

INDEX OF SHEETS

SEE SHEET 2

**STATE OF TEXAS
DEPARTMENT OF TRANSPORTATION**

**PLANS OF PROPOSED
STATE HIGHWAY IMPROVEMENT
PARKER COUNTY**

FEDERAL AID PROJECT # BR 2015(333)

THE CONSTRUCTION WORK WAS PERFORMED
IN SUBSTANTIAL COMPLIANCE WITH CONTRACT.

DESIGN SPEED: 40 MPH
CURRENT ADT (2019): 959
PROPOSED ADT (2038): 1,343
FUNCTIONAL CLASS: LOCAL

P. E. _____

DATE _____

CSJ	ROADWAY	BRIDGE	NET LENGTH OF PROJECT
0902-38-120	480.00 FT	145.00 FT	625.00 FT = 0.118 MILES

FINAL PLANS

LETTING DATE: _____

DATE CONTRACTOR BEGAN WORK: _____

DATE WORK WAS COMPLETED: _____

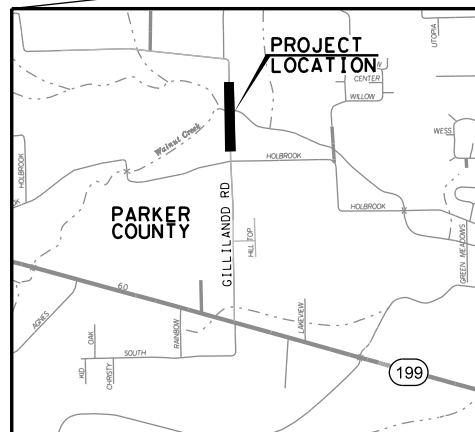
DATE WORK WAS ACCEPTED: _____

FINAL CONTRACT COST: \$ _____

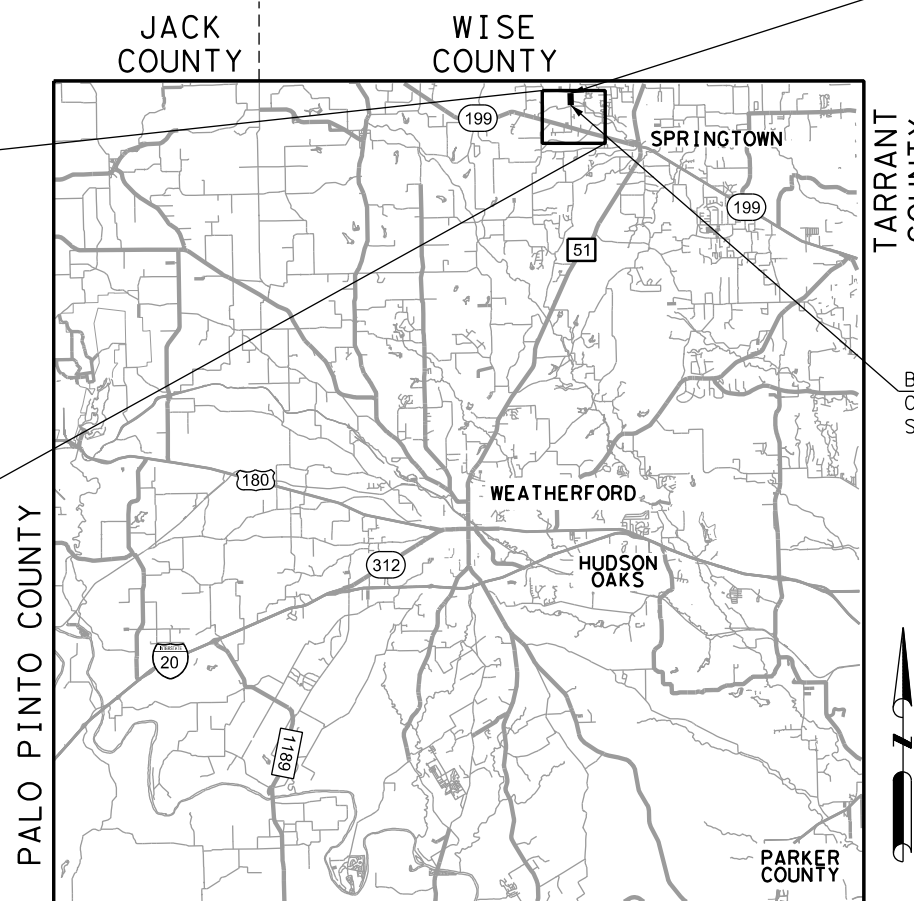
CONTRACTOR : _____

CR (GILLILAND ROAD)

LIMITS: AT WALNUT CREEK
FOR THE CONSTRUCTION OF: REPLACE BRIDGE AND APPROACHES
CONSISTING OF REPLACING BRIDGE AND APPROACHES



LOCATION MAP
SCALE: N. T. S.



VICINITY MAP
SCALE: N. T. S.

END PROJECT
CSJ: 0902-38-120
STA: 109+00.00

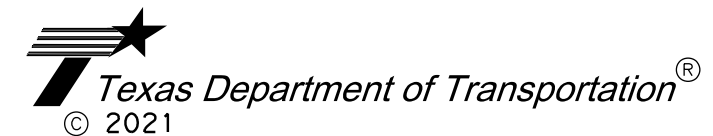
BEGIN PROJECT
CSJ: 0902-38-120
STA: 102+75.00

FINAL PLANS



[Signature]

11/5/2020



TDLR INSPECTION NOT REQUIRED

SPECIFICATIONS ADOPTED BY THE TEXAS DEPARTMENT OF TRANSPORTATION, NOVEMBER 1, 2014 AND SPECIFICATION ITEMS LISTED AND DATED AS FOLLOWS, SHALL GOVERN ON THIS PROJECT: REQUIRED CONTRACT PROVISIONS FOR ALL FEDERAL-AID CONSTRUCTION CONTRACTS (FORM FHWA 1273, MAY, 2012).

EXCEPTIONS: NONE
EQUATIONS: NONE
RAILROAD CROSSINGS: NONE

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SUBMITTED FOR LETTING: 12/3/2020
DocuSigned by: *[Signature]*
AREA ENGINEER
2F552E37025E4A8...

APPROVED FOR LETTING: 12/8/2020
DocuSigned by: *[Signature]*
DISTRICT ENGINEER
2FE36139F0614C3...

RECOMMENDED FOR LETTING: 12/7/2020
DocuSigned by: *[Signature]*
DIRECTOR OF TRANSPORTATION
PLANNING AND DEVELOPMENT

COUNTY PARKER PROJ. NO. BR 2015(333)
HWY. NO. GILLILAND ROAD LETTING DATE MARCH 2021
DATE ACCEPTED

SHEET NO. DESCRIPTION

	GENERAL
1	TITLE SHEET
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3	PROJECT LAYOUT
4	TYPICAL SECTIONS
5	GENERAL NOTES
6	ESTIMATE AND QUANTITY SHEETS
7-8	SUMMARY OF QUANTITIES
9	EARTHWORK SUMMARY
10	SUMMARY OF SMALL SIGNS
	TRAFFIC CONTROL PLAN
11	ADVANCE WARNING SIGNS AND SEQUENCE OF WORK
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24	# WZ(RCD)-12
	ROADWAY ITEMS
25	SURVEY CONTROL DATA
26	HORIZONTAL ALIGNMENT DATA
27	REMOVAL LAYOUT
28-30	ROADWAY PLAN & PROFILE
31	GRADING LAYOUT
32-33	CONSTRUCTION EASEMENT LAYOUT
34	ROADWAY DETAILS
	ROADWAY STANDARDS
35	# GF(31)-19
36-37	# GF(31)TR TL3-19
38	# GF(31)MS-19
39	# BED-14
40	# SGT(10S)31-16
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45	# WF(1)-10
46	# WF(2)-10
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49	OFFSITE DRAINAGE AREA MAP
50	HYDRAULIC DATA SHEET

SHEET NO. DESCRIPTION

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55	FOUNDATION LAYOUT
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60	# BIG-30-30
61-64	# C223
65	# CSAB
66-67	# FD
68	# IGCS
69-70	# IGD
71-73	# IGEB
74-75	# IGMS
76-77	# IGSD-30
78	# IGTS
79-82	# PCP
83	# PCP-FAB
84-85	# PMDF
86	# AJ
87-88	# SIG-30-30
89-90	# SRR
	SIGNING & PAVEMENT MARKINGS ITEMS
91	SIGNING & PAVEMENT MARKINGS LAYOUT
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92	# TSR(4)-13
93	# D&OM(1)-15
94	# D&OM(2)-15
95	# D&OM(4)-15
96	# D&OM(5)-15
97	# D&OM(VIA)-15
98-99	# PM(1)-(2)-12
100	# SMD(GEN)-08
101-102	# SMD(SLIP-1)-(SLIP-2)-08
	ENVIRONMENTAL ITEMS
103	STORM WATER POLLUTION PREVENTION PLAN (SW3P)
104	SW3P LAYOUT
105-106	ENVIRONMENTAL PERMITS, ISSUES AND COMMITMENTS (EPIC) (FTW)
	ENVIRONMENTAL STANDARDS
107	# TECL-04(FW)
108	# EC(1)-16
109	# EC(2)-16
110	# EC(3)-16



THE STANDARD SHEETS SPECIFICALLY IDENTIFIED ABOVE WITH A POUND SIGN (#) HAVE BEEN SELECTED BY ME, OR UNDER MY RESPONSIBLE SUPERVISION AS BEING APPLICABLE TO THIS PROJECT.

R. Prieto
 RICARDO A. PRIETO, P.E. DATE 1/22/2021

PRELIMINARY
SUBMITTED FOR 90% REVIEW BY RICARDO A. PRIETO, P.E. TX 91123
AIA ENGINEERS TEXAS REGISTERED ENGINEERING FIRM F-2801 1/22/2021
NOT FOR CONSTRUCTION, BIDDING OR PERMITTING



GILLILAND ROAD
AT WALNUT CREEK

INDEX OF SHEETS

SHEET 1 OF 1

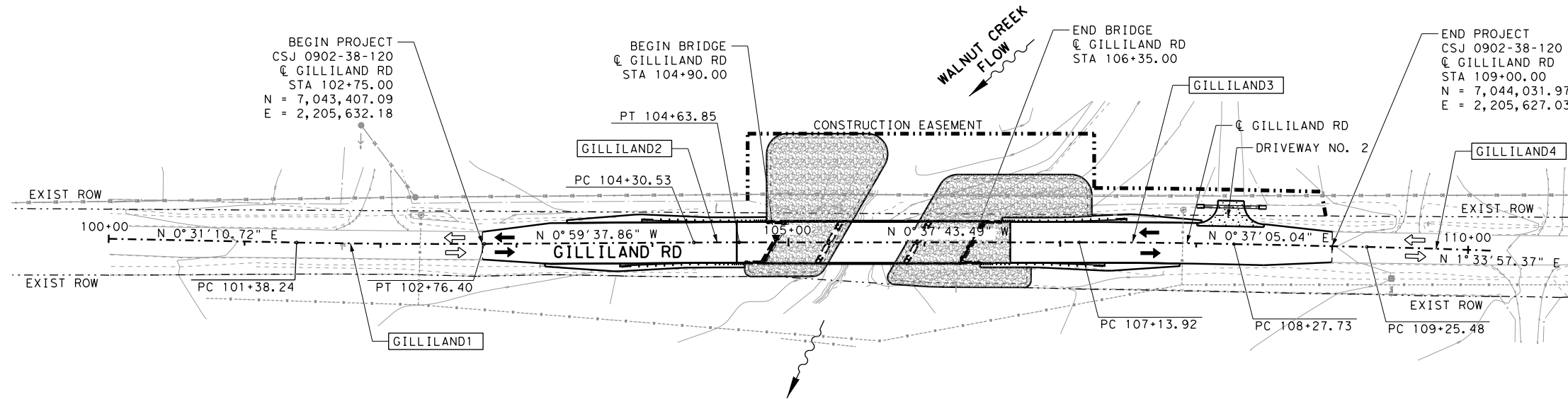
FED RD DIV NO.	FEDERAL AID PROJECT	SHEET NO.
6	SEE TITLE SHEET	2
STATE	DISTRICT	COUNTY
TEXAS	FTW	PARKER
CONTROL	SECTION	JOB HIGHWAY
0902	38	120 GILLILAND RD

NOTE:

TxDOT STANDARDS

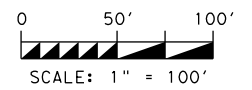
LEGEND

- EXIST ROW
- - - - CONSTRUCTION EASEMENT
- PROP TRAFFIC
- ⇄ EXIST TRAFFIC
- [Pattern] PROP DRIVEWAY (6" CONC)
- [Pattern] PROP RIPRAP (STONE PROTECTION)
- GILLILAND# CURVE NUMBER



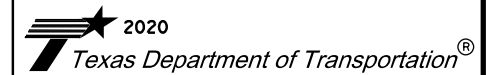
NOTE:

1. REFER TO HORIZONTAL ALIGNMENT DATA SHEET FOR CURVE INFORMATION.



[Handwritten Signature]

11/5/2020

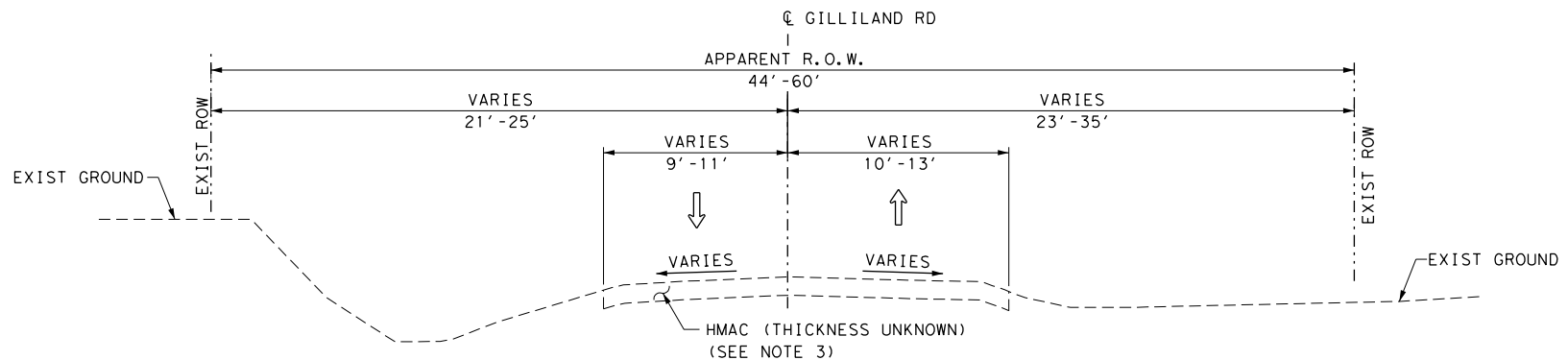


**GILLILAND ROAD
AT WALNUT CREEK**

PROJECT LAYOUT

SHEET 1 OF 1

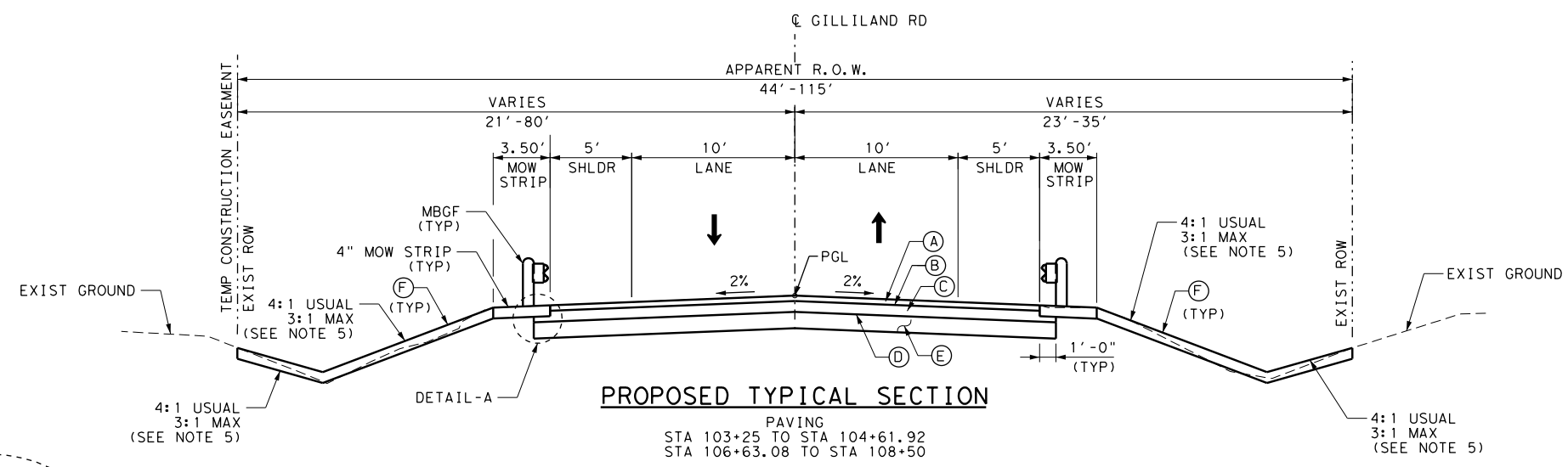
FED RD DIV NO.	FEDERAL AID PROJECT		SHEET NO.
6	SEE TITLE SHEET		3
STATE	DISTRICT	COUNTY	
TEXAS	FTW	PARKER	
CONTROL	SECTION	JOB	HIGHWAY
0902	38	120	GILLILAND RD



EXISTING TYPICAL SECTION

STA 102+75 TO STA 109+00
(EXISTING BRIDGE FROM STA 105+40 TO STA 105+70)
(SEE NOTE 4)

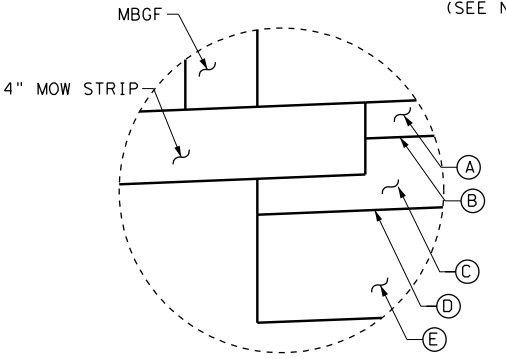
- LEGEND**
- (A) 2" D-GR HMA (SQ) TY-C SAC-A PG70-28
 - (B) TACK COAT
 - (C) 4" D-GR HMA (SQ) TY-B PG64-22
 - (D) PRIME COAT
 - (E) 6" FLEX BASE (CMP IN PLC) (TY A GR 4)
 - (F) 4" FURNISHING AND PLACING TOPSOIL
- ← EXIST TRAFFIC FLOW
→ PROP TRAFFIC FLOW



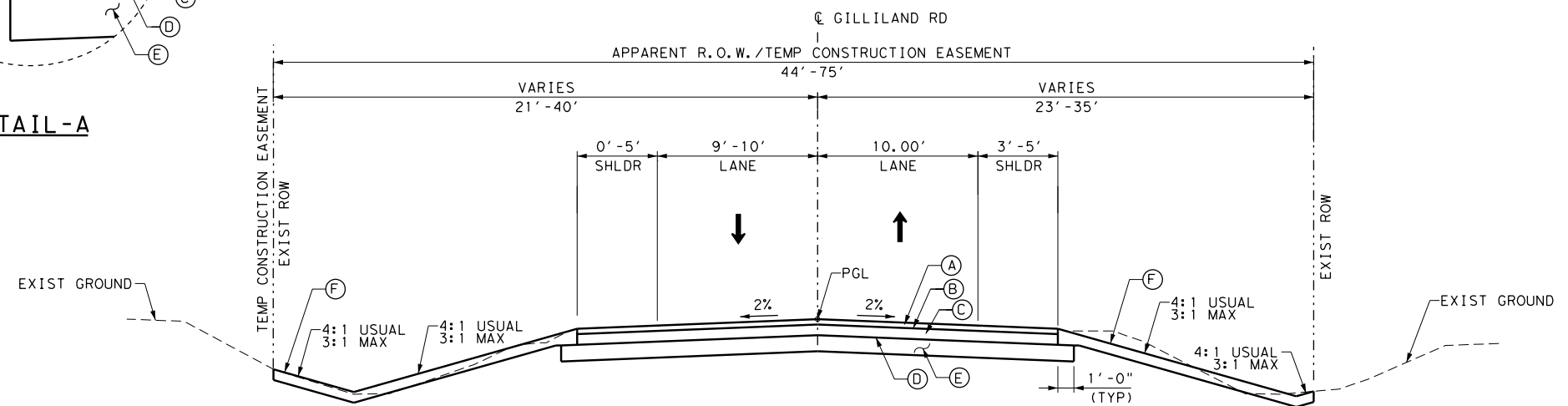
PROPOSED TYPICAL SECTION

PAVING
STA 103+25 TO STA 104+61.92
STA 106+63.08 TO STA 108+50

BRIDGE LIMITS (SEE NOTE 4)
(PROP APPROACH SLABS)
STA 104+61.92 TO STA 104+90
STA 106+35 TO STA 106+63.08
(PROP BRIDGE FROM STA 104+90 TO STA 106+35)



DETAIL - A



PROPOSED TYPICAL SECTION PAVEMENT TRANSITION

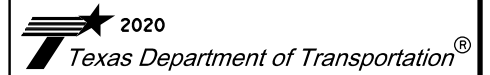
STA 102+75 TO STA 103+25
STA 108+50 TO STA 109+00

- NOTES:**
- EXISTING ROW SHOWN IS A PRESCRIBED WIDTH BASED ON VISIBLE FEATURES SUCH AS UTILITY MARKERS, MAINTAINED AREA WIDTH AND APPROXIMATE LIMITS AT TOP OF DITCH BACK SLOPE. A BOUNDARY SURVEY WAS NOT PERFORMED; NO CONVEYANCE OR EASEMENT OF THE COUNTY ROAD COULD BE FOUND.
 - 10:1 CROSS SLOPE AT ALL POST-MOUNTED BARRIER.
 - CORE SAMPLE AND AS-BUILT INFORMATION ARE NOT AVAILABLE.
 - REFER TO BRIDGE LAYOUT & TYPICAL SECTION SHEET FOR MORE INFORMATION.
 - REFER TO THE ROADWAY PLAN AND PROFILE AND GRADING LAYOUT SHEETS FOR STONE RIPRAP LIMITS.

SCALE: N. T. S.



11/5/2020



GILLILAND ROAD AT WALNUT CREEK

TYPICAL SECTIONS

SHEET 1 OF 1

FED RD DIV NO.	FEDERAL AID PROJECT	SHEET NO.	
6	SEE TITLE SHEET	4	
STATE	DISTRICT	COUNTY	
TEXAS	FTW	PARKER	
CONTROL	SECTION	JOB	HIGHWAY
0902	38	120	GILLILAND RD

H:\TXPROJ\TX2495-01\DWG\DCN\Roadway\A_GILLILAND_RTS01.dgn 5:24:27 PM 11/5/2020

11/5/2020 5:24:27 PM

H:\TXPROJ\TX2495-01\DWG\DCN\Roadway\A_GILLILAND_RTS01.dgn

Project Number: BR 2015 (333)

County: Parker

Control: 0902-38-120

Highway: CR

Specification Data

Basis of Estimate

Item	Description	Rate	Unit
168	Vegetative Watering	169,400 gal./acre	1,000 gal.
310	Asph Mat'l (MC-30, EC-30, or CBSMS-1S) (Flex Base)	0.30 gal./sq. yd.*	gal.
340	Hot Mix (All Types)	115 lb./sq. yd.-in.	ton
3076	Tack Coat - Trackless Tack	0.15-0.22 gal./sq. yd.	gal.

* Based On 50% Asphalt Residue.

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

Compaction Requirements for Base Courses

Item	Material	Course	Min. Density
247	Flex Base	All	100 %

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

Special Notes

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

Check this site for new information. Notices of new postings will not be sent out by the Engineer.5

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

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

Access is read-only.

All files in the FTP site are subject to the License Agreement shown on the FTP site.

To obtain a copy of the project plans free of charge, submit a request from the following site:

General Notes

Project Number: BR 2015 (333)

County: Parker

Control: 0902-38-120

Highway: CR

<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: David.Neeley@txdot.gov

Assistant Area Engineer's Email: Gary.Beck@txdot.gov

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

All contractor questions will be reviewed by the Engineer. Once a response is developed, it will be posted to TxDOT's Public FTP at the following Address:

<https://ftp.dot.state.tx.us/pub/txdot-info/Pre-Letting Responses/>

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.

General Notes

Sheet 5

Project Number: BR 2015 (333)

County: Parker

Control: 0902-38-120

Highway: CR

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.

Prevention of Migratory Bird Nesting

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

Structures

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

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

No extension of time or compensation payment will be granted for a delay or suspension of work caused by nesting swallows. This work is subsidiary to the various bid items. The Contractor's attention is directed to the following list of temporary easements and their expiration dates:

Parcel Number	Expiration Date
---------------	-----------------

General Notes

Project Number: BR 2015 (333)

County: Parker

Control: 0902-38-120

Highway: CR

Complete all work in these easement areas prior to the expiration dates shown. In the event that work is done after these expiration dates, all costs for extending these dates will be paid by the Contractor.

Remove all existing fences within the right of way and remove and replace all existing fences within easements where such fences conflict with the work. Protect the remaining fence from damage due to slacking. Erect temporary fencing in the easement areas as necessary to secure the property. Provide at least one week notice to the property owner prior to removing or relocating the fence. Restore permanent fencing to an equal or better condition.

Mail box manipulation made necessary because of construction will be in accordance with Item 560 "Mailbox Assemblies," except that this work will not be paid for directly but will subsidiary to the pertinent bid items.

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.

All driveway openings will be determined by the Engineer and will conform with Texas Department of Transportation "Regulations for Access Driveways to State Highways" adopted September 1953, and revised June 2004.

Locations and lengths of all private entrances are approximate only. The actual locations, lengths, lines, and grades are to be established in the field.

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.

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.

Item 2. Instructions to Bidders

Proposals with a bid of more than 124 working days for the substantial completion of the project will be considered non-responsive.

General Notes

Sheet 5A

Project Number: BR 2015 (333)

County: Parker

Control: 0902-38-120

Highway: CR

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.

Prior to contract letting, bidders may obtain a free computer diskette or a computerized transfer of files (from the Engineer's office) that contains the earthwork information in ASCII format, plain text files. If copies of the actual cross-sections are requested, in addition to, or instead of the diskette, they will be available at the Engineers office for borrowing by copying companies for the purpose of making copies for the bidder, at the bidder's expense.

Item 7. Legal Relations and Responsibilities

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

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

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

Project Number: BR 2015 (333)

County: Parker

Control: 0902-38-120

Highway: CR

- (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 1.54 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.

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	3 PM Thursday through 9 AM Tuesday

Project Number: BR 2015 (333)

County: Parker

Control: 0902-38-120

Highway: CR

Monday)	
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.

<u>Event Lane Closure Restrictions</u>			
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			
Arlington Entertainment District			
Grapevine Festivals			
MayFest			
Weatherford Peach Festival			

Item 8. Prosecution and Progress

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

Work is allowed to be performed during the nighttime.

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.

General Notes

Project Number: BR 2015 (333)

County: Parker

Control: 0902-38-120

Highway: CR

Item 104. Removing Concrete

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

Item 105. Removing Treated and Untreated Base and Asphalt Pavement

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

Item 110. Excavation

Review proposed waste sites to determine if any site is located in a "Base Floodplain" or "Floodway" as defined by the Federal Emergency Management Agency (FEMA).

If waste material from this project is placed in a base floodplain as defined by FEMA, obtain a permit from the local community responsible for enforcing National Flood Insurance Program (NFIP) regulations. Ensure that the owner of the property receiving the waste has obtained the necessary permit.

Items 110, 112, and 132. Excavation, Subgrade Widening, and Embankment

Test soils for soluble sulfates in accordance with Test Method Tex-145 and Tex-146-E.

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

Item 132. Embankment

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

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

1. At the "beginning of bridge" or "end of bridge" station (if abutment is on retaining wall, location may be adjusted by not more than 5 feet.)

General Notes

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2. At 25-foot intervals for a distance of 150 feet in advance of the "beginning of bridge" station.
3. At 25-foot intervals for a distance of 150 feet after the "end of bridge" station.

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

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

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

Item 160. Topsoil

Place approximately 4 inches of topsoil on areas shown or directed.

Excavation for topsoil should not exceed 3 feet in depth unless otherwise directed.

Item 164. Seeding for Erosion Control

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

Item 166. Fertilizer

Fertilize all areas of project to be seeded or sodded.

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.

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

Average weekly rainfall rates for the District are:

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

Item 247. Flexible Base

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

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

Build and maintain a 5,000 cu. yd. stockpile of approved material before and during hauling operations.

(TY A, GR 4) Furnish aggregate conforming to the following requirements:

Gradation:	
Retained on <u>Sieve Size</u>	Percent (%) <u>by Weight</u>
1-3/4 in.	0-5
No. 4	30-75
No. 40	65-85

Plasticity Index (PI)	15 max.
Liquid Limit	45 max.
Wet Ball Mill	50 max.
Wet Ball Mill, %	20 max.

(Increase Passing the No. 40)

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

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

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Item 301. Asphalt Antistripping Agent

Furnish a liquid antistripping agent unless otherwise directed.

Item 310. Prime Coat

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

Item 340. Dense-Graded Hot-Mix Asphalt (Small Quantity)

RAP aggregate must meet the requirements of Table 1.

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

Provide aggregate with a Surface Aggregate Classification (SAC) value of A for the surfaces other than the travel lanes.

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

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.

Grade Substitution per Table 5 is not allowed.

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.

Substitute binders are not allowed on this project.

Use only the Superpave Gyrotory Compactor (SGC) to design the mixture. 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.

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Use a Material Transfer Device (MTD) unless otherwise directed.

Stop production after Lot 1. Review all test data and confirm any changes with the Engineer. Do not start production and placement on subsequent Lots until approved by the Engineer.

Shoulders, crossovers, and other areas listed on the Plan sheets or as directed are not subject to in-place air void determination for this project.

Temporary detours are subject to in-place air void determination for this project.

Ride quality is not required on this project.

Item 420. Concrete Substructures

Restrict large aggregate size to ¾" maximum for class "C" concrete used in aesthetic details requiring form liners.

Item 427. Surface Finishes for Concrete

Unless otherwise noted, provide a surface area *****(I, II, or III)***** with a slurry coat finish on the bridge.

Item 432. Riprap

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

Item 440. Reinforcement for Concrete

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

Item 496. Removing Structures

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

The structure(s) to be removed have surface coatings which may contain hazardous materials. Provide for the safety and health of employees and abide by all OSHA standards and regulations.

General Notes

Sheet 5E

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To allow for disassembly, the Department will remove paint containing hazardous materials off the steel during the Contract in accordance with the following:

- For simple steel I-beam spans less than 80' in length, a four inch wide strip around the perimeter of the diaphragm member or members at each attachment location to the beams.
- A four inch wide strip around bearing attachments and at the anchor bolts.
- As requested elsewhere and approved by the Engineer. Paint removal requested beyond that listed herein will be at the Contractor's expense.

Provide to the Engineer a detailed plan of the locations of paint removal at least 60 days prior to start of steel structure removal.

Do not cut simple I-beams less than 80' in length.

Cut continuous I-beams or simple I-beams more than 80' in length, into sections not less than 40' in length or more than 70' in length, as directed. Contact the District BRINSAP Coordinator, Mark Burwell, at 817-370-6882 for information on lengths needed.

Salvage and transport the following items to the storage area or maintenance barn located as directed:

**STEEL I-BEAMS
SHOES
DIAPHRAGMS**

Item 502. Barricades, Signs, and Traffic Handling

The contractor force account 'safety contingency' that has been established for this project is intended to be utilized for work zone enhancements to improve the effectiveness of the traffic control plan that could typically not be foreseen in the project planning and design stage. These enhancements will be mutually agreed upon by the Engineer and the Contractor's responsible person based on weekly or more frequent traffic management reviews on the project. The Engineer may choose to use existing bid items if it does not slow the implementation of enhancement.

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

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

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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 506. Temporary Erosion, Sedimentation, and Environmental Controls

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

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.

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 1/2" from the edge of the hole.

General Notes

Sheet 5F

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Item 666. Reflectorized Pavement Markings with Retroreflective Requirements

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

Item 6001. Portable Changeable Message Signs

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

(2) 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



CONTROLLING PROJECT ID 0902-38-120

DISTRICT Fort Worth
HIGHWAY CR

COUNTY Parker

QUANTITY SHEET

CONTROL SECTION JOB				0902-38-120		TOTAL EST.	TOTAL FINAL
PROJECT ID				A00033042			
COUNTY				Parker			
HIGHWAY				CR			
ALT	BID CODE	DESCRIPTION	UNIT	EST.	FINAL		
	100-6002	PREPARING ROW	STA	6.250		6.250	
	104-6017	REMOVING CONC (DRIVEWAYS)	SY	51.000		51.000	
	105-6014	REMOVING STAB BASE & ASPH PAV (7"-12")	SY	1,393.000		1,393.000	
	110-6001	EXCAVATION (ROADWAY)	CY	1,865.000		1,865.000	
	110-6002	EXCAVATION (CHANNEL)	CY	3,161.000		3,161.000	
	132-6006	EMBANKMENT (FINAL)(DENS CONT)(TY C)	CY	844.000		844.000	
	161-6017	COMPOST MANUF TOPSOIL (4")	SY	1,348.000		1,348.000	
	164-6001	BROADCAST SEED (PERM) (RURAL) (SANDY)	SY	1,348.000		1,348.000	
	164-6009	BROADCAST SEED (TEMP) (WARM)	SY	674.000		674.000	
	164-6011	BROADCAST SEED (TEMP) (COOL)	SY	674.000		674.000	
	168-6001	VEGETATIVE WATERING	MG	95.000		95.000	
	247-6061	FL BS (CMP IN PLC)(TYA GR1-2) (6")	SY	1,505.000		1,505.000	
	310-6009	PRIME COAT (MC-30)	GAL	452.000		452.000	
	400-6005	CEM STABIL BKFL	CY	119.000		119.000	
	416-6001	DRILL SHAFT (18 IN)	LF	76.000		76.000	
	416-6004	DRILL SHAFT (36 IN)	LF	314.000		314.000	
	420-6014	CL C CONC (ABUT)(HPC)	CY	46.800		46.800	
	420-6030	CL C CONC (CAP)(HPC)	CY	32.200		32.200	
	420-6038	CL C CONC (COLUMN)(HPC)	CY	16.000		16.000	
	422-6002	REINF CONC SLAB (HPC)	SF	4,630.000		4,630.000	
	422-6016	APPROACH SLAB (HPC)	CY	69.000		69.000	
	425-6035	PRESTR CONC GIRDER (TX28)	LF	574.000		574.000	
	432-6031	RIPRAP (STONE PROTECTION)(12 IN)	CY	1,060.000		1,060.000	
	432-6045	RIPRAP (MOW STRIP)(4 IN)	CY	31.000		31.000	
	450-6033	RAIL (TY C223)(HPC)	LF	346.000		346.000	
	454-6004	ARMOR JOINT (SEALED)	LF	73.000		73.000	
	464-6005	RC PIPE (CL III)(24 IN)	LF	40.000		40.000	
	467-6395	SET (TY II) (24 IN) (RCP) (6: 1) (P)	EA	2.000		2.000	
	496-6007	REMOV STR (PIPE)	LF	50.000		50.000	
	496-6009	REMOV STR (BRIDGE 0 - 99 FT LENGTH)	EA	1.000		1.000	
	496-6040	REMOV STR (RET WALL)	LF	107.000		107.000	
	496-6043	REMOV STR (SMALL FENCE)	LF	74.000		74.000	
	496-6099	REMOVE STR (RAIL)	LF	129.000		129.000	
	500-6001	MOBILIZATION	LS	100.00%		100.00%	
	502-6001	BARRICADES, SIGNS AND TRAFFIC HANDLING	MO	8.000		8.000	
	506-6002	ROCK FILTER DAMS (INSTALL) (TY 2)	LF	75.000		75.000	
	506-6003	ROCK FILTER DAMS (INSTALL) (TY 3)	LF	86.000		86.000	



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DISTRICT	COUNTY	CCSJ	SHEET
Fort Worth	Parker	0902-38-120	6



CONTROLLING PROJECT ID 0902-38-120

DISTRICT Fort Worth
HIGHWAY CR

COUNTY Parker

QUANTITY SHEET

CONTROL SECTION JOB				0902-38-120		TOTAL EST.	TOTAL FINAL
PROJECT ID				A00033042			
COUNTY				Parker			
HIGHWAY				CR			
ALT	BID CODE	DESCRIPTION	UNIT	EST.	FINAL		
	506-6011	ROCK FILTER DAMS (REMOVE)	LF	161.000		161.000	
	506-6020	CONSTRUCTION EXITS (INSTALL) (TY 1)	SY	312.000		312.000	
	506-6024	CONSTRUCTION EXITS (REMOVE)	SY	312.000		312.000	
	506-6038	TEMP SEDMT CONT FENCE (INSTALL)	LF	926.000		926.000	
	506-6039	TEMP SEDMT CONT FENCE (REMOVE)	LF	926.000		926.000	
	506-6042	BIODEG EROSN CONT LOGS (INSL) (18")	LF	25.000		25.000	
	506-6043	BIODEG EROSN CONT LOGS (REMOVE)	LF	25.000		25.000	
	530-6004	DRIVEWAYS (CONC)	SY	58.000		58.000	
	540-6001	MTL W-BEAM GD FEN (TIM POST)	LF	100.000		100.000	
	540-6006	MTL BEAM GD FEN TRANS (THRIE-BEAM)	EA	4.000		4.000	
	544-6001	GUARDRAIL END TREATMENT (INSTALL)	EA	4.000		4.000	
	552-6001	WIRE FENCE (TY A)	LF	500.000		500.000	
	560-6004	MAILBOX INSTALL-S (TWG-POST) TY 2	EA	1.000		1.000	
	644-6001	IN SM RD SN SUP&AM TY10BWG(1)SA(P)	EA	2.000		2.000	
	644-6076	REMOVE SM RD SN SUP&AM	EA	1.000		1.000	
	658-6014	INSL DEL ASSM (D-SW)SZ (BRF)CTB (BI)	EA	12.000		12.000	
	658-6048	INSL OM ASSM (OM-2Z)(FLX)GND	EA	2.000		2.000	
	658-6051	INSL OM ASSM (OM-3L)(FLX)SRF	EA	2.000		2.000	
	658-6054	INSL OM ASSM (OM-3R)(FLX)SRF	EA	2.000		2.000	
	658-6060	REMOVE DELIN & OBJECT MARKER ASSMS	EA	4.000		4.000	
	658-6062	INSL DEL ASSM (D-SW)SZ 1(BRF)GF2(BI)	EA	12.000		12.000	
	666-6302	RE PM W/RET REQ TY I (W)4*(SLD)(090MIL)	LF	1,201.000		1,201.000	
	666-6314	RE PM W/RET REQ TY I (Y)4*(SLD)(090MIL)	LF	1,250.000		1,250.000	
	672-6009	REFL PAV MRKR TY II-A-A	EA	16.000		16.000	
	3076-6001	D-GR HMA TY-B PG64-22	TON	342.000		342.000	
	3076-6028	D-GR HMA TY-C SAC-A PG70-28	TON	163.000		163.000	
	3076-6066	TACK COAT	GAL	283.000		283.000	
	5070-6001	STEEL FENCE (REMOVE)	LF	361.000		361.000	
	5070-6002	STEEL FENCE (INSTALL)	LF	173.000		173.000	
	6001-6001	PORTABLE CHANGEABLE MESSAGE SIGN	DAY	124.000		124.000	
18		EROSION CONTROL MAINTENANCE: CONTRACTOR FORCE ACCOUNT WORK (PART)	LS	1.000		1.000	
		SAFETY CONTINGENCY: CONTRACTOR FORCE ACCOUNT WORK (PARTICIPATING)	LS	1.000		1.000	

DISTRICT	COUNTY	CCSJ	SHEET
Fort Worth	Parker	0902-38-120	GA


SUMMARY OF ROADWAY ITEMS															
GILLILAND RD AT WALNUT CREEK	100	110	110	132	161	247	310	3076	3076	3076	432	464	467	500	530
	6002	6001	6002	6006	6017	6061	6009	6001	6028	6066	6045	6005	6395	6001	6004
	PREPARING ROW	EXCAVATION (ROADWAY)	EXCAVATION (CHANNEL)	EMBANKMENT (FINAL) (DENS CONT) (TY C)	COMPOST MANUF TOPSOIL (4")	FL BS (CMP IN PLC) (TYA GR1-2) (6")	PRIME COAT (MC-30)	D-GR HMA (SQ) TY-B PG64-22	D-GR HMA (SQ) TY-C SAC-A PG70-28	TACK COAT	RIPRAP (MOW STRIP) (4 IN)	RC PIPE (CL III) (24 IN)	SET (TY II) (24 IN) (RCP) (6: 1) (P)	MOBILIZATION	DRIVEWAYS (CONC)
	STA	CY	CY	CY	SY	SY	GAL	TON	TON	GAL	CY	LF	EA	LS	SY
BEGIN CSJ TO STA 104+00.00	1.25	575		128	283	445	134	100	48	84	8				
STA 104+00.00 TO STA 107+50.00	3.50	1,144	3,161	676	404	526	158	121	57	99	18				
STA 107+50.00 TO END CSJ	1.50	146		40	661	534	160	121	58	100	5	40	2		58
PROJECT TOTALS	6.25	1,865	3,161	844	1,348	1,505	452	342	163	283	31	40	2	1	58

SUMMARY OF ROADWAY ITEMS CON'T						
GILLILAND RD AT WALNUT CREEK	540	540	544	552	560	5070
	6001	6006	6001	6001	6004	6002
	MTL W-BEAM GD FEN (TIM POST)	MTL BEAM GD FEN TRANS (THRIE-BEAM)	GUARDRAIL END TREATMENT (INSTALL)	WIRE FENCE (TY A)	MAILBOX INSTALL-S (TWG-POST) TY 2 (SEE NOTE 1)	STEEL FENCE (INSTALL) (SEE NOTE 3)
	LF	EA	EA	LF	EA	LF
BEGIN CSJ TO STA 104+00.00			2	0		
STA 104+00.00 TO STA 107+50.00	100	4		390		71
STA 107+50.00 TO END CSJ			2	110	1	102
PROJECT TOTALS	100	4	4	500	1	173

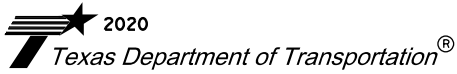
* BASIS OF ESTIMATE:			
ITEM	DESCRIPTION	RATE	UNIT
168	VEGETATIVE WATERING	169,400 GAL/ACRE	MG
310	ASPH MATERIAL (MC-30)	0.30 GAL/SY	GAL
3076	TRACKLESS TACK	0.20 GAL/SY	GAL
3076	D-GR HMA (SG) TY-B PG 64-22	115 LB/SY IN	TON
3076	D-GR HMA (SG) TY-C PG 70-28	115 LB/SY IN	TON

- NOTES:
- REMOVAL & REPLACEMENT OF EXISTING MAILBOX FOR DRIVEWAY # 1 IS SUBSIDIARY TO ITEM 560 (MAILBOX ASSEMBLIES).
 - TREE & BRUSH REMOVAL WITHIN THE PROJECT LIMIT IS SUBSIDIARY TO ITEM 100 (PREPARING RIGHT OF WAY).
 - CONTRACTOR MUST REMOVE EXISTING STEEL FENCE AND INSTALL NEW STEEL FENCE AT THE LOCATIONS SPECIFIED IN PLANS. THE REMOVED EXISTING STEEL FENCE WILL BECOME THE PROPERTY OF THE PROPERTY OWNER.
 - REFER TO THE CONSTRUCTION EASEMENT LAYOUT FOR TEMPORARY WIRE FENCE QUANTITY AND ROADWAY PLAN & PROFILE FOR PERMANENT WIRE FENCE QUANTITY.

SUMMARY OF TRAFFIC ITEMS		
GILLILAND RD AT WALNUT CREEK	502	6001
	6001	6002
	BARRICADES, SIGNS AND TRAFFIC HANDLING	PORTABLE CHANGEABLE MESSAGE SIGN (SEE NOTE 1)
	MO	DAYS
BEGIN CSJ TO END CSJ	8	124
PROJECT TOTALS	8	124



F-12040



GILLILAND ROAD AT WALNUT CREEK

SUMMARY OF QUANTITIES

SHEET 1 OF 2		
FED RD DIV NO. 6	FEDERAL AID PROJECT SEE TITLE SHEET	SHEET NO. 7
STATE TEXAS	DISTRICT FTW	COUNTY PARKER
CONTROL 0902	SECTION 38	JOB 120
HIGHWAY GILLILAND RD		

SUMMARY OF EROSION CONTROL ITEMS													
GILLILAND RD AT WALNUT CREEK	164	164	164	168	506	506	506	506	506	506	506	506	506
	6001	6009	6011	6001	6002	6003	6011	6020	6024	6038	6039	6042	6043
	BROADCAST SEED (PERM) (RURAL) (SANDY)	BROADCAST SEED (TEMP) (WARM)	BROADCAST SEED (TEMP) (COOL)	VEGETATIVE WATERING *	ROCK FILTER DAMS (INSTALL) (TY 2)	ROCK FILTER DAMS (INSTALL) (TY 3)	ROCK FILTER DAMS (REMOVE)	CONSTRUCTION EXITS (INSTALL) (TY 1)	CONSTRUCTION EXITS (REMOVE)	TEMP SEDMT CONT FENCE (INSTALL)	TEMP SEDMT CONT FENCE (REMOVE)	BIODEG EROSN CONT LOGS (INSTL) (18")	BIODEG EROSN CONT LOGS (REMOVE)
	SY	SY	SY	MG	LF	LF	LF	SY	SY	LF	LF	LF	LF
BEGIN CSJ TO END CSJ	1,348	674	674	95	75	86	161	312	312	926	926	25	25
PROJECT TOTALS	1,348	674	674	95	75	86	161	312	312	926	926	25	25

SUMMARY OF REMOVAL ITEMS										
GILLILAND RD AT WALNUT CREEK	104	105	496	496	496	496	496	644	658	5070
	6017	6014	6007	6009	6040	6043	6099	6076	6060	6001
	REMOVING CONC (DRIVEWAYS)	REMOVING STAB BASE & ASPH PAV (7"-12")	REMOV STR (PIPE)	REMOV STR (BRIDGE 0 - 99 FT LENGTH)	REMOV STR (RET WALL)	REMOV STR (SMALL FENCE)	REMOVE STR (RAIL)	REMOVE SM RD SN SUP&AM	REMOVE DELIN & OBJECT MARKER ASSMS	STEEL FENCE (REMOVE) (SEE NOTE 3)
	SY	SY	LF	EA	LF	LF	LF	EA	EA	LF
BEGIN CSJ TO END CSJ	51	1,393	50	1	107	74	129	1	4	361
PROJECT TOTALS	51	1,393	50	1	107	74	129	1	4	361

* BASIS OF ESTIMATE:

ITEM	DESCRIPTION	RATE	UNIT
168	VEGETATIVE WATERING	169,400 GAL/ACRE	MG
310	ASPH MATERIAL (MC-30)	0.30 GAL/SY	GAL
3076	TRACKLESS TACK	0.20 GAL/SY	GAL
3076	D-GR HMA (SG) TY-B PG 64-22	115 LB/SY IN	TON
3076	D-GR HMA (SG) TY-C PG 70-28	115 LB/SY IN	TON

NOTES:

- REMOVAL & REPLACEMENT OF EXISTING MAILBOX FOR DRIVEWAY #1 IS SUBSIDIARY TO ITEM 560 (MAILBOX ASSEMBLIES).
- TREE & BRUSH REMOVAL WITHIN THE PROJECT LIMIT IS SUBSIDIARY TO ITEM 100 (PREPARING RIGHT OF WAY).
- CONTRACTOR MUST REMOVE EXISTING STEEL FENCE AND INSTALL NEW STEEL FENCE AT THE LOCATIONS SPECIFIED IN PLANS. THE REMOVED EXISTING STEEL FENCE WILL BECOME THE PROPERTY OF THE PROPERTY OWNER.
- REFER TO THE CONSTRUCTION EASEMENT LAYOUT FOR TEMPORARY WIRE FENCE QUANTITY AND ROADWAY PLAN & PROFILE FOR PERMANENT WIRE FENCE QUANTITY.

SUMMARY OF SIGNING & PAVEMENT MARKING ITEMS									
GILLILAND RD AT WALNUT CREEK	644	658	658	658	658	658	666	666	672
	6001	6014	6048	6051	6054	6062	6302	6314	6009
	IN SM RD SN SUP&AM TY10BWG (1) SA (P)	INSTR DEL ASSM (D-SW) SZ (BRF) CTB (BI)	INSTR OM ASSM (OM-2Z) (FLX) GND	INSTR OM ASSM (OM-3L) (FLX) SRF	INSTR OM ASSM (OM-3R) (FLX) SRF	INSTR DEL ASSM (D-SW) SZ 1 (BRF) GF2 (BI)	RE PM W/RET REQ TY I (W) 4" (SLD) (090MIL)	RE PM W/RET REQ TY I (Y) 4" (SLD) (090MIL)	REFL PAV MRKR TY II-A-A
	EA	EA	EA	EA	EA	EA	LF	LF	EA
BEGIN CSJ TO END CSJ	2	12	2	2	2	12	1,201	1,250	16
PROJECT TOTALS	2	12	2	2	2	12	1,201	1,250	16



F-12040



GILLILAND ROAD AT WALNUT CREEK
SUMMARY OF QUANTITIES

SHEET 2 OF 2

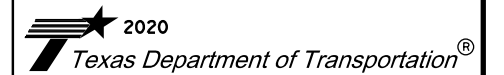
FED RD DIV NO.	FEDERAL AID PROJECT		SHEET NO.
6	SEE TITLE SHEET		8
STATE	DISTRICT	COUNTY	
TEXAS	FTW	PARKER	
CONTROL	SECTION	JOB	HIGHWAY
0902	38	120	GILLILAND RD

GILLILAND ROADWAY EARTHWORK					
BASELINE STATION	STATION CUT	STATION FILL	ACCUM. CUT	ACCUM. FILL	MASS ORDINATE
	CY	CY	CY	CY	
102+75.00	0	0	0	0	0
103+00.00	9	3	9	3	6
103+25.00	83	8	92	11	81
103+50.00	161	17	253	28	225
103+75.00	167	32	420	60	360
103+92.20	110	40	530	100	430
104+00.00	45	28	575	128	447
104+25.00	142	99	717	227	490
104+40.70	91	51	808	278	530
104+50.00	21	25	829	303	526
104+75.00	161	52	990	355	635
104+90.00	221	16	1211	371	840
END ROADWAY, BEGIN CHANNEL					
105+00.00	253	3	1464	374	1,090
105+17.45	527	0	1991	374	1,617
105+25.00	229	0	2220	374	1,846
105+50.00	418	89	2638	463	2,175
105+75.00	396	115	3034	578	2,456
106+00.00	718	49	3752	627	3,125
106+25.00	620	55	4372	682	3,690
END CHANNEL, BEGIN ROADWAY					
106+35.00	150	29	4522	711	3,811
106+50.00	109	29	4631	740	3,891
106+75.00	107	19	4738	759	3,979
107+00.00	75	22	4813	781	4,032
107+20.00	39	14	4852	795	4,057
107+25.00	7	3	4859	798	4,061
107+50.00	21	6	4880	804	4,076
107+75.00	19	8	4899	812	4,087
108+00.00	26	7	4925	819	4,106
108+25.00	20	4	4945	823	4,122
108+50.00	37	11	4982	834	4,148
108+75.00	34	8	5016	842	4,174
109+00.00	10	2	5026	844	4,182

ROADWAY TOTAL = 1865 533
CHANNEL TOTAL = 3161 311
PROJECT TOTAL = 5026 844



F-12040



GILLILAND ROAD
AT WALNUT CREEK

EARTHWORK SUMMARY

SHEET 1 OF 1

FED RD DIV NO.	FEDERAL AID PROJECT		SHEET NO.
6	SEE TITLE SHEET		9
STATE	DISTRICT	COUNTY	
TEXAS	FTW	PARKER	
CONTROL	SECTION	JOB	HIGHWAY
0902	38	120	GILLILAND RD

SUMMARY OF SMALL SIGNS

DISCLAIMER: The use of this standard is governed by the "Texas Engineering Practice Act". No warranty of any kind is made by TxDOT for any purpose whatsoever. TxDOT assumes no responsibility for the conversion of this standard to other formats or for incorrect results or damages resulting from its use.
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PLAN SHEET NO.	SIGN NO.	SIGN NOMENCLATURE	SIGN	DIMENSIONS	FLAT ALUMINUM (TYPE A)	EXAL ALUMINUM (TYPE G)	SM RD SGN ASSM TY XXXXX (X) XX (X-XXXX)				BRIDGE MOUNT CLEARANCE SIGNS (See Note 2)			
							POST TYPE	POSTS	ANCHOR TYPE	MOUNTING DESIGNATION	TY	N TY S		
							FRP = Fiberglass TWT = Thin-Wall 10BWG = 10 BWG S80 = Sch 80		UA=Universal Conc UB=Universal Bolt SA=Slipbase-Conc SB=Slipbase-Bolt WS=Wedge Steel WP=Wedge Plastic		PREFABRICATED P = "Plain" T = "T" U = "U"		1EXT or 2EXT = # of Ext BM = Extruded Wind Beam WC = 1.12 #/ft Wing Channel EXAL= Extruded Alum Sign Panels	
91	1	W8-13aT		36 X 36	X		10BWG	1	SA	P				
91	2	W8-13aT		36 X 36	X		10BWG	1	SA	P				

Square Feet	Minimum Thickness
Less than 7.5	0.080"
7.5 to 15	0.100"
Greater than 15	0.125"

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

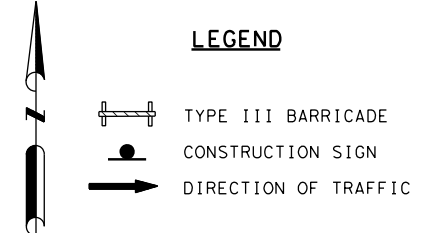
- NOTE:**
- Sign supports shall be located as shown on the plans, except that the Engineer may shift the sign supports, within design guidelines, where necessary to secure a more desirable location or to avoid conflict with utilities. Unless otherwise shown on the plans, the Contractor shall stake and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



SUMMARY OF SMALL SIGNS

SOSS

FILE:	slums16.dgn	DW:	TxDOT	CK:	TxDOT	DW:	TxDOT	CK:	TxDOT
©	TxDOT May 1987	CONT:	0902	SECT:	38	JOB:	120	HIGHWAY:	GILLILAND RD
REVISIONS		DIST:	2	COUNTY:	PARKER	SHEET NO.:	10		



- NOTES:**
1. TYPE III BARRICADES SHALL BE PLACED AFTER LAST DRIVEWAY.
 2. LOCATION OF BARRICADES AND SIGNS SHOWN ARE APPROXIMATE AND MAY BE ADJUSTED IN THE FIELD BY THE ENGINEER.
 3. CONTRACTOR MUST MAINTAIN ACCESS TO DRIVEWAYS AT ALL TIMES.
 4. CONTRACTOR MUST REMOVE EXISTING BARRICADES FROM PROJECT AREA AND STOCKPILE THEM AS DIRECTED BY THE ENGINEER FOR COLLECTION BY THE CITY OF SPRINGTOWN. THIS WORK SHALL BE SUBSIDIARY TO ITEM 502.
 5. CONTRACTOR MUST COORDINATE WITH LOCAL POLICE, FIRE, EMS, ISD, TRASH COLLECTION AND POST OFFICE TO NOTIFY OF CLOSURE PRIOR TO CONSTRUCTION.

