TEXAS OF TEXAS
DEPARTMENT OF TRANSPORTATION

INDEX OF SHEETS

PLANS OF PROPOSED
STATE HIGHWAY IMPROVEMENT
FEDERAL-AID PROJECT # BR 2025(152)

US 377
E BELKNAP AT TRINITY RIVER

TARRANT COUNTY

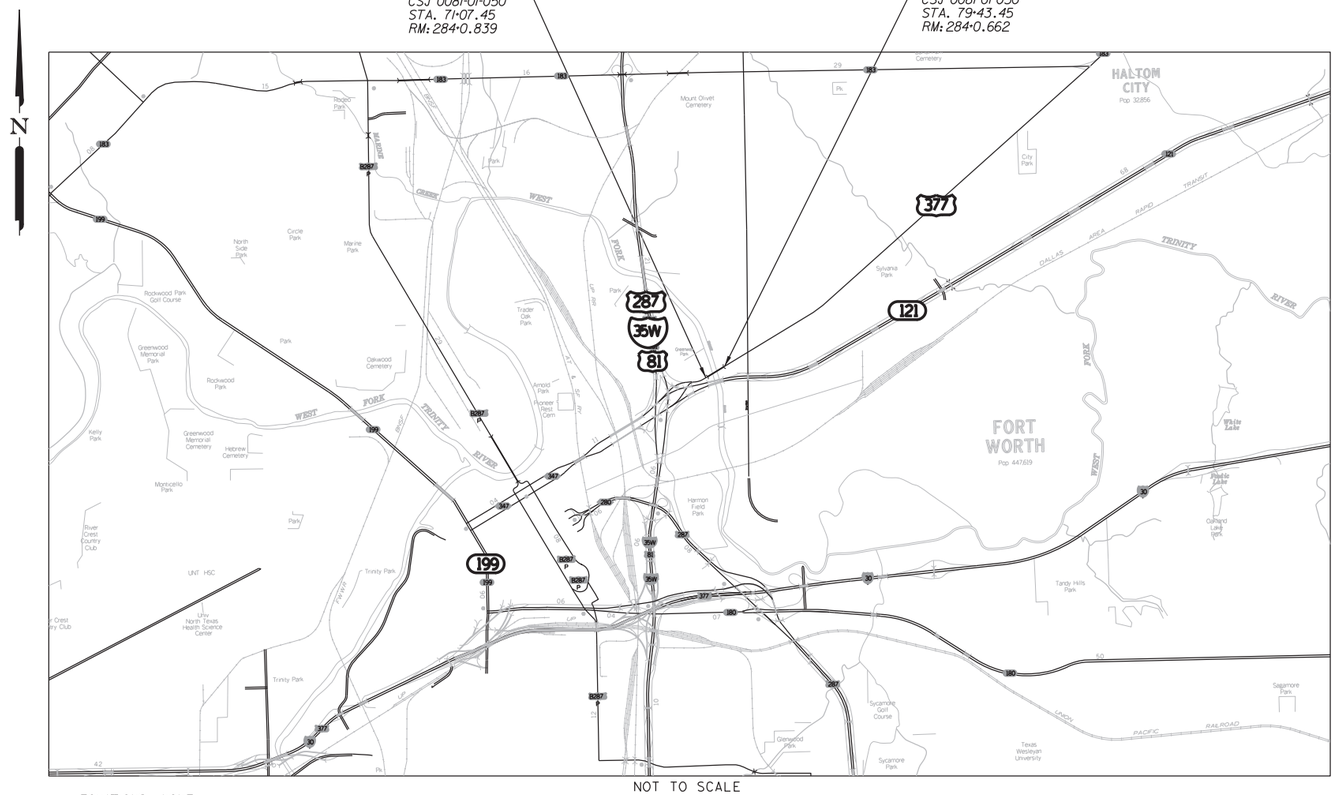
CSJ	HWY	LIMITS	ROADWAY LENGTH		BRIDGE LENGTH		PROJECT LENGTH	
			FEET	MILES	FEET	MILES	FEET	MILES
0081-01-050	US 377	STA. 70+07.45 TO STA. 79+43.45	219.19	.041	716.81	0.136	936.00	0.177

TOTAL PROJECT LENGTH = 0.177 MILES

FOR THE CONSTRUCTION OF BRIDGE WIDENING OR REHABILITATION
CONSISTING OF BRIDGE REHABILITATION

BEGIN PROJECT
CSJ 0081-01-050
STA. 71+07.45
RM: 284+0.839

END PROJECT
CSJ 0081-01-050
STA. 79+43.45
RM: 284+0.662



NOT TO SCALE

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

FEDERAL AID PROJECT NO.			
BR 2025(152)			
CONT.	SECT.	JOB	HIGHWAY
0081	01	050	US 377
DIST	COUNTY		SHEET NO.
FTW	TARRANT		1

FUNCTIONAL CLASS: PRINCIPAL ARTERIAL
DESIGN SPEED: 45 MPH

ADT (2022) = 5,322
ADT (2042) = 7,451

LETTING DATE:
CONTRACTOR:

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

STATE OF TEXAS
KENNETH E. GOTTLEABER
61759
REGISTERED PROFESSIONAL ENGINEER
7/10/2024

Bartlett&West
9330 LBJ FREEWAY, STE 1150 - DALLAS, TX 75243
PHONE 888-200-6464
TBPE FIRM REGISTRATION NO. 6499

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. SEPTEMBER 1, 2024 AND SPECIFICATION ITEMS LISTED AND DATED AS FOLLOWS, SHALL GOVERN ON THIS PROJECT:
REQUIRED CONTRACT PROVISIONS FOR ALL FEDERAL-AID CONSTRUCTION CONTRACTS FORM FHWA 1273, OCTOBER 2023)

Texas Department of Transportation®

SUBMITTED FOR LETTING: 7/12/2024
DocuSigned by:
7B89CC87CF2847...ER

RECOMMENDED FOR LETTING: 7/18/2024
DocuSigned by:
7879B0B92E5D403...TOR, TP&D

APPROVED FOR LETTING: 7/18/2024
DocuSigned by:
David M Salazar, P.E.
B741E64FAD82411...

DATE: 7/10/2024 TIME: 4:15:02 PM TxDOT_PDF_11x17-BW.pltcfg
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SHEET NO.	DESCRIPTION
	GENERAL
1	TITLE SHEET
2	INDEX OF SHEETS
3	TYPICAL SECTION
4 - 4H	GENERAL NOTES
5 - 5A	E & Q
6 - 8	QUANTITY SUMMARIES
	TRAFFIC CONTROL PLAN ITEMS
9	SEQUENCE OF WORK
10	DETOUR MAP
11 - 12	TRAIL CLOSURE PLAN
13 - 14	CONSTRUCTION PHASING
	TRAFFIC CONTROL STANDARDS
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27	TCP 1-4-18
28	TCP 6-4-12
29	TCP 2-4-18
30	TCP 2-5-18
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32	TREATMENT FOR VARIOUS EDGE CONDITIONS
	ROADWAY DETAILS
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36	CURB DRAIN DETAILS
	ROADWAY STANDARDS
37	CCCG (FTW) (MOD)
38	CSWD (FTW)
39	GF(31)TR TL2-19
40	GF(31)-19
41	SGT (12S) 31-18
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	BRIDGE DETAILS
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49	ABUTMENT REPAIR ABUTMENTS 1 & 2
50 - 51	ABUTMENT REPAIR PHOTOS
52	BENT REPAIR BENTS 1-3 & 9-13
53	BENT REPAIR BENTS 4, 5 & 8
54	BENT REPAIR BENTS 6 & 7
55	PIER REPAIR PIERS 1 & 2
56 - 58	BENT REPAIR PHOTOS
59	PIER REPAIR PHOTOS
60	T-BEAM SPAN REPAIR SPANS 1-6 & 10-16
61 - 63	T-BEAM SPANS REPAIR PHOTOS
64 - 65	T-GIRDER UNIT REPAIR SPANS 7, 8 & 9
66 - 68	T-GIRDER UNIT REPAIR PHOTOS
69	CONCRETE RAIL REPAIR (IN-KIND)
70 - 72	CONCRETE RAIL REPAIR PHOTOS
73 - 74	CONCRETE STRUCTURE REPAIR
75 - 76	CONCRETE DECK REPAIR (FULL DEPTH)
77	CLEANING AND SEALING EXISTING BRIDGE JOINTS
78	ARMOR JOINT REPAIR
79	BRIDGE DECK OVERLAY NOTES
80 - 82	TYPE C411
83	TRF
	PAVEMENT MARKING & SIGNING STANDARDS
84	PM(1)-22
85	PM(2)-22
86	D & OM (1)-20
87	D & OM (2)-20
88	D & OM (3)-20
89	D & OM (6)-20
90	D & OM (VIA) - 20
91	D & OM (ST-FTW)-21
	ENVIRONMENTAL ITEMS DETAILS
92	EPIC
93 - 94	STORM WATER POLLUTION PREVENTION PLAN (SWP3)
95	SWP3 PLAN
	ENVIRONMENTAL STANDARDS
96	EC(3)-16
97	EC(9)-16

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

STATE OF TEXAS
KENNETH E. GOTTLEABER
61759
REGISTERED PROFESSIONAL ENGINEER
7/10/2024

Bartlett&West
9330 LBJ FREEWAY, STE 1150 - DALLAS, TX 75243
PHONE 888-200-6464
TBPE FIRM REGISTRATION NO. 6499

Texas Department of Transportation

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WEST FORK TRINITY RIVER
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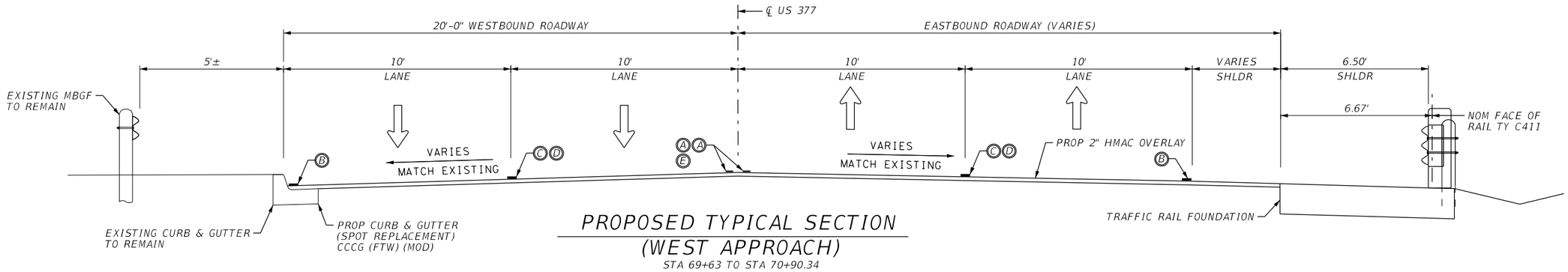
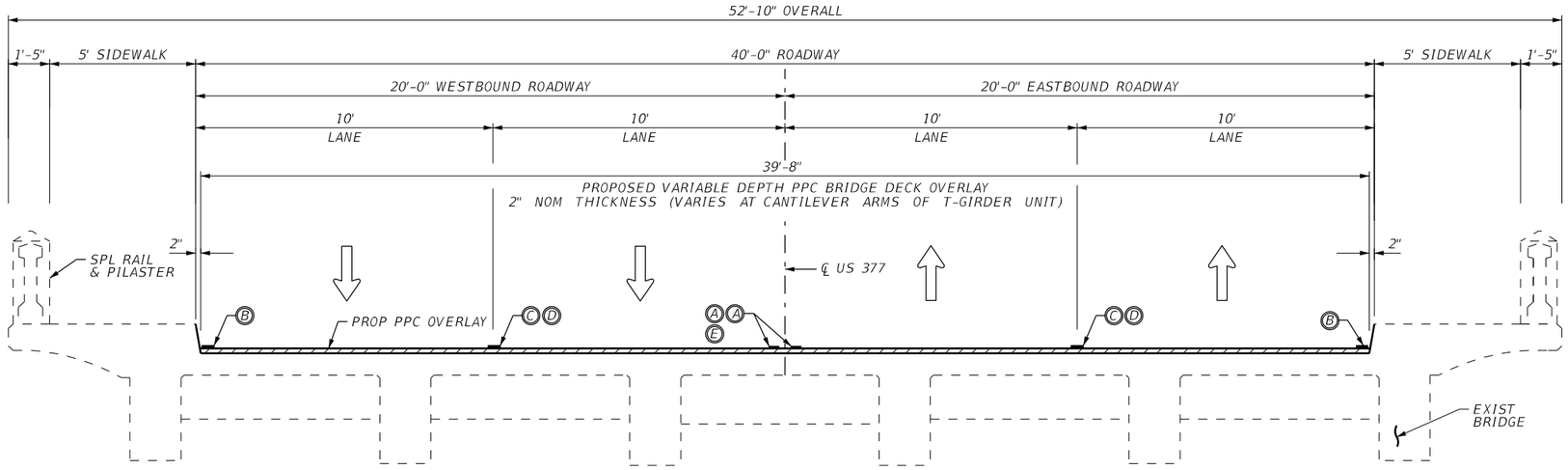
STATE	DISTRICT	COUNTY	
TEXAS	FTW	TARRANT	
CONTROL	SECTION	JOB	HIGHWAY
0081	01	050	US 377



PROPOSED TYPICAL SECTION (WEST APPROACH)

STA 69+63 TO STA 70+90.34

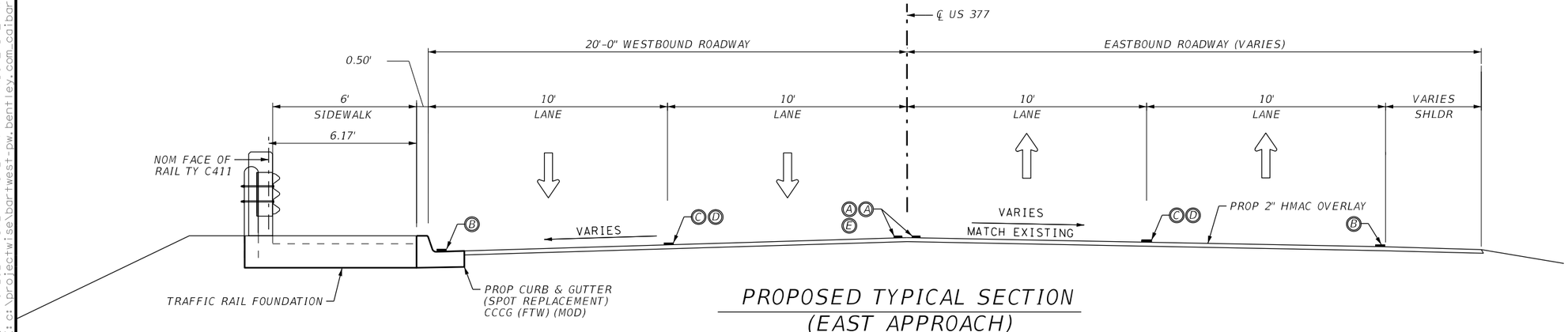


LEGEND

- (A) REFL PAV MRK TY I (Y) 6" (SLD)
- (B) REFL PAV MRK TY I (W) 6" (SLD)
- (C) REFL PAV MRK TY I (W) 6" (BRK)
- (D) REFL PAV MRKR TY I-C
- (E) REFL PAV MRKR TY II-A-A

PROPOSED TYPICAL SECTION ON BRIDGE

STA STA 70+90.34 TO 78+07.15



PROPOSED TYPICAL SECTION (EAST APPROACH)

STA 78+07.15 TO STA 79+71

STATE OF TEXAS
JAMES EDWARD BROWNE
62207
LICENSED PROFESSIONAL ENGINEER
7/10/2024

Bartlett&West
9330 LBJ FREEWAY, STE 1150 - DALLAS, TX 75243
PHONE 888-200-6464
TBPE FIRM REGISTRATION NO. 6499

Texas Department of Transportation

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TYPICAL SECTION

WEST FORK TRINITY RIVER
EXISTING NBI: 02-220-0081-01-001

SHEET 1 OF 1

FED.RD. DIV. NO.	FEDERAL AID PROJECT NO.		SHEET NO.
6	SEE TITLE SHEET		3
STATE	DISTRICT	COUNTY	
TEXAS	FTW	TARRANT	
CONTROL	SECTION	JOB	HIGHWAY
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Specification Data

Basis of Estimate

Item	Description	Unit	Rate
166	Fertilizer (16-8-8)	ton	600 lb./acre**
168	Vegetative Watering	1,000 gal.	169,400 gal./acre
341	Hot Mix (All Types)	ton	115 lb./sq. yd.-in.
341	Tack Coat - Trackless Tack	gal.	0.15-0.22 gal./sq. yd.

** Non-Pay, for Contractor's Information Only.

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.

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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: Yacoub@txdot.gov

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.

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.

On superelevated curves the shoulders will have the same cross-slope as the pavement, unless otherwise indicated.

On superelevated curves where the grade line is in a sag or on a flat grade, overlay the shoulders to the extent necessary to prevent trapping of water on the high side.

Do not discolor or damage existing curb and 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.

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2) Street Inlets—Locations are at the face of curb at a distance of L/2 from the end of the inlet.

3) Headwalls—Locations are to the outside face of the headwall at the centerline of the pipe or box structure. For pipe headwalls with Type "P" or "C" safety end treatment, locations are on the centerline of the pipe structure at the limit of payment for pipe.

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.

Install all required concrete riprap flumes immediately following the construction of ditches in which they are to be placed. In addition, apply all erosion control measures as shown on the plans or as directed, immediately following construction of channels to their required line, grade, and section.

The following standard detail sheets have been modified:
CONCRETE CURB AND CURB AND GUTTER DETAILS: CCCG(FTW)(MOD)

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.

The Contractor may perform bridge repair work that is below deck level and not in the proximity to traffic on a 24 hour per day basis with prior approval of the Area Engineer.

The Contractor shall maintain a clear zone of 10 feet when working in or near uncurbed roadways and a clear zone of 4 feet or 6 feet when working in or near 6 foot curbed roadways.

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 a notarized original of the TxDOT Construction Material Buy America Certification Form for all items classified as construction materials. This form is not required for materials classified as a manufactured product.

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

The Buy America Material Classification Sheet is located at the below link. https://www.txdot.gov/business/resources/materials/buy-america-material-classification-sheet.html for clarification on material categorization.

Item 7. Legal Relations and Responsibilities

This contract requires work to be done on railroad property. Cooperate with the railroads and comply with all of their requirements including obtaining any required training before performing work on railroad property.

Submit to the Engineer an original railroad liability insurance policy.

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

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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 0.05 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 and all railroad tracks encountered as approved. 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

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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 30 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.

Event Lane Closure Restrictions 3 PM the day before Event to 9 AM the day after the Event			
NASCAR Races at Texas Motor Speedway (generally 3 events):	NASCAR Nationwide and Sprint Cup Series (Held in late March/early April)	NASCAR Nationwide and Sprint Cup Series (Held in Late October/early November)	Indy Series Racing and NASCAR Truck Series (Held in June)
Within one mile radius of major retail traffic generators i.e. malls (Thanksgiving Day through January 2)			
Fort Worth Stock Show and Rodeo			
MayFest			

Item 8. Prosecution and Progress

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

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 the schedule and obtain approval prior to beginning construction. The baseline schedule working days will be the same as the number of working days established by the Contract. The Estimate will be held if a monthly schedule update is not submitted. Also submit the XER file.

Item 100. Preparing Right of Way

Measurement for this item will be along the centerline of the project with the limits of measurements as shown on the plans.

Removal of existing concrete pavement will be in accordance with Item 104, "Removing Concrete" except that this work will not be paid for directly, but will be subsidiary to Item 100, "Preparing Right of Way."

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Item 110. Excavation

Cross-sections for pay quantity determination of earthwork may be developed photogrammetrically.

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, 112, and 132. Excavation, Subgrade Widening, 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

Do not provide Type B embankment material with a Plasticity Index (PI) higher than 35.

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. The Engineer will perform separate testing of the material.

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

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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. Blending compost on-site is not permitted.

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 341. Dense-Graded Hot-Mix Asphalt

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.

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Provide a PG 64-22 asphalt for the base course.

Furnish a CSS-1P with greater than 50% asphalt residue for the tack coat on this project. A trackless tack can be used in lieu of CSS-1P tack coat or as directed by the Engineer. The Engineer will set the rate at time of application.

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 per Table 5 is not allowed.

Include the approved mix design number on each delivery ticket.

Use Surface Test Type A for this project.

Item 344. 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.

Natural (field) sands are not allowed.

Provide a PG 64-22 asphalt for the base course.

Provide a PG 64-22 asphalt for the concrete underlayment course.

Provide a PG 70-28 asphalt for the surface course and levelup course, if applicable.

Furnish a CSS-1P with greater than 50% asphalt residue for the tack coat on this project. A trackless tack can be used in lieu of CSS-1P tack coat or as directed by the Engineer. The Engineer will set the rate at time of application.

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 per Table 5 is not allowed.

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

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Use the Boil Test, Test Procedure Tex-530-C, and provide only mixes that produce zero percent (0%) stripping for design verification and during production.

Include the approved mix design number on each delivery ticket.

Use Surface Test Type A for this project.

Item 354. Planing and Texturing Pavement

All salvaged materials to become the property of the contractor.

Intent is to remove all HMAC from existing concrete in one pass. Repair damaged concrete paving caused by Contractor's operations at the expense of the Contractor as directed by the Engineer.

Take precaution to avoid damage to existing bridge decks and bridge joints including but not limited to armor joints, header joints, relieve joints, etc. Repair any damage to the bridge decks and/or joints as approved. This work will not be paid directly, but will be performed at the Contractor's expense.

Item 428. Penetrating Concrete Surface Treatment

Provide a Type 1-Silane surface treatment to the roadway slab, inside face of rail and any other areas shown on the detail sheets.

Item 432. Riprap

Provide weep holes as directed.

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.

An 8 inch (.67 ft.) by 18 inch (1.5 ft.) toe wall is required at the exposed edges of all concrete riprap, unless otherwise directed.

Locations and lengths of riprap flumes shown on the plans are approximate. Actual lengths and locations are to be determined in the field.

When synthetic fiber reinforcement concrete option is chosen, provide the following:

- At all construction joints (vertical or horizontal) provide #3 bars 24 in. long and placed on 18 in. centers along joint length. Bars should be centered in concrete cross section.

- At all toe wall locations #3 L-bars will be required on 18 in. centers with a length 2 times the depth of the toe wall. Place three #3 bars the length of the toe wall and equally spaced on the L-bars.

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 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.

Maintenance of roadways, not paid as Item 508, "Constructing Detours," and designated in the traffic control plan to carry traffic, will be the responsibility of the Contractor and will be paid for by "Contractor Force Account or Agreed Unit Price".

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.

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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 503. 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.

(Number) 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

Item 505. 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 __ additional shadow vehicle(s) with TMA for TCP (_-_)-_ as detailed on General Note of this standard sheet.

Therefore, _2_ 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.

Item 506. Temporary Erosion, Sedimentation, and Environmental Controls

The SW3P for this project will consist of using the following items as directed:

- Construction exits
- Erosion control logs

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.

Items 530 And 531. Intersections, Driveways and Turnouts, and Sidewalks

The furnishing and installation of the sand cushion in proposed sidewalks, sidewalk ramps, and driveways will not be paid for directly but will be subsidiary to this bid item.

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.

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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 666. Reflectorized Pavement Markings with Retroreflective Requirements

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.

Estimate & Quantity Sheet

CONTROLLING PROJECT ID 0081-01-050 **DISTRICT** Fort Worth **COUNTY** Tarrant
HIGHWAY US 377

			CONTROL SECTION JOB		**0081-01-050**	TOTAL EST.	TOTAL FINAL
			PROJECT ID		**A00061163**		
			COUNTY		**Tarrant**		
			HIGHWAY		**US 377**		
ALT	**BID CODE**	**DESCRIPTION**	**UNIT**	EST.	FINAL		
	104-7006	REMOV CONC (RIPRAP)	SY	13.000		13.000	
	104-7015	REMOV CONC (CURB RAMP)	SY	8.000		8.000	
	104-7017	REMOV CONC (CURB & GUTTER)	LF	8.000		8.000	
	105-7022	RMV (2") TRT/UNTRT BASE & ASPH PAV	SY	105.000		105.000	
	132-7001	EMBANK (FNL)(OC)(TY A)	CY	13.000		13.000	
	161-7002	COMPOST MANUF TOPSOIL (4")	SY	131.000		131.000	
	162-7002	BLOCK SODDING	SY	131.000		131.000	
	168-7001	VEGETATIVE WATERING	TGL	5.000		5.000	
	341-7025	D-GR HMA TY-C SAC-A PG70-22 (EXEMPT)	TON	115.000		115.000	
	341-7064	D-GR HMA TY-D PG 64-22 (EXEMPT)	TON	13.000		13.000	
	341-7082	TACK COAT	GAL	229.000		229.000	
	354-7035	PLANE ASPH CONC PAV(0" TO 6")	SY	4,313.000		4,313.000	
	420-7052	CL C CONC (RAIL FOUNDATION)	CY	21.200		21.200	
	420-7067	CL C CONC (MISC)	CY	2.200		2.200	
	428-7001	PENETRATING CONCRETE SURFACE TREATMENT	SY	7,507.000		7,507.000	
	429-7003	CONC STR REPAIR(DECK REP(PART DEPTH))	SF	4,300.000		4,300.000	
	429-7005	CONC STR REPAIR(DECK REP (FULL DEPTH))	SF	66.000		66.000	
	429-7007	CONC STR REPAIR (VERTICAL & OVERHEAD)	SF	845.000		845.000	
	432-7007	RIPRAP (CONC) (CL B) (4 IN)	CY	3.000		3.000	
	438-7001	CLEANING AND SEALING EXISTING JOINTS	LF	533.000		533.000	
	439-7017	POLYESTER POLYMER CONC OVERLAY (2")	SY	2,834.000		2,834.000	
	439-7019	POLYESTER POLYMER CONC OVERLAY (3")	SY	353.000		353.000	
	442-7007	STR STEEL (MISC NON-BRIDGE)	LB	712.000		712.000	
	450-7038	RAIL (TY C411)	LF	50.000		50.000	
	500-7001	MOBILIZATION	LS	1.000		1.000	
	502-7001	BARRICADES, SIGNS AND TRAFFIC HANDLING	MO	9.000		9.000	
	503-7002	PORTABLE CHANGEABLE MESSAGE SIGN	EA	2.000		2.000	
	505-7001	TMA (STATIONARY)	DAY	30.000		30.000	
	505-7002	TMA (MOBILE OPERATION)	HR	8.000		8.000	
	506-7020	CONSTRUCTION EXITS (INSTALL) (TY 1)	SY	156.000		156.000	
	506-7024	CONSTRUCTION EXITS (REMOVE)	SY	156.000		156.000	
	506-7044	BIODEG EROSN CONT LOGS (INSTL) (12")	LF	963.000		963.000	
	506-7046	BIODEG EROSN CONT LOGS (REMOVE)	LF	963.000		963.000	
	529-7009	CONC CURB & GUTTER (TY II)	LF	132.000		132.000	
	531-7001	CONC SIDEWALKS (4")	SY	20.000		20.000	
	531-7006	CURB RAMPS (TY 2)	EA	1.000		1.000	
	540-7001	MTL W-BEAM GD FEN (TIM POST)	LF	50.000		50.000	

Estimate & Quantity Sheet

CONTROLLING PROJECT ID 0081-01-050 **DISTRICT** Fort Worth **COUNTY** Tarrant
HIGHWAY US 377

			CONTROL SECTION JOB		**0081-01-050**	TOTAL EST.	TOTAL FINAL
			PROJECT ID		**A00061163**		
			COUNTY		**Tarrant**		
			HIGHWAY		**US 377**		
ALT	**BID CODE**	**DESCRIPTION**	**UNIT**	EST.	FINAL		
	540-7006	MTL BEAM GD FEN TRANS (TL2)	EA	2.000		2.000	
	542-7001	REMOVE METAL BEAM GUARD FENCE	LF	88.000		88.000	
	544-7001	GUARDRAIL END TREATMENT (INSTALL)	EA	2.000		2.000	
	658-7012	INSTL DEL ASSM (D-SW)SZ 1(BRF)CTB	EA	18.000		18.000	
	658-7018	INSTL DEL ASSM (D-SW)SZ 1(BRF)GF2	EA	2.000		2.000	
	658-7056	INSTL OM ASSM (OM-2Y)(WC)GND	EA	2.000		2.000	
	662-7112	WK ZN PAV MRK SHT TERM (TAB)TY W	EA	144.000		144.000	
	662-7114	WK ZN PAV MRK SHT TERM (TAB)TY Y-2	EA	94.000		94.000	
	666-7347	PAVEMENT SLER 6"	LF	3,228.000		3,228.000	
	666-7407	REFL PAV MRK TY I (W)6"(BRK)(090MIL)	LF	460.000		460.000	
	666-7410	REFL PAV MRK TY I (W)6"(SLD)(090MIL)	LF	1,911.000		1,911.000	
	666-7422	REFL PAV MRK TY I (Y)6"(SLD)(090MIL)	LF	1,873.000		1,873.000	
	672-7002	REFL PAV MRKR TY I-C	EA	28.000		28.000	
	672-7004	REFL PAV MRKR TY II-A-A	EA	28.000		28.000	
	778-7001	CONCRETE RAIL REPAIR (IN-KIND)	LF	183.000		183.000	
	778-7004	CONCRETE RAIL REPLACEMENT (IN-KIND)	LF	51.000		51.000	
	780-7002	CNC CRACK REPAIR (DISCRETE)(INJECT)	LF	1,965.000		1,965.000	
	785-7004	BRIDGE JOINT REPAIR (ARMOR)	LF	82.000		82.000	
	18	EROSION CONTROL MAINTENANCE: CONTRACTOR FORCE ACCOUNT WORK (PART)	LS	1.000		1.000	
		SAFETY CONTINGENCY: CONTRACTOR FORCE ACCOUNT WORK (PART)	LS	1.000		1.000	

SUMMARY OF REMOVAL ITEMS

SHEET No.	ITEM-SERIES DESCRIPTION / LOCATION / DESCRIPTION	104-7006 REMOVING CONC (RIPRAP) SY	104-7015 REMOVING CONC (CURB RAMP) SY	104-7017 REMOVING CONC (CURB & GUTTER) LF	354-7035 PLANE ASPH CONC PAV (0" TO 6") SY	542-7001 REMOVE METAL BEAM GUARD FENCE LF
44, 45	BRIDGE DECK - PHASE 2				3,186	
31	WEST APPROACH			8	388	
32	EAST APPROACH	13	8		739	88
	TOTALS	13	8	8	4,313	88

SUMMARY OF ROADWAY ITEMS

SHEET No.	ITEM-SERIES DESCRIPTION / LOCATION / DESCRIPTION	132-7001 EMBANK (FNL) (OC) (TY A) CY	341-7025 D-GR HMA TY-C SAC-A PG70-22 (EXEMPT) TON	341-7082 TACK COAT GAL	420-7067 CL C CONC (MISC) CY	432-7007 RIPRAP (CONC) (CL B) (4") CY	529-7009 CONC CURB & GUTTER (TY II) LF	531-7001 CONC SIDEWALKS (4") SY	531-7006 CURB RAMPS (TY 2) EA	540-7001 MTL W-BEAM GD FEN (TIM POST) LF	540-7006 MTL BEAM GD FEN TRANS (TL2) EA	544-7001 GUARDRAIL END TREATMENT (INSTALL) EA
31	WEST APPROACH		43	85			8			25	1	1
33	EAST APPROACH	13	72	144		3	124	20	1	25	1	1
34	EAST APPROACH - CURB DRAIN				2.2							
	TOTALS	13	115	229	2.2	3	132	20	1	50	2	2

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US 377 QUANTITY SUMMARIES

WEST FORK TRINITY RIVER
NBI: 02-220-0081-01-001

SHEET 1 OF 3

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6	SEE TITLE SHEET		6
STATE	DISTRICT	COUNTY	
TEXAS	FTW	TARRANT	
CONTROL	SECTION	JOB	HIGHWAY
0081	01	050	US 377

DATE: 7/10/2024 TIME: 7:46:36 AM TxDOT_PDF_11x17-BW.pltcfg
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SUMMARY OF PAVEMENT MARKING ITEMS

SHEET No.	LOCATION / DESCRIPTION	ITEM-SERIES DESCRIPTION	658-7012 INSTL DEL ASSM (D-SW) SZ 1 (BRF) CTB	658-7018 INSTL DEL ASSM (D-SW) SZ 1 (BRF) GF2	658-7056 INSTL OM ASSM (OM-2Y) (WC) GND	666-7407 REFL PAV MRK TY I (W) 6" (BRK) (090 MIL)	666-7410 REFL PAV MRK TY I (W) 6" (SLD) (090 MIL)	666-7422 REFL PAV MRK TY I (Y) 6" (SLD) (090 MIL)	666-7347 PAVEMENT SLER 6"	672-7002 REFL PAV MRKR TY I-C	672-7004 REFL PAV MRKR TY II-A-A
			EA	EA	EA	LF	LF	LF	LF	EA	EA
3	BRIDGE DECK - PHASE 2		14			360	1,434	1434	3,228	18	18
3, 31	WEST APPROACH		2	1	1	40	165	165		4	4
3, 33	EAST APPROACH		2	1	1	60	312	274		6	6
	TOTALS		18	2	2	460	1,911	1,873	3,228	28	28

SUMMARY OF TRAFFIC CONTROL ITEMS

SHEET No.	LOCATION / DESCRIPTION	ITEM-SERIES DESCRIPTION	105-7022 RMV (2") TRT/UNTRT BASE & ASPH PAV	341-7064 D-GR HMA TY-D PG64-22 (EXEMPT)	502-7001 BARRICADES SIGNS AND TRAFFIC HANDLING	503-7002 PORTABLE CHANGEABLE MESSAGE SIGN	505-7001 TMA (STATIONARY)	505-7002 TMA (MOBILE OPERATION)	662-7112 WK ZN PAV MRK SHT TERM (TAB) TY W	662-7114 WK ZN PAV MRK SHT TERM (TAB) TY Y-2
			SY	TON	MO	EA	DAY	HR	EA	EA
WZ STDS	WEST APPROACH					1			12	8
WZ STDS	EAST APPROACH					1			24	14
WZ STDS	BRIDGE REPAIR								108	72
11	TEMPORARY TRAIL DETOUR		75	9						
12	TEMPORARY TRAIL DETOUR		30	4						
	TOTALS		105	13	9	2	30	8	144	94

SUMMARY OF EROSION CONTROL ITEMS

SHEET No.	LOCATION / DESCRIPTION	ITEM-SERIES DESCRIPTION	161-7002 COMPOST MANUF TOPSOIL (4")	162-7002 BLOCK SODDING	168-7001 VEGETATIVE WATERING	506-7020 CONSTRUCTION EXITS (INSTALL) (TY 1)	506-7024 CONSTRUCTION EXITS (REMOVE)	506-7044 BIODEG EROSN CONT LOGS (INSTL) (12")	506-7046 BIODEG EROSN CONT LOGS (REMOVE)
			SY	SY	TGL	SY	SY	LF	LF
87	SWP3 PLAN		131	131	5	156	156	963	963
	TOTALS		131	131	5	156	156	963	963

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US 377 QUANTITY SUMMARIES

WEST FORK TRINITY RIVER
NBI: 02-220-0081-01-001

SHEET 2 OF 3

FED.RD. DIV. NO.	FEDERAL AID PROJECT NO.		SHEET NO.
6	SEE TITLE SHEET		7
STATE	DISTRICT	COUNTY	
TEXAS	FTW	TARRANT	
CONTROL	SECTION	JOB	HIGHWAY
0081	01	050	US 377

SUMMARY OF ESTIMATED BRIDGE REPAIR QUANTITIES

SHEET No.	ITEM-SERIES DESCRIPTION / BRIDGE ELEMENT	420-7052 CL C CONC (RAIL FOUNDATION) CY	428-7001 PENETRATING CONCRETE SURFACE TREATMENT SY	429-7003 CONC STR REPAIR (DECK REP (PART DEPTH)) SF	429-7005 CONC STR REPAIR (DECK REP (FULL DEPTH)) SF	429-7007 CONC STR REPAIR (VERTICAL & OVERHEAD) SF	438-7001 CLEANING AND SEALING EXISTING JOINTS LF	439-7017 POLYESTER POLYMER CONC OVERLAY (2") SY	439-7019 POLYESTER POLYMER CONC OVERLAY (3") SY	442-7007 STR STEEL (MISC NON-BRIDGE) LB
31	WEST APPROACH	12.3								
32	EAST APPROACH	8.9								
34	EAST APPROACH - CURB DRAIN									712
44, 45	BRIDGE SIDEWALK (& CURB FACE) (BRIDGE LENGTH)		960							
45, 45	BRIDGE DECK - 716.83' (16 SPANS)						533			
47	ABUTMENTS - 2 EA		205			30				
50-52	INTERIOR BENTS - 13 EA		3,015			240		2,456		
53	PIERS - 2 EA		640			30		378	353	
58	T-BEAM SPANS - 13 EA X 42.50'		923	3,315	66	325				
62-63	T-GIRDER UNIT - 1 EA X 164.33' (39.67' - 85.00' - 39.66')		514	985		220				
67	RAIL - 16 SPANS X 2 (LEFT & RIGHT)		1,250							
	TOTALS	21.2	7,507	4,300	66	845	533	2,834	353	712

SUMMARY OF ESTIMATED BRIDGE REPAIR QUANTITIES (CONT'D)

SHEET No.	ITEM-SERIES DESCRIPTION / BRIDGE ELEMENT	450-7038 RAIL (TY C411) LF	778-7001 CONCRETE RAIL REPAIR (IN-KIND) LF	778-7004 CONCRETE RAIL REPLACEMENT (IN-KIND) LF	780-7002 CNC CRACK REPAIR (DISCRETE) (INJECT) LF	785-7004 BRIDGE JOINT REPAIR (ARMOR) LF
31	WEST APPROACH	25.0				
32	EAST APPROACH	25.0				
34	EAST APPROACH - CURB DRAIN					
45, 45	BRIDGE DECK - 716.83' (16 SPANS)					82
47	ABUTMENTS - 2 EA				80	
50-52	INTERIOR BENTS - 13 EA				670	
53	PIERS - 2 EA				200	
58	T-BEAM SPANS - 13 EA X 42.50'				525	
62-63	T-GIRDER UNIT - 1 EA X 164.33' (39.67' - 85' - 39.66')				150	
67	RAIL - 16 SPANS X 2 (NORTH & SOUTH)		183	51	340	
	TOTALS	50.0	183	51	1,965	82

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US 377 QUANTITY SUMMARIES

WEST FORK TRINITY RIVER
NBI: 02-220-0081-01-001

SHEET 3 OF 3

FED.RD. DIV. NO.	FEDERAL AID PROJECT NO.		SHEET NO.
6	SEE TITLE SHEET		8
STATE	DISTRICT	COUNTY	
TEXAS	FTW	TARRANT	
CONTROL	SECTION	JOB	HIGHWAY
0081	01	050	US 377

PHASE 1 DURING NORMAL WORK HOURS (OFF-PEAK HOURS):

1. REDUCE TRAFFIC TO ONE LANE EACH DIRECTION AT THE RIGHT OF CENTERLINE OF US 377 (SEE SHEETS "CONSTRUCTION PHASING"). SEE SHEET "TCP(1-4)-18" FOR TRAFFIC CONTROL REQUIREMENTS.
2. CLOSE ROADWAY LEFT OF CENTERLINE OF US 377.
3. COMPLETE PHASE 1 EAST APPROACH REPAIR WORK:
   A. COMPLETE REMOVAL WORK WITHIN PHASE 1 LIMITS (SEE "APPROACH REPAIR" SHEET 2 OF 3).
   B. CONSTRUCT REPAIRS WITHIN PHASE 1 LIMITS (SEE "APPROACH REPAIR" SHEET 3 OF 3).
   C. CONSTRUCT TRAIL DETOURS TO PROVIDE TEMPORARY CONNECTIONS BETWEEN THE EXISTING TRAILS AT THE WEST & EAST SIDES OF THE TRINITY RIVER (SEE "TRAIL CLOSURE PLAN", SHEETS 1 & 2).
4. BRIDGE REPAIR WORK IS ALLOWED BELOW DECK LEVEL SUBJECT TO FOLLOWING RESTRICTIONS:
   A. DURING REPAIR WORK BELOW SPANS 1 & 12 AND REPAIR OF ADJACENT SUBSTRUCTURE, TRAIL TRAFFIC SHALL BE DETOURED TO THE EXISTING TRAILS BELOW SPANS 3 & 13 (SEE "TRAIL CLOSURE PLAN", SHEET 1 OF 2).
   B. DURING REPAIR BELOW SPANS 3 & 13 AND REPAIR OF ADJACENT SUBSTRUCTURE, TRAIL TRAFFIC SHALL BE DETOURED TO THE EXISTING TRAILS BELOW SPANS 1 & 12 (SEE "TRAIL CLOSURE PLAN", SHEET 2 OF 2).
   C. PROTECT EXISTING TRAILS FROM DAMAGE DURING BRIDGE REPAIR WORK.
   D. REMOVE DEBRIS FROM TRAILS AND REPAIR DAMAGE EACH WORKING DAY.
5. REINSTALL THE BRIDGE SIDEWALK EXPANSION JOINT COVER PLATE UPON COMPLETION OF PHASE 1 REPAIR WORK.

PHASE 1 OUTSIDE NORMAL WORK HOURS (PEAK HOURS AND BETWEEN 7:00 P.M. AND 9:00 A.M.):

1. REOPEN ONE WB LANE AND TWO EB LANES TO TRAFFIC. THE OUTSIDE LEFT LANE AT THE EAST APPROACH SHALL REMAIN CLOSED DURING PHASE 1 (SEE SHEETS "CONSTRUCTION PHASING"). SEE SHEET "TCP(1-4)-18" FOR TRAFFIC CONTROL REQUIREMENTS.
2. REOPEN EXISTING TRAILS FOR USE AT THE END OF THE WORKING DAY.

PHASE 2:

1. CLOSE EAST APPROACH, BRIDGE, AND WEST APPROACH TRAFFIC BETWEEN THE LIMITS SHOWN ON SHEET "DETOUR MAP".
2. PERFORM APPROACH REPAIRS AS SHOWN ON APPROACH REPAIR SHEETS.
3. PERFORM BRIDGE REPAIRS:
   A. ABOVE DECK LEVEL AS SHOWN IN THE PLANS.
   B. REMAINDER OF BRIDGE REPAIRS BELOW DECK LEVEL THAT WERE NOT COMPLETED IN PHASE 1.
4. REOPEN EAST & WEST ROADWAY APPROACHES AND BRIDGE TO NORMAL TRAFFIC UPON COMPLETION OF PHASE 2.
5. REMOVE TRAIL DETOURS (TEMPORARY TRAIL CONNECTIONS).
6. REMOVE TEMPORARY WORKS (CONSTRUCTION EXITS, TEMPORARY BARGE ACCESS, TEMPORARY FENCING, SURFACING AND FACILITIES AT TEMPORARY WORK YARDS USED FOR CONSTRUCTION AND/OR STORAGE OF MATERIALS).
7. REMOVE TEMPORARY EROSION CONTROL DEVICES.
8. RESTORE GROUND SURFACES ADJACENT TO EXISTING TRAILS, TOE OF SLOPE (EAST APPROACH), BELOW THE BRIDGE, AND AT TEMPORARY WORK YARDS.
9. INSTALL PERMANENT EROSION CONTROL ITEMS & APPLY VEGETATIVE WATERING.

GENERAL NOTES:

1. SEE "CONSTRUCTIONS PHASING" SHEETS FOR ADDITIONAL INFORMAITON.

TARRANT REGIONAL WATER DISTRICT REQUIREMENTS:

1. TARRANT REGIONAL WATER DISTRICT (TRWD) HAS CONTROL OF THE AREA NORTH, SOUTH AND BELOW THE US 377 BRIDGE.
2. THE CONTRACTOR MUST SECURE A PERMIT FROM TRWD FOR:
   A. TEMPORARY ACCESS FOR EQUIPMENT AND PERSONNEL TO PERFORM REPAIR AND INSPECTION WORK WITHIN THE AREA CONTROLLED BY TRWD.
   B. TEMPORARY GROUND ACCESS RAMPS (ENTRANCE AND/OR EXIT).
   C. OPERATION AND STORAGE OF EQUIPMENT DURNING CONSTRUCTION.
   D. TEMPORARY WORK SCAFFOLDING AND PLATFORMS.
   E. TEMPORARY FACILITIES (FENCING, BUILDINGS, AND WORK YARDS FOR CONSTRUCTION, STORAGE OF MATERIALS, AND SUPPLIES, ETC.)
   F. TEMPORARY RIVER ACCESS RAMP TO MOVE EQUIPMENT, PERSONNEL, MATERIALS, SUPPLIES, ECT. FROM GROUND TO BARGES ON THE RIVER.
   G. BARGES FOR STAGING REPAIR WORK AND FOR MOVING EQUIPMENT FROM LAND TO BARGE(S) ON THE RIVER.
3. CONTRACTOR TO REMOVE ALL TEMPORARY RAMPS, YARDS, BUILDINGS, FENCING, AND EQUIPMENT, AND RESTORE THE IMPACTED AREAS TO PRE-CONSTRUCTION CONDITIONS UPON COMPLETION OF REPAIR WORK IN ACCORDANCE WITH THE REQUIREMENTS OF THE TRWD PERMIT.

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JAMES EDWARD BROWNE
62207
LICENSED
PROFESSIONAL ENGINEER
7/10/2024

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PHONE 888-200-6464
TBPE FIRM REGISTRATION NO. 6499

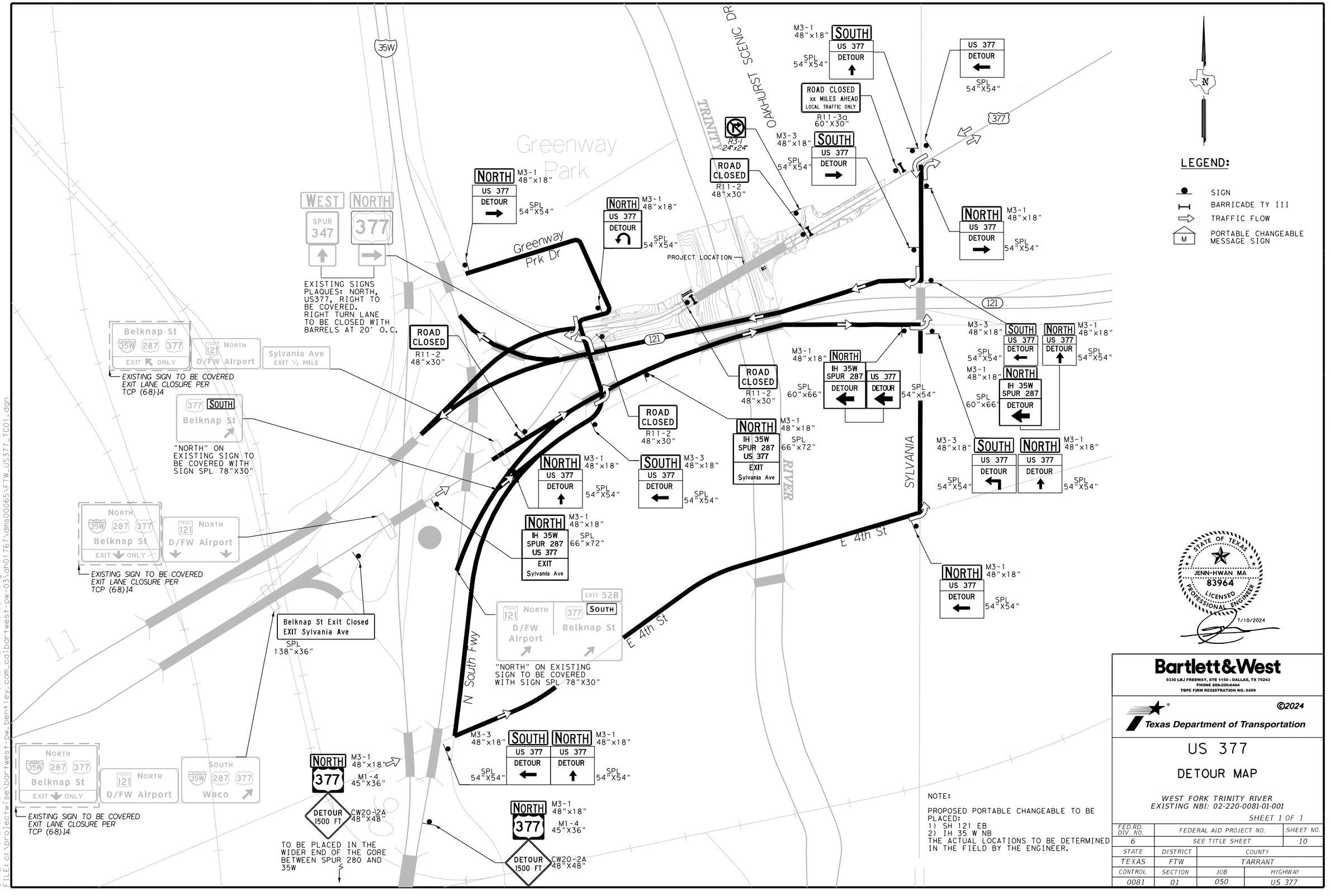
Texas Department of Transportation

US 377

SEQUENCE OF WORK

WEST FORK TRINITY RIVER
EXISTING NBI: 02-220-0081-01-001

FED.RD. DIV. NO.	FEDERAL AID PROJECT NO.		SHEET NO.
6	SEE TITLE SHEET		9
STATE	DISTRICT	COUNTY	
TEXAS	FTW	TARRANT	
CONTROL	SECTION	JOB	HIGHWAY
0081	01	050	US 377



LEGEND:

- SIGN
- BARRICADE TY III
- TRAFFIC FLOW
- M PORTABLE CHANGEABLE MESSAGE SIGN

NOTE:

PROPOSED PORTABLE CHANGEABLE TO BE PLACED:
1) SH 121 EB
2) IH 35 W NB
THE ACTUAL LOCATIONS TO BE DETERMINED IN THE FIELD BY THE ENGINEER.

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US 377

DETOUR MAP

WEST FORK TRINITY RIVER
EXISTING NBI: 02-220-0081-01-001

SHEET 1 OF 1

FED.RD. DIV. NO.	FEDERAL AID PROJECT NO.	SHEET NO.
6	SEE TITLE SHEET	10
STATE	DISTRICT	COUNTY
TEXAS	FTW	TARRANT
CONTROL	SECTION	JOB / HIGHWAY
0081	01	050 / US 377

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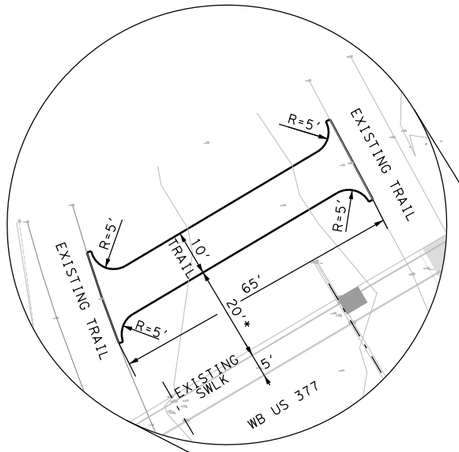
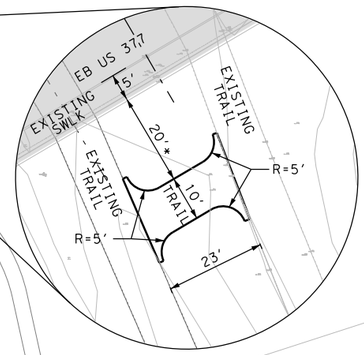
* THE DISTANCE PROJECTED FROM EXISTING SIDEWALK ON BRIDGE.





DETOUR
R4-9S
30"x24"

ROAD CLOSED
R11-2
48"x30"

DETOUR
M4-9L
30"x24"

ROAD CLOSED
R11-2
48"x30"

ROAD CLOSED
R11-2
48"x30"

DETOUR
M4-9R
30"x24"

ROAD CLOSED
R11-2
48"x30"

DETOUR
M4-9R
30"x24"

377

121

TRINITY RIVER

LEGEND:

- SIGN
- BARRICADE TY III
- TRAFFIC FLOW
- REPAIR WORK
- (X) SPAN ID

NOTE: 10' WIDE TRAIL TO BE CONSTRUCTED WITH 2" HMAC

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Texas Department of Transportation

US 377
TRAIL CLOSURE PLAN
BELOW SPAN 1 & 12

WEST FORK TRINITY RIVER
EXISTING NBI: 02-220-0081-01-001

SHEET 1 OF 2

FED.RD. DIV. NO.	FEDERAL AID PROJECT NO.		SHEET NO.
6	SEE TITLE SHEET		11
STATE	DISTRICT	COUNTY	
TEXAS	FTW	TARRANT	
CONTROL	SECTION	JOB	HIGHWAY
0081	01	050	US 377

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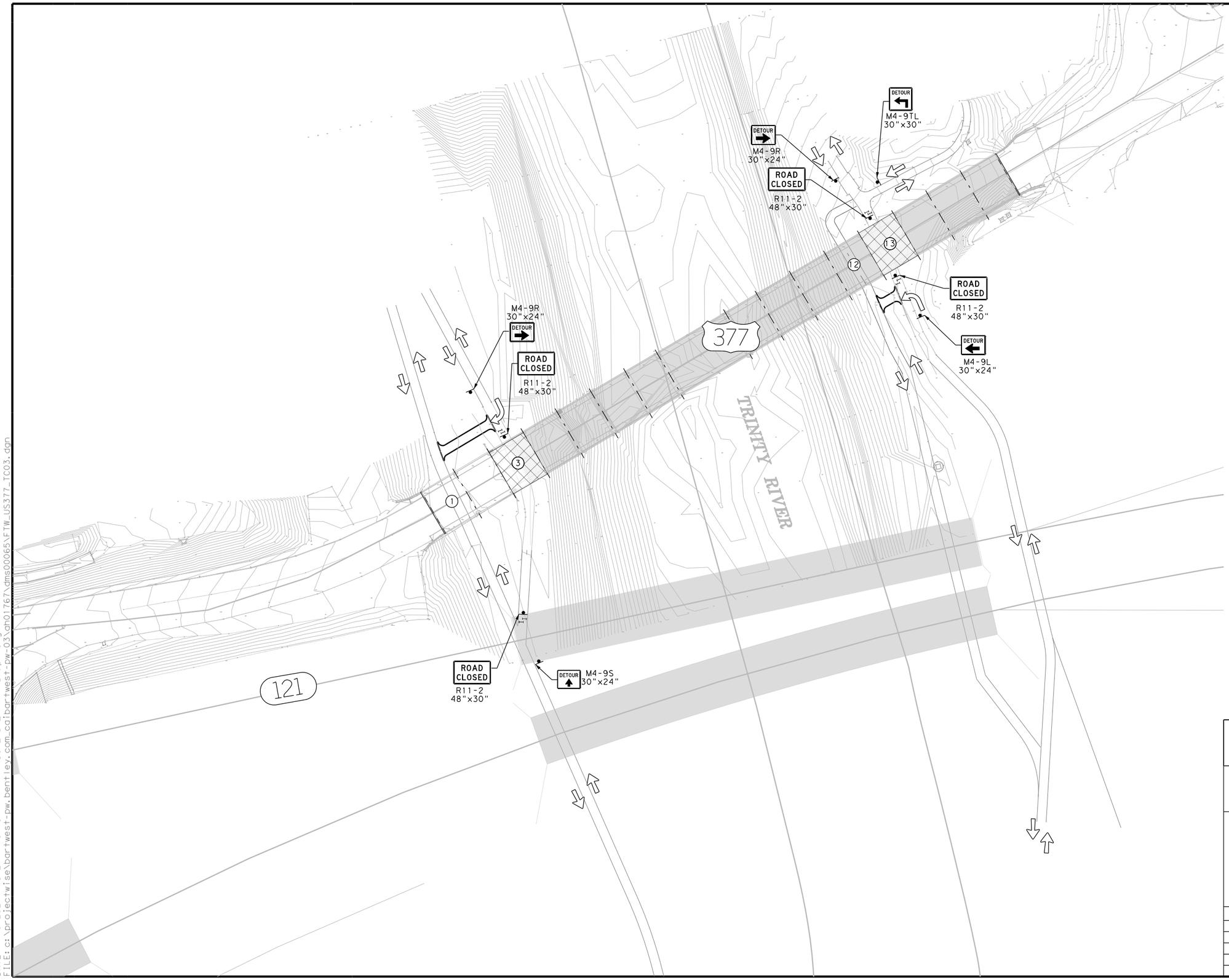

N

LEGEND:

- SIGN
- BARRICADE TY III
- TRAFFIC FLOW
- REPAIR WORK
- (X) SPAN ID

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US 377
TRAIL CLOSURE PLAN

BELOW SPAN 3 & 13

WEST FORK TRINITY RIVER
EXISTING NBI: 02-220-0081-01-001

SHEET 2 OF 2

FED.RD. DIV. NO.	FEDERAL AID PROJECT NO.		SHEET NO.
6	SEE TITLE SHEET		12
STATE	DISTRICT	COUNTY	
TEXAS	FTW	TARRANT	
CONTROL	SECTION	JOB	HIGHWAY
0081	01	050	US 377

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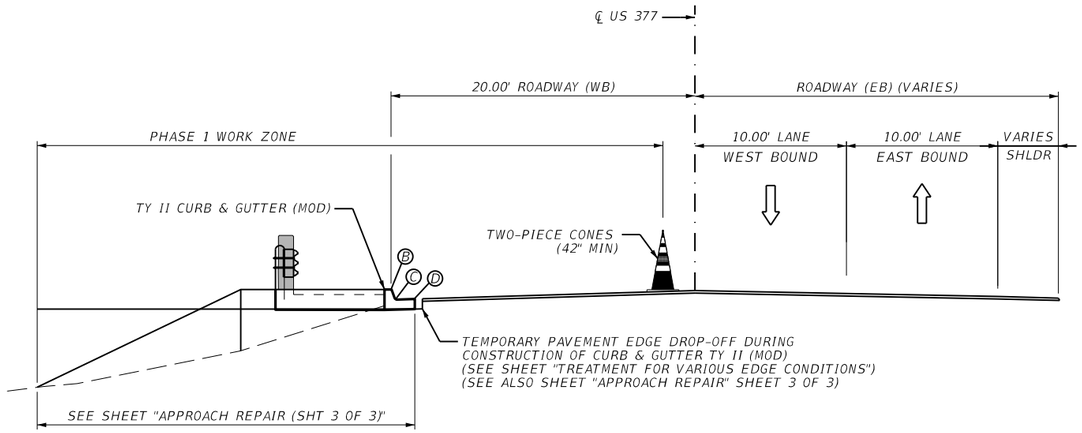
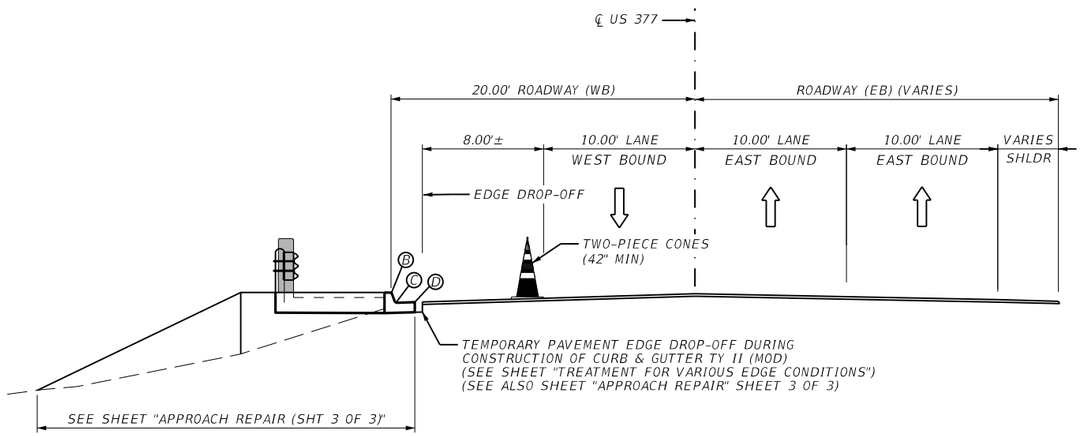


APPROACH CONSTRUCTION PHASE 1 DURING NORMAL WORKING HOURS

SCALE 1"=10'



APPROACH CONSTRUCTION PHASE 1 OUTSIDE NORMAL WORKING HOURS

SCALE 1"=10'

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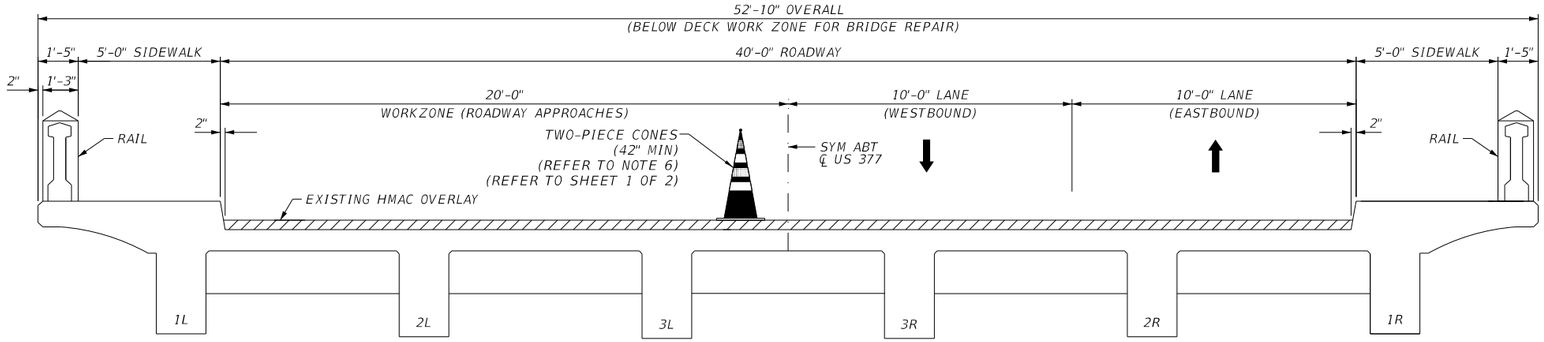
Texas Department of Transportation

US 377 CONSTRUCTION PHASING

WEST FORK TRINITY RIVER
NBI No. 02-220-0081-01-001

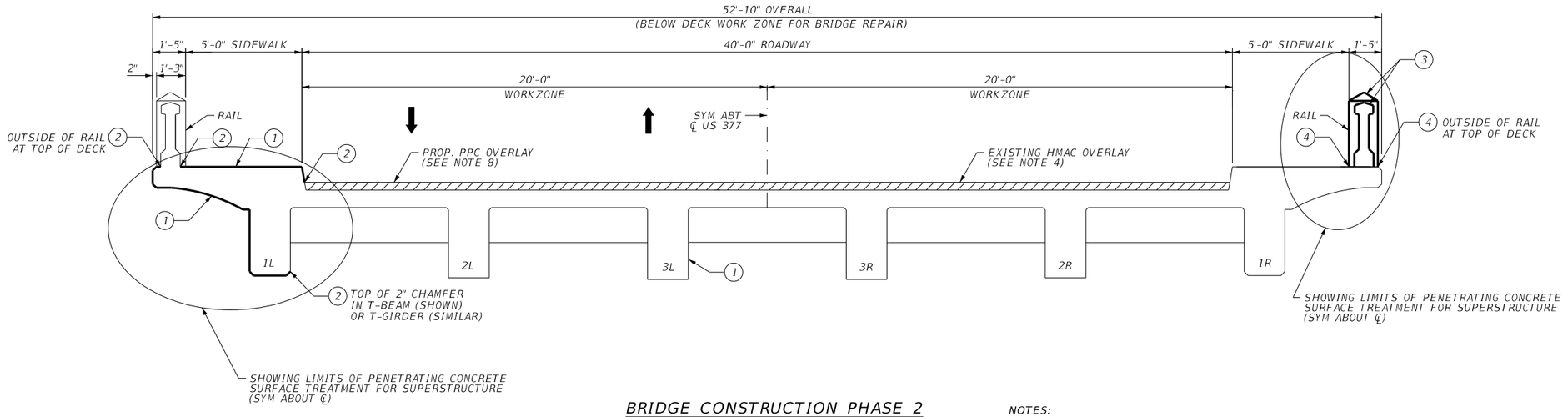
SHEET 1 OF 2

FED.RD. DIV. NO.	FEDERAL AID PROJECT NO.		SHEET NO.
6	SEE TITLE SHEET		13
STATE	DISTRICT	COUNTY	
TEXAS	FTW	TARRANT	
CONTROL	SECTION	JOB	HIGHWAY
0081	01	050	US 377



BRIDGE CONSTRUCTION PHASE 1

SCALE: 3/16" = 1'-0"



BRIDGE CONSTRUCTION PHASE 2

SCALE: 3/16" = 1'-0"

NOTES:

(1) PENETRATING CONCRETE SURFACE TREATMENT (SUPERSTRUCTURE).

(2) LIMIT OF PENETRATING CONCRETE SURFACE TREATMENT FOR SUPERSTRUCTURE.

(3) PENETRATING CONCRETE SURFACE TREATMENT (RAILING).

(4) LIMIT OF PENETRATING CONCRETE SURFACE TREATMENT FOR RAILING INCLUDES ALL EXPOSED/ACCESSIBLE SURFACES INCLUDING OPENINGS BETWEEN POSTS.

GENERAL NOTES (PHASE 1):

1. CONSTRUCT BRIDGE AND ROADWAY APPROACH REPAIR IN PHASES AS SET OUT HEREIN AND ON SHEET "SEQUENCE OF WORK."
2. REDUCE TRAFFIC TO ONE LANE IN EACH DIRECTION ALONG THE RIGHT SIDE OF THE ROADWAY.
3. CONSTRUCT APPROACH REPAIR AT THE LEFT SIDE OF THE ROADWAY. REFER TO APPROACH REPAIR SHEET 3 OF 3 FOR INFORMATION AND DETAILS.
4. BRIDGE REPAIR IS ALLOWED BELOW DECK LEVEL. REFER TO SHEET "SEQUENCE OF WORK" FOR RESTRICTIONS ON SUPERSTRUCTURE AND SUBSTRUCTURE REPAIR WORK AT SPANS 1 & 3 AND SPANS 12 & 13. PROTECT TRAILS AGAINST DAMAGE DURING REPAIR WORK.
5. REFER TO TRAIL DETOUR SHEETS FOR TRAIL DETOUR INFORMATION AND DETAILS.
6. REFER TO BARRICADE AND CONSTRUCTION STANDARD SHEET "BC(10)-21" FOR INFORMATION ON TWO-PIECE TRAFFIC CONES.

GENERAL NOTES (PHASE 2):

1. CLOSE BRIDGE TO TRAFFIC. SEE ROADWAY DETOUR SHEET.
2. CONSTRUCT APPROACH REPAIRS NOT INCLUDED IN PHASE 1.
3. REMOVE HMAC OVERLAY FROM BRIDGE DECK BY MILLING. CLEAN TOP OF MILLED DECK TO FACILITATE INSPECTION OF TOP OF DECK BY THE ENGINEER.
4. CONSTRUCT PARTIAL DEPTH DECK REPAIR AND RAIL REPAIR AT LOCATIONS DIRECTED BY THE ENGINEER.
5. CONSTRUCT FULL DEPTH REPAIR AND RAIL REPLACEMENT AT LOCATIONS SHOWN ON SHEET "CONCRETE RAIL REPAIR (IN-KIND)" AND LOCATIONS DIRECTED BY THE ENGINEER.
6. CLEAN AND SEAL BRIDGE JOINTS AND REPAIR ARMOR JOINTS. SEE BRIDGE LAYOUT FOR LOCATIONS.
7. CONSTRUCT POLYESTER POLYMER CONCRETE (PPC) OVERLAY. SEE SHEETS "T-BEAM REPAIR", "T-GIRDER REPAIR", AND BRIDGE DECK OVERLAY NOTES" FOR INFORMATION AND DETAILS.
8. APPLY PENETRATING CONCRETE SURFACE TREATMENT TO BRIDGE SUPERSTRUCTURE AND RAIL.

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7/10/2024

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US 377 CONSTRUCTION PHASING

WEST FORK TRINITY RIVER
NBI No. 02-220-0081-01-001

SHEET 2 OF 2

FED.RD. DIV. NO.	FEDERAL AID PROJECT NO.		SHEET NO.
6	SEE TITLE SHEET		14
STATE	DISTRICT	COUNTY	
TEXAS	FTW	TARRANT	
CONTROL	SECTION	JOB	HIGHWAY
0081	01	050	US 377

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BARRICADE AND CONSTRUCTION (BC) STANDARD SHEETS GENERAL NOTES:

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

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

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

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

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

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

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

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

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

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

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

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

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

WORKER SAFETY NOTES:

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

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

COMPLIANT WORKZONE TRAFFIC CONTROL DEVICES

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

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

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

Texas Department of Transportation

Traffic Safety Division Standard

BARRICADE AND CONSTRUCTION GENERAL NOTES AND REQUIREMENTS

BC(1)-21

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©TxDOT November 2002	CONT	SECT	JOB	HIGHWAY
REVISIONS 4-03 7-13 9-07 8-14 5-10 5-21	0081	01	050	US 377
	DIST	COUNTY		SHEET NO.
	FTW	TARRANT		15

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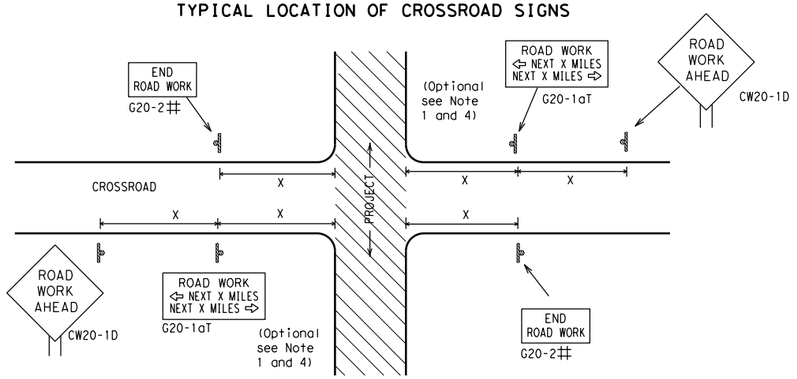
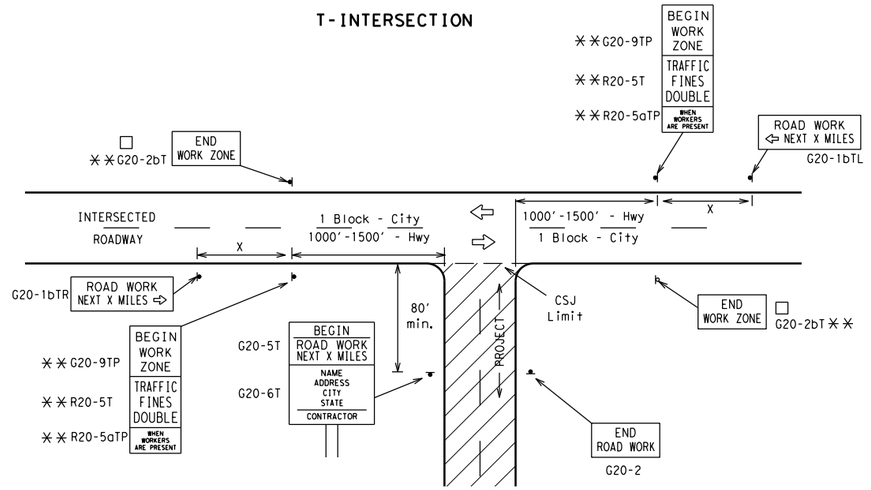
TYPICAL LOCATION OF CROSSROAD SIGNS



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

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

T-INTERSECTION



CSJ LIMITS AT T-INTERSECTION

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

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

SIZE

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

SPACING

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

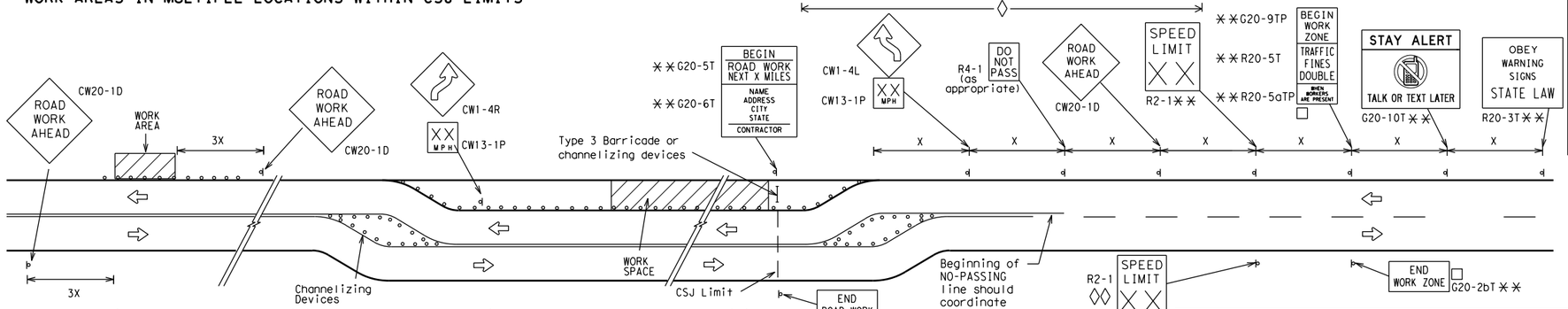
✳ For typical sign spacings on divided highways, expressways and freeways, see Part 6 of the "Texas Manual on Uniform Traffic Control Devices" (TMUTCD) typical application diagrams or TCP Standard Sheets.

