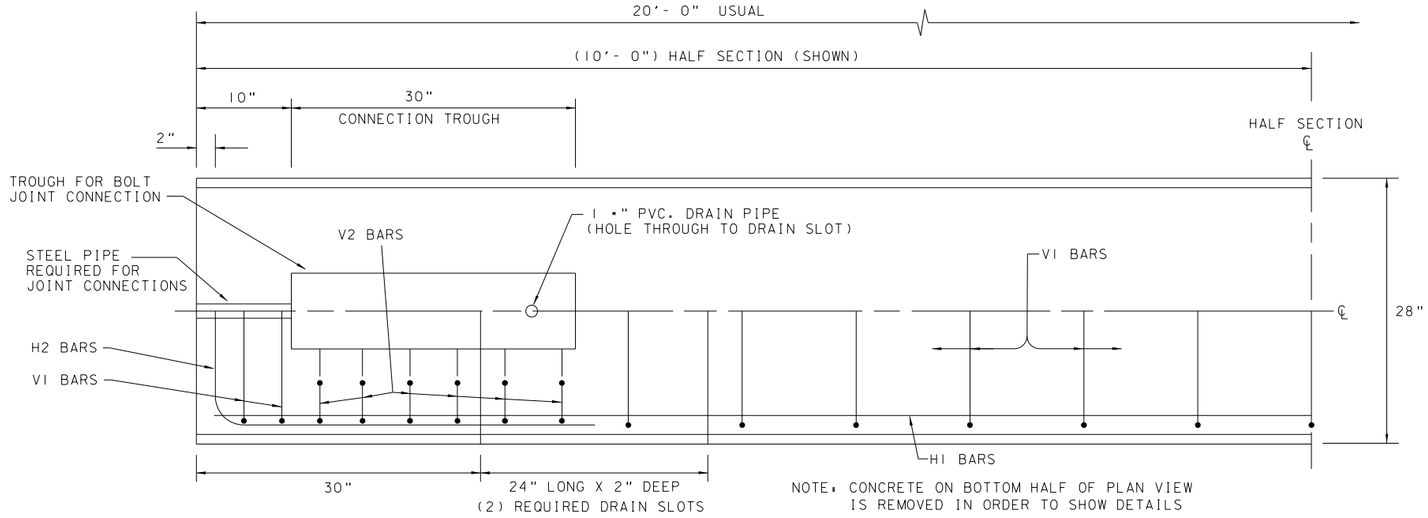
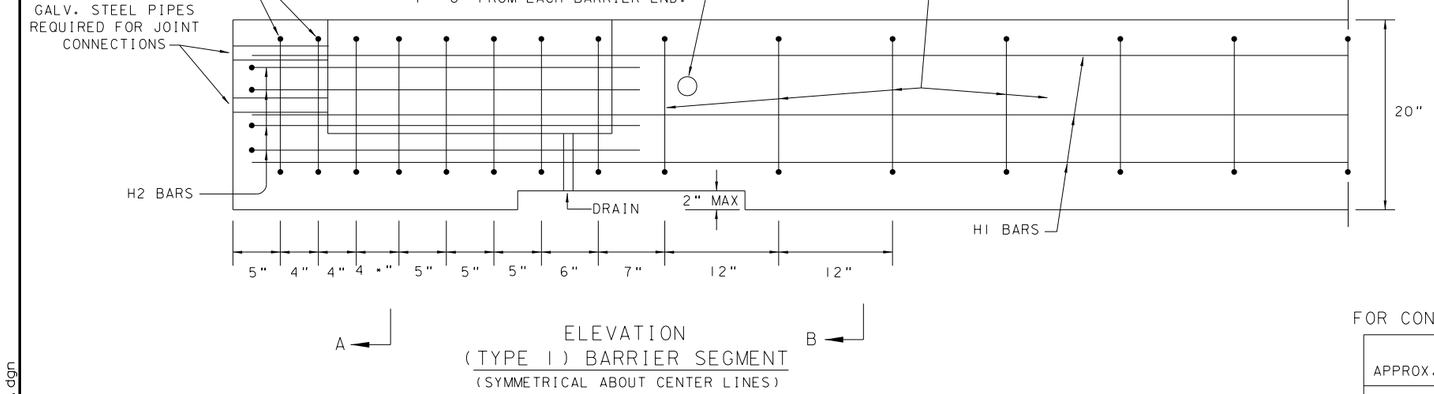
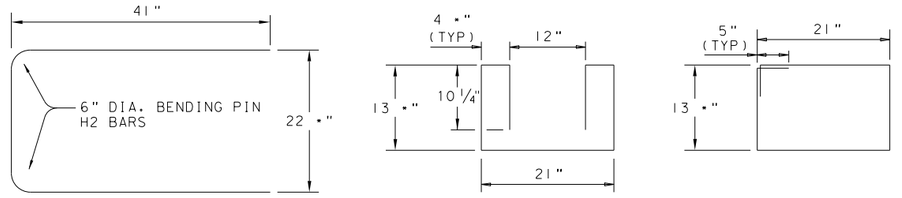


NOTE, CONCRETE ON BOTTOM HALF OF PLAN VIEW IS REMOVED IN ORDER TO SHOW DETAILS

PLAN
(TYPE 1) BARRIER SEGMENT
(SYMMETRICAL ABOUT CENTER LINES)



ELEVATION
(TYPE 1) BARRIER SEGMENT
(SYMMETRICAL ABOUT CENTER LINES)



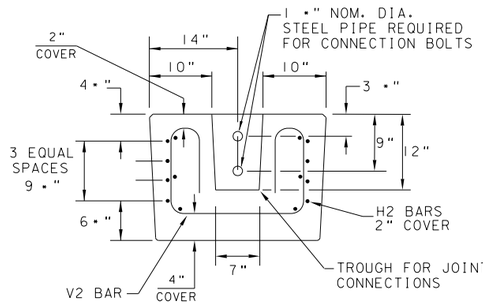
(8)•H2 BARS
(•5) BARS

(12)•V2 BARS
(•4) BARS

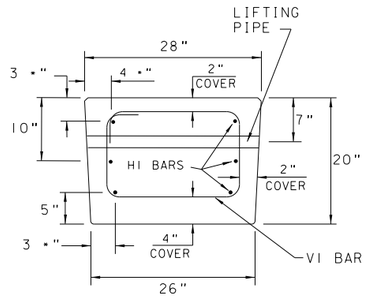
(17)•V1 BARS
(•4) BARS

REINFORCING STEEL DETAILS
TYPE 1 - BARRIER SEGMENT

NOTE, USE 2" DIA. BENDING PIN, UNLESS OTHERWISE SHOWN



SECTION A-A



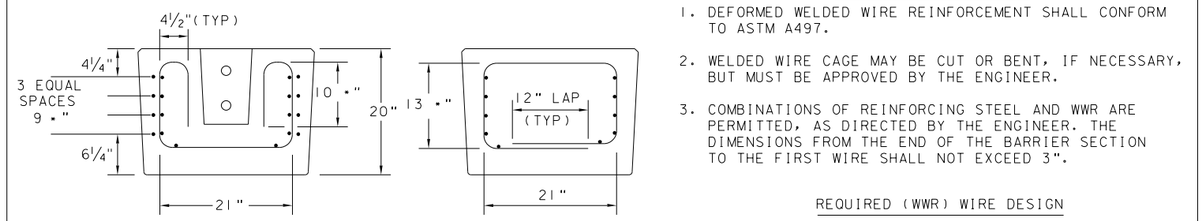
SECTION B-B

GENERAL NOTES

1. LOW PROFILE CONCRETE BARRIER (LPCB), IS APPROVED FOR USE IN TEMPORARY WORK ZONE LOCATIONS, WHERE THE POSTED SPEED IS 45 MPH, OR LESS.
2. CONCRETE SHALL BE CLASS H FOR PRECAST BARRIER WITH A MINIMUM COMPRESSIVE STRENGTH OF 3,600 PSI.
3. WHERE USED, REBAR REINFORCEMENT SHALL BE GRADE 60 AND CONFORM TO ASTM A615.
4. PRECAST LPCB BARRIER LENGTH SHALL BE 20 FT.
5. ALL BARRIER EDGES SHALL HAVE •" CHAMFER OR A TOOLED RADIUS.
6. JOINT CONNECTION HARDWARE SHALL BE IN ACCORDANCE WITH ITEM 449, "ANCHOR BOLTS." AND IS CONSIDERED SUBSIDIARY.
7. STEEL PIPE REQUIRED FOR JOINT CONNECTION BOLTS SHALL BE GALVANIZED IN ACCORDANCE WITH ITEM 445,"GALVANIZING."
8. WELDED WIRE REINFORCEMENT (WWR) MAY BE USED IN LIEU OF CONVENTIONAL REINFORCEMENT FOR TYPE 1 BARRIER, AND SHALL MEET THE REQUIREMENTS SHOWN.

FOR CONTRACTORS INFORMATION ONLY

(TYPE 1) APPROX. QUANTITIES 20 FT. SECTION		
CONCRETE	CY	2.6
REINFORCING STEEL	LBS	330
TOTAL BARRIER WT.	LBS	11000



SECTION A-A SECTION B-B

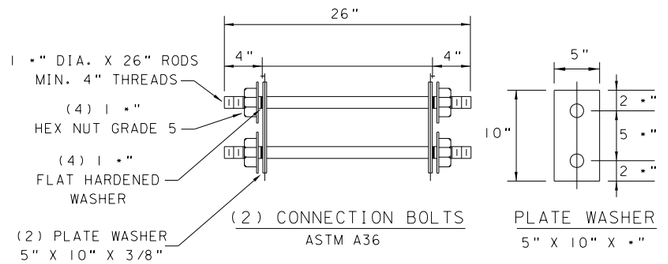
(WWR) GENERAL NOTES

1. DEFORMED WELDED WIRE REINFORCEMENT SHALL CONFORM TO ASTM A497.
2. WELDED WIRE CAGE MAY BE CUT OR BENT, IF NECESSARY, BUT MUST BE APPROVED BY THE ENGINEER.
3. COMBINATIONS OF REINFORCING STEEL AND WWR ARE PERMITTED, AS DIRECTED BY THE ENGINEER. THE DIMENSIONS FROM THE END OF THE BARRIER SECTION TO THE FIRST WIRE SHALL NOT EXCEED 3".

REQUIRED (WWR) WIRE DESIGN

8 • (D31) HORIZONTAL WIRES (EQUALLY SPACED)
10 • (D20) HORIZONTAL WIRES (EQUALLY SPACED)
29 • (D20) VERTICAL WIRES (SPACED AS SHOWN IN ELEVATION VIEW)

WELDED WIRE REINFORCEMENT (WWR)- OPTIONAL REINFORCING



(2) CONNECTION BOLTS
ASTM A36

PLATE WASHER
5" X 10" X •"

NOTE, RODS, HEX NUTS AND WASHERS SHALL BE GALVANIZED.

SHEET 1 OF 2

Texas Department of Transportation

Design Division Standard

LOW PROFILE CONCRETE BARRIER
PRECAST BARRIER
(TYPE 1)
LPCB-13

FILE, LPCB13.DGN	DN, TXDOT	CK, AM	DW, VP	CK,
©TXDOT DECEMBER 2010	CONT	SECT	JOB	HIGHWAY
REVISIONS	0902	90	019,ETC	CS
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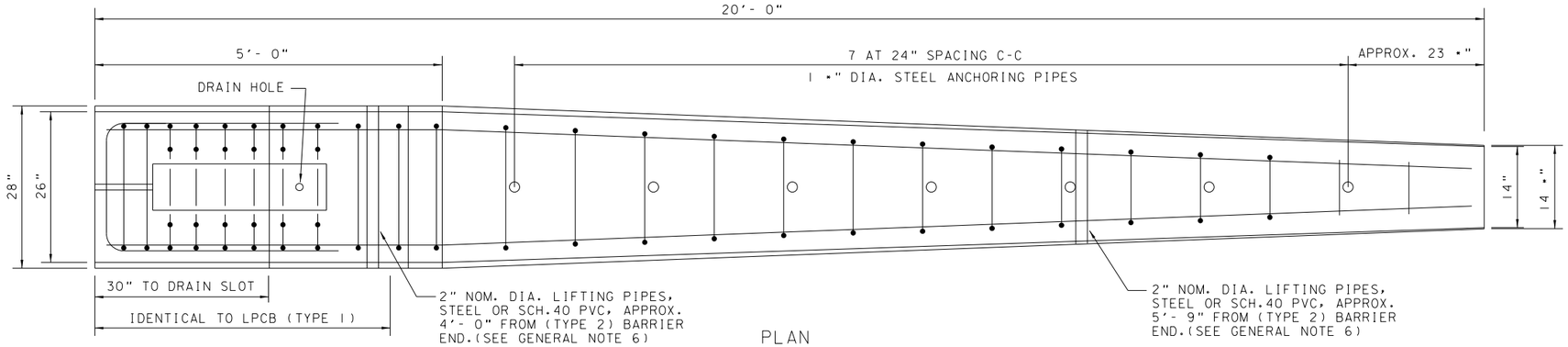
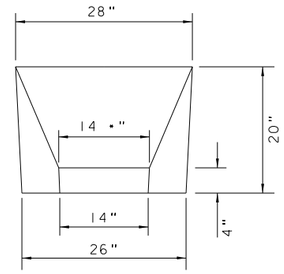
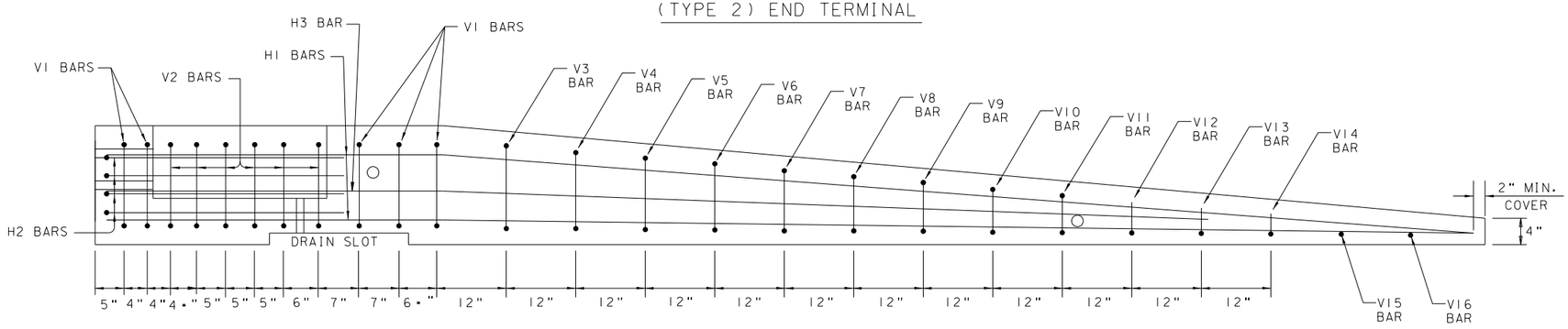


PLAN
(TYPE 2) END TERMINAL



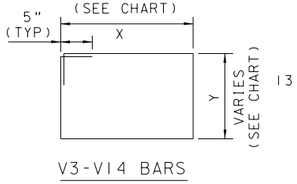
APPROACH VIEW



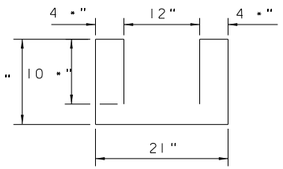
ELEVATION
(TYPE 2) END TERMINAL

TYPE 2 - NOTES

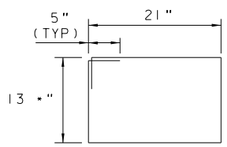
1. WELDED WIRE REINFORCMENT (WWR) IS "NOT" AN OPTION FOR TYPE 2 BARRIER.
2. TYPE 2 BARRIER SHALL BE USED AS AN END TREATMENT FOR THE TYPE 1 BARRIER SEGMENTS, WHEN APPLICABLE.
3. THE END TREATMENT CAN BE USED WITHOUT THE ANCHOR PINS IN LOCATIONS THAT CAN ACCOMMODATE APPROXIMATELY 4 FT. OF LATERAL DISPLACEMENT OF THE END TREATMENT. THE USE OF NON-PINNED END TREATMENT DOES NOT AFFECT THE PERFORMANCE OR THE DEFLECTION OF THE LOW-PROFILE BARRIER SYSTEM.
4. THE ANCHOR PINS ARE ALL THE SAME LENGTH AND ARE TO BE DRIVEN FLUSH WITH THE TOP OF THE (TYPE 2) BARRIER SURFACE.
5. THE BENDS IN THE H3 AND H1 BARS ARE SLIGHT, NO FORMAL BEND IS NECESSARY.
6. THE TYPE 2 BARRIER SEGMENT MUST BE LIFTED FROM THE REAR FIRST, TO PREVENT CRACKING OF SLOPED SECTION.
7. SEE LPCB SHEET 1 FOR ADDITIONAL INFORMATION.



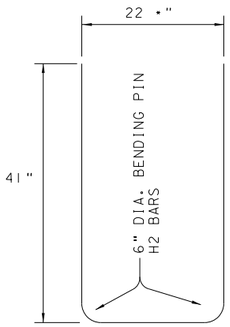
V3-V14 BARS



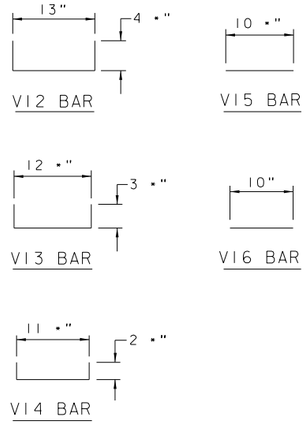
(6)•V2 BARS



(5)•V1 BARS



(4)•H2 BARS
(•5) BARS

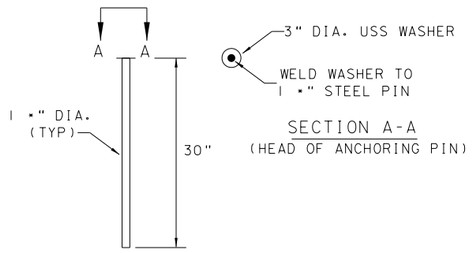


NOTE: ALL V BARS ARE (•4)

BAR(•4)	X (IN.)	Y (IN.)
V3 BAR	20 •	14 •
V4 BAR	19 •	13 •
V5 BAR	18 •	12 •
V6 BAR	17 •	11 •
V7 BAR	17	10 •
V8 BAR	16 •	9
V9 BAR	15 •	8
V10 BAR	14 •	7
V11 BAR	13 •	6

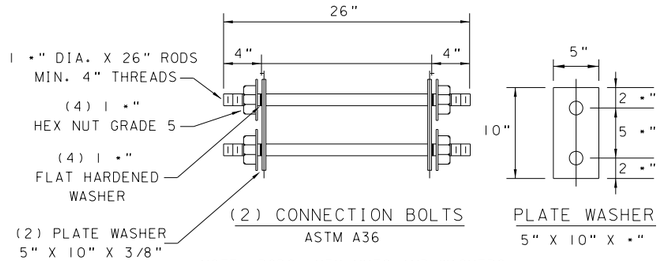
REINFORCING STEEL DETAILS
TYPE 2 - END TERMINAL

NOTE: ANCHORING PIPES NOT SHOWN IN ELEVATION VIEW



SECTION A-A
(HEAD OF ANCHORING PIN)

(7) ANCHOR PINS (SEE NOTE 3)
ASTM A36 STEEL

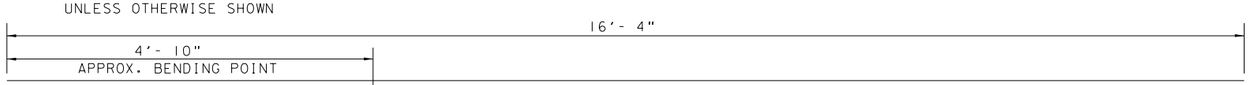


(2) CONNECTION BOLTS
ASTM A36

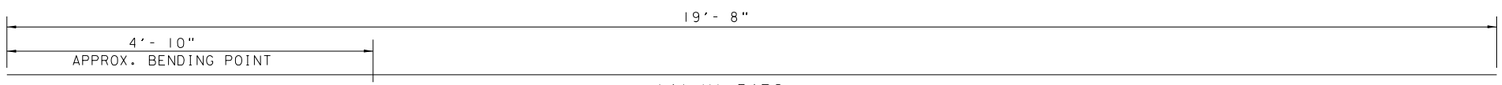
PLATE WASHER
5" X 10" X •"

NOTE: RODS, HEX NUTS AND WASHERS SHALL BE GALVANIZED.

NOTE: USE 2" DIA. BENDING PIN, UNLESS OTHERWISE SHOWN



(2)•H3 BARS
(•5) BAR



NOTE: BENDS ON H1 AND H3 BARS ARE SLIGHT AND DO NOT REQUIRE FORMAL BENDS.

(4)•H1 BARS
(•5) BAR

FOR CONTRACTORS INFORMATION ONLY

(TYPE 2) APPROX. QUANTITIES	20 FT. SECTION	
CONCRETE	CY	1.65
REINFORCING STEEL	LBS	240
TOTAL BARRIER WT.	LBS	7000

Texas Department of Transportation

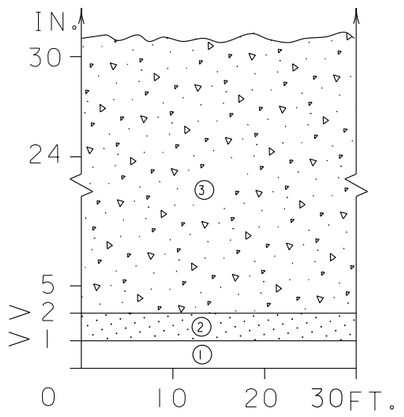
Design Division Standard

LOW PROFILE CONCRETE BARRIER
PRECAST BARRIER (TYPE 2)
LPCB-13

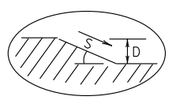
FILE: LPCB13.DGN	DN: TXDOT	CK: AM	DW: VP	CK:
©TXDOT DECEMBER 2010	CONT	SECT	JOB	HIGHWAY
REVISIONS	0902	90	019,ETC	CS
	DIST	COUNTY		SHEET NO.
	FTW	TARRANT		35

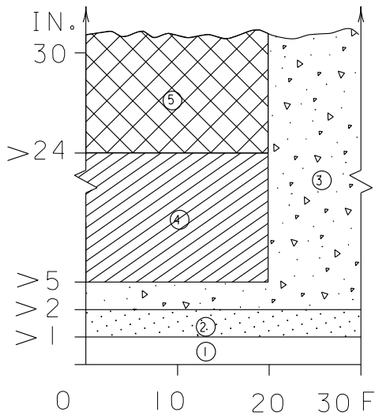
DEFINITION OF TREATMENT ZONES FOR VARIOUS EDGE CONDITIONS

EDGE HEIGHT (D) IN INCHES VERSUS LATERAL CLEARANCE (Y) IN FEET

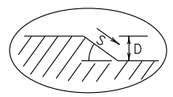


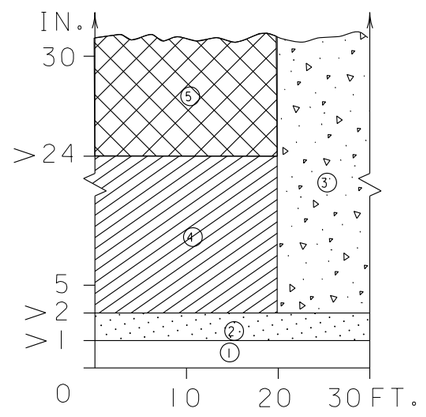
EDGE CONDITION I
S = (3:1) (OR FLATTER)



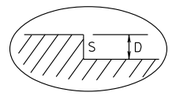


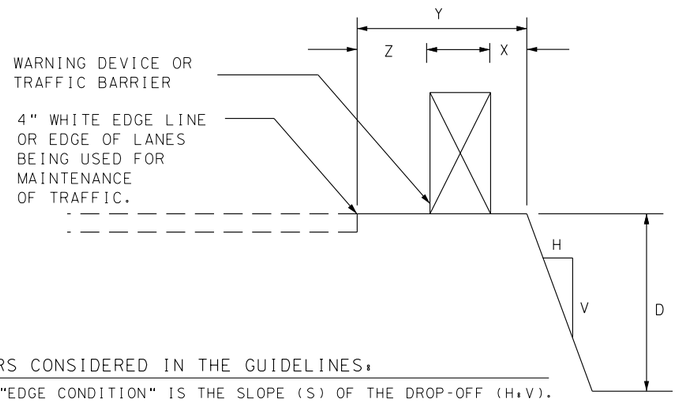
EDGE CONDITION II
S = ((2.99):1) TO (1:1)





EDGE CONDITION III
S IS STEEPER THAN (1:1)





FACTORS CONSIDERED IN THE GUIDELINES:

1. THE "EDGE CONDITION" IS THE SLOPE (S) OF THE DROP-OFF (H:V). THE "EDGE HEIGHT IS THE DEPTH OF THE DROP-OFF "D".

2. DISTANCE "X" IS TO BE THE MAXIMUM PRACTICAL UNDER JOB CONDITIONS. TWO FEET MINIMUM FOR HIGH SPEED CONDITIONS. DISTANCE "Y" IS THE LATERAL CLEARANCE FROM EDGE OF TRAVEL LANE TO EDGE OF DROPOFF. DISTANCE "Z" DOES NOT HAVE A MINIMUM.

3. IN ADDITION TO THE FACTORS CONSIDERED IN THE GUIDELINES, EACH CONSTRUCTION ZONE DROP-OFF SITUATION SHOULD BE ANALYZED INDIVIDUALLY, TAKING INTO ACCOUNT OTHER VARIABLES, SUCH AS: TRAFFIC MIX, POSTED SPEED IN THE CONSTRUCTION ZONE, HORIZONTAL CURVATURE, AND THE PRACTICALITY OF THE TREATMENT OPTIONS.

4. THE CONDITIONS FOR INDICATING THE USE OF POSITIVE OR PROTECTIVE BARRIERS ARE GIVEN BY ZONE-5 AND FIGURE-1. TRAFFIC BARRIERS ARE PRIMARILY APPLICABLE FOR HIGH SPEED CONDITIONS. URBAN AREAS WITH SPEEDS OF 30 MPH OR LESS MAY HAVE A LESSER NEED FOR SIGNING, DELINEATION, AND BARRIERS. RIGHT-ANGLED EDGES, HOWEVER, WITH "D" GREATER THAN 2 INCHES AND LOCATED WITHIN A LATERAL OFFSET OF 6 FEET, MAY INDICATE A HIGHER LEVEL OF TREATMENT.

5. IF THE DISTANCE "Y" MUST BE LESS THAN 3 FEET, THE USE OF A POSITIVE BARRIER MAY NOT BE FEASIBLE. IN SUCH A CASE, CONSIDER EITHER: 1) NARROWING THE LANES TO A DESIRED 11 TO 12 FEET OR 10 FOOT MINIMUM (SEE CW20-8 SIGN), OR 2) PROVIDE AN EDGE SLOPE SUCH AS EDGE CONDITION I.

ZONE	TREATMENT TYPES GUIDELINES:
1	NO TREATMENT
2	CW 8-11 "UNEVEN LANES" SIGNS.
3	CW 8-9A SHOULDER DROP-OFF" OR CW 8-11 SIGNS PLUS VERTICAL PANELS.
4	CW8-9A OR CW 8-11, SIGNS PLUS DRUMS. WHERE RESTRICTED SPACE PRECLUDES THE USE OF DRUMS, USE VERTICAL PANELS. AN EDGE SLOPE TO THAT OF THE PROFERED EDGE CONDITION I.
5	CHECK INDICATIONS (FIGURE-1) FOR POSSITIVE BARRIER. WHERE POSITIVE BARRIER IS NOT INDICATED, THE TREATMENT SHOWN ABOVE FOR ZONE-4 MAY BE USED AFTER CONSIDERATION OF OTHER APPLICABLE FACTORS.

EDGE CONDITION NOTES:

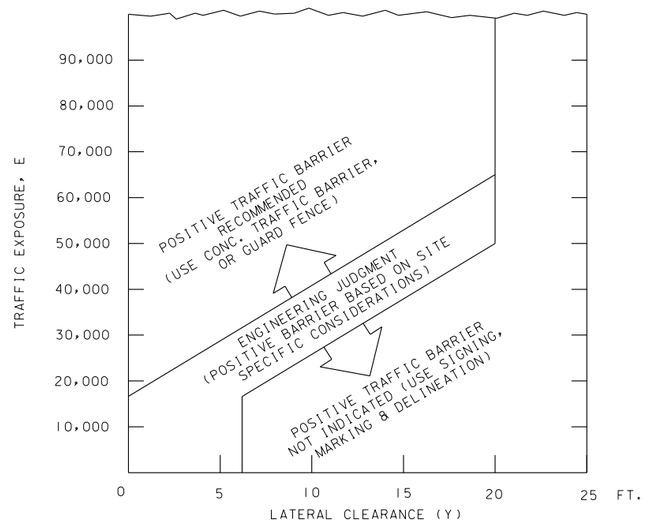
1. EDGE CONDITION I: MOST VEHICLES ARE ABLE TO TRAVERSE AN EDGE CONDITION WITH A SLOPE RATE OF (3 TO 1) OR FLATTER. THE SLOPE MUST BE CONSTRUCTED WITH A COMPACTED MATERIAL CAPABLE OF SUPPORTING VEHICLES.

2. EDGE CONDITION II: MOST VEHICLES ARE ABLE TO TRAVERSE AN EDGE CONDITION WITH A SLOPE BETWEEN (2.99 TO 1) AND (1 TO 1) SO LONG AS "D" DOES NOT EXCEED 5 INCHES. UNDER-CARRIAGE DRAG ON MOST AUTOMOBILES WILL OCCUR WHEN "D" EXCEEDS 6 INCHES. AS "D" EXEEDS 24 INCHES, THE POSSIBILITY FOR ROLLOVER IS GREATER IN MOST VEHICLES.

3. EDGE CONDITION III: WHEN SLOPES ARE GREATER THAN (1 TO 1) AND WHERE "D" IS GREATER THAN 2 INCHES, A MORE DIFFICULT CONTROL FACTOR MAY EXIST FOR SOME VEHICLES, IF NOT PROPERLY TREATED. FOR EXAMPLE, WHERE "D" IS GREATER THAN 2 INCHES AND UP TO 24 INCHES DIFFERENT TYPES OF VEHICLES MAY EXPERIENCE DIFFERENT STEERING CONTROL AT DIFFERENT EDGE HEIGHTS. AUTOMOBILES MIGHT EXPERIENCE MORE STEERING CONTROL DIFFERENTIAL WHEN "D" IS GREATER THAN 2 INCHES AND UP TO 5 INCHES. TRUCKS, PARTICULARILY THOSE WITH HIGH LOADS, HAVE MORE STEERING CONTROL DIFFERENTIAL WHEN "D" IS GREATER THAN 5 INCHES AND UP TO 24 INCHES. WHEN "D" EXCEEDS 24 INCHES, THE POSSIBILITY OF ROLLOVER IS GREATER FOR MOST VEHICLES.

4. MILLING OR OVERLAY OPERATIONS THAT RESULT IN EDGE CONDITION III SHOULD NOT BE IN PLACE WITHOUT APPROPRIATE WARNING TREATMENTS, AND THESE CONDITIONS SHOULD NOT BE LEFT IN PLACE FOR EXTENDED PERIODS OF TIME.

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



1. E = ADT X T
WHERE ADT IS THAT PORTION OF THE AVERAGE DAILY TRAFFIC VOLUME TRAVELING WITHIN 20 FEET (GENERALLY TWO ADJACENT LANES) OF THE EDGE DROPOFF CONDITION; AND, T IS THE DURATION TIME IN YEARS OF THE DROPOFF CONDITION.

2. FIGURE-1 PROVIDES A PRACTICAL APPROACH TO THE USE OF POSITIVE BARRIERS FOR THE PROTECTION OF VEHICLES FROM PAVEMENT DROP-OFFS. OTHER FACTORS, SUCH AS THE PRESENCE OF HEAVY MACHINERY, CONSTRUCTION WORKERS, OR THE MIX AND VOLUME OF TRAFFIC MAY MAKE THE USE OF POSITIVE BARRIERS APPROPRIATE, EVEN WHEN THE EDGE CONDITION ALONE MAY NOT JUSTIFY THE USE OF A BARRIER.

3. AN APPROVED END TREATMENT SHOULD BE PROVIDED FOR ANY POSITIVE BARRIER END LOCATED WITHIN THE CLEAR ZONE.

THESE GUIDELINES APPLY TO TEMPORARY TRAFFIC CONTROL AREAS OR WORK ZONES WHERE CONTINUOUS PAVEMENT EDGES OR DROP-OFFS EXISTS PARALLEL AND ADJACENT TO A LANE USED BY TRAFFIC. THE EDGE CONDITIONS MAY BE PRESENT BETWEEN SHOULDERS AND TRAVEL LANES, BETWEEN ADJACENT OR OPPOSING TRAVEL LANES, OR AT INTERMEDIATE POINTS ACROSS THE WIDTH OF THE PAVED SURFACE. DUE TO THE VARIABILITY IN CONSTRUCTION OPERATIONS, TOLERANCES IN THE VARIABLES MAY BE ALLOWED BY THE ENGINEER. THESE GUIDELINES DO NOT APPLY TO SHORT TERM OPERATIONS. THESE GUIDELINES DO NOT CONSTITUTE A RIGID STANDARD OR POLICY, RATHER, THEY ARE GUIDANCE TO BE USED IN CONJUNCTION WITH ENGINEERING JUDGEMENT. THESE GUIDELINES MAY BE UPDATED ON THE DESIGN DIVISION'S ON-LINE MANUALS.

STATE OF TEXAS
ALEX I. GARCIA
107317
PROFESSIONAL ENGINEER
04/12/2024

Texas Department of Transportation

Traffic Safety Division Standard

TREATMENT FOR VARIOUS EDGE CONDITIONS

FILE: EDGECON.DGN	DN:	CK:	DW:	CK:
©TXDOT AUGUST 2000	CONT	SECT	JOB	HIGHWAY
REVISIONS	0902	90	019,ETC	CS
03-01 08-01 9-21	DIST	COUNTY		SHEET NO.
	FTW	TARRANT		36

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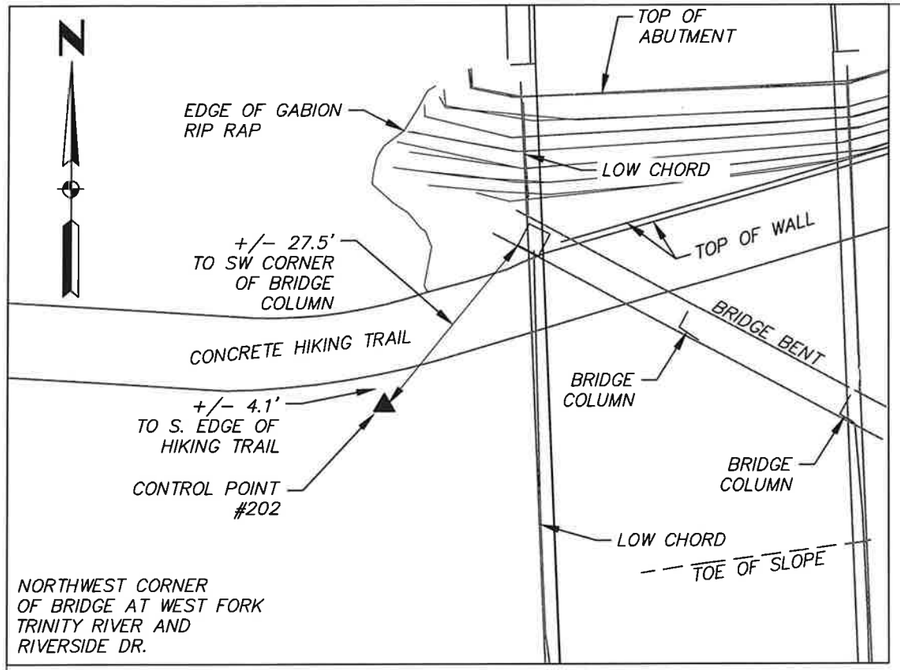

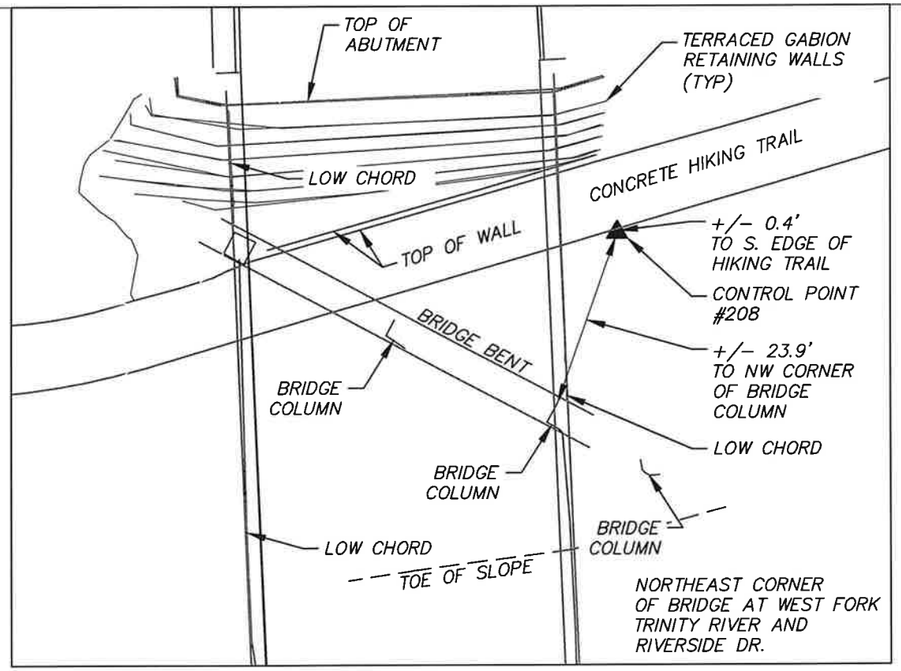

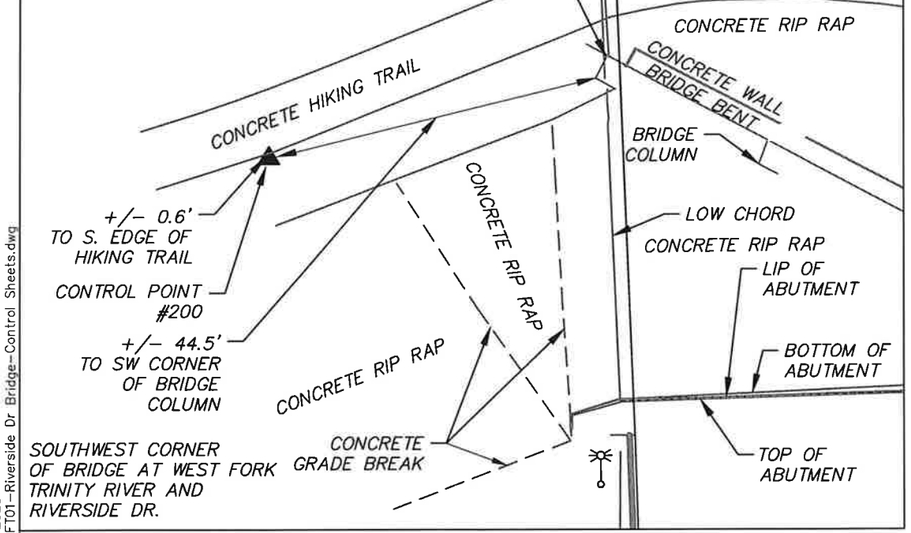

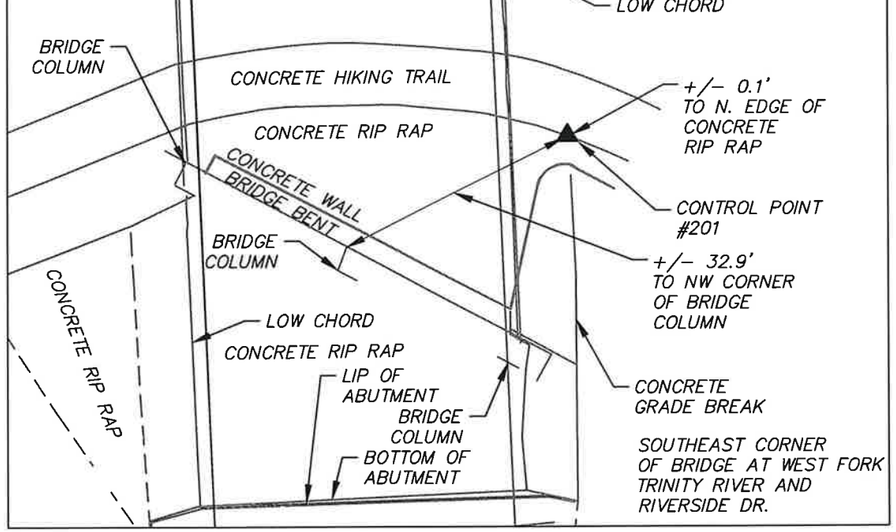

Point Table				
Point #	Raw Description	Elevation	Northing	Easting
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201	CPNS	507.394	6958807.6490	2336673.2500
202	CPRBPC	506.206	6959004.4680	2336594.0930
208	CPRBPC	510.781	6959028.2780	2336664.1530

0 20 40

SCALE: 1" = 20'

PLEASE REFER TO BAR SCALE. DRAWING MAY HAVE BEEN REDUCED OR ENLARGED

BASIS OF HORIZONTAL DATUM:
NAD 1983(2011) EPOCH 2010, TEXAS STATE PLANE COORDINATE SYSTEM, NORTH CENTRAL ZONE (4204), BASED ON THE ALLTERRA CENTRAL RTK NETWORK. STATE PLANE COORDINATE VALUES HAVE BEEN ADJUSTED TO SURFACE FOR THIS PROJECT USING A COMBINED SCALE FACTOR OF 1.00012. TO CONVERT BACK TO STATE PLANE COORDINATES MULTIPLY BY 0.999880014.

BASIS OF VERTICAL DATUM:
NAVD 88, GEOID 18, BASED ON THE ALLTERRA CENTRAL RTK NETWORK.

CONTROL POINT #200
5/8-INCH CAPPED IRON ROD SET WITH RED PLASTIC CAP STAMPED "RANDOM", BELOW THE BRIDGE, +/- 0.6' SOUTH OF A CONCRETE HIKING TRAIL AND +/- 44.5' WEST/SOUTHWEST OF THE SOUTHWEST CORNER OF A CONCRETE BRIDGE COLUMN.

CONTROL POINT #201
MAG NAIL WITH SHINER SET, BELOW THE BRIDGE, IN A CONCRETE HIKING TRAIL, +/- 0.1' NORTH OF THE EDGE OF CONCRETE RIP RAP AND +/- 32.9' NORTHEAST OF THE NORTHWEST CORNER OF A CONCRETE BRIDGE COLUMN.

CONTROL POINT #202
5/8-INCH CAPPED IRON ROD SET WITH RED PLASTIC CAP STAMPED "RANDOM", BELOW THE BRIDGE, +/- 4.1' SOUTH OF A CONCRETE HIKING TRAIL AND +/- 27.5' SOUTHWEST OF THE SOUTHWEST CORNER OF A CONCRETE BRIDGE COLUMN.

CONTROL POINT #208
5/8-INCH CAPPED IRON ROD SET WITH RED PLASTIC CAP STAMPED "RANDOM", BELOW THE BRIDGE, +/- 0.4' SOUTH OF A CONCRETE HIKING TRAIL AND +/- 23.9' NORTH/NORTHEAST OF THE NORTHWEST CORNER OF A CONCRETE BRIDGE COLUMN.

STATE OF TEXAS
REGISTERED
MITCHELL SAGUN PILLAR
5491
PROFESSIONAL
LAND SURVEYOR

SURVEYOR: MITCHELL S. PILLAR
R.P.L.S. NO. 5491
MARCH 8, 2024

REV	BY	DESCRIPTION	DATE

HUITT-ZOLLARS
Huitt-Zollars, Inc. Dallas
5430 LBJ FWY., Ste. 1500
Dallas, Texas 75240
Phone (214) 871-3311 Fax (214) 871-0757

Texas Department of Transportation

RIVERSIDE DRIVE SB

SURVEY CONTROL

FED RD. DIV.NO.	PROJECT NO.		HIGHWAY NO.
6	SEE TITLE SHEET		CS
STATE	DISTRICT	COUNTY	SHEET NO.
TEXAS	FTW	TARRANT	37
CONTROL	SECTION NO.	JOB	
0902	90	019, ETC.	

Plotted on: MARCH 21, 2023
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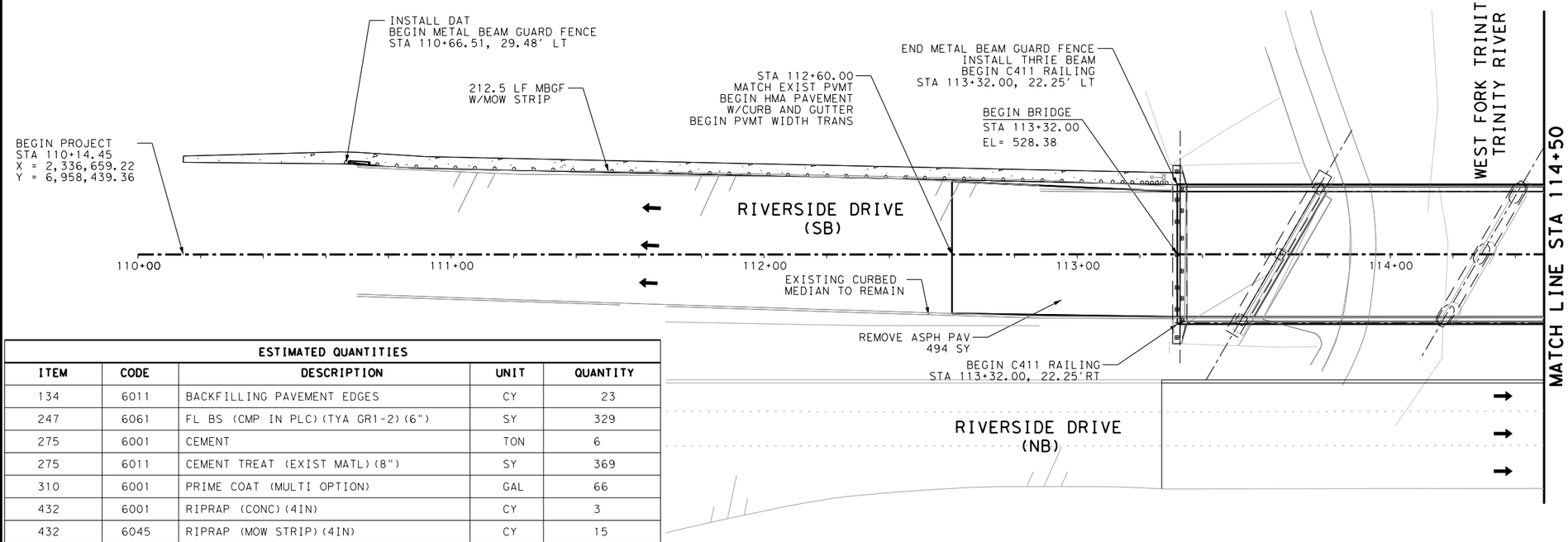


NOTES:

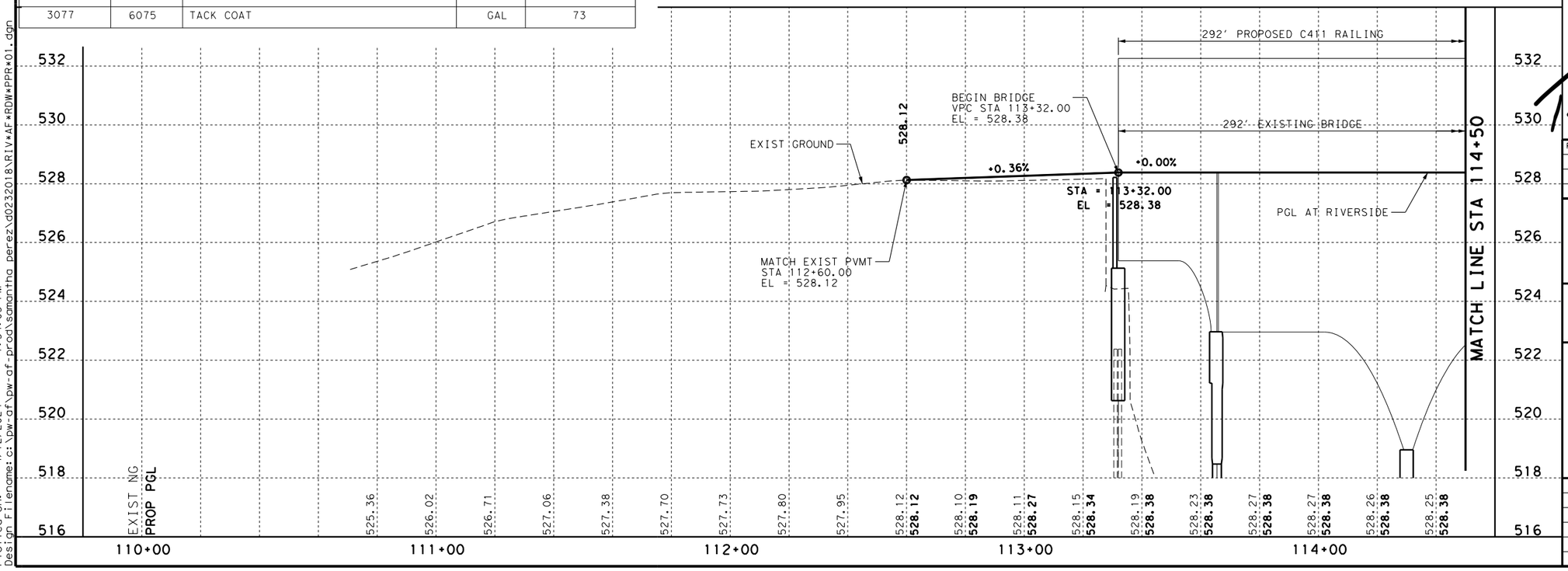
1. SEE BRIDGE LAYOUT SHEETS FOR BRIDGE DETAILS.
2. SEE BRIDGE DRAINAGE LAYOUT SHEETS FOR BRIDGE DETAILS.

0 20' 40'

SCALE: 1" = 40' HORZ
1" = 4' VERT

ESTIMATED QUANTITIES

ITEM	CODE	DESCRIPTION	UNIT	QUANTITY
134	6011	BACKFILLING PAVEMENT EDGES	CY	23
247	6061	FL BS (CMP IN PLC)(TYA GR1-2)(6")	SY	329
275	6001	CEMENT	TON	6
275	6011	CEMENT TREAT (EXIST MATL)(8")	SY	369
310	6001	PRIME COAT (MULTI OPTION)	GAL	66
432	6001	RIPRAP (CONC)(4IN)	CY	3
432	6045	RIPRAP (MOW STRIP)(4IN)	CY	15
529	6008	CONC CURB & GUTTER (TY II)	LF	144
536	6002	CONC MEDIAN	SY	316
540	6002	MTL W-BEAM GD FEN (STEEL POST)	LF	213
540	6006	MTL BEAM GD FEN TRANS (THRIE-BEAM)	EA	1
540	6016	DOWNSTREAM ANCHOR TERMINAL SECTION	EA	1
3076	6001	D-GR HMA TY-B PG64-22	TON	76
3077	6027	SP MIXES SP-C SAC-A PG70-28	TON	38
3077	6075	TACK COAT	GAL	73



STATE OF TEXAS
ALEX I. GARCIA
107317
PROFESSIONAL LICENSED ENGINEER

04/12/2024

REV	BY	DESCRIPTION	DATE

AGUIRRE & FIELDS
ENGINEERING INNOVATORS
TBPE FIRM REGISTRATION #739

Texas Department of Transportation

RIVERSIDE DR SB

PLAN AND PROFILE

BEGIN TO STA 114+50

SHEET 1 OF 2

FED.RD. DIV.NO.	PROJECT NO.	HIGHWAY NO.
6	SEE TITLE SHEET	CS

STATE	DISTRICT	COUNTY	SHEET NO.
TEXAS	FTW	TARRANT	38

CONTROL	SECTION NO.	JOB
0902	90	019, ETC

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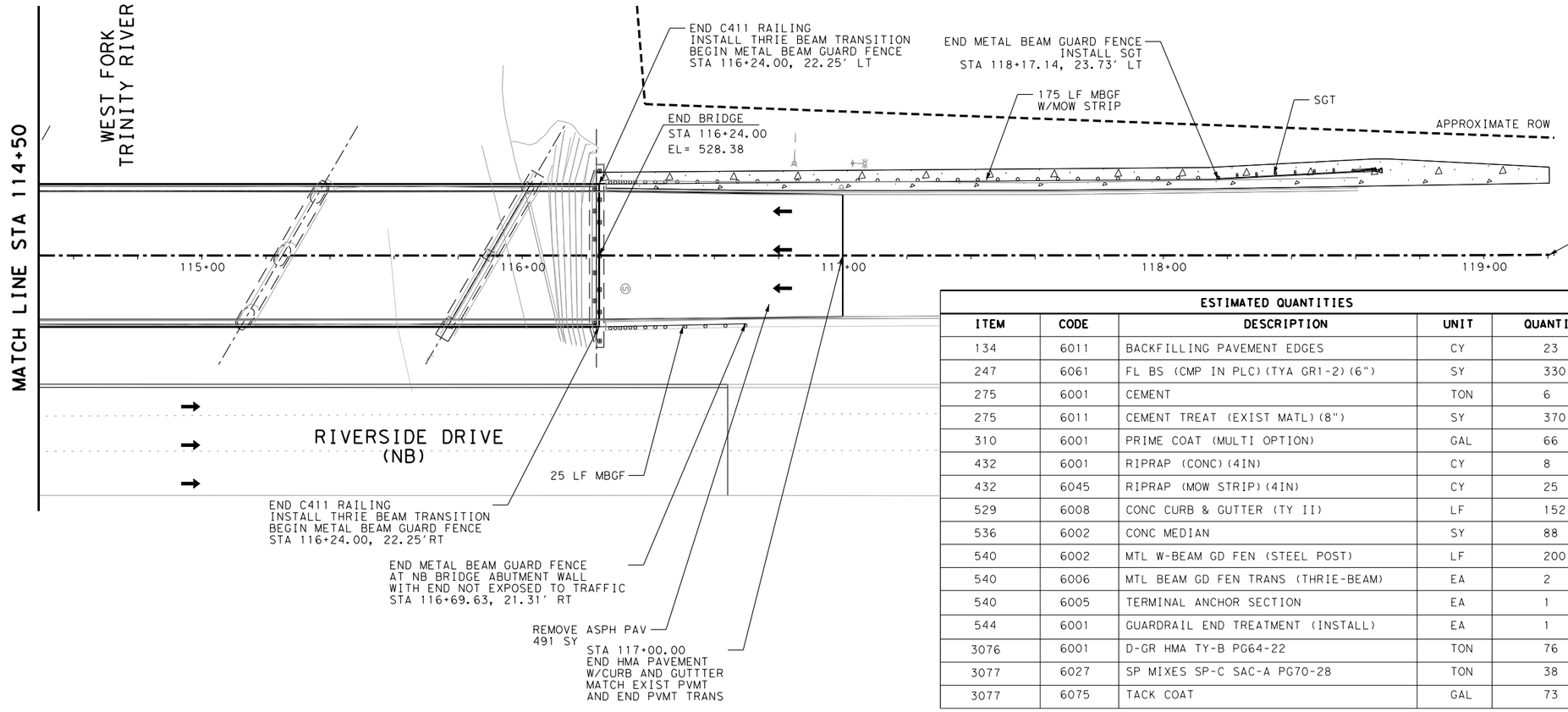
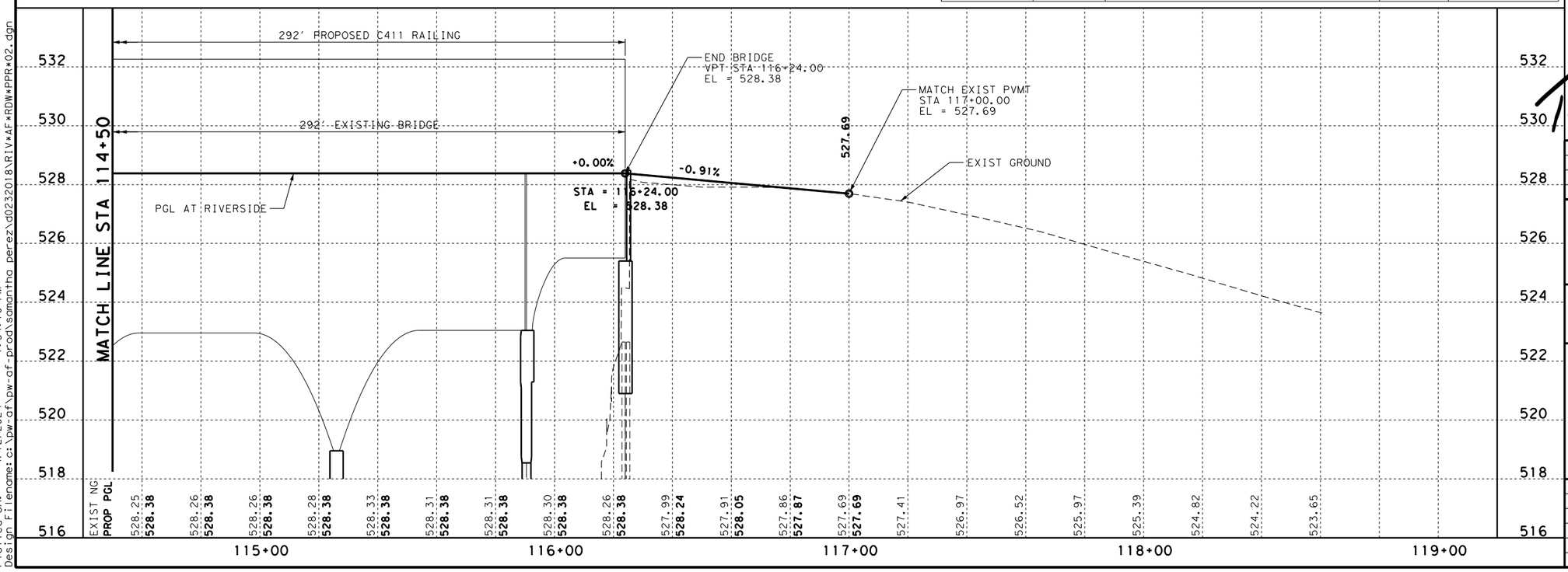


NOTES:

1. SEE BRIDGE LAYOUT SHEETS FOR BRIDGE DETAILS.
1. SEE BRIDGE DRAINAGE LAYOUT SHEETS FOR DRAINAGE DETAILS.

ESTIMATED QUANTITIES

ITEM	CODE	DESCRIPTION	UNIT	QUANTITY
134	6011	BACKFILLING PAVEMENT EDGES	CY	23
247	6061	FL BS (CMP IN PLC)(TYA GR1-2)(6")	SY	330
275	6001	CEMENT	TON	6
275	6011	CEMENT TREAT (EXIST MATL)(8")	SY	370
310	6001	PRIME COAT (MULTI OPTION)	GAL	66
432	6001	RIPRAP (CONC)(4IN)	CY	8
432	6045	RIPRAP (MOW STRIP)(4IN)	CY	25
529	6008	CONC CURB & GUTTER (TY II)	LF	152
536	6002	CONC MEDIAN	SY	88
540	6002	MTL W-BEAM GD FEN (STEEL POST)	LF	200
540	6006	MTL BEAM GD FEN TRANS (THRIE-BEAM)	EA	2
540	6005	TERMINAL ANCHOR SECTION	EA	1
544	6001	GUARDRAIL END TREATMENT (INSTALL)	EA	1
3076	6001	D-GR HMA TY-B PG64-22	TON	76
3077	6027	SP MIXES SP-C SAC-A PG70-28	TON	38
3077	6075	TACK COAT	GAL	73



0 20' 40'

SCALE: 1" = 40' HORZ
1" = 4' VERT

STATE OF TEXAS
ALEX I. GARCIA
107317
PROFESSIONAL LICENSED ENGINEER

04/12/2024

REV	BY	DESCRIPTION	DATE

AGUIRRE & FIELDS
ENGINEERING INNOVATORS
TBPE FIRM REGISTRATION #739

Texas Department of Transportation

RIVERSIDE DR SB

PLAN AND PROFILE

STA 114+50 TO END

SHEET 2 OF 2

FED.RD. DIV.NO.	PROJECT NO.		HIGHWAY NO.
6	SEE TITLE SHEET		CS
STATE	DISTRICT	COUNTY	SHEET NO.
TEXAS	FTW	TARRANT	39
CONTROL	SECTION NO.	JOB	
0902	90	019, ETC	

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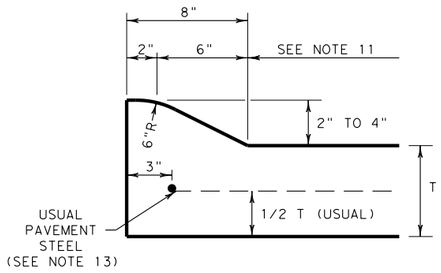
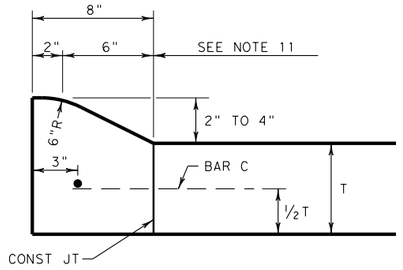


TYPE I CURB (MONOLITHIC)
2" - 4" HEIGHT



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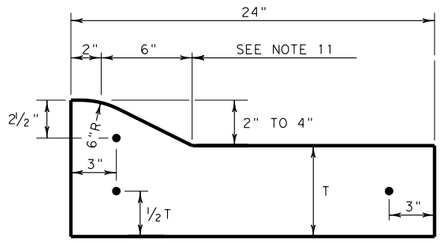
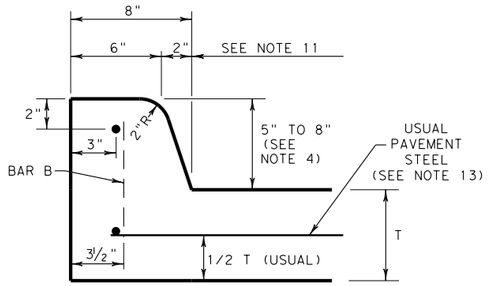
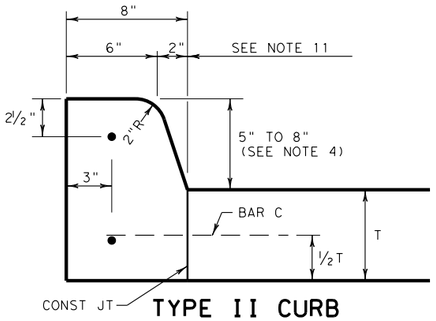
2" - 4" HEIGHT



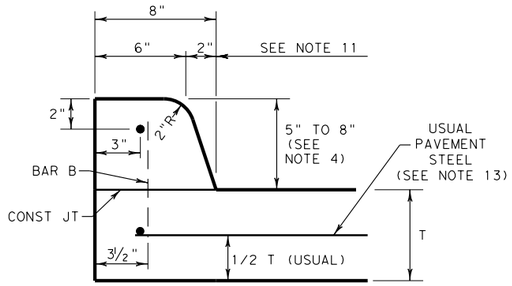
TYPE I CURB AND GUTTER
2" - 4" HEIGHT



TYPE II CURB (MONOLITHIC)
5" - 8" HEIGHT



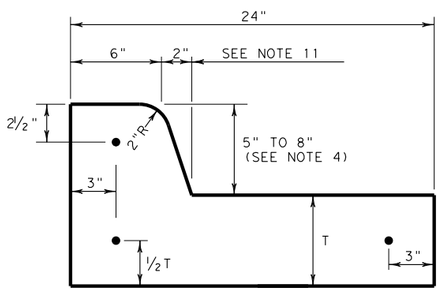
TYPE II CURB
5" - 8" HEIGHT
DOWELED VERTICAL JOINT



TYPE II CURB
5" - 8" HEIGHT
DOWELED HORIZONTAL JOINT

GENERAL NOTES

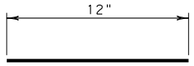
1. ALL MATERIALS AND CONSTRUCTION SHALL BE IN ACCORDANCE WITH ITEM 529, "CONCRETE CURB, GUTTER, AND COMBINED CURB AND GUTTER".
2. ALL CONCRETE SHALL BE CLASS "A".
3. ALL REINFORCING BARS SHALL BE #4, UNLESS OTHERWISE SHOWN.
4. UNLESS OTHERWISE SHOWN, ALL TYPE II CURB SHALL BE 6" HEIGHT .
5. ROUND EXPOSED SHARP EDGES WITH A ROUNDING TOOL, TO A MINIMUM RADIUS OF 1/4".
6. ALL EXISTING CURBS AND DRIVEWAYS TO BE REMOVED SHALL BE SAW CUT FULL DEPTH OR REMOVED AT EXISTING JOINTS.
7. WHERE CONCRETE CURB IS PLACED ON EXISTING CONCRETE PAVEMENT, THE PAVEMENT SHALL BE DRILLED AND THE REINFORCING BARS GROUTED OR EPOXIED IN PLACE.
8. EXPANSION AND CONTRACTION JOINTS SHALL BE CONSTRUCTED TO MATCH PAVEMENT JOINTS IN ALL CURBS OR CURB AND GUTTER ADJACENT TO JOINTED CONCRETE PAVEMENT. WHERE PLACEMENT OF CURB OR CURB AND GUTTER IS NOT ADJACENT TO CONCRETE PAVEMENT, EXPANSION JOINTS SHALL BE PROVIDED AT STRUCTURES, CURB RETURNS AT STREETS OR DRIVEWAYS, AND AT LOCATIONS DIRECTED BY THE ENGINEER.
9. VERTICAL AND HORIZONTAL DOWELS BARS AND TRANSVERSE REINFORCING BARS SHALL BE PLACED AT 4' C-C.
10. DIMENSION "T" SHOWN IS THE THICKNESS OF ADJACENT CONCRETE PAVEMENT, OR, WHEN CURB IS INSTALLED ADJACENT TO FLEXIBLE PAVEMENT, "T" IS 6" MINIMUM, 8" MAXIMUM.
11. USUAL PROFILE GRADE LINE. REFER TO TYPICAL SECTIONS AND PLAN-PROFILE SHEETS FOR EXACT LOCATIONS.
12. A SEALED, 1/2" EXPANSION JOINT SHALL BE PROVIDED WHERE CURB AND GUTTER IS ADJACENT TO SIDEWALK OR RIPRAP.
13. LONGITUDINAL AND TRANSVERSE PAVEMENT STEEL SHALL BE PLACED IN ACCORDANCE WITH PAVEMENT DETAILS SHOWN ELSEWHERE IN THE PLANS.



TYPE II CURB AND GUTTER
5" - 8" HEIGHT

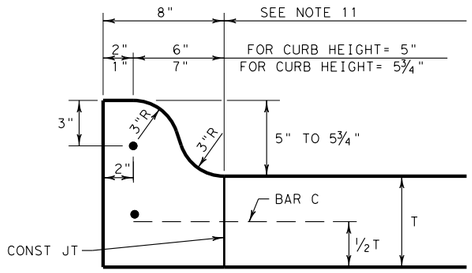
BAR B

L = (T/2) + (H- 1 1/2")
WHERE "H" = CURB HEIGHT
FOR NEW PAVEMENT, EMBED T/2 INTO FRESH CONCRETE.
FOR EXISTING PAVEMENT, DRILL 3/8" DIAM HOLE T/2 + 1/4" INTO PAVEMENT.
SECURE WITH TY III EPOXY, CLASS "E" OR "F".

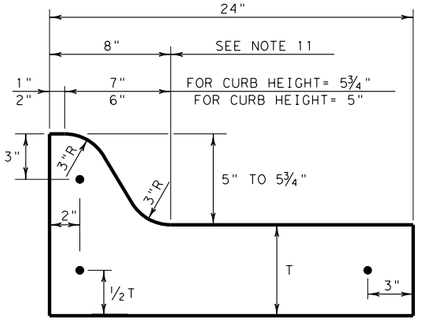


BAR C

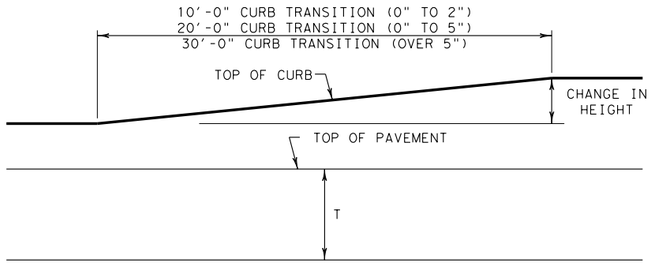
EMBED 6" INTO EXISTING CONCRETE PAVEMENT.
DRILL 3/8" X 6 1/4" HOLE
SECURE WITH TY III EPOXY, CLASS "E" OR "F".