- SEQUENCE OF WORK:**
1. PLACE ADVANCE WARNING SIGNS AND BARRICADES IN ACCORDANCE WITH BC(2-14).
 2. PLACE EROSION AND SEDIMENT CONTROL DEVICES.
 3. PREPARE RIGHT OF WAY, FROM ROW LINE TO ROW LINE.
 4. REMOVE EXISTING BRIDGE AND OTHER FACILITIES AS SHOWN IN THE REMOVAL PLAN AS NEEDED.
 5. CONSTRUCT EMBANKMENT AND CUT GRADE UNDER AND AROUND PROPOSED BRIDGE.
 6. PLACE DRILL SHAFT, BENTS AND ABUTMENTS.
 7. GRADE AND PLACE RIPRAP UNDER BRIDGE.
 8. COMPLETE THE BRIDGE AND ROADWAY ITEMS AS SHOWN IN THE PLANS. CONTRACTOR SHALL DEVELOP HIS PHASING/SEQUENCING PLAN WITH REQUIRED SIGNS AND TCP DEVICES FOR MAINTAINING ACCESS TO AND FROM ADJACENT PROPERTIES AND SUBMIT TO THE ENGINEER FOR APPROVAL BEFORE BEGINNING ANY ROADWAY WORK. DEVELOPING THESE PLANS AND IMPLEMENTING THEM DURING CONSTRUCTION WILL NOT BE PAID SEPARATELY AND WILL BE CONSIDERED SUBSIDIARY TO ITEM 502.
 9. PLACE PERMANENT SIGNING AND PAVEMENT MARKINGS.
 10. REMOVE EROSION AND SEDIMENT CONTROL DEVICES.
 11. FINAL CLEAN UP. REMOVE BARRICADES AND OPEN ROADWAY.

SCALE: N.T.S.

11/5/2020

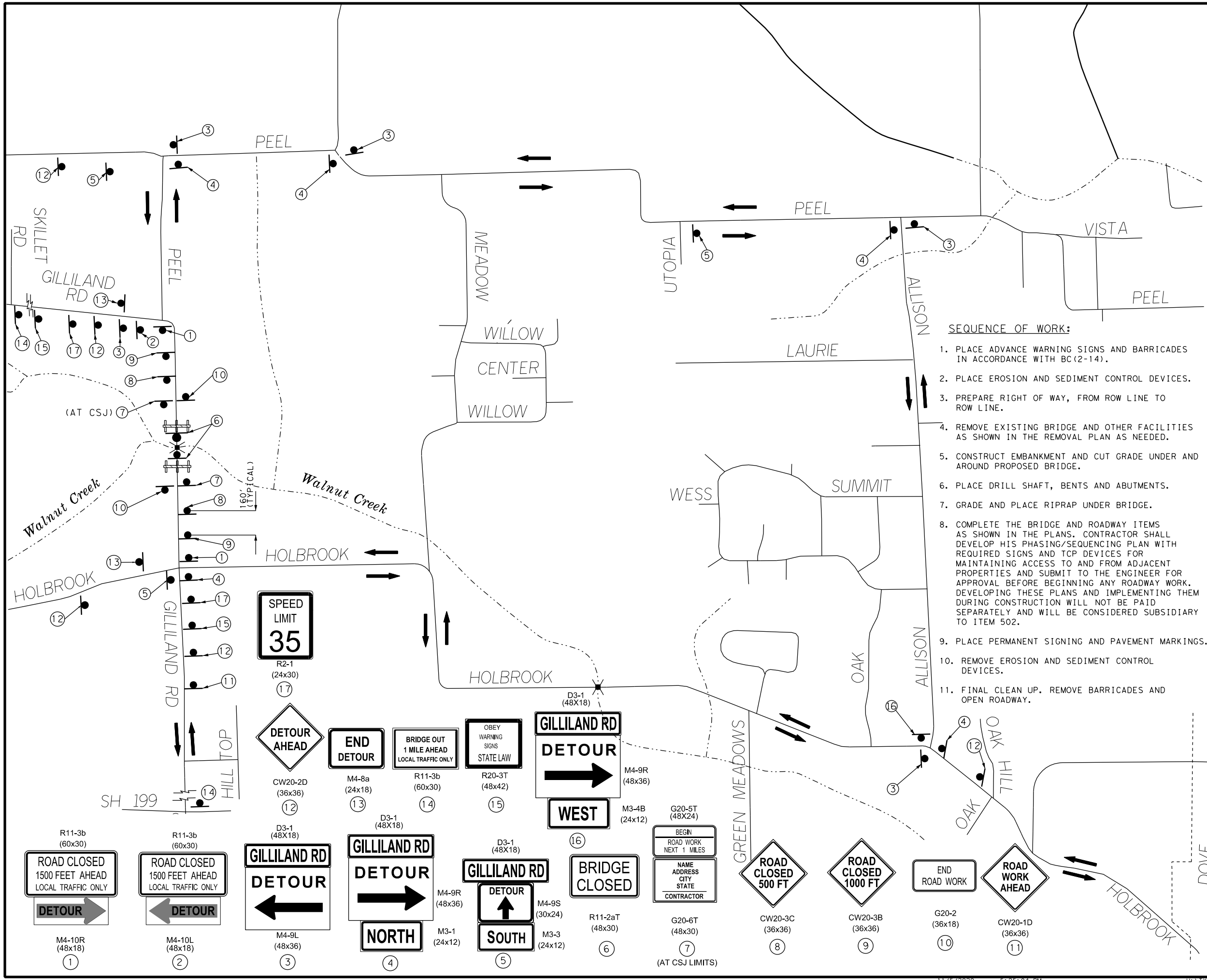
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2020
Texas Department of Transportation

GILLILAND ROAD AT WALNUT CREEK
ADVANCE WARNING SIGNS AND SEQUENCE OF WORK

SHEET 1 OF 1

FED RD DIV NO.	FEDERAL AID PROJECT	SHEET NO.	
6	SEE TITLE SHEET	11	
STATE	DISTRICT	COUNTY	
TEXAS	FTW	PARKER	
CONTROL	SECTION	JOB	HIGHWAY
0902	38	120	GILLILAND RD



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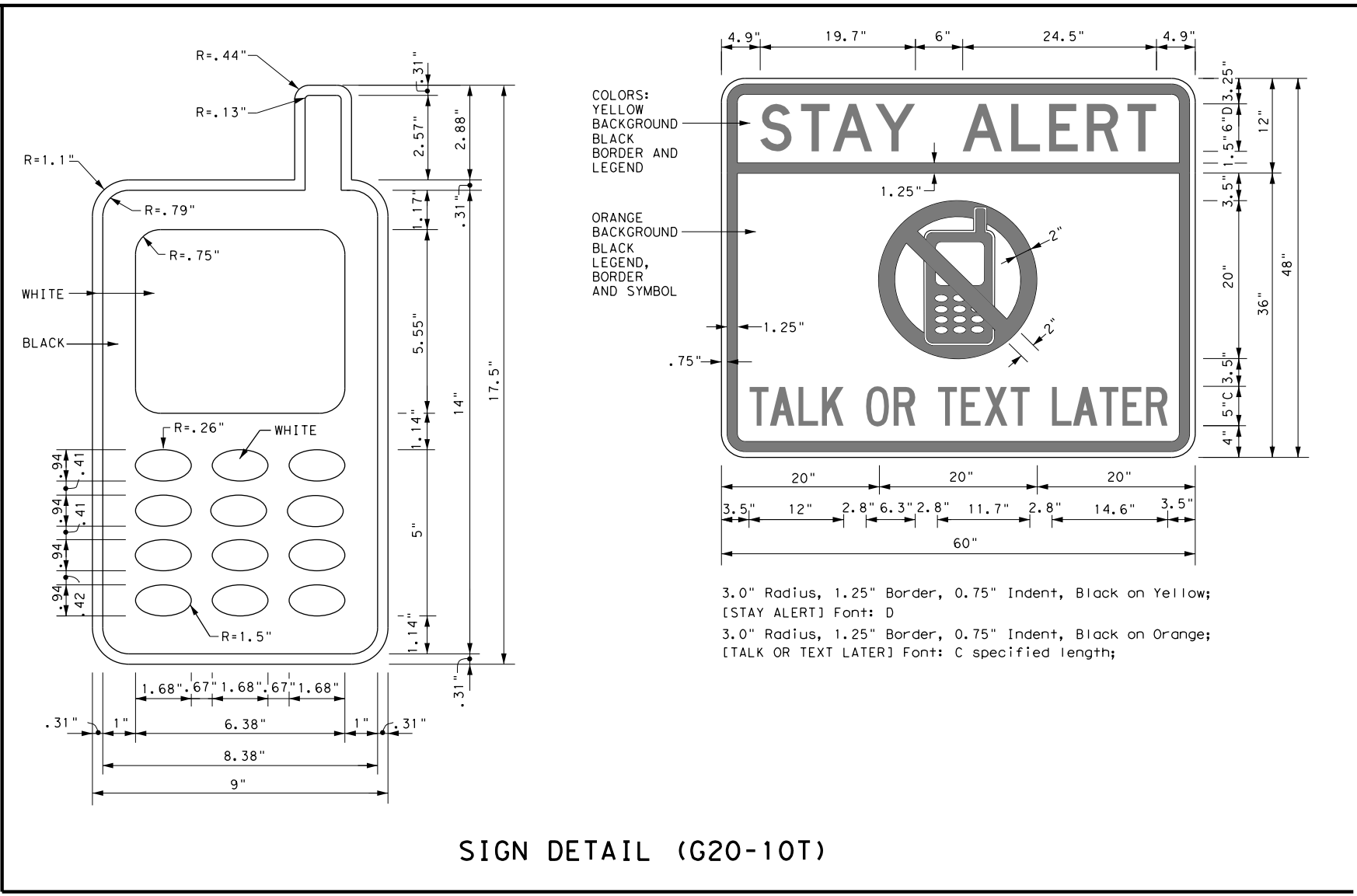
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BARRICADE AND CONSTRUCTION (BC) STANDARD SHEETS GENERAL NOTES:

- 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).
- The development and design of the Traffic Control Plan (TCP) is the responsibility of the Engineer.
- 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.
- 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.
- 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.
- 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.
- 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.
- 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.
- 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.
- As shown on BC(2), the OBEY WARNING SIGNS STATE LAW sign, STAY ALERT TALK OR TEXT LATER sign with plaque shall be erected in advance of the CSJ limits. However, the TRAFFIC FINES DOUBLE sign will not be required on projects consisting solely of mobile operation work, such as striping or milling edgeline rumble strips. The BEGIN ROAD WORK NEXT X MILES, CONTRACTOR and END ROAD WORK signs shall be erected at or near the CSJ limits.
- Except for devices required by Note 10, traffic control devices should be in place only while work is actually in progress or a definite need exists.
- The Engineer has the final decision on the location of all traffic control devices.
- 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 APPAREL NOTES:

- 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.



Only pre-qualified products shall be used. The "Compliant Work Zone Traffic Control Devices List" (CWZTCD) describes pre-qualified products and their sources and may be found on-line at the web address given below or by contacting:

Texas Department of Transportation
 Traffic Operations Division - TE
 Phone (512) 416-3118

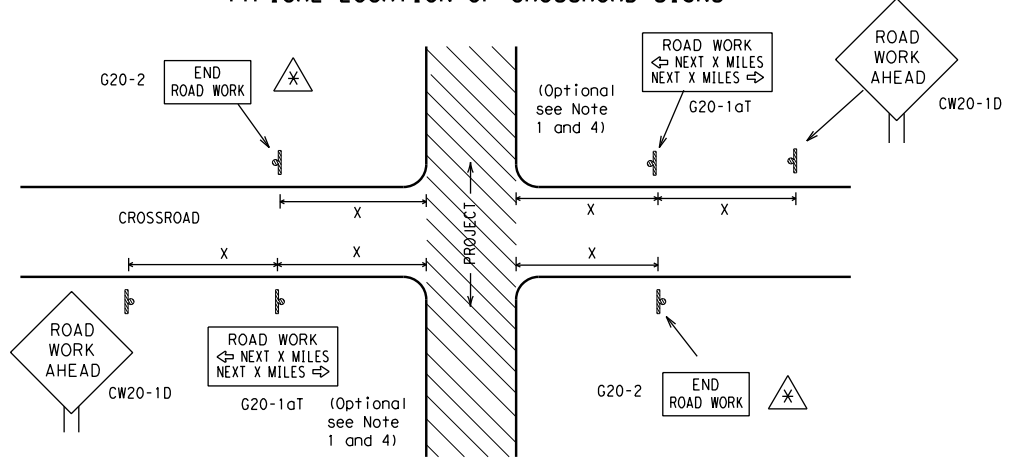
THE DOCUMENTS BELOW CAN BE FOUND ON-LINE AT http://www.txdot.gov	
COMPLIANT WORK ZONE TRAFFIC CONTROL DEVICES LIST (CWZTCD)	
DEPARTMENTAL MATERIAL SPECIFICATIONS (DMS)	
MATERIAL PRODUCER LIST (MPL)	
ROADWAY DESIGN MANUAL - SEE "MANUALS (ONLINE MANUALS)"	
STANDARD HIGHWAY SIGN DESIGNS FOR TEXAS (SHSD)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

SHEET 1 OF 12

		<i>Traffic Operations Division Standard</i>
BARRICADE AND CONSTRUCTION GENERAL NOTES AND REQUIREMENTS		
BC (1) - 14		
FILE: bc-14.dgn	DATE: TxDOT	CK: TxDOT
© TxDOT November 2002	CONT: 0902	SECT: 38
	JOB: 120	HIGHWAY: GILLILAND RD
REVISIONS	DIST: FTW	COUNTY: PARKER
4-03 5-10 8-14		SHEET NO. 12
9-07 7-13		

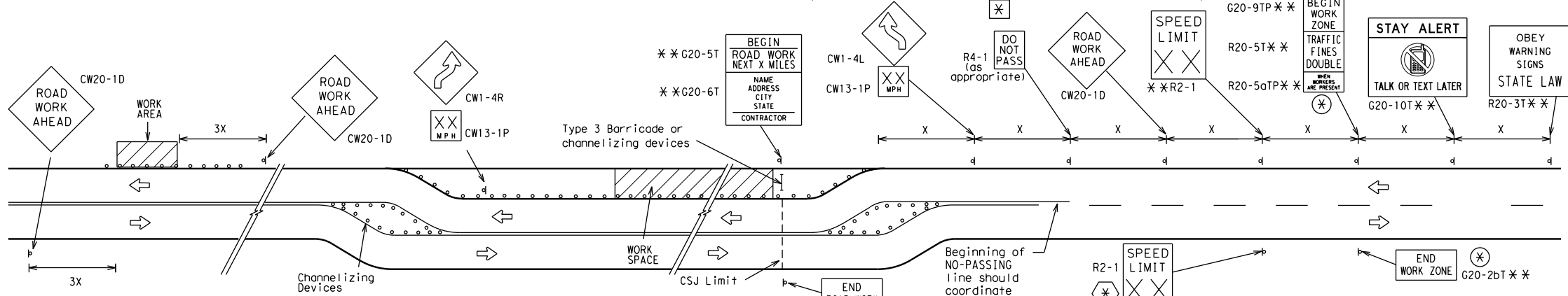
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TYPICAL LOCATION OF CROSSROAD SIGNS



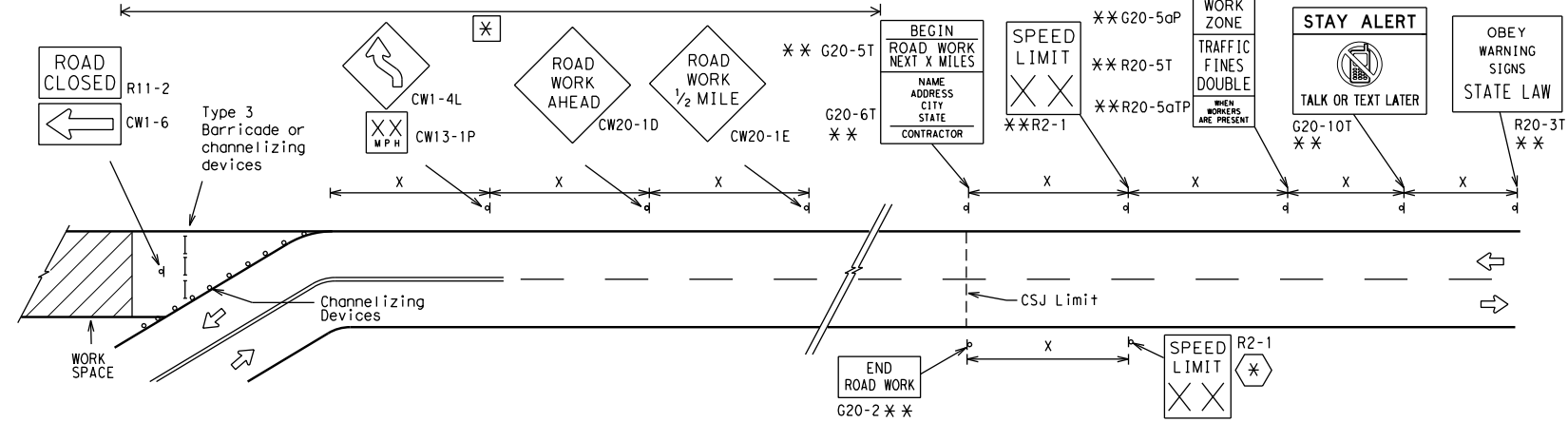
- ⊗ May be mounted on back of "ROAD WORK AHEAD" (CW20-1D) sign with approval of Engineer. (See note 2 below)
- The typical minimum signing on a crossroad approach should be a "ROAD WORK AHEAD" (CW20-1D) sign and a (G20-2) "END ROAD WORK" sign, unless noted otherwise in plans.
 - The Engineer may use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

WORK AREAS IN MULTIPLE LOCATIONS WITHIN CSJ LIMITS

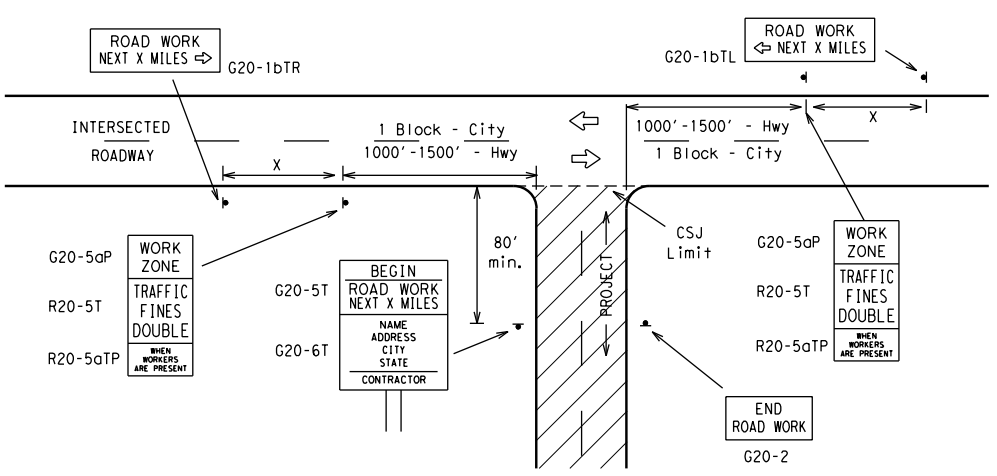


When extended distances occur between minimal work spaces, the Engineer/Inspector should ensure additional "ROAD WORK AHEAD" (CW20-1D) signs are placed in advance of these work areas to remind drivers they are still within the project limits. See the applicable TCP sheets for exact location and spacing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

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



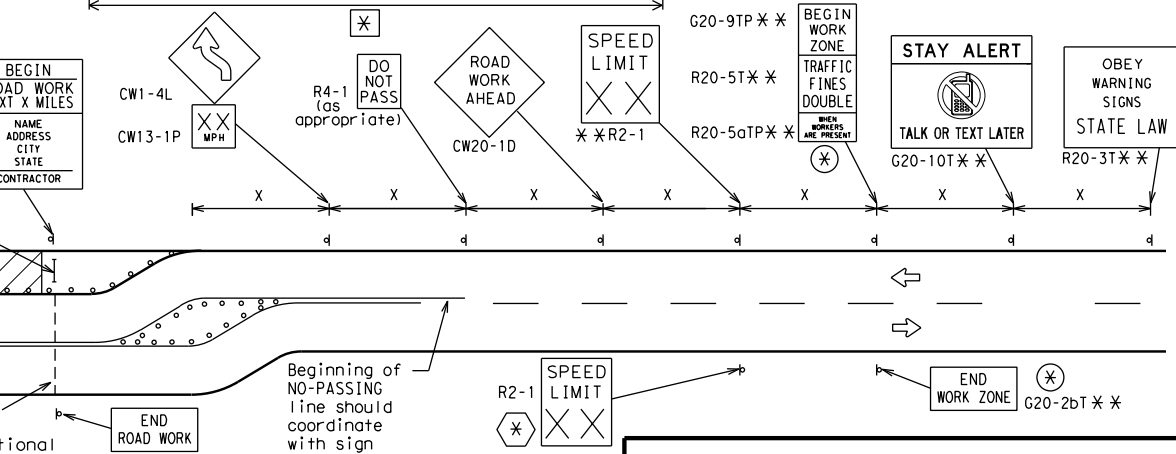
T-INTERSECTION



CSJ LIMITS AT T-INTERSECTION

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

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.
- ** Required CSJ Limit signing. See Note 10 on BC(1). TRAFFIC FINES DOUBLE signs will not be required on projects consisting solely of mobile operations work.
- ⊗ 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.

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

Sign Number or Series	SIZE		SPACING	
	Conventional Road	Expressway/Freeway	Posted Speed MPH	Sign Spacing "X" Feet (Apprx.)
CW20 ⁴ , CW21, CW22, CW23, CW25	48" x 48"	48" x 48"	30	120
CW1, CW2, CW7, CW8, CW9, CW11, CW14	36" x 36"	48" x 48"	35	160
CW3, CW4, CW5, CW6, CW8-3, CW10, CW12	48" x 48"	48" x 48"	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.
- Δ Minimum distance from work area to first Advance Warning sign nearest the work area and/or distance between each additional sign.

GENERAL NOTES

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

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

SHEET 2 OF 12



BARRICADE AND CONSTRUCTION PROJECT LIMIT

BC(2)-14

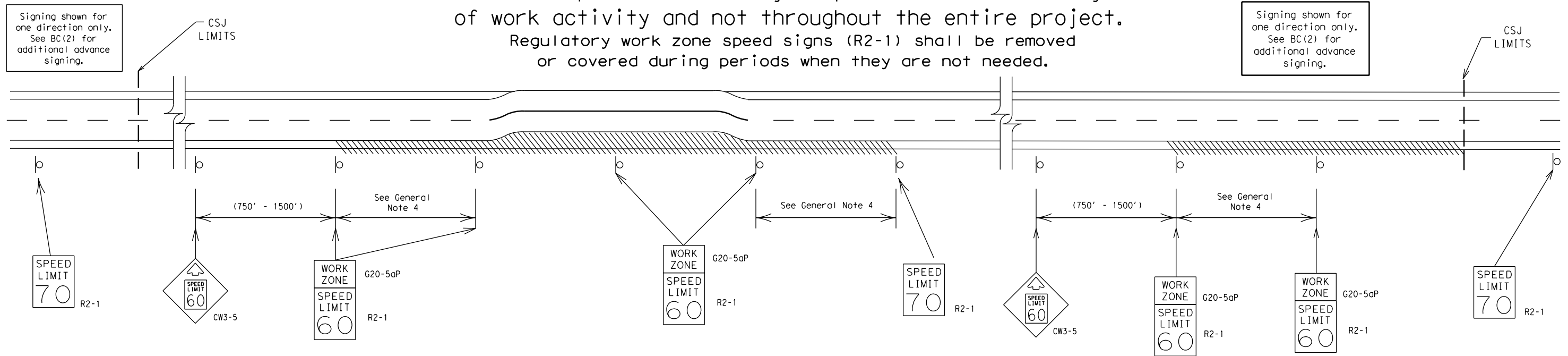
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© TxDOT November 2002	CONT 0902	SECT 38	JOB 120	HIGHWAY GILL ISLAND RD
REVISIONS				
9-07	8-14	DIST FTW	COUNTY PARKER	SHEET NO. 13
7-13				

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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:

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

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

SHORT TERM WORK ZONE SPEED LIMITS

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

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

GENERAL NOTES

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

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SHEET 3 OF 12



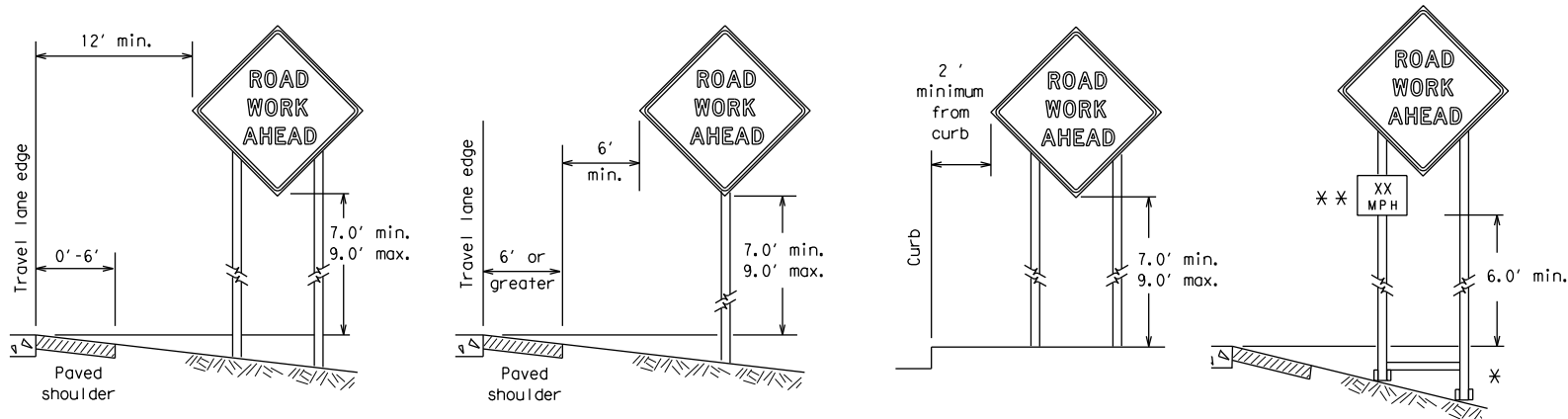
BARRICADE AND CONSTRUCTION WORK ZONE SPEED LIMIT

BC (3) - 14

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7-13		FTW	PARKER		14

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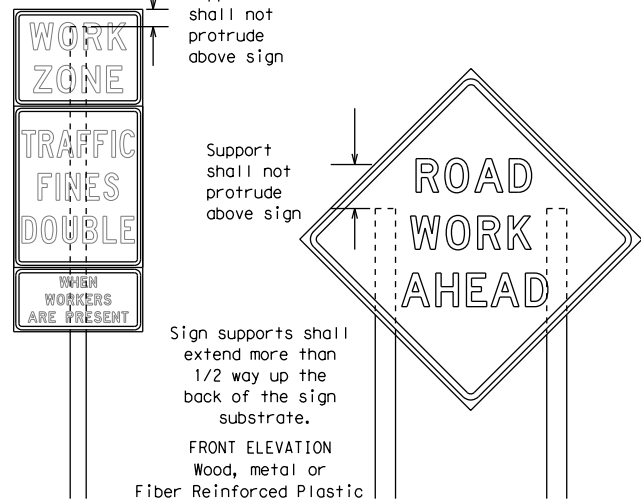
TYPICAL MINIMUM CLEARANCES FOR LONG TERM AND INTERMEDIATE TERM SIGNS



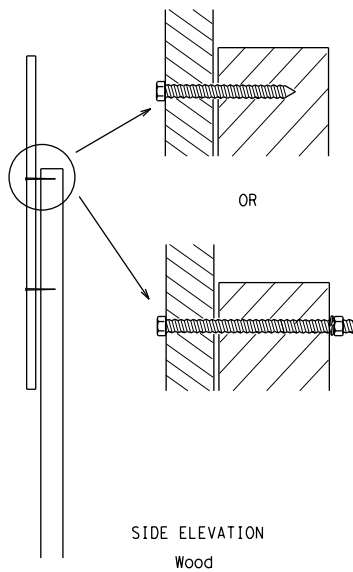
* When placing skid supports on unlevel ground, the leg post lengths must be adjusted so the sign appears straight and plumb. Objects shall NOT be placed under skids as a means of leveling.

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

ATTACHMENT FOR SIGN SUPPORTS



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



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

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

GENERAL NOTES FOR WORK ZONE SIGNS

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

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

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

SIGN MOUNTING HEIGHT

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

SIZE OF SIGNS

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

SIGN SUBSTRATES

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

REFLECTIVE SHEETING

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

SIGN LETTERS

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

REMOVING OR COVERING

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

SIGN SUPPORT WEIGHTS

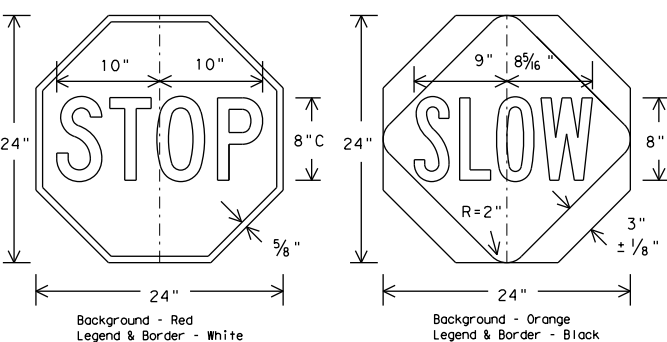
- Where sign supports require the use of weights to keep from turning over, the use of sandbags with dry, cohesionless sand should be used.
- The sandbags will be tied shut to keep the sand from spilling and to maintain a constant weight.
- Rock, concrete, iron, steel or other solid objects shall not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

FLAGS ON SIGNS

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

STOP/SLOW PADDLES

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



Background - Red
Legend & Border - White

Background - Orange
Legend & Border - Black

CONTRACTOR REQUIREMENTS FOR MAINTAINING PERMANENT SIGNS WITHIN THE PROJECT LIMITS

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



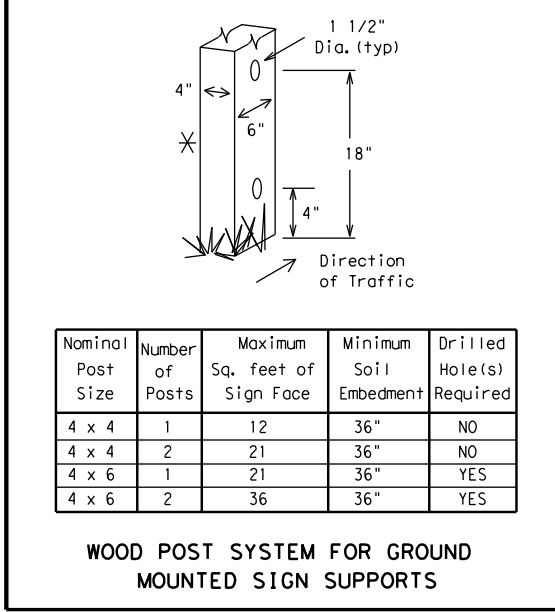
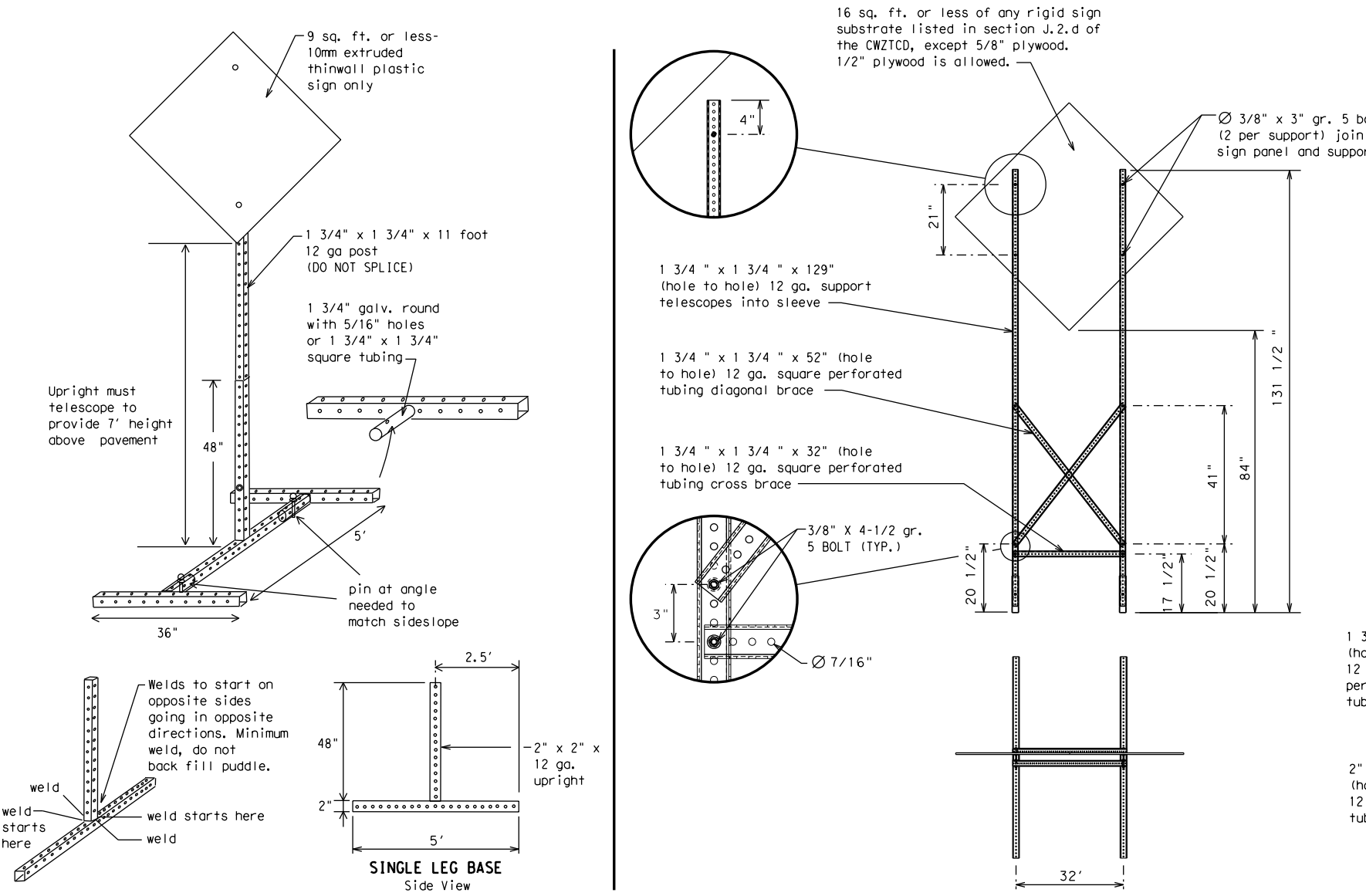
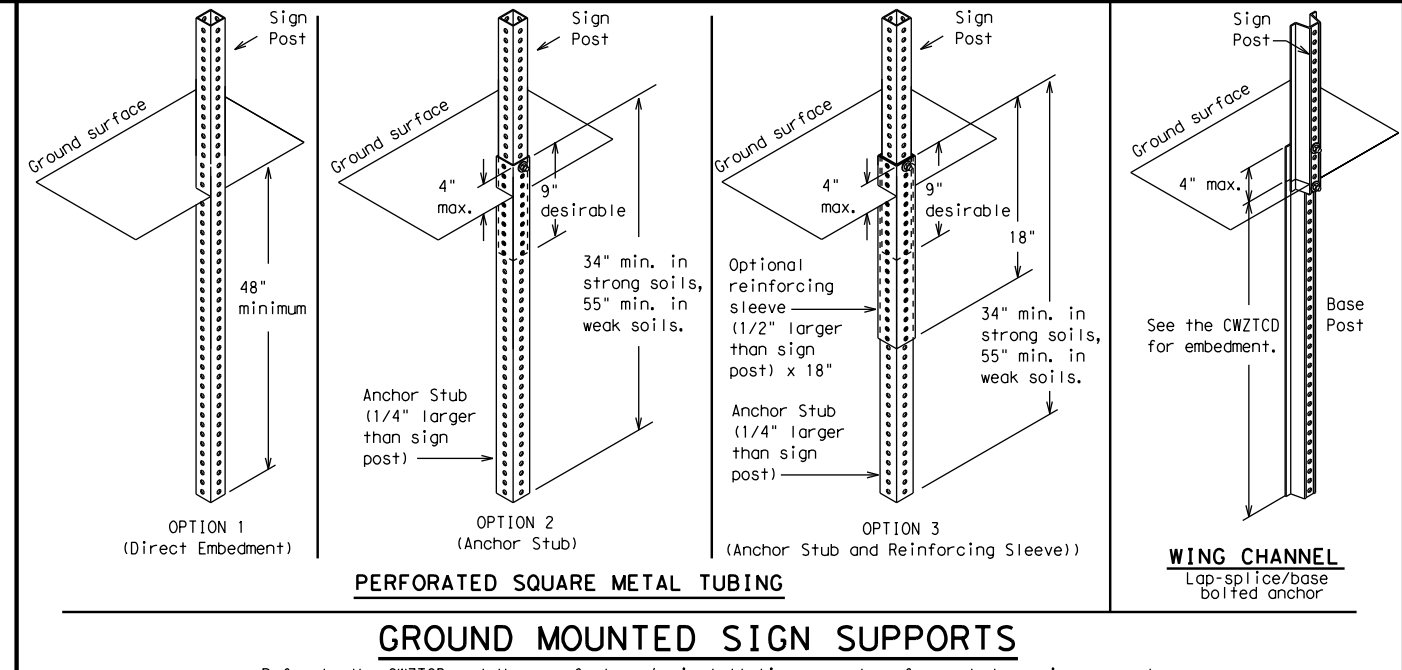
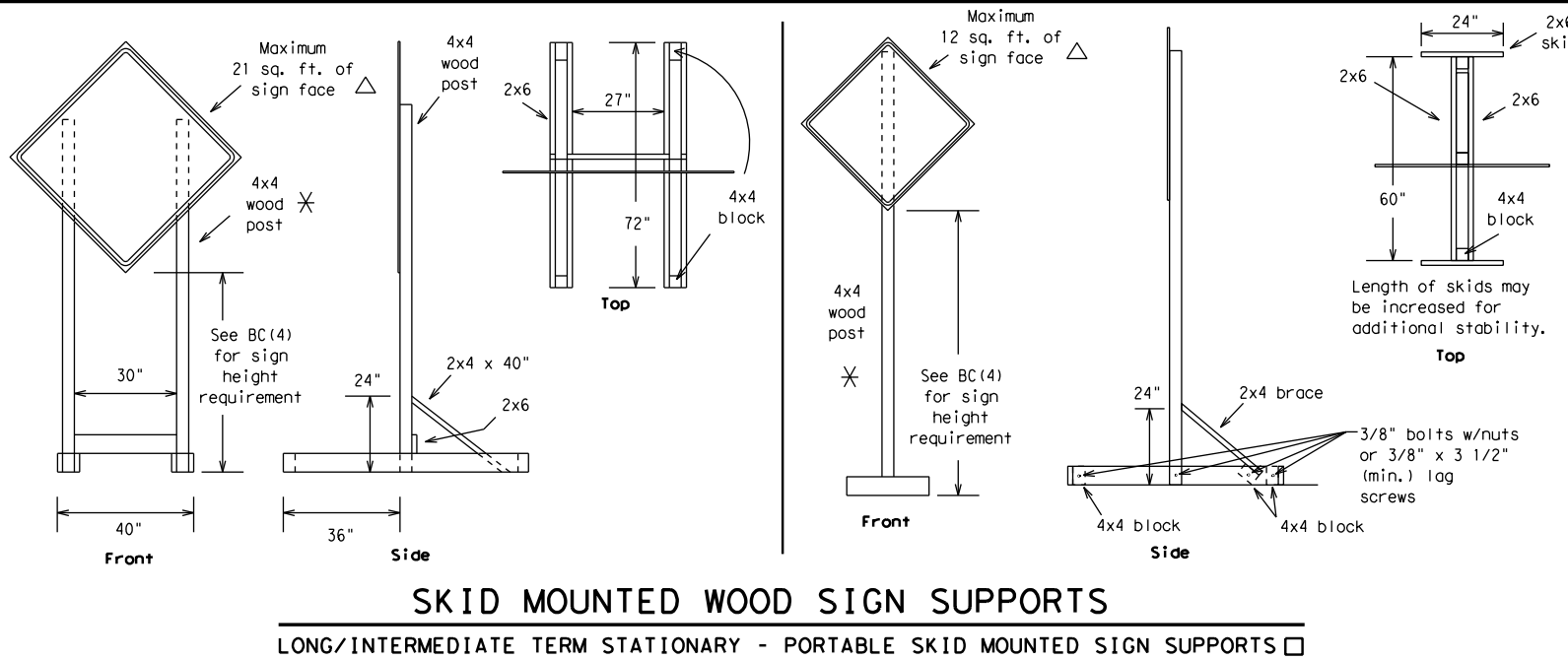
BARRICADE AND CONSTRUCTION TEMPORARY SIGN NOTES

BC (4) - 14

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

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

GENERAL NOTES

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

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

SHEET 5 OF 12



BARRICADE AND CONSTRUCTION TYPICAL SIGN SUPPORT

BC (5) - 14

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7-13		FTW	PARKER	16					

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

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

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

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

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
ROAD CLOSED AT SH XXX
ROAD CLSD AT FM XXXX
RIGHT X LANES CLOSED
CENTER LANE CLOSED
NIGHT LANE CLOSURES
VARIOUS LANES CLOSED
EXIT CLOSED
MALL DRIVEWAY CLOSED
XXXXXXXX BLVD CLOSED

Other Condition List

ROADWORK XXX FT
FLAGGER XXXX FT
RIGHT LN NARROWS XXXX FT
MERGING TRAFFIC XXXX FT
LOOSE GRAVEL XXXX FT
DETOUR X MILE
ROADWORK PAST SH XXXX
BUMP XXXX FT
TRAFFIC SIGNAL XXXX FT

ROAD REPAIRS XXXX FT
LANE NARROWS XXXX FT
TWO-WAY TRAFFIC XX MILE
CONST TRAFFIC XXX FT
UNEVEN LANES XXXX FT
ROUGH ROAD XXXX FT
ROADWORK NEXT FRI-SUN
US XXX EXIT X MILES
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
DETOUR NEXT X EXITS
USE EXIT XXX
STAY ON US XXX SOUTH
TRUCKS USE US XXX N
WATCH FOR TRUCKS
EXPECT DELAYS
REDUCE SPEED XXX FT
USE OTHER ROUTES
STAY IN LANE *

Location List

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

Warning List

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

** Advance Notice List

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

** See Application Guidelines Note 6.

APPLICATION GUIDELINES

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

WORDING ALTERNATIVES

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

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

FULL MATRIX PCMS SIGNS

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

		Traffic Operations Division Standard	
BARRICADE AND CONSTRUCTION PORTABLE CHANGEABLE MESSAGE SIGN (PCMS)			
BC (6) - 14			
FILE: bc-14.dgn	DN: TxDOT	CK: TxDOT	DW: TxDOT
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REVISIONS			
9-07 8-14	DIST: FTW	COUNTY: PARKER	SHEET NO. 17

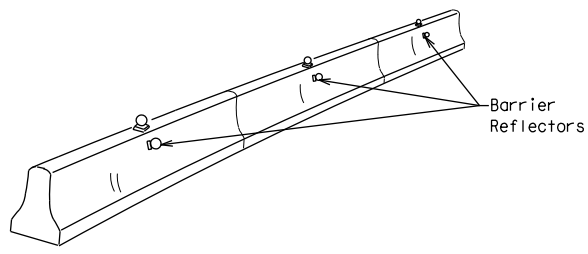
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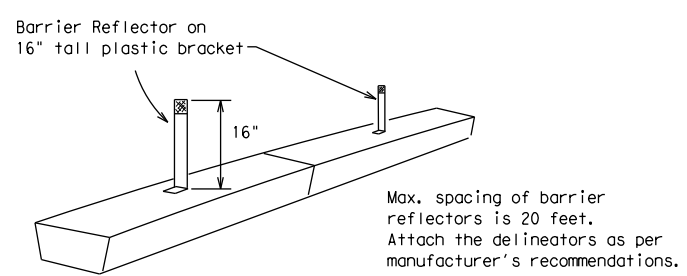
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- Barrier Reflectors shall be pre-qualified, and conform to the color and reflectivity requirements of DMS-8600. A list of prequalified Barrier Reflectors can be found at the Material Producer List web address shown on BC(1).
- Color of Barrier Reflectors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

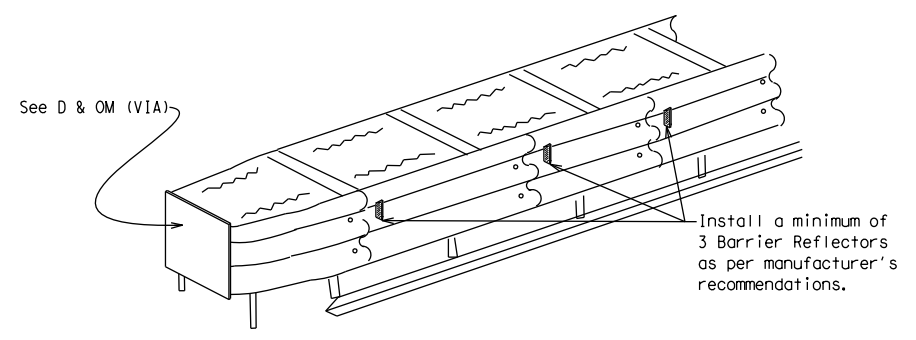


CONCRETE TRAFFIC BARRIER (CTB)

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



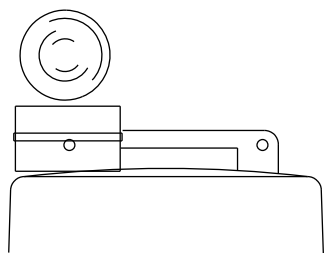
LOW PROFILE CONCRETE BARRIER (LPCB)



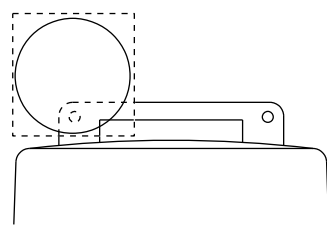
DELINEATION OF END TREATMENTS

END TREATMENTS FOR CTB'S USED IN WORK ZONES
 End treatments used on CTB's in work zones shall meet crashworthy standards as defined in the National Cooperative Highway Research Report 350. Refer to the CWZTCD List for approved end treatments and manufacturers.

BARRIER REFLECTORS FOR CONCRETE TRAFFIC BARRIER AND ATTENUATORS



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



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

WARNING LIGHTS

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

WARNING LIGHTS MOUNTED ON PLASTIC DRUMS

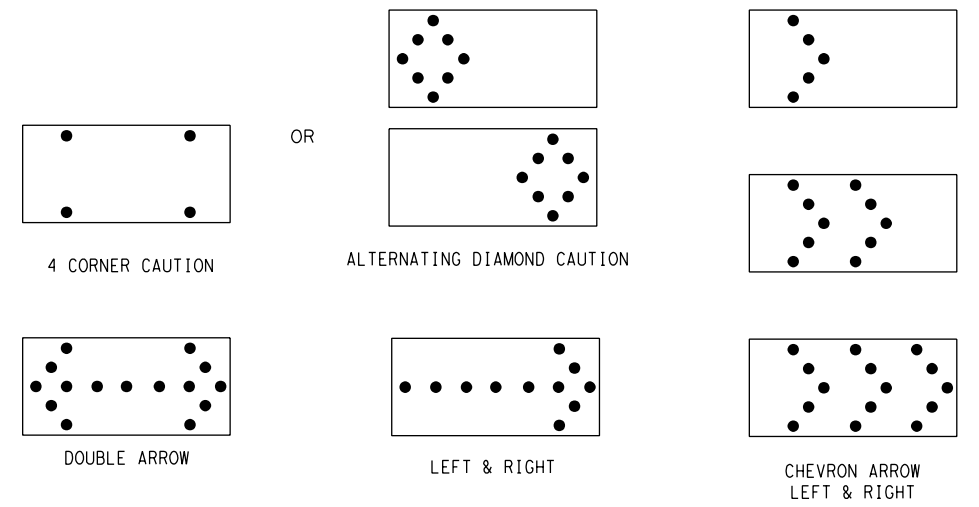
- Type A flashing warning lights are intended to warn drivers that they are approaching or are in a potentially hazardous area.
- Type A random flashing warning lights are not intended for delineation and shall not be used in a series.
- A series of sequential flashing warning lights placed on channelizing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

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

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

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

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



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

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

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

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

FLASHING ARROW BOARDS

TRUCK-MOUNTED ATTENUATORS

- Truck-mounted attenuators (TMA) used on TxDOT facilities must meet the requirements outlined in the National Cooperative Highway Research Report No. 350 (NCHRP 350) or the Manual for Assessing Safety Hardware (MASH).
- Refer to the CWZTCD for the requirements of Level 2 or Level 3 TMAs.
- Refer to the CWZTCD for a list of approved TMAs.
- TMAs are required on freeways unless otherwise noted in the plans.
- A TMA should be used anytime that it can be positioned 30 to 100 feet in advance of the area of crew exposure without adversely affecting the work performance.
- The only reason a TMA should not be required is when a work area is spread down the roadway and the work crew is an extended distance from the TMA.