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

GENERAL NOTES

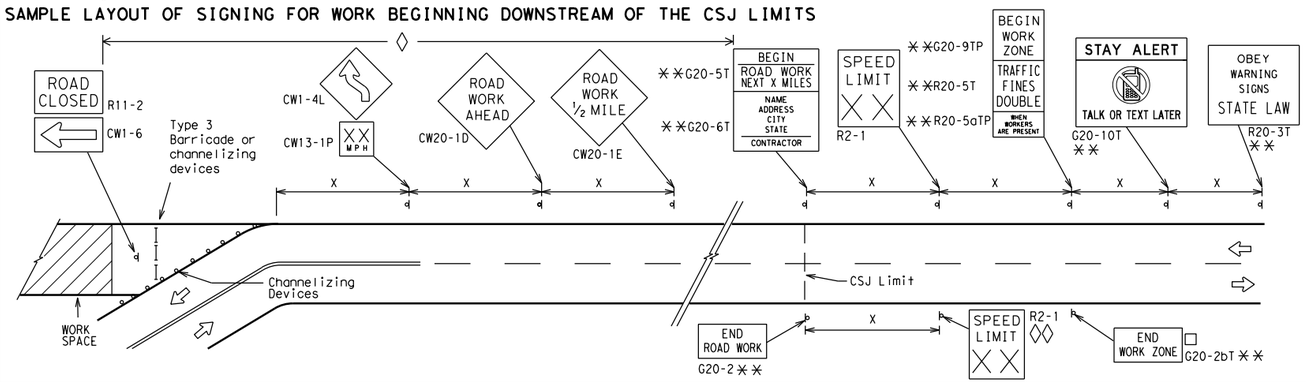
1. Special or larger size signs may be used as necessary.
2. Distance between signs should be increased as required to have 1500 feet advance warning.
3. Distance between signs should be increased as required to have 1/2 mile or more advance warning.
4. 36" x 36" "ROAD WORK AHEAD" (CW20-1D)signs may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

WORK AREAS IN MULTIPLE LOCATIONS WITHIN CSJ LIMITS



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

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



SAMPLE LAYOUT OF SIGNING FOR WORK BEGINNING AT THE CSJ LIMITS

NOTES

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

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

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

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

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

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

Texas Department of Transportation

Traffic Safety Division Standard

BARRICADE AND CONSTRUCTION PROJECT LIMIT

BC(2)-21

FILE: bc-21.dgn	DN: TxDOT	CK: TxDOT	DW: TxDOT	CK: TxDOT
©TxDOT November 2002	CONT	SECT	JOB	HIGHWAY
REVISIONS	0081	01	050	US 377
9-07 8-14	DIST	COUNTY		SHEET NO.
7-13 5-21	FTW	TARRANT		16

DATE: 7/10/2024 7:48:58 AM
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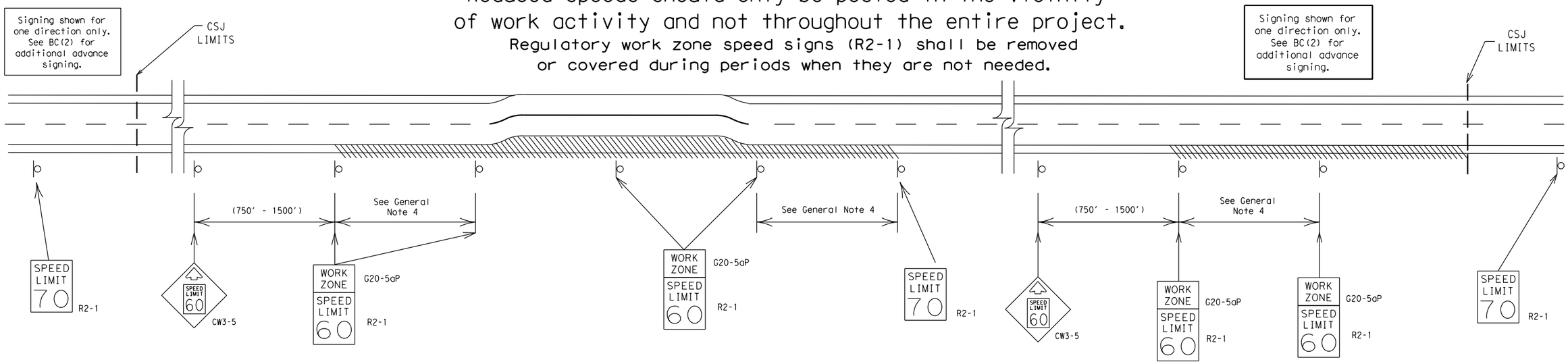
TYPICAL APPLICATION OF WORK ZONE SPEED LIMIT SIGNS

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

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

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



GUIDANCE FOR USE:

LONG/INTERMEDIATE TERM WORK ZONE SPEED LIMITS

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

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

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

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

SHORT TERM WORK ZONE SPEED LIMITS

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

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

GENERAL NOTES

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

Texas Department of Transportation

Traffic Safety Division Standard

BARRICADE AND CONSTRUCTION WORK ZONE SPEED LIMIT

BC(3)-21

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	FTW	TARRANT		17

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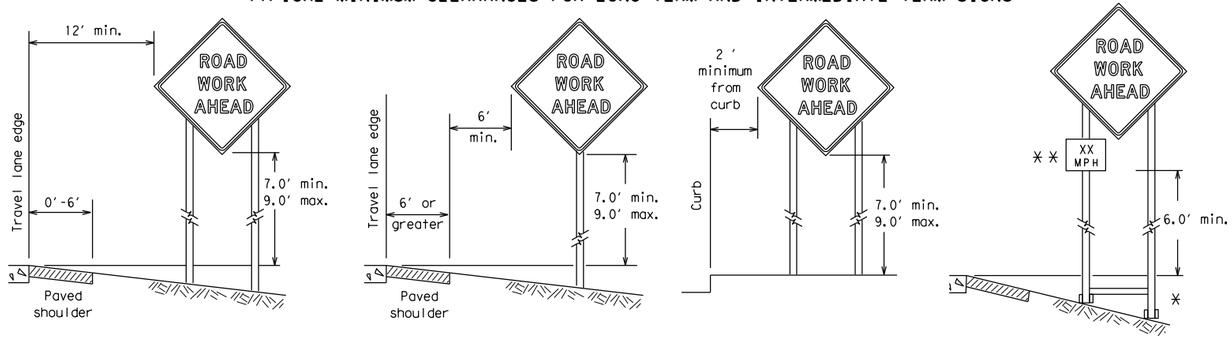
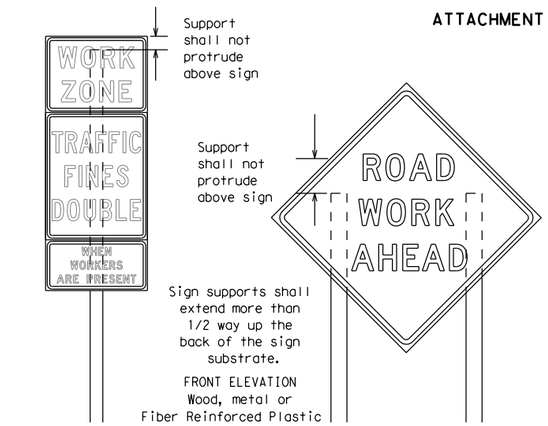
TYPICAL MINIMUM CLEARANCES FOR LONG TERM AND INTERMEDIATE TERM SIGNS



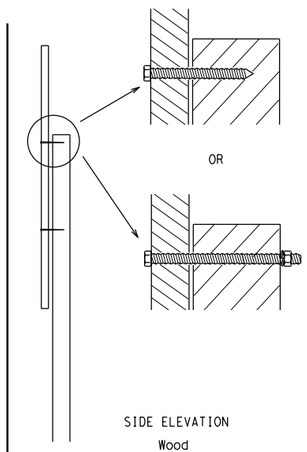
⁎ When placing skid supports on unlevel ground, the leg post lengths must be adjusted so the sign appears straight and plumb. Objects shall NOT be placed under skids as a means of leveling.

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

ATTACHMENT FOR SIGN SUPPORTS



FRONT ELEVATION
Wood, metal or
Fiber Reinforced Plastic



SIDE ELEVATION
Wood

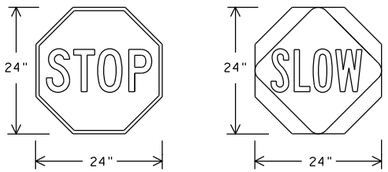
Attachment to wooden supports will be by bolts and nuts or screws. Use TxDOT's or manufacturer's recommended procedures for attaching sign substrates to other types of sign supports

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

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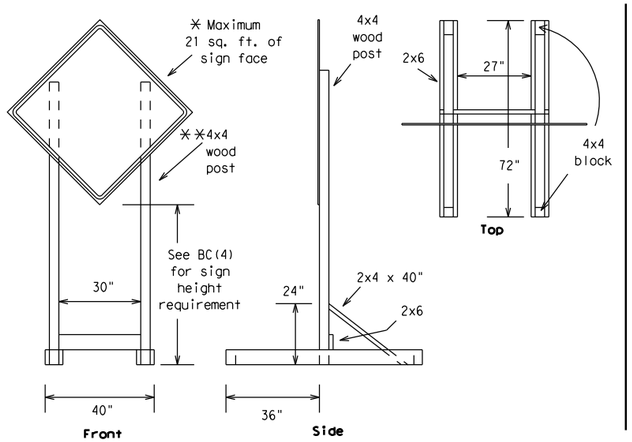
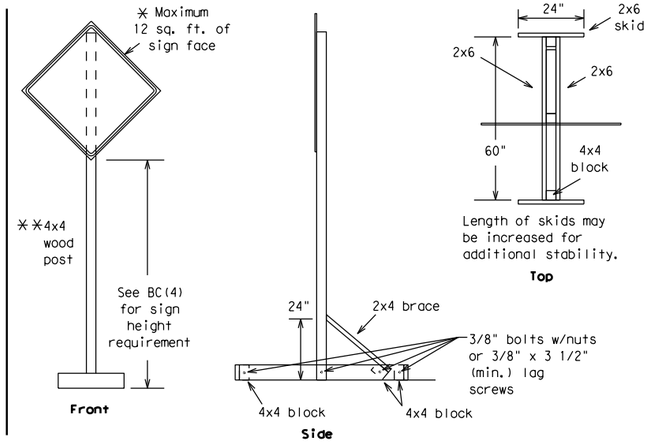
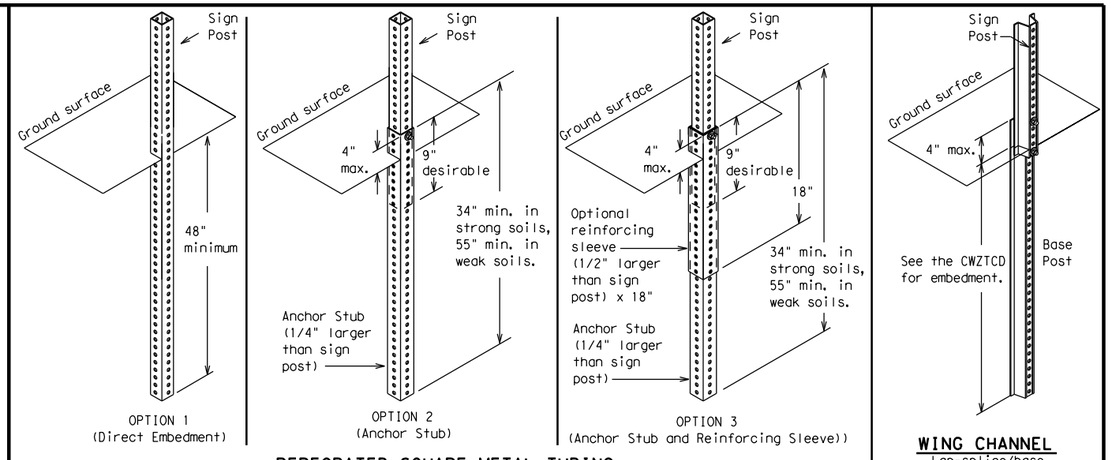




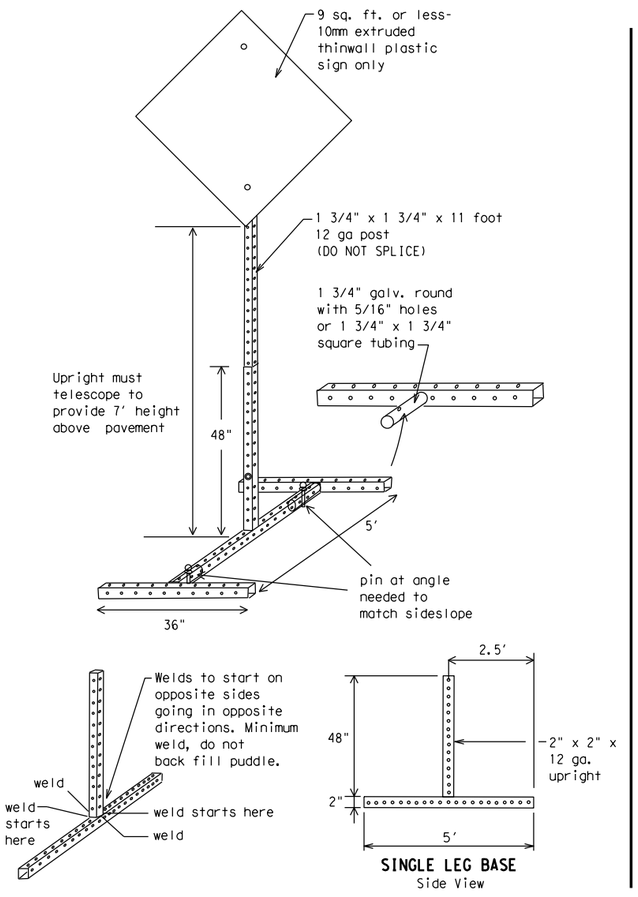
SKID MOUNTED WOOD SIGN SUPPORTS

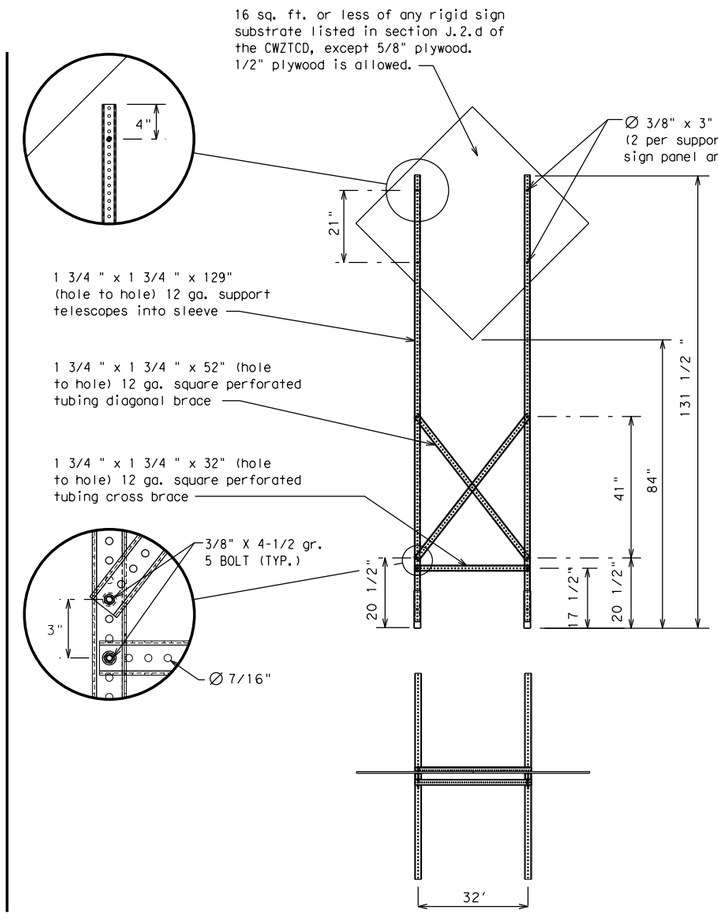
* LONG/INTERMEDIATE TERM STATIONARY - PORTABLE SKID MOUNTED SIGN SUPPORTS

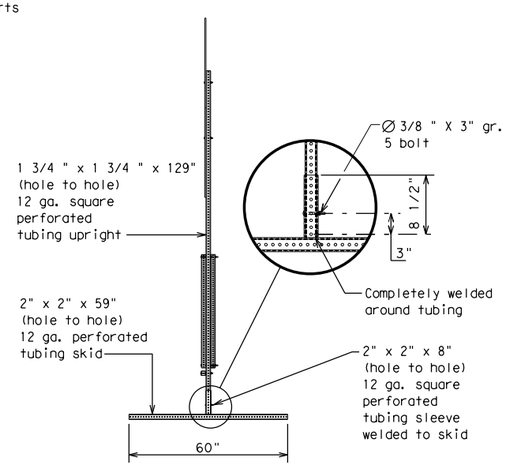


GROUND MOUNTED SIGN SUPPORTS

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







SKID MOUNTED PERFORATED SQUARE STEEL TUBING SIGN SUPPORTS

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

WEDGE ANCHORS

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

OTHER DESIGNS

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

GENERAL NOTES

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

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

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

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

Texas Department of Transportation

Traffic Safety Division Standard

BARRICADE AND CONSTRUCTION TYPICAL SIGN SUPPORT

BC(5)-21

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

PORTABLE CHANGEABLE MESSAGE SIGNS

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

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

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

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

RECOMMENDED PHASES AND FORMATS FOR PCMS MESSAGES DURING ROADWORK ACTIVITIES

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

Phase 1: Condition Lists

Road/Lane/Ramp Closure List

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

Other Condition List

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

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

Phase 2: Possible Component Lists

Action to Take/Effect on Travel List

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

Location List

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

Warning List

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

** Advance Notice List

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

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

** See Application Guidelines Note 6.

APPLICATION GUIDELINES

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

WORDING ALTERNATIVES

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

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

FULL MATRIX PCMS SIGNS

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

Texas Department of Transportation

Traffic Safety Division Standard

BARRICADE AND CONSTRUCTION PORTABLE CHANGEABLE MESSAGE SIGN (PCMS)

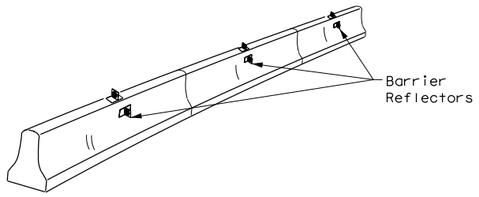
BC(6)-21

FILE: bc-21.dgn	DN: TxDOT	CK: TxDOT	DW: TxDOT	CK: TxDOT
©TxDOT November 2002	CONT	SECT	JOB	HIGHWAY
REVISIONS	0081	01	050	US 377
9-07 8-14	DIST	COUNTY		SHEET NO.
7-13 5-21	FTW	TARRANT		20

100

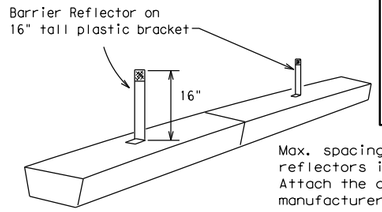
DATE: 7/10/2024 7:49:51 AM
FILE: c:\projectwise\bartwest-pw.bentley.com_caibartwest-pw-03\ah01767\dms03462\bc-21-7.dgn

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.



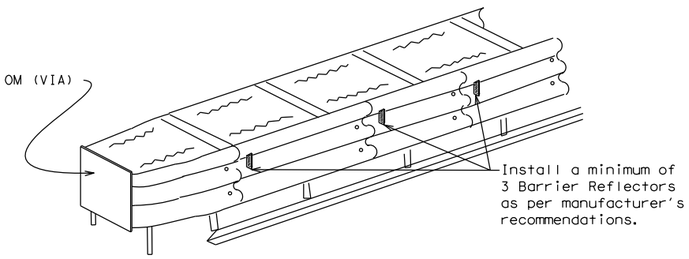
CONCRETE TRAFFIC BARRIER (CTB)

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)



DELINEATION OF END TREATMENTS

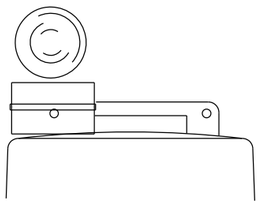
LOW PROFILE CONCRETE BARRIER (LPCB) USED IN WORK ZONES

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

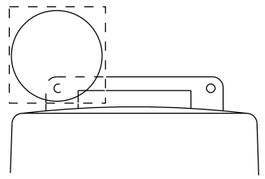
END TREATMENTS FOR CTB'S USED IN WORK ZONES

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

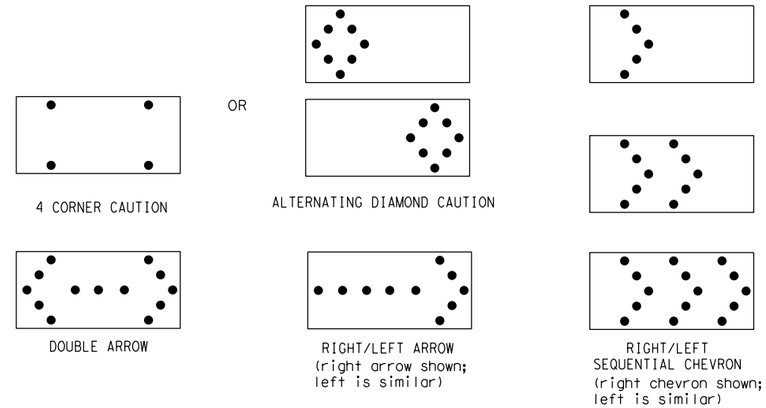
1. Type A flashing warning lights are intended to warn drivers that they are approaching or are in a potentially hazardous area.
2. Type A random flashing warning lights are not intended for delineation and shall not be used in a series.
3. A series of sequential flashing warning lights placed on channelizing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

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	0081	01	050	US 377
9-07 8-14	DIST	COUNTY		SHEET NO.
7-13 5-21	FTW	TARRANT		21

DATE: 7/10/2024 7:50:04 AM
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GENERAL NOTES

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

GENERAL DESIGN REQUIREMENTS

Pre-qualified plastic drums shall meet the following requirements:

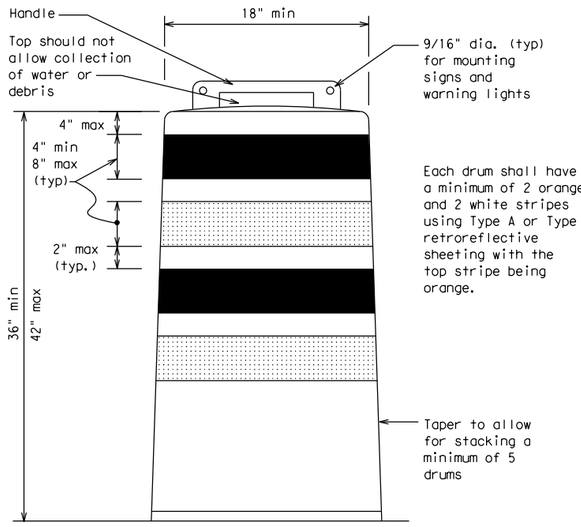
1. Plastic drums shall be a two-piece design; the "body" of the drum shall be the top portion and the "base" shall be the bottom.
2. The body and base shall lock together in such a manner that the body separates from the base when impacted by a vehicle traveling at a speed of 20 MPH or greater but prevents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

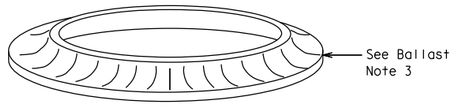
RETROREFLECTIVE SHEETING

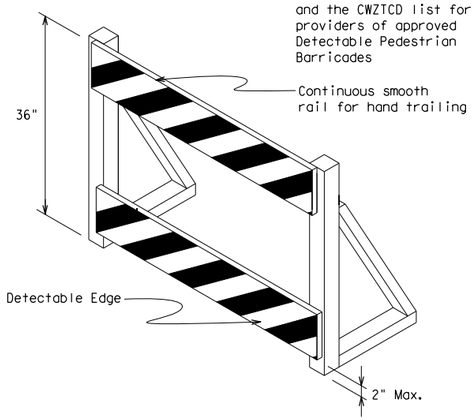
1. The stripes used on drums shall be constructed of sheeting meeting the color and retroreflectivity requirements of Departmental Materials Specification DMS-8300, "Sign Face Materials," Type A or Type B reflective sheeting shall be supplied unless otherwise specified in the plans.
2. The sheeting shall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

BALLAST

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

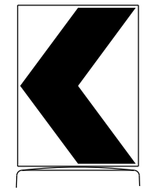




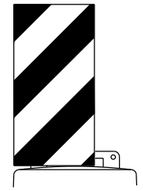


DETECTABLE PEDESTRIAN BARRICADES

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



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



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

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

SIGNS, CHEVRONS, AND VERTICAL PANELS MOUNTED ON PLASTIC DRUMS

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

Texas Department of Transportation | Traffic Safety Division Standard

BARRICADE AND CONSTRUCTION CHANNELIZING DEVICES

BC(8)-21

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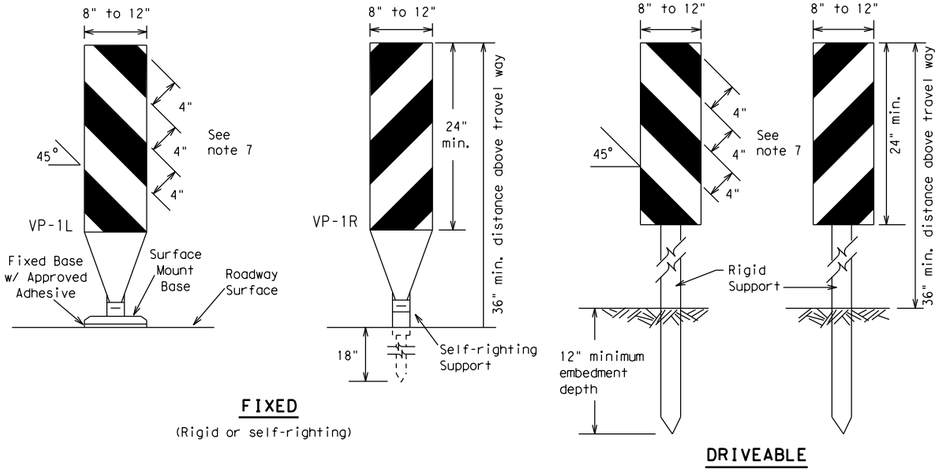
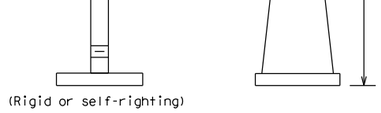


FIXED
(Rigid or self-righting)

DRIVEABLE

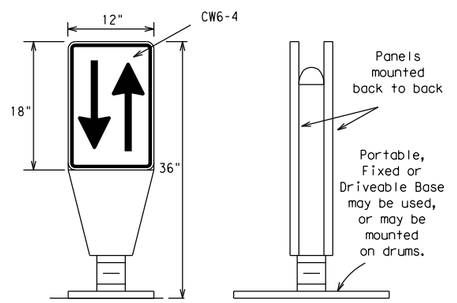


(Rigid or self-righting)

PORTABLE

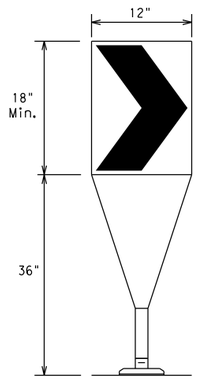
VERTICAL PANELS (VPs)

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



OPPOSING TRAFFIC LANE DIVIDERS (OTLD)

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.



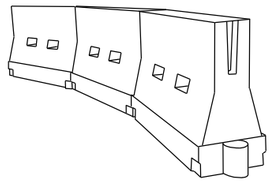
Fixed Base w/ Approved Adhesive (Driveable Base, or Flexible Support can be used)

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

CHEVRONS

GENERAL NOTES

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



LONGITUDINAL CHANNELIZING DEVICES (LCD)

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

WATER BALLASTED SYSTEMS USED AS BARRIERS

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

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

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

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

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

SUGGESTED MAXIMUM SPACING OF CHANNELIZING DEVICES AND MINIMUM DESIRABLE TAPER LENGTHS

SHEET 9 OF 12

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BARRICADE AND CONSTRUCTION CHANNELIZING DEVICES

BC(9)-21

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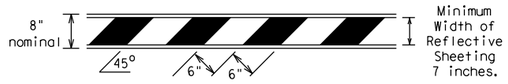
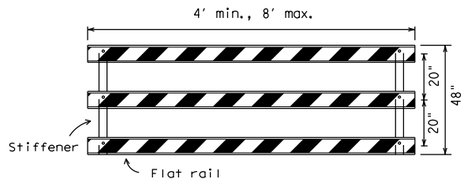
TYPE 3 BARRICADES

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

Barricades shall NOT be used as a sign support.



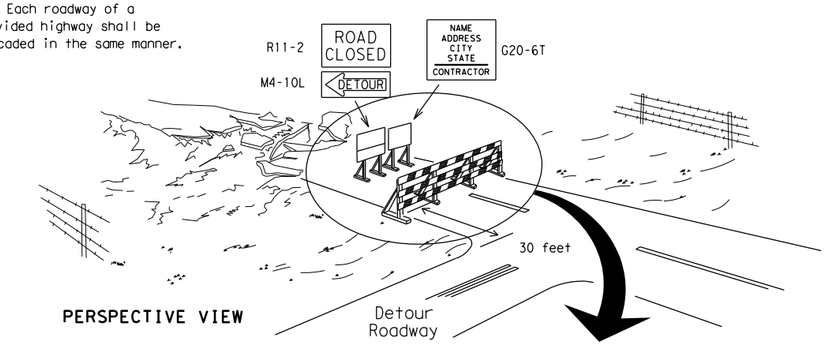
TYPICAL STRIPING DETAIL FOR BARRICADE RAIL



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

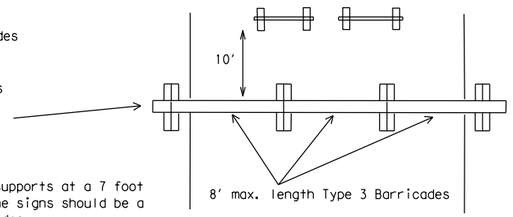
TYPICAL PANEL DETAIL FOR SKID OR POST TYPE BARRICADES

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



PERSPECTIVE VIEW

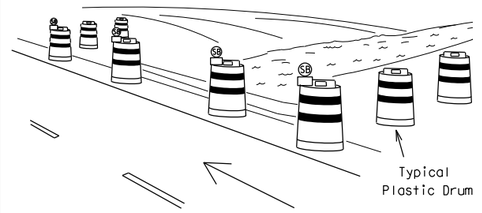
The three rails on Type 3 barricades shall be reflectorized orange and reflective white stripes on one side facing one-way traffic and both sides for two-way traffic.
Barricade striping should slant downward in the direction of detour.



PLAN VIEW

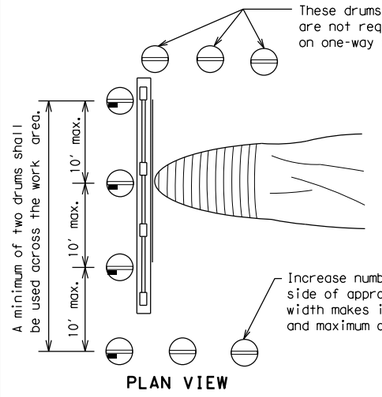
1. Signs should be mounted on independent supports at a 7 foot mounting height in center of roadway. The signs should be a minimum of 10 feet behind Type 3 Barricades.
2. Advance signing shall be as specified elsewhere in the plans.

TYPE 3 BARRICADE (POST AND SKID) TYPICAL APPLICATION



PERSPECTIVE VIEW

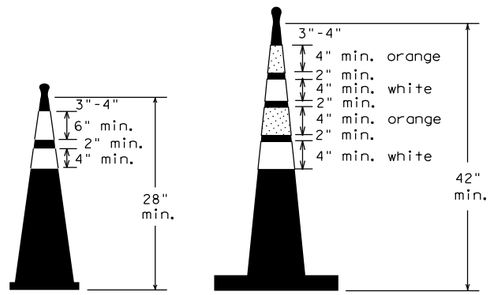
1. Where positive redirectional capability is provided, drums may be omitted.
2. Plastic construction fencing may be used with drums for safety as required in the plans.
3. Vertical Panels on flexible support may be substituted for drums when the shoulder width is less than 4 feet.
4. When the shoulder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



PLAN VIEW

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

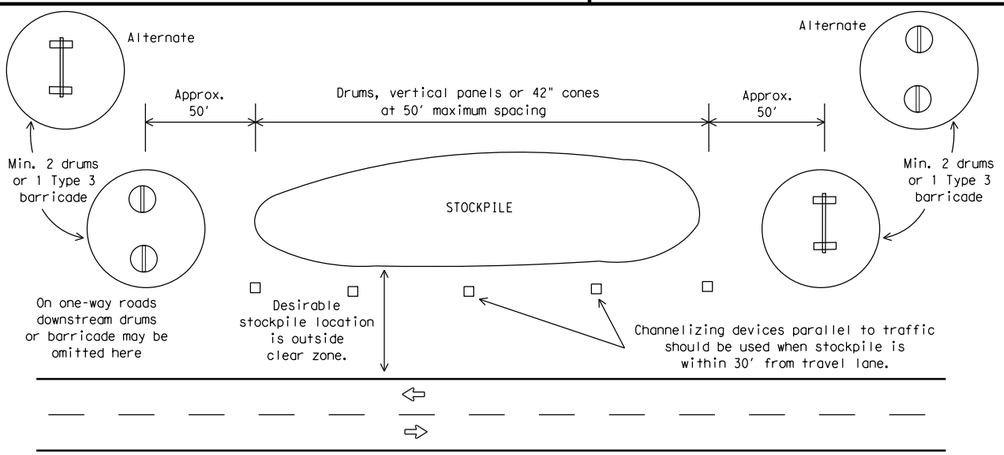
CULVERT WIDENING OR OTHER ISOLATED WORK WITHIN THE PROJECT LIMITS



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

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

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



TRAFFIC CONTROL FOR MATERIAL STOCKPILES

Texas Department of Transportation — Traffic Safety Division Standard

BARRICADE AND CONSTRUCTION CHANNELIZING DEVICES

BC(10)-21

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WORK ZONE PAVEMENT MARKINGS

GENERAL

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

RAISED PAVEMENT MARKERS

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

PREFABRICATED PAVEMENT MARKINGS

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

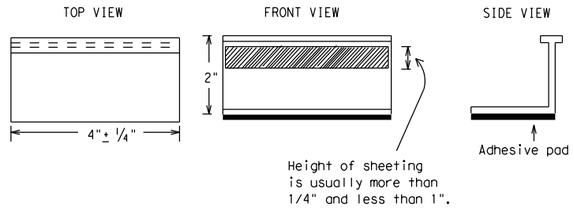
MAINTAINING WORK ZONE PAVEMENT MARKINGS

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

REMOVAL OF PAVEMENT MARKINGS

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

Temporary Flexible-Reflective Roadway Marker Tabs



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

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

RAISED PAVEMENT MARKERS USED AS GUIDEMARKS

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

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

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

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

Texas Department of Transportation

Traffic Safety Division Standard

BARRICADE AND CONSTRUCTION PAVEMENT MARKINGS

BC(11)-21

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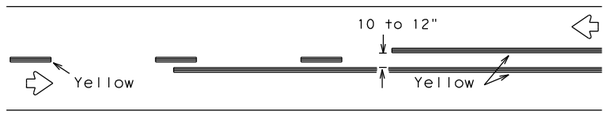
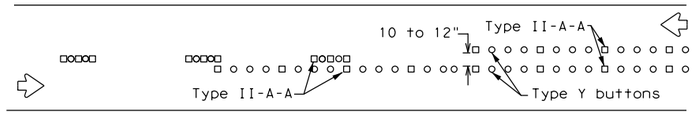
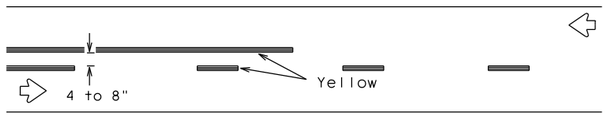
PAVEMENT MARKING PATTERNS



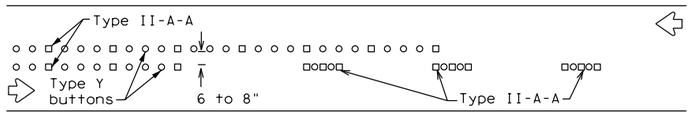
REFLECTORIZED PAVEMENT MARKINGS - PATTERN A



RAISED PAVEMENT MARKERS - PATTERN A



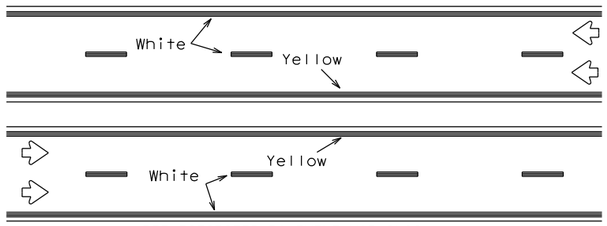
REFLECTORIZED PAVEMENT MARKINGS - PATTERN B



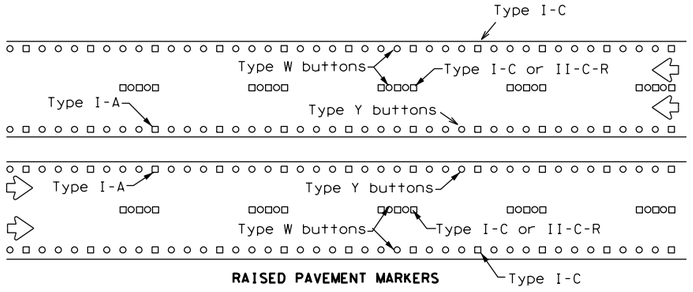
RAISED PAVEMENT MARKERS - PATTERN B

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

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



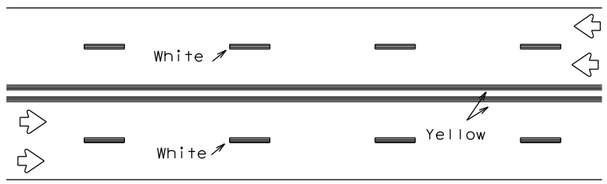
REFLECTORIZED PAVEMENT MARKINGS



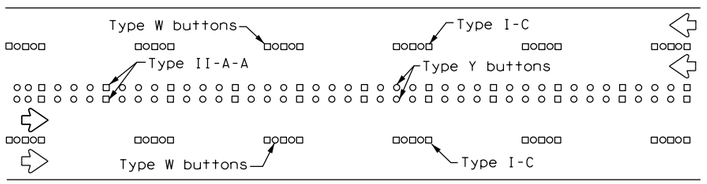
RAISED PAVEMENT MARKERS

Prefabricated markings may be substituted for reflectorized pavement markings.

EDGE & LANE LINES FOR DIVIDED HIGHWAY



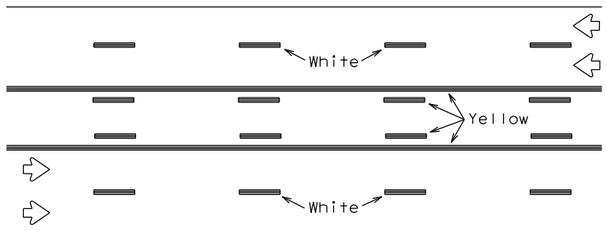
REFLECTORIZED PAVEMENT MARKINGS



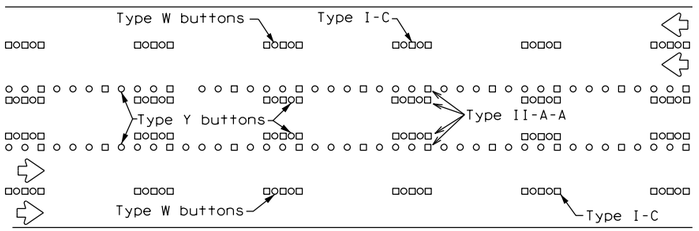
RAISED PAVEMENT MARKERS

Prefabricated markings may be substituted for reflectorized pavement markings.

LANE & CENTER LINES FOR MULTILANE UNDIVIDED HIGHWAYS



REFLECTORIZED PAVEMENT MARKINGS



RAISED PAVEMENT MARKERS

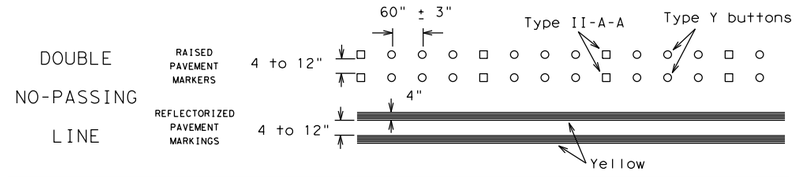
Prefabricated markings may be substituted for reflectorized pavement markings.

TWO-WAY LEFT TURN LANE

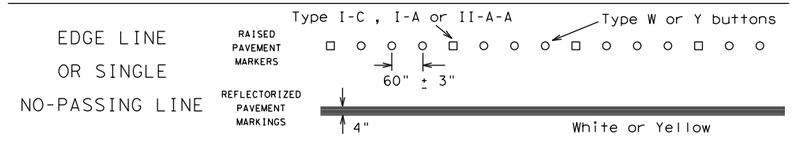
STANDARD WORK ZONE PAVEMENT MARKINGS DETAILS

SOLID LINES

DOUBLE NO-PASSING LINE

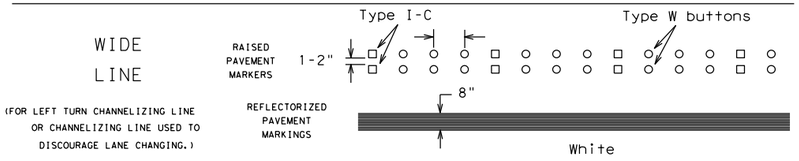


EDGE LINE OR SINGLE NO-PASSING LINE



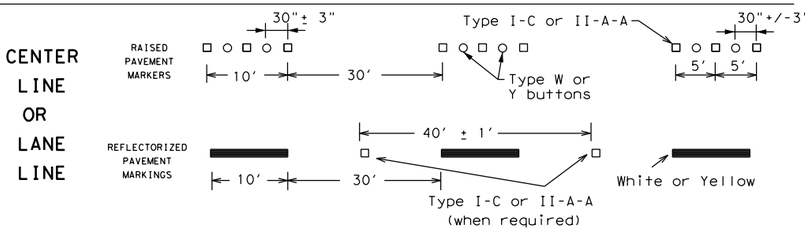
WIDE LINE

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

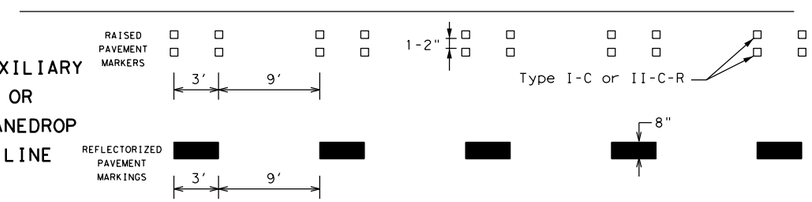


BROKEN LINES

CENTER LINE OR LANE LINE

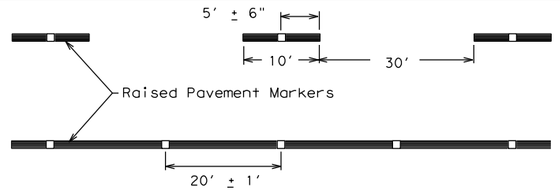


AUXILIARY OR LANEDROP LINE



REMOVABLE MARKINGS WITH RAISED PAVEMENT MARKERS

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



Centerline only - not to be used on edge lines

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

Texas Department of Transportation

Traffic Safety Division Standard

BARRICADE AND CONSTRUCTION PAVEMENT MARKING PATTERNS

BC(12)-21

FILE: bc-21.dgn	DN: TxDOT	CK: TxDOT	DW: TxDOT	CK: TxDOT
©TxDOT February 1998	CONT	SECT	JOB	HIGHWAY
REVISIONS 1-97 9-07 5-21 2-98 7-13 11-02 8-14	0081	01	050	US 377
	DIST	COUNTY		SHEET NO.
	FTW	TARRANT		26

DATE: DATE/TIME 7:51:15 AM
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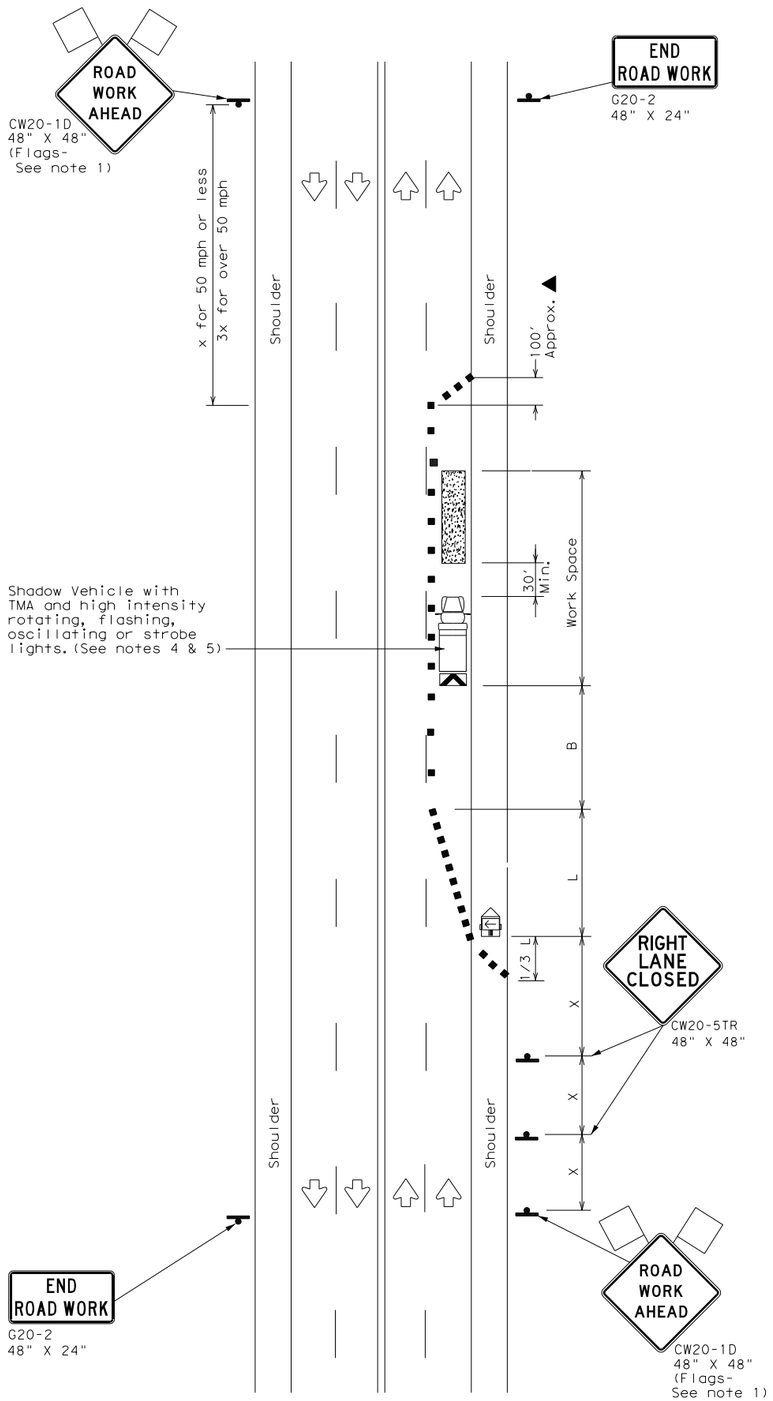
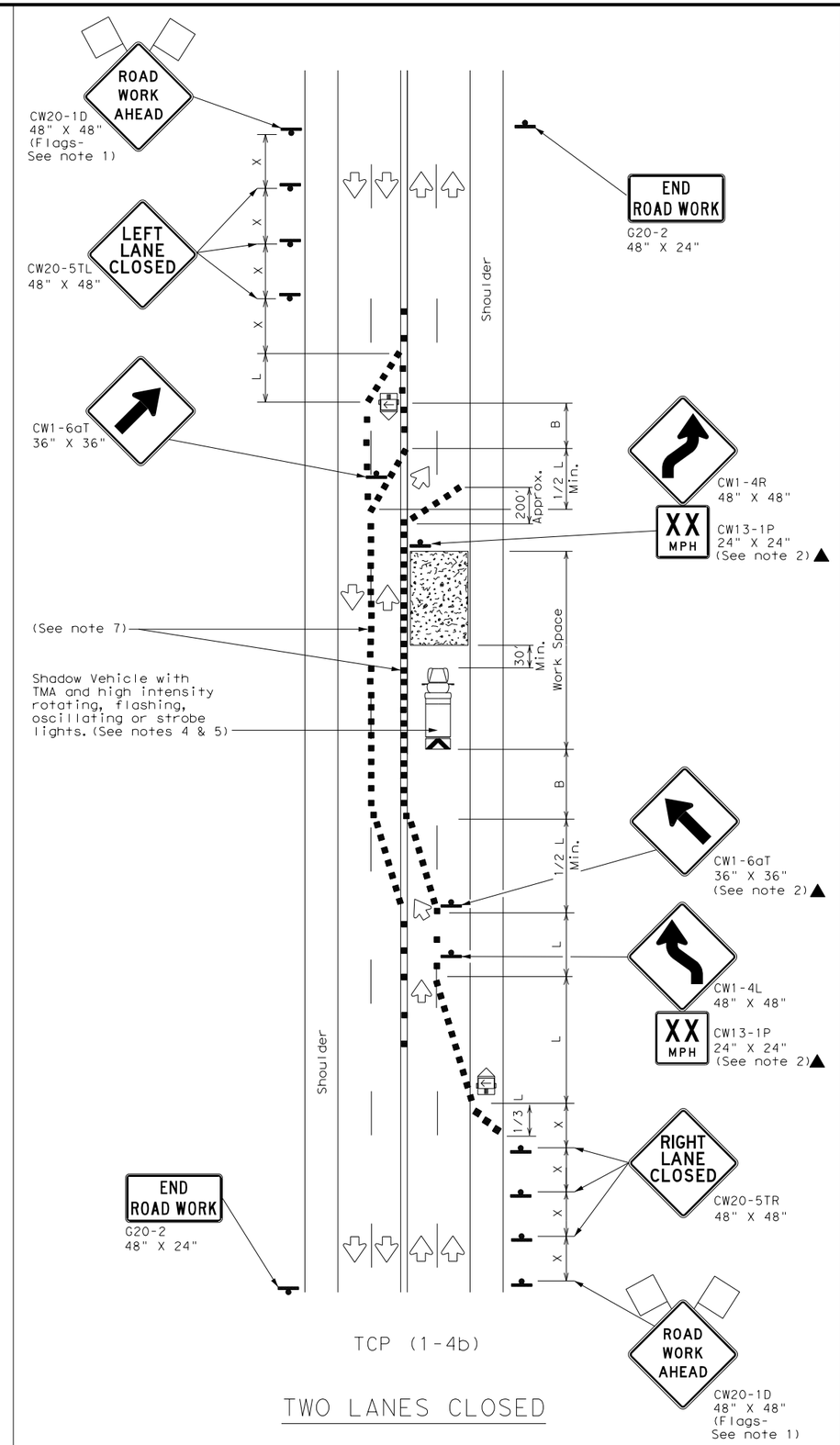


TCP (1-4a)

ONE LANE CLOSED



TCP (1-4b)

TWO LANES CLOSED

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. The CW20-1D "ROAD WORK AHEAD" sign may be repeated if the visibility of the work zone is less than 1500 feet.
4. A Shadow Vehicle with a TMA should be used anytime it can be positioned 30 to 100 feet in advance of the area of crew exposure without adversely affecting the performance or quality of the work. If workers are no longer present but road or work conditions require the traffic control to remain in place, Type 3 Barricades or other channelizing devices may be substituted for the Shadow Vehicle and TMA.
5. Additional Shadow Vehicles with TMAs may be positioned off the paved surface, next to those shown in order to protect wider work spaces.

TCP (1-4a)

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 where needed to protect the work space from opposing traffic with the arrow panel placed in the closed lane near the end of the merging taper.

TCP (1-4b)

7. Where traffic is directed over a yellow centerline, channelizing devices which separate two-way traffic should be spaced on tapers at 20' or 15' if posted speeds are 35 mph or slower, and for tangent sections, at 1/2S where S is the speed in mph. This tighter device spacing is intended for the areas of conflicting markings, not the entire work zone.

Texas Department of Transportation

Traffic Operations Division Standard

TRAFFIC CONTROL PLAN LANE CLOSURES ON MULTILANE CONVENTIONAL ROADS

TCP(1-4)-18

FILE: tcp1-4-18.dgn	DN:	CK:	DW:	CK:
© TxDOT December 1985	CONT	SECT	JOB	HIGHWAY
REVISIONS	0081	01	050	US 377
2-94 4-98	DIST	COUNTY		SHEET NO.
8-95 2-12	FTW	TARRANT		27
1-97 2-18				

DATE: DATE/TIME 7:51:29 AM
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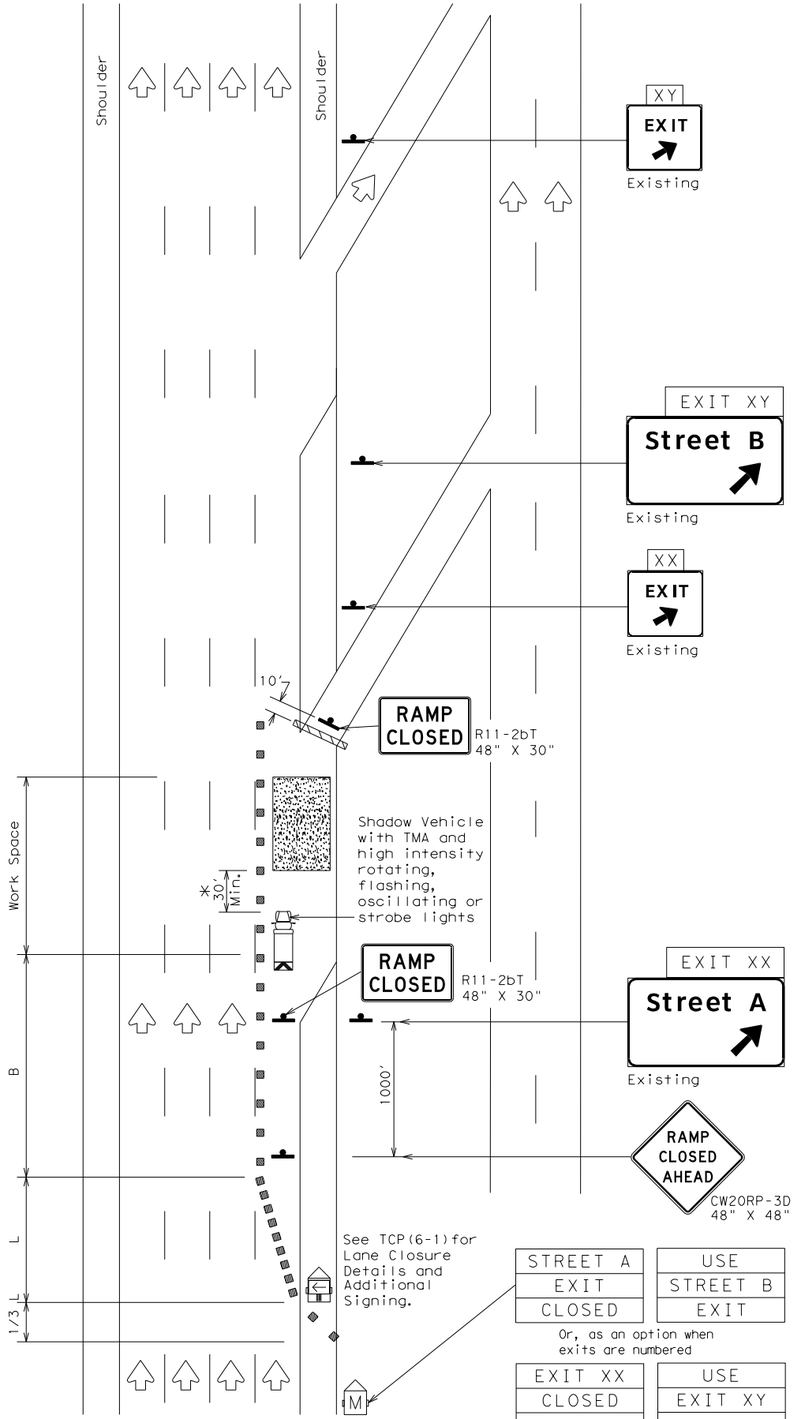
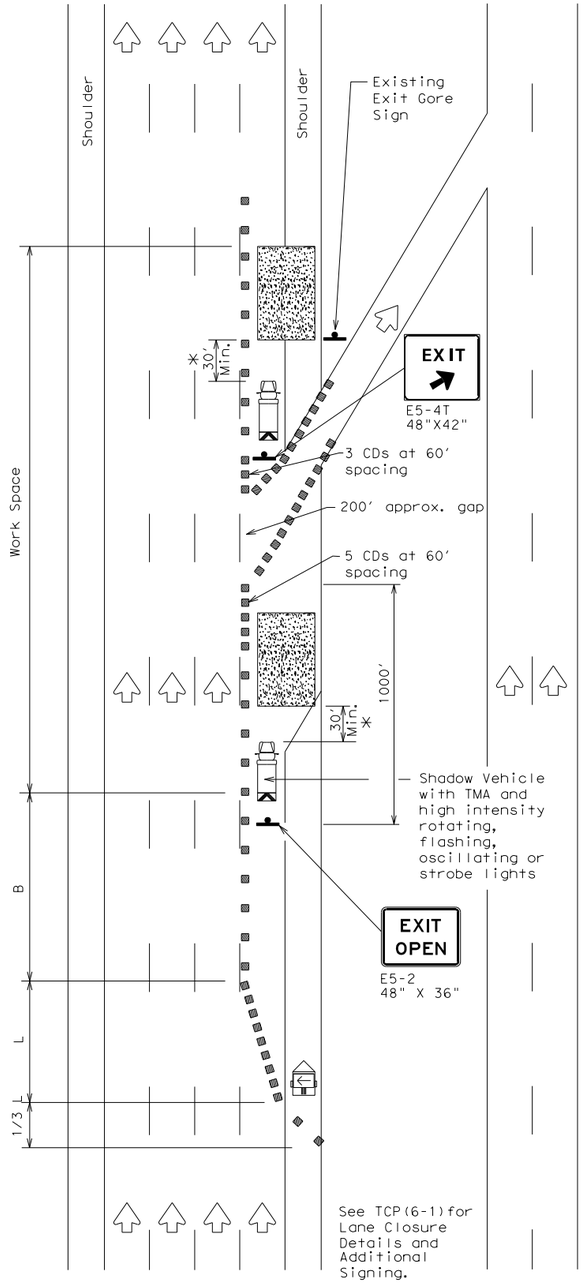


TCP (6-4a)

EXIT RAMP CLOSED

TRAFFIC EXITS PAST CLOSED RAMP



TCP (6-4b)

EXIT RAMP OPEN

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

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

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

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

GENERAL NOTES

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

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

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

Texas Department of Transportation
Traffic Operations Division Standard

TRAFFIC CONTROL PLAN
WORK AREA AT EXIT RAMP

TCP(6-4)-12

FILE: tcp6-4.dgn	DN: TxDOT	CK: TxDOT	DW: TxDOT	CK: TxDOT
©TxDOT Feburary 1994	CONT	SECT	JOB	HIGHWAY
REVISIONS	0081	01	050	US 377
1-97 8-98	DIST	COUNTY		SHEET NO.
4-98 8-12	FTW	TARRANT		28

DATE: 7/10/2024 7:51:43 AM
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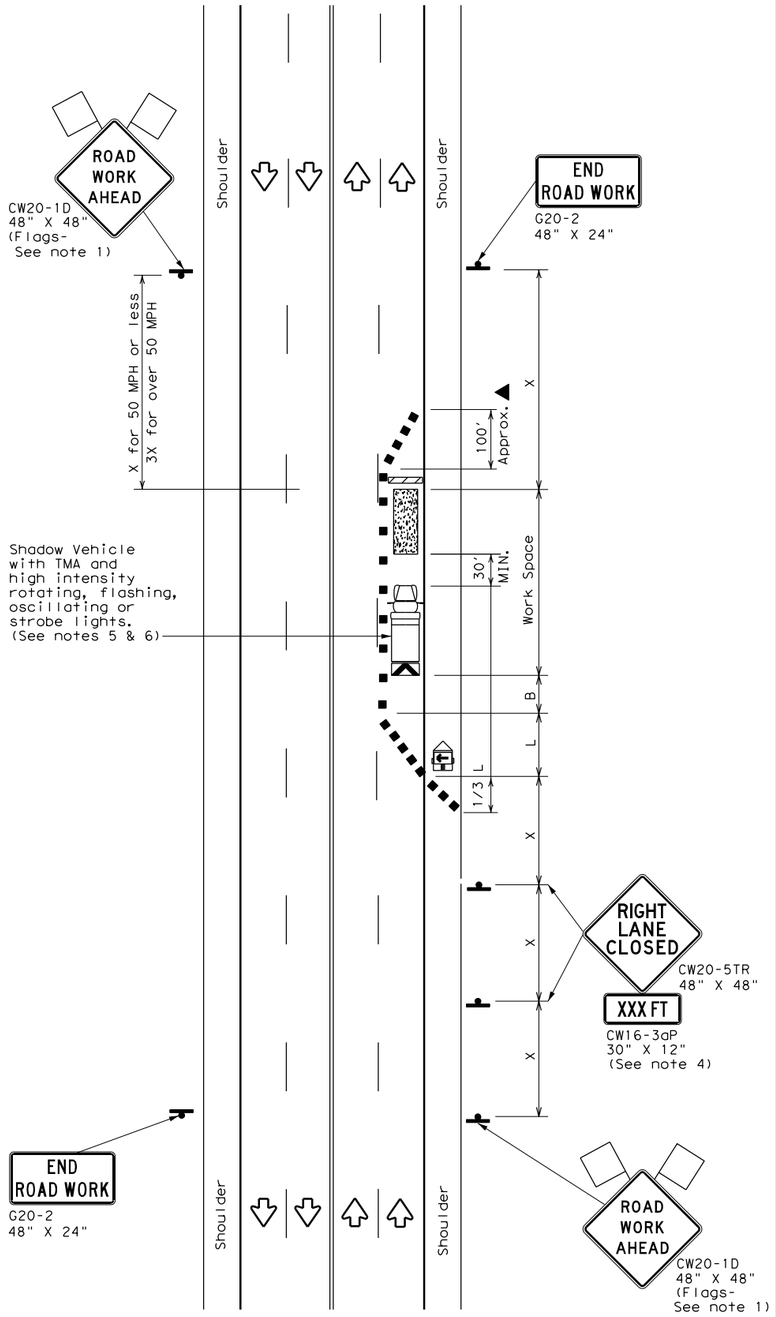
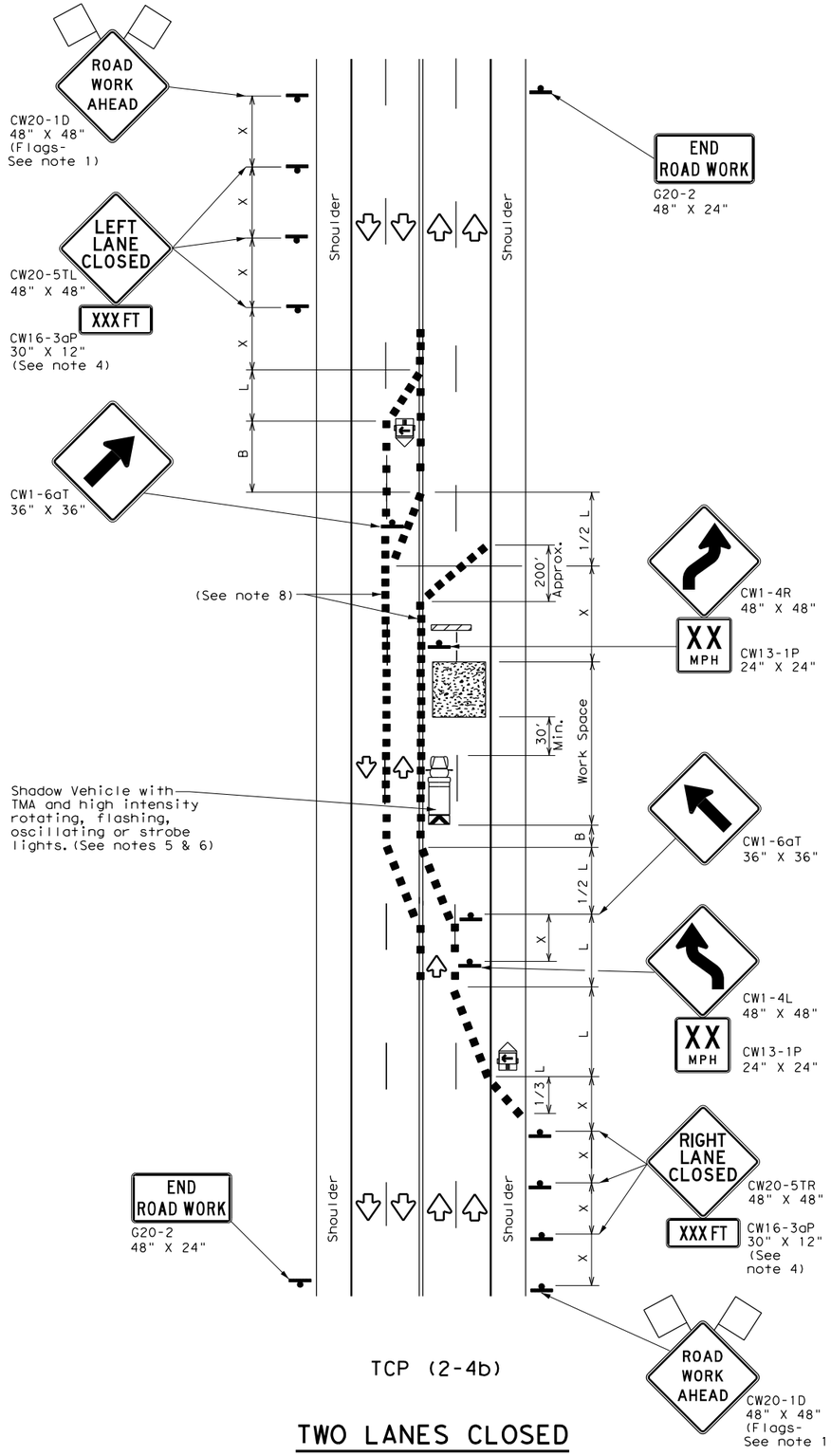


TCP (2-4a)

ONE LANE CLOSED



TCP (2-4b)

TWO LANES CLOSED

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. The downstream taper is optional. When used, it should be 100 feet minimum length per lane.
4. For short term applications, when post mounted signs are not used, the distance legend may be shown on the sign face rather than on a CW16-3aP supplemental plaque.
5. A Shadow Vehicle with a TMA should be used anytime it can be positioned 30 to 100 feet in advance of the area of crew exposure without adversely affecting the performance or quality of the work. If workers are no longer present but road or work conditions require the traffic control to remain in place, Type 3 Barricades or other channelizing devices may be substituted for the Shadow Vehicle and TMA.
6. Additional Shadow Vehicles with TMAs may be positioned in each closed lane, on the shoulder or off the paved surface, next to those shown in order to protect a wider work space.

TCP (2-4a)

7. 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 (2-4b)

8. For shorter durations where traffic is directed over a yellow centerline, channelizing devices which separate two-way traffic should be spaced on tapers at 20' or 15' if posted speeds are 35 mph or slower, and for tangent sections, at 1/2(S) where S is the speed in mph. This tighter devices spacing is intended for the area of conflicting markings, not the entire work zone.

Texas Department of Transportation

Traffic Operations Division Standard

TRAFFIC CONTROL PLAN LANE CLOSURES ON MULTILANE CONVENTIONAL ROADS

TCP(2-4)-18

FILE: tcp2-4-18.dgn	DN:	CK:	DW:	CK:
©TxDOT December 1985	CONT	SECT	JOB	HIGHWAY
REVISIONS 8-95 3-03	0081	01	050	US 377
1-97 2-12	DIST	COUNTY		SHEET NO.
4-98 2-18	FTW	TARRANT		29

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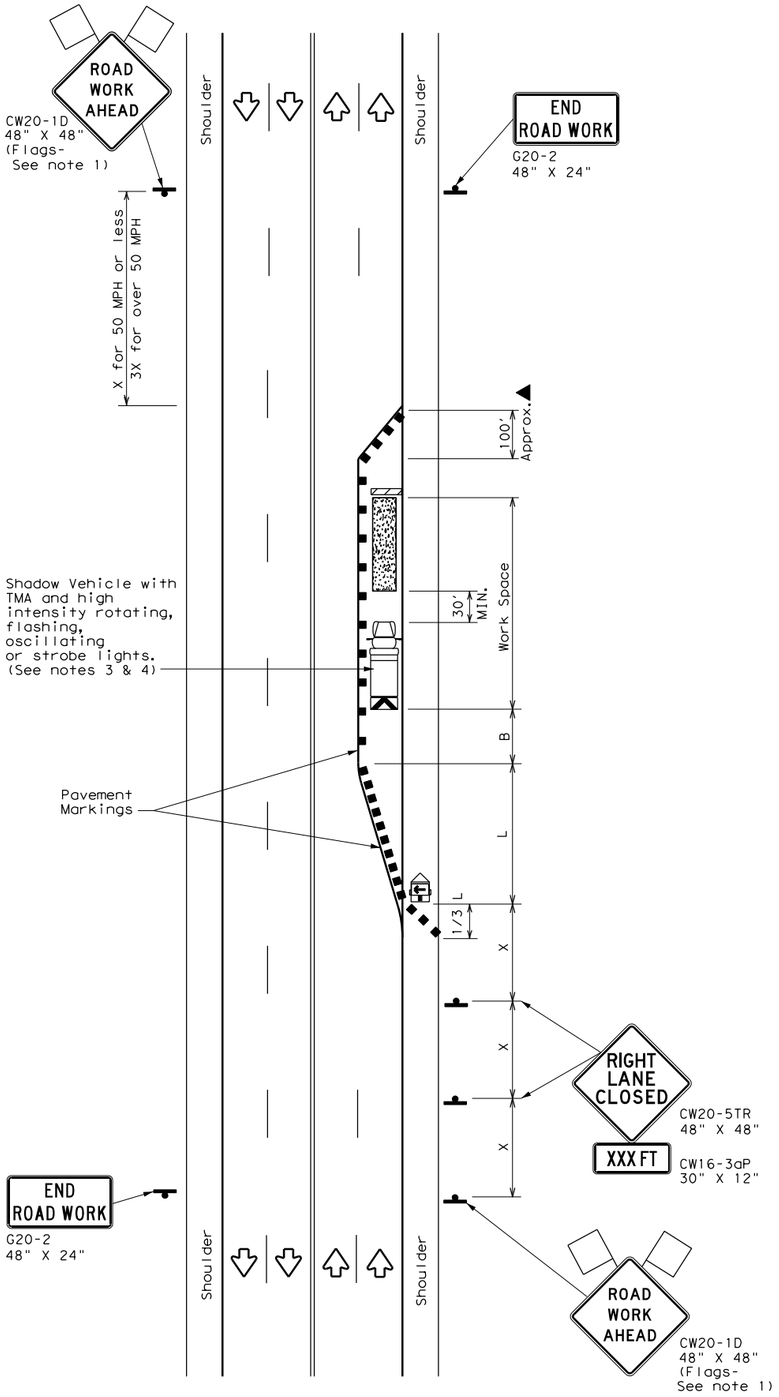
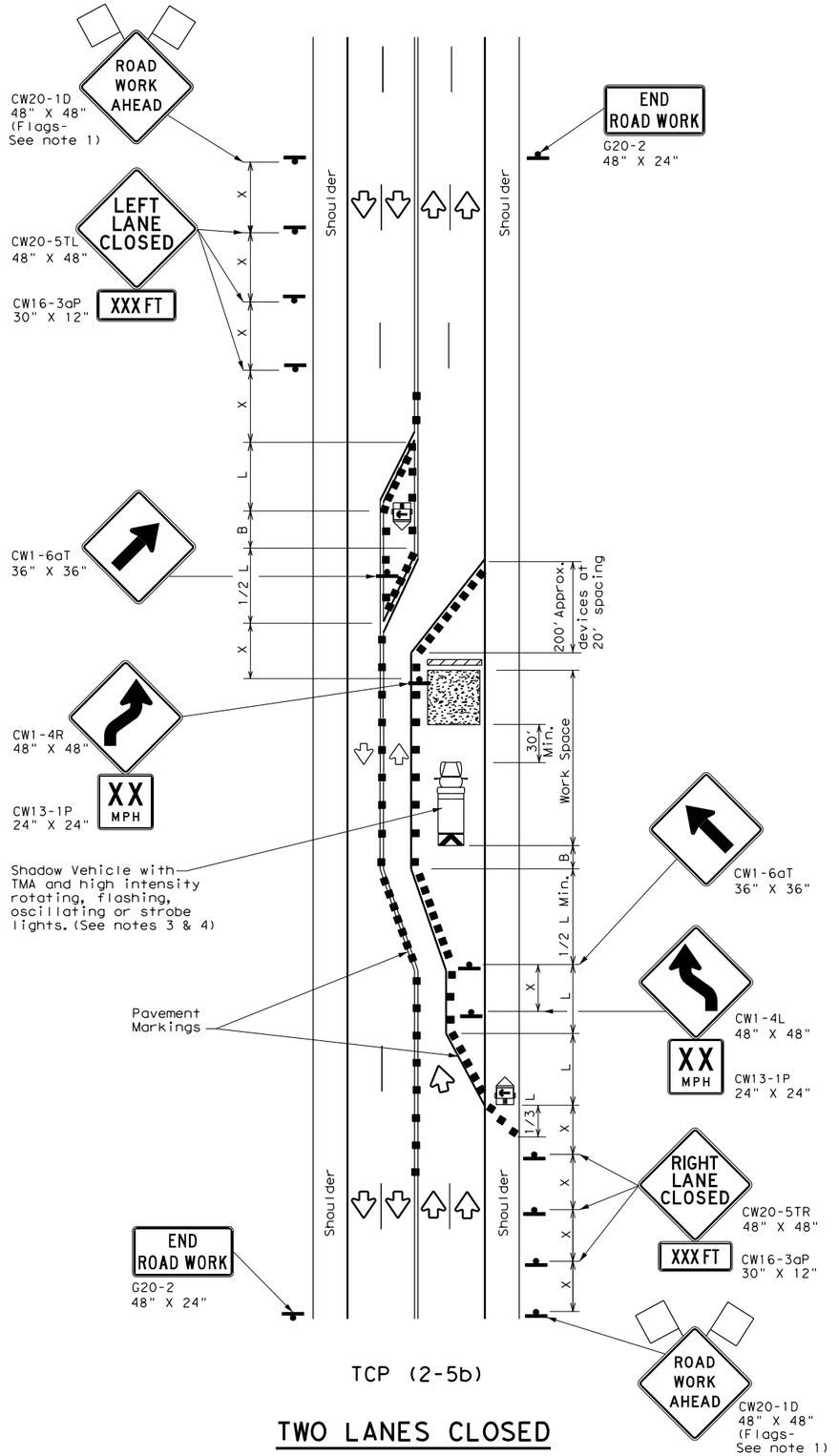


TCP (2-5a)

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	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. 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

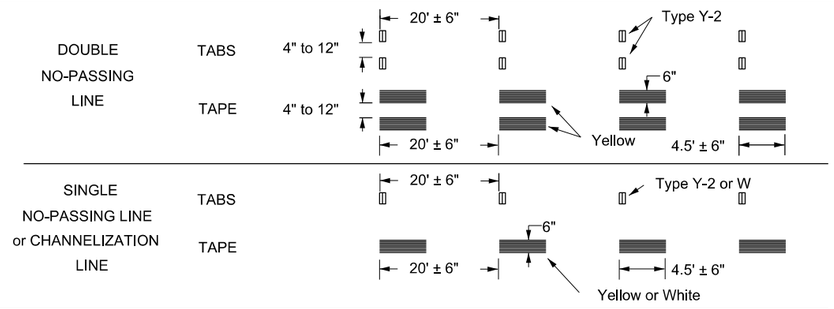
Traffic Operations Division Standard

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	0081	01	050	US 377
1-97 3-03	DIST	COUNTY		SHEET NO.
4-98 2-18	FTW	TARRANT		30

WORK ZONE SHORT TERM PAVEMENT MARKINGS DETAILS



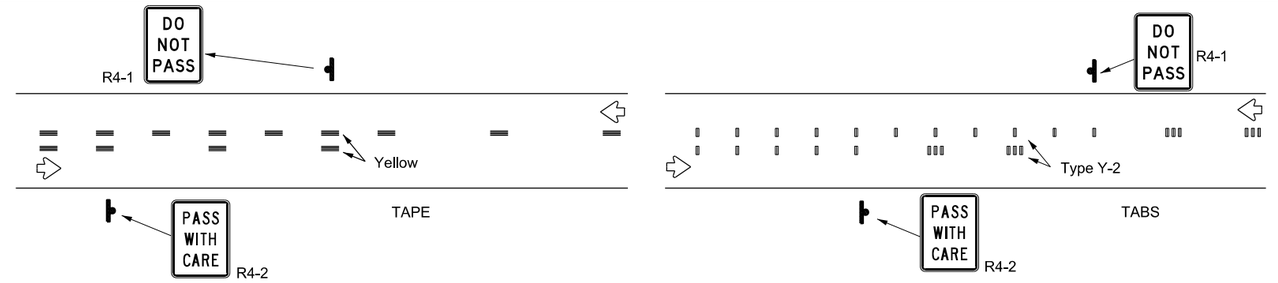
NOTES:

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.

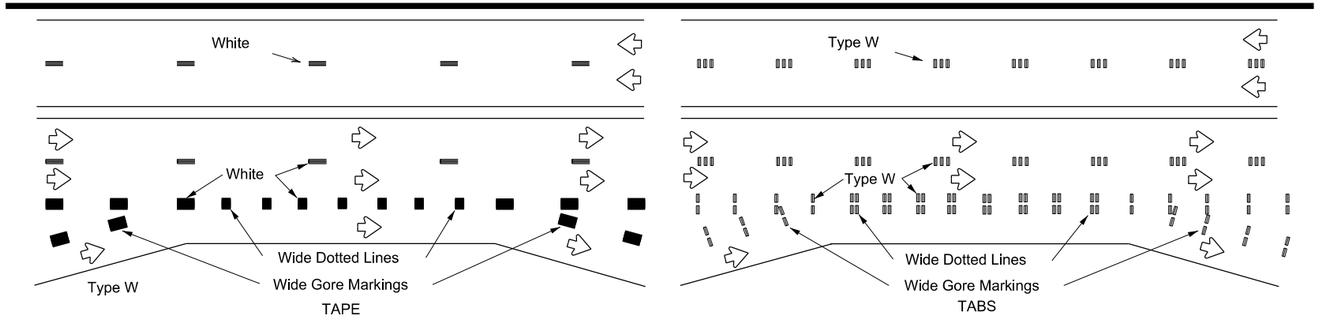
TEMPORARY FLEXIBLE, REFLECTIVE ROADWAY MARKER TABS (TABS)

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.