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

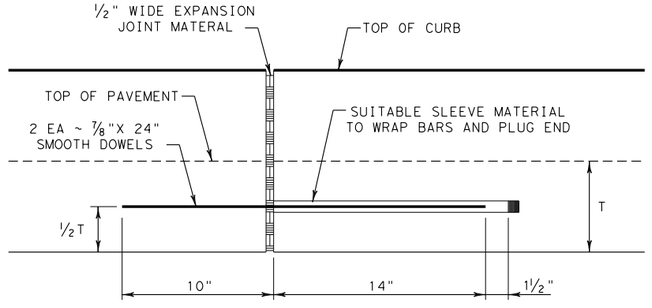


TYPE IIA CURB AND GUTTER
5" - 5 3/4" HEIGHT



CURB TRANSITION

NOTE: TO BE PAID FOR AS HIGHEST CURB



EXPANSION JOINT DETAIL

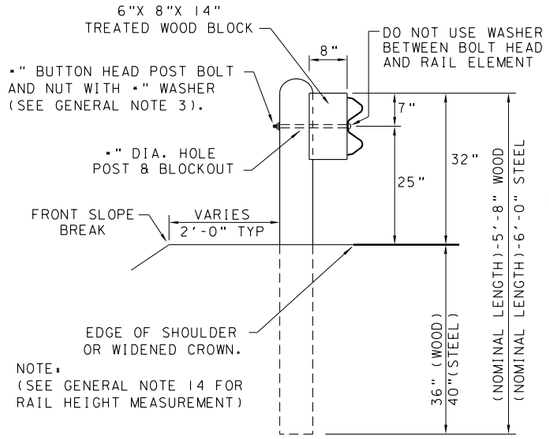
Texas Department of Transportation

Fort Worth District Standard

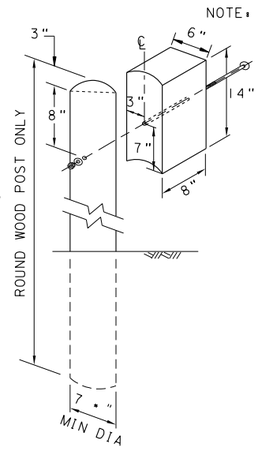
CONCRETE CURB AND CURB AND GUTTER DETAILS

CCCG (FTW)

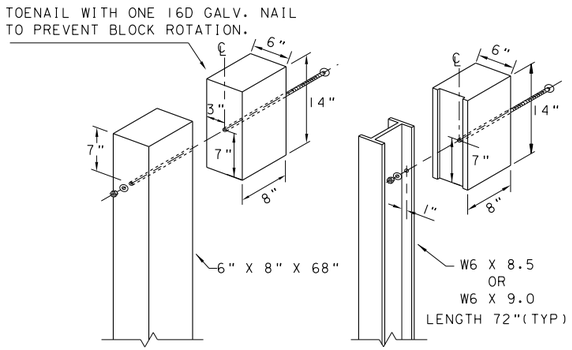
ORIGINAL DRAWING: 05/2019	cccg-ftw.dgn	FED.RD. DIV.NO.	PROJECT NO.		SHEET NO.
DATE	REVISIONS	6	SEE TITLE SHEET		40
05/2019	NEW STANDARD	STATE	STATE DIST.NO.	COUNTY	
07/2022	DESIGNATE USUAL 6" HEIGHT	TEXAS	FTW	TARRANT	
		CONT.	SECT.	JOB	HIGHWAY NO.
		0902	90	019,ETC	CS



TYPICAL POST PLACEMENT



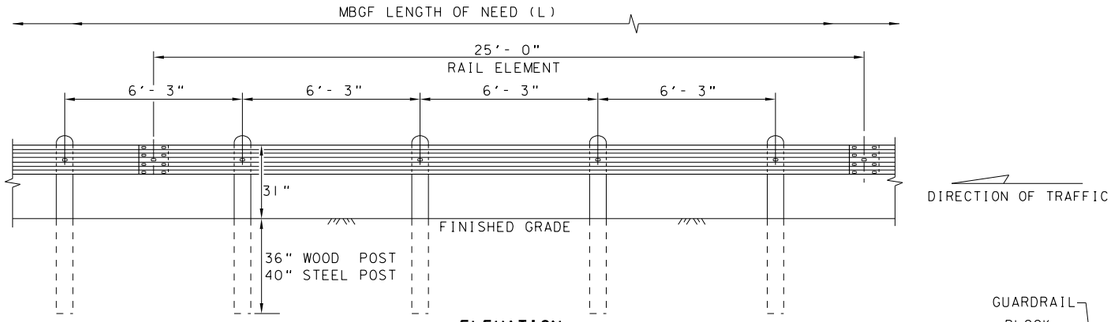
WOOD BLOCK TO ROUND WOOD POST



WOOD BLOCK TO RECTANGULAR WOOD POST

ROUTED WOOD BLOCK TO I-BEAM STEEL POST

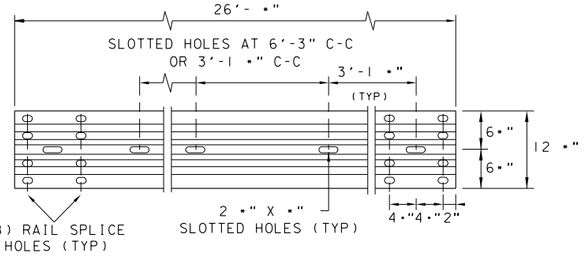
NOTE: ** "WOOD" INDICATES DIMENSIONS FOR BOTH ROUND AND RECTANGULAR WOOD POST SYSTEMS.



ELEVATION MID-SPAN RAIL SPLICE

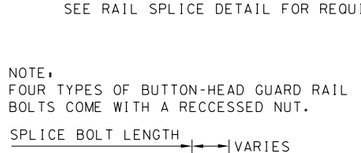
SHOWING A 25'- 0" SECTION OF W-BEAM RAIL. (SEE GENERAL NOTE 2)

DIRECTION OF TRAFFIC



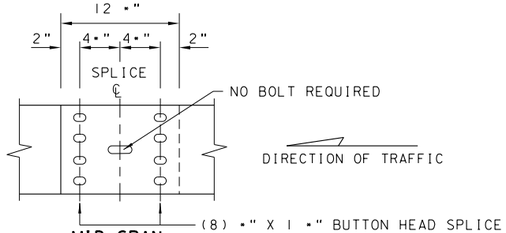
ELEVATION 25'- 0"(NOM.) W-BEAM SECTION

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



BUTTON HEAD BOLT

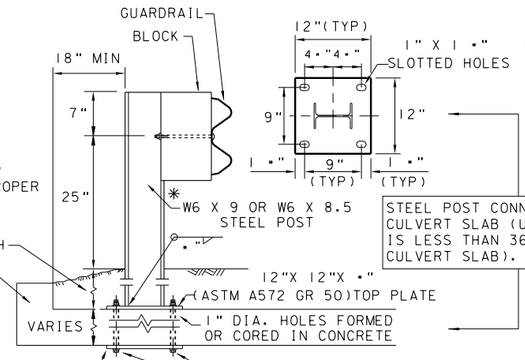
NOTE: SEE GENERAL NOTE 3 FOR SPLICE & POST BOLT DETAILS.



DIRECTION OF TRAFFIC

MID-SPAN RAIL SPLICE DETAIL

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



LOW FILL CULVERT POST

NOTE: TWO INSTALLATION OPTIONS.

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

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

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

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

GENERAL NOTES

1. THE TYPE OF POST (ROUND WOOD POST, RECTANGULAR WOOD POST, OR STEEL POST) WILL BE AS SHOWN IN THE PLANS. THE EXACT POSITION OF MBGF SHALL BE SHOWN IN THE PLANS OR AS DIRECTED BY THE ENGINEER. STEEL POSTS TO BE GALVANIZED IN ACCORDANCE WITH ITEM 445, "GALVANIZING."
2. RAIL ELEMENTS SHALL MEET THE REQUIREMENTS OF ITEM 540,"METAL BEAM GUARD FENCE" EXCEPT AS MODIFIED IN THE PLANS. THE CONTRACTOR MAY FURNISH RAIL ELEMENTS OF 25'- 0", OR 12'- 6" (NOM.) LENGTHS. RAIL ELEMENTS MAY HAVE SLOTTED HOLES AT 3'-1 •" C-C OR 6'-3" C-C. A SPECIAL LENGTH OF RAIL MAY BE MANUFACTURED TO ACCOMMODATE THE DOWNSTREAM ANCHOR TERMINAL (DAT) AND THE TRANSITION SECTIONS OF GUARDRAIL.
3. BUTTON HEAD "POST BOLTS & NUTS" SHALL MEET THE REQUIREMENTS OF (ASTM A307), AND SHALL BE OF SUFFICIENT LENGTH TO EXTEND THROUGH THE FULL THICKNESS OF THE NUT AND •" WASHER (FWC16A) AND NOT MORE THAN 1" BEYOND IT. TRIM REMAINING BOLT LENGTH TO MEET REQUIRED LENGTH.
4. FITTINGS (BOLTS, NUTS, AND WASHERS) SHALL BE GALVANIZED IN ACCORDANCE WITH ITEM 445,"GALVANIZING." FITTINGS SHALL BE SUBSIDIARY TO THE BID ITEM.
5. CROWN SHALL BE WIDENED TO ACCOMMODATE THE METAL BEAM GUARD FENCE.
6. THE LATERAL APPROACH TO THE GUARD FENCE, SHALL HAVE A MAXIMUM SLOPE OF 1V:10H.
7. IF SHOWN ELSEWHERE IN THE PLANS OR AS DIRECTED BY THE ENGINEER, THE GUARD FENCE MAY BE FLARED AT A RATE OF 25:1 OR FLATTER.
8. UNLESS OTHERWISE SHOWN IN THE PLANS, GUARD FENCE PLACED IN THE VICINITY OF CURBS SHALL BE POSITIONED SO THAT THE FACE OF CURB IS LOCATED DIRECTLY BELOW OR BEHIND THE FACE OF THE RAIL. RAIL PLACED OVER CURBS SHALL BE INSTALLED SO THAT THE POST BOLT IS LOCATED APPROXIMATELY 25 INCHES ABOVE THE GUTTER PAN OR EDGE OF SHOULDER.
9. APPLICATIONS IN SOLID ROCK ARE ONLY ALLOWED WITH STEEL POSTS. IF SOLID ROCK IS ENCOUNTERED WITHIN 0 TO 18" OF THE FINISHED GRADE, DRILL A 24" DIA. HOLE, 24" INTO THE ROCK. IF SOLID ROCK IS ENCOUNTERED BELOW 18", DRILL A 12" DIA. HOLE, 12" INTO THE ROCK OR TO THE STANDARD EMBEDMENT DEPTH, WHICHEVER MAYBE LESS. ANY EXCESS POST LENGTH, AFTER MEETING THESE DEPTHS, MAY BE FIELD CUT TO ENSURE PROPER GUARDRAIL MOUNTING HEIGHT. BACKFILL WITH COARSE AGGREGATE MATERIAL.
10. POSTS SHALL NOT BE SET IN CONCRETE, OF ANY DEPTH.
11. SPECIAL FABRICATION WILL BE REQUIRED AT INSTALLATION LOCATIONS HAVING A CURVATURE OF LESS THAN 150 FT. RADIUS.
12. UNLESS OTHERWISE SHOWN IN THE PLANS, A COMPOSITE MATERIAL BLOCK THAT MEETS THE REQUIREMENTS OF DMS-7210,"COMPOSITE MATERIAL POSTS AND BLOCKS FOR METAL BEAM GUARD FENCE" MAY BE SUBSTITUTED FOR BLOCKS OF SIMILAR DIMENSIONS. THE CONSTRUCTION DIVISION, TXDOT MAINTAINS A MATERIAL PRODUCER LIST (MPL) FOR PRODUCERS OF MATERIALS CONFORMING TO DMS-7210 ONLY PRODUCERS ON THE MPL MAY FURNISH COMPOSITE MATERIAL BLOCKS.
13. FOR THE LOW FILL CULVERT OPTION, POSTS LOCATED PARTIALLY OR WHOLLY BETWEEN PRECAST BOX CULVERT UNITS, THE USE OF A CAST-IN-PLACE CONCRETE CLOSURE BETWEEN BOXES IS REQUIRED. THE LENGTH OF THE CAST-IN-PLACE CONCRETE CLOSURE SHALL ACCOMMODATE THE PLACEMENT OF THE LOW FILL CULVERT OPTION. SEE CONCRETE CLOSURE DETAILS ON BRIDGE STANDARD SCP-MD.
14. GUARDRAIL HEIGHT MEASUREMENT, WHEN THE GUARDRAIL IS LOCATED ABOVE PAVEMENT, MEASURE THE HEIGHT FROM THE PAVEMENT TO THE TOP OF THE W-BEAM RAIL. WHEN THE GUARDRAIL IS LOCATED UP TO 2 FT. OFF OF THE EDGE OF PAVEMENT OR FOR A PAVEMENT OVERLAY, USE A 10-FOOT STRAIGHTEDGE TO EXTEND THE PAVEMENT/SHOULDER SLOPE TO THE BACK OF RAIL, MEASURE FROM THE BOTTOM OF STRAIGHTEDGE TO THE TOP OF RAIL. FOR GUARDRAIL LOCATED DOWN A 10:1 SLOPE, MEASURE FROM THE NOMINAL TERRAIN.

Texas Department of Transportation

Design Division Standard

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

FILE: GF3119.DGN	DN: TXDOT	CK: KM	DW: VP	CK: CGL/AG
©TXDOT, NOVEMBER 2019	CONT	SECT	JOB	HIGHWAY
REVISIONS	0902	90	019,ETC	CS
	DIST	COUNTY		SHEET NO.
	FTW	TARRANT		41

DATE: 4/12/2024
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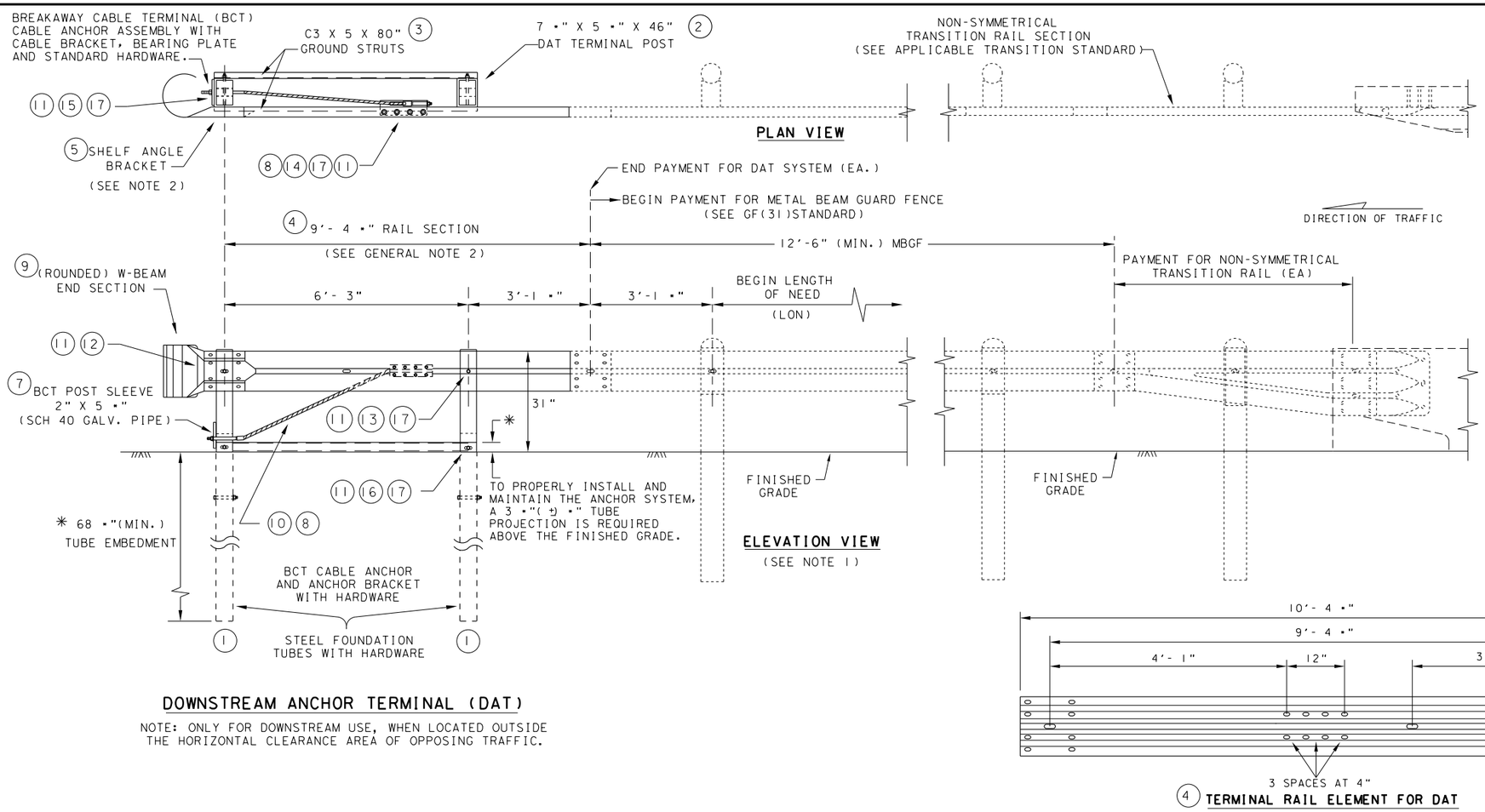


DOWNSTREAM ANCHOR TERMINAL (DAT)

NOTE: ONLY FOR DOWNSTREAM USE, WHEN LOCATED OUTSIDE THE HORIZONTAL CLEARANCE AREA OF OPPOSING TRAFFIC.

GENERAL NOTES

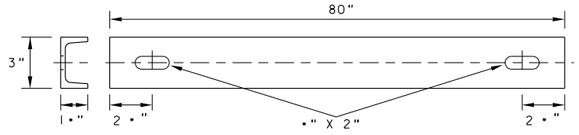
1. THE DETAIL SHOWN IS THE MINIMUM LENGTH OF NEED (LON) FOR A DOWNSTREAM ANCHOR TERMINAL (DAT) CONNECTED TO A CONCRETE RAIL.
2. THE RAIL SECTION AT THE END POST IS SUPPORTED BY THE SHELF ANGLE BRACKET. THE RAIL ELEMENT IS NOT ATTACHED TO THE END POST.
3. THE FOUNDATION TUBES SHALL NOT PROJECT MORE THAN 3 •" ABOVE THE FINISHED GRADE.
4. ALL HARDWARE FOR DAT SHALL BE ASTM A307 UNLESS OTHERWISE SHOWN.
5. REFER TO GF(31) SHEET FOR TERMINAL CONNECTION DETAILS.

MOW STRIP INSTALLATION

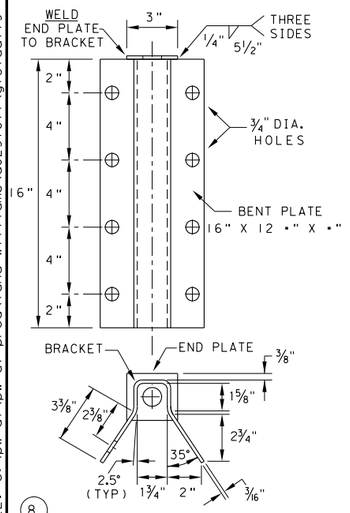
IF A MOW STRIP IS REQUIRED WITH THE DAT INSTALLATION THE LEAVE-OUT AREA AROUND THE STEEL FOUNDATION TUBES AND THE TWO CHANNEL STRUTS MAY BE OMITTED. THIS WILL REQUIRE A FULL POUR AT THE FOUNDATION TUBES.

*	(DAT) PARTS LIST	QTY
(1)	STEEL FOUNDATION TUBE	2
(2)	DAT TERMINAL POST	2
(3)	CHANNEL STRUT	2
(4)	TERMINAL RAIL ELEMENT	1
(5)	SHELF ANGLE BRACKET	1
(6)	BCT BEARING PLATE	1
(7)	BCT POST SLEEVE	1
(8)	GUARDRAIL ANCHOR BRACKET	1
(9)	(ROUNDED)W-BEAM END SECTION	1
(10)	BCT CABLE ANCHOR	1
(11)	RECESSED NUT, GUARDRAIL	20
(12)	1 •" BUTTON HEAD BOLT	4
(13)	10" BUTTON HEAD BOLT	2
(14)	•" X 2" HEX HEAD BOLT	8
(15)	•" X 8" HEX HEAD BOLT	4
(16)	•" X 10" HEX HEAD BOLT	2
(17)	•" FLAT WASHER	18

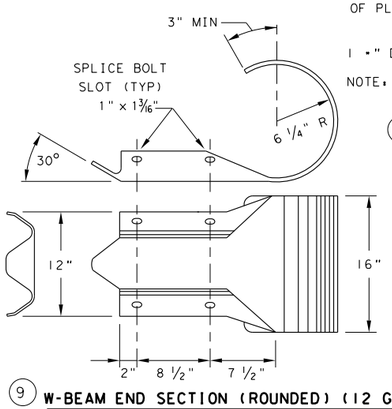
(4) TERMINAL RAIL ELEMENT FOR DAT



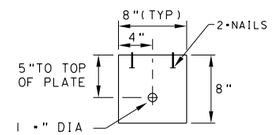
(3) CHANNEL STRUT
C3 X 5 X 80", GRADE A36



(8) GUARDRAIL ANCHOR BRACKET

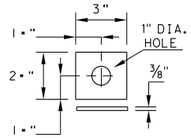


(9) W-BEAM END SECTION (ROUNDED) (12 GA.)

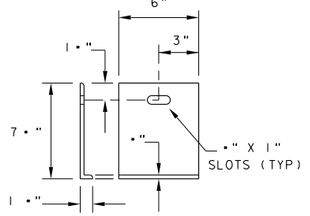


NOTE, DRIVE NAILS AND BEND OVER TO PREVENT PLATE ROTATION

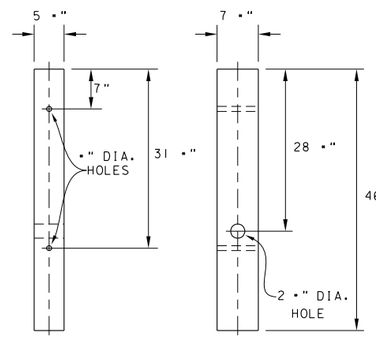
(6) BEARING PLATE
8"X 8"X •" PL



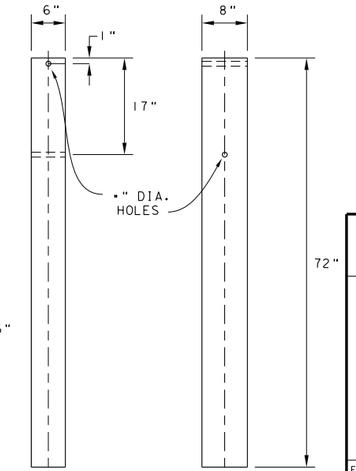
END PLATE



(5) SHELF ANGLE BRACKET



(2) TERMINAL POST
7 •"X 5 •"X 46" WOOD POST



(1) STEEL FOUNDATION TUBE
6"X 8"X •" X 72" STEEL TUBE

Texas Department of Transportation

Design Division Standard

METAL BEAM GUARD FENCE
(DOWNSTREAM ANCHOR TERMINAL)
TL-3 MASH COMPLIANT

GF(31)DAT-19

FILE: GF31DAT19.DGN	DN: TXDOT	CK: KM	DW: VP	CK: CGL/AG
©TXDOT, NOVEMBER 2019	CONT	SECT	JOB	HIGHWAY
REVISIONS	0902	90	019, ETC	CS
	DIST	COUNTY		SHEET NO.
	FTW	TARRANT		42

DATE: 4/12/2024
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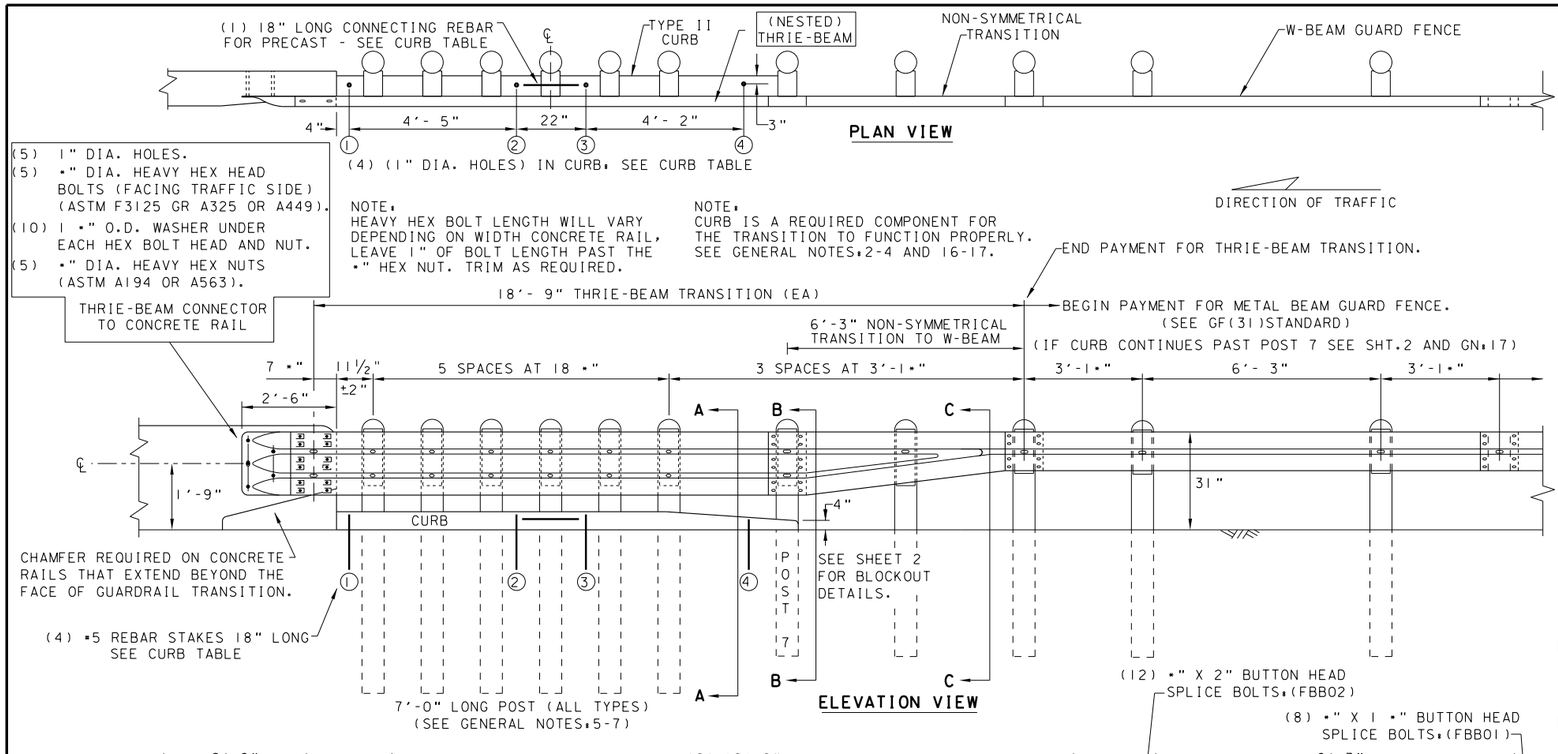


GENERAL NOTES

1. CONTACT THE DESIGN DIVISION FOR DRAINAGE CUT OUT OPTIONS NEEDED WITHIN THE CURB SECTION OF THE THRIE-BEAM TRANSITION. (512) 416-2678
2. CONCRETE CURB MAY BE CAST-IN-PLACE OR PRECAST AS SHOWN ON THIS SHEET. WHEN USED IN CONJUNCTION WITH THE THRIE-BEAM TRANSITIONS, CURB SHALL BE TYPE II (5- ⅝" HEIGHT), SEE CURRENT CCCG STANDARD SHEET FOR FURTHER DETAILS. IF OTHER CURB HEIGHTS ARE SHOWN IN THE PLANS IN CONJUNCTION WITH THE TRANSITION, THE CURB HEIGHT MAY BE FROM 4" TO 8" WITH A RELATIVELY VERTICAL FACE. CONCRETE CURB SHALL BE CONTINUOUS TO THE SEVENTH POST UNLESS OTHERWISE SHOWN IN THE PLANS. SEE GENERAL NOTE, 17 FOR CIRCUMSTANCES WHERE CURB CONTINUES PAST POST 7.
3. CONCRETE CURB TYPE II SUBSIDIARY TO "METAL BEAM GUARD FENCE TRANSITION". IF NO ADDITIONAL CURB IS INDICATED BEYOND THE TRANSITION, THEN ANY CURB HEIGHT GREATER THAN 4" WILL BE TAPERED DOWN BEGINNING AT THE LAST 7 FT. POST TO A MAXIMUM HEIGHT OF 4" AT POST 7. IF SHOWN ELSEWHERE IN THE PLANS, ADDITIONAL CURB UNDERNEATH GUARDRAIL WILL BE PAID FOR BY THE LINEAR FOOT.
4. UNLESS OTHERWISE SHOWN IN THE PLANS, TRANSITIONS SHALL BE PLACED WITH THE BLOCKOUT FACE IN FRONT OF OR DIRECTLY ABOVE THE CURB FACE. SEE SECTION A-A.
5. FOR ROUND WOOD POST SYSTEMS, ALL ROUND WOOD POSTS SHALL BE 7 ⅝" DIA. MINIMUM THROUGHOUT THE THRIE-BEAM TRANSITION.
6. THE TYPE OF POST (ROUND WOOD POST, RECTANGULAR WOOD POST OR STEEL POST) WILL BE AS SHOWN IN THE PLANS. REFER TO GF(31) STANDARD SHEET.
7. THE POST LENGTH SHALL BE MARKED ON ALL 7'- 0" LONG POSTS BY THE MANUFACTURER. THE MARK SHALL BE LOCATED WITHIN THE TOP 1 FT. REGION OF THE POST, AT LEAST ⅝" IN HEIGHT, AND VISIBLE AFTER INSTALLATION. WOODEN POSTS SHALL BE MARKED WITH A BRAND, AND STEEL POSTS WITH A STENCIL BEFORE GALVANIZING.
8. POSTS SHALL NOT BE SET IN CONCRETE, OF ANY DEPTH.
9. RAIL ELEMENTS SHALL MEET THE REQUIREMENTS OF ITEM 540, "METAL BEAM GUARD FENCE" EXCEPT AS MODIFIED ON THE PLANS. THE THRIE-BEAM TERMINAL CONNECTOR AND THE THRIE-BEAM TRANSITION TO W-BEAM SHALL BE OF THE SAME MATERIAL, BUT SHALL NOT BE LESS THAN 10 GAUGE. CONTRACTOR SHALL VERIFY THAT THE LOCATIONS OF BOLT HOLES MATCH THOSE IN THE THRIE-BEAM TERMINAL CONNECTOR PRIOR TO ORDERING MATERIALS.
10. BUTTON HEAD "POST BOLTS & NUTS" SHALL MEET THE REQUIREMENTS OF (ASTM A307), AND SHALL BE OF SUFFICIENT LENGTH TO EXTEND THROUGH THE FULL THICKNESS OF THE NUT AND ⅝" WASHER (FWC16A) AND NOT MORE THAN 1" BEYOND IT. TRIM REMAINING BOLT LENGTH TO MEET REQUIRED LENGTH.
11. FITTINGS (BOLTS, NUTS, AND WASHERS) SHALL BE GALVANIZED IN ACCORDANCE WITH ITEM 445, "GALVANIZING". FITTINGS SHALL BE SUBSIDIARY TO THE BID ITEM.
12. CROWN SHALL BE WIDENED TO ACCOMMODATE TRANSITIONS.
13. WHERE SOLID ROCK IS ENCOUNTERED, CONTACT THE DESIGN DIVISION FOR ADDITIONAL GUIDANCE. (512) 416-2678
14. UNLESS OTHERWISE SHOWN IN THE PLANS, A COMPOSITE MATERIAL BLOCK THAT MEETS THE REQUIREMENTS OF DMS-7210, "COMPOSITE MATERIAL POSTS AND BLOCKS FOR METAL BEAM GUARD FENCE" MAY BE SUBSTITUTED FOR BLOCKS OF SIMILAR DIMENSIONS. TXDOT'S MATERIALS AND TESTS DIVISION MAINTAINS A MATERIAL PRODUCER LIST (MPL) FOR PRODUCERS OF MATERIALS CONFORMING TO DMS-7210. ONLY PRODUCERS ON THE MPL CAN FURNISH COMPOSITE MATERIAL BLOCKS.
15. REFER TO GF(31) STANDARD SHEET & BRIDGE RAILING DETAILS FOR ADDITIONAL DETAILS.
16. THE INSTALLATION OF THE TYPE II CURB IS CRITICAL FOR THE PERFORMANCE OF THE THRIE-BEAM TRANSITION SYSTEM. THE CURB PREVENTS (VEHICLE WHEEL SNAGGING) AT THE CONCRETE RAIL AND IS REQUIRED TO MEET MASH CRASH TEST CRITERIA.
17. IF CURB EXTENDS BEYOND POST 7, 25' OF NESTED W-BEAM GUARDRAIL SHALL BE INSTALLED BEYOND THE PAY LIMITS OF THRIE-BEAM TRANSITION SECTION, (SEE SHT.2). PAYMENT FOR THIS 25' SECTION WILL BE BY LINEAR FOOT, PAY ITEM "0540 6XXX MTL W-BEAM GD FEN (NESTED)(TIM POST)" OR "540 6XXX MTL W-BEAM GD FEN (NESTED)(STEEL POST)" AS APPLICABLE FOR POST TYPE. SEE SHT.2 FOR ADDITIONAL INFORMATION.

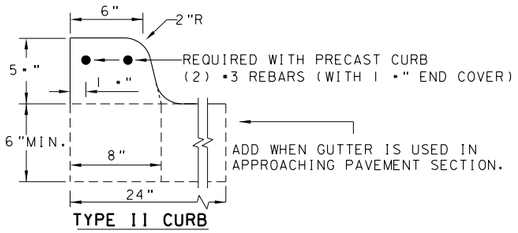
THRIE-BEAM TERMINAL - CURB TABLE

PRECAST CURB FULL LENGTH EQUALS 12'- 2"
THE PRECAST CURB MAY BE FORMED INTO TWO SECTIONS.

CURB (1) LENGTH 5'- 8"
CURB (2) LENGTH 6'- 6"
TAPER CURB (2) TO A HEIGHT OF 4" AT POST 7

CONNECTING PRECAST CURB SECTIONS (1) & (2),
FORM OR CORE 1" DIA. HOLE 9" LONG INTO EACH CURB END.
USE (1) #5 GR.60 REBAR 18" LONG TO CONNECT BOTH CURBS.

SECURING PRECAST OR CAST-IN-PLACE TO FINISHED GRADE*,
FORM OR CORE (4) 1" DIA. HOLES, SEE PLAN AND ELEVATION VIEWS FOR HOLE LOCATIONS. DRIVE (4) #5 GR.60 REBAR STAKES 18" LONG INTO THE GROUND AND ⅝" BELOW TOP OF CURB.
FILL HOLES WITH APPROVED GROUT MIXTURE.



TYPE II CURB

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

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

TYPE II CURB DETAILS

HIGH-SPEED TRANSITION

SHEET 1 OF 2

Texas Department of Transportation | Design Division Standard

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

GF(31)TR TL3-20

FILE, GF31TRTL320.DGN	DN, TXDOT	CK, KM	DW, VP	CK, CGL/AG
©TXDOT, NOVEMBER 2020	CONT	SECT	JOB	HIGHWAY
REVISIONS	0902	90	019, ETC	CS
	DIST	COUNTY		SHEET NO.
	FTW	TARRANT		43

DATE: 4/12/2024
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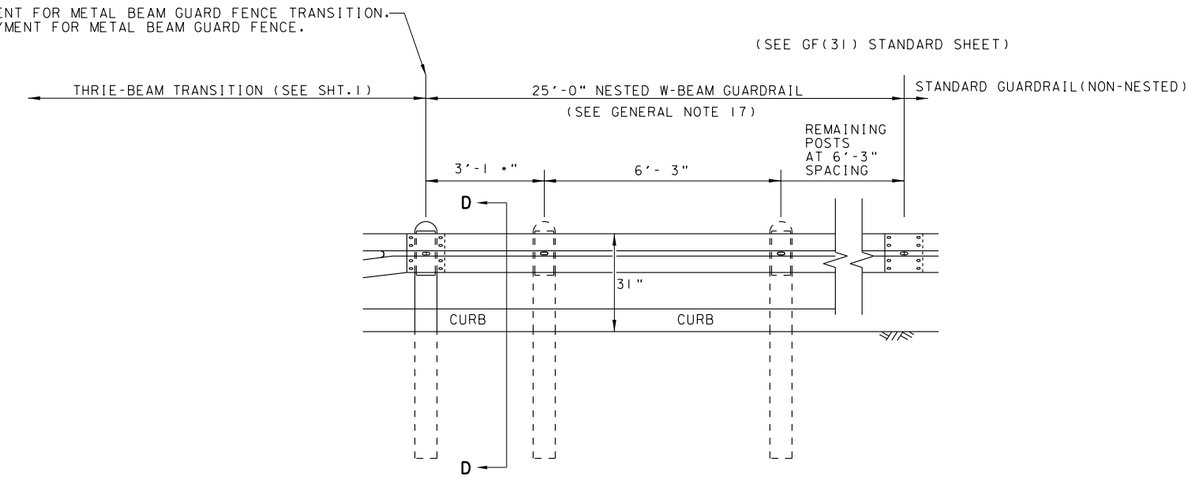
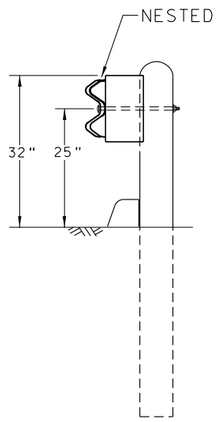
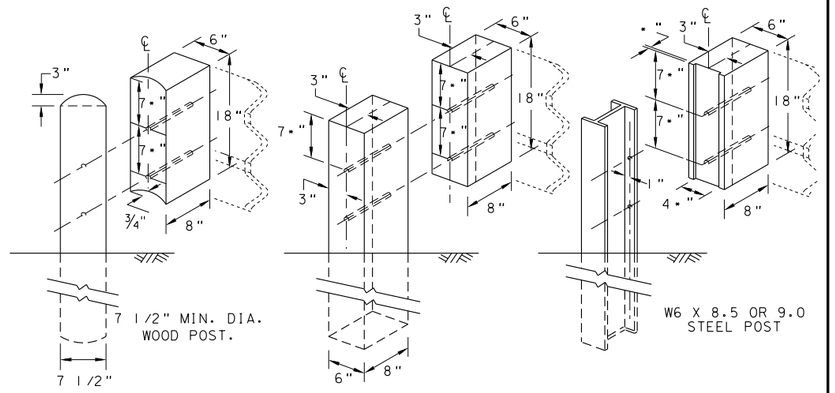
REQUIRED ALTERNATIVE FOR CONTINUOUS CURB EXTENDING PAST POST 7 (SEE SHT. 1 GENERAL NOTE 17)



ELEVATION VIEW



SECTION D-D



THRIE BEAM TRANSITION BLOCKOUT DETAILS

HIGH-SPEED TRANSITION

SHEET 2 OF 2

Texas Department of Transportation

Design Division Standard

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

GF(31)TR TL3-20

FILE: GF31TRTL320.DGN	DN: TXDOT		CK: KM		DW: KM		CK: CGL/AG
©TXDOT: NOVEMBER 2020	CONT	SECT	JOB		HIGHWAY		
REVISIONS	0902	90	019: ETC		CS		
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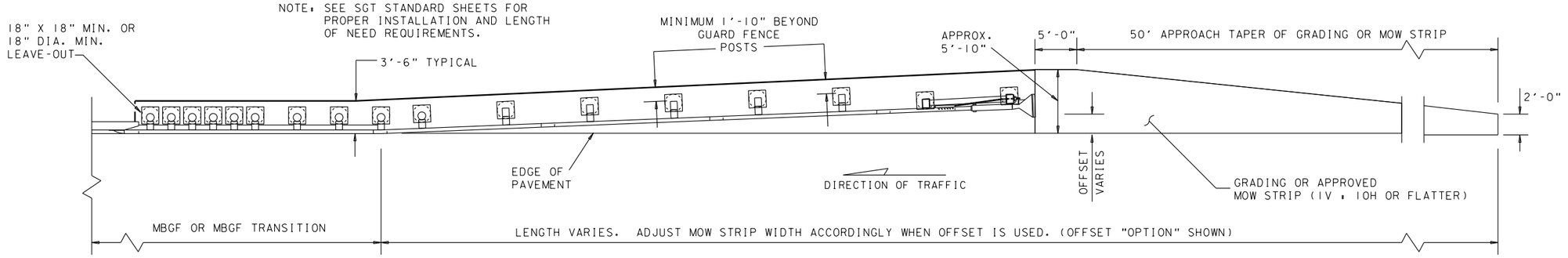
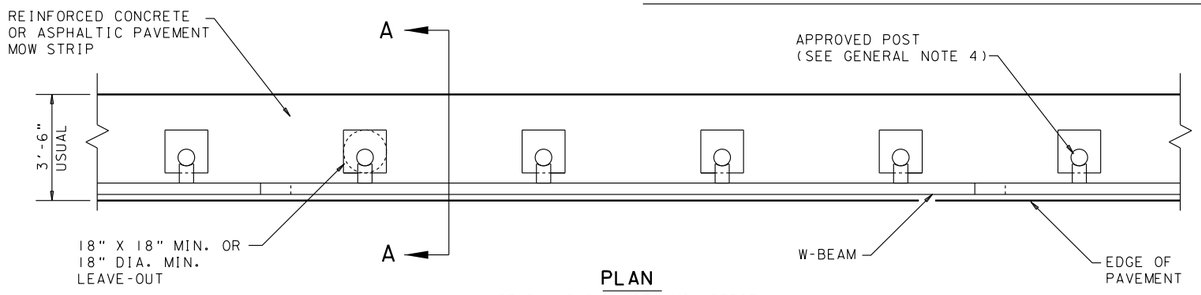
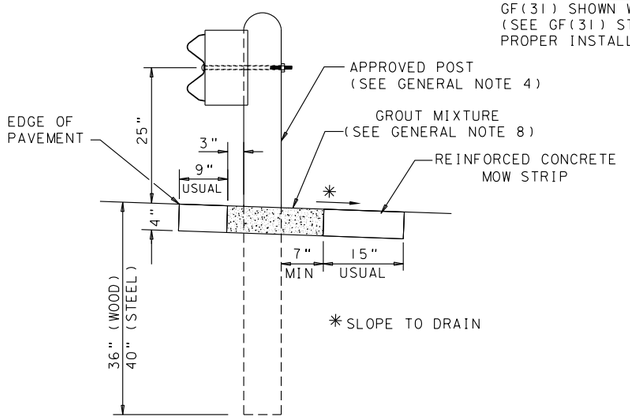


GRADING AND MOW STRIP AT GUARDRAIL END TREATMENTS



PLAN

GF(31) SHOWN WITH MOW STRIP
(SEE GF(31) STANDARD SHEET FOR PROPER INSTALLATION)

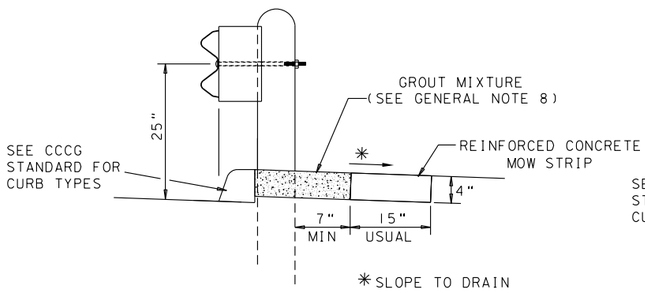


SECTION A-A

TYPICAL

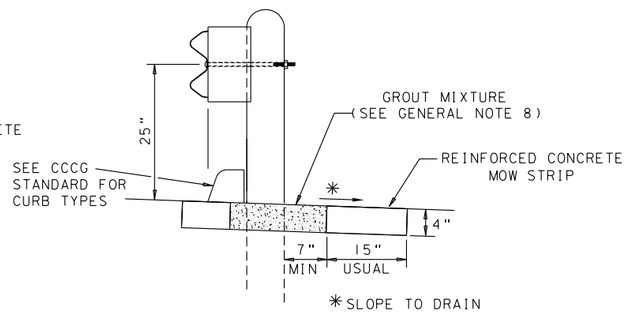
MOW STRIP DETAIL

REINFORCED CONCRETE MOW STRIP
WITH 18" X 18" SQUARE OR
18" DIA. MINIMUM LEAVE-OUT.



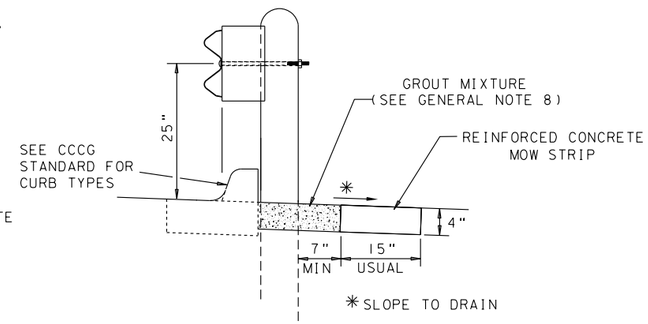
CURB OPTION (1)

THIS OPTION WILL INCREASE THE POST EMBEDMENT THROUGHOUT THE SYSTEM.



CURB OPTION (2)

CURB SHOWN ON TOP OF MOW STRIP



CURB OPTION (3)

NOTE: SITE CONDITION(S)

SITE CONDITIONS MAY EXIST WHERE GRADING IS REQUIRED FOR THE PROPER INSTALLATION OF METAL GUARD FENCE AND END TREATMENTS.

APPROACH GRADING OR MOW STRIP MAY BE DECREASED OR ELIMINATED, AS DIRECTED BY THE ENGINEER.

GENERAL NOTES

1. THIS MOW STRIP DESIGN IS FOR USE WITH METAL BEAM GUARD FENCE, GUARD FENCE TRANSITIONS, AND GUARD FENCE END TREATMENTS. SEE APPLICABLE GF(31) MBGF OR GF(31) TRANSITION STANDARD SHEET FOR ADDITIONAL INFORMATION.
2. MOW STRIPS SHALL BE REINFORCED CONCRETE WITH (WIRE MESH OR SYNTHETIC FIBER), AS SHOWN ON THE PLANS AND WILL BE PAID FOR UNDER THE PERTINENT BID ITEM. REINFORCED CONCRETE SHALL BE PLACED IN ACCORDANCE WITH ITEM 432, "RIPRAP." THE USE OF THE SYNTHETIC FIBER IN LIEU OF STEEL REINFORCING IS ACCEPTABLE, PROVIDED THE FIBER PRODUCER IS ON THE DEPARTMENT MATERIAL PRODUCER LIST (MPL), MAINTAINED BY TXDOT, CONSTRUCTION DIVISION.
3. THE LEAVE-OUT BEHIND THE POST SHALL BE A MINIMUM OF 7".
4. ONLY STEEL (W6 X 8.5 OR W6 X 9.0), OR 7 •" DIA. ROUND WOOD POSTS ARE ACCEPTABLE FOR USE IN THE MOW STRIP. SEE GF(31) STANDARD FOR ADDITIONAL DETAILS.
5. OTHER CURB PLACEMENT OPTIONS MAY BE USED. CURBS ARE NOT CONSIDERED PART OF THE MOW STRIP AND WILL BE PAID FOR UNDER OTHER PERTINENT BID ITEM.
6. THICKNESS OF THE MOW STRIP WILL BE 4".
7. THE LIMITS OF PAYMENT FOR REINFORCED CONCRETE WILL INCLUDE LEAVE-OUTS FOR THE POSTS.
8. THE LEAVE-OUTS SHALL BE FILLED WITH A GROUT MIXTURE CONSISTING OF: 2719 POUNDS SAND, 188 POUNDS TYPE I OR II CEMENT, AND 550 POUNDS OF WATER PER CUBIC YARD, WITH A 28-DAY COMPRESSIVE STRENGTH OF APPROXIMATELY 230 PSI OR LESS. PROVIDE GROUT WITH A CONSISTENCY THAT WILL FLOW INTO AND COMPLETELY FILL ALL VOIDS. DUE TO AUGER SIZE, LARGER LEAVE-OUT DIMENSIONS ARE ACCEPTABLE FROM BOTH AN IMPACT PERFORMANCE AND MAINTENANCE REPAIR STANDPOINT (SUGGESTED MAXIMUM LEAVE-OUT OF 20"). PAYMENT FOR FURNISHING AND PLACING THE GROUT MIXTURE WILL BE SUBSIDIARY TO THE PAY ITEM OF RIPRAP MOW STRIP.

Texas Department of Transportation

Design Division Standard

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

GF(31)MS-19

FILE: GF31MS19.DGN	DN: TXDOT	CK: KM	DW: VP	CK: CGL/AG
©TXDOT, NOVEMBER 2019	CONT	SECT	JOB	HIGHWAY
REVISIONS	0902	90	019,ETC	CS
	DIST	COUNTY		SHEET NO.
	FTW	TARRANT		45

DATE:
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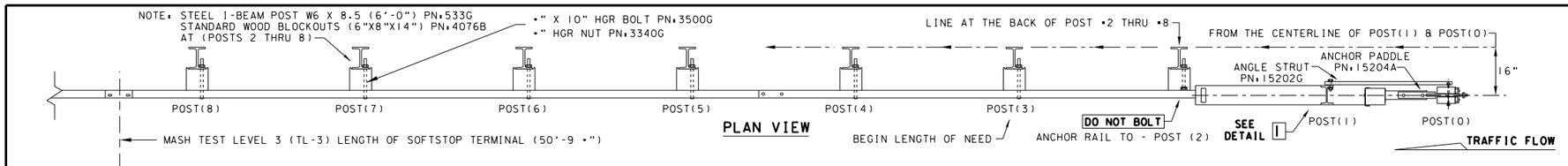
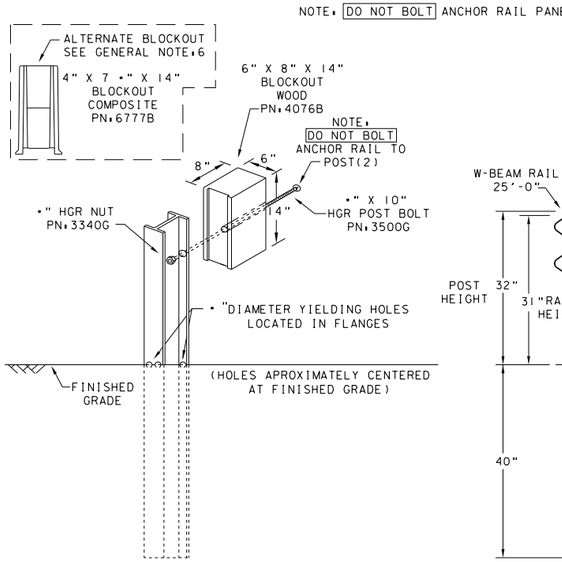
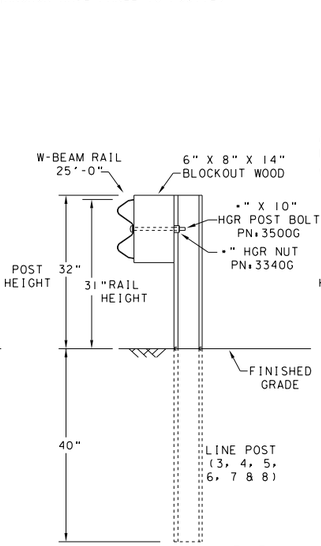




ISOMETRIC VIEW POST(1 & 2)

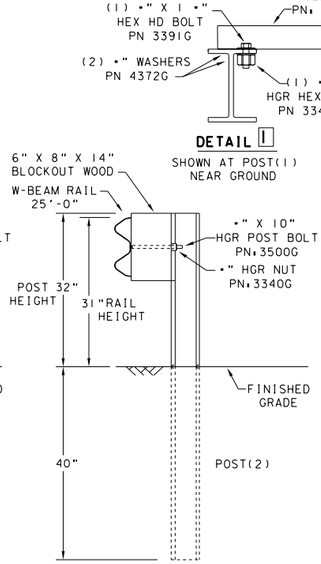
W6 X 8.5 I-BEAM POST SHOWING STANDARD WOOD BLOCKOUT

NOTE, NO BLOCKOUT INSTALLED AT POST(1)



SECTION VIEW B-B

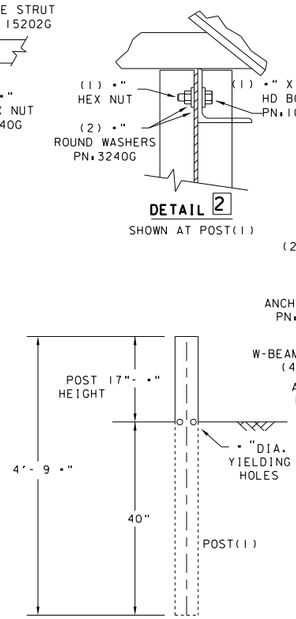
6'-0" (W6 X 8.5) I-BEAM POST PN: 533G



SECTION VIEW A-A

6'-0" (W6 X 8.5) (SYTP) I-BEAM POST PN:15000G

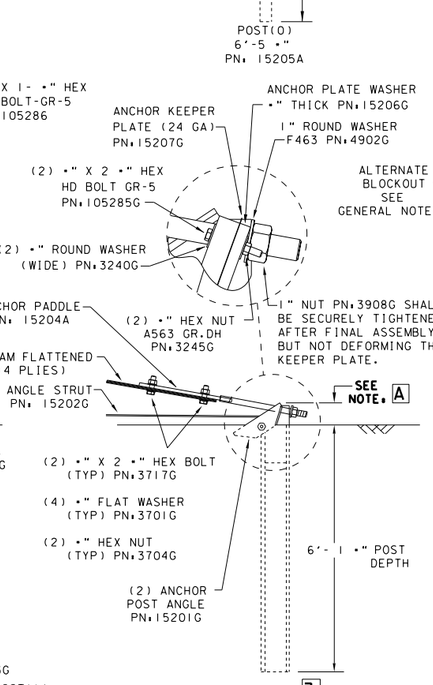
NOTE, DO NOT BOLT ANCHOR RAIL PANEL TO POST(2)



DETAIL 1

DETAIL 2

SHOWN AT POST(1)



DETAIL 3

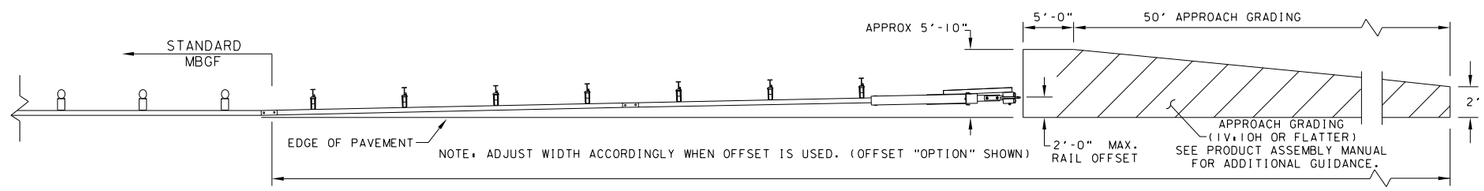
AT POST(0)

6'-5 •" (W6 X 15) I-BEAM POST PN:15205A

FRONT VIEW POST(1)

4'-9 •" (W6 X 8.5) (SYTP) I-BEAM POST PN:15203G

NOTE, NO BLOCKOUT INSTALLED AT POST(1)



APPROACH GRADING AT GUARDRAIL END TREATMENTS

GENERAL NOTES

1. FOR SPECIFIC INFORMATION REGARDING INSTALLATION AND TECHNICAL GUIDANCE OF THE SYSTEM, CONTACT, TRINITY HIGHWAY AT 1(888)323-6374. 2525 N. STEMMONS FREEWAY, DALLAS, TX 75207
2. FOR INSTALLATION, REPAIR AND MAINTENANCE REFER TO THE, SOFTSTOP END TERMINAL, PRODUCT DESCRIPTION ASSEMBLY MANUAL. PN.620237B
3. APPLY HIGH INTENSITY REFLECTIVE SHEETING, "OBJECT MARKER" ON THE FRONT FACE OF THE DEVICE PER MANUFACTURER'S RECOMMENDATIONS. OBJECT MARKER SHALL CONFORM TO THE STANDARDS REQUIRED IN TEXAS MUTCD.
4. FOR POST (LEAVE-OUT) INSTALLATION AND GUIDANCE SEE TXDOT'S LATEST ROADWAY MOW STRIP STANDARD.
5. HARDWARE (BOLTS, NUTS, & WASHERS) SHALL BE GALVANIZED IN ACCORDANCE WITH ITEM 445,"GALVANIZING". FITTINGS SHALL BE SUBSIDIARY TO THE BID ITEM.
6. A COMPOSITE MATERIAL BLOCKOUT THAT MEETS THE REQUIREMENTS OF DMS-7210, MAY BE SUBSTITUTED FOR BLOCKOUTS OF SIMILAR DIMENSIONS. SEE CONSTRUCTION DIVISION MATERIAL PRODUCER LIST (MPL) FOR CERTIFIED PRODUCERS.
7. IF SOLID ROCK IS ENCOUNTERED SEE THE MANUFACTURER'S INSTALLATION MANUAL AND REFER TO THE LATEST ROADWAY MBGF STANDARD FOR INSTALLATION GUIDANCE.
8. POSTS SHALL NOT BE SET IN CONCRETE.
9. IT IS ACCEPTABLE TO INSTALL THE SOFTSTOP IMPACT HEAD PARALLEL TO THE GRADE LINE OR WITH AN UPWARD TILT.
10. DO NOT ATTACH THE SOFTSTOP SYSTEM DIRECTLY TO A RIGID BARRIER.
11. UNDER NO CIRCUMSTANCES SHALL THE GUARDRAIL WITHIN THE SOFTSTOP SYSTEM BE CURVED.
12. A FLARE RATE OF UP TO 25:1 MAY BE USED TO PREVENT THE TERMINAL HEAD FROM ENCROACHING ON THE SHOULDER. THE FLARE MAY BE DECREASED OR ELIMINATED FOR SPECIFIC INSTALLATIONS, IF DIRECTED BY THE ENGINEER.

NOTE:A	THE INSTALLATION HEIGHT OF FULLY ASSEMBLED ANCHOR POST WILL VARY FROM 3-•" MIN. TO 4" MAX. ABOVE FINISHED GRADE.
NOTE:B	PART PN:5852B RIGHT-SIDE (HIGH INTENSITY REFLECTIVE SHEETING) PART PN:5851B LEFT-SIDE (HIGH INTENSITY REFLECTIVE SHEETING)
NOTE:C	W-BEAM SPLICE LOCATED BETWEEN LINE POST(4)AND LINE POST(5) GUARDRAIL PANEL 25'-0" PN:61G ANCHOR RAIL 25'-0" PN:15215G LAP GUARDRAIL IN DIRECTION OF TRAFFIC FLOW.

PART	QTY	MAIN SYSTEM COMPONENTS
620237B	1	PRODUCT DESCRIPTION ASSEMBLY MANUAL (LATEST REV.)
15208A	1	SOFTSTOP HEAD (SEE MANUAL FOR RIGHT-LEFT APPROACH)
15215G	1	SOFTSTOP ANCHOR RAIL (12GA) WITH CUTOUT SLOTS
61G	1	SOFTSTOP DOWNSTREAM W-BEAM RAIL (12GA) (25'- 0")
15205A	1	POST •0 - ANCHOR POST (6'- 5 •")
15203G	1	POST •1 - (SYTP) (4'- 9 •")
15000G	1	POST •2 - (SYTP) (6'- 0")
533G	6	POST •3 THRU •8 - I-BEAM (W6 X 8.5) (6'- 0")
4076B	7	BLOCKOUT - WOOD (ROUTED) (6" X 8" X 14")
6777B	7	BLOCKOUT - COMPOSITE (4" X 7 •" X 14")
15204A	1	ANCHOR PADDLE
15207G	1	ANCHOR KEEPER PLATE (24 GA)
15206G	1	ANCHOR PLATE WASHER (•" THICK)
15201G	2	ANCHOR POST ANGLE (10" LONG)
15202G	1	ANGLE STRUT
		HARDWARE
4902G	1	1" ROUND WASHER F436
3908G	1	1" HEAVY HEX NUT A563 GR.DH
3717G	2	•" X 2 •" HEX BOLT A325
3701G	4	•" ROUND WASHER F436
3704G	2	•" HEAVY HEX NUT A563 GR.DH
3360G	16	•" X 1 •" W-BEAM RAIL SPLICE BOLTS HGR
3340G	25	•" W-BEAM RAIL SPLICE NUTS HGR
3500G	7	•" X 10" HGR POST BOLT A307
3391G	1	•" X 1 •" HEX HD BOLT A325
4489G	1	•" X 9" HEX HD BOLT A325
4372G	4	•" WASHER F436
105285G	2	•" X 2 •" HEX HD BOLT GR-5
105286G	1	•" X 1 •" HEX HD BOLT GR-5
3240G	6	•" ROUND WASHER (WIDE)
3245G	3	•" HEX NUT A563 GR.DH
5852B	1	HIGH INTENSITY REFLECTIVE SHEETING - SEE NOTE:B

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

Texas Department of Transportation

Design Division Standard

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

FILE: SGT10S3116		DN:TXDOT		CK:KM	DW:VP		CK:MB/VP
©TXDOT, JULY 2016		CONT	SECT	JOB		HIGHWAY	
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		DIST		COUNTY			SHEET NO.
		FTW		TARRANT			46

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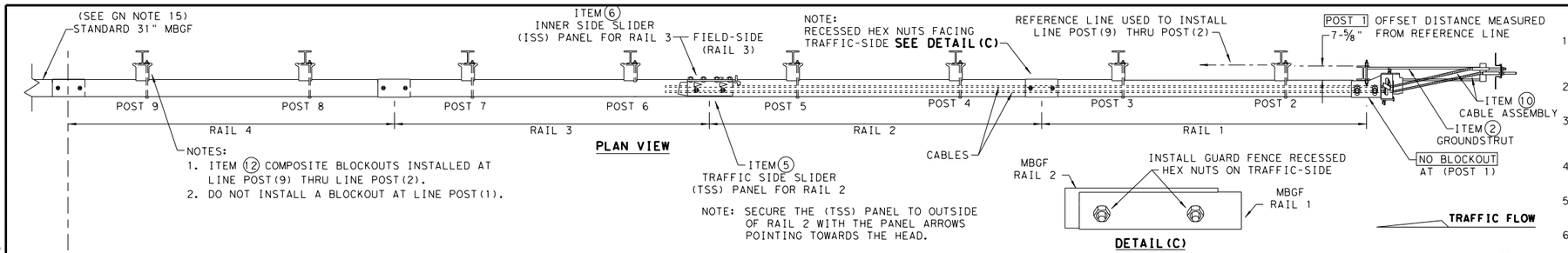
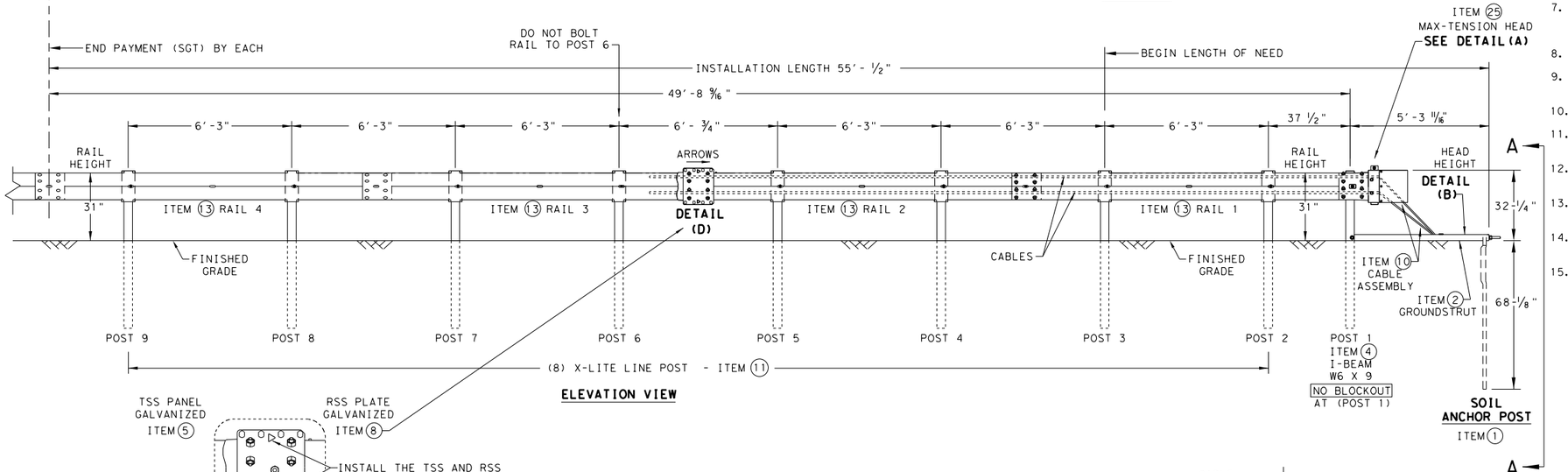
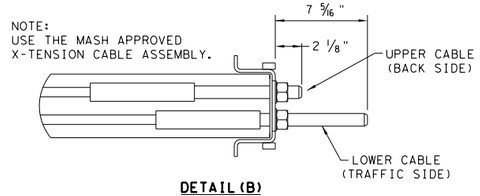
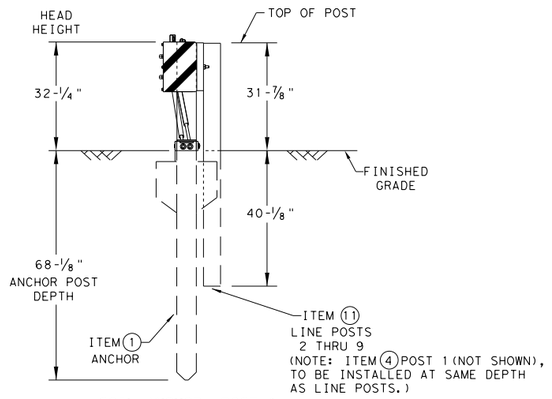
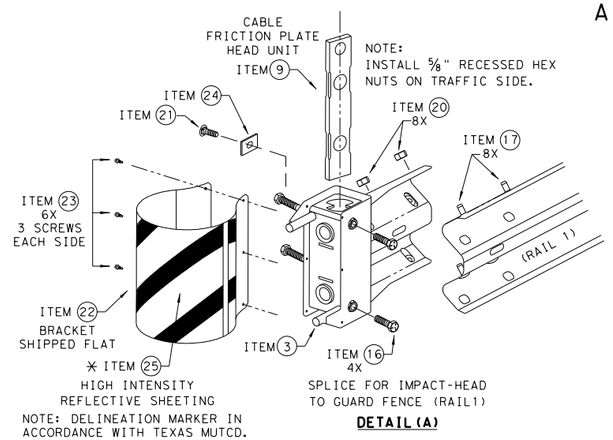










GENERAL NOTES

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

ITEM #	PART NUMBER	DESCRIPTION	QTY
1	BSI-1610060-00	SOIL ANCHOR - GALVANIZED	1
2	BSI-1610061-00	GROUND STRUT - GALVANIZED	1
3	BSI-1610062-00	MAX-TENSION IMPACT HEAD	1
4	BSI-1610063-00	W6x9 I-BEAM POST 6FT.-GALVANIZED	1
5	BSI-1610064-00	TSS PANEL - TRAFFIC SIDE SLIDER	1
6	BSI-1610065-00	ISS PANEL - INNER SIDE SLIDER	1
7	BSI-1610066-00	TOOTH - GEOMET	1
8	BSI-1610067-00	RSS PLATE - REAR SIDE SLIDER	1
9	B061058	CABLE FRICTION PLATE - HEAD UNIT	1
10	BSI-1610069-00	CABLE ASSEMBLY - MASH X-TENSION	2
11	BSI-1012078-00	X-LITE LINE POST-GALVANIZED	8
12	B090534	8" W-BEAM COMPOSITE-BLOCKOUT XT110	8
13	BSI-4004386	12'-6" W-BEAM GUARD FENCE PANELS 12GA.	4
14	BSI-1102027-00	X-LITE SQUARE WASHER	1
15	BSI-2001886	5/8" X 7" THREAD BOLT HH (GR.5)GEOMET	1
16	BSI-2001885	3/4" X 3" ALL-THREAD BOLT HH (GR.5)GEOMET	4
17	4001115	5/8" X 1 1/4" GUARD FENCE BOLTS (GR.2)MGAL	48
18	2001840	5/8" X 10" GUARD FENCE BOLTS MGAL	8
19	2001636	5/8" WASHER F436 STRUCTURAL MGAL	2
20	4001116	5/8" RECESSED GUARD FENCE NUT (GR.2)MGAL	59
21	BSI-2001888	5/8" X 2" ALL THREAD BOLT (GR.5)GEOMET	1
22	BSI-1701063-00	DELINEATION MOUNTING (BRACKET)	1
23	BSI-2001887	1/4" X 3/4" SCREW SD HH 410SS	7
24	4002051	GUARDRAIL WASHER RECT AASHTO FWR03	1
* 25	SEE NOTE BELOW	HIGH INTENSITY REFLECTIVE SHEETING	1
** 26	4002337	8" W-BEAM TIMBER-BLOCKOUT, PDB01B	8
** 27	BSI-4004431	25' W-BEAM GUARDRAIL PANEL,8-SPACE,12GA.	2
28	MANMAX Rev-(D)	MAX-TENSION INSTALLATION INSTRUCTIONS	1

* TO BE PROVIDED BY DISTRIBUTOR OR CONTRACTOR.