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

BC(7)-14

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7-13		FTW	PARKER		18				

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GENERAL NOTES

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

GENERAL DESIGN REQUIREMENTS

Pre-qualified plastic drums shall meet the following requirements:

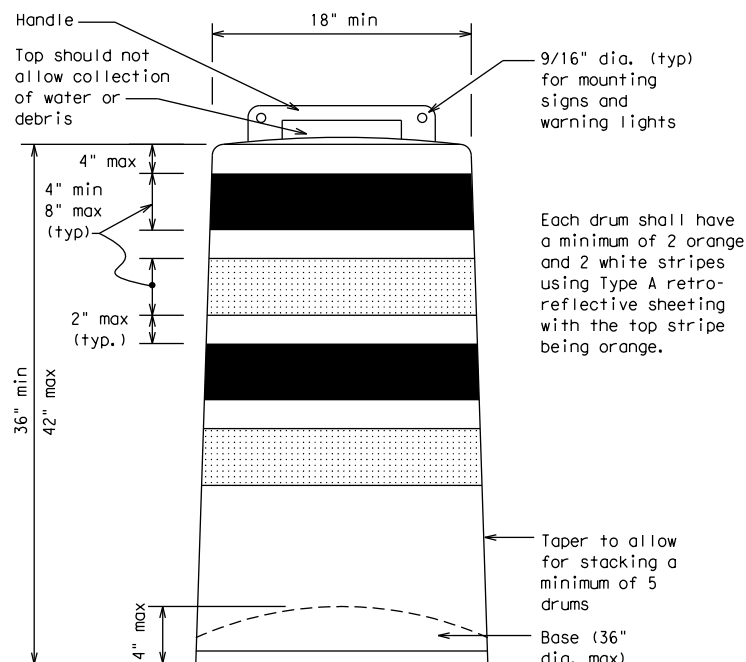
- Plastic drums shall be a two-piece design; the "body" of the drum shall be the top portion and the "base" shall be the bottom.
- The body and base shall lock together in such a manner that the body separates from the base when impacted by a vehicle traveling at a speed of 20 MPH or greater but prevents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

RETROREFLECTIVE SHEETING

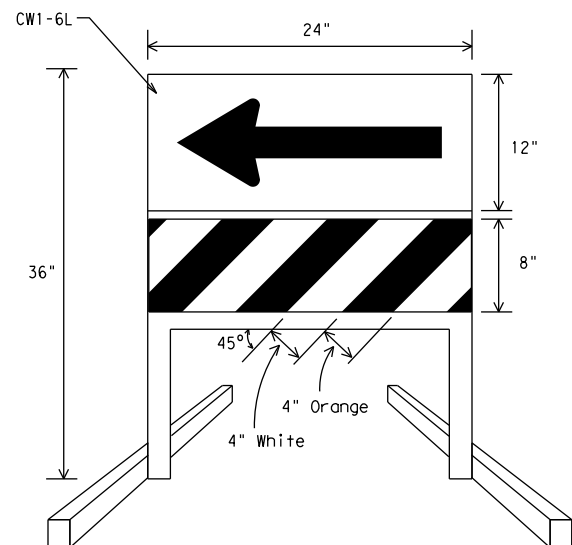
- The stripes used on drums shall be constructed of sheeting meeting the color and retroreflectivity requirements of Departmental Materials Specification DMS-8300, "Sign Face Materials." Type A reflective sheeting shall be supplied unless otherwise specified in the plans.
- The sheeting shall be suitable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

BALLAST

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

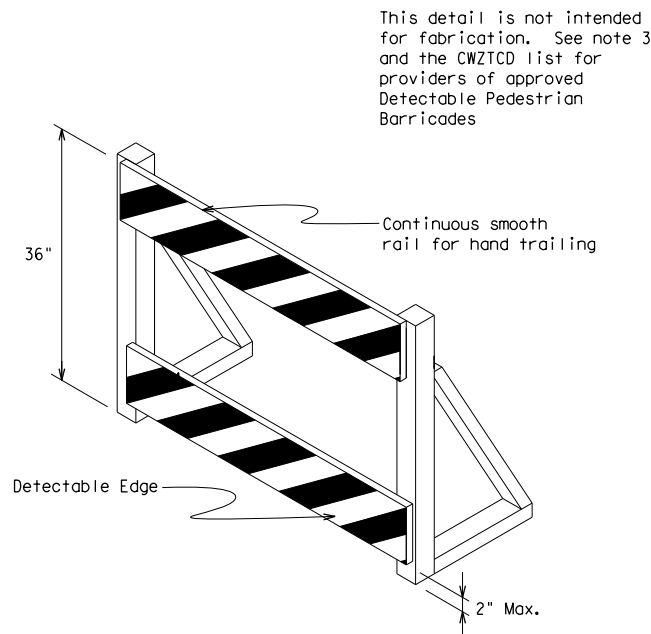


Each drum shall have a minimum of 2 orange and 2 white stripes using Type A retro-reflective sheeting with the top stripe being orange.



DIRECTION INDICATOR BARRICADE

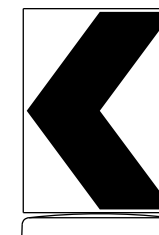
- The Direction Indicator Barricade may be used in tapers, transitions, and other areas where specific directional guidance to drivers is necessary.
- If used, the Direction Indicator Barricade should be used in series to direct the driver through the transition and into the intended travel lane.
- The Direction Indicator Barricade shall consist of One-Direction Large Arrow (CW1-6) sign in the size shown with a black arrow on a background of Type B_{FL} or Type C_{FL} Orange retroreflective sheeting above a rail with Type A retroreflective sheeting in alternating 4" white and orange stripes sloping downward at an angle of 45 degrees in the direction road users are to pass. Sheeting types shall be as per DMS 8300.
- Double arrows on the Direction Indicator Barricade will not be allowed.
- Approved manufacturers are shown on the CWZTCD List. Ballast shall be as approved by the manufacturers instructions.



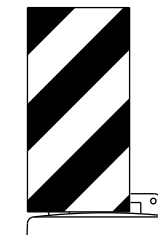
This detail is not intended for fabrication. See note 3 and the CWZTCD list for providers of approved Detectable Pedestrian Barricades

DETECTABLE PEDESTRIAN BARRICADES

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



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



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

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

SIGNS, CHEVRONS, AND VERTICAL PANELS MOUNTED ON PLASTIC DRUMS

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

SHEET 8 OF 12

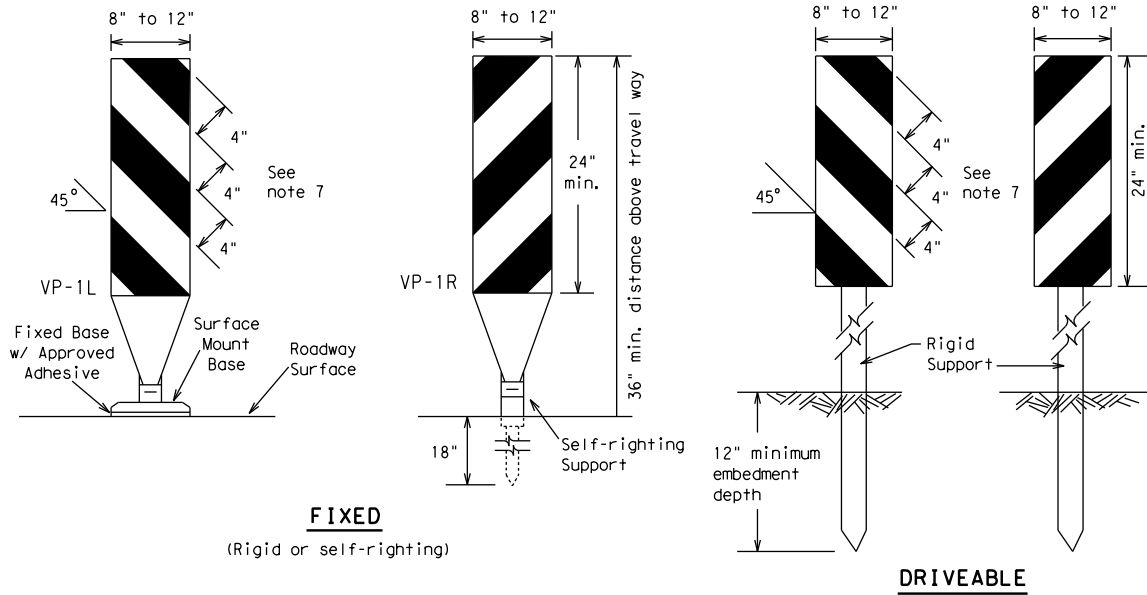


BARRICADE AND CONSTRUCTION CHANNELIZING DEVICES

BC (8) - 14

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9-07 8-14	FTW	PARKER	19	

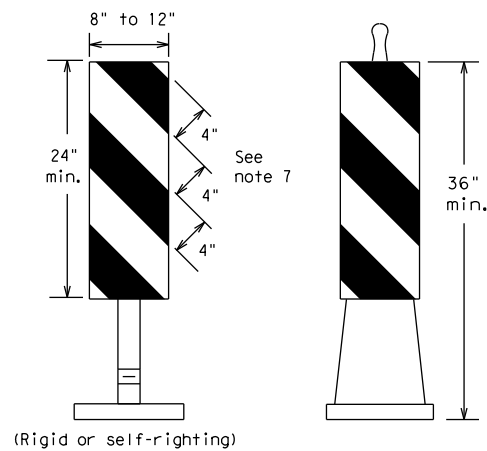
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FIXED
(Rigid or self-righting)

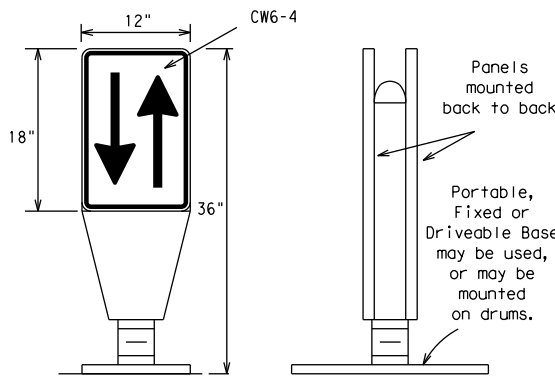
DRIVEABLE

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



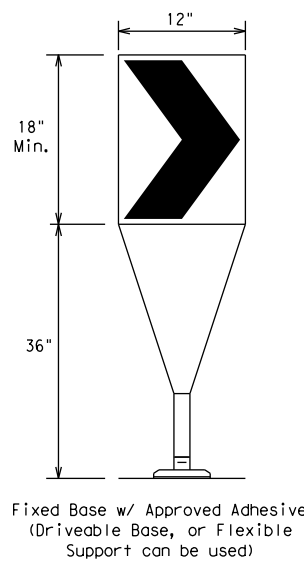
PORTABLE

VERTICAL PANELS (VPs)



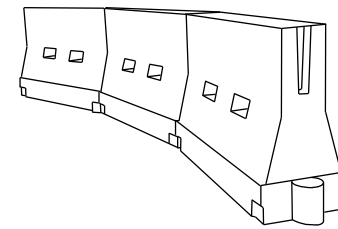
OPPOSING TRAFFIC LANE DIVIDERS (OTLD)

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



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

CHEVRONS



LONGITUDINAL CHANNELIZING DEVICES (LCD)

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

WATER BALLASTED SYSTEMS USED AS BARRIERS

- Water ballasted systems used as barriers shall not be used solely to channelize road users, but also to protect the work space per the appropriate NCHRP 350 crashworthiness requirements based on roadway speed and barrier application.
- Water ballasted systems used to channelize vehicular traffic shall be supplemented with retroreflective delineation or channelizing devices to improve daytime/nighttime visibility. They may also be supplemented with pavement markings.
- Water ballasted systems used as barriers shall be placed in accordance to application and installation requirements specific to the device, and used only when shown on the CWZTCD list.
- Water ballasted systems used as barriers should not be used for a merging taper except in low speed (less than 45 MPH) urban areas. When used on a taper in a low speed urban area, the taper shall be delineated and the taper length should be designed to optimize road user operations considering the available geometric conditions.
- When water ballasted systems used as barriers have blunt ends exposed to traffic, they should be attenuated as per manufacturer recommendations or flared to a point outside the clear zone.

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

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

GENERAL NOTES

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

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

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

SUGGESTED MAXIMUM SPACING OF CHANNELIZING DEVICES AND MINIMUM DESIRABLE TAPER LENGTHS

SHEET 9 OF 12



BARRICADE AND CONSTRUCTION CHANNELIZING DEVICES

BC (9) - 14

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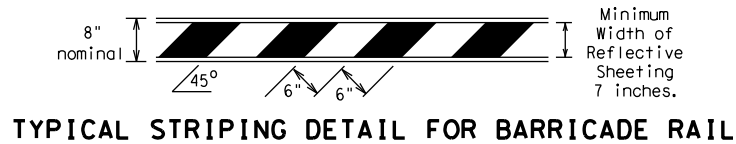
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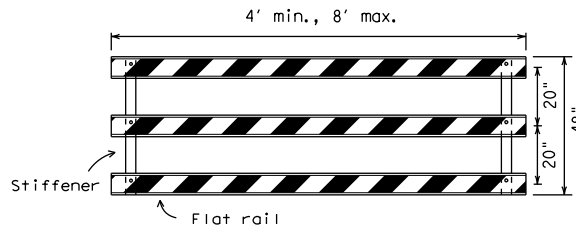
TYPE 3 BARRICADES

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 conforming to Departmental Material Specification DMS-8300 unless otherwise noted.

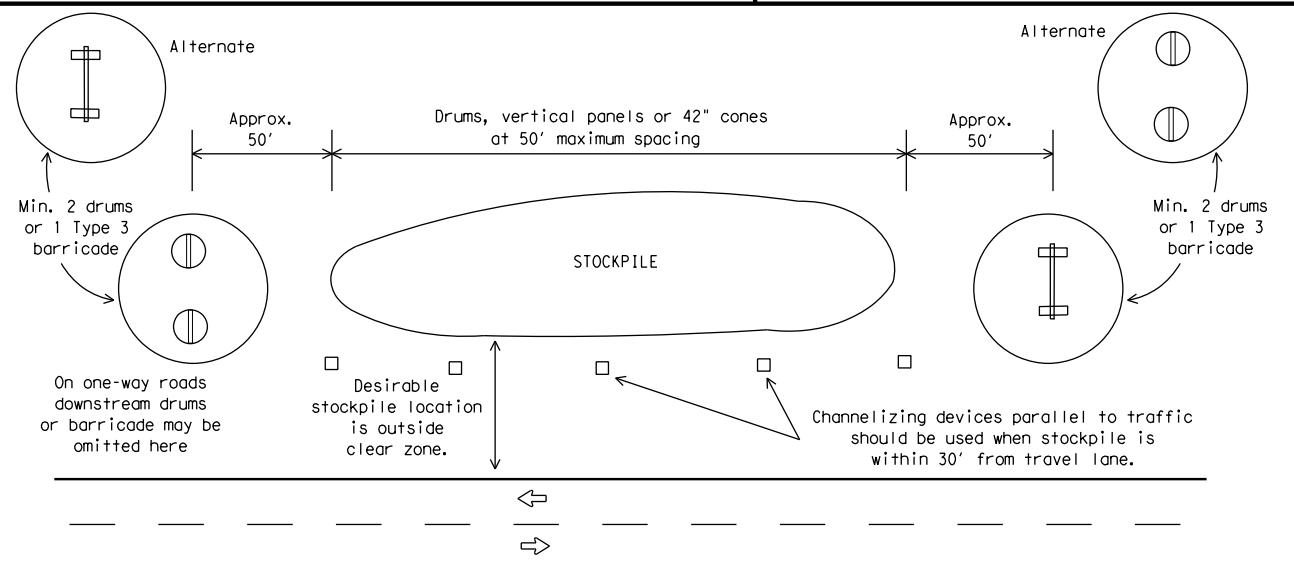
Barricades shall NOT be used as a sign support.



TYPICAL STRIPING DETAIL FOR BARRICADE RAIL

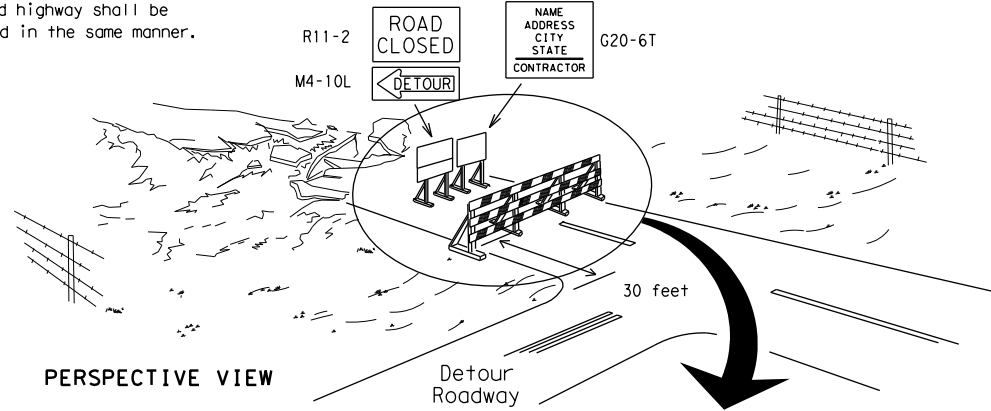


TYPICAL PANEL DETAIL FOR SKID OR POST TYPE BARRICADES



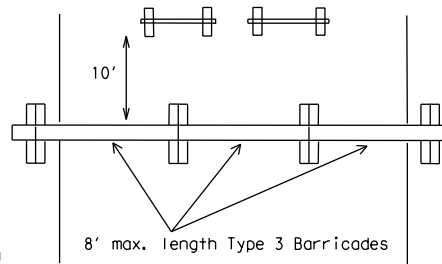
TRAFFIC CONTROL FOR MATERIAL STOCKPILES

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



PERSPECTIVE VIEW

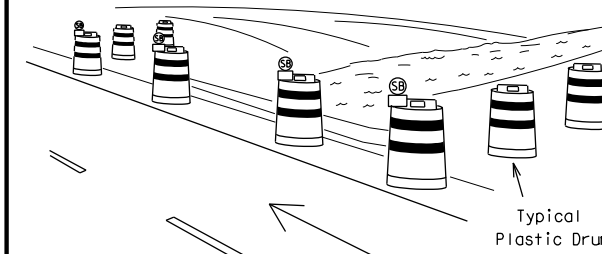
The three rails on Type 3 barricades shall be reflectorized orange and reflective white stripes on one side facing one-way traffic and both sides for two-way traffic. Barricade striping should slant downward in the direction of detour.



PLAN VIEW

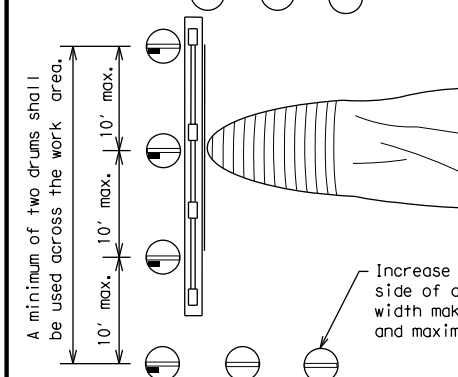
1. Signs should be mounted on independent supports at a 7 foot mounting height in center of roadway. The signs should be a minimum of 10 feet behind Type 3 Barricades.
2. Advance signing shall be as specified elsewhere in the plans.

TYPE 3 BARRICADE (POST AND SKID) TYPICAL APPLICATION



PERSPECTIVE VIEW

These drums are not required on one-way roadway



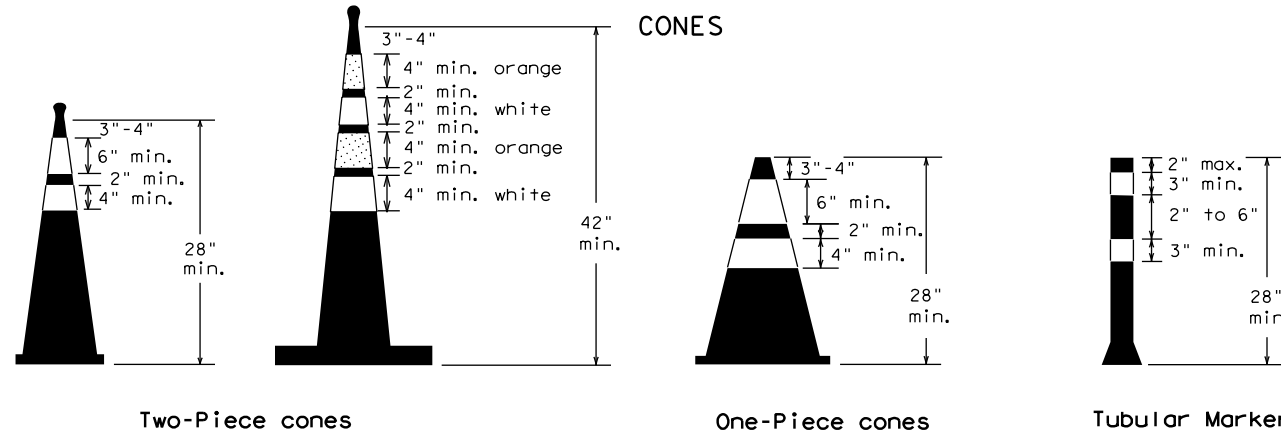
PLAN VIEW

CULVERT WIDENING OR OTHER ISOLATED WORK WITHIN THE PROJECT LIMITS

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

LEGEND

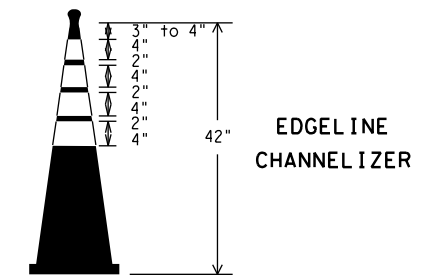
	Plastic drum
	Plastic drum with steady burn light or yellow warning reflector
	Steady burn warning light or yellow warning reflector



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 used at night 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.
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.

THIS DEVICE SHALL NOT BE USED ON PROJECTS LET AFTER MARCH 2014.



1. This device is intended only for use in place of a vertical panel to channelize traffic by indicating the edge of the travel lane. It is not intended to be used in transitions or tapers.
2. This device shall not be used to separate lanes of traffic (opposing or otherwise) or warn of objects.
3. This device is based on a 42 inch, two-piece cone with an alternate striping pattern: four 4 inch retroreflective bands, with an approximate 2 inch gap between bands. The color of the band should correspond to the color of the edgeline (yellow for left edgeline, white for right edgeline) for which the device is substituted or for which it supplements. The reflectorized bands shall be retroreflective Type A conforming to Departmental Material Specification DMS-8300, unless otherwise noted.
4. The base must weigh a minimum of 30 lbs.

SHEET 10 OF 12

		Traffic Operations Division Standard	
BARRICADE AND CONSTRUCTION CHANNELIZING DEVICES			
BC(10)-14			
FILE# bc-14.dgn	DN# TxDOT	CR# TxDOT	DW# TxDOT
© TxDOT November 2002	CONT SECT	JOB	HIGHWAY
REVISIONS		0902 38	120 GILL ISLAND RD
9-07 8-14	DIST COUNTY	SHEET NO.	
7-13	FTW PARKER	21	

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WORK ZONE PAVEMENT MARKINGS

GENERAL

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

RAISED PAVEMENT MARKERS

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

PREFABRICATED PAVEMENT MARKINGS

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

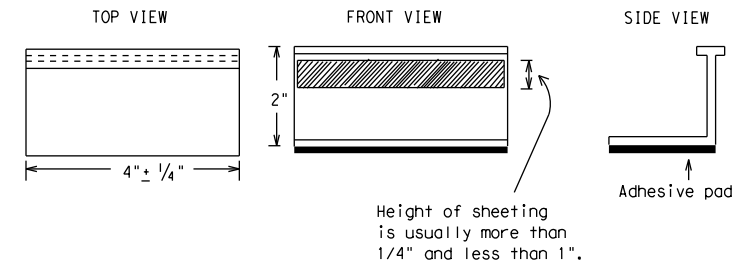
MAINTAINING WORK ZONE PAVEMENT MARKINGS

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

REMOVAL OF PAVEMENT MARKINGS

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

Temporary Flexible-Reflective Roadway Marker Tabs



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

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

RAISED PAVEMENT MARKERS USED AS GUIDEMARKS

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

Guidemarks shall be designated as:

- YELLOW - (two amber reflective surfaces with yellow body).
- WHITE - (one silver reflective surface with white body).

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

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

SHEET 11 OF 12



BARRICADE AND CONSTRUCTION PAVEMENT MARKINGS

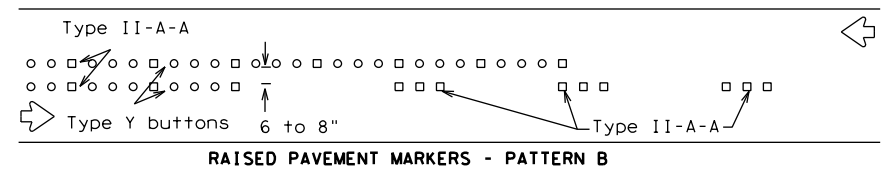
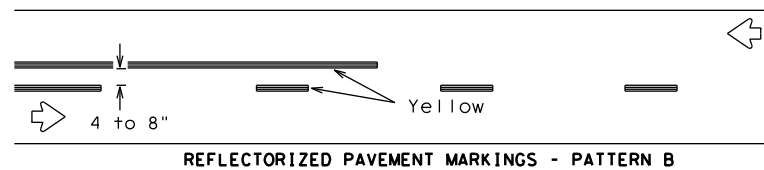
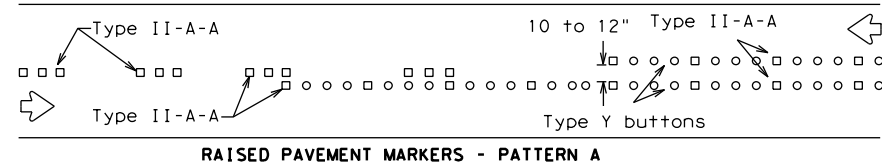
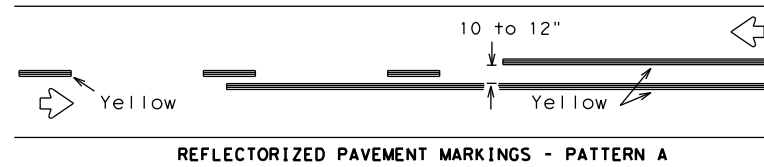
BC(11)-14

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© TxDOT February 1998	CONT	SECT	JOB	HIGHWAY
REVISIONS		0902	38	120 GILLILAND RD
2-98	9-07	DIST	COUNTY	SHEET NO.
1-02	7-13	FTW	PARKER	22
11-02	8-14			

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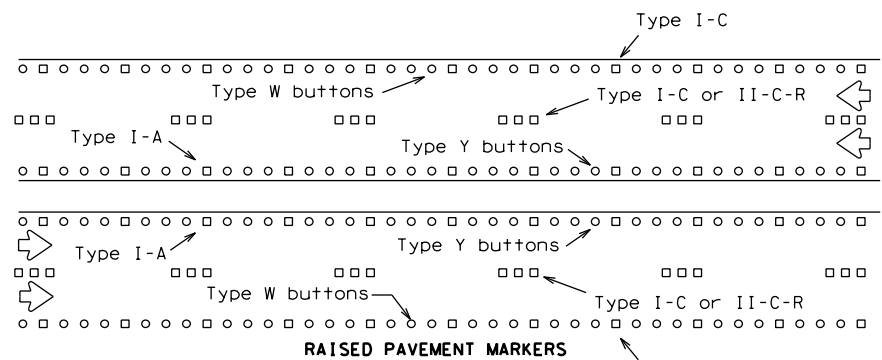
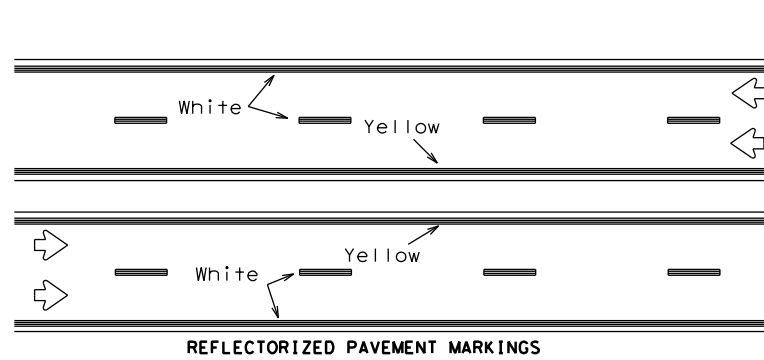
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PAVEMENT MARKING PATTERNS



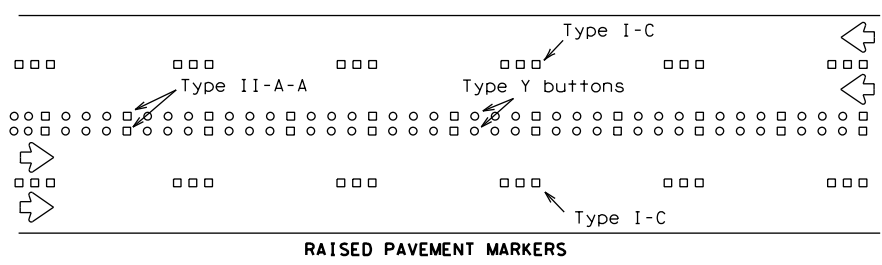
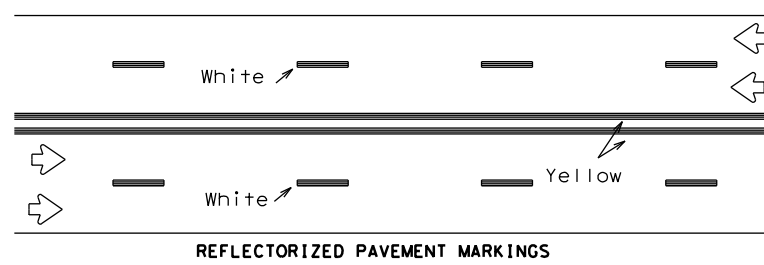
Pattern A is the TxDOT Standard, however Pattern B may be used if approved by the Engineer. Prefabricated markings may be substituted for reflectorized pavement markings.

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



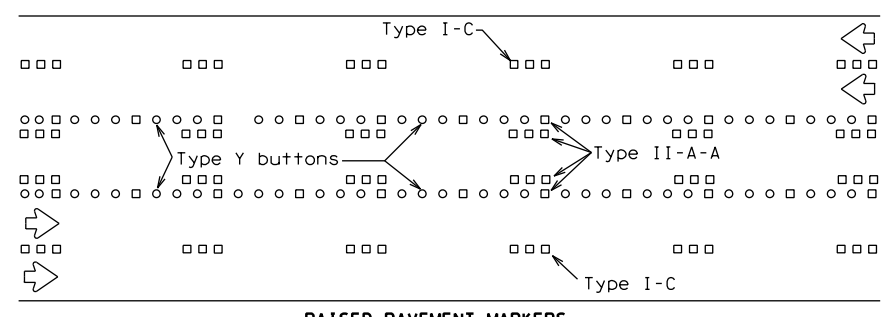
Prefabricated markings may be substituted for reflectorized pavement markings.

EDGE & LANE LINES FOR DIVIDED HIGHWAY



Prefabricated markings may be substituted for reflectorized pavement markings.

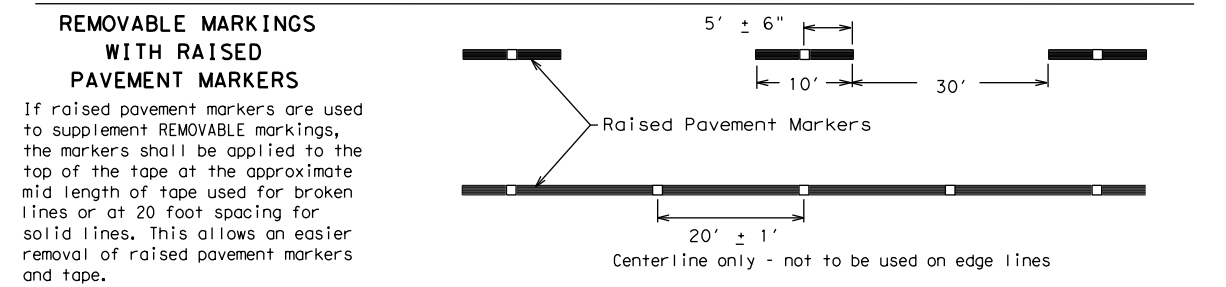
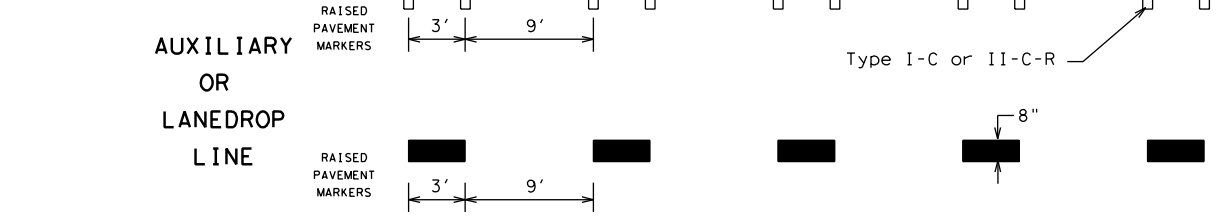
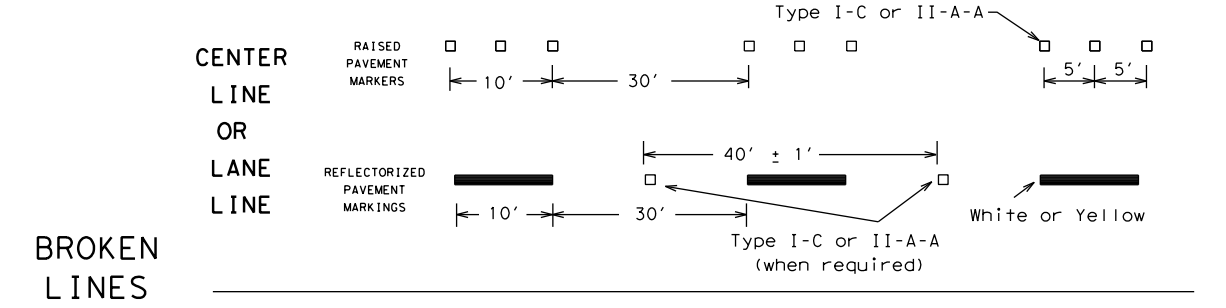
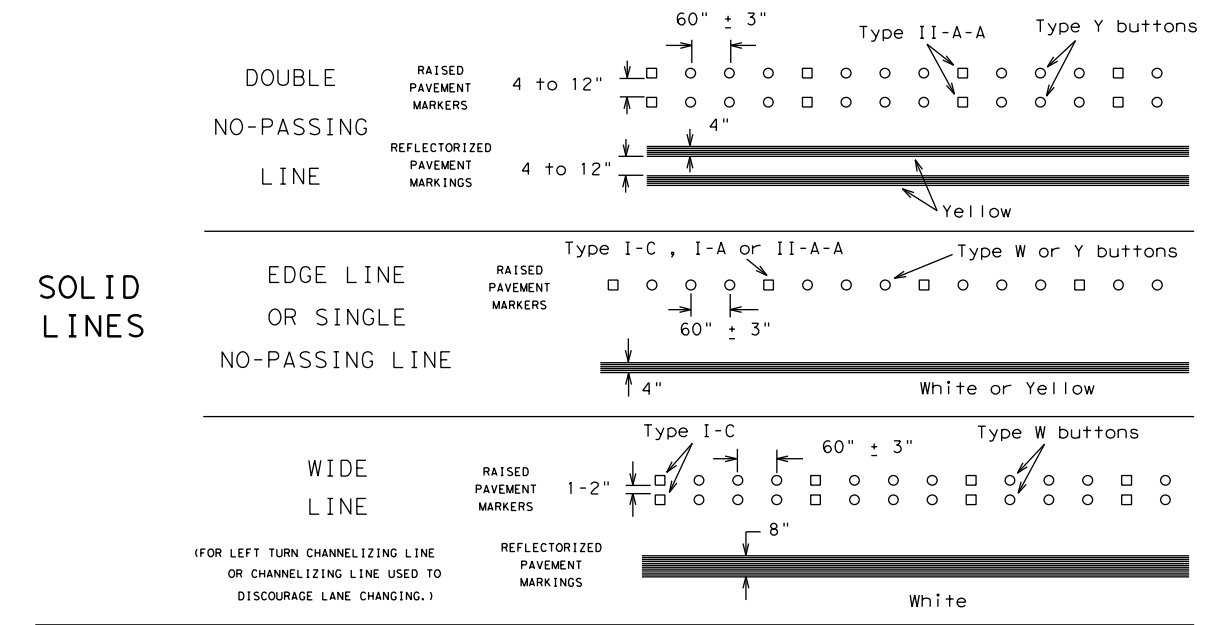
LANE & CENTER LINES FOR MULTILANE UNDIVIDED HIGHWAYS



Prefabricated markings may be substituted for reflectorized pavement markings.

TWO-WAY LEFT TURN LANE

STANDARD WORK ZONE PAVEMENT MARKINGS DETAILS



SHEET 12 OF 12

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."



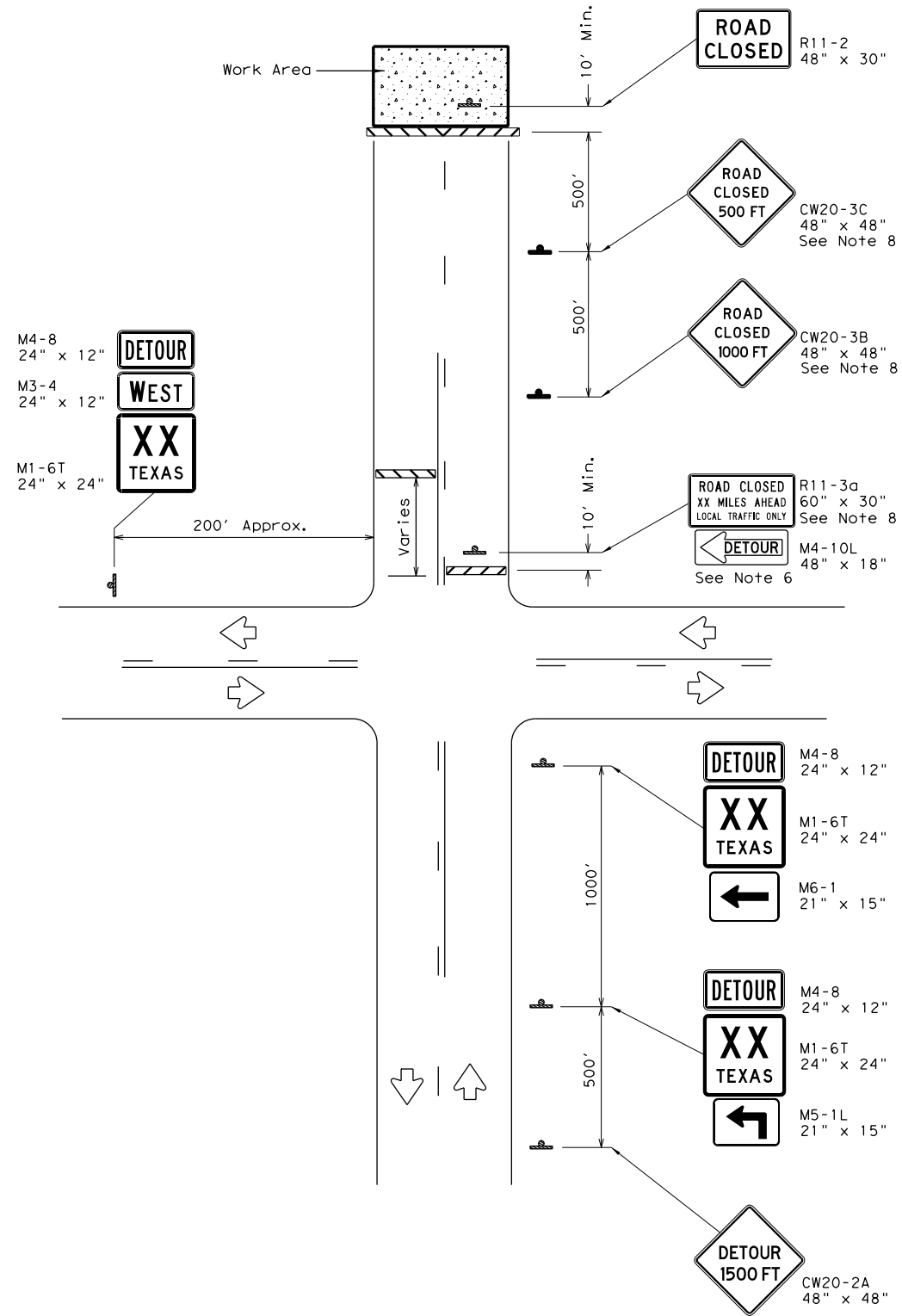
BARRICADE AND CONSTRUCTION PAVEMENT MARKING PATTERNS

BC(12)-14

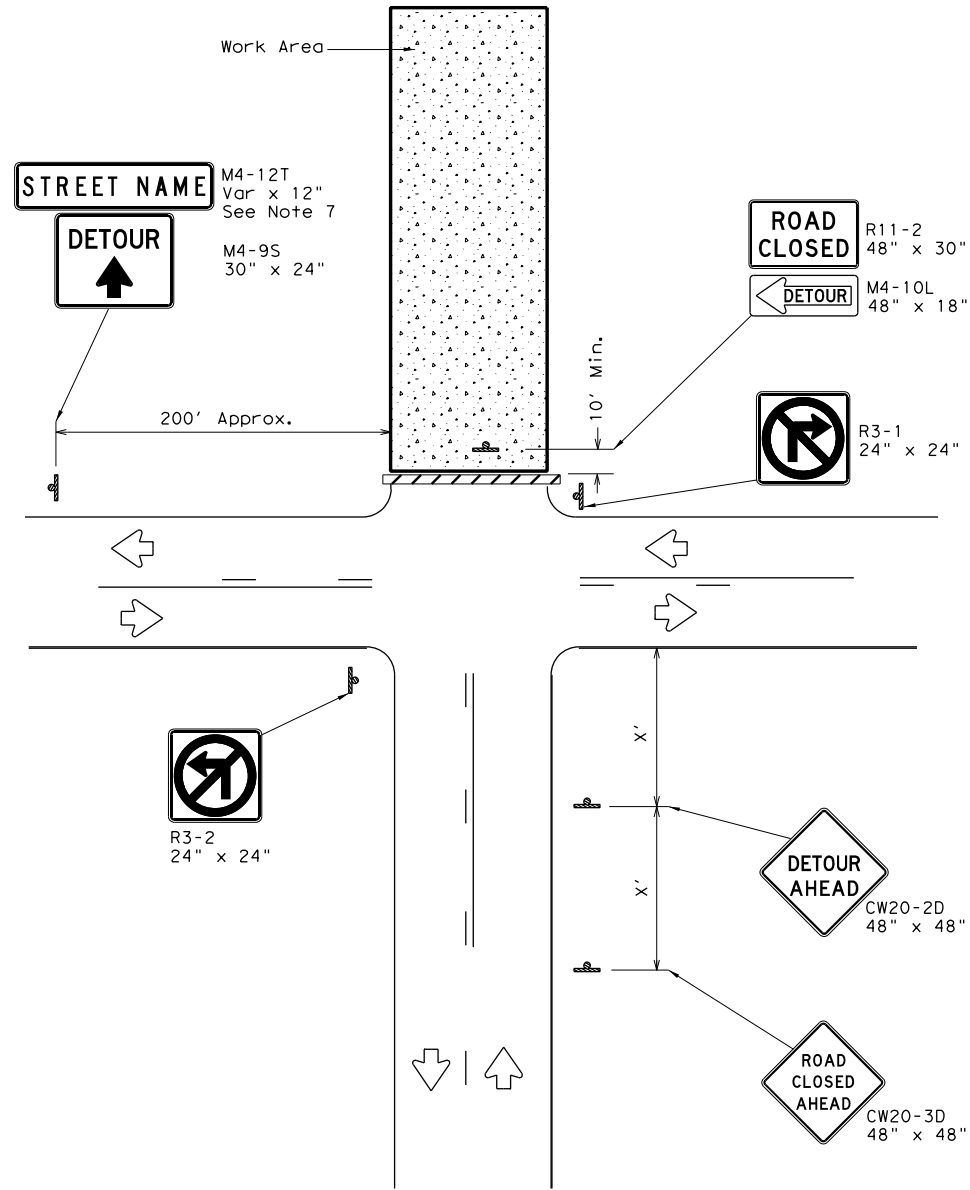
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© TxDOT February 1998	CONT 0902	SECT 38	JOB 120	HIGHWAY GILL ISLAND RD
REVISIONS				
1-97 9-07				
2-98 7-13				
11-02 8-14				
DIST FTW	COUNTY PARKER		SHEET NO. 23	

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



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

LEGEND	
	Type 3 Barricade
	Sign

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

* Conventional Roads Only

GENERAL NOTES

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

		Traffic Operations Division Standard	
WORK ZONE ROAD CLOSURE DETAILS			
WZ (RCD) - 13			
FILE: wzrcd-13.dgn	DN: TxDOT	CK: TxDOT	DW: TxDOT
© TxDOT August 1995	CONT	SECT	JOB
REVISIONS	0902	38	120 GILLILAND RD
1-97 4-98 7-13	DIST	COUNTY	SHEET NO.
2-98 3-03	FTW	PARKER	24

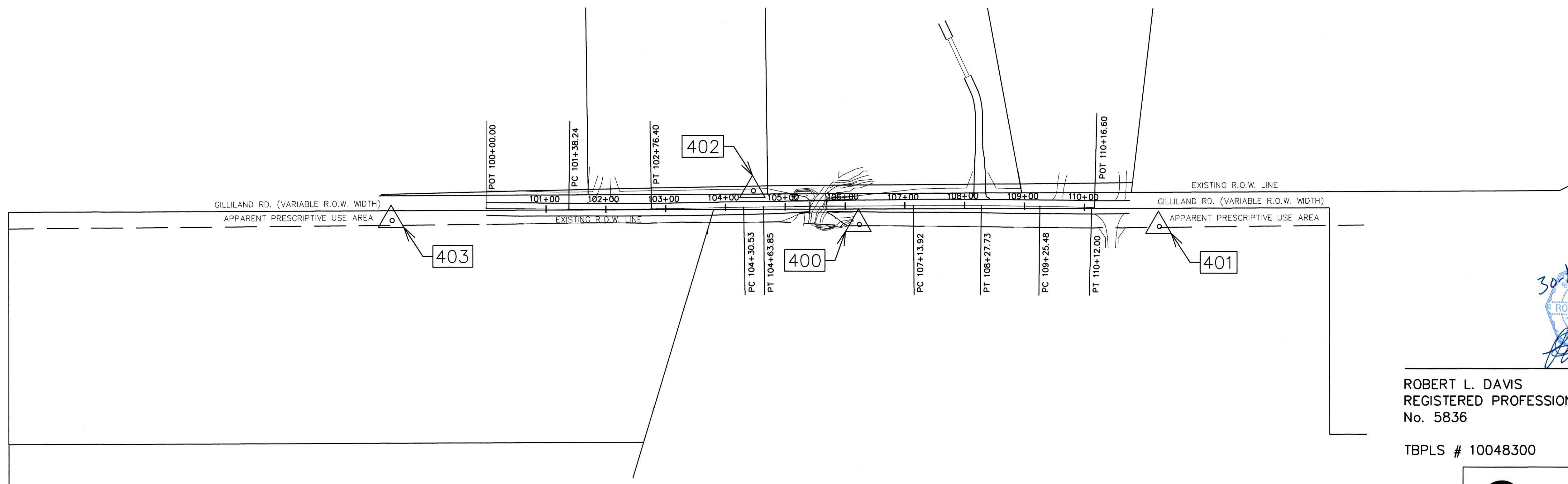
GILLILAND ROAD PRIMARY CONTROL POINTS, SURFACE ADJUSTMENT FACTOR: 1.00012

CONTROL (SURFACE COORDINATES)						
POINT	NORTHING	EASTING	ELEVATION	DESCRIPTION	STATION	OFFSET
400	7044601.1643	2205922.8027	933.678	5/8" IRON ROD WITH 1 3/4" TxDOT SURVEY CONTROL CAP	106+23.56	30.89
401	7045102.6405	2205925.1727	949.660	5/8" IRON ROD WITH 1 3/4" TxDOT SURVEY CONTROL CAP	N/A	N/A
402	7044424.1261	2205866.4591	934.020	5/8" IRON ROD WITH 1 3/4" TxDOT SURVEY CONTROL CAP	104+47.20	27.44
403	7043820.0525	2205916.3626	952.144	5/8" IRON ROD WITH 1 3/4" TxDOT SURVEY CONTROL CAP	N/A	N/A



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

1" = 400' (22" X 34" SHEETS)
1" = 800' (11" X 17" SHEETS)



ROBERT L. DAVIS
REGISTERED PROFESSIONAL LAND SURVEYOR
No. 5836

TBPLS # 10048300



LAMB-STAR ENGINEERING, L.P.
5700 W. PLANO PARKWAY, SUITE 1000
PLANO, TX 75093
P 214-440-3600
F 214-440-3601
TBPLS # 10048300



GILLILAND ROAD
AT WALNUT CREEK
SURVEY CONTROL
DATA SHEET

© 2019	CONT	SECT	JOB	HIGHWAY
DS:	CK:	0902	38	120
DIST	COUNTY	SHEET NO.		
DW:	CK:	FTW(02)	PARKER	25

I HEREBY CERTIFY THAT THE HORIZONTAL AND VERTICAL DATA SHOWN HEREON WAS DETERMINED BY A FILED SURVEY ON AUGUST 30, 2017 AND IS CORRECTLY SHOWN HEREON.

NOTE:

THE SURVEY CONTROL INFORMATION HAS BEEN ACCEPTED AND INCORPORATED INTO THIS PS&E WHICH IS SIGNED, SEALED AND DATED BY A TEXAS PROFESSIONAL ENGINEER

ALL SURVEY CONTROL IS TIED TO THE TxDOT VRS/GPS NETWORK OF RTK STATIONS.

DATE SET: AUGUST 30, 2017
MONUMENTS: 5/8" IRON ROD WITH A 1 3/4" PINK TxDOT SURVEY CONTROL CAP.
HORIZONTAL COORDINATES ARE IN SURFACE COORDINATES, US SURVEY FEET, TEXAS COORDINATE SYSTEM NAD 83 (2011) NORTH CENTRAL ZONE (4202) GEOID 12A AS DERIVED FROM THE TxDOT VRS NETWORK.

ELEVATIONS ARE NAVD 88 AS DERIVED FROM THE TxDOT VRS NETWORK.