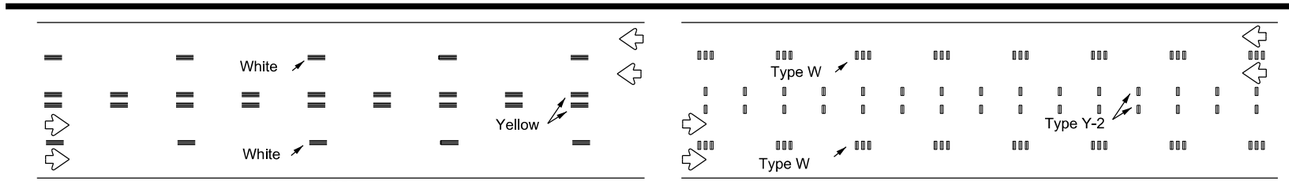
WORK ZONE SHORT TERM PAVEMENT MARKINGS PATTERNS



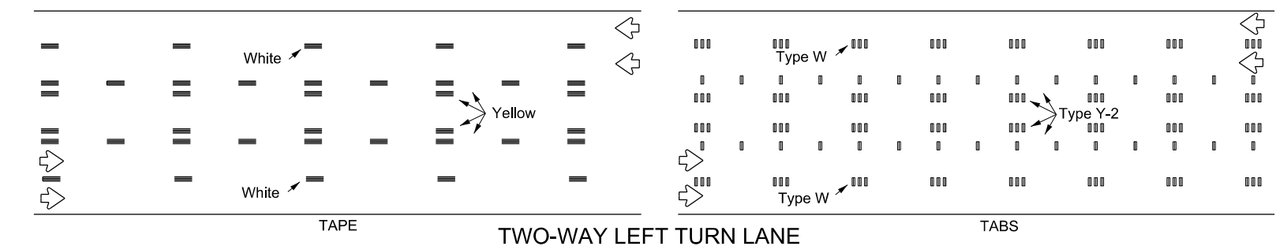
CENTER LINE & NO-PASSING ZONE BARRIER LINES FOR TWO LANE TWO-WAY HIGHWAYS



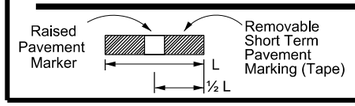
LANE LINES FOR DIVIDED HIGHWAY



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
REVISIONS 4-92 7-13 1-97 2-23 3-03	0081	01	050	US 377
	DIST	COUNTY		SHEET NO.
	FTW	TARRANT		31

DATE:
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DATE: 7/10/2024 7:52:25 AM
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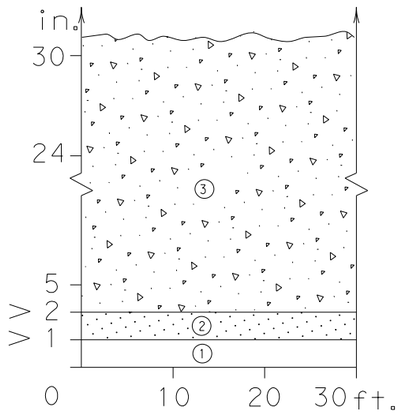
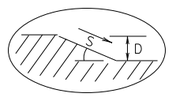
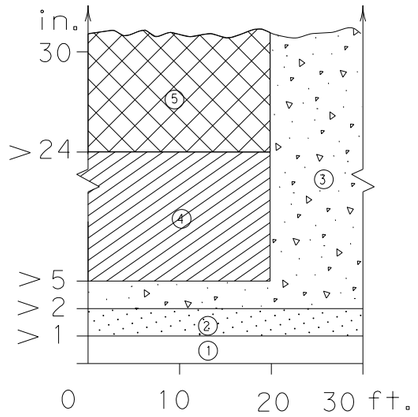
DEFINITION OF TREATMENT ZONES FOR VARIOUS EDGE CONDITIONS

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

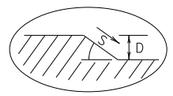


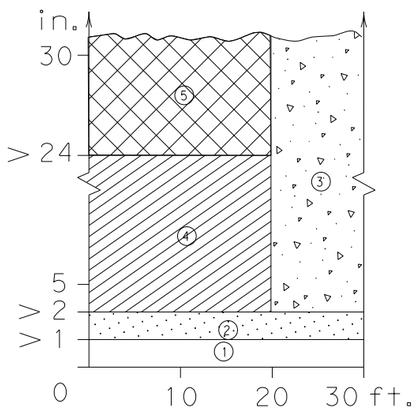
Edge Condition I
S = (3:1) (or flatter)



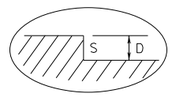


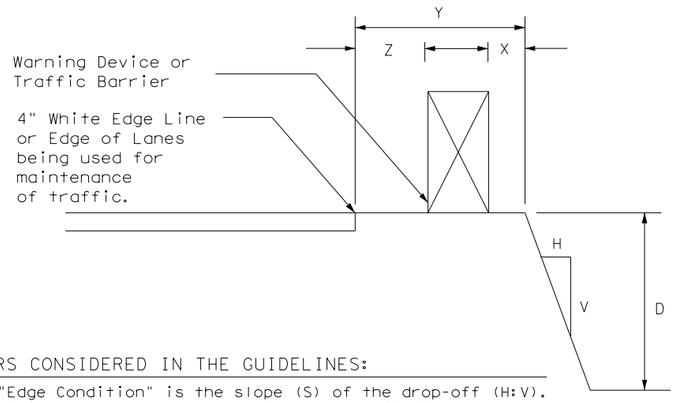
Edge Condition II
S = ((2.99):1) to (1:1)





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	
②	
③	
④	
⑤	

Edge Condition Notes:

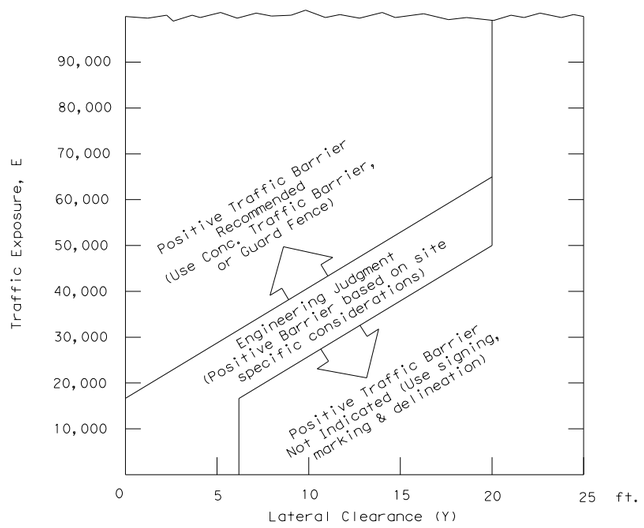
1. Edge Condition I: Most vehicles are able to traverse an edge condition with a slope rate of (3 to 1) or flatter. The slope must be constructed with a compacted material capable of supporting vehicles.

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, particularly those with high loads, have more steering control differential when "D" is greater than 5 inches and up to 24 inches. When "D" exceeds 24 inches, the possibility of rollover is greater for most vehicles.

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

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



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

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

3. An approved end treatment should be provided for any positive barrier end located within 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.

Engineer's Seal

STATE OF TEXAS
JAMES EDWARD BROWNE
62207
LICENSED
PROFESSIONAL ENGINEER

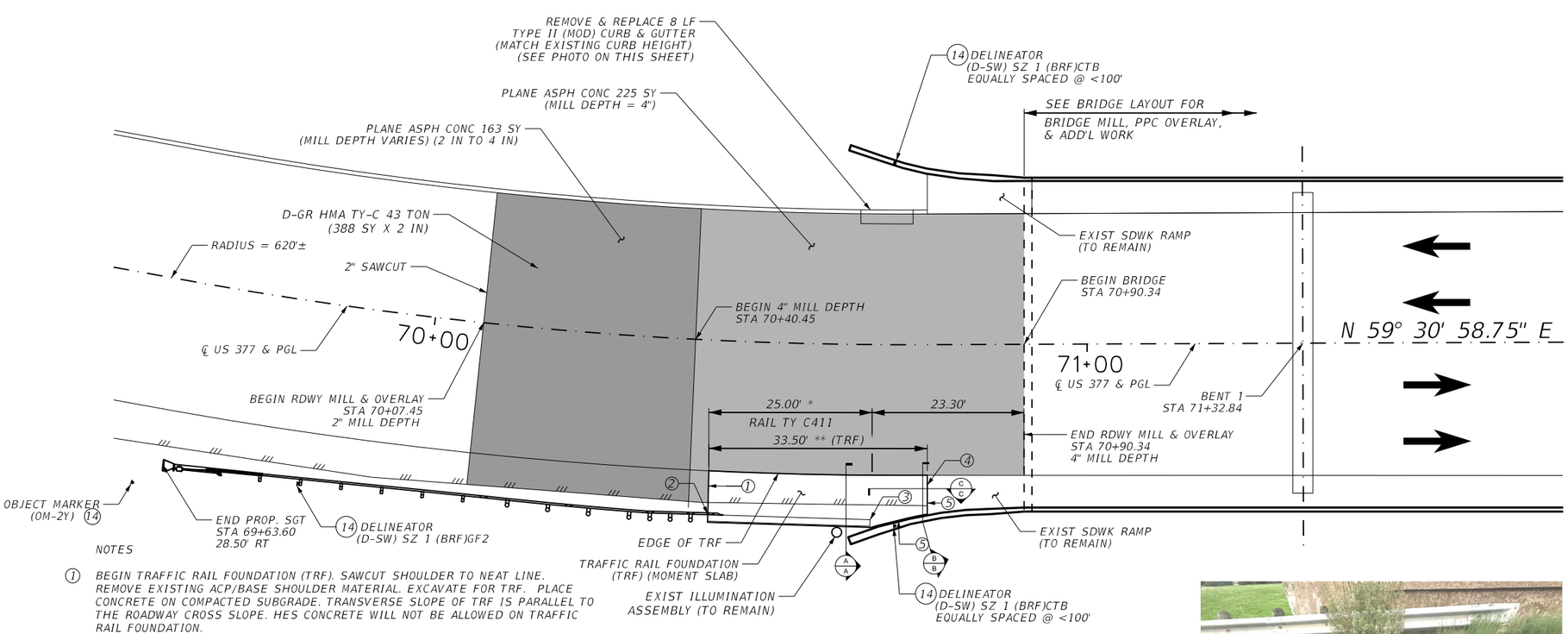
7/10/2024

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	C	S	J	HWY
03-01 08-01 9-21	DIST	COUNTY		SHEET NO.
	DST	CTY		32



NOTES

1. BEGIN TRAFFIC RAIL FOUNDATION (TRF). SAWCUT SHOULDER TO NEAT LINE. REMOVE EXISTING ACP/BASE SHOULDER MATERIAL. EXCAVATE FOR TRF. PLACE CONCRETE ON COMPACTED SUBGRADE. TRANSVERSE SLOPE OF TRF IS PARALLEL TO THE ROADWAY CROSS SLOPE. HES CONCRETE WILL NOT BE ALLOWED ON TRAFFIC RAIL FOUNDATION.
2. NOM FACE OF RAIL TY C411 @ 26.67' RT 70+43.12.
3. NOM FACE OF RAIL TY C411 @ 26.67' RT 70+66.98.
4. END TRF STA 70+75.50.
5. 1/2" ISOLATION JT (SEE SECTION B-B, SECTION C-C & DETAIL ON SHEET 2 OF 3).
6. MILL DEPTH VARIES FROM 2" AT STA 70+07.45 AT STA 70+40.45.
7. 4" MILL DEPTH FROM STA 70+40.45 TO STA 70+90.34.
8. 6" WHITE LANE LINE (SEE STANDARD SHEET "PM(1)-22").
9. 6" SOLID WHITE EDGE LINE (SEE STANDARD SHEET "PM(1)-22").
10. 6" SOLID YELLOW EDGE LINE (SEE STANDARD SHEET "PM(1)-22").
11. TYPE I-C REFL RAISED PVMT MARKER (SEE STANDARD SHEET "PM(2)-22").
12. TYPE II-A-A REFL RAISED PVMT MARKER (SEE STANDARD SHEET "PM(2)-22").
13. GROOVE SURFACE OF TRF LONGITUDINALLY IN ACCORDANCE WITH ARTICLE 422.4.11 "FINAL SURFACE TEXTURE".
14. SEE DELINEATOR & OBJECT MARKER STANDARDS.

NOTE: SEE SHEET 2 OF 3 FOR SECTIONS A, B & C
*NOTE: MEASURED SLONG NOM FACE OF RAIL
**NOTE: MEASURED ALONG EDGE OF SHOULDER/TRF

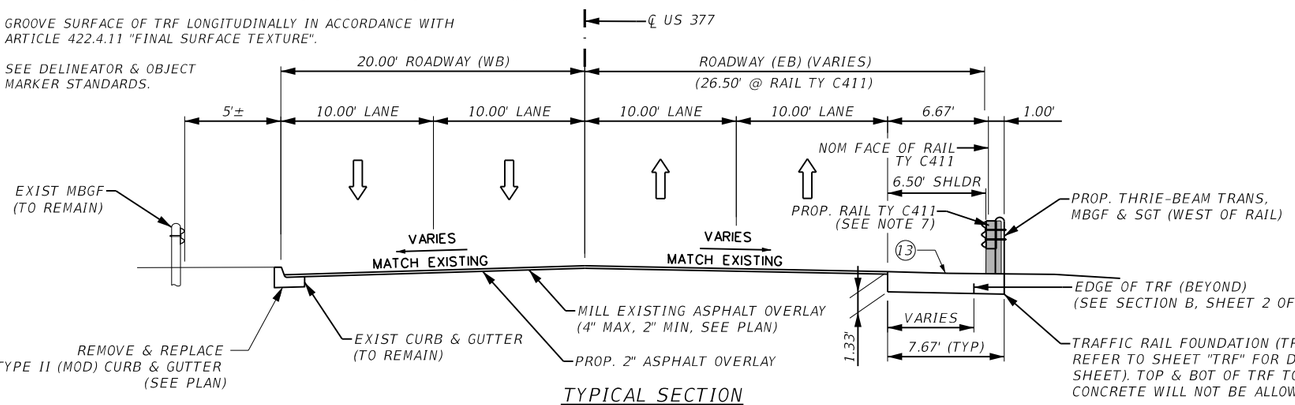
WEST APPROACH REMOVAL & REPAIR PLAN
(PHASE 2)

NOTE: ROADWAY APPROACH IS CLOSED TO TRAFFIC DURING PHASE 2.

DAMAGED NORTH (LEFT) CURB AT WEST APPROACH

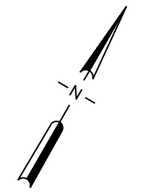
PHASE 2 ESTIMATED QUANTITIES

ITEM-SERIES	DESCRIPTION	UNITS	TOTAL	
104-7017	REMOVING CONC (CURB & GUTTER)	LF	8	
341-7025	D-GR HMA TY-C SAC-A PG70-22 (EXEMPT)	TON	43	
341-7082	TACK COAT	GAL	85	
354-7035	PLANE ASPHALT CONC PAV (0" TO 6")	SY	163	6
354-7035	PLANE ASPHALT CONC PAV (0" TO 6")	SY	225	7
420-7052	CL C CONC (RAIL FOUNDATION)	CY	12.3	
450-7038	RAIL (TY C411)	LF	25.0	
529-7009	CONC CURB & GUTTER (TYPE II)	LF	8	
540-7001	MTL W-BEAM GD FEN (TIM POST)	LF	25	
540-7006	MTL BEAM GD FEN TRANS (TL2)	EA	1	
544-7001	GUARDRAIL END TREATMENT (INSTALL)	EA	1	
658-7012	INSTL DEL ASSM (D-SW) SZ1 (BRF)CTB	EA	2	14
658-7018	INSTL DEL ASSM (D-SW) SZ1 (BRF)GF2	EA	1	14
658-7056	INSTL OM ASSM (OM-2Y)(WC)GND	EA	1	14
666-7407	REFL PAV MRK TY I (W) 6" (BRK)	LF	40	8
666-7410	REFL PAV MRK TY I (W) 6" (SLD)	LF	165	9
666-7422	REFL PAV MRK TY I (Y) 6" (SLD)	LF	165	10
672-7002	REFL PAV MRKR TY I-C	EA	4	11
672-7004	REFL PAV MRKR TY II-A-A	EA	4	12



TYPICAL SECTION
SCALE 1"=10'
(PHASE 2)

NOTE: ROADWAY APPROACH IS CLOSED TO TRAFFIC DURING PHASE 2.



GENERAL NOTES:

1. LAYOUT AND STATIONS SHOWN ARE BASED ON AS-BUILT PLANS AND FIELD SURVEY. COPIES OF AVAILABLE PORTIONS OF AS-BUILT PLANS MAY BE PROVIDED UPON REQUEST. CONTRACTOR TO VERIFY INFORMATION PRIOR TO CONSTRUCTION.
2. REPAIR INSPECTION PERFORMED IN OCTOBER AND DECEMBER 2021. CURRENT CONDITIONS MAY VARY. FIELD VERIFY LOCATIONS AND EXTENT OF REPAIRS AND CONFIRM WITH THE ENGINEER PRIOR TO ORDERING MATERIALS.
3. THE THICKNESS OF ASPHALT OVERLAY AT THE ROADWAY APPROACH IS ESTIMATED TO BE APPROXIMATELY 4 INCHES BASED ON FIELD MEASUREMENT OF THE CURB HEIGHT ON THE BRIDGE.
4. PROVIDE 2 INCH DEEP SAWCUT AT END OF MILL & OVERLAY AND PERIMETER OF RAIL FOUNDATION. SAWCUT TO BE SUBSIDIARY.
5. CONSTRUCT REPAIRS SHOWN ON THIS SHEET IN PHASE 2. REFER TO "CONSTRUCTION PHASING" SHEETS FOR ADDITIONAL INFORMATION.
6. REMOVAL OF EXISTING ACP/BASE MATERIAL AND EXCAVATION FOR RAIL FOUNDATION TO BE SUBSIDIARY.
7. USE RAIL WINGWALL PANEL FOR RAIL TY C411 (25' LENGTH).

7/10/2024

James E. Browne

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Texas Department of Transportation

US 377
APPROACH REPAIR

WEST FORK TRINITY RIVER
NBI No. 02-220-0081-01-001

SHEET 1 OF 3

FED.RD. DIV. NO.	FEDERAL AID PROJECT NO.		SHEET NO.
6	SEE TITLE SHEET		33
STATE	DISTRICT	COUNTY	
TEXAS	FTW	TARRANT	
CONTROL	SECTION	JOB	HIGHWAY
0081	01	050	US 377

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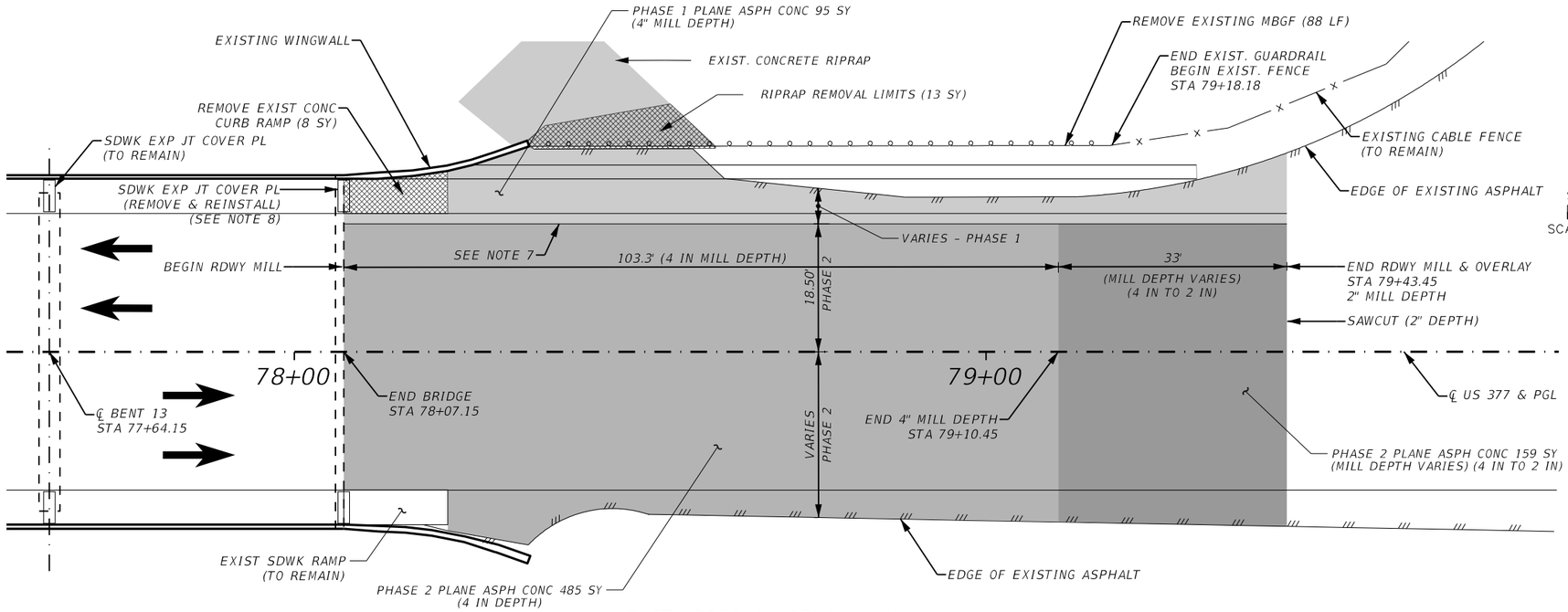
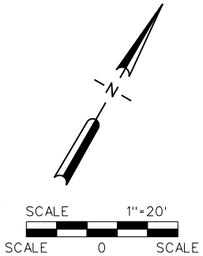
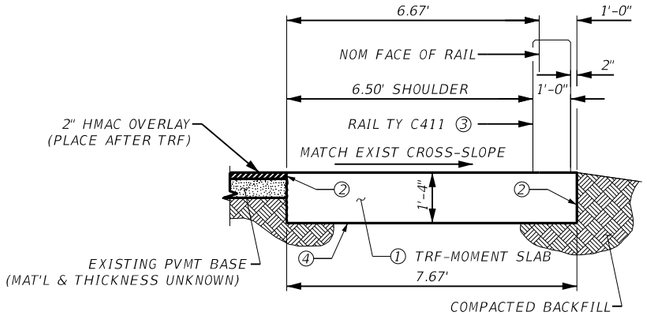


EAST APPROACH REMOVAL PLAN

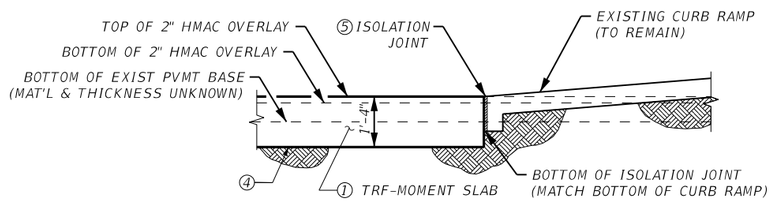


GENERAL NOTES:

1. LAYOUT AND STATIONS SHOWN ARE BASED ON AS-BUILT PLANS AND FIELD SURVEY. COPIES OF AVAILABLE PORTIONS OF AS-BUILT PLANS MAY BE PROVIDED UPON REQUEST. CONTRACTOR TO VERIFY INFORMATION PRIOR TO CONSTRUCTION.
2. PROVIDE 2 INCH DEEP SAWCUT AT END OF MILL & OVERLAY. SAWCUT TO BE SUBSIDIARY.
3. EXISTING CONCRETE RIPRAP WAS CONSTRUCTED AFTER DESIGN SURVEY. LIMITS ARE UNKNOWN. CONTRACTOR TO VERIFY LIMITS PRIOR TO CONSTRUCTION.
4. THE THICKNESS OF ASPHALT OVERLAY AT THE ROADWAY APPROACH IS ESTIMATED TO BE APPROXIMATELY 4 INCHES BASED ON FIELD MEASUREMENT OF THE CURB HEIGHT ON THE BRIDGE.
5. REPAIRS ARE CONSTRUCTED IN PHASES. REFER TO "CONSTRUCTION PHASING" SHEETS FOR ADDITIONAL INFORMATION.
6. REFER TO SHEET "APPROACH REPAIR" SHEET 3 OF 3 FOR ESTIMATED QUANTITIES.
7. FINISH GRADE AT 18.50 FEET LEFT OF CENTERLINE VARIES FROM EXISTING. MILL TO MATCH PROPOSED GUTTER ELEVATIONS AND CROSS SLOPES SHOWN IN SCHEDULE ON SHEET "APPROACH REPAIR", SHEET 3 OF 3.
8. TEMPORARILY REMOVE SIDEWALK EXPANSION JOINT COVER PLATE TO FACILITATE REMOVAL OF EXISTING CONCRETE SIDEWALK RAMP AND REPAIR OF MINOR SPALL IN BRIDGE CURB AT END OF BRIDGE. SEE SHEET "APPROACH REPAIR" SHEET 3 OF 3 FOR REINSTALLATION.



SECTION A
SCALE 1/4" = 1'-0"



SECTION C
SCALE 1/4" = 1'-0"

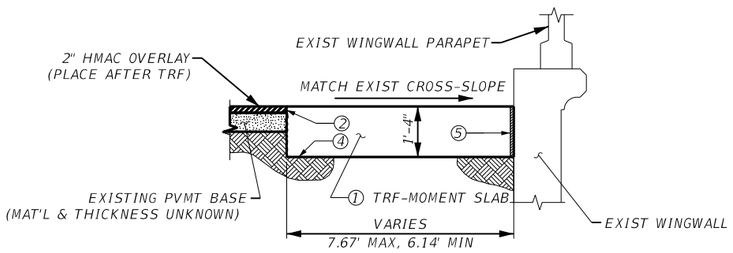
① USE MOMENT SLAB OPTION. SEE SHEET "TRF" FOR REINF & DETAILS.

② FORM TOP 2" OF INSIDE FACE. FORM OUTSIDE FACE FULL DEPTH.

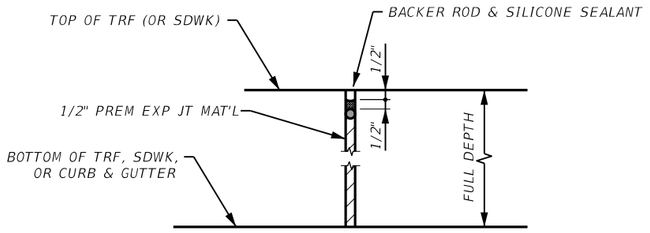
③ WINGWALL PANEL (SEE SHEET "TYPE C411" FOR REINF & RAIL ANCHORAGE).

④ CONSTRUCT TRF MOMENT SLAB ON COMPACTED SUBGRADE.

⑤ ISOLATION JOINT (SEE DETAIL THIS SHEET).



SECTION B
SCALE 1/4" = 1'-0"



ISOLATION JOINT DETAIL

7/10/2024

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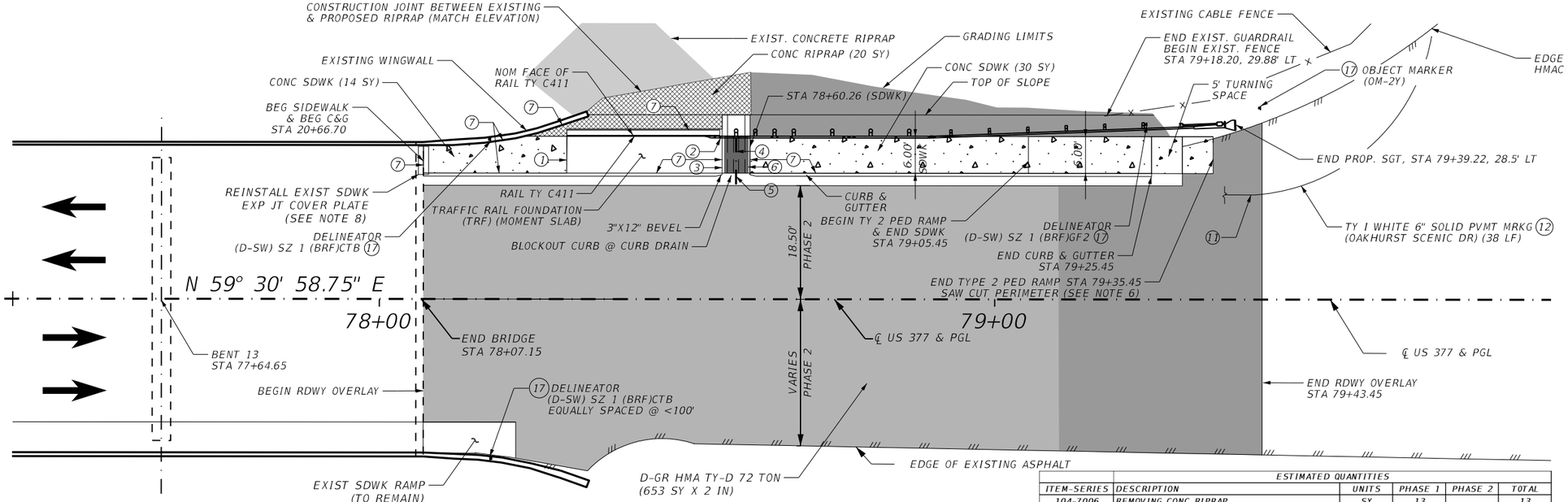
Texas Department of Transportation

US 377
APPROACH REPAIR

WEST FORK TRINITY RIVER
NBI No. 02-220-0081-01-001
SHEET 2 OF 3

FED.RD. DIV. NO.	FEDERAL AID PROJECT NO.		SHEET NO.
6	SEE TITLE SHEET		34
STATE	DISTRICT	COUNTY	
TEXAS	FTW	TARRANT	
CONTROL	SECTION	JOB	HIGHWAY
0081	01	050	US 377



PLAN
(SHOWING PROPOSED WORK)

SCHEDULE OF DIMENSIONS, SLOPES & ELEVATIONS

STATION	COMMENTS	W (FT)	SIDE SLOPE (H:V)	TOP OF SLOPE ELEV POINT A	TOP OF CURB ELEV POINT B	GUTTER LINE ELEV POINT C	CURB HEIGHT (IN)	EDGE C&G ELEV POINT D	SHORT-TERM EDGE DROP-OFF** (FT)	CROSS SLOPE (%)	PGL ELEV POINT E
78+07.15	END BRIDGE	N/A	N/A	N/A	536.26	535.43	10	535.46	N/A	2.62	535.95
78+10.45	BEGIN CURB TRANSITION	N/A	N/A	N/A	536.25	535.42	10	535.46	0.87	2.67	535.95
78+20.45	CURB TRANSITION	N/A	N/A	N/A	536.07	535.32	9	535.36	0.90	3.18	535.95
78+30.45	END CURB TRANSITION	N/A	N/A	N/A	535.88	535.21	8	535.26	0.92	3.78	535.96
78+40.45		N/A	2:1	N/A	535.76	535.09	8	535.15	0.92	4.39	535.96
78+50.45		N/A	2:1	N/A	535.69	535.02	8	535.08	0.91	4.74	535.96
78+60.45		6.9	2.5:1	535.82	535.67	535.00	8	535.07	0.92	4.99	535.99
78+70.45	BEGIN CURB TRANSITION	6.5	3:1	535.86	535.71	535.04	8	535.11	0.93	5.14	536.06
78+80.45	CURB TRANSITION	4.6	3:1	535.84	535.69	535.15	6.5	535.22	0.90	4.94	536.13
78+90.45	END CURB TRANSITION	3.1	3:1	535.86	535.71	535.29	5	535.35	0.87	4.59	536.20
78+95.45		2.3	3:1	535.92	535.77	535.35	5	535.41	0.84	4.44	536.23
79+05.45	BEGIN CURB TRANS & PED RAMP	1.2	3:1	536.06	535.91	535.49	5	535.54	0.83	4.08	536.30
79+15.45	CURB TRANS & PED RAMP	0.6	3:1	535.99	535.84	535.63	2.5	535.68	0.82	3.98	536.42
79+25.45	END CURB TRANS	0.3	3:1	535.92	N/A	535.77	N/A	535.82	N/A	3.88	536.54
79+30.45	END TURNING SPACE	N/A	N/A	535.99	N/A	535.84	N/A	535.89	N/A	3.83	536.60
79+35.45	END PED RAMP	N/A	N/A	N/A	N/A	N/A	N/A				

**NOTE: EDGE DROP OFF DURING CONSTRUCTION OF CURB & GUTTER (MOD) SEE SHEET "CONSTRUCTION PHASING" SHEET 1 OF 2 FOR TRAFFIC LANES DURING CONSTRUCTION

NOTES

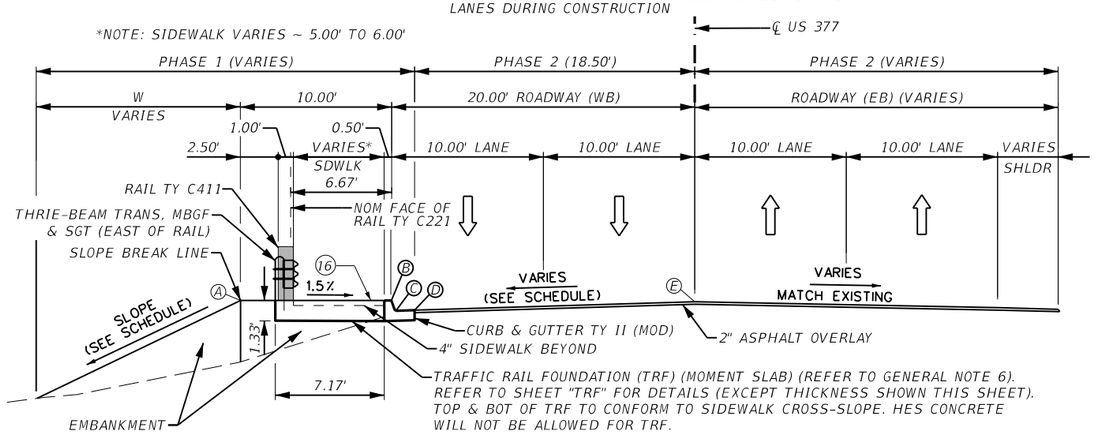
Ⓐ TOP OF SLOPE

Ⓑ TOP OF CURB

Ⓒ TOE OF CURB (GUTTER ELEV)

Ⓓ EDGE OF ASPHALT

Ⓔ FINISH GRADE AT ℄ US 377



PROPOSED TYPICAL SECTION
SCALE 1"=10'

ESTIMATED QUANTITIES					
ITEM-SERIES	DESCRIPTION	UNITS	PHASE 1	PHASE 2	TOTAL	
104-7006	REMOVING CONC RIPRAP	SY	13	-	13	
104-7017	REMOVING CONC RAMP	SY	8	-	8	
132-7001	EMBANKMENT	CY	13	-	13	
341-7025	D-GR HMA TY-D PG64-22 (EXEMPT)	TON	-	72	72	
341-7082	TACK COAT	GAL	-	144	144	
354-7035	PLANE ASPHALT CONC PAV (0" TO 6")	SY	95	485	580	(8)
354-7035	PLANE ASPHALT CONC PAV (0" TO 6")	SY	-	159	159	(9)
420-7052	CL C CONC (RAIL FOUNDATION)	CY	8.9	-	8.9	
420-7067	CL C CONC (MISC) (SDWK CURB DRAIN)	CY	2.2	-	2.2	
432-7007	RIPRAP (CONC) (CL B) (4")	CY	3	-	3	
442-7007	STR STEEL (MISC NON-BRIDGE)	LB	712	-	712	
450-7038	RAIL (TY C411)	LF	25.0	-	25	
529-7009	CONC CURB & GUTTER (TYPE II) (MOD)	LF	124	-	124	
531-7001	CONC SIDEWALKS (4")	SY	20	-	20	
531-7006	CURB RAMPS (TY 2)	EA	1	-	1	
540-7001	MTL W-BEAM GD FEN (TIM POST)	LF	25	-	25	
540-7006	MTL BEAM GD FEN TRANS (TL2)	EA	1	-	1	
542-7001	REMOVE METAL BEAM GUARD FENCE	LF	88	-	88	
544-7001	GUARDRAIL END TREATMENT (INSTALL)	EA	1	1	2	
658-7012	INSTL DEL ASSM (D-SW) SZ1 (BRF)CTB	EA	1	-	1	(17)
658-7018	INSTL DEL ASSM (D-SW) SZ1 (BRF)GF2	EA	1	-	1	(17)
658-7056	INSTL OM ASSM (OM-2Y)(WC)GND	EA	1	-	1	(17)
666-7407	REFL PAV MRK TY I (W) 6" (BRK)	LF	-	60	60	(10)
666-7410	REFL PAV MRK TY I (W) 6" (SLD)	LF	-	274	274	(11)
666-7410	REFL PAV MRK TY I (W) 6" (SLD)	LF	-	38	38	(12)
666-7422	REFL PAV MRK TY I (Y) 6" (SLD)	LF	-	274	274	(13)
672-7002	REFL PAV MRKR TY I-C	EA	-	6	6	(14)
672-7004	REFL PAV MRKR TY II-A-A	EA	-	6	6	(15)

NOTES

(1) BEGIN RAIL TY C411 & TRF STA 78+30.45. NOM FACE OF RAIL AT 26.67' LT

(2) END RAIL TY C411 STA 78+55.45. NOM FACE OF RAIL AT 26.67' LT

(3) END TRF STA 78+55.68

(4) ℄ CURB DRAIN STA 78+57.97 (REFER TO SHEET "CURB DRAIN DETAILS")

(5) LOW POINT STA 78+58.00

(6) DRAIN COVER PLATE (¾" X 72" X 3'-11" (SEE CURB DRAIN DETAIL)

(7) ½" ISOLATION JOINT (SEE "APPROACH REPAIR" SHEET 2 OF 3)

(8) 4" MILL DEPTH

(9) MILL DEPTH VARIES FROM 4" TO 2"

(10) 6" WHITE LANE LINE (SEE STD SHT "PM(1)-22")

(11) 6" SOLID WHITE EDGE LINE (SEE STD SHT "PM(1)-22")

(12) 6" SOLID WHITE EDGE LINE (SEE STD SHT "PM(1)-22")

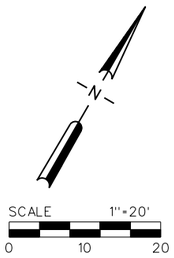
(13) 6" SOLID YELLOW EDGE LINE (SEE STD SHT "PM(1)-22")

(14) TYPE I-C REFL RAISED PVMT MARKER (SEE STD SHT "PM(2)-22")

(15) TYPE II-A-A REFL RAISED PVMT MARKER (SEE STD SHT "PM(2)-22")

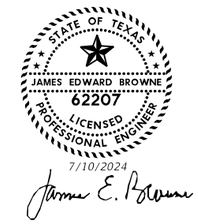
(16) SURFACE TEXTURE OF TRF TO MATCH SURFACE TEXTURE OF SIDEWALK.

(17) SEE DELINEATOR & OBJECT MARKER STANDARDS.



GENERAL NOTES:

1. LAYOUT AND STATIONS SHOWN ARE BASED ON AS-BUILT PLANS AND FIELD SURVEY.
2. REPAIR INSPECTION PERFORMED IN OCTOBER AND DECEMBER 2021. CURRENT CONDITIONS MAY VARY. FIELD VERIFY LOCATIONS AND EXTENT OF REPAIRS AND CONFIRM WITH THE ENGINEER PRIOR TO ORDERING MATERIALS.
3. EXISTING CONCRETE RIPRAP WAS CONSTRUCTED AFTER DESIGN SURVEY. LIMITS ARE UNKNOWN. CONTRACTOR TO VERIFY LIMITS PRIOR TO CONSTRUCTION.
4. THE THICKNESS OF ASPHALT OVERLAY AT THE ROADWAY APPROACH IS ESTIMATED TO BE APPROXIMATELY 4 INCHES.
5. CONSTRUCT REPAIRS IN PHASE 1 OR 2 AS NOTED. REFER TO "CONSTRUCTION PHASING" SHEETS ADDITIONAL INFORMATION
6. REMOVAL OF EXISTING ACP AND EXCAVATION TO BE SUBSIDIARY.
7. USE RAIL WINGWALL PANEL FOR RAIL TY C411 (25 FEET LENGTH) ANCHORED TO TRF.
8. REINSTALL EXISTING SIDEWALK EXPANSION JOINT COVER PLATE AFTER REPAIR OF SPALL AND APPLICATION OF PENETRATING CONCRETE SURFACE TREATMENT. PROVIDE NEW ANCHORS. REFER TO SHEET "BS-EJCP) FOR ANCHORS. REMOVAL AND REINSTALLATION OF SIDEWALK EXPANSION JOINT COVER PLATE IS SUBSIDIARY.



Bartlett&West
TEXAS FIRM REGISTRATION No. F-6499
4500 MERCANTILE PLAZA, SUITE 301
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Texas Department of Transportation

US 377
APPROACH REPAIR

WEST FORK TRINITY RIVER
NBI No. 02-220-0081-01-001
SHEET 3 OF 3

FED.RD. DIV. NO.	FEDERAL AID PROJECT NO.		SHEET NO.
6	SEE TITLE SHEET		35
STATE	DISTRICT	COUNTY	
TEXAS	FTW	TARRANT	
CONTROL	SECTION	JOB	HIGHWAY
0081	01	050	US 377

DATE: 7/10/2024 TIME: 7:23:31 AM $PLTDRVSS
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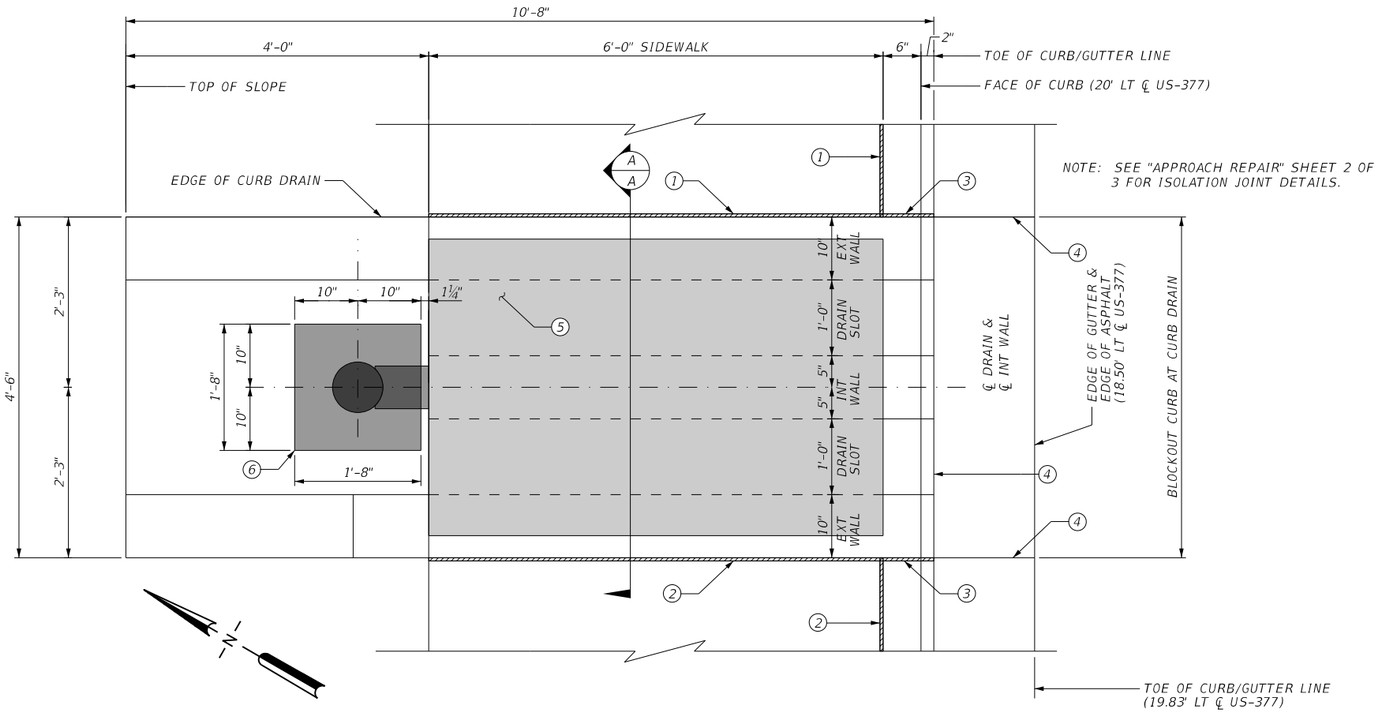
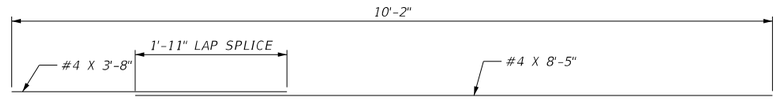
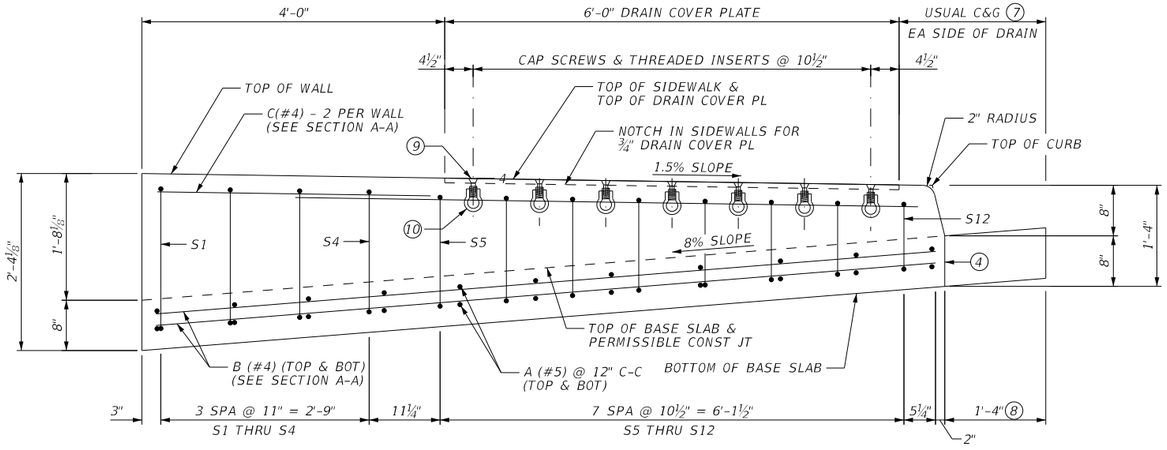


PLAN

SCALE: ½" = 1'-0"

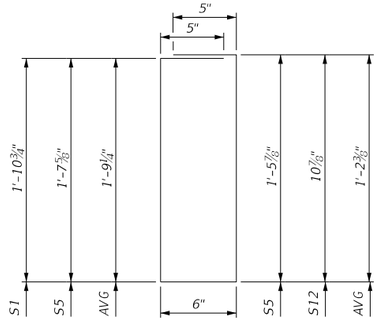




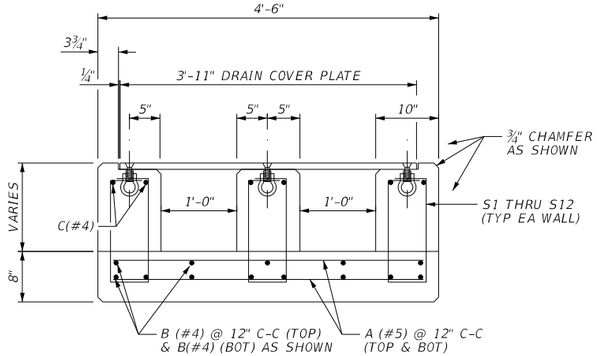
SIDE ELEVATION

SCALE: ½" = 1'-0"

CONCRETE COVER:
PROVIDE 2" CLEAR COVER AT TOP AND SIDE FACES.
PROVIDE 3" CLEAR COVER TO BOTTOM MAT OF REINFORCING.
PROVIDE 2" CLEAR COVER TO END OF BARS.



S1 THRU S4 & S5 THRU S12
NOTE: BARS S ARE #4



SECTION A-A

SCALE: ½" = 1'-0"

CONSTRUCTION NOTES:

1. ½" ISOLATION JOINT BETWEEN SIDEWALK AND CURB DRAIN OR BETWEEN SIDEWALK AND CURB & GUTTER (MOD) (TO BOTTOM OF SIDEWALK).
2. ½" ISOLATION JOINT BETWEEN TRAFFIC RAIL FOUNDATION AND CURB DRAIN OR BETWEEN TRAFFIC RAIL FOUNDATION AND CURB & GUTTER (BOTTOM OF TRF AND C&G TO TOP OF CURB).
3. ½" ISOLATION JOINT BETWEEN CURB DRAIN AND CURB (TOP OF GUTTER TO TOP OF CURB).
4. CONSTRUCTION JOINT IN BASE SLAB OF CURB & GUTTER (MOD). BLOCKOUT CURB AT CURB DRAIN.
5. DRAIN COVER PLATE (PL 3/4" X 47" X 6'-0" SLIP RESISTANT STEEL PLATE). INSTALL COVER PLATE FLUSH WITH TOP OF SIDEWALK.
6. 1'-8" X 1'-8" LEAVE-OUT IN BOTTOM SLAB TO FACILITATE REPLACEMENT OF DAMAGED MBGF POST. LEAVE-OUT SHALL BE FILLED WITH ITEM 401, "FLOWABLE FILL" (EXCAVATABLE) WITH 28-DAY COMPRESSIVE STRENGTH BETWEEN 80 AND 200 PSI. REFER TO TABLE 2 (ITEM 401) FOR ADDITIONAL REQUIREMENTS.
7. USUAL CURB & GUTTER EACH SIDE OF CURB DRAIN.
8. BLOCK OUT CURB WITHIN LIMITS OF CURB DRAIN.
9. ½" DIA STAINLESS STEEL HEXAGON FLAT COUNTERSUNK HEAD CAP SCREWS (ASTM F879). PRIVIDE 9/16" DIA COUNTERSUNK HOLES IN DRAIN COVER PLATE. INSTALL SCREWS FLUSH (OR BELOW) TOP OF DRAIN COVER PLATE.
10. ½" X 4" STAINLESS STEEL THREADED FERRULE LOOP INSERTS. REQUIRED SAFE WORKING LOAD CAPACITY =
    TENSION = 2,250 LBS MIN.
    SHEAR = 1,510 LBS MIN.

GENERAL NOTES:

1. DESIGNED ACCORDING TO AASHTO LRFD BRIDGE DESIGN SPECIFICATIONS, 2020, 9TH EDITION.
2. DRAIN COVER PLATES TO BE FABRICATED WITH A SLIP RESISTANT SURFACE BY ONE OF THREE APPROVED MANUFACTURERS.
3. SUBMIT SHOP DRAWINGS FOR REVIEW AND APPROVAL BY THE ENGINEER.
4. CONTRACTOR TO UTILIZE A TEMPLATE TO CONTROL THE LOCATION OF FERRULE LOOP ANCHORS IN CONCRETE WALLS TO ASSURE SCREWS FOR DRAIN COVER PLATE WILL ALIGN WITH ANCHORS.
5. PROVIDE STEEL TROWEL FINISH TO TOP SURFACE OF CURB DRAIN BASE SLAB BETWEEN WALLS.

MATERIAL NOTES:

1. CONCRETE FOR DRAIN SHALL BE CLASS C (f'c = 3,600 psi).
2. REINFORCING STEEL SHALL BE ASTM A615, GRADE 60 (fY = 60,000 psi).
3. STRUCTURAL STEEL FOR DRAIN COVER PLATE TO BE IN ACCORDANCE WITH ITEM 442, "METAL FOR STRUCTURES".
4. DRAIN COVER PLATE SHALL BE HOT-DIP GALVANIZED AFTER FABRICATION IN ACCORDANCE WITH ITEM 445, "GALVANIZING". CHAMFER OR ROUND EDGES APPROXIMATELY 1/16" PRIOR TO GALVANIZING.

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

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

STATE OF TEXAS
JAMES EDWARD BROWNE
62207
LICENSED PROFESSIONAL ENGINEER
7/10/2024

Bartlett&West
TEXAS FIRM REGISTRATION No. F-6499
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Texas Department of Transportation

US 377 CURB DRAIN DETAILS

WEST FORK TRINITY RIVER
NBI No. 02-220-0081-01-001

FED.RD. DIV. NO.	FEDERAL AID PROJECT NO.		SHEET NO.
6	SEE TITLE SHEET		36
STATE	DISTRICT	COUNTY	
TEXAS	FTW	TARRANT	
CONTROL	SECTION	JOB	HIGHWAY
0081	01	050	US 377

DATE: 7/10/2024 TIME: 7:23:36 AM $PLTDRV55
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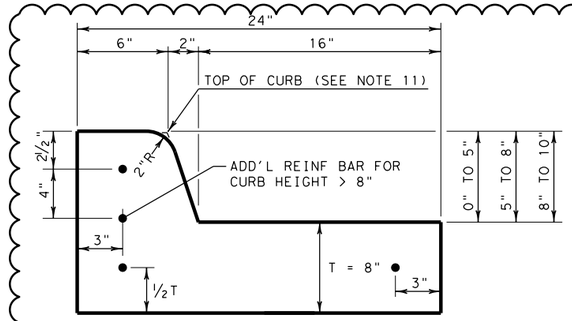
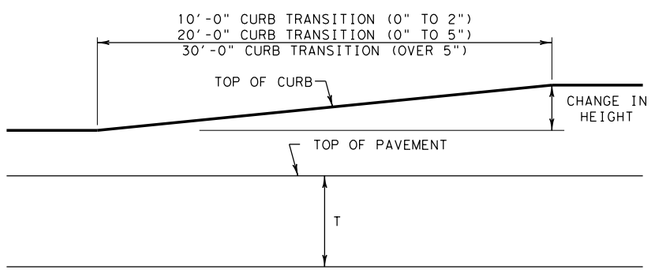
DELETED DETAILS NOT USED FOR PROJECT

GENERAL NOTES

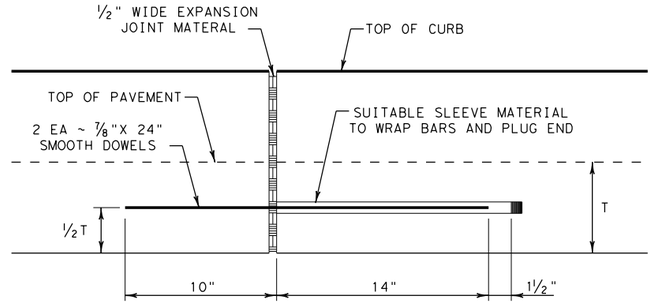
1. ALL MATERIALS AND CONSTRUCTION SHALL BE IN ACCORDANCE WITH ITEM 529, "CONCRETE CURB, GUTTER, AND COMBINED CURB AND GUTTER".
2. ALL CONCRETE SHALL BE CLASS "A".
3. ALL REINFORCING BARS SHALL BE #4, UNLESS OTHERWISE SHOWN.
4. UNLESS OTHERWISE SHOWN, ALL TYPE II CURB SHALL BE 6" HEIGHT .
5. ROUND EXPOSED 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 (MOD)
0" - 10" HEIGHT



CURB TRANSITION
NOTE: TO BE PAID FOR AS HIGHEST CURB



EXPANSION JOINT DETAIL

STATE OF TEXAS
JAMES EDWARD BROWNE
62207
LICENSED PROFESSIONAL ENGINEER
7/10/2024

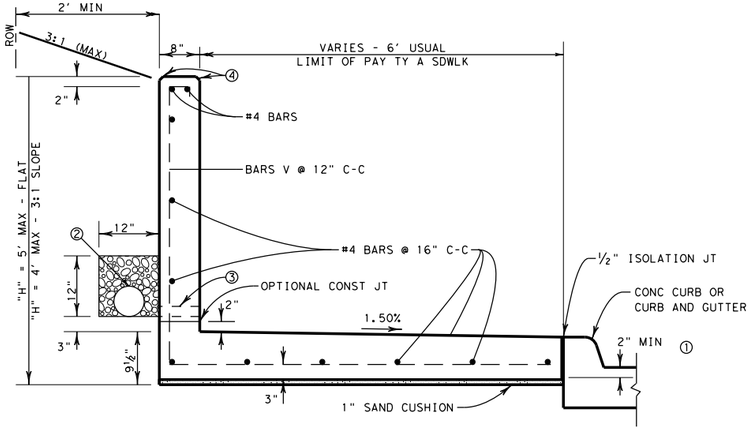
Texas Department of Transportation

Fort Worth District Standard

CONCRETE CURB AND CURB AND GUTTER DETAILS

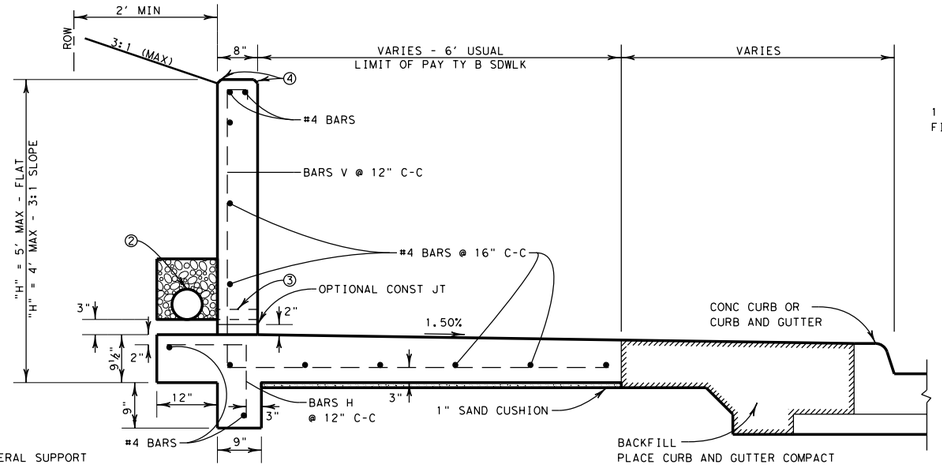
CCCG (FTW)(MOD)

ORIGINAL DRAWING: 05/2019	cccg-ftw.dgn	FED.RD. DIV.NO.	PROJECT NO.		SHEET NO.
DATE	REVISIONS	6	SEE TITLE SHEET		37
05/2019	NEW STANDARD	STATE	STATE DIST.NO.	COUNTY	
07/2022	DESIGNATE USUAL 6" HEIGHT	TEXAS	FTW	TARRANT	
09/05/2023	1 MODIFIED FOR CURB HEIGHTS 0" TO 10" & DELETED DETAILS NOT USED FOR PROJECT	CONT.	SECT.	JOB	HIGHWAY NO.
		0081	01	050	US 377



① 2" MINIMUM REQUIRED FOR LATERAL SUPPORT
② INSTALL 6" PIPE UNDERDRAIN (TY. 5, 6, 7, OR 8) ENTIRE LENGTH OF WALL. USE TY. "E" FILTER MATERIAL. SLOPE TO DRAIN AND CONNECT TO STORM DRAIN.
⑤ IF, IN THE OPINION OF THE ENGINEER, USE OF UNDERDRAIN IS IMPRACTICAL, INSTALL WEEP HOLES AS SHOWN.
④ ¾" CHAMFER

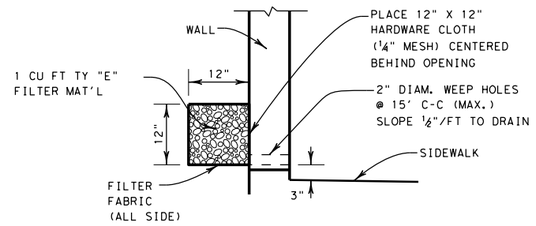
TYPE A SIDEWALK-ADJACENT TO CURB



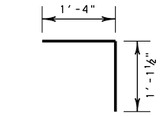
TYPE B SIDEWALK-REMOTE FROM CURB

SPECIAL CONCRETE SIDEWALK w/ INTEGRATED RETAINING WALL

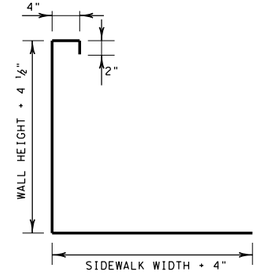
N. T. S.



WEEP HOLE DETAIL

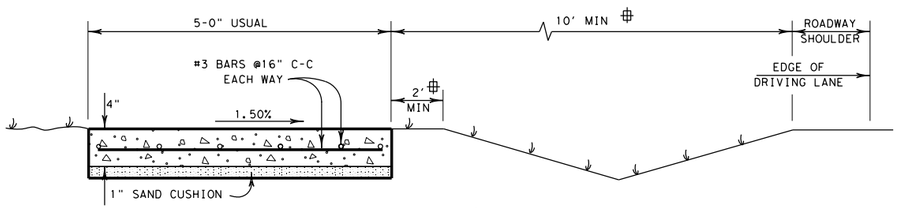


#4 BARS H @ 12" C-C



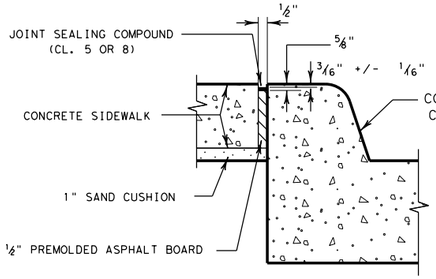
#4 BARS V @ 12" C-C

REINFORCING STEEL DETAILS



SIDEWALK TO BE 10' MIN. FROM EDGE OF SHOULDER OR 2' MIN. FROM TOP OF DITCH BACK SLOPE, WHICHEVER IS GREATER (10' MIN. FROM EDGE OF SHOULDER IF NO DITCH.)

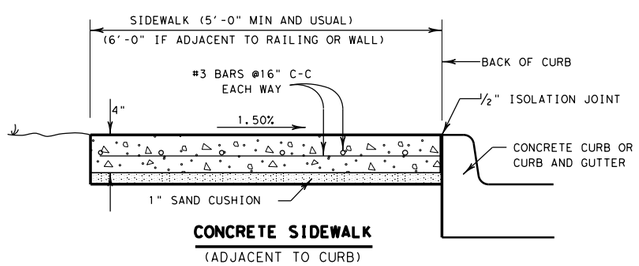
CONCRETE SIDEWALK
(ROADWAY W/O CURB)



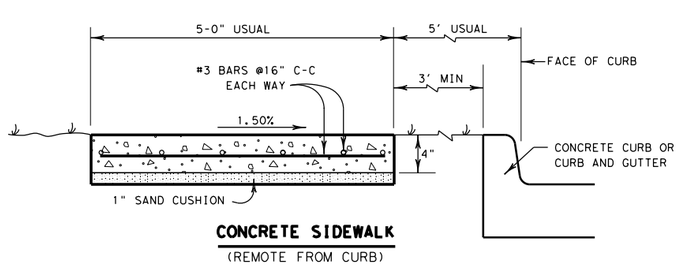
1/2" ISOLATION JOINT
(SIDEWALK ADJACENT TO CURB)

GENERAL NOTES:

1. ALL CONCRETE SHALL BE CLASS "C".
2. ALL REINFORCING STEEL SHALL BE GRADE 60, # 4 BARS UNLESS OTHERWISE INDICATED.
3. SEE PLAN SHEETS FOR LOCATIONS OF SIDEWALKS AND RETAINING WALLS.
4. LONGITUDINAL SLOPE OF SIDEWALKS SHALL NOT EXCEED 5% EXCEPT IN CASES WHERE THE ADJACENT ROADWAY SLOPE EXCEEDS 5%. IF ROADWAY SLOPE EXCEEDS 5%, LONGITUDINAL SLOPE OF SIDEWALK MAY MATCH THAT OF ROADWAY.
5. IF SIDEWALK WIDTH IS LESS THAN 5', PROVIDE 5' X 5' PASSING AREAS AT INTERVALS NOT TO EXCEED 200' SPACING.
6. RETAINING WALL WILL BE SUBSIDIARY TO THE ITEM, "CONC SIDEWALKS (SPECIAL) (TYPE A)" OR "CONC SIDEWALKS (SPECIAL)(TYPE B)", WITH LIMITS OF PAY AS SHOWN.
7. SURFACE TREATMENT OF RETAINING WALL FACE DETAILED ELSEWHERE IN THE PLANS.
8. SEE PED STANDARDS FOR TREATMENT AT INTERSECTIONS AND CROSSWALKS.



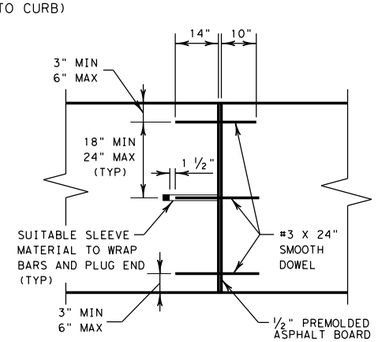
CONCRETE SIDEWALK
(ADJACENT TO CURB)



CONCRETE SIDEWALK
(REMOTE FROM CURB)

CONCRETE SIDEWALK DETAILS

N. T. S.



TRANSVERSE EXPANSION JOINT

Texas Department of Transportation

Fort Worth District Standard

CONCRETE SIDEWALK DETAILS
CSWD (FTW)

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DATE	REVISIONS				38
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11/2020	REVISE JOINT NOMENCLATURE, REVISE ALLOWABLE SEALANT TYPES	TEXAS	FTW	TARRANT	
		CONT.	SECT.	JOB	HIGHWAY NO.
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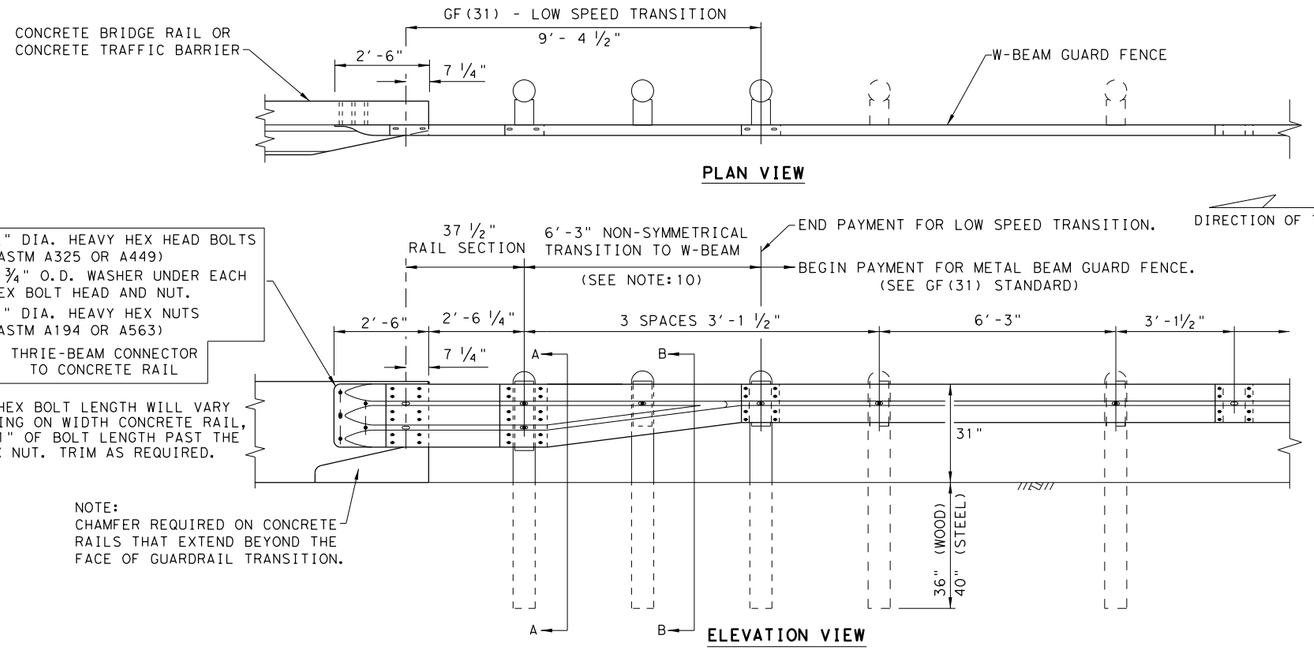
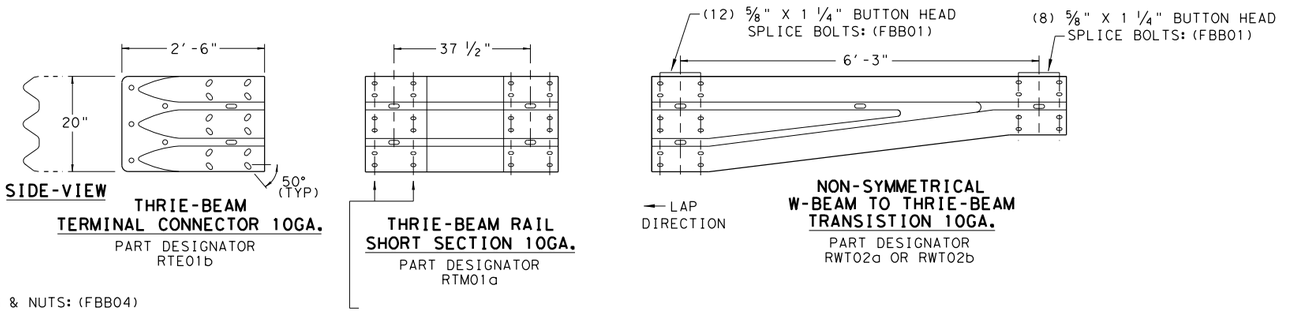


GENERAL NOTES

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



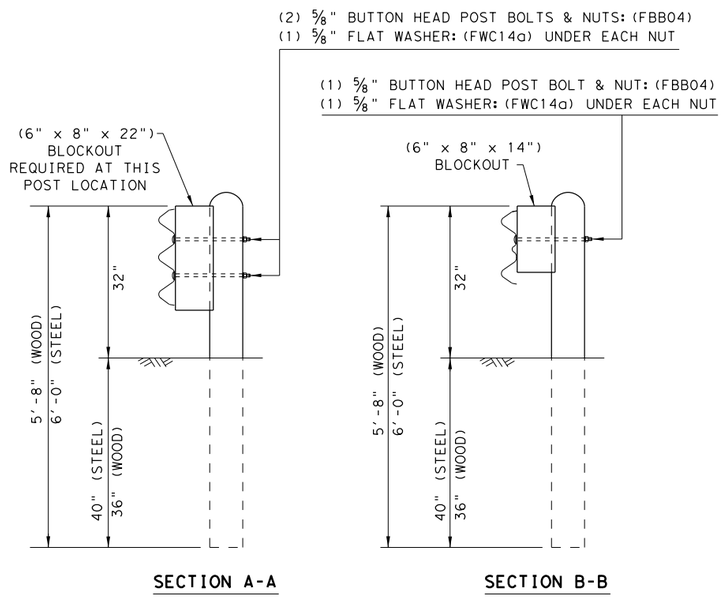
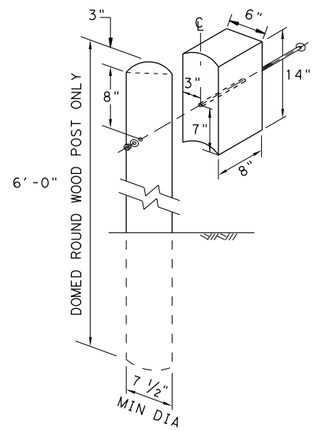
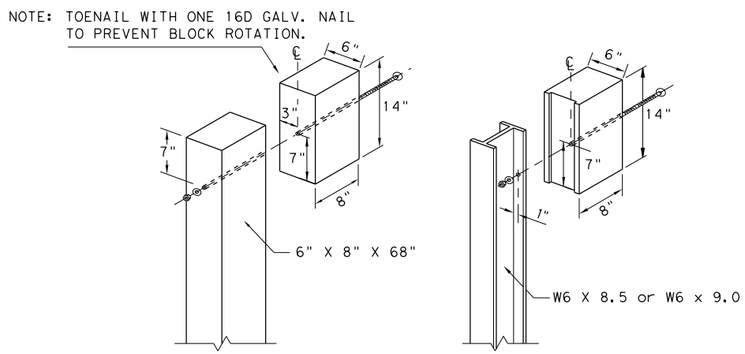


PLATE WASHER INSTRUCTIONS

BRIDGE APPROACH - UPSTREAM: THE SHORT RAIL LAPS OVER THE TERMINAL CONNECTOR. PLATE WASHERS ARE INSTALLED UNDER THE SPLICE NUTS AGAINST INSIDE OF CONNECTOR.
BRIDGE EXIT - DOWNSTREAM: THE TERMINAL CONNECTOR LAPS OVER THE NESTED RAIL. PLATE WASHERS ARE INSTALLED UNDER THE BOLT HEAD AGAINST OUTSIDE OF CONNECTOR.





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

LOW-SPEED TRANSITION

Texas Department of Transportation | Design Division Standard

METAL BEAM GUARD FENCE THRIE-BEAM TRANSITION TL-2 MASH COMPLIANT

GF(31)TR TL2-19

FILE: gf31tr1219.dgn	DN: TxDOT	CK: KM	DW: VP	CK: CGL/AG	
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	FTW	TARRANT		39	

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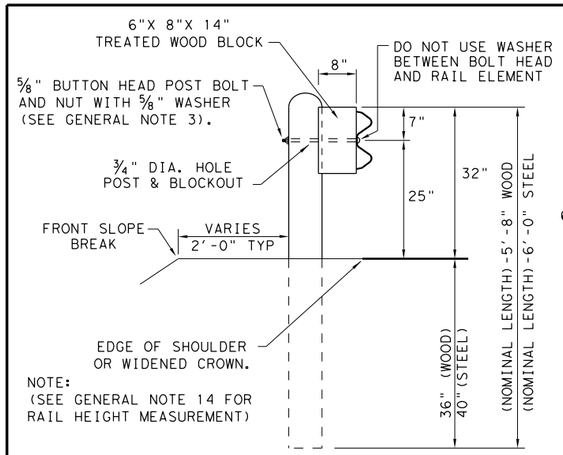
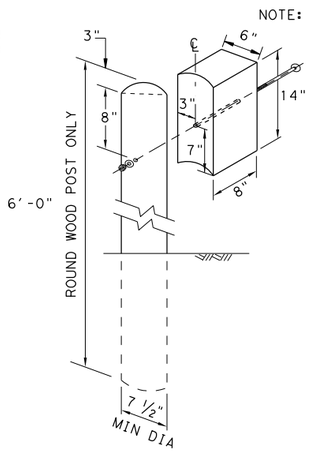
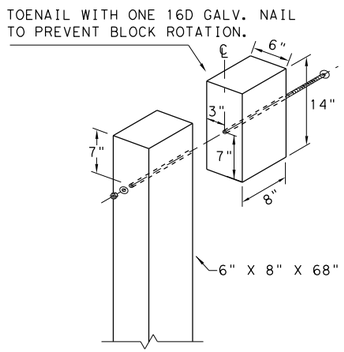


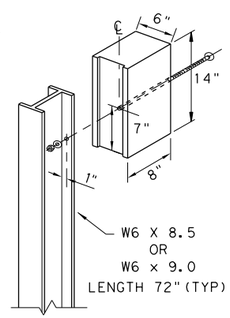
TYPICAL POST PLACEMENT



WOOD BLOCK TO ROUND WOOD POST

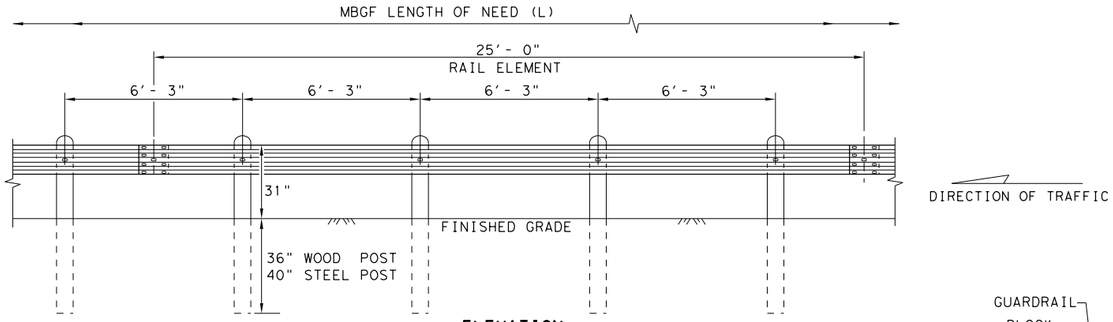


WOOD BLOCK TO RECTANGULAR WOOD POST



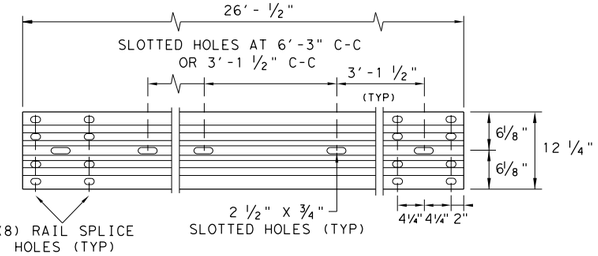
ROUTED WOOD BLOCK TO I-BEAM STEEL POST

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



ELEVATION
MID-SPAN RAIL SPLICE

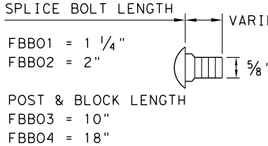
SHOWING A 25'- 0" SECTION OF W-BEAM RAIL. (SEE GENERAL NOTE 2)



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

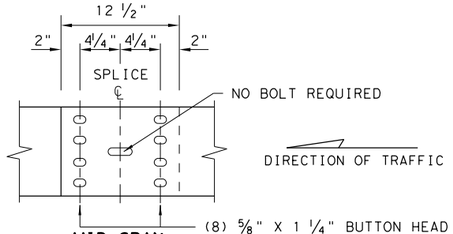
NOTES: SEE GENERAL NOTE 2 FOR ALLOWABLE RAIL TYPES.
SEE RAIL SPLICE DETAIL FOR REQUIRED HARDWARE.