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

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

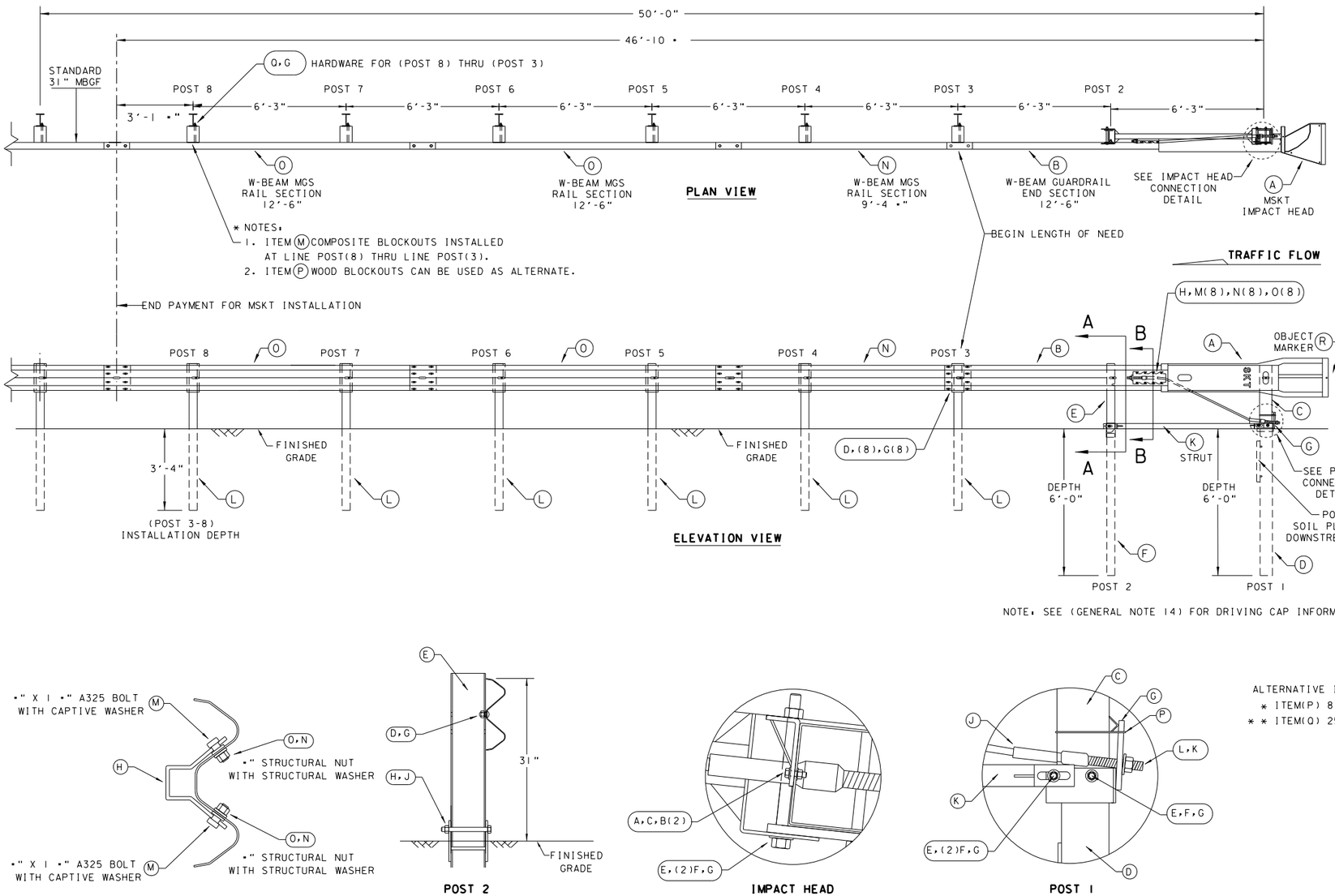
Texas Department of Transportation

Design Division Standard

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

FILE: sgt11s3118.dgn	DN: TxDOT	CK: KM	DW: TxDOT	CK: CL
© TxDOT: FEBRUARY 2018	CONT	SECT	JOB	HIGHWAY
REVISIONS	0902	90	019,ETC	CS
	DIST	COUNTY		SHEET NO.
	FTW	TARRANT		47

DATE:
FILE:



NOTE: SEE (GENERAL NOTE 14) FOR DRIVING CAP INFORMATION.

SECTION B-B
ANCHOR BRACKET

POST 2
SECTION A-A

IMPACT HEAD
CONNECTION DETAIL

POST 1
CONNECTION DETAIL

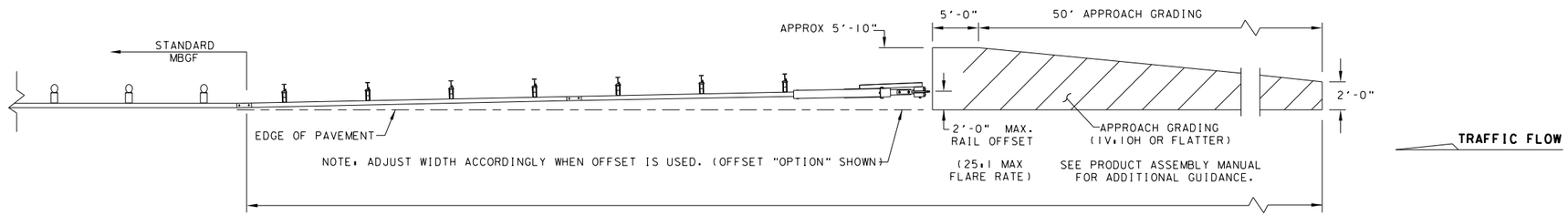
SEE NOTES: *

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

GENERAL NOTES

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

ITEM	QTY	MAIN SYSTEM COMPONENTS	ITEM NUMBERS
A	1	MSKT IMPACT HEAD	MS3000
B	1	W-BEAM GUARDRAIL END SECTION, 12 GA.	SF1303
C	1	POST 1 - TOP (6" X 6" X •" TUBE)	MTPHP1A
D	1	POST 1 - BOTTOM (6' W6X15)	MTPHP1B
E	1	POST 2 - ASSEMBLY TOP	UHP2A
F	1	POST 2 - ASSEMBLY BOTTOM (6' W6X9)	HP2B
G	1	BEARING PLATE	E750
H	1	CABLE ANCHOR BOX	S760
J	1	BCT CABLE ANCHOR ASSEMBLY	E770
K	1	GROUND STRUT	MS785
L	6	W6X9 OR W6X8.5 STEEL POST	P621
M	6	COMPOSITE BLOCKOUTS	CBSP-14
N	1	W-BEAM MGS RAIL SECTION (9'-4 •")	GI2025
O	2	W-BEAM MGS RAIL SECTION (12'-6")	GI203A
P	6	WOOD BLOCKOUT 6" X 8" X 14"	P675
Q	1	W-BEAM MGS RAIL SECTION (25'-0")	GI209
		SMALL HARDWARE	
A	2	•" X 1" HEX BOLT (GRD 5)	B5160104A
B	4	•" WASHER	W0516
C	2	•" HEX NUT	N0516
D	25	•" DIA. X 1 •" SPLICE BOLT (POST 2)	B580122
E	2	•" DIA. X 9" HEX BOLT (GRD A449)	B580904A
F	3	•" WASHER	W050
G	33	•" DIA. H.G.R NUT	N050
H	1	•" DIA. X 8 •" HEX BOLT (GRD A449)	B340854A
J	1	•" DIA. HEX NUT	N030
K	2	1 ANCHOR CABLE HEX NUT	N100
L	2	1 ANCHOR CABLE WASHER	W100
M	8	•" X 1 •" A325 BOLT WITH CAPTIVE WASHER	SB12A
N	8	•" STRUCTURAL NUTS	N012A
O	8	1 •" O.D. X •" I.D. STRUCTURAL WASHERS	W012A
P	1	BEARING PLATE RETAINER TIE	CT-100ST
Q	6	•" X 10" H.G.R. BOLT	B581002
R	1	OBJECT MARKER 18" X 18"	E3151



APPROACH GRADING AT GUARDRAIL END TREATMENTS

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

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

Texas Department of Transportation

Design Division Standard

SINGLE GUARDRAIL TERMINAL

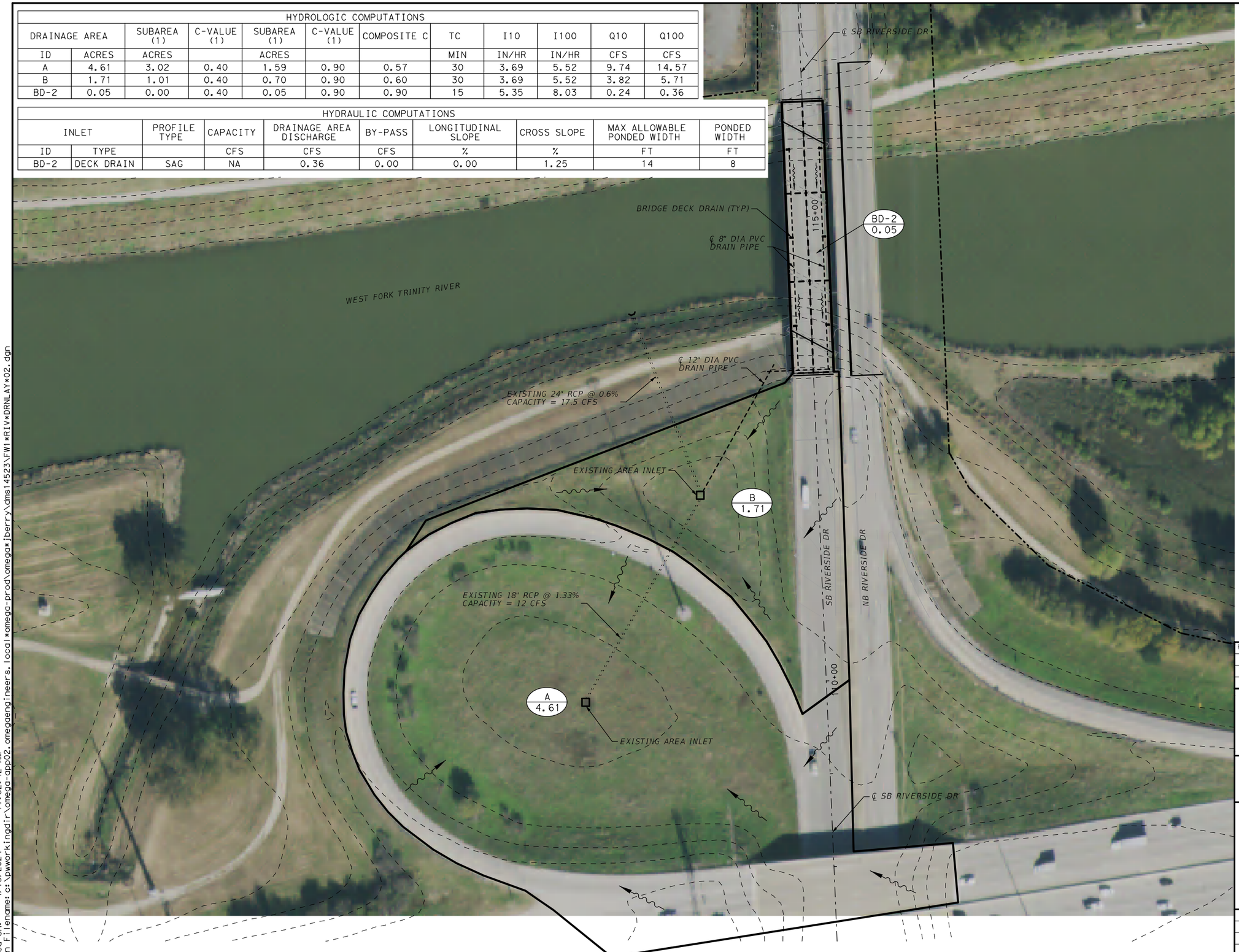
MSKT-MASH-TL-3

SGT(12S)31-18

FILE: SGT12S3118.DGN		DN: TXDOT		CK: KM	DW: VP		CK: CL
©TXDOT: APRIL 2018		CONT	SECT	JOB		HIGHWAY	
REVISIONS		0902	90	019,ETC		CS	
		DIST	COUNTY			SHEET NO.	
		FTW	TARRANT			48	

HYDROLOGIC COMPUTATIONS											
DRAINAGE AREA		SUBAREA (1)	C-VALUE (1)	SUBAREA (1)	C-VALUE (1)	COMPOSITE C	TC	I10	I100	Q10	Q100
ID	ACRES	ACRES		ACRES			MIN	IN/HR	IN/HR	CFS	CFS
A	4.61	3.02	0.40	1.59	0.90	0.57	30	3.69	5.52	9.74	14.57
B	1.71	1.01	0.40	0.70	0.90	0.60	30	3.69	5.52	3.82	5.71
BD-2	0.05	0.00	0.40	0.05	0.90	0.90	15	5.35	8.03	0.24	0.36

HYDRAULIC COMPUTATIONS									
INLET		PROFILE TYPE	CAPACITY	DRAINAGE AREA DISCHARGE	BY-PASS	LONGITUDINAL SLOPE	CROSS SLOPE	MAX ALLOWABLE PONDED WIDTH	PONDED WIDTH
ID	TYPE		CFS	CFS	CFS	%	%	FT	FT
BD-2	DECK DRAIN	SAG	NA	0.36	0.00	0.00	1.25	14	8



0 50 100
SCALE: 1"=100'

N

LEGEND

- X / X.XX — DRAINAGE AREA LABEL / DRAINAGE AREA (ACRES)
- FLOW ARROW
- DRAINAGE AREA BOUNDARY
- INLET DRAINAGE AREA
- 5-FT CONTOURS
- APPROXIMATE ROW

GENERAL NOTES:

1. ALL BRIDGE DECK DRAINS HAVE THE SAME DRAINAGE AREA OF 0.05 ACRES.
2. DRAINAGE AREA 'B' INCLUDES ALL BRIDGE DECK DRIANS (APPROX. 0.30 ACRES).
3. AREA HYDROLOGY WAS CALCULATED USING RATIONAL METHOD.
4. INTENSITIES WERE CALCULATED USING THE 2018 NOAA ATLAS 14 IDF DATA.

STATE OF TEXAS
ZACHARY STEINKUHLER
122305
LICENSED
PROFESSIONAL ENGINEER
4/15/2024

REV	BY	DESCRIPTION	DATE

HUITT-ZOLLARS, INC.
5430 LBJ FREEWAY,
SUITE 1500,
DALLAS, TEXAS 75240-2601
Firm No. F-761

Texas Department of Transportation

RIVERSIDE DR SB

DRAINAGE AREA MAP

FED. RD. DIV. NO.	PROJECT NO.		HIGHWAY NO.
6	SEE TITLE SHEET		CS
STATE	DISTRICT	COUNTY	SHEET NO.
TEXAS	FTW	TARRANT	49
CONTROL	SECTION NO.	JOB	
0902	90	019, ETC.	

Plotted on: 4/15/2024 11:32:42 AM
Design Filename: c:\pwworkingdir\omega-app02.omegaengineers.local*omega-prod\omega*jberry\dms14523\FW1*RIV*DRNLAY*02.dgn

INDEX TO DRAWINGS

CONTACT LIST

CLAYTON TORRANCE, P.E.	CITY OF FORT WORTH – WATER DEPARTMENT	(817) 392–8528
CESAR ZAVALA	CITY OF FORT WORTH – FIELD OPERATIONS SUPERVISOR	(817) 392–5026
KENNY WILSON	CITY OF FORT WORTH – DISTRIBUTION OPERATIONS	(817) 475–2656
JOHN KASAVICH, P.E.	CITY OF FORT WORTH – WATER DEPARTMENT	(817) 223–2258
APRIL ROSE ESCAMILLA, P.E.	KIMLEY–HORN AND ASSOCIATES, INC.	(817) 335–6511
CARL DEZEE, P.E.	KIMLEY–HORN AND ASSOCIATES, INC.	(817) 335–6511
TRENT HARGRODER, EIT	KIMLEY–HORN AND ASSOCIATES, INC.	(817) 335–6511
DAVID LOPEZ	AT&T	(972) 649–8728
ROBERT MARTINEZ	ONCOR ELECTRIC	(817) 215–6688
JACOB LINDSAY	ATMOS ENERGY	(806) 777–0274
TRACY LEE	ENLINK MIDSTREAM	(214) 206–2789
CHARLES VAUGHN	BARNETT GATHERING	(817) 487–1560

LEGEND

- X" WL — EXISTING WATER LINE
- X" SS — EXISTING SANITARY SEWER LINE
- X" SD — EXISTING STORM SEWER LINE
- X" G — EXISTING GAS LINE
- X" UTILITY LINE — EXISTING UTILITY W/ DIA. ≥ 24"
- OHE — EXISTING OVERHEAD ELECTRIC
- UGT — EXISTING UNDERGROUND TELEPHONE
- UGE — EXISTING UNDERGROUND ELECTRIC
- UGC — EXISTING UNDERGROUND CABLE
- EXISTING CURB
- ASPHALT
- EXISTING CHAIN LINK FENCE
- EXISTING WOOD FENCE
- X — EXISTING BARBED WIRE FENCE
- // — // — EXISTING METAL FENCE
- PROPERTY LINE
- EXISTING PERMANENT EASEMENT
- PROPOSED PERMANENT EASEMENT
- TEMPORARY CONSTRUCTION EASEMENT
- PROPOSED WATER/SANITARY SEWER LINE
- PROPOSED WATER LINE IN CASING
- WATER/SANITARY SEWER LINE TO BE GROUT FILLED AND ABANDONED
- WATER/SANITARY SEWER LINE TO BE REMOVED
- WATER/SANITARY SEWER LINE TO BE ABANDONED IN PLACE
- EXISTING WATER/SANITARY SEWER LINE PREVIOUSLY ABANDONED
- PROPOSED WATER/SANITARY SEWER LINE REFERENCED TO ANOTHER SHEET
- EXISTING WATER MANHOLE
- WM — EXISTING WATER METER
- EXISTING FIRE HYDRANT
- PP — EXISTING POWER POLE
- CO — EXISTING SANITARY SEWER CLEAN OUT
- EXISTING SANITARY SEWER MANHOLE
- EXISTING LIGHT POLE
- WV — EXISTING WATER VALVE
- EXISTING TRAFFIC SIGNAL LIGHT
- EXISTING BLOW OFF VALVE (PLAN)
- EXISTING REDUCER
- EXISTING STREET SIGN
- EXISTING TREE
- EXISTING TREE TO BE REMOVED
- CONTROL POINT
- BENCHMARK
- WM — PROPOSED WATER METER
- PROPOSED PLUG
- PROPOSED SANITARY SEWER MANHOLE
- RE: A/B — REFERENCE FIGURE A ON SHEET B
- BH–# — BORE HOLE–#
- PROPOSED GATE VALVE
- C/O — PROPOSED CLEAN OUT
- PROPOSED ACCESS ROAD LIMITS
- PROPOSED FIRE HYDRANT
- A — UTILITY LOCATION BASED ON SUE LEVEL A
- B — UTILITY LOCATION BASED ON SUE LEVEL B
- R — UTILITY LOCATION BASED ON RECORD DRAWINGS
- U — UTILITY LOCATION UNKNOWN

GENERAL NOTES

1. DIVISION 01 – GENERAL REQUIREMENTS

GENERAL:

1. THE CONTRACTOR SHALL BE RESPONSIBLE FOR LOCATING ALL UTILITIES, WHETHER PUBLIC OR PRIVATE, PRIOR TO EXCAVATION. THE INFORMATION AND DATA SHOWN WITH RESPECT TO EXISTING UNDERGROUND FACILITIES AT OR CONTIGUOUS TO THE SITE IS APPROXIMATE AND BASED ON INFORMATION FURNISHED BY THE OWNERS OF SUCH UNDERGROUND FACILITIES OR ON PHYSICAL APPURTENANCES OBSERVED IN THE FIELD. THE CITY AND ENGINEER SHALL NOT BE RESPONSIBLE FOR THE ACCURACY OR COMPLETENESS OF ANY SUCH INFORMATION OR DATA. THE CONTRACTOR SHALL HAVE FULL RESPONSIBILITY FOR REVIEWING AND CHECKING ALL SUCH INFORMATION OR DATA, FOR LOCATING ALL UNDERGROUND FACILITIES, FOR COORDINATION OF THE WORK WITH THE OWNERS OF SUCH UNDERGROUND FACILITIES DURING CONSTRUCTION AND FOR THE SAFETY AND PROTECTION THEREOF AND REPAIRING ANY DAMAGE THERETO RESULTING FROM THE WORK. THIS WORK SHALL BE CONSIDERED AS A SUBSIDIARY ITEM OF WORK, THE COST OF WHICH SHALL BE INCLUDED IN THE PRICE BID IN THE PROPOSAL FOR VARIOUS BID ITEMS. THE CONTRACTOR SHALL NOTIFY ANY AFFECTED OWNERS (UTILITY COMPANIES) OR AGENCIES IN WRITING AT LEAST 48 HOURS PRIOR TO CONSTRUCTION.

1.1. NOTIFY TEXAS 811 (1–800–DIG–TESS OR WWW.TEXAS811.ORG) TO LOCATE EXISTING UTILITIES PRIOR TO CONSTRUCTION.

1.2. CAUTION! BURIED ELECTRIC LINES MAY EXIST ALONG THIS PROJECT. CONTACT ELECTRICAL PROVIDERS 48 HOURS PRIOR TO EXCAVATION (ONCOR ELECTRIC DELIVERY – ROBERT MARTINEZ: 817–215–6688)

1.3. CAUTION! BURIED GAS LINES MAY EXIST ALONG THIS PROJECT. CONTACT BARNETT GATHERING 48 HOURS PRIOR TO EXCAVATION, AND WITHIN TWO (2) HOURS OF ENCOUNTERING A GAS LINE (ATMOS ENERGY CORPORATION– JACOB LINDSAY: 806–777–0274).

1.4. CAUTION! BURIED COMMUNICATION CABLES MAY EXIST ALONG THIS PROJECT. CONTACT COMMUNICATION COMPANIES 48 HOURS PRIOR TO EXCAVATION (AT&T – DAVID LOPEZ: 972–649–8728)

1.5. CAUTION! WHEN DOING WORK WITHIN 200 FEET OF ANY SIGNALIZED INTERSECTION, THE CONTRACTOR SHALL NOTIFY TRAFFIC MANAGEMENT DIVISION OF CITY OF FORT WORTH T/PW, 72 HOURS PRIOR TO EXCAVATION (KEN BROCK: 817–360–6364, OR TRAFFIC SERVICES: 817–392–7738). THE CONTRACTOR SHALL PROTECT EXISTING SIGNAL HARDWARE, GROUND BOXES, DETECTION LOOPS, AND UNDERGROUND CONDUIT AT SIGNALIZED INTERSECTIONS. ANY DAMAGES AT SIGNALIZED INTERSECTIONS SHALL BE REPLACED AT THE EXPENSE OF THE CONTRACTOR. THE CONTRACTOR SHALL CONTACT THE CITY AT 817–392–8100 TO PERFORM CONDUIT LINE LOCATES AT SIGNALIZED INTERSECTIONS 72 HOURS PRIOR TO COMMENCING WORK AT THE INTERSECTION.

1.6. THE CONTRACTOR SHALL NOTIFY THE CITY OF FORT WORTH PROJECT MANAGER 48 HOURS PRIOR TO THE START OF ANY EXCAVATION (CLAYTON TORRANCE: 817–392–8528)

2. THE LOCATION OF ALL DRIVEWAYS, RETAINING WALLS, STRUCTURES, ETC. WHICH MAY BE SHOWN ON THESE PLANS ARE APPROXIMATE. THE CONTRACTOR SHALL VERIFY THE EXACT SIZE, LOCATION, ELEVATION, AND CONFIGURATION OF ALL STRUCTURES PRIOR TO CONSTRUCTION.

3. CONTRACTOR SHALL BE RESPONSIBLE FOR MAINTAINING THE GENERAL SAFETY AT AND ADJACENT TO THE PROJECT AREA, INCLUDING THE PERSONAL SAFETY OF PUBLIC AND PRIVATE PROPERTY. CONTRACTOR SHALL PROVIDE TEMPORARY SANITARY SEWER FACILITIES TO AFFECTED PROPERTY OWNERS, IF NECESSARY PER SECTION 01 50 00 TEMPORARY FACILITIES AND CONTROLS. NOT A SEPARATE PAY ITEM.

4. CONTRACTOR'S PERSONNEL SHALL HAVE IDENTIFYING CLOTHING, HATS OR BADGES AT ALL TIMES WHICH IDENTIFY THE CONTRACTOR'S NAME, LOGO OR COMPANY.

5. THE CONTRACTOR SHALL DISTRIBUTE NOTICES (DOOR HANGER) TO ALL AFFECTED PROPERTY OWNERS PRIOR TO BEGINNING WORK ON EACH PROPERTY PER SECTION 01 35 13.

6. THE CONTRACTOR SHALL VIDEO ALL POTENTIALLY IMPACTED PRIVATE PROPERTY AREAS PRIOR TO WORK. VIDEOS SHALL INCLUDE DATE, NOTATION, AND AUDIO IDENTIFICATION OF PROPERTY ADDRESS AND MAIN/LATERAL NAME AND STATION NUMBER. THIS PRE–CONSTRUCTION VIDEO OF IMPACTED PROPERTIES SHALL BE CONSIDERED SUBSIDIARY WORK PER SECTION 01 32 33 PRECONSTRUCTION VIDEO.

7. CONTRACTOR'S PERSONNEL SHALL HAVE IDENTIFYING CLOTHING OR HATS AT ALL TIMES. THE CONTRACTOR SHALL ALSO HAVE IDENTIFICATION ON ALL VEHICLES.

8. CONSTRUCTION ACTIVITIES SHALL BE LIMITED TO THE HOURS OF 7:00 AM TO 6:00 PM MONDAY THRU FRIDAY UNLESS APPROVED OR DIRECTED BY THE CITY. AT THE PRE–CONSTRUCTION MEETING, THE CONTRACTOR SHALL PROVIDE A CONSTRUCTION SCHEDULE IN ACCORDANCE WITH SECTION 01 32 16, AND PROVIDE MONTHLY UPDATES ALONG WITH THE PROGRESS PAYMENT PER GENERAL CONDITIONS, SECTION 00 72 00, ARTICLE 6.04. ANY PROPOSED WORK BEYOND REGULAR WORKING HOURS WILL REQUIRE WRITTEN REQUEST BY THE CONTRACTOR PER GENERAL CONDITIONS, SECTION 00 72 00, ARTICLE 6.02.

9. SHOP DRAWINGS SHALL BE SUBMITTED TO THE CITY INSPECTOR, CITY PROJECT MANAGER AT THE PRE–CONSTRUCTION MEETING FOR REVIEW. ANY CONSTRUCTION ACTIVITY, MATERIALS, ETC. THAT ARE IDENTIFIED BY THE CITY AS NON–COMPLIANT WITH THE STANDARD DETAILS AND SPECIFICATIONS SHALL BE REMOVED AND REPLACED WITH MATERIALS THAT CONFORM WITH THE STANDARD DETAILS AND SPECIFICATIONS AT THE CONTRACTOR'S EXPENSE. REFERENCE SECTION 01 33 00 SUBMITTALS AND SECTION 01 60 00 PRODUCT REQUIREMENTS, AND THE GENERAL CONDITIONS.

GENERAL NOTES (CONT)

10. THE CONTRACTOR IS RESPONSIBLE FOR KEEPING STREETS AND SIDEWALKS ADJACENT TO PROJECT FREE OF MUD AND DEBRIS FROM THE CONSTRUCTION PER SECTION 01 74 23. WORK ASSOCIATED WITH THIS ITEM IS CONSIDERED SUBSIDIARY TO VARIOUS ITEMS BID.

11. THE CONTRACTOR SHALL CLEAN UP AND RESTORE THE AREA OF OPERATIONS TO A CONDITION AS GOOD AS OR BETTER THAN THAT WHICH EXISTED PRIOR TO WORK, PER SECTION 01 74 23.

12. PRIOR TO SCHEDULING THE PROJECT FINAL, THE CONTRACTOR SHALL PROVIDE REDLINES, CUT SHEETS, FINAL APPROVED PIPE SHOP DRAWINGS, CCTV VIDEO/REPORTS, LINER RESULTS, ETC., PIPE REPORT AND SERVICE REPORT PER SECTIONS 01 77 19, 01 78 39, AND 33 01 31 TO THE CITY FOR REVIEW, REVISIONS, AND FINAL ACCEPTANCE.

13. WHEN IT IS REQUIRED THAT A CONTRACTOR WORK OR ENTER PRIVATE PROPERTY, THE CONTRACTOR SHALL CONTACT THE PROPERTY OWNER 48 HOURS PRIOR TO CONSTRUCTION PER SECTION 01 11 00. DO NOT STORE EQUIPMENT OR MATERIAL ON PRIVATE PROPERTY UNLESS AND UNTIL THE SPECIFIED APPROVAL OF THE PROPERTY OWNER HAS BEEN SECURED IN WRITING BY THE CONTRACTOR AND A COPY FURNISHED TO THE CITY.

14. THE CONTRACTOR SHALL REMOVE FROM THE PROJECT AREA ALL SURPLUS MATERIAL. THIS SHALL BE INCIDENTAL AND NOT A SEPARATE PAY ITEM. SURPLUS MATERIALS FROM EXCAVATION INCLUDING DIRT, TRASH, ETC. SHALL BE PROPERLY DISPOSED OF AT A SITE ACCEPTABLE TO THE CITY'S FLOOD PLAIN ADMINISTRATOR IF WITHIN THE CITY LIMITS. IF THE LOCATION IS NOT WITHIN THE CITY LIMITS, THE CONTRACTOR SHALL PROVIDE A LETTER STATING SO. SURPLUS MATERIAL MAY NOT BE PLACED IN NATURAL DRAINAGE WAY WITHOUT WRITTEN PERMISSION FROM THE AFFECTED PROPERTY OWNER AND THE CITY'S FLOOD PLAIN ADMINISTRATOR. IF THE CONTRACTOR PLACES EXCESS MATERIAL IN THE AREAS WITHOUT WRITTEN PERMISSION, CONTRACTOR SHALL RESPONSIBLE FOR ALL DAMAGE RESULTING FROM SUCH FILL AND SHALL REMOVE THE MATERIAL AT THEIR OWN COST.

15. COSTS ASSOCIATED WITH PROPOSED CONNECTIONS TO EXISTING FACILITIES SHALL BE INCLUDED IN EACH RESPECTIVE BID ITEM, IF NO SPECIFIC BID ITEM IS INCLUDED. NO SEPARATE PAY, EXCEPT AS SPECIFICALLY INDICATED WITHIN THESE PLANS OR THE CONTRACT DOCUMENTS.

DIVISION 02 – EXISTING CONDITIONS

1. NO SEPARATE PAY ITEM WILL BE MADE FOR THE REMOVAL AND DISPOSAL OF EXISTING PUBLIC FACILITIES (PIPES, VALVES, ETC.) WITHIN A PROPOSED UTILITY TRENCH UNLESS OTHERWISE INDICATED WITHIN THE PROJECT SPECIFICATIONS. ITEMS TO BE REMOVED OR ABANDONED OUTSIDE OF A PROPOSED UTILITY TRENCH SHALL BE PAID AS A SEPARATE PAY ITEM PER SECTION 02 41 14.

2. CONTRACTOR SHALL PROTECT CONCRETE CURB AND GUTTER, DRIVEWAYS, AND SIDEWALKS THAT ARE NOT DESIGNATED FOR REMOVAL. REMOVAL AND REPLACEMENT OF THESE ITEMS SHALL BE AS DESIGNATED.

03/07/2024

STATE OF TEXAS
CARL T. DEZEE
87685
LICENSED
PROFESSIONAL ENGINEER
P.E.

REV	BY	DESCRIPTION	DATE

Kimley»Horn
801 Cherry St, Unit 11, Suite 1300, Fort Worth, TX 76102 817-335-6511
TBPE No. F-928

Texas Department of Transportation

RIVERSIDE DR WATERLINE RELOCATIONS

DRAWING INDEX, GENERAL NOTES, AND PROJECT SPECIFIC NOTES I

FED.RD. DIV.NO.	PROJECT NO.		HIGHWAY NO.
6	SEE TITLE SHEET		CS
STATE	DISTRICT	COUNTY	SHEET NO.
TEXAS	FTW	TARRANT	50
CONTROL	SECTION NO.	JOB	
0902	90	019, ETC.	

GENERAL NOTES (CONT)

3. THE CONTRACTOR SHALL PRESERVE AND PROTECT OR REMOVE AND REPLACE WHEN SHOWN ON THE PLANS (WITH PRIOR APPROVAL OF CITY PARKS AND COMMUNITY SERVICES AND/OR AFFECTED PROPERTY OWNERS) ALL TREES, SHRUBS, HEDGES, RETAINING WALLS, LANDSCAPING, BUILDINGS, WALKS, ETC. IN OR NEAR PROPOSED CONSTRUCTION AREA. IF SPECIFIC BID ITEM(S) ARE NOT INCLUDED, THIS WORK SHALL BE CONSIDERED INCIDENTAL AND NOT A SEPARATE PAY ITEM.

DIVISION 03 – CONCRETE

1. HORIZONTAL BLOCKING FOR WATER LINES HAS BEEN OMITTED FOR CLARITY. HOWEVER, BLOCKING SHALL BE CONSTRUCTED AND SHOP DRAWINGS SUBMITTED TO THE CITY INSPECTOR FOR REVIEW, IN ACCORDANCE WITH SECTION 03 30 00.

DIVISION 31 – EARTHWORK

1. THE CONTRACTOR MUST REVIEW AND MAINTAIN A COPY OF THE STORM WATER POLLUTION PREVENTION PLAN WITH ALL CONDITIONS, ATTACHMENTS, EXHIBITS, AND PERMIT MODIFICATIONS IN GOOD CONDITION AT THE CONSTRUCTION SITE. THE COMPLETE PERMIT MUST BE AVAILABLE FOR REVIEW UPON REQUEST.
2. EROSION CONTROL MEASURES MAY ONLY BE PLACED IN FRONT OF INLETS, OR IN CHANNELS, DRAINAGE WAYS, OR BORROW DITCHES AT RISK OF CONTRACTOR. CONTRACTOR SHALL REMAIN LIABLE FOR ANY DAMAGE CAUSED BY THE MEASURES, INCLUDING FLOODING DAMAGE, WHICH MAY OCCUR DUE TO BLOCKED DRAINAGE. AT THE CONCLUSION OF ANY PROJECT, ALL CHANNELS, DRAINAGE WAYS, AND BORROW DITCHES IN THE WORK ZONE SHALL BE DREDGED OF ANY SEDIMENT GENERATED BY THE PROJECT OR DEPOSITED AS A RESULT OF EROSION CONTROL MEASURES.
3. THE CONTRACTOR SHALL COMPLY WITH ALL FEDERAL, STATE, AND LOCAL EROSION, CONSERVATION, AND SILTATION ORDINANCES. THE CONTRACTOR SHALL USE SEDIMENT FILTERS OR OTHER MEASURES APPROVED BY THE ENGINEER AND CONSTRUCTION MANAGER TO PREVENT SILT AND CONSTRUCTION DEBRIS FROM CLOGGING STORM SEWER PIPES OR PROPOSED OR EXISTING INLETS, OR FROM BEING TRANSPORTED TO ADJACENT PROPERTIES AND STREET RIGHT-OF-WAYS. ALL EROSION CONTROL DEVICES SHALL BE INSTALLED PRIOR TO SITE DISTURBANCE AND SHALL REMAIN IN PLACE UNTIL FINAL GRADING AND PAVING IS COMPLETE AND PERMANENT SOIL STABILIZATION IS ACHIEVED.
4. CONSTRUCTION OPERATIONS SHALL BE MANAGED SO THAT AS MUCH OF THE SITE AS POSSIBLE IS LEFT COVERED WITH EXISTING TOPSOIL AND VEGETATION.
5. ALL SLOPES AND AREAS DISTURBED BY CONSTRUCTION SHALL BE GRADED SMOOTH. SODDING OR SEEDING SHALL BE PER SECTIONS 32 92 13 "SODDING" OR 32 92 14 "NON-NATIVE SEEDING", RESPECTIVELY.
6. CONTRACTOR SHALL CONSTRUCT A STABILIZED CONSTRUCTION ENTRANCE AT ALL PRIMARY POINTS OF ACCESS. CONTRACTOR IS RESPONSIBLE FOR ENSURING THAT ALL CONSTRUCTION TRAFFIC UTILIZES THE STABILIZED ENTRANCE AT ALL TIMES FOR INGRESS AND EGRESS TO THE SITE.
7. SITE ENTRY AND EXIT LOCATIONS SHALL BE MAINTAINED IN A CONDITION WHICH SHALL PREVENT TRACKING OR FLOWING OF SEDIMENT ONTO PUBLIC ROADWAYS. ALL SEDIMENT SPILLED, DROPPED, WASHED, OR TRACKED ON A PUBLIC ROADWAY SHALL BE REMOVED IMMEDIATELY. WHEN WASHING IS REQUIRED TO REMOVE SEDIMENT PRIOR TO ENTRANCE TO A PUBLIC ROADWAY, IT SHALL BE DONE ON AN AREA STABILIZED WITH CRUSHED STONE WHICH DRAINS INTO AN APPROVED SEDIMENT BASIN. ALL FINES IMPOSED FOR TRACKING ONTO PUBLIC ROADS SHALL BE PAID BY THE CONTRACTOR.
8. CONTRACTOR IS RESPONSIBLE FOR PROPER MAINTENANCE OF THE REQUIRED EROSION CONTROL DEVICES THROUGHOUT THE ENTIRE CONSTRUCTION PROCESS. EROSION CONTROLS SHALL BE REPAIRED OR REPLACED AS INSPECTION DEEMS NECESSARY, OR AS DIRECTED BY THE OWNER'S REPRESENTATIVE. ACCUMULATED SILT IN ANY EROSION CONTROL DEVICE SHALL BE REMOVED AND SHALL BE DISTRIBUTED ON SITE IN A MANNER NOT CONTRIBUTING TO ADDITIONAL SILTATION. THE CONTRACTOR IS RESPONSIBLE FOR RE-ESTABLISHING ANY EROSION CONTROL DEVICE WHICH IS DISTURBED.
9. BEFORE ANY EARTHWORK IS DONE, THE CONTRACTOR SHALL STAKE OUT AND MARK THE LIMITS OF CONSTRUCTION AND OTHER ITEMS ESTABLISHED BY THE PLANS. THE CONTRACTOR SHALL PROTECT AND PRESERVE CONTROL POINTS AT ALL TIMES DURING THE COURSE OF THE PROJECT. THE GRADING CONTRACTOR SHALL PROVIDE ALL NECESSARY ENGINEERING AND SURVEYING FOR LINE AND GRADE CONTROL POINTS RELATED TO EARTHWORK.
10. 10. CONTRACTOR STAGING AREA TO BE AGREED UPON BY OWNER PRIOR TO BEGINNING CONSTRUCTION.
11. TAKE APPROPRIATE MEASURES TO PRESERVE WILDLIFE IN ACCORDANCE WITH APPLICABLE FEDERAL, STATE AND LOCAL GUIDELINES.

DIVISION 32 – EXTERIOR IMPROVEMENTS

GENERAL:

1. AT LOCATIONS WHERE THE CURB AND GUTTER ARE TO BE REPLACED, THE CONTRACTOR SHALL ASSUME ALL RESPONSIBILITY FOR THE RE-ESTABLISHMENT OF EXISTING STREET AND GUTTER GRADES. IF BID ITEM FROM CONSTRUCTION STAKING IS NOT INCLUDED, ESTABLISHMENT OF GRADES SHALL BE CONSIDERED AS A SUBSIDIARY ITEM OF WORK, THE COST OF WHICH SHALL BE INCLUDED IN THE PRICE BID IN THE PROPOSAL FOR VARIOUS BID ITEMS.
2. ALL DRIVEWAYS, WHICH ARE OPEN CUT, SHALL HAVE AT LEAST A TEMPORARY DRIVING SURFACE AT THE END OF EACH DAY. THE TEMPORARY SURFACE SHALL BE CONSIDERED AS A SUBSIDIARY ITEM OF WORK. THE COST OF WHICH SHALL BE INCLUDED IN THE PRICE BID IN THE PROPOSAL FOR VARIOUS BID ITEMS.

GENERAL NOTES (CONT)

3. CONTRACTOR SHALL VERIFY WITH CITY PROJECT MANAGER THE LOCATION OF ALL CITY OWNED PARKLAND ASSOCIATED WITH AND ADJACENT TO THE PROJECT AND CITY OWNED LAND THAT IS MAINTAINED BY PARD. ADDITIONALLY, THE CONTRACTOR MAY NEED A SEPARATE AGREEMENT IN ORDER TO ACCESS CITY PARKLAND FOR STAGING AND/OR CONSTRUCTION. CONTACT PARK PLANNER AT 817-392-5764 TO VERIFY NEED FOR SEPARATE AGREEMENT.

DIVISION 33 – UTILITIES

GENERAL:

1. WHEN IT IS REQUIRED THAT A CONTRACTOR WORK ON PRIVATE PROPERTY WITHIN UTILITY EASEMENTS, THE CONTRACTOR SHALL CONTACT THE PROPERTY OWNER 48 HOURS PRIOR TO CONSTRUCTION. ONCE THE PIPE HAS BEEN INSTALLED OR REHABILITATED, THE CONTRACTOR SHALL IMMEDIATELY COMMENCE SURFACE RESTORATION. SURFACE RESTORATION MUST BE COMPLETED TO THE OWNER'S SATISFACTION WITHIN TEN (10) WORKING DAYS. FAILURE TO MAINTAIN AND/OR COMPLETE SITE RESTORATION, AS NOTED ABOVE, MAY RESULT IN DEFERMENT OF FURTHER PIPE INSTALLATION ACTIVITIES.
2. EXISTING VERTICAL DEFLECTIONS AND PIPE SLOPES SHOWN ON THE PLANS WERE OBTAINED FROM RECORD DRAWINGS AND HAVE NOT BEEN FIELD VERIFIED. SOME PIPELINE SLOPES WERE ADJUSTED TO MATCH SURVEYED MANHOLE FLOW LINES. RIM ELEVATIONS, FLOW LINES, AND HORIZONTAL LOCATIONS OF EXISTING MANHOLES WERE DETERMINED FROM FIELD SURVEY. HOWEVER, IF CONFLICTS WITH PAVING, ADDITIONAL FILL, STORM SEWER, DRAINAGE HEADWALLS, INLETS, BRIDGE PIERS, EMBANKMENTS, MSE WALLS, RETAINING WALLS, ABOVE GROUND STRUCTURES, FRANCHISE UTILITIES, ETC. HAVE BEEN IDENTIFIED, THE UTILITIES IN CONFLICT SHALL BE LOCATED AND POTHOLED USING VACUUM EXCAVATION METHOD PER SECTION 33 05 30 PRIOR TO CONSTRUCTION OF THE MAIN. CONTRACTOR SHALL PROVIDE ALL POTHOLE DATA AND OTHER DOCUMENTATION OF THESE CONFLICTS (PLANS, SHOP DRAWINGS, SURVEY DATA, ETC.) TO THE CITY INSPECTOR, WATER ENGINEERING, WATER FIELD OPERATIONS, AS PLANS SHALL BE REVISED AND SUBMITTED FOR REVIEW BY THE CITY IN ORDER TO AVOID A CONFLICT.
3. MAINTAIN ALL EXISTING WATER AND SEWER CONNECTIONS TO CUSTOMERS IN WORKING ORDER AT ALL TIMES, EXCEPT FOR BRIEF INTERRUPTIONS IN SERVICE FOR WATER AND SEWER SERVICES TO BE REINSTATED. IN NO CASE SHALL SERVICES BE ALLOWED TO REMAIN OUT OF SERVICE OVERNIGHT.
4. PROVIDE AND FOLLOW APPROVED CONFINED SPACE ENTRY PROGRAM IN ACCORDANCE WITH OSHA REQUIREMENTS. CONFINED SPACES SHALL INCLUDE MANHOLES AND ALL OTHER CONFINED SPACES IN ACCORDANCE WITH OSHA'S PERMIT REQUIRED FOR CONFINED SPACES.
5. ONLY CITY PREQUALIFIED CONTRACTORS, BY APPROPRIATE WATER DEPARTMENT WORK CATEGORY, SHALL BE ALLOWED TO ADJUST VALVE BOXES, MANHOLES, RING & COVERS, ETC.
6. CONTRACTOR IS RESPONSIBLE FOR ALL TRENCH SAFETY. THE CONTRACTOR SHALL CONSTRUCT THE PROPOSED WORK UTILIZING A TRENCH SAFETY PLAN PREPARED BY A LICENSED PROFESSIONAL ENGINEER IN THE STATE OF TEXAS, FOR THIS PROJECT, IN ACCORDANCE WITH OSHA EXCAVATION SAFETY STANDARDS, FEDERAL AND STATE REQUIREMENTS, PER SECTION 33 05 10. A TRENCH SAFETY PLAN SHALL BE SUBMITTED AT THE PRE-CONSTRUCTION MEETING. THIS WOULD ALSO INCLUDE A GROUND WATER CONTROL PLAN IF CONDITIONS MEETING CRITERIA OUTLINED IN SECTION 33 05 10 EXIST.
7. ALL EMBEDMENT AND BACKFILL SHALL BE IN ACCORDANCE WITH SPECIFICATION 33 05 10. CONTRACTOR SHALL PROVIDE THE EMBEDMENT/BACKFILL DENSITY TEST PLAN WHICH OUTLINES TESTING NOTIFICATION, FREQUENCY, TESTING LAB, TEST METHODS, TEST RESULT FORMAT, CONTACT INFORMATION ETC. CONTRACTOR SHALL NOTIFY THE CITY INSPECTOR IN WRITING TO OBTAIN SAMPLES AND PERFORM STANDARD PROCTOR TEST IN ACCORDANCE WITH ASTM D698. UPON COMMENCING OF BACKFILL PLACEMENT, CONTRACTOR SHALL SCHEDULE A DEMONSTRATION OF MEANS AND METHODS TO OBTAIN THE REQUIRED DENSITIES. DEPTH OF LIFTS FOR BACKFILL SHALL NOT EXCEED 12-INCHES. TEST REPORTS SHALL BE POSTED WITHIN 48 HOURS. INCLUDES THE INSTALLATION OF THE TRENCH GEOTEXTILE FABRIC AND UTILITY MARKER TAPE IN ACCORDANCE WITH SECTION 33 05 26. ALL PAVEMENT REPAIR SHALL BE PER SECTIONS 32 01 17, 32 01 18, AND 32 01 29. ALL NON-CONFORMING WORK SHALL BE REMOVED AND REPLACED.
8. EXISTING UTILITY INFORMATION IS PROVIDED FOR INFORMATION ONLY. ALTHOUGH THIS DATA IS SHOWN AS ACCURATELY AS POSSIBLE, THE CONTRACTOR IS CAUTIONED THAT THE CITY AND THE ENGINEER NEITHER ASSUMES NOR IMPLIES ANY RESPONSIBILITY FOR THE ACCURACY OF THE DATA.
9. EXISTING UTILITY CROSSINGS SHOWN ON THE PROFILE ARE FROM REFERENCE PLANS, AND FROM INFORMATION OBTAINED FROM THE UTILITY COMPANIES. IT SHALL BE THE CONTRACTOR'S RESPONSIBILITY TO FIELD VERIFY THE HORIZONTAL AND VERTICAL LOCATIONS OF THE EXISTING UTILITIES.

DIVISION 33 – UTILITIES

WATER:

1. PROVIDE THRUST RESTRAINT BY MEANS OF RESTRAINING JOINTS AT FITTINGS AND CONCRETE BLOCKING. WHEN SPECIFICALLY INDICATED ON THE DRAWINGS, PROVIDE THRUST RESTRAINT AT DESIGNATED JOINTS BEYOND THE FITTINGS. EACH METHOD SHALL BE CAPABLE OF THRUST RESTRAINT INDEPENDENT OF THE OTHER SYSTEM. THE CONTRACTOR SHALL REFER TO CITY STANDARD DETAILS FOR AREA REQUIRED TO INSTALL CONCRETE BLOCKING.
2. ALL DUCTILE IRON MECHANICAL JOINT FITTINGS SHALL BE RESTRAINED TO PIPE USING RETAINER GLANDS.
3. PROPOSED WATER MAINS SHALL HAVE A MINIMUM COVER OF 48-INCHES COVER ABOVE THE TOP OF PIPE, UNLESS SHOWN OTHERWISE ON THE DRAWINGS OR DETAILS.
4. ALL WATER SERVICES SHALL BE INSTALLED ABOVE STORM SEWERS, EXCEPT WHERE SHOWN OTHERWISE IN THE DRAWINGS.

GENERAL NOTES (CONT)

5. ELEVATION ADJUSTMENT AT CONNECTIONS MAY BE MADE WITH BENDS, OFFSETS, OR JOINT DEFLECTIONS. JOINT DEFLECTIONS SHALL NOT EXCEED FIFTY PERCENT (50%) OF MANUFACTURER'S RECOMMENDATIONS.
6. TEMPORARY PRESSURE PLUGS REQUIRED FOR SEQUENCING OF CONSTRUCTION AND TESTING OF PROPOSED WATER LINES SHALL BE CONSIDERED SUBSIDIARY TO THE WORK AND SHALL BE INCLUDED IN THE PRICE BID IN THE PROPOSAL FOR VARIOUS BID ITEMS.
7. 12-INCH DIAMETER AND SMALLER WATER MAINS SHALL BE INSTALLED WITH A MINIMUM COVER OF 48-INCHES AND 16-INCH AND LARGER WATER MAINS SHALL BE INSTALLED A MINIMUM COVER OF 60-INCHES, MEASURED FROM TOP OF SURFACE (EXISTING AND PROPOSED) EXCEPT WHERE SHOWN OTHERWISE IN THESE PLANS.
8. VALVES SHALL BE INSTALLED WHERE DESIGNATED ON THESE PLANS IN ACCORDANCE AND SHOP DRAWINGS PROVIDED TO THE CITY INSPECTOR FOR REVIEW PER SECTION 33 12 20. VAULTS SHALL BE INSTALLED ON ALL MAINS 16-INCH DIAMETER AND LARGER PER SECTIONS 33 12 20, 33 05 16, AND 03 30 00.
9. FIRE HYDRANTS SHALL BE A MINIMUM OF 3 FT. BEHIND THE BACK OF CURB (MAXIMUM 9 FT.) AND IN LINE WITH THE PROPERTY/LOT LINES EXCEPT WHERE SHOWN OTHERWISE IN THESE PLANS. CONSTRUCTION AND SHOP DRAWING SUBMITTALS TO THE CITY INSPECTOR PER SECTION 33 12 40.
10. INSTALL CHLORINATION AND SAMPLING POINTS AT DESIGNATED LOCATIONS PER SECTION 33 04 40.
11. CORPORATION STOPS SHALL BE TESTED FOR FULL FLOW WHEN THE SYSTEM IS PRESSURE TESTED. CONSTRUCTION AND SHOP DRAWING SUBMITTALS PER SECTION 33 12 10.
12. ALL WATER MAINS CROSSING BELOW STORM SEWER LINES SHALL BE DUCTILE IRON PIPE PER SECTION 33 11 10 AND BACKFILLED WITH CLSM PER SECTION 03 34 13, UNLESS NOTED OTHERWISE.
13. CONTRACTOR SHALL PROVIDE PIPE SHOP DRAWINGS IN ACCORDANCE WITH THE SPECIFICATIONS. DETAILED PIPE SHOP DRAWINGS/LAY SCHEDULE WATER MAINS 16-INCH DIAMETER AND LARGER, SIGNED AND SEALED BY A LICENSED PROFESSIONAL ENGINEER IN TEXAS FOR DUCTILE IRON PIPE, CONCRETE, AND STEEL PIPE ARE REQUIRED SUBMITTALS BEFORE START OF CONSTRUCTION. ELEVATION ADJUSTMENT AT CONNECTIONS MAY BE MADE WITH BENDS, OFFSETS, OR JOINT DEFLECTIONS (FOR EXAMPLE, PVC JOINT DEFLECTIONS NOT TO EXCEED 50% OF THE MANUFACTURER'S RECOMMENDATIONS PER SECTION 33 11 12). REFERENCE DUCTILE IRON, CONCRETE, AND STEEL PIPE PER SECTIONS 33 11 10, 33 11 13, 33 11 14, FOR THE DEFLECTION REQUIREMENTS. PRIOR TO SCHEDULING THE PROJECT FINAL, THE CONTRACTOR SHALL PROVIDE REDLINES, CUT SHEETS, FINAL APPROVED PIPE SHOP DRAWINGS, ETC., PIPE REPORT AND SERVICE REPORT PER SECTIONS 01 77 19, 01 78 39, AND 33 01 31 TO THE CITY FOR REVIEW, REVISIONS, AND FINAL ACCEPTANCE.
14. ALL NON-STANDARD BENDS SHALL BE MADE BY USING THE CLOSEST STANDARD MJ FITTINGS OR FITTINGS WITH THE REQUIRED JOINT DEFLECTIONS. JOINT DEFLECTIONS AND ASSOCIATED SHOP DRAWING SUBMITTALS, SHALL BE IN ACCORDANCE WITH SECTIONS 33 11 10, 33 11 11, 33 11 13, AND 33 11 14.
16. ALL EXISTING ¾-INCH WATER SERVICE LINES SHALL BE REPLACED WITH 1-INCH TYPE K COPPER SERVICE LINES (PER ASTM B88), WITH 1-INCH CORPORATION STOPS AND IF REQUIRED 1-INCH TAPPING SADDLE AND 1-INCH X ¾-INCH REDUCER AT THE ¾-INCH CURB STOP AS DIRECTED BY THE ENGINEER. SHOP DRAWINGS SHALL INDICATE FLARED COPPER TUBING WITH THREAD DIMENSIONS PER AWWA C800 AND SERVICE SADDLES SHALL BE DOUBLE STRAP PER SECTION 33 12 10.
17. ALL EXISTING WATER METERS SHALL BE RELOCATED 3 FT. BEHIND THE CURB OR AS DIRECTED BY THE ENGINEER (SECTION 33 12 10).
18. THE CONTRACTOR SHALL INSTALL A 2-INCH TEMPORARY WATER SERVICE MAIN PER SECTION 33 04 30. LARGE DOMESTIC SERVICES (3-INCH AND LARGER) AND FIRE LINES SHALL REQUIRE A LARGER MAIN FOR TEMPORARY WATER SERVICE DURING CONSTRUCTION.
19. ALL PVC WATER MAINS 12-INCH DIAMETER AND SMALLER SHALL BE DR-14 PER SECTION 33 11 12. ALL DUCTILE IRON WATER MAINS SHALL BE POLY WRAPPED PER SECTION 33 11 10, 33 11 11. CATHODIC PROTECTION STUDY IS REQUIRED ON ALL PIPES OTHER THAN PVC. IN ACCORDANCE WITH THE RECOMMENDATIONS FROM THE CATHODIC PROTECTION STUDY, THE DRAWINGS AND SPECIFICATIONS FOR CATHODIC PROTECTION SHALL APPLY.
20. ALL WATER MAINS SHALL HAVE TEMPORARY PLUGS PER SECTIONS 33 04 40, 33 12 25 AND DETAIL AT THE END OF EACH WORK DAY. DEFLECT WATER MAINS AT JOINTS TO CLEAR CURB INLETS. MINIMUM HORIZONTAL SEPARATION FROM OUTER WALL OF MAIN TO OUTER WALL OF INLET SHALL BE 5 FEET. MINIMUM HORIZONTAL SEPARATION FROM OUTER WALL OF MAIN TO OUTER DIAMETER DRILLED SHAFTS, AND OUTER WALL OF HEADWALLS SHALL BE 10 FT.
21. UNLESS OTHERWISE NOTED ON THE PLANS, THE GATE VALVES SHALL BE INSTALLED TO LINE UP WITH THE PROPERTY/ROW LINE.
22. CONTRACTOR AND CITY INSPECTOR SHALL CONTACT WATER FIELD OPERATIONS PRIOR TO ALL ITEMS BEING REMOVED OR SALVAGED. CONTRACTOR SHALL PROVIDE THE DOCUMENTS TO THE CITY INSPECTOR FOR ALL ITEMS REMOVED AND SALVAGED TO WATER FIELD OPERATIONS WAREHOUSE. CONTACT WAREHOUSE SUPERVISOR AND DELIVER ALL SALVAGED MATERIALS TO THE WAREHOUSE LOCATED AT 1608 11TH/ AVE. FORT WORTH TX 76102.

SANITARY SEWER:

1. VERIFY THAT ALL CONNECTIONS TO THE SANITARY SEWER SYSTEM ARE FOR SANITARY SEWER ONLY. NOTIFY CITY OF ANY DISCOVERED ILLICIT CONNECTIONS.

GENERAL NOTES (CONT)

2. THE CONTRACTOR SHALL BE LIABLE FOR ALL DAMAGES TO PROPERTIES, HOMES, AND BASEMENTS FROM BACKUP, WHICH MAY RESULT DURING THE INSTALLATION OF NEW PIPE AND/OR ABANDONMENT OF EXISTING PIPE. THE CONTRACTOR WILL BE ALLOWED TO OPEN CLEAN OUTS WHERE AVAILABLE. THE CONTRACTOR WILL BE RESPONSIBLE FOR ALL CLEAN UP ASSOCIATED WITH OPENING CLEAN OUTS.
3. FOR ALL SANITARY SEWER SERVICE CONNECTIONS AT MANHOLES, PROVIDE A HYDRAULIC SLIDE IN ACCORDANCE WITH THE DETAILS.
4. THE PROPOSED SANITARY SEWER LINES AT TIMES WILL BE LAID CLOSE TO OTHER EXISTING UTILITIES AND STRUCTURES BOTH ABOVE AND BELOW GROUND. THE CONTRACTOR SHALL MAKE NECESSARY PROVISIONS FOR THE SUPPORT AND PROTECTION OF ALL UTILITY POLES, GAS MAINS, TELEPHONE CABLES, SANITARY SEWER MAINS, WATER MAINS, DRAINAGE PIPES, UTILITY SERVICES, AND ALL OTHER UTILITIES AND STRUCTURES BOTH ABOVE AND BELOW GROUND DURING CONSTRUCTION. CONTRACTOR SHALL SUBMIT SHOP DRAWINGS AT THE PRE-CONSTRUCTION MEETING PER SECTION 01 33 00 FOR SUPPORT/PROTECTION OF LARGE DIAMETER WATER MAINS (16-INCH AND LARGER) AND SANITARY SEWER MAINS (15-INCH AND LARGER) FOR REVIEW BY CITY INSPECTOR, WATER ENGINEERING, AND WATER FIELD OPERATIONS PRIOR TO CONSTRUCTION IN THESE AREAS. IN ADDITION, THE CONTRACTOR SHALL SUBMIT A CONTINGENCY PLAN AND EMERGENCY PLAN TO THE SAME PERSONNEL WHICH INCLUDES ACCEPTABLE PIPE MATERIALS ON-SITE FOR REPAIRS. THE CONTRACTOR IS LIABLE FOR ALL DAMAGES TO EXISTING WATER AND SANITARY SEWER MAINS AS A RESULT OF THE CONTRACTOR'S OPERATIONS.
5. CONTRACTOR SHALL CONDUCT A PRE-CONSTRUCTION TELEVISION INSPECTION (CCTV) OF ALL EXISTING SANITARY SEWER LINES, WHICH ARE TO BE ABANDONED OR REHABILITATED VIA TRENCHLESS METHODS, TO VERIFY LOCATIONS OF ALL SANITARY SEWER SERVICE CONNECTIONS PRIOR TO CONSTRUCTION OF THE ENTIRE PROJECT. FORMAT OF THE CCTV VIDEO, PLAN EXHIBITS, AND REPORT SHALL BE IN ACCORDANCE WITH SECTION 33 01 31. REPORT SHALL CLEARLY IDENTIFY EXISTING SANITARY SEWER MAIN/LATERAL NUMBER, MANHOLES, STATION NUMBER (FROM AND TO), STREET ADDRESS, PIPE SIZE, PIPE MATERIAL, SERVICE LOCATIONS, PIPE MATERIAL CHANGES, ETC. COPIES OF THE CCTV VIDEO, LAYOUT, MARKED UP PLANS SHOWING LIMITS, AND REPORT SHALL BE PROVIDED TO THE CITY INSPECTOR, CITY PROJECT MANAGER, WATER ENGINEERING, AND WATER FIELD OPERATIONS, AS THE SCHEDULE SHALL ALLOW FOR A REVIEW TIME OF 2 WEEKS.
6. CONTRACTOR SHALL ENSURE THAT ALL ACTIVE SERVICES CAN BE RECONNECTED AND/OR REROUTED TO THE NEW SANITARY SEWER MAIN/LATERAL PER SECTION 33 31 50. CONTACTOR SHALL NOTIFY THE CITY INSPECTOR, CITY PROJECT MANAGER, WATER ENGINEERING, AND WATER FIELD OPERATIONS OF ANY POTENTIAL CONFLICTS PRIOR TO CONSTRUCTION, SO MODIFICATIONS TO THE PLANS CAN BE MADE IF NECESSARY. NOT A SEPARATE PAY ITEM, AS THIS WORK SHALL BE SUBSIDIARY TO THE PRE-CONSTRUCTION TELEVISION INSPECTION OF SANITARY SEWER LINES.

03/07/2024

REV	BY	DESCRIPTION	DATE

Kimley»Horn
801 Cherry St, Unit 11, Suite 1300, Fort Worth, TX 76102 817-335-6511
TBPE No. F-928

RIVERSIDE DR
WATERLINE RELOCATIONS

GENERAL NOTES, AND
PROJECT SPECIFIC NOTES II

FED.RD. DIV.NO.	PROJECT NO.		HIGHWAY NO.
6	SEE TITLE SHEET		CS
STATE	DISTRICT	COUNTY	SHEET NO.
TEXAS	FTW	TARRANT	51
CONTROL	SECTION NO.	JOB	
0902	90	019, ETC.	

LEGEND

- EXISTING WATER LINE
- EXISTING AIR RELEASE VALVE
- EXISTING GATE VALVE
- EXISTING FIRE HYDRANT
- EXISTING ISOLATION VALVES

MAP # 2054-400
MAP # 2054-404
MAP # 2060-404

0 125 250
SCALE: 1"=250'

INTERSTATE 30
BOMAR
RETTA
HUFMAN
RIVERSIDE DR.
GIPSON ST.
CARLUS ST.
CLOSED
SYLVANIA ST.
BAURLINE ST.
SYLVANIA

A.1 A.2 A.3 A.4 A.5 A.6 A.7 A.8 A.9 B.1

03/07/2024

STATE OF TEXAS
CARL T. DEZEE
87685
LICENSED PROFESSIONAL ENGINEER
P.E.

REV	BY	DESCRIPTION	DATE

Kimley»Horn
801 Cherry St, Unit 11, Suite 1300, Fort Worth, TX 76102 817-335-6511
TBPE No. F-928

Texas Department of Transportation

RIVERSIDE DR
WATERLINE RELOCATIONS

EXISTING WATER LINE LOCATION MAP

FED.RD. DIV.NO.	PROJECT NO.		HIGHWAY NO.
6	SEE TITLE SHEET		CS
STATE	DISTRICT	COUNTY	SHEET NO.
TEXAS	FTW	TARRANT	52
CONTROL	SECTION NO.	JOB	
0902	90	019, ETC.	

LEGEND

- EXISTING WATER LINE
- EXISTING AIR RELEASE VALVE
- EXISTING GATE VALVE
- EXISTING FIRE HYDRANT
- EXISTING WATER LINE TO BE ABANDONED
- EXISTING WATER LINE TO BE REMOVED

MAP # 2054-400
MAP # 2054-404
MAP # 2060-404

0 125 250
SCALE: 1"=250'

INSTALL: (1) 12" PRESSURE PLUG RE: D123/56 (TO BE COMPLETED UNDER BID ITEM "WATER CONSTRUCTION ALLOWANCE")

REMOVE AND SALVAGE EXISTING 1" AIR RELEASE VALVE

REMOVE AND SALVAGE EXISTING 12" GATE VALVE

GROUT FILL AND ABANDON APPROXIMATELY 460 LF OF 12" WATERLINE

INSTALL: (1) 12" ABANDONMENT PLUG RE: D007/57

REMOVE APPROXIMATELY 282 LF OF 12" WATER LINE

REMOVE AND SALVAGE EXISTING 1" AIR RELEASE VALVE

GROUT FILL AND ABANDON APPROXIMATELY 450 LF OF 12" WATERLINE

INSTALL: (1) 12" PRESSURE PLUG RE: D123/56 (TO BE COMPLETED UNDER BID ITEM "WATER CONSTRUCTION ALLOWANCE")

INSTALL: (1) 12" ABANDONMENT PLUG RE: D007/57

INSTALL: (1) 12" ABANDONMENT PLUG RE: D007/57

INSTALL: (1) 12" ABANDONMENT PLUG RE: D007/57

INTERSTATE 30

RIVERSIDE DR.

BOMAR

HUFMAN

RETTA

SYLVANIA ST.

CLOSED

CARLUS ST.

BAURLINE ST.

SYLVANIA

03/07/2024

STATE OF TEXAS
CARL T. DEZEE
87685
LICENSED PROFESSIONAL ENGINEER
P.E.

REV	BY	DESCRIPTION	DATE

Kimley»Horn
801 Cherry St., Unit 11, Suite 1300, Fort Worth, TX 76102 817-335-6511
TBPE No. F-928

Texas Department of Transportation

RIVERSIDE DR WATERLINE RELOCATIONS

PROPOSED WATER LINE ABANDONMENTS

FED.RD. DIV.NO.	PROJECT NO.		HIGHWAY NO.
6	SEE TITLE SHEET		CS
STATE	DISTRICT	COUNTY	SHEET NO.
TEXAS	FTW	TARRANT	53
CONTROL	SECTION NO.	JOB	
0902	90	019, ETC.	

LEGEND

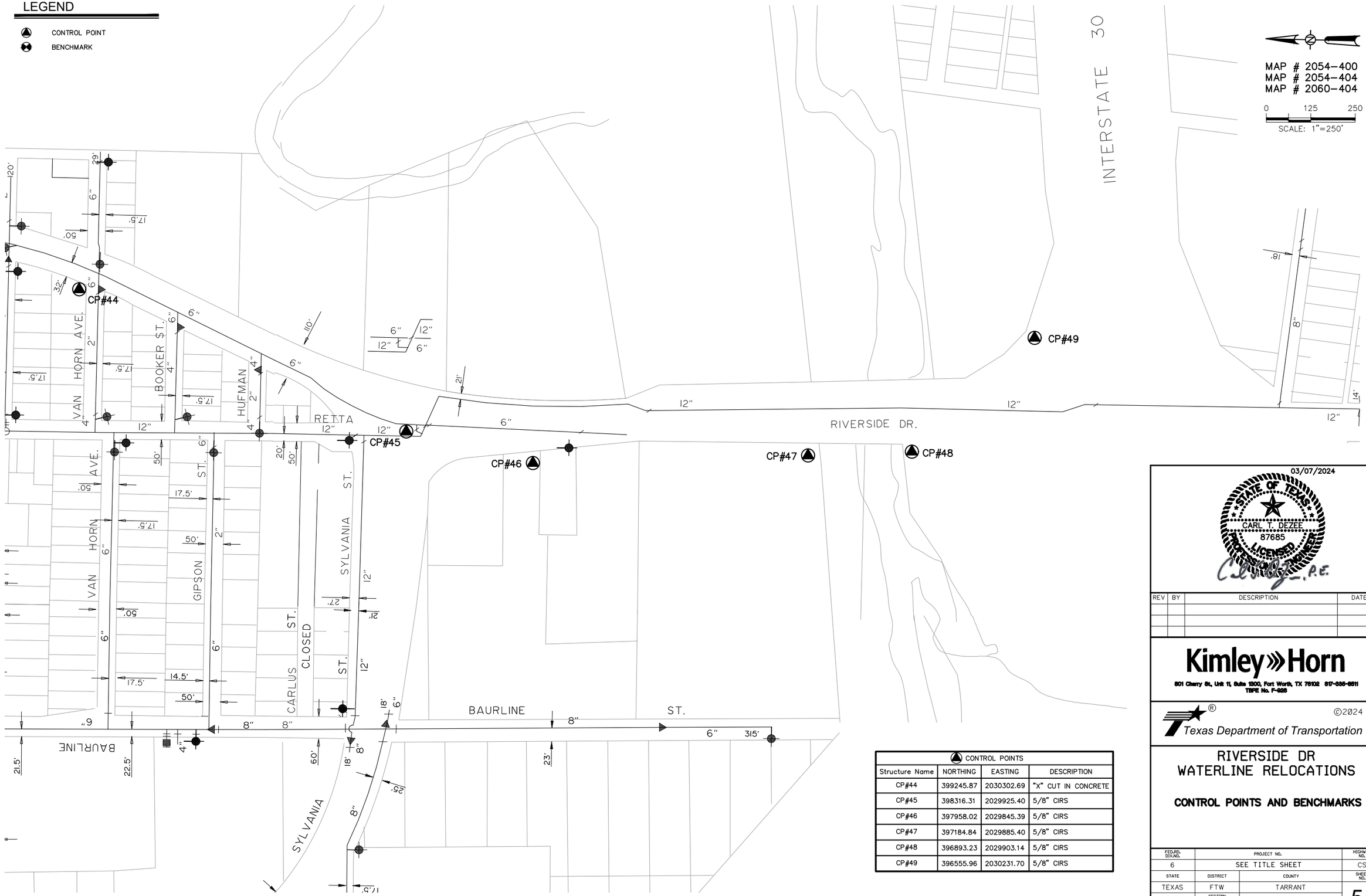
CONTROL POINT

BENCHMARK

MAP # 2054-400
MAP # 2054-404
MAP # 2060-404

0 125 250

SCALE: 1"=250'



CONTROL POINTS			
Structure Name	NORTHING	EASTING	DESCRIPTION
CP#44	399245.87	2030302.69	"X" CUT IN CONCRETE
CP#45	398316.31	2029925.40	5/8" CIRS
CP#46	397958.02	2029845.39	5/8" CIRS
CP#47	397184.84	2029885.40	5/8" CIRS
CP#48	396893.23	2029903.14	5/8" CIRS
CP#49	396555.96	2030231.70	5/8" CIRS

03/07/2024

STATE OF TEXAS
CARL T. DEZEE
87685
LICENSED PROFESSIONAL ENGINEER
P.E.