PARKER COUNTY SURFACE ADJUSTMENT FACTOR: 1.00012

DATE: 12/3/2020 2:20:43 PM
FILE: L:\Projects\B200072.01 - AIA WA1 Gilliland Bridge Parker County\CAD\GDN\GILLILAND ROAD_CONTROL DATA SHEETS.dgn

GILLILAND RD

Chain GILLILAND contains:
G001 CUR GILLILAND1 CUR GILLILAND2 CUR GILLILAND3 CUR GILLILAND4 G002

Beginning chain GILLILAND description

Point G001 N 7,043,977.31 E 2,205,896.15 Sta 100+00.00

Course from G001 to PC GILLILAND1 N 0° 31' 10.72" E Dist 138.24

Curve Data

Curve GILLILAND1
P.I. Station 102+07.32 N 7,044,184.63 E 2,205,898.03
Delta = 1° 30' 48.58" (LT)
Degree = 1° 05' 43.88"
Tangent = 69.08
Length = 138.15
Radius = 5,230.00
External = 0.46
Long Chord = 138.15
Mid. Ord. = 0.46
P.C. Station 101+38.24 N 7,044,115.55 E 2,205,897.40
P.T. Station 102+76.40 N 7,044,253.70 E 2,205,896.83
C.C. N 7,044,162.98 E 2,200,667.61
Back = N 0° 31' 10.72" E
Ahead = N 0° 59' 37.86" W
Chord Bear = N 0° 14' 13.57" W

Course from PT GILLILAND1 to PC GILLILAND2 N 0° 59' 37.86" W Dist 154.13

Curve Data

Curve GILLILAND2
P.I. Station 104+47.19 N 7,044,424.46 E 2,205,893.87
Delta = 0° 21' 54.37" (RT)
Degree = 1° 05' 43.88"
Tangent = 16.66
Length = 33.33
Radius = 5,230.00
External = 0.03
Long Chord = 33.33
Mid. Ord. = 0.03
P.C. Station 104+30.53 N 7,044,407.80 E 2,205,894.15
P.T. Station 104+63.85 N 7,044,441.13 E 2,205,893.68
C.C. N 7,044,498.52 E 2,211,123.37
Back = N 0° 59' 37.86" W
Ahead = N 0° 37' 43.49" W
Chord Bear = N 0° 48' 40.67" W

Course from PT GILLILAND2 to PC GILLILAND3 N 0° 37' 43.49" W Dist 250.07

GILLILAND RD (CONT)

Curve Data

Curve GILLILAND3
P.I. Station 107+70.83 N 7,044,748.08 E 2,205,890.31
Delta = 1° 14' 48.53" (RT)
Degree = 1° 05' 43.88"
Tangent = 56.91
Length = 113.81
Radius = 5,230.00
External = 0.31
Long Chord = 113.81
Mid. Ord. = 0.31
P.C. Station 107+13.92 N 7,044,691.18 E 2,205,890.94
P.T. Station 108+27.73 N 7,044,804.99 E 2,205,890.93
C.C. N 7,044,748.57 E 2,211,120.62
Back = N 0° 37' 43.49" W
Ahead = N 0° 37' 05.04" E
Chord Bear = N 0° 00' 19.22" W

Course from PT GILLILAND3 to PC GILLILAND4 N 0° 37' 05.04" E Dist 97.75

Curve Data

Curve GILLILAND4
P.I. Station 109+68.74 N 7,044,945.99 E 2,205,892.45
Delta = 0° 56' 52.33" (RT)
Degree = 1° 05' 43.88"
Tangent = 43.26
Length = 86.52
Radius = 5,230.00
External = 0.18
Long Chord = 86.52
Mid. Ord. = 0.18
P.C. Station 109+25.48 N 7,044,902.73 E 2,205,891.98
P.T. Station 110+12.00 N 7,044,989.24 E 2,205,893.63
C.C. N 7,044,846.31 E 2,211,121.68
Back = N 0° 37' 05.04" E
Ahead = N 1° 33' 57.37" E
Chord Bear = N 1° 05' 31.21" E

Course from PT GILLILAND4 to G002 N 1° 33' 57.37" E Dist 4.59

Point G002 N 7,044,993.83 E 2,205,893.76 Sta 110+16.60

Ending chain GILLILAND description



R. Prieto

11/5/2020



F-12040



GILLILAND ROAD
AT WALNUT CREEK
HORIZONTAL ALIGNMENT
DATA

SHEET 1 OF 1

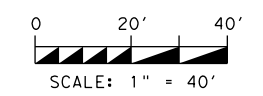
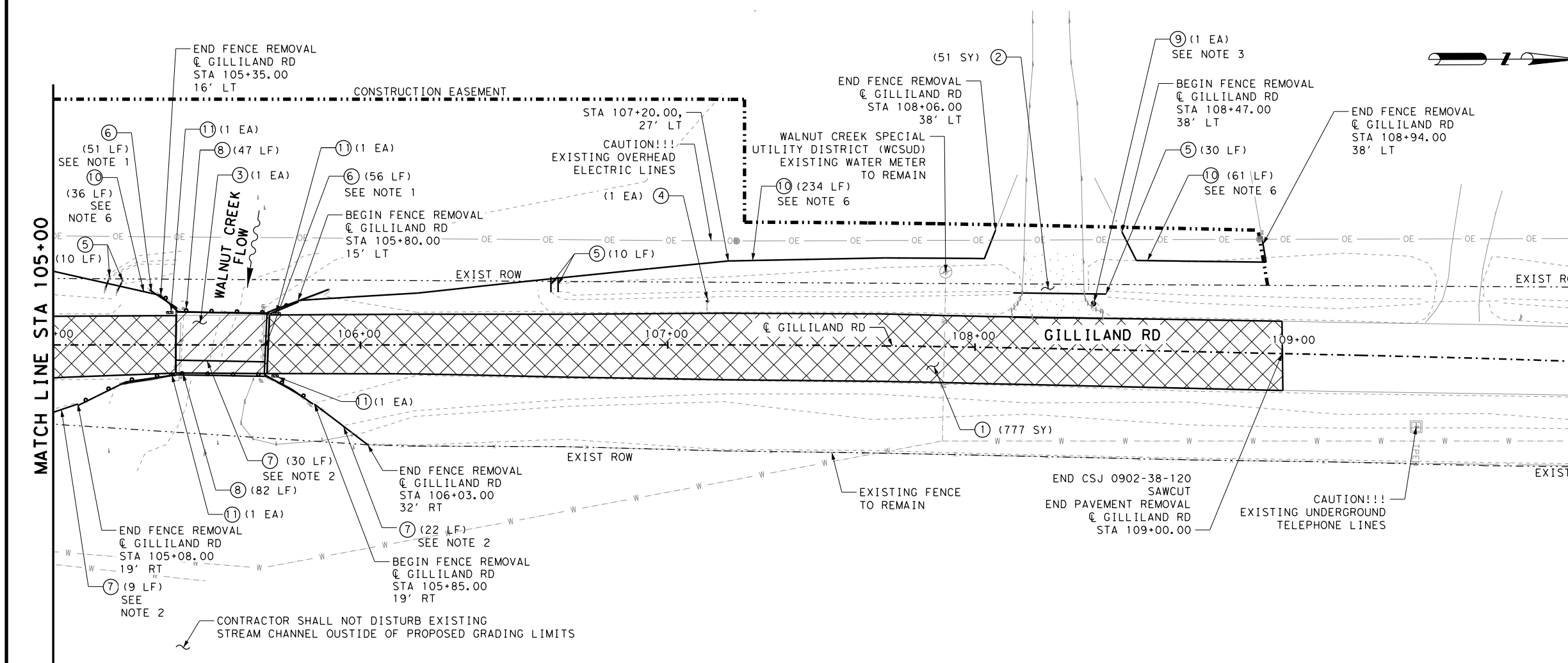
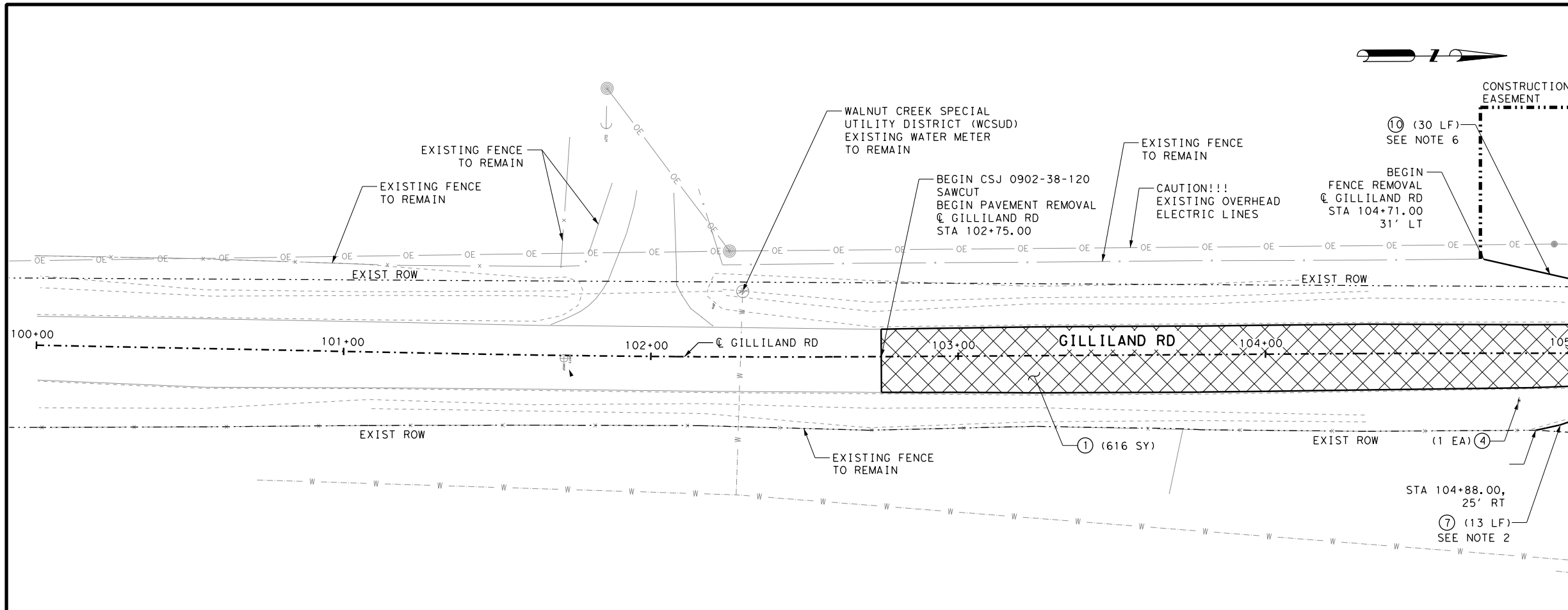
FED RD DIV NO.	FEDERAL AID PROJECT		SHEET NO.
6	SEE TITLE SHEET		26
STATE	DISTRICT	COUNTY	
TEXAS	FTW	PARKER	
CONTROL	SECTION	JOB	HIGHWAY
0902	38	120	GILLILAND RD

LEGEND

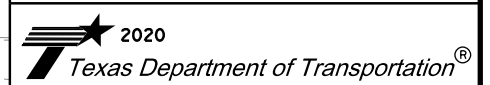
- ① REMOVING STAB BASE & ASPH PAV (7"-12")
- ② REMOVING CONC (DRIVEWAYS)
- ③ REMOV STR (BRIDGE 0-99 FT LENGTH)
- ④ REMOVE SM RD SN SUP&AM
- ⑤ REMOVE STR (PIPE)
- ⑥ REMOVE STR (RETAINING WALL)
- ⑦ REMOVE STR (SMALL WIRE FENCE)
- ⑧ REMOVE STR (RAIL)
- ⑨ REMOVE AND RELOCATE MAILBOX
- ⑩ REMOVE STEEL FENCE
- ⑪ REMOVE OBJECT MARKERS ASSMS

NOTES:

1. CONTRACTOR SHALL REMOVE AND DISPOSE EXISTING STEEL RETAINING WALLS.
2. REMOVAL OF EXISTING WIRE FENCE IS SUBSIDIARY TO ITEM 496-6043 (REMOV STR FENCE).
3. REMOVAL OF EXISTING MAILBOX IS SUBSIDIARY TO ITEM 560-6004 (MAILBOX INSTALL-S).
4. GRAVEL DRIVEWAY REMOVAL IS SUBSIDIARY TO ITEM 110 (EXCAVATION).
5. REFER TO "ROADWAY PLAN AND PROFILE" SHEET FOR
6. REFER TO "ROADWAY PLAN AND PROFILE" SHEET FOR LOCATION OF PROPOSED WIRE FENCE. CONTRACTOR MUST COORDINATE WITH ADJACENT PROPERTY OWNERS DURING REMOVAL AND PLACEMENT OF PROPOSED FENCES.



11/5/2020



**GILLILAND ROAD AT WALNUT CREEK
REMOVAL LAYOUT
BEGIN CSJ TO END CSJ**

SHEET 1 OF 1

FED RD DIV NO.	FEDERAL AID PROJECT	SHEET NO.	
6	SEE TITLE SHEET	27	
STATE	DISTRICT	COUNTY	
TEXAS	FTW	PARKER	
CONTROL	SECTION	JOB	HIGHWAY
0902	38	120	GILLILAND RD

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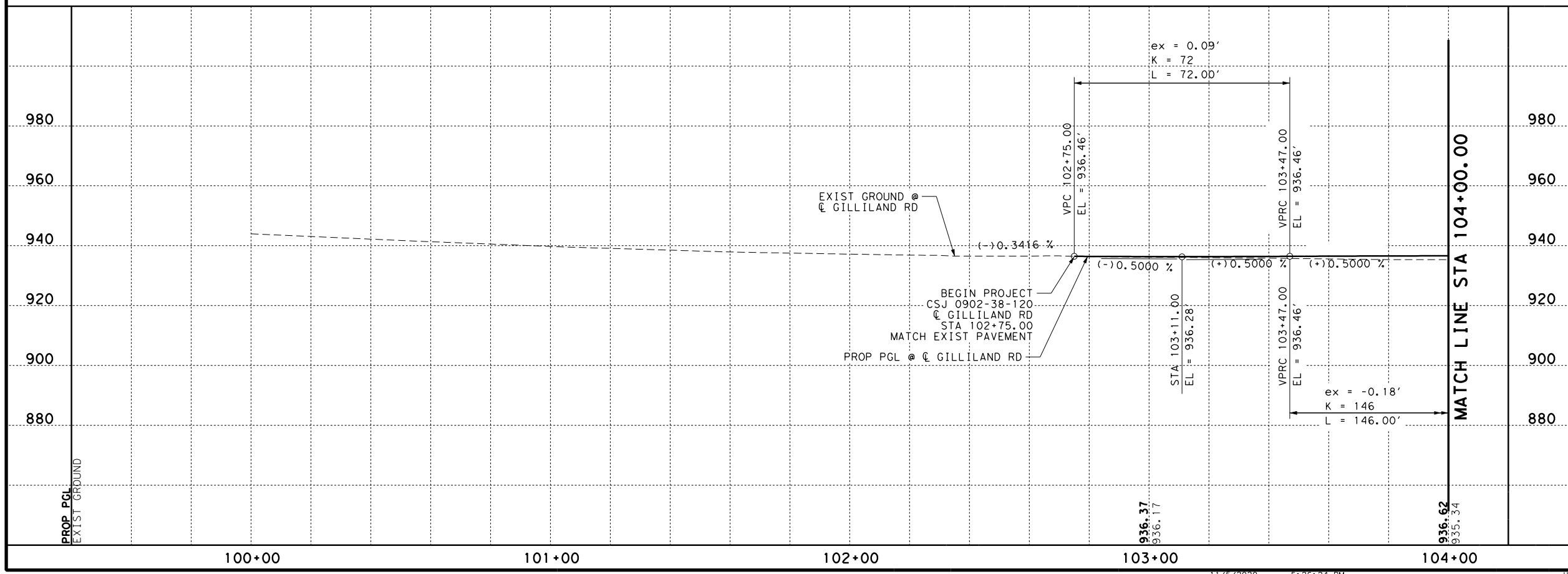
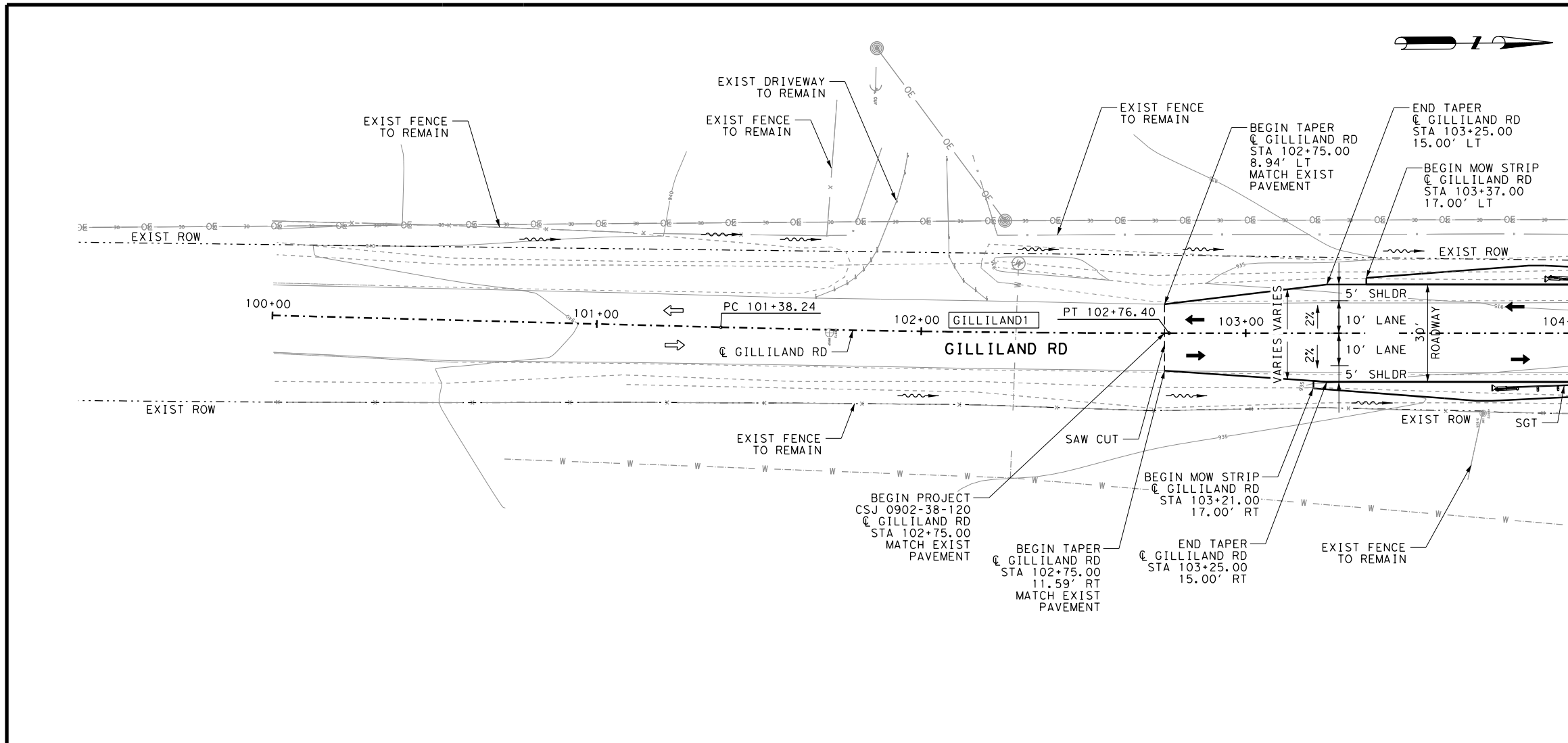
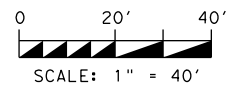
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LEGEND

- EXIST ROW
- CONSTRUCTION EASEMENT
- PROP TRAFFIC
- ⇨ EXIST TRAFFIC
- ~ DITCH FLOWLINE
- ⊗ XX DRIVEWAY NUMBER
- Ⓜ MAILBOX
- GILLILAND# CURVE DATA
- PROP DRIVEWAY (6" CONC.)
- PROP DRIVEWAY RCP PIPE AND SET
- x-x-x-x-x PROP WIRE FENCE (TY A)
- PROP STEEL FENCE

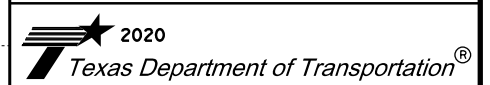
NOTES:

1. REFER TO "SURVEY CONTROL DATA" SHEET FOR SURVEY DATA/MONUMENT CONTROL.
2. REFER TO "BRIDGE LAYOUT" SHEET FOR BRIDGE INFORMATION.
3. REFER TO "ROADWAY DETAILS" SHEET FOR DRIVEWAY DETAILS & DRIVEWAY CULVERT INFORMATION.
4. REFER TO "GRADING LAYOUT" SHEET FOR PROPOSED GRADING AND PROPOSED RIPRAP INFORMATION AND BRIDGE LAYOUT FOR QUANTITY INFO.
5. REFER TO "HORIZONTAL ALIGNMENT DATA" SHEET FOR CURVE INFORMATION.
6. REFER TO "CONSTRUCTION EASEMENT LAYOUT" SHEET FOR PROPOSED CONSTRUCTION EASEMENT INFORMATION.
7. REFER TO "UTILITY LAYOUT" SHEET FOR UTILITIES INFORMATION.
8. CONTRACTOR SHALL BE RESPONSIBLE FOR REGRADING THE AREA AFTER REMOVING THE EXISTING PAVEMENT AND OTHER FEATURES.



[Signature]

11/5/2020



GILLILAND ROAD AT WALNUT CREEK

ROADWAY PLAN & PROFILE
BEGIN CSJ TO STA 104+00.00

SHEET 1 OF 3

FED RD DIV NO.	FEDERAL AID PROJECT	SHEET NO.	
6	SEE TITLE SHEET	28	
STATE	DISTRICT	COUNTY	
TEXAS	FTW	PARKER	
CONTROL	SECTION	JOB	HIGHWAY
0902	38	120	GILLILAND RD

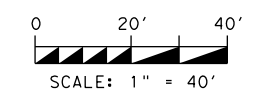
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11/5/2020

LEGEND

- EXIST ROW
- CONSTRUCTION EASEMENT
- PROP TRAFFIC
- ⇨ EXIST TRAFFIC
- ~ DITCH FLOWLINE
- ⊗ XX DRIVEWAY NUMBER
- ☐ MAILBOX
- GILLILAND# CURVE DATA
- PROP DRIVEWAY (6" CONC.)
- PROP DRIVEWAY RCP PIPE AND SET
- PROP WIRE FENCE (TY A)
- PROP STEEL FENCE

NOTES:

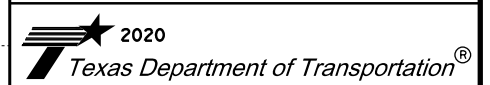
1. REFER TO "SURVEY CONTROL DATA" SHEET FOR SURVEY DATA/MONUMENT CONTROL.
2. REFER TO "BRIDGE LAYOUT" SHEET FOR BRIDGE INFORMATION.
3. REFER TO "ROADWAY DETAILS" SHEET FOR DRIVEWAY DETAILS & DRIVEWAY CULVERT INFORMATION.
4. REFER TO "GRADING LAYOUT" SHEET FOR PROPOSED GRADING AND PROPOSED RIPRAP INFORMATION AND BRIDGE LAYOUT FOR QUANTITY INFO.
5. REFER TO "HORIZONTAL ALIGNMENT DATA" SHEET FOR CURVE INFORMATION.
6. REFER TO "CONSTRUCTION EASEMENT LAYOUT" SHEET FOR PROPOSED CONSTRUCTION EASEMENT INFORMATION.
7. REFER TO "UTILITY LAYOUT" SHEET FOR UTILITIES INFORMATION.
8. CONTRACTOR SHALL BE RESPONSIBLE FOR REGRADING THE AREA AFTER REMOVING THE EXISTING PAVEMENT AND OTHER FEATURES.



11/5/2020



F-12040



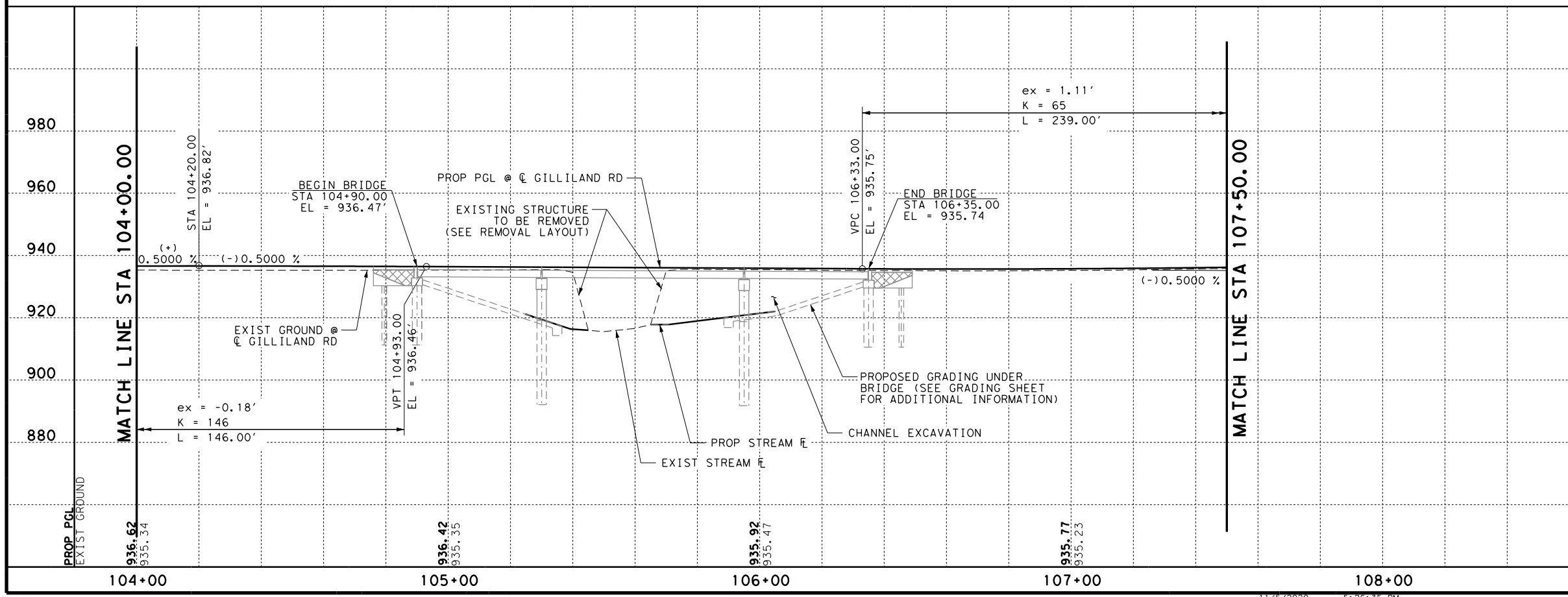
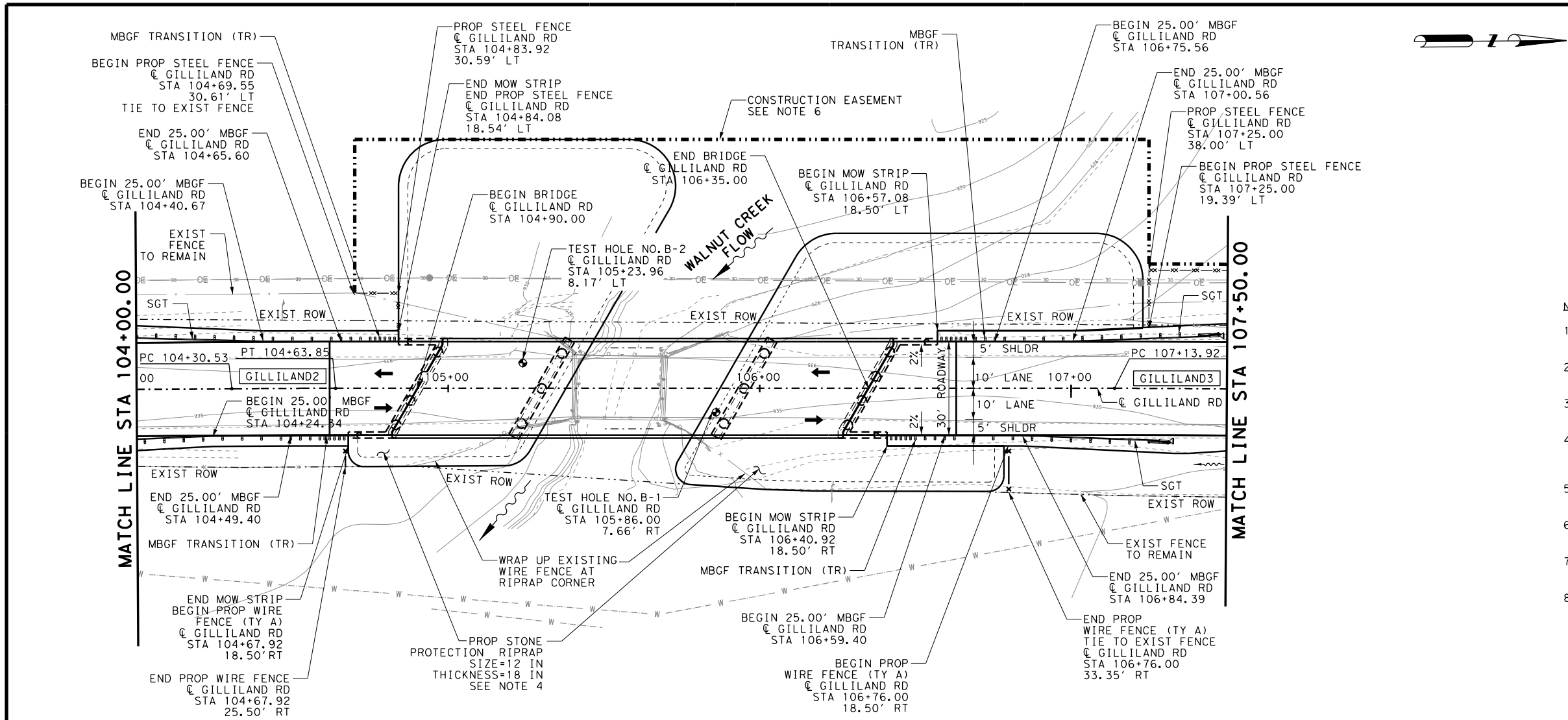
GILLILAND ROAD AT WALNUT CREEK

ROADWAY PLAN & PROFILE

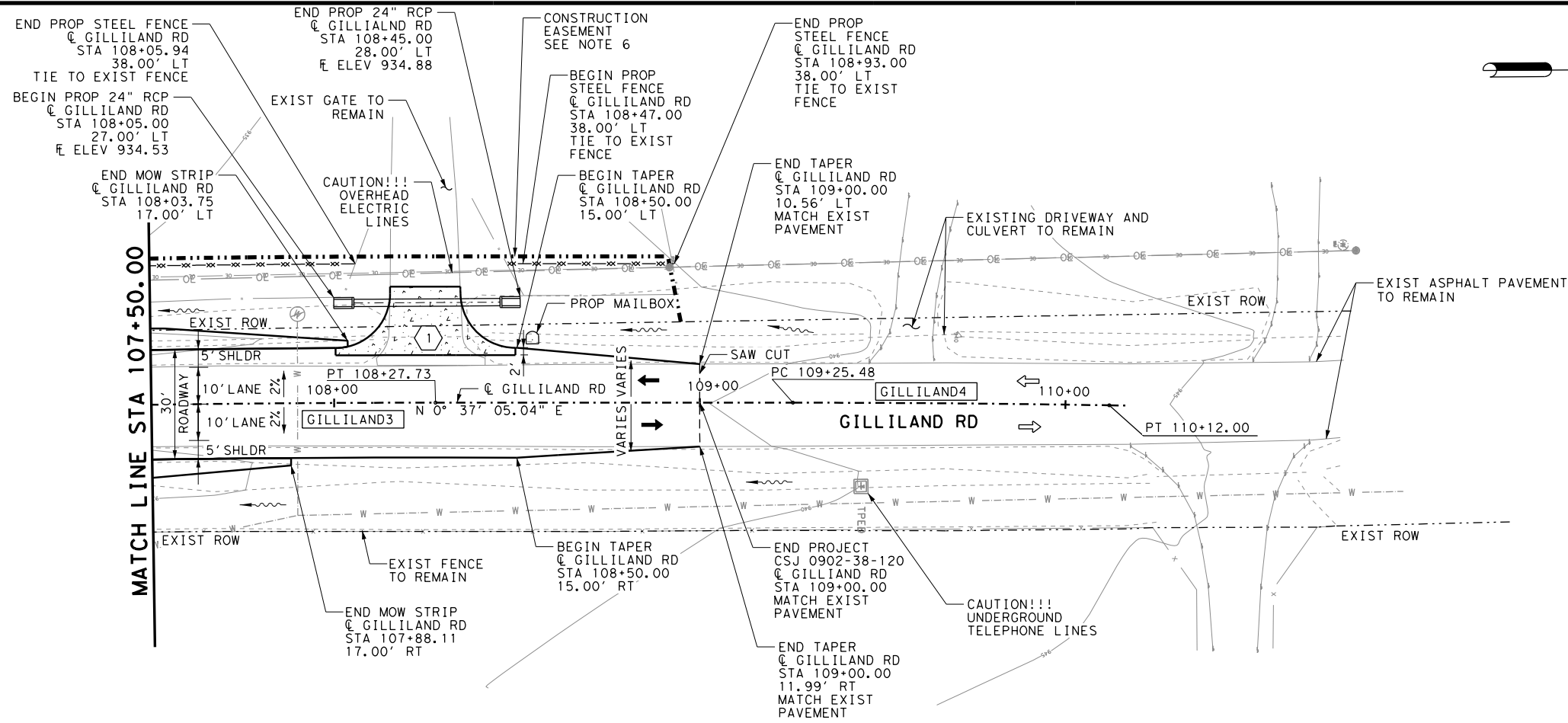
STA 104+00.00 TO STA 107+50.00

SHEET 2 OF 3

FED RD DIV NO.	FEDERAL AID PROJECT		SHEET NO.
6	SEE TITLE SHEET		29
STATE	DISTRICT	COUNTY	
TEXAS	FTW	PARKER	
CONTROL	SECTION	JOB	HIGHWAY
0902	38	120	GILLILAND RD



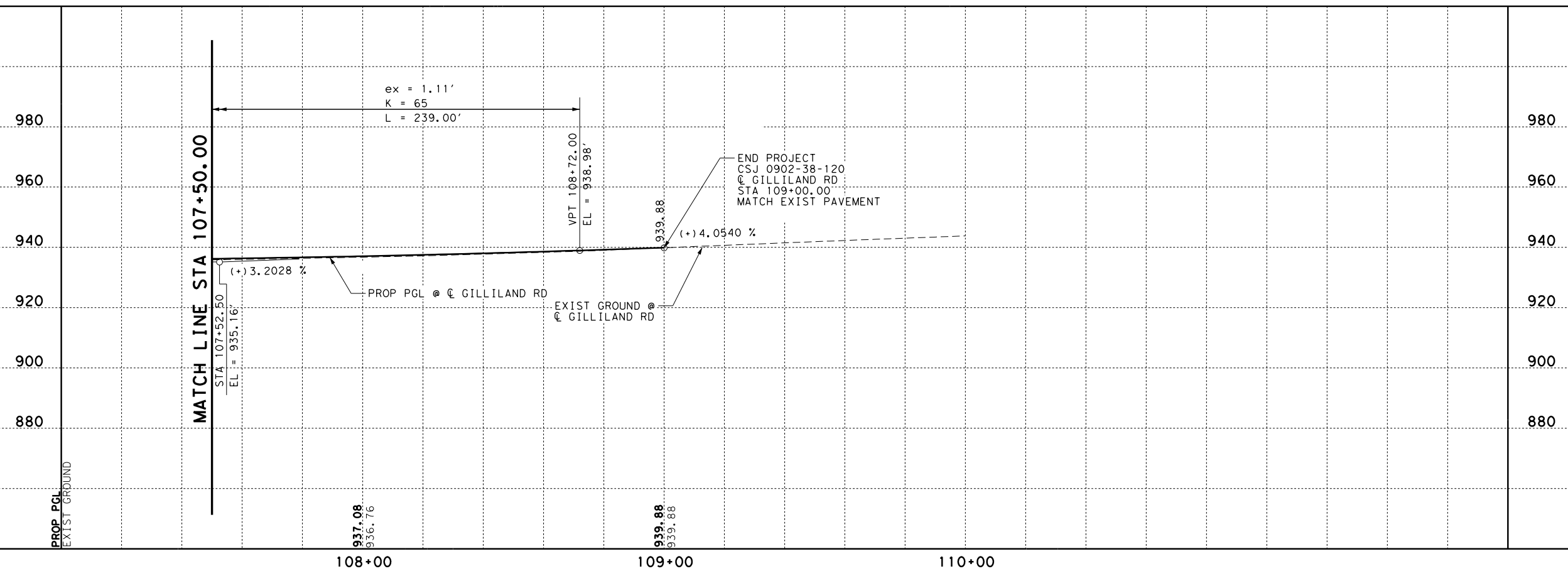
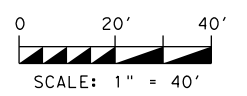
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LEGEND

- EXIST ROW
- CONSTRUCTION EASEMENT
- PROP TRAFFIC
- ⇨ EXIST TRAFFIC
- ~ DITCH FLOWLINE
- ⓧ DRIVEWAY NUMBER
- ☐ MAILBOX
- GILLILAND# CURVE DATA
- PROP DRIVEWAY (6" CONC.)
- PROP DRIVEWAY RCP PIPE AND SET
- x-x-x-x-x PROP WIRE FENCE (TY A)
- PROP STEEL FENCE

- NOTES:**
- REFER TO "SURVEY CONTROL DATA" SHEET FOR SURVEY DATA/MONUMENT CONTROL.
 - REFER TO "BRIDGE LAYOUT" SHEET FOR BRIDGE INFORMATION.
 - REFER TO "ROADWAY DETAILS" SHEET FOR DRIVEWAY DETAILS & DRIVEWAY CULVERT INFORMATION.
 - REFER TO "GRADING LAYOUT" SHEET FOR PROPOSED GRADING AND PROPOSED RIPRAP INFORMATION AND BRIDGE LAYOUT FOR QUANTITY INFO.
 - REFER TO "HORIZONTAL ALIGNMENT DATA" SHEET FOR CURVE INFORMATION.
 - REFER TO "CONSTRUCTION EASEMENT LAYOUT" SHEET FOR PROPOSED CONSTRUCTION EASEMENT INFORMATION.
 - REFER TO "UTILITY LAYOUT" SHEET FOR UTILITIES INFORMATION.
 - CONTRACTOR SHALL BE RESPONSIBLE FOR REGRADING THE AREA AFTER REMOVING THE EXISTING PAVEMENT AND OTHER FEATURES.



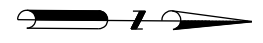
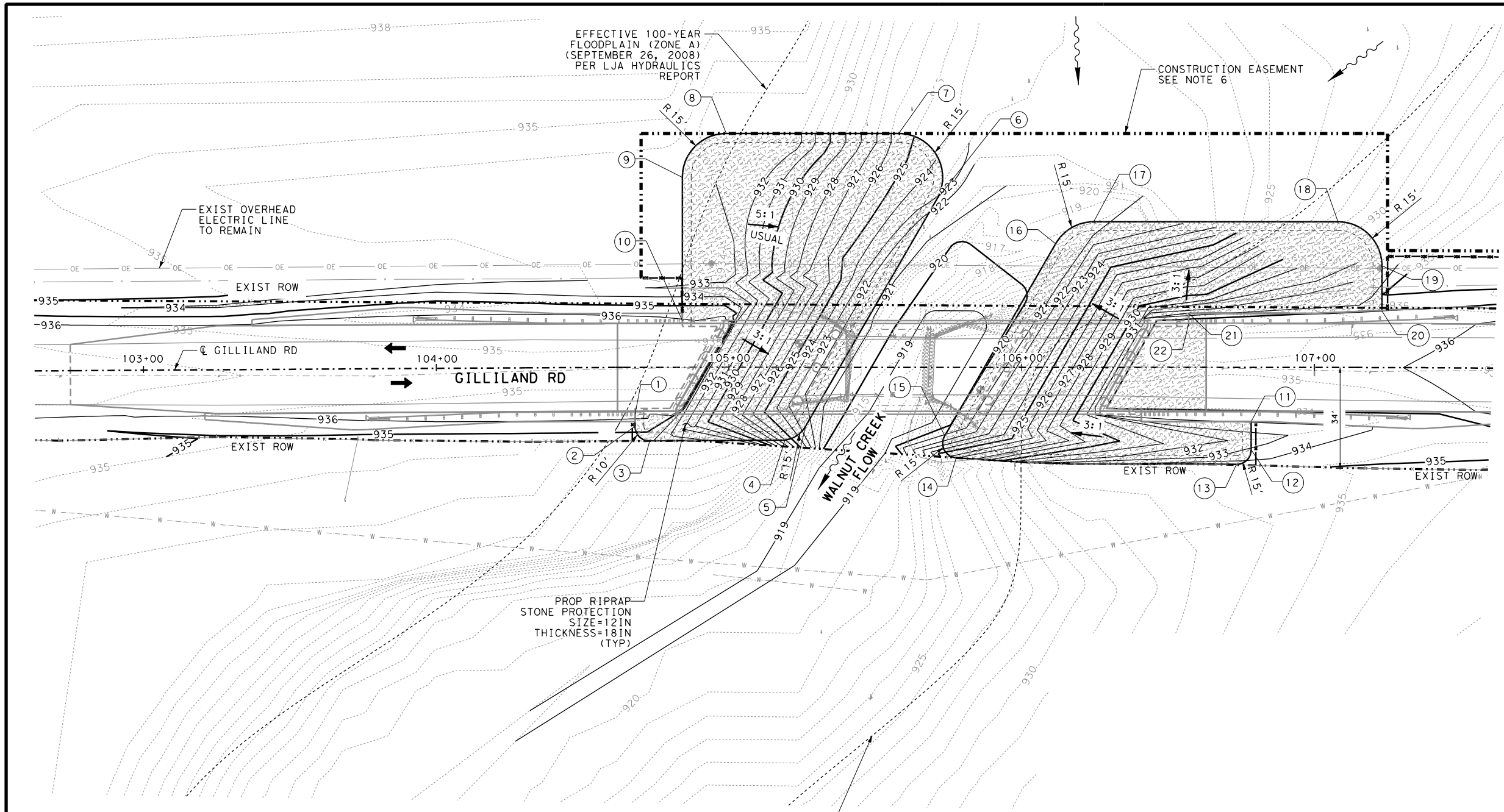
11/5/2020

**GILLILAND ROAD
AT WALNUT CREEK
ROADWAY
PLAN & PROFILE
STA 107+50.00 TO END CSJ**

SHEET 3 OF 3

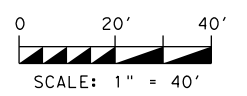
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6	SEE TITLE SHEET	30	
STATE	DISTRICT	COUNTY	
TEXAS	FTW	PARKER	
CONTROL	SECTION	JOB	HIGHWAY
0902	38	120	GILLILAND RD

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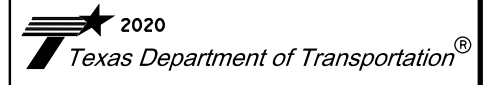


LEGEND

- EXIST ROW
- - - - CONSTRUCTION EASEMENT
- ← PROP TRAFFIC
- FLOW DIRECTION



11/5/2020



**GILLILAND ROAD
AT WALNUT CREEK**

GRADING LAYOUT

SHEET 1 OF 1

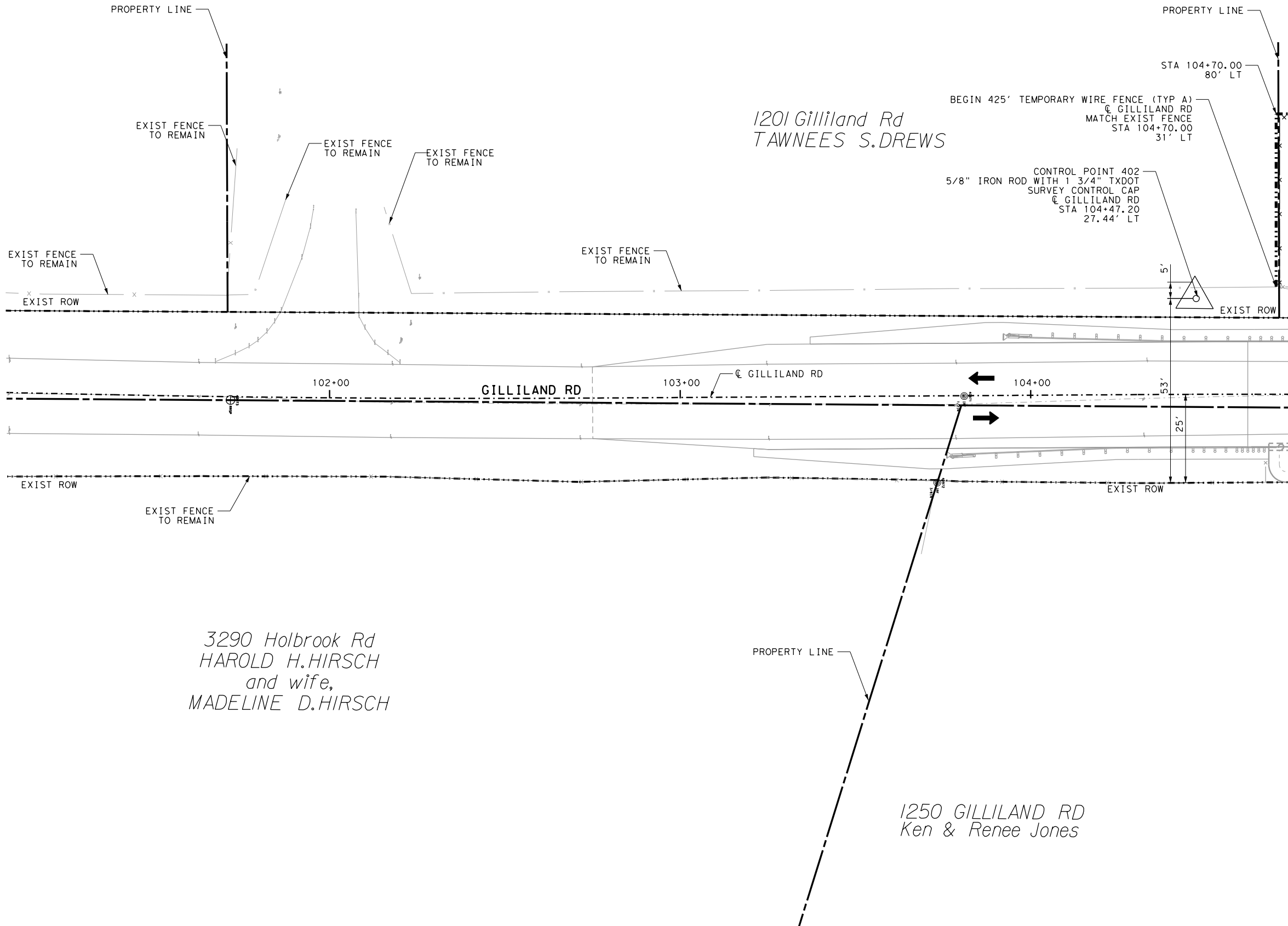
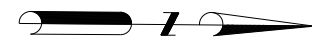
FED RD DIV NO.	FEDERAL AID PROJECT	SHEET NO.	
6	SEE TITLE SHEET	31	
STATE	DISTRICT	COUNTY	
TEXAS	FTW	PARKER	
CONTROL	SECTION	JOB	HIGHWAY
0902	38	120	GILLILAND RD

PROPOSED RIPRAP LIMITS		
POINT	STATION	OFFSET
1	104+68	16' RT
2	104+68	20' RT
3	104+73	25' RT
4	105+19	25' RT
5	105+26	20' RT
6	105+71	57' LT
7	105+58	80' LT
8	104+99	80' LT
9	104+84	65' LT
10	104+84	16' RT
11	106+78	19' RT
12	106+78	28' RT
13	106+74	33' RT
14	105+78	31' RT
15	105+74	22' RT
16	106+12	42' LT
17	106+25	50' LT
18	107+08	50' LT
19	107+23	35' LT
20	107+23	19' LT
21	106+57	19' LT
22	106+57	15' LT

NOTES:

1. THIS PLAN IS TO AID CONTRACTOR IN REGRADING THE DISTURBED NATURAL GROUND AT EASEMENT SLOPES AFTER CONSTRUCTION IS COMPLETE.
2. CONTRACTOR SHALL RE-VEGETATE GRADED SLOPES AT CONTRACTOR'S EXPENSE. GRADING OF CONSTRUCTION EASEMENTS IS SUBSIDIARY TO VARIOUS BID ITEMS.
3. EXISTING POWER POLES SHALL NOT BE DISTURBED. CONTRACTOR SHALL BE LIABLE FOR ANY DAMAGES TO THE EXISTING POWER POLE AND POWER LINES DURING CONSTRUCTION AT CONTRACTOR'S OWN EXPENSE.
4. EXISTING WATER LINE DOWNSTREAM OF THE PROJECT SHALL NOT BE DISTURBED. CONTRACTOR SHALL BE LIABLE FOR ANY DAMAGES TO THE WATER LINE DURING CONSTRUCTION AT CONTRACTOR'S OWN EXPENSE.
5. REFER TO "ROADWAY PLAN & PROFILE" SHEET FOR ROADWAY INFORMATION.
6. REFER TO "CONSTRUCTION EASEMENT LAYOUT" SHEET FOR CONSTRUCTION EASEMENT INFORMATION.

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1201 Gilliland Rd
TAWNEES S.DREWS

3290 Holbrook Rd
HAROLD H.HIRSCH
and wife,
MADELINE D.HIRSCH

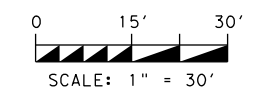
1250 GILLILAND RD
Ken & Renee Jones

LEGEND

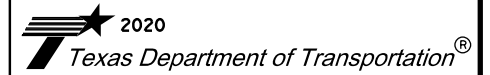
- EXIST ROW
- - - - CONSTRUCTION EASEMENT
- PROPERTY LINE
- ← PROP TRAFFIC
- x---x--- TEMPORARY WIRE FENCE (TY A)

NOTES:

1. REFER TO "ROADWAY PLAN & PROFILE" SHEET FOR MORE INFORMATION.
2. REFER TO "GRADING LAYOUT" SHEET FOR GRADING AND RIPRAP LIMITS INFORMATION.
3. REFER TO "BRIDGE LAYOUT" SHEET FOR MORE INFORMATION.
4. REFER TO "SURVEY CONTROL DATA SHEET" FOR MORE INFORMATION ON CONTROL POINTS.
5. TEMPORARY WIRE FENCE WILL BE PAID UNDER ITEM 552.