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



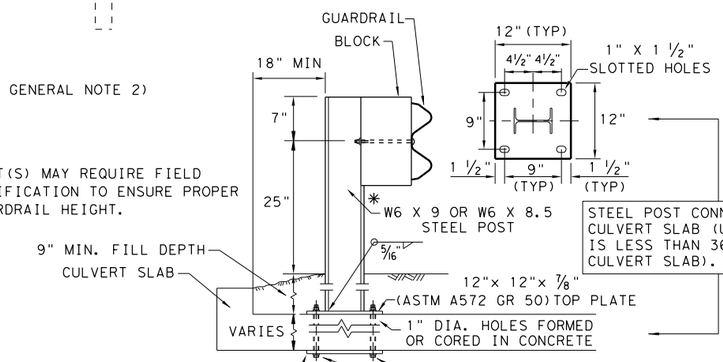
BUTTON HEAD BOLT

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



MID-SPAN RAIL SPLICE DETAIL

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



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

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

LOW FILL CULVERT POST

NOTE: TWO INSTALLATION OPTIONS.

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

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

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

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

GENERAL NOTES

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

Texas Department of Transportation

Design Division Standard

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

FILE: gf3119.dgn	DN: TxDOT	CK: KM	DW: VP	CK: CGL/AG		
©TxDOT: NOVEMBER 2019	CONT	SECT	JOB	HIGHWAY		
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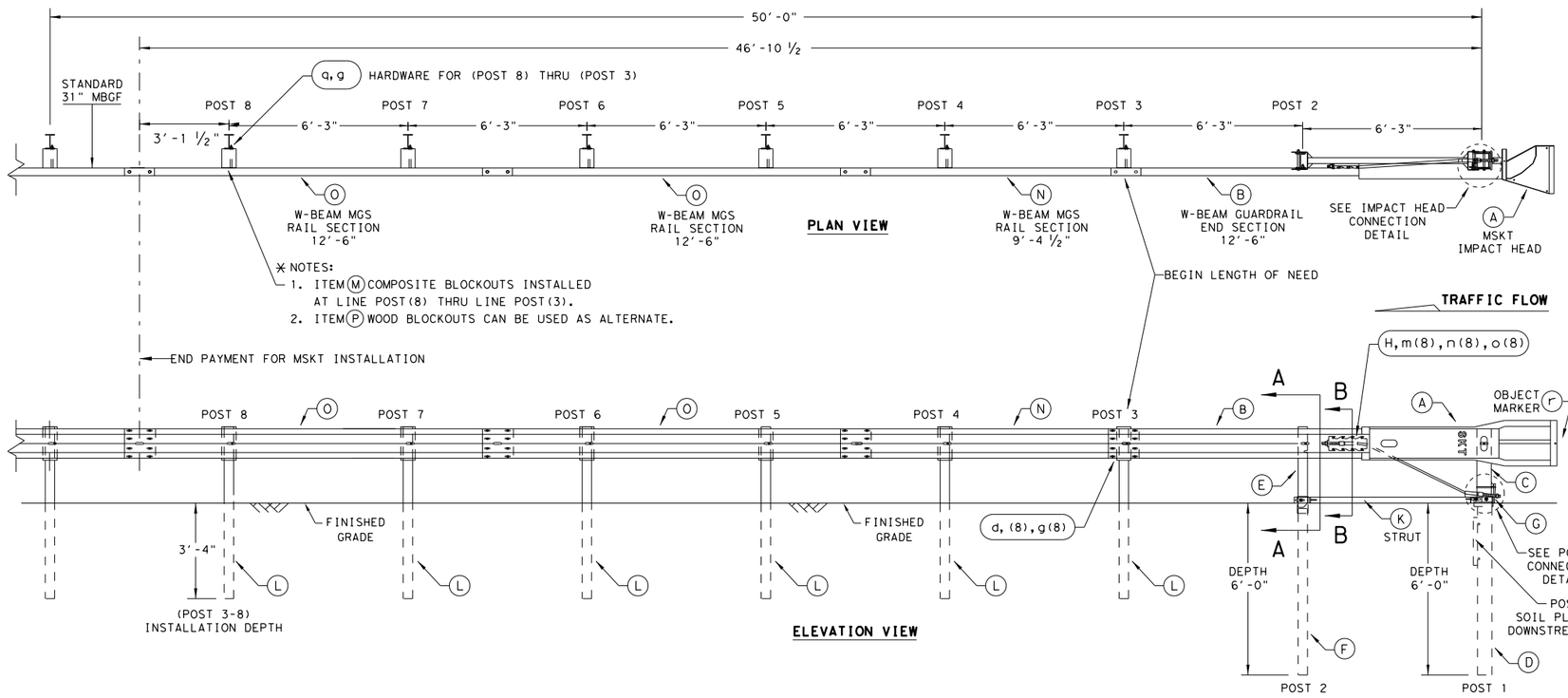


NOTE: SEE (GENERAL NOTE 14) FOR DRIVING CAP INFORMATION.

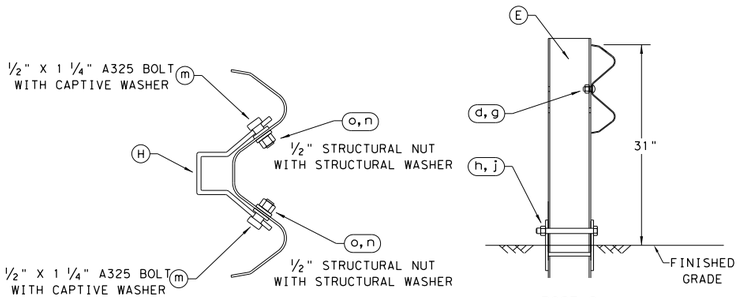
GENERAL NOTES

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 1/8" TUBE)	MTPHP1A
D	1	POST 1 - BOTTOM (6' W6X15)	MTPHP1B
E	1	POST 2 - ASSEMBLY TOP	UHP2A
F	1	POST 2 - ASSEMBLY BOTTOM (6' W6X9)	HP2B
G	1	BEARING PLATE	E750
H	1	CABLE ANCHOR BOX	S760
J	1	BCT CABLE ANCHOR ASSEMBLY	E770
K	1	GROUND STRUT	MS785
L	6	W6x9 OR W6x8.5 STEEL POST	P621
M	6	COMPOSITE BLOCKOUTS	CBSP-14
N	1	W-BEAM MGS RAIL SECTION (9'-4 1/2")	G12025
O	2	W-BEAM MGS RAIL SECTION (12'-6")	G1203A
P	6	WOOD BLOCKOUT 6" X 8" X 14"	P675
Q	1	W-BEAM MGS RAIL SECTION (25'-0")	G1209
		SMALL HARDWARE	
a	2	5/8" x 1" HEX BOLT (GRD 5)	B5160104A
b	4	5/8" WASHER	W0516
c	2	5/8" HEX NUT	N0516
d	25	5/8" Dia. x 1 1/4" SPLICE BOLT (POST 2)	B580122
e	2	5/8" Dia. x 9" HEX BOLT (GRD A449)	B580904A
f	3	5/8" WASHER	W050
g	33	5/8" Dia. H.G.R NUT	N050
h	1	3/4" Dia. x 8 1/2" HEX BOLT (GRD A449)	B340854A
j	1	3/4" Dia. HEX NUT	N030
k	2	1 ANCHOR CABLE HEX NUT	N100
l	2	1 ANCHOR CABLE WASHER	W100
m	8	1/2" x 1 1/4" A325 BOLT WITH CAPTIVE WASHER	SB12A
n	8	1/2" STRUCTURAL NUTS	N012A
o	8	1 1/16" O.D. x 5/16" I.D. STRUCTURAL WASHERS	W012A
p	1	BEARING PLATE RETAINER TIE	CT-100ST
q	6	5/8" x 10" H.G.R. BOLT	B581002
r	1	OBJECT MARKER 18" X 18"	E3151

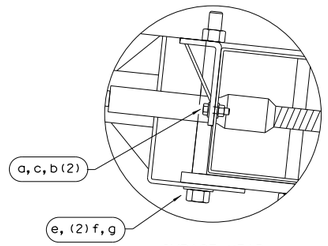
SEE NOTES: ✳

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

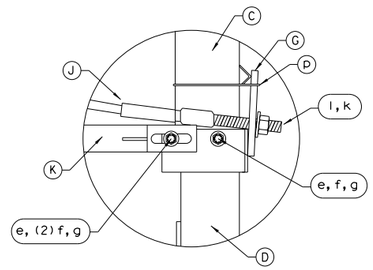


SECTION B-B
ANCHOR BRACKET

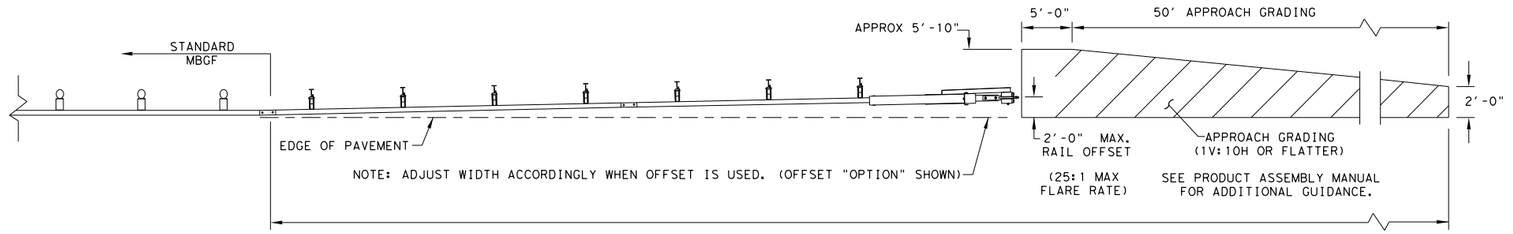
POST 2
SECTION A-A



IMPACT HEAD
CONNECTION DETAIL



POST 1
CONNECTION DETAIL



APPROACH GRADING AT GUARDRAIL END TREATMENTS

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

TRAFFIC FLOW

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	0081	01	050		US 377
	DIST	COUNTY			SHEET NO.
	FTW	TARRANT			41

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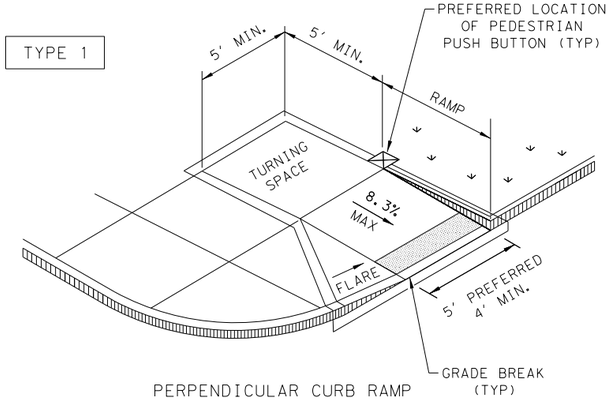
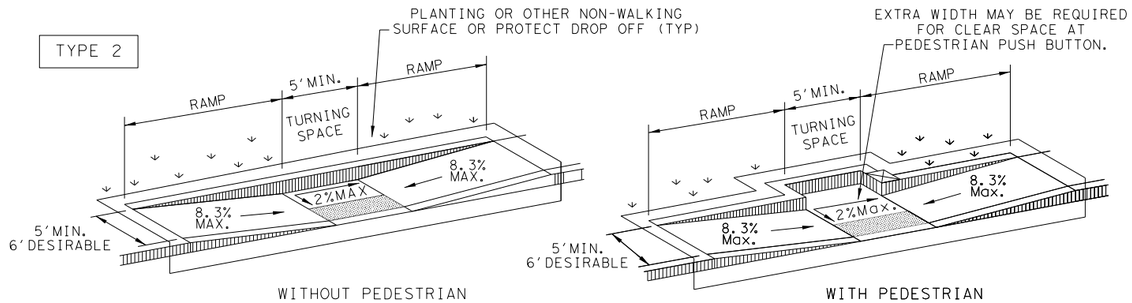
DATE: 7/10/2024
FILE: c:\projectwise\bartwest-pw.bentley.com_caibartwest-pw-03\dn01767\dms00067\ped18-1.dgn

TYPE 1



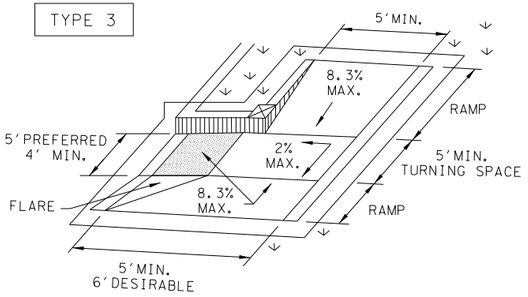
PERPENDICULAR CURB RAMP

TYPE 2

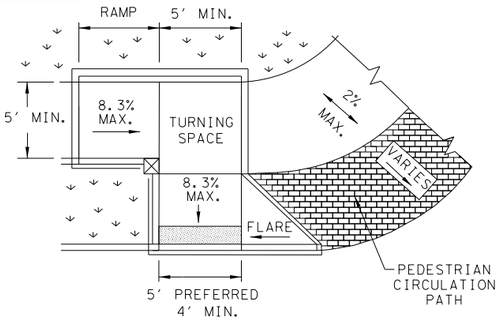


PARALLEL CURB RAMP

TYPE 3

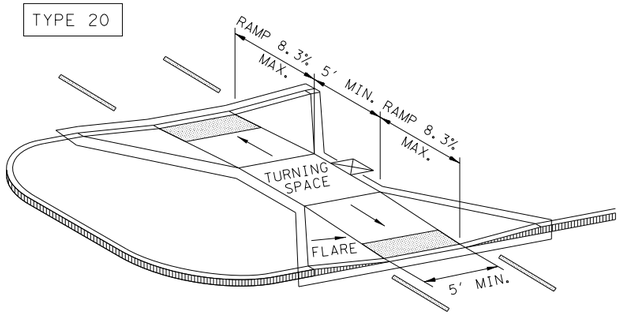


TYPE 6



COMBINATION CURB RAMPS

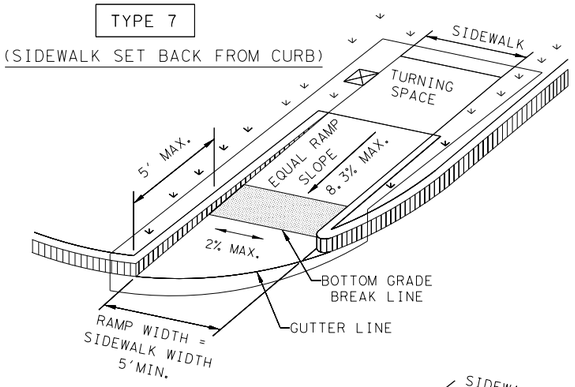
TYPE 20



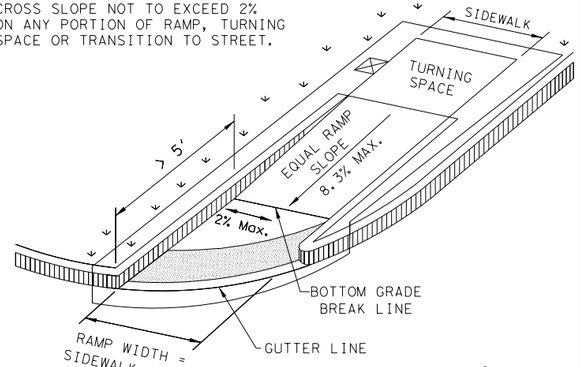
CURB RAMPS AT MEDIAN ISLANDS

TYPE 7

(SIDEWALK SET BACK FROM CURB)

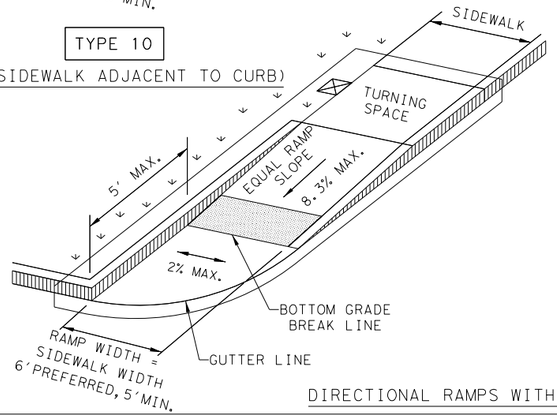


CROSS SLOPE NOT TO EXCEED 2% ON ANY PORTION OF RAMP, TURNING SPACE OR TRANSITION TO STREET.

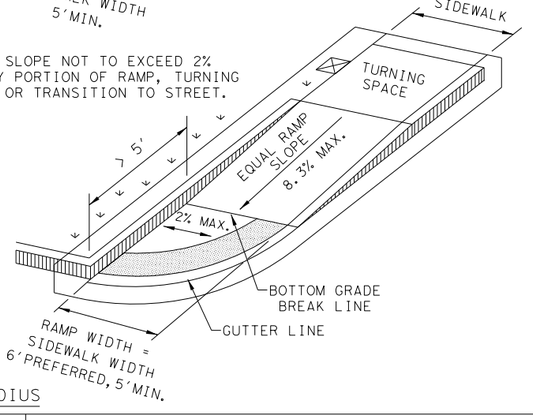


TYPE 10

(SIDEWALK ADJACENT TO CURB)

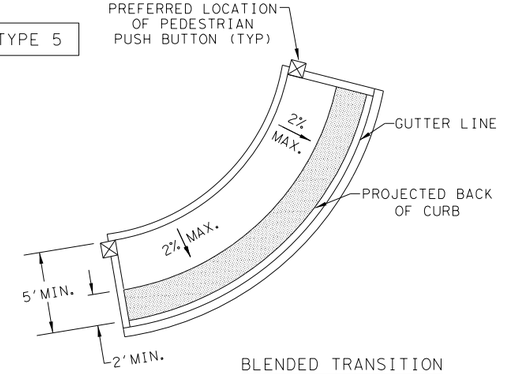


CROSS SLOPE NOT TO EXCEED 2% ON ANY PORTION OF RAMP, TURNING SPACE OR TRANSITION TO STREET.



DIRECTIONAL RAMPS WITHIN RADIUS

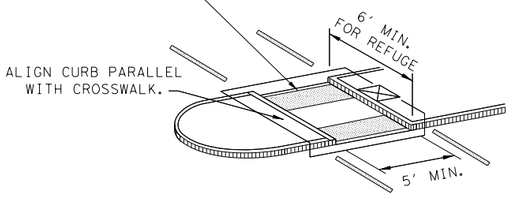
TYPE 5



BLENDED TRANSITION
(FLUSH LANDING)

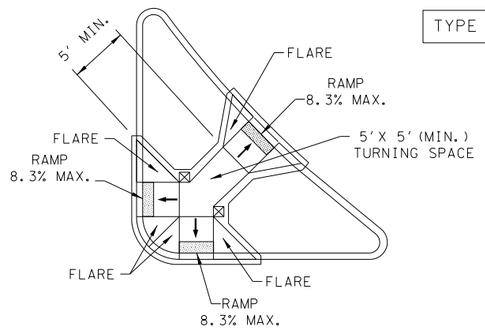
INSTALL DETECTABLE WARNING SURFACE AT EACH END OF THE CUT-THROUGH RAMP WITH A MINIMUM 2' USUAL SIDEWALK SURFACE BETWEEN. IF MEDIAN IS LESS THAN 6' WIDE, ELIMINATE DETECTABLE WARNING SURFACES.

TYPE 21



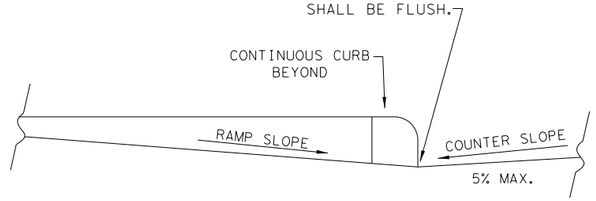
NOTE: CURB DETAILS ARE SHOWN ELSEWHERE IN THE PLANS.

TYPE 22



COMBINATION ISLAND RAMPS

BOTTOM GRADE BREAK OF CURB RAMP WILL NORMALLY BE AT GUTTER LINE. SURFACE SLOPES AT GRADE BREAKS SHALL BE FLUSH.



TYPICAL SECTION OF PERPENDICULAR CURB RAMP AT CONNECTION TO ROADWAY

NOTES / LEGEND:

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

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

DETECTABLE WARNING SURFACE

DENOTES PREFERRED LOCATION OF PEDESTRIAN PUSH BUTTON IF APPLICABLE.

GUTTER LINE

GRADE BREAK

RAMP LIMITS OF PAYMENT

SHEET 1 OF 4

Texas Department of Transportation

Design Division Standard

PEDESTRIAN FACILITIES CURB RAMPS

PED-18

FILE: ped18	DN: TxDOT	DW: VP	CK: KM	CK: PK & JG
© TxDOT: MARCH, 2002	CONT	SECT	JOB	HIGHWAY
REVISIONS	0081	01	050	US 377
REVISED 08,2005 REVISED 06,2012 REVISED 01,2018	DIST	COUNTY		SHEET NO.
	FTW	TARRANT		42

DATE: 7/10/2024
FILE: c:\projectwise\bartwest-pw.bentley.com_caibartwest-pw-03\dn01767\dms00067\ped18-2.dgn

GENERAL NOTES

CURB RAMPS

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

DETECTABLE WARNING MATERIAL

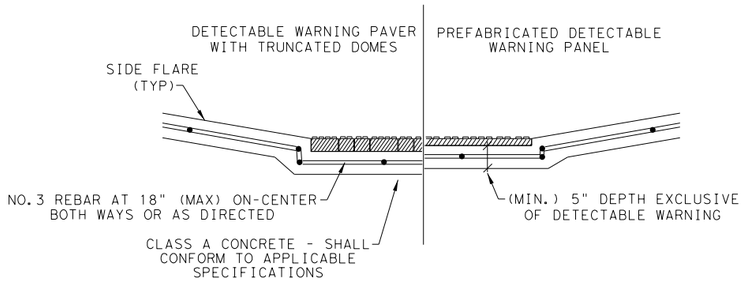
19. Curb ramps must contain a detectable warning surface that consists of raised truncated domes complying with PROWAG. The surface must contrast visually with adjoining surfaces, including side flares. Furnish and install an approved cast-in-place dark brown or dark red detectable warning surface material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

DETECTABLE WARNING PAVERS (IF USED)

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

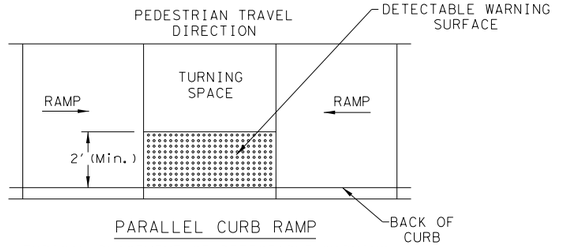
SIDEWALKS

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

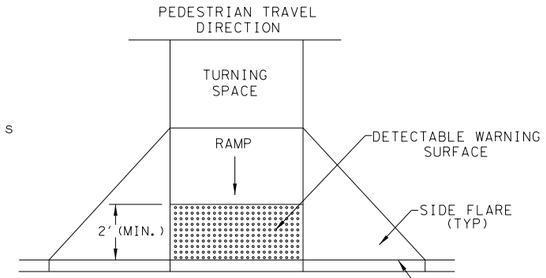


SECTION VIEW DETAIL
CURB RAMP AT DETECTIBLE WARNINGS

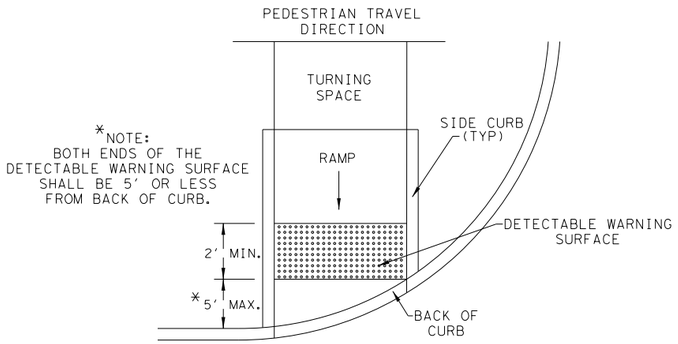
DETECTABLE WARNING SURFACE DETAILS



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



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



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

Texas Department of Transportation
Design Division Standard

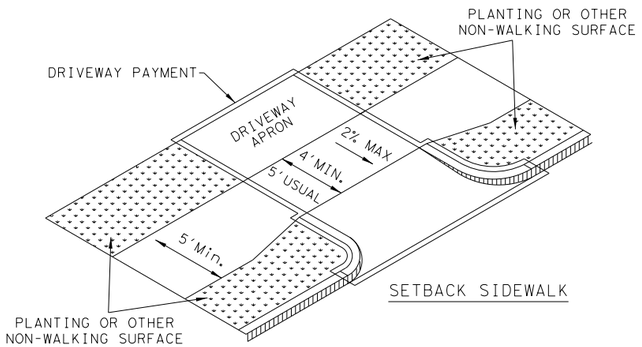
PEDESTRIAN FACILITIES CURB RAMPS

PED-18

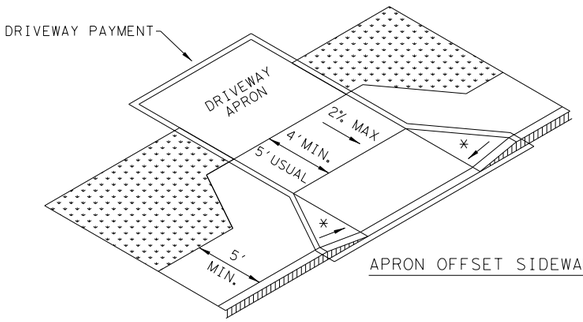
FILE: ped18	DN: TxDOT		DW: VP	CK: KM	CK: PK & JG
© TxDOT: MARCH, 2002	CONT	SECT	JOB		HIGHWAY
REVISIONS	0081	01	050		US 377
REVISED 08,2005 REVISED 06,2012 REVISED 01,2018	DIST	COUNTY			SHEET NO.
	FTW	TARRANT			43

DATE: 7/10/2024
FILE: c:\projectwise\bartwest-pw.bentley.com_caibartwest-pw-03\dh01767\dms00067\ped18-3.dgn

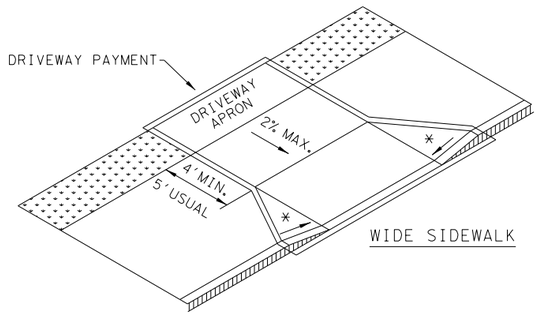
SIDEWALK TREATMENT AT DRIVEWAYS



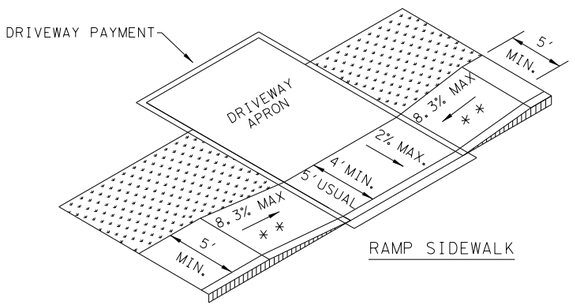
SETBACK SIDEWALK



APRON OFFSET SIDEWALK



WIDE SIDEWALK

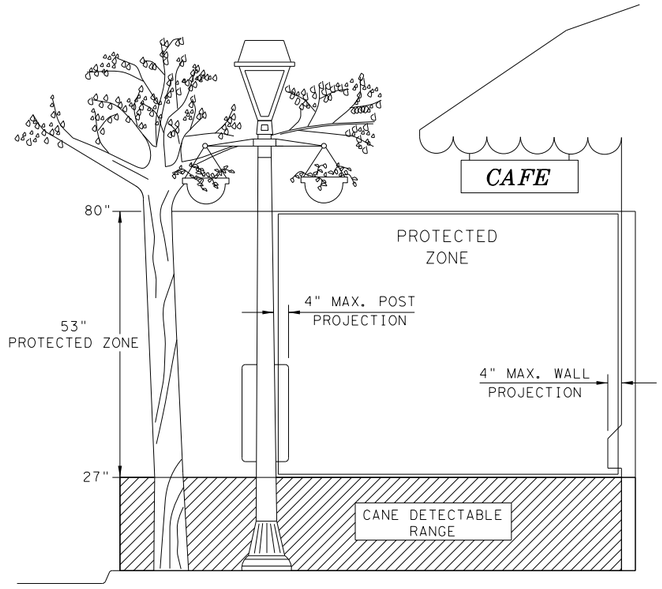


RAMP SIDEWALK

NOTES:

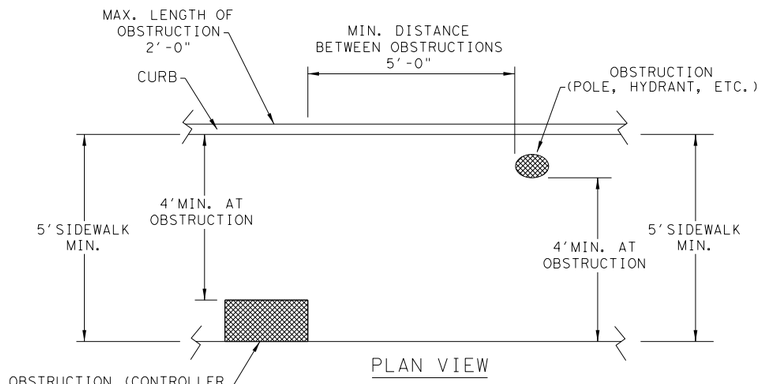
* WHERE DRIVEWAYS CROSS THE PEDESTRIAN ROUTE, SIDES SHALL BE FLARED AT 10% MAX SLOPE.

* * IF CURB HEIGHT IS GREATER THAN 6 INCHES, USE GRADE LESS THAN OR EQUAL TO 5%. HANDRAIL AND DETECTABLE WARNING ARE NOT REQUIRED.



PROTECTED ZONE

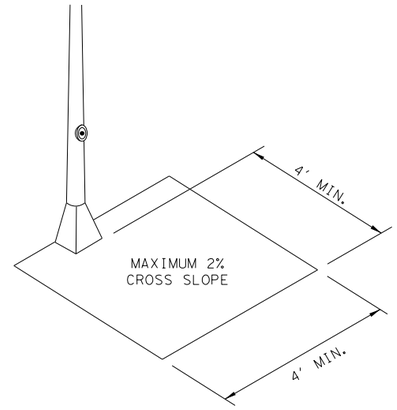
NOTE: IN PEDESTRIAN CIRCULATION AREA, MAXIMUM 4" PROJECTION FOR POST OR WALL MOUNTED OBJECTS BETWEEN 27" AND 80" ABOVE THE SURFACE.



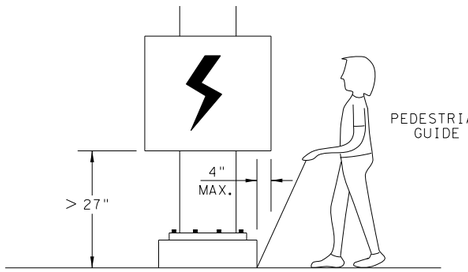
PLAN VIEW

PLACEMENT OF STREET FIXTURES

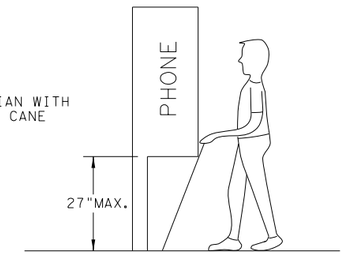
NOTE: ITEMS NOT INTENDED FOR PUBLIC USE. MINIMUM 4' X 4' CLEAR GROUND SPACE REQUIRED AT PUBLIC USE FIXTURES.



CLEAR SPACE ADJACENT TO PEDESTRIAN PUSH BUTTON



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



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

DETECTION BARRIER FOR VERTICAL CLEARANCE < 80"

Texas Department of Transportation

Design Division Standard

PEDESTRIAN FACILITIES CURB RAMPS

PED-18

FILE: ped18	DN: TxDOT		DW: VP	CK: KM	CK: PK & JG
© TxDOT: MARCH, 2002	CONT	SECT	JOB		HIGHWAY
REVISIONS	0081	01	050		US 377
REVISED 08,2005 REVISED 06,2012 REVISED 01,2018	DIST	COUNTY			SHEET NO.
	FTW	TARRANT			44

DATE: 7/10/2024
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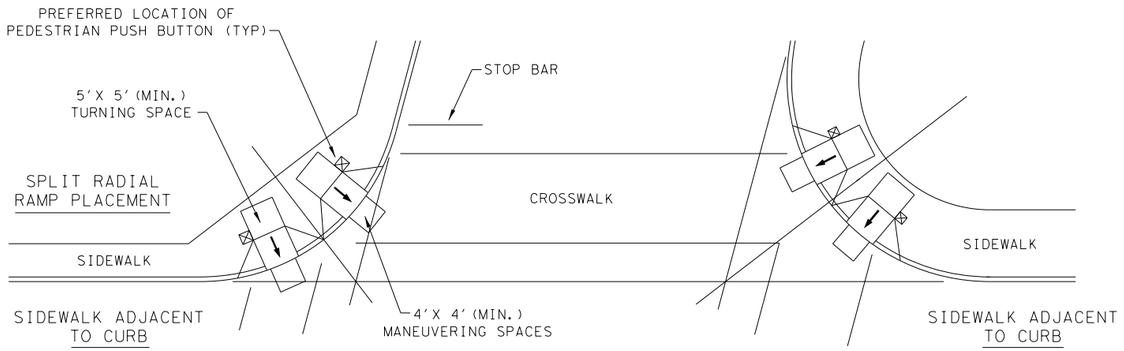
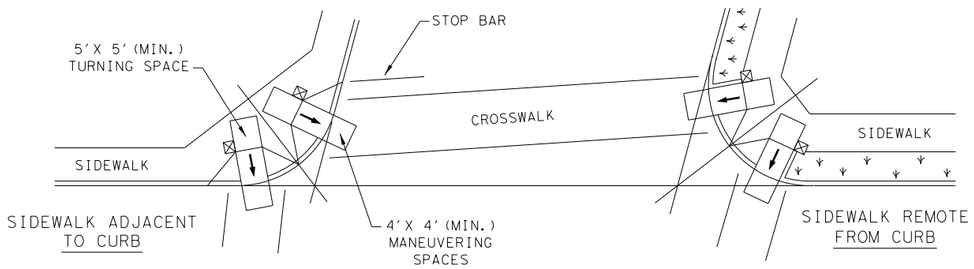
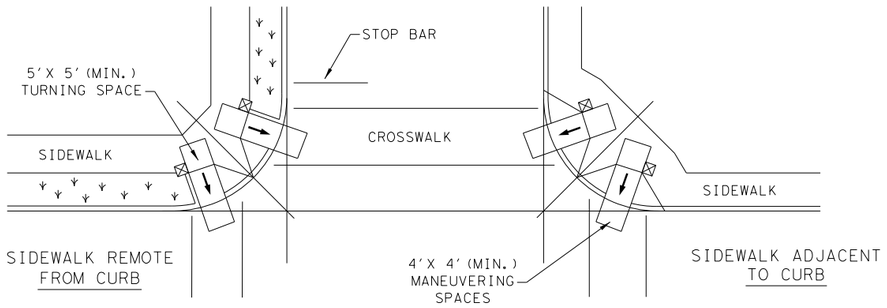
TYPICAL CROSSING LAYOUTS
SEE SHEET 1 OF 4 FOR DETAILS AND DIMENSIONS



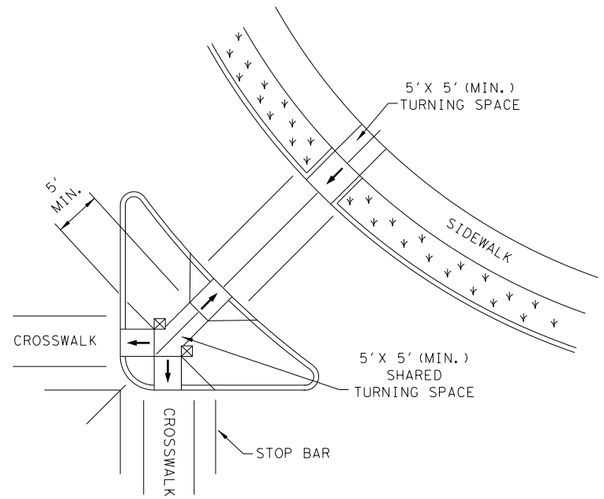
SKEWED INTERSECTION WITH "LARGE" RADIUS



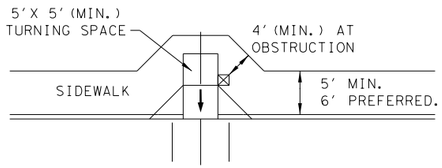
SKEWED INTERSECTION WITH "SMALL" RADIUS

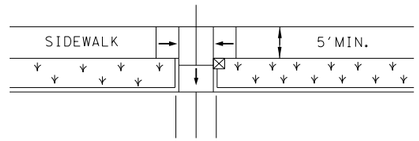


NORMAL INTERSECTION WITH "SMALL" RADIUS



AT INTERSECTION
W/FREE RIGHT TURN & ISLAND





MID-BLOCK PLACEMENT
PERPENDICULAR RAMPS

LEGEND:

SHOWS DOWNWARD SLOPE. →

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

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

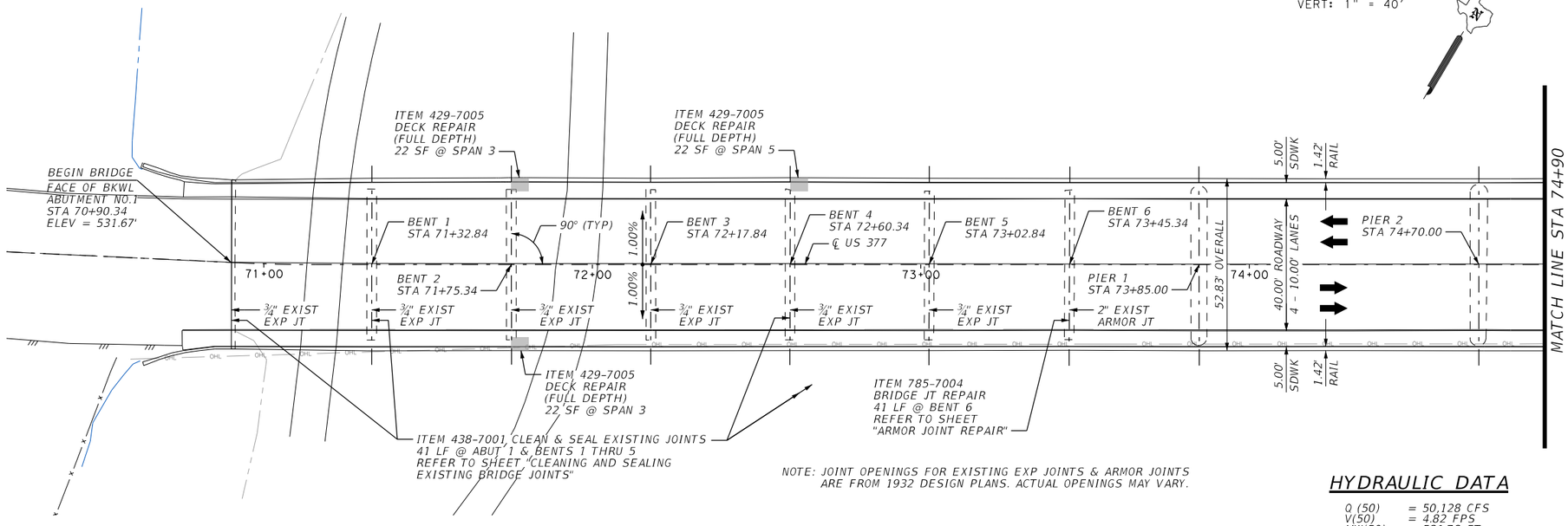
SHEET 4 OF 4

Texas Department of Transportation | Design Division Standard

PEDESTRIAN FACILITIES
CURB RAMPS

PED-18

FILE: ped18	DN: TxDOT		DW: VP	CK: KM	CK: PK & JG
© TxDOT: MARCH, 2002	CONT	SECT	JOB		HIGHWAY
REVISIONS	0081	01	050		US 377
REVISED 08, 2005 REVISED 06, 2012 REVISED 01, 2018	DIST	COUNTY			SHEET NO.
	FTW	TARRANT			45



NOTE: JOINT OPENINGS FOR EXISTING EXP JOINTS & ARMOR JOINTS ARE FROM 1932 DESIGN PLANS. ACTUAL OPENINGS MAY VARY.

PLAN

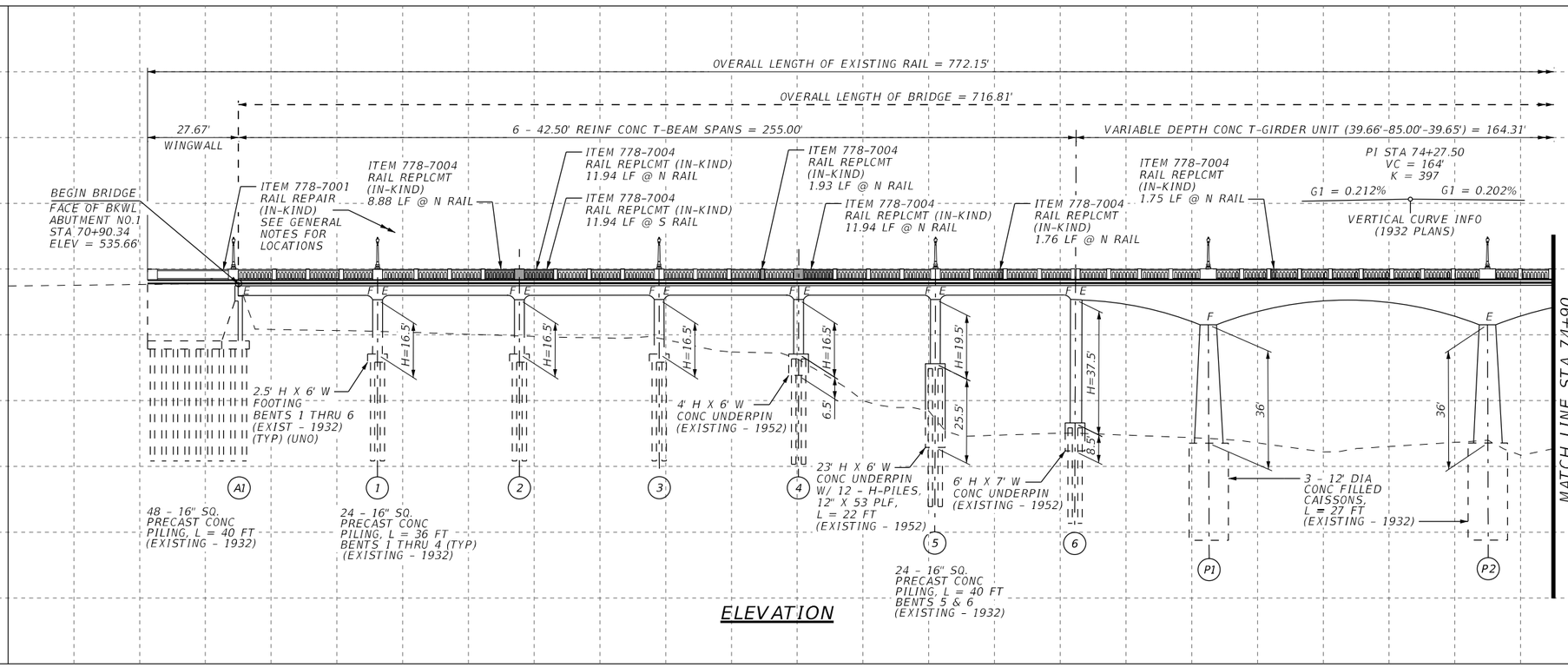
HYDRAULIC DATA

Q (50)	= 50,128 CFS
V(50)	= 4.82 FPS
HW(50)	= 521.78 FT
Q(100)	= 58,970 CFS
V(100)	= 5.35 FPS
HW(100)	= 523.16 FT

GENERAL NOTES:

1. THE GEOMETRIC DATA, SPAN ARRANGEMENTS, BEAM TYPES, COLUMN HEIGHTS, AND FOUNDATIONS SHOWN ON THIS SHEET WERE TAKEN FROM THE 1932 AND 1952 DESIGN PLANS. STATIONS HAVE BEEN ADJUSTED TO CORRELATE WITH SURVEY DATA.
2. APPROXIMATE LOCATIONS AND ESTIMATED QUANTITIES FOR FULL DEPTH DECK REPAIR ARE SHOWN THIS SHEET. REFER TO SHEETS "CONCRETE DECK REPAIR (FULL DEPTH)" FOR DETAILS FROM 1932 PLANS.
3. APPROXIMATE LOCATIONS FOR RAIL REPLACEMENT (IN-KIND) ARE SHOWN THIS SHEET.
4. REFER TO SHEETS "CONCRETE RAIL REPAIR (IN-KIND)" FOR RAIL REPAIR LOCATIONS & ESTIMATED QUANTITIES AND DETAILS.
5. FOR ABUTMENT REPAIR REFER TO SHEETS "ABUTMENT REPAIR".
6. FOR BENT REPAIR REFER TO SHEETS "BENT REPAIR".
7. FOR PIER REPAIR REFER TO SHEETS "PIER REPAIR".
8. FOR T-BEAM REPAIR REFER TO SHEETS "T-BEAM SPAN REPAIR".
9. FOR T-GIRDER REPAIR REFER TO SHEETS "T-GIRDER UNIT REPAIR".
10. A PERMIT IS REQUIRED FROM TARRANT REGIONAL WATER DISTRICT (TRWD) TO ACCESS REPAIR WORK FROM GROUND LEVEL OR WATER LEVEL.
11. PROTECT AGAINST DEBRIS FALLING INTO THE RIVER.

POSTED SPEED = 45 MPH
AADT (2022) = 5322
AADT (2042) = 7451
FUNCTION CLASS = URBAN ARTERIAL
EXISTING NBI: 02-220-0081-01-001



ELEVATION

STATE OF TEXAS
KENNETH E. GOTTLEABER
61759
REGISTERED PROFESSIONAL ENGINEER
7/10/2024

Bartlett&West
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PHONE 888-200-6464
TBPE FIRM REGISTRATION NO. 6499

Texas Department of Transportation

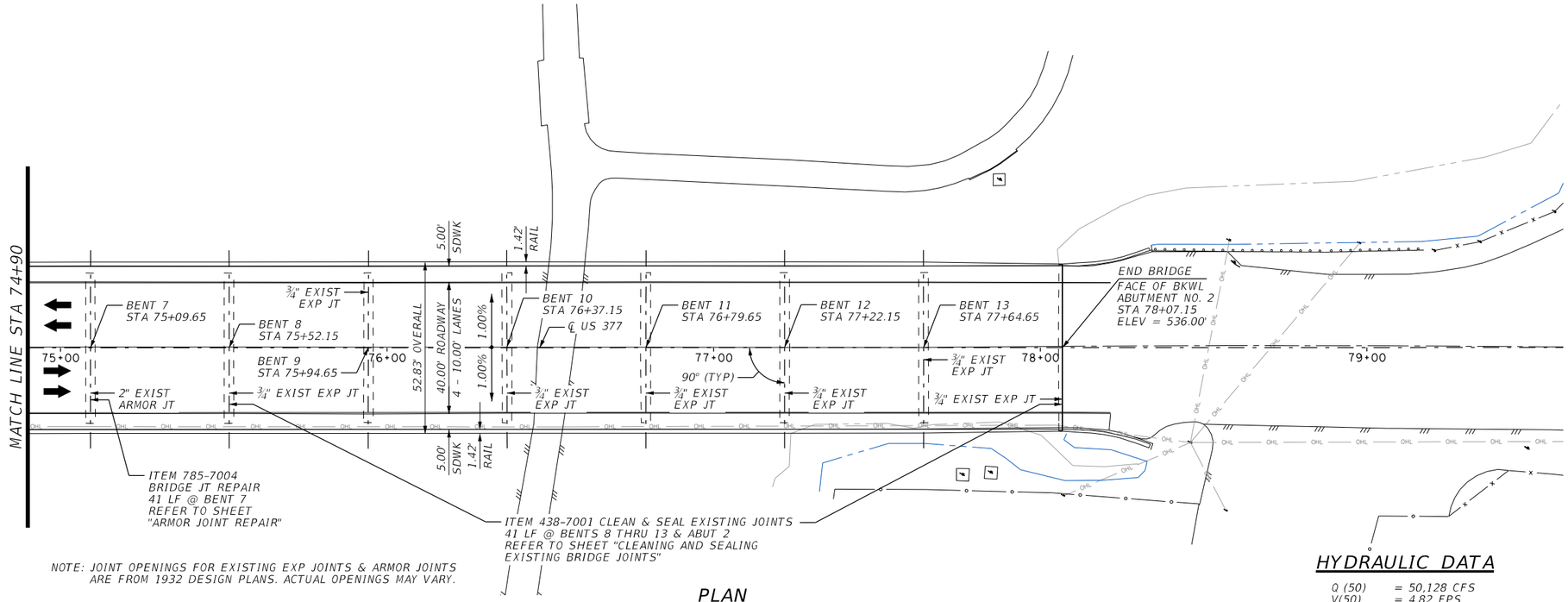
US 377

BRIDGE LAYOUT

WEST FORK TRINITY RIVER
EXISTING NBI: 02-220-0081-01-001

SHEET 1 OF 3

FED.RD. DIV. NO.	FEDERAL AID PROJECT NO.		SHEET NO.
6	SEE TITLE SHEET		46
STATE	DISTRICT	COUNTY	
TEXAS	FTW	TARRANT	
CONTROL	SECTION	JOB	HIGHWAY
0081	01	050	US 377



NOTE: JOINT OPENINGS FOR EXISTING EXP JOINTS & ARMOR JOINTS ARE FROM 1932 DESIGN PLANS. ACTUAL OPENINGS MAY VARY.

PLAN

SCALE 1"=40'
SCALE 0 SCALE
HORZ: 1" = 40'
VERT: 1" = 40'

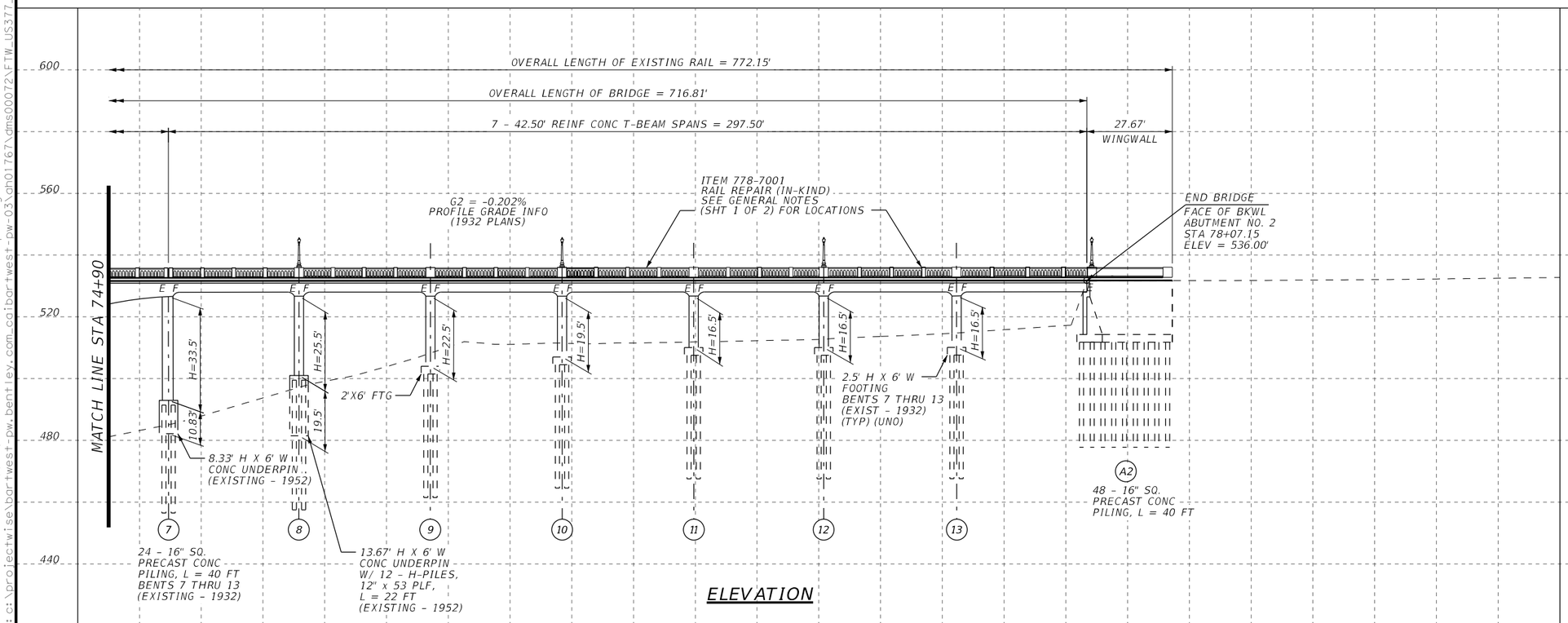
GENERAL NOTES:

1. THE GEOMETRIC DATA, SPAN ARRANGEMENTS, BEAM TYPES, COLUMN HEIGHTS, AND FOUNDATIONS SHOWN ON THIS SHEET WERE TAKEN FROM THE 1932 AND 1952 DESIGN PLANS. STATIONS HAVE BEEN ADJUSTED TO CORRELATE WITH SURVEY DATA.
2. A PERMIT IS REQUIRED FROM TARRANT REGIONAL WATER DISTRICT (TRWD) TO ACCESS REPAIR WORK FROM GROUND LEVEL OR WATER LEVEL.
3. PROTECT AGAINST DEBRIS FALLING INTO THE RIVER.
4. SEE SHEET 1 OF 3 FOR ADDITIONAL NOTES.

HYDRAULIC DATA

Q (50)	= 50,128 CFS
V(50)	= 4.82 FPS
HW(50)	= 521.78 FT
Q(100)	= 58,970 CFS
V(100)	= 5.35 FPS
HW(100)	= 523.16 FT

POSTED SPEED = 45 MPH
AADT (2022) = 5322
AADT (2042) = 7451
FUNCTION CLASS = URBAN ARTERIAL
EXISTING NBI: 02-220-0081-01-001



ELEVATION

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Texas Department of Transportation

US 377

BRIDGE LAYOUT

WEST FORK TRINITY RIVER
EXISTING NBI: 02-220-0081-01-001

SHEET 2 OF 3

FED.RD. DIV. NO.	FEDERAL AID PROJECT NO.		SHEET NO.
6	SEE TITLE SHEET		47
STATE	DISTRICT	COUNTY	
TEXAS	FTW	TARRANT	
CONTROL	SECTION	JOB	HIGHWAY
0081	01	050	US 377

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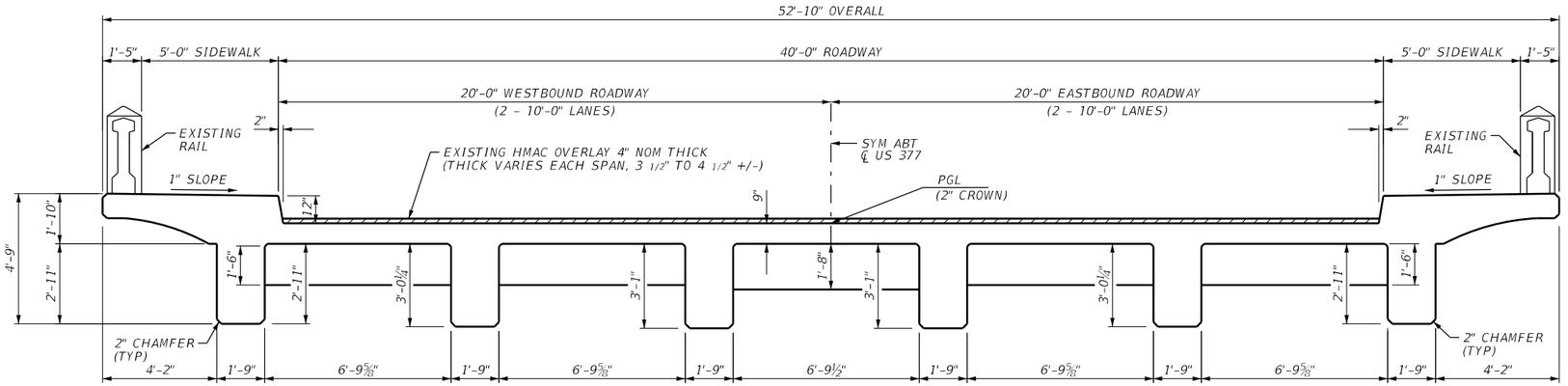
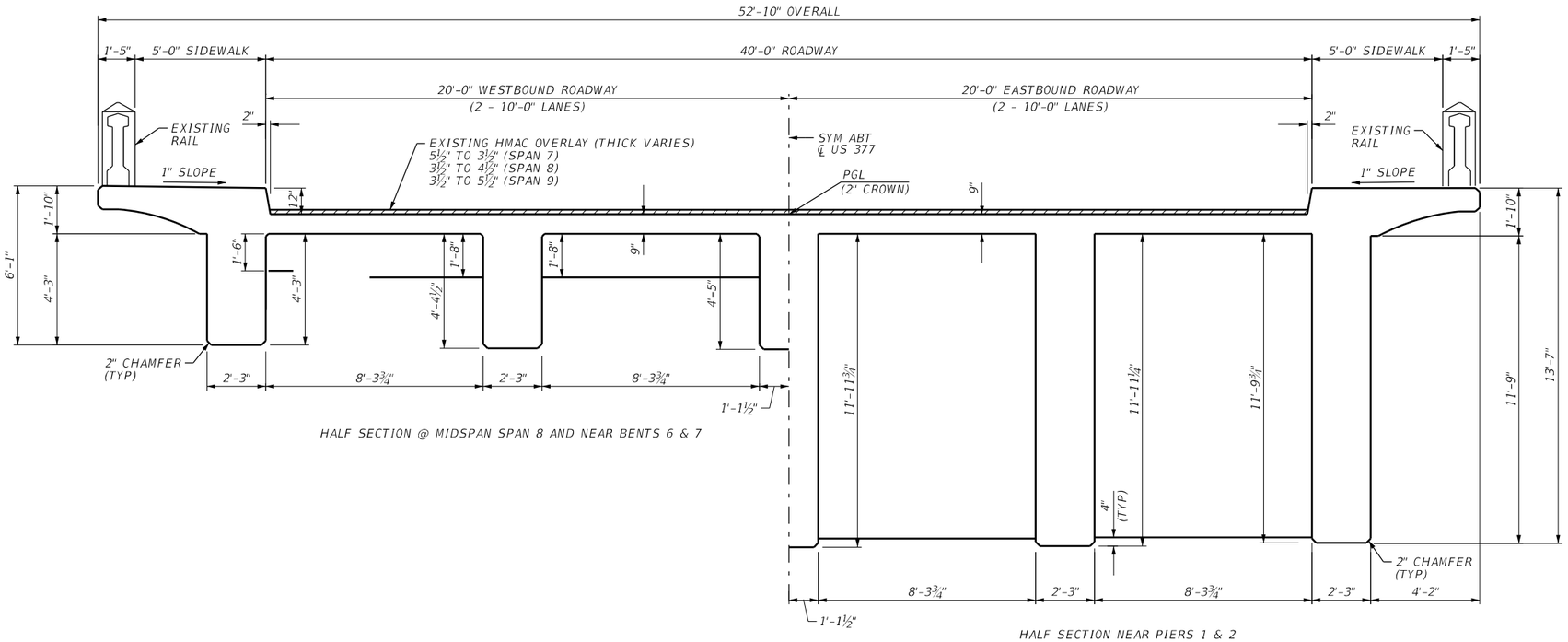


EXISTING TYPICAL SECTION - SPANS 1-6 & 10-16

SCALE: 3/16" = 1'-0"

NOTES:

1. DIMENSIONS SHOWN ON THIS SHEET WERE TAKEN FROM 1932 DESIGN PLANS.
2. THE THICKNESS OF EXISTING HMAC OVERLAY IS APROXIMATELY 4" (+/- 1/2") BASED ON FIELD MEASUREMENT OF EXPOSED CURB HEIGHT AT VARIOUS LOCATIONS IN T-BEAM SPANS ON THE BRIDGE. THICKNESS OF OVERLAY AT CENTERLINE OF ROADWAY IS UNKNOWN.
3. THE THICKNESS OF EXISTING HMAC OVERLAY VARIES THROUGHOUT THE T-GIRDER UNIT. THE THICKNESS IN SPAN 8 IS SIMILAR TO T-BEAM SPANS. BASED ON FIELD OBSERVATION, THE EXISTING HMAC OVERLAY IS APPROXIMATELY 1" +/- THICKER AT THE T-GIRDER SIDE OF ARMOR JOINTS AT BENTS 6 & 7.



HALF SECTION @ MIDSPAN SPAN 8 AND NEAR BENTS 6 & 7

HALF SECTION NEAR PIERS 1 & 2

EXISTING TYPICAL SECTION - SPANS 7-9

SCALE: 3/16" = 1'-0"

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Texas Department of Transportation

US 377

BRIDGE LAYOUT

WEST FORK TRINITY RIVER
EXISTING NBI: 02-220-0081-01-001

SHEET 3 OF 3

FED.RD. DIV. NO.	FEDERAL AID PROJECT NO.		SHEET NO.
6	SEE TITLE SHEET		48
STATE	DISTRICT	COUNTY	
TEXAS	FTW	TARRANT	
CONTROL	SECTION	JOB	HIGHWAY
0081	01	050	US 377

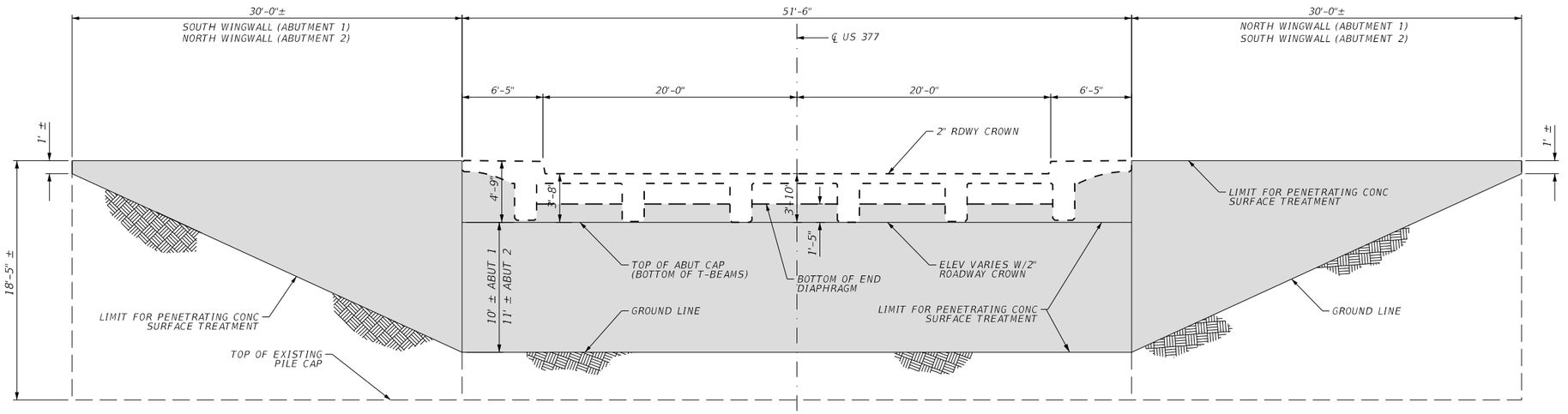
ESTIMATED REPAIR QUANTITIES			
ITEM-SERIES	428-7001	429-7007	780-7002
DESCRIPTION	PENETRATING CONCRETE SURFACE TREATMENT (1)	CONC STRUCTURE REPAIR (VERTICAL & OVERHEAD)	CONCRETE CRACK REPAIR (DISCRETE) (INJECT)
ABUTMENT	SY	SF	LF
1	99	10	35
2	106	20	45
TOTAL	205	30	80

NOTES:

(1) ESTIMATED QUANTITY INCLUDES SURFACE AREA (SY) OF ABUTMENT AS FOLLOWS:
FACE OF BACKWALL AT OVERHANG AND BELOW DIAPHRAGMS (BETWEEN T-BEAMS).
ACCESSIBLE TOP SURFACE OF ABUTMENT (OVERHANG AREA & BETWEEN T-BEAMS).
EXPOSED FRONT FACE OF ABUTMENT BELOW TOP OF CAP, AND EXTENDING TO FINISHED GROUND LINE.
EXPOSED AREA OF WINGWALLS BELOW THE BASE OF WINGWALL PARAPET, AND EXTENDING TO FINISHED GROUND LINE. (SEE GENERAL NOTE 5).

GENERAL NOTES:

1. REPAIR QUANTITIES ARE BASED ON REPAIR INSPECTION PERFORMED IN OCTOBER AND DECEMBER 2021 USING VISUAL INSPECTION FROM GROUND LEVEL AND WATER LEVEL.
2. REFER TO "ABUTMENT REPAIR PHOTOS" SHEETS FOR DAMAGE LOCATIONS AND DESCRIPTIONS. REPAIR DEFICIENCIES SHOWN IN PHOTOS AND OTHER DEFICIENCIES OF SIMILAR CONDITION AT LOCATIONS AS DIRECTED BY THE ENGINEER.
3. CONCRETE REPAIR WORK SHALL MEET THE REQUIREMENTS OF:
   (A) ITEM 429, "CONCRETE STRUCTURE REPAIR",
   (B) TxDOT CONCRETE REPAIR MANUAL, CHAPTER 3, SECTIONS 1 AND 2,
   (C) "CONCRETE STRUCTURE REPAIR DETAILS" SHEETS,
   (D) ITEM 780, "CONCRETE CRACK REPAIR", AND
   (E) TxDOT CONCRETE REPAIR MANUAL, CHAPTER 3, SECTION 5.
4. A COPY OF THE TxDOT CONCRETE REPAIR MANUAL MUST BE AVAILABLE ON SITE DURING ALL CONCRETE REPAIR OPERATIONS.
5. WINGWALL PARAPET REPAIR IS INCLUDED UNDER ITEM 778, "CONCRETE RAIL REPAIR." REFER TO RAIL REPAIR SHEETS.



ELEVATION
(ABUTMENT 1 LOOKING WEST)
(ABUTMENT 2 LOOKING EAST)

NOTE: WINGWALL PARAPET REPAIRS ARE INCLUDED WITH RAIL REPAIRS (SEE NOTE 5)

STATE OF TEXAS
JAMES EDWARD BROWNE
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7/10/2024

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Texas Department of Transportation

US 377
ABUTMENT REPAIR
ABUTMENTS 1 & 2

WEST FORK TRINITY RIVER
NBI No. 02-220-0081-01-001

FED.RD. DIV. NO.	FEDERAL AID PROJECT NO.		SHEET NO.
6	SEE TITLE SHEET		49
STATE	DISTRICT	COUNTY	
TEXAS	FTW	TARRANT	
CONTROL	SECTION	JOB	HIGHWAY
0081	01	050	US 377

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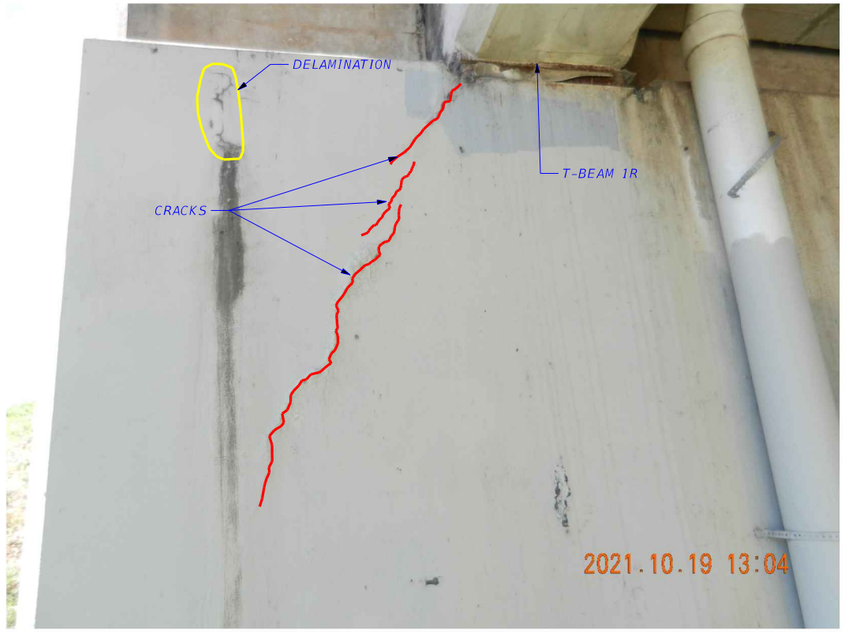


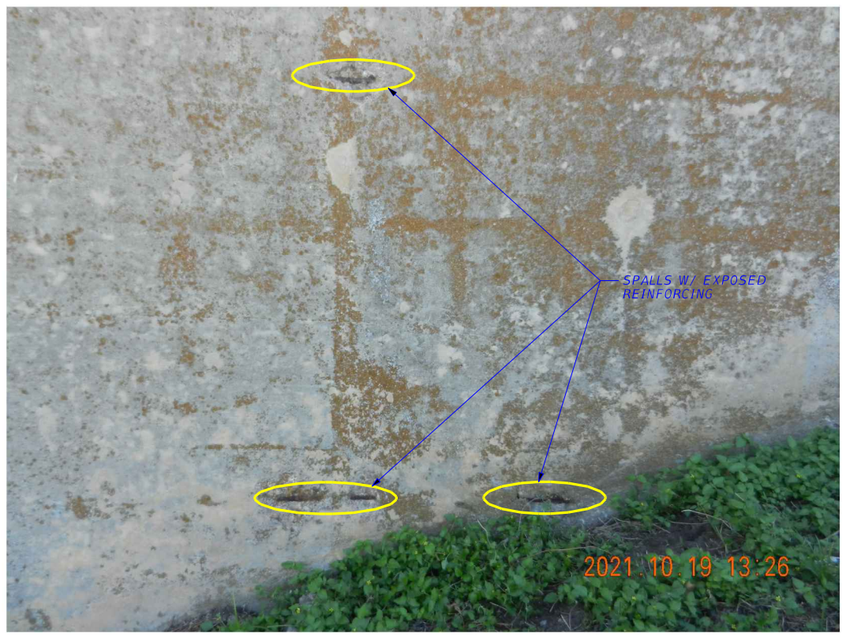
DELAMINATION AND CRACKS AT ABUTMENT 1

DELAMINATION (SPALL) AT ABUTMENT 1

GENERAL NOTES:

1. PHOTOS SHOWN ARE REPRESENTATIVE ONLY AND ARE NOT ALL-INCLUSIVE. FIELD VERIFY LOCATIONS AND EXTENT OF REPAIRS WITH THE ENGINEER PRIOR TO ORDERING MATERIALS.
2. SEE ABUTMENT REPAIR SHEETS FOR ADDITIONAL NOTES AND REQUIREMENTS.

DELAMINATION (SPALL) AT ABUTMENT 1



SPALLS W/EXPOSED REINFORCING (NORTH WING ABUTMENT 1)

STATE OF TEXAS
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Texas Department of Transportation

US 377
ABUTMENT REPAIR PHOTOS

WEST FORK TRINITY RIVER
NBI No. 02-220-0081-01-001

SHEET 1 OF 2

FED.RD. DIV. NO.	FEDERAL AID PROJECT NO.		SHEET NO.
6	SEE TITLE SHEET		50
STATE	DISTRICT	COUNTY	
TEXAS	FTW	TARRANT	
CONTROL	SECTION	JOB	HIGHWAY
0081	01	050	US 377

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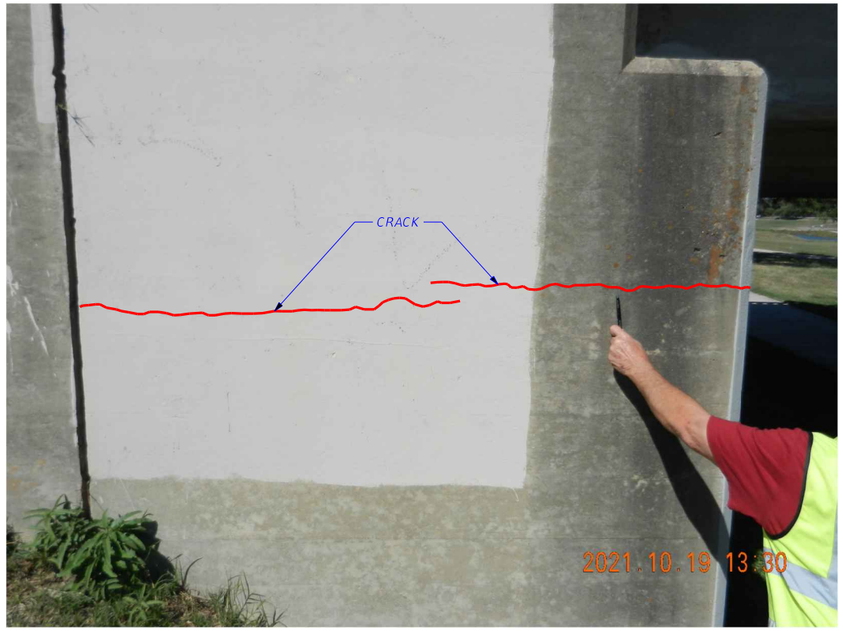
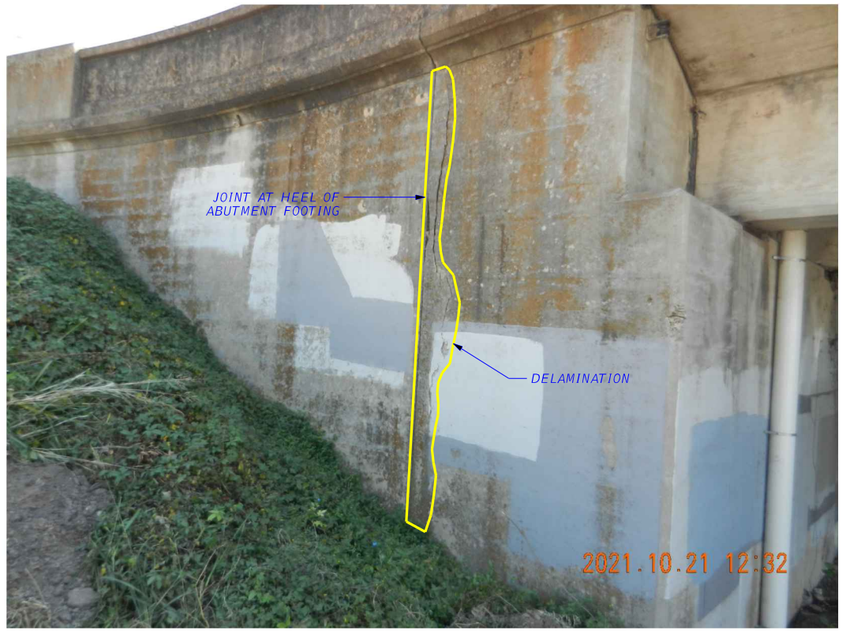


CRACKS AT SOUTH WING AT ABUTMENT 1



DELAMINATION (SPALL), CRACKING AT NORTH WING ABUTMENT NO 2

SPALL (EXPOSED REINFORCING) AT NW CORNER ABUTMENT 2

DELAMINATION (SPALL) WEST FACE ABUTMENT 2

GENERAL NOTES:

1. PHOTOS SHOWN ARE REPRESENTATIVE ONLY AND ARE NOT ALL-INCLUSIVE. FIELD VERIFY LOCATIONS AND EXTENT OF REPAIRS WITH THE ENGINEER PRIOR TO ORDERING MATERIALS.
2. SEE ABUTMENT REPAIR SHEETS FOR ADDITIONAL NOTES AND REQUIREMENTS.