REV	BY	DESCRIPTION	DATE

Kimley»Horn

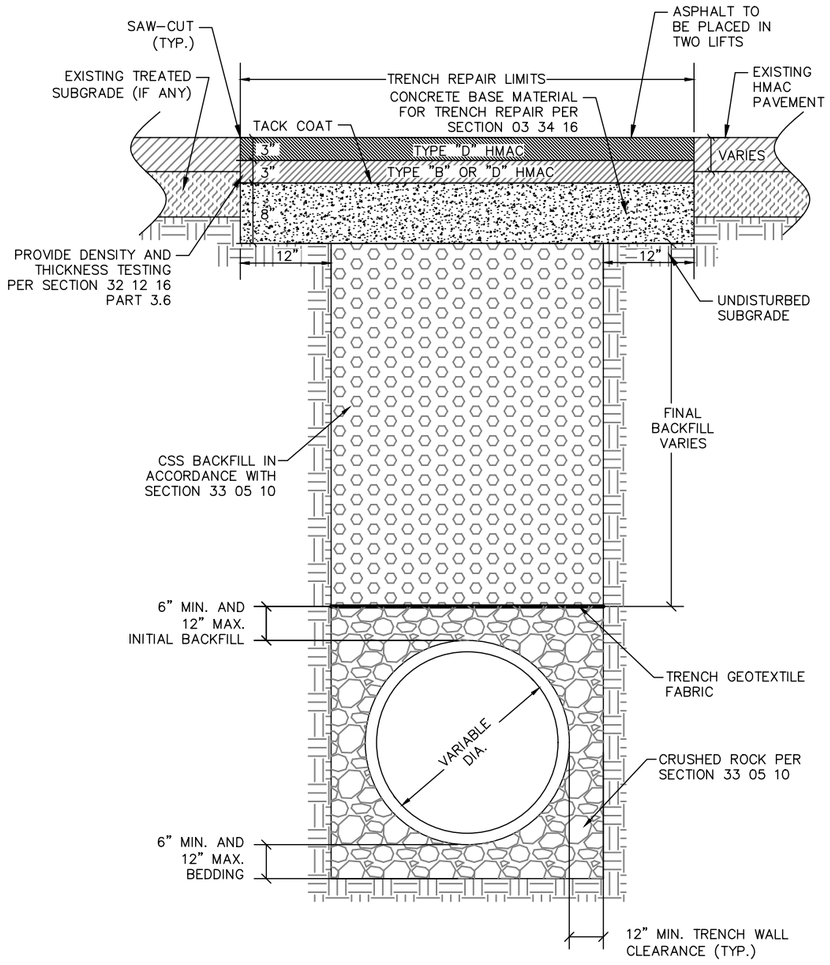
801 Cherry St, Unit 11, Suite 1300, Fort Worth, TX 76102 817-335-6511
TBPE No. F-928

Texas Department of Transportation

RIVERSIDE DR WATERLINE RELOCATIONS

CONTROL POINTS AND BENCHMARKS

FED.RD. DIV.NO.	PROJECT NO.		HIGHWAY NO.
6	SEE TITLE SHEET		CS
STATE	DISTRICT	COUNTY	SHEET NO.
TEXAS	FTW	TARRANT	54
CONTROL	SECTION NO.	JOB	
0902	90	019, ETC.	

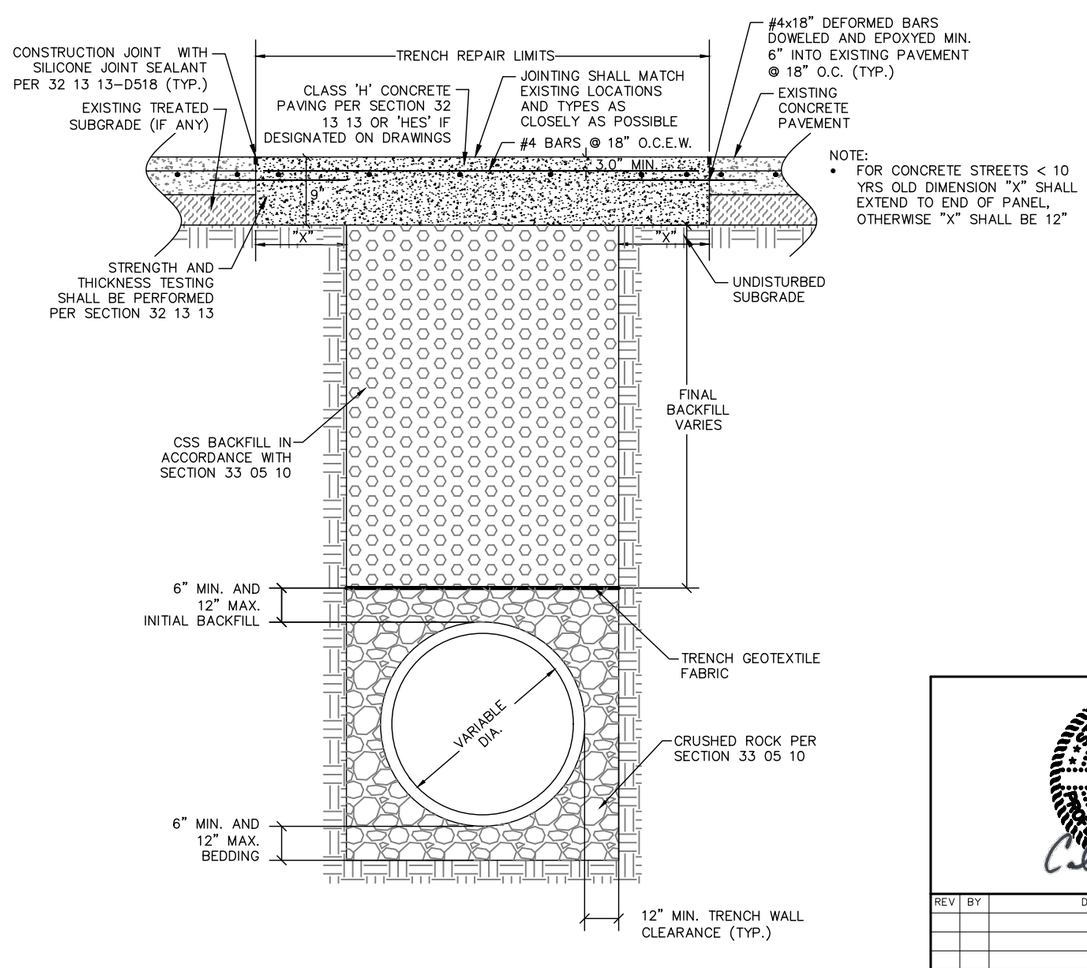


32 01 17-D520 ASPHALT PAVEMENT TRENCH REPAIR-ARTERIAL & INDUSTRIAL STREETS
33 05 10-D003 CEMENT STABILIZED SAND (CSS) BACKFILL
33 05 10-D101 EMBEDMENT FOR WATER LINES 12-INCH AND SMALLER

D520
D003
D101

55

SCALE: N.T.S.



NOTE:
- FOR CONCRETE STREETS < 10 YRS OLD DIMENSION "X" SHALL EXTEND TO END OF PANEL, OTHERWISE "X" SHALL BE 12"

32 01 17-D523 CONCRETE PAVEMENT TRENCH REPAIR-RESIDENTIAL STREETS
33 05 10-D003 CEMENT STABILIZED SAND (CSS) BACKFILL
33 05 10-D101 EMBEDMENT FOR WATER LINES 12-INCH AND SMALLER

D523
D003
D101

55

SCALE: N.T.S.

03/07/2024

STATE OF TEXAS
CARL T. DEZEE
87685
LICENSED
PROFESSIONAL ENGINEER
P.E.

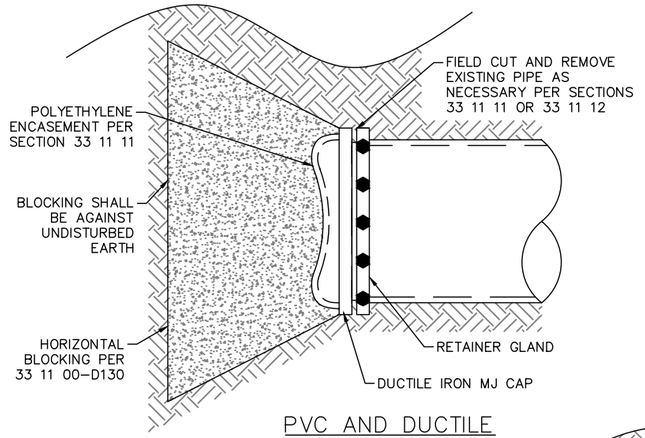
REV	BY	DESCRIPTION	DATE

Kimley»Horn
801 Cherry St, Unit 11, Suite 1300, Fort Worth, TX 76102 817-335-6511
TBPE No. F-928

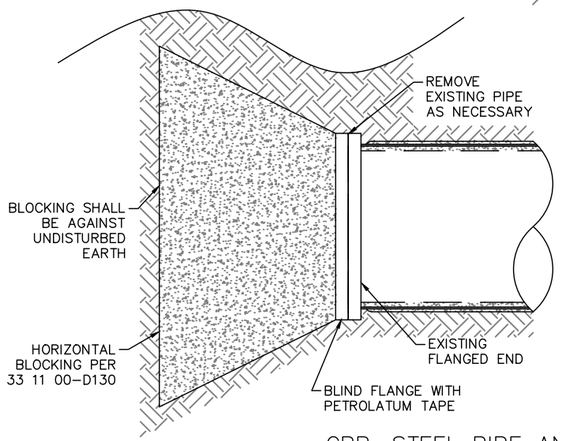
RIVERSIDE DR
WATERLINE RELOCATIONS

WATER DETAILS I

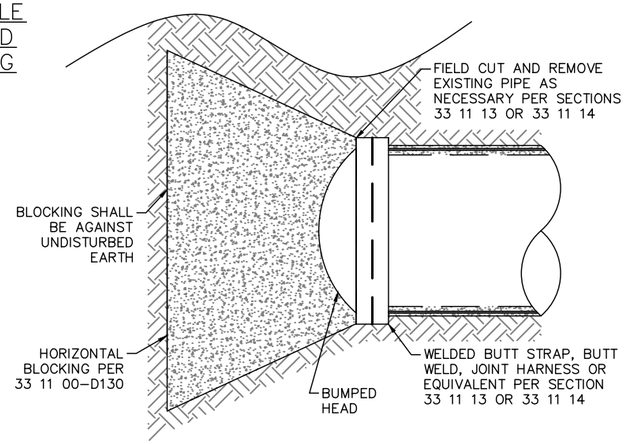
FED.RD. DIV.NO.	PROJECT NO.		HIGHWAY NO.
6	SEE TITLE SHEET		CS
STATE	DISTRICT	COUNTY	SHEET NO.
TEXAS	FTW	TARRANT	55
CONTROL	SECTION NO.	JOB	
0902	90	019, ETC.	



PVC AND DUCTILE IRON PLAIN END PRESSURE PLUG



CPP, STEEL PIPE AND DIP FLANGED END PRESSURE PLUG



CPP AND STEEL PLUG PLAIN END PRESSURE PLUG

NOTES:
1. ALL ABANDONMENT SHALL BE PER SECTION 02 41 14.
2. SURFACE REPAIR SHALL BE PER SECTIONS 32 01 17, 32 01 29 OR 32 14 16 DEPENDING ON EXISTING SURFACE AND AS DESIGNATED ON THE PLANS.
3. CAST–IN–PLACE CONCRETE SHALL BE PER SECTION 03 30 00.
4. ALLOW CONCRETE BLOCKING TO CURE FOR 24 HOURS PRIOR TO PRESSURIZING WATER LINE.

PVC, DUCTILE IRON, CONCRETE PRESSURE AND BURIED STEEL PIPE PRESSURE PLUGS

DETAIL 02 41 14-D123

1
56

SCALE: N.T.S.

REVISED: 08–31–2012

03/07/2024

STATE OF TEXAS
CARL T. DEZEE
87685
LICENSED
PROFESSIONAL ENGINEER
P.E.

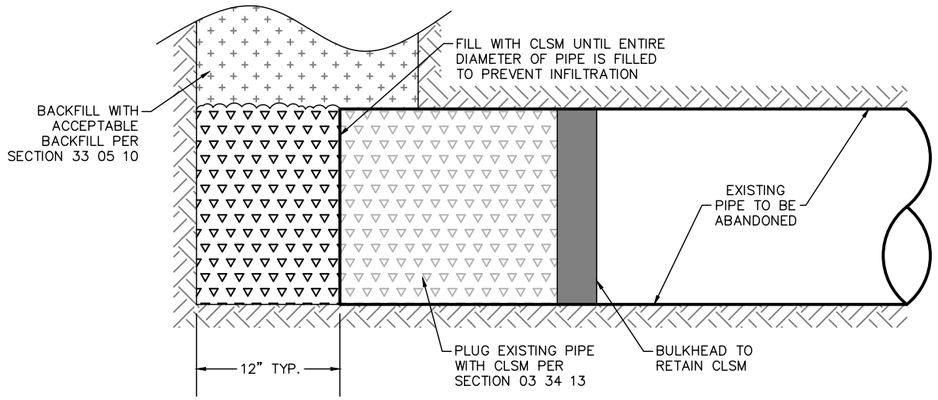
REV	BY	DESCRIPTION	DATE

Kimley»Horn
801 Cherry St, Unit 11, Suite 1300, Fort Worth, TX 76102 817-335-6511
TBPE No. F-928

RIVERSIDE DR
WATERLINE RELOCATIONS

WATER DETAILS II

FED.RD. DIV.NO.	PROJECT NO.		HIGHWAY NO.
6	SEE TITLE SHEET		CS
STATE	DISTRICT	COUNTY	SHEET NO.
TEXAS	FTW	TARRANT	56
CONTROL	SECTION NO.	JOB	
0902	90	019, ETC.	



NOTE:
1. ABANDONMENT SHALL BE PER SECTION 02 41 14
2. SURFACE REPAIR SHALL BE PER SECTIONS 32 01 17, 32 01 29 OR 32 14 16 DEPENDING ON EXISTING SURFACE
3. A WATER PRESSURE PLUG PER 02 41 14–D123 SHALL BE AN ACCEPTABLE ALTERNATIVE WHERE APPLICABLE.

PIPE ABANDONMENT PLUG

DETAIL 02 41 14-D007

1
57

SCALE: N.T.S.

REVISED: 08–31–2012

03/07/2024

STATE OF TEXAS
CARL T. DEZEE
87685
LICENSED
PROFESSIONAL ENGINEER
P.E.

REV	BY	DESCRIPTION	DATE

Kimley»Horn
801 Cherry St, Unit 11, Suite 1300, Fort Worth, TX 76102 817-335-6511
TBPE No. F-928

Texas Department of Transportation

RIVERSIDE DR
WATERLINE RELOCATIONS

WATER DETAILS III

FED.RD. DIV.NO.	PROJECT NO.		HIGHWAY NO.
6	SEE TITLE SHEET		CS
STATE	DISTRICT	COUNTY	SHEET NO.
TEXAS	FTW	TARRANT	57
CONTROL	SECTION NO.	JOB	
0902	90	019, ETC.	

MAP # 2054-400
MAP # 2054-404
MAP # 2060-404

0 75 150
SCALE: 1"=150'

CALLED 3.21 ACRES
1121 RIVERSIDE, LLC
INST. NO. D218195431
O.P.R.T.C.T.

BLOCK 1, LOT 7-R
ADAM HEIRS SUBDIVISION
CABINET A, SLIDE 877
P.R.T.C.T.

REMAINDER OF
TRACT 4
PATRICIA BOWEN FEATHERGILL,LLC
R.W.BOWEN, LLC
R.X.PAMELA B. ANDERSON, LLC
BOWEN TRAIL, LLC
INST. NO. D206189806
O.P.R.T.C.T.

CALLED 7.385 ACRES
TARRANT COUNTY WATER CONTROL AND
IMPROVEMENT DISTRICT NUMBER ONE
VOLUME 3800, PAGE 144
O.P.R.T.C.T.

WEST FORK TRINITY RIVER

STATE OF TEXAS

SURFACE REPAIR PLAN

SHEET 59

SHEET 59

RIVERSIDE DRIVE
(ASPHALT PAVING)
(VARIABLE WIDTH ROW)

INTERSTATE HIGHWAY 30
(ASPHALT PAVING)
(VARIABLE WIDTH ROW)

STATE OF TEXAS

I-30 WEST
OFF RAMP

BLOCK 1, LOT 2
B.E. WALLER ADDITION
INST. NO. D15772000
O.P.R.T.C.T

CALLED 0.57 ACRES
AIRGAS USA, LLC
INST.NO.D218087716
O.P.R.T.C.T.

SURFACE REPAIR PLAN

SOUTH SYLVANIA AVENUE
(ASPHALT PAVING)
(VARIABLE WIDTH ROW)

CALLED 2.81 ACRES
1428 S. RIVERSIDE, LLC
INST. NO. D221150971
O.P.R.T.C.T.

LOT 1, BLOCK 1
ED MAX ADDITION
VOLUME 388-150, PAGE 63
P.R.T.C.T.

CALLED 2.75 ACRES
TARRANT COUNTY WATER CONTROL
AND IMPROVEMENT DISTRICT
NUMBER ONE
VOLUME 2956, PAGE 88
D.R.T.C.T.

BLOCK 1, LOT 1A
B.E. WALLER ADDITION
INST. NO. D202039340
O.P.R.T.C.T

BLOCK 1,
LOT 3
B.E. WALLER
ADDITION
INST. NO.
D15772000
O.P.R.T.C.T

BAURLINE STREET
(ASPHALT PAVING)

03/07/2024

STATE OF TEXAS
CARL T. DEZEE
87685
LICENSED
PROFESSIONAL ENGINEER
P.E.

REV	BY	DESCRIPTION	DATE

Kimley»Horn
801 Cherry St, Unit 11, Suite 1300, Fort Worth, TX 76102 817-335-6811
TBPE No. F-928

Texas Department of Transportation

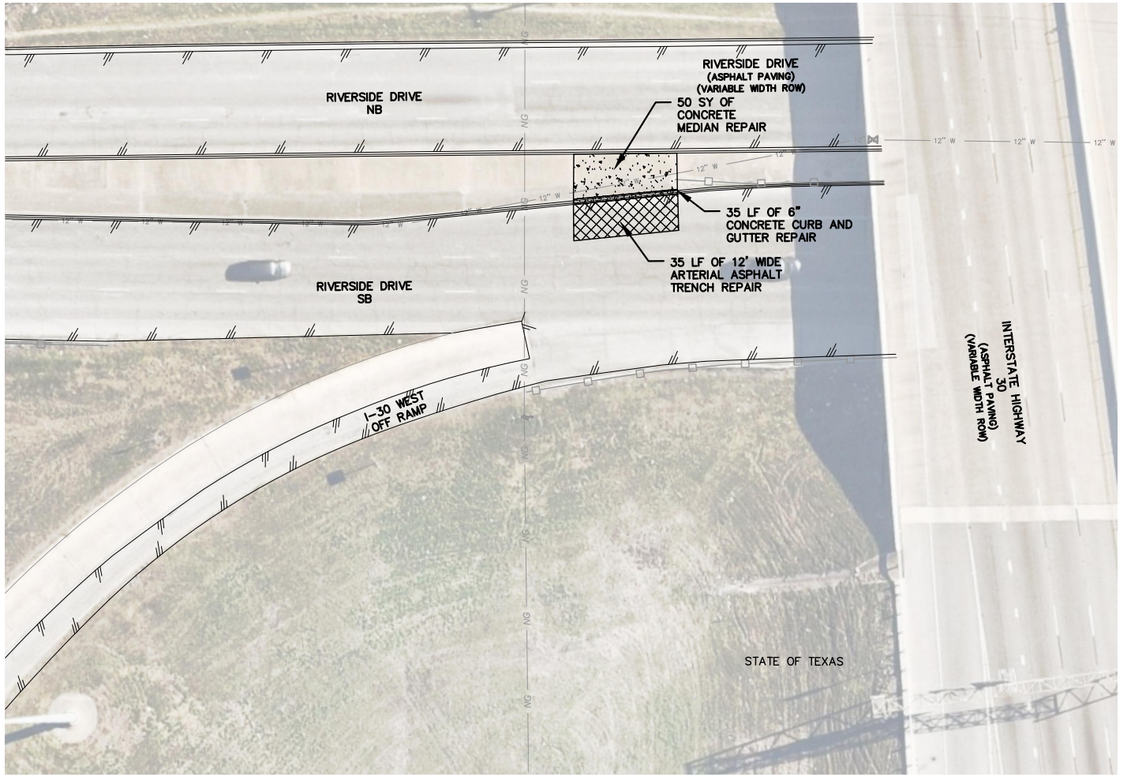
RIVERSIDE DR
WATERLINE RELOCATIONS

SURFACE REPAIR PLAN INDEX

FED.RD. DIV.NO.	PROJECT NO.		HIGHWAY NO.
6	SEE TITLE SHEET		CS
STATE	DISTRICT	COUNTY	SHEET NO.
TEXAS	FTW	TARRANT	58
CONTROL	SECTION NO.	JOB	
0902	90	019, ETC.	

MAP # 2054-400
MAP # 2054-404
MAP # 2060-404

0 25 50
SCALE: 1"=50'



MAP # 2054-400
MAP # 2054-404
MAP # 2060-404

0 25 50
SCALE: 1"=50'

LEGEND

- ARTERIAL ASPHALT TRENCH REPAIR
- CONCRETE PAVEMENT REPAIR
- 6" CONCRETE CURB AND GUTTER REPAIR

03/07/2024

STATE OF TEXAS
CARL T. DEZEE
87685
LICENSED
PROFESSIONAL ENGINEER
C. T. Dezee, P.E.

REV	BY	DESCRIPTION	DATE

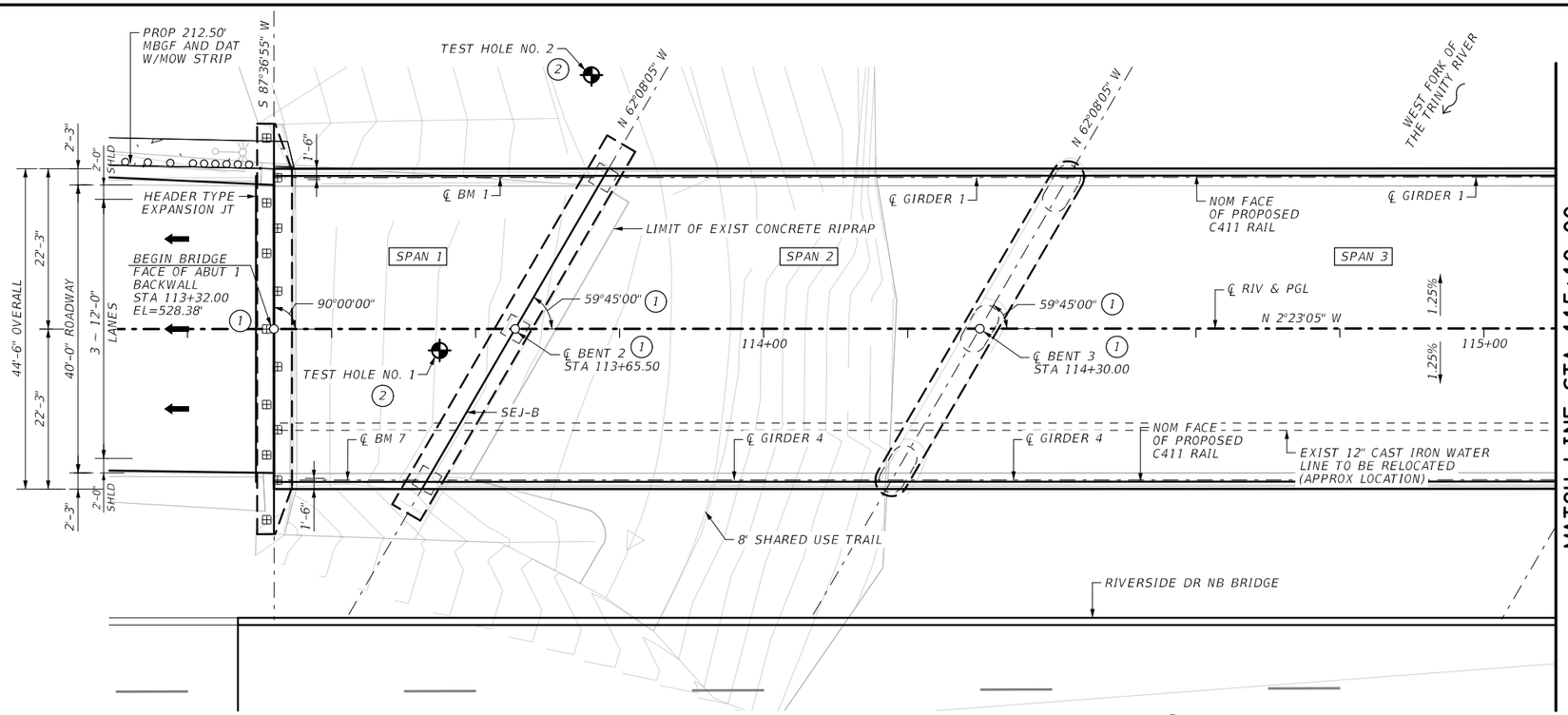
Kimley»Horn
801 Cherry St., Unit 11, Suite 1300, Fort Worth, TX 76102 817-335-6511
TBPE No. F-928

Texas Department of Transportation

RIVERSIDE DR
WATERLINE RELOCATIONS

SURFACE REPAIR PLAN

FED.RD. DIV.NO.	PROJECT NO.		HIGHWAY NO.
6	SEE TITLE SHEET		CS
STATE	DISTRICT	COUNTY	SHEET NO.
TEXAS	FTW	TARRANT	59
CONTROL	SECTION NO.	JOB	
0902	90	019, ETC.	



PLAN

1. DATA FROM EXISTING PLANS
2. TEST HOLES ARE NOT SHOWN IN TRUE LOCATIONS AND ARE BASED ON 1931 CORES
3. EXIST GROUND BASED ON AS-BUILT DATA

SCALE: 1"=20'

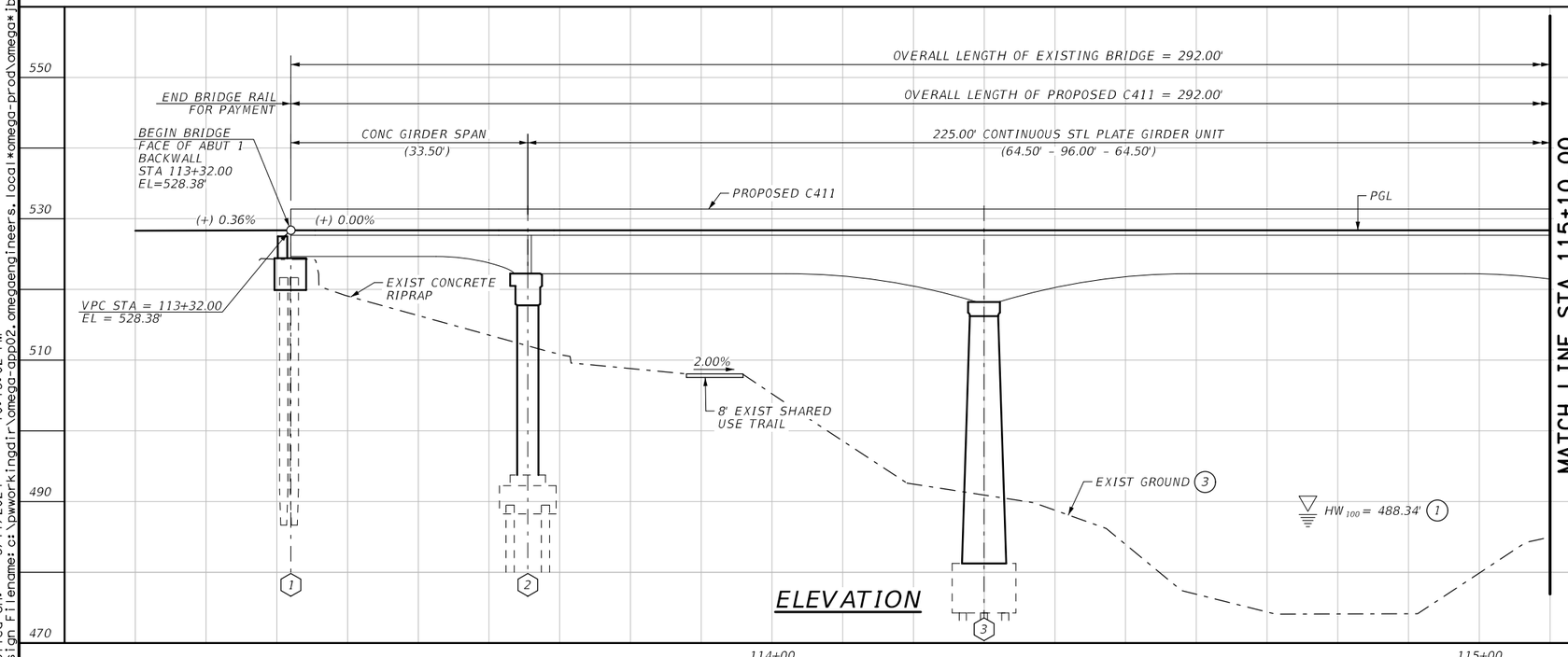
GENERAL NOTES:

1. DECK REPLACEMENT DESIGNED ACCORDING TO AASHTO LRFD BRIDGE DESIGN SPECIFICATIONS (9TH EDITION).
2. THE CONTRACTOR IS RESPONSIBLE FOR FIELD VERIFYING THE LOCATION OF ALL UTILITIES PRIOR TO ORDERING MATERIALS AND EXCAVATION.
3. PROFILE IS DRAWN FOR INFORMATION ONLY. CONTRACTOR IS RESPONSIBLE FOR CALCULATING ACTUAL PROFILE MEASUREMENTS BASED ON FIELD CONDITIONS.
4. THE CONTRACTOR SHALL FIELD VERIFY ALL EXISTING BRIDGE DIMENSIONS, ELEVATIONS, ABUTMENT AND BENT BEARINGS, AND BEAM LOCATIONS PRIOR TO BEGINNING CONSTRUCTION.
5. SUBMIT DEMOLITION PLAN PER ITEM 496 FOR EXISTING SLAB REMOVAL. ALLOW A MINIMUM OF FOUR WEEKS FOR THE REVIEW AND APPROVAL OF EACH SUBMITTAL.
6. CONTRACTOR TO PREVENT DEBRIS FROM FALLING INTO THE RIVER
7. BRIDGE STATIONING BASED OFF OF 1931 AS-BUILTS WITH A MODIFICATION TO MAKE STA 100+00.00 THE ALIGNMENT BEGINNING POINT.

REPAIR NOTES

1. REMOVE EXISTING DECK FOR SPANS 2 - 4 AND REPLACE WITH A NEW DECK. ADDITIONAL SHEAR STUDS WILL BE ADDED PRIOR TO CONSTRUCTION OF NEW DECK. SEE GIRDER STUD LAYOUT SHEET FOR DETAILS.
2. MILL THE ASPHALT OVERLAY TO THE DECK OF THE CONCRETE BEAM SPANS (SPANS 1 AND 5).
3. APPLY PENETRATING CONCRETE SURFACE TREATMENT ON THE DECK OF THE CONCRETE BEAM SPANS, ABUTMENTS, BENTS AND PIERS, EXTERIOR AND BOTTOM SURFACE OF CONCRETE BEAMS.
4. REPAIR ALL CRACKS AND SPALLS IN THE ABUTMENTS, BENTS, PIERS AND BEAMS. SEE SUPERSTRUCTURE REPAIR DETAILS, ABUTMENT REPAIR DETAILS, AND BENT REPAIR DETAILS FOR ADDITIONAL INFORMATION.
5. CLEAN AND PAINT TOP SURFACE OF THE STEEL BRACINGS UNDER THE DECK IN THE STEEL BEAM SPANS, SEE SUPERSTRUCTURE REPAIR DETAILS.
6. RETROFIT EXIST RAILS ON CONCRETE SPANS, SEE RAIL RETROFIT SHEET FOR DETAILS.
7. INSTALL HEADER TYPE JOINT AT ABUTMENTS 1 & 6.

EXISTING NBI NUMBER: 02-220-0-ZR50-50-001
FUNCTION CLASSIFICATION: URBAN MAJOR COLLECTOR
DESIGN SPEED: 35 MPH
EXISTING ADT: 21,344 (2019)
FUTURE ADT: 32,016 (2042)



ELEVATION

GODWIN A. ARTHUR
127720
LICENSED
PROFESSIONAL ENGINEER
STATE OF TEXAS
03/11/2024

REV	BY	DESCRIPTION	DATE

OMEGA ENGINEERS, INC.
8200 N. MOPAC EXPRESSWAY, STE #280
AUSTIN, TEXAS 78759
OMEGAENGINEERS.COM
TX PE Firm Reg. No. F-2147
P:512 575 2288 F:281 647 9184

Texas Department of Transportation

RIVERSIDE DR SB

BRIDGE LAYOUT

SHEET 1 OF 2

FED. RD. DIV. NO.	PROJECT NO.		HIGHWAY NO.
6	SEE TITLE SHEET		CS
STATE	DISTRICT	COUNTY	SHEET NO.
TEXAS	FTW	TARRANT	60
CONTROL	SECTION NO.	JOB	
0902	90	019, ETC.	

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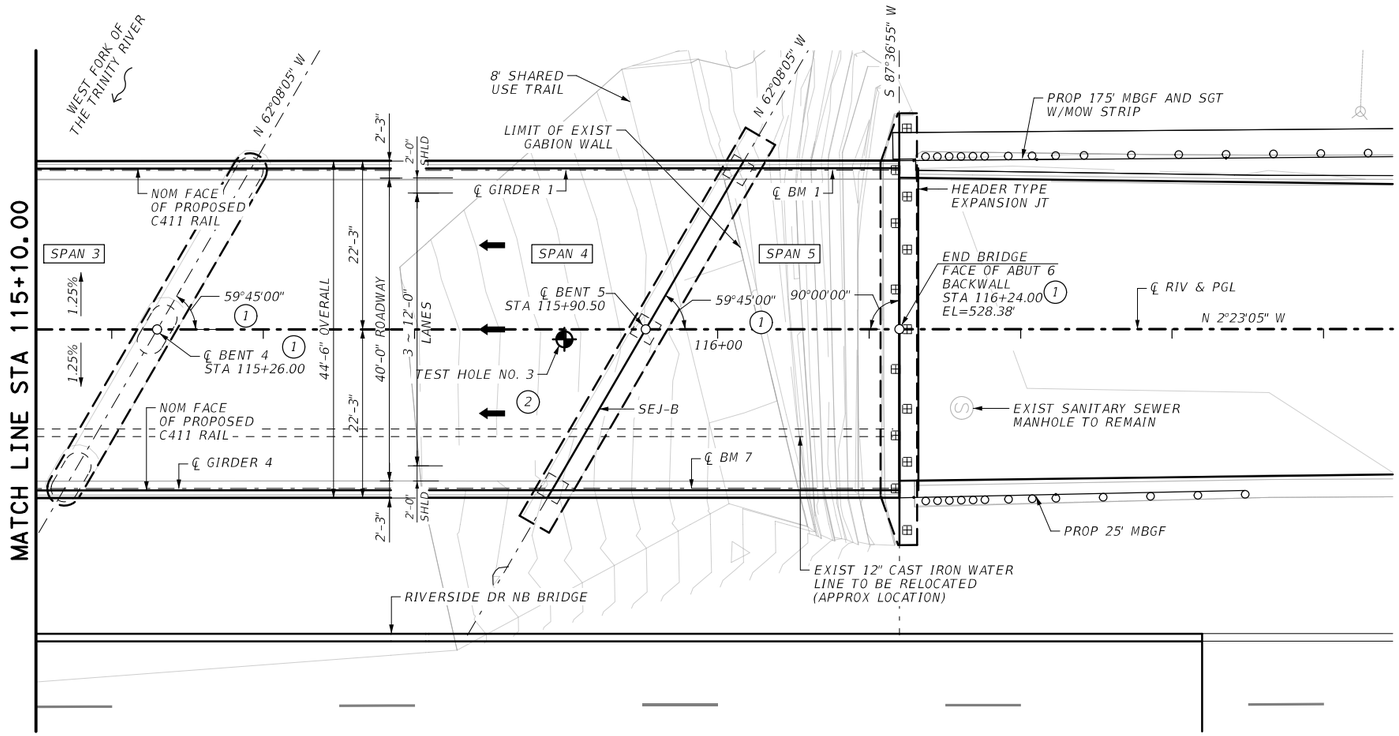
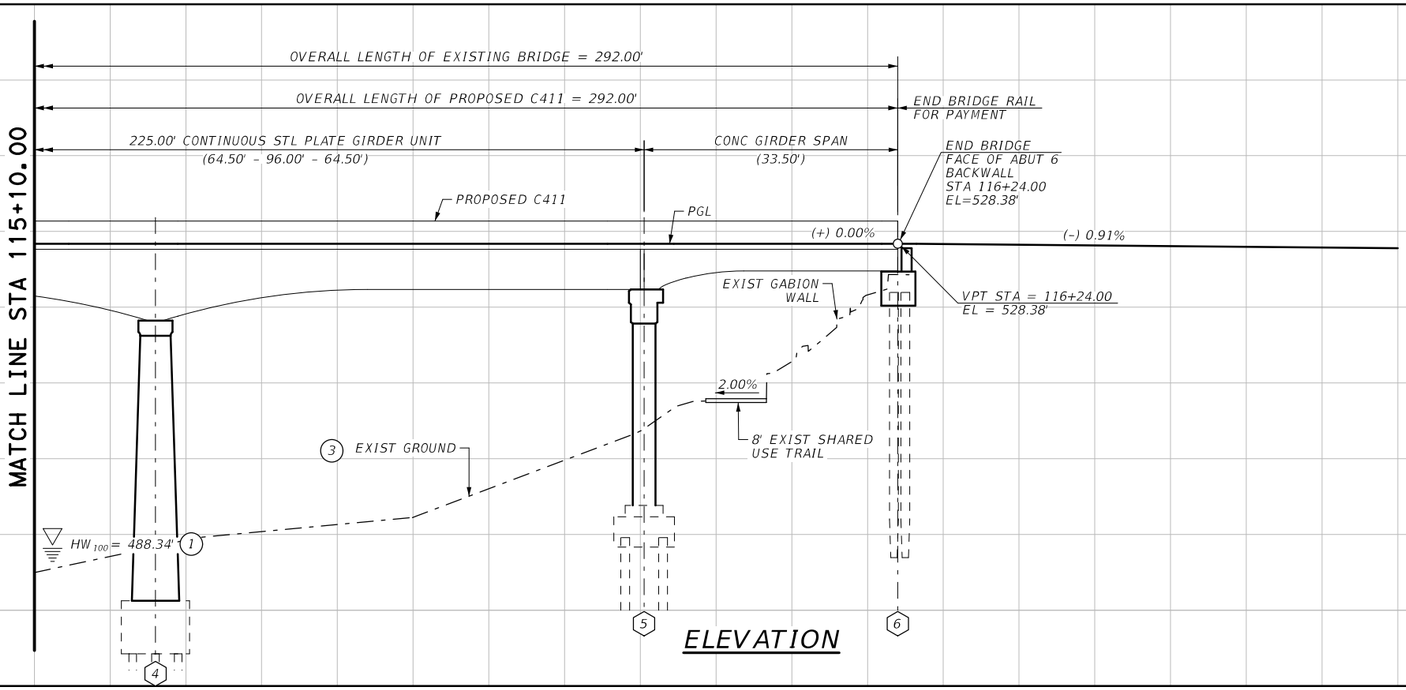


PLAN



ELEVATION

0 10 20
SCALE: 1"=20'

1 DATA FROM EXISTING PLANS

2 TEST HOLES ARE NOT SHOWN IN TRUE LOCATIONS AND ARE BASED ON 1931 CORES

3 EXIST GROUND BASED ON AS-BUILT DATA

STATE OF TEXAS
GODWIN A. ARTHUR
127720
LICENSED
PROFESSIONAL ENGINEER
03/11/2024

REV	BY	DESCRIPTION	DATE

OMEGA ENGINEERS, INC.
8200 N. MOPAC EXPRESSWAY, STE #280
AUSTIN, TEXAS 78759
OMEGAENGINEERS.COM
TX PE Firm Reg. No. F-2147
P:512 575 2288 F:281 647 9184

Texas Department of Transportation

RIVERSIDE DR SB

BRIDGE LAYOUT

SHEET 2 OF 2

FED.RD. DIV.NO.	PROJECT NO.		HIGHWAY NO.
6	SEE TITLE SHEET		CS
STATE	DISTRICT	COUNTY	SHEET NO.
TEXAS	FTW	TARRANT	61
CONTROL	SECTION NO.	JOB	
0902	90	019, ETC.	

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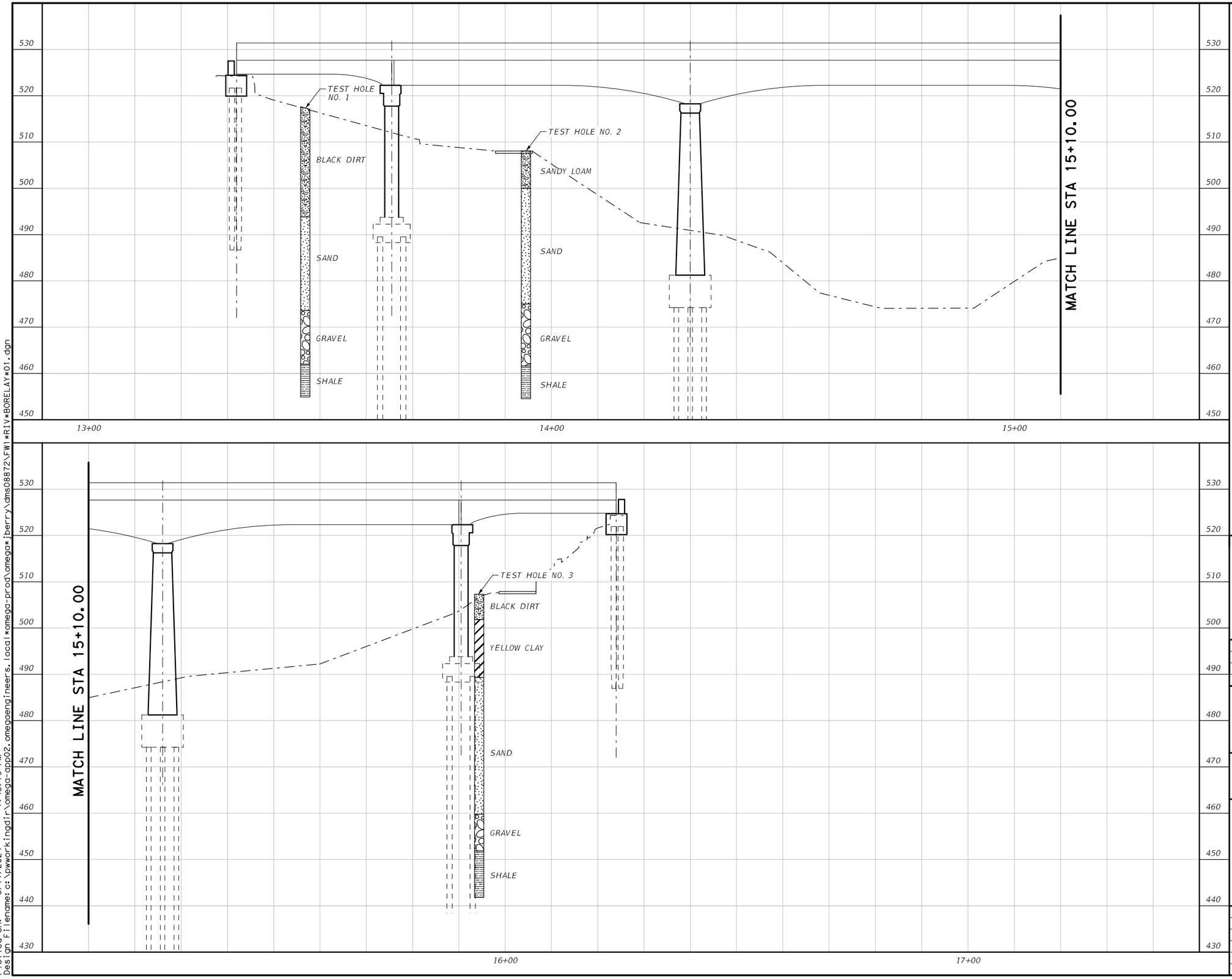

GENERAL NOTES:

1. EXIST GROUND AND BOREHOLE SOIL INFORMATION BASED ON PROPOSED BRIDGE OVER TRINITY RIVER ON FREY AVENUE EXT (CSJ 0902-48-922), 1931 AS-BUILTS.

STATE OF TEXAS
GODWIN A. ARTHUR
127720
LICENSED
PROFESSIONAL ENGINEER
03/11/2024

REV	BY	DESCRIPTION	DATE

OMEGA ENGINEERS, INC.
8200 N. MOPAC EXPRESSWAY, STE #280
AUSTIN, TEXAS 78759
OMEGAENGINEERS.COM
TX PE Firm Reg. No. F-2147
P:512 575 2288 F:281 647 9184

Texas Department of Transportation

RIVERSIDE DR SB

BRIDGE LAYOUT
SOIL DATA

FED. RD. DIV. NO.	PROJECT NO.		HIGHWAY NO.
6	SEE TITLE SHEET		CS
STATE	DISTRICT	COUNTY	SHEET NO.
TEXAS	FTW	TARRANT	62
CONTROL	SECTION NO.	JOB	
0902	90	019, ETC.	

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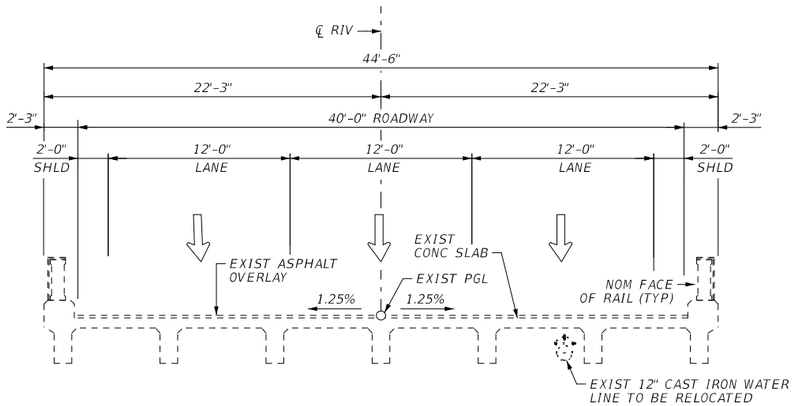
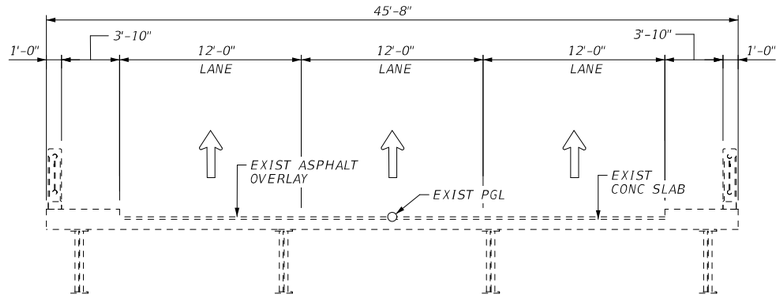
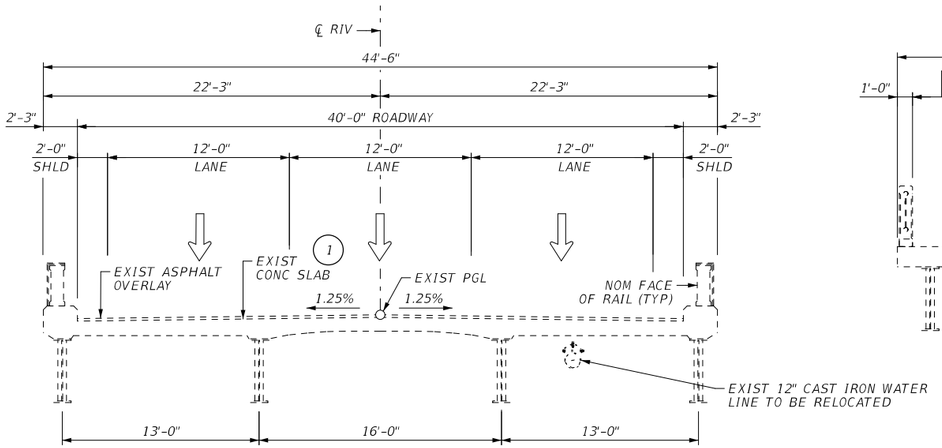


(SPANS 1 AND 5)
SB RIVERSIDE

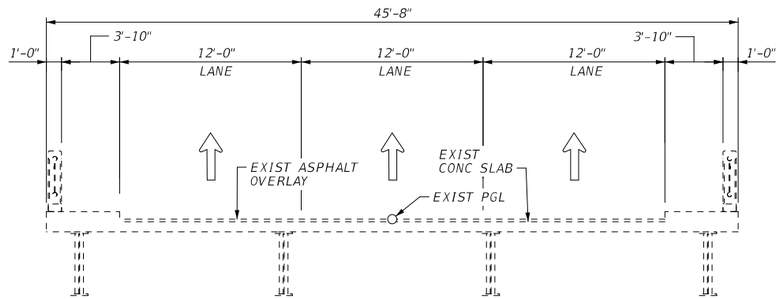


(SPANS 1 – 3)
NB RIVERSIDE

EXISTING TYPICAL SECTION



(SPANS 2 – 4)
SB RIVERSIDE



(SPANS 1 – 3)
NB RIVERSIDE

EXISTING TYPICAL SECTION

GENERAL NOTES:

1. *REFER TO TRAFFIC CONTROL PLANS FOR COMPLETE TRAFFIC CONTROL PHASING DESCRIPTION AND DETAILS.*
2. *EXTENSIVE HORIZONTAL AND VERTICAL SAW CUTTING WILL BE REQUIRED DURING DEMOLITION OPERATION.*

(1) *VARIES FROM 11" – 17" BASED ON AS-BUILT PLANS*

STATE OF TEXAS
GODWIN A. ARTHUR
127720
LICENSED
PROFESSIONAL ENGINEER
03/11/2024

REV	BY	DESCRIPTION	DATE

OMEGA ENGINEERS, INC.
8200 N. MOPAC EXPRESSWAY, STE #280
AUSTIN, TEXAS 78759
OMEGAENGINEERS.COM
TX PE Firm Reg. No. F-2147
P:512 575 2288 F:281 647 9184

RIVERSIDE DR SB

BRIDGE TYPICAL SECTION

SHEET 1 OF 3

FED. RD. DIV. NO.	PROJECT NO.		HIGHWAY NO.
6	SEE TITLE SHEET		CS
STATE	DISTRICT	COUNTY	SHEET NO.
TEXAS	FTW	TARRANT	63
CONTROL	SECTION NO.	JOB	
0902	90	019, ETC.	

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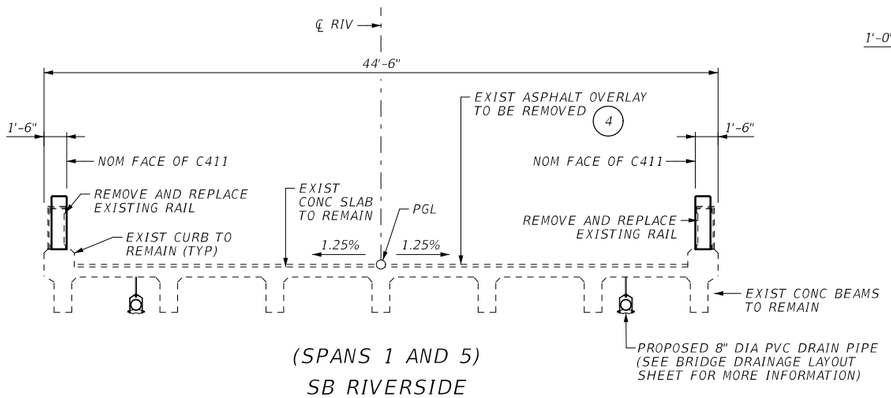
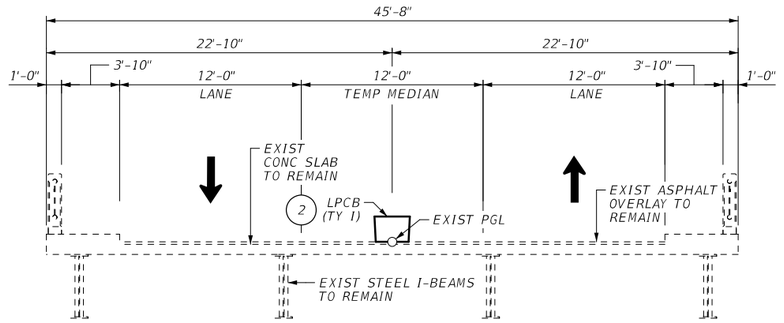
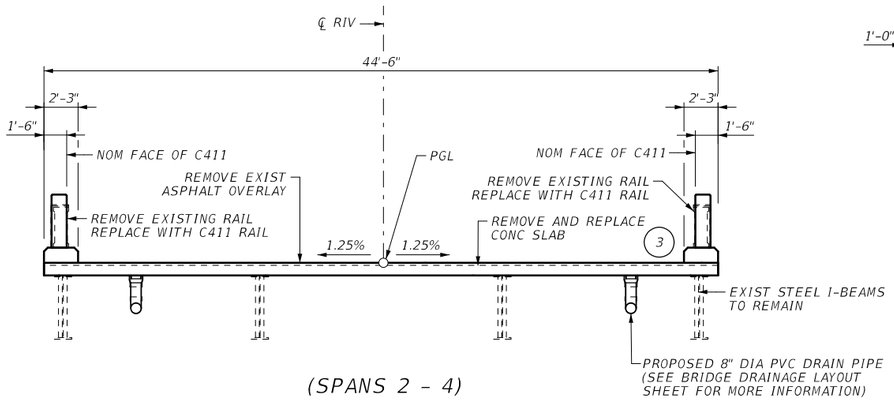


(SPANS 1 AND 5)
SB RIVERSIDE

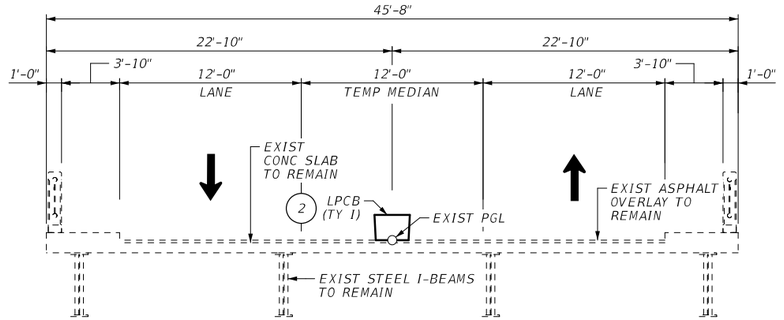


(SPANS 1 - 3)
NB RIVERSIDE

PHASE 1 TYPICAL SECTION



(SPANS 2 - 4)
SB RIVERSIDE



(SPANS 1 - 3)
NB RIVERSIDE

PHASE 1 TYPICAL SECTION

(2) UNPINNED LOW PROFILE CONCRETE BARRIER. SEE TRAFFIC CONTROL PLANS FOR CSB LAYOUT AND QUANTITIES.

(3) THE EXISTING DECK SHALL BE REMOVED IN ACCORDANCE WITH ITEM 496. CONTRACTOR SHALL TAKE MEASURES TO AVOID DAMAGE TO EXISTING BEAMS, COVER PLATES AND DIAPHRAGMS WHILE REMOVING THE EXISTING DECK.

(4) APPLY PENETRATING CONCRETE SURFACE TREATMENT. SEE REPAIR NOTES ON BRIDGE LAYOUT SHEET 1 FOR DETAILS.

STATE OF TEXAS
GODWIN A. ARTHUR
127720
LICENSED
PROFESSIONAL ENGINEER
03/11/2024

REV	BY	DESCRIPTION	DATE

OMEGA ENGINEERS, INC.
8200 N. MOPAC EXPRESSWAY, STE #280
AUSTIN, TEXAS 78759
OMEGAENGINEERS.COM
TX PE Firm Reg. No. F-2147
P:512 575 2288 F:281 647 9184

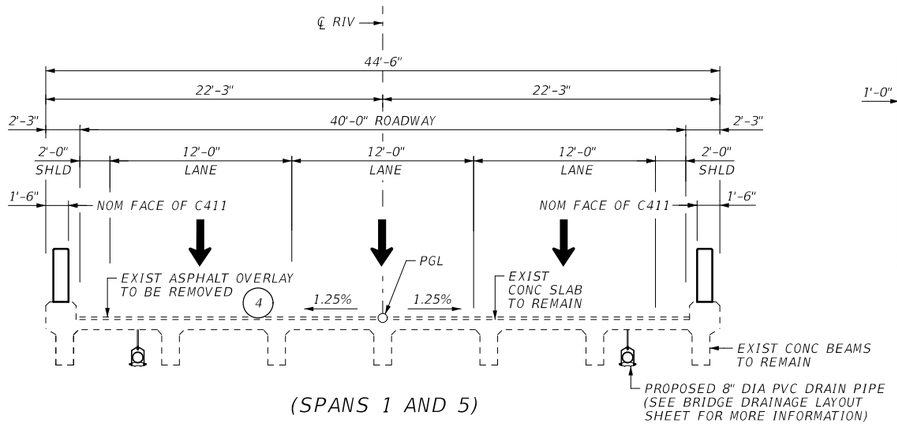
Texas Department of Transportation

RIVERSIDE DR SB

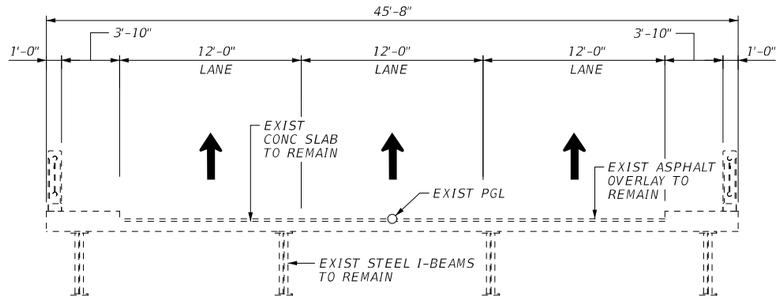
BRIDGE TYPICAL SECTION

SHEET 2 OF 3

FED. RD. DIV. NO.	PROJECT NO.		HIGHWAY NO.
6	SEE TITLE SHEET		CS
STATE	DISTRICT	COUNTY	SHEET NO.
TEXAS	FTW	TARRANT	64
CONTROL	SECTION NO.	JOB	
0902	90	019, ETC.	

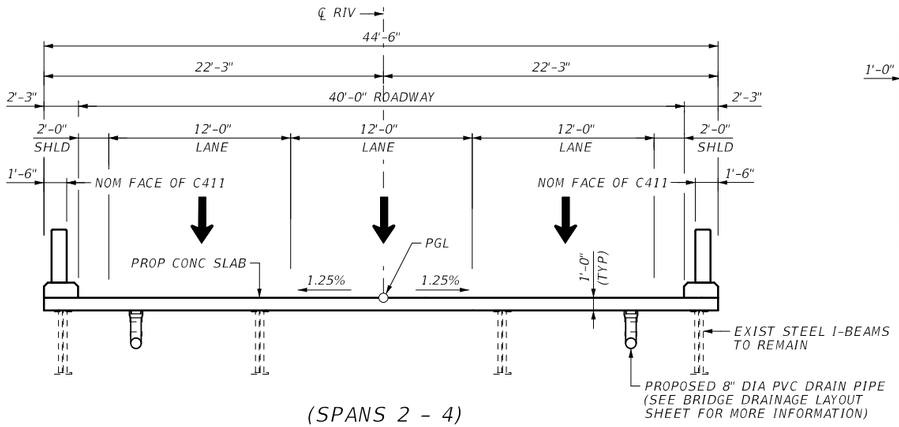


(SPANS 1 AND 5)
SB RIVERSIDE

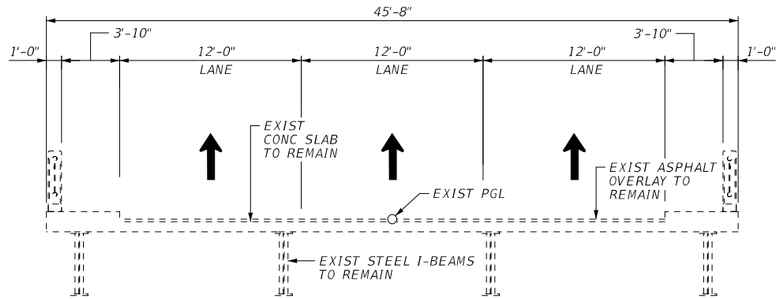


(SPANS 1 - 3)
NB RIVERSIDE

FINAL TYPICAL SECTION



(SPANS 2 - 4)
SB RIVERSIDE



(SPANS 1 - 3)
NB RIVERSIDE

FINAL TYPICAL SECTION

(4) APPLY PENETRATING CONCRETE SURFACE TREATMENT. SEE REPAIR NOTES ON BRIDGE LAYOUT SHEET 1 FOR DETAILS.

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LICENSED PROFESSIONAL ENGINEER
STATE OF TEXAS
03/11/2024

OMEGA ENGINEERS, INC.
8200 N. MOPAC EXPRESSWAY, STE #280
AUSTIN, TEXAS 78759
OMEGAENGINEERS.COM
TX PE Firm Reg. No. F-2147
P:512 575 2288 F:281 647 9184

REV	BY	DESCRIPTION	DATE

Texas Department of Transportation

RIVERSIDE DR SB

BRIDGE TYPICAL SECTION

SHEET 3 OF 3

FED. RD. DIV. NO.	PROJECT NO.		HIGHWAY NO.
6	SEE TITLE SHEET		CS
STATE	DISTRICT	COUNTY	SHEET NO.
TEXAS	FTW	TARRANT	65
CONTROL	SECTION NO.	JOB	
0902	90	019, ETC.	

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SUMMARY OF ESTIMATED BRIDGE QUANTITIES

BID CODES	0104 6009	0110 6003	0132 6007	0422 6002	0428 6001	0429 6007	0432 6002	0442 6010	0446 6002	0450 6036	0451 6037	0454 6007	0454 6020	0479 6002	0481 6014
BRIDGE ELEMENT / BID ITEM DESCRIPTION	REMOVING CONC (RIPRAP)	EXCAVATION (SPECIAL)	EMBANKMENT (FINAL)(ORD COMP)(TY D)	REINF CONC SLAB (HPC)	PENETRATING CONCRETE SURFACE TREATMENT	CONC STR REPAIR (VERTICAL & OVERHEAD) (1)	RIPRAP (CONC)(5 IN)	STR STEEL (SHEAR CONNECTOR)	CLEAN & PAINT EXIST STR (SYSTEM II)	RAIL (TY C411)	RETROFIT RAIL (TY C411)	HEADER TYPE EXPANSION JOINT	SEALED EXPANSION JOINT (4 IN) (SEJ - B)	ADJUSTING INLETS	PIPE (PVC) (SCH 40) (8 IN)
	SY	CY	CY	SF	SY	SF	CY	LB	LS	LF	LF	LF	LF	EA	LF
2 - ABUTMENTS	22	30	15		110	2	3								
4 - INTERIOR BENTS					1,126	222							102		
2 - CONC GIRDER SPANS					732	130					134	90		1	80
1 - CONTINUOUS STL PLATE GIRDER UNIT				10,102				4,689	1	450					520
TOTAL	22	30	15	10,102	1,968	354	3	4,689	1	450	134	90	102	1	600

SUMMARY OF ESTIMATED BRIDGE QUANTITIES

BID CODES	0481 6016	0496 6013	0529 6036	0780 6002
BRIDGE ELEMENT / BID ITEM DESCRIPTION	PIPE (PVC) (SCH 40) (12 IN)	REMOV STR (BRIDGE SLAB)	CONCRETE CURB (SPECIAL)	CNC CRACK REPAIR (DISCRETE)(INJECT) (1)
	LF	EA	LF	LF
2 - ABUTMENTS				84
4 - INTERIOR BENTS				46
2 - CONC GIRDER SPANS	200			43
1 - CONTINUOUS STL PLATE GIRDER UNIT		1	450	
TOTAL	200	1	450	173

(1) QUANTITIES SHOWN ARE BEST ESTIMATES BASED UPON CONDITION SURVEY DATA. ACTUAL REPAIR QUANTITY MAY INCREASE OR DECREASE ONCE DAMAGED CONCRETE IS REMOVED.

STATE OF TEXAS
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03/11/2024

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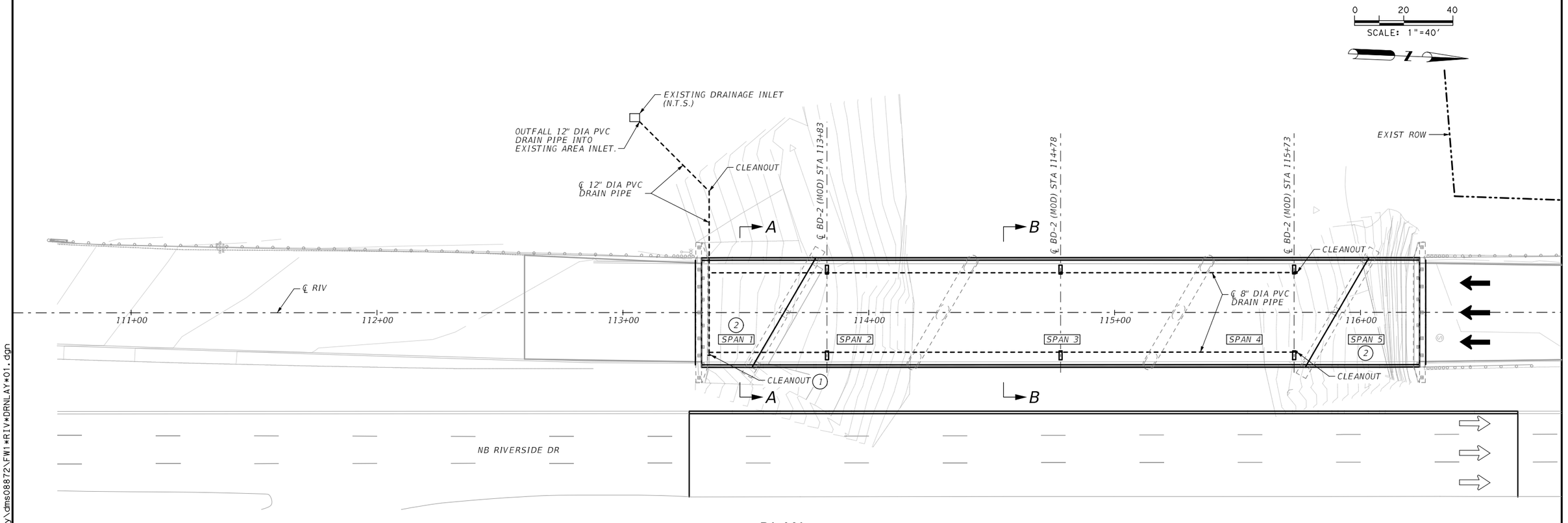
ESTIMATED QUANTITIES

FED. RD. DIV. NO.	PROJECT NO.		HIGHWAY NO.
6	SEE TITLE SHEET		CS
STATE	DISTRICT	COUNTY	SHEET NO.
TEXAS	FTW	TARRANT	66
CONTROL	SECTION NO.	JOB	
0902	90	019, ETC.	



PLAN

1. CLEANOUT LOCATED AT THE END OF THE 12" DIA PVC DRAIN PIPE UNDER SPAN 1 SHALL BE MOUNTED TO THE ABUTMENT CAP ABOVE THE RIPRAP AND SLOPE TO DRAIN. PROVIDE A TAMPER-PROOF COVER.
2. CLOSE EXIST BRIDGE DRAINS IN SPAN 1 AND 5. PAYMENT WILL BE SUBSIDIARY TO THE INSTALLATION OF NEW BRIDGE DRAINAGE

GENERAL NOTES:

1. CONTRACTOR SHALL SUBMIT SHOP DRAWINGS FOR PIPE HANGER SPACING FOR ENGINEER'S APPROVAL.
2. CONTRACTOR SHALL SUBMIT CALCULATIONS AND SHOP DRAWINGS OF HANGER ROD CONNECTIONS TO EXISTING BRIDGE DECK IN SPANS 1 & 5 FOR ENGINEER'S APPROVAL.
3. LOCATE ADJUSTABLE HANGERS 2'-0" (MIN), 4'-0" (MAX) FROM DECK EXPANSION JOINTS. EQUALLY SPACE HANGERS ON EITHER SIDE OF PIPE EXPANSION COUPLERS.
4. ALL PRODUCTS SHALL BE INSTALLED PER MANUFACTURER'S RECOMMENDATIONS.
5. SEE BRIDGE DRAINAGE DETAILS BD-2 (MOD) FOR DETAILS NOT SHOWN.

MATERIAL NOTES:

1. ALL STEEL ASSEMBLIES INCLUDING THREADED HANGER RODS, NUTS, AND WASHERS, SHALL BE HOT-DIP GALVANIZED IN ACCORDANCE WITH TXDOT SPECIFICATION ITEM 445.
2. PROVIDE ASTM A36 THREADED HANGER RODS WITH HEAVY HEX NUTS AND WASHERS INSTALLED SNUG TIGHT.
3. PROVIDE SCHEDULE 40 DWV PVC PIPE CONFORMING TO ASTM D2665. MINIMUM WALL THICKNESS: 0.322" ~ 8" DIA. USE FITTINGS AS DIRECTED BY THE ENGINEER. ATTACH PIPE SECURELY TO SUPERSTRUCTURE. SLOPE DRAIN PIPE TO MATCH ROADWAY GRADE, A MIN SLOPE OF 0.3%, OR AS DIRECTED BY THE ENGINEER.

STATE OF TEXAS
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Texas Department of Transportation

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BRIDGE DRAINAGE LAYOUT

FED.RD. DIV.NO.	PROJECT NO.		HIGHWAY NO.
6	SEE TITLE SHEET		CS
STATE	DISTRICT	COUNTY	SHEET NO.
TEXAS	FTW	TARRANT	67
CONTROL	SECTION NO.	JOB	
0902	90	019, ETC.	