11/5/2020

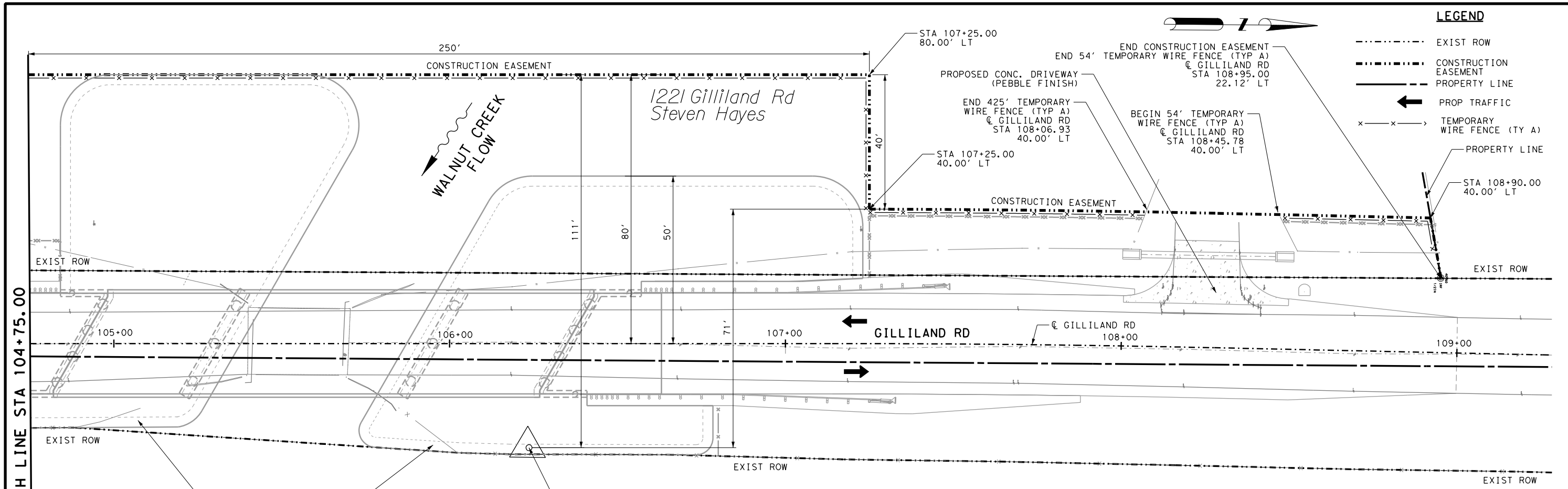


GILLILAND ROAD
AT WALNUT CREEK
**CONSTRUCTION EASEMENT
LAYOUT**

SHEET 1 OF 2

FED RD DIV NO.	FEDERAL AID PROJECT		SHEET NO.
6	SEE TITLE SHEET		32
STATE	DISTRICT	COUNTY	
TEXAS	FTW	PARKER	
CONTROL	SECTION	JOB	HIGHWAY
0902	38	120	GILLILAND RD

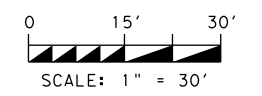
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LEGEND

- EXIST ROW
- - - - CONSTRUCTION EASEMENT
- PROPERTY LINE
- ← PROP TRAFFIC
- x-x-x-x TEMPORARY WIRE FENCE (TY A)
- PROPERTY LINE
- STA 108+90.00 40.00' LT

MATCH LINE STA 104+75.00



LIMITS OF PROP RIPRAP
SEE NOTE 2

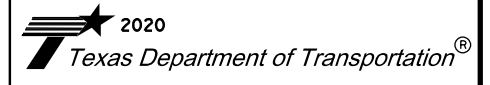
CONTROL POINT 400
5/8" IRON ROD WITH 1 3/4" TXDOT
SURVEY CONTROL CAP
GILLILAND RD
STA 106+23.56
30.89' RT

1250 GILLILAND RD
Ken & Renee Jones



R. Prieto

11/5/2020



**GILLILAND ROAD
AT WALNUT CREEK
CONSTRUCTION EASEMENT
LAYOUT**

NOTES:

1. REFER TO "ROADWAY PLAN & PROFILE" SHEET FOR MORE INFORMATION.
2. REFER TO "GRADING LAYOUT" SHEET FOR GRADING AND RIPRAP LIMITS INFORMATION.
3. REFER TO "BRIDGE LAYOUT" SHEET FOR MORE INFORMATION.
4. REFER TO "SURVEY CONTROL DATA SHEET" FOR MORE INFORMATION ON CONTROL POINTS.
5. TEMPORARY WIRE FENCE WILL BE PAID UNDER ITEM 552 6001.

SHEET 2 OF 2

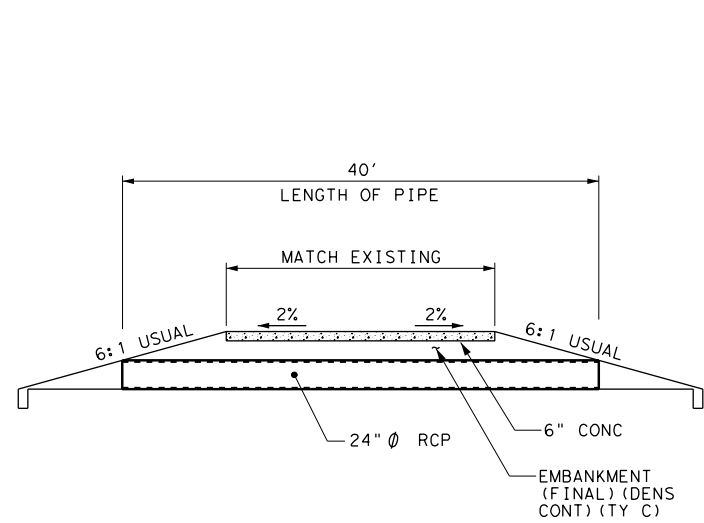
FED RD DIV NO.	FEDERAL AID PROJECT		SHEET NO.
6	SEE TITLE SHEET		33
STATE	DISTRICT	COUNTY	
TEXAS	FTW	PARKER	
CONTROL	SECTION	JOB	HIGHWAY
0902	38	120	GILLILAND RD

DRIVEWAY CULVERT CLEARANCES

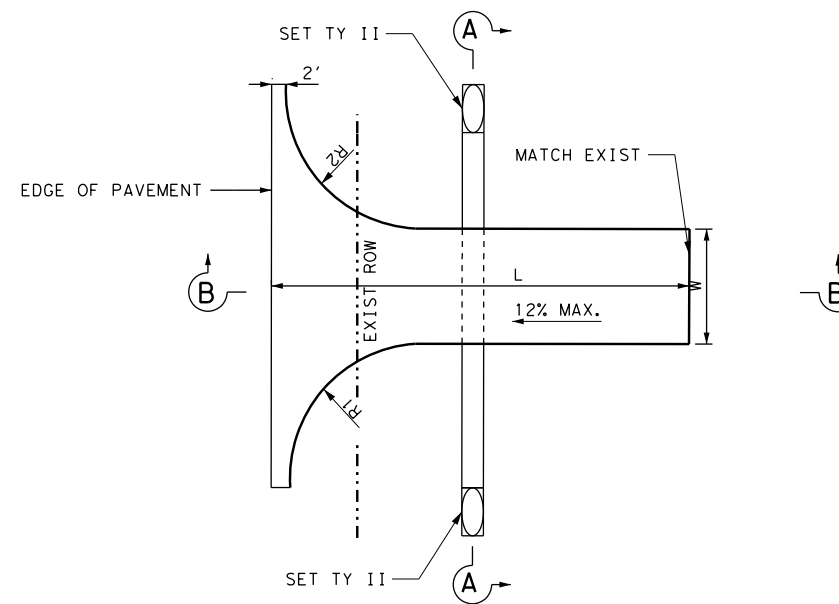
DRIVEWAY NO.	DRIVEWAY STA LOCATION	LT/RT	ELEV AT EDGE OF RDWY	RDWY TO DITCH DISTANCE, D1	DITCH TO TIE IN, D2	VPI	CULVERT FL US ELEV	CULVERT FL DS ELEV	CULVERT FL ELEV AT DRIVEWAY CENTERLINE	CULVERT SIZE (IN)	CULVERT LENGTH (FT)	ELEV AT TIE IN	GRADE G1	CURVE L1 (FT)	GRADE G2	CURVE L2 (FT)	G1-G2	DRWY PENETRATION WIDTH (FT)	DRWY PENETRATION LENGTH (FT)
1	108+25.00	LT	937.34	11.81	6.25	937.28	934.88	934.53	934.71	24	40	938.37	-2.00%	6.00	8.00%	3.60	10%	19.00	6.00

DRIVEWAYS DETAILS

STATION AT GILLILAND	DRIVEWAY NO	OFFSET (LT/RT)	DEPTH(L)	WIDTH(W)	RADIUS (LT) R1	RADIUS (RT) R2
108+25.00	1	LT	20	19	15'	15'



SECTION A-A



NOTES:

1. QUANTITIES FOR DRIVEWAYS ARE SUMMARIZED UNDER CORRESPONDING ROADWAY QUANTITIES.
2. REFER TO ROADWAY PLAN & PROFILE" SHEETS FOR DRIVEWAY LOCATION INFORMATION.

SCALE: N. T. S.



[Signature]

11/5/2020



F-12040



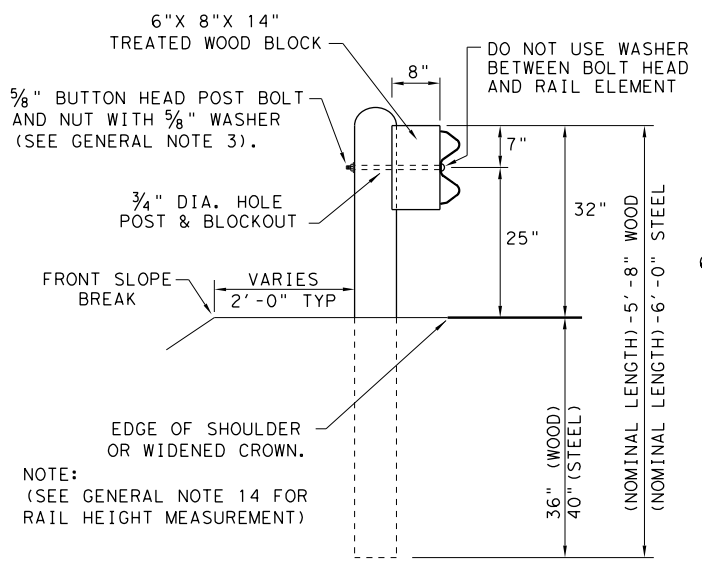
**GILLILAND ROAD
AT WALNUT CREEK
ROADWAY DETAILS**

SHEET 1 OF 1

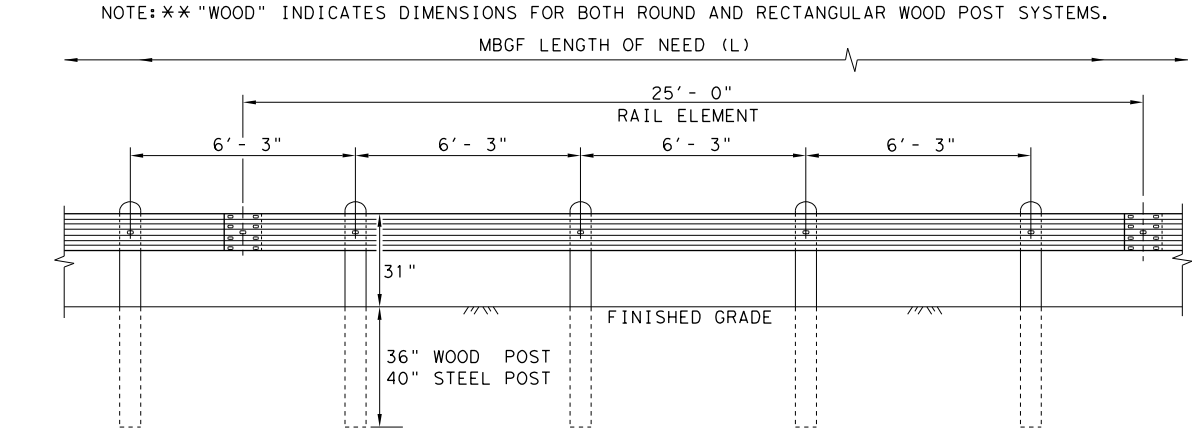
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6	SEE TITLE SHEET	34	
STATE	DISTRICT	COUNTY	
TEXAS	FTW	PARKER	
CONTROL	SECTION	JOB	HIGHWAY
0902	38	120	GILLILAND RD

DISCLAIMER: THE USE OF THIS STANDARD IS GOVERNED BY THE "TEXAS ENGINEERING PRACTICE ACT". NO WARRANTY OF ANY KIND IS MADE BY TXDOT FOR ANY PURPOSE WHATSOEVER. TXDOT ASSUMES NO RESPONSIBILITY FOR THE CONVERSION OF THIS STANDARD TO OTHER FORMATS OR FOR INCORRECT RESULTS OR DAMAGES RESULTING FROM ITS USE.

DATE: 11/5/2020
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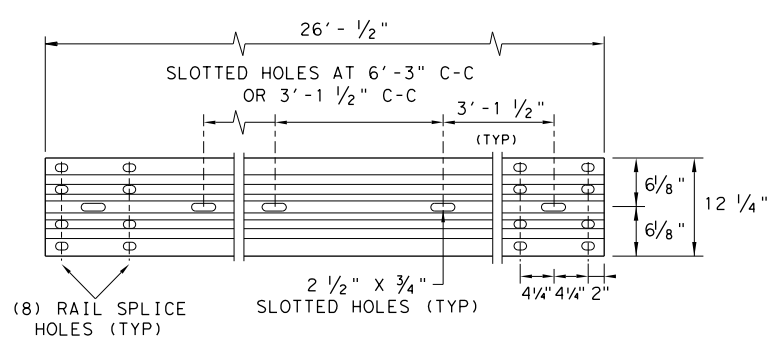


TYPICAL POST PLACEMENT



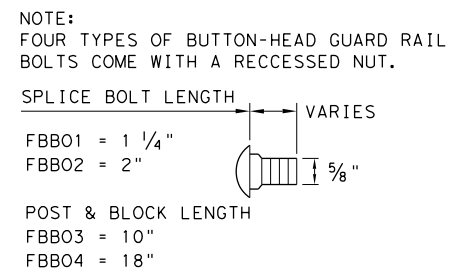
ELEVATION MID-SPAN RAIL SPLICE

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



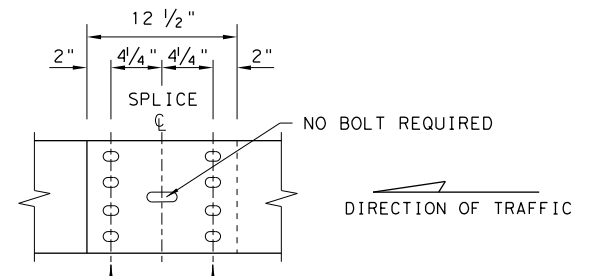
ELEVATION 25' - 0" (NOM.) W-BEAM SECTION

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



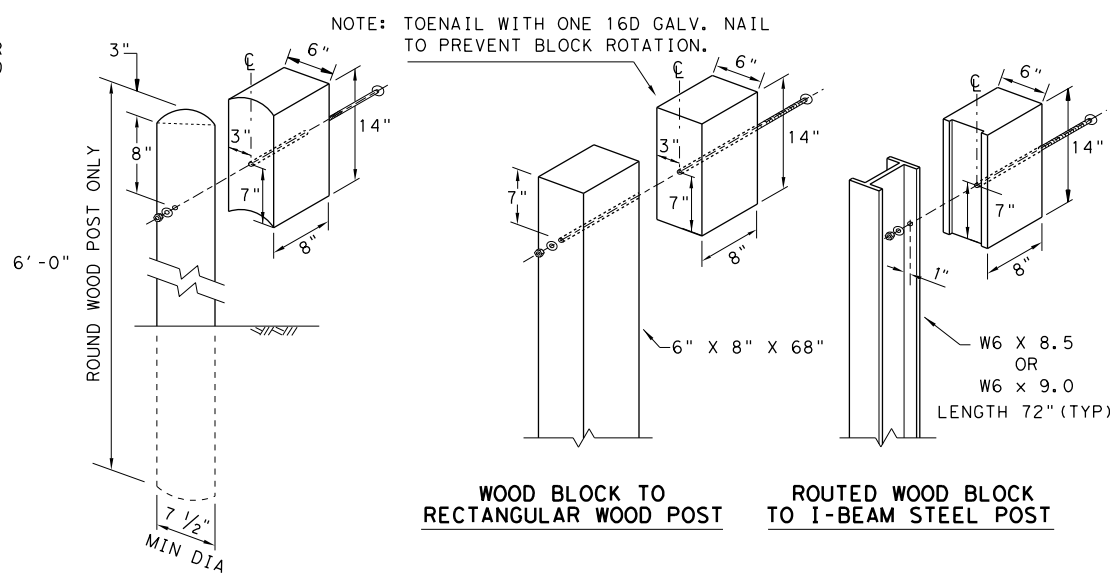
BUTTON HEAD BOLT

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



MID-SPAN RAIL SPLICE DETAIL

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



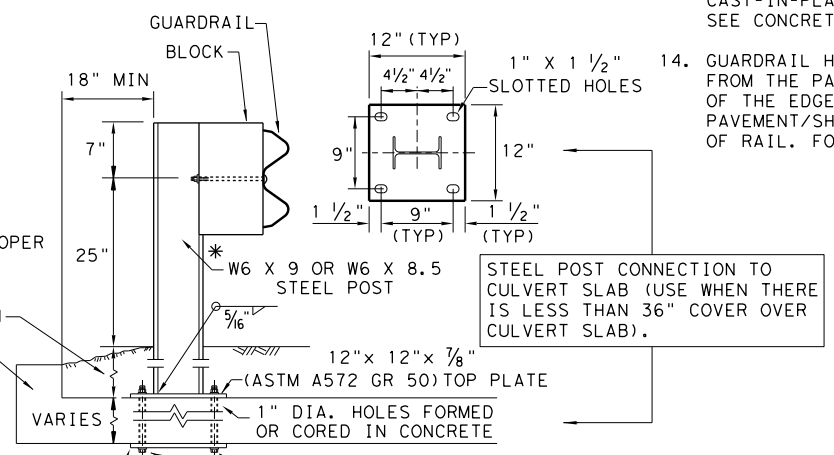
WOOD BLOCK TO RECTANGULAR WOOD POST **ROUTED WOOD BLOCK TO I-BEAM STEEL POST**

- 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 1/2" C-C OR 6'-3" C-C. A SPECIAL LENGTH OF RAIL MAY BE MANUFACTURED TO ACCOMMODATE THE DOWNSTREAM ANCHOR TERMINAL (DAT) AND THE TRANSITION SECTIONS OF GUARDRAIL.
 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 5/8" WASHER (FWC160) 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.

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

12" X 12" X 1/4" (ASTM A36) STEEL BOTTOM PLATE WITH 1" DIA. HOLES REQUIRED WITH BOLT-THROUGH INSTALLATION.

LOW FILL CULVERT POST

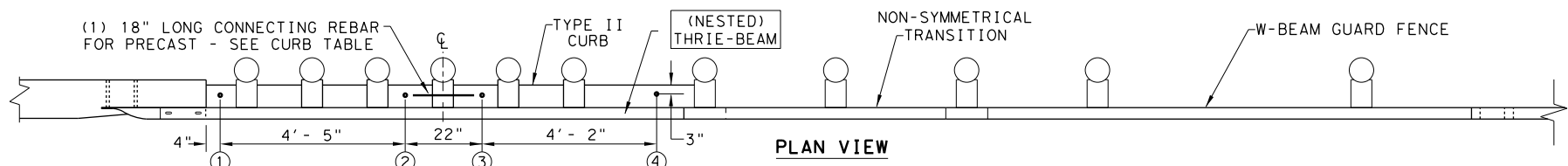


1. **BOLT-THROUGH OPTION:** REQUIRES A 6" MIN. SLAB THICKNESS. 7/8" DIA (ASTM A449) HEAVY HEX BOLTS WITH TWO HARDENED WASHER EACH AND HEAVY HEX NUTS. NOTE: BOLT LENGTH = SLAB PLUS 2 1/4" MIN.
2. **EPOXY ANCHOR OPTION:** THIS OPTION MAY ONLY BE USED IF THE CULVERT SLAB IS 9" MIN. THICK. THREADED ANCHOR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

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

		Design Division Standard	
METAL BEAM GUARD FENCE TL-3 MASH COMPLIANT GF (31) - 19			
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	FTW	PARKER	35

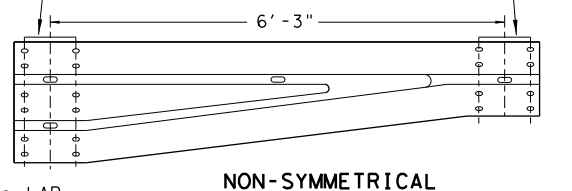
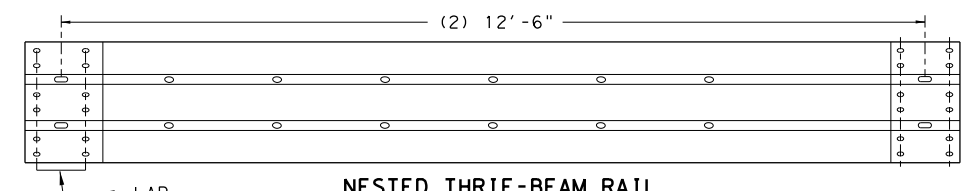
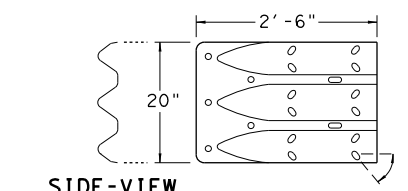
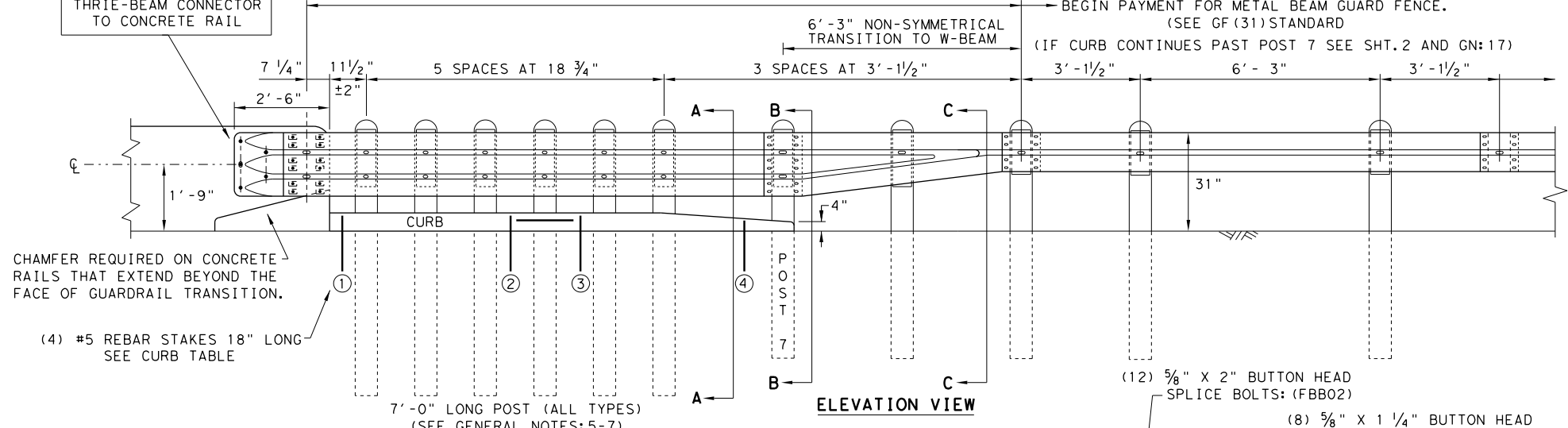
11/5/2020
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- (5) 7/8" DIA. HEAVY HEX HEAD BOLTS (ASTM A325 OR A449)
- (10) 1 3/4" O.D. WASHER UNDER EACH HEX BOLT HEAD AND NUT.
- (5) 7/8" DIA. HEAVY HEX NUTS (ASTM A194 OR A563)

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

NOTE: CURB IS A REQUIRED COMPONENT FOR THE TRANSITION TO FUNCTION PROPERLY. SEE GENERAL NOTES: 2-4 AND 16-17.



THRIE-BEAM TERMINAL CONNECTOR 10GA.
PART DESIGNATOR RTE01D
NOTE: SEE GENERAL NOTE: 9

NESTED THRIE-BEAM RAIL
PART DESIGNATOR RTM10a

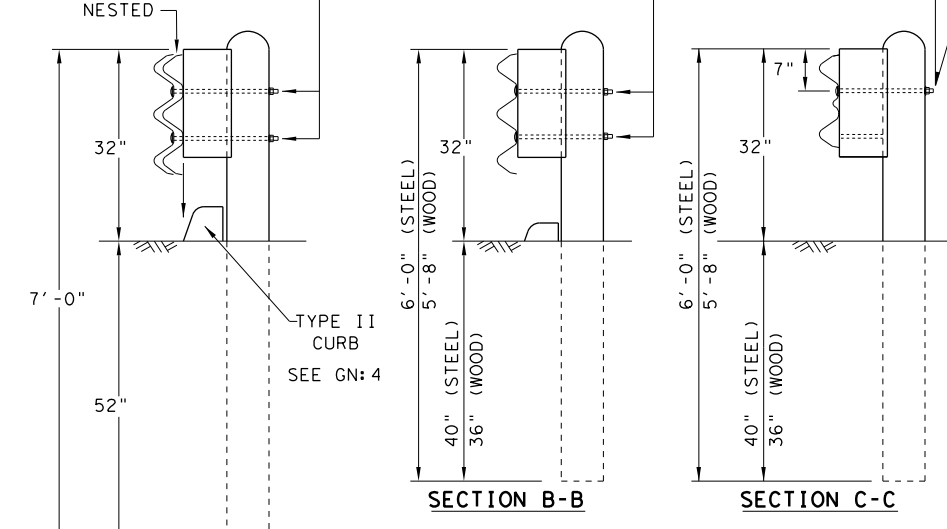
NON-SYMMETRICAL W-BEAM TO THRIE-BEAM TRANSITION 10GA.
PART DESIGNATOR RWT02a OR RWT02b

PLATE WASHER INSTRUCTIONS

BRIDGE APPROACH - UPSTREAM: THE NESTED 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.

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

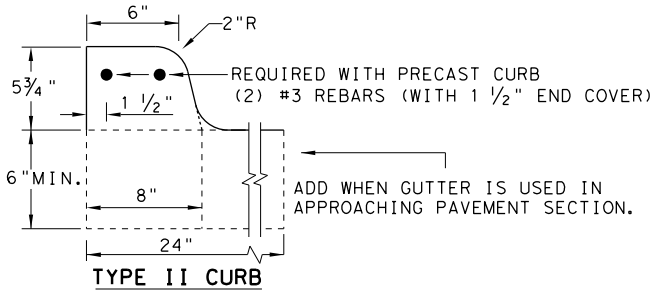
NOTE: ONLY (1) 5/8" BOLT REQUIRED AT THIS POST LOCATION.



TRANSITION SECTIONS
NOTE: ALL POST TYPES, SEE GENERAL NOTE: 5 & 6
NOTE: ** "WOOD" INDICATES DIMENSIONS FOR BOTH ROUND AND RECTANGULAR WOOD POST SYSTEMS.

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

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



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

GENERAL NOTES

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

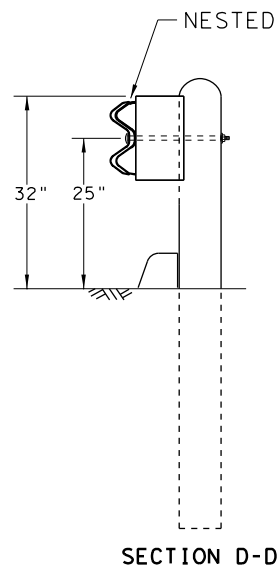
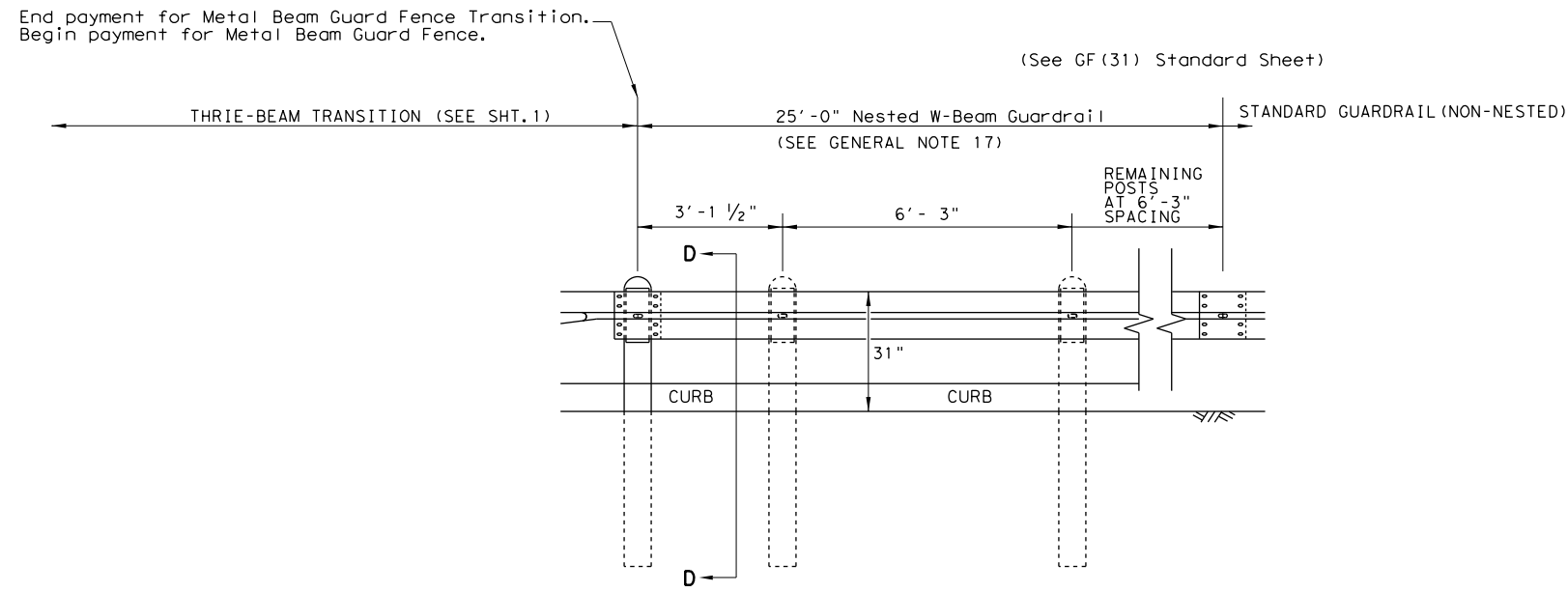
HIGH-SPEED TRANSITION
SHEET 1 OF 2

		Design Division Standard	
METAL BEAM GUARD FENCE THRIE-BEAM TRANSITION TL-3 MASH COMPLIANT			
GF (31) TR TL3-19			
FILE: gf31trtl319.dgn	DN: TXDOT	CK: KM	DW: VP
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REQUIRED ALTERNATIVE FOR CONTINUOUS CURB EXTENDING PAST POST 7 (SEE SHT. 1 GENERAL NOTE 17)



HIGH-SPEED TRANSITION

SHEET 2 OF 2

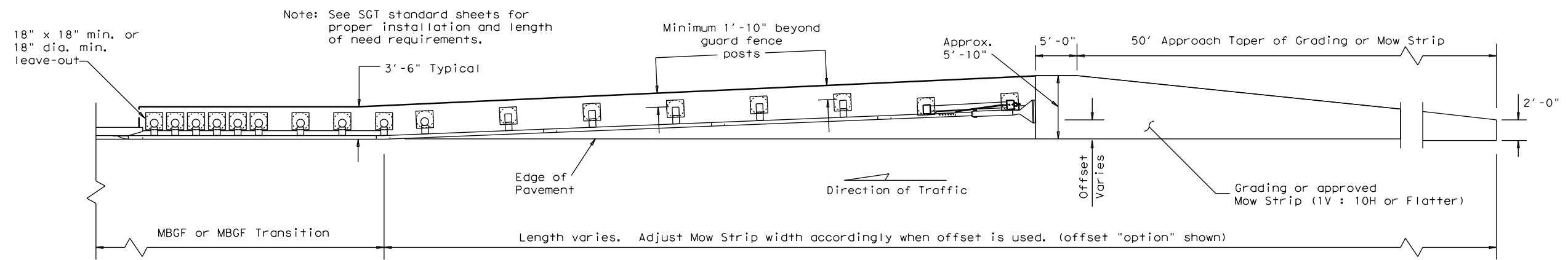


METAL BEAM GUARD FENCE
 THRIE-BEAM TRANSITION
 TL-3 MASH COMPLIANT
 GF (31) TR TL3-19

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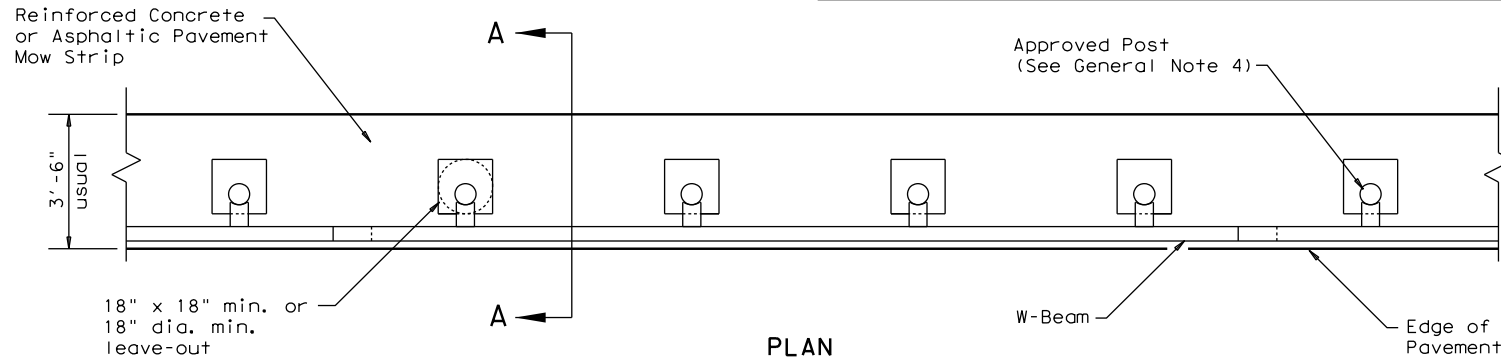
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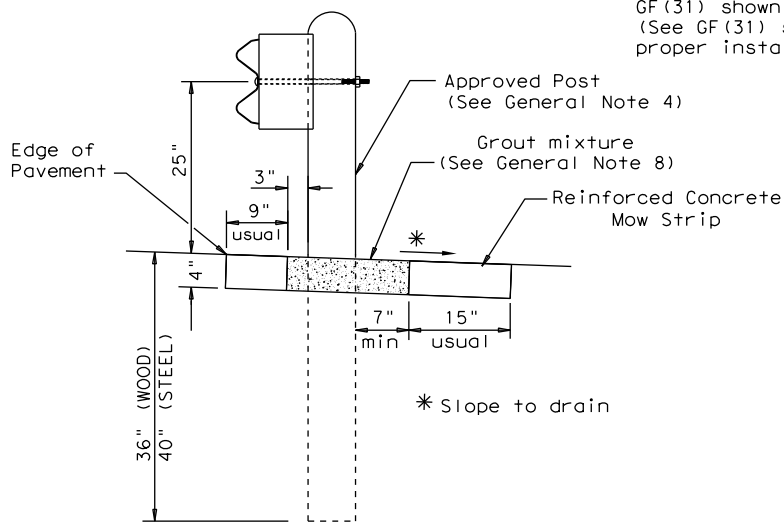
GRADING AND MOW STRIP AT GUARDRAIL END TREATMENTS

Note: Site Condition(s)
 Site conditions may exist where grading is required for the proper installation of metal guard fence and end treatments.
 Approach grading or mow strip may be decreased or eliminated, as directed by the Engineer.



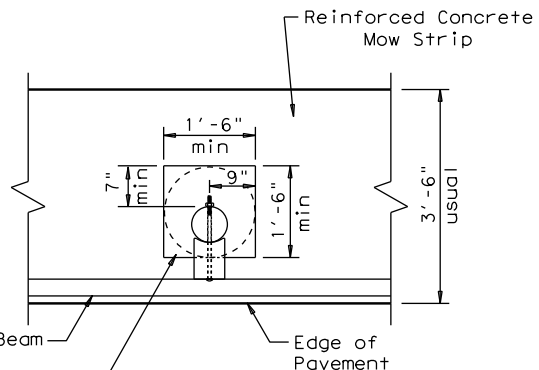
PLAN

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



SECTION A-A

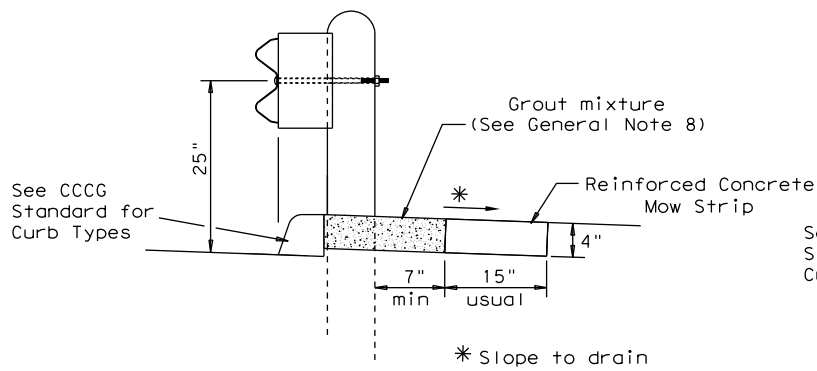
Typical



MOW STRIP DETAIL

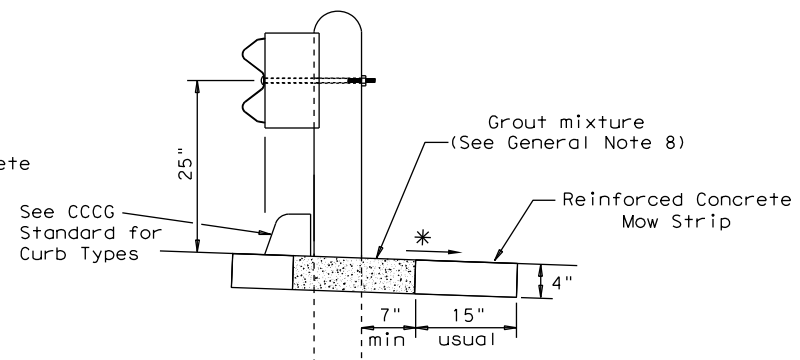
Reinforced Concrete Mow Strip with 18" x 18" Square or 18" Dia. minimum leave-out.

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



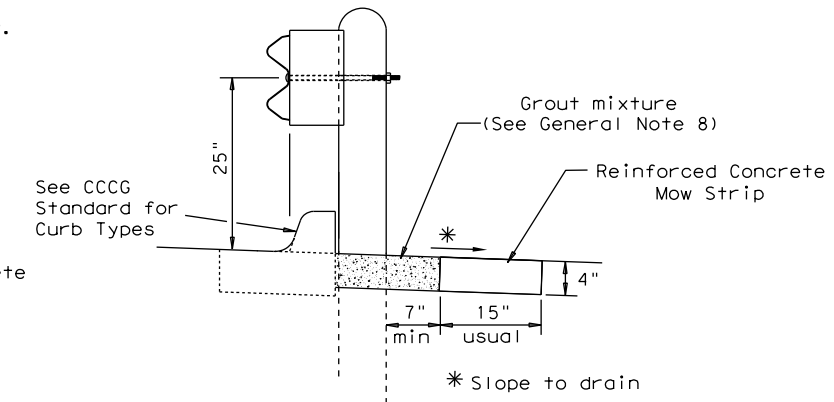
CURB OPTION (1)

This option will increase the post embedment throughout the system.



CURB OPTION (2)

Curb shown on top of mow strip



CURB OPTION (3)

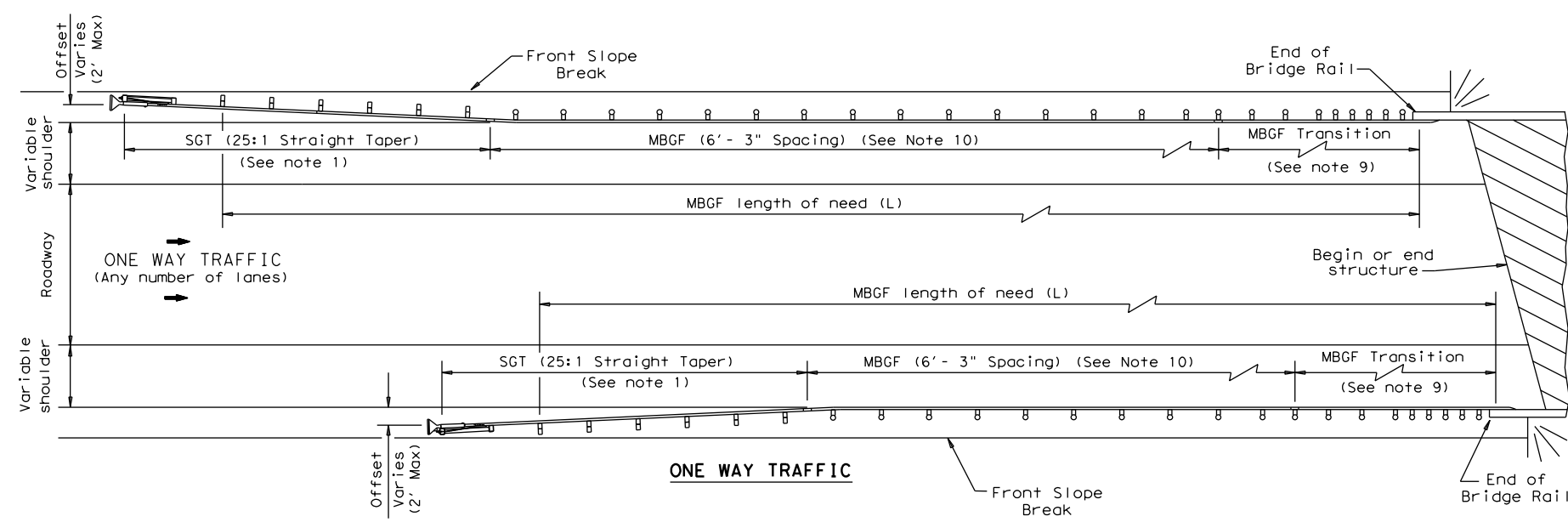
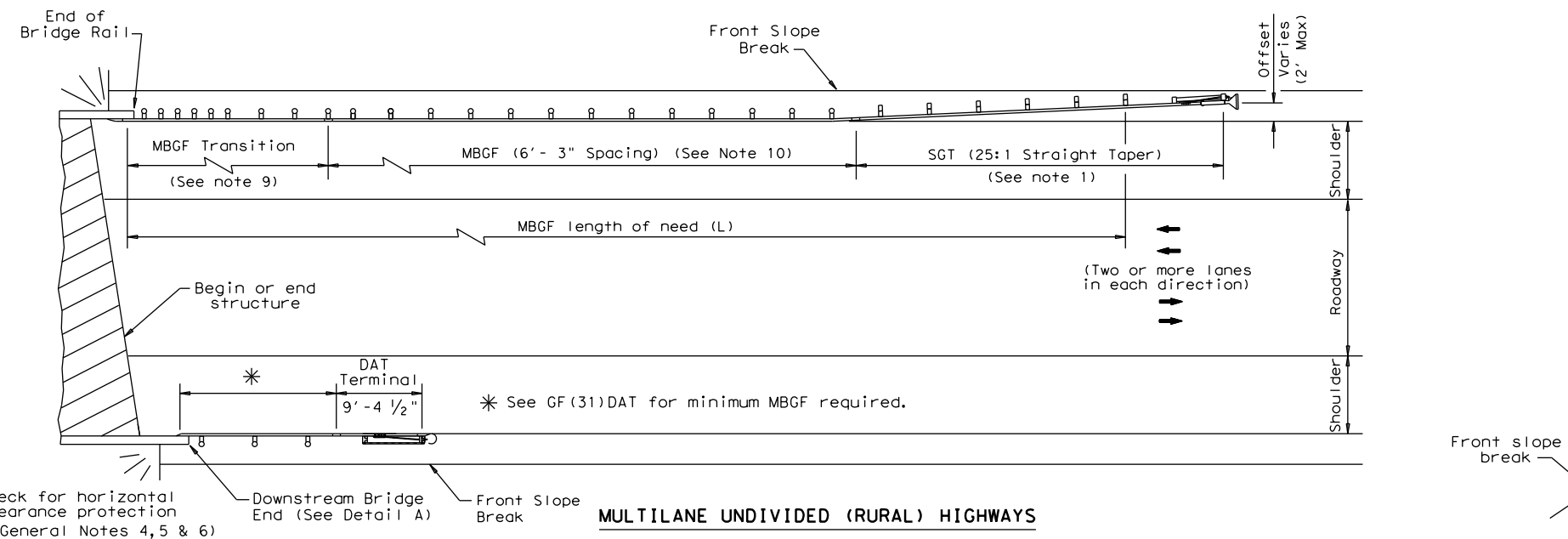
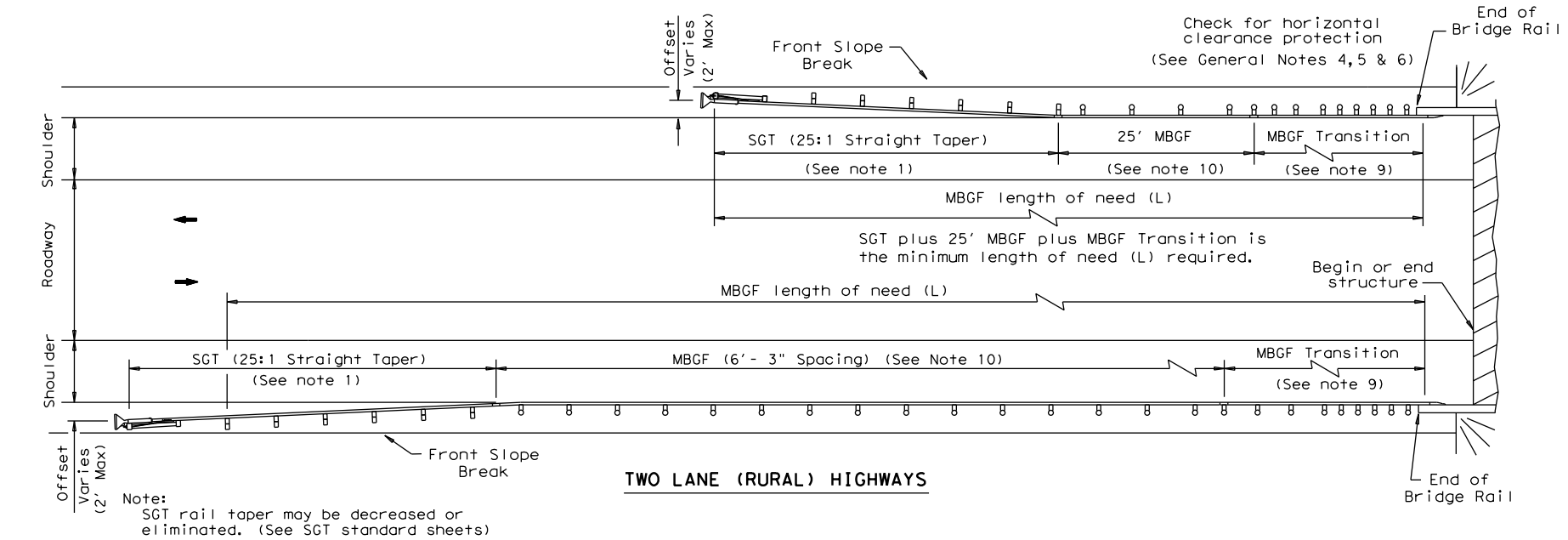


METAL BEAM GUARD FENCE (MOW STRIP) TL-3 MASH COMPLIANT GF (31)MS-19

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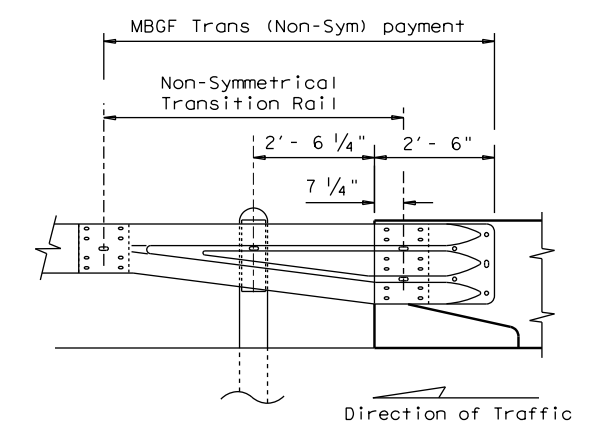
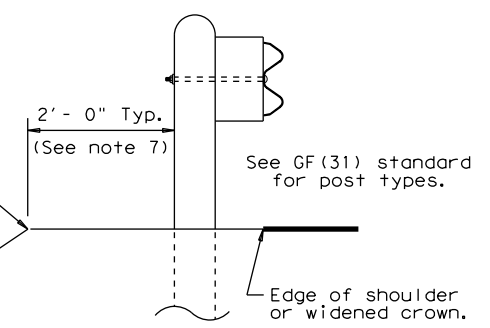
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GENERAL NOTES