STATE OF TEXAS
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7/10/2024

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Texas Department of Transportation

US 377
ABUTMENT REPAIR PHOTOS

WEST FORK TRINITY RIVER
NBI No. 02-220-0081-01-001

SHEET 2 OF 2

FED.RD. DIV. NO.	FEDERAL AID PROJECT NO.		SHEET NO.
6	SEE TITLE SHEET		51
STATE	DISTRICT	COUNTY	
TEXAS	FTW	TARRANT	
CONTROL	SECTION	JOB	HIGHWAY
0081	01	050	US 377

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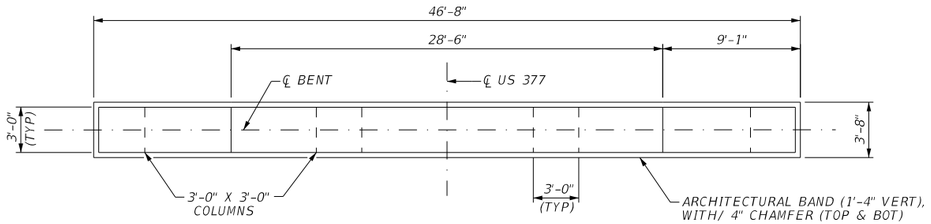
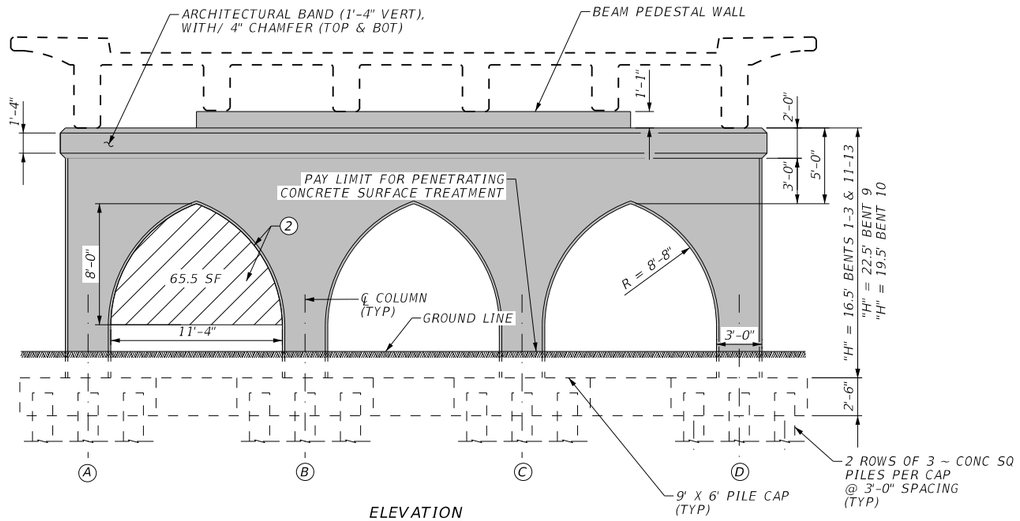


PLAN

(BENTS 1 - 3 & 9 - 13)



ELEVATION

(BENTS 1 - 3 & 9 - 13)
(LOOKING EAST)

NOTE: SHADING DENOTES LIMITS FOR PENETRATING CONCRETE SURFACE TREATMENT

ESTIMATED REPAIR QUANTITIES			
ITEM-SERIES	428-7001	429-7007	780-7002
DESCRIPTION	PENETRATING CONCRETE SURFACE TREATMENT (1)	CONC STRUCTURE REPAIR (VERTICAL & OVERHEAD)	CONCRETE CRACK REPAIR (DISCRETE) (INJECT)
BENTS	SY	SF	LF
1	180	10	20
2	185	15	20
3	190	10	20
9	205	10	20
10	195	15	20
11	190	15	20
12	185	10	20
13	180	15	40
TOTAL	1,510	100	180

NOTES:

(1) ESTIMATED QUANTITY INCLUDES SURFACE AREA (SY) OF BENT AS FOLLOWS:
ACCESSIBLE SIDE FACES (FOUR) OF BEAM PEDESTAL WALL.
ACCESSIBLE TOP SURFACE OF BENT.
SIDE FACES (FOUR) OF BENT AND COLUMNS.
UNDERSIDE OF COLUMN FLARES.
TOP AND BOTTOM SLOPING SURFACES OF CHAMFERS FOR ARCHITECTURAL BAND.

(2) THEORETICAL AREA BETWEEN COLUMN FLARES IS 65.5 SF AND THEORETICAL PERIMETER OF THE UNDERSIDE OF LEFT AND RIGHT COLUMN FLARES IS 21.0 LF (FOR CONTRACTOR'S INFORMATION).

GENERAL NOTES:

1. REPAIR QUANTITIES ARE BASED ON REPAIR INSPECTION PERFORMED IN OCTOBER AND DECEMBER 2021 USING VISUAL INSPECTION FROM GROUND LEVEL AND WATER LEVEL.
2. REFER TO "BENT REPAIR PHOTOS" SHEETS FOR DAMAGE LOCATIONS AND DESCRIPTIONS. REPAIR DEFICIENCIES SHOWN IN PHOTOS AND OTHER DEFICIENCIES OF SIMILAR CONDITION AT LOCATIONS AS DIRECTED BY THE ENGINEER.
3. NOTIFY THE ENGINEER IF DAMAGE EXTENDS UNDER STEEL BEARING ASSEMBLIES OF EXISTING T-BEAMS OR UNDER STEEL PEDESTALS FOR EVALUATION.
4. CONCRETE REPAIR WORK SHALL MEET THE REQUIREMENTS OF:
   (A) ITEM 429, "CONCRETE STRUCTURE REPAIR",
   (B) TxDOT CONCRETE REPAIR MANUAL, CHAPTER 3, SECTIONS 1 AND 2,
   (C) "CONCRETE STRUCTURE REPAIR DETAILS" SHEETS,
   (D) ITEM 780, "CONCRETE CRACK REPAIR", AND
   (E) TxDOT CONCRETE REPAIR MANUAL, CHAPTER 3, SECTION 5.
5. A COPY OF THE TxDOT CONCRETE REPAIR MANUAL MUST BE AVAILABLE ON SITE DURING ALL CONCRETE REPAIR OPERATIONS.

STATE OF TEXAS
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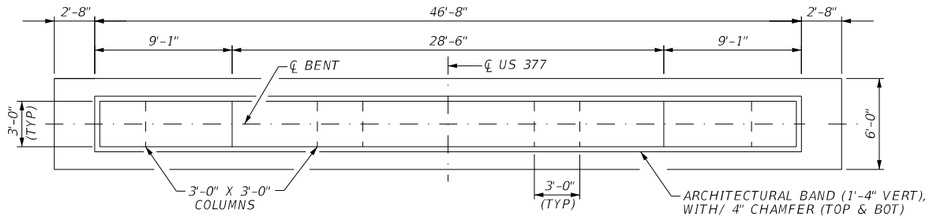
Texas Department of Transportation

US 377
BENT REPAIR
BENTS 1 - 3 & 9 - 13

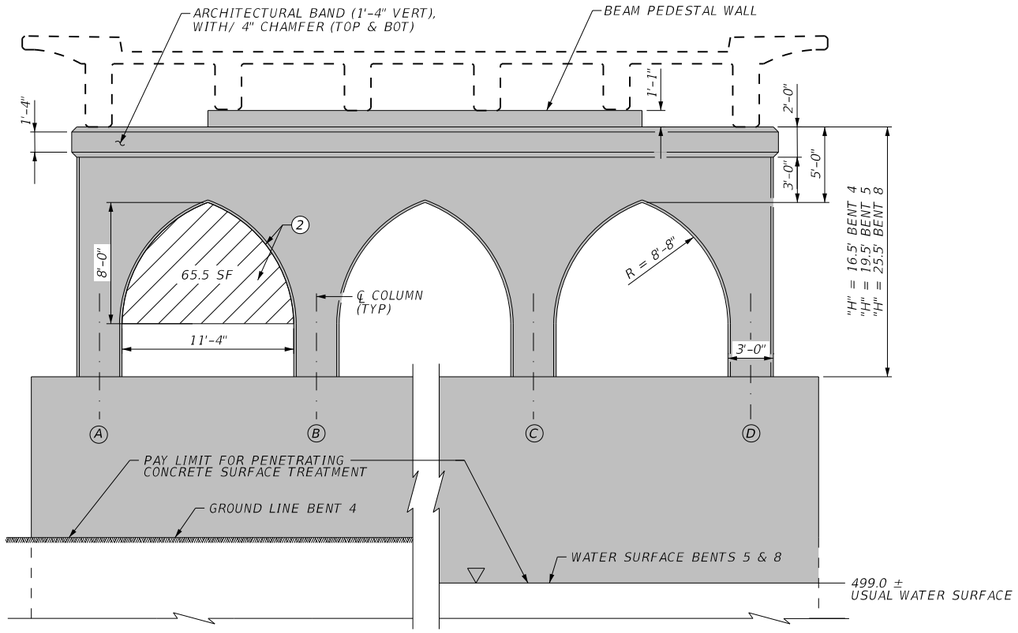
WEST FORK TRINITY RIVER
NBI No. 02-220-0081-01-001

FED.RD. DIV. NO.	FEDERAL AID PROJECT NO.		SHEET NO.
6	SEE TITLE SHEET		52
STATE	DISTRICT	COUNTY	
TEXAS	FTW	TARRANT	
CONTROL	SECTION	JOB	HIGHWAY
0081	01	050	US 377



PLAN

(BENTS 4, 5 & 8)



ELEVATION

(BENTS 4, 5 & 8)
(LOOKING EAST)

NOTE: SHADING DENOTES LIMITS FOR PENETRATING CONCRETE SURFACE TREATMENT

ESTIMATED REPAIR QUANTITIES			
ITEM-SERIES	428-7001	429-7007	780-7002
DESCRIPTION	PENETRATING CONCRETE SURFACE TREATMENT (1)	CONC STRUCTURE REPAIR (VERTICAL & OVERHEAD)	CONCRETE CRACK REPAIR (DISCRETE) (INJECT)
BENT	SY	SF	LF
4	320	30	170
5	370	40	230
8	305	30	50
TOTAL	995	100	450

NOTES:

(1) ESTIMATED QUANTITY INCLUDES SURFACE AREA (SY) OF BENT AS FOLLOWS:
ACCESSIBLE SIDE FACES (FOUR) OF BEAM PEDESTAL WALL.
ACCESSIBLE TOP SURFACE OF BENT.
SIDE FACES (FOUR) OF BENT AND COLUMNS.
UNDERSIDE OF COLUMN FLARES.
TOP AND BOTTOM SLOPING SURFACES OF CHAMFERS FOR ARCHITECTURAL BAND.

(2) THEORETICAL AREA BETWEEN COLUMN FLARES IS 65.5 SF AND THEORETICAL PERIMETER OF THE UNDERSIDE OF LEFT AND RIGHT COLUMN FLARES IS 21.0 LF (FOR CONTRACTOR'S INFORMATION).

GENERAL NOTES:

1. REPAIR QUANTITIES ARE BASED ON REPAIR INSPECTION PERFORMED IN OCTOBER AND DECEMBER 2021 USING VISUAL INSPECTION FROM GROUND LEVEL AND WATER LEVEL.
2. REFER TO "BENT REPAIR PHOTOS" SHEETS FOR DAMAGE LOCATIONS AND DESCRIPTIONS. REPAIR DEFICIENCIES SHOWN IN PHOTOS AND OTHER DEFICIENCIES OF SIMILAR CONDITION AT LOCATIONS AS DIRECTED BY THE ENGINEER.
3. NOTIFY THE ENGINEER IF DAMAGE EXTENDS UNDER STEEL BEARING ASSEMBLIES OF EXISTING T-BEAMS OR UNDER STEEL PEDESTALS FOR EVALUATION.
4. CONCRETE REPAIR WORK SHALL MEET THE REQUIREMENTS OF:
   (A) ITEM 429, "CONCRETE STRUCTURE REPAIR",
   (B) TxDOT CONCRETE REPAIR MANUAL, CHAPTER 3, SECTIONS 1 AND 2,
   (C) "CONCRETE STRUCTURE REPAIR DETAILS" SHEETS,
   (D) ITEM 780, "CONCRETE CRACK REPAIR", AND
   (E) TxDOT CONCRETE REPAIR MANUAL, CHAPTER 3, SECTION 5.
5. A COPY OF THE TxDOT CONCRETE REPAIR MANUAL MUST BE AVAILABLE ON SITE DURING ALL CONCRETE REPAIR OPERATIONS.

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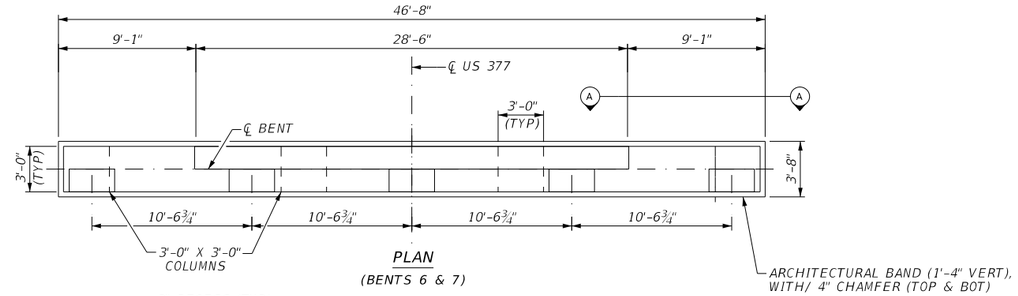
Texas Department of Transportation

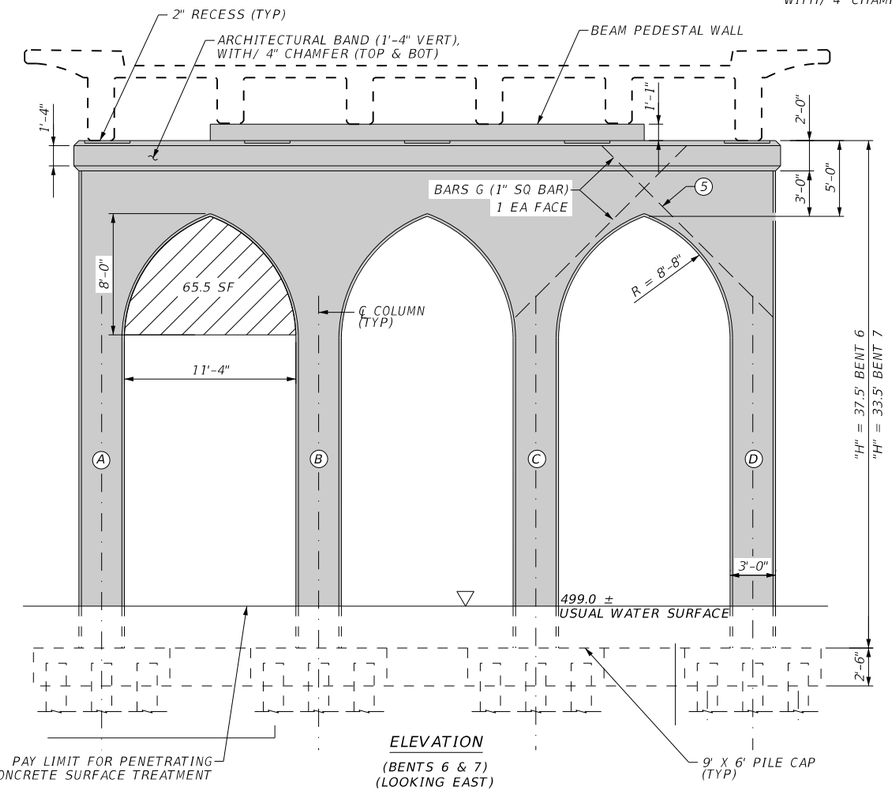
US 377
BENT REPAIR
BENTS 4, 5 & 8

WEST FORK TRINITY RIVER
NBI No. 02-220-0081-01-001

FED.RD. DIV. NO.	FEDERAL AID PROJECT NO.		SHEET NO.
6	SEE TITLE SHEET		53
STATE	DISTRICT	COUNTY	
TEXAS	FTW	TARRANT	
CONTROL	SECTION	JOB	HIGHWAY
0081	01	050	US 377

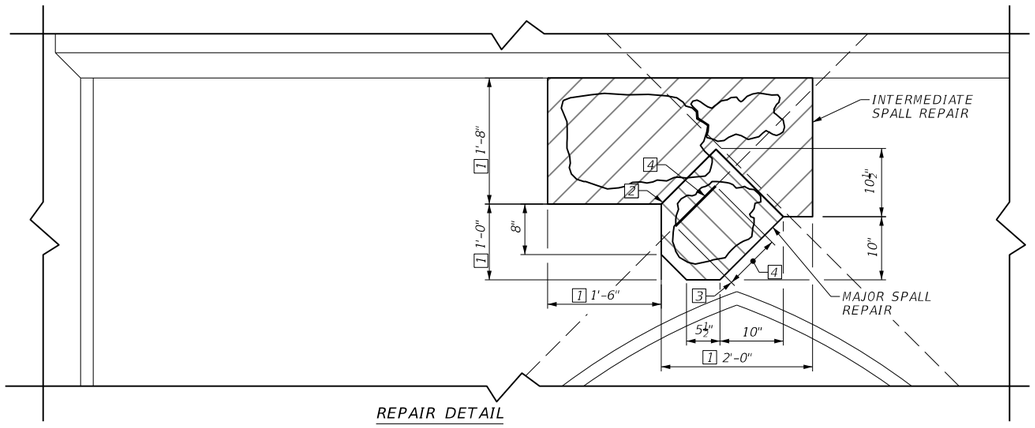


PLAN
(BENTS 6 & 7)



ELEVATION
(BENTS 6 & 7)
(LOOKING EAST)

NOTE: SHADING DENOTES LIMITS FOR PENETRATING CONCRETE SURFACE TREATMENT



REPAIR DETAIL
SCALE: ½"=1'

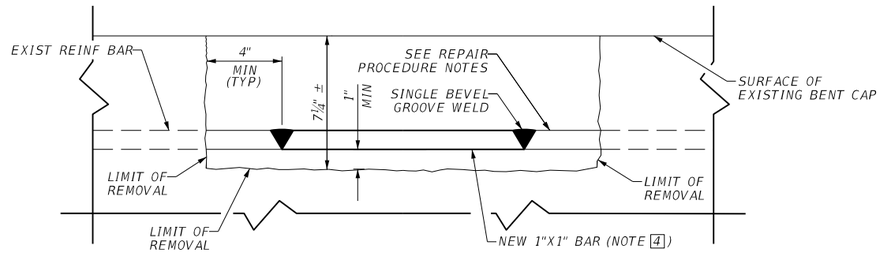
ESTIMATED REPAIR QUANTITIES				
ITEM-SERIES	428-7001	429-7007	429-7007	780-7002
DESCRIPTION	PENETRATING CONCRETE SURFACE TREATMENT (1)	CONC STRUCTURE REPAIR (VERTICAL & OVERHEAD)	CONC STRUCTURE REPAIR (VERTICAL & OVERHEAD) (3)	CONCRETE CRACK REPAIR (DISCRETE) (INJECT)
BENTS	SY	SF	SF	LF
6	255	15		20
7	255	15	10	20
TOTAL	510	30	10	40

NOTES:

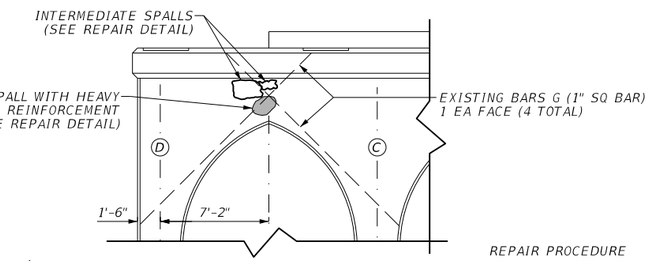
(1) ESTIMATED QUANTITY INCLUDES SURFACE AREA (SY) OF BENT AS FOLLOWS:
ACCESSIBLE SIDE FACES (FOUR) OF BEAM PEDESTAL WALL.
ACCESSIBLE TOP SURFACE OF BENT.
SIDE FACES (FOUR) OF BENT AND COLUMNS.
UNDERSIDE OF COLUMN FLARES.
TOP AND BOTTOM SLOPING SURFACES OF CHAMFERS FOR ARCHITECTURAL BAND.

(2) THEORETICAL AREA BETWEEN COLUMN FLARES IS 65.5 SF AND THEORETICAL PERIMETER OF THE UNDERSIDE OF LEFT AND RIGHT COLUMN FLARES IS 21.0 LF (FOR CONTRACTOR'S INFORMATION).

(3) SPECIAL REPAIR AT EAST FACE OF BENT 7. SPALL AT EAST FACE OF BENT 7 WITH HEAVY CORROSION IN BAR G. SEE REPAIR DETAIL THIS SHEET.



WELD PREPARATION DETAIL
SCALE: 1 1/2" = 1'-0"



VIEW A-A
SCALE: 1" = 10'
BENT 7 FACE (LOOKING WEST)
(REFER TO BENT REPAIR PHOTOS, SHEET 3 OF 3)

NOTES

1 DIMENSIONS ESTIMATED VISUALLY IN THE OCTOBER 2021 REPAIR INSPECTION. DIMENSIONS ARE APPROXIMATE.

2 REMOVE CONCRETE – APPROXIMATE LIMITS AS SHOWN (PROVIDE 1" CLEAR COVER BEHIND BACK FACE OF BAR). ADJUST REPAIR DIMENSIONS AS NEEDED FOR FIELD CONDITIONS.

3 SAWCUT 1" BEYOND LIMITS OF CORROSION.

4 1" X 1" BAR – LENGTH AS REQUIRED. PROVIDE ASTM A36 STEEL.

REPAIR PROCEDURE

1. ½" DEEP SAWCUT ALONG REMOVAL BOUNDARY TO NEAT LINES.
2. REMOVE CONCRETE TAKING CARE TO NOT DAMAGE EXISTING REINFORCING.
3. CLEAN EXISTING REINFORCING BAR G.
4. DETERMINE LENGTH OF NEW 1" SQ BAR REQUIRED.
5. PREPARE ENDS OF NEW AND EXISTING STEEL BAR FOR FULL PENETRATION SINGLE BEVEL GROOVE WELDS. NEW BAR TO BE PREPARED IN THE SHOP. EXISTING BAR TO BE PREPARED IN THE FIELD.
6. SUBMIT REPAIR PROCEDURE, SHOP DRAWINGS, WELDING PROCEDURE FOR APPROVAL BY THE ENGINEER PRIOR TO ORDERING MATERIAL.
7. FIELD WELDING TO BE IN ACCORDANCE WITH ITEM 448, STRUCTURAL FIELD WELDING. FIELD WELDING TO BE PERFORMED BY WELDER W/APPROPRIATE CERTIFICATION FOR WELDING (INCLUDING POSITION OF WELDS).
8. PERFORM CONCRETE STRUCTURE REPAIR AFTER WELDS HAVE BEEN APPROVED. CONCRETE STRUCTURE REPAIR TO BE PERFORMEND IN ACCORDANCE WITH ITEM 429, "CONCRETE STRUCTURE REPAIR" AND THE TxDOT CONCRETE REPAIR MANUAL.

GENERAL NOTES:

1. REPAIR QUANTITIES ARE BASED ON REPAIR INSPECTION PERFORMED IN OCTOBER AND DECEMBER 2021 USING VISUAL INSPECTION FROM GROUND LEVEL AND WATER LEVEL.
2. REFER TO "BENT REPAIR PHOTOS" SHEETS FOR DAMAGE LOCATIONS AND DESCRIPTIONS. REPAIR DEFICIENCIES SHOWN IN PHOTOS AND OTHER DEFICIENCIES OF SIMILAR CONDITION AT LOCATIONS AS DIRECTED BY THE ENGINEER.
3. NOTIFY THE ENGINEER IF DAMAGE EXTENDS UNDER STEEL BEARING ASSEMBLIES OF EXISTING T-BEAMS OR UNDER STEEL PEDESTALS FOR EVALUATION.
4. CONCRETE REPAIR WORK SHALL MEET THE REQUIREMENTS OF:
   (A) ITEM 429, "CONCRETE STRUCTURE REPAIR",
   (B) TxDOT CONCRETE REPAIR MANUAL, CHAPTER 3, SECTIONS 1 AND 2,
   (C) "CONCRETE STRUCTURE REPAIR DETAILS" SHEETS,
   (D) ITEM 780, "CONCRETE CRACK REPAIR", AND
   (E) TxDOT CONCRETE REPAIR MANUAL, CHAPTER 3, SECTION 5.
5. A COPY OF THE TxDOT CONCRETE REPAIR MANUAL MUST BE AVAILABLE ON SITE DURING ALL CONCRETE REPAIR OPERATIONS.
6. THE CONTRACTOR SHALL LAYOUT TENTATIVE REPAIR AREAS FOLLOWING THE PROCEDURE SHOWN ON SHEETS "CONCRETE STRUCTURE REPAIR DETAILS". CONFIRM REPAIR LOCATIONS AND QUANTITIES WITH THE ENGINEER PRIOR TO ORDERING MATERIALS OR BEGINNING REPAIR.

STATE OF TEXAS
JAMES EDWARD BROWNE
62207
LICENSED PROFESSIONAL ENGINEER
7/10/2024

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Texas Department of Transportation

US 377
BENT REPAIR
BENTS 6 & 7

WEST FORK TRINITY RIVER
NBI No. 02-220-0081-01-001

FED.RD. DIV. NO.	FEDERAL AID PROJECT NO.		SHEET NO.
6	SEE TITLE SHEET		54
STATE	DISTRICT	COUNTY	
TEXAS	FTW	TARRANT	
CONTROL	SECTION	JOB	HIGHWAY
0081	01	050	US 377

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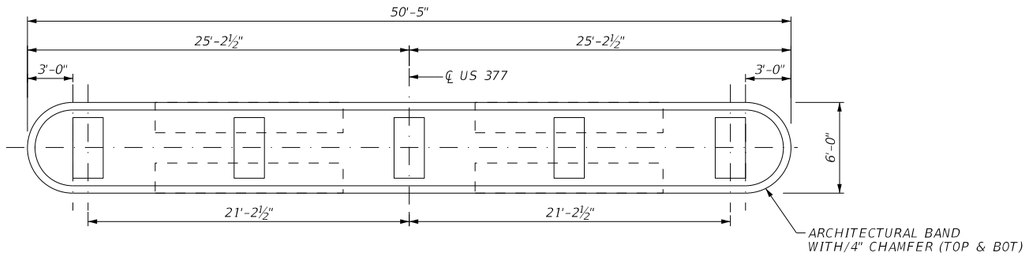
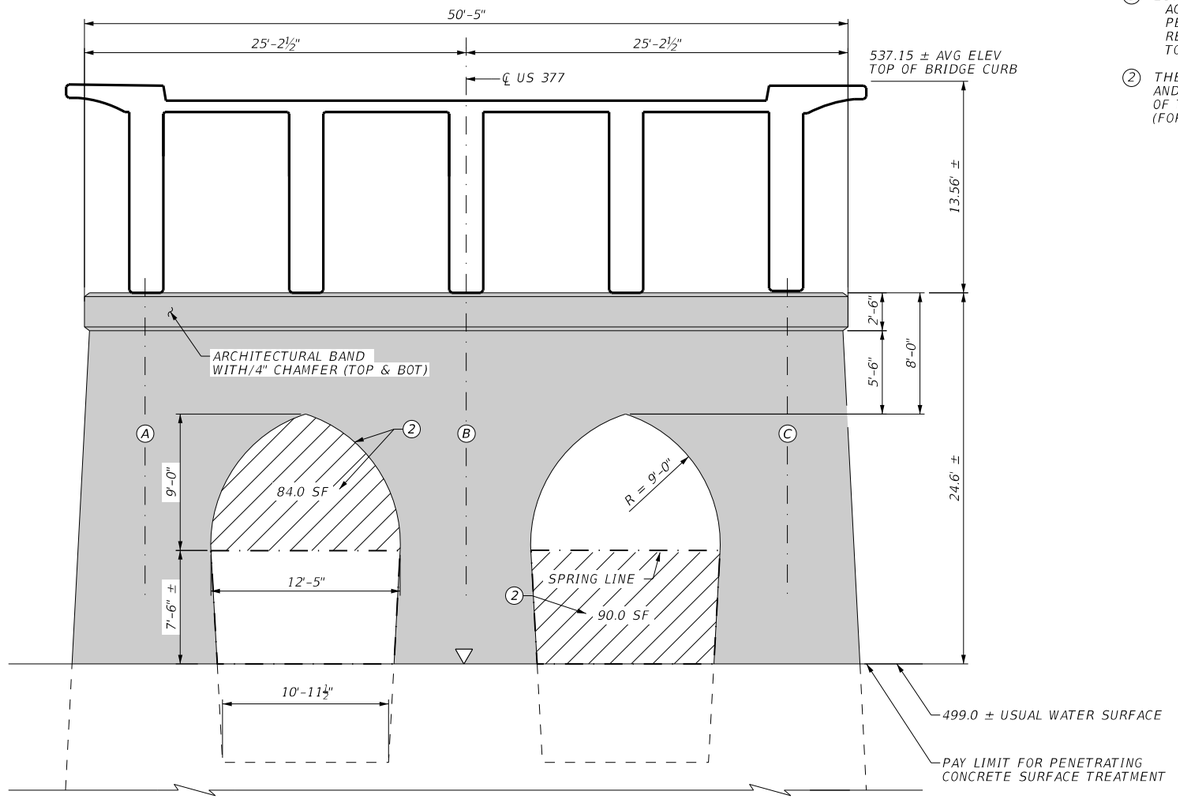


PLAN

(PIER 1 & 2)



ELEVATION

(PIER 1 & 2)
(LOOKING EAST)

NOTE: SHADING DENOTES LIMITS FOR PENETRATING CONCRETE SURFACE TREATMENT

ESTIMATED REPAIR QUANTITIES			
ITEM-SERIES	428-7001	429-7007	780-7002
DESCRIPTION	PENETRATING CONCRETE SURFACE TREATMENT (1)	CONC STRUCTURE REPAIR (VERTICAL & OVERHEAD)	CONCRETE CRACK REPAIR (DISCRETE) (INJECT)
PIER	SY	SF	LF
1	320	15	75
2	320	15	125
TOTAL	640	30	200

NOTES:

(1) ESTIMATED QUANTITY INCLUDES SURFACE AREA (SY) OF PIER AS FOLLOWS:
ACCESSIBLE TOP SURFACE OF PIER.
PERIMETER SIDE FACE OF PIER (ABOVE WATER LEVEL).
RECESSES IN EAST AND WEST FACES OF PIERS (ABOVE WATER LEVEL).
TOP AND BOTTOM SLOPING SURFACES OF CHAMFERS FOR ARCHITECTURAL BAND.

(2) THEORETICAL AREA BETWEEN COLUMN FLARES IS 84 SF (ABOVE SPRING LINE) AND 90 SF (BELOW SPRING LINE) AT EACH RECESS. THEORETICAL PERIMETER OF THE UNDERSIDE OF LEFT AND RIGHT COLUMN FLARES IS 38.6 LF (FOR CONTRACTOR'S INFORMATION).

GENERAL NOTES:

1. REPAIR QUANTITIES ARE BASED ON REPAIR INSPECTION PERFORMED IN OCTOBER AND DECEMBER 2021 USING VISUAL INSPECTION FROM GROUND LEVEL AND WATER LEVEL.
2. REFER TO "PIER REPAIR PHOTOS" SHEETS FOR DAMAGE LOCATIONS AND DESCRIPTIONS. REPAIR DEFICIENCIES SHOWN IN PHOTOS AND OTHER DEFICIENCIES OF SIMILAR CONDITION AT LOCATIONS AS DIRECTED BY THE ENGINEER.
3. CONCRETE REPAIR WORK SHALL MEET THE REQUIREMENTS OF:
   (A) ITEM 429, "CONCRETE STRUCTURE REPAIR",
   (B) TxDOT CONCRETE REPAIR MANUAL, CHAPTER 3, SECTIONS 1 AND 2,
   (C) "CONCRETE STRUCTURE REPAIR DETAILS" SHEETS,
   (D) ITEM 780, "CONCRETE CRACK REPAIR", AND
   (E) TxDOT CONCRETE REPAIR MANUAL, CHAPTER 3, SECTION 5.
4. A COPY OF THE TxDOT CONCRETE REPAIR MANUAL MUST BE AVAILABLE ON SITE DURING ALL CONCRETE REPAIR OPERATIONS.
5. THE CONTRACTOR SHALL LAYOUT TENTATIVE REPAIR AREAS FOLLOWING THE PROCEDURE SHOWN ON SHEETS "CONCRETE STRUCTURE REPAIR DETAILS". CONFIRM REPAIR LOCATIONS AND QUANTITIES WITH THE ENGINEER PRIOR TO ORDERING MATERIALS OR BEGINNING REPAIR.

STATE OF TEXAS
JAMES EDWARD BROWNE
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LICENSED PROFESSIONAL ENGINEER

7/10/2024

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Texas Department of Transportation

US 377
PIER REPAIR
PIERS 1 & 2

WEST FORK TRINITY RIVER
NBI No. 02-220-0081-01-001

FED.RD. DIV. NO.	FEDERAL AID PROJECT NO.		SHEET NO.
6	SEE TITLE SHEET		55
STATE	DISTRICT	COUNTY	
TEXAS	FTW	TARRANT	
CONTROL	SECTION	JOB	HIGHWAY
0081	01	050	US 377

CRACK(DELAMINATION/SPALL) AT W FACE COLUMN D AT BENT 1

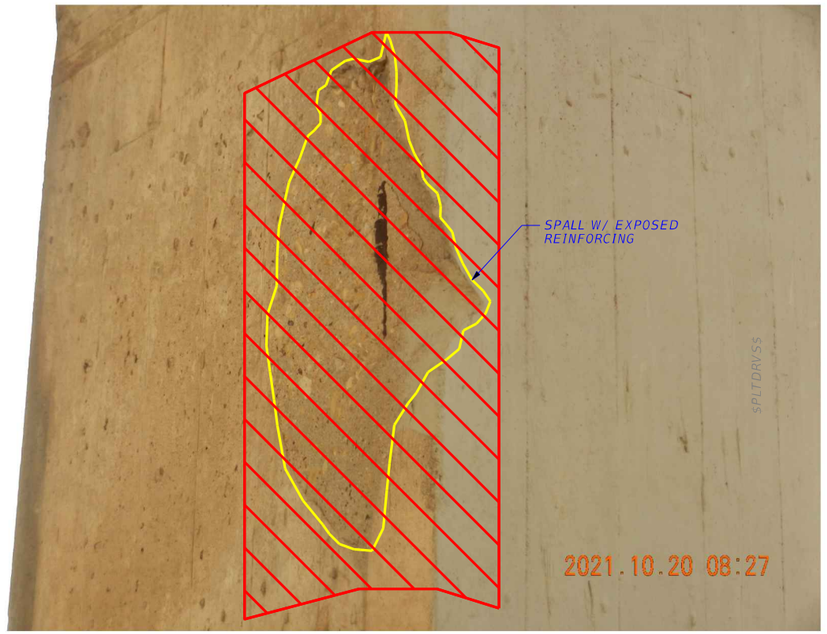
REPAIR AS MINOR SPALL

SPALL AT NW CORNER COLUMN A AT BENT 2

REPAIR AS MINOR SPALL

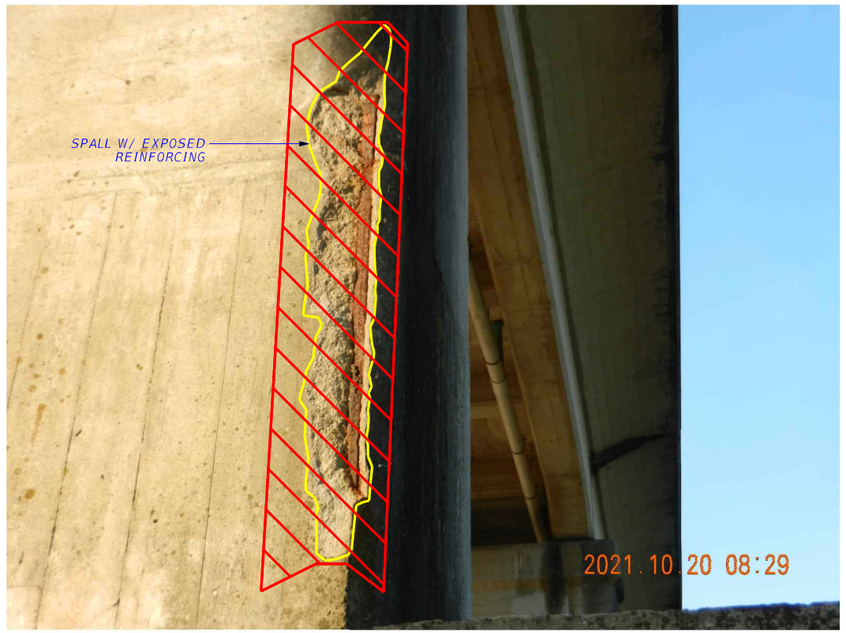
GENERAL NOTES:

1. PHOTOS SHOWN ARE REPRESENTATIVE ONLY AND ARE NOT ALL-INCLUSIVE. FIELD VERIFY LOCATIONS AND EXTENT OF REPAIRS WITH THE ENGINEER PRIOR TO ORDERING MATERIALS.
2. SEE BENT REPAIR SHEETS FOR ADDITIONAL NOTES AND REQUIREMENTS.



SPALL W/ EXPOSED REINFORCING AT NW CORNER COLUMN D AT BENT 4

REPAIR AS MINOR SPALL



SPALL W/ EXPOSED REINFORCING AT NE CORNER COLUMN A AT BENT 4

REPAIR AS INTERMEDIATE SPALL

STATE OF TEXAS
JAMES EDWARD BROWNE
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7/10/2024

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Texas Department of Transportation

US 377
BENT REPAIR PHOTOS

WEST FORK TRINITY RIVER
NBI No. 02-220-0081-01-001

SHEET 1 OF 3

FED.RD. DIV. NO.	FEDERAL AID PROJECT NO.		SHEET NO.
6	SEE TITLE SHEET		56
STATE	DISTRICT	COUNTY	
TEXAS	FTW	TARRANT	
CONTROL	SECTION	JOB	HIGHWAY
0081	01	050	US 377

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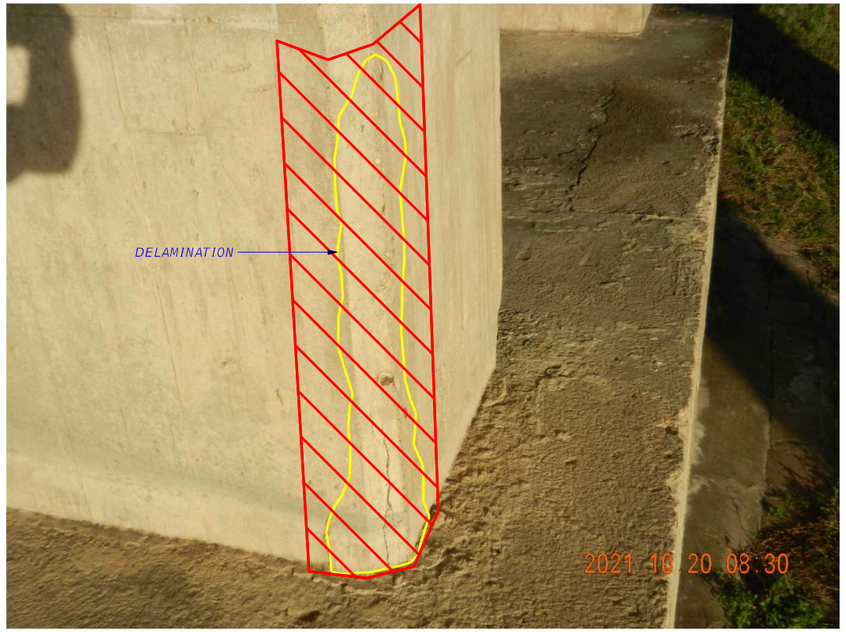
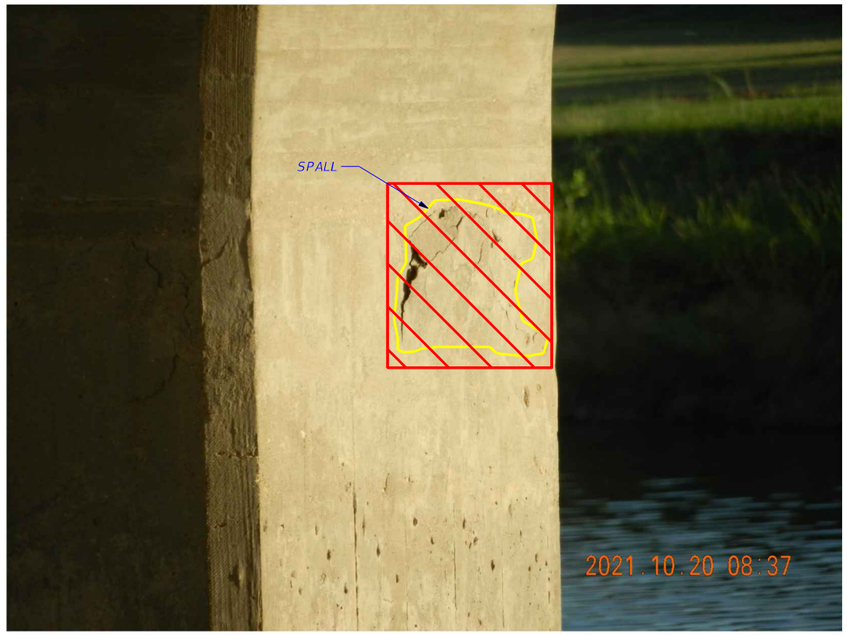
GENERAL NOTES:

1. PHOTOS SHOWN ARE REPRESENTATIVE ONLY AND ARE NOT ALL-INCLUSIVE. FIELD VERIFY LOCATIONS AND EXTENT OF REPAIRS WITH THE ENGINEER PRIOR TO ORDERING MATERIALS.
2. SEE BENT REPAIR SHEETS FOR ADDITIONAL NOTES AND REQUIREMENTS.



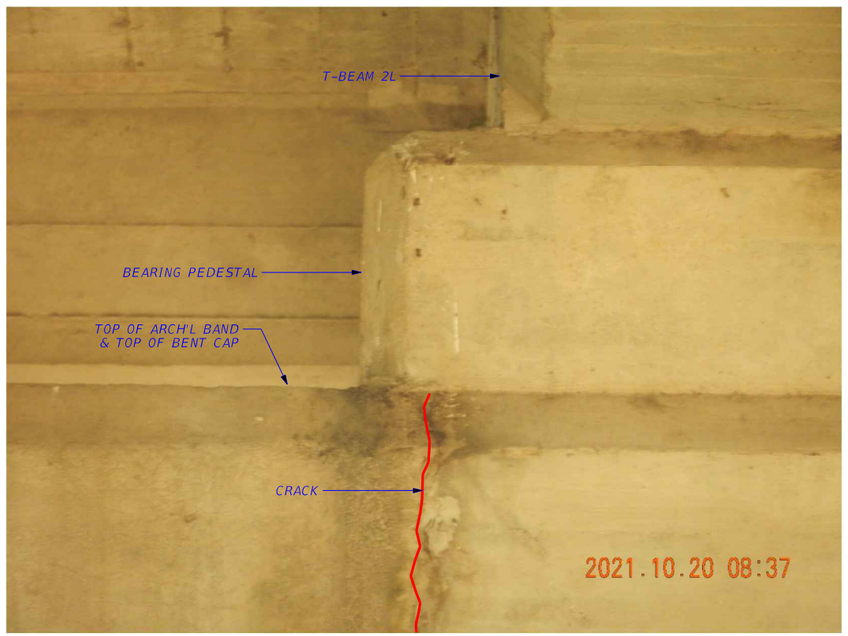
CRACK W/DELAMINATION/SPALL AT SE CORNER COLUMN C AT BENT 4

REPAIR AS INTERMEDIATE SPALL



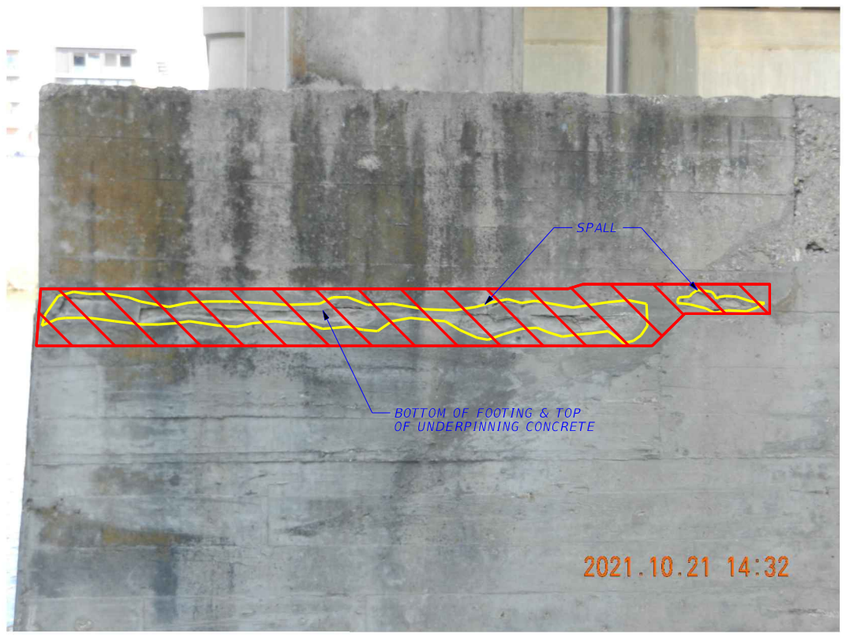
SPALL W/ POPOUT AT SOUTH FACE OF COLUMN B AT BENT 5

REPAIR AS MINOR SPALL



VERTICAL CRACK IN ARCH'L BAND AT WEST FACE OF CAP AT BENT 5

CONCRETE CRACK REPAIR (EPOXY INJECTION)



SPALLING IN WEST FACE OF FOOTING AT BENT 5

REPAIR AS MINOR OR INTERMEDIATE SPALL
(DEPENDS ON DEPTH AND IF REINFORCING IS ENCOUNTERED DURING PREPARATION)

STATE OF TEXAS
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7/10/2024

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Texas Department of Transportation

US 377
BENT REPAIR PHOTOS

WEST FORK TRINITY RIVER
NBI No. 02-220-0081-01-001

SHEET 2 OF 3

FED.RD. DIV. NO.	FEDERAL AID PROJECT NO.		SHEET NO.
6	SEE TITLE SHEET		57
STATE	DISTRICT	COUNTY	
TEXAS	FTW	TARRANT	
CONTROL	SECTION	JOB	HIGHWAY
0081	01	050	US 377

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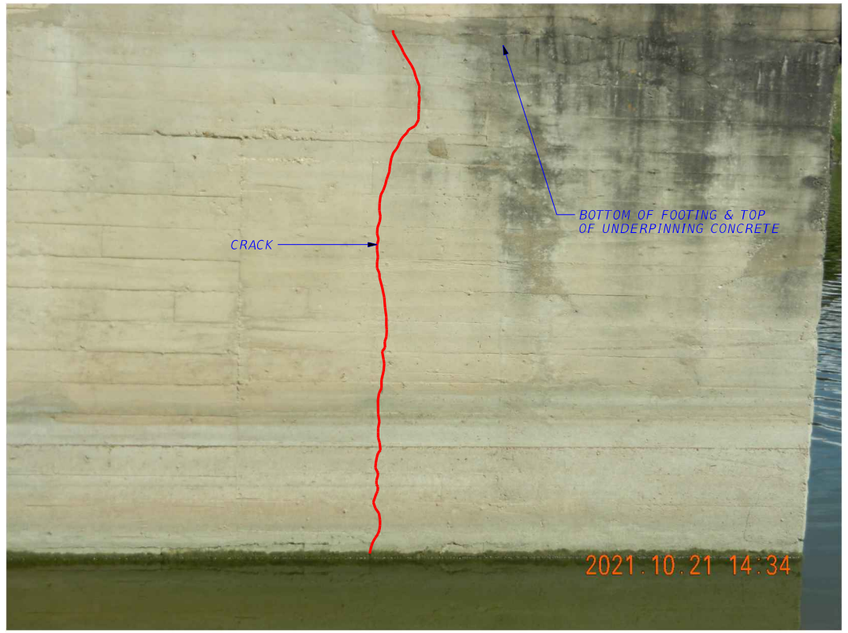
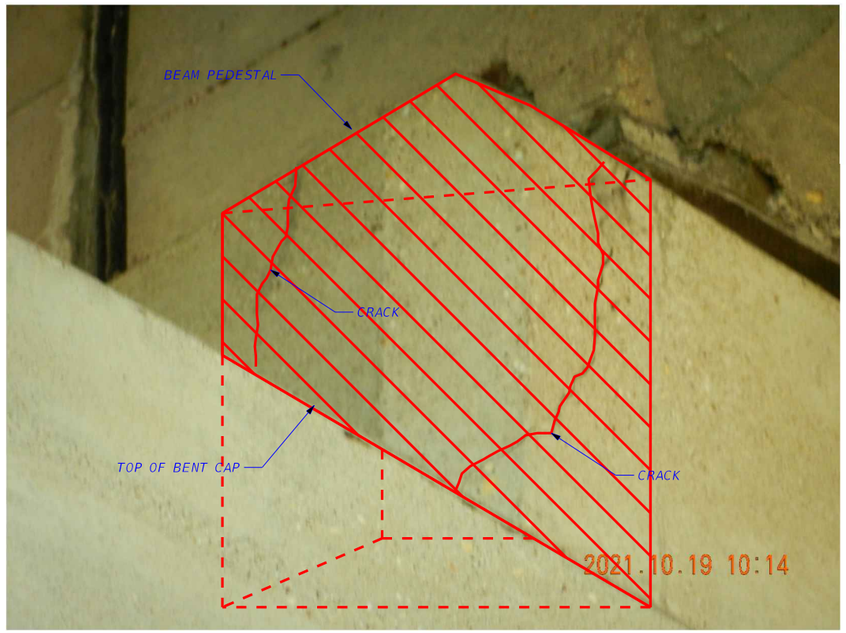


VERTICAL CRACK IN WEST FACE OF UNDERPINNING CONCRETE AT BENT 5

CONCRETE CRACK REPAIR (EPOXY INJECTION)

MAJOR SPALL W/ SEVERE CORROSION AT EAST FACE OF CAP AT BENT 7

REPAIR AS MAJOR SPALL (REFER TO SHEET "BENT REPAIR BENTS 6 & 7" FOR REPAIR DETAIL")



CRACKING/SPALL AT NW CORNER BEAM PEDESTAL WALL AT BENT 10

REPAIR AS INTERMEDIATE SPALL

GENERAL NOTES:

1. PHOTOS SHOWN ARE REPRESENTATIVE ONLY AND ARE NOT ALL-INCLUSIVE. FIELD VERIFY LOCATIONS AND EXTENT OF REPAIRS WITH THE ENGINEER PRIOR TO ORDERING MATERIALS.
2. SEE BENT REPAIR SHEETS FOR ADDITIONAL NOTES AND REQUIREMENTS.

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7/10/2024

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Texas Department of Transportation

US 377
BENT REPAIR
PHOTOS

WEST FORK TRINITY RIVER
NBI No. 02-220-0081-01-001

SHEET 3 OF 3

FED.RD. DIV. NO.	FEDERAL AID PROJECT NO.		SHEET NO.
6	SEE TITLE SHEET		58
STATE	DISTRICT	COUNTY	
TEXAS	FTW	TARRANT	
CONTROL	SECTION	JOB	HIGHWAY
0081	01	050	US 377

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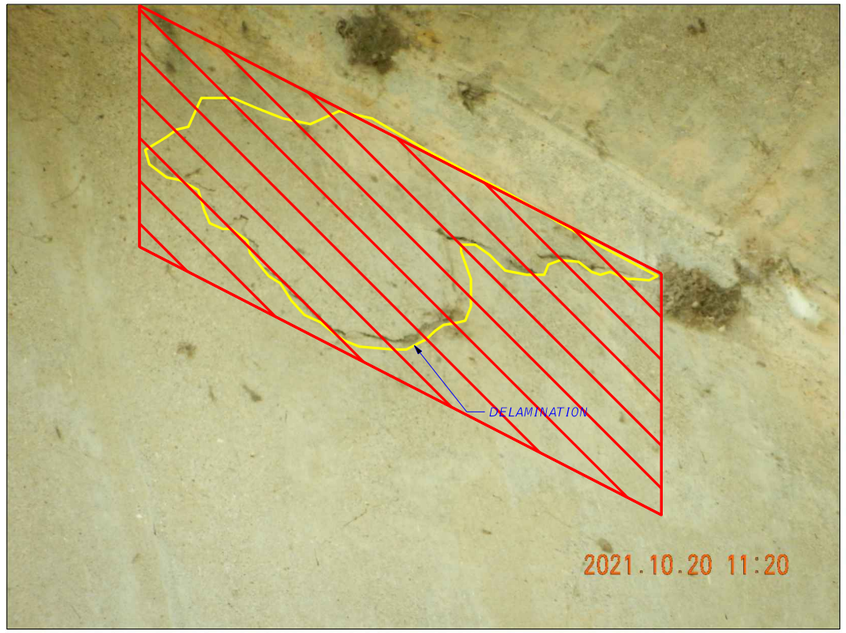
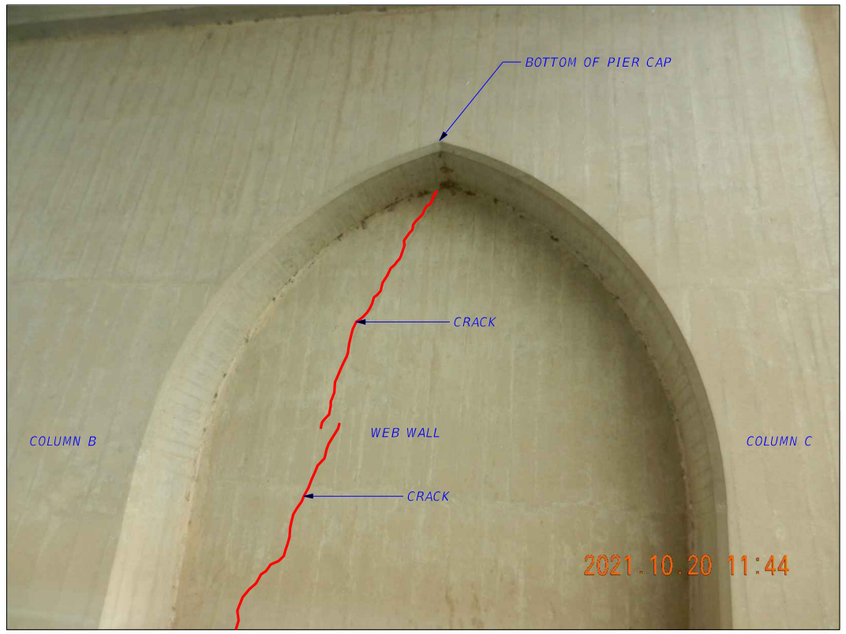


CRACK W/ DELAM/SPALL IN WEB WALL BTWN COLUMNS A & B AT PIER 1

REPAIR AS INTERMEDIATE SPALL



CRACK IN WEST FACE OF WEB WALL AT PIER 2

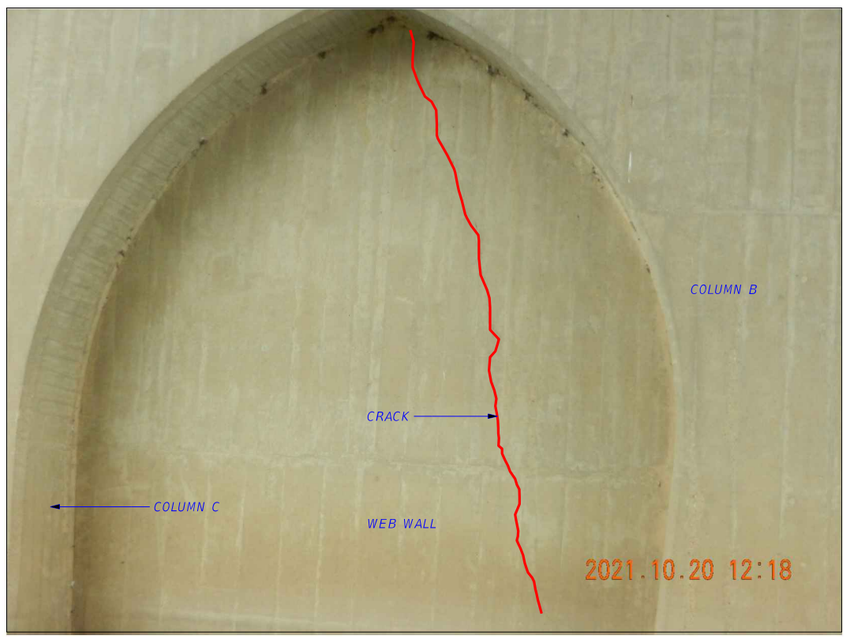
CONCRETE CRACK REPAIR (EPOXY INJECTION)

GENERAL NOTES:

1. PHOTOS SHOWN ARE REPRESENTATIVE ONLY AND ARE NOT ALL-INCLUSIVE. FIELD VERIFY LOCATIONS AND EXTENT OF REPAIRS WITH THE ENGINEER PRIOR TO ORDERING MATERIALS.
2. SEE PIER REPAIR SHEETS FOR ADDITIONAL NOTES AND REQUIREMENTS.

CRACK IN W FACE OF WEB WALL & N FACE COLUMN C AT PIER 2

CONCRETE CRACK REPAIR (EPOXY INJECTION)



INCLINED CRACK IN EAST FACE OF WEB WALL AT PIER 2

CONCRETE CRACK REPAIR (EPOXY INJECTION)

STATE OF TEXAS
JAMES EDWARD BROWNE
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LICENSED PROFESSIONAL ENGINEER

7/10/2024

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US 377
PIER REPAIR PHOTOS

WEST FORK TRINITY RIVER
NBI No. 02-220-0081-01-001

FED.RD. DIV. NO.	FEDERAL AID PROJECT NO.		SHEET NO.
6	SEE TITLE SHEET		59
STATE	DISTRICT	COUNTY	
TEXAS	FTW	TARRANT	
CONTROL	SECTION	JOB	HIGHWAY
0081	01	050	US 377

DATE: 7/10/2024 TIME: 7:24:37 AM $PLTDRVSS
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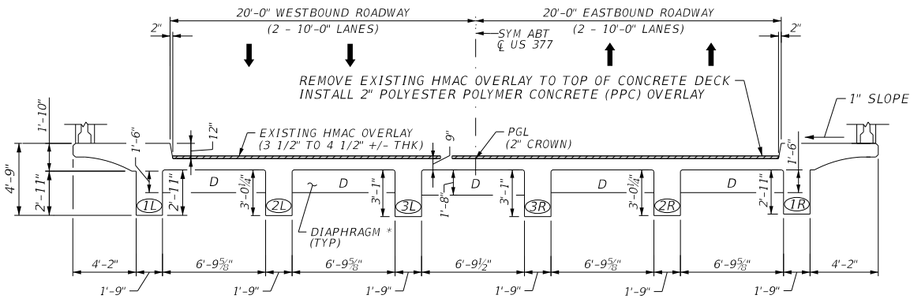
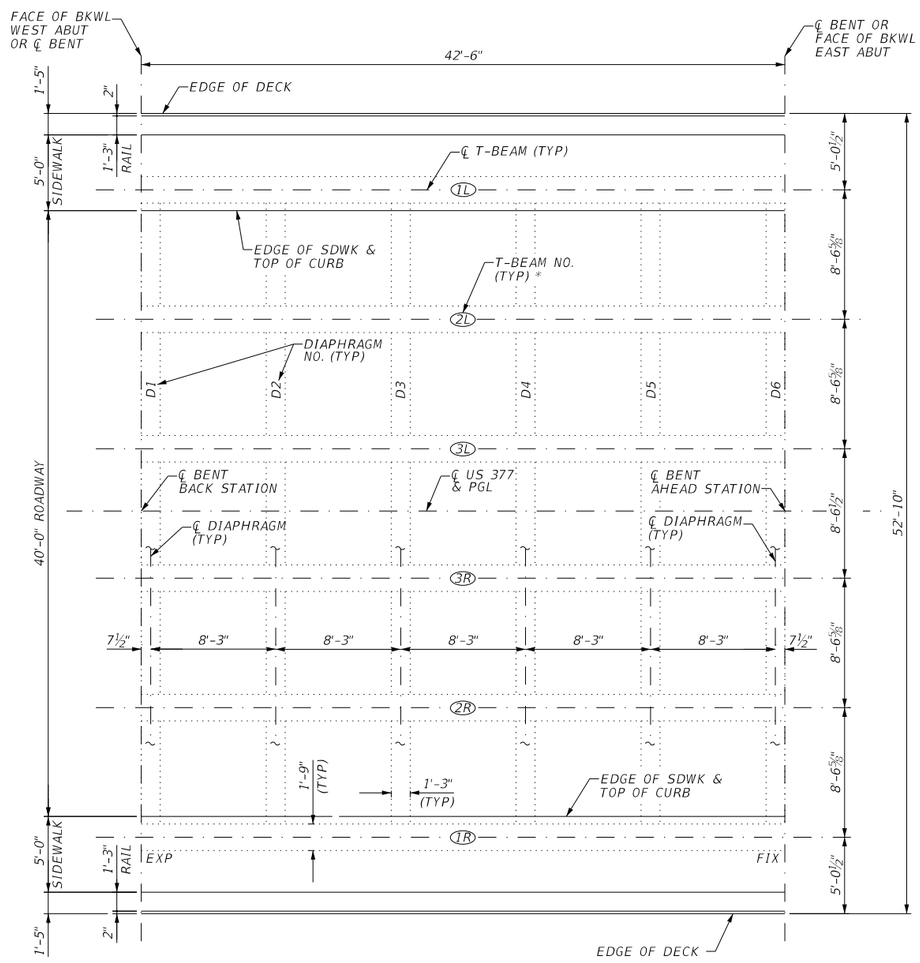


* NOTE: SEE FRAMING PLAN FOR DIAPHRAGM NOS.

TYPICAL SECTION - SPANS 1-6 & 10-16



NOTE: T-BEAM NOS. & DIAPHRAGM NOS. ARE REFERENCED ON "T-BEAM SPANS REPAIR PHOTOS" SHEETS

TYPICAL T-BEAM FRAMING PLAN - SPANS 1-6 & 10-16

ESTIMATED REPAIR QUANTITIES					
ITEM-SERIES	428-7001	429-7003	429-7005	429-7007	780-7002
DESCRIPTION	PENETRATING CONCRETE SURFACE TREATMENT (1)	CONC STRUCTURE REPAIR (DECK REPAIR (PART DEPTH)) (2)	CONC STRUCTURE REPAIR (DECK REPAIR (FULL DEPTH)) (3)	CONC STRUCTURE REPAIR (VERTICAL & OVERHEAD)	CONCRETE CRACK REPAIR (DISCRETE) (INJECT)
SPAN - UNITS	SY	SF	SF	SF	LF
1	71			25	45
2	71			25	35
3	71		44	25	25
4	71			25	45
5	71		22	25	75
6	71			25	75
10	71			25	75
11	71			25	25
12	71			25	25
13	71			25	25
14	71			25	25
15	71			25	25
16	71			25	25
TOTAL	923	3,315	66	325	525

NOTES:

(1) FOR LIMITS OF PENETRATING CONCRETE SURFACE TREATMENT REFER TO SHEET "CONSTRUCTION PHASING" SHEET 2 OF 2.

(2) IT MAY BE NECESSARY TO CONSTRUCT PARTIAL DEPTH DECK REPAIR PRIOR TO INSTALLING THE POLYESTER POLYMER CONCRETE (PPC) OVERLAY. CLEAN THE TOP OF DECK AFTER THE EXISTING ASPHALT OVERLAY HAS BEEN REMOVED AND INSPECT (TOP OF DECK) FOR DELAMINATIONS AND SPALLS. LAYOUT TENTATIVE DECK REPAIR AREAS (SEE GENERAL NOTE 6). DELAMINATIONS AND SPALLS UP TO ½" DO NOT REQUIRE PARTIAL DEPTH DECK REPAIR AND CAN BE FILLED WITH PPC OVERLAY MATERIAL. DELAMINATIONS AND SPALLS GREATER THAN ½" IN DEPTH WILL REQUIRE PARTIAL DEPTH DECK REPAIR.

(3) ESTIMATED QUANTITY IS FOR FULL DEPTH REPAIR OF DECK OVERHANG AND SIDEWALK AT LOCATIONS SHOWN ON THE BRIDGE LAYOUT AND AS DIRECTED BY THE ENGINEER. REFER TO SHEET "CONCRETE DECK REPAIR (FULL DEPTH)" FOR DIMENSIONS AND REINFORCING DETAILS FROM THE 1932 DESIGN PLANS.

GENERAL NOTES:

1. REPAIR QUANTITIES ARE BASED ON REPAIR INSPECTION PERFORMED IN OCTOBER AND DECEMBER 2021 USING VISUAL INSPECTION FROM GROUND LEVEL AND WATER LEVEL
2. REFER TO "T-BEAM SPAN REPAIR PHOTOS" SHEETS FOR DAMAGE LOCATIONS AND DESCRIPTIONS. REPAIR DEFICIENCIES SHOWN IN PHOTOS AND OTHER DEFICIENCIES OF SIMILAR CONDITION AT LOCATIONS AS DIRECTED BY THE ENGINEER.
3. REPAIR AT ENDS OF T-BEAMS IS LIMITED TO EPOXY CRACK INJECTION AND MINOR SPALL REPAIR. NOTIFY THE ENGINEER IF DAMAGE EXTENDS BEYOND REINFORCING STEEL.
4. CONCRETE REPAIR WORK SHALL MEET THE REQUIREMENTS OF:
   (A) ITEM 429, "CONCRETE STRUCTURE REPAIR",
   (B) TxDOT CONCRETE REPAIR MANUAL, CHAPTER 3, SECTIONS 1 AND 2,
   (C) "CONCRETE STRUCTURE REPAIR DETAILS" SHEETS,
   (D) ITEM 780, "CONCRETE CRACK REPAIR", AND
   (E) TxDOT CONCRETE REPAIR MANUAL, CHAPTER 3, SECTION 5.
5. A COPY OF THE TxDOT CONCRETE REPAIR MANUAL MUST BE AVAILABLE ON SITE DURING ALL CONCRETE REPAIR OPERATIONS.
6. THE CONTRACTOR SHALL LAYOUT TENTATIVE REPAIR AREAS FOLLOWING THE PROCEDURE SHOWN ON SHEETS "CONCRETE STRUCTURE REPAIR DETAILS". CONFIRM REPAIR LOCATIONS AND QUANTITIES WITH THE ENGINEER PRIOR TO ORDERING MATERIALS OR BEGINNING REPAIR.
7. SEE SHEETS "BRIDGE LAYOUTS", "CONSTRUCTION PHASING" "CLEANING AND SEALING EXISTING BRIDGE JOINTS", "ARMOR JOINT REPAIR" AND "BRIDGE DECK OVERLAY NOTES" FOR ADDITIONAL REPAIR WORK ON T-BEAM SPANS.

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7/10/2024

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Texas Department of Transportation

US 377
T-BEAM SPAN REPAIR
SPANS 1-6 & 10-16

WEST FORK TRINITY RIVER
NBI No. 02-220-0081-01-001

FED.RD. DIV. NO.	FEDERAL AID PROJECT NO.		SHEET NO.
6	SEE TITLE SHEET		60
STATE	DISTRICT	COUNTY	
TEXAS	FTW	TARRANT	
CONTROL	SECTION	JOB	HIGHWAY
0081	01	050	US 377

DATE: 7/10/2024 TIME: 7:24:43 AM $PLTDRV$$
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CRACK IN NORTH FACE OF T-BEAM 1L IN SPAN 1

CONCRETE CRACK REPAIR (EPOXY INJECTION)

DIAGONAL CRACK IN NORTH SIDE OF T-BEAM 1L IN SPAN 1 (AT ABUT 1)

CONCRETE CRACK REPAIR (EPOXY INJECTION)

GENERAL NOTES:

1. PHOTOS SHOWN ARE REPRESENTATIVE ONLY AND ARE NOT ALL-INCLUSIVE. FIELD VERIFY LOCATIONS AND EXTENT OF REPAIRS WITH THE ENGINEER PRIOR TO ORDERING MATERIALS.
2. SEE T-BEAM SPAN REPAIR SHEETS FOR ADDITIONAL NOTES AND REQUIREMENTS.

CRACK AT NORTH SIDE OF T-BEAM 2L IN SPAN 1 (ABUT 1)

CONCRETE CRACK REPAIR (EPOXY INJECTION)

DELAMINATION (SPALL) UNDERSIDE OF DIAPHRAGM D6 IN SPAN 1 (BENT1)

REPAIR AS INTERMEDIATE SPALL

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US 377
T-BEAM SPANS
REPAIR PHOTOS

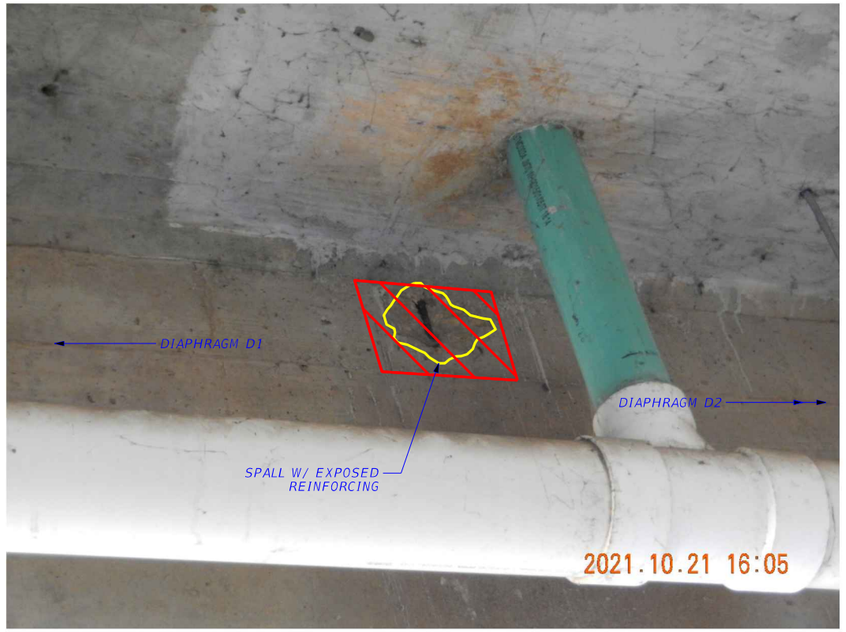
WEST FORK TRINITY RIVER
NBI No. 02-220-0081-01-001

SHEET 1 OF 3

FED.RD. DIV. NO.	FEDERAL AID PROJECT NO.		SHEET NO.
6	SEE TITLE SHEET		61
STATE	DISTRICT	COUNTY	
TEXAS	FTW	TARRANT	
CONTROL	SECTION	JOB	HIGHWAY
0081	01	050	US 377

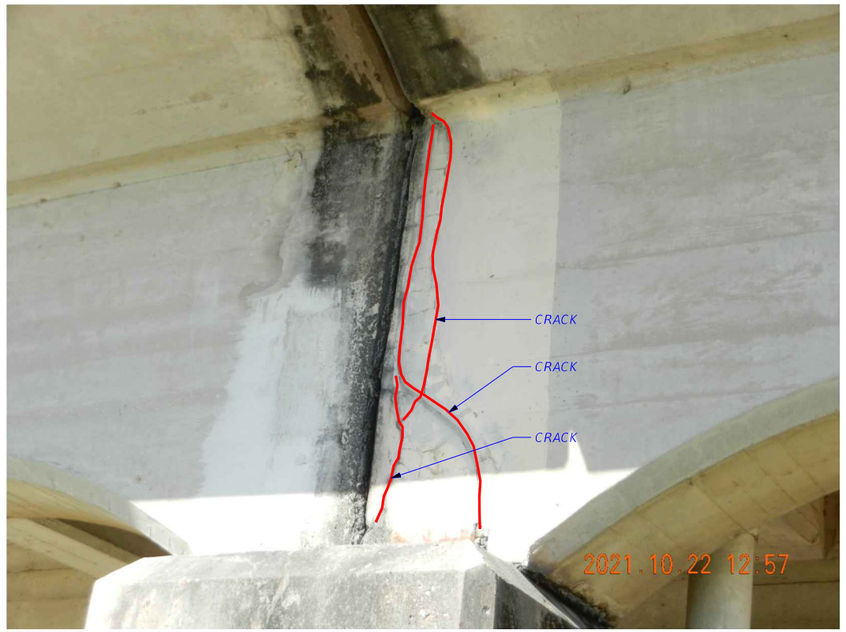
GENERAL NOTES:

1. PHOTOS SHOWN ARE REPRESENTATIVE ONLY AND ARE NOT ALL-INCLUSIVE. FIELD VERIFY LOCATIONS AND EXTENT OF REPAIRS WITH THE ENGINEER PRIOR TO ORDERING MATERIALS.
2. SEE T-BEAM SPAN REPAIR SHEETS FOR ADDITIONAL NOTES AND REQUIREMENTS.