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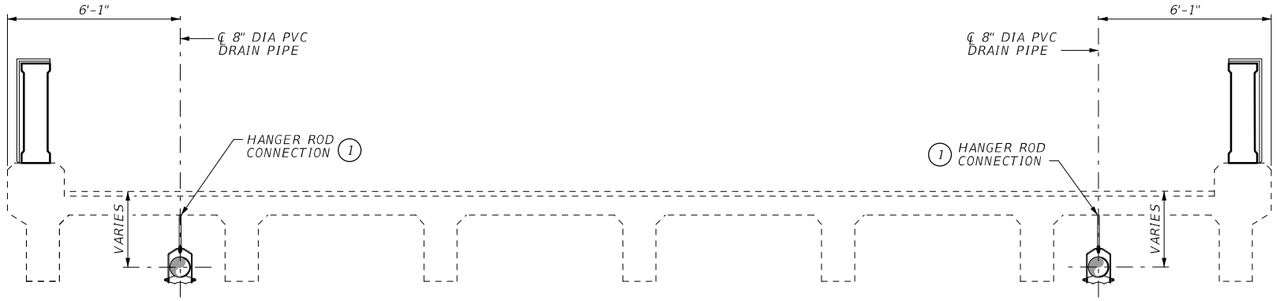
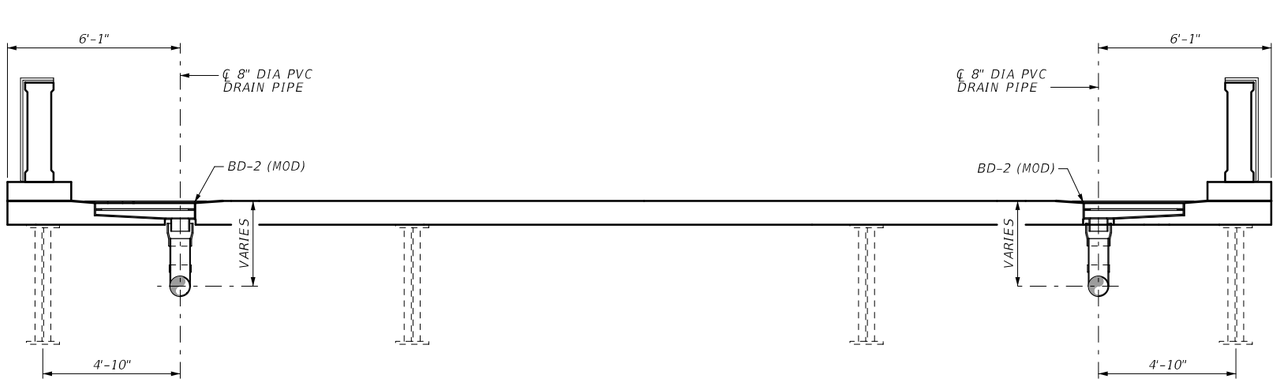
NOTES:

1. SEE BRIDGE DRAINAGE LAYOUT FOR LOCATION/SPACING OF BD-2 (MOD) DECK DRAINS.
2. SEE BD-2 (MOD) STANDARD FOR DECK DRAIN DETAILS NOT SHOWN.
3. ANY ADDITIONAL SLAB REINFORCING AROUND THE DECK DRAINS IS CONSIDERED SUBSIDIARY TO "REINFORCED CONCRETE SLAB".

(1) SEE BD-MOD(2) FOR DETAILS



SECTION A-A (SPAN 1)



SECTION B-B (SPANS 2 - 4)

GODWIN A. ARTHUR
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STATE OF TEXAS
03/11/2024

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BRIDGE DRAINAGE DETAILS

SHEET 1 OF 3

FED. RD. DIV. NO.	PROJECT NO.		HIGHWAY NO.
6	SEE TITLE SHEET		CS
STATE	DISTRICT	COUNTY	SHEET NO.
TEXAS	FTW	TARRANT	68
CONTROL	SECTION NO.	JOB	
0902	90	019, ETC.	

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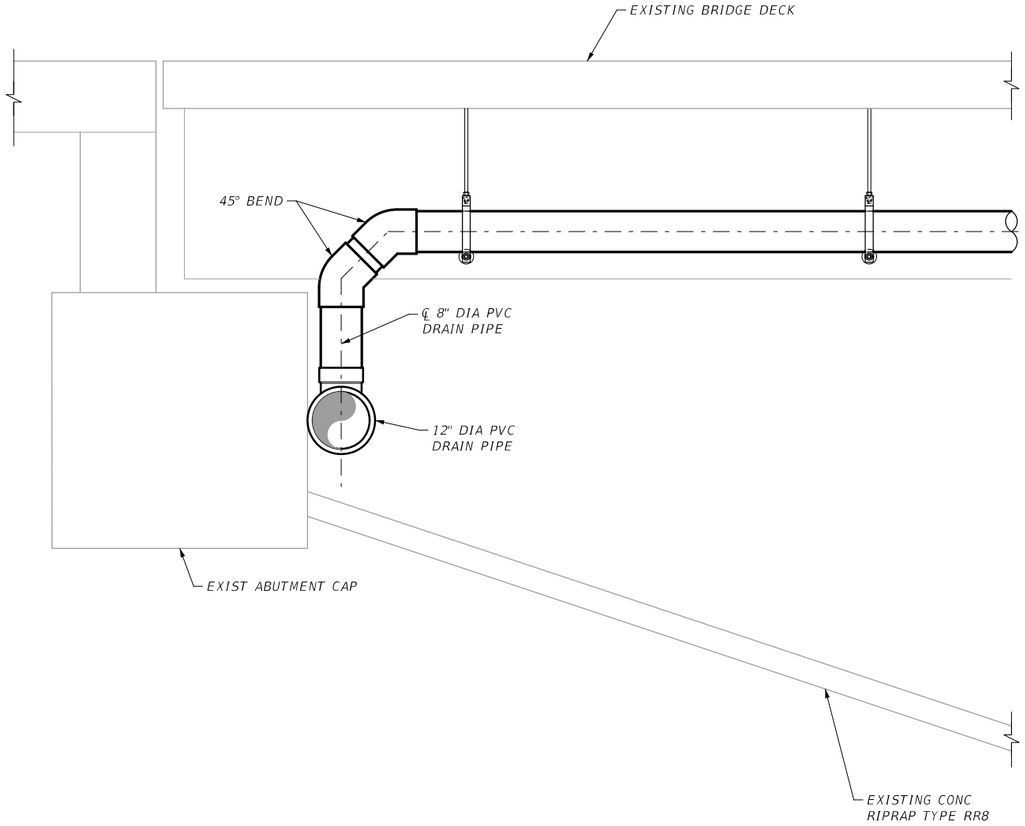
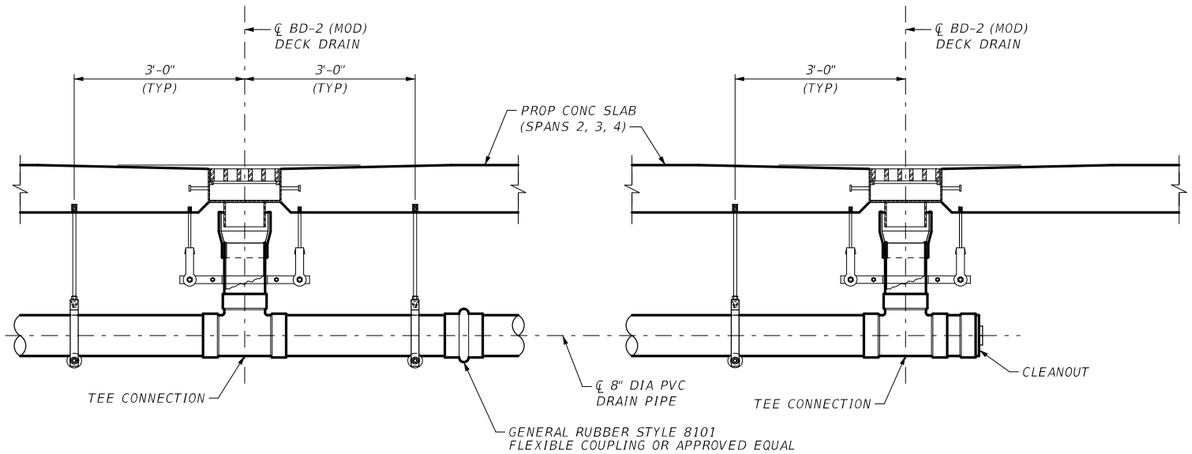


SPAN 1



SPANS 2 & 3

SPAN 4

NOTES:

1. SEE BRIDGE DRAINAGE LAYOUT FOR LOCATION/SPACING OF BD-2 (MOD) DECK DRAINS.
2. SEE BD-2 (MOD) STANDARD FOR DECK DRAIN DETAILS NOT SHOWN.
3. PROVIDE GENERAL RUBBER STYLE 8101 FLEXIBLE COUPLING OR APPROVED EQUAL AS NEEDED TO ACCOMODATE LONGITUDINAL MOVEMENTS OF THE DRAIN PIPE AND BRIDGE SLAB.

STATE OF TEXAS
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BRIDGE DRAINAGE DETAILS

SHEET 2 OF 3

FED. RD. DIV. NO.	PROJECT NO.		HIGHWAY NO.
6	SEE TITLE SHEET		CS
STATE	DISTRICT	COUNTY	SHEET NO.
TEXAS	FTW	TARRANT	69
CONTROL	SECTION NO.	JOB	
0902	90	019, ETC.	

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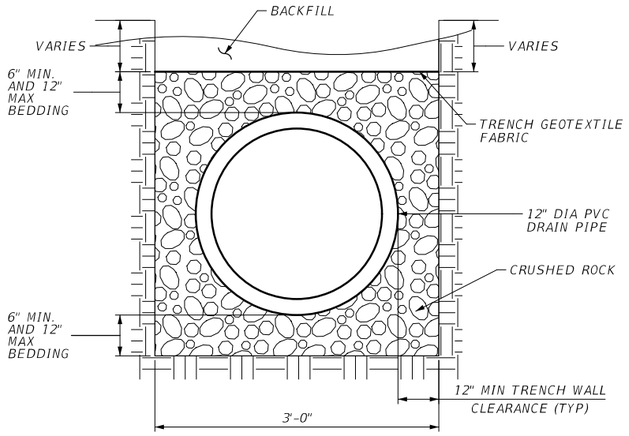
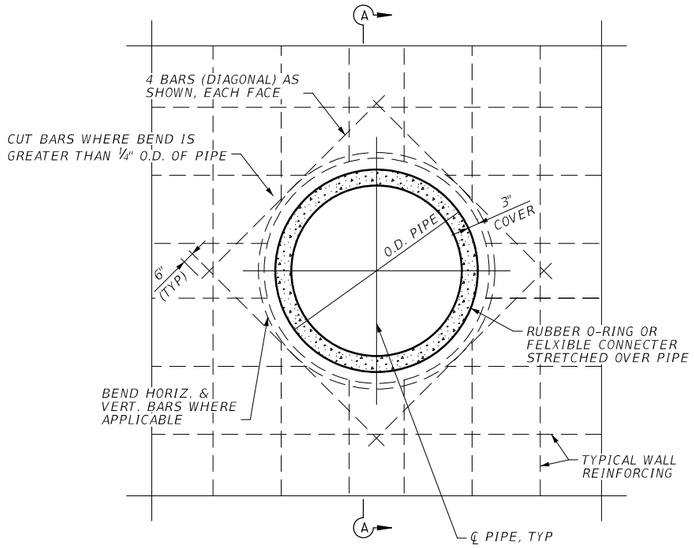


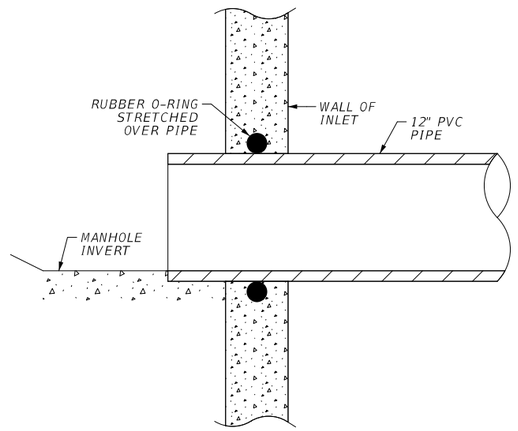
PIPE EMBEDMENT



TYPICAL ELEVATION

NOTES:

1. MATERIAL AND WORKMANSHIP SHALL CONFORM WITH THE REQUIREMENTS OF CITY OF FORT WORTH STANDARD SPECIFICATION 33 49 10, CAST-IN-PLACE STORM DRAIN MANHOLES AND JUNCTION BOXES.
2. ALL REINFORCING STEEL SHALL BE GRADE 60.
3. DIAGONAL BAR SIZE SHALL MATCH THE LARGER SIZE OF HORIZONTAL OR VERTICAL WALL REINFORCING.



SECTION A-A

STATE OF TEXAS
GODWIN A. ARTHUR
127720
LICENSED
PROFESSIONAL ENGINEER
03/11/2024

REV	BY	DESCRIPTION	DATE

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RIVERSIDE DR SB

BRIDGE DRAINAGE DETAILS

SHEET 3 OF 3

FED. RD. DIV. NO.	PROJECT NO.		HIGHWAY NO.
6	SEE TITLE SHEET		CS
STATE	DISTRICT	COUNTY	SHEET NO.
TEXAS	FTW	TARRANT	70
CONTROL	SECTION NO.	JOB	
0902	90	019, ETC.	

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DATE:
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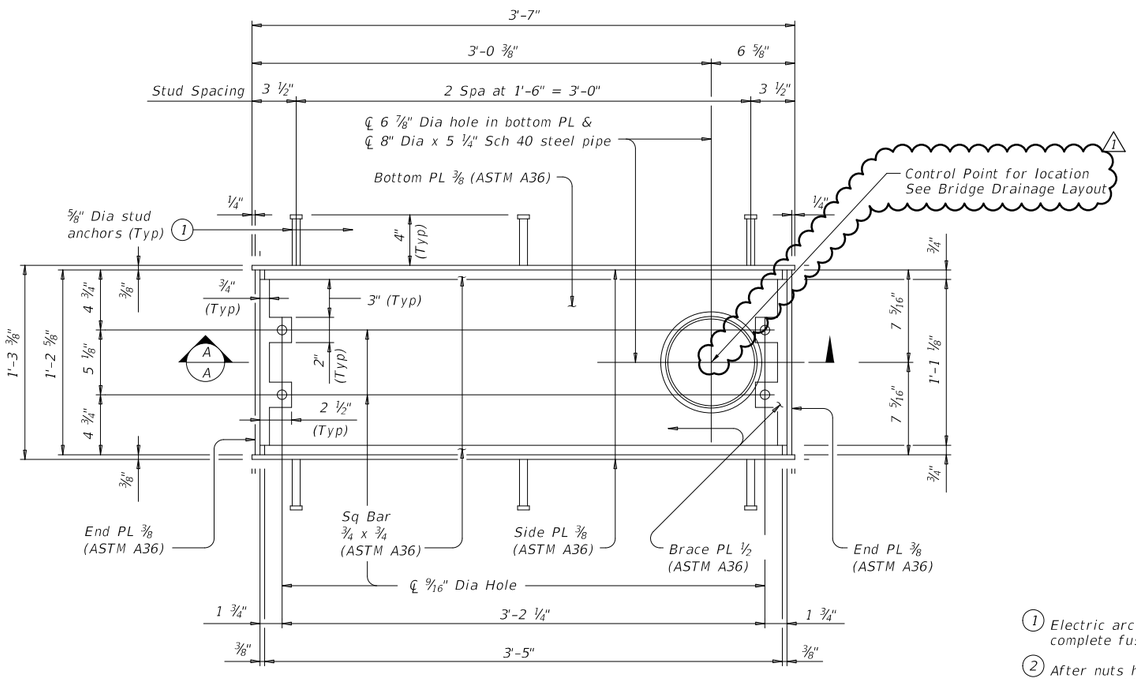
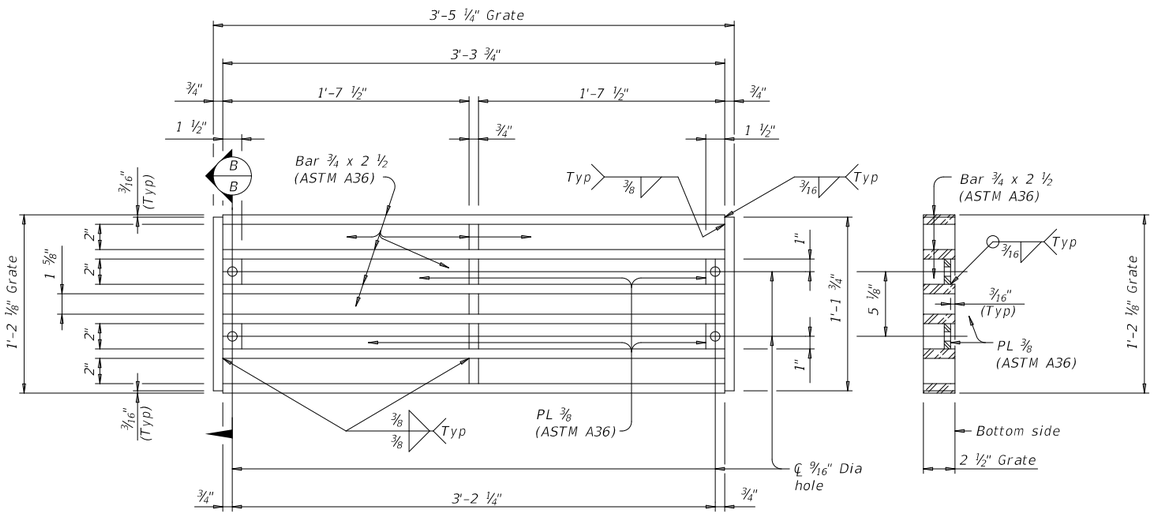


PLAN

(Grate not shown for clarity)



PLAN

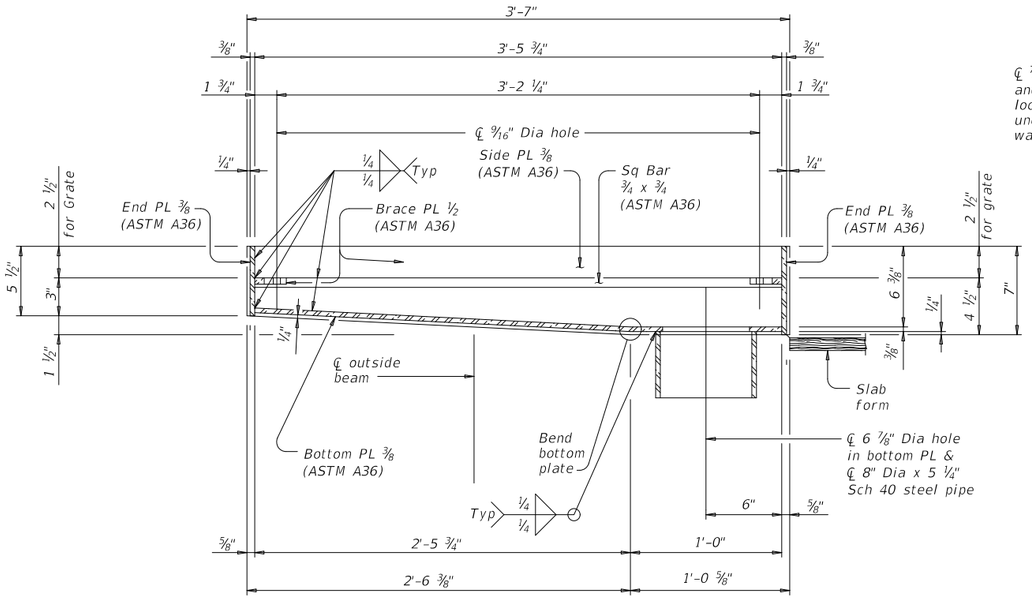
SECTION B-B

GRATE DETAILS

(1) Electric arc end-weld stud anchors to plates with complete fusion.

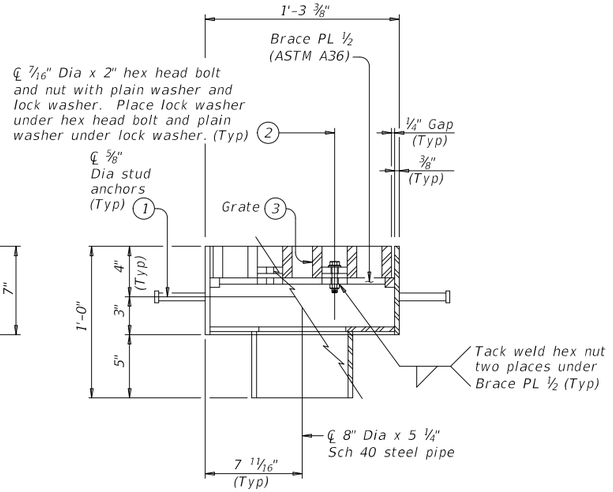
(2) After nuts have been tack welded to the frame, test the assembly for fit of frame and grate with hex bolt assembly.

(3) During fabrication, test fit grate to ensure grate can be rotated 180° to accommodate assembly in the field.



SECTION A-A

(Grate not shown for clarity)



ASSEMBLED END VIEW OF FRAME AND GRATE

03/11/2024

HL93 LOADING

SHEET 1 OF 2

Texas Department of Transportation

Bridge Division Standard

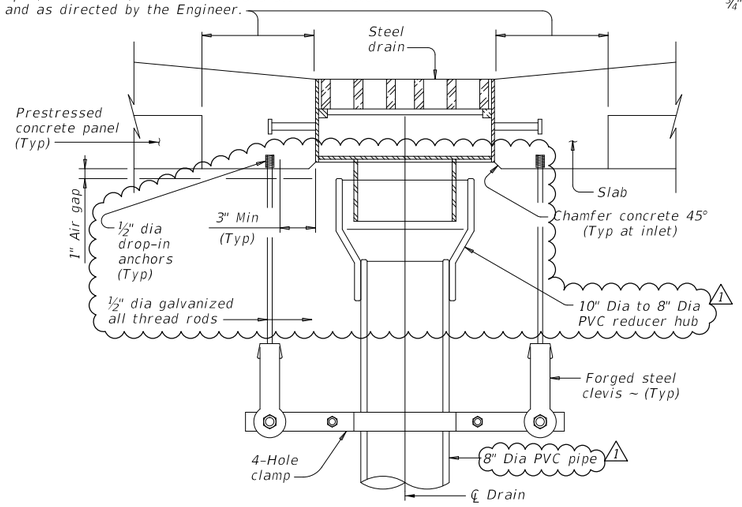
BRIDGE DRAIN DETAILS (WELDED)

BD-2 (MOD)

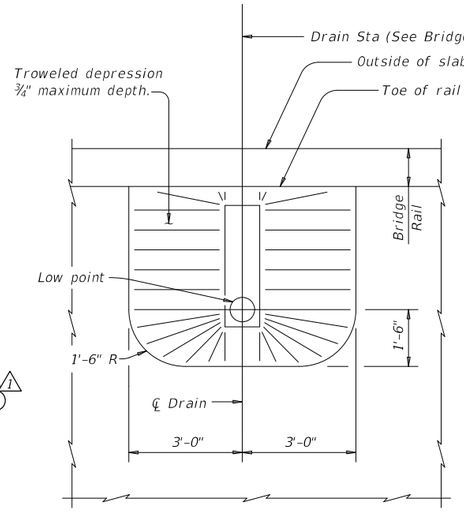
FILE: bdstde02-20.dgn	DN: MAS	CK: TxDOT	DW: JTR	CK: TxDOT
©TxDOT February 2020	CONT	SECT	JOB	HIGHWAY
REVISIONS	0902	90	019, ETC.	CS
1 MOD STD 8-30-22	DIST	COUNTY		SHEET NO.
	FTW	TARRANT		71

DATE:
FILE:

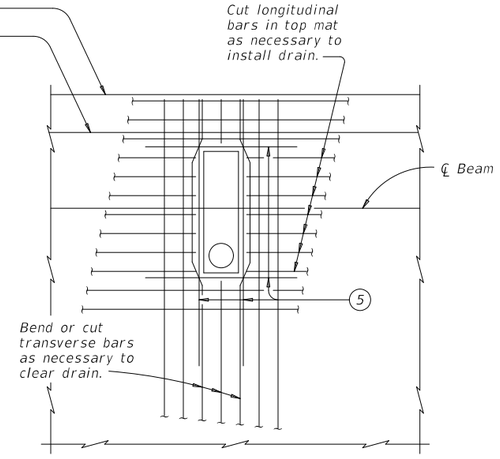
If prestressed concrete panels are used, place panels 3' Min from edges of drain. Conventionally reinforce this portion of cast-in-place slab as detailed on the span, unit sheets, or miscellaneous standard details and as directed by the Engineer.



HOOK-UP TO INLET WITH VERTICAL PIPE SUPPORT (4)



TROWELED DEPRESSION



SHOWING TYPICAL SLAB REINFORCING

(Showing top map of reinforcing, bottom mat and panels omitted for clarity.)

(4) Place edge of bridge drain close to the toe of rail.

(5) Provide 4 additional #5 bars around perimeter in top mat of reinforcing and 4 additional #5 bars around perimeter in bottom mat of reinforcing. Extend bars 1'-6" from edges of drain.

GENERAL NOTES:

Galvanize all steel components in accordance with Item 445 "Galvanizing" unless noted otherwise.

Provide $\frac{7}{16}$" Dia ASTM A307 Grade A hex bolt with one hex nut, one plain washer and one lock washer.

Round or chamfer exposed edges of Grate and Frame to approximately $\frac{1}{16}$" by grinding, unless otherwise noted.

Take care to ensure uniform bearing between contact surfaces of grate and frame.

Alternate bridge drains may be substituted for the bridge drain shown on this sheet provided they are approved by the Engineer prior to fabrication and installation. Alternate drains must have an approximately equal grate opening area (350 sq in) and an 8" diameter outfall. The grate should be of a similar configuration.

Bend slab reinforcing bars to clear drain by 1". When bending is not possible, stop or cut reinforcing bars to clear drain as shown. Additional slab reinforcing is considered subsidiary to "Reinforced Concrete Slab". When placing concrete, take care to prevent honeycombing or air pockets around or beneath the drain.

Provide Schedule 40 DWV PVC pipe conforming to ASTM D2665. Minimum wall thickness: 0.322" ~ 8" Dia. Use fittings as directed by the Engineer. Attach the pipe securely to the superstructure.

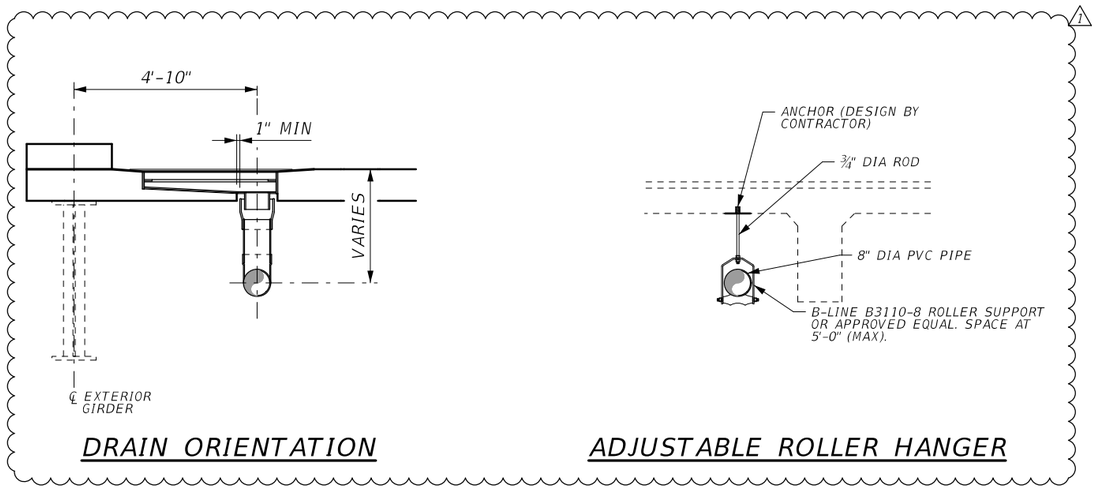
Provide pipe and supports that accommodate anticipated longitudinal movements of pipe and bridge slab. For long downhill pipe runs, match pipe grade to roadway grade. Galvanize metallic pipe support hardware and fasteners in accordance with Item 445 "Galvanizing". Include cost of attachment devices in the unit price bid for "Grate and Frame".

Payment will be by each Grate and Frame (Bridge Drain).

See Bridge Layout for location of drains.

Deviations from Bridge Drain Details contained herein will not be permitted without prior approval from the Engineer.

Average weight of Grate and Frame:
321 Lb total
148 Lb (Grate)
173 Lb (Frame).



DRAIN ORIENTATION

ADJUSTABLE ROLLER HANGER

03/11/2024

HL93 LOADING

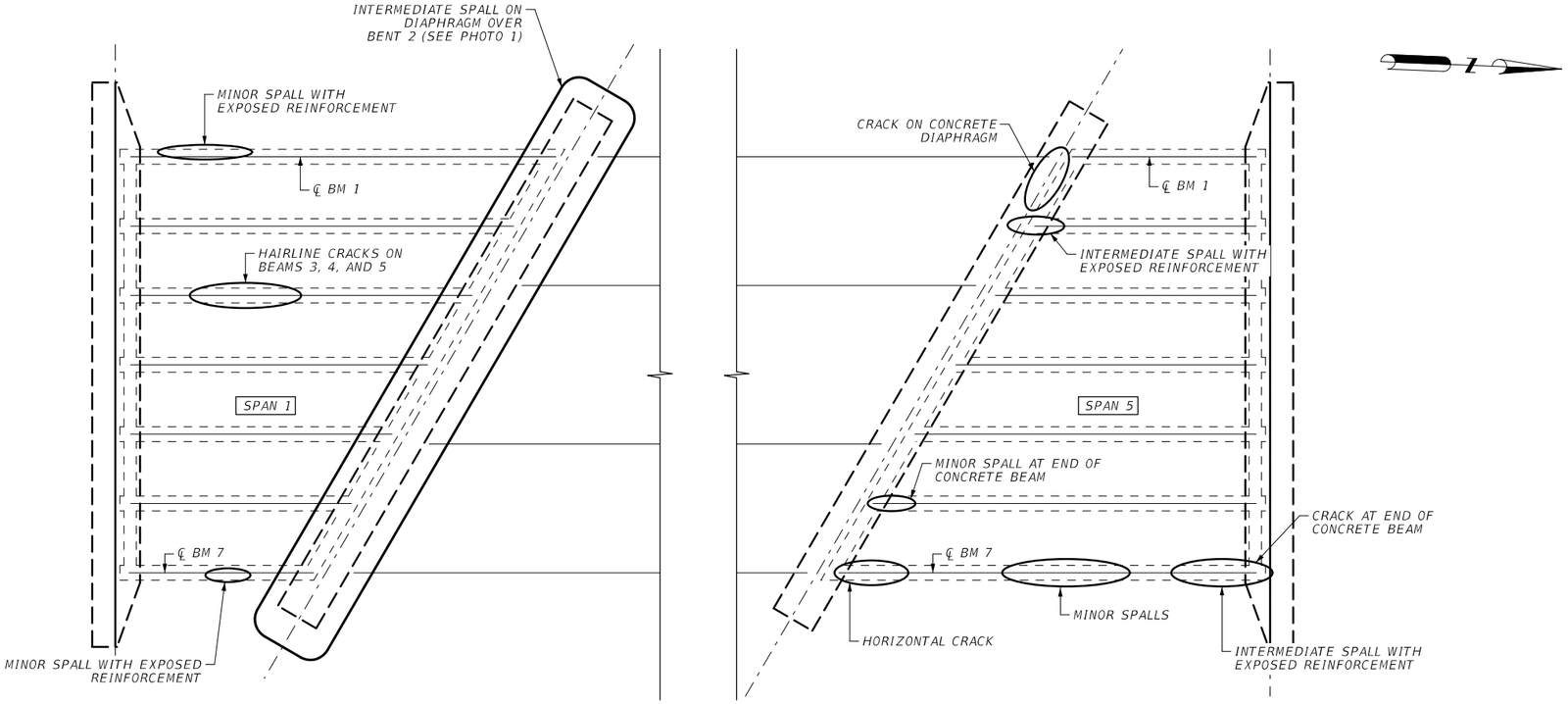
Texas Department of Transportation

Bridge Division Standard

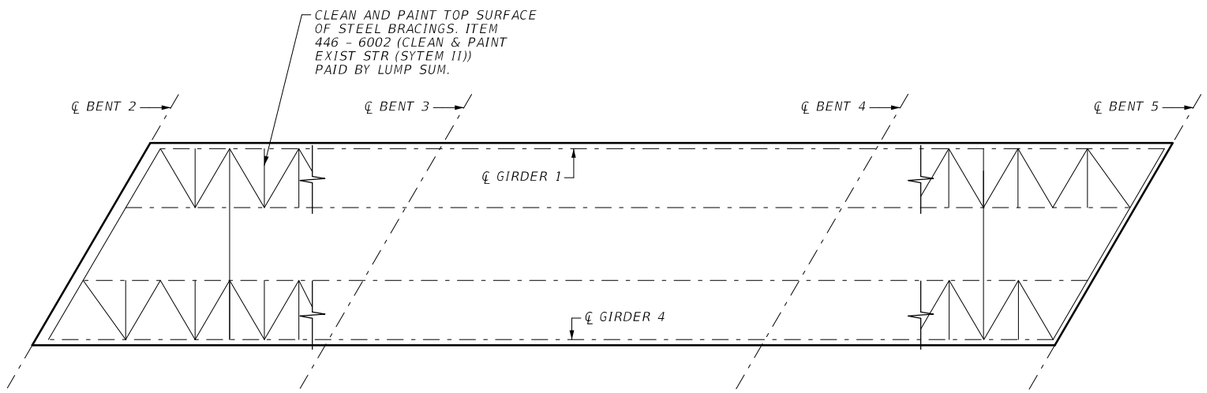
BRIDGE DRAIN DETAILS (WELDED)

BD-2 (MOD)

FILE: bdstde02-20.dgn	DN: MAS	CK: TxDOT	DW: JTR	CK: TxDOT
©TxDOT February 2020	CONT	SECT	JOB	HIGHWAY
REVISIONS	0902	90	019, ETC.	CS
1 MOD STD 8-30-22	DIST	COUNTY		SHEET NO.
	FTW	TARRANT		72



PLAN



SPALL REPAIR
CONC STR REPAIR (VERTICAL & OVERHEAD) 04296007

SPAN	LOCATION	DAMAGE QUANTITY	ESTIMATED REPAIR QUANTITY
		SF	SF
1	CONCRETE DIAPHRAGM OVER BENT 2	30.0	35.0
1	BOTTOM SURFACE OF BEAM 1	40.0	45.0
1	EAST SIDE ON BEAM 7	6.0	10.0
5	BOTTOM SURFACE OF BEAM 7	8.0	10.0
5	SOUTH END OF BEAM 6	7.0	10.0
5	BOTTOM SURFACE OF BEAM 7	7.0	10.0
5	SOUTH END OF BEAM 2	5.0	10.0
TOTAL SPALL REPAIR QUANTITIY		103.0	130.0

CRACK REPAIR
CNC CRACK REPAIR (DISCRETE)(INJECT) 07806002

SPAN	LOCATION	DAMAGE QUANTITY	ESTIMATED REPAIR QUANTITY
		LF	LF
1	BEAMS 3 - 5	15.0	25.0
5	BENT 5 DIAPGRAHM BETWEEN BEAMS 1 & 2	3.0	4.0
5	BEAM 7 EAST FACE 2	5.0	7.0
5	NORTH END OF BEAM 7	5.0	7.0
TOTAL CRACK REPAIR QUANTITIY		28.0	43.0

STEEL BRACE PAINTING
CLEAN & PAINT EXIST STR (SYSTEM II) 04466002

SPAN	LOCATION	DAMAGE QUANTITY	ESTIMATED REPAIR QUANTITY
		LS	LS
1	BEAMS 3 - 5	1.0	1.0
TOTAL CRACK REPAIR QUANTITIY		1.0	1.0

CONCRETE SURFACE TREATMENT
PENETRATING CONCRETE SURFACE TREATMENT 04286001

ELEMENT	ESTIMATED REPAIR QUANTITY
	SY
SPAN 1	366
SPAN 5	366
TOTAL PENETRATING CONCRETE SURFACE TREATMENT QUANTITY	732

GENERAL NOTES:

1. REMOVE EXISTING DECK FOR SPANS 2 - 4 AND REPLACE WITH A NEW DECK. ADDITIONAL SHEAR STUDS WILL BE ADDED PRIOR TO CONSTRUCTION OF NEW DECK. SEE GIRDER STUD DESIGN SHEET FOR DETAILS.
2. MILL THE SEAL COAT TO THE DECK OF THE CONCRETE BEAM SPANS (SPANS 1 AND 5).
3. REPAIR ALL CRACKS AND SPALLS IN THE ABUTMENTS, BENTS, PIERS AND BEAMS. SEE ABUTMENT, BENT AND MISCELLANEOUS REPAIR DETAILS SHEET FOR GUIDANCE.
4. APPLY PENETRATING CONCRETE SURFACE TREATMENT ON THE DECK OF THE CONCRETE BEAM SPANS, ABUTMENTS, BENTS AND PIERS, EXTERIOR AND BOTTOM SURFACE OF CONCRETE BEAMS.
5. CLEAN AND PAINT TOP SURFACE OF THE STEEL BRACINGS UNDER THE DECK IN THE STEEL BEAM SPANS.
6. THE CONTRACTOR SHALL FIELD VERIFY ALL EXISTING BRIDGE DIMENSIONS, ELEVATIONS, ABUTMENT AND BENT BEARINGS, AND BEAM LOCATIONS PRIOR TO BEGINNING CONSTRUCTION.
7. ALL PHOTOS COME FROM OCTOBER 4TH, 2021 BRIDGE CONDITION SURVEY. SEE SURVEY FOR ADDITIONAL INFORMATION ON REPAIR CONDITIONS AS OF 2021.
8. NOTIFY EOR IF EXISTING CONDITIONS DO NOT MATCH THE PHOTOS DURING REPAIR.

STATE OF TEXAS
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PROFESSIONAL ENGINEER
03/11/2024

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OMEGA ENGINEERS, INC.
8200 N. MOPAC EXPRESSWAY, STE #280
AUSTIN, TEXAS 78759
OMEGAENGINEERS.COM
TX PE Firm Reg. No. F-2147
P:512 575 2288 F:281 647 9184

Texas Department of Transportation

RIVERSIDE DR SB

SUPERSTRUCTURE REPAIR DETAILS

SHEET 1 OF 4

FED. RD. DIV. NO.	PROJECT NO.		HIGHWAY NO.
6	SEE TITLE SHEET		CS
STATE	DISTRICT	COUNTY	SHEET NO.
TEXAS	FTW	TARRANT	73
CONTROL	SECTION NO.	JOB	
0902	90	019, ETC.	

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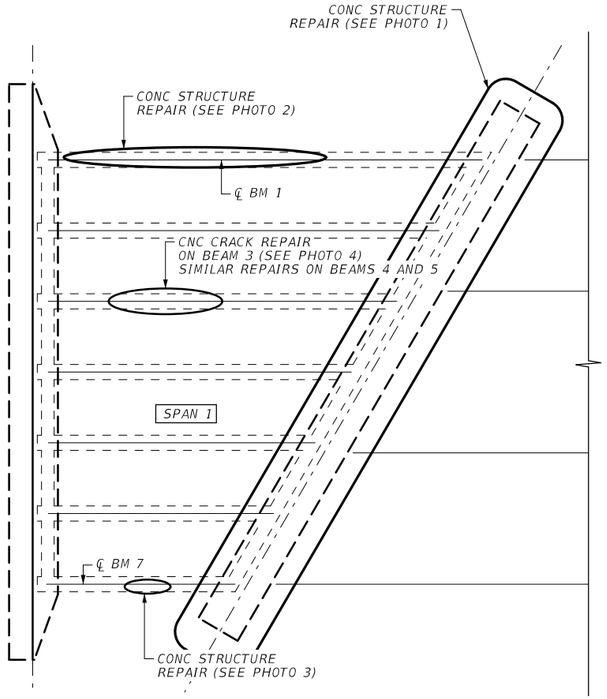

SPAN 1 PLAN

PHOTO 1

INTERMEDIATE SPALL ON CONCRETE DIAPHRAGM OVER BENT 2

PHOTO 2

MINOR SPALL WITH EXPOSED STEEL REINFORCEMENT ON BOTTOM SURFACE OF BEAM 1 OF SPAN 1

PHOTO 3

MINOR SPALL WITH EXPOSED REINFORCEMENT ON EAST SIDE ON BEAM 7 OF SPAN 1

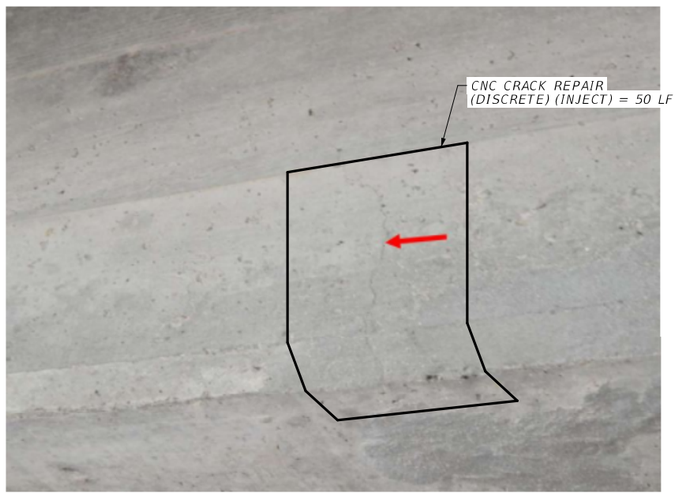

PHOTO 4

HAIRLINE CRACKS ON BEAMS 3, 4, AND 5 OF SPAN 1.
BEAM 3 CRACK SHOWN ABOVE

STATE OF TEXAS
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SUPERSTRUCTURE REPAIR DETAILS

SHEET 2 OF 4

FED. RD. DIV. NO.	PROJECT NO.		HIGHWAY NO.
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STATE	DISTRICT	COUNTY	SHEET NO.
TEXAS	FTW	TARRANT	74
CONTROL	SECTION NO.	JOB	
0902	90	019, ETC.	

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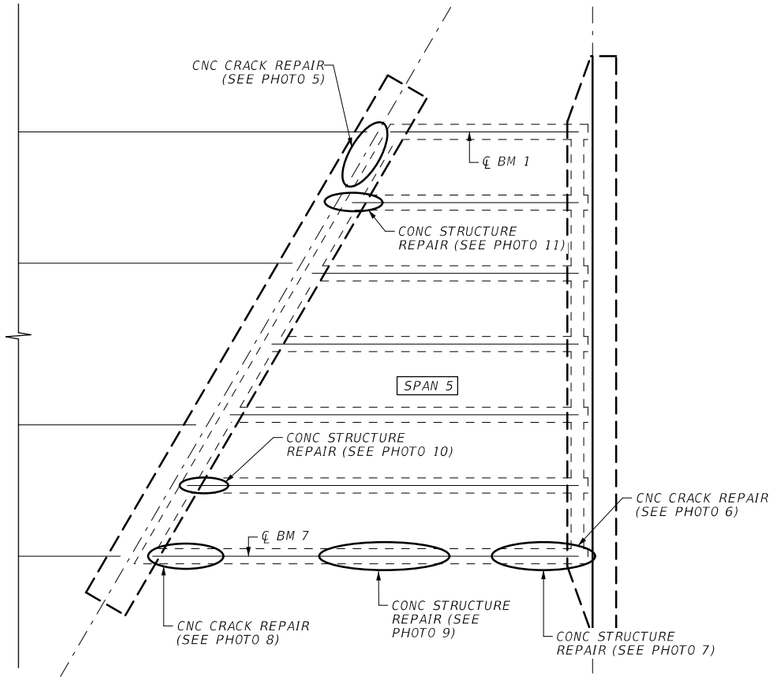

SPAN 5 PLAN

PHOTO 5

CRACK ON DIAPHRAGM BETWEEN BEAM 1 AND BEAM 2 AT BENT 5.

PHOTO 6

CRACK ON NORTH END ON BEAM 7 OF SPAN 5

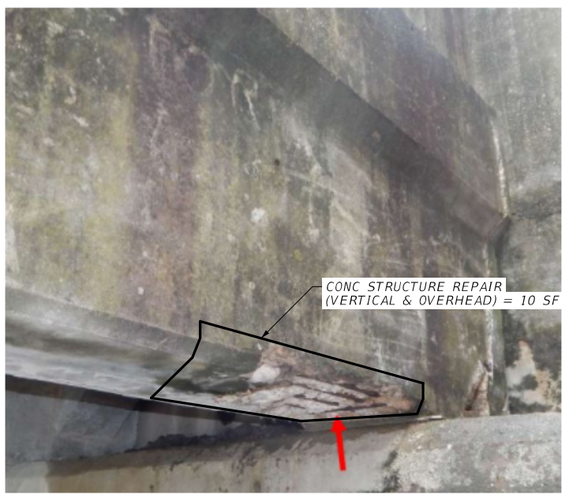

PHOTO 7

INTERMEDIATE SPALL WITH EXPOSED REINFORCEMENT ON BOTTOM SURFACE ON BEAM 7 OF SPAN 5

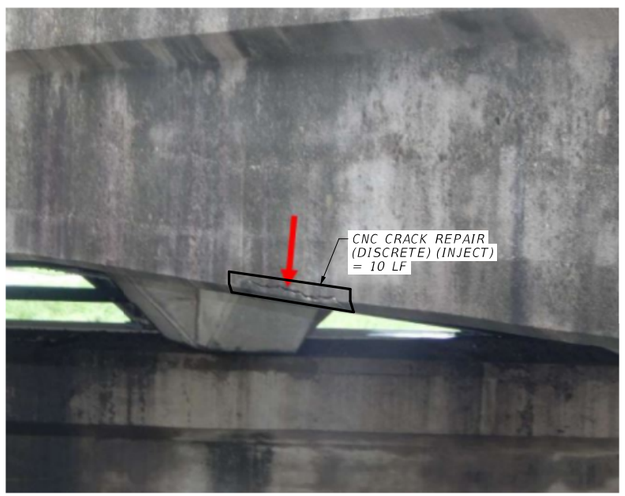

PHOTO 8

HORIZONTAL CRACK ON EAST FACE ON BEAM 7 OF SPAN 5

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STATE OF TEXAS
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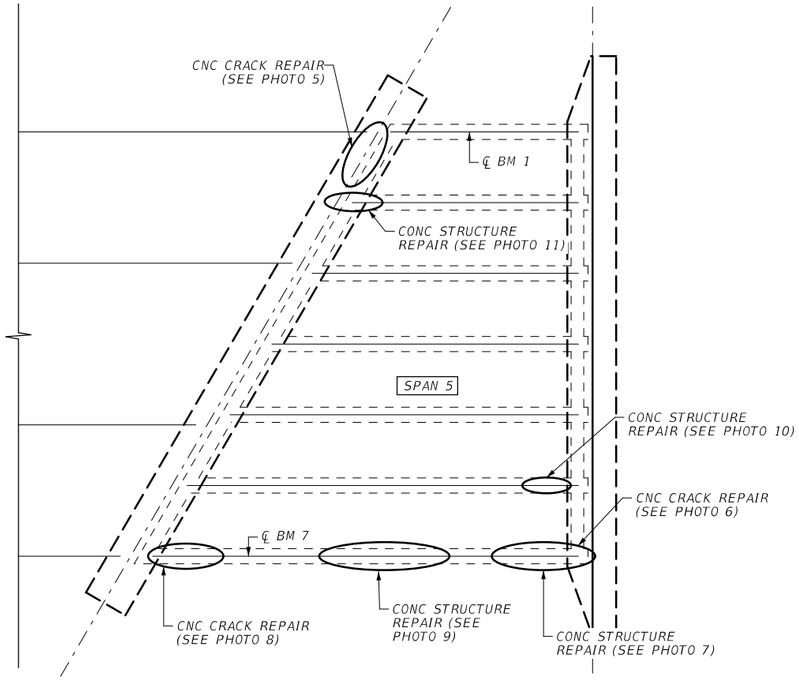
SUPERSTRUCTURE REPAIR DETAILS

SHEET 3 OF 4

FED. RD. DIV. NO.	PROJECT NO.		HIGHWAY NO.
6	SEE TITLE SHEET		CS
STATE	DISTRICT	COUNTY	SHEET NO.
TEXAS	FTW	TARRANT	75
CONTROL	SECTION NO.	JOB	
0902	90	019, ETC.	



SPAN 5 PLAN

PHOTO 9

MINOR SPALLS ON BEAM 7 BOTTOM SURFACE OF SPAN 5

PHOTO 10

MINOR SPALL AT SOUTH END OF BEAM 6 OF SPAN 5

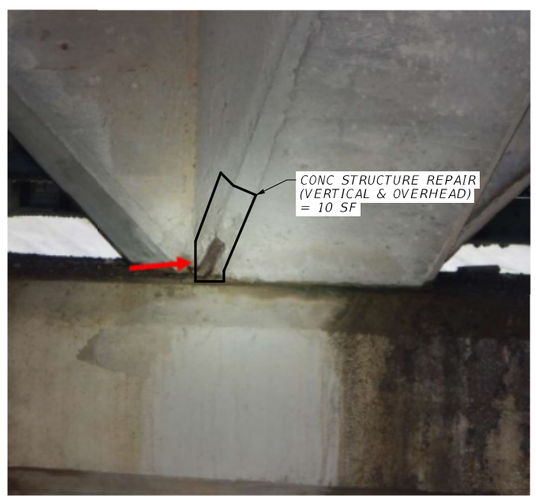


PHOTO 11

INTERMEDIATE SPALL WITH EXPOSED REINFORCEMENT AT SOUTH END OF BEAM 2 OF SPAN 5

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SUPERSTRUCTURE REPAIR DETAILS

SHEET 4 OF 4

FED. RD. DIV. NO.	PROJECT NO.		HIGHWAY NO.
6	SEE TITLE SHEET		CS
STATE	DISTRICT	COUNTY	SHEET NO.
TEXAS	FTW	TARRANT	76
CONTROL	SECTION NO.	JOB	
0902	90	019, ETC.	

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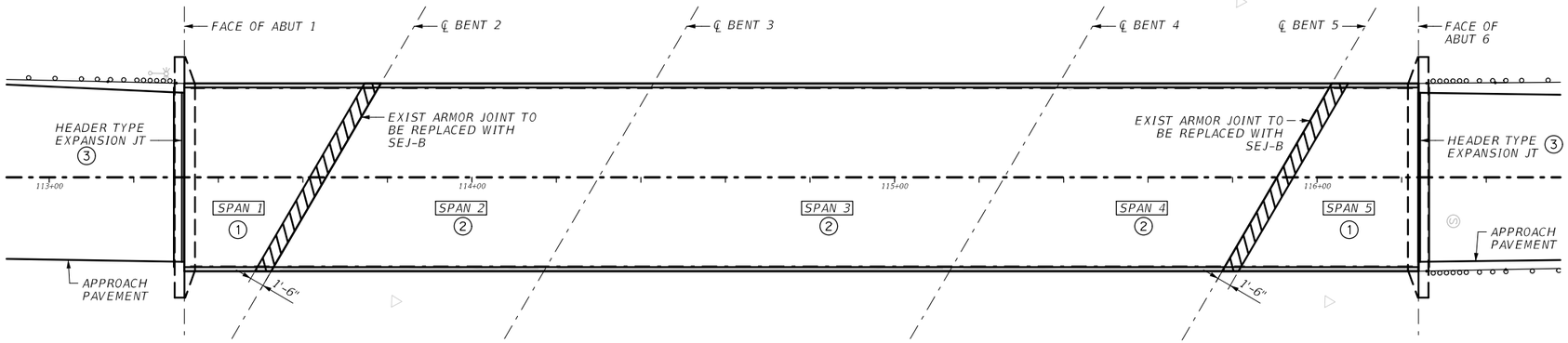


1. EXIST SLAB TO REMAIN
2. EXIST SLAB TO BE REMOVED AND REPLACED WITH A NEW DECK
3. FIELD VERIFY LOCATION AT END OF BRIDGE DECK

CONCRETE AREA TO BE REMOVED

CONSTRUCTION SEQUENCE

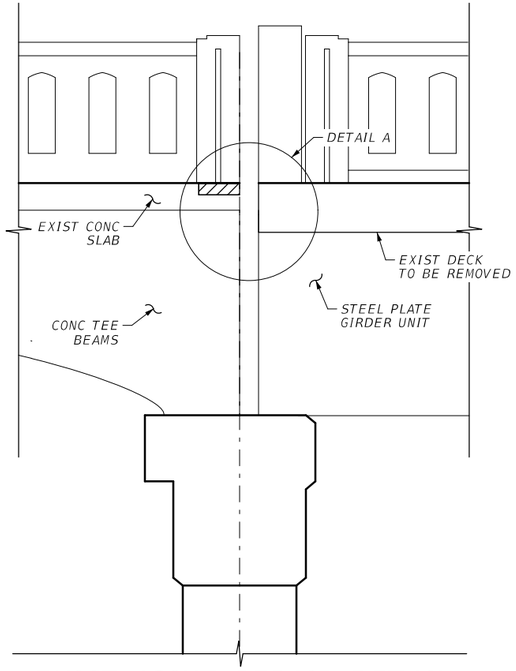
1. SAW-CUT THE PERIMETER OF THE PROPOSED AREA TO BE REMOVED APPROXIMATELY 1", BUT DO NOT CUT EXISTING REINFORCING STEEL. ADJUST THE DEPTH AS NECESSARY TO AVOID DAMAGING REINFORCING STEEL.
2. USE POWER-DRIVEN CHIPPING TOOLS OR HYDRO-DEMOLITION TO REMOVE CONCRETE. AVOID DAMAGE TO SOUND CONCRETE. CONTRACTOR MAY USE 30 LB. HAMMERS FOR THE BULK OF THE WORK, HOWEVER, 15LB. HAMMER OR SMALLER MUST BE USED AT THE BASE AND THE PERIMETER OF THE AREA TO AVOID DAMAGING THE EXISTING DECK CONCRETE. PROVIDE A UNIFORMLY ROUGH SURFACE WITH A CHIPPED APPEARANCE.
3. REMOVE EXISTING JOINT AND ENOUGH CONCRETE TO ENSURE THERE IS A MINIMUM ¾ IN CLEARANCE BELOW THE TOP LAYER OF REINFORCING STEEL.
4. REMOVE ALL RUST AND DELETERIOUS MATERIAL FROM THE REINFORCING STEEL.
5. PRIOR TO INSTALLATION OF NEW SEJ-B, THOROUGHLY CLEAN THE CONCRETE SURFACES (BOTTOM AND SIDES) BY HIGH-PRESSURE WATER BLASTING, OR OTHER APPROVED METHODS.
6. REMOVE ALL LOOSE PARTICLES, DIRT, DETERIORATED CONCRETE, OR OTHER SUBSTANCES THAT WOULD IMPAIR THE BOND OF THE PLACED CONCRETE. FOLLOW WITH A HIGH-PRESSURE AIR BLAST FOR FINAL CLEANING.
7. INSTALL SEALED EXPANSION JOINT (SEJ-B)
8. PRIOR TO CASTING OF CONCRETE, ENSURE THE SURFACE OF THE EXISTING CONCRETE IS IN A SATURATED SURFACE-DRY (SSD) CONDITION. REMOVE ALL FREE (PONDED) WATER. ACHIEVE AN SSD CONDITION BY HIGH-PRESSURE WATER BLASTING AT LEAST 15 MINUTES BEFORE PLACING CONCRETE.
9. PLACE CLASS "S" (HPC) CONCRETE ONTO THE PREPARED SURFACES. CONSOLIDATE USING IMMERSION-TYPE VIBRATORS OR OTHER METHODS ACCEPTABLE TO THE ENGINEER.

GENERAL NOTES:

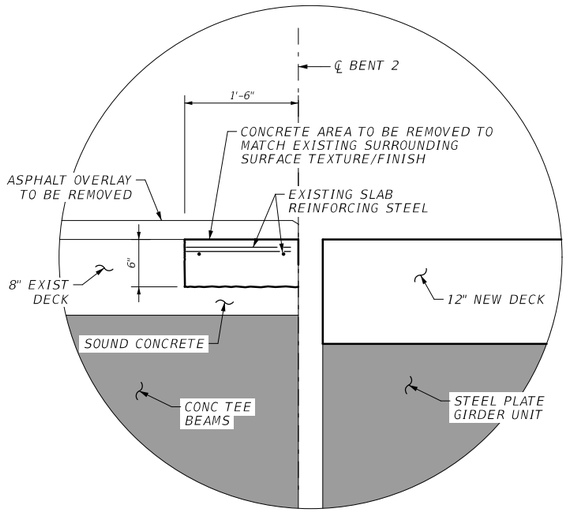
1. REPAIR SHALL BE PERFORMED IN ACCORDANCE WITH THE TXDOT CONCRETE REPAIR MANUAL, MARCH 2021.
2. SEE SEJ-B STANDARDS FOR OTHER DETAILS NOT SHOWN.

MATERIAL NOTES:

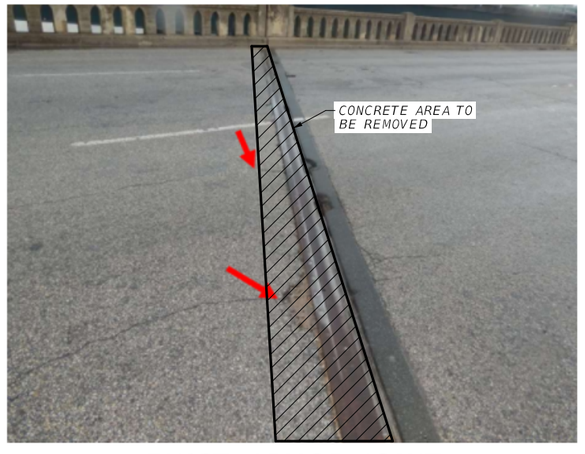
1. PROVIDE CLASS S (HPC) CONCRETE (f'c = 4,000 PSI).
2. PROVIDE GRADE 60 REINFORCING EPOXY COATED STEEL BARS. LAPS WHERE REQUIRED SHALL BE AS FOLLOWS:
   #4 = 2'-5"
   #6 = 3'-7"
3. REINFORCING STEEL WEIGHT IS CALCULATED USING AN APPROXIMATE FACTOR OF 7.0 LBS/SF.



EXIST JOINT REPAIR DETAIL



DETAIL A



EXIST ARMOR JOINT

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BRIDGE JOINT REPAIR DETAIL

SHEET 1 OF 2

FED.RD. DIV.NO.	PROJECT NO.		HIGHWAY NO.
6	SEE TITLE SHEET		CS
STATE	DISTRICT	COUNTY	SHEET NO.
TEXAS	FTW	TARRANT	77
CONTROL	SECTION NO.	JOB	
0902	90	019, ETC.	

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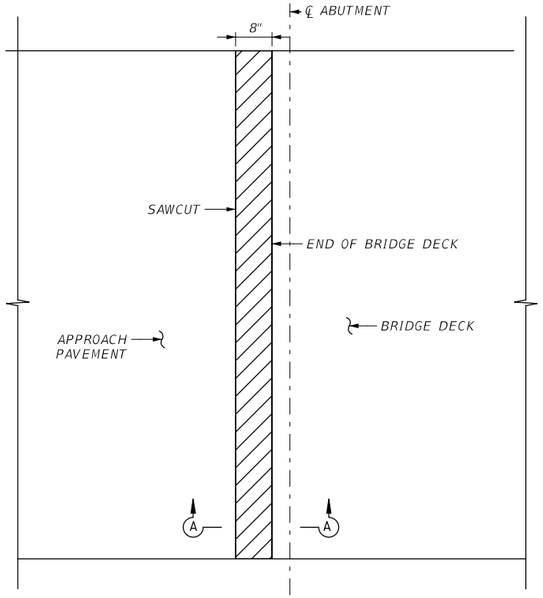
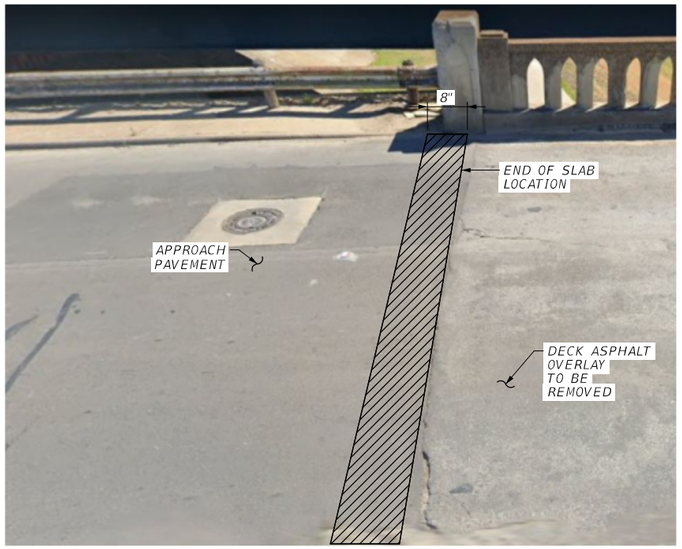


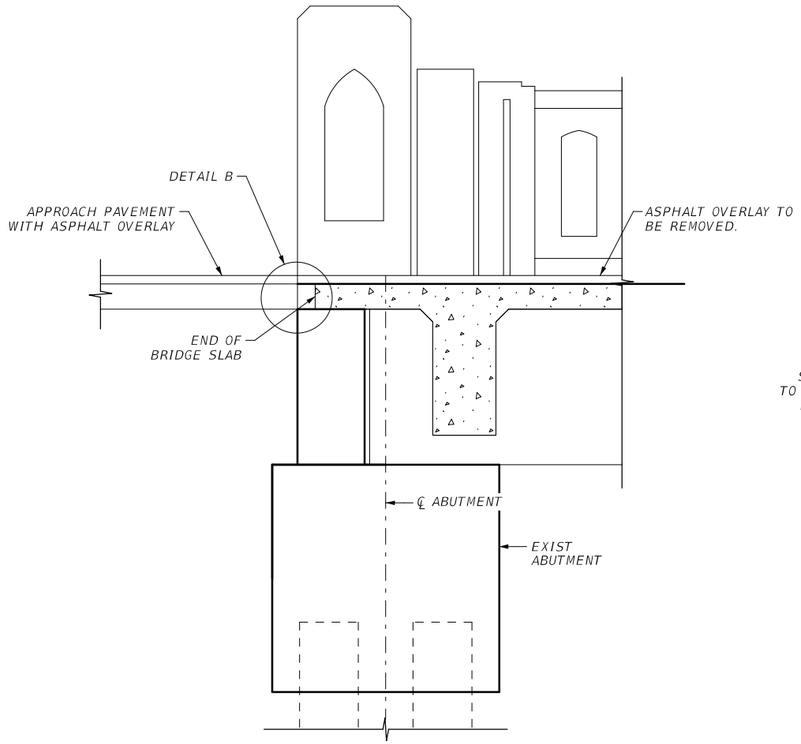
PLAN



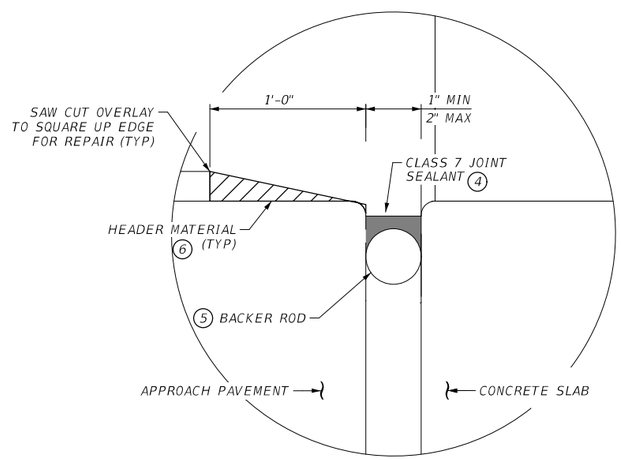
EXISTING CONDITION - ABUT 6 (LOOKING EAST)

CONSTRUCTION SEQUENCE - HEADER EXPANSION JOINT

1. VERIFY LOCATION OF END OF BRIDGE DECK AFTER ASPHALT OVERLAY HAS BEEN REMOVED.
2. REMOVE ASPHALT OVERLAY ON APPROACH PAVEMENT WITHIN LIMITS OF REMOVAL.
3. CLEAN THE VOIDED REGION OF ALL MATERIALS THAT COULD INHIBIT THE BOND BETWEEN HEADER MATERIAL AND APPROACH PAVEMENT.
4. FORM THE JOINT OPENING TO THE REQUIRED WIDTH (1" MIN AND 2" MAX) AND PLACE HEADER MATERIAL TO FILL VOIDED REGION. PLACE HEADER MATERIAL IN ACCORDANCE WITH ITEM 785, "BRIDGE JOINT REPAIR OR REPLACEMENT".
5. PLACE BACKER ROD INTO JOINT OPENING 1" BELOW THE TOP OF HEADER MATERIAL.
6. SEAL THE JOINT OPENING WITH A CLASS 7 JOINT SEALANT. RECESS SEAL ½" BELOW TOP OF EXIST DECK IN TRAVEL LANES AND ¼" BELOW TOP OF EXIST DECK IN SHOULDERS.



SECTION A-A



DETAIL B

(4) USE CLASS 7 JOINT SEALANT IN ACCORDANCE WITH DMS-6310, "JOINT SEALANTS AND FILLERS". PREPARE JOINT AND SEAL IN ACCORDANCE WITH ITEM 438 "CLEANING AND SEALING JOINTS".

(5) PROVIDE BACKER ROD 25% LARGER THAN JOINT OPENING AND COMPATIBLE WITH THE SEALANT. USE OF MULTIPLE PIECES TO CREATE A BACKER ROD CROSS SECTION IS NOT PERMITTED. TOP OF BACKER ROD MUST BE CONVEX AS SHOWN.

(6) USE HEADER MATERIAL IN ACCORDANCE WITH DMS-6140, "POLYMER CONCRETE FOR BRIDGE JOINT SYSTEMS". MATCH THE THICKNESS OF THE HEADER MATERIAL WITH THE THICKNESS OF THE OVERLAY, TAPERED TOWARDS DECK JOINT

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RIVERSIDE DR SB

BRIDGE JOINT REPAIR DETAIL

SHEET 2 OF 2

FED. RD. DIV. NO.	PROJECT NO.		HIGHWAY NO.
6	SEE TITLE SHEET		CS
STATE	DISTRICT	COUNTY	SHEET NO.
TEXAS	FTW	TARRANT	78
CONTROL	SECTION NO.	JOB	
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GENERAL NOTES:

Quantities provided are approximations derived from the "BRIDGE CONDITION SURVEY-Riverside Dr SB (10-4-2021)" developed by TxDOT. Repair methods described in these details may be modified in the field by the engineer upon actual investigation.

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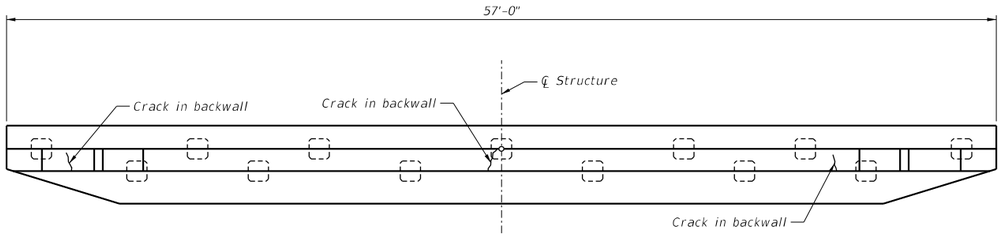
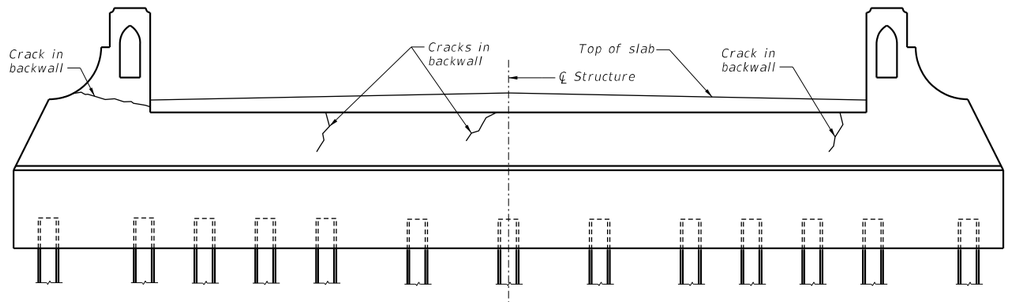
See MISCELLANEOUS REPAIR DETAILS sheet for guidance and details for each repair specified.



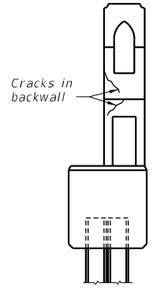
PLAN - ABUTMENT 1

Abutment 6 similar



ELEVATION - ABUTMENT 1

Abutment 6 similar



SIDE ELEVATION

CRACK REPAIR
CNC CRACK REPAIR (DISCRETE)(INJECT) 07806002

Element	Location	Damage Quantity	Estimated Repair Quantity
		LF	LF
Abutment 1	Cap - Beam 5	15	23
Abutment 1	Backwall - Beam 4-7	30	45
Abutment 1	Backwall - East Side of Abutment	5	8
	Total	50	76
Abutment 6	Cap - Beam 4	2	3
Abutment 6	Backwall - West Side of Abutment	3	5
	Total	5	8
TOTAL CRACK REPAIR QUANTITY		55	84

SPALL REPAIR
CONC STR REPAIR (VERTICAL & OVERHEAD) 04296007

Element	Location	Damage Quantity	Estimated Repair Quantity
		SF	SF
Abutment 6	Cap - West Edge of Abutment	1	2
TOTAL SPALL REPAIR QUANTITY		1	2

CONCRETE SURFACE TREATMENT
PENETRATING CONCRETE SURFACE TREATMENT 04286001

Element	Estimated Repair Quantity
	SY
Abutment 1	55
Abutment 6	55
TOTAL PENETRATING CONCRETE SURFACE TREATMENT QUANTITY	110

NICHOLAS NEMEC
102288
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PROFESSIONAL ENGINEER

03/11/2024

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ABUTMENT REPAIR DETAILS

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STATE	DISTRICT	COUNTY	SHEET NO.
TEXAS	FTW	TARRANT	79
CONTROL	SECTION NO.	JOB	
0902	90	019, ETC.	