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



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

Texas Department of Transportation Design Division Standard

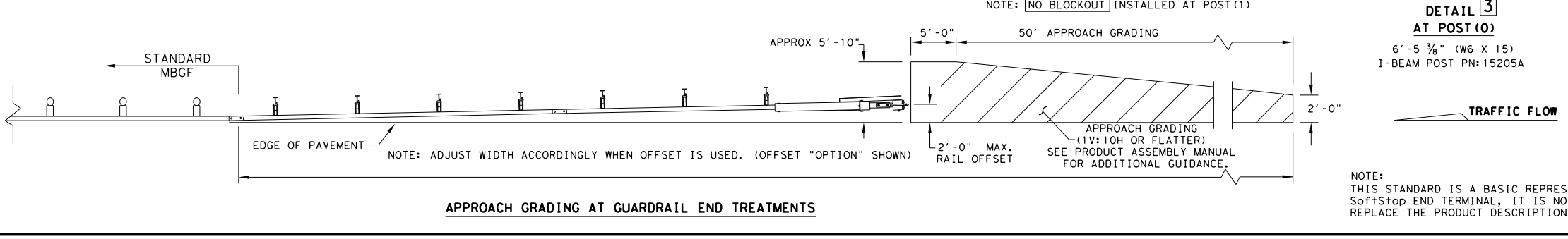
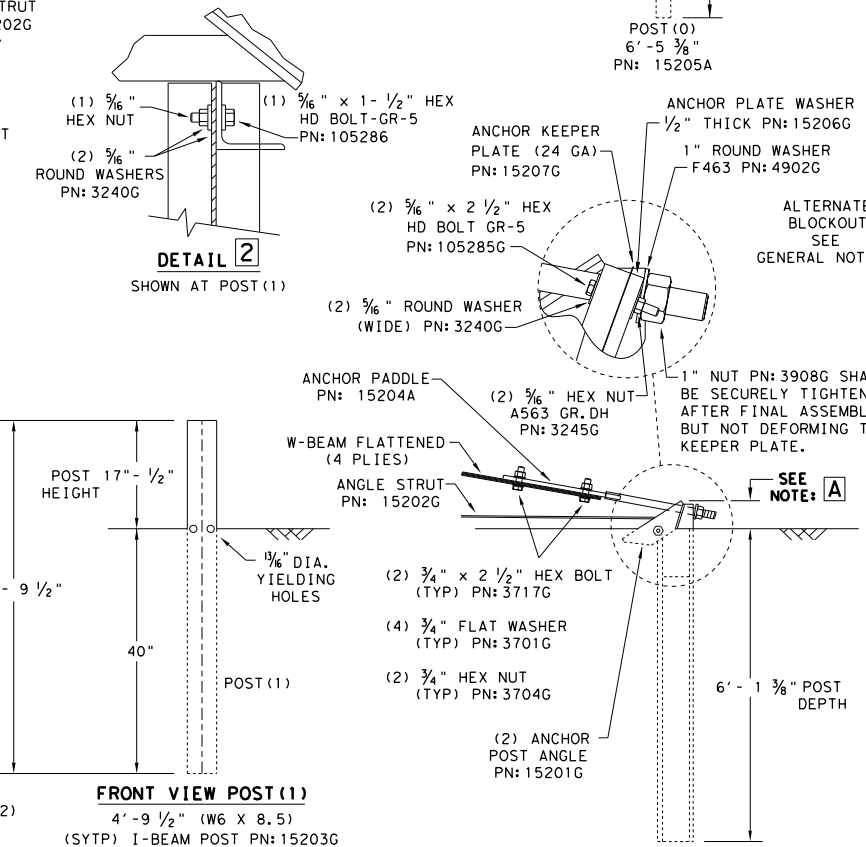
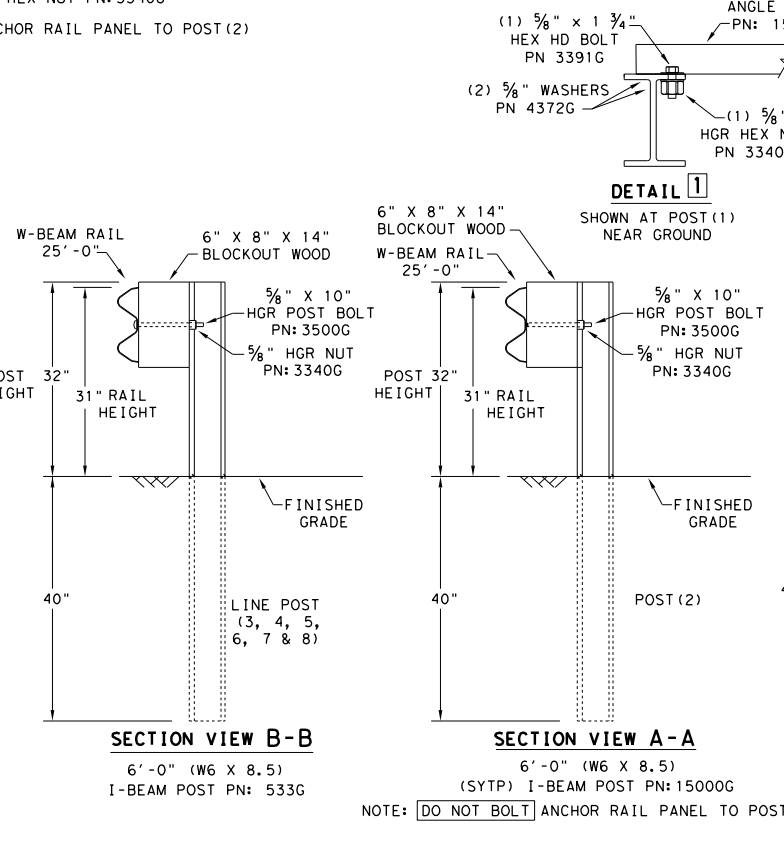
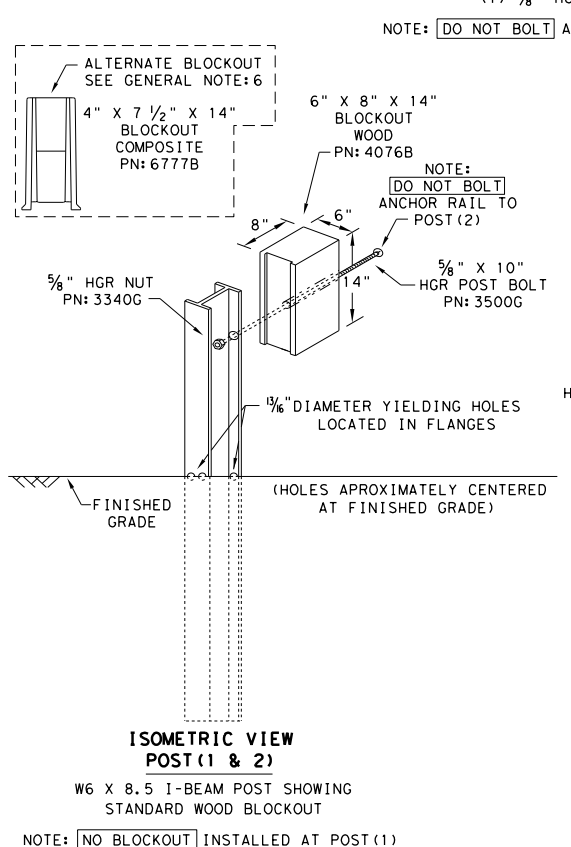
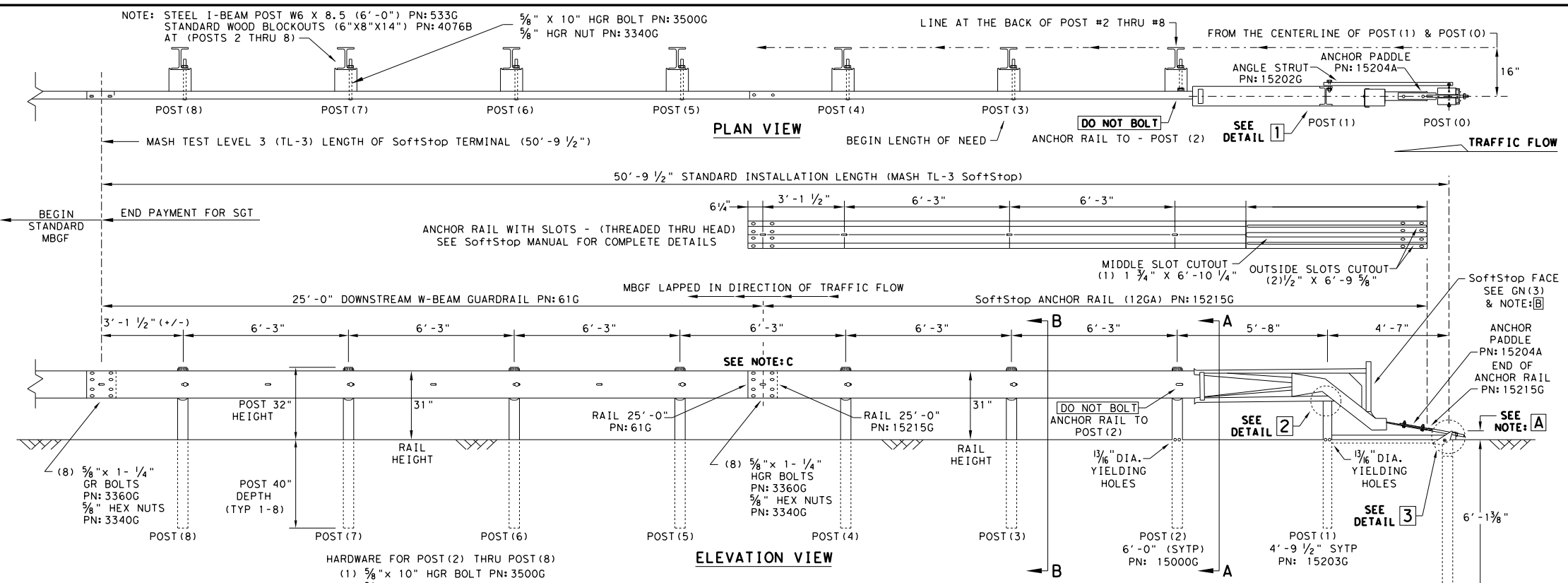
BRIDGE END DETAILS
 (METAL BEAM GUARD FENCE APPLICATIONS TO RIGID RAILS)

BED-14

FILE: bed14.dgn	DN: TxDOT	CK: AM	DW: BD/VP	CK: CGL
© TxDOT: December 2011	CONT	SECT	JOB	HIGHWAY
REVISIONS	0902	38	120	GILLILAND RD
	DIST	COUNTY		SHEET NO.
	FTW	PARKER		39

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 FILE: H:\TXPROJ\TX2495-01\Drawings\Standards\ROADWAY\SGT(10S)31-16.dgn



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

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

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

Design Division Standard

TRINITY HIGHWAY

SOFTSTOP END TERMINAL

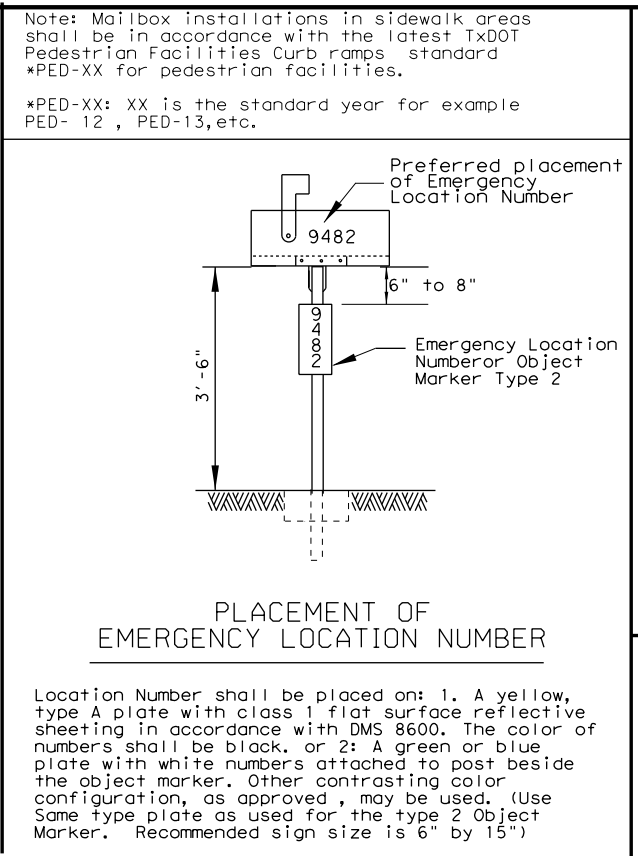
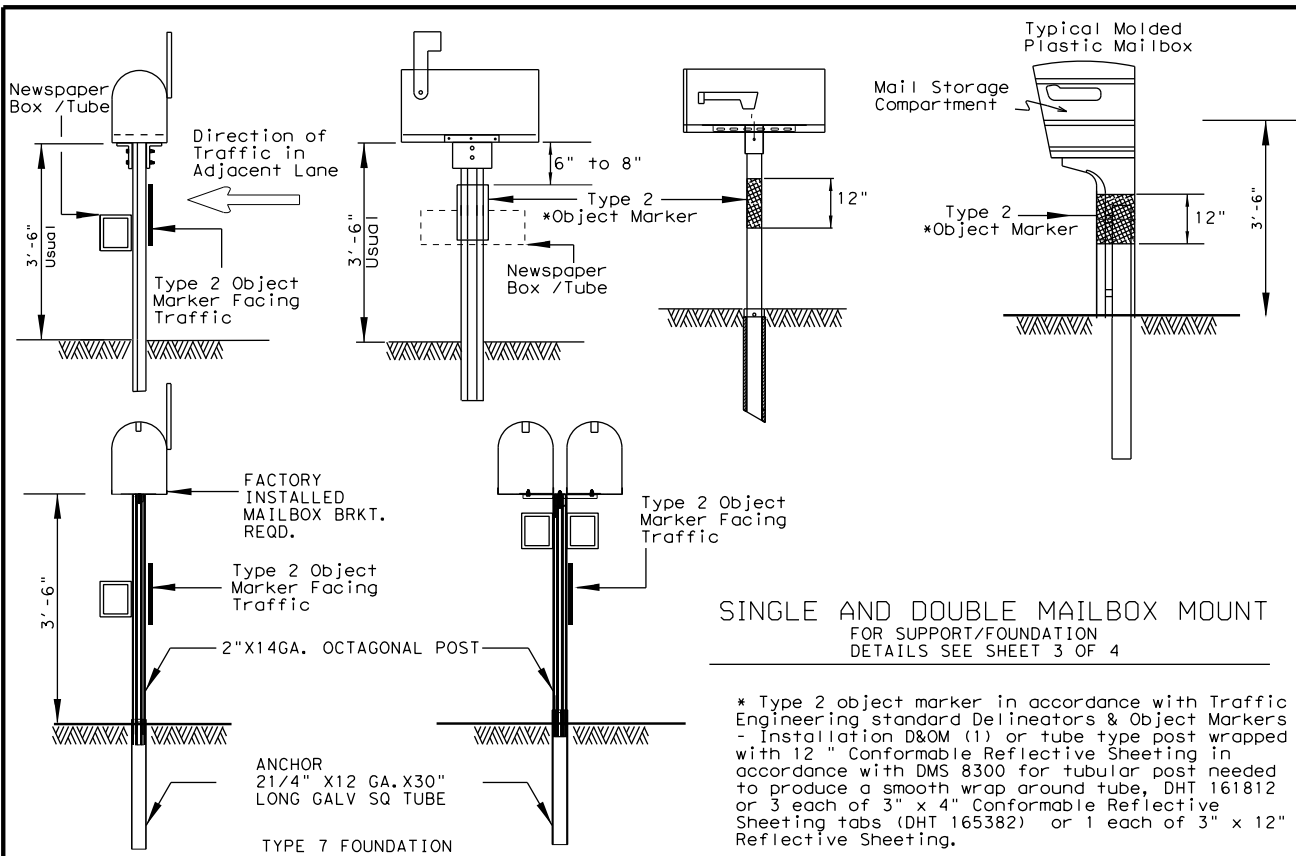
MASH - TL-3

SGT (10S) 31-16

FILE: sgt10s3116	DN: TxDOT	CK: KM	DW: VP	CK: MB/VP
©TxDOT: JULY 2016	CONT	SECT	JOB	HIGHWAY
REVISIONS	0902	38	120	GILLILAND RD
	DIST	COUNTY		SHEET NO.
	FTW	PARKER		40

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TYPICAL MAILBOX SIZE

SIZE	INCHES			POUNDS	
	LENGTH	WIDTH	HEIGHT	MAXIMUM WEIGHT	
SMALL	19 1/2	6	7	5	5
MEDIUM	22 1/2	8	11 1/2	7	7
LARGE	23 1/2*	11 1/2*	13 1/2*	10	10

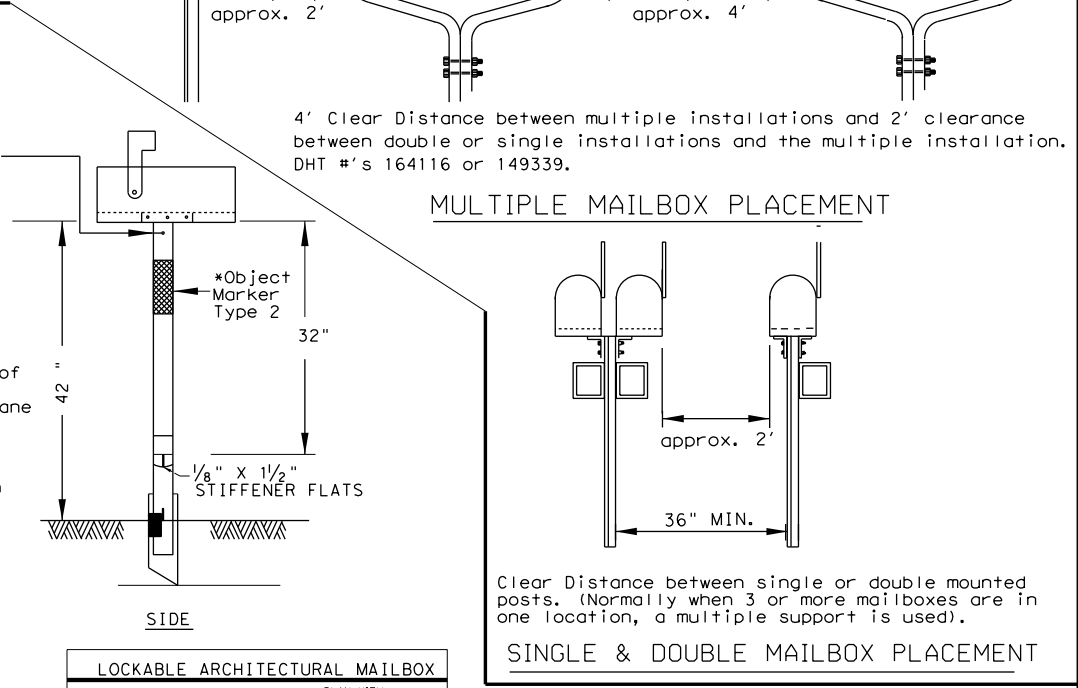
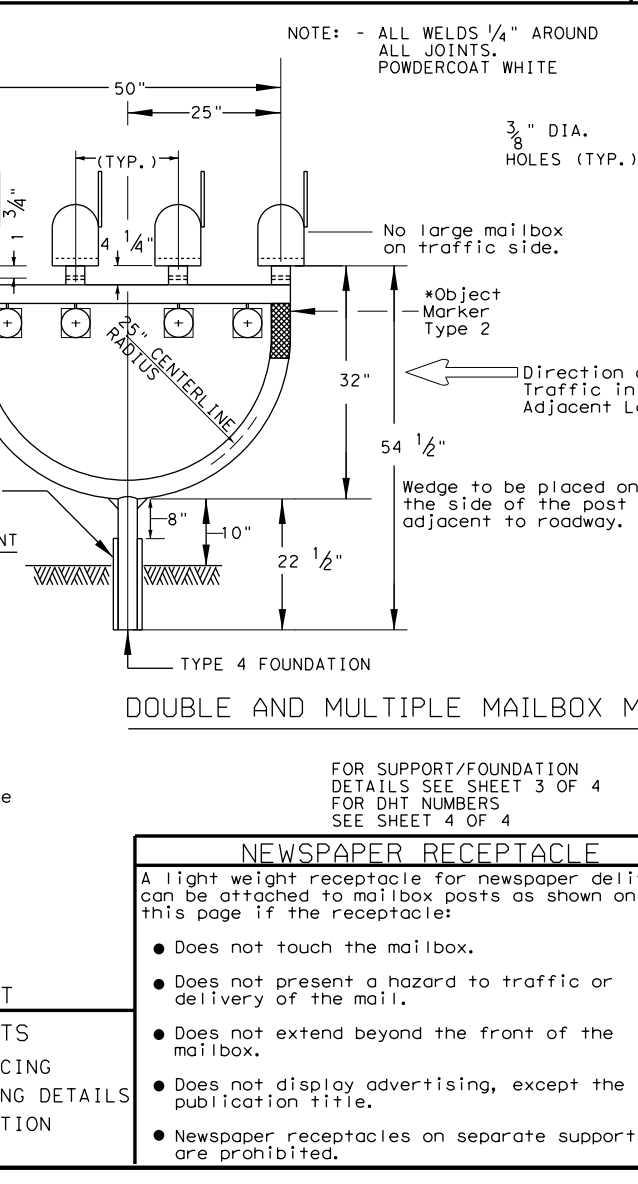
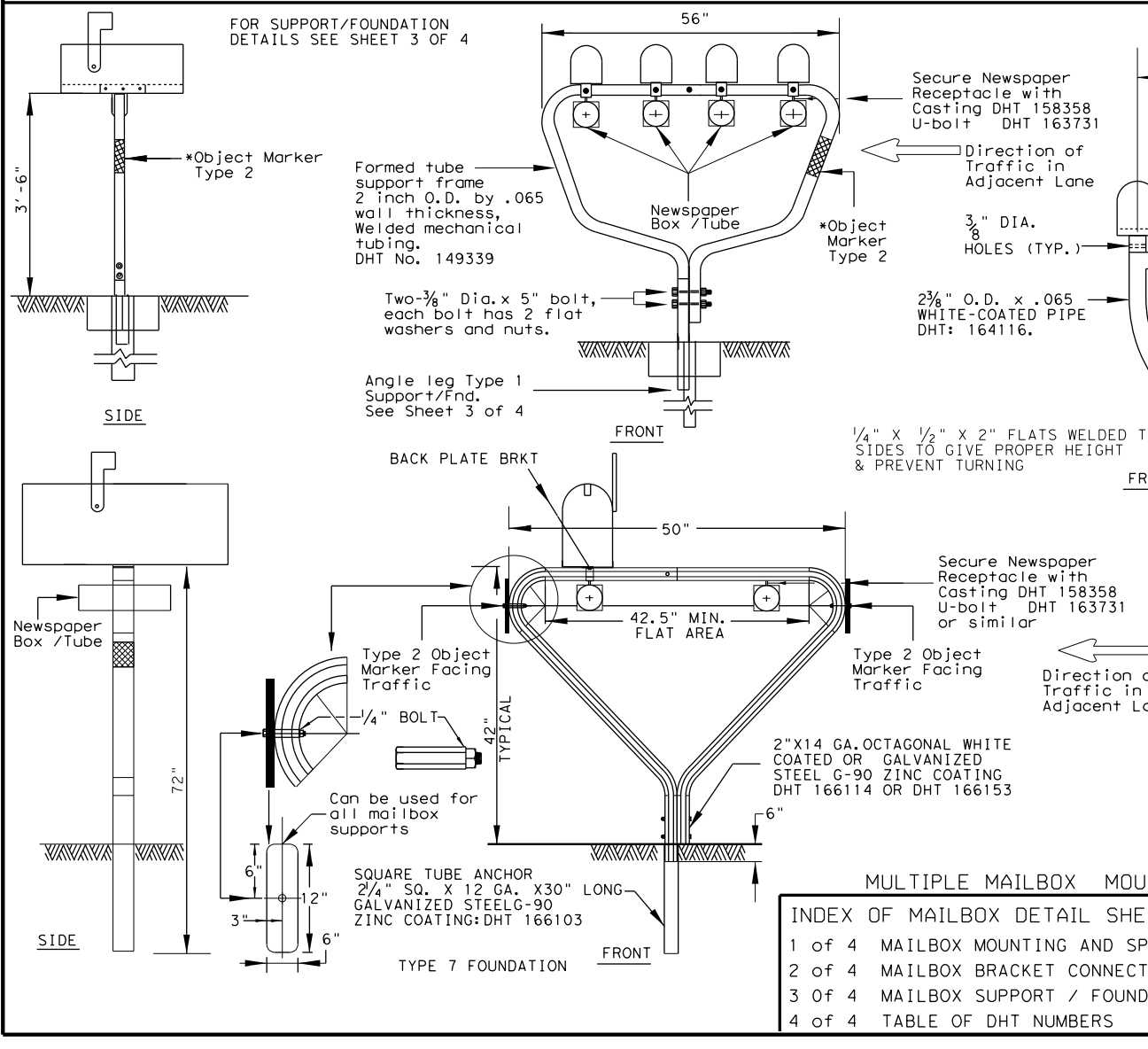
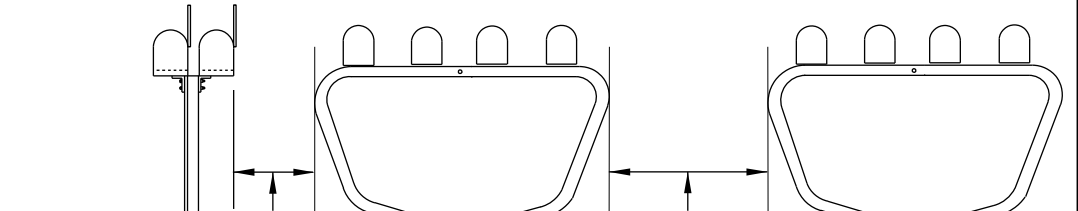
* Maximum allowed dimensions for mailbox
 ** Excluding Molded Plastic on 4 X 4 Post

LOCKABLE ARCHITECTURAL MAILBOX SIZE (INCHES)

VIEW	INCHES				WEIGHT (POUNDS)
	TOP	BOTTOM	FRONT SIDE	BACK SIDE	
TOP	18	15	18.3	15	22.4
FRONT SIDE	11 1/2	11 1/2		15	
BACK SIDE					

Mailboxes shall be made of light weight sheet metal or light weight plastic. Lockable architectural mailboxes shall meet the requirements of the above table.

Heavy steel, cast iron or decorative mailboxes shall not be used on the state highway system.



INDEX OF MAILBOX DETAIL SHEETS

1 of 4	MAILBOX MOUNTING AND SPACING
2 of 4	MAILBOX BRACKET CONNECTING DETAILS
3 of 4	MAILBOX SUPPORT / FOUNDATION
4 of 4	TABLE OF DHT NUMBERS

SHEET 1 OF 4

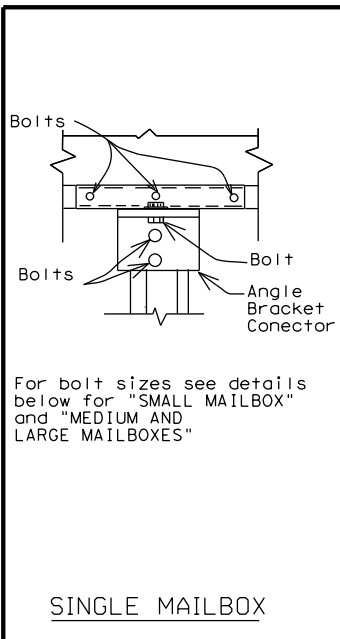
Texas Department of Transportation
 Maintenance Division Standard

MAILBOX MOUNTING AND SPACING MB-15(1)

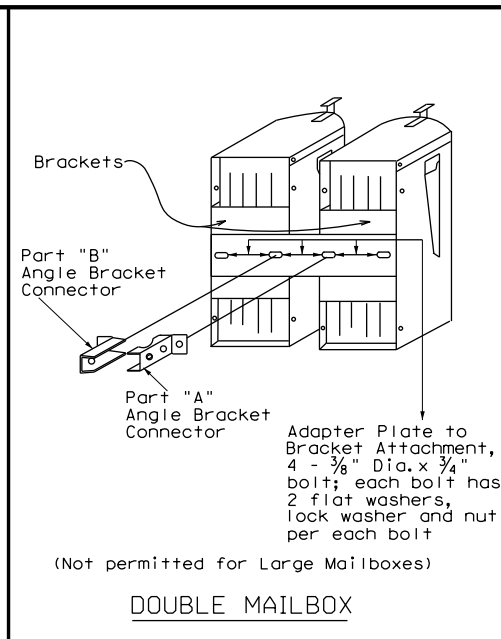
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© TxDOT APRIL 2015	CONT	SECT	JOB	HIGHWAY
REVISIONS:	0902	38	120	GILLILAND RD
Added additional newspaper receptacle for double mailbox support	DIST	COUNTY	SHEET NO.	
	FTW	PARKER	41	

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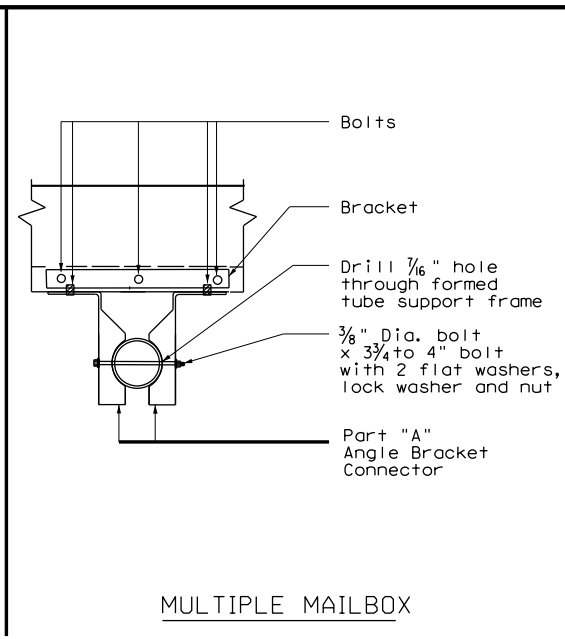
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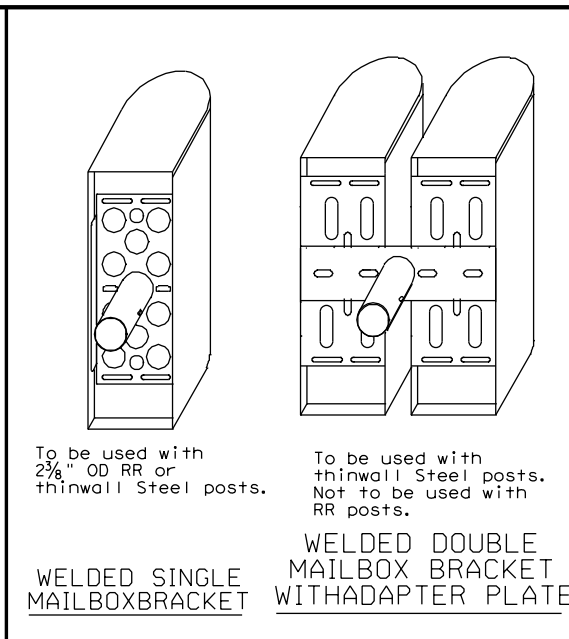
SINGLE MAILBOX



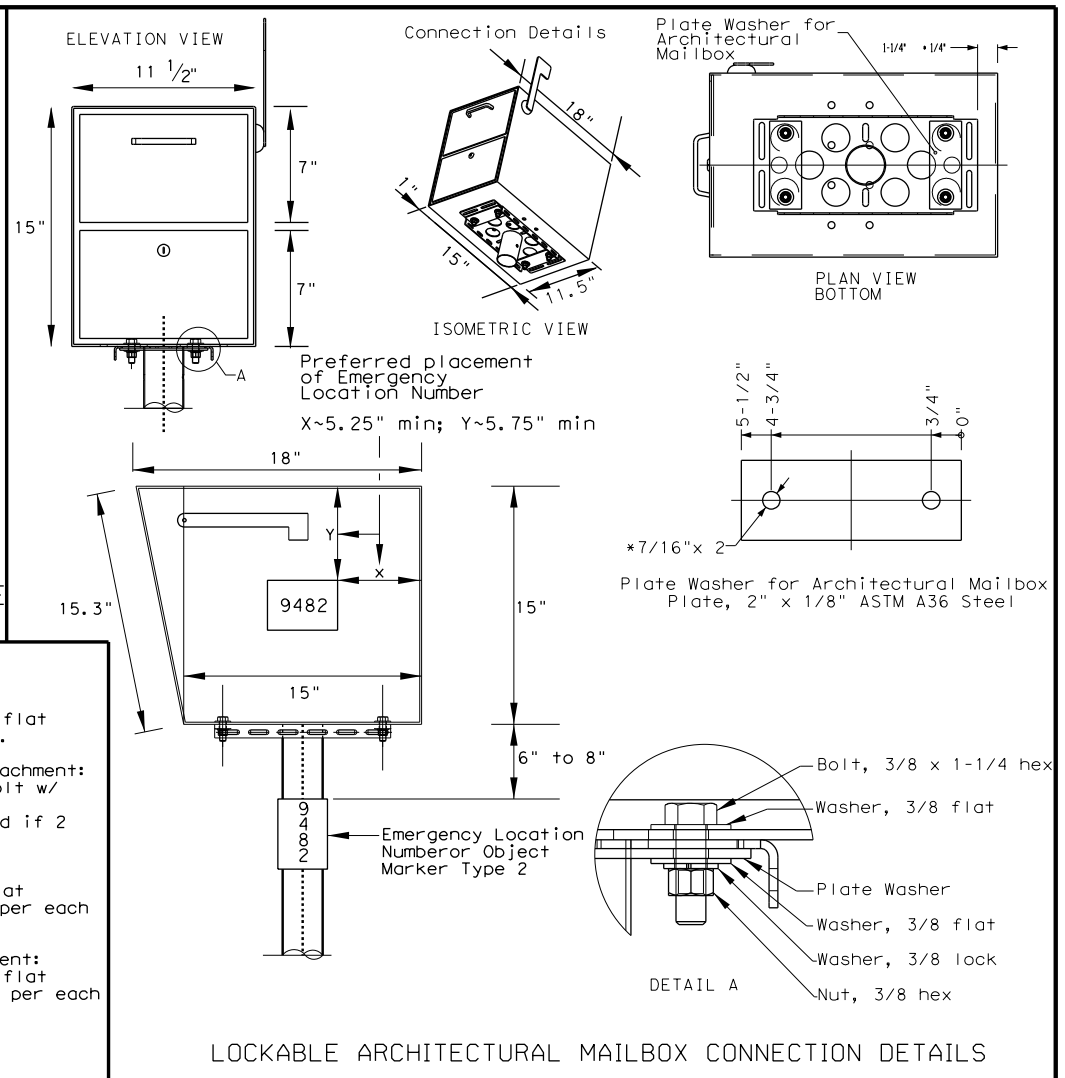
DOUBLE MAILBOX



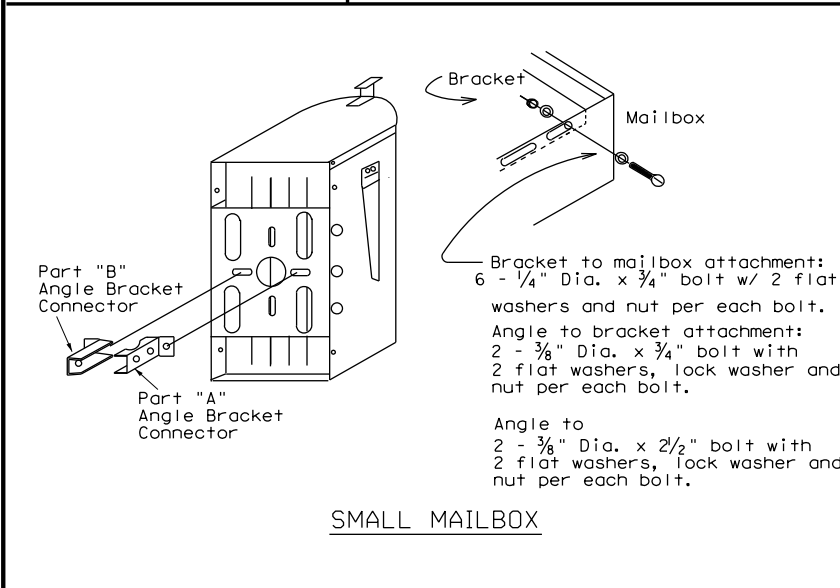
MULTIPLE MAILBOX



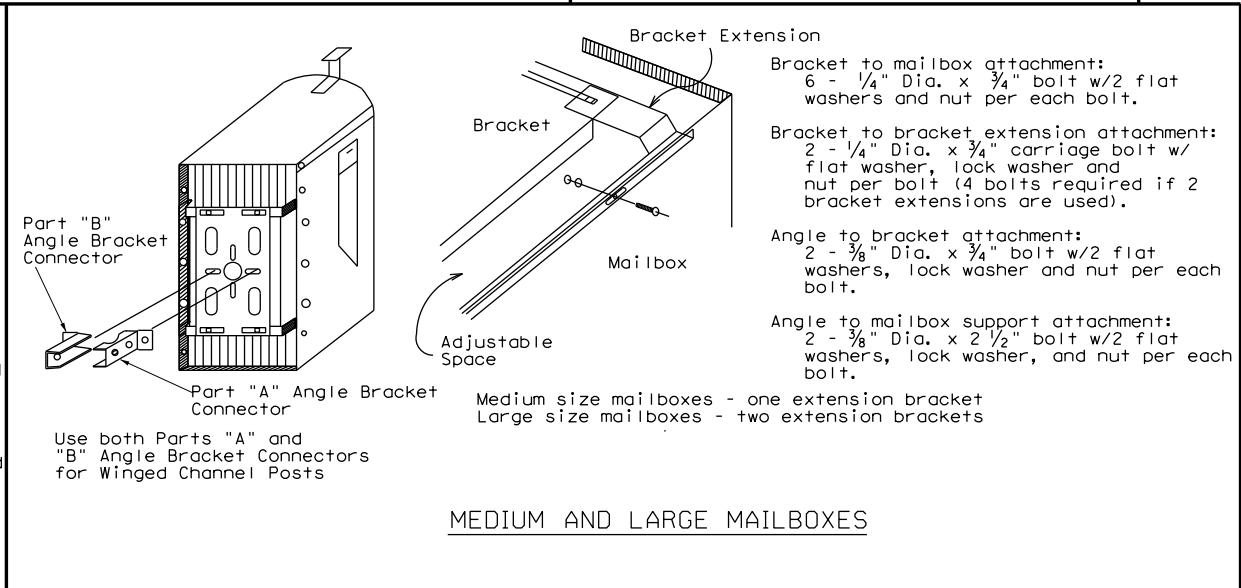
WELDED SINGLE MAILBOX BRACKET
 WELDED DOUBLE MAILBOX BRACKET WITH ADAPTER PLATE



LOCKABLE ARCHITECTURAL MAILBOX CONNECTION DETAILS



SMALL MAILBOX

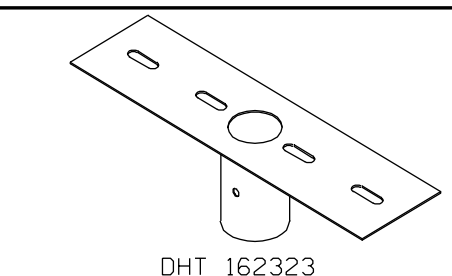


MEDIUM AND LARGE MAILBOXES

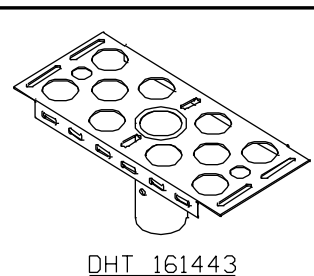
GENERAL NOTES

1. Connecting hardware detailed on this sheet is for the hardware that the Department stocks at the Regional Warehouses. This hardware is available to the contractor only when so stated elsewhere in the plans or specification.
2. Hardware for mounting mailboxes to the support/foundation furnished by industry should be used when shown on the Maintenance Divisions "Approved Products List." Only mailbox hardware that have been crash tested in accordance with NCHRP Report 350, will be on the approved list.
3. Hardware furnished by industry shall be erected in accordance with the manufacturer's recommendation.
4. Bracket and bracket extension shall be constructed of 14 gauge galvanized steel sheet metal.
5. The angles, brackets and adapter plates shall be constructed of 12 gauge galvanized steel sheet metal.
6. Items with evidence of damage to the galvanized coating or wet storage stains (white rust) will not be accepted.

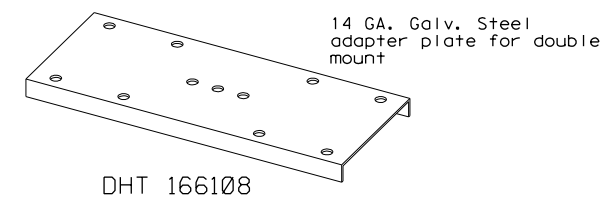
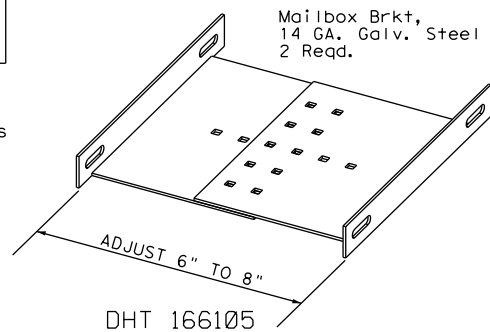
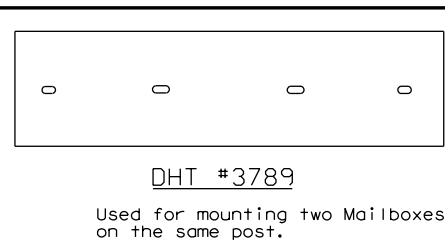
SHEET 2 OF 4



For use with galvanized thinwall steel posts DHT # 143426 or powder-coated thinwall steel post DHT # 162911.

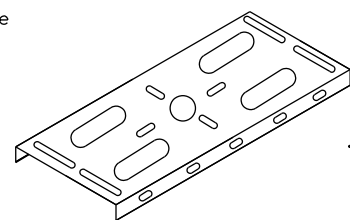


For use with RCR post DHT # 161442 or galvanized thinwall steel post DHT # 143426 or powder-coated thinwall steel post. DHT # 162911.

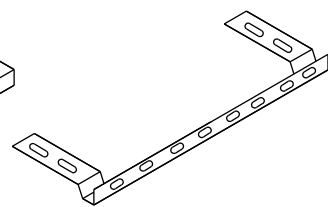


HARDWARE AT TXDOT REGIONAL WAREHOUSES

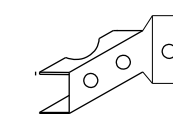
Brackets and adapter plate shown in this section should be available to the Contractor when stated elsewhere in plans or specifications.



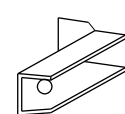
Mailbox Bracket



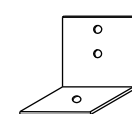
Used for extending 6" wide bracket to attach larger mailboxes.
 Bracket Extension



Part "A" Angle Bracket Connector



Part "B" Angle Bracket Connector



Angle Bracket For Temporary Mailbox

See Table of Applicable DHT Numbers on sheet 4 of 4 for DHT description and unit of measure.

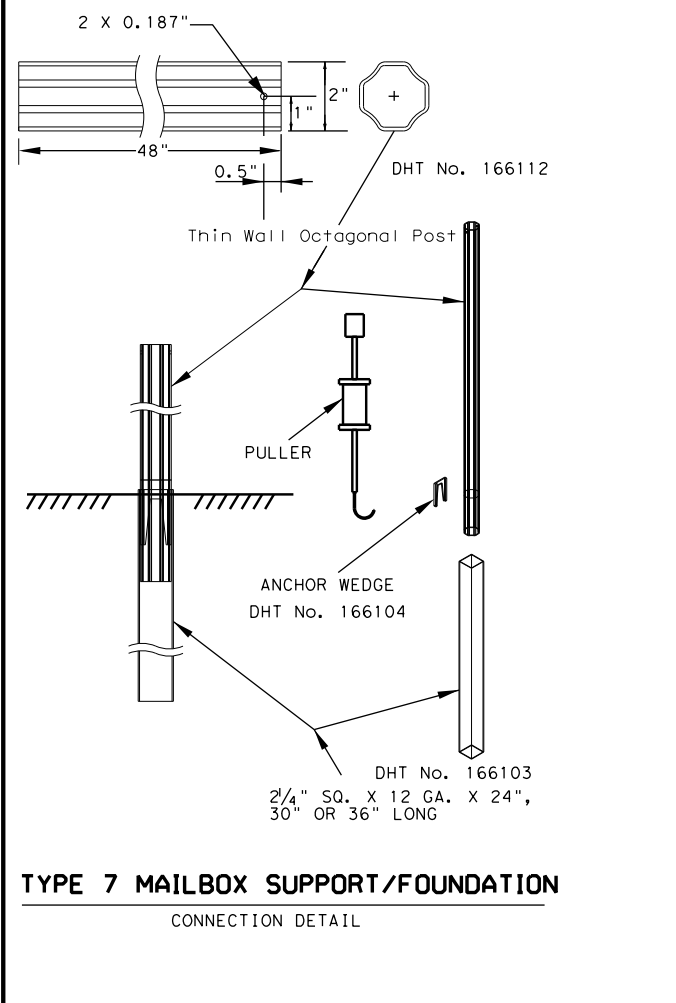
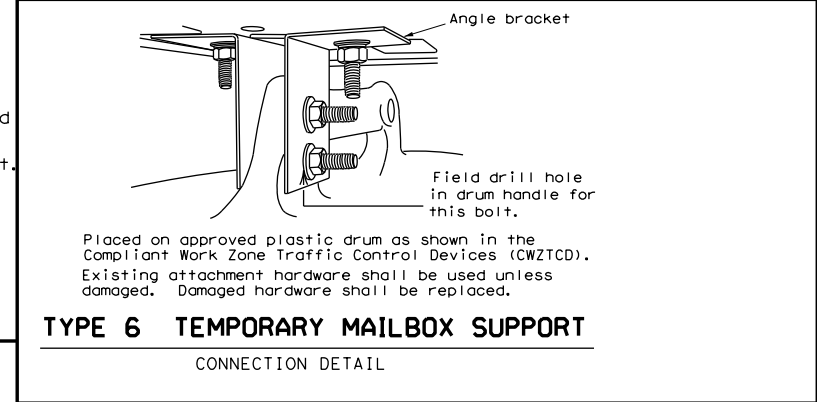
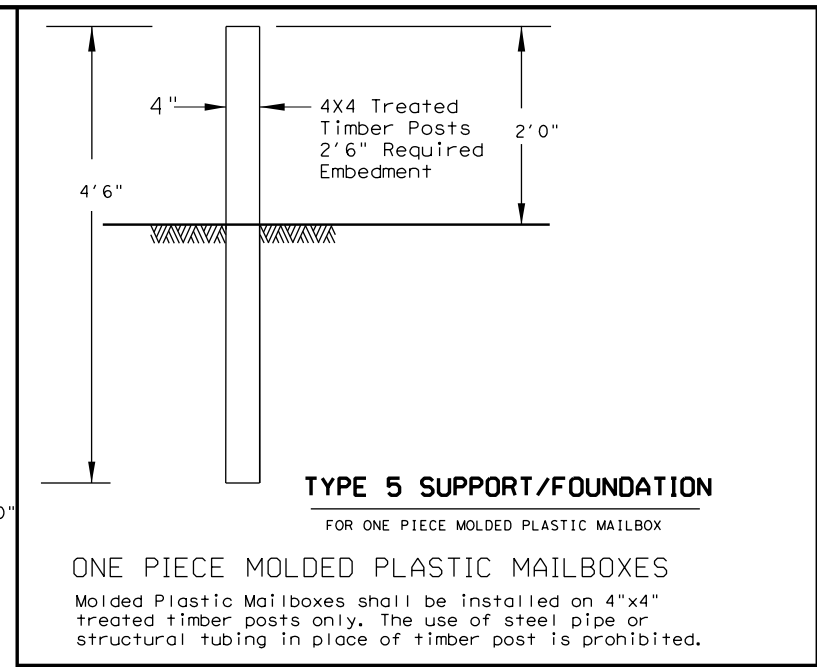
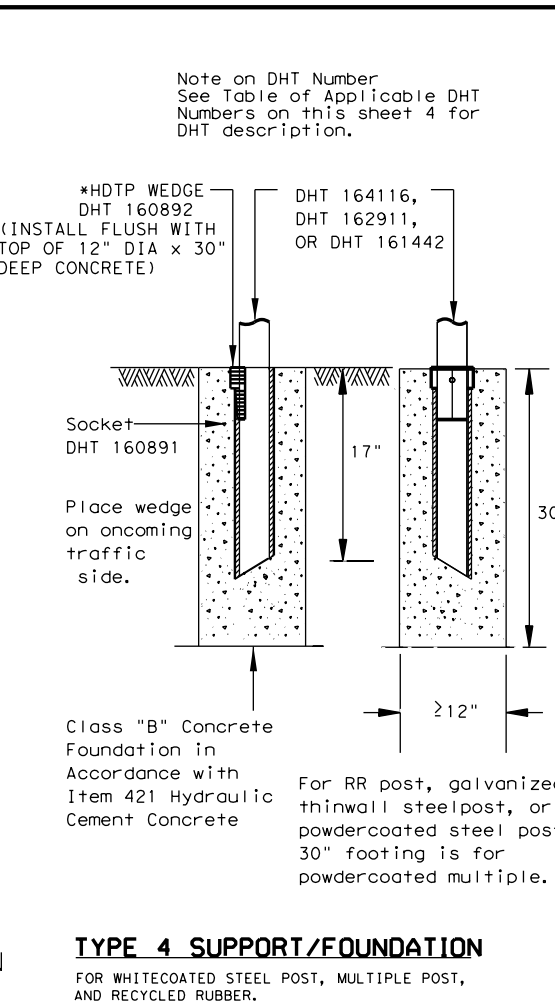
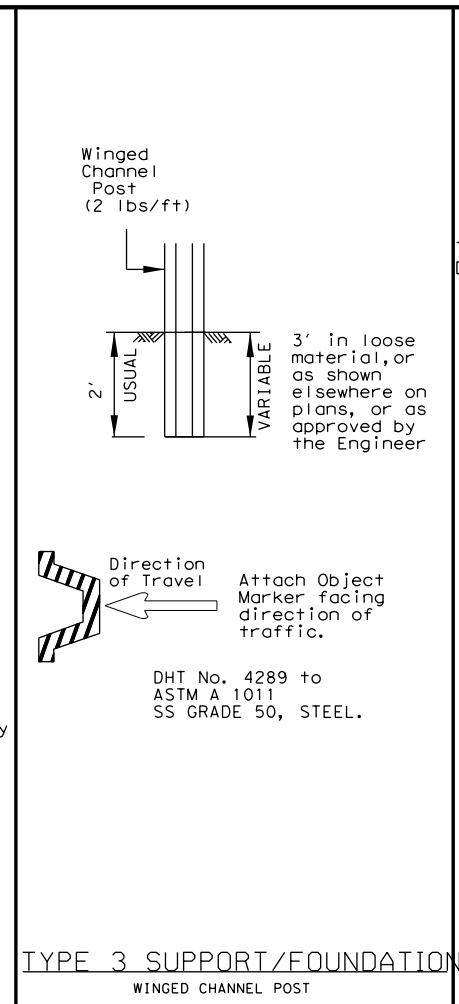
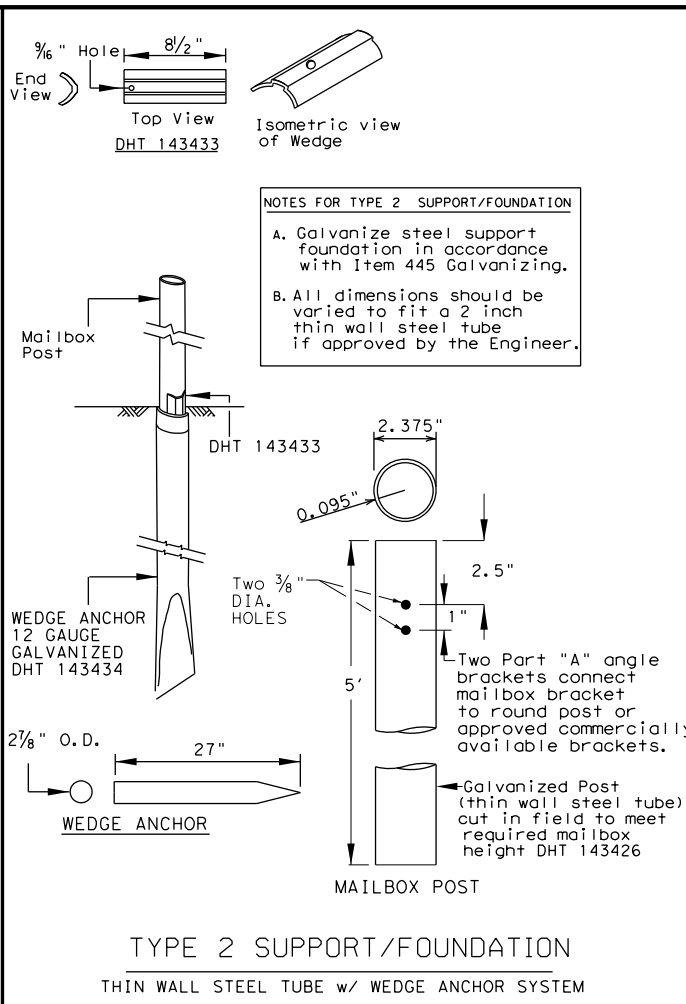
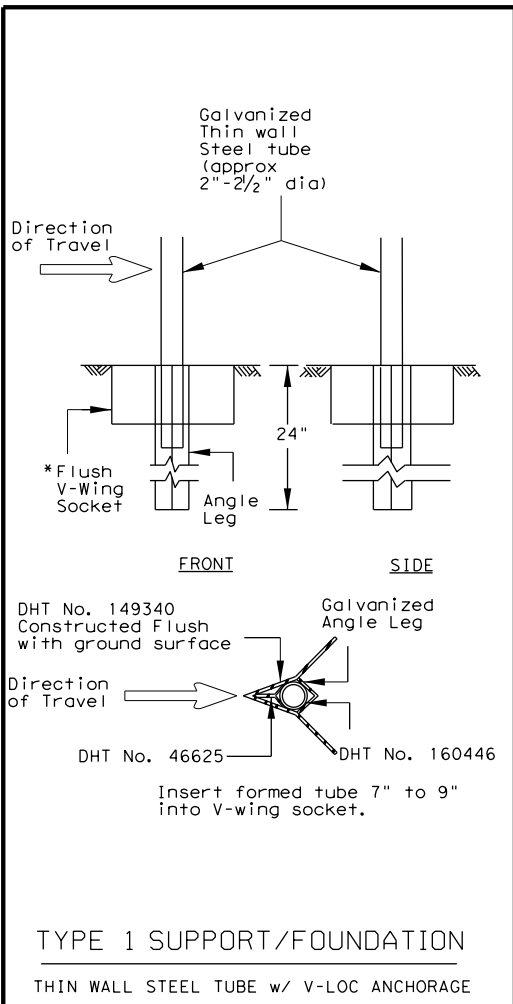
Texas Department of Transportation
 Maintenance Division Standard

MAILBOX BRACKET CONNECTING DETAILS
 MB-15(1)

FILE: MB14(1).DGN	DN: JEO	CK:	DW: JEO	CK:
© TxDOT APRIL 2015	CONT	SECT	JOB	HIGHWAY
ADDED DHT 163730	0902	38	120	GILLILAND RD
	DIST	COUNTY	SHEET NO.	
	FTW	PARKER	42	

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GENERAL NOTES

- Erect post plumb or vertical.
- When galvanized part is required galvanize in accordance with Item 445.
- type 1, 2, 3, 4 or 7 supports or foundations can be used for single or double mailbox installations. The RCR post should be used only for a single installation with a small mailbox. The Type 5 support/foundation is used for the single molded plastic mailbox. The Type 4 support/foundation is used for the 2.375" O.D. RR post, thin wall steel post, and white multiple mailbox post.
- The Type 1 or type 7 support/foundation can be used for a multiple mailbox mount.
- The Type 4 support should be used with thin wall steel pipe for the medium, large and double mailbox installations.
- Use a concrete footing as shown or when directed. Concrete footing will be required when soils do not hold the support/foundations in a stable condition.