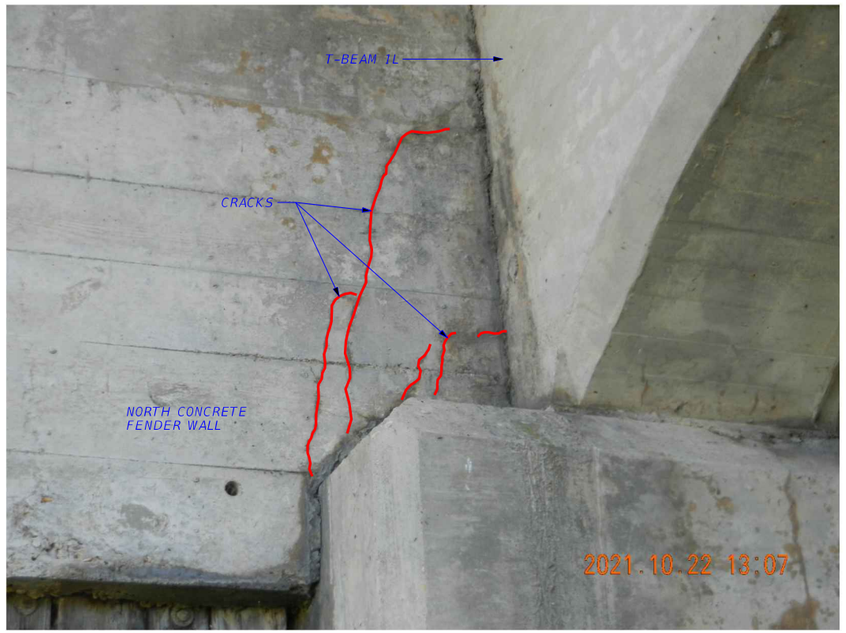
SPALL W/ EXPOSED REINFORCING IN FACE T-BEAM 1R IN SPAN 1

REPAIR AS INTERMEDIATE SPALL



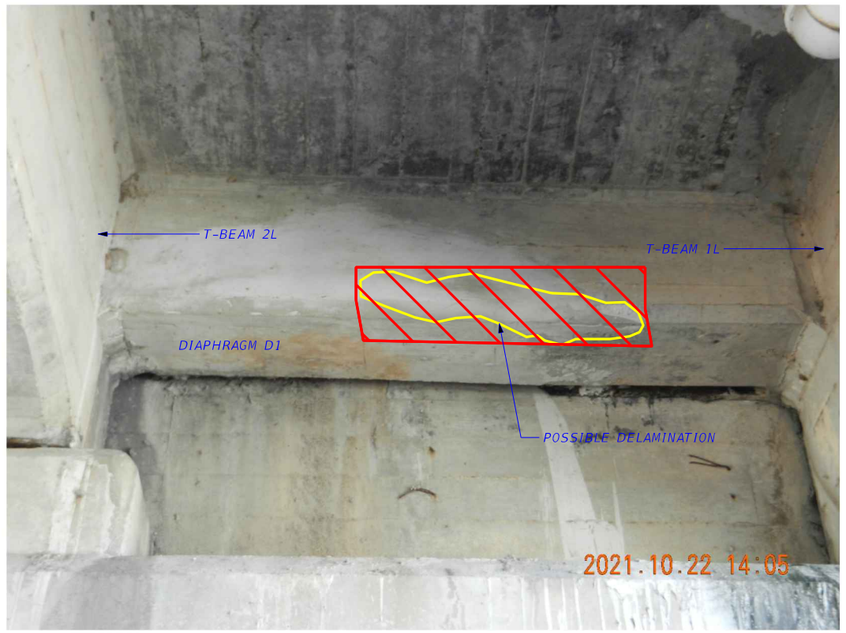
CRACKS AT SOUTH SIDE OF T-BEAM 1R IN SPAN 2 (BENT 1)

CONCRETE CRACK REPAIR (EPOXY INJECTION)



CRACKS IN W FACE OF FENDER WALL NORTH SIDE IN SPAN 2 (BENT 2)

CONCRETE CRACK REPAIR (EPOXY INJECTION)



CRACK W/ DELAMINATION (SPALL) IN DIAPHRAGM D1 IN SPAN 3

REPAIR AS INTERMEDIATE SPALL

STATE OF TEXAS
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Texas Department of Transportation

US 377
T-BEAM SPANS
REPAIR PHOTOS

WEST FORK TRINITY RIVER
NBI No. 02-220-0081-01-001

SHEET 2 OF 3

FED.RD. DIV. NO.	FEDERAL AID PROJECT NO.		SHEET NO.
6	SEE TITLE SHEET		62
STATE	DISTRICT	COUNTY	
TEXAS	FTW	TARRANT	
CONTROL	SECTION	JOB	HIGHWAY
0081	01	050	US 377

DATE: 7/10/2024 TIME: 7:24:58 AM $PLTDRVSS
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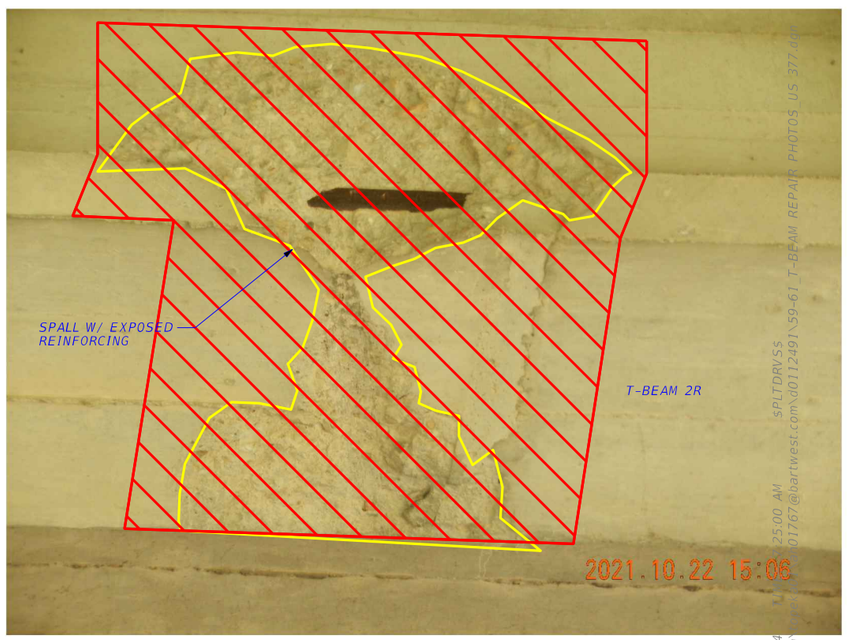
HONEYCOMB UNDERSIDE OF T-BEAM IN SPAN 3

REPAIR AS INTERMEDIATE SPALL
(REF FIG 3-3, TxDOT CRM)

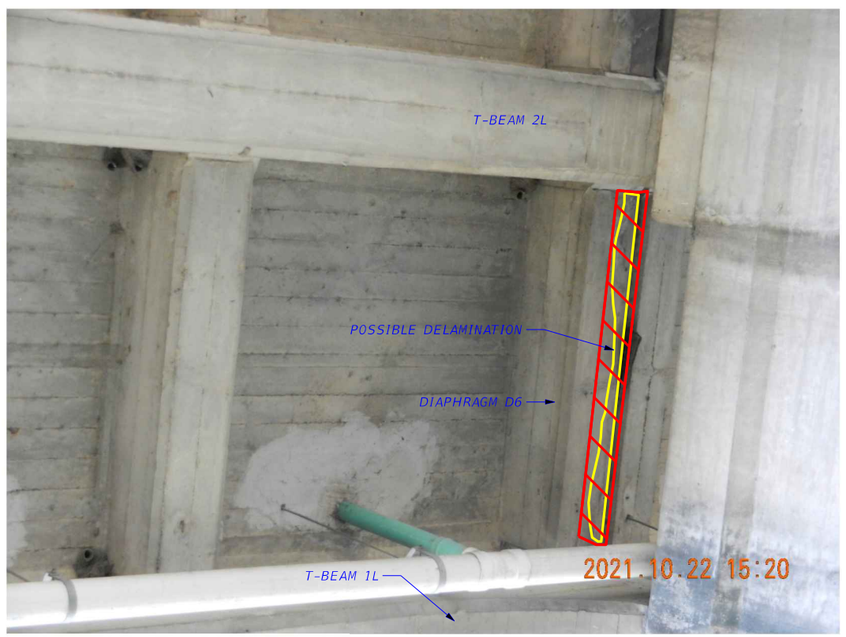
DELAMINATION/SPALLS S SIDE OF T-BEAM 2L IN SPAN 4

REPAIR AS INTERMEDIATE SPALL



SPALL W/ EXPOSED REINFORCING S SIDE T-BEAM 2R IN SPAN 4

REPAIR AS INTERMEDIATE SPALL



CRACKS W/ DELAM/SPALL UNDERSIDE OF DIAPHRAGM D6 IN SPAN 5

REPAIR AS INTERMEDIATE SPALL

GENERAL NOTES:

1. PHOTOS SHOWN ARE REPRESENTATIVE ONLY AND ARE NOT ALL-INCLUSIVE. FIELD VERIFY LOCATIONS AND EXTENT OF REPAIRS WITH THE ENGINEER PRIOR TO ORDERING MATERIALS.
2. SEE T-BEAM SPAN REPAIR SHEETS FOR ADDITIONAL NOTES AND REQUIREMENTS.

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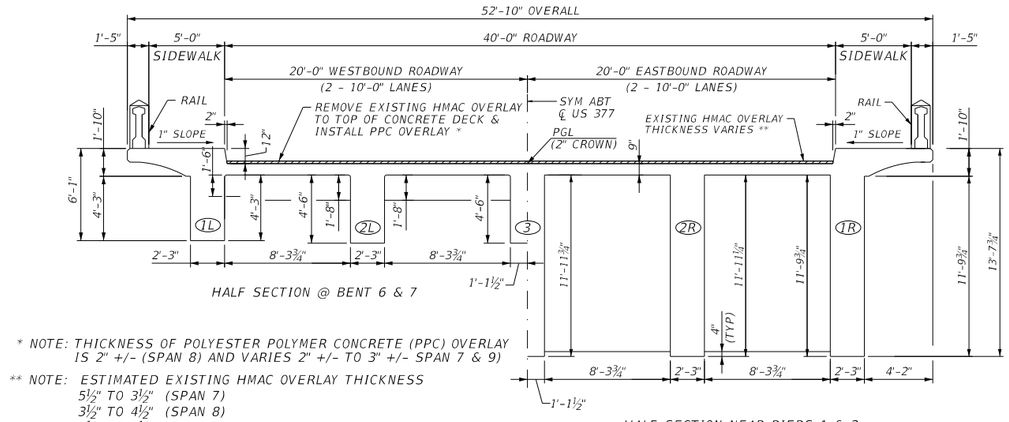
US 377
T-BEAM SPANS
REPAIR PHOTOS

WEST FORK TRINITY RIVER
NBI No. 02-220-0081-01-001

SHEET 3 OF 3

FED.RD. DIV. NO.	FEDERAL AID PROJECT NO.		SHEET NO.
6	SEE TITLE SHEET		63
STATE	DISTRICT	COUNTY	
TEXAS	FTW	TARRANT	
CONTROL	SECTION	JOB	HIGHWAY
0081	01	050	US 377



HALF SECTION @ BENT 6 & 7

HALF SECTION NEAR PIERS 1 & 2

* NOTE: THICKNESS OF POLYESTER POLYMER CONCRETE (PPC) OVERLAY IS 2" +/- (SPAN 8) AND VARIES 2" +/- TO 3" +/- SPAN 7 & 9)

** NOTE: ESTIMATED EXISTING HMAC OVERLAY THICKNESS
5½" TO 3½" (SPAN 7)
3½" TO 4½" (SPAN 8)
3½" TO 5½" (SPAN 9)

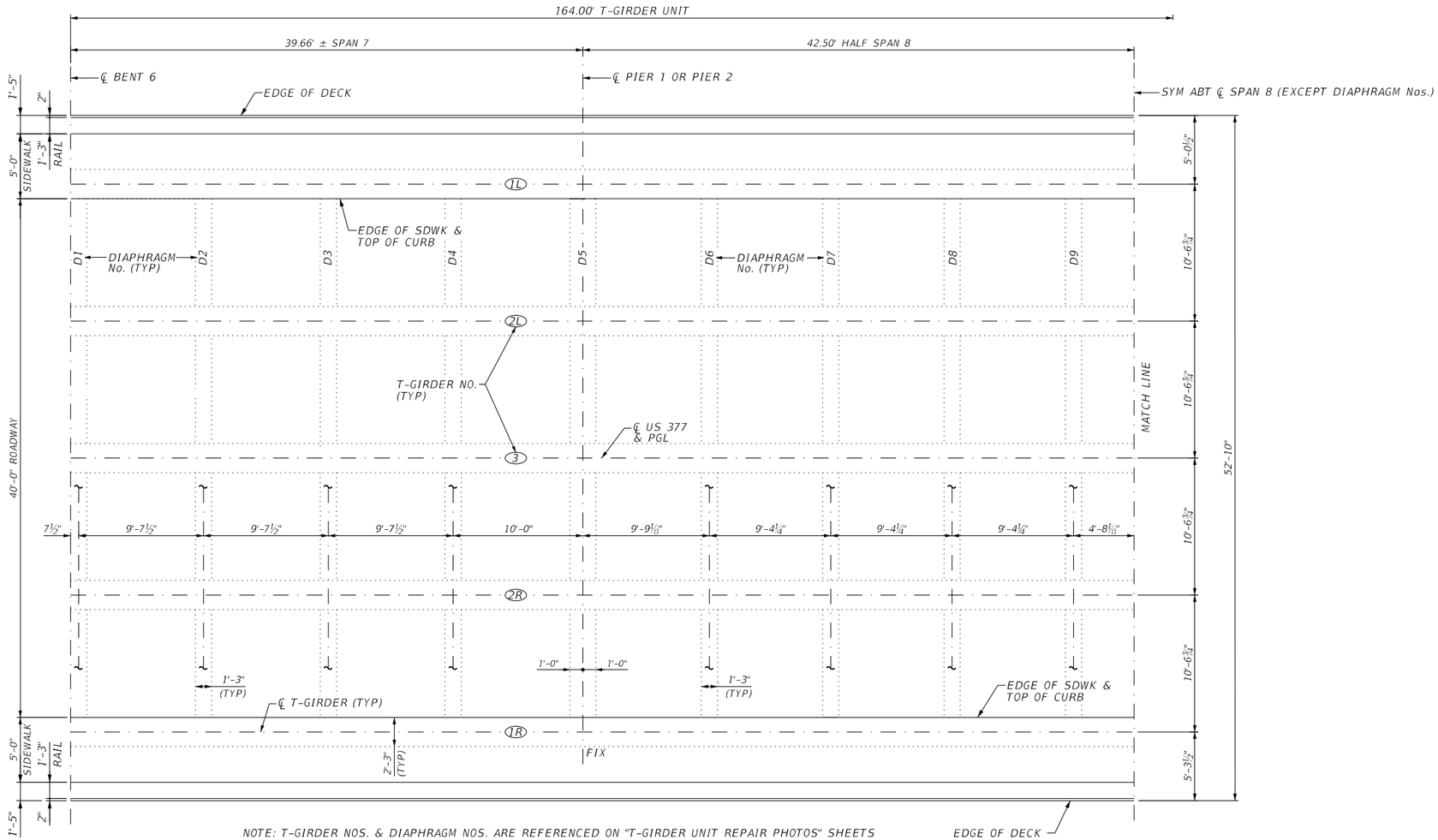
TYPICAL SECTION - SPANS 7-9

ESTIMATED REPAIR QUANTITIES				
ITEM-SERIES	428-7001	429-7003	429-7007	780-7002
DESCRIPTION	PENETRATING CONCRETE SURFACE TREATMENT (1)	CONC STRUCTURE REPAIR (DECK REPAIR (PART DEPTH)) (2)	CONC STRUCTURE REPAIR (VERTICAL & OVERHEAD)	CONCRETE CRACK REPAIR (DISCRETE) (INJECT) 4
SPAN - UNITS	SY	SF	SF	LF
7	124		40	25
8	266		140	100
9	124		40	25
TOTAL	514	985	220	150

NOTES:

(1) FOR LIMITS OF PENETRATING CONCRETE SURFACE TREATMENT REFER TO SHEET "CONSTRUCTION PHASING" SHEET 2 OF 2.

(2) IT MAY BE NECESSARY TO CONSTRUCT PARTIAL DEPTH DECK REPAIR PRIOR TO INSTALLING THE POLYESTER POLYMER CONCRETE (PPC) OVERLAY. CLEAN THE TOP OF DECK AFTER THE EXISTING ASPHALT OVERLAY HAS BEEN REMOVED AND INSPECT (TOP OF DECK) FOR DELAMINATIONS AND SPALLS. LAYOUT TENTATIVE DECK REPAIR AREAS (SEE GENERAL NOTE 5 ON SHEET 2 OF 2). DELAMINATIONS AND SPALLS UP TO 1/2" DO NOT REQUIRE PARTIAL DEPTH DECK REPAIR AND CAN BE FILLED WITH PPC OVERLAY MATERIAL. DELAMINATIONS AND SPALLS GREATER THAN 1/2" IN DEPTH WILL REQUIRE PARTIAL DEPTH DECK REPAIR.



NOTE: T-GIRDER NOS. & DIAPHRAGM NOS. ARE REFERENCED ON "T-GIRDER UNIT REPAIR PHOTOS" SHEETS

T-GIRDER FRAMING PLAN - SPANS 7 & 8

STATE OF TEXAS
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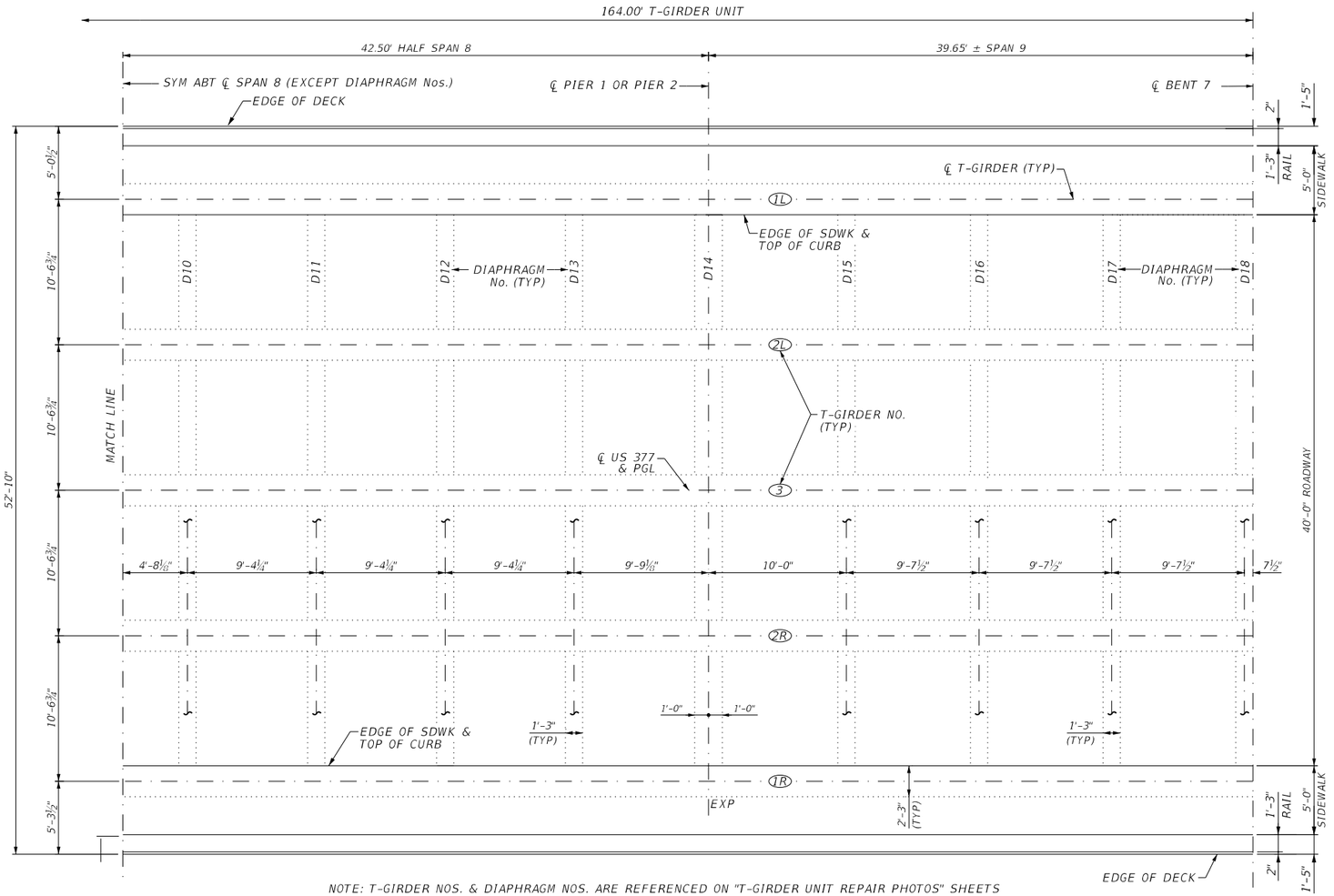
US 377
T-GIRDER UNIT REPAIR
SPANS 7, 8 & 9

WEST FORK TRINITY RIVER
NBI No. 02-220-0081-01-001

SHEET 1 OF 2

FED.RD. DIV. NO.	FEDERAL AID PROJECT NO.		SHEET NO.
6	SEE TITLE SHEET		64
STATE	DISTRICT	COUNTY	
TEXAS	FTW	TARRANT	
CONTROL	SECTION	JOB	HIGHWAY
0081	01	050	US 377



NOTE: T-GIRDER NOS. & DIAPHRAGM NOS. ARE REFERENCED ON "T-GIRDER UNIT REPAIR PHOTOS" SHEETS

T-GIRDER FRAMING PLAN - SPANS 8 & 9

GENERAL NOTES:

1. QUANTITIES ARE BASED ON REPAIR INSPECTION PERFORMED IN OCTOBER AND DECEMBER 2021 USING VISUAL INSPECTION FROM GROUND LEVEL AND WATER LEVEL.
2. REFER TO "T-GIRDER UNIT REPAIR PHOTOS" SHEETS FOR DAMAGE LOCATIONS AND DESCRIPTIONS. REPAIR DEFICIENCIES SHOWN IN PHOTOS AND OTHER DEFICIENCIES OF SIMILAR CONDITION AT LOCATIONS AS DIRECTED BY THE ENGINEER.
3. CONCRETE REPAIR WORK SHALL MEET THE REQUIREMENTS OF:
   (A) ITEM 429, "CONCRETE STRUCTURE REPAIR",
   (B) TxDOT CONCRETE REPAIR MANUAL, CHAPTER 3, SECTIONS 1 AND 2,
   (C) "CONCRETE STRUCTURE REPAIR DETAILS" SHEETS,
   (D) ITEM 780, "CONCRETE CRACK REPAIR", AND
   (E) TxDOT CONCRETE REPAIR MANUAL, CHAPTER 3, SECTION 5.
4. A COPY OF THE TxDOT CONCRETE REPAIR MANUAL MUST BE AVAILABLE ON SITE DURING ALL CONCRETE REPAIR OPERATIONS.
5. THE CONTRACTOR SHALL LAYOUT TENTATIVE REPAIR AREAS FOLLOWING THE PROCEDURE SHOWN ON SHEETS "CONCRETE STRUCTURE REPAIR DETAILS". CONFIRM REPAIR LOCATIONS AND QUANTITIES WITH THE ENGINEER PRIOR TO ORDERING MATERIALS OR BEGINNING REPAIR.
6. SEE SHEETS "BRIDGE LAYOUTS", " CONSTRUCTION PHASING", "CONCRETE RAIL REPAIR (IN-KIND)", "ARMOR JOINT REPAIR" AND "BRIDGE DECK OVERLAY NOTES" FOR ADDITIONAL REPAIR WORK ON THE T-GIRDER UNIT.

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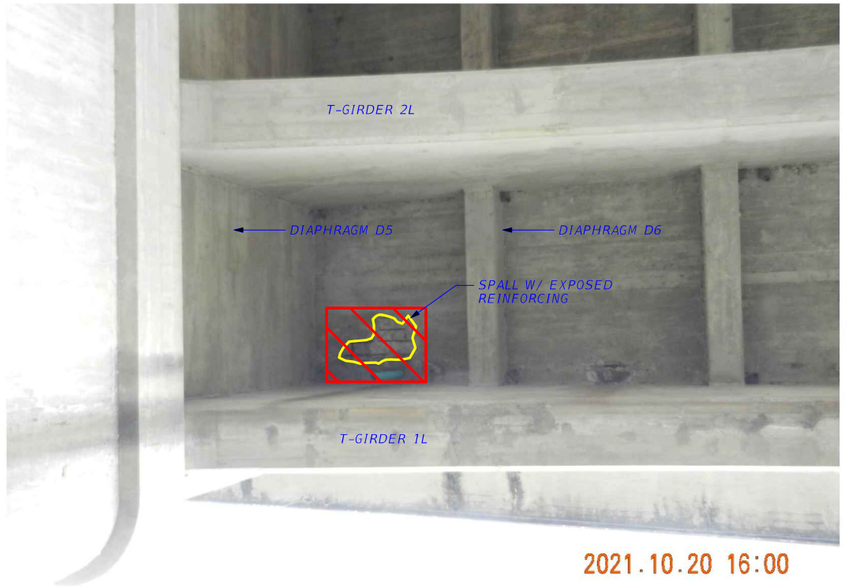
Texas Department of Transportation

US 377
T-GIRDER UNIT REPAIR
SPANS 7, 8 & 9

WEST FORK TRINITY RIVER
NBI No. 02-220-0081-01-001

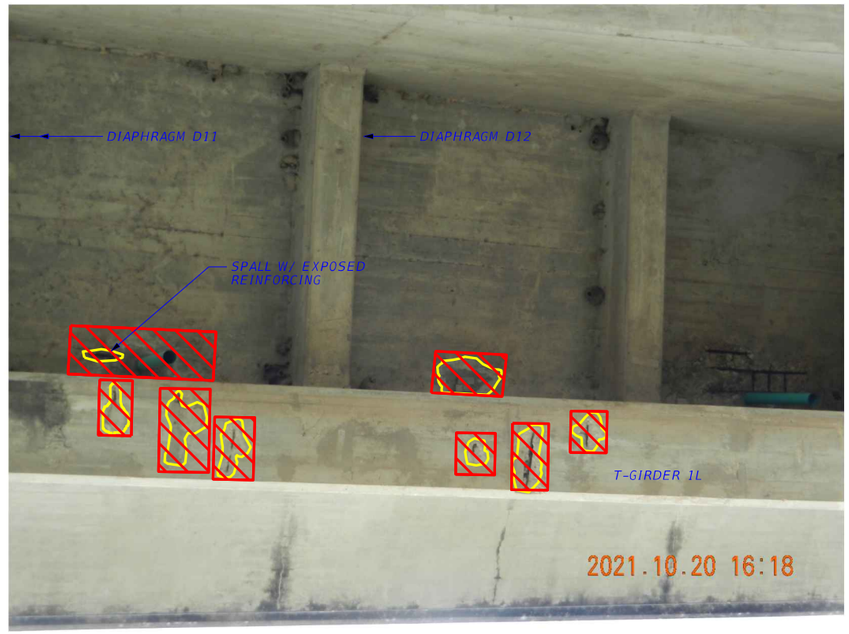
SHEET 2 OF 2

FED.RD. DIV. NO.	FEDERAL AID PROJECT NO.		SHEET NO.
6	SEE TITLE SHEET		65
STATE	DISTRICT	COUNTY	
TEXAS	FTW	TARRANT	
CONTROL	SECTION	JOB	HIGHWAY
0081	01	050	US 377



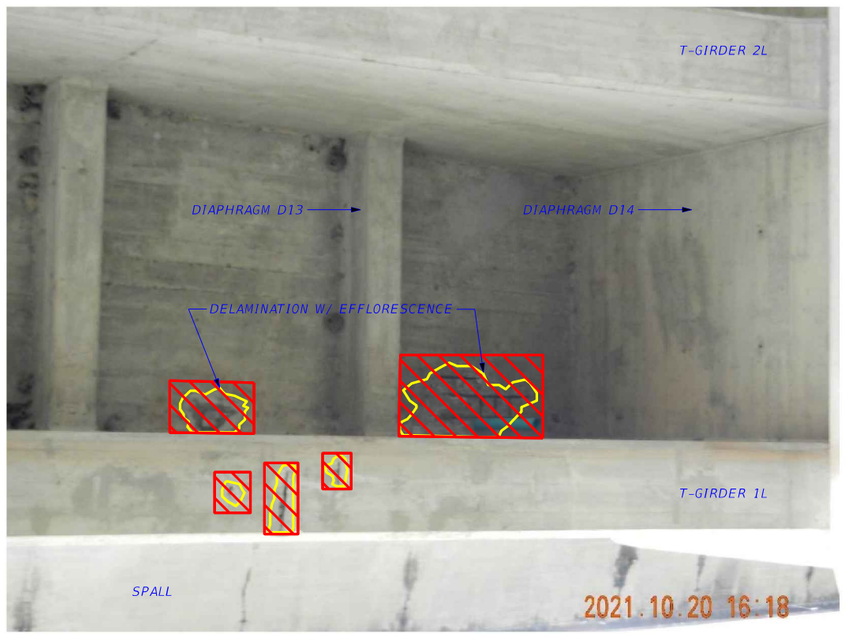
SPALL UNDERSIDE OF DECK W/ EXPOSED REINFORCING IN SPAN 8

REPAIR AS INTERMEDIATE SPALL



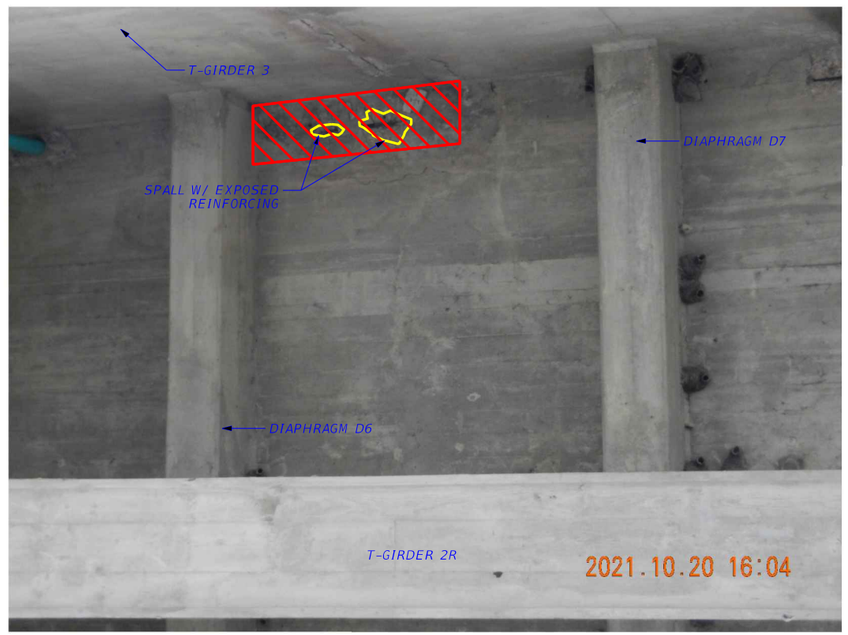
SPALL UNDERSIDE OF DECK W/ EXPOSED REINFORCING IN SPAN 8

REPAIR AS INTERMEDIATE SPALL



SPALLS W/ EXPOSED REINFORCING AT UNDERSIDE OF DECK IN SPAN 8

REPAIR AS INTERMEDIATE SPALL



SPALL W/ EXP REINFORCING UNDERSIDE OF DECK IN SPAN 8

REPAIR AS INTERMEDIATE SPALL

GENERAL NOTES:

1. PHOTOS SHOWN ARE REPRESENTATIVE ONLY AND ARE NOT ALL-INCLUSIVE. FIELD VERIFY LOCATIONS AND EXTENT OF REPAIRS WITH THE ENGINEER PRIOR TO ORDERING MATERIALS.
2. SEE T-GIRDER UNIT REPAIR SHEETS FOR ADDITIONAL NOTES AND REQUIREMENTS.

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US 377
T-GIRDER UNIT REPAIR PHOTOS

WEST FORK TRINITY RIVER
NBI No. 02-220-0081-01-001

SHEET 1 OF 3

FED.RD. DIV. NO.	FEDERAL AID PROJECT NO.		SHEET NO.
6	SEE TITLE SHEET		66
STATE	DISTRICT	COUNTY	
TEXAS	FTW	TARRANT	
CONTROL	SECTION	JOB	HIGHWAY
0081	01	050	US 377

SPALL W/ EXPOSED REINFORCING UNDERSIDE OF DECK IN SPAN 8

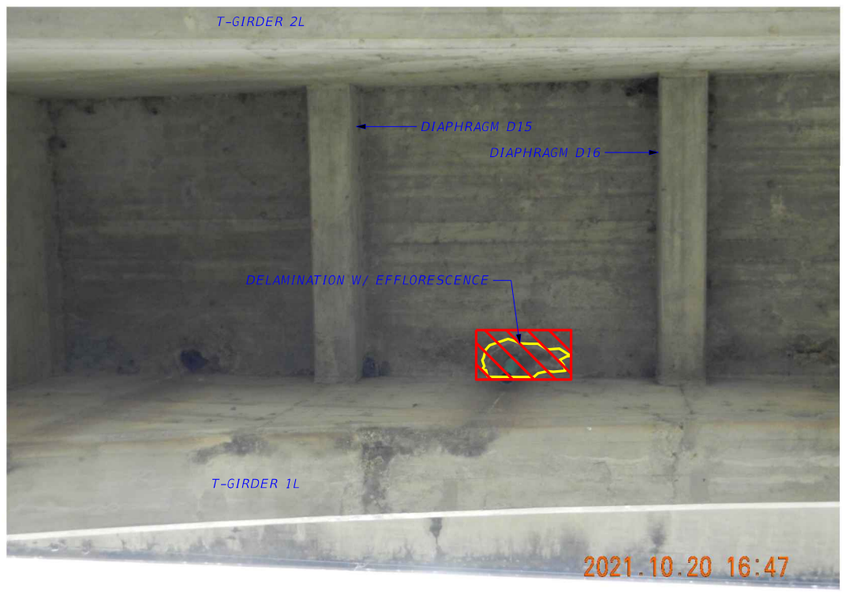
REPAIR AS INTERMEDIATE SPALL

SPALL W/ EXPOSED REINFORCING UNDERSIDE OF DECK IN SPAN 8

REPAIR AS INTERMEDIATE SPALL

DELAMINATION (SPALL) AT UNDERSIDE OF DECK IN SPAN 9

REPAIR AS INTERMEDIATE SPALL



PREVIOUS DECK REPAIR DELAMINATING AT UNDERSIDE OF DECK IN SPAN 9

REPAIR AS INTERMEDIATE SPALL

GENERAL NOTES:

1. PHOTOS SHOWN ARE REPRESENTATIVE ONLY AND ARE NOT ALL-INCLUSIVE. FIELD VERIFY LOCATIONS AND EXTENT OF REPAIRS WITH THE ENGINEER PRIOR TO ORDERING MATERIALS.
2. SEE T-GIRDER UNIT REPAIR SHEETS FOR ADDITIONAL NOTES AND REQUIREMENTS.

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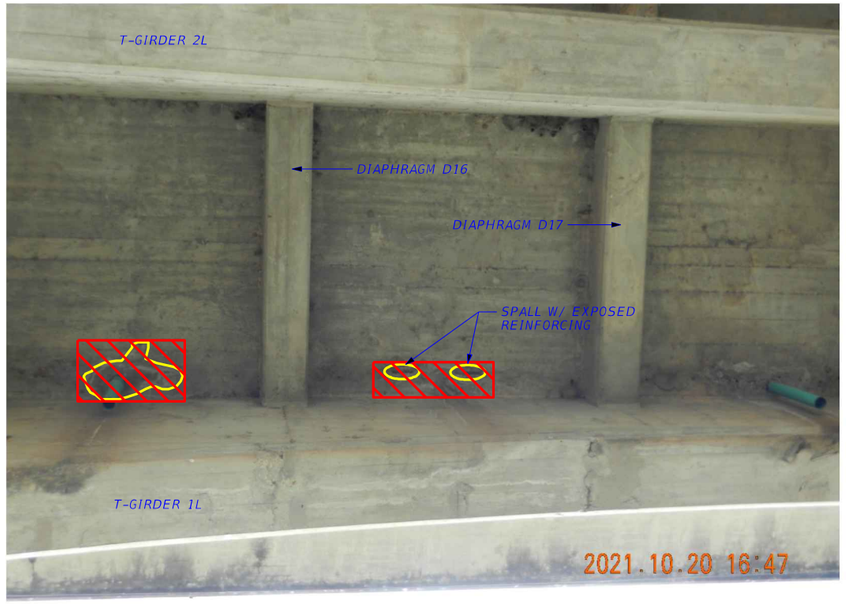
US 377
T-GIRDER UNIT REPAIR PHOTOS

WEST FORK TRINITY RIVER
NBI No. 02-220-0081-01-001

SHEET 2 OF 3

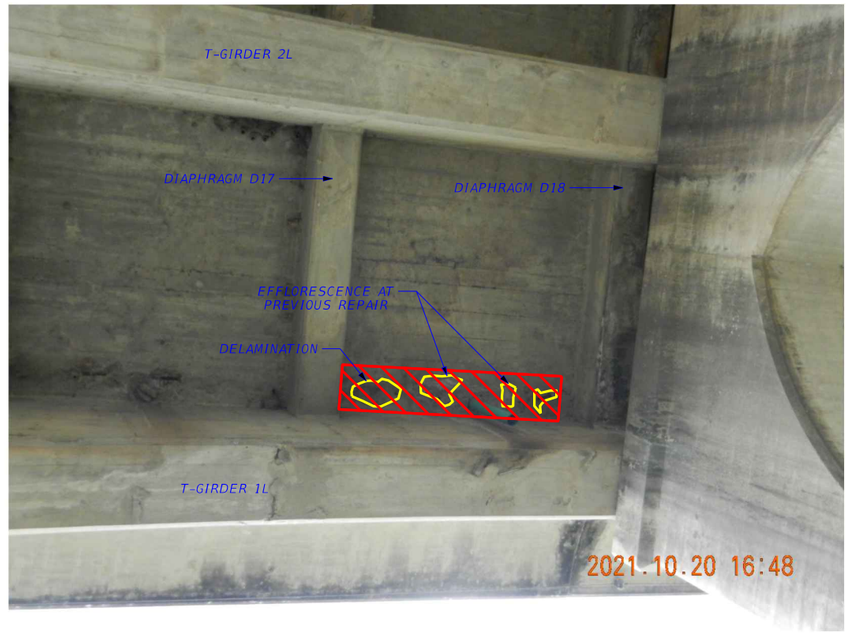
FED.RD. DIV. NO.	FEDERAL AID PROJECT NO.		SHEET NO.
6	SEE TITLE SHEET		67
STATE	DISTRICT	COUNTY	
TEXAS	FTW	TARRANT	
CONTROL	SECTION	JOB	HIGHWAY
0081	01	050	US 377

DATE: 7/10/2024 TIME: 7:25:21 AM $PLTDRVSS
FILE: c:\pwdata\topeka01\alh01767@bartwest.com\d0112491\64-66 T-GIRDER REPAIR PHOTOS US 377.dgn



SPALLS W/ EXPOSED REINFORCING AT UNDERSIDE OF DECK IN SPAN 9

REPAIR AS INTERMEDIATE SPALL

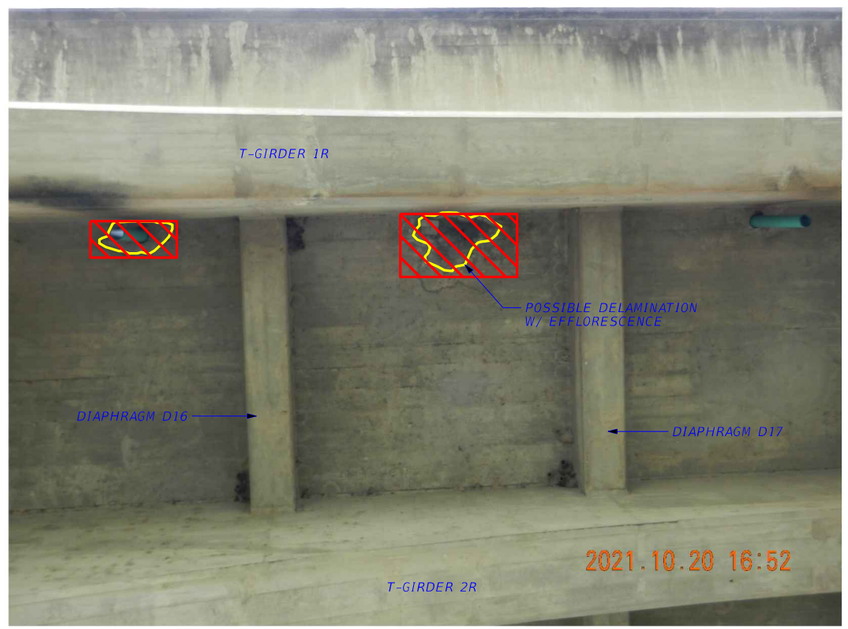


PREVIOUS REPAIR DELAMINATING AT UNDERSIDE OF DECK IN SPAN 9

REPAIR AS INTERMEDIATE SPALL

SPALL W/ EXPOSED REINFORCING AT UNDERSIDE OF DECK IN SPAN 9

REPAIR AS INTERMEDIATE SPALL



DELAMINATION (SPALL) AT UNDERSIDE OF DECK IN SPAN 9

REPAIR AS INTERMEDIATE SPALL

GENERAL NOTES:

1. PHOTOS SHOWN ARE REPRESENTATIVE ONLY AND ARE NOT ALL-INCLUSIVE. FIELD VERIFY LOCATIONS AND EXTENT OF REPAIRS WITH THE ENGINEER PRIOR TO ORDERING MATERIALS.
2. SEE T-GIRDER UNIT REPAIR SHEETS FOR ADDITIONAL NOTES AND REQUIREMENTS.

STATE OF TEXAS
JAMES EDWARD BROWNE
62207
LICENSED PROFESSIONAL ENGINEER

7/10/2024

James E. Browne

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Texas Department of Transportation

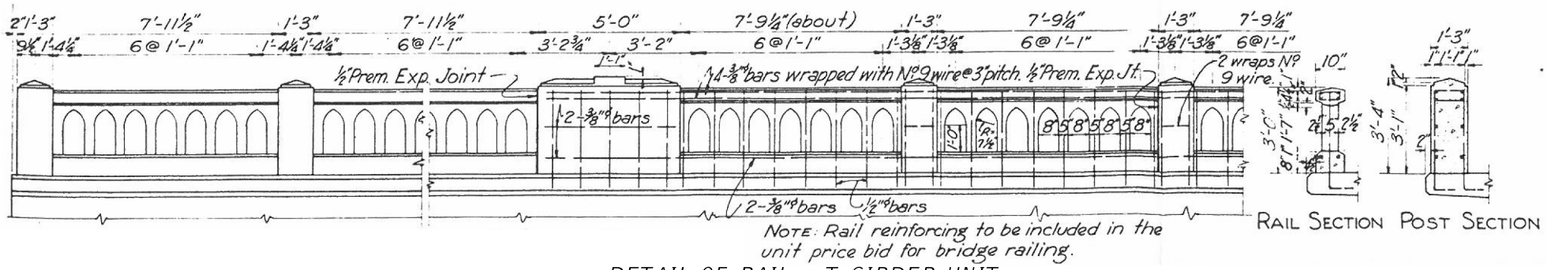
US 377
T-GIRDER UNIT REPAIR PHOTOS

WEST FORK TRINITY RIVER
NBI No. 02-220-0081-01-001

SHEET 3 OF 3

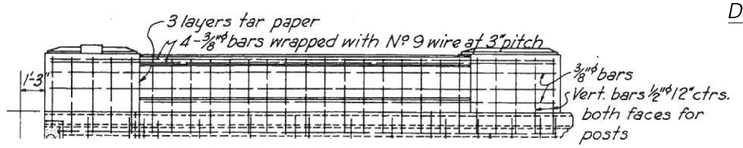
FED.RD. DIV. NO.	FEDERAL AID PROJECT NO.		SHEET NO.
6	SEE TITLE SHEET		68
STATE	DISTRICT	COUNTY	
TEXAS	FTW	TARRANT	
CONTROL	SECTION	JOB	HIGHWAY
0081	01	050	US 377

DATE: 7/10/2024 TIME: 7:25:23 AM $PLTDRVSS
FILE: c:\pwdata\topeka01\ah01767@bartlettwest.com\d0112491\64-66 T-GIRDER REPAIR PHOTOS US 377.dgn



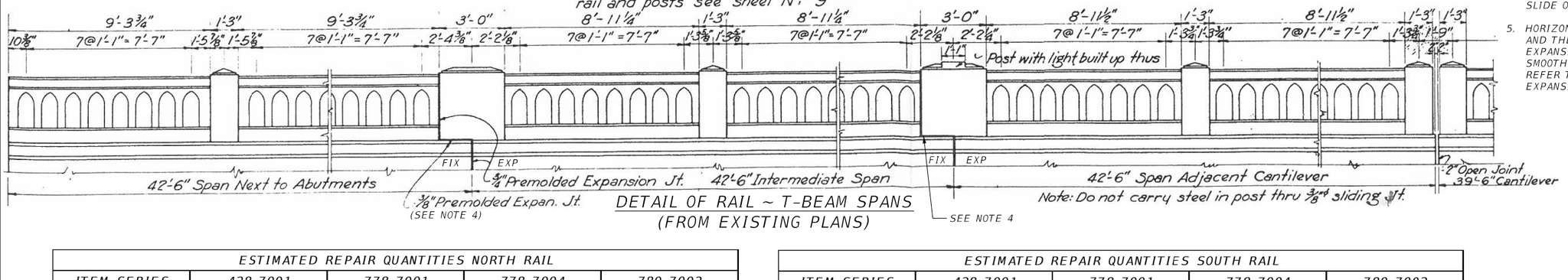
NOTE: Rail reinforcing to be included in the unit price bid for bridge railing.

DETAIL OF RAIL ~ T-GIRDER UNIT
(FROM EXISTING PLANS)



DETAIL OF RAIL ON WINGWALL
(FROM EXISTING PLANS)

Note: For sections and reinforcing of rail and posts see sheet No 9



DETAIL OF RAIL ~ T-BEAM SPANS
(FROM EXISTING PLANS)

GENERAL NOTES:

1. REPAIR QUANTITIES ARE BASED ON REPAIR INSPECTION PERFORMED IN OCTOBER AND DECEMBER 2021 USING VISUAL INSPECTION FROM GROUND LEVEL AND WATER LEVEL.
2. CONCRETE RAIL REPAIR (IN-KIND) INCLUDES PART OR ALL OF WINGWALL PARAPET, POST & WINDOW PANELS (5" X 5" POSTS), AND PEDESTALS (5'-0" X 15", 3'-0" X 15" & 15" X 15"). REFER TO "RAIL REPAIR PHOTO" SHEETS FOR DAMAGE LOCATIONS AND DESCRIPTIONS. REPAIR DEFICIENCIES SHOWN IN PHOTOS AND OTHER DEFICIENCIES OF SIMILAR CONDITION AT LOCATIONS AS DIRECTED BY THE ENGINEER.
3. CONCRETE RAIL REPLACEMENT (IN-KIND) INCLUDES PART OR ALL OF POST & WINDOW PANELS AND PEDESTALS AT LOCATIONS SHOWN ON THE BRIDGE LAYOUTS. CONCRETE RAIL REPLACEMENT (IN-KIND) SHALL BE CONSTRUCTED FOLLOWING THE DETAILS TAKEN FROM THE 1932 PLANS SHOWN AND SHOWN ON THIS SHEET.
4. PARTICULAR CARE SHALL BE TAKEN RECONSTRUCTING THE PEDESTALS. PEDESTALS ARE ANCHORED TO THE DECK ON THE EXPANSION SIDE OF THE DECK JOINT AND SLIDE ON THE FIXED SIDE OF THE DECK JOINT.
5. HORIZONTAL REINFORCING IN THE UPPER BEAM AND THE BASE CURB IS DISCONTINUOIS AT RAIL EXPANSION JOINTS. PROVIDE 2 - ⅞" X 24" LONG SMOOTH DOWELS AT RAIL EXPANSION JOINTS. REFER TO SHEET "CCCG (FTW) (MOD)" FOR EXPANSION JOINT DETAIL.

ESTIMATED REPAIR QUANTITIES NORTH RAIL

ITEM-SERIES	428-7001	778-7001	778-7004	780-7002
DESCRIPTION	PENETRATING CONCRETE SURFACE TREATMENT	CONC RAIL REPAIR (IN-KIND)	CONC RAIL REPLACEMENT (IN-KIND)	CONCRETE CRACK REPAIR (DISCRETE) (INJECT)
LOCATION	SY	LF	LF	LF
ABUT 1	8	2		5
SPAN 1	35	6		10
SPAN 2	37	10	9 (PANEL 4)	10
SPAN 3	37	1	12 (PANEL 1)	10
SPAN 4	37	6	2 (PANEL 3)	10
SPAN 5	37	2	12 (PANEL 1)	10
SPAN 6	37	5	2 (PANEL 2)	10
SPAN 7	32	5		10
SPAN 8	68	5	2 (PANEL 3)	10
SPAN 9	32	5		10
SPAN 10	37	8		10
SPAN 11	37	4		10
SPAN 12	37	6		10
SPAN 13	37	7		10
SPAN 14	37	3		10
SPAN 15	37	12		10
SPAN 16	35	1		10
ABUT 2	8			5
TOTAL	625	88	39	170

ESTIMATED REPAIR QUANTITIES SOUTH RAIL

ITEM-SERIES	428-7001	778-7001	778-7004	780-7002
DESCRIPTION	PENETRATING CONCRETE SURFACE TREATMENT	CONC RAIL REPAIR (IN-KIND)	CONC RAIL REPLACEMENT (IN-KIND)	CONCRETE CRACK REPAIR (DISCRETE) (INJECT)
LOCATION	SY	LF	LF	LF
ABUT 1	8			5
SPAN 1	35	8		10
SPAN 2	37	10		10
SPAN 3	37		12 (PANEL 1)	10
SPAN 4	37	7		10
SPAN 5	37	1		10
SPAN 6	37	6		10
SPAN 7	32	6		10
SPAN 8	68	17		10
SPAN 9	32	1		10
SPAN 10	37	1		10
SPAN 11	37	2		10
SPAN 12	37	6		10
SPAN 13	37	6		10
SPAN 14	37	5		10
SPAN 15	37	7		10
SPAN 16	35	10		10
ABUT 2	8	2		5
TOTAL	625	95	12	170

STATE OF TEXAS
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7/10/2024

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Texas Department of Transportation

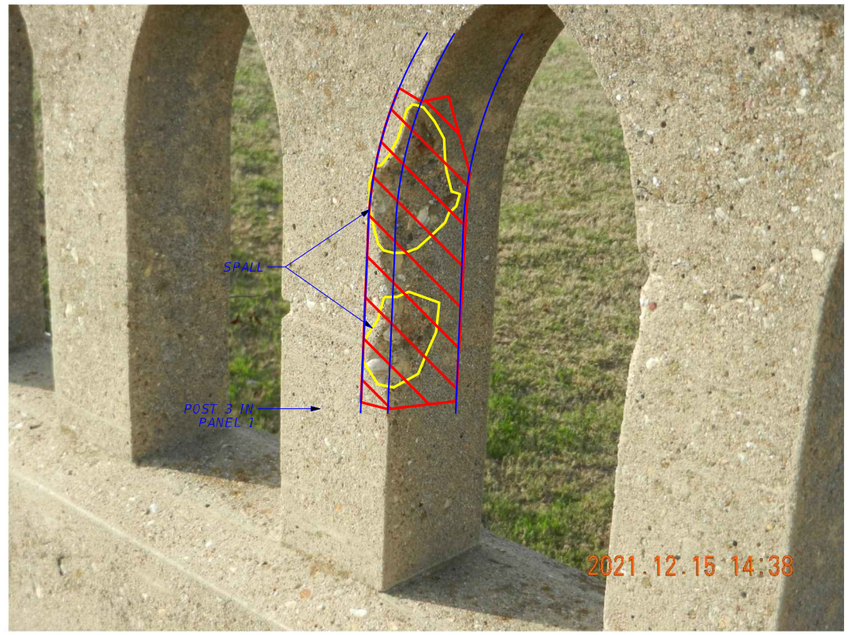
US 377
CONCRETE RAIL REPAIR (IN-KIND)

WEST FORK TRINITY RIVER
NBI No. 02-220-0081-01-001

FED.RD. DIV. NO.	FEDERAL AID PROJECT NO.		SHEET NO.
6	SEE TITLE SHEET		69
STATE	DISTRICT	COUNTY	
TEXAS	FTW	TARRANT	
CONTROL	SECTION	JOB	HIGHWAY
0081	01	050	US 377

SPALL AT TOP OF NORTH WINGWALL PARAPET AT ABUTMENT 1

CONCRETE RAIL REPAIR (IN-KIND) - 2 LF (WINGWALL PANEL)
REPAIR AS INTERMEDIATE SPALL

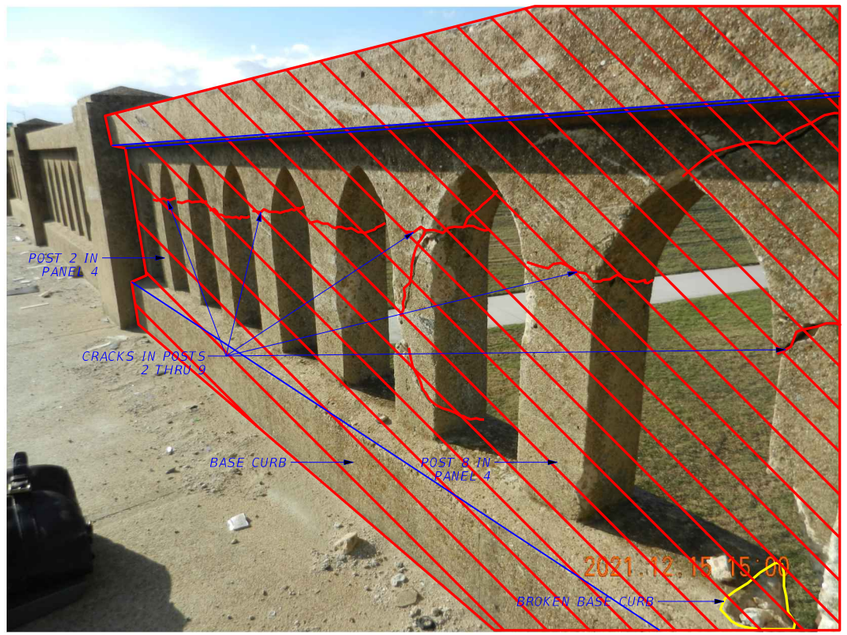


SPALLS IN 5" X 5" POSTS IN PANEL 1 IN NORTH RAIL IN SPAN 1

CONCRETE RAIL REPAIR (IN-KIND) - 1 LF (PANEL 1)
REPAIR AS MINOR SPALL

SPALL W/ EXP REINFORCING AT POST 9, PANEL 2, NORTH RAIL (SPAN 1)

CONCRETE RAIL REPAIR (IN-KIND) - 1 LF (PANEL 2)
REPAIR AS MINOR SPALL (CLEAN REINFORCING, APPLY CORROSION PROTECTION COATING, EPOXY MORTAR)



CRACKS POSTS 2-9 BROKEN BASE CURB IN PANEL 4, NORTH RAIL (SPAN 2)

CONCRETE RAIL REPLACEMENT (IN-KIND) - 8.88 LF (PANEL 4)

GENERAL NOTES:

1. PHOTOS SHOWN ARE REPRESENTATIVE ONLY AND ARE NOT ALL-INCLUSIVE. ANTICIPATED REPAIR LIMITS ARE INDICATED BY HATCHING ON THE PHOTOS. FIELD VERIFY LOCATIONS AND EXTENT OF REPAIRS WITH THE ENGINEER PRIOR TO ORDERING MATERIALS.
2. SEE RAIL REPAIR SHEETS FOR ADDITIONAL NOTES AND REQUIREMENTS.

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US 377
CONCRETE RAIL REPAIR PHOTOS

WEST FORK TRINITY RIVER
NBI No. 02-220-0081-01-001

SHEET 1 OF 3

FED.RD. DIV. NO.	FEDERAL AID PROJECT NO.		SHEET NO.
6	SEE TITLE SHEET		70
STATE	DISTRICT	COUNTY	
TEXAS	FTW	TARRANT	
CONTROL	SECTION	JOB	HIGHWAY
0081	01	050	US 377

DATE: 7/10/2024 TIME: 7:25:52 AM $PLTDRVSS
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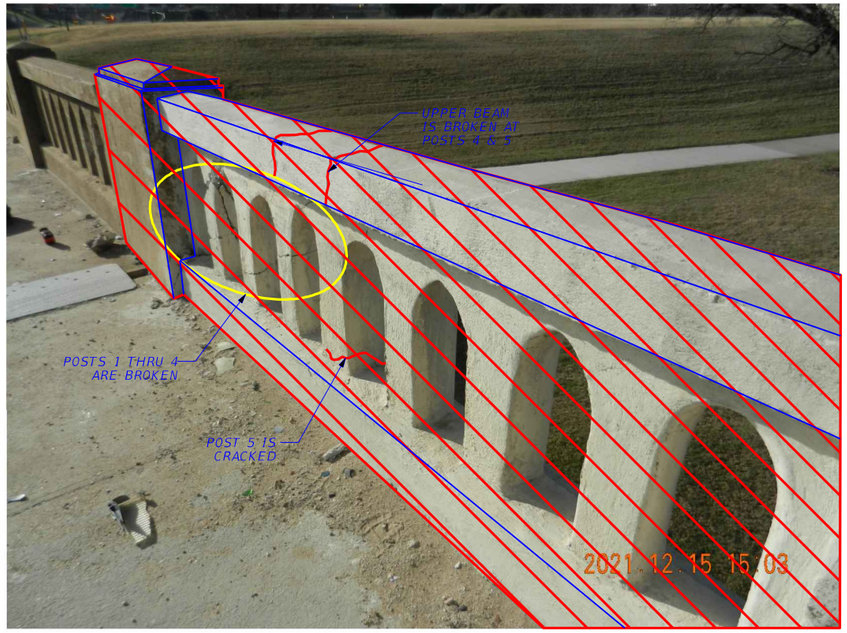


POSTS 1-4 BROKEN, No. 5 CRACKED, BM BROKEN, PANEL 1, N RAIL (SPAN 3)

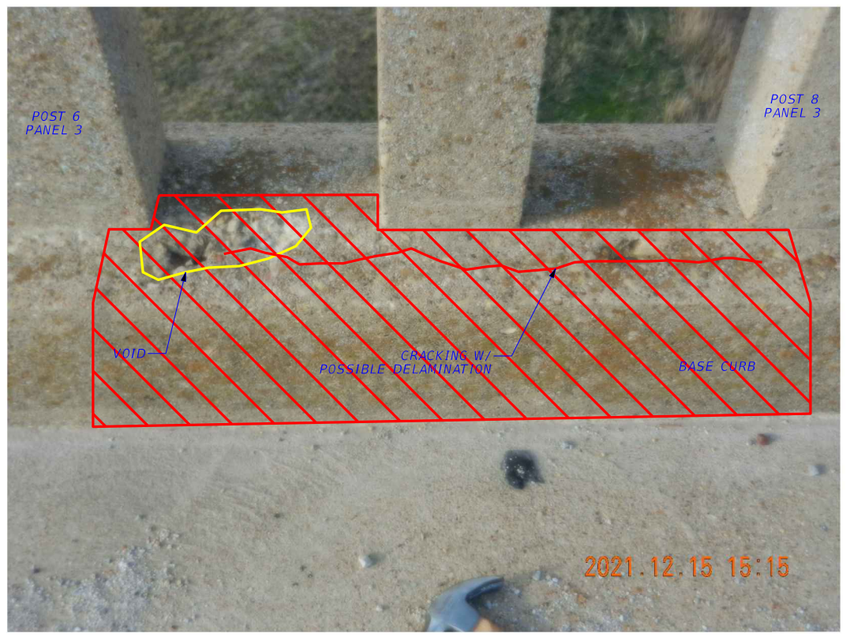
CONCRETE RAIL REPLACEMENT (IN-KIND) - 11.94 LF (PEDESTAL & PANEL 1)

36" X 15" POST BROKEN DECK FAILED IN PANEL 1 IN N RAIL IN SPAN 3

CONCRETE RAIL REPLACEMENT (IN-KIND) - 11.94 LF (PEDESTAL & PANEL 1)
CONCRETE RAIL REPLACEMENT (IN-KIND) - 8.88 LF (PANEL 4)

GENERAL NOTES:

1. PHOTOS SHOWN ARE REPRESENTATIVE ONLY AND ARE NOT ALL-INCLUSIVE. ANTICIPATED REPAIR LIMITS ARE INDICATED BY HATCHING ON THE PHOTOS. FIELD VERIFY LOCATIONS AND EXTENT OF REPAIRS WITH THE ENGINEER PRIOR TO ORDERING MATERIALS.
2. SEE RAIL REPAIR SHEETS FOR ADDITIONAL NOTES AND REQUIREMENTS.



VOID & CRACK IN BASE CURB IN PANEL 3 IN NORTH RAIL IN SPAN 4

CONCRETE RAIL REPAIR (IN-KIND) - 2 LF (PANEL 3)
REPAIR AS INTERMEDIATE SPALL

CRACK IN POST 9 AND 15" X 15" POST IN PANEL 3 IN NORTH RAIL IN SPAN 4

CONCRETE RAIL REPLACEMENT (IN-KIND) - 1.93 LF (PARTIAL PANEL 3 & 15" X 15" POST)

STATE OF TEXAS
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US 377
CONCRETE RAIL REPAIR PHOTOS

WEST FORK TRINITY RIVER
NBI No. 02-220-0081-01-001
SHEET 2 OF 3

FED.RD. DIV. NO.	FEDERAL AID PROJECT NO.		SHEET NO.
6	SEE TITLE SHEET		71
STATE	DISTRICT	COUNTY	
TEXAS	FTW	TARRANT	
CONTROL	SECTION	JOB	HIGHWAY
0081	01	050	US 377

DATE: 7/10/2024 TIME: 7:25:54 AM $PLTDRV$$
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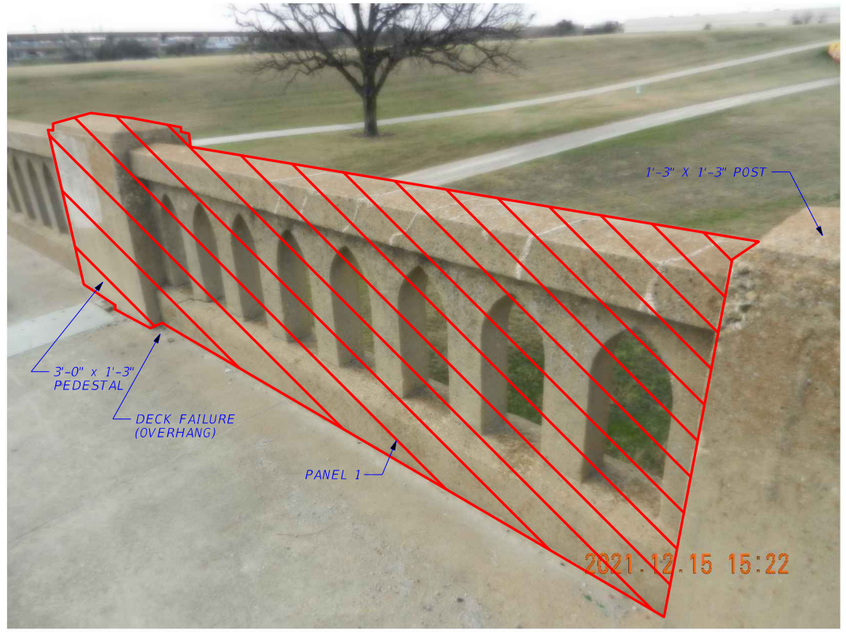


RAIL PANEL FAILURE (& DECK FAILURE) IN PANEL 1 IN NORTH RAIL IN SPAN 5

CONCRETE RAIL REPLACEMENT (IN-KIND) - 11.94 LF (PEDESTAL & PANEL 1)

RAIL PANEL FAILURE (& DECK FAILURE) IN PANEL 1 IN NORTH RAIL IN SPAN 5

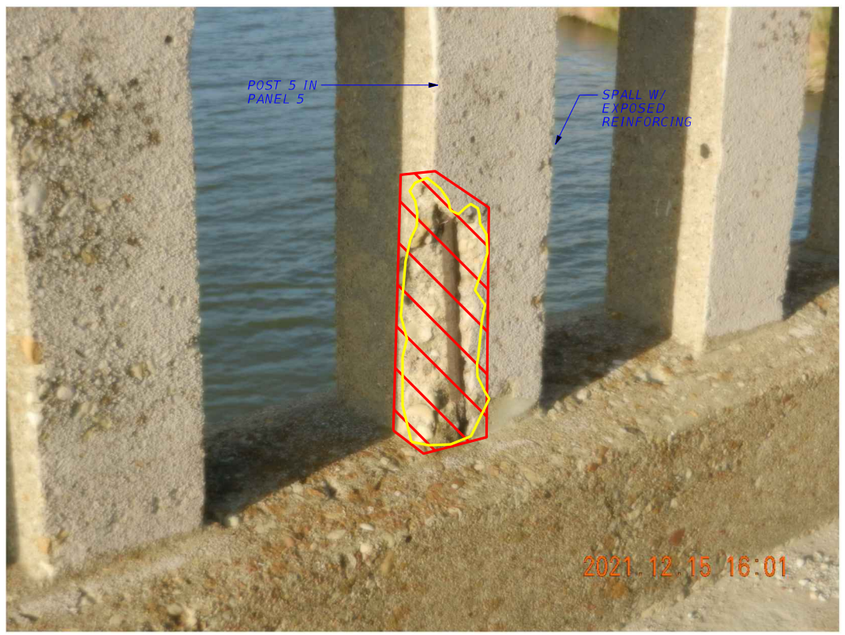
CONCRETE RAIL REPLACEMENT (IN-KIND) - 11.94 LF (PEDESTAL & PANEL 1)

GENERAL NOTES:

1. PHOTOS SHOWN ARE REPRESENTATIVE ONLY AND ARE NOT ALL-INCLUSIVE. ANTICIPATED REPAIR LIMITS ARE INDICATED BY HATCHING ON THE PHOTOS. FIELD VERIFY LOCATIONS AND EXTENT OF REPAIRS WITH THE ENGINEER PRIOR TO ORDERING MATERIALS.
2. SEE RAIL REPAIR SHEETS FOR ADDITIONAL NOTES AND REQUIREMENTS.

BROKEN POST 8 IN PANEL 2 IN NORTH RAIL IN SPAN 6

CONCRETE RAIL REPLACEMENT (IN-KIND) - 1.76 LF (PARTIAL PANEL 2)



SPALL W/ EXPOSED REINFORCING IN PANEL 5 IN NORTH RAIL IN SPAN 8

CONCRETE RAIL REPAIR (IN-KIND) - 1 LF (PANEL 5)
REPAIR AS MINOR SPALL (CLEAN REINFORCING, APPLY CORROSION PROTECTION COATING, EPOXY MORTAR)

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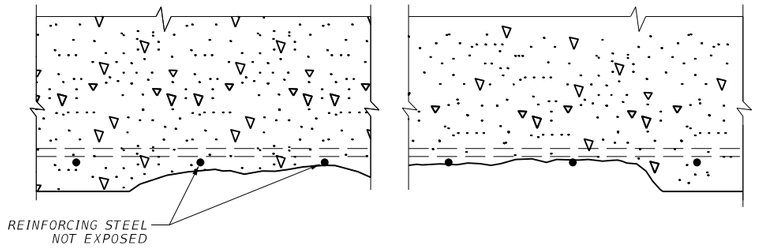
NBI No. 02-220-0081-01-001

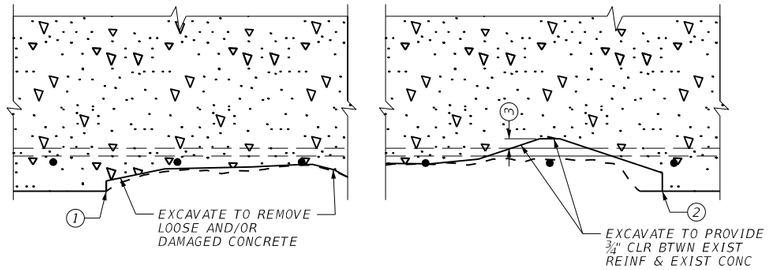
SHEET 3 OF 3

FED.RD. DIV. NO.	FEDERAL AID PROJECT NO.		SHEET NO.
6	SEE TITLE SHEET		72
STATE	DISTRICT	COUNTY	
TEXAS	FTW	TARRANT	
CONTROL	SECTION	JOB	HIGHWAY
0081	01	050	US 377



MINOR SPALL — INTERMEDIATE SPALL

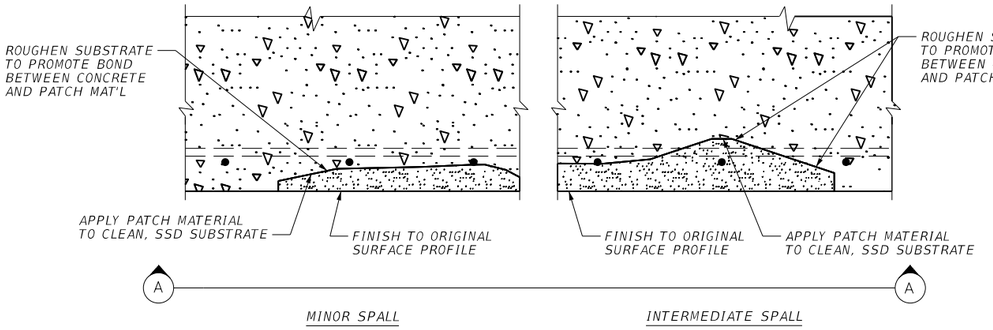
DAMAGED CONDITION



MINOR SPALL — INTERMEDIATE SPALL

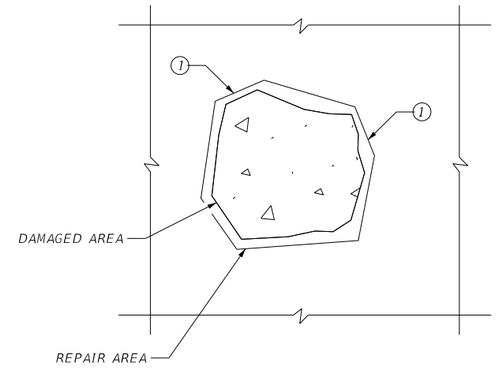
EXCAVATION & PREPARATION

ROUGHEN SUBSTRATE



MINOR SPALL — INTERMEDIATE SPALL

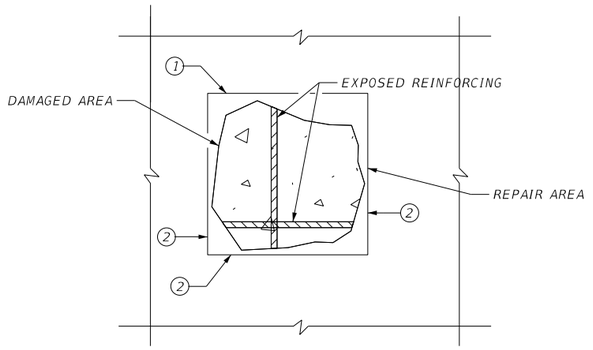
REPAIR APPLICATION



MINOR SPALL

(WITHOUT EXPOSED REINFORCING)

NOTE: MINOR SPALLS CAN BE PATCHED USING NEAT EPOXY OR EPOXY MORTAR



INTERMEDIATE OR MAJOR SPALL

VIEW A-A

CONCRETE STRUCTURE REPAIR

VERTICAL AND OVERHEAD

STRENGTH OF REPAIRS

CONCRETE REPAIR MATERIAL MUST ATTAIN A COMPRESSIVE STRENGTH BETWEEN 3,000 psi AND 4,000 psi.

INSPECTION AND ACCEPTANCE OF REPAIRS

AFTER CURING, EACH REPAIR AREA WILL BE INSPECTED VISUALLY FOR CRACKING AND SOUNDED BY THE INSPECTOR WITH FIRM HAMMER BLOWS TO ENSURE THE REPAIR HAS ADEQUATE BOND WITHOUT CRACKING AND IS FREE OF SOFT OR OTHER UNSOUND MATERIAL. ACCEPTANCE OF EACH REPAIR WILL BE BASED ON THE FINDINGS OF THIS INSPECTION.

CURING REPAIR NOTES

MOIST CURE EXPOSED REPAIR SURFACES FOR 72 HOURS USING WET MATS, WATER SPRAY, OR PONDING. DO NOT USE CURING COMPOUND IN LIEU OF MOIST CURING UNLESS APPROVED BY THE ENGINEER AND MANUFACTURER OF THE REPAIR MATERIAL. IF CURING COMPOUND IS AUTHORIZED, ALL REMAINING RESIDUE MUST BE COMPLETELY REMOVED AFTER THE CURING PERIOD.

DO NOT ALLOW REPAIR SURFACES TO BECOME DRY DURING THE MOIST CURING PERIOD.

HEAT AND INSULATE REPAIRS AS NECESSARY TO ENSURE ADEQUATE HEAT FOR CURING IF THE AMBIENT TEMPERATURE IS EXPECTED TO FALL BELOW 50° F. LIMIT AIR TEMPERATURE DURING HEATING TO 130° F.

CONCRETE STRUCTURE REPAIR NOTES

1. ½" DEEP SAWCUT ALONG PERIMETER TO NEAT LINE. SAWCUT MAY BE CONFIGURED TO MINIMIZE AREA OF REPAIR
2. ½" DEEP SAWCUT. SAWCUT TO BE PLACED PARALLEL AND PERPENDICULAR TO REINFORCING STEEL TO PROVIDE A RECTANGULAR REPAIR AREA.
3. PROVIDE ¾" CLEARANCE OR 1.5 TIMES THE LARGEST SIZED AGGREGATE IN THE REPAIR MATERIAL, WHICHEVER IS GREATER, BETWEEN THE STEEL AND SURROUNDING CONCRETE TO PERMIT ADEQUATE FLOW OF THE REPAIR MATERIAL. PERFORM REPAIRS CONFORMING TO ITEM 429, "CONCRETE STRUCTURE REPAIR" AND "CONCRETE REPAIR MANUAL".
4. WHEREVER EXISTING REINFORCING HAS LESS THAN 1½" COVER, CLEAN REINFORCING TO REMOVE CORROSION, AND APPLY A CORROSION INHIBITING COATING PRIOR TO APPLYING CONCRETE STRUCTURE REPAIR.

LAYOUT PROCEDURE FOR REPAIR AREAS

ALL REPAIR AREAS SHALL BE LAID OUT AS FOLLOWS:

MINOR SPALLS: LAYOUT THE REPAIR PERIMETER USING STRAIGHT LINES. PERIMETER LINES CAN INTERSECT AT ANGLES OTHER THAN 90 DEGREES.

INTERMEDIATE SPALLS: LAYOUT THE PERIMETER USING STRAIGHT LINES. REPAIR BOUNDARIES SHALL BE SQUARE OR RECTANGULAR AND SHALL BE ORIENTED PARALLEL OR PERPENDICULAR TO MEMBER (OR EXISTING REINFORCING STEEL).

MAJOR SPALLS: FOR MAJOR SPALLS AT BENT 7 REFER TO SHEET "BENT REPAIR BENTS 6&7". REMOVAL AND SURFACE PREPARATION SHALL BE AS SHOWN THEREIN.

THE CONTRACTOR SHALL LAYOUT TENTATIVE REPAIR AREAS AND CONFIRM REPAIR LOCATIONS AND QUANTITIES WITH THE ENGINEER PRIOR TO ORDERING MATERIALS OR BEGINNING REPAIRS.

REFER TO CONCRETE REPAIR MANUAL FOR DETAILED INFORMATION AND REQUIREMENTS.

SEE SHEET "CONCRETE STRUCTURE REPAIR", SHEET 2 OF 2 FOR ADDITIONAL INFORMATION.

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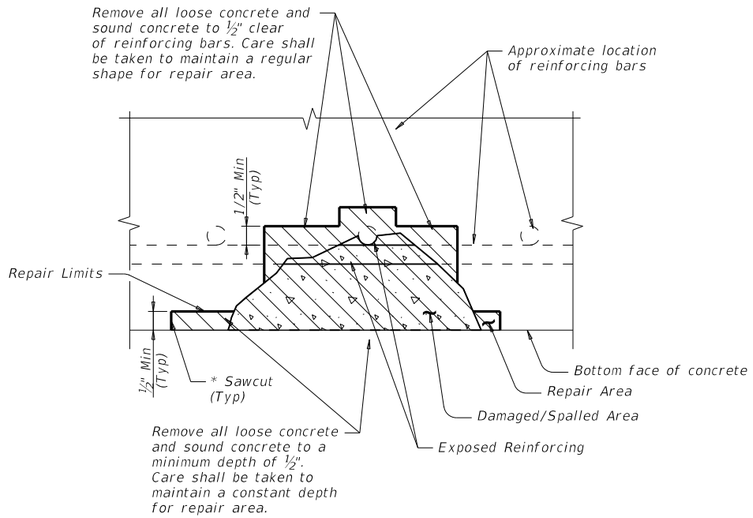
US 377
CONCRETE STRUCTURE REPAIR

WEST FORK TRINITY RIVER
NBI No. 02-220-0081-01-001

SHEET 1 OF 2

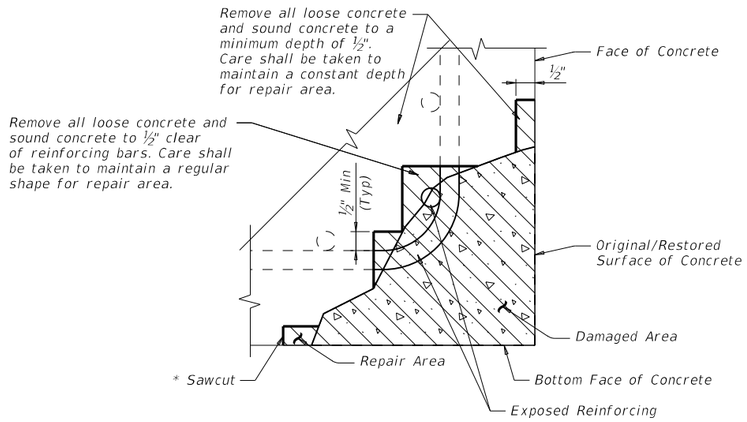
FED.RD. DIV. NO.	FEDERAL AID PROJECT NO.		SHEET NO.
6	SEE TITLE SHEET		73
STATE	DISTRICT	COUNTY	
TEXAS	FTW	TARRANT	
CONTROL	SECTION	JOB	HIGHWAY
0081	01	050	US 377

DATE: 7/10/2024 TIME: 7:26:01 AM $PLTDRV$$
FILE: c:\pwdata\topeka01\ah01767@bartlettwest.com\d0112491\71 CONCRETE STRUCTURE REPAIR US 377.dgn



REPAIR ON ONE FACE

(Showing overhead repair)
(Repair on vertical surface similar)



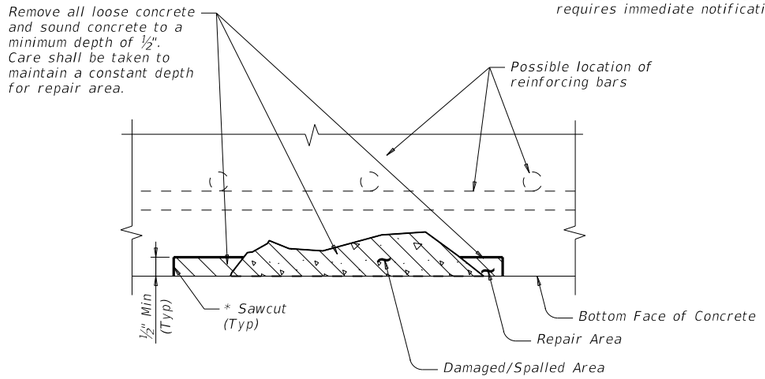
REPAIR ON MULTIPLE FACES

(Showing repair at corner between overhead surface and vertical surface)
(Repair at corner between vertical surfaces similar)

* Sawcut perimeter of each repair area in accordance with Item 429, "Concrete Structure Repair"

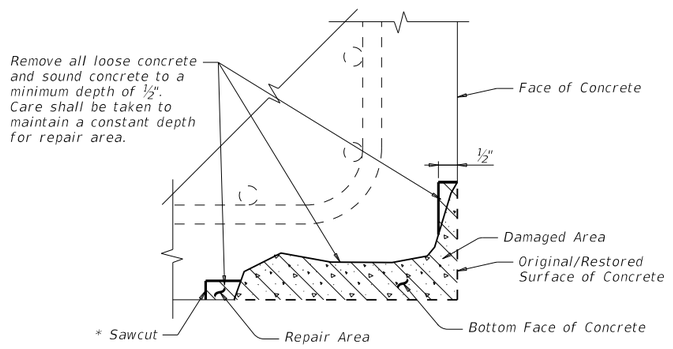
INTERMEDIATE SPALL REPAIR

1. Damage exposes more than 50% of the thickness of the outer layer of reinforcing bar or the damage is greater than 2" deep.
2. Maximimum depth of spall is 6".
3. If damage extends well beyond the outer layer of reinforcement after removal of unsound concrete the spall is classified as a major spall and requires immediate notification of the Engineer.