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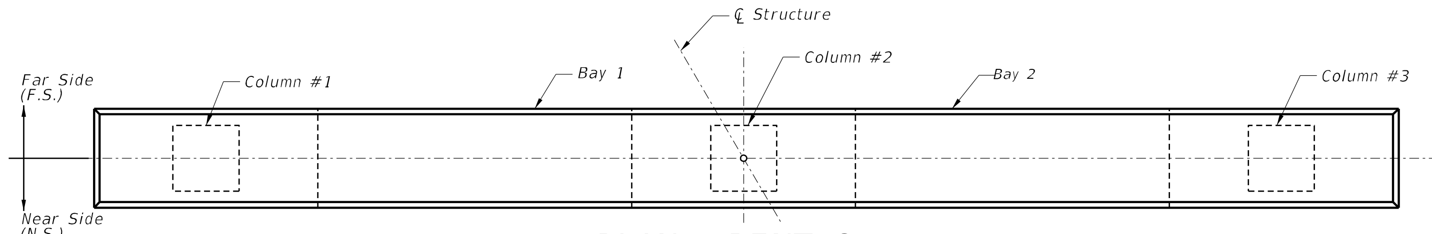
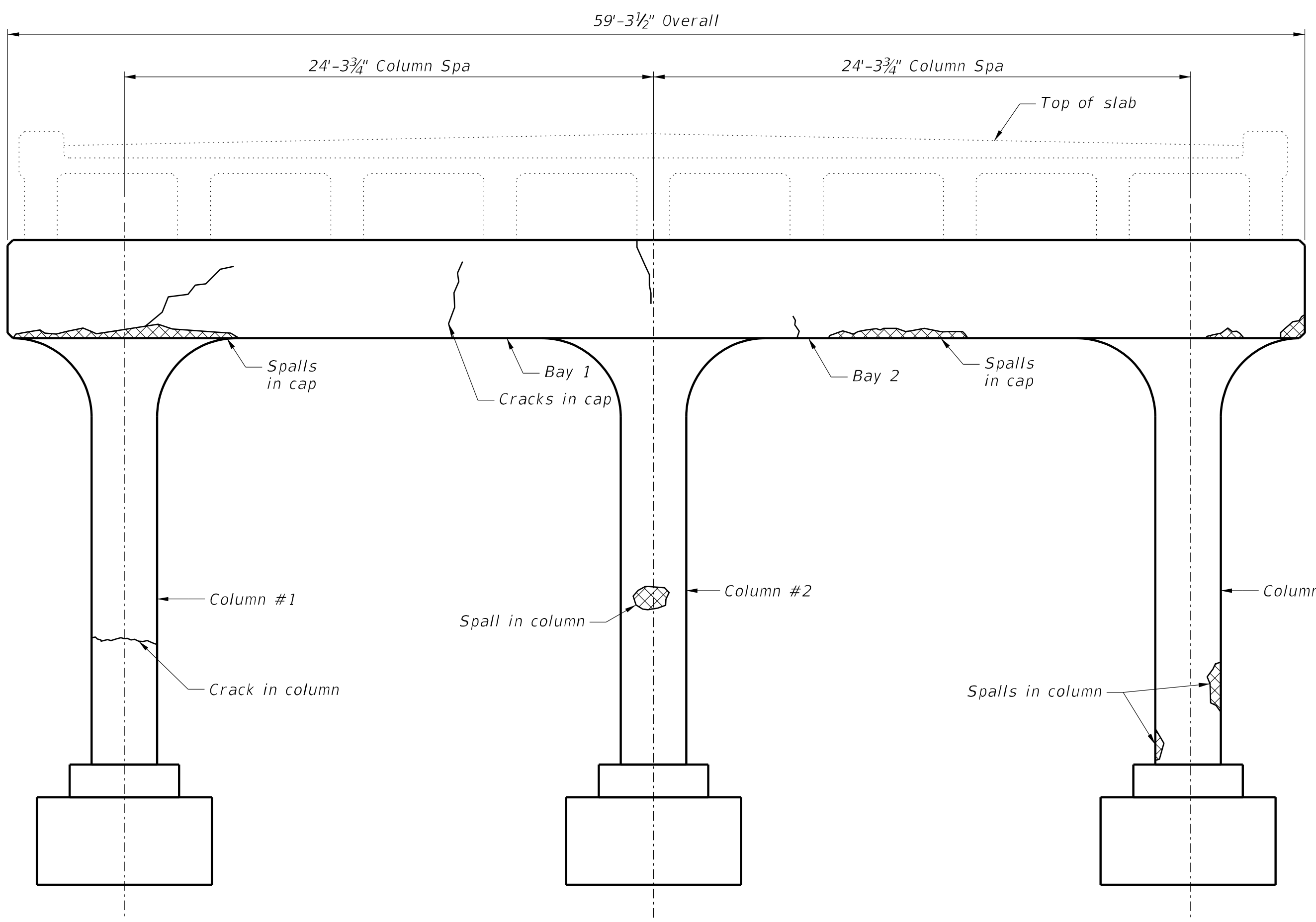


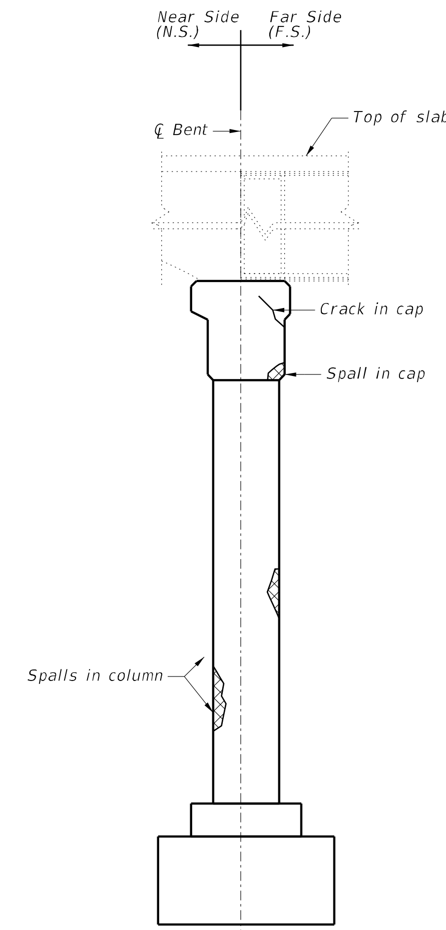
PLAN - BENT 2

Bent 5 similar



ELEVATION - BENT 2

Bent 5 similar



SIDE ELEVATION

Superstructure shown is just for Bent 2

CRACK REPAIR CNC CRACK REPAIR (DISCRETE)(INJECT) 07806002			
Element	Location	Damage Quantity	Estimated Repair Quantity
		LF	LF
Bent 2	N.S. Cap Face, Column 1	6	9
Bent 2	N.S. Cap Face, Bay 1	5	8
Bent 2	N.S. Cap Face, Column 2	4	6
	Total	15	23
Bent 5	Column 1 -Horizontal Crack	12	18
Bent 5	Cap Face - Bay 1, Edge of Cap	1	2
	Total	13	20
TOTAL CRACK REPAIR QUANTITY		28	43

SPALL REPAIR CONC STR REPAIR (VERTICAL & OVERHEAD) 04296007			
Element	Location	Damage Quantity	Estimated Repair Quantity
		SF	SF
Bent 2	Column 1 - West Face	3	6
Bent 2	Column 1 - North Face, Ground Elev	2	4
Bent 2	Cap - Bottom Edges/Corners	20	40
	Total	25	50
Bent 5	Column 2	1	2
Bent 5	Column 3	2	4
Bent 5	Cap - Bottom Edges/Corners	20	40
	Total	23	46
TOTAL SPALL REPAIR QUANTITY		48	96

CONCRETE SURFACE TREATMENT PENETRATING CONCRETE SURFACE TREATMENT 04286001	
Element	Estimated Repair Quantity
	SY
Bent 2	175
Bent 5	175
TOTAL PENETRATING CONCRETE SURFACE TREATMENT QUANTITY	350

GENERAL NOTES:

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BENTS 2 & 5 REPAIR DETAILS

FED.RD. DIV.NO.	PROJECT NO.		HIGHWAY NO.
6	SEE TITLE SHEET		CS
STATE	DISTRICT	COUNTY	SHEET NO.
TEXAS	FTW	TARRANT	80
CONTROL	SECTION NO.	JOB	
0902	90	019, ETC.	

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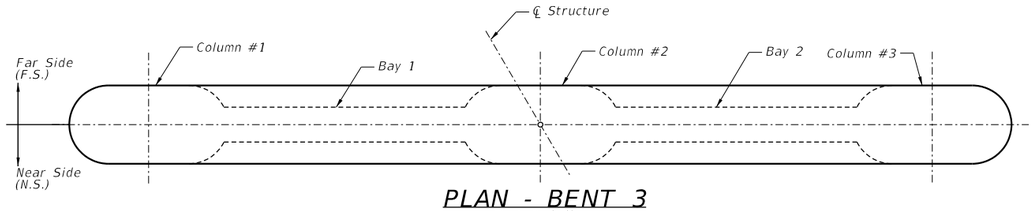
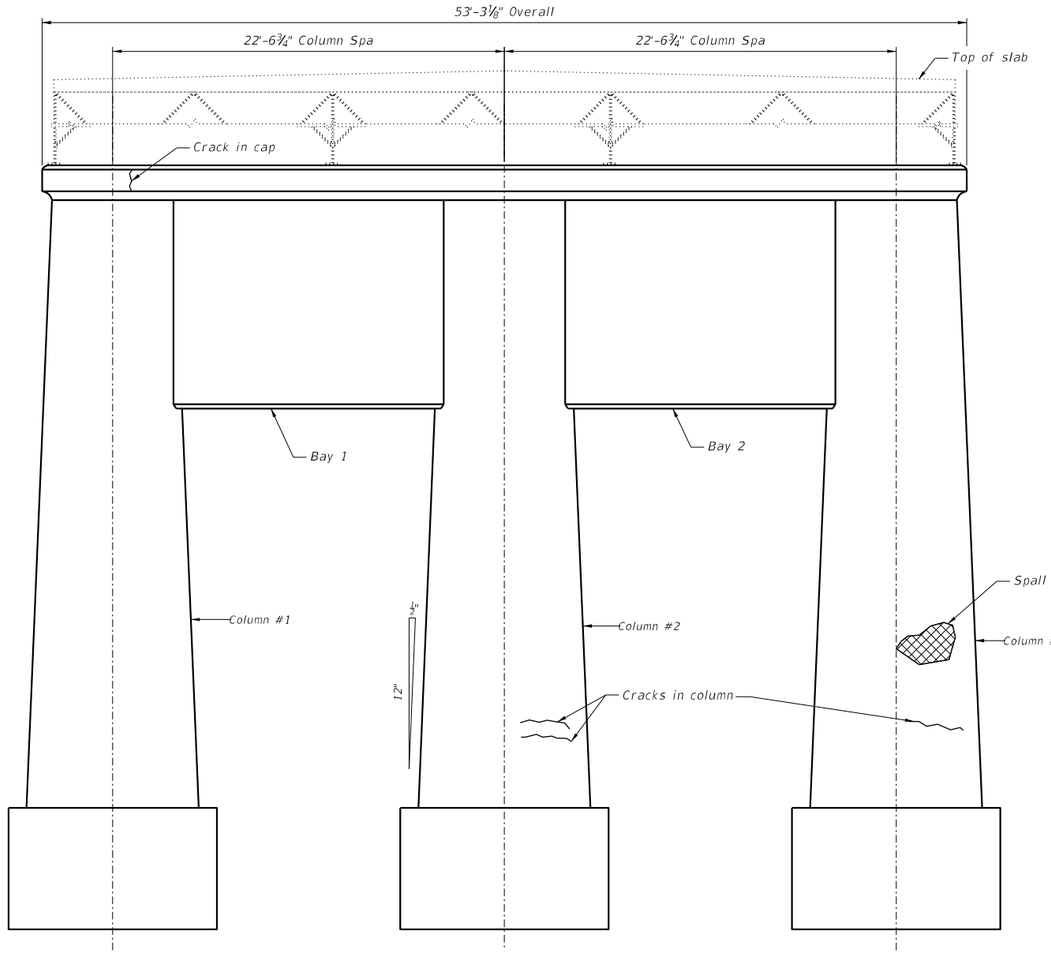


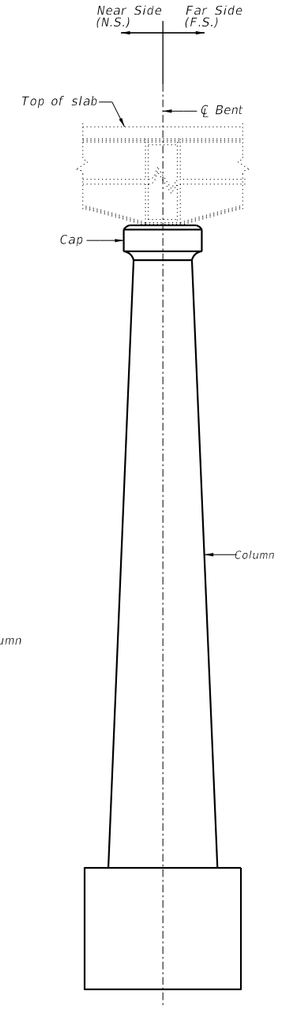
PLAN - BENT 3

Bent 4 similar



ELEVATION - BENT 3

Bent 4 similar



SIDE ELEVATION

CRACK REPAIR
CNC CRACK REPAIR (DISCRETE)(INJECT) 07806002

Element	Location	Damage Quantity	Estimated Repair Quantity
		LF	LF
Bent 3	Cap - Column 1 - Veritical Crack	2	3
TOTAL CRACK REPAIR QUANTITY		2	3

SPALL REPAIR
CONC STR REPAIR (VERTICAL & OVERHEAD) 04296007

Element	Location	Damage Quantity	Estimated Repair Quantity
		SF	SF
Bent 3	Cap - Bottom Edges/Corners	20	40
Bent 3	N.S. - Column 2	36	72
Bent 3	N.S. - Column 3	7	14
TOTAL SPALL REPAIR QUANTITY		63	126

CONCRETE SURFACE TREATMENT
PENETRATING CONCRETE SURFACE TREATMENT 04286001

Element	Estimated Repair Quantity
	SY
Bent 3	388
Bent 4	388
TOTAL PENETRATING CONCRETE SURFACE TREATMENT QUANTITY	776

GENERAL NOTES:

Quantities provided are approximations derived from the "BRIDGE CONDITION SURVEY-Riverside Dr SB (10-4-2021)" developed by TxDOT. Repair methods described in these details may be modified in the field by the engineer upon actual investigation.

Details provided on this sheet are for the purpose of illustrating typical noted defects and estimated quantities. Note that the repair quantities provided in the tables are increased (compared to the damage quantity) to account for surface preparation as required by the TxDOT Concrete Repair Manual.

See MISCELLANEOUS REPAIR DETAILS sheet for guidance and details for each repair specified.

STATE OF TEXAS
NICHOLAS M. MASSA
102289
LICENSED
PROFESSIONAL ENGINEER

03/11/2024

REV	BY	DESCRIPTION	DATE

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8200 N. MOPAC EXPRESSWAY, STE #280
AUSTIN, TEXAS 78759
OMEGAENGINEERS.COM
TX PE Firm Reg. No. F-2147
P:512 575 2288 F:281 647 9184

Texas Department of Transportation

TEXAS P.E. Registration No F-12185
MODJESKI and MASTERS
Experience great bridges.

RIVERSIDE DR SB

BENTS 3 & 4 REPAIR DETAILS

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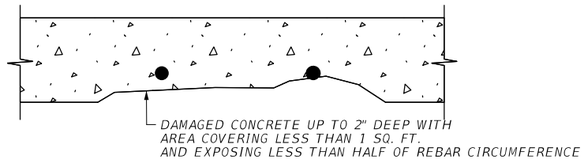
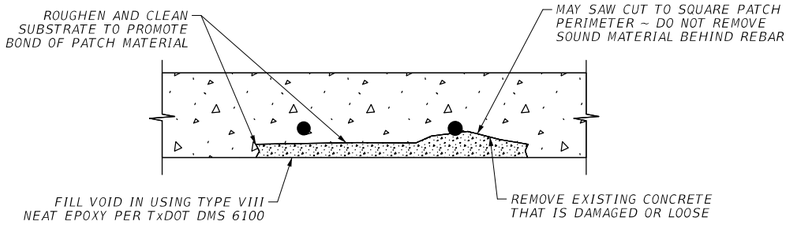
6	SEE TITLE SHEET		CS
STATE	DISTRICT	COUNTY	SHEET NO.
TEXAS	FTW	TARRANT	81
CONTROL	SECTION NO.	JOB	
0902	90	019, ETC.	

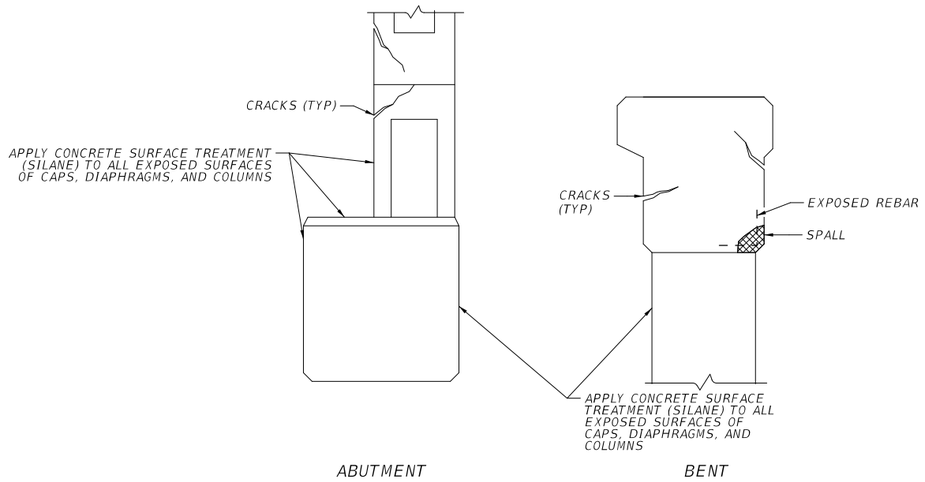
PLOTTED ON: $DATE$ $TIME$
DESIGN FILENAME: $FILE$



STEP 1 - MINOR SPALL REPAIR



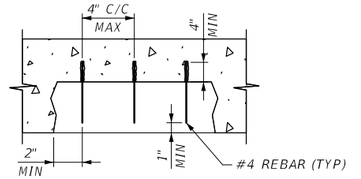
STEP 2 - MINOR SPALL REPAIR



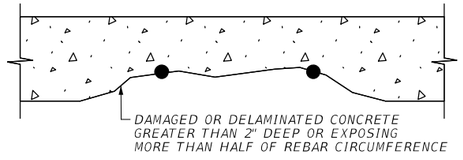
CRACK & EDGE SPALL REPAIR DETAILS

GENERAL NOTES:

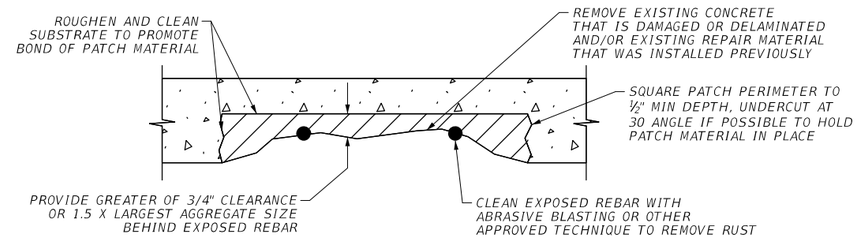
1. PERFORM REPAIR IN ACCORDANCE WITH TXDOT, MARCH 2021 CONCRETE REPAIR MANUAL (CRM) IN ADDITION TO DETAILS SHOWN ON THIS SHEET. THE MANUAL INCLUDES CRITERIA FOR APPLICATION, SURFACE PREPARATION, FORMS, AND CURING
2. CONTRACTOR TO SUBMIT ALL MATERIALS AND METHODS OF APPLICATION FOR APPROVAL
3. CONTRACTOR TO PROVIDE COMPRESSIVE STRENGTH TESTING OF TYPE C REPAIR MATERIAL AND CLASS "C" (HPC) CONCRETE.
4. REPAIR ALL CRACKS USING DISCRETE INJECTION FOLLOWING THE CRM FOR "CRACK REPAIR PRESSURE INJECTED EPOXY" IN CHAPTER 3, SECTION 5. ALL WORK IS PAID FOR UNDER ITEM 780-6002 "CONCRETE CRACK REPAIR, DISCRETE INJECTION."
5. UNLESS OTHERWISE NOTED, REPAIR ALL SPALLS FOLLOWING THE PROCEDURES OUTLINED IN CRM FOR "INTERMEDIATE SPALL" IN CHAPTER 3, SECTION 2. ALL WORK IS PAID FOR UNDER ITEM 429-6007 " CONCRETE STRUCTURAL REPAIR, VERTICAL AND OVERHEAD"
6. FOR CORNER SPALL REPAIRS, ENSURE THAT FINAL REPAIRED CROSS SECTION MATCHES ORIGINAL SECTION, INCLUDING CHAMFERED EDGES.
5. APPLY TREATMENT AFTER ALL SPALL AND CRACK REPAIR IS COMPLETED AND APPROVED BY ENGINEER. REMOVE ALL DEBRIS FROM ABUTMENT/BENT CAPS. APPLY SILANE COATING TO ALL EXPOSED SURFACES OF CAPS, VERTICAL FACES AND BACKWALLS OF THE ABUTMENTS. APPLY SILANE COATING TO ALL EXPOSED SURFACES OF CONCRETE BEAMS, BENT CAPS, INCLUDING DIAPHRAGMS AND COLUMNS. ALL WORK IS PAID FOR UNDER ITEM 428-6001 "PENETRATING CONCRETE SURFACE TREATMENT." REMOVAL OF DEBRIS IS SUBSIDIARY TO ITEM 428.



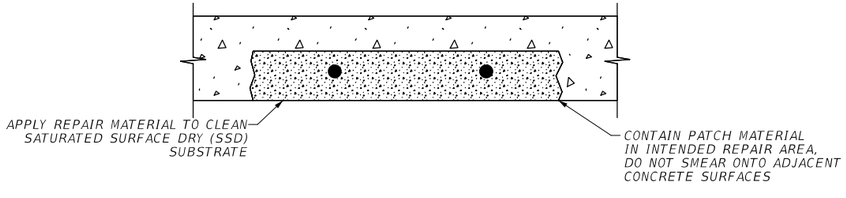
MECHANICAL TIE DETAIL



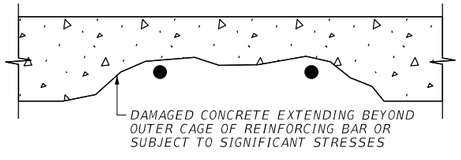
STEP 1 - INTERMEDIATE SPALL REPAIR



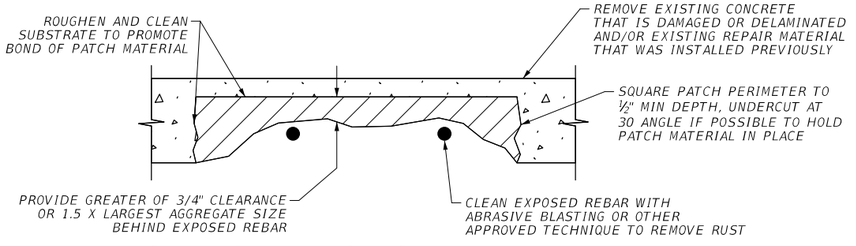
STEP 2 - INTERMEDIATE SPALL REPAIR



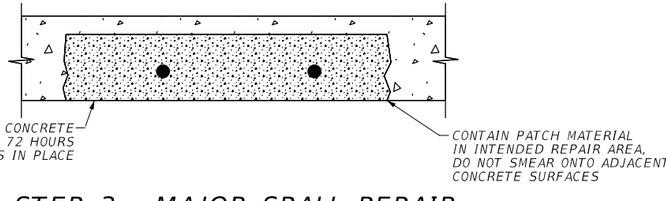
STEP 3 - INTERMEDIATE SPALL REPAIR



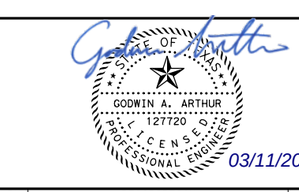
STEP 1 - MAJOR SPALL REPAIR



STEP 2 - MAJOR SPALL REPAIR



STEP 3 - MAJOR SPALL REPAIR



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OMEGA ENGINEERS, INC.
8200 N. MOPAC EXPRESSWAY, STE #280
AUSTIN, TEXAS 78759
OMEGAENGINEERS.COM
TX PE Firm Reg. No. F-2147
P:512 575 2288 F:281 647 9184

RIVERSIDE DR SB

MISCELLANEOUS REPAIR DETAILS

SHEET 1 OF 1

FED.RD. DIV.NO.	PROJECT NO.		HIGHWAY NO.
6	SEE TITLE SHEET		CS
STATE	DISTRICT	COUNTY	SHEET NO.
TEXAS	FTW	TARRANT	
CONTROL	SECTION NO.	JOB	82
0902	90	019, ETC.	

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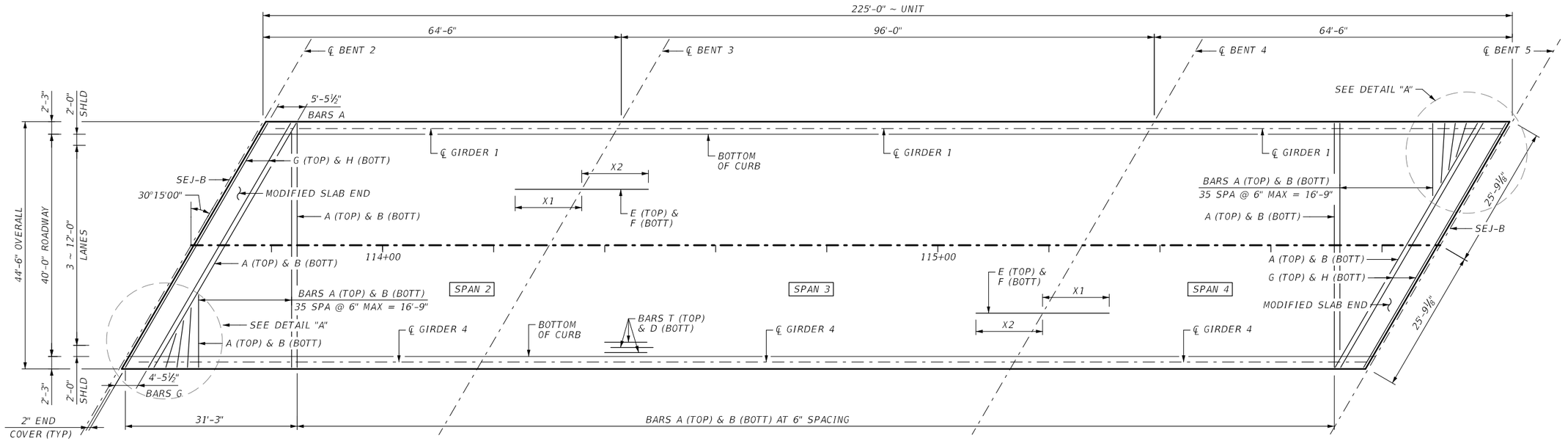
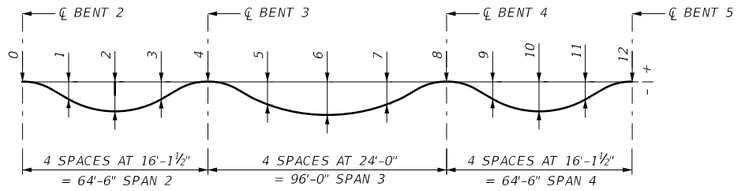
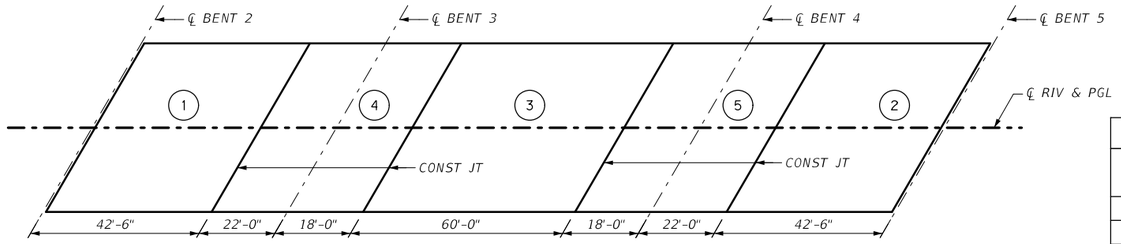


PLAN

DETAIL "A"



DEAD LOAD DEFLECTION DIAGRAM



CONCRETE PLACEMENT SEQUENCE

N.T.S.

TABLE "X"		
BAR	X1	X2
E	24'-2"	20'-0"
F	23'-6"	19'-0"

DECK REBAR	
BAR	SIZE
A	#7
AA	#5
B	#6
D	#5
E	#6
F	#4
G	#7
H	#6
OA	#5
L1	#5
T	#5

TABLE OF ESTIMATED QUANTITIES		
SPAN	REINF CONCRETE SLAB	REINF STEEL (1)
NO.	SF	LB
2	2,870.3	20,091.8
3	4,272.0	29,904.0
4	2,870.3	20,091.8
TOTAL	10,012.5	70,087.6

(1) FOR CONTRACTOR INFORMATION ONLY

GENERAL NOTES:

1. DESIGNED ACCORDING TO AASHTO LRFD DESIGN SPECIFICATION, 9TH EDITION (2020).
2. SEE APPLICABLE RAIL DETAILS FOR RAIL ANCHORAGE IN SLAB.
3. SEE TRAFFIC RAIL TYPE C411 (MOD) FOR DETAILS NOT SHOWN.
4. SEE SEJ-B STANDARD FOR SEALED EXPANSION JOINT DETAILS NOT SHOWN.

MATERIAL NOTES:

1. PROVIDE CLASS S (HPC) CONCRETE ($f'c$ = 4,000 PSI).
2. PROVIDE GRADE 60 REINFORCING EPOXY COATED STEEL BARS. LAPS WHERE REQUIRED SHALL BE AS FOLLOWS:
   #4 = 2'-5"
   #6 = 3'-7"
3. REINFORCING STEEL WEIGHT IS CALCULATED USING AN APPROXIMATE FACTOR OF 7.0 LBS/SF.

TABLE OF DEAD LOAD DEFLECTIONS DUE TO CAST IN PLACE CONCRETE ONLY (FT)					
LOCATION		GIRDER NO. 1	GIRDER NO. 2	GIRDER NO. 3	GIRDER NO. 4
SPAN 2	0	0.000	0.000	0.000	0.000
	1	0.011	0.022	0.022	0.011
	2	0.011	0.021	0.021	0.011
	3	0.000	0.001	0.001	0.000
	4	0.000	0.000	0.000	0.000
SPAN 3	5	0.032	0.062	0.062	0.032
	6	0.056	0.108	0.108	0.056
	7	0.032	0.062	0.062	0.032
	8	0.000	0.000	0.000	0.000
SPAN 4	9	0.000	0.001	0.001	0.000
	10	0.011	0.021	0.021	0.011
	11	0.011	0.022	0.022	0.011
	12	0.000	0.000	0.000	0.000

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

HL-93 LOADING

STATE OF TEXAS
GODWIN A. ARTHUR
127720
LICENSED
PROFESSIONAL ENGINEER
03/11/2024

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8200 N. MOPAC EXPRESSWAY, STE #280
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Texas Department of Transportation

RIVERSIDE DR SB

255.00' CONTINUOUS STEEL PLATE GIRDER UNIT

SHEET 1 OF 2

FED. RD. DIV. NO.	PROJECT NO.		HIGHWAY NO.
6	SEE TITLE SHEET		CS
STATE	DISTRICT	COUNTY	SHEET NO.
TEXAS	FTW	TARRANT	83
CONTROL	SECTION NO.	JOB	
0902	90	019, ETC.	

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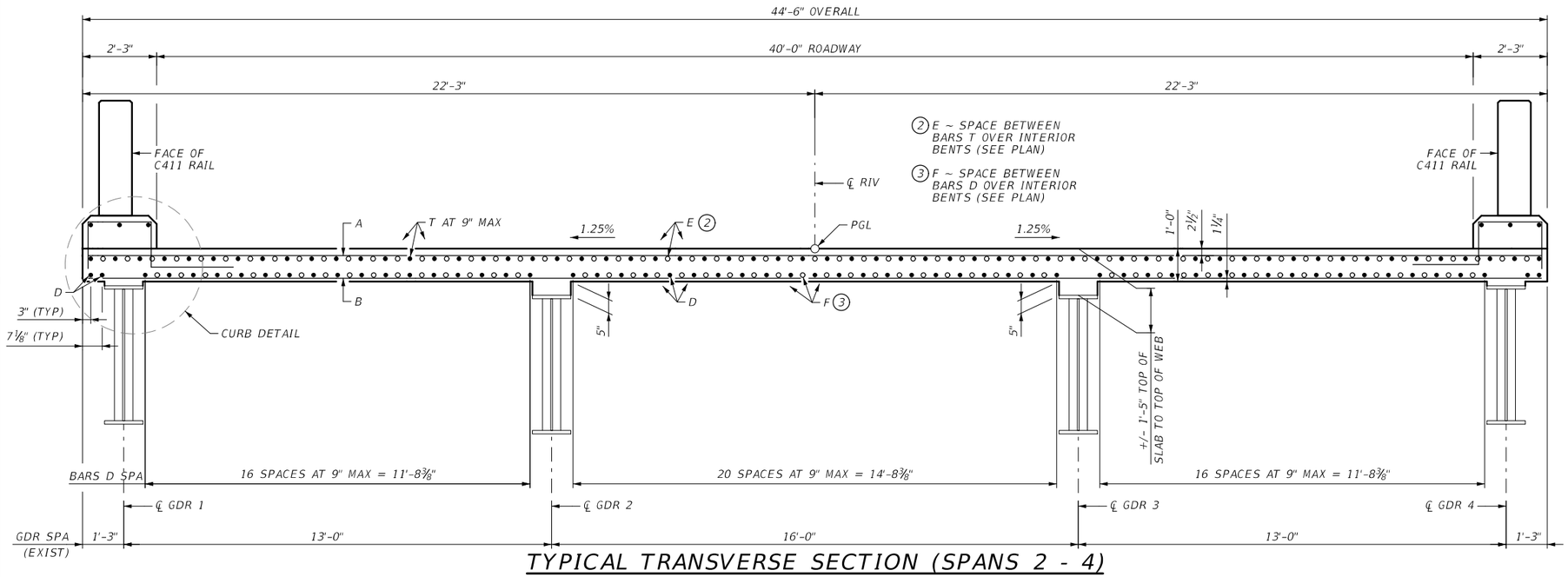
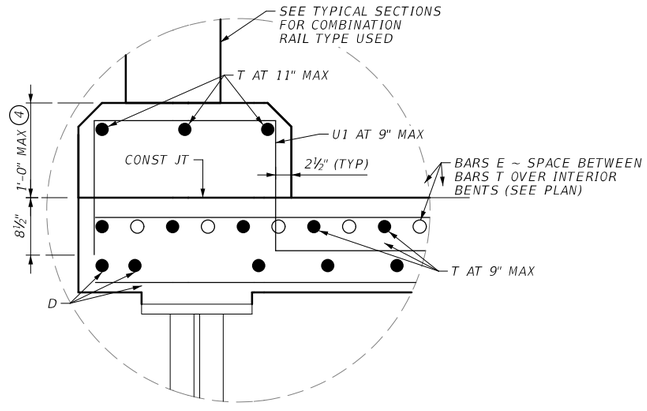


(2) E ~ SPACE BETWEEN BARS T OVER INTERIOR BENTS (SEE PLAN)

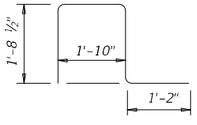
(3) F ~ SPACE BETWEEN BARS D OVER INTERIOR BENTS (SEE PLAN)

TYPICAL TRANSVERSE SECTION (SPANS 2 - 4)

(WITHIN SPAN)



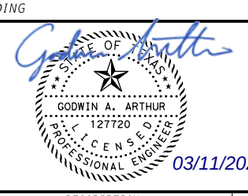
CURB DETAIL



BARS U1 (#5)

(4) FIELD VERIFY TO MATCH CURB THICKNESS WITH EXIST

HL-93 LOADING



REV	BY	DESCRIPTION	DATE

OMEGA ENGINEERS, INC.
8200 N. MOPAC EXPRESSWAY, STE #280
AUSTIN, TEXAS 78759
OMEGAENGINEERS.COM
TX PE Firm Reg. No. F-2147
P:512 575 2288 F:281 647 9184

Texas Department of Transportation

RIVERSIDE DR SB

255.00' CONTINUOUS STEEL PLATE GIRDER UNIT

SHEET 2 OF 2

FED.RD. DIV.NO.	PROJECT NO.		HIGHWAY NO.
6	SEE TITLE SHEET		CS
STATE	DISTRICT	COUNTY	SHEET NO.
TEXAS	FTW	TARRANT	
CONTROL	SECTION NO.	JOB	84
0902	90	019, ETC.	

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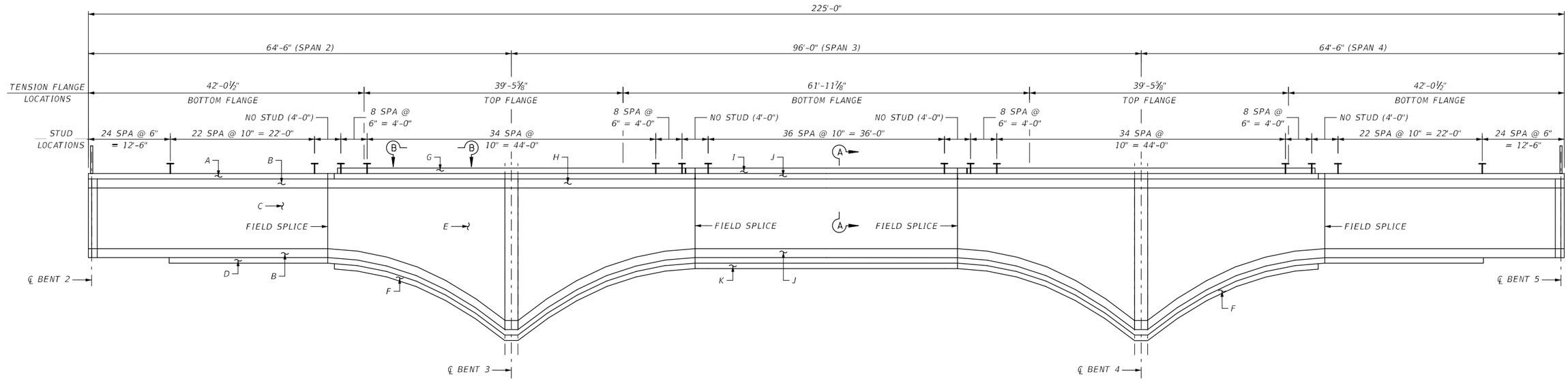
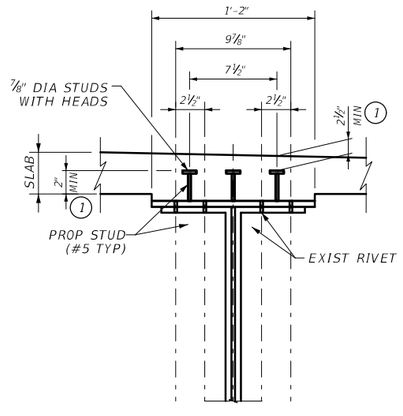


TYPICAL GIRDER ELEVATION

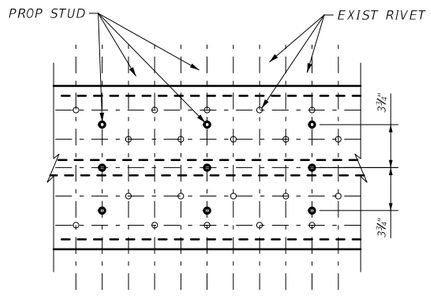
(N.T.S.)

GIRDER PLATES	
PLATE	SIZE
A	14 x ½ x 37'-9"
B	2 L6 x 6 x ½ x 38'-9"
	2 L6 x 6 x ½ x 34'-9"
C	52 x 7/16 x 36'-6 ½"
D	14 x ½ x 52'-0"
E	100 x ⅜ x 28'-1 ½"
F	14 x ⅜ x 52'-4"
G	14 x ⅜ x 53'-0 ½"
	14 x ½ x 55'-0 ¼"
H	2 L6 x 6 x ½ x 56'-0 ½"
I	14 x ⅜ x 33'-9"
	14 x ½ x 40'-4"
J	2 L6 x 6 x ½"
K	14 x ⅜ x 48'-0"
	14 x ½ x 48'-0"



SECTION A-A

(STAGGERED RIVETS LOCATIONS)



SECTION B-B

(STAGGERED RIVETS LOCATIONS)

GENERAL NOTES:

1. DESIGNED ACCORDING TO AASHTO LRFD BRIDGE DESIGN SPECIFICATIONS, "9TH EDITION (2020)"
2. CONTRACTOR TO FIELD VERIFY LOCATIONS OF ALL RIVETS BEFORE STUD PLACEMENT.
3. STUD SPACING SHOULD BE ADJUSTED BY NOT MORE THAN 10 IN WHEN STUD IS IN CONFLICT WITH EXIST RIVET.
4. PROVIDE GALVANIZED BOLTS, NUTS, AND WASHERS FOR ALL FIELD CONNECTIONS IN PAINTED STRUCTURES REQUIRING ASTM F3125 GR A325 BOLTS, INCLUDING ERECTION BOLTS. GALVANIZING MUST MEET THE REQUIREMENTS OF ITEM 445, "GALVANIZING". FIT-UP BOLTS ARE NOT REQUIRED TO BE GALVANIZED.
5. DO NOT PROVIDE GALVANIZED ASTM F3125 GR A490 BOLTS FOR ANY STRUCTURE.

(1) THE FABRICATOR IS REQUIRED TO PROVIDE STUDS MEETING THE RESTRICTIONS SHOWN. STUDS MUST BE AT LEAST 5" IN HEIGHT.

STATE OF TEXAS
GODWIN A. ARTHUR
127720
LICENSED PROFESSIONAL ENGINEER
03/11/2024

REV	BY	DESCRIPTION	DATE

OMEGA ENGINEERS, INC.
8200 N. MOPAC EXPRESSWAY, STE #280
AUSTIN, TEXAS 78759
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TX PE Firm Reg. No. F-2147
P:512 575 2288 F:281 647 9184

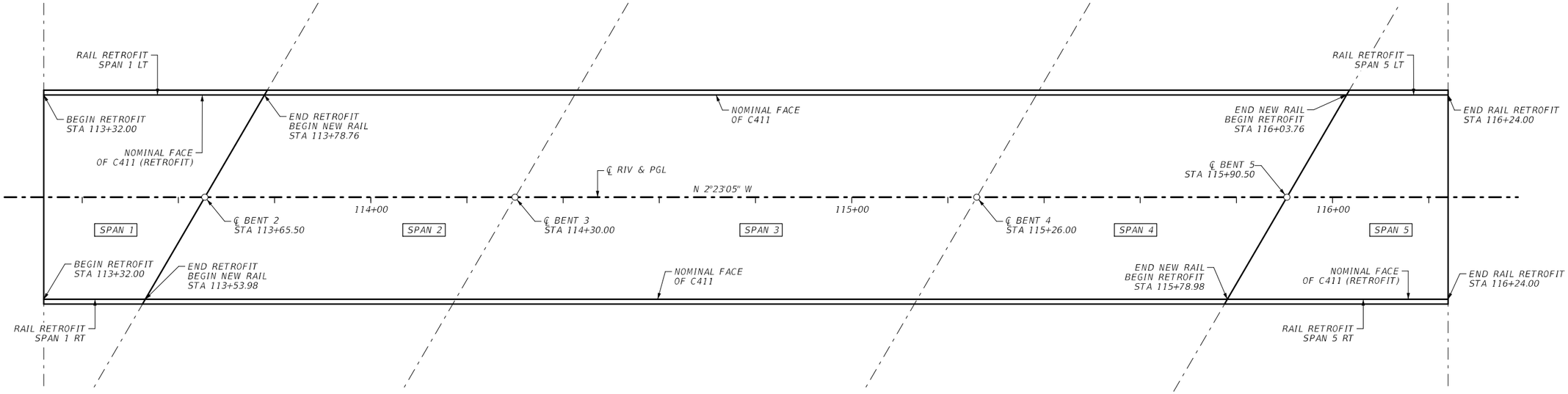
Texas Department of Transportation

RIVERSIDE DR SB

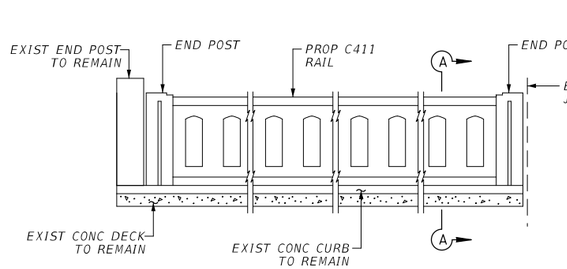
GIRDER STUD LAYOUT

SHEET 1 OF 1

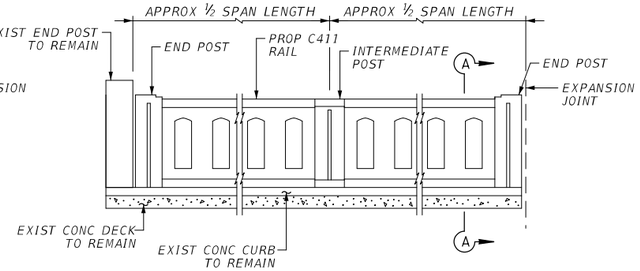
FED. RD. DIV. NO.	PROJECT NO.		HIGHWAY NO.
6	SEE TITLE SHEET		CS
STATE	DISTRICT	COUNTY	SHEET NO.
TEXAS	FTW	TARRANT	85
CONTROL	SECTION NO.	JOB	
0902	90	019, ETC.	



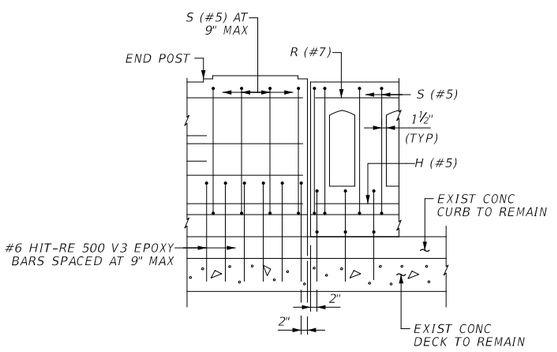
PLAN OF RAIL



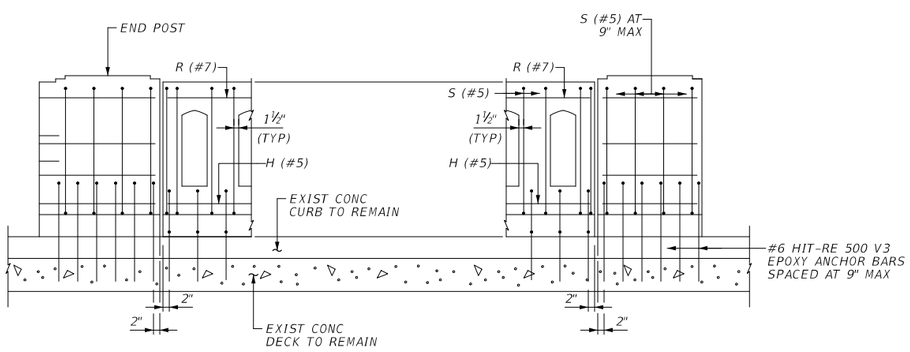
RAIL RETROFIT SPAN 1 RT & SPAN 5 LT (TYPE C)



RAIL RETROFIT SPAN 1 LT AND SPAN 5 RT (TYPE C)



RAIL RETROFIT SPAN 1 RT & SPAN 5 LT REBAR ELEVATION



RAIL RETROFIT SPAN 1 LT AND SPAN 5 RT REBAR ELEVATION

ROADWAY ELEVATION OF RAIL

GODWIN A. ARTHUR
127720
LICENSED
PROFESSIONAL ENGINEER
STATE OF TEXAS
03/11/2024

REV	BY	DESCRIPTION	DATE

OMEGA ENGINEERS, INC.
8200 N. MOPAC EXPRESSWAY, STE #280
AUSTIN, TEXAS 78759
OMEGAENGINEERS.COM
TX PE Firm Reg. No. F-2147
P:512 575 2288 F:281 647 9184

Texas Department of Transportation

RIVERSIDE DR SB

RAIL RETROFIT

SHEET 1 OF 2

FED. RD. DIV. NO.	PROJECT NO.		HIGHWAY NO.
6	SEE TITLE SHEET		CS
STATE	DISTRICT	COUNTY	SHEET NO.
TEXAS	FTW	TARRANT	86
CONTROL	SECTION NO.	JOB	
0902	90	019, ETC.	

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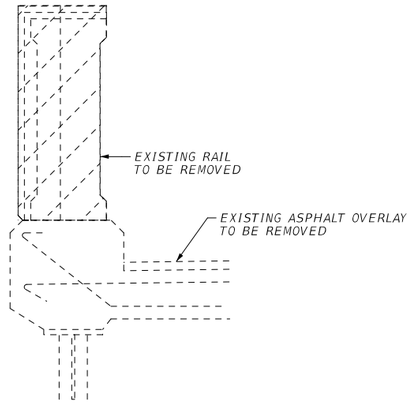
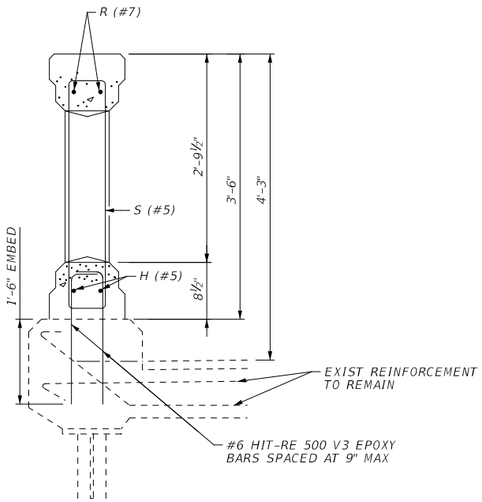


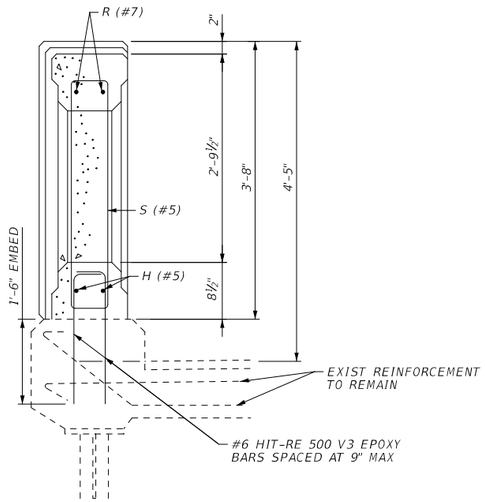
EXISTING RAIL SECTION

GENERAL NOTES:

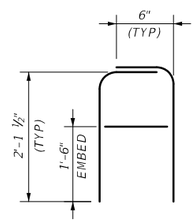
1. SEE RAIL STANDARD, TYP C411 (MOD), FOR OTHER DETAILS NOT SHOWN.
2. APPLICABLE WINDOW TYPE WILL BE TYPE C,
3. ANCHOR INSTALLATION, INCLUDING HOLE SIZE, DRILLING AND CLEAN OUT MUST BE IN ACCORDANCE WITH ITEM 450, "RAILING"
4. USE DRILL EQUIPPED WITH DEPTH GAUGE STOP DEVICE TO KEEP FROM DRILLING THROUGH BOTTOM OF SLAB. IF HOLE EXTENDS THROUGH TO BOTTOM OF SLAB, PLUG BOTTOM OF HOLE PRIOR TO PLACING ADHESIVE ANCHORAGE SYSTEM.
5. LOCATE EXIST REINFORCEMENT IN CURB PRIOR TO DRILLING.



SECTION A-A (THRU WINDOW SPANS 1 & 5)



SECTION A-A (THRU POST SPANS 1 & 5)



(#6)
(SHOWING ONE COMPLETE BAR)

PROPOSED RAIL SECTIONS - SPANS 1 & 5

GODWIN A. ARTHUR
127720
LICENSED
PROFESSIONAL ENGINEER
STATE OF TEXAS
03/11/2024

OMEGA ENGINEERS, INC.
8200 N. MOPAC EXPRESSWAY, STE #280
AUSTIN, TEXAS 78759
OMEGAENGINEERS.COM
TX PE Firm Reg. No. F-2147
P:512 575 2288 F:281 647 9184

REV	BY	DESCRIPTION	DATE

Texas Department of Transportation

RIVERSIDE DR SB

RAIL RETROFIT

SHEET 2 OF 2

FED. RD. DIV. NO.	PROJECT NO.		HIGHWAY NO.
6	SEE TITLE SHEET		CS
STATE	DISTRICT	COUNTY	SHEET NO.
TEXAS	FTW	TARRANT	87
CONTROL	SECTION NO.	JOB	
0902	90	019, ETC.	

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DATE: 3/11/2024 1:46:12 PM
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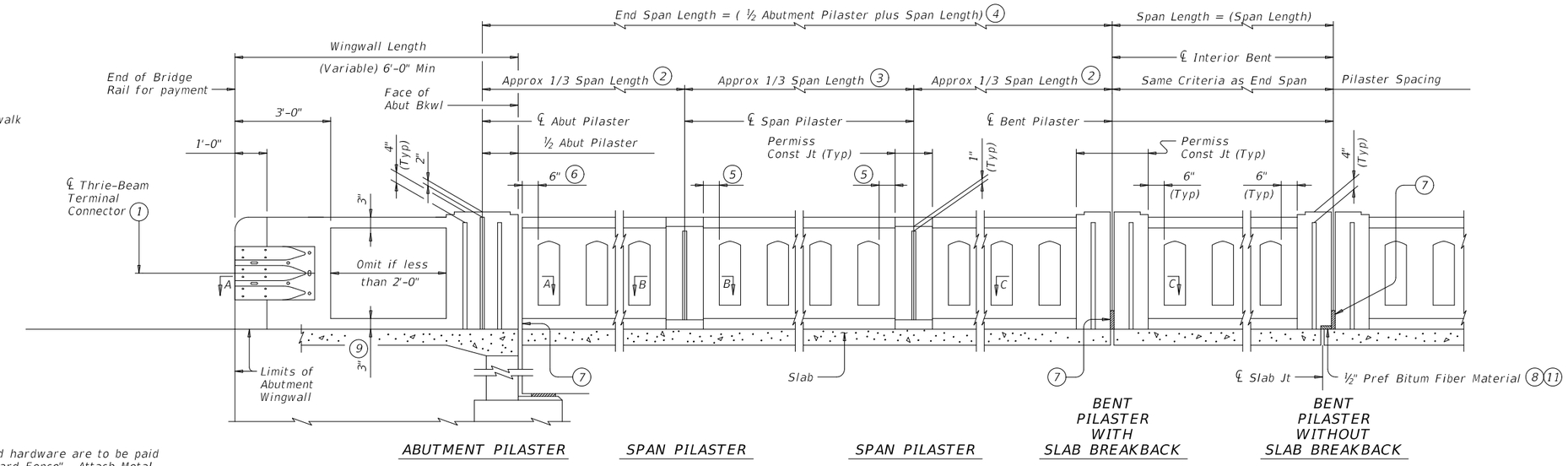
1 Revised section with raised sidewalk with Curb, 05/10/2023



ROADWAY ELEVATION OF RAIL

(Showing without raised sidewalk)

(1) Terminal Connectors and associated hardware are to be paid for under the Item "Metal Beam Guard Fence". Attach Metal Beam Guard Fence Transitions to the bridge rail and extend along the embankment unless otherwise shown in the plans.

(2) Number of windows in exterior bays are equal.

(3) Number of windows in interior bay(s) are not less than the amount in exterior bays (Note 2).

(4) Space Span Pilasters at 1/3 span length (Approx) when spans are 100 ft and less, as shown. Space Span Pilasters at 1/5 span length (Approx) for spans greater than 100 ft.

(5) Dimension is the same for all posts adjacent to Span Pilasters in a span. Dimension may vary from span to span, Min = 3", Max = 7 ½".

(6) Min = 6", Max = 1'-3".

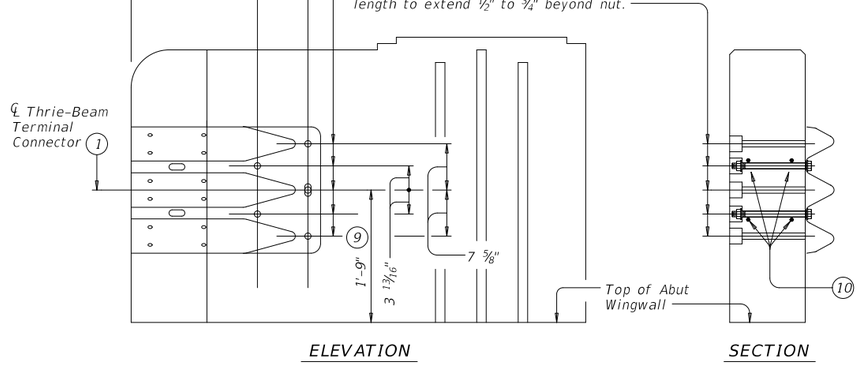
(7) Provide rail joints at ends of all spans the same width as Slab joint opening, except that Rail Joints over construction joints must be ¼" Min to ¾" Max in width. Joints must be open if slab joint opening is not sealed. Joints over construction joints and over sealed deck joints must be plugged. Forming material used in joints may be left in place if it is light in color and compressible, such as the following materials: polystyrene, molded cork granules, sponge rubber sheet, etc. If forming material is not left in place, plug the bottom 6" with slab joint sealing compound to prevent drainage and staining.

(8) Place Preformed Bituminous Fiber Material between slab and rail when rail extends over expansion joint. Shift Bars U as necessary.

(9) Increase 2" for structures with overlay.

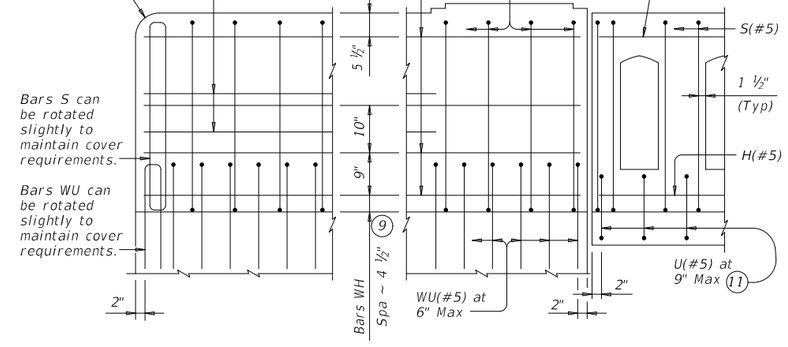
(10) Place 4 additional Bars WH(#5) 3'-8" in length inside Bars S(#5) and centered 2'-0" from end of rail when Terminal Connections are required. Field bend as needed.

(11) Shift U Bars from region below ½" Preformed Bituminous Fiber Material at joints.



TERMINAL CONNECTION DETAILS

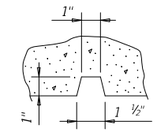
(Showing parapet with Pilaster on 6'-0" Wingwall)



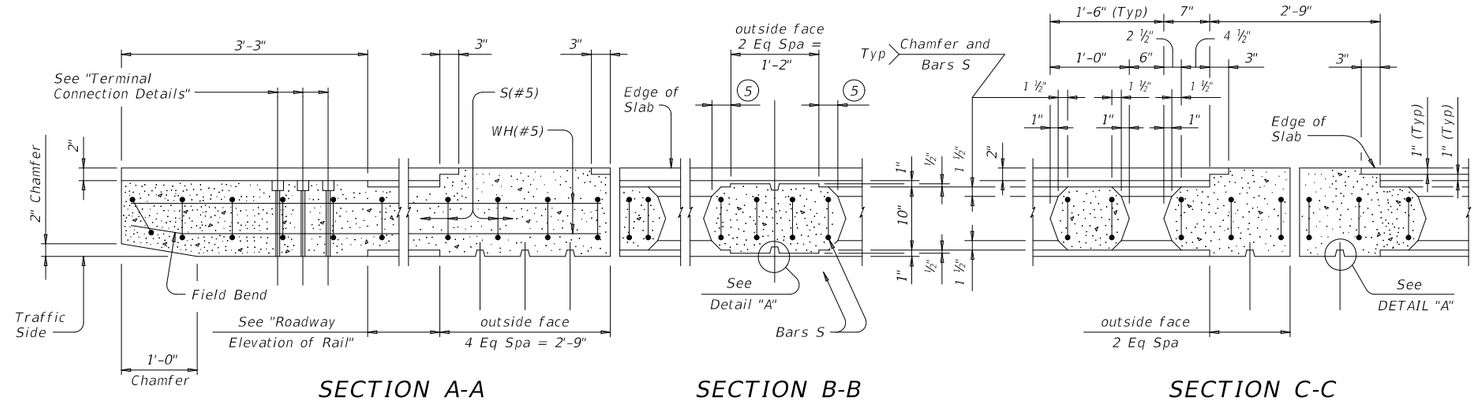
ELEVATION SHOWING TYPICAL REINFORCING PLACEMENT

(Showing without raised sidewalk)

The use of this railing is restricted to speeds of 45 mph or less.



DETAIL "A"



STATE OF TEXAS
GODWIN A. ARTHUR
127220
LICENSED
PROFESSIONAL ENGINEER
03/11/2024

SHEET 1 OF 3

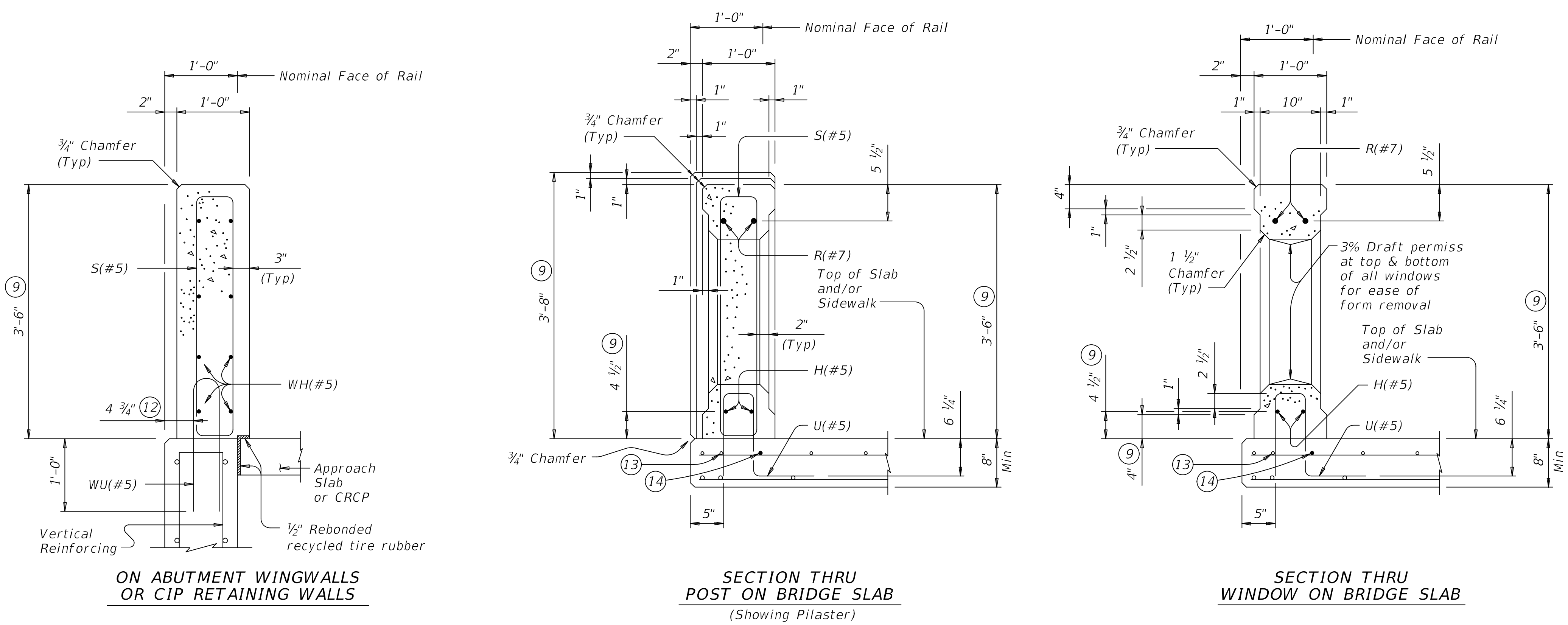
Texas Department of Transportation

Bridge Division Standard

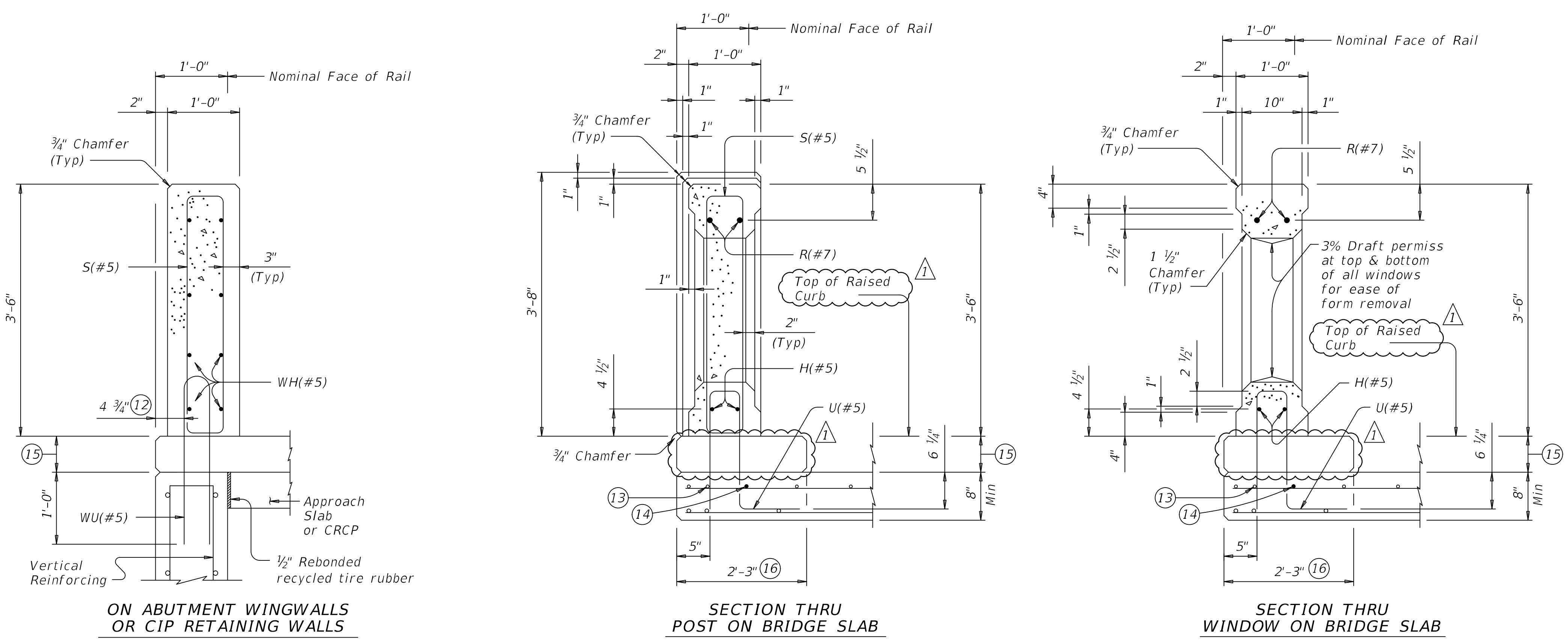
COMBINATION RAIL TEXAS CLASSIC

1 TYPE C411 (MOD)

FILE: rlstd021-20.dgn	DN: TxDOT	CK: TxDOT	DW: TxDOT	CK: TxDOT
©TxDOT September 2019	CONT	SECT	JOB	HIGHWAY
REVISIONS 7-20: Bronze star change to one manufacturer.	0902	90	019, ETC.	CS
	DIST	COUNTY		SHEET NO.
	FTW	TARRANT		88



SECTIONS THRU RAIL WITHOUT RAISED SIDEWALK



SECTIONS THRU RAIL WITH RAISED CURB

(9) Increase 2" for structures with overlay.

(12) 5 ¼" when vertical reinforcing has closer clear cover over horizontal reinforcing in abutment wingwalls or retaining walls on traffic side of wall.

(13) As an aid in supporting reinforcement, additional longitudinal bars may be used in the slab with the approval of the Engineer. Such bars must be furnished at the Contractor's expense.

(14) Top longitudinal slab bar may be adjusted laterally 3" plus or minus to tie reinforcing.