MB-(X) ASSM TY (XXX) (X) (XX) ((OPTIONAL))

Type of Mailbox
 S = Single
 D = Double
 M = Multiple
 SP = Single Plastic

Type of Post
 WC = Winged Channel Post
 RR = Recycled Rubber
 TW = Thin Walled White Tubing
 TWG = Thin Walled Galvanized Tubing
 TIM = Timber

Type of Foundation
 Ty 1 = V-Loc
 Ty 2 = Wedge Anchor Steel System
 Ty 3 = Winged Channel Post
 Ty 4 = Wedge Anchor Plastic System
 Ty 5 = 4 X 4 Post
 Ty 7 = Wedge Anchor

Type of Bracket
 AB = Angle Bracket.
 TB = 2.375" Tube Bracket

DOUBLE AND LARGE MAILBOXES MUST BE ON STEEL POST. *HOTP: High density thermoplastic polyesters

Placed on approved plastic drum as shown in the Compliant Work Zone Traffic Control Devices (CWZTCD). Existing attachment hardware shall be used unless damaged. Damaged hardware shall be replaced.

SHEET 3 OF 4

Texas Department of Transportation
 Maintenance Division Standard

MAILBOX SUPPORT AND FOUNDATION
 MB-15(1)

FILE: MB14(1).DGN	DN: JEO	CK:	DW: JEO	CK:
© TxDOT APRIL 2015	CONT	SECT	JOB	HIGHWAY
REVISIONS	0902	38	120	GILLILAND RD
	DIST	COUNTY	SHEET NO.	
	FTW	PARKER	43	

LOCKABLE ARCHITECTURAL MAILBOX

SINGLE-MOUNT INSTALLATION PARTS			
#	PART NAME	PART/DHT #	QTY
1	SOCKET, TYPE 4 FOUNDATION	160891	1
2	WEDGE FOR TYPE 4 FOUNDATION	160892	1
3	THIN-WALL WHITE STEEL TUBE 2.375 OD	162911	1
4	BRACKET FOR ATTACHING MAILBOX	161443	1
5	ARCHITECTURAL MAILBOX	SEE NOTE	1
6	NUT, 5/16" HEX	NUT, 5/16" HEX	1
7	BOLT, 5/16 X 3 HEX	GRADE 5	1
8	PLATE WASHER FOR ARCHITECTURAL MAILBOX	SEE SEE SHEET 2	2
9	WASHER, 3/8 FLAT		8
10	WASHER, 3/8 LOCK		4
11	NUT, 3/8 HEX		4
12	BOLT, 3/8 X 1-1/4 HEX	GRADE 5	4
13	CONCRETE, CLASS B (2000 PSI)		1

LOCKABLE ARCHITECTURAL MAILBOX DETAILS

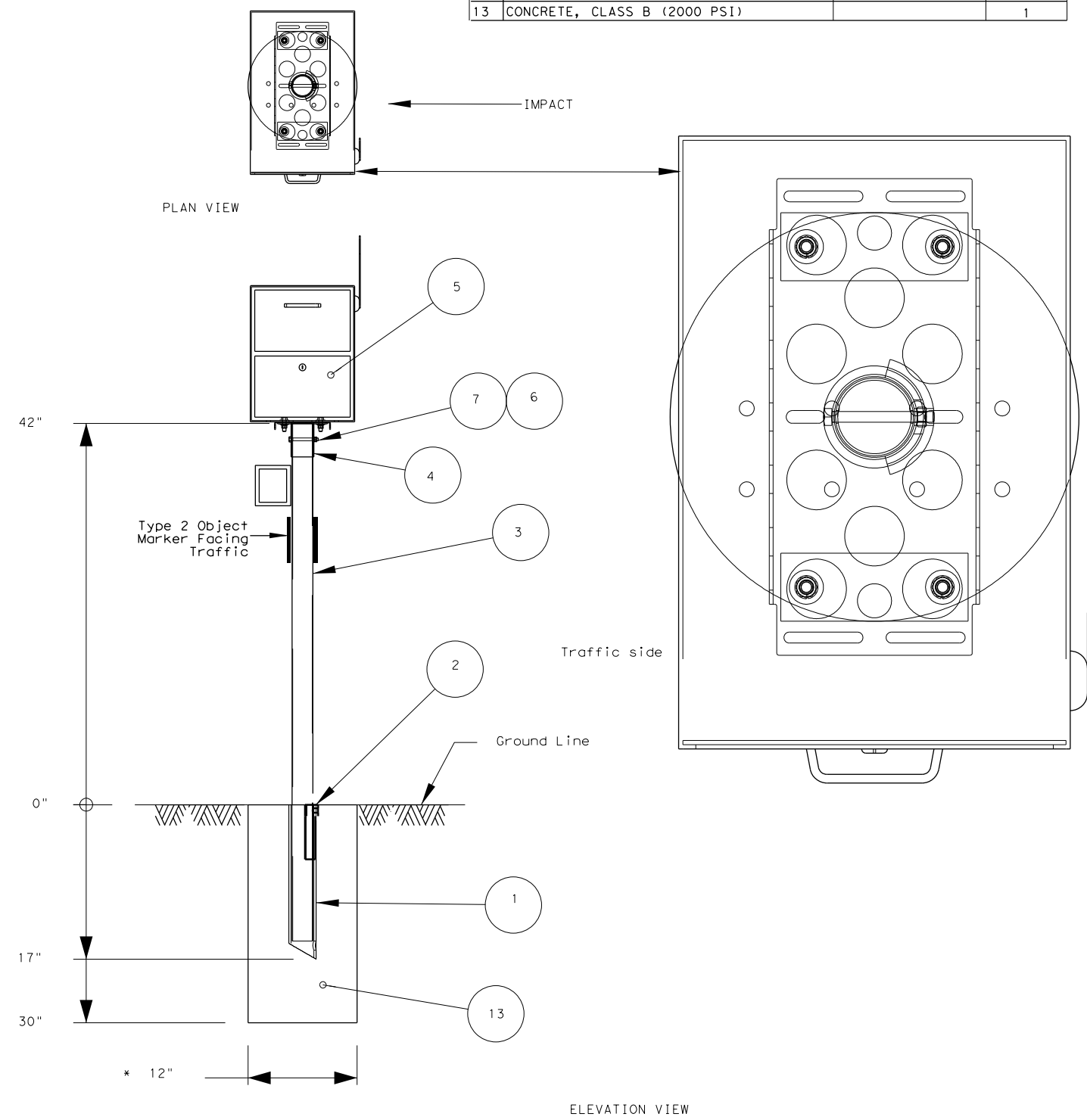


TABLE OF APPLICABLE DHT NUMBERS	
DHT NUMBER	DESCRIPTION
FOUNDATIONS	
46625	WEDGE FOR V-WING SOCKET FOR TYPE 1 FOUNDATION
149340	V-WING SOCKET FOR TYPE 1 FOUNDATION
143433	WEDGE FOR TYPE 2 FOUNDATION
143434	ANCHOR FOR TYPE 2 FOUNDATION
166103	ANCHOR FOR TYPE 7 FOUNDATION
160891	SOCKET FOR TYPE 4 FOUNDATION
160892	WEDGE FOR TYPE 4 FOUNDATION
166104	WEDGE FOR TYPE 7 FOUNDATION
POSTS	
4289	WINGED CHANNEL MAILBOX POST
149339	MULTIPLE MAILBOX POST (GALVANIZED TUBING)
164116	MULTIPLE MAILBOX POST (WHITE COATED)
166114	MULTIPLE MAILBOX POST (WHITE COATED OCTAGONAL)
166153	MULTIPLE MAILBOX POST (GALVANIZED OCTAGONAL)
161442	RECYCLED RUBBER POST. FOR SMALL MAILBOX ONLY
143426	THIN-WALL GALVANIZED STEEL TUBE 2.375" OUTER DIAMETER
162911	THINWALL WHITE STEEL TUBE 2.375" OUTER DIAMETER
	SINGLE OR DOUBLE THIN-WALL MAILBOX POST GALVANIZED
166152	2" OCTAGONAL
	SINGLE OR DOUBLE THIN-WALL MAILBOX POST WHITECOATED
166112	2" OCTAGONAL
REFLECTIVE SHEETING	
161812	REFLECTIVE SHEETING FOR EMERGENCY LOCATION NUMBER PANEL
CONNECTING HARDWARE	
2917	ANGLE BRACKET USED FOR TEMPORARY MAILBOX SUPPORT
166105	BRACKET FOR SINGLE MOUNTING OF MAILBOXES (MOUNTING KIT)
3789	PLATE FOR DOUBLE MOUNTING OF MAILBOXES
166108	BRACKET FOR DOUBLE MOUNTING OF MAILBOXES (MOUNTING KIT)
166111	BRACKET FOR MULTIPLE MOUNTING OF MAILBOXES (MOUNTING KIT)
148939	BRACKET FOR ATTACHING SMALL OR MEDIUM SIZE MAIL BOX
148938	EXTENDER TO BRACKET FOR ATTACHING LARGE MAILBOX
159489	ANGLE BRACKET PART A
159490	ANGLE BRACKET PART B
	BRACKET FOR DOUBLE MOUNTING OF MAILBOXES ON THINWALL
162323	STEEL POST, GALVANIZED OR POWDERCOATED.
	BRACKET FOR ATTACHING MAILBOX TO RECYCLED RUBBER POST
161443	AND TO MULTIPLE WHITE MAILBOX POST
158358	CASTING (NEWSPAPER RECEPTACLE BRACKET)
163731	U-BOLT (NEWSPAPER RECEPTACLE BRACKET)
160698	BOLT;HEX HEAD, GALV;3/8"DIA X 3/4"L HD, W/2-FLAT WASHERS
163750	BOLT;HEX HEAD, GALV;3/8" X 1-1/2, 16 NC, W/WASHERS
160701	BOLT;HEX HEAD, GALV;3/8"DIA X 2-1/2"L, HD, W/2-FLAT WASHERS
163730	BOLT;HEX HEAD, GALV;3/8" X 3-1/2", NC, W/NUT, 2 FLAT WASHERS
160699	BOLT;HEX HEAD, GALV;3/8"DIA X 3-3/4"L HD, W/2-FLAT WASHERS
160700	BOLT;HEX HEAD, GALV;3/8"DIA X 4"L HD, W/2-FLAT WASHERS

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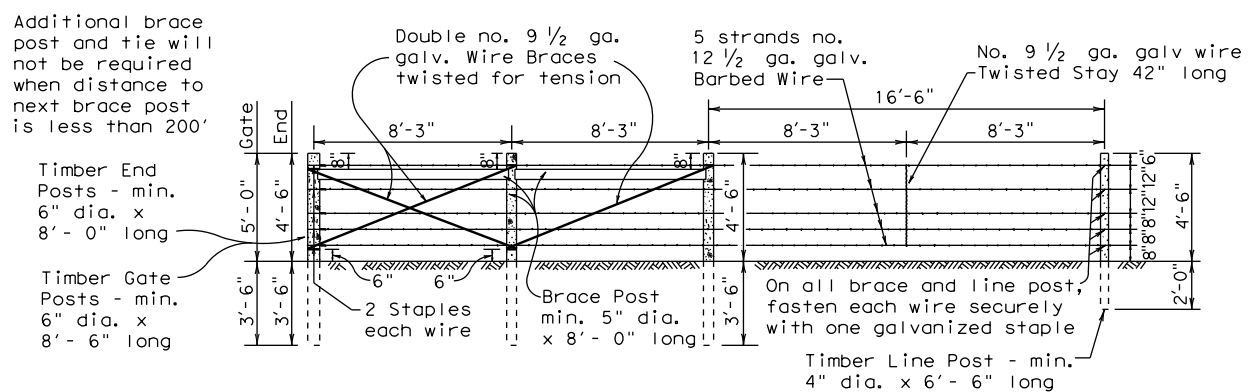


DHT NUMBERS TABLE
MB-15(1)

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© TxDOT APRIL 2015	CONT	SECT	JOB	HIGHWAY
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	FTW	PARKER	44	

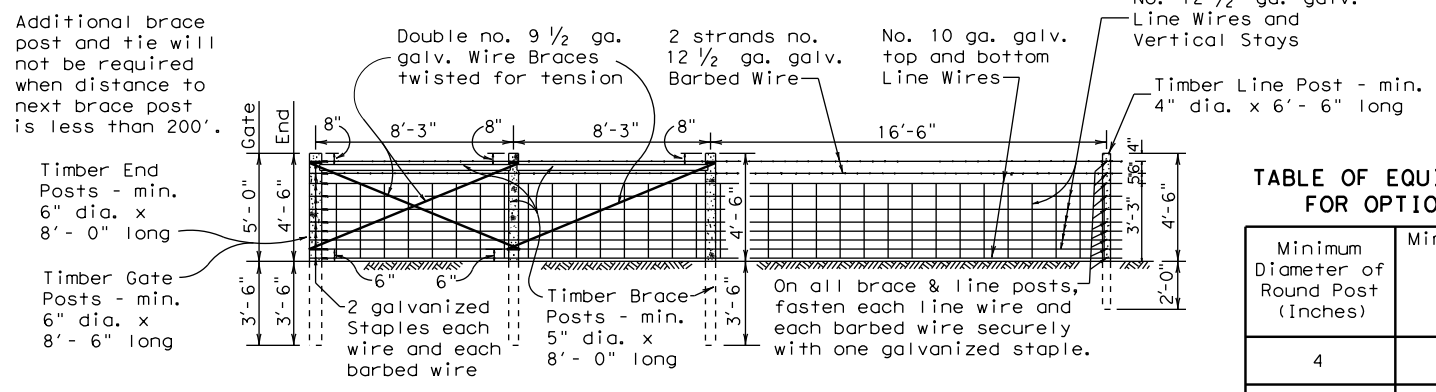
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DATE: 11/5/2020
 FILE: H:\TXPROJ\TX2495-01\Drawings\Standards\ROADWAY\WF (1) - 10.dgn



SECTION GALVANIZED BARBED WIRE FENCE WITH WOOD POSTS
 Bracing Detail Used at Ends and Gates

TYPE "A" FENCE
 (See General Note 6)



SECTION GALVANIZED WOVEN WIRE FENCE WITH WOOD POSTS
 Bracing Detail Used at Ends and Gates

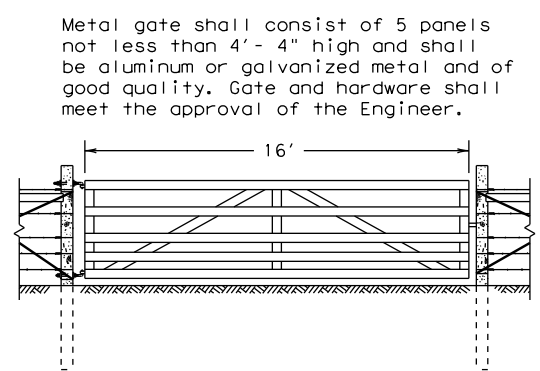
TYPE "B" FENCE
 (See General Note 6)

TABLE OF EQUIVALENT SIZES FOR OPTIONAL SHAPE

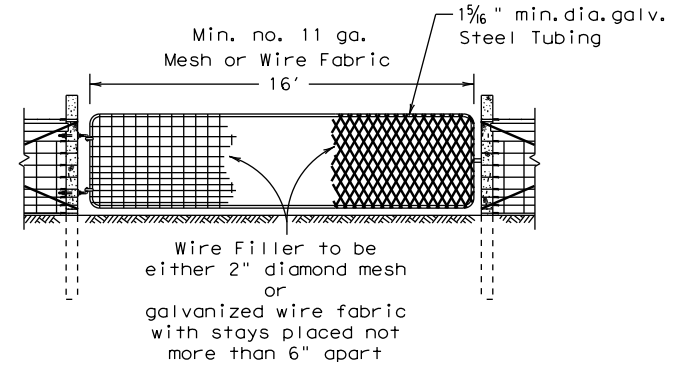
Minimum Diameter of Round Post (Inches)	Minimum Equivalent Dimension for Each Side of Square Post (Inches)
4	3 1/2
5	4 1/2
6	5 1/4

GENERAL NOTES

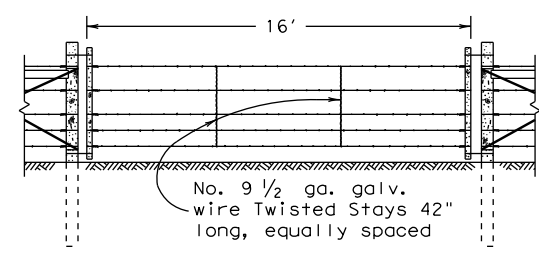
- Any high point which interferes with the placing of wire mesh shall be excavated to provide 2" clearance.
- Latches for Type 1 and Type 2 gates shall be good commercial quality and design latches of the spring, fork or chain type. All latches shall be suitable for the gate and shall be approved by the Engineer.
- Hinges for Type 2 gates shall be commercial design approved by the Engineer suitable for post and gate.
- Concrete shall be of the design and consistency approved by the Engineer and shall contain not less than 4 sacks of cement per cubic yard. Concrete footings are to be crowned at the top to shed water.
- If rock is encountered at a depth less than the embedded depth required, a 15" or larger diameter hole shall be drilled for the post and the post shall be set in concrete. If rock is encountered at a depth of 1'-6" or more below the ground surface, the hole shall be drilled to the required depth. If rock is encountered at a depth less than 1'-6" below the ground surface, the holes shall be drilled a minimum of 2'-0" into the rock or to the depth whichever is the lesser depth.
- Barbed wire shall be in accordance with ASTM A 121 (Class 1) Design designation 12-2-4-1 4R or 12-2-5-1 4R, or as approved by the Engineer.
- Woven Wire Fence (Type B) shall be in accordance with ASTM A 116 (Class 1) No. 12-1/2 Grade 60 (See Table 1 ASTM A 116) to the height and design shown on the plans, or as approved by the Engineer.
- The location of gates and corner posts will be as indicated elsewhere on these plans.
- Square wood posts may be used in lieu of round posts provided minimum equivalent size requirements, as shown are met. All wood posts shall be in accordance with Item 552, "Wire Fence."



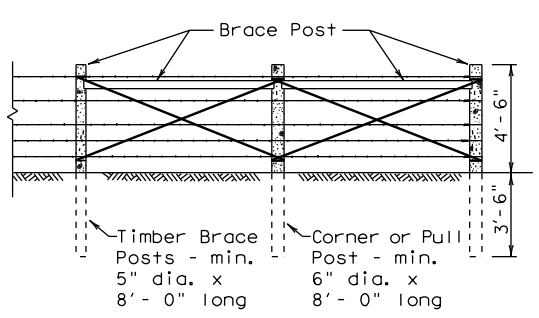
DETAIL TYPE 1 GATE



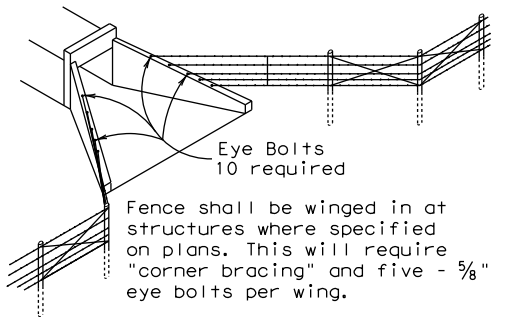
DETAIL TYPE 2 GATE



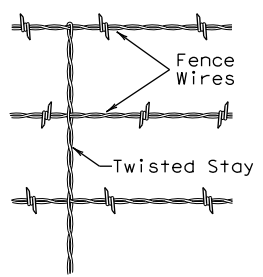
DETAIL TYPE 3 GATE



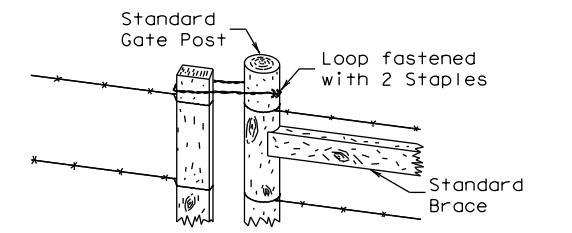
CORNER OR PULL POST ASSEMBLY



DETAIL OF FENCE TREATMENT AT STRUCTURES

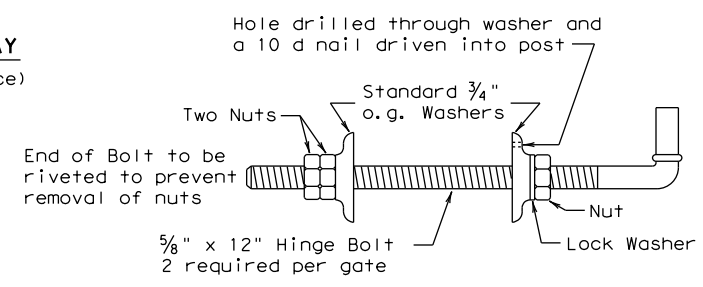


DETAIL OF STAY
 (Barbed wire fence)

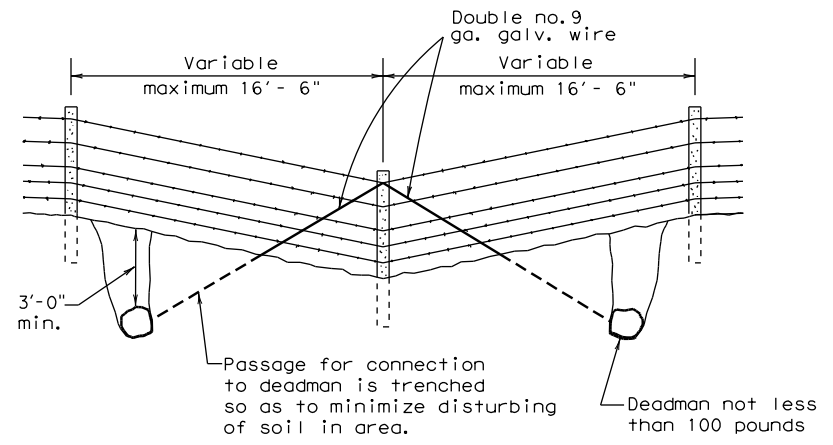


Loop to be made from two strands twisted no. 9 1/2 ga. galv. smooth wire, and to be securely fastened to gate post with two galv. staples.

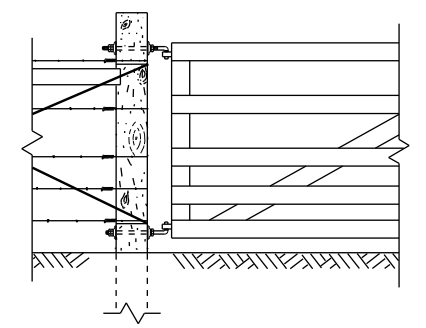
DETAIL FASTENER TYPE 3 GATE



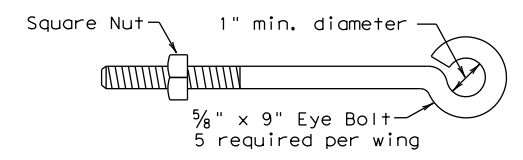
DETAIL OF GATE HINGE BOLT ASSEMBLY



DETAIL OF FENCE SAG
 (Single Line Connection)



DETAIL SHOWING INSTALLATION OF HINGES OF TYPE 1 & 2 GATE



DETAIL OF EYE BOLT

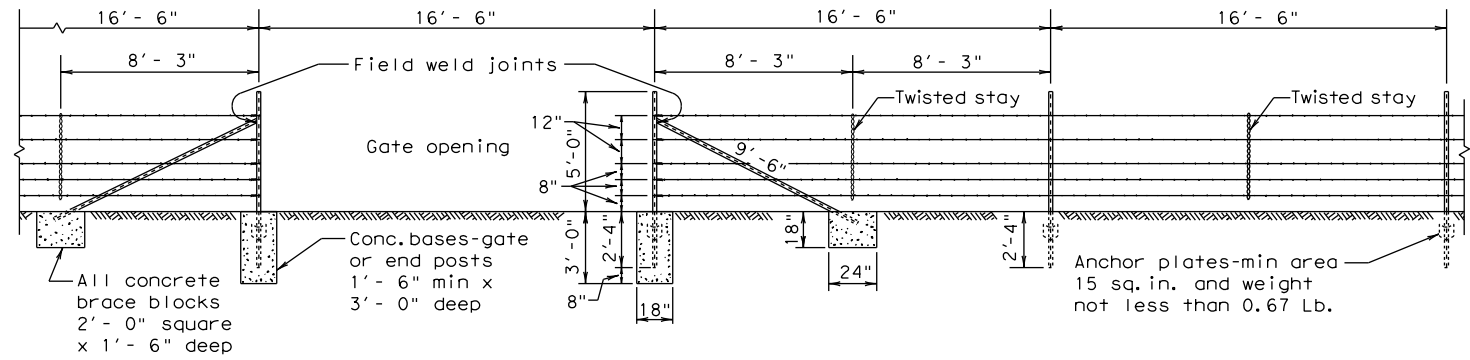
Texas Department of Transportation Design Division Standard

BARBED WIRE AND WOVEN WIRE FENCE (WOOD POSTS) WF (1) - 10

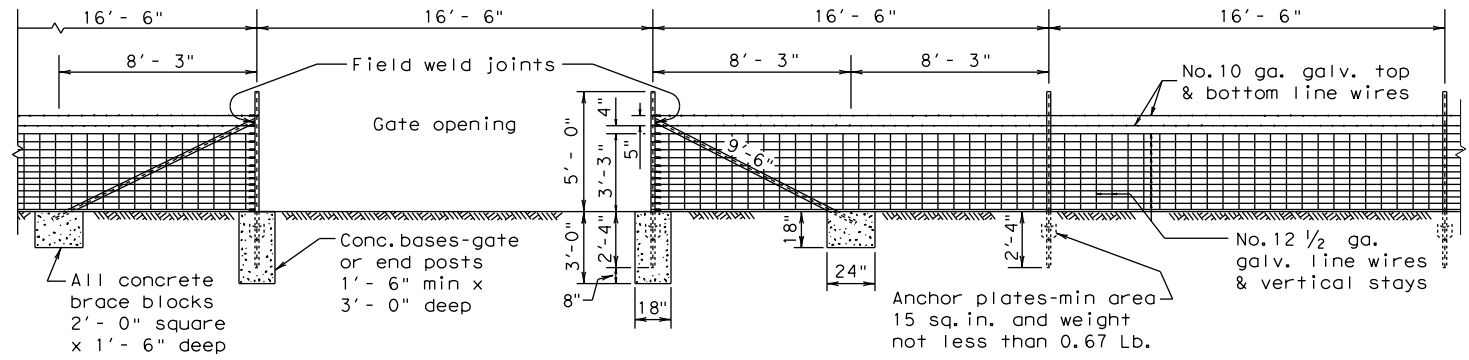
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© TxDOT 1994	CONT	SECT	JOB	HIGHWAY
REVISIONS	0902	38	120	GILLILAND RD
	DIST	COUNTY		SHEET NO.
	FTW	PARKER		45

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DATE: 11/5/2020
 FILE: H:\TXPROJ\TX2495-01\Drawings\Standards\ROADWAY\WF (2) - 10.dgn



SECTION GALVANIZED BARBED WIRE FENCE WITH METAL POSTS
 BRACING DETAIL USED AT ENDS AND GATES
TYPE "C" FENCE
 (See General Note 8)



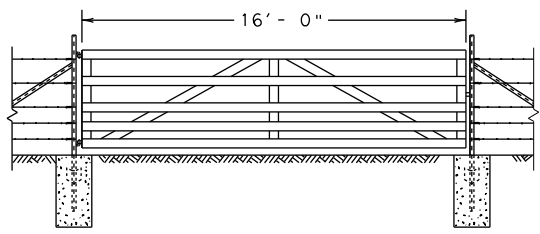
SECTION GALVANIZED WOVEN WIRE FENCE WITH METAL POSTS
 BRACING DETAIL USED AT ENDS AND GATES
TYPE "D" FENCE
 (See General Note 8)

Note:
 For Steel pipe and T-Post requirements.
 (See General Notes 6 & 7)

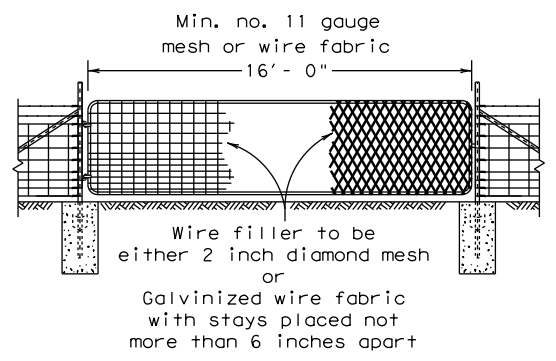
GENERAL NOTES

- Any high point which interferes with the placing of wire mesh shall be excavated to provide a 2 inch clearance.
 - Latches for Type 1 and Type 2 gates shall be good commercial quality and design latch of the spring, fork or chain type. All latches shall be suitable to the gate and shall be approved by the Engineer.
 - Hinges for Type 2 gates shall be a commercial design approved by the Engineer suitable for post and gate.
 - Concrete shall be of the design and consistency approved by the Engineer and shall contain not less than 4 sacks of cement per cubic yard. Concrete footings are to be crowned at the top to shed water.
 - Steel anchor plates shall be of a design and thickness sufficient to prevent turning of the post in firm soil.
 - Steel pipe end posts, corner and pull posts shall be a minimum of 2" Std. pipe (2.375" O.D., 0.154" wall thickness) with a 1/4" Std. pipe brace (1.660" O.D., 0.140" wall thickness), with a 2"x2"x1/4" angle, or other as approved by the Engineer. Fasteners for securing barbed wire or woven wire fence to metal posts shall be a minimum of 11 gauge galvanized steel wire. Tubular posts shall be fitted with water malleable iron caps.
 - If Steel pipe is used for posts and braces, use standard pipe in accordance with ASTM A 53, Class B or A 501. For T-Posts use steel that meets ASTM A 702. Metal line posts shall be not less than 6'-6" in length and shall weigh not less than (1.33 lbs./lin.ft.). These items shall be in accordance with Item 552, "Wire Fence."
 - Barbed Wire shall be in accordance with ASTM A 121, Class 1 Design designation 12-2-4-1 4R or 12-2-5-1 4R, or as approved by the Engineer.
- Woven Wire Fence (Type D) shall be in accordance with ASTM A 116, Class 1 No. 12-1/2 Grade 60 (See Table 1 ASTM A 116) to the height and design shown on the plans, or as approved by the Engineer.
- The location of gates and corner posts will be as indicated elsewhere in these plans.

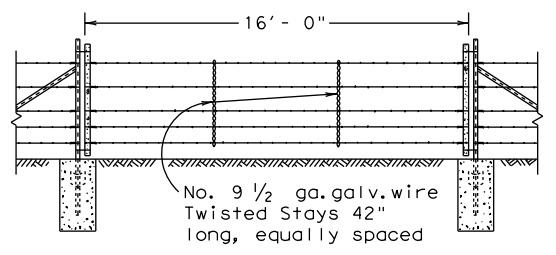
Metal gate shall consist of 5 panels not less than 4'-4" high and shall be aluminum or galvanized metal and of good quality. Gate and hardware shall meet the approval of the engineer.



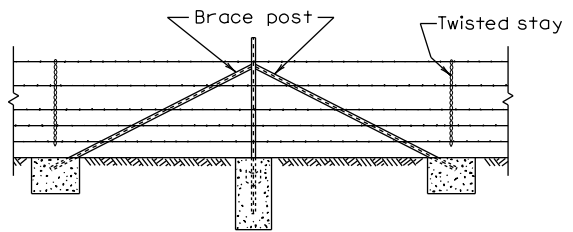
DETAIL TYPE 1 GATE



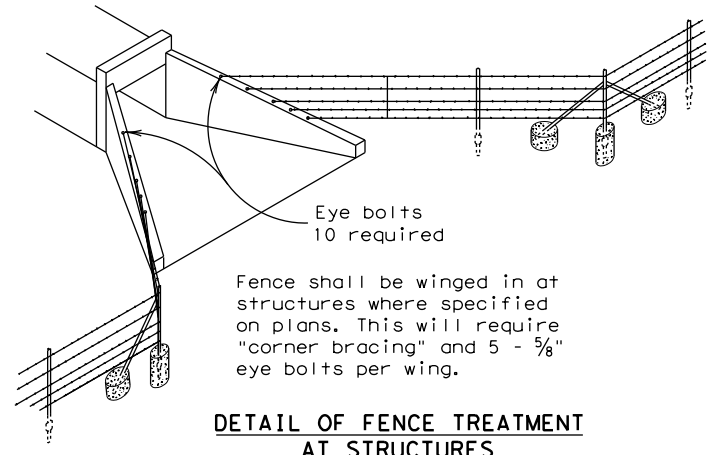
DETAIL TYPE 2 GATE



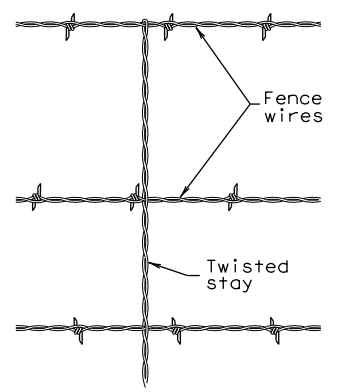
DETAIL TYPE 3 GATE



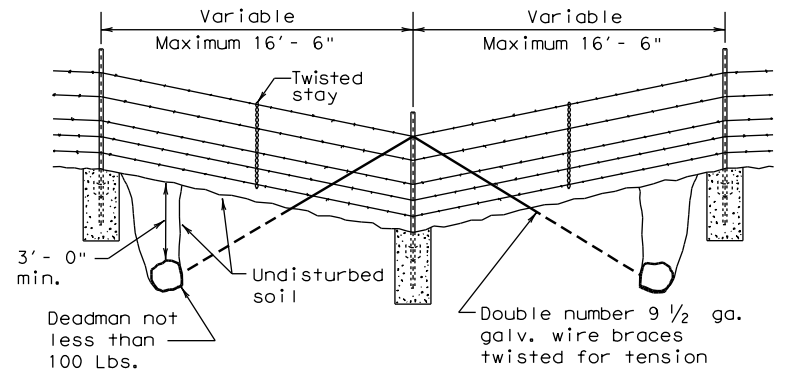
CORNER OR PULL POST ASSEMBLY



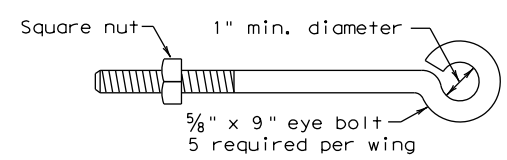
DETAIL OF FENCE TREATMENT AT STRUCTURES



DETAIL OF STAY (Barbed Wire Fence)



DETAIL OF FENCE SAG

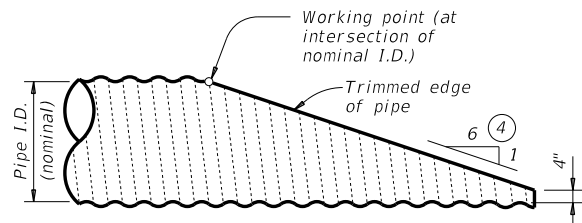


DETAIL OF EYE BOLT

		Design Division Standard	
BARBED WIRE AND WOVEN WIRE FENCE (STEEL POSTS)			
WF (2) - 10			
FILE: wf210.dgn	DN: TxDOT	CK: AM	DW: VP
© TxDOT 1996	CONT SECT	JOB	HIGHWAY
REVISIONS	0902 38	120	GILLILAND RD
	DIST	COUNTY	SHEET NO.
	FTW	PARKER	46

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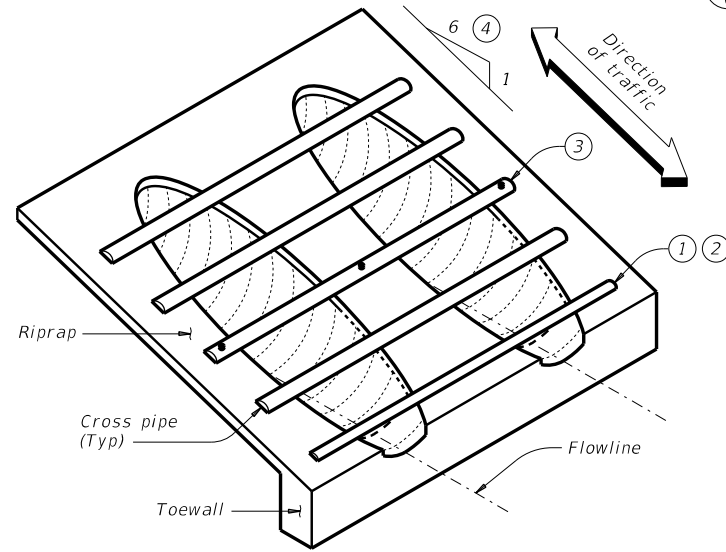
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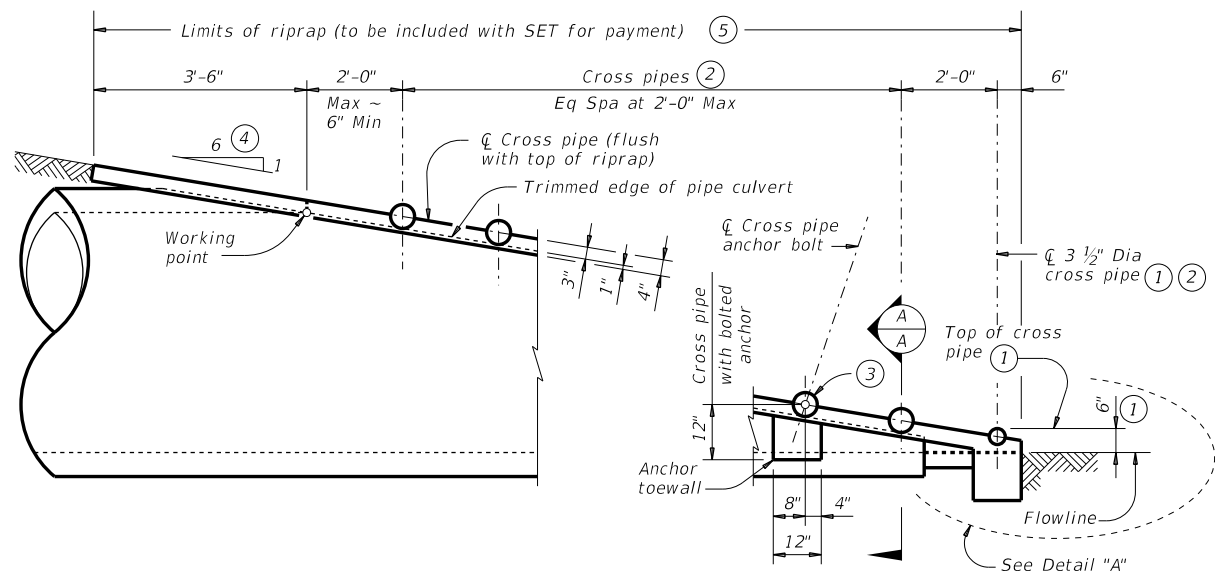
NOTE: All cross pipes, calculations, and dimensions are based on the pipe culverts mitered as shown in this detail. Alternate styles of mitered ends will require that appropriate adjustments be made to the values presented on this standard.

SIDE ELEVATION OF TYPICAL PIPE CULVERT MITER

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

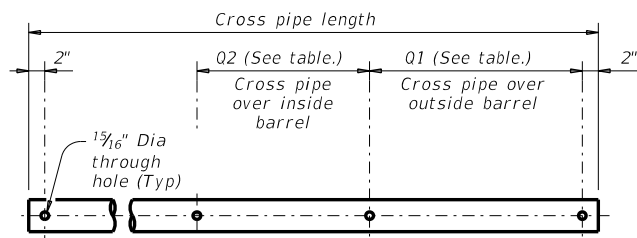


ISOMETRIC VIEW OF TYPICAL INSTALLATION

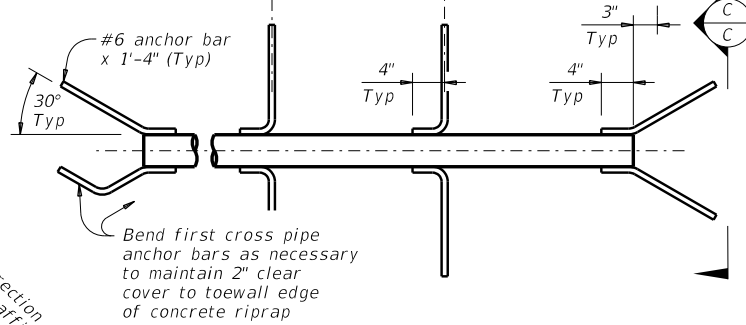


SIDE ELEVATION OF CAST-IN-PLACE CONCRETE

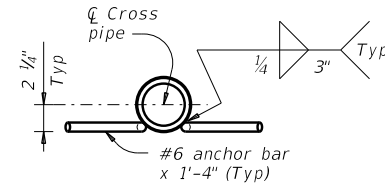
(Showing reinforced concrete pipe (RCP) culvert. Details at corrugated metal pipe (CMP) culvert are similar.)



PIPE WITH BOLTED ANCHOR

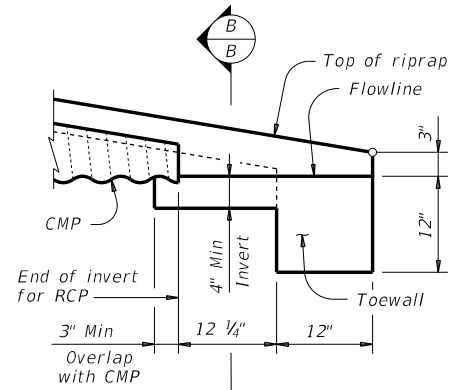


PIPE WITH ANCHOR BARS



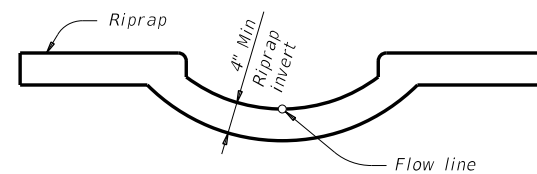
SECTION C-C

CROSS PIPE DETAILS



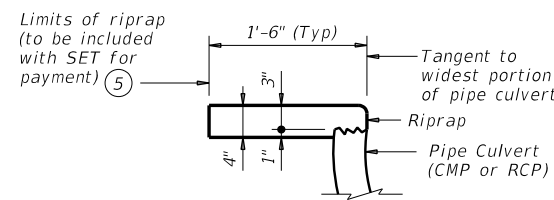
DETAIL "A"

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

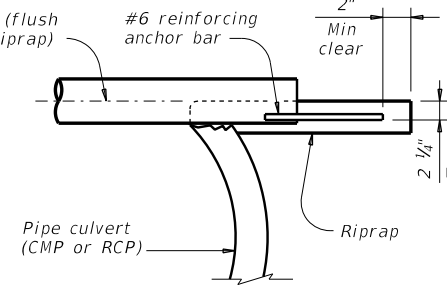


SECTION B-B

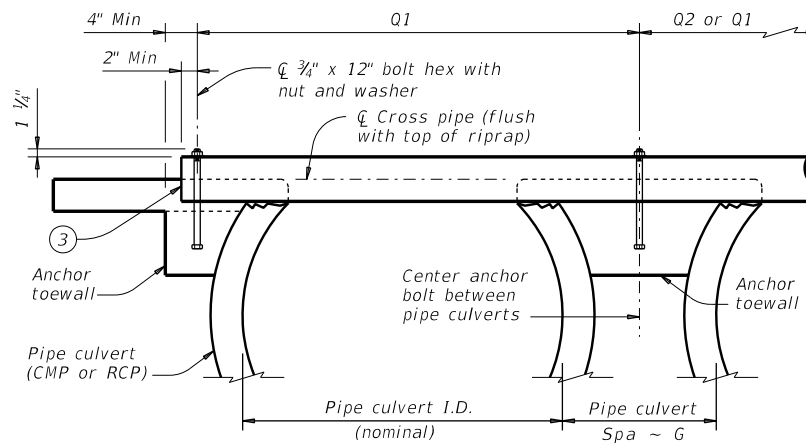
(Cross pipes not shown for clarity.)



SHOWING TYPICAL PIPE CULVERT AND RIPRAP



SHOWING CROSS PIPE WITH ANCHOR BAR



SHOWING CROSS PIPE WITH BOLTED ANCHOR

SECTION A-A

CROSS PIPE LENGTHS, REQUIRED PIPE SIZES, AND RIPRAP QUANTITIES

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

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

MATERIAL NOTES:

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

GENERAL NOTES:

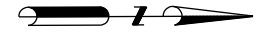
Cross pipes are designed for a traversing load of 10,000 pounds at yield as recommended by Research Report 280-2F, "Safety Treatment of Roadside Parallel-Drainage Structures", Texas Transportation Institute, March 1981. Safety end treatments (SET) shown herein are intended for use in those installations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

Texas Department of Transportation
 Bridge Division Standard

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

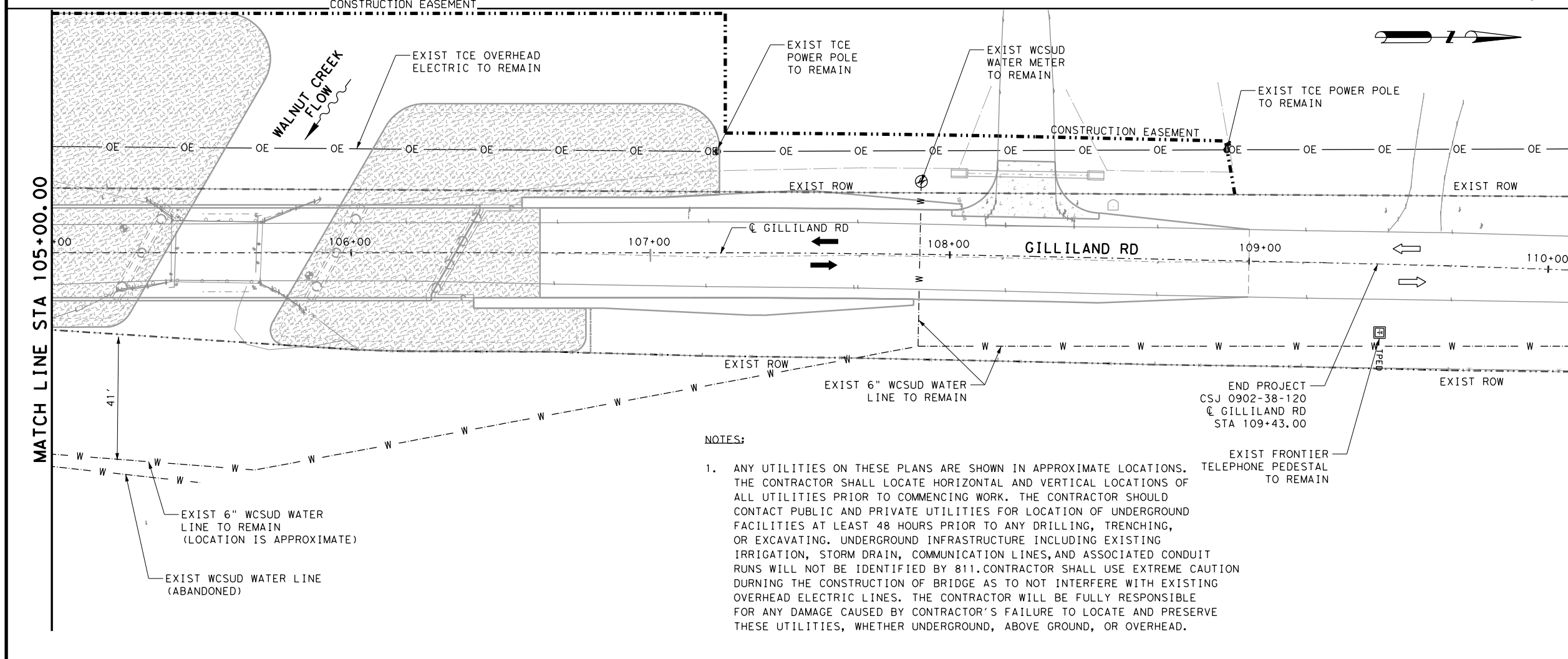
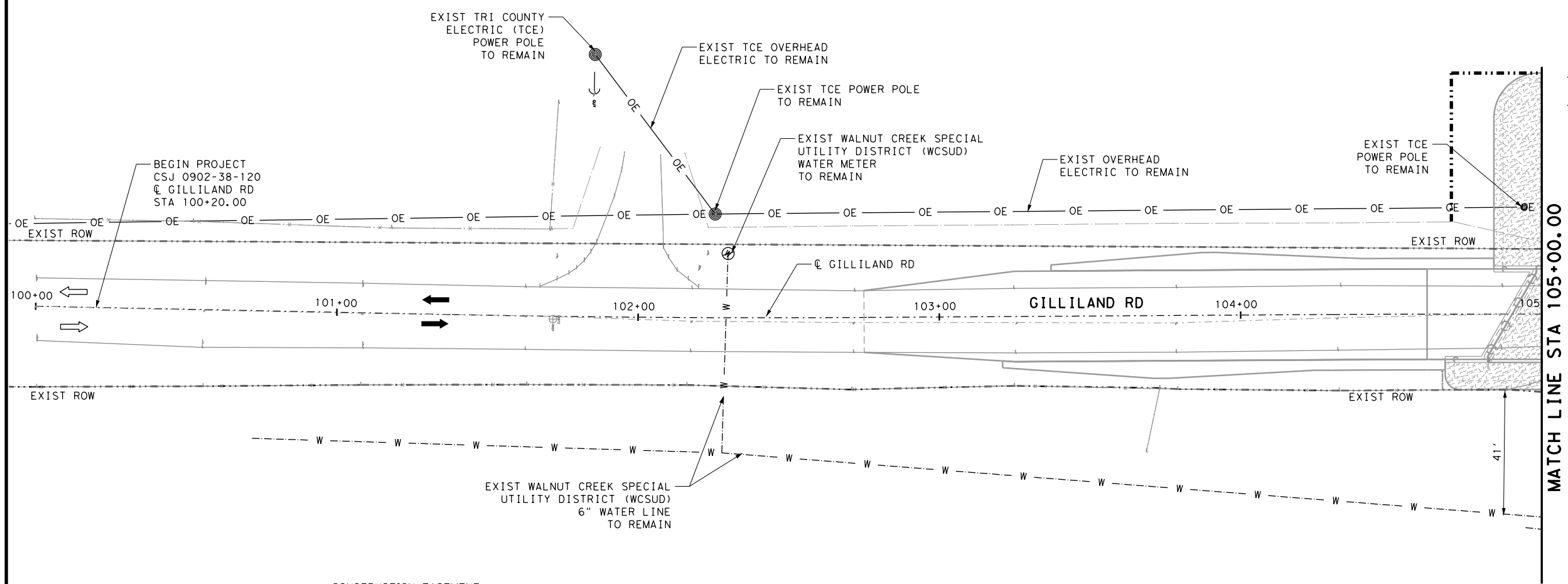
SETP-PD

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©TxDOT February 2020	CONT	SECT	JOB	HIGHWAY
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	FTW	PARKER	47	



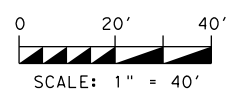
LEGEND

- OE — TCE OVERHEAD ELECTRIC
- - - W - - - WCSUD 6" WATER LINE
- TCE POWER POLE
- ⊙ WCSUD WATER METER
- ➡ PROP TRAFFIC
- ➡ EXIST TRAFFIC
- ⤿ WATER FLOW



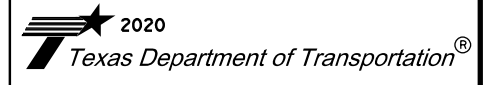
NOTES:

1. ANY UTILITIES ON THESE PLANS ARE SHOWN IN APPROXIMATE LOCATIONS. THE CONTRACTOR SHALL LOCATE HORIZONTAL AND VERTICAL LOCATIONS OF ALL UTILITIES PRIOR TO COMMENCING WORK. THE CONTRACTOR SHOULD CONTACT PUBLIC AND PRIVATE UTILITIES FOR LOCATION OF UNDERGROUND FACILITIES AT LEAST 48 HOURS PRIOR TO ANY DRILLING, TRENCHING, OR EXCAVATING. UNDERGROUND INFRASTRUCTURE INCLUDING EXISTING IRRIGATION, STORM DRAIN, COMMUNICATION LINES, AND ASSOCIATED CONDUIT RUNS WILL NOT BE IDENTIFIED BY 811. CONTRACTOR SHALL USE EXTREME CAUTION DURING THE CONSTRUCTION OF BRIDGE AS TO NOT INTERFERE WITH EXISTING OVERHEAD ELECTRIC LINES. THE CONTRACTOR WILL BE FULLY RESPONSIBLE FOR ANY DAMAGE CAUSED BY CONTRACTOR'S FAILURE TO LOCATE AND PRESERVE THESE UTILITIES, WHETHER UNDERGROUND, ABOVE GROUND, OR OVERHEAD.