REPAIR ON ONE FACE

(Showing overhead repair)
(Repair on vertical surface similar)



REPAIR ON MULTIPLE FACES

(Showing repair at corner between overhead surface and vertical surface)
(Repair at corner between vertical surfaces similar)

* Sawcut perimeter of each repair area in accordance with Item 429, "Concrete Structure Repair"

MINOR SPALL REPAIR

1. Damage is less than 1" deep after removal of unsound concrete.
2. Damage covers an area less than 12 square inches after removal of unsound concrete.
3. Spalls up to 2" max depth can be categorized as minor provided the spall does not progress deeper than ½ of the thickness of the outer layer of reinforcing after removal of unsound concrete.

GENERAL NOTES:

1. REFER TO REPAIR PHOTOS FOR DAMAGE LOCATIONS AND DESCRIPTIONS. REPAIR DEFICIENCIES SHOWN IN THE PHOTOS AND OTHER DEFICIENCIES OF SIMILAR CONDITION AT LOCATIONS AS DIRECTED BY THE ENGINEER.
2. REPAIR QUANTITIES ARE BASED ON REPAIR INSPECTION PERFORMED IN OCTOBER AND DECEMBER 2021 USING VISUAL INSPECTION FROM GROUND LEVEL AND WATER LEVEL.
3. CONCRETE REPAIR WORK SHALL MEET THE REQUIREMENTS OF:
   (A) ITEM 429, "CONCRETE STRUCTURE REPAIR",
   (B) TxDOT CONCRETE REPAIR MANUAL, CHAPTER 3, SECTIONS 1 & 2.
   (C) CONCRETE STRUCTURE REPAIR DETAILS" SHEETS.
   (D) ITEM 780, "CONCRETE CRACK REPAIR". AND
   (E) TxDOT CONCRETE REPAIR MANUAL, CHAPTER 3, SECTION 5.
4. A COPY OF THE TxDOT CONCRETE REPAIR MANUAL MUST BE AVAILABLE ON SITE DURING ALL CONCRETE REPAIR OPERATIONS.
5. AREAS OF DELAMINATION/POSSIBLE DELAMINATION ARE NOTED ON SOME REPAIR PHOTOS. THESE AREAS SHALL BE SOUNDED BY THE CONTRACTOR TO CONFIRM THE EXTENT OF THE DEFICIENCY. IF CONFIRMED TO BE A SPALL, REPAIR AS PER THE DETAILS ON THIS SHEET.
6. FOR MAJOR SPALL REPAIR AT BENT 7 REFER TO DETAILS ON SHEET "BENT REPAIR BENTS 6 & 7".
7. UTILIZE TYPE C AND TYPE D REPAIR MATERIALS, OR EPOXY OR EPOXY MORTARS (TYPE VIII CLASS A) AS ALLOWED BY THE REPAIR DETAILS. THE USE OF RAPID REPAIR AND/OR HIGH STRENGTH MATERIAL IS NOT ALLOWED.
8. SEE SHEET "CONCRETE STRUCTURE REPAIR", SHEET 1 OF 2 FOR ADDITIONAL INFORMATION.

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US 377
CONCRETE STRUCTURE REPAIR

WEST FORK TRINITY RIVER
NBI No. 02-220-0081-01-001

SHEET 2 OF 2

FED.RD. DIV. NO.	FEDERAL AID PROJECT NO.		SHEET NO.
6	SEE TITLE SHEET		74
STATE	DISTRICT	COUNTY	
TEXAS	FTW	TARRANT	
CONTROL	SECTION	JOB	HIGHWAY
0081	01	050	US 377

DATE: 7/10/2024 TIME: 7:26:05 AM $PLTDRVSS
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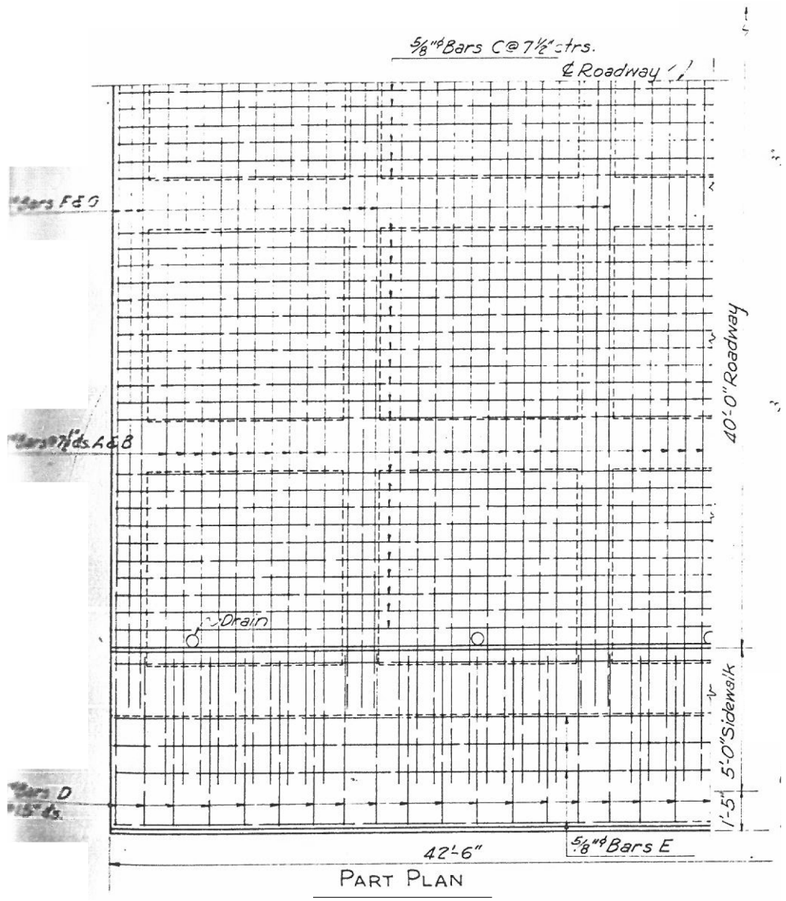
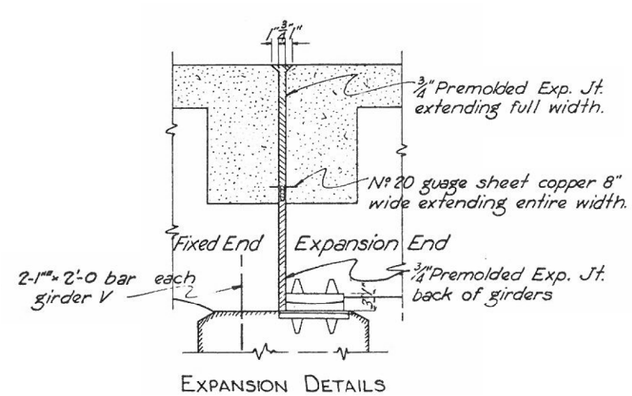


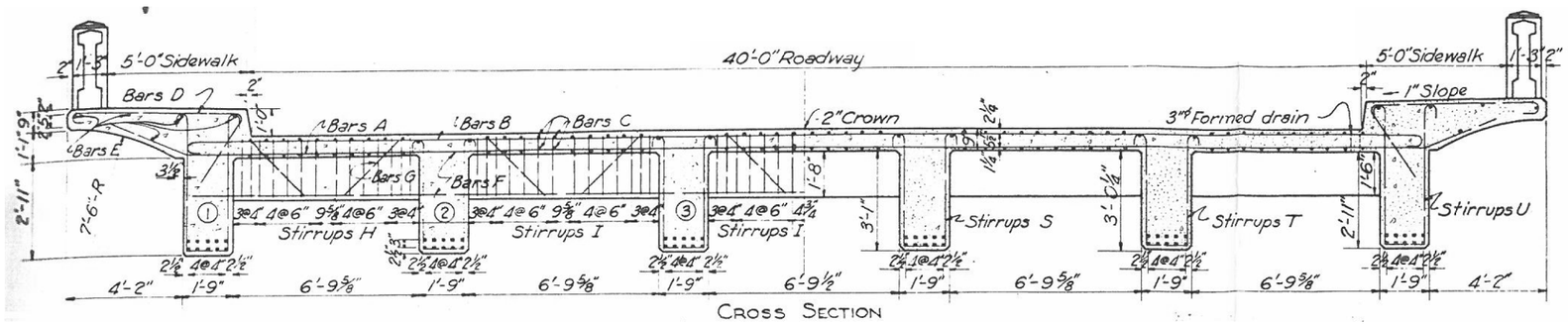
PART PLAN

EXISTING DECK REINFORCING PLAN

NOTE: SEE SHEET 2 OF 2 FOR FULL DEPTH REPAIR PLAN



EXPANSION DETAILS



CROSS SECTION

GENERAL NOTES:

1. REPAIR QUANTITIES ARE BASED ON REPAIR INSPECTION PERFORMED IN OCTOBER AND DECEMBER 2021 USING VISUAL INSPECTION FROM GROUND LEVEL AND WATER LEVEL.
2. LAYOUT TENTATIVE REPAIR AREAS FOLLOWING THE PROCEDURE SHOWN ON SHEETS "CONCRETE STRUCTURE REPAIR". CONFIRM REPAIR LOCATIONS AND QUANTITIES WITH THE ENGINEER PRIOR TO ORDERING MATERIALS OR BEGINNING REPAIR.
3. REMOVE A PORTION OF EXISTING CONCRETE RAIL AS NECESSARY TO PROVIDE ACCESS FOR FULL DEPTH DECK REPAIR. RECONSTRUCT CONCRETE RAIL AFTER FULL DEPTH DECK REPAIR. REFER TO SHEET "CONCRETE RAIL REPAIR (IN-KIND)" FOR DETAILS.
4. REMOVE EXISTING DECK TO NEAT LINES. REMOVAL LIMITS SHALL GENERALLY BE TO TRANSVERSE, LONGITUDNAL AND VERTICAL PLANES. SAWCUT ALONG REMOVAL LINES (½" DEPTH) TAKING CARE TO AVOID DAMAGE TO EXISTING REINFORCING.
5. FULL DEPTH CONCRETE DECK REPAIR SHALL BE CONSTRUCTED IN ACCORDANCE WITH THE DETAILS TAKEN FROM THE 1932 PLANS AND SHOWN ON THIS SHEET. PROVIDE RAIL ANCHORAGE REINFORCING AS SHOWN ON SHEET "CONCRETE RAIL REPAIR (IN-KIND)".
6. REFER TO SHEET 2 OF 2 FOR ADDITIONAL DETAILS AND INFORMATION.

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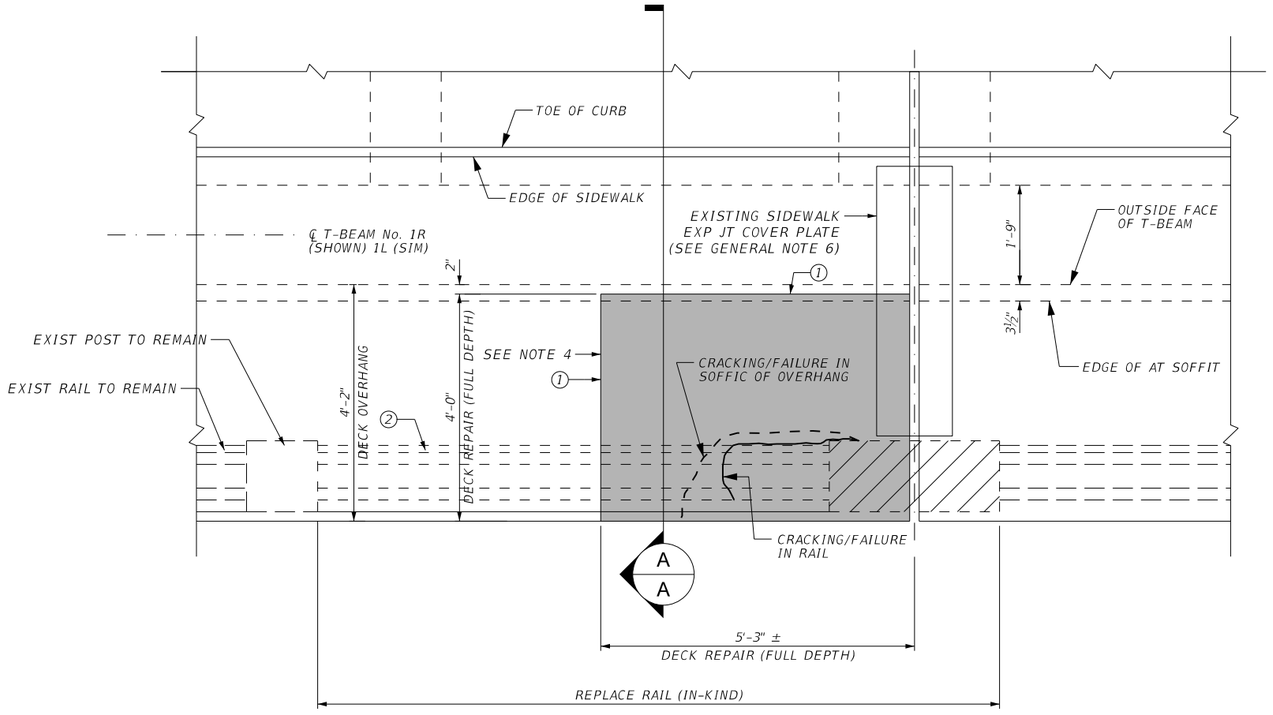
US 377
CONCRETE DECK REPAIR (FULL DEPTH)

WEST FORK TRINITY RIVER
NBI No. 02-220-0081-01-001

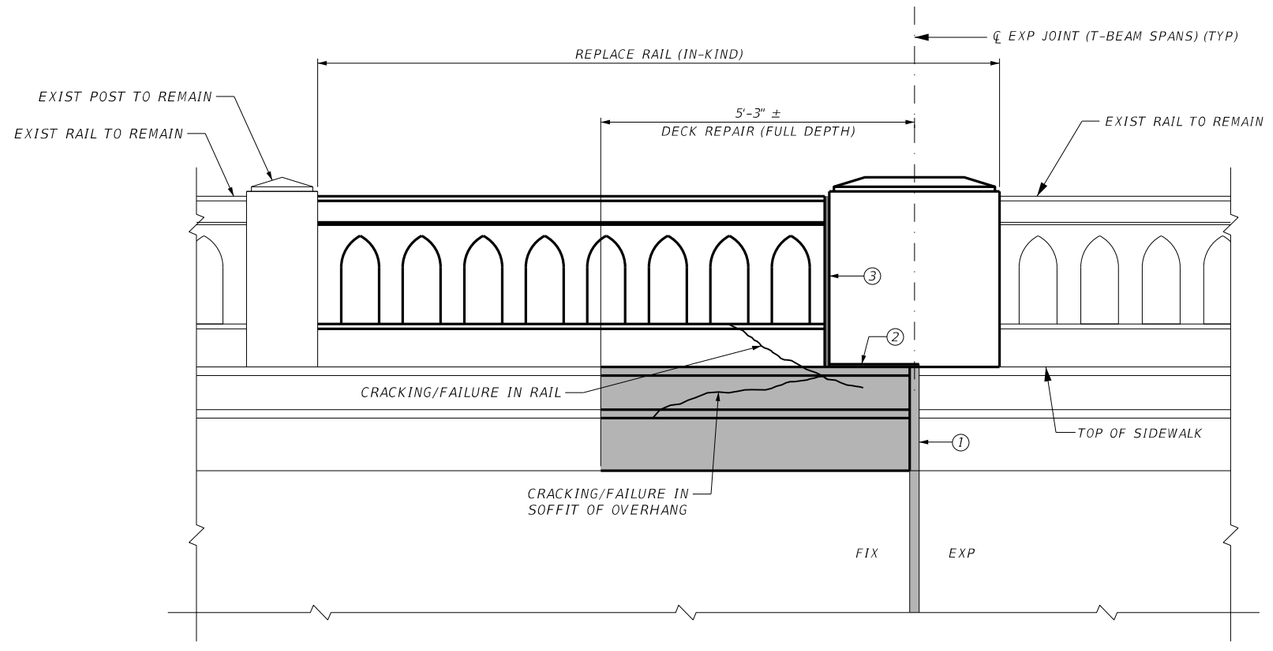
SHEET 1 OF 2

FED.RD. DIV. NO.	FEDERAL AID PROJECT NO.		SHEET NO.
6	SEE TITLE SHEET		75
STATE	DISTRICT	COUNTY	
TEXAS	FTW	TARRANT	
CONTROL	SECTION	JOB	HIGHWAY
0081	01	050	US 377



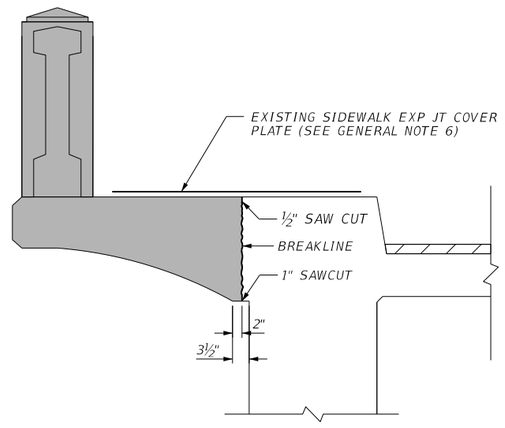
FULL DEPTH DECK REPAIR PLAN

SCALE: ⅜" = 1'-0"



FULL DEPTH DECK REPAIR ELEVATION

SCALE: ⅜" = 1'-0"



SECTION A-A

SCALE: ⅜" = 1'-0"

CONSTRUCTION NOTES

1. ½" DEEP SAWCUT & LIMIT OF DECK REPAIR (SEE GENERAL NOTES).
2. REMOVE EXISTING RAIL & REPLACE (IN-KIND) (SEE GENERAL NOTES).
3. ¾" PREMOLDED EXP JT MAT'L (PROPOSED) - AT DECK REPAIR LOCATIONS.
4. ⅜" REBONDED RECYCLED TIRE RUBBER (PROPOSED) (SEE NOTES).
5. ¾" REBONDED RECYCLED TIRE RUBBER (PROPOSED) (SEE NOTES).

GENERAL NOTES:

1. SEE BRIDGE LAYOUT FOR LOCATION OF BRIDGE DECK REPAIR. THE ENGINEER MAY DIRECT ADDITIONAL REPAIR LOCATIONS IF DAMAGE SUBSEQUENT TO 2021 INSPECTION IS FOUND.
2. REMOVE EXISTING RAIL TO FACILITATE ACCESS FOR DECK REPAIR. SEE BRIDGE LAYOUT AND SHEET "CONCRETE RAIL REPAIR (IN-KIND)" FOR LOCATIONS FOR REMOVAL AND REPLACEMENT OF RAIL.
3. REFER TO SHEET 1 OF 2 FOR DECK REINFORCING. PROTECT EXISTING CONCRETE OUTSIDE THE REPAIR BOUNDARY AND EXISTING REINFORCING AGAINST DAMAGE DURING REMOVAL OF CONCRETE DECK. DAMAGE SHALL BE REPAIRED AT CONTRACTOR'S EXPENSE.
4. PROVIDE 2" CLEAR COVER FROM EXISTING REINFORCING PARALLEL TO REMOVAL LIMIT (ADJUST REMOVAL LIMIT AS NECESSARY).
5. REFER TO SHEET "CONCRETE RAIL REPAIR (IN-KIND)" FOR REINFORCING STEEL FOR ANCHORAGE OF NEW RAIL IN DECK REPAIR.
6. TEMPORARILY REMOVE SIDEWALK EXPANSION JOINT COVER PLATE FOR DECK REPAIR. MARK LOCATION ON THE UNDERSIDE OF PLATE TO ENSURE IT WILL FIT ANCHORS ON EXISTING SIDE OF EXPANSION JOINT FOR REINSTALLATION UPON COMPLETION OF DECK REPAIR AND REPLACEMENT OF RAIL.

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US 377
CONCRETE DECK REPAIR (FULL DEPTH)

WEST FORK TRINITY RIVER
NBI No. 02-220-0081-01-001

SHEET 2 OF 2

FED.RD. DIV. NO.	FEDERAL AID PROJECT NO.		SHEET NO.
6	SEE TITLE SHEET		76
STATE	DISTRICT	COUNTY	
TEXAS	FTW	TARRANT	
CONTROL	SECTION	JOB	HIGHWAY
0081	01	050	US 377

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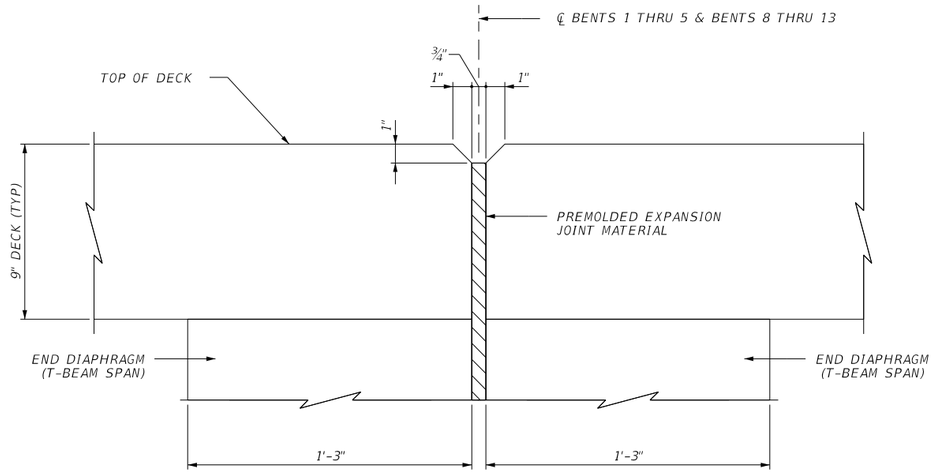
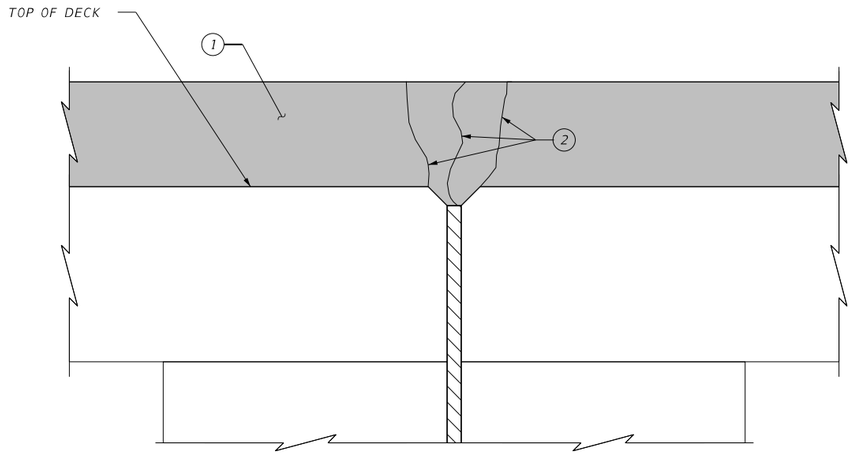


ORIGINAL EXPANSION JOINT DETAIL

(INFORMATION SHOWN FROM 1932 PLANS)
SCALE: 1½" = 1'-0"



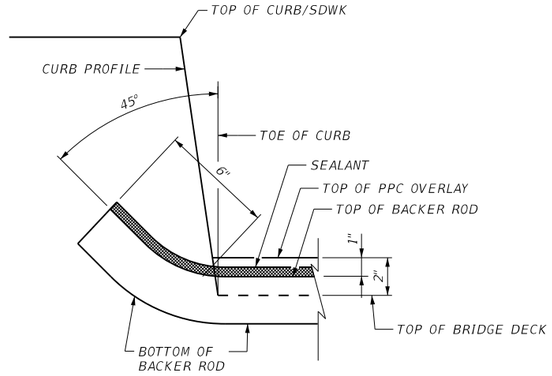
CURRENT EXPANSION JOINT CONDITION

(CONDITION NOTED DURING OCT/DEC 2021 CONDITION SURVEY)
SCALE: 1½" = 1'-0"

NOTES:

(1) ASPHALT OVERLAY – THICKNESS VARIES FROM APPROXIMATELY 3½" TO 4½".

(2) RANDOM CRACKING IN OVERLAY AT EXPANSION JOINT.



JOINT SEALANT TERMINATION DETAIL

SCALE: 1½" = 1'-0"

NOTES:

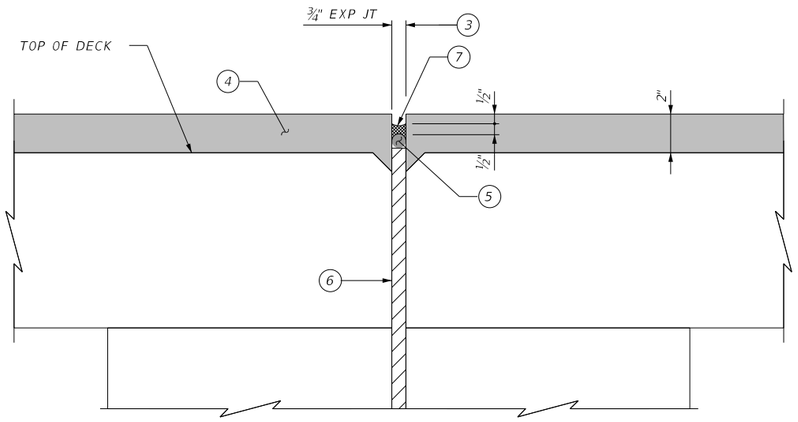
(3) PROVIDE ¾" EXPANSION JOINT OPENING (MATCH OPENING SHOWN IN 1931 PLANS). NOTIFY THE ENGINEER IF THE DIMENSION VARIES FROM THE 1931 PLANS.

(4) POLYESTER POLYMER CONCRETE (PPC) OVERLAY. FORM EXPANSION JOINT OPENING.

(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) FILL VOID BELOW BACKER ROD WITH EXTRUDED POLYSTYRENE FOAM BEFORE PLACING BACKER ROD.

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



CLEANING EXPANSION JOINTS FOR T-BEAM SPANS

SCALE: 1½" = 1'-0"

PROCEDURE FOR CLEANING AND SEALING T-BEAM EXPANSION JOINTS

1. REMOVE EXISTING ASPHALT OVERLAY. INSPECT TOP OF BRIDGE DECK AND COMPLETE DECK REPAIRS AS SHOWN IN THE PLANS AND AS DIRECTED BY THE ENGINEER.
2. CLEAN JOINT OPENING OF ALL OLD EXPANSION MATERIALS, DIRT, AND ALL OTHER DELETERIOUS MATERIALS IN ACCORDANCE WITH ITEM 438, "CLEANING AND SEALING JOINTS".
3. PLACE THE POLYESTER POLYMER CONCRETE (PPC) OVERLAY LEAVING A GAP FOR THE EXPANSION JOINT. FORM THE JOINT OPENING TO THE REQUIRED WIDTH.
4. OBTAIN APPROVAL OF CLEANED JOINT PRIOR TO PROCEEDING WITH JOINT SEALING OPERATION.
5. PLACE BACKER ROD INTO JOINT OPENING 1" BELOW TOP OF (PPC) OVERLAY. FILL VOID BELOW BACKER ROD WITH EXTRUDED POLYSTYRENE FOAM BEFORE PLACING BACKER ROD.
6. SEAL THE JOINT OPENING WITH A CLASS 7 JOINT SEALANT.

GENERAL NOTES

1. CLEANING EXISTING JOINT OPENING (FULL DEPTH) OF ALL DEBRIS, AND PROVIDING AND PLACING BACKER ROD AND SEALING JOINT IS PAID FOR BY ITEM 438, "CLEANING AND SEALING JOINTS" AND MEASURED BY THE LINEAR FOOT.
2. OBTAIN APPROVAL FOR ALL TOOLS, EQUIPMENT MATERIALS AND TECHNIQUES PROPOSED TO CLEAN AND SEAL EXPANSION JOINTS BETWEEN T-BEAM SPANS INCLUDING MEANS OF FORMING THE EXPANSION JOINTS IN THE POLYESTER POLYMER CONCRETE OVERLAY.
3. PROVIDE CLASS 7 JOINT SEALANT IN ACCORDANCE WITH DMS-6310, "JOINT SEALANT AND FILLERS" FOR JOINTS IN CONCRETE.
4. EXTEND BACKER ROD AND SEALANT UP INTO THE SIDEWALK CURB AT THE LEFT & RIGHT CURB LINES. REFER TO JOINT SEALANT TERMINATION DETAIL THIS SHEET. IF THE CLASS 7 SEALANT CANNOT BE EFFECTIVELY PLACED IN THE VERTICAL POSITION, A CLASS 4 JOINT SEALANT THAT IS COMBATIBLE WITH THE CLASS 7 SEALANT IS ALLOWED FOR THE EXTENSION OF SEAL INTO THE CURB.
5. PREPARE SURFACES WHERE SEALANT IS TO BE PLACED IN ACCORDANCE WITH MANUFACTURER'S SPECIFICATIONS.

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7/10/2024

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US 377
CLEANING AND SEALING EXISTING BRIDGE JOINTS

WEST FORK TRINITY RIVER
NBI No. 02-220-0081-01-001

FED.RD. DIV. NO.	FEDERAL AID PROJECT NO.		SHEET NO.
6	SEE TITLE SHEET		77
STATE	DISTRICT	COUNTY	
TEXAS	FTW	TARRANT	
CONTROL	SECTION	JOB	HIGHWAY
0081	01	050	US 377

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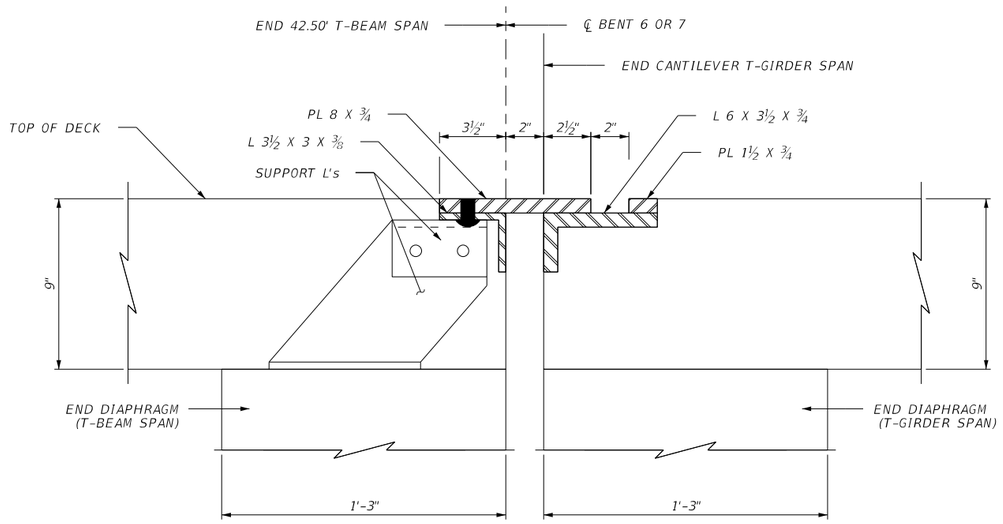


ORIGINAL EXPANSION JOINT DETAIL

(INFORMATION SHOWN FROM 1931 PLANS)
SCALE: 1½" = 1'-0"

NOTES:

(4) SAWCUT AND REMOVE PORTION OF EXISTING 8" X ¾" EXP JOINT COVER PLATE. GRIND EDGE SMOOTH (ROUND OR CHAMFER CORNERS OF PLATE TO 1/16"). PROTECT EXISTING MATERIAL TO REMAIN FROM DAMAGE DURING CONSTRUCTION.

(5) 2" JOINT OPENING AS SHOWN IN 1932 PLANS. NOTIFY THE ENGINEER IF THE DIMENSION VARIES FROM THE 1932 PLANS.

(6) POLYESTER POLYMER CONCRETE (PPC) OVERLAY.

(7) 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.

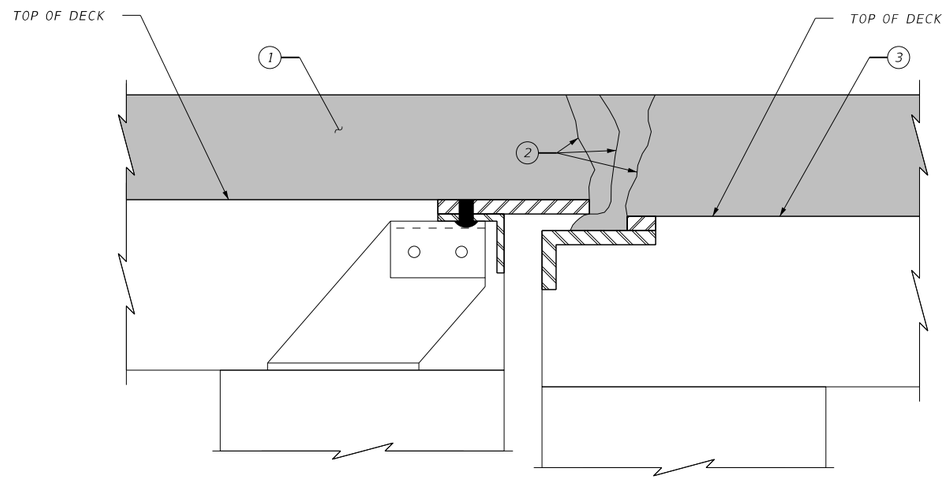
(8) FILL VOID BELOW BACKER ROD WITH EXTRUDED POLYSTYRENE FOAM BEFORE PLACING BACKER ROD.

(9) USE CLASS 7 SEALANT IN ACCORDANCE WITH DMS-6310, "JOINT SEALANTS AND FILLERS". PREPARE JOINT AND SEAL IN ACCORDANCE WITH ITEM 438, "CLEANING AND SEALING JOINTS". REFER TO GENERAL NOTE 6.

(10) CLEAN CUT EDGE AFTER GRINDING & APPLY CORROSION INHIBITING PAINT. EXTEND PAINT 1" ONTO TOP SURFACE OF COVER PLATE AND TOP 1" OF THE VERTICAL FACE OF THE 3½ X 3 X ⅜ ANGLE BELOW THE COVER PLATE.

GENERAL NOTES

1. SAWCUT THE EXISTING COVER PLATE AS SHOWN ON THIS SHEET. REMOVE THE PORTION OF THE COVER PLATE AT THE LEFT AND RIGHT ENDS THAT CONFORM TO THE CURB PROFILE.
2. OBTAIN APPROVAL FOR ALL TOOLS, EQUIPMENT MATERIALS AND TECHNIQUES PROPOSED TO REPAIR AND SEAL THE ARMOR JOINT.
3. PROVIDE CLASS 7 JOINT SEALANT IN ACCORDANCE WITH DMS-6310, "JOINT SEALANT AND FILLERS" FOR JOINTS IN CONCRETE.
4. EXTEND BACKER ROD AND SEALANT UP INTO THE SIDEWALK CURB AT THE LEFT & RIGHT CURB LINES. REFER TO "JOINT SEALANT TERMINATION DETAIL" ON SHEET "CLEANING AND SEALING EXISTING BRIDGE JOINTS". IF THE CLASS 7 SEALANT CANNOT BE EFFECTIVELY PLACED IN THE VERTICAL POSITION, A CLASS 4 JOINT SEALANT THAT IS COMBATIBLE WITH THE CLASS 7 SEALANT IS ALLOWED FOR THE EXTENSION OF SEAL INTO THE CURB.
5. PREPARE SURFACES WHERE SEALANT IS TO BE PLACED IN ACCORDANCE WITH MANUFACTURER'S SPECIFICATIONS.
6. WORK SHALL BE PERFORMED IN ACCORDANCE WITH ITEM 785 "BRIDGE JOINT REPAIR OR REPLACEMENT". MEASUREMENT WILL BE BY THE LINEAR FOOT OF JOINT REPAIRED (BOTH SIDES OF JOINT MEASURED TOGETHER, 41 LF PER JOINT) AT LOCATIONS SHOWN ON THE BRIDGE LAYOUTS AND QUANTITY SUMMARY SHEETS.



CURRENT EXPANSION JOINT CONDITION

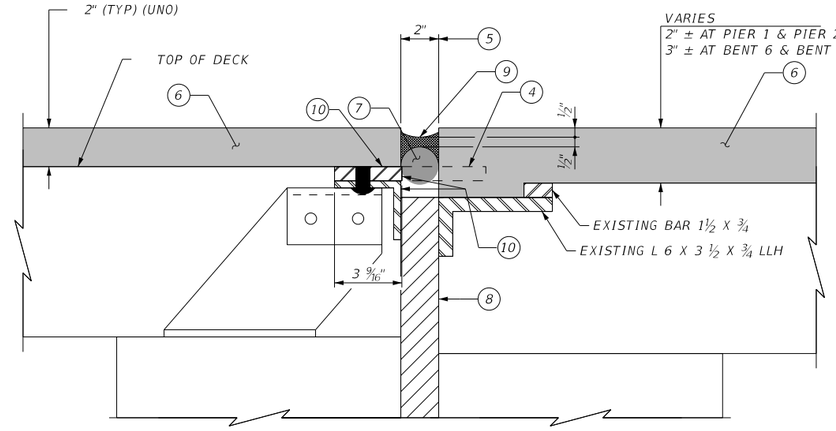
(CONDITION NOTED DURING OCT/DEC 2021 CONDITION SURVEY)
(BENT 6 SHOWN, BENT 7 SIM)
SCALE: 1½" = 1'-0"

NOTES:

(1) ASPHALT OVERLAY - THICKNESS VARIES FROM APPROXIMATELY 3½" TO 4½".

(2) RANDOM CRACKING IN OVERLAY AT EXPANSION JOINT.

(3) CANTILEVER SPAN HAS DEFLECTED DOWNWARD, SAG AT END OF T-GIRDER VARIES (½" ± MIN TO ¾" ± MAX).



ARMOR JOINT REPAIR DETAIL

SCALE: 1½" = 1'-0"

PROCEDURE FOR REPAIRING ARMOR JOINT

1. REMOVE EXISTING ASPHALT OVERLAY. INSPECT TOP OF BRIDGE DECK AND COMPLETE DECK REPAIRS AS SHOWN IN THE PLANS AND AS DIRECTED BY THE ENGINEER.
2. SAWCUT EXISTING 8 X ¾" COVER PLATE TO ENSURE THE EXPANSION JOINT IS CLEAR PRIOR TO INSTALLATION OF BACKER ROD AND SEALANT. GRIND EDGE SMOOTH (ROUND OR CHAMBER TO 1/16"). APPLY CORROSION INHIBITING PAINT.
3. PLACE POLYESTER POLYMER (PPC) OVERLAY (SEE SHEET "BRIDGE DECK OVERLAY NOTES").
4. ABRASIVE BLAST CLEAN STEEL SURFACES WHERE SILICONE SEAL IS TO BE PLACED.
5. OBTAIN APPROVAL OF CLEANED JOINT PRIOR TO PROCEEDING WITH JOINT SEALING OPERATION.
6. PLACE BACKER ROD INTO JOINT OPENING 1" BELOW TOP OF (PPC) OVERLAY. FILL VOID BELOW BACKER ROD WITH EXTRUDED POLYSTYRENE FOAM.
7. SEAL THE JOINT OPENING WITH A CLASS 7 JOINT SEALANT (SEE GENERAL NOTE 4).

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US 377
ARMOR JOINT REPAIR

WEST FORK TRINITY RIVER
NBI No. 02-220-0081-01-001

FED.RD. DIV. NO.	FEDERAL AID PROJECT NO.		SHEET NO.
6	SEE TITLE SHEET		78
STATE	DISTRICT	COUNTY	
TEXAS	FTW	TARRANT	
CONTROL	SECTION	JOB	HIGHWAY
0081	01	050	US 377

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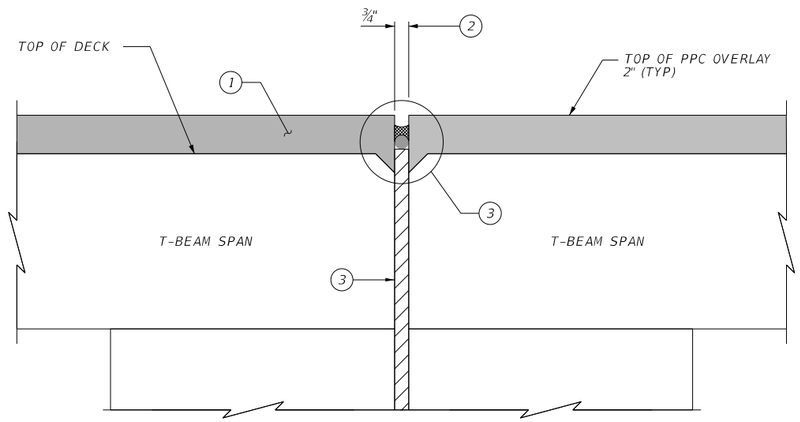
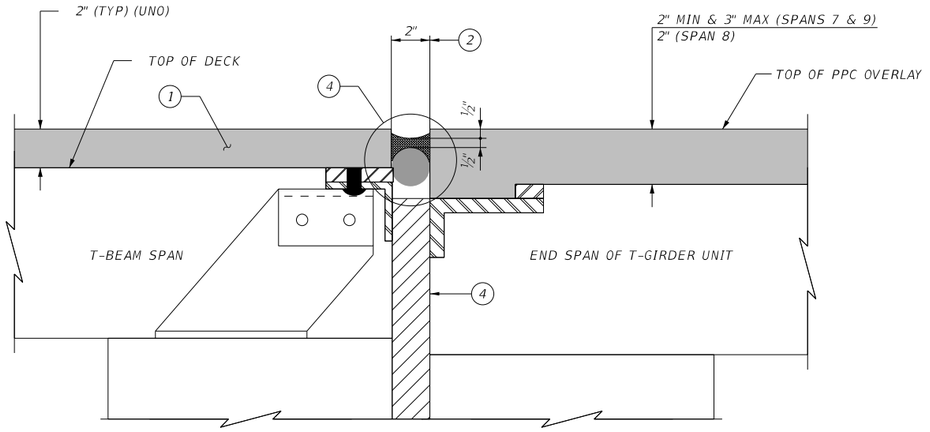


DETAIL AT T-BEAM EXPANSION JOINTS

SCALE: 1½" = 1'-0"
(SPANS 1 THRU 5 & 10 THRU 16)



DETAIL AT ARMOR JOINT

(JOINT AT BENT 6 SHOWN, JOINT AT BENT 7 OPPOSITE HAND)
SCALE: 1½" = 1'-0"

NOTES:

1. POLYESTER POLYMER CONCRETE (PPC) OVERLAY 2 THICK (TYP), VARIES 2" MIN TO 3" MAX SPANS 7 & 9
2. JOINT OPENINGS ARE BASED ON EXISTING PLANS
3. REFER TO SHEET "CLEANING AND SEALING EXISTING BRIDGE JOINTS" FOR ITEMS INSTALLED IN THE OPENING
4. REFER TO SHEET "ARMOR JOINT REPAIR" FOR ITEMS INSTALLED IN THE OPENING

POLYESTER POLYMER CONCRETE (PPC) OVERLAY NOTES:

Perform work in accordance with item 439 and instructions below. A technical representative of the overlay manufacturer shall be present at the pre-construction meeting and execution of all work associated with the overlay installation.

1. Plane asphalt from bridge deck per Item 354, "Planing and Texturing Pavement." The thickness of the existing ACP varies from approximately 3½ inches to 4½ inches.
2. Inspect the bridge deck for potential deck repairs or delaminated concrete. Spalls and delaminations up to ½" deep do not require repair, and after surface cleaning and preparation can be filled with PPC overlay material. Repairs greater than ½" in depth will require partial depth deck repair. Perform partial and/or full depth bridge deck repairs in accordance with Item 429, "Concrete Structure Repair" and Chapter 3, Section 4 of TxDOT Concrete Repair Manual. Cure repairs in accordance with Manufacturer's recommendations unless approved otherwise. This work will be paid for in accordance with Item 429, "Concrete Structure Repair."
3. Prepare the deck surface by shot blasting and cleaning with high pressure air. Remove all oil and other contaminants. Provide a surface profile with amax deviation of ¼ inch. This work is subsidiary to Special Specification 4106.
4. Mask existing joints and deck drains. Saw cutting of joints after overlay installation is prohibited.
5. Install Polyester Polymer Concrete Overlay (PPCO) per Special Specification 4106.
   Thickness of PPCO as follows:
   - Spans 1 thru 6 = 2"
   - Span 8 = 2"
   - Spans 7 & 9 = varies, 2" min & 3" ± max
   - Spans 10 thru 16 = 2"
6. The Contractor is responsible for the ride quality of the finished surface. See Article 422.4.10, "Defective Work" for acceptance criteria to be enforced for this work.
7. Groove surface longitudinally in accordance with Article 422.4.11 "Final Surface Texture."
8. Install pavement markings as shown on plans.
9. Seal all expansion joints. See "Cleaning and Sealing Existing Bridge Joints" and "Armor Joint Repair" for joint details.

STATE OF TEXAS
JAMES EDWARD BROWNE
62207
LICENSED PROFESSIONAL ENGINEER
7/10/2024

Texas Department of Transportation | Bridge Division

BRIDGE DECK OVERLAY NOTES

NBI: 02-220-0081-01-001

FILE:	DN: JEB	CK: BLJ	DW: BLJ	CK: JEB
©TxDOT August 2022	CONT	SECT	JOB	HIGHWAY
REVISIONS	0081	01	050	US 377
	DIST	COUNTY		SHEET NO.
	FTW	TARRANT		79

DATE: 7/10/2024 7:55:36 AM
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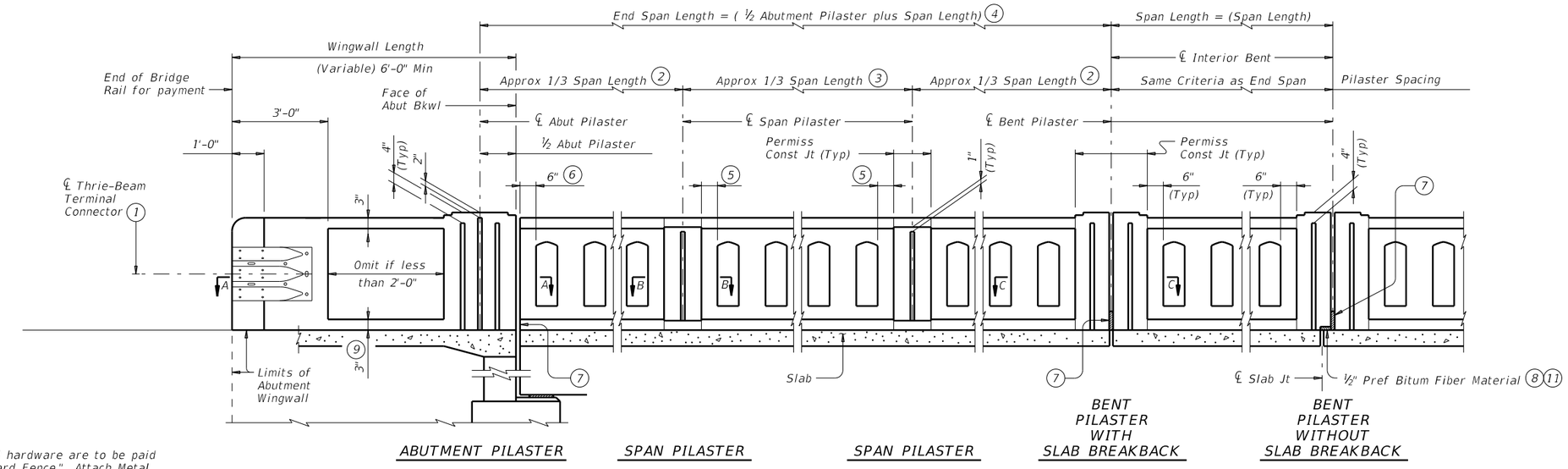
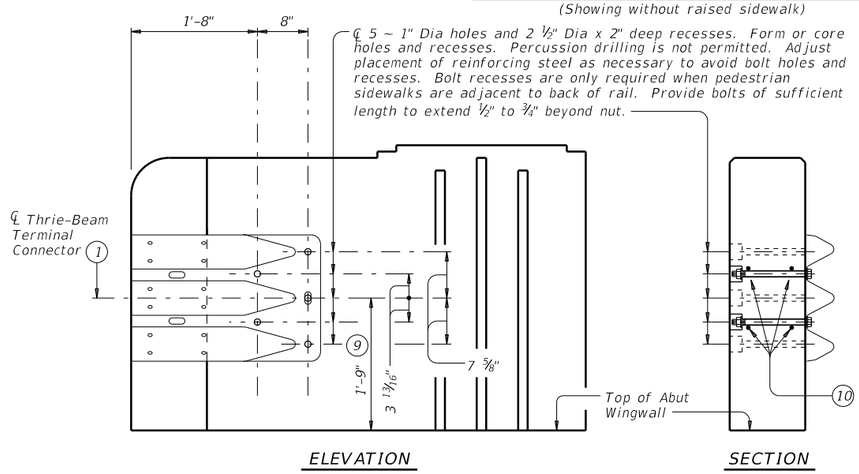


ROADWAY ELEVATION OF RAIL

(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.



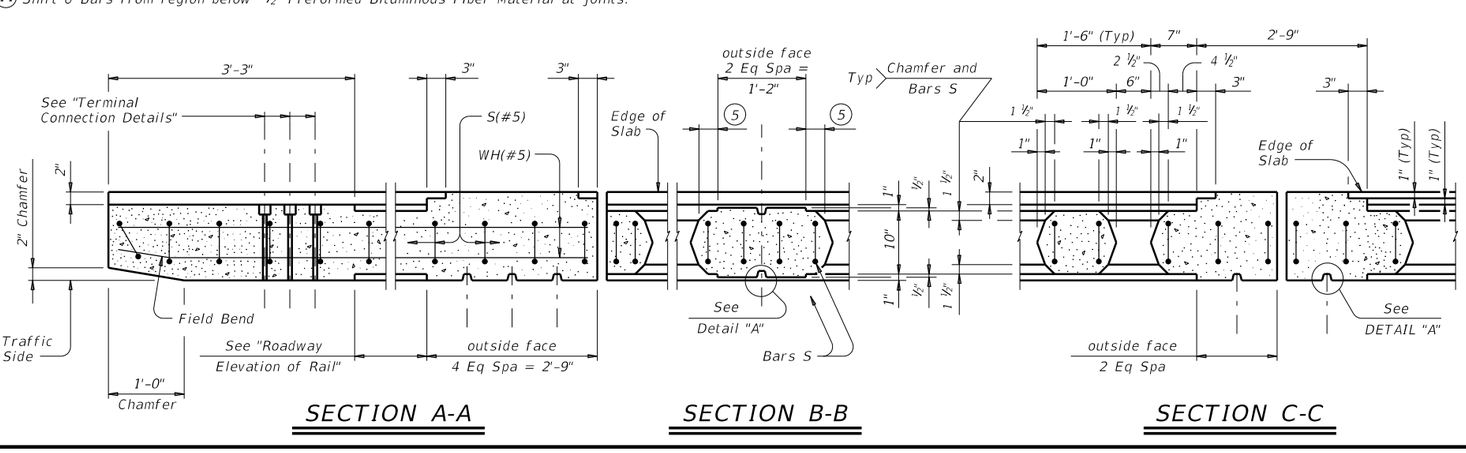
TERMINAL CONNECTION DETAILS

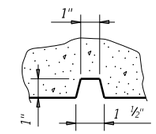
(Showing parapet with Pilaster on 6'-0" Wingwall)

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"

SHEET 1 OF 3

Texas Department of Transportation

Bridge Division Standard

COMBINATION RAIL TEXAS CLASSIC

TYPE C411

FILE:	DN: TxDOT	CK: TxDOT	DW: TxDOT	CK: TxDOT
©TxDOT September 2019	CONT	SECT	JOB	HIGHWAY
REVISIONS 7-20: Bronze star change to one manufacturer.	0081	01	050	US 377
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	FTW	TARRANT		80

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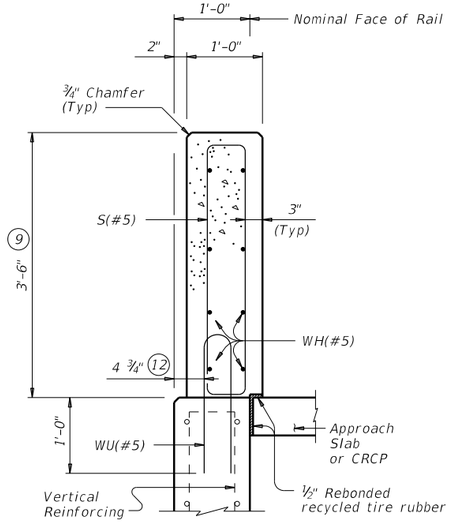
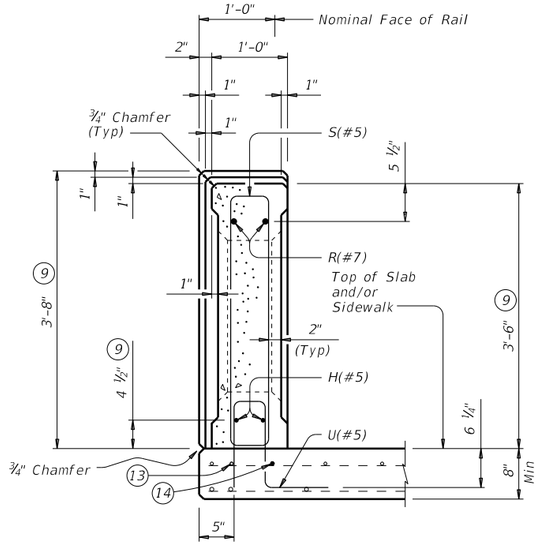
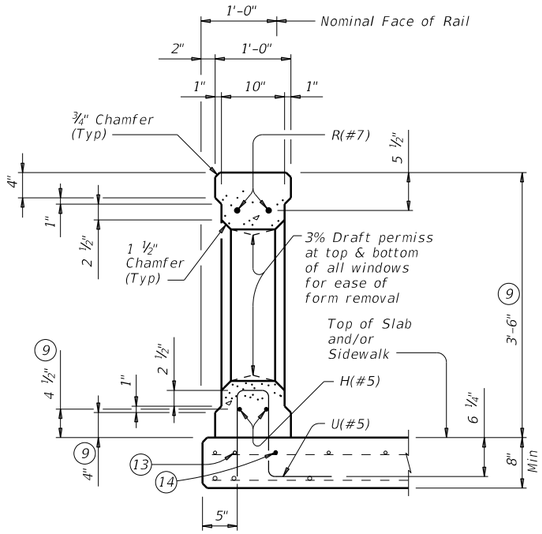


ON ABUTMENT WINGWALLS OR CIP RETAINING WALLS



SECTION THRU POST ON BRIDGE SLAB
(Showing Pilaster)



SECTION THRU WINDOW ON BRIDGE SLAB

SECTIONS THRU RAIL WITHOUT RAISED SIDEWALK

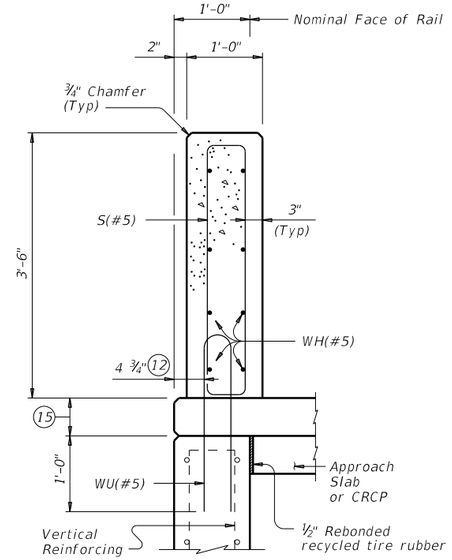
(9) Increase 2" for structures with overlay.

(12) 5 ¼" when vertical reinforcing has closer clear cover over horizontal reinforcing in abutment wingwalls or retaining walls on traffic side of wall.

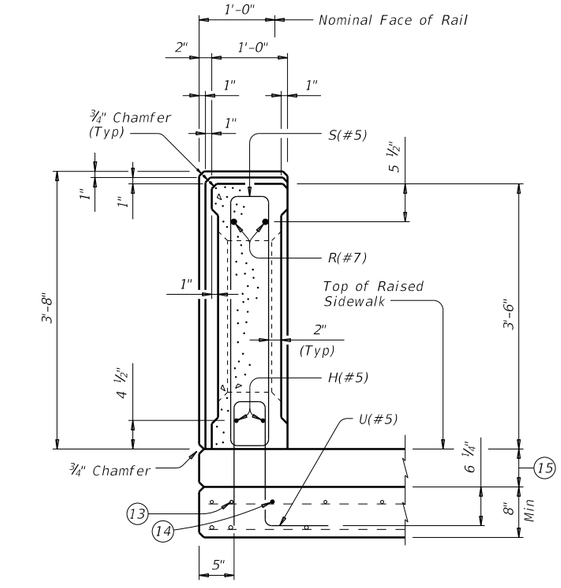
(13) As an aid in supporting reinforcement, additional longitudinal bars may be used in the slab with the approval of the Engineer. Such bars must be furnished at the Contractor's expense.

(14) Top longitudinal slab bar may be adjusted laterally 3" plus or minus to tie reinforcing.

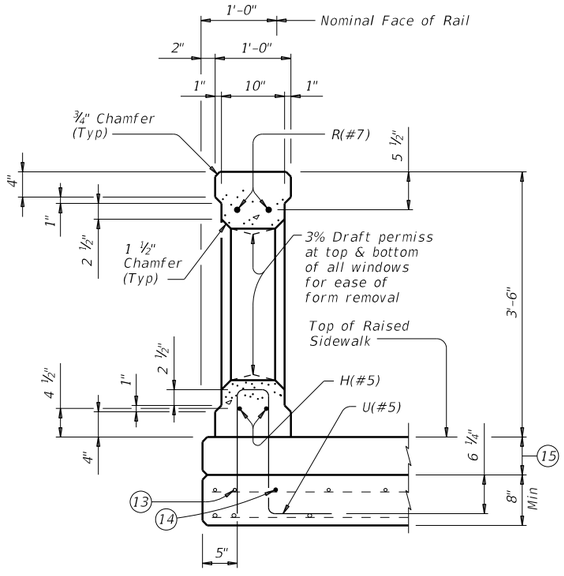
(15) Raised Sidewalk



ON ABUTMENT WINGWALLS OR CIP RETAINING WALLS



SECTION THRU POST ON BRIDGE SLAB
(Showing Pilaster)



SECTION THRU WINDOW ON BRIDGE SLAB

SECTIONS THRU RAIL WITH RAISED SIDEWALK

Texas Department of Transportation

Bridge Division Standard

COMBINATION RAIL TEXAS CLASSIC

TYPE C411

FILE:	DN: TxDOT	CK: TxDOT	DW: TxDOT	CK: TxDOT
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7-20: Bronze star change to one manufacturer.	DIST	COUNTY		SHEET NO.
	FTW	TARRANT		81

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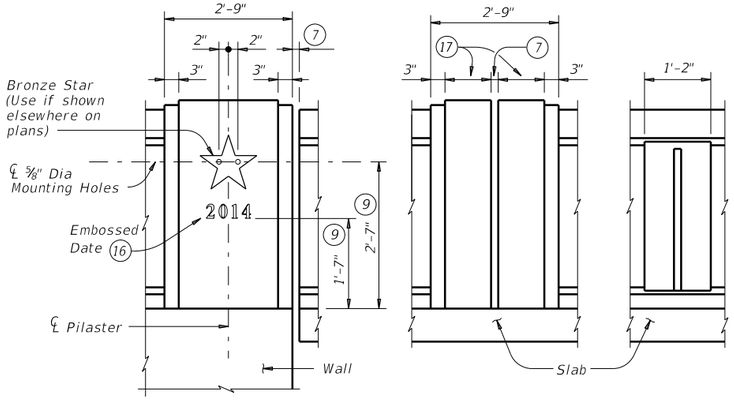
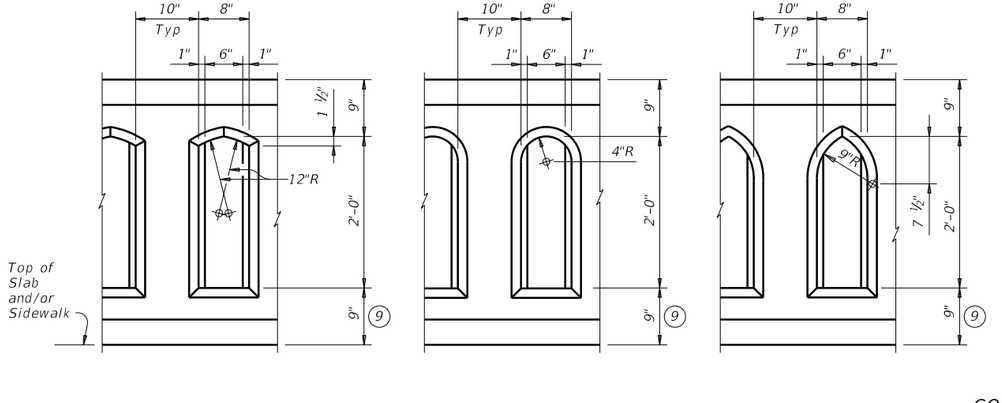


EXTERIOR PILASTER ELEVATIONS

(Showing without raised sidewalk)



WINDOW TYPES

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.

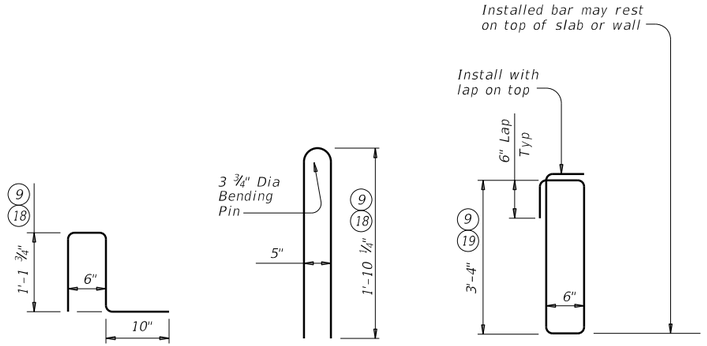
See Bridge Layout or other plan sheets for the following: dimensions with the number of span pilasters, dimensions with the number of windows, window type, inclusion of bronze stars, inclusion of construction year with abutment identity.

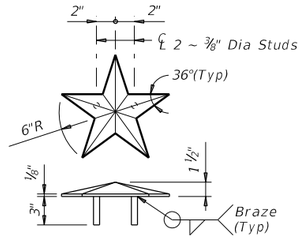
Submit erection drawings showing span number, span pilaster locations, number of windows between pilasters and spacing to first window (see Note 6) to the Engineer for approval.

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.

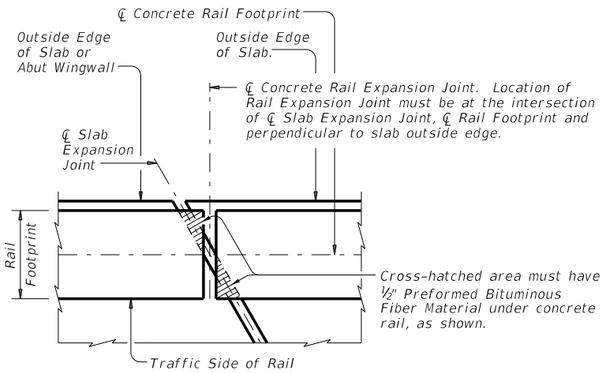




BRONZE STAR DETAIL (20)

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 sidewalks, add sidewalk height to total bar height. Use sidewalk height at rail's location.

(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.

SHEET 3 OF 3

Texas Department of Transportation

Bridge Division Standard

COMBINATION RAIL TEXAS CLASSIC

TYPE C411

FILE:	DN: TxDOT	CK: TxDOT	DW: TxDOT	CK: TxDOT
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REVISIONS	0081	01	050	US 377
7-20: Bronze star change to one manufacturer.	DIST	COUNTY		SHEET NO.
	FTW	TARRANT		82

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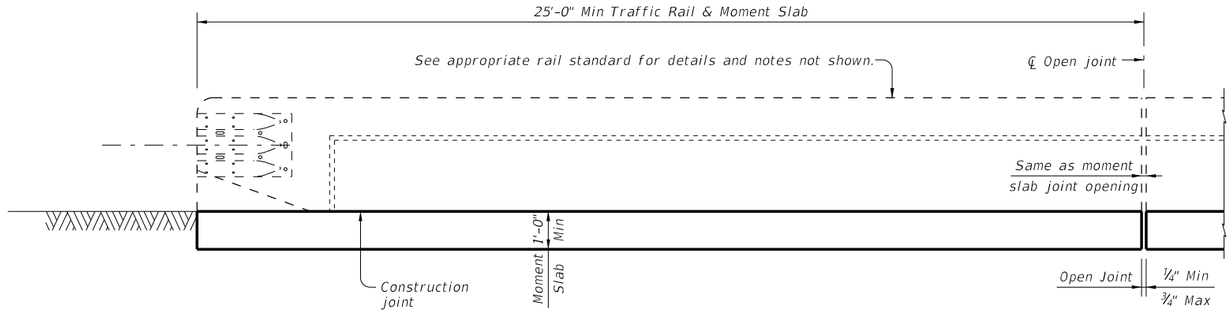
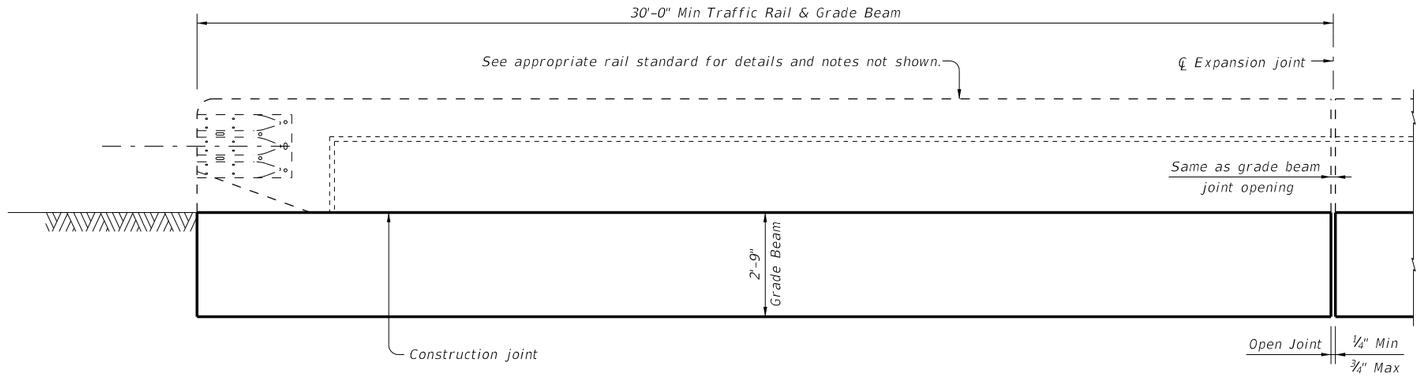


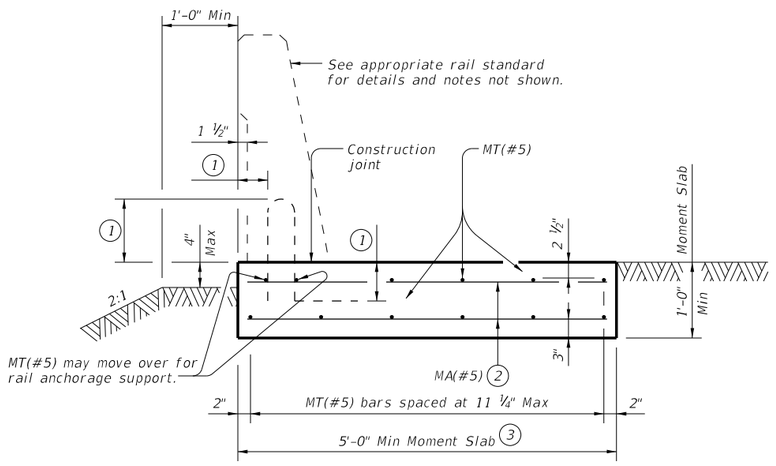
ROADWAY ELEVATION OF TRAFFIC RAIL ON MOMENT SLAB (TRF-MS)

(Showing SSTR rail other rails are similar. Reinforcing not shown for clarity.)



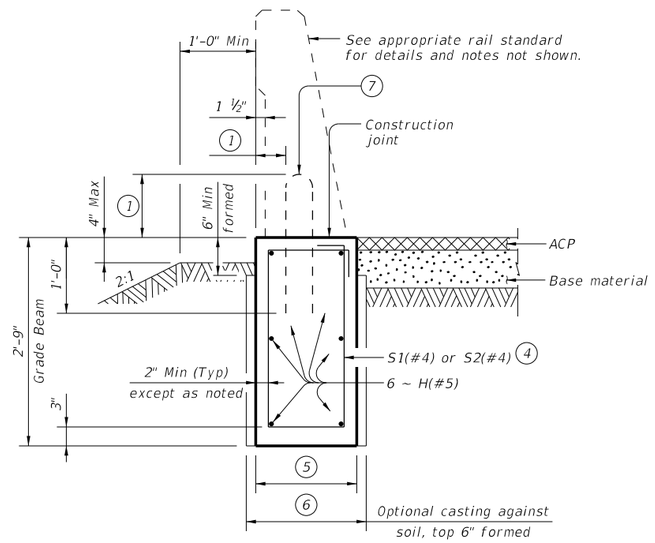
ROADWAY ELEVATION OF TRAFFIC RAIL ON GRADE BEAM (TRF-GB)

(Showing SSTR rail other rails are similar. Reinforcing not shown for clarity.)



SECTION OF TRAFFIC RAIL ON MOMENT SLAB (TRF-MS)

(Showing SSTR rail other rails are similar.)



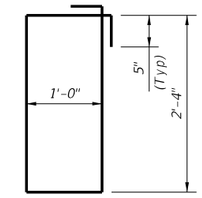
SECTION OF TRAFFIC RAIL ON GRADE BEAM (TRF-GB)

(Showing SSTR rail other rails are similar.)

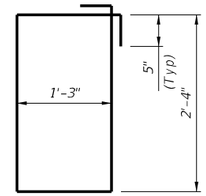
1. See applicable bridge rail standard.
2. MA(#5) space longitudinally along moment slab at 12" Max. (Spaced 2 ½" longitudinally from outside edge of moment slab).
3. Approximate moment slab concrete = 0.19 CY/LF and reinforcement = 22.4 LB/LF.
4. S1(#4) or S2(#4) spaced longitudinally along grade beam at 8" Max. (Spaced 2 ½" longitudinally from outside edge of grade beam).
5. Use bar S1(#4) with 1'-4" grade beam width and bridge rail types: All rails except for T224, C412, T66, C66, T80HT and T80SS.
   Approximate grade beam concrete = 0.14 CY/LF and reinforcement = 13.8 LB/LF.

   Use bar S2(#4) with 1'-7" grade beam width and bridge rail types: T66 and C66.
   Approximate grade beam concrete = 0.16 CY/LF and reinforcement = 14.2 LB/LF.
6. 1'-6" for bridge rail types: All rails except for T224, C412, T66, C66, T80HT and T80SS.

   1'-9" bridge rail types: T66 and C66.
7. Modify reinforcing on standard bridge rail anchorage if necessary by extending rail anchorage 12" Min, vertically into traffic rail



BARS S1(#4)



BARS S2(#4)

CONSTRUCTION NOTES:

Align moment slab (TRF-MS) or grade beam (TRF-GB) open joints with rail open joints maintaining no less than minimum rail length. Provide moment slab (TRF-MS) or grade beam (TRF-GB) with open joints at no greater than 100' spacing unless otherwise shown on the plans or approved by the Engineer.

MATERIAL NOTES:

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

Provide Grade 60 reinforcing steel.

Epoxy coat or galvanize all reinforcing steel if required elsewhere.

Deformed Welded Wire Reinforcement (WWR) (ASTM A1064) of equal size and spacing may be substituted for bars S1(#4), S2(#4) and H(#5) unless noted otherwise. Provide the same laps as required for reinforcing bars.

Provide bar laps, where required, as follows:

Uncoated or galvanized ~ #5 = 2'-4"
Epoxy coated ~ #5 = 3'-6"

GENERAL NOTES:

Use of these details will result in a moment slab (TRF-MS) or grade beam (TRF-GB) foundation that is acceptable for traffic rails which are MASH TL-2, TL-3, or TL-4 compliant.

See elsewhere in the plans for selected options between moment slab (TRF-MS) and/or grade beam (TRF-GB).

The foundation design resistance is based on the current AASHTO bridge railing requirements with the assumption of fair to good soil support conditions. Poor soil conditions will require suitably deeper and/or wider foundations.

See appropriate rail standard for details and notes not shown.

This detail is intended for use as a guide to unusual railing anchorage situations but may be included in the plans, modified as necessary to apply to specific installations required on the project.

Payment for moment slab (TRF-MS) and/or grade beam (TRF-GB) will be by Class "C" concrete or Class "C" (HPC) concrete for rail foundations.

The associated bridge railing will be paid for by the linear foot which includes the concrete and reinforcement.

Excavation will be subsidiary to other Items.