(15) Raised Curb = 1'-0"

(16) Concrete curb is incidental and will be paid for under the item 529 - 6036 "Concrete Curb (Special)"

GODWIN A. ARTHUR 127220 LICENSED PROFESSIONAL ENGINEER STATE OF TEXAS
03/11/2024

△1 Revised section with raised sidewalk with Curb, 05/10/2023

SHEET 2 OF 3

Texas Department of Transportation | Bridge Division Standard

COMBINATION RAIL TEXAS CLASSIC

TYPE C411 (MOD)

FILE: rlstd021-20.dgn	DN: TxDOT	CK: TxDOT	DW: TxDOT	CK: TxDOT
©TxDOT September 2019	CONT	SECT	JOB	HIGHWAY
REVISIONS	0902	90	019, ETC.	CS
7-20: Bronze star change to one manufacturer.	DIST		COUNTY	SHEET NO.
	FTW		TARRANT	89

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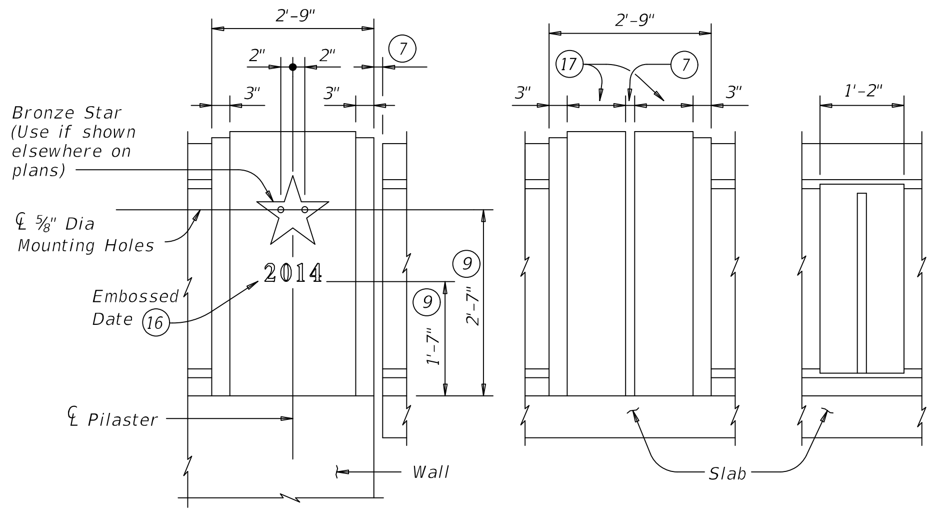
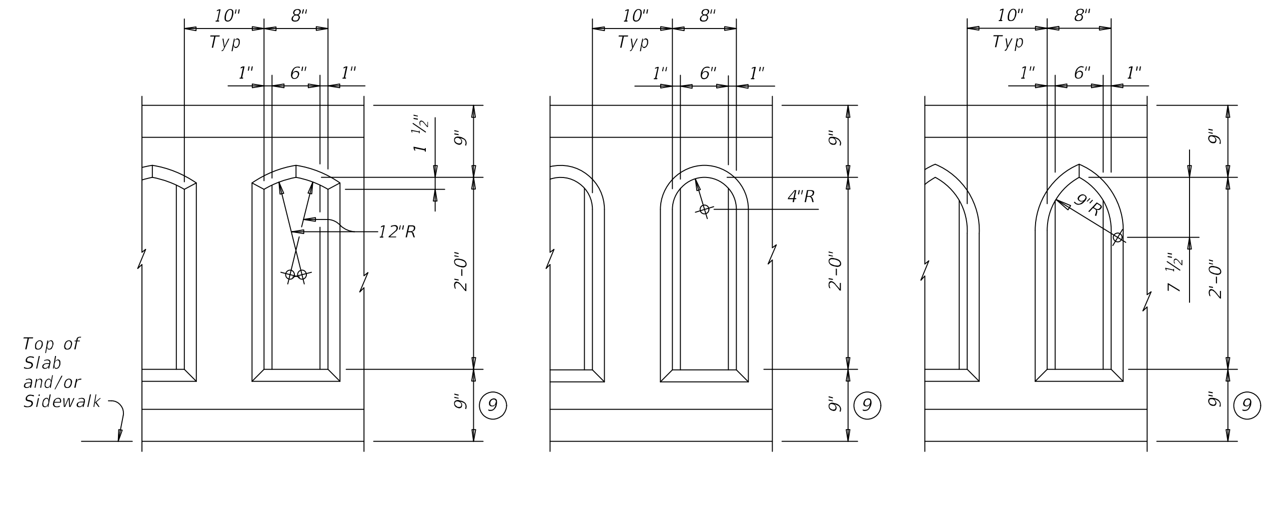
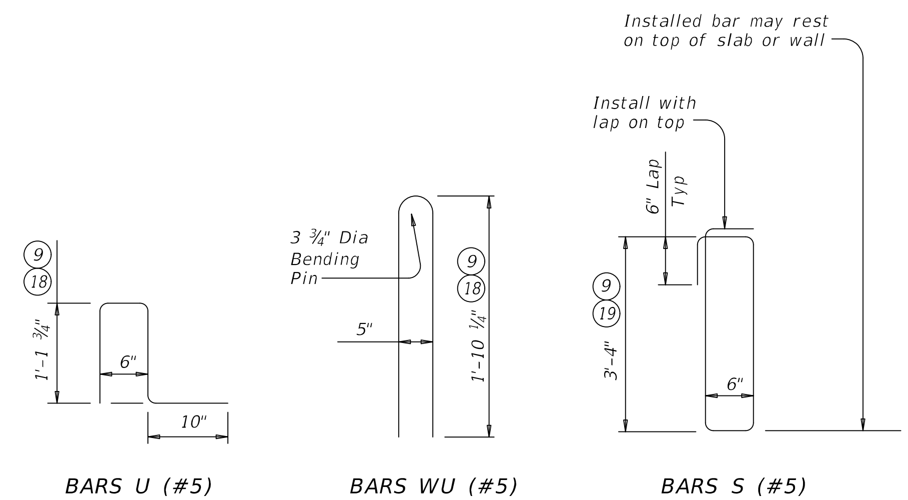


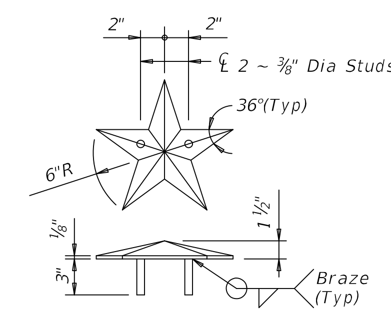
EXTERIOR PILASTER ELEVATIONS

(Showing without raised sidewalk)



WINDOW TYPES

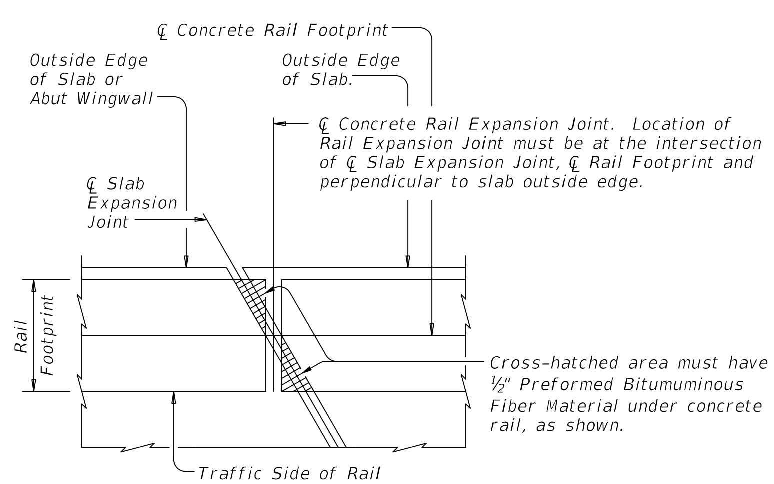




BRONZE STAR DETAIL (20)

One known manufacturer is:

1. Southwell Company
Corpus Christi, Texas



PLAN OF RAIL AT EXPANSION JOINTS

Example showing Slab Expansion Joints without breakbacks.

(7) Provide rail joints at ends of all spans the same width as Slab joint opening, except that Rail Joints over construction joints must be ¼" Min to ¾" Max in width. Joints must be open if slab joint opening is not sealed. Joints over construction joints and over sealed deck joints must be plugged. Forming material used in joints may be left in place if it is light in color and compressible, such as the following materials: polystyrene, molded cork granules, sponge rubber sheet, etc. If forming material is not left in place, plug the bottom 6" with slab joint sealing compound to prevent drainage and staining.

(9) Increase 2" for structures with overlay.

(16) Construction year (use if shown elsewhere on plans) 3" High "Plantin Bold" Typeface with ¼" recess. Placed at one Abutment only or as directed by the Engineer.

(17) Dimensions must be the same on each side of joint.

(18) For raised curbs, add curb height to total bar height. Use sidewalk height at rail's location. ⚠1

(19) Reduce by 2" or field bend over Preformed Bituminous Fiber Material to gain cover.

(20) Bronze Star dimensions of the final product can be slightly smaller due to shrinkage after casting.

⚠1 Revised section with raised sidewalk with Curb, 05/10/2023

CONSTRUCTION NOTES:

Attach Bronze Star with a Type III Class C, D, E, or F epoxy adhesive. Clamp star until epoxy achieves set. Remove any visible epoxy "squeeze out" from under star.

Face of rail and pilasters, parapet must be plumb unless otherwise approved.

Apply a one rub finish to all railing surfaces unless otherwise shown elsewhere on the plans.

MATERIAL NOTES:

Provide Class "C" concrete for railing. Provide Class "C" (HPC) concrete if shown elsewhere in the plans.

Provide Grade 60 reinforcing steel.

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

Bronze Star must be cast of architectural bronze having the following composition: Copper 85 %, Tin 5 %, Lead 5 %, Zinc 5 %.

Provide bar laps, where required, as follows:

Uncoated or galvanized ~ #5 = 2'-0"
Uncoated or galvanized ~ #7 = 2'-11"
Epoxy coated ~ #5 = 3'-0"
Epoxy coated ~ #7 = 4'-4"

GENERAL NOTES:

This rail has been successfully evaluated by full-scale crash test to meet MASH TL-2 criteria. This rail can be used for speeds of 45 mph and less when a TL-2 or TL-3 rated guard fence transition is used. This rail is only approved for low speed use, speeds of 45 mph and less.

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

Rail anchorage details shown on this standard may require modification for select structure types. See appropriate details elsewhere in plans for these modifications.

Shop drawings will not be required for this rail.

⚠1 See Rail Retrofit Sheet or other plan sheets for the following: dimensions with the number of span pilasters, dimensions with the number of windows, window type, inclusion of bronze stars, inclusion of construction year with abutment identity.

Submit erection drawings showing span number, span pilaster locations, number of windows between pilasters and spacing to first window (see Note 6) to the Engineer for approval.

Average weight of railing with no overlay increase and no pilasters is 350 plf.

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

SHEET 3 OF 3

Texas Department of Transportation — Bridge Division Standard

COMBINATION RAIL TEXAS CLASSIC

⚠1 TYPE C411 (MOD)

STATE OF TEXAS — GODWIN A. ARTHUR — 127220 — LICENSED PROFESSIONAL ENGINEER
03/11/2024

FILE: rlstd021-20.dgn	DN: TxDOT	CK: TxDOT	DW: TxDOT	CK: TxDOT
©TxDOT September 2019	CONT 0902	SECT 90	JOB 019, ETC.	HIGHWAY CS
REVISIONS: 7-20: Bronze star change to one manufacturer.	DIST FTW		COUNTY TARRANT	SHEET NO. 90

DATE: 3/11/2024 1:46:26 PM
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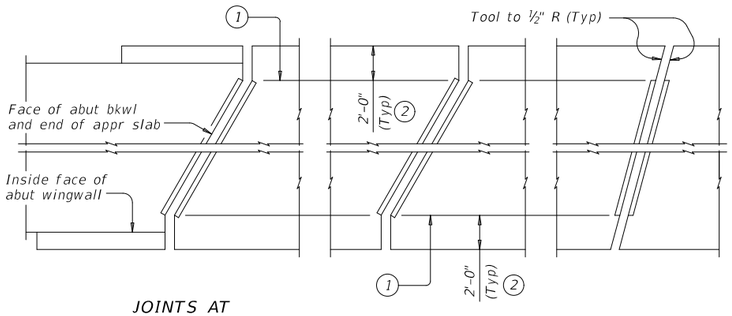
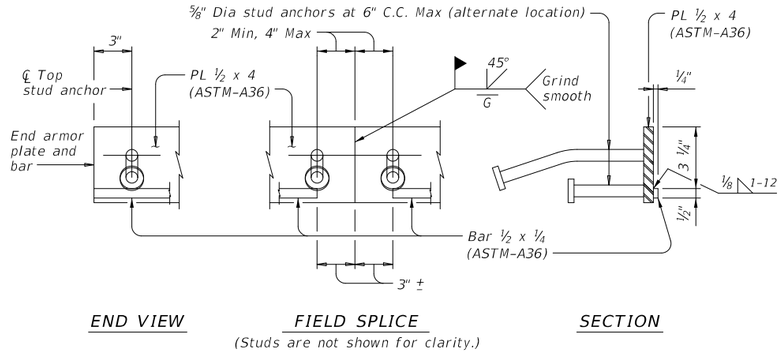


JOINTS AT ABUTMENTS — SKEWS OVER 15° — SKEWS THRU 15°

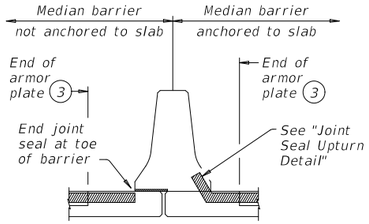
PLANS OF ARMOR PLATES



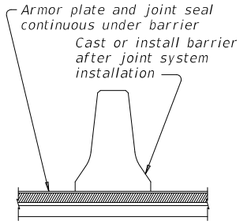
END VIEW — FIELD SPLICE — SECTION

(Studs are not shown for clarity.)

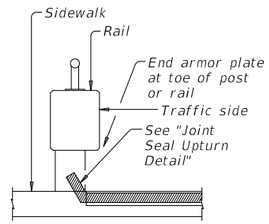
ELEVATION OF ARMOR PLATE



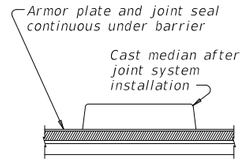
WITH OPEN DECK JOINT BELOW MEDIAN BARRIER



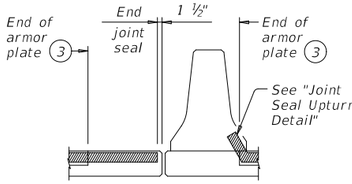
AT MEDIAN BARRIER



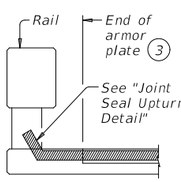
AT SIDEWALK BEHIND BRIDGE RAIL



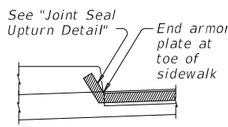
AT RAISED MEDIAN



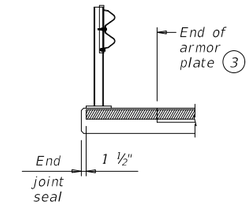
WITH OPEN DECK JOINT ADJACENT TO MEDIAN BARRIER



AT CONCRETE BRIDGE RAIL

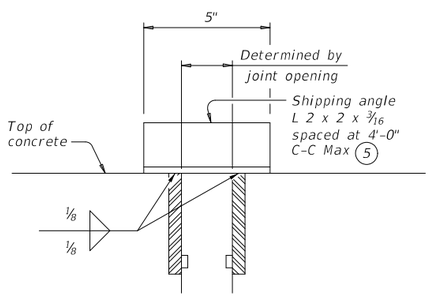


AT SIDEWALK



AT STEEL POST BRIDGE RAIL

TYPICAL SECTIONS OF ARMOR PLATES AND SEALS (4)

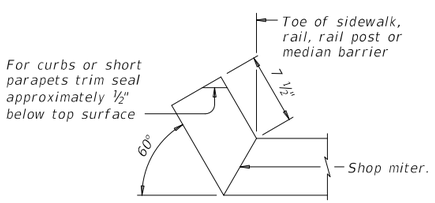


SHOWING ARMOR PLATE

(Studs not shown for clarity)

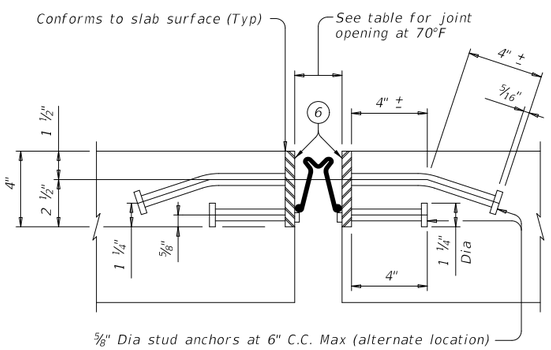
SHIPPING ANGLE

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



JOINT SEAL UPTURN DETAIL

Upturn seal only. Terminate armor plates as shown in "Plans of Armor Plates" and "Typical Sections of Armor Plates & Seals."



JOINT SECTION

Showing R J Watson strip seal. Other strip seals are similar.

TABLE OF SEALED EXPANSION JOINT INFORMATION			
MANUFACTURER	STEEL SECTION (7)	STRIP SEAL 4" JOINT	
		Seal Type	Joint Opening (8)
D.S. Brown	As shown	V-400	2 ¼"
R.J. Watson	As shown	SF-400	2 ½"
SSI	As shown	SSS-400	2 ½"
Watson Bowman Acme	As shown	SPS-400	2"

REDUCED LONGITUDINAL MOVEMENT RANGE	
SKEW (deg)	JOINT SIZE 4"
0	4.0"
15	4.0"
30	3.5"
45	2.8"

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) At Fabricator's option, armor plate may extend up to 6" beyond this point for skews through 15°.

(2) Unless shown otherwise, terminate armor plate at slab break point if break is more than 2'-0" from slab edge.

(3) See "Plans of Armor Plates".

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

(5) Align shipping angle perpendicular to joint.

(6) Coat with Manufacturer's supplied epoxy primer above bar before installing sealant.

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

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

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." Provide paints in accordance with Item 446.2. Prepare steel and apply paint in accordance with Item 446.4.7.3 and 446.4.7.4.

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

CONSTRUCTION NOTES:

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

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

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

Splice and install seal in accordance with the Manufacturer's directions and with the adhesive provided by the Manufacturer.

Splice in joint seal may be performed in the field.

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-B is 6 ½".

Texas Department of Transportation

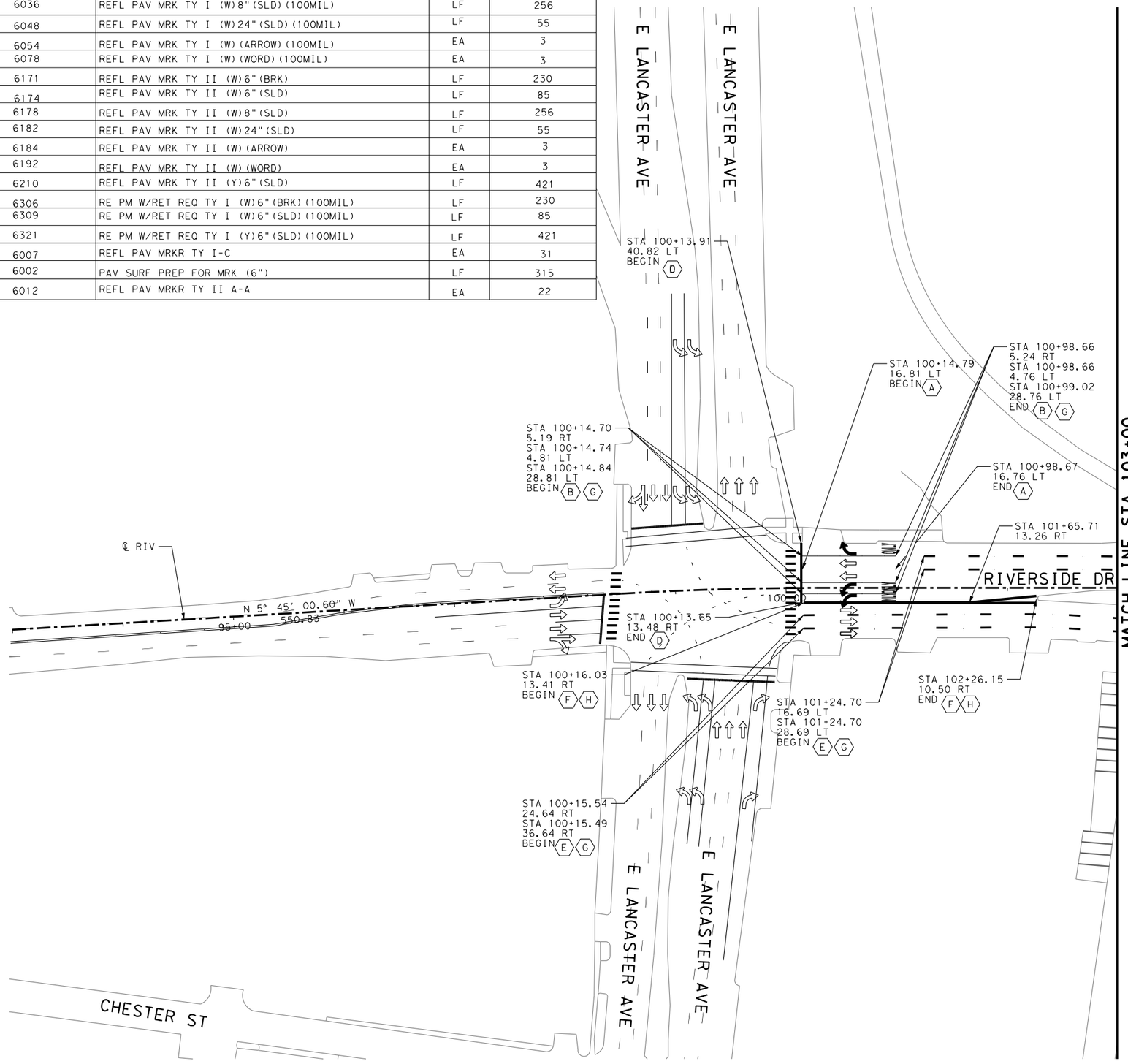
Bridge Division Standard

SEALED EXPANSION JOINT TYPE B WITHOUT OVERLAY

SEJ-B

FILE: sejbste1-19.dgn	DN: TxDOT	CK: TxDOT	DW: JTR	CK: JMH
©TxDOT April 2019 REVISIONS	CONT	SECT	JOB	HIGHWAY
	0902	90	019, ETC.	CS
	DIST	COUNTY		SHEET NO.
	FTW	TARRANT		91

ESTIMATED QUANTITIES				
ITEM	CODE	DESCRIPTION	UNIT	QUANTITY
666	6036	REFL PAV MRK TY I (W)8"(SLD)(100MIL)	LF	256
666	6048	REFL PAV MRK TY I (W)24"(SLD)(100MIL)	LF	55
666	6054	REFL PAV MRK TY I (W)(ARROW)(100MIL)	EA	3
666	6078	REFL PAV MRK TY I (W)(WORD)(100MIL)	EA	3
666	6171	REFL PAV MRK TY II (W)6"(BRK)	LF	230
666	6174	REFL PAV MRK TY II (W)6"(SLD)	LF	85
666	6178	REFL PAV MRK TY II (W)8"(SLD)	LF	256
666	6182	REFL PAV MRK TY II (W)24"(SLD)	LF	55
666	6184	REFL PAV MRK TY II (W)(ARROW)	EA	3
666	6192	REFL PAV MRK TY II (W)(WORD)	EA	3
666	6210	REFL PAV MRK TY II (Y)6"(SLD)	LF	421
666	6306	RE PM W/RET REQ TY I (W)6"(BRK)(100MIL)	LF	230
666	6309	RE PM W/RET REQ TY I (W)6"(SLD)(100MIL)	LF	85
666	6321	RE PM W/RET REQ TY I (Y)6"(SLD)(100MIL)	LF	421
672	6007	REFL PAV MRKR TY I-C	EA	31
678	6002	PAV SURF PREP FOR MRK (6")	LF	315
6037	6012	REFL PAV MRKR TY II A-A	EA	22



LEGEND:

- ⇦ TRAFFIC FLOW ARROW
- TY I (W) (ARROW)
- (A) TY I (W)6"(SLD)(100 MIL)
- (B) TY I (W)8"(SLD)(100 MIL)
- (C) TY I (W)12"(SLD)(100 MIL)
- (D) TY I (W)24"(SLD)(100 MIL)
- (E) TY I (W)6"(BRK)(100 MIL)
- (F) TY I (Y)6"(DBL)(SLD)(100 MIL)
- (G) TY I-C MRKR
- (H) TY II A-A MRKR
- INSTL DEL ASSM (D-SW) SZ 1(BRF)GF2
- ▬ PROP PAVE MARKINGS
- ── EXIST PAVE MARKINGS

NOTE:
1. ALL TYPE I STRIPING TO INCLUDE TYPE II STRIPING AS A SEALER.
2. RPM'S NOT SHOWN FOR CLARITY

0 50' 100'

SCALE: 1" = 100'

STATE OF TEXAS
ALEX I. GARCIA
107317
PROFESSIONAL LICENSED ENGINEER

04/12/2024

REV	BY	DESCRIPTION	DATE

AGUIRRE & FIELDS
ENGINEERING INNOVATORS
TBPE FIRM REGISTRATION •739

Texas Department of Transportation

RIVERSIDE DR SB

SIGNING AND PAVEMENT MARKING PLAN

BEGIN TO STA 103+00

SHEET 1 OF 4

FED.RD. DIV.NO.	PROJECT NO.		HIGHWAY NO.
6	SEE TITLE SHEET		CS
STATE	DISTRICT	COUNTY	SHEET NO.
TEXAS	FTW	TARRANT	92
CONTROL	SECTION NO.	JOB	
0902	90	019, ETC	

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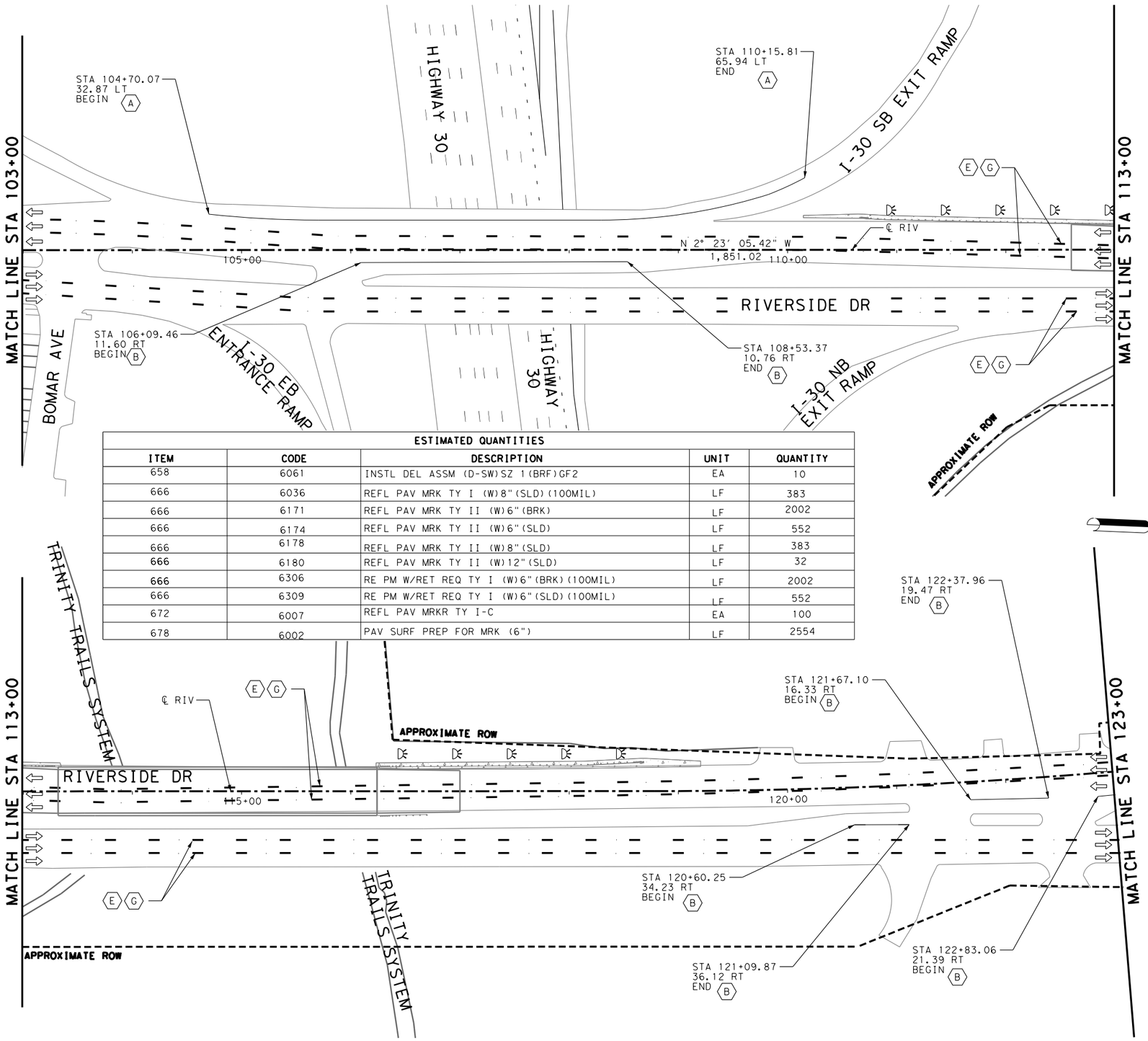

ESTIMATED QUANTITIES				
ITEM	CODE	DESCRIPTION	UNIT	QUANTITY
658	6061	INSTL DEL ASSM (D-SW)SZ 1(BRF)GF2	EA	10
666	6036	REFL PAV MRK TY I (W)8"(SLD)(100MIL)	LF	383
666	6171	REFL PAV MRK TY II (W)6"(BRK)	LF	2002
666	6174	REFL PAV MRK TY II (W)6"(SLD)	LF	552
666	6178	REFL PAV MRK TY II (W)8"(SLD)	LF	383
666	6180	REFL PAV MRK TY II (W)12"(SLD)	LF	32
666	6306	RE PM W/RET REQ TY I (W)6"(BRK)(100MIL)	LF	2002
666	6309	RE PM W/RET REQ TY I (W)6"(SLD)(100MIL)	LF	552
672	6007	REFL PAV MRKR TY I-C	EA	100
678	6002	PAV SURF PREP FOR MRK (6")	LF	2554

LEGEND:

- TRAFFIC FLOW ARROW
- TY I (W) (ARROW)
- (A) TY I (W)6"(SLD)(100 MIL)
- (B) TY I (W)8"(SLD)(100 MIL)
- (C) TY I (W)12"(SLD)(100 MIL)
- (D) TY I (W)24"(SLD)(100 MIL)
- (E) TY I (W)6"(BRK)(100 MIL)
- (F) TY I (Y)6"(DBL)(SLD)(100 MIL)
- (G) TY I-C MRKR
- (H) TY II A-A MRKR
- INSTL DEL ASSM (D-SW) SZ 1(BRF)GF2
- PROP PAVE MARKINGS
- EXIST PAVE MARKINGS

NOTE:
1. ALL TYPE I STRIPING TO INCLUDE TYPE II STRIPING AS A SEALER.
2. RPM'S NOT SHOWN FOR CLARITY

0 50' 100'

SCALE: 1" = 100'

STATE OF TEXAS
ALEX I. GARCIA
107317
PROFESSIONAL LICENSED ENGINEER

04/12/2024

REV	BY	DESCRIPTION	DATE

AGUIRRE & FIELDS
ENGINEERING INNOVATORS
TBPE FIRM REGISTRATION •739

Texas Department of Transportation

RIVERSIDE DR SB

SIGNING AND PAVEMENT MARKING PLAN

STA 103+00 TO STA 123+00

SHEET 2 OF 4

FED.RD. DIV.NO.	PROJECT NO.		HIGHWAY NO.
6	SEE TITLE SHEET		CS
STATE	DISTRICT	COUNTY	SHEET NO.
TEXAS	FTW	TARRANT	
CONTROL	SECTION NO.	JOB	93
0902	90	019, ETC	

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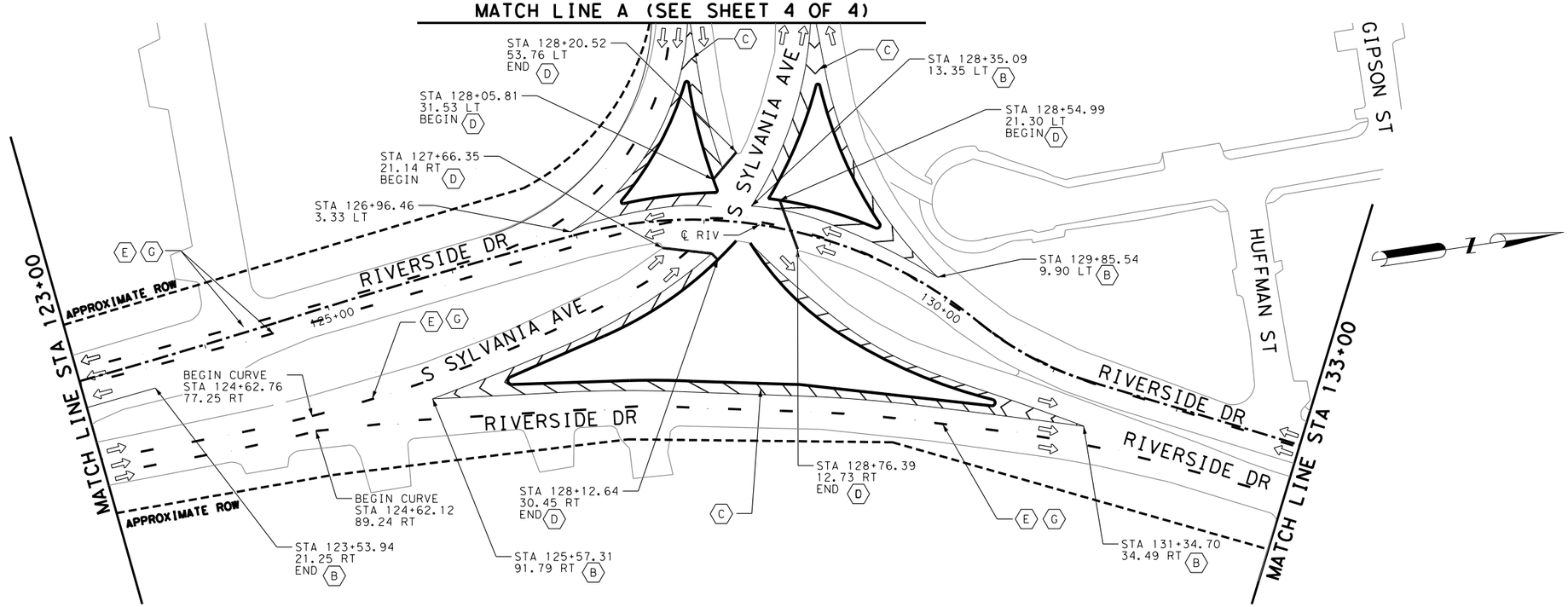

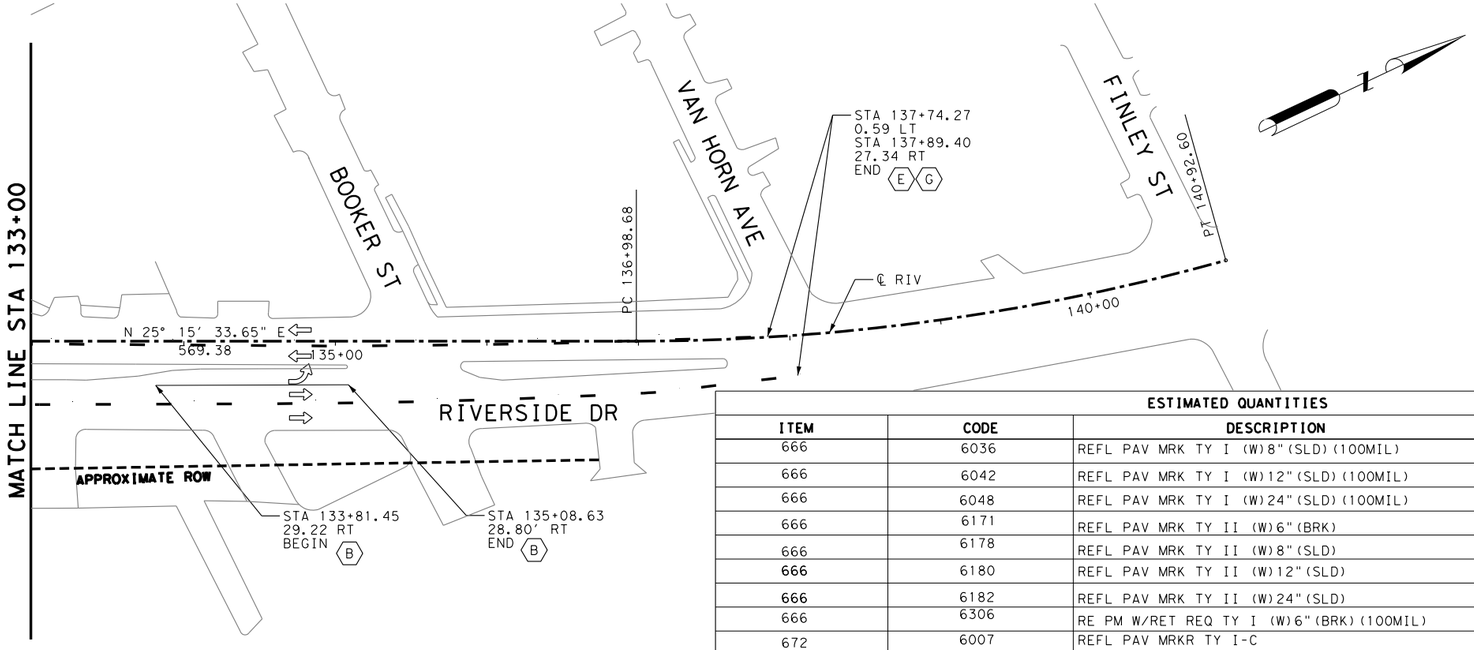

LEGEND:

- TRAFFIC FLOW ARROW
- TY I (W) (ARROW)
- A — TY I (W)6"(SLD)(100 MIL)
- B — TY I (W)8"(SLD)(100 MIL)
- C — TY I (W)12"(SLD)(100 MIL)
- D — TY I (W)24"(SLD)(100 MIL)
- E — TY I (W)6"(BRK)(100 MIL)
- F — TY I (Y)6"(DBL)(SLD)(100 MIL)
- G — TY I-C MRKR
- H — TY II A-A MRKR
- INSTL DEL ASSM (D-SW) SZ 1(BRF)GF2
- PROP PAVE MARKINGS
- EXIST PAVE MARKINGS

NOTE:
1. ALL TYPE I STRIPING TO INCLUDE TYPE II STRIPING AS A SEALER.
2. RPM'S NOT SHOWN FOR CLARITY

0 50' 100'

SCALE: 1" = 100'

ESTIMATED QUANTITIES

ITEM	CODE	DESCRIPTION	UNIT	QUANTITY
666	6036	REFL PAV MRK TY I (W)8"(SLD)(100MIL)	LF	2183
666	6042	REFL PAV MRK TY I (W)12"(SLD)(100MIL)	LF	885
666	6048	REFL PAV MRK TY I (W)24"(SLD)(100MIL)	LF	114
666	6171	REFL PAV MRK TY II (W)6"(BRK)	LF	995
666	6178	REFL PAV MRK TY II (W)8"(SLD)	LF	2183
666	6180	REFL PAV MRK TY II (W)12"(SLD)	LF	885
666	6182	REFL PAV MRK TY II (W)24"(SLD)	LF	114
666	6306	RE PM W/RET REQ TY I (W)6"(BRK)(100MIL)	LF	995
672	6007	REFL PAV MRKR TY I-C	EA	50
678	6002	PAV SURF PREP FOR MRK (6")	LF	995

STATE OF TEXAS
ALEX I. GARCIA
107317
PROFESSIONAL LICENSED ENGINEER

04/12/2024

REV	BY	DESCRIPTION	DATE

AGUIRRE & FIELDS
ENGINEERING INNOVATORS
TBPE FIRM REGISTRATION #739

Texas Department of Transportation

RIVERSIDE DR SB

SIGNING AND PAVEMENT MARKING PLAN

STA 123+00 TO END

SHEET 3 OF 4

FED.RD. DIV.NO.	PROJECT NO.	HIGHWAY NO.
6	SEE TITLE SHEET	CS

STATE	DISTRICT	COUNTY	SHEET NO.
TEXAS	FTW	TARRANT	94

CONTROL	SECTION NO.	JOB
0902	90	019, ETC

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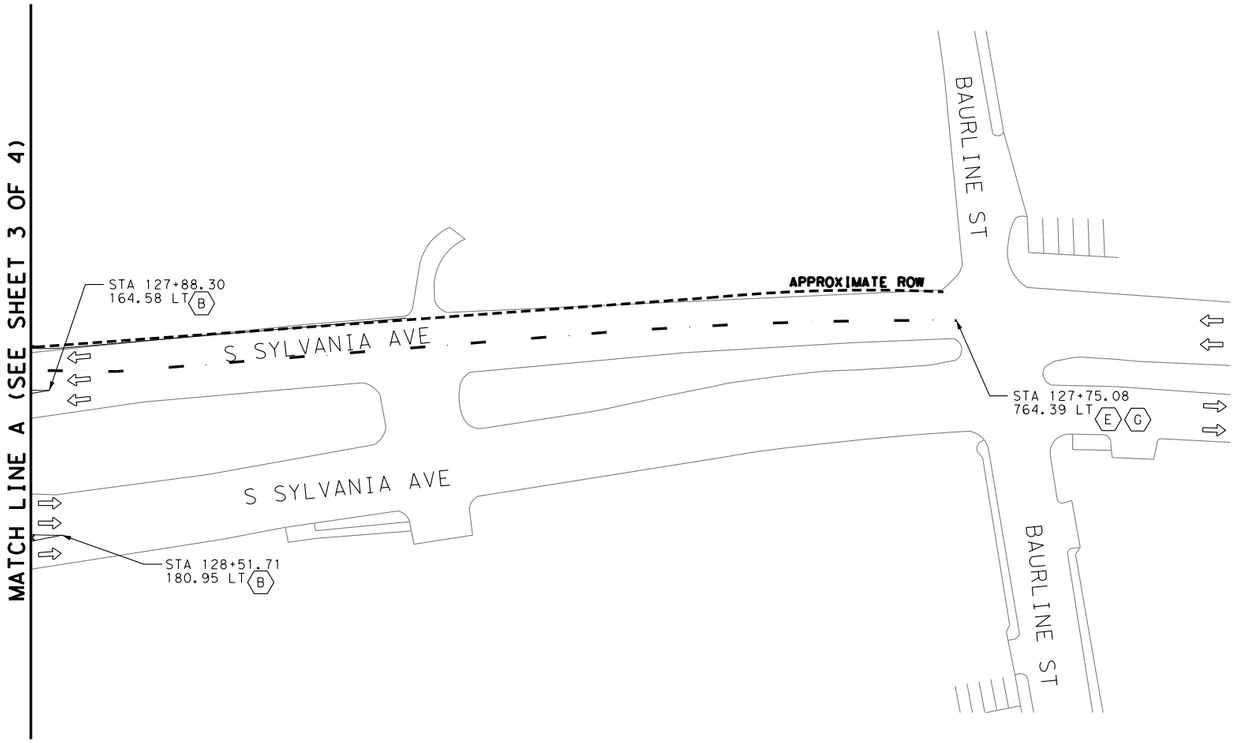

LEGEND:

- TRAFFIC FLOW ARROW
- TY I (W) (ARROW)
- A — TY I (W)6"(SLD)(100 MIL)
- B — TY I (W)8"(SLD)(100 MIL)
- C — TY I (W)12"(SLD)(100 MIL)
- D — TY I (W)24"(SLD)(100 MIL)
- E — TY I (W)6"(BRK)(100 MIL)
- F — TY I (Y)6"(DBL)(SLD)(100 MIL)
- G — TY I-C MRKR
- H — TY II A-A MRKR
- INSTL DEL ASSM (D-SW) SZ 1(BRF)GF2
- PROP PAVE MARKINGS
- EXIST PAVE MARKINGS

NOTE:
1. ALL TYPE I STRIPING TO INCLUDE TYPE II STRIPING AS A SEALER.
2. RPM'S NOT SHOWN FOR CLARITY

0 50' 100'

SCALE: 1" = 100'

ESTIMATED QUANTITIES

ITEM	CODE	DESCRIPTION	UNIT	QUANTITY
666	6036	REFL PAV MRK TY I (W)8"(SLD)(100MIL)	LF	67
666	6042	REFL PAV MRK TY I (W)12"(SLD)(100MIL)	LF	5
666	6171	REFL PAV MRK TY II (W)6"(BRK)	LF	153
666	6178	REFL PAV MRK TY II (W)8"(SLD)	LF	67
666	6180	REFL PAV MRK TY II (W)12"(SLD)	LF	5
666	6306	RE PM W/RET REQ TY I (W)6"(BRK)(100MIL)	LF	153
672	6007	REFL PAV MRKR TY I-C	EA	8
678	6002	PAV SURF PREP FOR MRK (6")	LF	153

STATE OF TEXAS
ALEX I. GARCIA
107317
PROFESSIONAL LICENSED ENGINEER

04/12/2024

REV	BY	DESCRIPTION	DATE

AGUIRRE & FIELDS
ENGINEERING INNOVATORS
TBPE FIRM REGISTRATION •739

Texas Department of Transportation

RIVERSIDE DR SB

SIGNING AND PAVEMENT MARKING PLAN

MATCHLINE A TO END

SHEET 4 OF 4

FED.RD. DIV.NO.	PROJECT NO.		HIGHWAY NO.
6	SEE TITLE SHEET		CS
STATE	DISTRICT	COUNTY	SHEET NO.
TEXAS	FTW	TARRANT	95
CONTROL	SECTION NO.	JOB	
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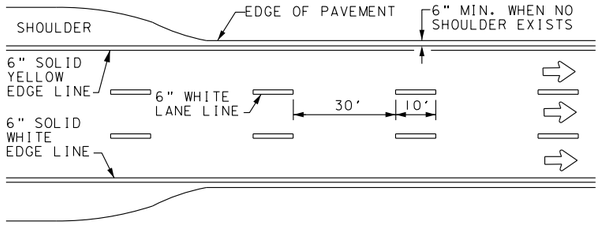
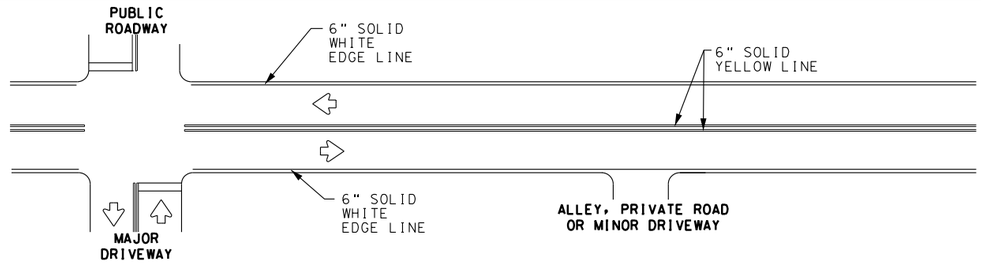
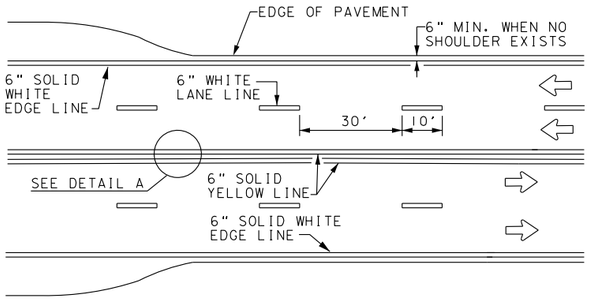
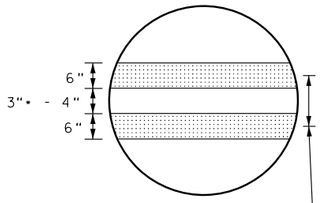


EDGE LINE AND LANE LINES
ONE-WAY ROADWAY
WITH OR WITHOUT SHOULDERS



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

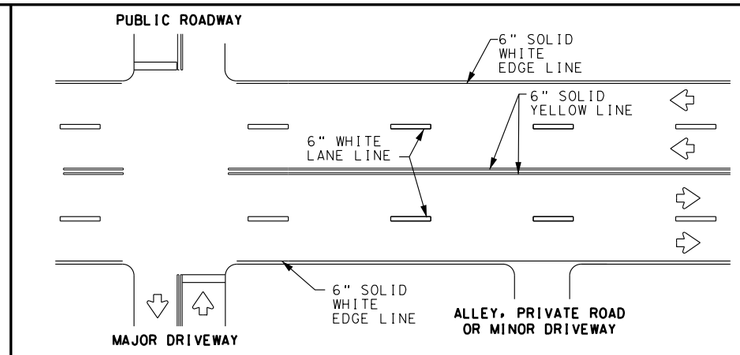




CENTERLINE AND LANE LINES
FOUR LANE TWO-WAY ROADWAY
WITH OR WITHOUT SHOULDERS

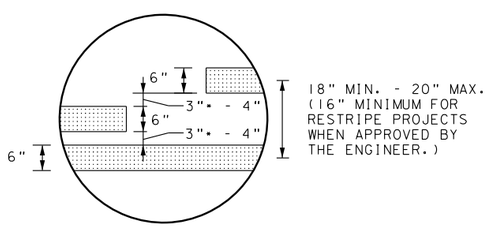
* 2" MINIMUM FOR RESTRIPE PROJECTS WHEN APPROVED BY THE ENGINEER.

** 8" MINIMUM FOR RESTRIPE PROJECTS WHEN APPROVED BY THE ENGINEER.

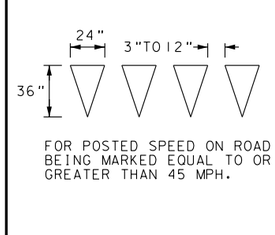


TYPICAL MULTI-LANE, TWO-WAY PAVEMENT
MARKINGS THROUGH INTERSECTIONS

TWO LANE TWO-WAY ROADWAY
WITH OR WITHOUT SHOULDERS



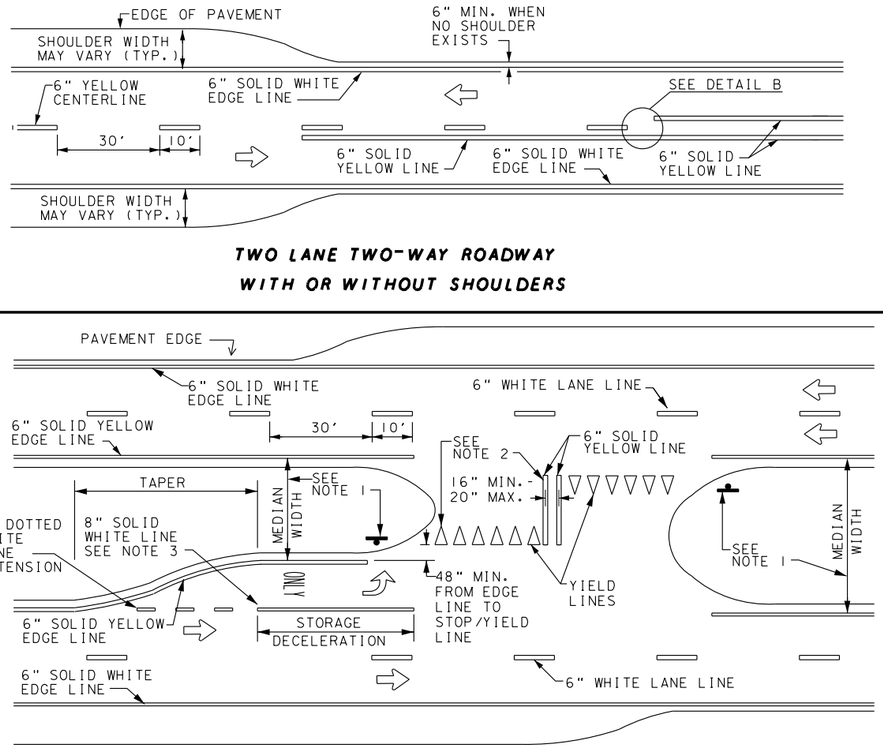
* 2" MINIMUM FOR RESTRIPE PROJECTS WHEN APPROVED BY THE ENGINEER.



FOR POSTED SPEED ON ROAD BEING MARKED EQUAL TO OR GREATER THAN 45 MPH.

YIELD LINES

FOR POSTED SPEED ON ROAD BEING MARKED EQUAL TO OR LESS THAN 40 MPH.



FOUR LANE DIVIDED ROADWAY CROSSOVERS

NOTES

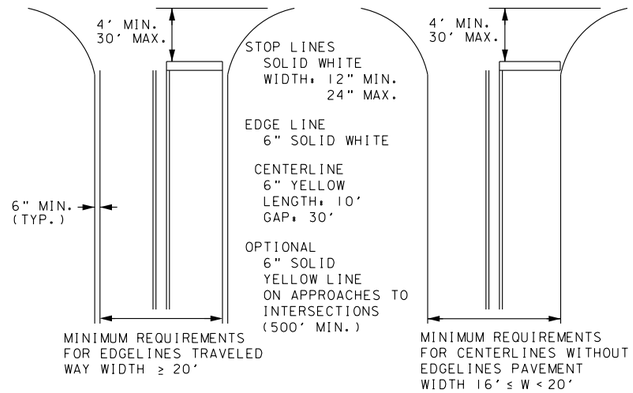
1. WHERE DIVIDED HIGHWAYS ARE SEPARATED BY MEDIAN WIDTHS AT THE MEDIAN OPENING ITSELF OF 30 FEET OR MORE, MEDIAN OPENINGS SHALL BE SIGNED AS TWO SEPARATE INTERSECTIONS.
   EACH MEDIAN OPENING HAS TWO WIDTH MEASUREMENTS, WITH ONE MEASUREMENT FOR EACH APPROACH. THE NARROW MEDIAN WIDTH WILL BE THE CONTROLLING WIDTH TO DETERMINE IF SIGNS ARE REQUIRED. YIELD SIGNS ARE THE TYPICAL INTERSECTION CONTROL. STOP SIGNS AND STOP BARS ARE OPTIONAL AS DETERMINED BY THE ENGINEER.
2. INSTALL MEDIAN STRIPING (DOUBLE YELLOW CENTERLINES AND STOP LINES/YIELD LINES) WHEN A 50' OR GREATER MEDIAN CENTERLINE CAN BE PLACED. STOP LINES SHALL ONLY BE USED WITH STOP SIGNS. YIELD LINES SHALL ONLY BE USED WITH YIELD SIGNS.
3. LENGTH OF TURN BAYS, INCLUDING TAPER, DECELERATION, AND STORAGE LENGTHS SHALL BE AS SHOWN ON THE PLANS OR AS DIRECTED BY THE ENGINEER.

GENERAL NOTES

1. EDGE LINE STRIPING SHALL BE AS SHOWN IN THE PLANS OR AS DIRECTED BY THE ENGINEER. THE EDGE LINE SHOULD NOT BE PLACED LESS THAN 6 INCHES FROM THE EDGE OF PAVEMENT. THIS DISTANCE MAY VARY DUE TO PAVEMENT RAVELING OR OTHER CONDITIONS. EDGE LINES ARE NOT REQUIRED IN CURB AND GUTTER SECTIONS OF ROADWAYS.
2. THE TRAVELED WAY INCLUDES ONLY THAT PORTION OF THE ROADWAY USED FOR VEHICULAR TRAVEL. IT DOES NOT INCLUDE THE PARKING LANES, SIDEWALKS, BERMS AND SHOULDERS. THE TRAVELED WAYS SHALL BE MEASURED FROM THE CENTER OF EDGE LINE TO THE CENTER OF EDGE LINE OF A TWO LANE ROADWAY.

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

ALL PAVEMENT MARKING MATERIALS SHALL MEET THE REQUIRED DEPARTMENTAL MATERIAL SPECIFICATIONS AS SPECIFIED BY THE PLANS.



NOTE: TRAVELED WAY IS EXCLUSIVE OF SHOULDER WIDTHS. REFER TO GENERAL NOTE 2 FOR ADDITIONAL DETAILS.

GUIDE FOR PLACEMENT OF STOP LINES, EDGE LINE & CENTERLINE
BASED ON TRAVELED WAY AND PAVEMENT WIDTHS FOR UNDIVIDED ROADWAYS

Texas Department of Transportation

Traffic Safety Division Standard

TYPICAL STANDARD PAVEMENT MARKINGS

PM(1)-22

FILE: PMI-22.DGN	DN:	CK:	DW:	CK:
©TXDOT DECEMBER 2022	CONT	SECT	JOB	HIGHWAY
REVISIONS 11-78 8-00 6-20 8-95 3-03 12-22 5-00 2-12	0902	90	019,ETC	CS
	DIST	COUNTY		SHEET NO.
	FTW	TARRANT		96

22A

DATE: 4/12/2024 1:06:10 PM
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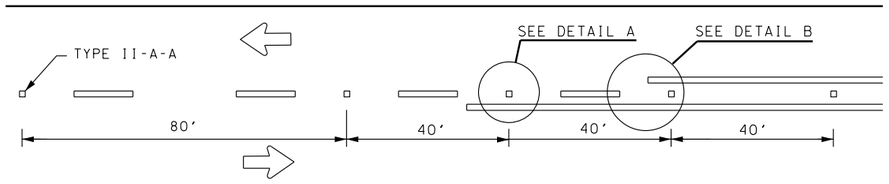
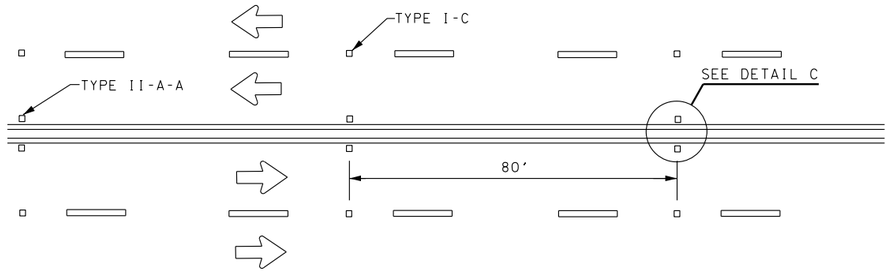
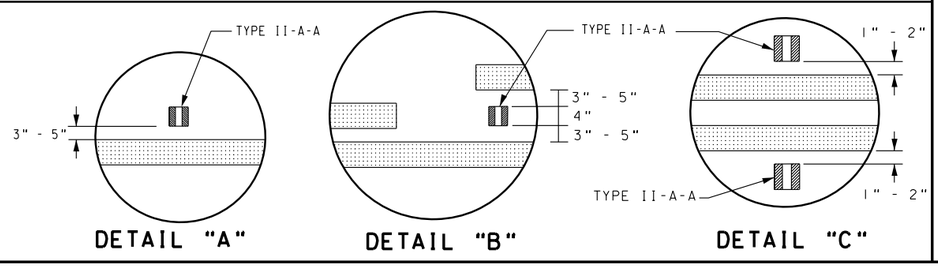
REFLECTIVE RAISED PAVEMENT MARKERS FOR VEHICLE POSITIONING GUIDANCE

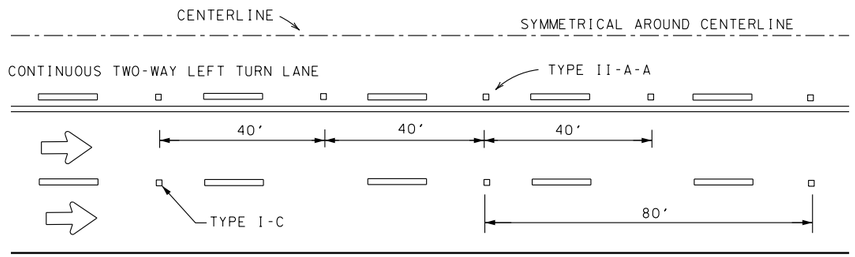


CENTERLINE FOR ALL TWO LANE TWO-WAY ROADWAYS

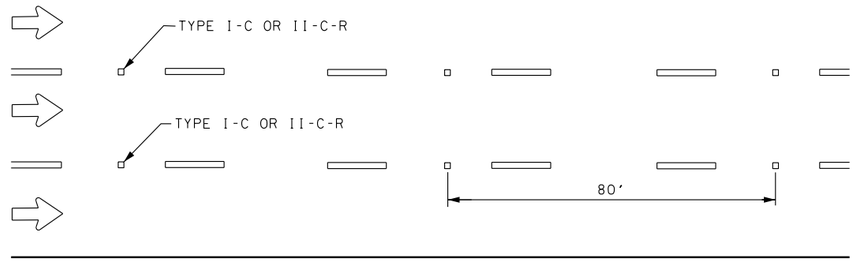


CENTERLINE & LANE LINES FOR FOUR LANE TWO-WAY ROADWAYS





CENTERLINE AND LANE LINES FOR TWO-WAY LEFT TURN LANE



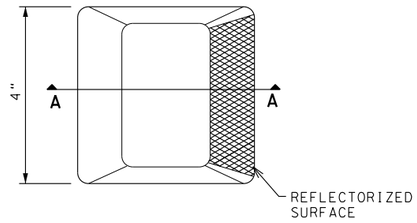
LANE LINES FOR ONE-WAY ROADWAY (NON-FREEWAY FACILITIES)

RAISED PAVEMENT MARKERS TYPE II-C-R SHALL HAVE CLEAR FACE TOWARD NORMAL TRAFFIC AND RED FACE TOWARD WRONG-WAY TRAFFIC.

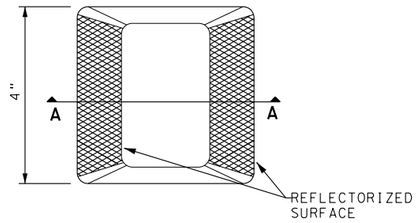
SEE NOTE 3.

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

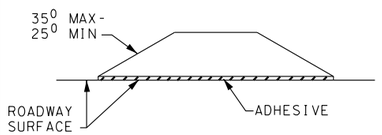
ALL PAVEMENT MARKING MATERIALS SHALL MEET THE REQUIRED DEPARTMENTAL MATERIAL SPECIFICATIONS AS SPECIFIED BY THE PLANS.



TYPE I (TOP VIEW)

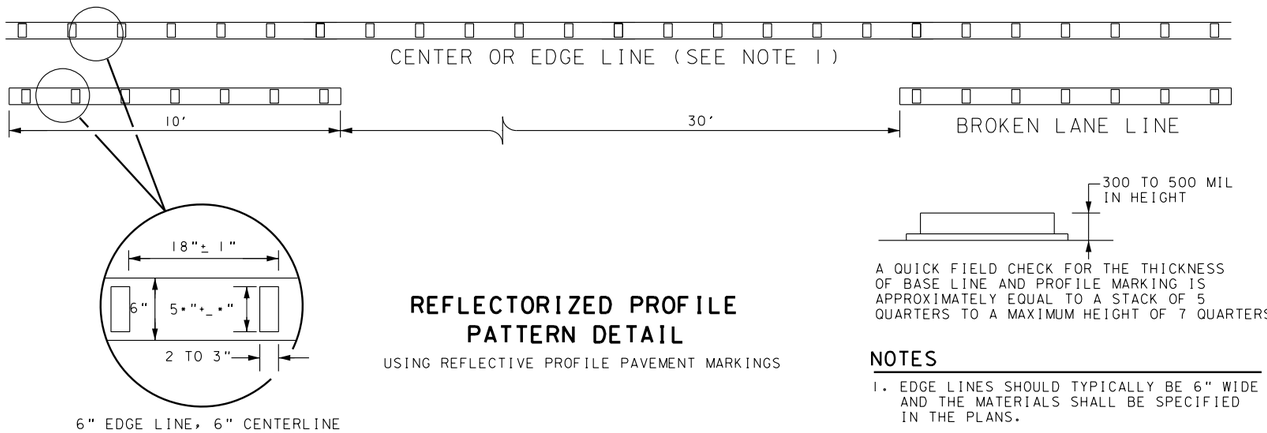


TYPE II (TOP VIEW)



SECTION A

RAISED PAVEMENT MARKERS



6" EDGE LINE, 6" CENTERLINE OR 6" LANE LINE

REFLECTORIZED PROFILE PATTERN DETAIL

USING REFLECTIVE PROFILE PAVEMENT MARKINGS

A QUICK FIELD CHECK FOR THE THICKNESS OF BASE LINE AND PROFILE MARKING IS APPROXIMATELY EQUAL TO A STACK OF 5 QUARTERS TO A MAXIMUM HEIGHT OF 7 QUARTERS.

NOTES

1. EDGE LINES SHOULD TYPICALLY BE 6" WIDE AND THE MATERIALS SHALL BE SPECIFIED IN THE PLANS.
2. PROFILE MARKINGS SHALL NOT BE PLACED ON ROADWAYS WITH A POSTED SPEED LIMIT OF 45 MPH OR LESS.

GENERAL NOTES

1. ALL RAISED PAVEMENT MARKERS PLACED ALONG BROKEN LINES SHALL BE PLACED IN LINE WITH AND MIDWAY BETWEEN THE STRIPES.
2. ON CONCRETE PAVEMENTS THE RAISED PAVEMENT MARKERS SHOULD BE PLACED TO ONE SIDE OF THE LONGITUDINAL JOINTS.
3. USE RAISED PAVEMENT MARKER TYPE I-C WITH UNDIVIDED ROADWAYS, FLUSH MEDIANS AND TWO WAY LEFT TURN LANES. USE RAISED PAVEMENT MARKER TYPE II-C-R WITH DIVIDED HIGHWAYS AND RAISED MEDIANS.

Texas Department of Transportation

Traffic Safety Division Standard

POSITION GUIDANCE USING RAISED MARKERS RELECTORIZED PROFILE MARKINGS PM(2)-22

FILE: PM2-22.DGN	DN:	CK:	DW:	CK:
©TXDOT DECEMBER 2022	CONT	SECT	JOB	HIGHWAY
REVISIONS 4-77 8-00 6-20 4-92 2-10 12-22 5-00 2-12	0902	90	019,ETC	CS
	DIST	COUNTY		SHEET NO.
	FTW	TARRANT		97

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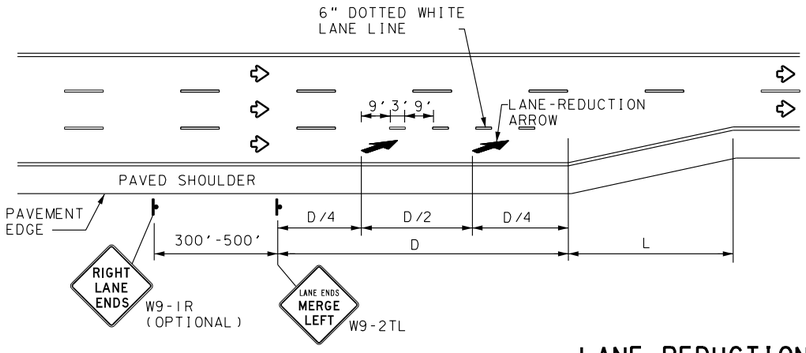


LANE REDUCTION

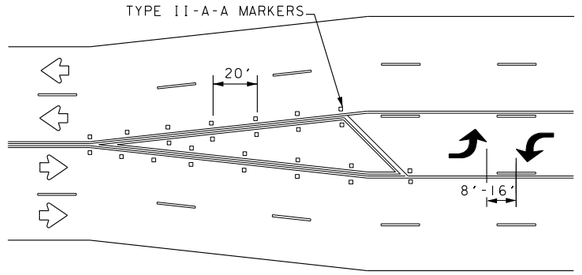
NOTES

1. LANE REDUCTION PAVEMENT MARKINGS ARE USED WHERE THE NUMBER OF THROUGH LANES IS REDUCED BECAUSE OF NARROWING OF THE ROADWAY OR BECAUSE OF A SECTION OF ON-STREET PARKING IN WHAT WOULD OTHERWISE BE A THROUGH LANE. FOR TEXAS SUPER 2 PASSING LANES, SEE TS2(PL) STANDARD SHEETS.
2. ON DIVIDED HIGHWAYS, AN ADDITIONAL RIGHT LANE ENDS (W9-1R) SIGN MAY BE INSTALLED IN THE MEDIAN ALIGNED WITH THE W9-1R SIGN ON THE RIGHT SIDE OF THE HIGHWAY.
3. LANE REDUCTION ARROWS ARE REQUIRED FOR SPEEDS OF 45 MPH OR GREATER. AN OPTIONAL THIRD LANE REDUCTION ARROW MAY BE ADDED BASED ON ENGINEERING JUDGEMENT. IF USED, THE OPTIONAL THIRD LANE REDUCTION ARROW SHOULD BE CENTERED BETWEEN THE FIRST AND LAST LANE REDUCTION ARROWS.
4. FOR LANE REDUCTIONS ON FREEWAYS AND EXPRESSWAYS, SIGNING SHALL CONFORM TO THE TXDOT FREEWAY SIGNING HANDBOOK.

ADVANCED WARNING SIGN DISTANCE (D)		
POSTED SPEED	D (FT)	L (FT)
30 MPH	460	$L = \frac{WS^2}{60}$
35 MPH	565	
40 MPH	670	
45 MPH	775	L = WS
50 MPH	885	
55 MPH	990	
60 MPH	1,100	
65 MPH	1,200	
70 MPH	1,250	
75 MPH	1,350	

GENERAL NOTES

1. LANE USE WORD AND ARROW MARKINGS SHALL BE USED WHERE THROUGH LANES APPROACHING AN INTERSECTION BECOME MANDATORY TURN LANES. LANE USE WORD AND ARROW MARKINGS SHOULD BE USED IN AUXILIARY LANES OF SUBSTANTIAL LENGTH. LANE USE ARROW MARKINGS OR WORD AND ARROW MARKINGS MAY BE USED IN OTHER LANES AND TURN BAYS FOR EMPHASIS. DETAILS FOR WORDS AND ARROWS ARE AS SHOWN IN THE STANDARD HIGHWAY SIGN DESIGNS FOR TEXAS.
2. WHEN LANE-USE WORDS AND ARROW MARKINGS ARE USED, TWO SETS OF ARROWS SHOULD BE USED IF THE LENGTH OF THE BAY IS GREATER THAN 180 FEET. WHEN A SINGLE LANE USE ARROW OR WORD AND ARROW MARKING IS USED FOR A SHORT TURN LANE, IT SHOULD BE LOCATED AT OR NEAR THE UPSTREAM END OF THE FULL-WIDTH TURN LANE.
3. USE RAISED PAVEMENT MARKER TYPE I-C WITH UNDIVIDED HIGHWAYS, FLUSH MEDIANS AND TWO WAY LEFT TURN LANES. USE RAISED PAVEMENT MARKER TYPE II-C-R WITH DIVIDED HIGHWAYS AND RAISED MEDIANS.
4. LENGTH OF TURN BAYS, INCLUDING TAPER, DECELERATION, AND STORAGE LENGTHS SHALL BE AS SHOWN ON THE PLANS OR AS DIRECTED BY THE ENGINEER. SEE CHAPTER 3 OF THE ROADWAY DESIGN MANUAL FOR ADDITIONAL INFORMATION ON TURNING LANES OR STORAGE LENGTHS.

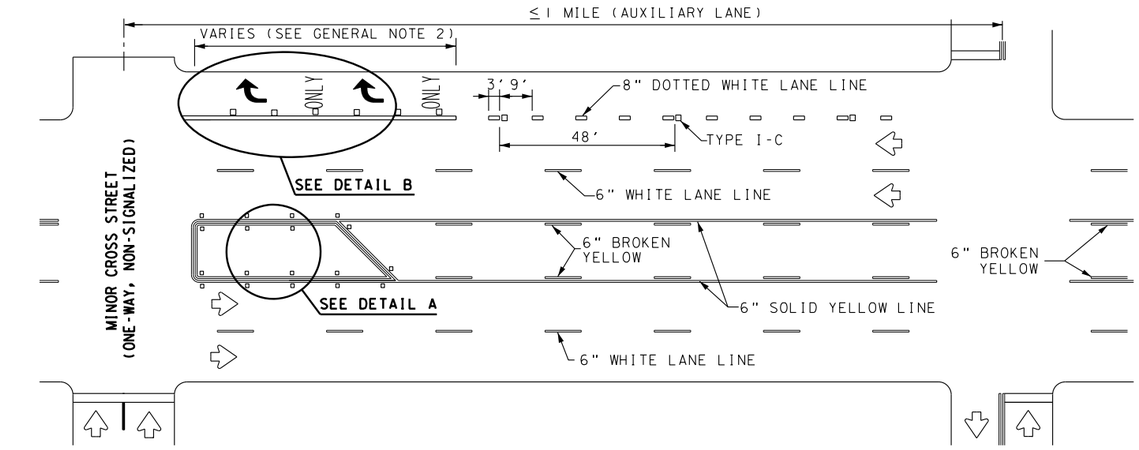


A TWO-WAY LEFT-TURN (TWLT) LANE-USE ARROW PAVEMENT MARKING SHOULD BE USED AT OR JUST DOWNSTREAM FROM THE BEGINNING OF A TWO-WAY LEFT-TURN LANE WITHIN A CORRIDOR. REPEATING THE MARKING AFTER EACH INTERSECTION OR DEDICATED TURN BAY IS NOT REQUIRED UNLESS STATED ELSEWHERE IN THE PLANS.

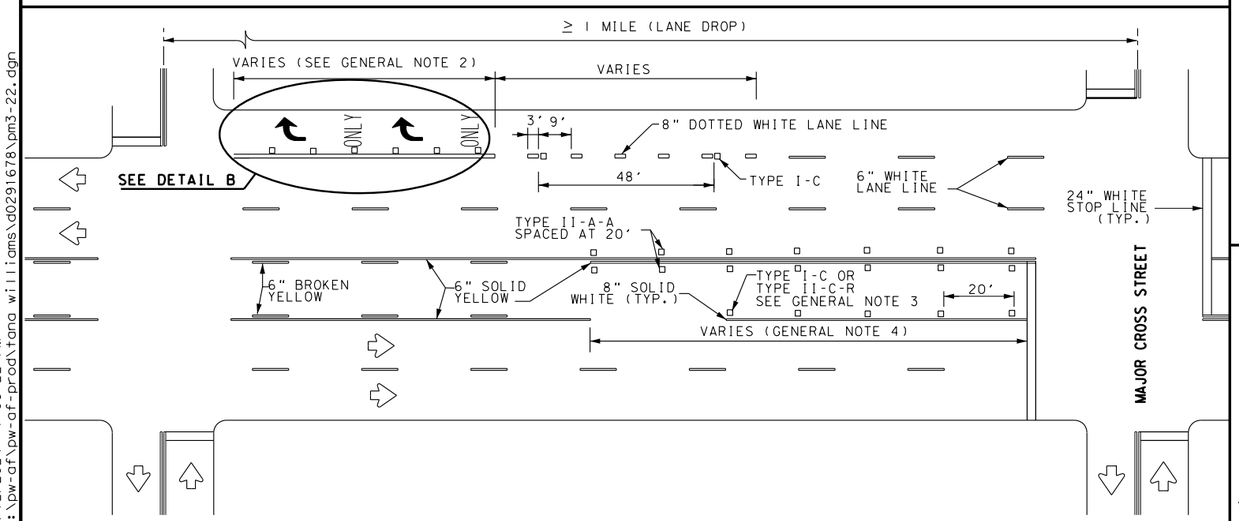
TYPICAL TRANSITION FOR TWLTL AND DIVIDED HIGHWAY

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

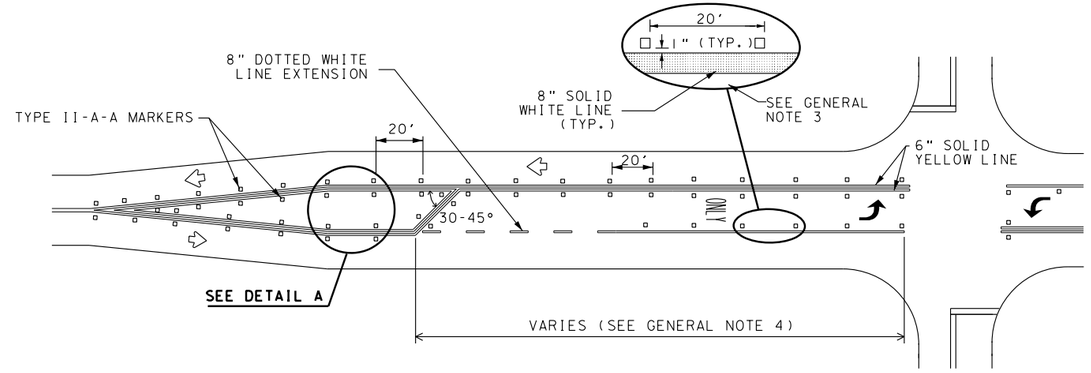
ALL PAVEMENT MARKING MATERIALS SHALL MEET THE REQUIRED DEPARTMENTAL MATERIAL SPECIFICATIONS AS SPECIFIED BY THE PLANS.



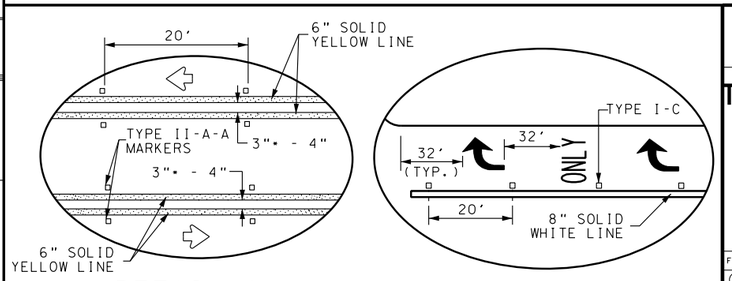
TYPICAL TWLTL AT ONE-WAY STREET AND RIGHT TURN AUXILIARY LANE



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



TYPICAL TWO-LANE ROADWAY INTERSECTION WITH LEFT TURN BAYS



* 2" MINIMUM ALLOWED FOR RESTRIPE PROJECTS WHEN APPROVED BY THE ENGINEER.

Texas Department of Transportation

Traffic Safety Division Standard

TWO-WAY LEFT TURN LANES, RURAL LEFT TURN BAYS, AND LANE REDUCTION PAVEMENT MARKINGS

PM(3)-22

FILE: PM3-22.DGN	DN:	CK:	DW:	CK:
©TXDOT DECEMBER 2022	CONT	SECT	JOB	HIGHWAY
REVISIONS 4-98 3-03 6-20 5-00 2-10 12-22 8-00 2-12	0902	90	019,ETC	CS
	DIST	COUNTY		SHEET NO.
	FTW	TARRANT		98

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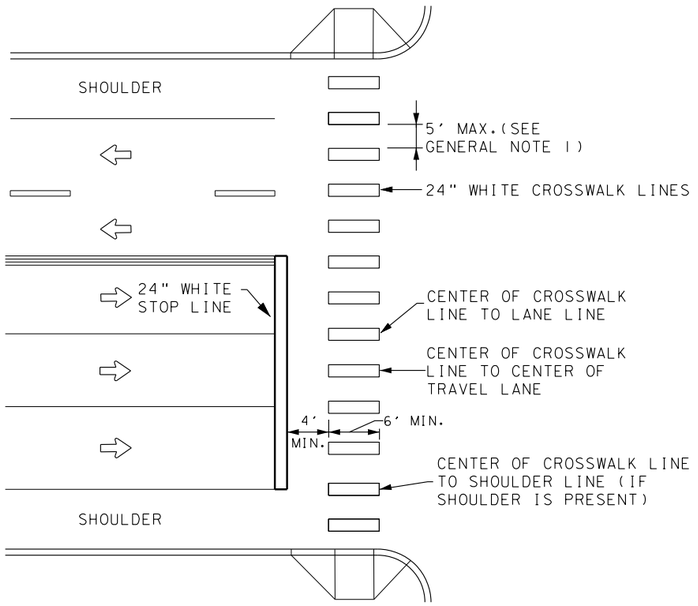


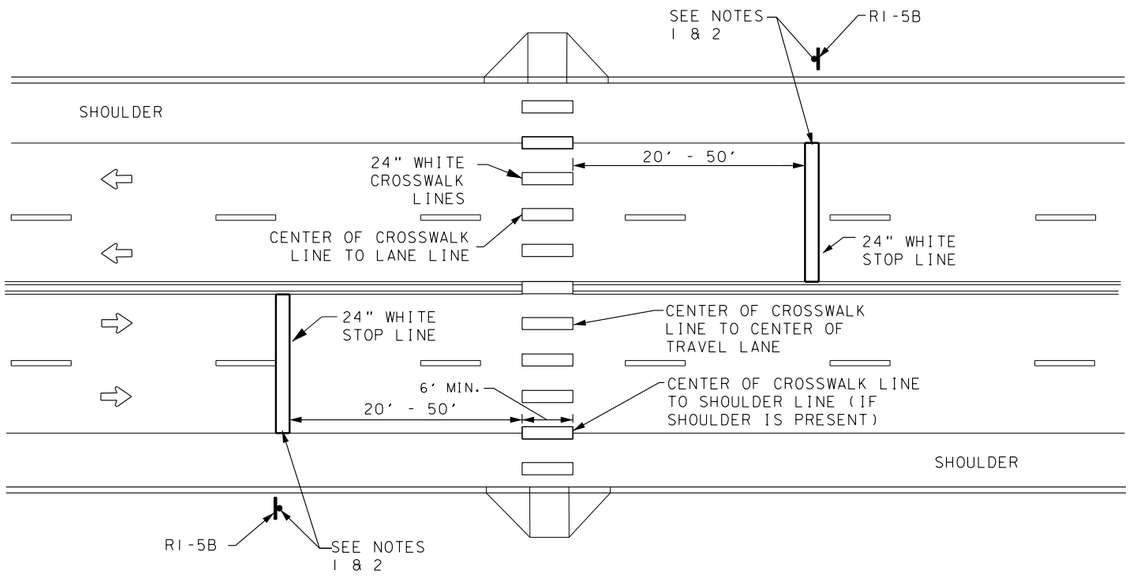
HIGH-VISIBILITY LONGITUDINAL CROSSWALK AT CONTROLLED APPROACH

GENERAL NOTES

1. LONGITUDINAL CROSSWALK LINES SHOULD NOT BE PLACED IN THE WHEEL PATH OF VEHICLES. CENTER THE CROSSWALK LINES ON TRAVEL LANES, LANE LINES, AND SHOULDER LINES (IF PRESENT).
2. A MINIMUM 6" CLEAR DISTANCE SHALL BE PROVIDED TO THE CURB FACE. IF THE LAST CROSSWALK LINE FALLS INTO THIS DISTANCE IT MUST BE OMITTED.
3. FOR DIVIDED ROADWAYS, ADJUSTMENTS IN SPACING OF THE CROSSWALK LINES SHOULD BE MADE IN THE MEDIAN SO THAT THE CROSSWALK LINES ARE MAINTAINED IN THEIR PROPER LOCATION ACROSS THE TRAVEL PORTION OF THE ROADWAY.
4. AT SKEWED CROSSWALKS, THE CROSSWALK LINES ARE TO REMAIN PARALLEL TO THE LANE LINES.
5. EACH CROSSWALK SHALL BE A MINIMUM OF 6' WIDE.
6. THE HIGH-VISIBILITY LONGITUDINAL CROSSWALK IS THE PREFERRED CROSSWALK PATTERN ON STATE HIGHWAYS. OTHER CROSSWALK PATTERNS AS SHOWN IN THE "TEXAS MANUAL ON UNIFORM TRAFFIC CONTROL DEVICES" MAY BE USED. ALL CROSSWALK DESIGNS AND DIMENSION SHALL COMPLY WITH THE "TEXAS MANUAL ON UNIFORM TRAFFIC CONTROL DEVICES."
7. FINAL PLACEMENT OF STOP BAR AND CROSSWALK SHALL BE APPROVED BY THE ENGINEER IN THE FIELD.

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

ALL PAVEMENT MARKING MATERIALS SHALL MEET THE REQUIRED DEPARTMENTAL MATERIAL SPECIFICATIONS AS SPECIFIED BY THE PLANS.



UNSIGNALIZED MIDBLOCK HIGH-VISIBILITY LONGITUDINAL CROSSWALK

NOTES:

1. USE STOP BARS WITH STOP HERE FOR PEDESTRIANS (R1-5B) SIGNS AT UNSIGNALIZED MIDBLOCK CROSS WALKS.
2. USE STOP BARS WITH STOP HERE ON RED (R10-6 OR R10-6A) SIGNS AT MID BLOCK CROSSWALKS CONTROLLED BY TRAFFIC SIGNALS OR PEDESTRIAN HYBRID BEACONS.

Texas Department of Transportation

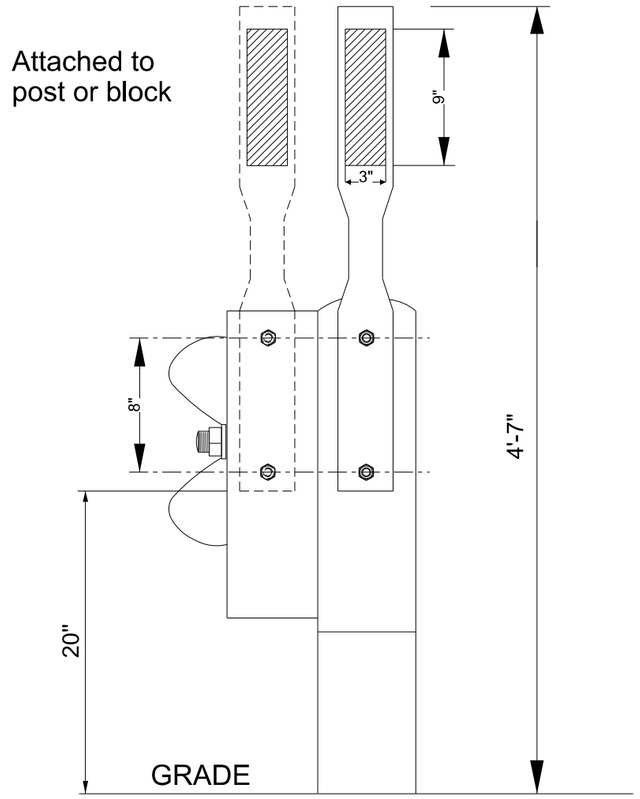
Traffic Safety Division Standard

CROSSWALK PAVEMENT MARKINGS

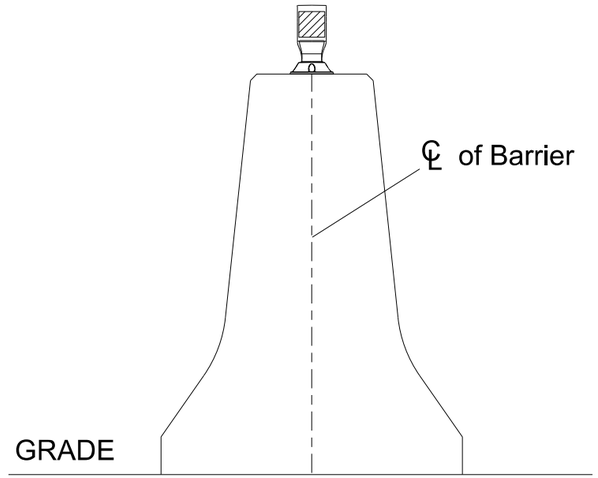
PM(4)-22A

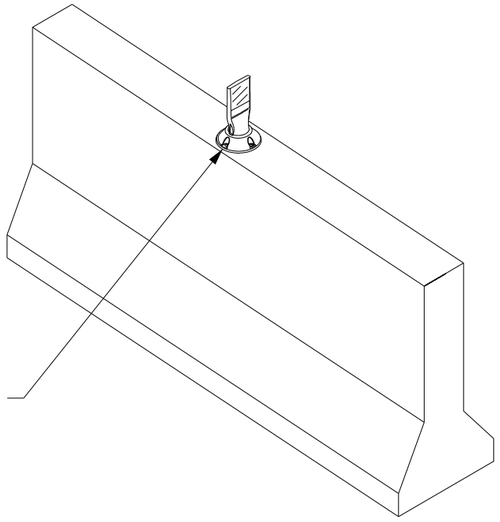
FILE: PM4-22A.DGN	DN:	CK:	DW:	CK:
©TXDOT DECEMBER 2022	CONT	SECT	JOB	HIGHWAY
REVISIONS	0902	90	019,ETC	CS
6-20	DIST	COUNTY		SHEET NO.
6-22	FTW	TARRANT		99
12-22				
220				

TYPICAL METAL BEAM GAURD FENCE

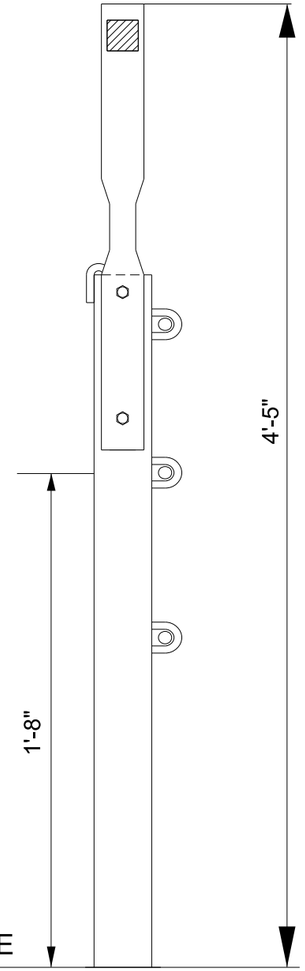


TYPICAL CONCRETE TRAFFIC BARRIER

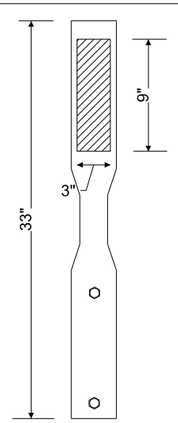
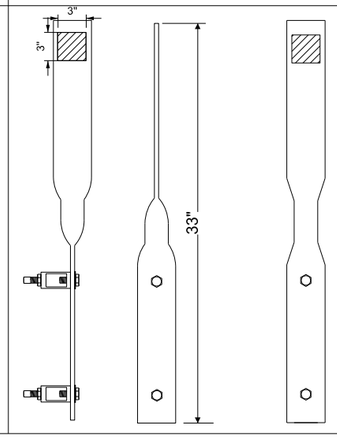
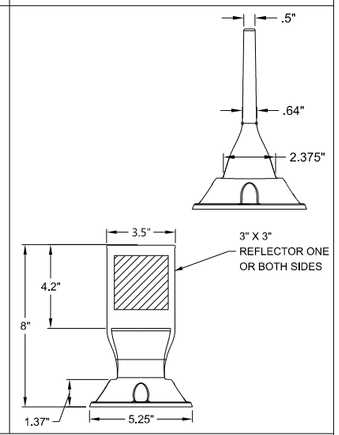




TYPICAL CABLE BARRIER SYSTEM



BARRIER REFLECTORS (BRF)

	MBGF	CBS	CTB
DEVICE			
SHEETING	Yellow, White & Red		

GENERAL NOTES

1. See "Flexible Delineator and Object Marker Posts" Material Producer List for approved devices.

2. Install per manufacturer's recommendations.

3. When separating opposing direction of travel, such as centerline or median use, the posts shall be yellow.

4. Barrier reflectors shall meet the requirements of DMS 8600.

5. Approved Barrier Reflectors are listed on the "Barrier Reflectors" Material Producer List at: www.txdot.gov.

6. Reflective sheeting shall have a minimum dimension of 3 inches and minimum surface area of 9 square inches.

7. Posts shall be permanently sealed at the top and have a 3-1/2 wide x 13" flattened surface to accommodate up to a 3" x 12" reflective sheet on both sides.

8. The delineator or barrier reflector color shall conform to the color of the pavement edge line on the side of the road where the delineators or barrier reflectors are placed.

9. Single red delineators may be mounted on the back side of the delineator posts for wrong way drive applications.

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

Texas Department of Transportation

Fort Worth District Standard

DELINEATOR & OBJECT MARKER

D & OM(ST-FTW)-21

ORIGINAL DRAWING: 10/2021	st-ftw.dgn	FED.RD. DIV.NO.	PROJECT NO.	SHEET NO.
DATE	REVISIONS	6	SEE TITLE SHEET	100
10/19/21	⚠	STATE	STATE DIST.NO.	COUNTY
		TEXAS	FTW	TARRANT
		0902	90	019,ETC CS

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):

0902-90-019

1.2 PROJECT LIMITS:

From: South of River Drive SB bridge over W Fork Trinity River

To: North of River Drive SB bridge over W Fork Trinity River

1.3 PROJECT COORDINATES:

BEGIN: (Lat) 32°44'57.40" N ,(Long) 97°18'11.99" W

END: (Lat) 32°45'6.09" N ,(Long) 97°18'12.19" W

1.4 TOTAL PROJECT AREA (Acres): 3.22 Acres

1.5 TOTAL AREA TO BE DISTURBED (Acres): 0.72 Acres

1.6 NATURE OF CONSTRUCTION ACTIVITY:

FOR THE CONSTRUCTION OF BRIDGE REHABILITATION (DECK REPLACEMENT) CONSISTING OF PAVEMENT, STRUCTURE, AND PAVEMENT MARKINGS.

1.7 MAJOR SOIL TYPES:

Soil Type	Description
Frio-Urban Land Complex, 0 to 1% slopes	Frio, occasionally flooded, and similar soils: 55% Urban Land: 30% Minor Components: 15% Well Drained & Low Runoff
Urban Land, 0 to 16% Slopes	Urban Land 1 to 5% slopes: 85% Minor Components: 15%

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
West Fork Trinity River Below Lake Worth	*River

* 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: _____

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.
6	SEE TITLE SHEET		101
STATE	STATE DIST.	COUNTY	
TEXAS	FTW	TARRANT	
CONT.	SECT.	JOB	HIGHWAY NO.
0902	90	019, ETC	CS

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

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

2.2 SEDIMENT CONTROL BMPs:

T / P

- ☐ ☐ Biodegradable Erosion Control Logs
- ☐ ☐ Dewatering Controls
- ☐ ☐ Inlet Protection
- X ☐ Rock Filter Dams/ Rock Check Dams
- ☐ ☐ Sandbag Berms
- ☐ ☐ Sediment Control Fence
- ☐ ☐ Stabilized Construction Exit
- ☐ ☐ Floating Turbidity Barrier
- ☐ ☐ Vegetated Buffer Zones
- ☐ ☐ Vegetated Filter Strips
- X ☐ Other: Silt Fences
- X ☐ Other: Rock Bedding at Construction Exit
- ☐ ☐ 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
- X Stabilized construction exit
- ☐ Daily street sweeping
- ☐ Other: _____
- ☐ Other: _____
- ☐ Other: _____
- ☐ Other: _____

2.5 POLLUTION PREVENTION MEASURES:

- ☐ Chemical Management
- X Concrete and Materials Waste Management
- X Debris and Trash Management
- ☐ Dust Control
- X 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:

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

2.8 DEWATERING:

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

2.9 INSPECTIONS:

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

2.10 MAINTENANCE:

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

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

July 2023 Sheet 2 of 2

Texas Department of Transportation

FED. RD. DIV. NO.	PROJECT NO.		SHEET NO.
6	SEE TITLE SHEET		102
STATE	STATE DIST.	COUNTY	
TEXAS	FTW	TARRANT	
CONT.	SECT.	JOB	HIGHWAY NO.
0902	90	019, ETC	CS

DATE: 4/15/2024
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I. STORMWATER POLLUTION PREVENTION-CLEAN WATER ACT SECTION 402

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

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

1. City of Fort Worth, Municipal Separate Stormwater Sewer System (MS4), Industrial Stormwater Program
2. TxDOT, MS4, Fort Worth District

☐ 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# _____

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. West Fork of Trinity River
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.

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. Efforts shall be taken to avoid and minimize disturbance to vegetation and soils.
2. Refer to Section V for Migratory Bird Treaty Act (MBTA) requirements regarding vegetation.

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

☐ No Action Required ☒ Required Action

See Sheet 2 of 2.

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.

VII. OTHER ENVIRONMENTAL ISSUES

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

☐ No Action Required ☒ Required Action

Action No.

1. Make every reasonable effort to minimize construction noise and vehicle emissions through abatement measures such as work-hour controls, appropriate maintenance of muffler systems, emissions control devices, limiting unnecessary idling of construction vehicles, and other measures as directed by the engineer.
2. Minimize particulate matter emissions from construction sites by using fugitive dust control measures such as covering or treating disturbed areas with dust suppression techniques, sprinkling, covering loaded trucks, and other dust abatement controls, as appropriate.
3. Mitigation must be provided to prevent debris from all construction activities from entering the West Fork of Trinity River below.
4. Any change orders and/or deviations from the final design must be reported to the Engineer prior to commencement of construction activities, as additional environmental clearance may be required.

Texas Department of Transportation — Design Division Standard

ENVIRONMENTAL PERMITS, ISSUES AND COMMITMENTS

EPIC

SHEET 1 OF 2

FILE: epic.dgn	DN: TxDOT	CK: RG	DW: VP	CK: AR
©TxDOT: February 2015	CONT	SECT	JOB	HIGHWAY
REVISIONS 12-12-2011 (DS) 05-07-14 ADDED NOTE SECTION IV. 01-23-2015 SECTION I (CHANGED ITEM 1122 TO ITEM 506, ADDED GRASSY SWALES.	0902	90	019, ETC.	CS
	DIST	COUNTY		SHEET NO.
	FTW	TARRANT		103

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1. General Design and Construction BMP:

o Employees and contractors will be provided information prior to start of construction to educate personnel of the potential for all state-listed threatened species or other SGCN to occur within the project area and should be advised of relevant rules and regulations to protect plants, fish, and wildlife.
o Contractors will be informed to avoid harming all wildlife species if encountered and allow them to safely leave the project site. Due diligence should be used to avoid killing or harming any wildlife species in the implementation of transportation projects.
o Direct animals away from the construction area with the judicious use and placement of sediment control fencing to exclude wildlife. Exclusion fence should be buried at least 6 inches and be at least 24 inches high, maintained for the life of the project, and removed after construction is completed. Contractors should examine the inside of the exclusion area daily to determine if any wildlife species have been trapped inside the area of impact and provide safe egress opportunities prior to initiation of construction activities.
o Apply hydromulching and/or hydroseeding in areas for soil stabilization and/or revegetation of disturbed areas around wetlands and in riparian areas.
o If erosion control blankets or mats will be used, the product should not contain netting, but should only contain loosely woven natural fiber netting in which the mesh design allows the threads to move, therefore allowing expansion of the mesh openings. Plastic netting should be avoided.
o Project staging areas, stockpiles, temporary construction easements, and other project related sites should be situated in previously disturbed areas to avoid or minimize impacts to sensitive or unique habitats including intact native vegetation, floodplains, riparian corridors, wetlands, playa lakes, and habitat for wildlife species.
o When lighting is added, consider wildlife impacts from light pollution and incorporating dark-sky practices into design strategies. Minimize sky glow by focusing light downward, with full cutoff luminaries to avoid light emitting above the horizontal. The minimum amount of night-time lighting needed for safety and security should be used.

2. Aquatic Amphibian and Reptile BMP:

o Minimize impacts to wetlands, temporary and permanent open water features, including depressions, and riverine habitats.
o Maintain the existing hydrologic regime and any connections between wetlands and other aquatic features.
o Use barrier fencing to direct animal movements away from construction activities and areas of potential wildlife-vehicle collisions in construction areas directly adjacent, or that may directly impact, potential habitat for the target species.
o Apply hydromulching and/or hydroseeding in areas for soil stabilization and/or re-vegetation of disturbed areas around wetlands and in riparian areas. If erosion control blankets or mats will be used, the product should not contain netting, but should only contain loosely woven natural fiber netting in which the mesh design allows the threads to move, therefore allowing expansion of the mesh openings. Plastic netting should be avoided.
o Project specific locations (PSLs) proposed within state-owned ROW should be located in uplands away from aquatic features.
o When work is directly adjacent to the water, minimize impacts to shoreline basking sites (e.g., downed trees, sand bars, exposed bedrock) and refugia/overwinter sites (e.g., brush and debris piles, crayfish burrows, aquatic logjams, and leaf packs).
o If gutters and curbs are part of the roadway design, install gutters that do not include the side box inlet and include sloped (i.e., mountable) curbs to allow small animals to leave roadway. If this modification to the entire curb system is not possible, install sections of sloped curb on either side of the storm water drain for several feet to allow small animals to leave the roadway. Priority areas for these design recommendations are those with nearby wetlands or other aquatic features.

3. Bat BMP:
The following survey and exclusion protocols should be followed prior to commencement of construction activities. For the purposes of this document, structures are defined as bridges, culverts (concrete or metal), wells, and buildings.
* Inform TPWD WHAB during initial collaborative review phase for projects that may impact the following bat species:
    o Any Myotis spp.
    o Tricolored bat (Perimyotis subflavus)
* If identification of a bat species is in question, consult with TPWD or a qualified TxDOT biologist during initial collaborative review phase.
* For activities that have the potential to impact structures, cliffs or caves, or trees; a qualified biologist will perform a habitat assessment and occupancy survey of the feature(s) with roost potential as early in the planning process as possible or within one year before project letting.
* For roosts where occupancy is strongly suspected but unconfirmed during the initial survey, revisit feature(s) at most four weeks prior to scheduled disturbance to confirm absence of bats.
* If bats are present or recent signs of occupation (i.e., piles of guano, distinct musky odor, or staining and rub marks at potential entry points) are observed, take appropriate measures to ensure that bats are not harmed, such as implementing non-lethal exclusion activities or timing or phasing of construction.
* Exclusion devices can be installed by a qualified individual between September 1 and March 31. Exclusion devices should be used for a minimum of seven days when minimum nighttime temperatures are above 50°F AND minimum daytime temperatures are above 70°F. Prior to exclusion, ensure that alternate roosting habitat is available in the immediate area. If no suitable roosting habitat is available, installation of alternate roosts is recommended to replace the loss of an occupied roost. If alternate roost sites are not provided, bats may seek shelter in other inappropriate sites, such as buildings, in the surrounding area.
* If feature(s) used by bats are removed as a result of construction, replacement structures should incorporate bat-friendly design or artificial roosts should be constructed to replace these features.
* Conversion of property containing cave or cliff features to transportation purposes should be avoided.
* In all instances, avoid harm or death to bats. Bats should only be handled as a last resort and after communication with TPWD.
* Coordinate with TPWD about the latest bat handling restrictions and protocols involving COVID-19 and bat handling. In general, all staff must follow the guidelines listed below:
    o Do not handle bats if not part of a critical or time-sensitive research project. Contact TPWD to discuss your project needs before beginning work.
    o All participants must follow CDC social-distancing guidelines.
    o Wear a face mask to minimize the exchange of respiratory droplets such as a surgical mask, dust mask, or cloth mask when within 6 feet of a living bat.
    o Use disposable exam gloves or other reusable gloves (e.g., rubber dish-washing gloves) that can be decontaminated to prevent spread of pathogens. Do not touch your face or other potentially contaminated surfaces with your gloves prior to handling bats.
    o Limit handling to as few handlers as possible.
    o Do not blow on bats for any reason.
    o Use separate temporary holding containers for each bat such as disposable paper bags.
    o Caves housing bats should be avoided unless absolutely necessary. o Implement additional disinfection, quarantine, and cleaning procedures.
* Bat surveys of structures should include visual inspections of structural fissures (cracked or spalled concrete, damaged or split beams, split or damaged timber railings), crevices (expansion joints, space between parallel beams, spaces above supports piers), and alternative structures (drainage pipes, bolt cavities, open sections between support beams, swallow nests) for the presence of bats.
* Before excluding bats from any occupied structure, bat species, weather, temperature, season, and geographic location must be incorporated into any exclusion plans to avoid unnecessary harm or death to bats. Winter exclusion must entail a survey to confirm either, 1) bats are absent or 2) present but active (i.e., continuously active 13#32 not intermittently active due to arousals from hibernation).
    o Avoid using materials that degrade quickly, like paper, steel wool or rags, to close holes.
    o Avoid using products or making structural modifications that may block natural ventilation, like hanging plastic sheeting over an active roost entrance, thereby altering roost microclimate.
o Avoid using chemical and ultrasonic repellents.
    o Avoid use of silicone, polyurethane or similar non-water-based caulk products.
    o Avoid use of expandable foam products at occupied sites.
    o Avoid the use of flexible netting attached with duct tape.
* In order to avoid entombing bats, exclusion activities should be only implemented by a qualified individual. A qualified individual or company should possess at least the following minimum qualifications:
    o Experience in bat exclusion (the individual, not just the company).
    o Proof of rabies pre-exposure vaccinations.
    o Demonstrated knowledge of the relevant bat species, including maternity season date range and habitat requirements.
    o Demonstrated knowledge of rabies and histoplasmosis in relation to bat roosts.
* Contact TPWD for additional resources and information to assist in executing successful bat exclusions that will avoid unnecessary harm or death in bats.

4. Water Quality BMP:

In addition to BMP required for a TCEQ Storm Water Pollution Prevention Plan and/or 401 Water Quality Certification:
o Minimize the use of equipment in streams and riparian areas during construction. When possible, equipment access should be from banks, bridge decks, or barges.
o When temporary stream crossings are unavoidable, remove stream crossings once they are no longer needed and stabilize banks and soils around the crossing.
o Wet-Bottomed detention ponds are recommended to benefit wildlife and downstream water quality. Consider potential wildlife-vehicle interactions when siting detention ponds.
o Rubbish found near bridges on TxDOT ROW should be removed and disposed of properly to minimize the risk of pollution. Rubbish does not include brush piles or snags.

5. Depending on where work will occur, Amphibian and Reptile Exclusion Fence will be used as necessary.

6. Bird BMP:

In addition to complying with the Migratory Bird Treaty Act (MBTA) and Chapter 64 of the Parks and Wildlife Code (PWC) regarding nongame bird protections, perform the following BMP:
o Avoid vegetation clearing activities during the general bird nesting season, March through August, to minimize adverse impacts to birds.
o Prior to construction, perform daytime surveys for nests including under bridges and in culverts to determine if they are active before removal. Nests that are active should not be disturbed. If active nests are observed during surveys, TPWD recommends a 150-foot buffer of vegetation remain around the nests until the young have fledged or the nest is abandoned.
o Do not disturb, destroy, or remove active nests, including ground nesting birds, during the nesting season.
o If unoccupied, inactive nests will be removed, ensure that nests are not protected under the Endangered Species Act (ESA), MBTA, or BGEPA.
o Prevent the establishment of active nests during the nesting season on TxDOT owned and operated facilities and structures proposed for replacement or repair.
o Do not collect, capture, relocate, or transport birds, eggs, young, or active nests without a permit.
o Minimize extended human presence near nesting birds during construction and maintenance activities. Protect sensitive habitat areas with temporary barriers or fencing to limit human foot-traffic and off-road vehicle use to alert and discourage contractors from causing any unintentional impacts.
o Minimize construction noise above ambient levels during general bird nesting season to minimize adverse impacts on birds.
o Minimize construction lighting during the general bird nesting season by scheduling work activities between dawn and dusk.

7. Terrestrial Amphibian and Reptile BMP:

o For open trenches and excavated pits, install escape ramps at an angle of less than 45 degrees (1:1) in areas left uncovered. Visually inspect excavation areas for trapped wildlife prior to backfilling
o Avoid or minimize disturbing or removing cover objects, such as downed trees, rotting stumps, brush piles, and leaf litter. If avoidance or minimization is not practicable, consider removing cover objects prior to the start of the project and replace them at project completion.
o Examine heavy equipment stored on site before use, particularly after rain events when reptile and amphibian movements occur more often, to ensure use will not harm individuals that might be seeking temporary refuge.
o Due to increased activity (mating) of reptiles and amphibian during the spring, construction activities like clearing or grading should attempt to be scheduled outside of the spring (March-May) season. Also, timing ground disturbing activities before October when reptiles and amphibians become less active and may be using burrows in the project area is also encouraged.
o When designing roads with curbs, consider using Type I or Type III curbs to provide a gentle slope to enable turtles and small animals to get out of roadways.
o If Texas tortoises (Gopherus berlandieri) or box turtles (Terrepene spp.) are present in a project area, they should be removed from the area and relocated between 100 and 200 meters from the project area. After removal of the individuals, the area that will be disturbed during active construction and project specific locations should be fenced off to exclude reentry by turtles, tortoises, and other reptiles. The exclusion fence should be constructed and maintained as follows:
    o The exclusion fence should be constructed with metal flashing or drift fence material.
    o Rolled erosion control mesh material should not be used.
    o The exclusion fence should be buried at least 6 inches deep and be at least 24 inches high.
    o The exclusion fence should be maintained for the life of the project and only removed after the construction is completed and the disturbed site has been revegetated.
o After project is complete, revegetate disturbed areas with an appropriate locally sourced native seed mix. If erosion control blankets or mats will be used, the product should not contain netting, but should only contain loosely woven natural fiber netting in which the mesh design allows the threads to move, therefore allowing expansion of the mesh openings. Plastic netting should be avoided.

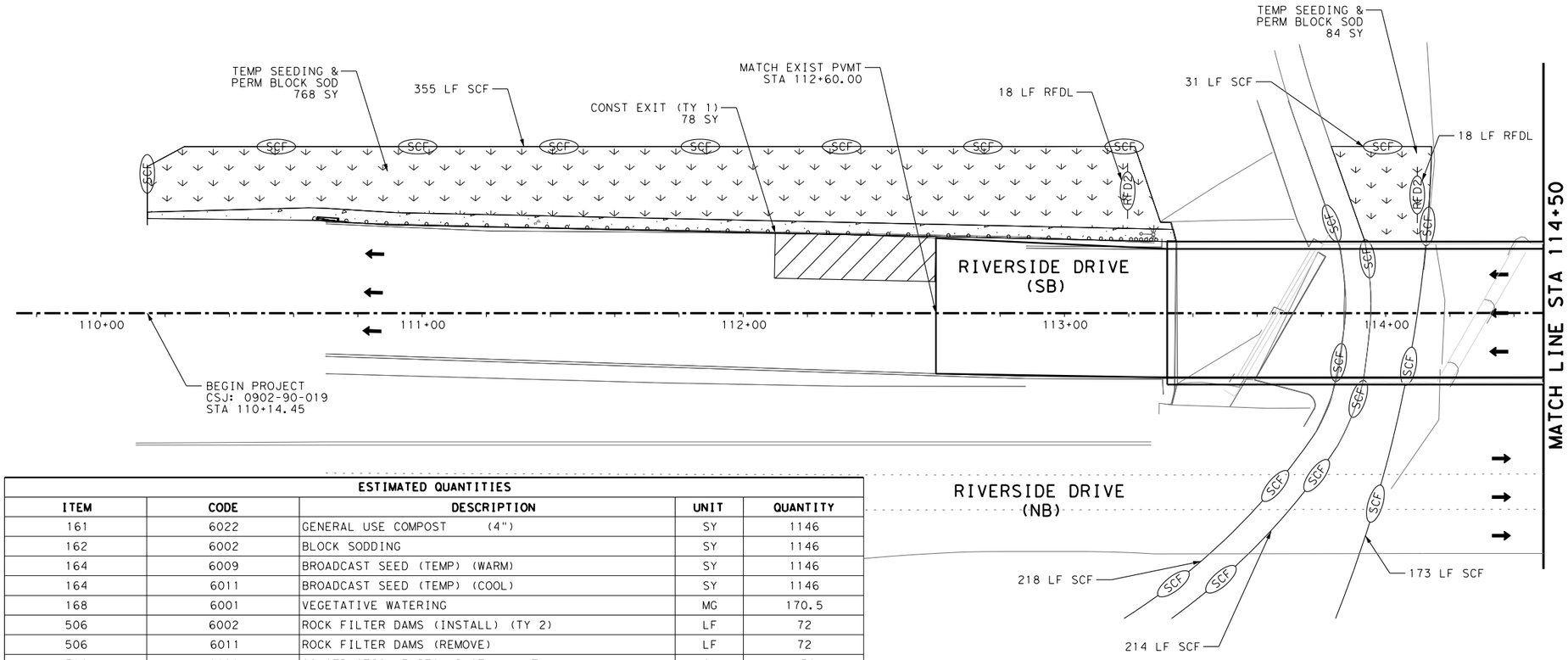
Texas Department of Transportation

Design Division Standard

ENVIRONMENTAL PERMITS, ISSUES AND COMMITMENTS

EPIC

FILE: epic.dgn	DN: TxDOT	CK: RG	DW: VP	CK: AR
	CONT	SECT	JOB	HIGHWAY
REVISIONS	0902	90	019, ETC.	CS
12-12-2011 (DS)	DIST	COUNTY		SHEET NO.
05-07-14 ADDED NOTE SECTION IV.	FTW	TARRANT		104
01-23-2015 SECTION I (CHANGED ITEM 1122 TO ITEM 506, ADDED GRASSY SWALES.				



LEGEND:

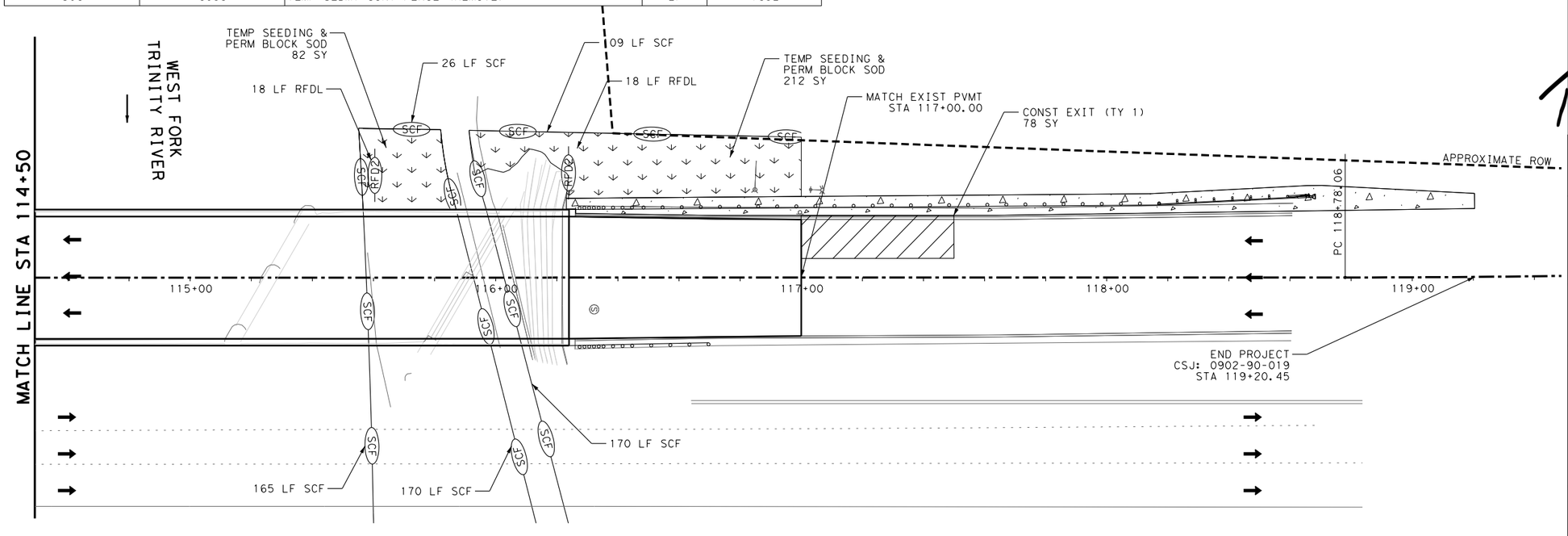
- BLOCK SOD
- TRAFFIC DIRECTION
- DIRECTION OF FLOW
- SCF — SEDIMENT CONTROL FENCE
- RFD2 — ROCK FILTER DAM TY II
- CONSTRUCTION EXIT

0 20′ 40′

SCALE: 1" = 40′

ESTIMATED QUANTITIES

ITEM	CODE	DESCRIPTION	UNIT	QUANTITY
161	6022	GENERAL USE COMPOST (4")	SY	1146
162	6002	BLOCK SODDING	SY	1146
164	6009	BROADCAST SEED (TEMP) (WARM)	SY	1146
164	6011	BROADCAST SEED (TEMP) (COOL)	SY	1146
168	6001	VEGETATIVE WATERING	MG	170.5
506	6002	ROCK FILTER DAMS (INSTALL) (TY 2)	LF	72
506	6011	ROCK FILTER DAMS (REMOVE)	LF	72
506	6020	CONSTRUCTION EXITS (INSTALL) (TY 1)	SY	156
506	6024	CONSTRUCTION EXITS (REMOVE)	SY	156
506	6038	TEMP SEDMT CONT FENCE (INSTALL)	LF	1632
506	6039	TEMP SEDMT CONT FENCE (REMOVE)	LF	1632



STATE OF TEXAS
ALEX I. GARCIA
107317
PROFESSIONAL LICENSED ENGINEER

04/12/2024

REV	BY	DESCRIPTION	DATE

AGUIRRE & FIELDS
ENGINEERING INNOVATORS
TBPE FIRM REGISTRATION •739

Texas Department of Transportation

RIVERSIDE DR SB

SWP3 LAYOUT

FED.RD. DIV.NO.	PROJECT NO.		HIGHWAY NO.
6	SEE TITLE SHEET		CS
STATE	DISTRICT	COUNTY	SHEET NO.
TEXAS	FTW	TARRANT	
CONTROL	SECTION NO.	JOB	105
0902	90	019, ETC	

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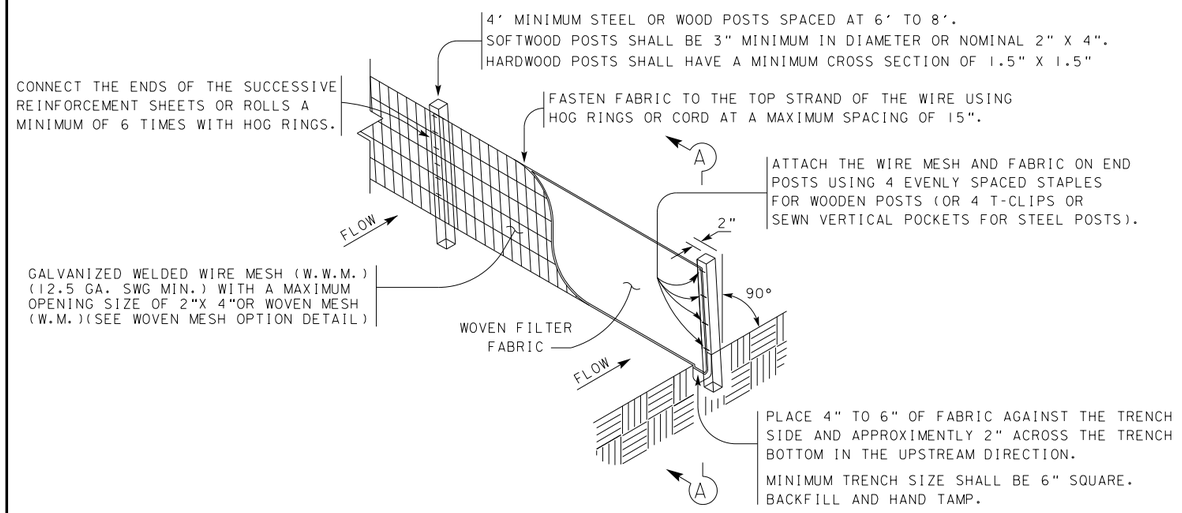
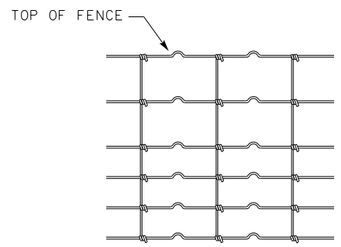
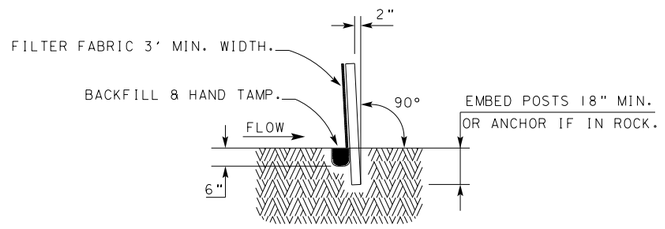


TEMPORARY SEDIMENT CONTROL FENCE

SCF





SECTION A-A

HINGE JOINT KNOT WOVEN MESH (OPTION) DETAIL

GALVANIZED HINGE JOINT KNOT WOVEN MESH (12.5 GA.SWG MIN.) REQUIRES A MINIMUM OF FIVE HORIZONTAL WIRES SPACED AT A MAXIMUM OF 12 INCHES APART AND ALL VERTICAL WIRES SPACED AT A MAXIMUM OF 12 INCHES APART.

SEDIMENT CONTROL FENCE USAGE GUIDELINES

A SEDIMENT CONTROL FENCE MAY BE CONSTRUCTED NEAR THE DOWNSTREAM PERIMETER OF A DISTURBED AREA ALONG A CONTOUR TO INTERCEPT SEDIMENT FROM OVERLAND RUNOFF. A 2 YEAR STORM FREQUENCY MAY BE USED TO CALCULATE THE FLOW RATE TO BE FILTERED.

SEDIMENT CONTROL FENCE SHOULD BE SIZED TO FILTER A MAXIMUM FLOW THROUGH RATE OF 100 GPM/FT^2. SEDIMENT CONTROL FENCE IS NOT RECOMMENDED TO CONTROL EROSION FROM A DRAINAGE AREA LARGER THAN 2 ACRES.

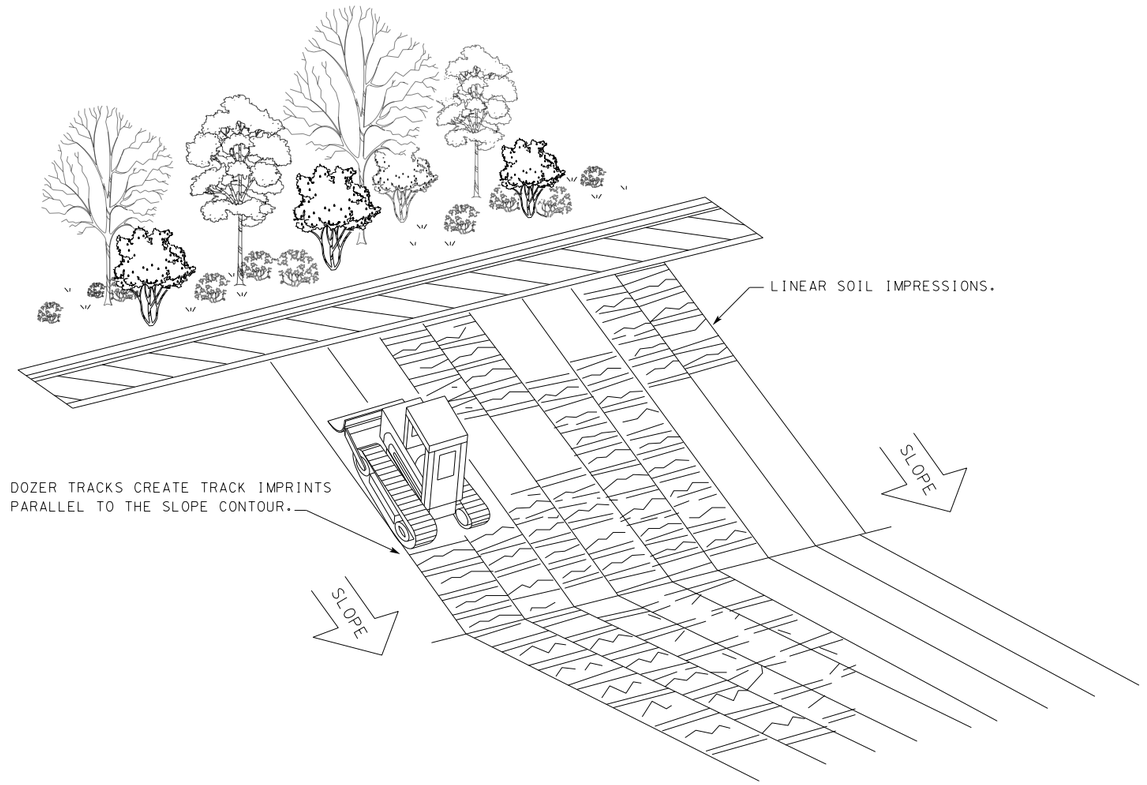
LEGEND

SEDIMENT CONTROL FENCE

SCF

GENERAL NOTES

1. VERTICAL TRACKING IS REQUIRED ON PROJECTS WHERE SOIL DISTRIBUTING ACTIVITIES HAVE OCCURRED UNLESS OTHERWISE APPROVED.
2. PERFORM VERTICAL TRACKING ON SLOPES TO TEMPORARILY STABILIZE SOIL.
3. PROVIDE EQUIPMENT WITH A TRACK UNDERCARRIAGE CAPABLE OF PRODUCING LINEAR SOIL IMPRESSIONS MEASURING A MINIMUM OF 12" IN LENGTH BY 2" TO 4" IN WIDTH BY 1/2" TO 2" IN DEPTH.
4. DO NOT EXCEED 12" BETWEEN TRACK IMPRESSIONS.
5. INSTALL CONTINOUS LINEAR TRACK IMPRESSIONS WHERE THE MINIMUM 12" LENGTH IMPRESSIONS ARE PERPENDICULAR TO THE SLOPE OR DIRECTION OF WATER FLOW.



VERTICAL TRACKING

Texas Department of Transportation

Design Division Standard

TEMPORARY EROSION, SEDIMENT AND WATER POLLUTION CONTROL MEASURES

FENCE & VERTICAL TRACKING

EC(1)-16

FILE: EC116	DN:TXDOT	CK:KM	DW:VP	DN/CK:LS
	CONT	SECT	JOB	HIGHWAY
REVISIONS	0902	90	019,ETC	CS
	DIST	COUNTY		SHEET NO.
	FTW	TARRANT		106

DATE: 4/12/2024
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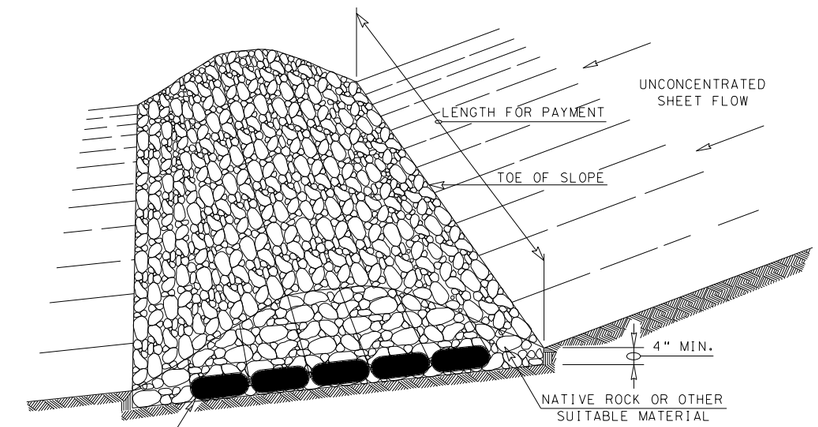
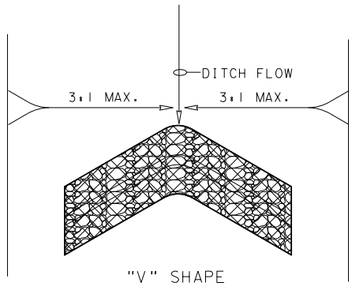
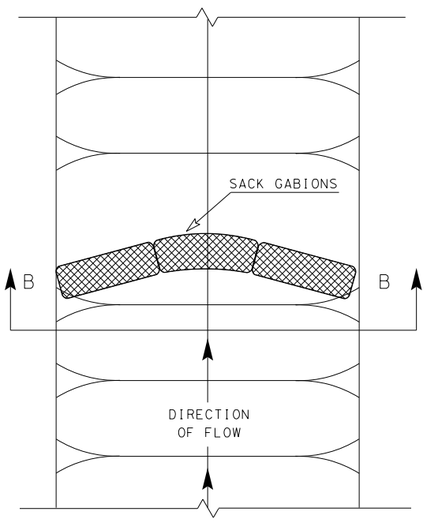


FILTER DAM AT TOE OF SLOPE

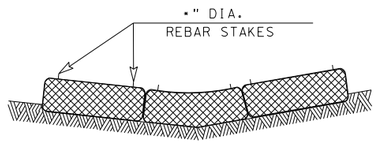
RFD1



"V" SHAPE
PLAN VIEW



PLAN VIEW



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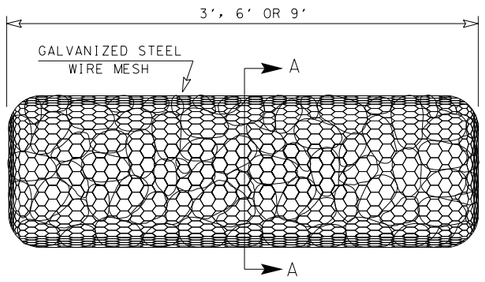
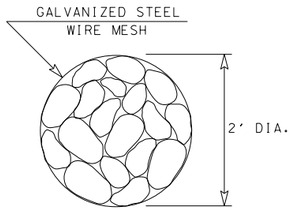
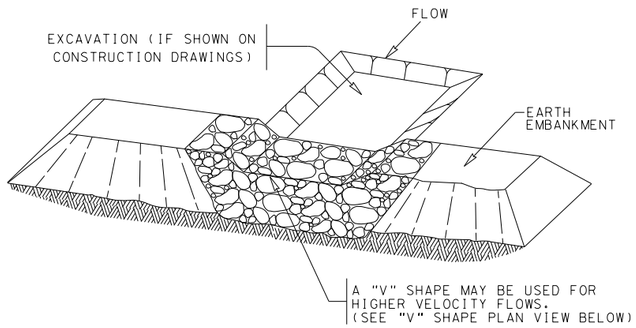


TYPE 4 (SACK GABIONS)

RFD4

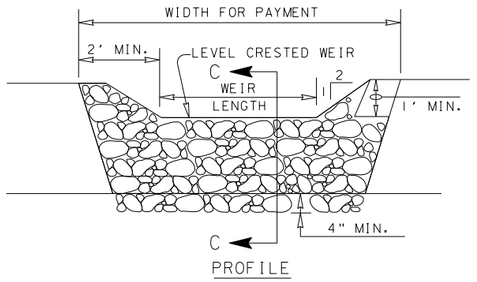


SECTION A-A

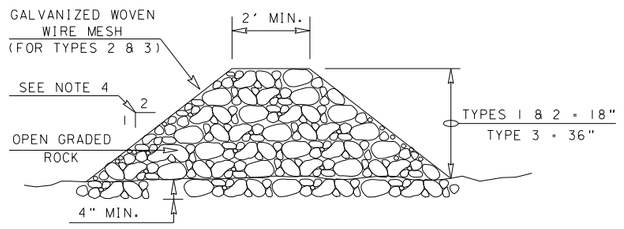


FILTER DAM AT SEDIMENT TRAP

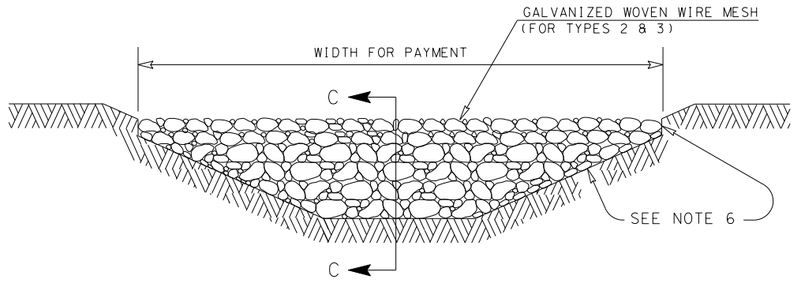
RFD1 — OR — RFD2



PROFILE



SECTION C-C



FILTER DAM AT CHANNEL SECTIONS

RFD1 — OR — RFD2 — OR — RFD3

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.

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 •" DIA. REBAR STAKES, AND HAVE A DOUBLE-TWISTED HEXAGONAL WEAVE WITH A NOMINAL MESH OPENING OF 2 •" X 3 •"
10. FLOW OUTLET SHOULD BE ONTO A STABILIZED AREA (VEGETATION, ROCK, ETC.).
11. THE GUIDELINES SHOWN HEREON ARE SUGGESTIONS ONLY AND MAY BE MODIFIED BY THE ENGINEER.

PLAN SHEET LEGEND

TYPE 1 ROCK FILTER DAM	RFD1
TYPE 2 ROCK FILTER DAM	RFD2
TYPE 3 ROCK FILTER DAM	RFD3
TYPE 4 ROCK FILTER DAM	RFD4

Texas Department of Transportation — Design Division Standard

TEMPORARY EROSION, SEDIMENT AND WATER POLLUTION CONTROL MEASURES

ROCK FILTER DAMS

EC(2)-16

FILE: EC216	DN:TXDOT	CK:KM	DW:VP	DN/CK:LS
	CONT	SECT	JOB	HIGHWAY
REVISIONS	0902	90	019,ETC	CS
	DIST	COUNTY		SHEET NO.
	FTW	TARRANT		107

DATE: 4/12/2024
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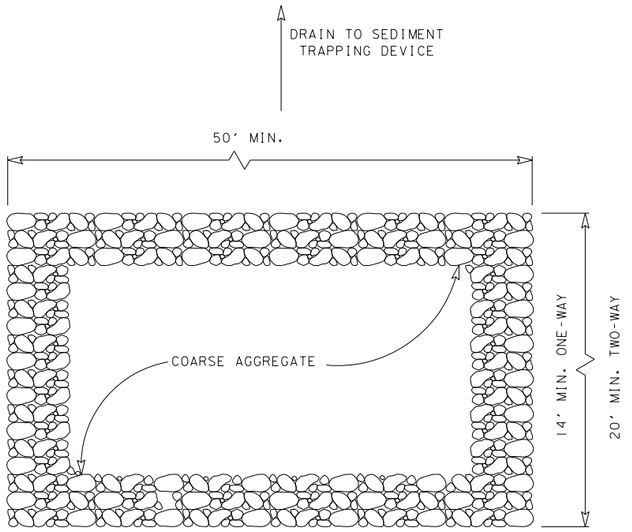
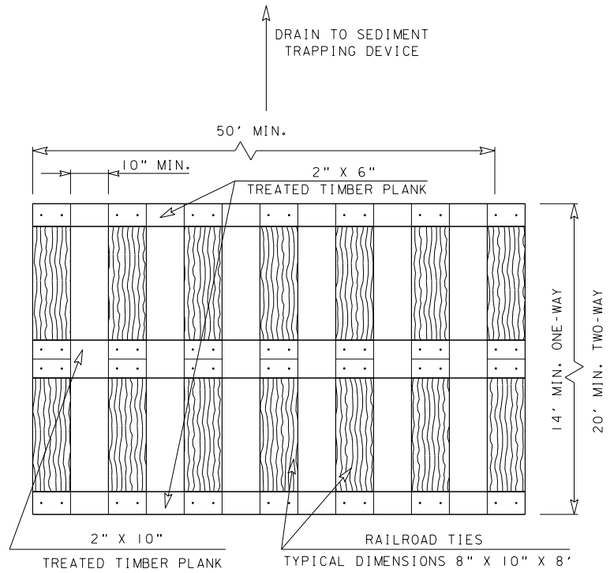
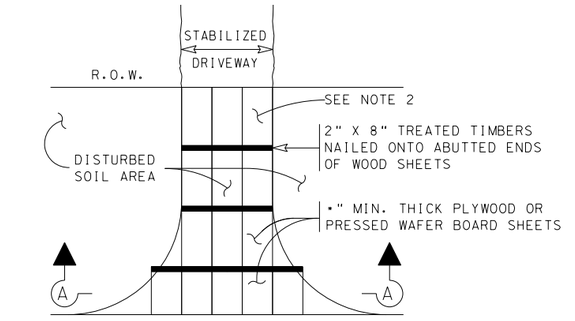


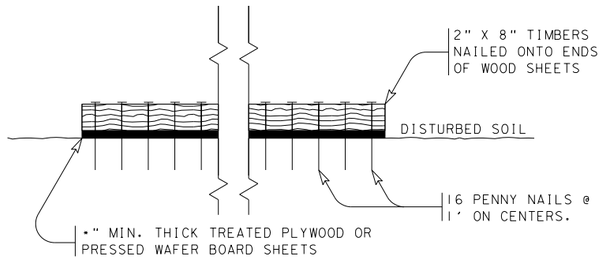
PLAN VIEW



PLAN VIEW



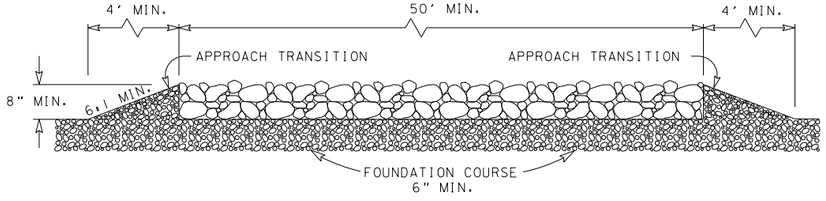
PLAN VIEW



SECTION A-A

CONSTRUCTION EXIT (TYPE 3)

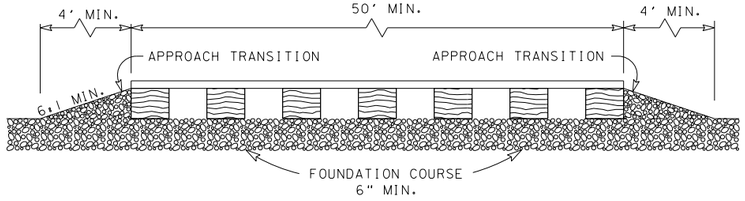
SHORT TERM



ELEVATION VIEW

CONSTRUCTION EXIT (TYPE 1)

ROCK CONSTRUCTION (LONG TERM)



ELEVATION VIEW

CONSTRUCTION EXIT (TYPE 2)

TIMBER CONSTRUCTION (LONG TERM)

GENERAL NOTES (TYPE 1)

1. THE LENGTH OF THE TYPE 1 CONSTRUCTION EXIT SHALL BE AS INDICATED ON THE PLANS, BUT NOT LESS THAN 50'.
2. THE COARSE AGGREGATE SHOULD BE OPEN GRADED WITH A SIZE OF 4" TO 8".
3. THE APPROACH TRANSITIONS SHOULD BE NO STEEPER THAN 6:1 AND CONSTRUCTED AS DIRECTED BY THE ENGINEER.
4. THE CONSTRUCTION EXIT FOUNDATION COURSE SHALL BE FLEXIBLE BASE, BITUMINOUS CONCRETE, PORTLAND CEMENT CONCRETE OR OTHER MATERIALAS APPROVED BY THE ENGINEER.
5. THE CONSTRUCTION EXIT SHALL BE GRADED TO ALLOW DRAINAGE TO A SEDIMENT TRAPPING DEVICE.
6. THE GUIDELINES SHOWN HEREON ARE SUGGESTIONS ONLY AND MAY BE MODIFIED BY THE ENGINEER.
7. CONSTRUCT EXITS WITH A WIDTH OF AT LEAST 14 FT. FOR ONE-WAY AND 20 FT. FOR TWO-WAY TRAFFIC FOR THE FULL WIDTH OF THE EXIT, OR AS DIRECTED BY THE ENGINEER.

GENERAL NOTES (TYPE 2)

1. THE LENGTH OF THE TYPE 2 CONSTRUCTION EXIT SHALL BE AS INDICATED ON THE PLANS, BUT NOT LESS THAN 50'.
2. THE TREATED TIMBER PLANKS SHALL BE ATTACHED TO THE RAILROAD TIES WITH •"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
	CONT	SECT	JOB	HIGHWAY
REVISIONS	0902	90	019,ETC	CS
	DIST	COUNTY		SHEET NO.
	FTW	TARRANT		108