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

Texas Department of Transportation

Bridge Division Standard

TRAFFIC RAIL FOUNDATIONS
FOR MASH TL-2, TL-3 & TL-4 BRIDGE RAILS

TRF

FILE: RL-TRF-20.dgn	DN: TxDOT	CK: TAR	DW: JTR	CK: TAR
©TxDOT September 2019	CONT	SECT	JOB	HIGHWAY
REVISIONS 07-20: Added moment slab with rail foundation lengths.	0081	01	050	US 377
	DIST	COUNTY		SHEET NO.
	FTW	TARRANT		83

DATE: 7/10/2024 7:56:30 AM
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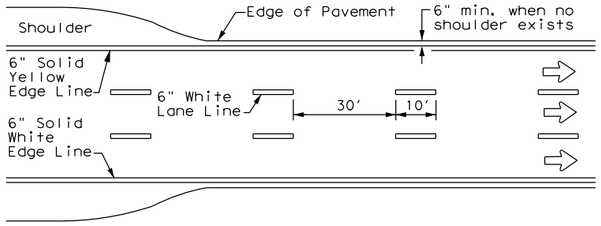
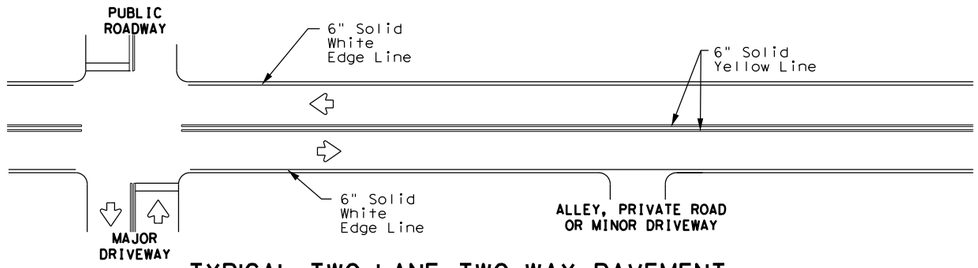
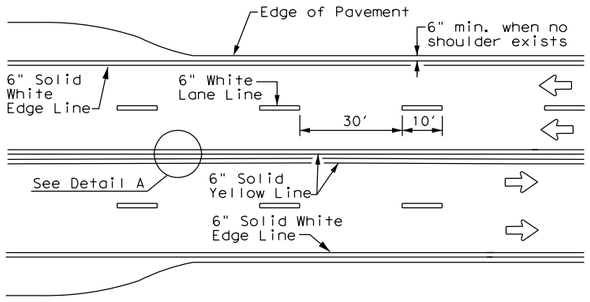
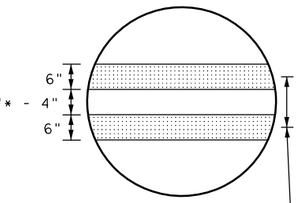


EDGE LINE AND LANE LINES ONE-WAY ROADWAY WITH OR WITHOUT SHOULDERS



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





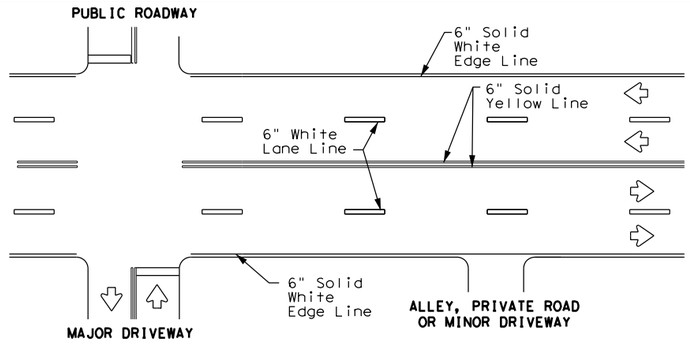
DETAIL "A"

9"** min. - 10" typ.
(18" max. for traveled way greater than 48' only)

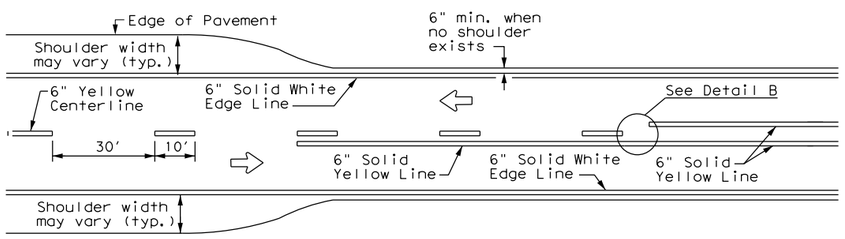
CENTERLINE AND LANE LINES FOUR LANE TWO-WAY ROADWAY WITH OR WITHOUT SHOULDERS

* 2" minimum for restripe projects when approved by the Engineer.

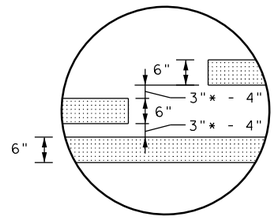
** 8" minimum for restripe projects when approved by the Engineer.



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



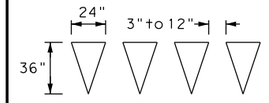
TWO LANE TWO-WAY ROADWAY WITH OR WITHOUT SHOULDERS



18" min. - 20" max.
(16" minimum for restripe projects when approved by the Engineer.)

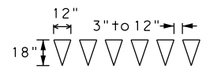
DETAIL "B"

* 2" minimum for restripe projects when approved by the Engineer.

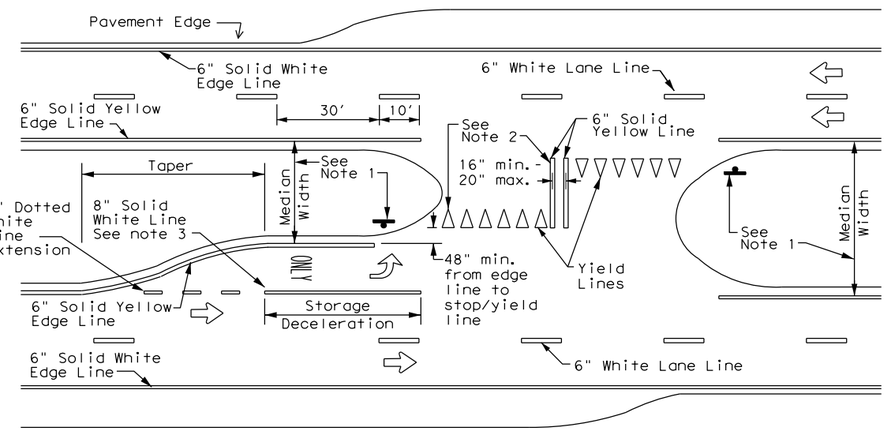


For posted speed on road being marked equal to or greater than 45 MPH.

YIELD LINES



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



FOUR LANE DIVIDED ROADWAY CROSSOVERS

NOTES

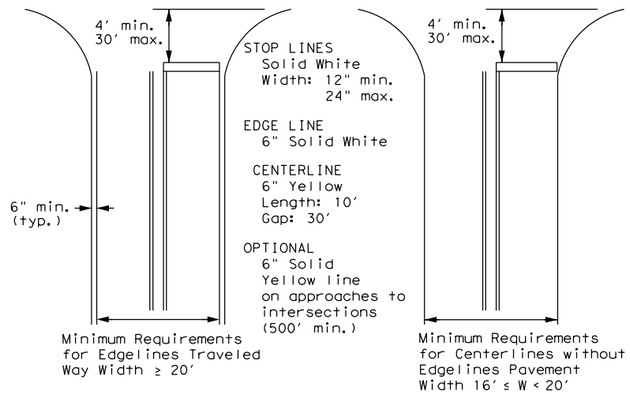
1. Where divided highways are separated by median widths at the median opening itself of 30 feet or more, median openings shall be signed as two separate intersections. Each median opening has two width measurements, with one measurement for each approach. The narrow median width will be the controlling 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

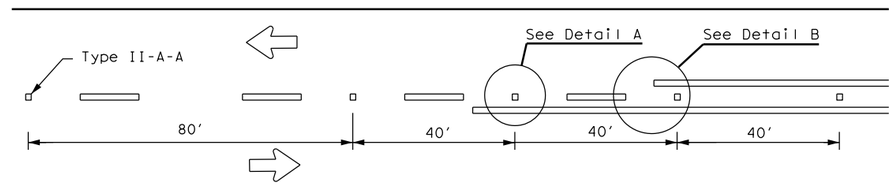
TYPICAL STANDARD PAVEMENT MARKINGS

PM(1)-22

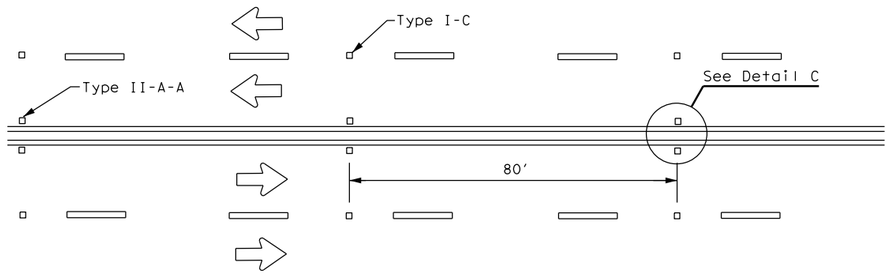
FILE: pm1-22.dgn	DN:	CK:	DW:	CK:
© TxDOT December 2022	CONT	SECT	JOB	HIGHWAY
REVISIONS 11-78 8-00 6-20 8-95 3-03 12-22 5-00 2-12	0081	01	050	US 377
	DIST	COUNTY		SHEET NO.
	FTW	TARRANT		84

22A

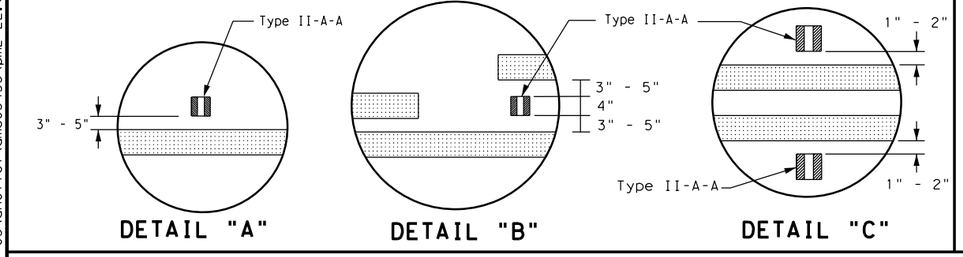
REFLECTIVE RAISED PAVEMENT MARKERS FOR VEHICLE POSITIONING GUIDANCE

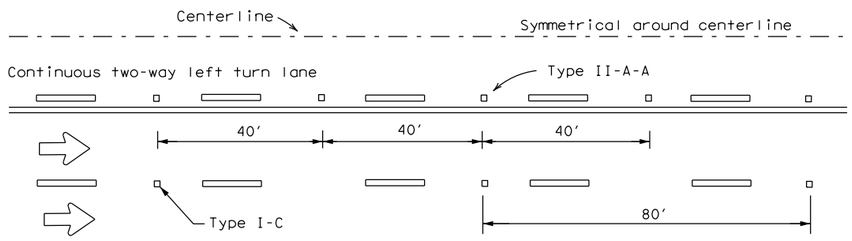


CENTERLINE FOR ALL TWO LANE TWO-WAY ROADWAYS

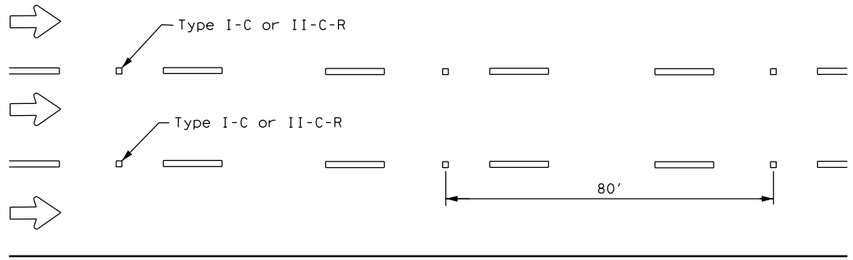


CENTERLINE & LANE LINES FOR FOUR LANE TWO-WAY ROADWAYS





CENTERLINE AND LANE LINES FOR TWO-WAY LEFT TURN LANE



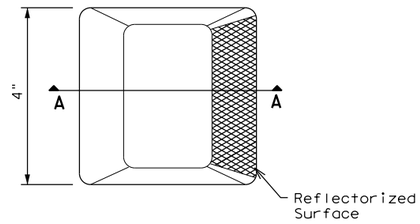
LANE LINES FOR ONE-WAY ROADWAY (NON-FREEWAY FACILITIES)

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

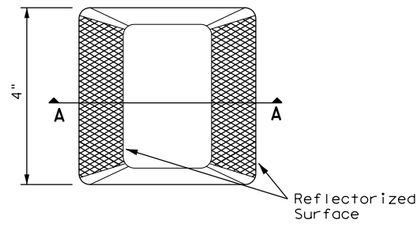
See Note 3.

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

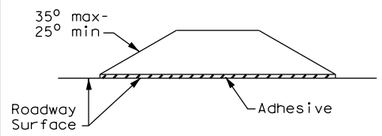
All pavement marking materials shall meet the required Departmental Material Specifications as specified by the plans.



Type I (Top View)

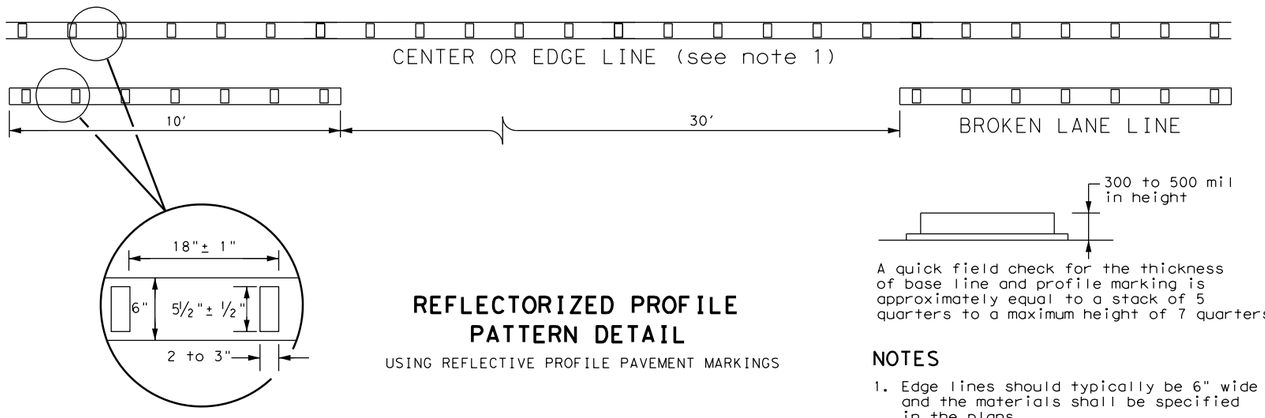


Type II (Top View)



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

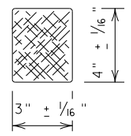
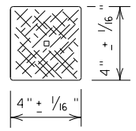
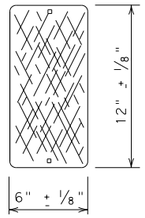
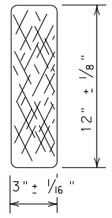
POSITION GUIDANCE USING RAISED MARKERS RELECTORIZED PROFILE MARKINGS PM(2)-22

FILE: pm2-22.dgn	DN:	CK:	DW:	CK:
©TxDOT December 2022	CONT	SECT	JOB	HIGHWAY
REVISIONS	0081	01	050	US 377
4-77 8-00 6-20	DIST	COUNTY		SHEET NO.
4-92 2-10 12-22	FTW	TARRANT		85
5-00 2-12				

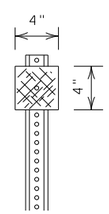
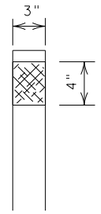
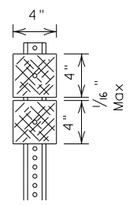
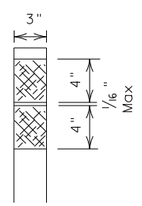
22B

DATE: 7/10/2024 7:56:46 AM
FILE: c:\projectwise\bartwest-pw.bentley.com_caibartwest-pw-03\dn01767\dms\6453\pm2-22.dgn

REFLECTOR UNIT SIZES FOR DELINEATORS AND OBJECT MARKERS

	SIZE 1	SIZE 2	SIZE 3	SIZE 4
DEVICE				
SHEETING	Yellow, White or Red Type B or C reflective sheeting			
NOTE	1. Size 1 and 4 - Direct applied reflective sheeting for use on flexible post (flx). 2. Size 2 and 3 - For use on wing channel (wc) post only. Use approved metal, plastic or fiberglass backplate with 17/64" mounting holes.			

DELINEATORS

	SINGLE		DOUBLE	
DEVICE				
	1-Size 2 reflector unit	1-Size 1 reflector unit	2-Size 2 reflector units	2-Size 1 reflector units
SHEETING	Yellow, White or Red Type B or C Reflective Sheeting			
POST TYPE	WC	YFLX, WFLX	WC	YFLX, WFLX
MOUNT TYPE	GND	GND, SRF	GND	GND, SRF

D & OM DESCRIPTIVE CODES

INSTL DEL ASSM (D-XX)SZ X (XXXX)XXX(XX)

NUMBER OF REFLECTORS
- S = Single
- D = Double

COLOR OF REFLECTORS
- W = White
- Y = Yellow
- R = Red

REFLECTOR UNIT SIZE
- 1 or 2

TYPE OF POST OR DELINEATOR
- WC = Wing Channel Post
- YFLX = Yellow Flexible Post
- WFLX = White Flexible Post
- BRF = Barrier Reflector

TYPE OF MOUNT
- GND = Embedded (drivable or set in concrete)
- CTB = Concrete Barrier Mount
- GF1 or GF2 = Guard Fence Attachment
- SRF = Surface Mount

DIRECTION
If Required
- BI = Bi-Directional
- BR = Bi-Directional with red on back

INSTL OM ASSM (OM-XX) (XXXX)XXX(XX)

TYPE OF OBJECT MARKER
- 1, 2, 3, or 4

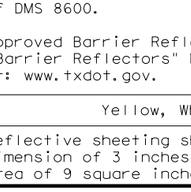
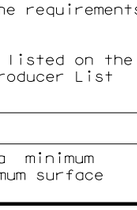
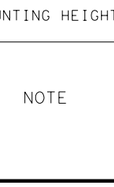
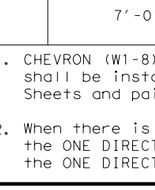
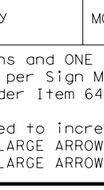
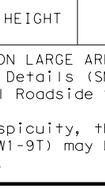
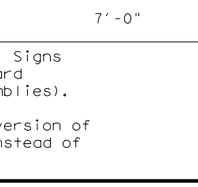
NUMBER OF REFLECTORS OR DIRECTION
- X = 3-Size 2 reflector units (Type 2 only)
- Y = 1-Size 3 reflector unit (Type 2 only)
- Z = 3-Size 1 or 1-Size 4 reflector unit(s)(Type 2 only)
- L = Left Side (Type 3 Object Marker only)
- R = Right Side (Type 3 Object Marker only)
- C = Center (Type 3 Object Marker only)

TYPE OF POST
- WC = Wing Channel Post
- WFLX = White Flexible Post
- TWT = Thin Walled Tubing

TYPE OF MOUNT
- GND = Embedded (drivable)
- SRF = Surface Mount
- WAS = Wedge Anchor Steel
- WAP = Wedge Anchor Plastic

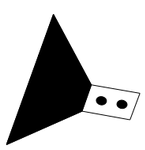
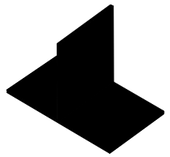
DIRECTION
If Required
- BI = Bi-Directional

OBJECT MARKERS

	Type 1 (OM-1)	Type 2 (OM-2)			Type 3 (OM-3)			Type 4 (OM-4)
	OM-1	OM-2X	OM-2Y	OM-2Z	OM-3L	OM-3R	OM-3C	OM-4
DEVICE								
		3-Size 2 reflector units	1-Size 3 reflector unit	3-Size 1 reflector units or 1-Size 4 reflector unit				
SHEETING	Yellow-Type B_{FL} or C_{FL} Sheeting	Yellow - Type B or C Sheeting			Alternating acrylic black and retroflective yellow - Type B_{FL} or C_{FL} Sheeting			Red -Type B_{FL} or C_{FL} Sheeting
POST TYPE	TWT	WC	WC	WFLX	TWT			TWT
MOUNT TYPE	WAS, WAP	GND	GND	GND, SRF	WAS, WAP			WAS, WAP

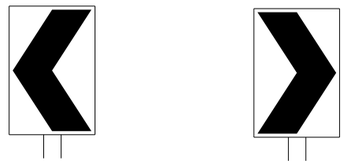
DEPARTMENTAL MATERIAL SPECIFICATIONS	
FLEXIBLE DELINEATOR & OBJECT MARKER POSTS (EMBEDDED & SURFACE MOUNT TYPES)	DMS-4400
SIGN FACE MATERIALS	DMS-8300
DELINEATORS, OBJECT MARKERS AND BARRIER REFLECTORS	DMS-8600

BARRIER REFLECTORS (BRF)

	GF1	GF2	CTB
DEVICE			
	1. Barrier reflectors shall meet the requirements of DMS 8600. 2. Approved Barrier Reflectors are listed on the "Barrier Reflectors" Material Producer List at: www.txdot.gov.		
SHEETING	Yellow, White, Red		
NOTE	1. Reflective sheeting shall have a minimum dimension of 3 inches and minimum surface area of 9 square inches.		

CHEVRONS

DEVICE



W1-8

SIZE (W x L)	18"x 24" (Conventional)	24"x 30" (Conventional Oversize)	30"x 36" (Expressway)	36" x 48" (Freeway)
MOUNTING HEIGHT	4'-0" or 7'-0"		7'-0" Only	

NOTE
1. CHEVRON (W1-8) signs and ONE DIRECTION LARGE ARROW (W1-6) Signs shall be installed per Sign Mounting Details (SMD) Standard Sheets and paid under Item 644 (Small Roadside Sign Assemblies).
2. When there is a need to increase conspicuity, the Texas version of the ONE DIRECTION LARGE ARROW sign (W1-9T) may be used instead of the ONE DIRECTION LARGE ARROW (W1-6).

ONE DIRECTION LARGE ARROW

DEVICE

W1-6

SIZE (W x L)	48" x 24" (Conventional)	60" x 30" (Expressway & Freeway)
MOUNTING HEIGHT	7'-0"	

NOTE:

Delineator and object marker substrates and sign substrates shall be 0.080" Aluminum sign blank to conform to ASTM B-209 Alloy 6061-T6 or approved alternative.

Texas Department of Transportation

Traffic Safety Division Standard

DELINEATOR & OBJECT MARKER MATERIAL DESCRIPTION

D & OM(1)-20

FILE: dom1-20.dgn	DN: TXDOT	CK: TXDOT	DW: TXDOT	CK: TXDOT
©TxDOT August 2004	CONT	SECT	JOB	HIGHWAY
REVISIONS	0081	01	050	US 377
10-09 3-15	DIST	COUNTY		SHEET NO.
4-10 7-20	FTW	TARRANT		86

20A

DATE: 7/10/2024 7:57:01 AM
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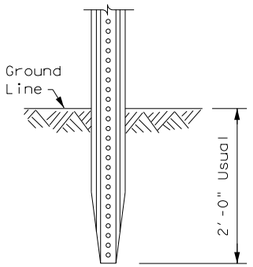
DATE: 7/10/2024 7:57:15 AM
FILE: c:\projectwise\bartwest-pw.bentley.com_caibartwest-pw-03\wh01767\dms\95439\dom2-20.dgn

POST TYPE AND SUPPORT FOUNDATION DETAILS

WING CHANNEL (WC)

GND

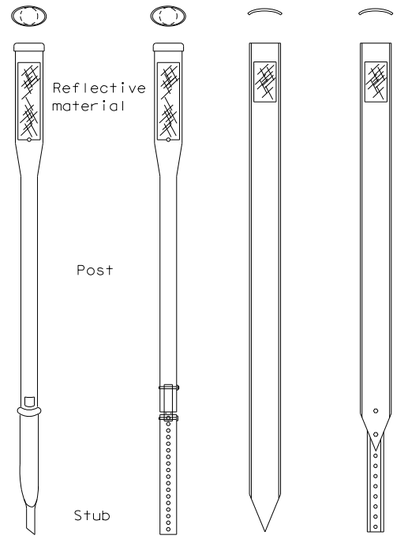


NOTES

1. Embedded Wing Channel (WC) post option may be used for Type 2 Object Markers and Delineators only.
2. 1.12 lbs/ft steel per ASTM A 1011 SS Gr. 50, or ASTM A499.

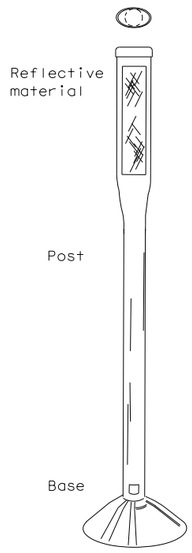
FLEXIBLE POSTS (YFLX, WFLX)

GND



EMBEDDED

SRF



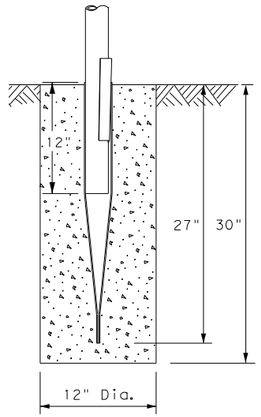
SURFACE MOUNT

NOTES

1. See "Flexible Delineator and Object Marker Posts" Material Producer List for approved devices.
2. Install per manufacturer's recommendations.
3. Post length may vary to meet field conditions.
4. When using yellow delineators with flexible posts to separate opposing direction of travel, such as centerline or median use, the flexible posts shall be yellow.

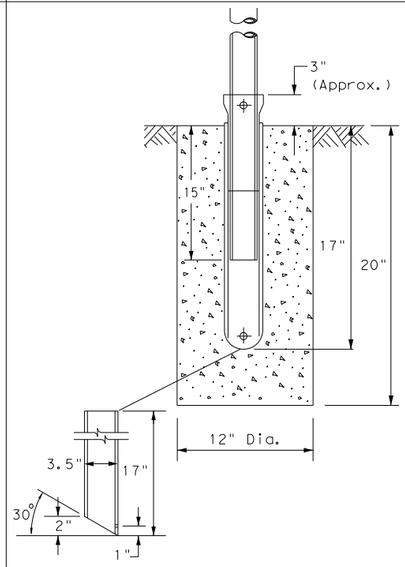
WEDGE ANCHOR SYSTEMS

WAS



STEEL

WAP



PLASTIC

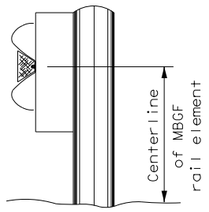
NOTE

1. Install per manufacturer's recommendations.

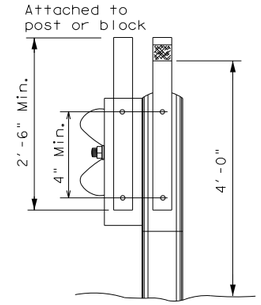
TYPE OF BARRIER MOUNTS

GUARD FENCE ATTACHMENT

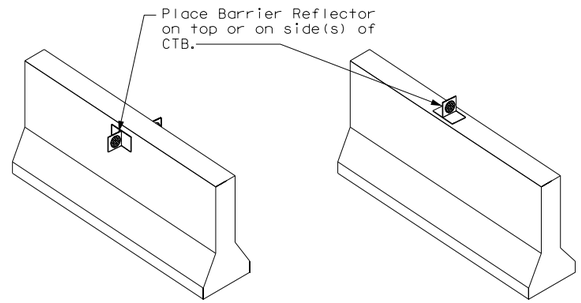
GF1



GF2



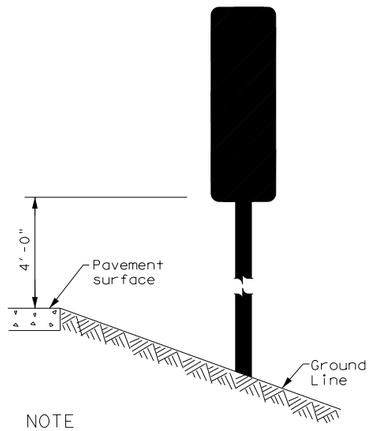
CONCRETE TRAFFIC BARRIER (CTB)



GENERAL NOTES

1. Place delineators on a section of roadway at a consistent distance from the edge of pavement.
2. Where a restriction prevents consistent placement from the pavement edge, place the affected object markers in line with the innermost edge of the obstruction.
3. When Type 2 object markers and delineators are more than 8'-0" from the edge of the pavement, it may not be possible to maintain a height of approximately 4'-0". If this is the case, place the object marker or delineator as close to the desired height as possible.
4. Install all delineators, object markers and barrier reflectors in accordance with the manufacturer's recommendation.
5. Barrier reflectors should be installed a minimum of 18 inches above the edge of the pavement surface.
6. Diagonal stripes on Type 3 object markers shall slope down toward the intended travel lane.

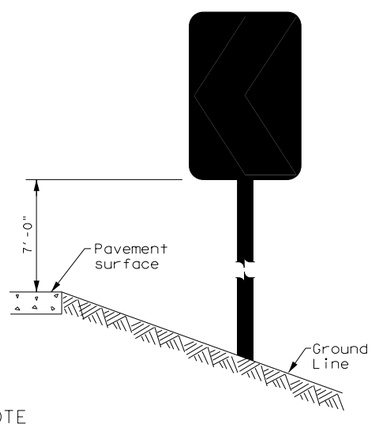
TYPES 1, 3, AND 4 OBJECT MARKERS AND CHEVRONS



NOTE

Mounting at 4 feet to the bottom of the chevron is permitted for chevrons that will not exceed a height of 6'-6" to the top of the chevron (sizes 24" x 30" and smaller)

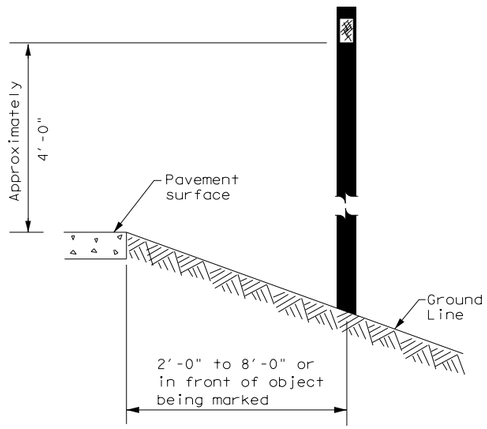
CHEVRONS AND ONE DIRECTION LARGE ARROW SIGN



NOTE

Chevrons 30" x 36" and larger shall be mounted at a height of 7' to the bottom of the chevron. Chevron sign and ONE DIRECTION LARGE ARROW sign (W1-9T) shall be installed per SMD standard sheets and paid under item 644.

DELINEATORS AND TYPE 2 OBJECT MARKERS



See general notes 1, 2 and 3.

Texas Department of Transportation — Traffic Safety Division Standard

DELINEATOR & OBJECT MARKER INSTALLATION

D & OM(2)-20

FILE: dom2-20.dgn	DN: TXDOT	CK: TXDOT	DW: TXDOT	CK: TXDOT
©TxDOT August 2004	CONT	SECT	JOB	HIGHWAY
REVISIONS	0081	01	050	US 377
10-09 3-15	DIST	COUNTY		SHEET NO.
4-10 7-20	FTW	TARRANT		87

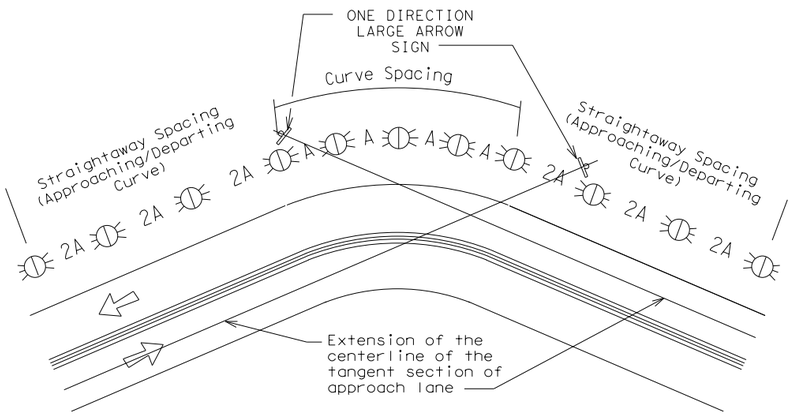
20B

DATE: 7/10/2024 7:57:36 AM
FILE: c:\projectwise\bartwest-pw.bentley.com_caibartwest-pw-03\ah01767\dms05439\dom3-20.dgn

MINIMUM WARNING DEVICES AT CURVES WITH ADVISORY SPEEDS

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

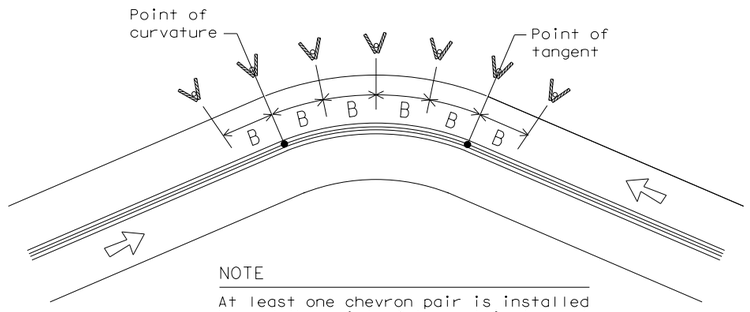
SUGGESTED SPACING FOR DELINEATORS ON HORIZONTAL CURVES



NOTE

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

SUGGESTED SPACING FOR CHEVRONS ON HORIZONTAL CURVES



NOTE

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

DELINEATOR AND CHEVRON SPACING

WHEN DEGREE OF CURVE OR RADIUS IS KNOWN

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

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

DELINEATOR AND CHEVRON SPACING

WHEN DEGREE OF CURVE OR RADIUS IS NOT KNOWN

Advisory Speed (MPH)	Spacing in Curve	Spacing in Straightaway	Chevron Spacing in Curve
	A	2xA	B
65	130	260	200
60	110	220	160
55	100	200	160
50	85	170	160
45	75	150	120
40	70	140	120
35	60	120	120
30	55	110	80
25	50	100	80
20	40	80	80
15	35	70	40

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

DELINEATOR AND OBJECT MARKER APPLICATION AND SPACING

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

NOTES

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

LEGEND	
	Bi-directional Delineator
	Delineator
	Sign

Texas Department of Transportation

Traffic Safety Division Standard

DELINEATOR & OBJECT MARKER PLACEMENT DETAILS

D & OM(3)-20

FILE: dom3-20.dgn	DN: TXDOT	CK: TXDOT	DW: TXDOT	CK: TXDOT
©TxDOT August 2004	CONT	SECT	JOB	HIGHWAY
REVISIONS	0081	01	050	US 377
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8-15 7-20	FTW	TARRANT		88

20C

DATE: 7/10/2024 7:57:53 AM
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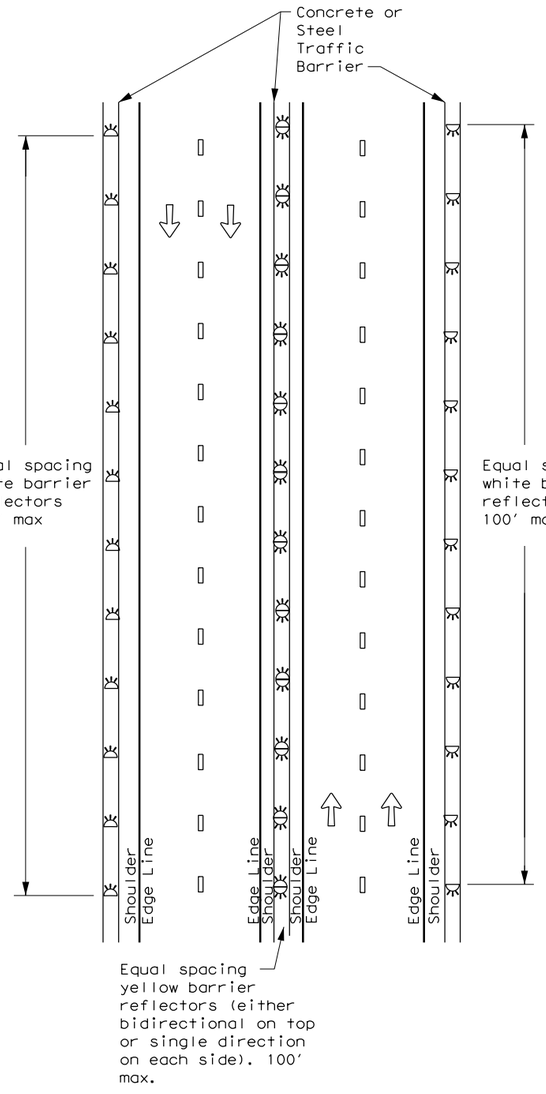
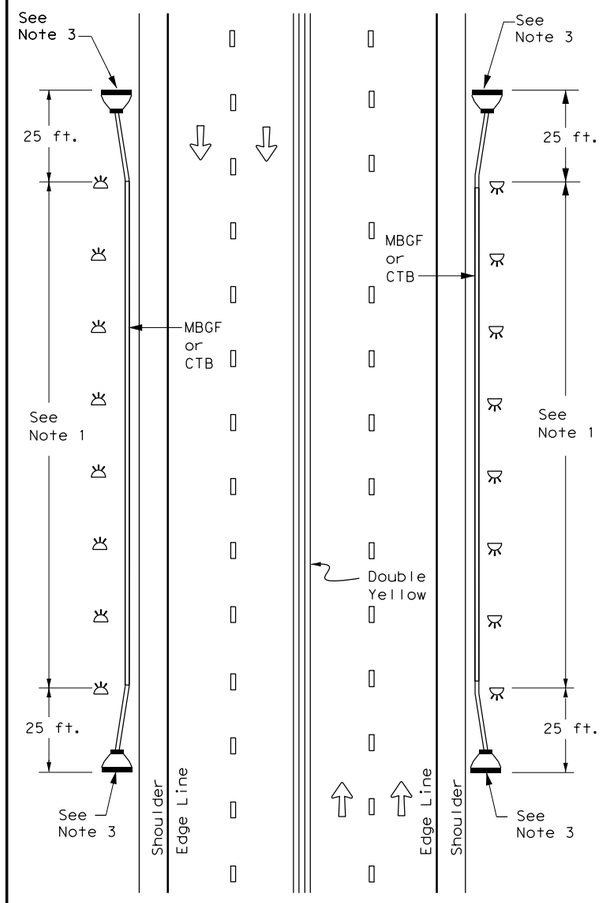
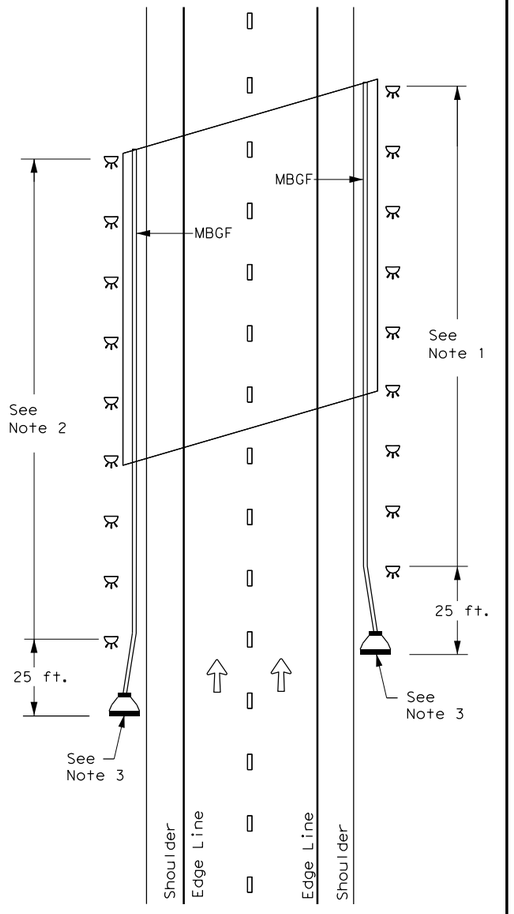
CONTINUOUS CONCRETE OR STEEL BARRIER



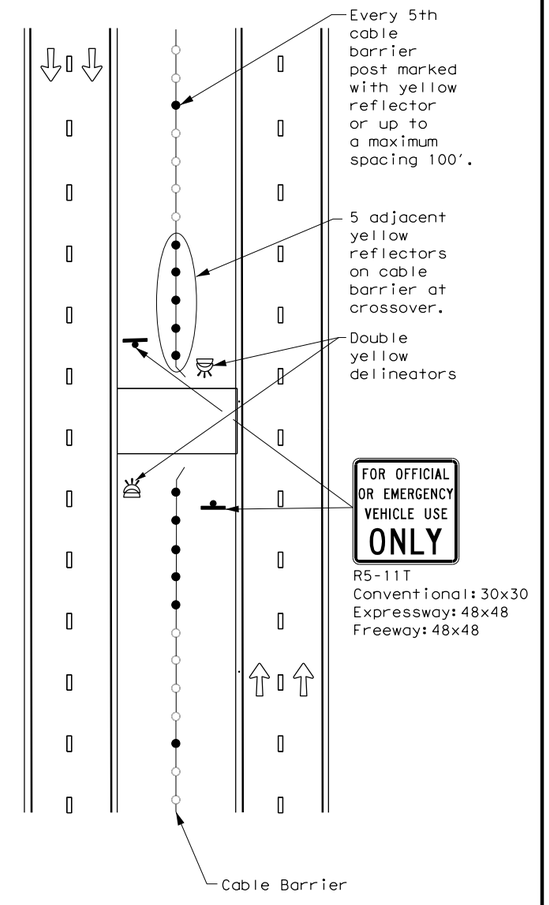
MULTI-LANE UNDIVIDED, TWO-WAY ROADWAY WITH METAL BEAM GUARD FENCE (MBGF)



DIVIDED ROADWAY WITH METAL BEAM GUARD FENCE (MBGF)



EMERGENCY CROSSOVER



NOTES

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

LEGEND

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

Texas Department of Transportation

Traffic Safety Division Standard

DELINEATOR & OBJECT MARKER PLACEMENT DETAILS

D & OM(6)-20

FILE: dom6-20.dgn	DN: TxDOT	CK: TxDOT	DW: TxDOT	CK: TxDOT
©TxDOT August 2015	CONT	SECT	JOB	HIGHWAY
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	FTW	TARRANT		89

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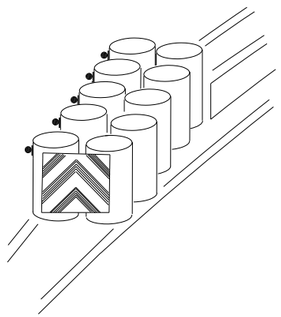
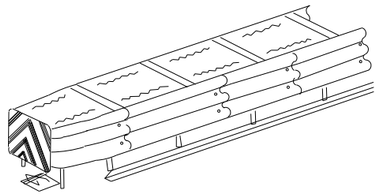
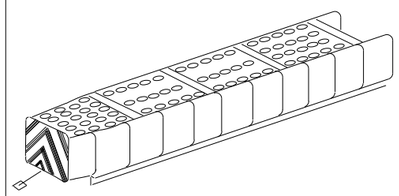
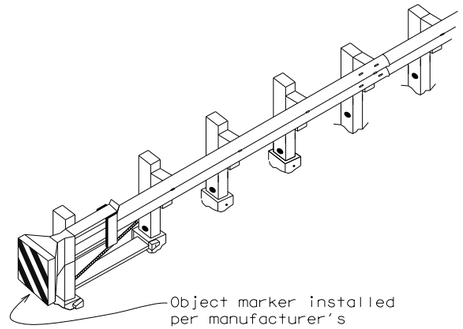
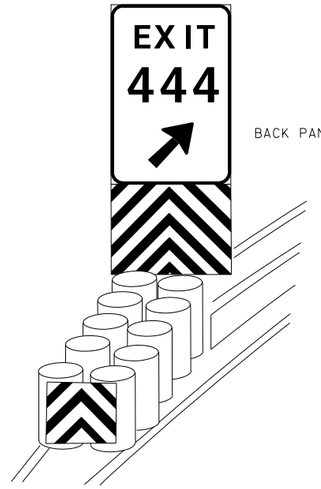
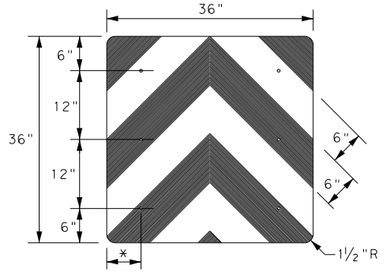


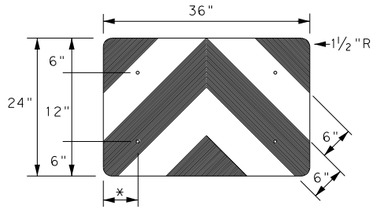




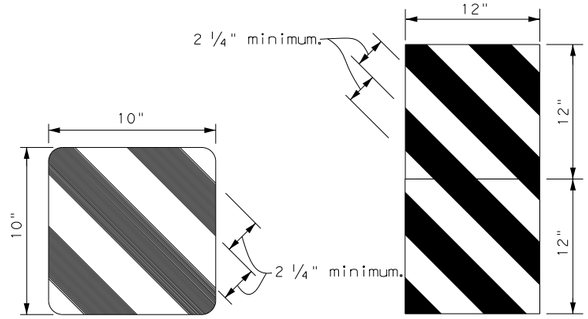




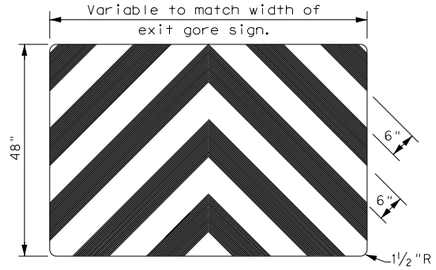


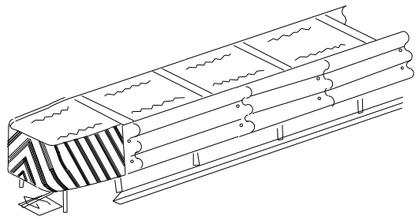


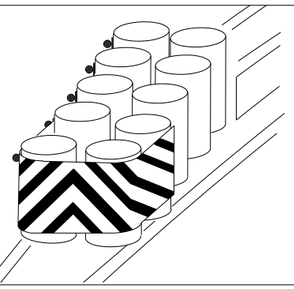
* Adjust to fit attenuator per manufacturer's recommendation, or as directed by the Engineer

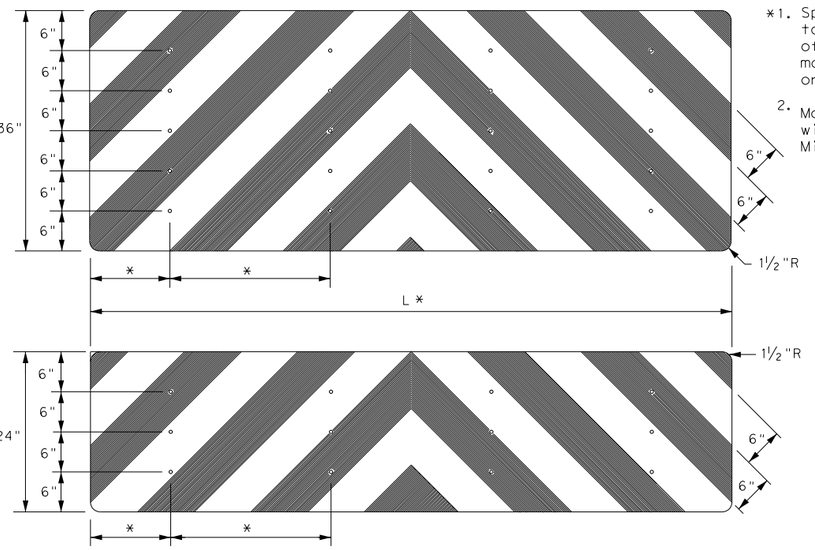


OBJECT MARKERS SMALLER THAN 3 FT^2









NOTES

*1. Spacing should be adjusted to attach through centerline of drum, per attenuator manufacturers recommendation, or as directed by the Engineer.

2. Mounting should be flush with top of attenuator. Minimum size 96" x 24".

NOTES

1. Object Markers shall conform to the Texas MUTCD and meet the color and reflectivity requirement of Department Material Specification DMS 8300. Background shall be yellow reflective sheeting (Type B or C) and Chevron shall be black.

2. Object Markers may be fabricated from adhesive backed reflective sheeting applied directly to guardrail end treatment, or applied directly to an "end cap" as per the manufacturer's recommendation. Direct applied sheeting shall provide a smooth surface and have no wrinkles, air bubbles, cuts or tears. A radius at the corners is not required for direct applied sheeting.

3. Object Marker size may be reduced to fit smaller devices. Width of alternating black and yellow stripes are typically 6". Object Markers smaller than 3ft may have reduced width stripes of a minimum of 2 ¼".

4. Pop rivets, screws, or nuts and bolts may be used to attach object markers and reflectors. Holes, slots or other openings may be cut or drilled through object markers to allow cable or other attachments.

5. Object Marker at nose of attenuator is subsidiary to the attenuator.

6. See D & OM (1-4) for required barrier reflectors.

Texas Department of Transportation

Traffic Safety Division Standard

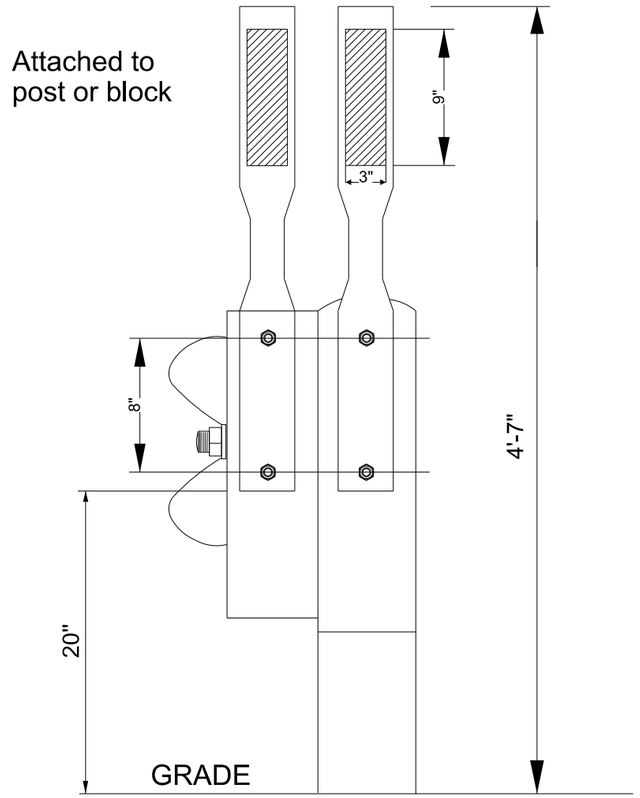
DELINEATOR & OBJECT MARKER FOR VEHICLE IMPACT ATTENUATORS

D & OM(VIA)-20

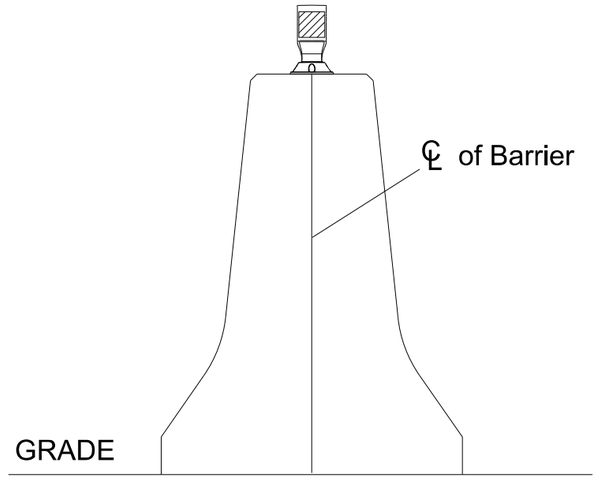
FILE: domvia20.dgn	DN: TXDOT	CK: TXDOT	DW: TXDOT	CK: TXDOT
©TxDOT December 1989	CONT	SECT	JOB	HIGHWAY
REVISIONS	0081	01	050	US 377
4-92 8-04	DIST	COUNTY		SHEET NO.
8-95 3-15	FTW	TARRANT		90
4-98 7-20				

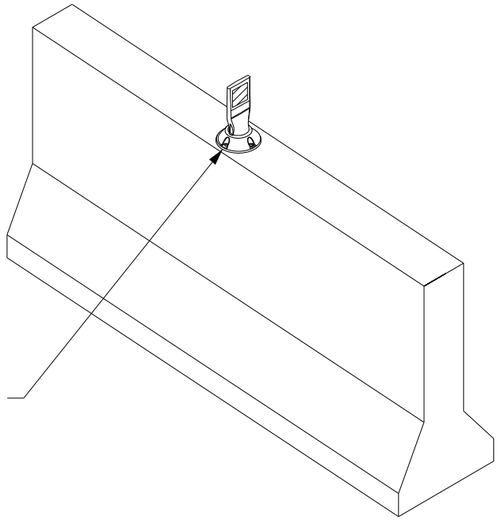
20G

TYPICAL METAL BEAM GAURD FENCE

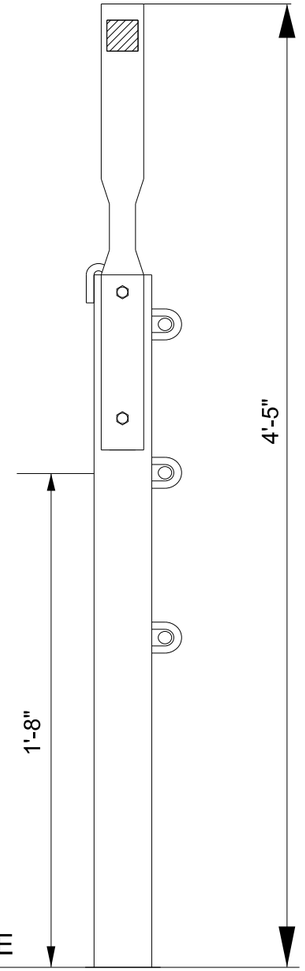


TYPICAL CONCRETE TRAFFIC BARRIER

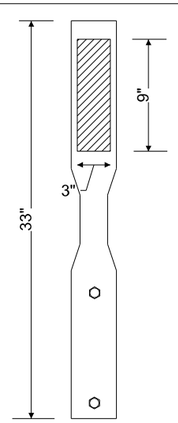
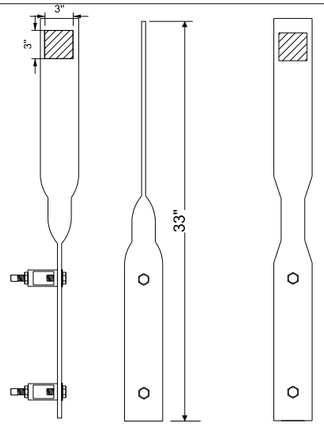
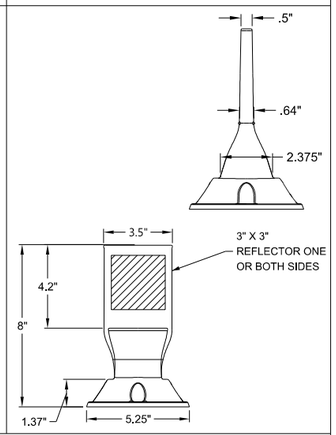




TYPICAL CABLE BARRIER SYSTEM



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		91
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		0081	01	050 US 377

DATE: 7/10/2024
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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.

2.

☒ No Action Required ☐ Required Action

Action No.

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

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

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

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

☒ No Permit Required

☐ Nationwide Permit 14 - PCN not Required (less than 1/10th acre waters or wetlands affected)

☐ Nationwide Permit 14 - PCN Required (1/10 to <1/2 acre, 1/3 in tidal waters)

☐ Individual 404 Permit Required

☐ Other Nationwide Permit Required: NWP# _____

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

1.

2.

3.

4.

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

Best Management Practices:

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

III. CULTURAL RESOURCES

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

☒ No Action Required ☐ Required Action

Action No.

1.

2.

3.

4.

IV. VEGETATION RESOURCES

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

☒ No Action Required ☐ Required Action

Action No.

1.

2.

3.

4.

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

☒ No Action Required ☐ Required Action

Action No.

1.

2.

3.

4.

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 TBD

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

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

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

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

☒ No Action Required ☐ Required Action

Action No.

1.

2.

3.

VII. OTHER ENVIRONMENTAL ISSUES

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

☒ No Action Required ☐ Required Action

Action No.

1.

2.

3.

Texas Department of Transportation — Design Division Standard

ENVIRONMENTAL PERMITS, ISSUES AND COMMITMENTS

EPIC

FILE: epic.dgn	DN: TxDOT	CK: RG	DW: VP	CK: AR
© TxDOT: February 2015	CONT	SECT	JOB	HIGHWAY
REVISIONS 12-12-2011 (DS)	0081	01	050	US 377
05-07-14 ADDED NOTE SECTION IV.	DIST	COUNTY		SHEET NO.
01-23-2015 SECTION I (CHANGED ITEM 1122 TO ITEM 506, ADDED GRASSY SWALES.	FTW	TARRANT		92

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.

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):
008-01-050

1.2 PROJECT LIMITS:

From: AT WEST FORK TRINITY RIVER

To: ON US 377 (EAST BELKNAP ROAD)

1.3 PROJECT COORDINATES:

BEGIN: (Lat) 32.7679374 ,(Long) -97.3124189

END: (Lat) 32.7679374 ,(Long) -97.3124189

1.4 TOTAL PROJECT AREA (Acres): _____

1.5 TOTAL AREA TO BE DISTURBED (Acres): _____

1.6 NATURE OF CONSTRUCTION ACTIVITY:

REHABILITATION OF BRIDGE AND APPROACHES

1.7 MAJOR SOIL TYPES:

Soil Type	Description

1.8 PROJECT SPECIFIC LOCATIONS (PSLs):

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

☐ PSLs determined during preconstruction meeting
☐ PSLs determined during construction
☒ No PSLs planned for construction

Type	Sheet #s

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

1.9 CONSTRUCTION ACTIVITIES:

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

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

1.10 POTENTIAL POLLUTANTS AND SOURCES:

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

* 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		93
STATE	STATE DIST.	COUNTY	
TEXAS	FWT	TARRANT	
CONT.	SECT.	JOB	HIGHWAY NO.
0081	01	050	US 377

STORMWATER POLLUTION PRVENTION PLAN (SWP3):

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

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

2.1 EROSION CONTROL AND SOIL STABILIZATION BMPs:

T / P

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

2.2 SEDIMENT CONTROL BMPs:

T / P

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

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

2.3 PERMANENT CONTROLS:

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

BMPs To Be Left In Place Post Construction:

Type	Stationing	
	From	To
TBD		

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

2.4 OFFSITE VEHICLE TRACKING CONTROLS:

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

2.5 POLLUTION PREVENTION MEASURES:

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

2.6 VEGETATED BUFFER ZONES:

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

Type	Stationing	
	From	To

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

2.7 ALLOWABLE NON-STORMWATER DISCHARGES:

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

2.8 DEWATERING:

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)

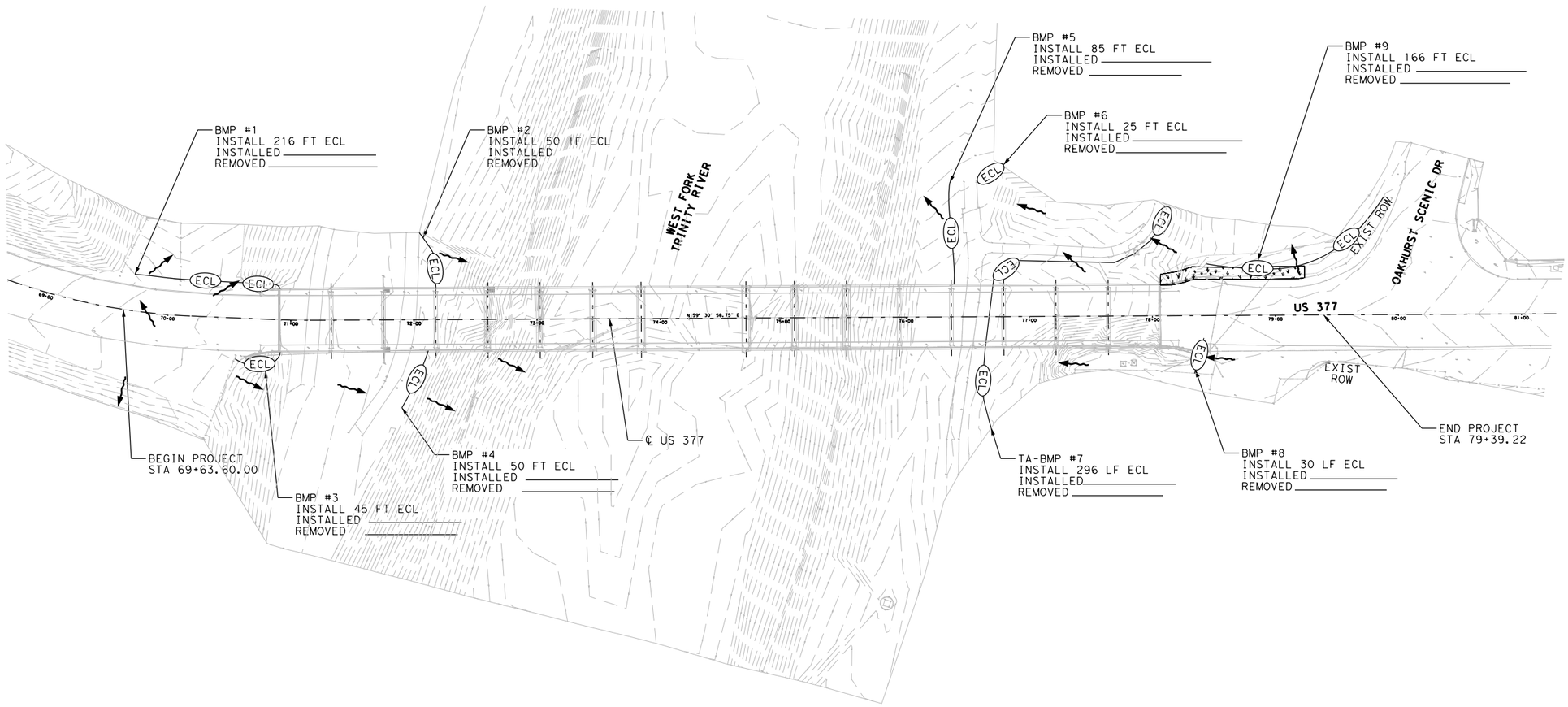
July 2023 Sheet 2 of 2

Texas Department of Transportation

FED. RD. DIV. NO.	PROJECT NO.		SHEET NO.
6	SEE TITLE SHEET		94
STATE	STATE DIST.	COUNTY	
TEXAS	FWT	TARRANT	
CONT.	SECT.	JOB	HIGHWAY NO.
0081	01	050	US 377

SUMMARY OF SWP3 ITEMS

SHT NO.	BID ITEM NO.	161	7002	162	7002	168	7001	506	7020	506	7024	506	7044	506	7046
	DESCRIPTION	COMPOST MANUF TOPSOIL (4")		BLOCK SODDING		VEGETATIVE WATERING		CONSTRUCTION EXITS (INSTALL) (TY 1)		CONSTRUCTION EXITS (REMOVE)		BIODEG EROSN CONT LOGS (INSTL) (12")		BIODEG EROSN CONT LOGS (REMOVE)	
	UNIT	SY		SY		TGL		SY		SY		LF		LF	
1		131		131		5		156		156		963		963	
	PROJECT TOTAL	131		131		5		156		156		963		963	



LEGEND

- ECL — EROSION CONTROL LOG (12")
- FLOW DIRECTION
- BLOCK SODDING

NOTES

1. LOCATIONS OF EROSION CONTROL DEVICES ARE APPROXIMATIONS. ACTUAL LOCATIONS TO BE DETERMINED IN THE FIELD AND APPROVED BY THE ENGINEER IN THE FIELD.
2. EROSION CONTROL DEVICE INSTALLATION, MAINTENANCE AND REMOVAL SHALL BE IN ACCORDANCE WITH THE TxDOT STANDARDS FOR EROSION CONTROL.
3. CONSTRUCTION EXIT LOCATION TO BE APPROVED BY THE ENGINEER IN THE FIELD

SCALE 1"=100'

SCALE 0 SCALE

HORZ: 1" = 100'

STATE OF TEXAS
JENN-HWAN MA
83964
LICENSED
PROFESSIONAL ENGINEER
7/10/2024

Bartlett&West
9330 LBJ FREEWAY, STE 1150 - DALLAS, TX 75243
PHONE 888-200-6464
TBPE FIRM REGISTRATION NO. 6499

Texas Department of Transportation

US 377

SWP3 PLAN

WEST FORK TRINITY RIVER
EXISTING NBI: 02-220-0081-01-001

SHEET 1 OF 1

FED.RD. DIV. NO.	FEDERAL AID PROJECT NO.		SHEET NO.
6	SEE TITLE SHEET		95
STATE	DISTRICT	COUNTY	
TEXAS	FTW	TARRANT	
CONTROL	SECTION	JOB	HIGHWAY
0081	01	050	US 377

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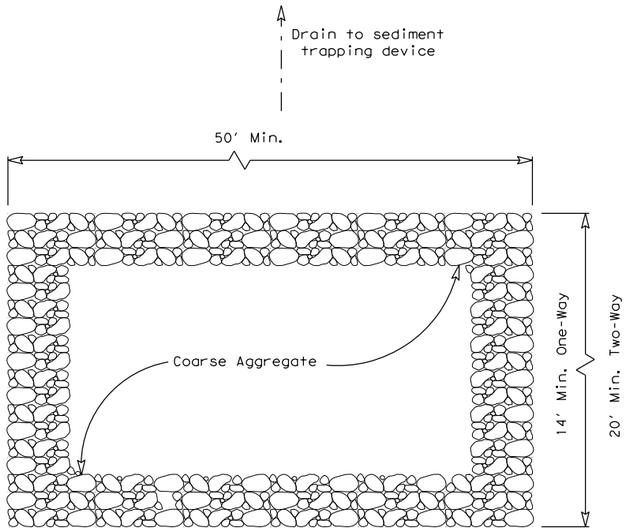
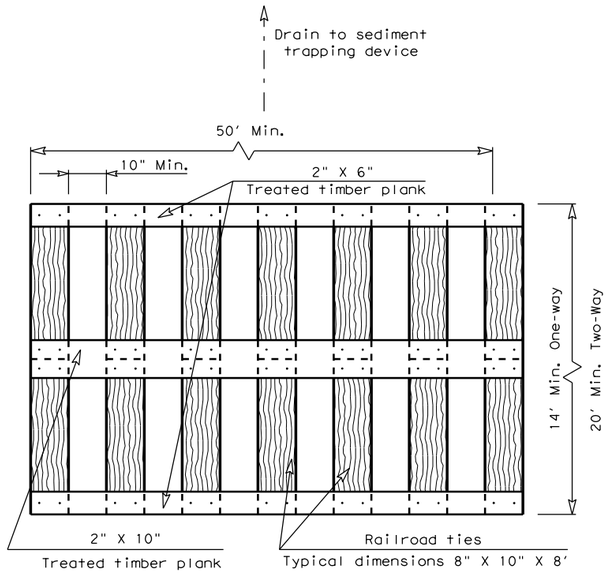
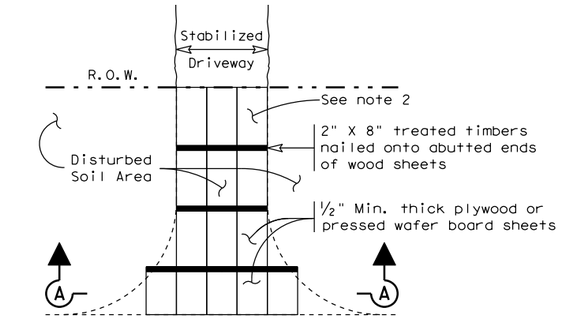


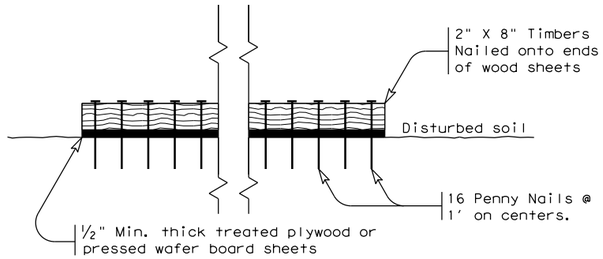
PLAN VIEW



PLAN VIEW



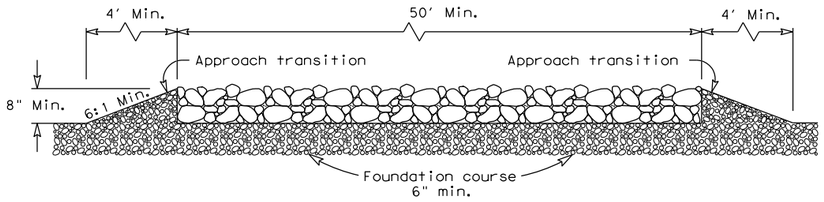
PLAN VIEW



SECTION A-A

CONSTRUCTION EXIT (TYPE 3)

SHORT TERM



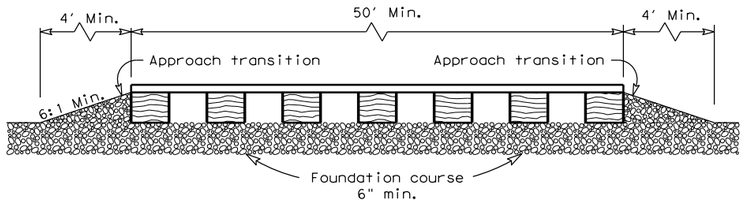
ELEVATION VIEW

CONSTRUCTION EXIT (TYPE 1)

ROCK CONSTRUCTION (LONG TERM)

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.



ELEVATION VIEW

CONSTRUCTION EXIT (TYPE 2)

TIMBER CONSTRUCTION (LONG TERM)

GENERAL NOTES (TYPE 2)

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

GENERAL NOTES (TYPE 3)

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

Texas Department of Transportation

Design Division Standard

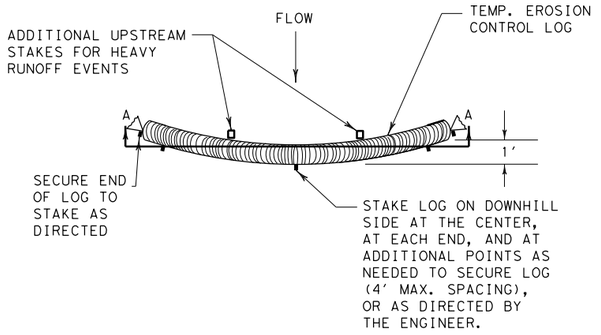
TEMPORARY EROSION, SEDIMENT AND WATER POLLUTION CONTROL MEASURES

CONSTRUCTION EXITS

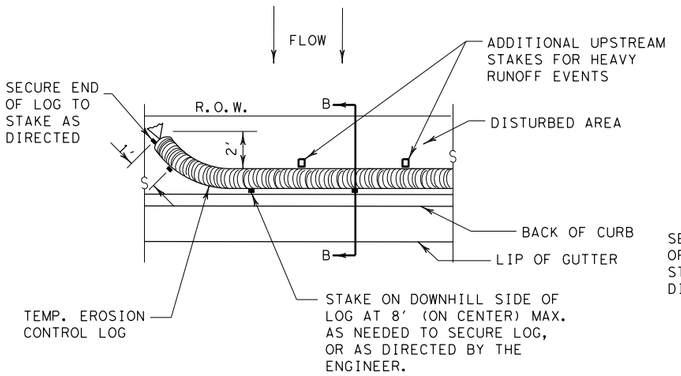
EC(3)-16

FILE: ec316	DN: TxDOT	CK: KM	DW: VP	DN/CK: LS
©TxDOT: JULY 2016	CONT	SECT	JOB	HIGHWAY
REVISIONS	0081	01	050	US 377
	DIST	COUNTY		SHEET NO.
	FTW	TARRANT		96

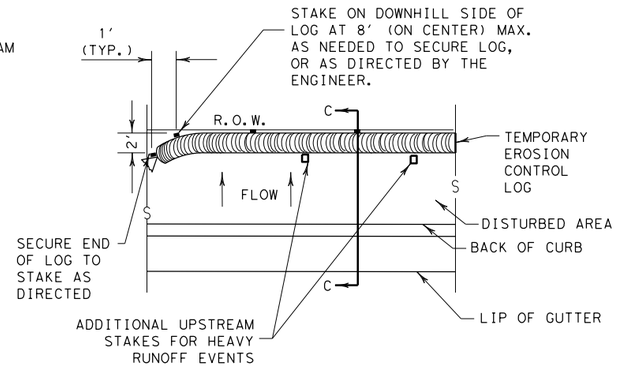
DATE:
FILE:



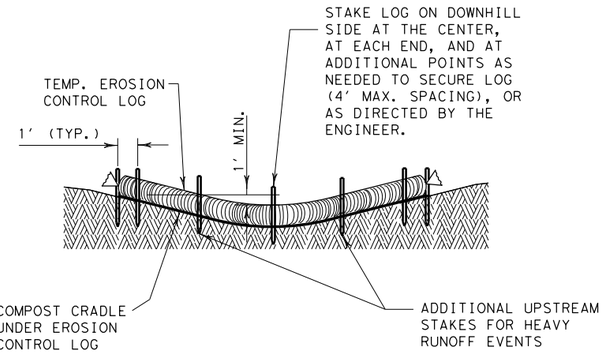
PLAN VIEW



PLAN VIEW



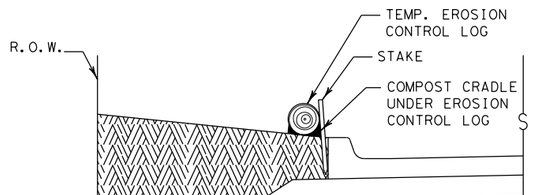
PLAN VIEW



SECTION A-A

EROSION CONTROL LOG DAM

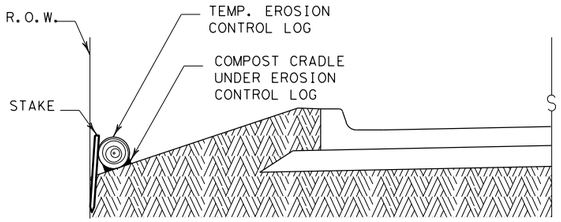
CL-D



SECTION B-B

EROSION CONTROL LOG AT BACK OF CURB

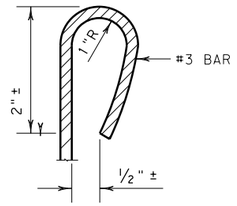
CL-BOC



SECTION C-C

EROSION CONTROL LOG AT EDGE OF RIGHT-OF-WAY

CL-ROW



REBAR STAKE DETAIL

LEGEND

- CL-D — EROSION CONTROL LOG DAM
- CL-BOC — EROSION CONTROL LOG AT BACK OF CURB
- CL-ROW — EROSION CONTROL LOG AT EDGE OF RIGHT-OF-WAY
- CL-SST — EROSION CONTROL LOGS ON SLOPES STAKE AND TRENCHING ANCHORING
- CL-SSL — EROSION CONTROL LOGS ON SLOPES STAKE AND LASHING ANCHORING
- CL-DI — EROSION CONTROL LOG AT DROP INLET
- CL-CI — EROSION CONTROL LOG AT CURB INLET
- CL-GI — EROSION CONTROL LOG AT CURB & GRATE INLET

GENERAL NOTES:

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

SEDIMENT BASIN & TRAP USAGE GUIDELINES

An erosion control log sediment trap may be used to filter sediment out of runoff draining from an unstabilized area.

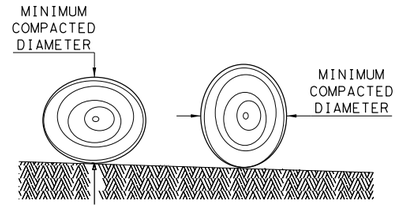
Log Traps: The drainage area for a sediment trap should not exceed 5 acres. The trap capacity should be 1800 CF/Acre (0.5" over the drainage area).

Control logs should be placed in the following locations:

1. Within drainage ditches spaced as needed or min. 500' on center
2. Immediately preceding ditch inlets or drain inlets
3. Just before the drainage enters a water course
4. Just before the drainage leaves the right of way
5. Just before the drainage leaves the construction limits where drainage flows away from the project.

The logs should be cleaned when the sediment has accumulated to a depth of 1/2 the log diameter.

Cleaning and removal of accumulated sediment deposits is incidental and will not be paid for separately.



DIAMETER MEASUREMENTS OF EROSION CONTROL LOGS SPECIFIED IN PLANS

SHEET 1 OF 3

Texas Department of Transportation

Design Division Standard

TEMPORARY EROSION, SEDIMENT AND WATER POLLUTION CONTROL MEASURES

EROSION CONTROL LOG

EC(9)-16

FILE: ec916	DN: TxDOT		CK: KM	DW: LS/PT		CK: LS
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REVISIONS	0081	01	050		US 377	
	DIST	COUNTY			SHEET NO.	
	FTW	TARRANT			97	