[Signature]

11/5/2020



**GILLILAND ROAD AT WALNUT CREEK
UTILITY LAYOUT
BEGIN CSJ TO END CSJ**

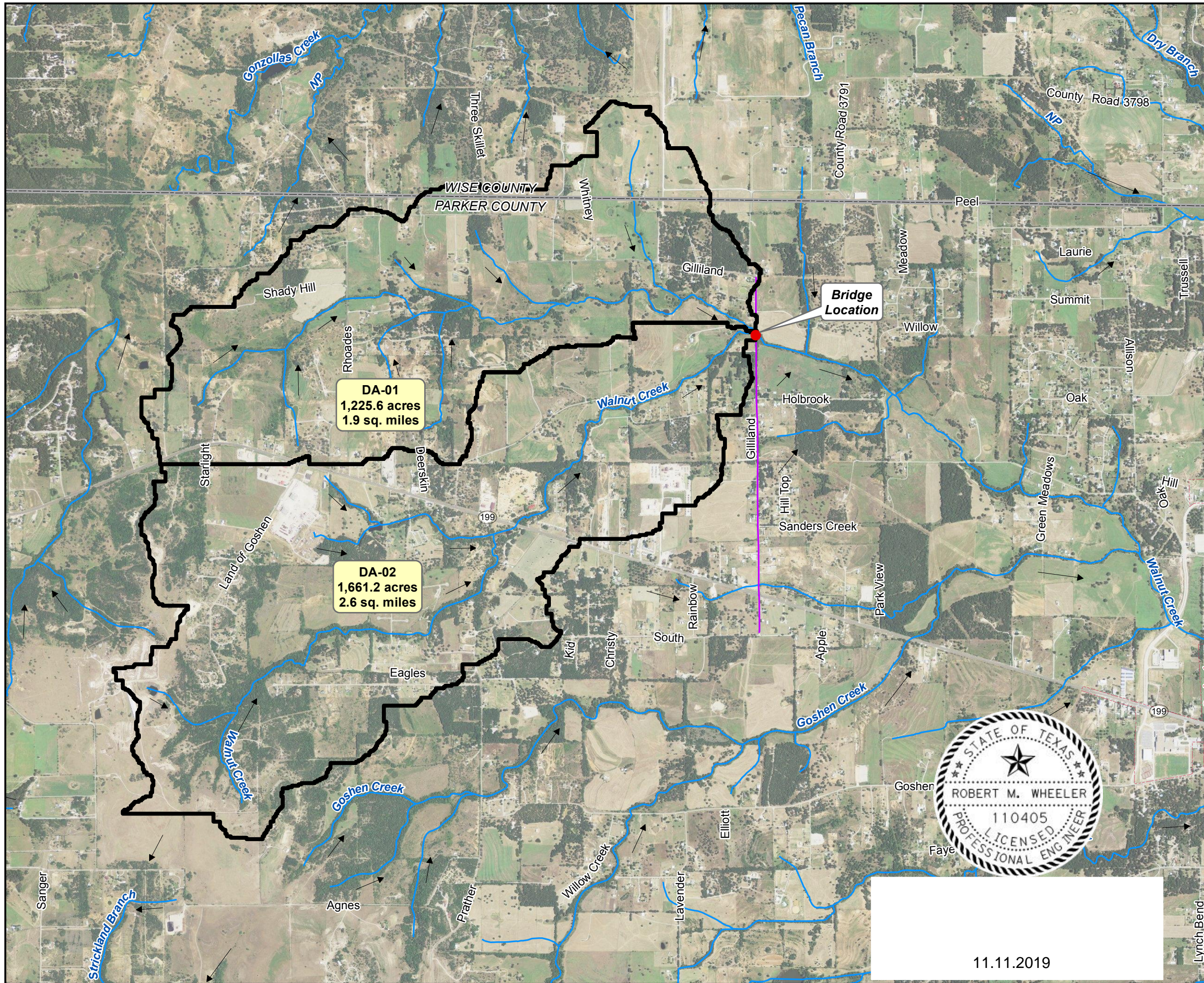
SHEET 1 OF 1

FED RD DIV NO.	FEDERAL AID PROJECT	SHEET NO.	
6	SEE TITLE SHEET	48	
STATE	DISTRICT	COUNTY	
TEXAS	FTW	PARKER	
CONTROL	SECTION	JOB	HIGHWAY
0902	38	120	GILLILAND RD

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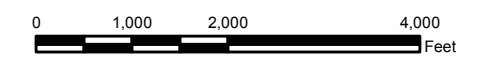
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Vicinity Map

LEGEND

- Bridge Location
- Gilliland Road
- Drainage Area Boundary
- County Boundary
- City Boundary
- ~ Stream Centerline
- General Flow Direction



Aerial photography from NAIP, USDA, 2012;
Stream centerline from FEMA.



11.11.2019

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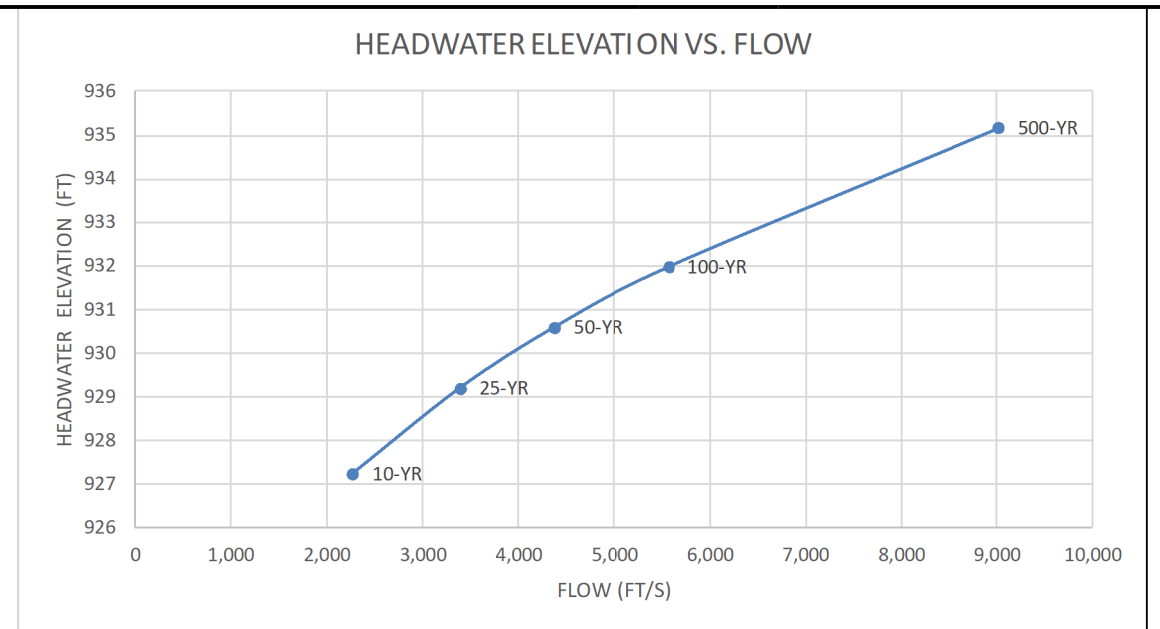
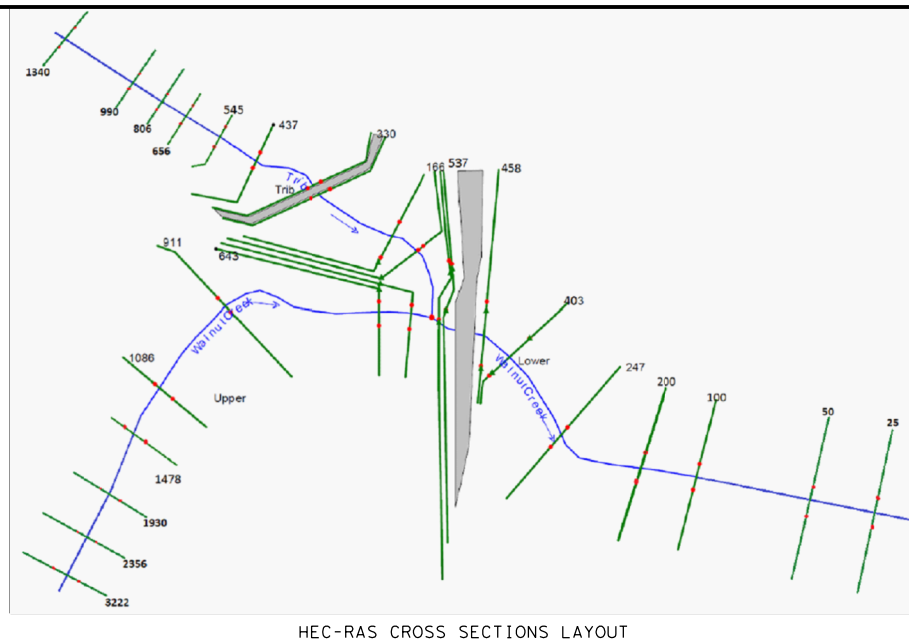
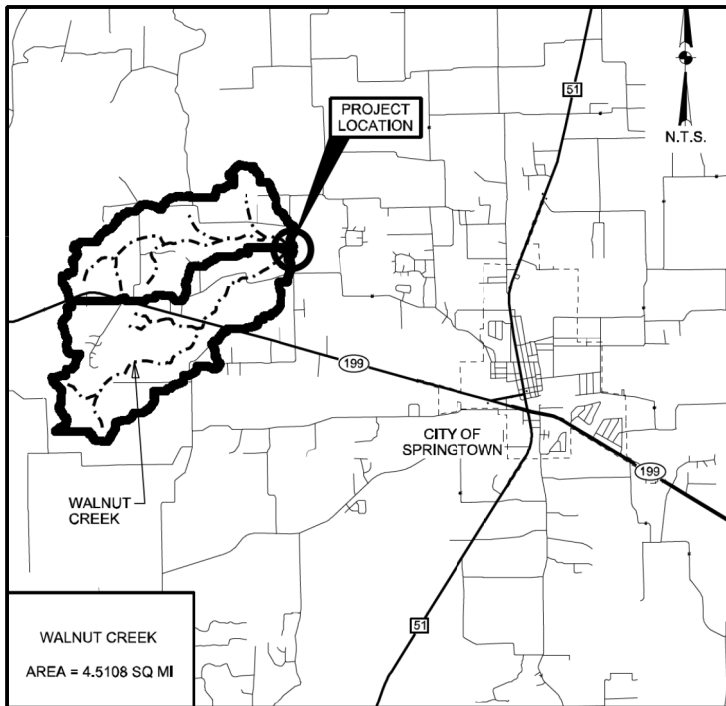
Texas Department of Transportation
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GILLILAND ROAD BRIDGE AT WALNUT CREEK
HYDRAULIC ANALYSIS

Offsite Drainage Area Map

SHEET 1 OF 1

FED. RD. DIV. NO.	STATE	PROJECT NO.			HIGHWAY NO.
6	TEXAS				GILLILAND
STATE DISTRICT	COUNTY	CONTROL NO.	SECTION NO.	JOB NO.	EXHIBIT NO.
FTW	PARKER	0902	38	120	49



HYDRAULIC METHOD

PROJECT HEC-RAS MODEL WAS DEVELOPED USING SURVEYED TOPOGRAPHIC AND CROSS-SECTION DATA, NCTCOG CONTOUR TOPOGRAPHY.

HYDROLOGIC METHOD

FLows FOR 10-YEAR, 25-YEAR, 50-YEAR, 100-YEAR, AND 500-YEAR FREQUENCIES WERE COMPUTED USING TXDOT OMEGA-EM REGRESSION EQUATIONS

NOTES:

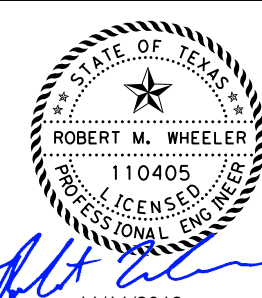
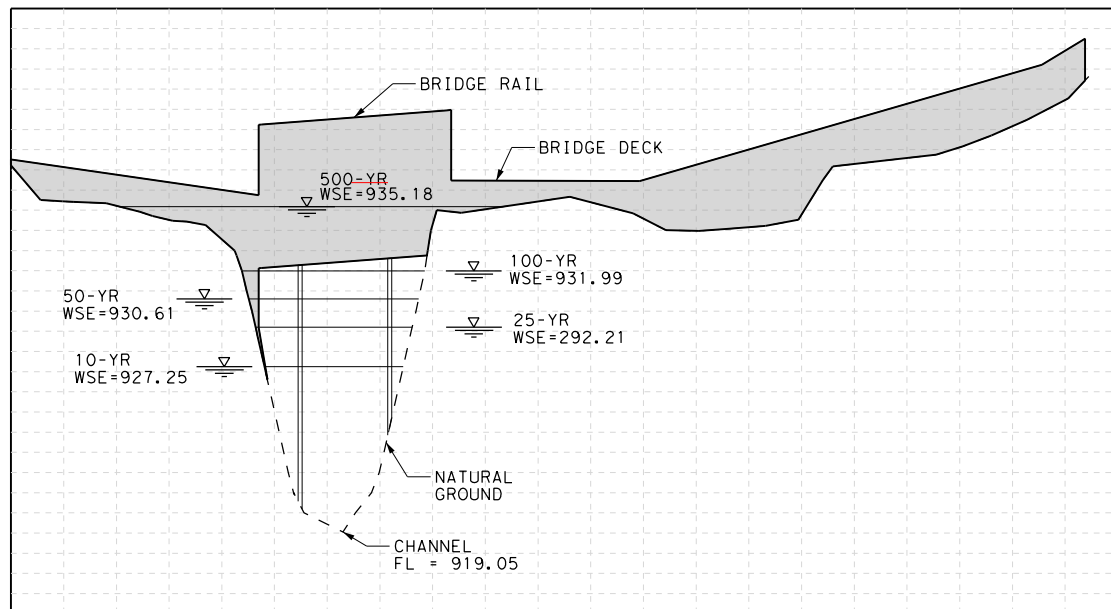
1. DATA PRESENTED FROM HYDROLOGIC AND HYDRAULIC ANALYSIS FOR GILLILAND ROAD BRIDGE REPLACEMENT AT WALNUT CREEK, DATED SEPTEMBER 2017, BY LJA ENGINEERING.
2. PROPOSED BRIDGE IS LOCATED AT HEC-RAS STATION 500, BETWEEN STA 521 (UPSTREAM) AND STA 455 (DOWNSTREAM).
3. PROPOSED BRIDGE: 32 FEET IN WIDTH, 180 FEET IN LENGTH.
4. PROJECT DATUM: NAD 83 (HORIZONTAL), NAVD 88 (VERTICAL)
5. ALL ELEVATIONS SHOWN REFLECT THE PROJECT DATUM.
6. THIS SITE IS DESIGNATED AS ZONE "A" & ZONE "X" AS SHOWN ON FEMA FIRM PANEL NO. 48367C0175E. COORDINATION COMPLETED WITH LOCAL ADMINISTRATOR FOR PARKER COUNTY, TEXAS, KIRK FUQUA, ON SEPTEMBER 14, 2018.
7. HYDRAULIC COMPUTATIONS BASED ON CURRENT CONDITIONS FOR THE EXISTING HEC-RAS ANALYSIS. THE PROPOSED HEC-RAS ANALYSIS WAS DEVELOPED WITH CURRENT INFORMATION AND BRIDGE LAYOUTS BY AIA INC.
8. THE BOUNDARY CONDITION USED FOR THE EXISTING AND PROPOSED HEC-RAS ANALYSIS WAS NORMAL DEPTH (SLOPE, S=0.005 FT/FT).
9. EXISTING WSE CAN BE FOUND IN TABLE.

CROSS SECTION	STORM EVENT	EXISTING			PROPOSED			Difference	
		PEAK Q (cfs)	WSE (ft)	VELOCITY (ft/s)	PEAK Q (cfs)	WSE (ft)	VELOCITY (ft/s)	WSE (ft)	VELOCITY (ft/s)
3222	10_YR	1511	945.22	5.38	1511	945.22	5.38	0	0
3222	100_YR	3525	947.81	6.80	3525	947.81	6.80	0	0
2356	10_YR	1511	942.70	4.23	1511	942.70	4.23	0	0
2356	100_YR	3525	945.19	5.46	3525	945.19	5.46	0	0
1930	10_YR	1511	937.20	9.16	1511	937.20	9.16	0	0
1930	100_YR	3525	939.30	10.86	3525	939.30	10.86	0	0
1478	10_YR	1511	931.84	6.72	1511	931.85	6.71	0.01	-0.01
1478	100_YR	3525	936.76	5.49	3525	935.28	7.11	-1.48	1.62
1086	10_YR	1511	930.00	6.04	1511	928.71	7.55	-1.29	1.51
1086	100_YR	3525	935.89	6.39	3525	932.32	10.01	-3.57	3.62
911	10_YR	1511	929.94	4.18	1511	928.18	6.24	-1.76	2.06
911	100_YR	3525	936.10	3.33	3525	932.69	5.68	-3.41	2.35
643	10_YR	1511	929.74	3.55	1511	927.39	5.79	-2.35	2.24
643	100_YR	3525	936.11	1.91	3525	932.56	4.18	-3.55	2.27
590	10_YR	1511	929.79	2.45	1511	927.53	3.77	-2.26	1.32
590	100_YR	3525	936.11	1.77	3525	932.56	3.83	-3.55	2.06

CROSS SECTION	STORM EVENT	EXISTING			PROPOSED			Difference	
		PEAK Q (cfs)	WSE (ft)	VELOCITY (ft/s)	PEAK Q (cfs)	WSE (ft)	VELOCITY (ft/s)	WSE (ft)	VELOCITY (ft/s)
1340	10_YR	1155	941.44	3.57	1155	941.44	3.57	0	0
1340	100_YR	2596	942.93	4.14	2596	942.93	4.14	0	0
990	10_YR	1155	940.05	5.08	1155	940.05	5.08	0	0
990	100_YR	2596	941.64	6.29	2596	941.63	6.30	-0.01	0.01
806	10_YR	1155	937.65	8.21	1155	937.65	8.21	0	0
806	100_YR	2596	939.22	9.72	2596	939.23	9.69	0.01	-0.03
656	10_YR	1155	932.58	6.25	1155	932.58	6.25	0	0
656	100_YR	2596	935.90	5.22	2596	933.51	9.85	-2.39	4.63
545	10_YR	1155	930.95	6.71	1155	930.95	6.72	0	0.01
545	100_YR	2596	935.98	2.86	2596	933.44	5.11	-2.54	2.25
437	10_YR	1155	930.15	5.25	1155	930.12	5.27	-0.03	0.02
437	100_YR	2596	935.87	4.04	2596	933.05	6.54	-2.82	2.5
330	10_YR	1155	930.15	4.12	1155	930.12	4.14	-0.03	0.02
330	100_YR	2596	935.89	3.25	2596	933.04	5.68	-2.85	2.43
316	PRIVATE DRIVEWAY BRIDGE								
312	10_YR	1155	930.10	3.93	1155	930.07	3.95	-0.03	0.02
312	100_YR	2596	935.85	3.25	2596	932.65	5.71	-3.2	2.46
166	10_YR	1155	930.13	2.30	1155	930.10	2.30	-0.03	0
166	100_YR	2596	935.84	2.52	2596	932.70	3.62	-3.14	1.1
117	10_YR	1155	929.38	7.74	1155	929.11	8.85	-0.27	1.11
117	100_YR	2596	935.79	2.70	2596	932.37	5.66	-3.42	2.96
537	10_YR	2278	929.73	2.67	2278	927.40	3.97	-2.33	1.3
537	100_YR	5564	936.01	2.87	5564	932.22	5.18	-3.79	2.31
528	10_YR	2278	929.57	3.84	2278	927.25	4.72	-2.32	0.88
528	100_YR	5564	935.92	3.63	5564	931.99	6.11	-3.93	2.48
500	GILLILAND BRIDGE								
458	10_YR	2278	926.29	6.32	2278	926.45	4.55	0.16	-1.77
458	100_YR	5564	930.47	8.85	5564	930.95	5.96	0.48	-2.89
403	10_YR	2278	926.16	5.77	2278	926.23	5.06	0.07	-0.71
403	100_YR	5564	930.38	7.93	5564	930.55	7.03	0.17	-0.9
247	10_YR	2278	925.91	5.33	2278	925.91	5.33	0	0
247	100_YR	5564	929.90	8.49	5564	929.90	8.49	0	0
200	10_YR	2278	925.59	5.11	2278	925.59	5.11	0	0
200	100_YR	5564	929.32	8.46	5564	929.32	8.46	0	0
100	10_YR	2278	921.16	8.67	2278	921.16	8.67	0	0
100	100_YR	5564	923.12	10.62	5564	923.12	10.62	0	0
50	10_YR	2278	914.77	3.47	2278	914.77	3.47	0	0
50	100_YR	5564	917.68	4.71	5564	917.68	4.71	0	0
25	10_YR	2278	913.10	5.34	2278	913.10	5.34	0	0
25	100_YR	5564	915.77	7.06	5564	915.77	7.06	0	0

Regression Equation Variables	
Drainage Area (A)	4.51 SQ. MI.
Mean Annual Precipitation (P)	33.5 IN
Omega Value (*)	0.175
Channel Slope (S)	0.01 FT/FT

HEC-RAS STATION - 500
CROSS SECTION SHOWN FACING DOWNSTREAM ALONG WALNUT CREEK



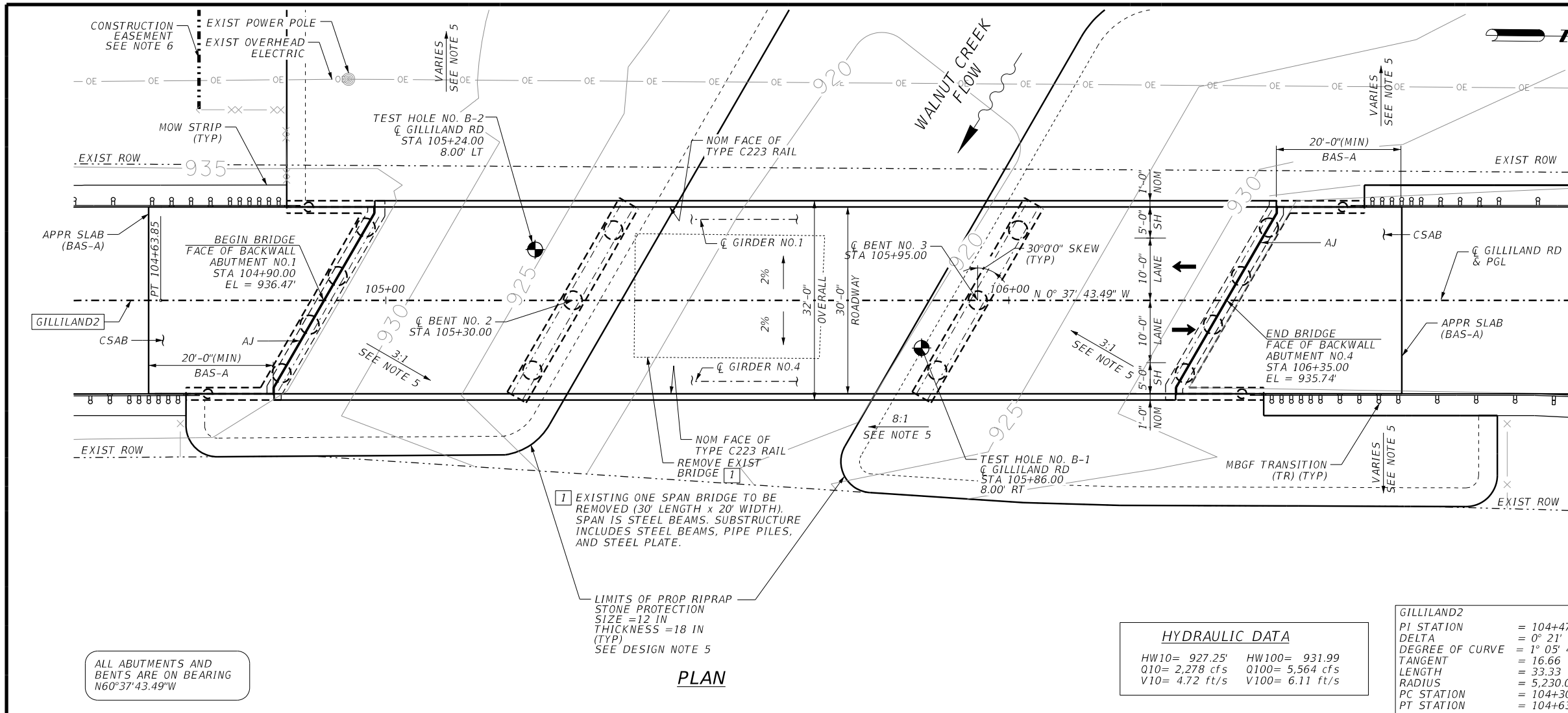
LJA Engineering, Inc.
FRN - F-1386

2019
Texas Department of Transportation

GILLILAND ROAD
AT WALNUT CREEK

GILLILAND ROAD
AT WALNUT CREEK
HYDRAULIC DATA SHEET

FED RD DIV NO.	FEDERAL AID PROJECT	SHEET NO.	
6	BR 2015 (333)	50	
STATE	DISTRICT	COUNTY	
TEXAS	FTW	PARKER	
CONTROL	SECTION	JOB	HIGHWAY
0902	38	120	GILLILAND ROAD



LEGEND

- ➔ PROPOSED TRAFFIC
- ⊕ ABUT OR BENT NUMBER
- GILLILAND# CURVE NAME
- ▭ CHANNEL EXCAVATION

- DESIGN NOTES:**
- BRIDGE DESIGNED FOR HL-93 LOADING PER AASHTO LRFD BRIDGE DESIGN SPECIFICATION 8TH EDITION (2017).
 - FUNCTIONAL CLASS = LOCAL ROAD
DESIGN SPEED = 40 MPH
EXIST ADT = 1,090 (2013)
PROP ADT = 1,200 (2033)
EXIST NBI NO. = 02-184-0-AA02-20-001
PROP NBI NO. = 02-184-0-AA02-20-002
 - CONTRACTOR MUST LOCATE ALL UTILITIES AND INFORM ENGINEER IN WRITING OF ANY CONFLICTS PRIOR TO BEGINNING CONSTRUCTION.
 - HYDRAULIC DATA OBTAINED FROM CONSULTANT LJA.
 - REFER TO "GRADING LAYOUT" FOR PROPOSED RIPRAP LIMITS.
 - REFER TO "CONSTRUCTION EASEMENT LAYOUT" FOR MORE INFORMATION.
 - "D" DENOTES BENT WITH D BARS FOR EXTERIOR BEAMS WITH SLOTTED HOLE.

- FOUNDATION NOTES:**
- ALL DRILLED SHAFTS AT ABUTMENTS AND BENTS ARE DESIGNED FOR COMBINED SKIN FRICTION AND POINT BEARING.
 - FOUND DRILLED SHAFTS AT THE ELEVATION SHOWN OR DEEPER AS NECESSARY TO PENETRATE CLAYSTONE LAYER TO THE FOLLOWING MINIMUM DEPTHS:
ABUTMENTS - 3.00 FT.
BENTS - 6.00 FT.

ALL ABUTMENTS AND BENTS ARE ON BEARING N60°37'43.49"W

1 EXISTING ONE SPAN BRIDGE TO BE REMOVED (30' LENGTH x 20' WIDTH). SPAN IS STEEL BEAMS. SUBSTRUCTURE INCLUDES STEEL BEAMS, PIPE PILES, AND STEEL PLATE.

LIMITS OF PROP RIPRAP
STONE PROTECTION
SIZE = 12 IN
THICKNESS = 18 IN
(TYP)
SEE DESIGN NOTE 5

HYDRAULIC DATA

HW10= 927.25'	HW100= 931.99'
Q10= 2,278 cfs	Q100= 5,564 cfs
V10= 4.72 ft/s	V100= 6.11 ft/s

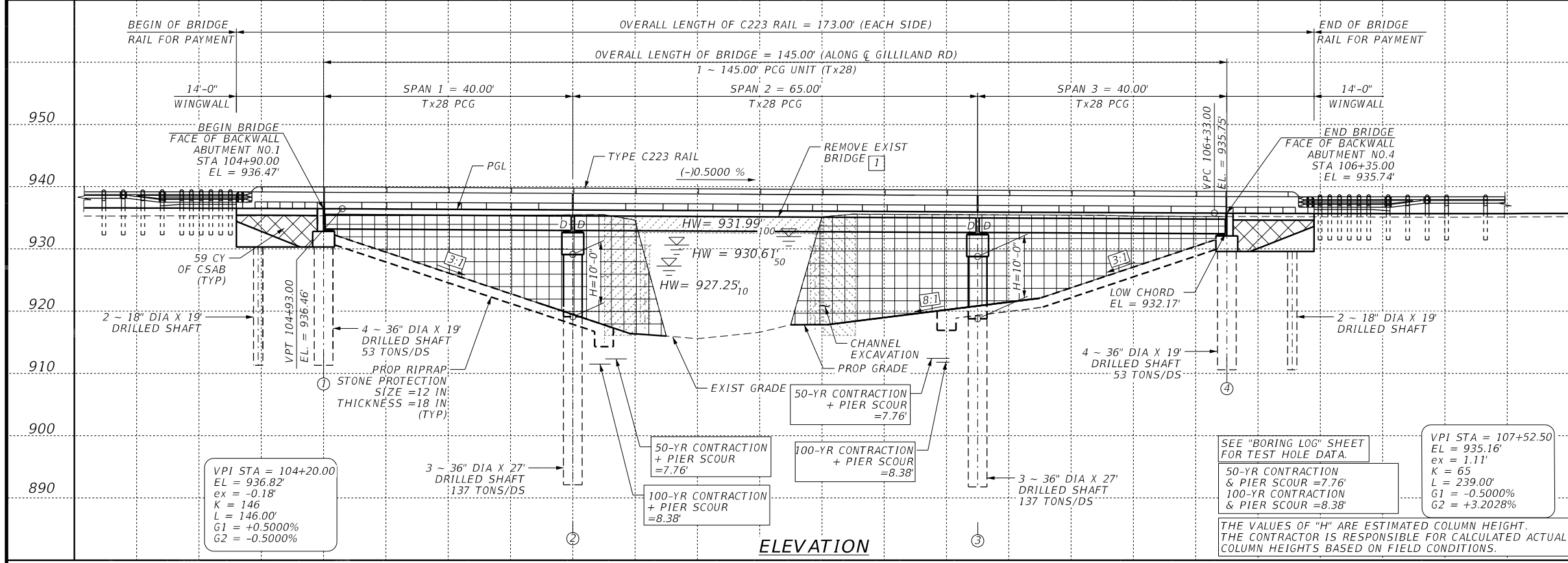
GILLILAND2

PI STATION	= 104+47.19
DELTA	= 0° 21' 54.37" (RT)
DEGREE OF CURVE	= 1° 05' 43.88"
TANGENT	= 16.66
LENGTH	= 33.33
RADIUS	= 5,230.00
PC STATION	= 104+30.53
PT STATION	= 104+63.85

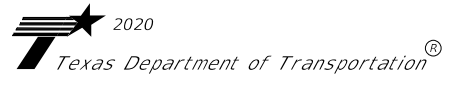
HL-93 LOADING

SCALE: 1" = 20' HORZ
1" = 20' VERT

PLAN



11/6/2020



GILLILAND ROAD AT WALNUT CREEK

BRIDGE LAYOUT
NBI NO. = 02-184-0-AA02-20-002

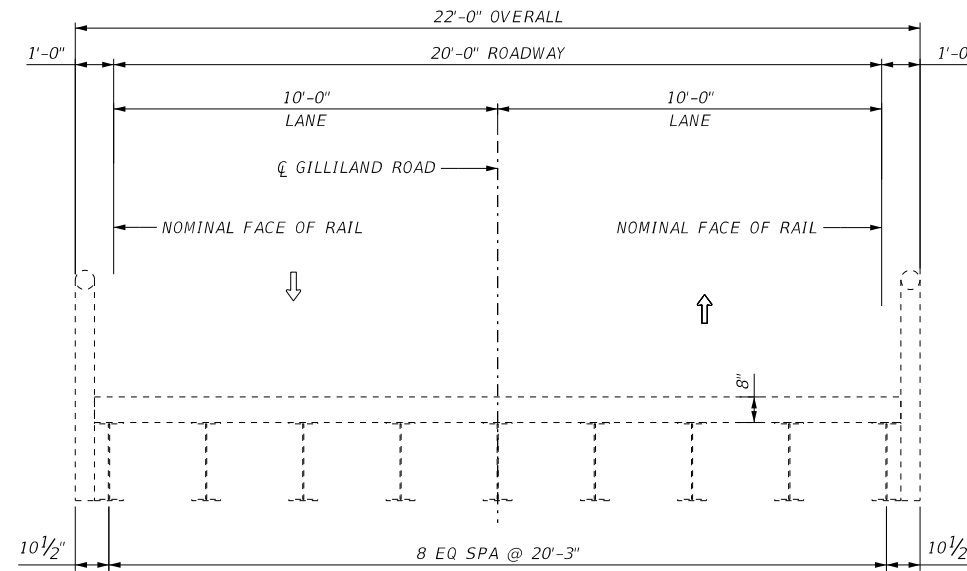
SHEET 1 OF 1

FED RD DIV NO.	FEDERAL AID PROJECT	SHEET NO.	
6	BR 2015 (333)	51	
STATE	DISTRICT	COUNTY	
TEXAS	FTW	PARKER	
CONTROL	SECTION	JOB	HIGHWAY
0902	38	120	GILLILAND RD

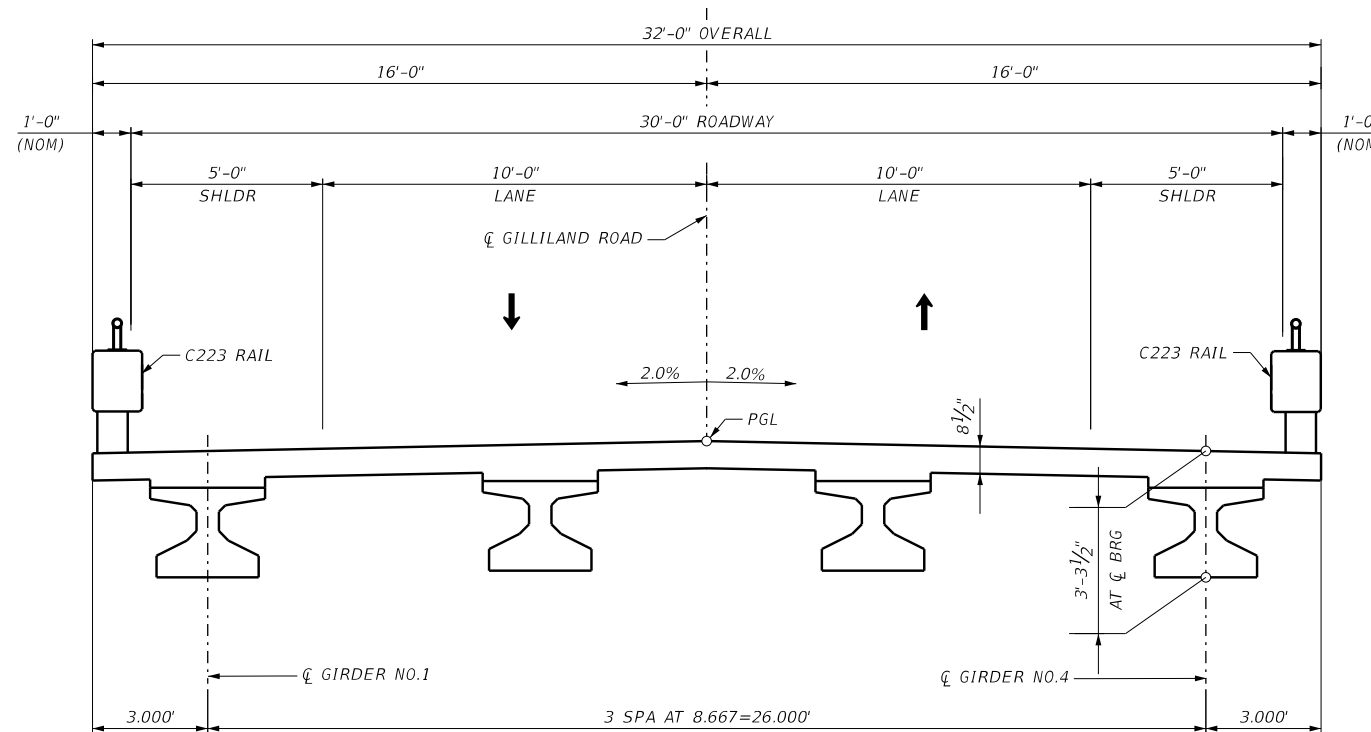
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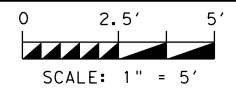


EXISTING TYPICAL SECTION



PROPOSED TYPICAL SECTION
(ALL GIRDERS ARE TYPE Tx28)

HL-93 LOADING



[Signature]
11/5/2020



F-12040



GILLILAND ROAD
AT WALNUT CREEK
BRIDGE
TYPICAL SECTIONS

SHEET 1 OF 1

FED RD DIV NO.	FEDERAL AID PROJECT	SHEET NO.	
6	BR 2015 (333)	52	
STATE	DISTRICT	COUNTY	
TEXAS	FTW	PARKER	
CONTROL	SECTION	JOB	HIGHWAY
0902	38	120	GILLILAND RD

SUMMARY OF ESTIMATED QUANTITIES												
BID CODES	400 6005	416 6001	416 6004	420 6014	420 6030	420 6038	422 6002	422 6016	425 6035	432 6031	450 6033	454 6004
BID ITEM DESCRIPTION	CEM STABIL BKFL *	DRILL SHAFT (18 IN)	DRILL SHAFT (36 IN)	CL C CONC (ABUT)(HPC)	CL C CONC (CAP)(HPC)	CL C CONC (COLUMN)(HPC)	REINF CONC SLAB (HPC)	APPROACH SLAB (HPC)	PRESTR CONC GIRDER (TX28)	RIPRAP (STONE PROTECTION)(12 IN)	RAIL (TY C223)(HPC)	ARMOR JOINT (SEALED)
BRIDGE ELEMENT	CY	LF	LF	CY	CY	CY	SF	CY	LF	CY	LF	LF
2-ABUTMENTS	119	76	152	46.8				69		1060	56.0	73
2-INTERIOR BENTS			162		32.2	16.0	4630					
145.00' PRESTR CONC TX28 GIRDER SPANS									574.00		290.0	
PROJECT TOTALS	119	76	314	46.8	32.2	16.0	4630	69	574.00	1060	346.0	73

* FLOWABLE BACKFILL MAY BE SUBSTITUTED FOR CEMENT STABILIZED BACKFILL AT NO ADDITIONAL COST.

BEARING SEAT ELEVATION

			BEAM 1	BEAM 2	BEAM 3	BEAM 4
ABUT	1	(FWD)	932.646	932.844	932.869	932.718
BENT	2	(BK)	932.457	932.656	932.681	932.532
		(FWD)	932.446	932.644	932.669	932.521
BENT	3	(BK)	932.132	932.331	932.356	932.207
		(FWD)	932.121	932.319	932.344	932.196
ABUT	4	(BK)	931.938	932.132	932.156	932.007

HL-93 LOADING

SCALE: N.T.S.



11/5/2020



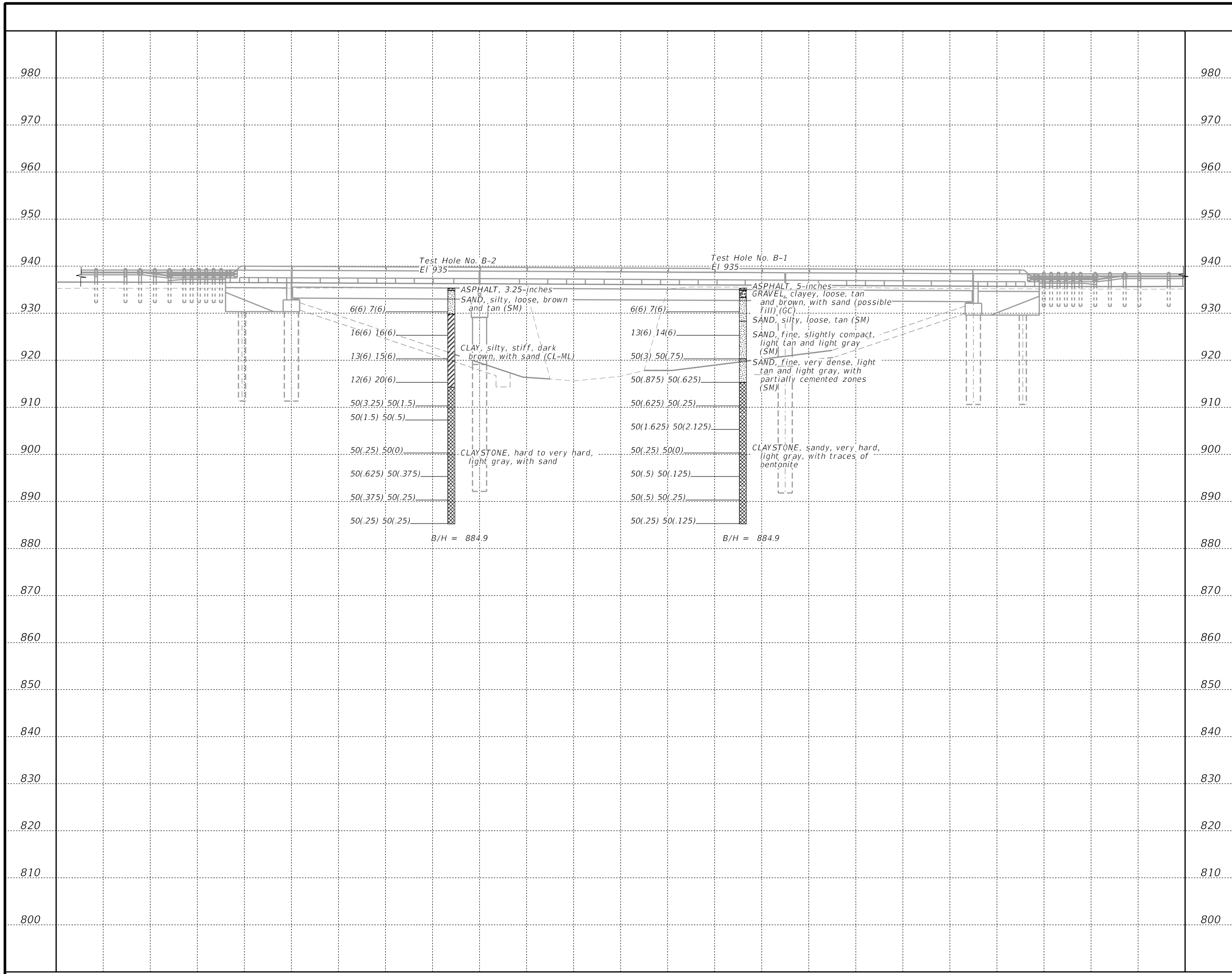
F-12040



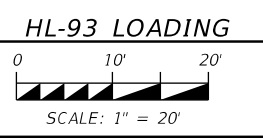
GILLILAND ROAD
AT WALNUT CREEK
SUMMARY OF
ESTIMATED QUANTITIES

SHEET 1 OF 1

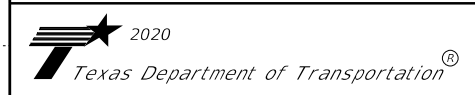
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6	BR 2015 (333)	53	
STATE	DISTRICT	COUNTY	
TEXAS	FTW	PARKER	
CONTROL	SECTION	JOB	HIGHWAY
0902	38	120	GILLILAND RD



NOTES:
1. REFER TO "BRIDGE LAYOUT" SHEET FOR BORE HOLE LOCATION.



[Signature]
11/5/2020



GILLILAND ROAD AT WALNUT CREEK

BORING LOGS

SHEET 1 OF 1

FED RD DIV NO.	FEDERAL AID PROJECT	SHEET NO.	
6	BR 2015 (333)	54	
STATE	DISTRICT	COUNTY	
TEXAS	FTW	PARKER	
CONTROL	SECTION	JOB	HIGHWAY
0902	38	120	GILLILAND RD

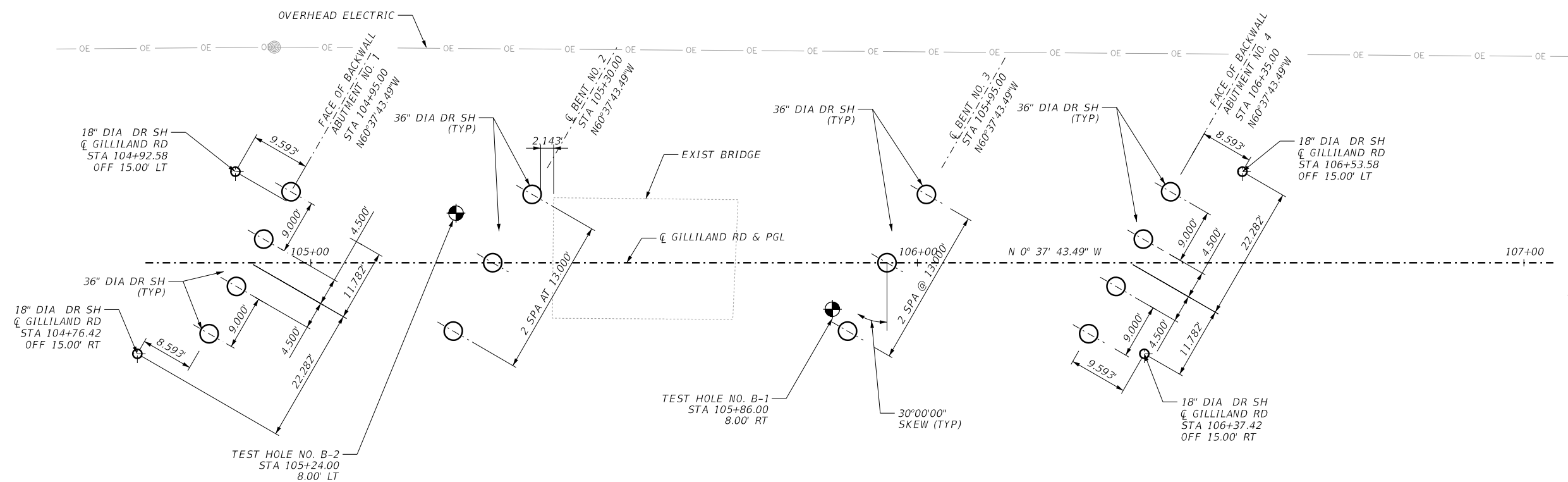
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106+00

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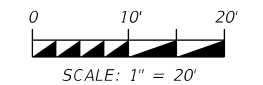


FOUNDATION LAYOUT

ALL ABUTMENTS AND BENTS ARE ON BEARING N60°37'43.49"W

- NOTES:**
- REFER TO FOUNDATION DETAIL (FD) STANDARD, BENT STANDARD (BIG-30-30) & ABUTMENT STANDARD (AIG-30-30) FOR ALL FOUNDATION DETAILS AND NOTES NOT SHOWN FOR BENTS & ABUTMENTS.
 - REFER TO "BRIDGE LAYOUT" & "BORING LOGS" SHEETS FOR DRILLED SHAFT LENGTHS AND BORE HOLE DATA INFORMATION.

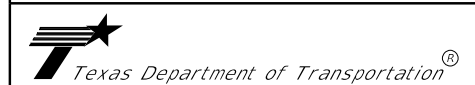
HL-93 LOADING



[Signature]
11/5/2020



F-12040



**GILLILAND ROAD
AT WALNUT CREEK
FOUNDATION LAYOUT**

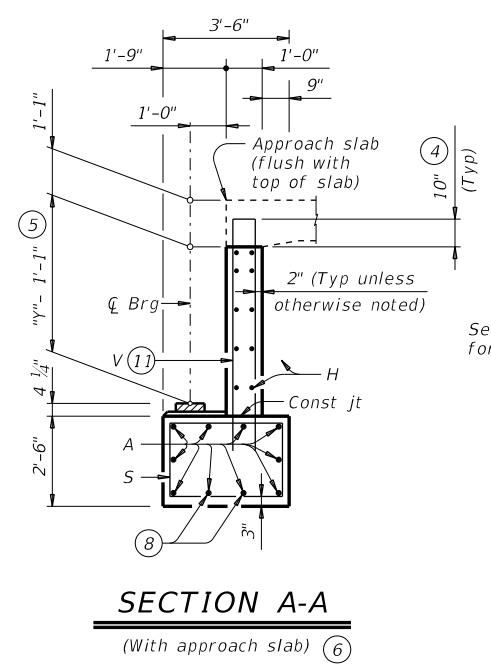
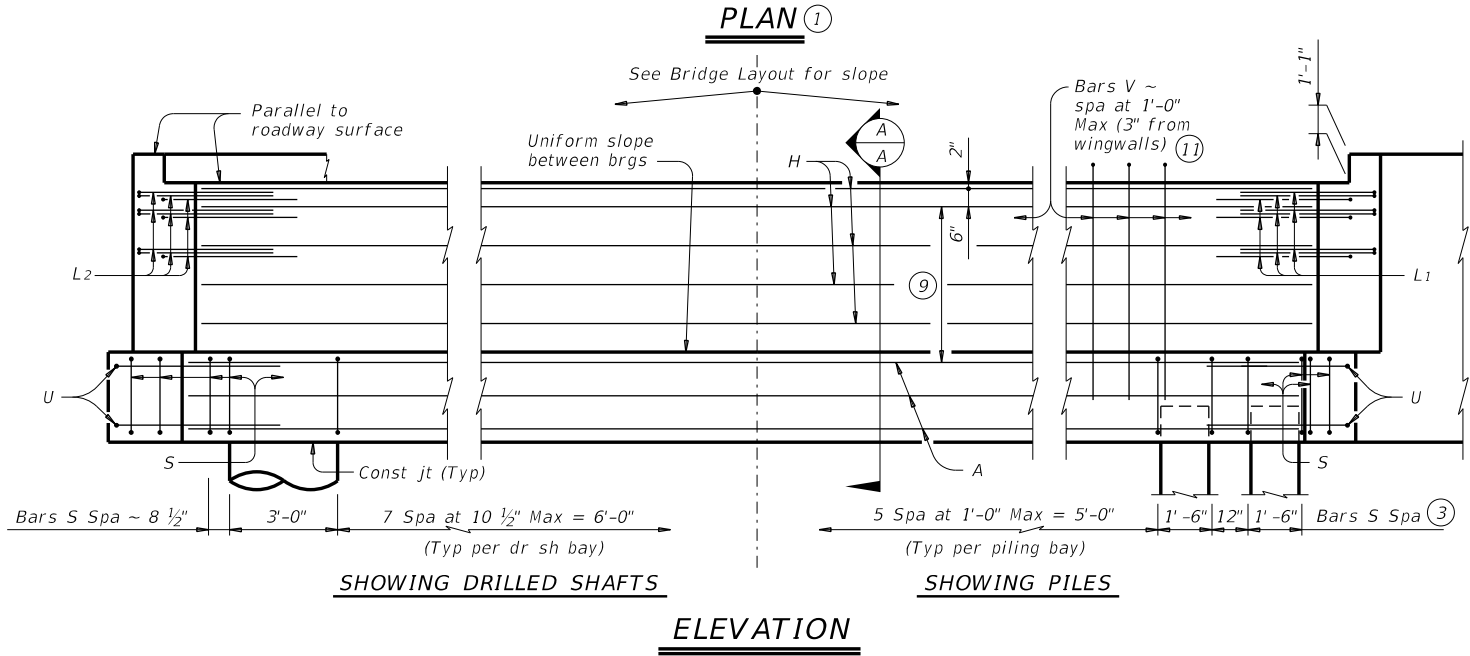
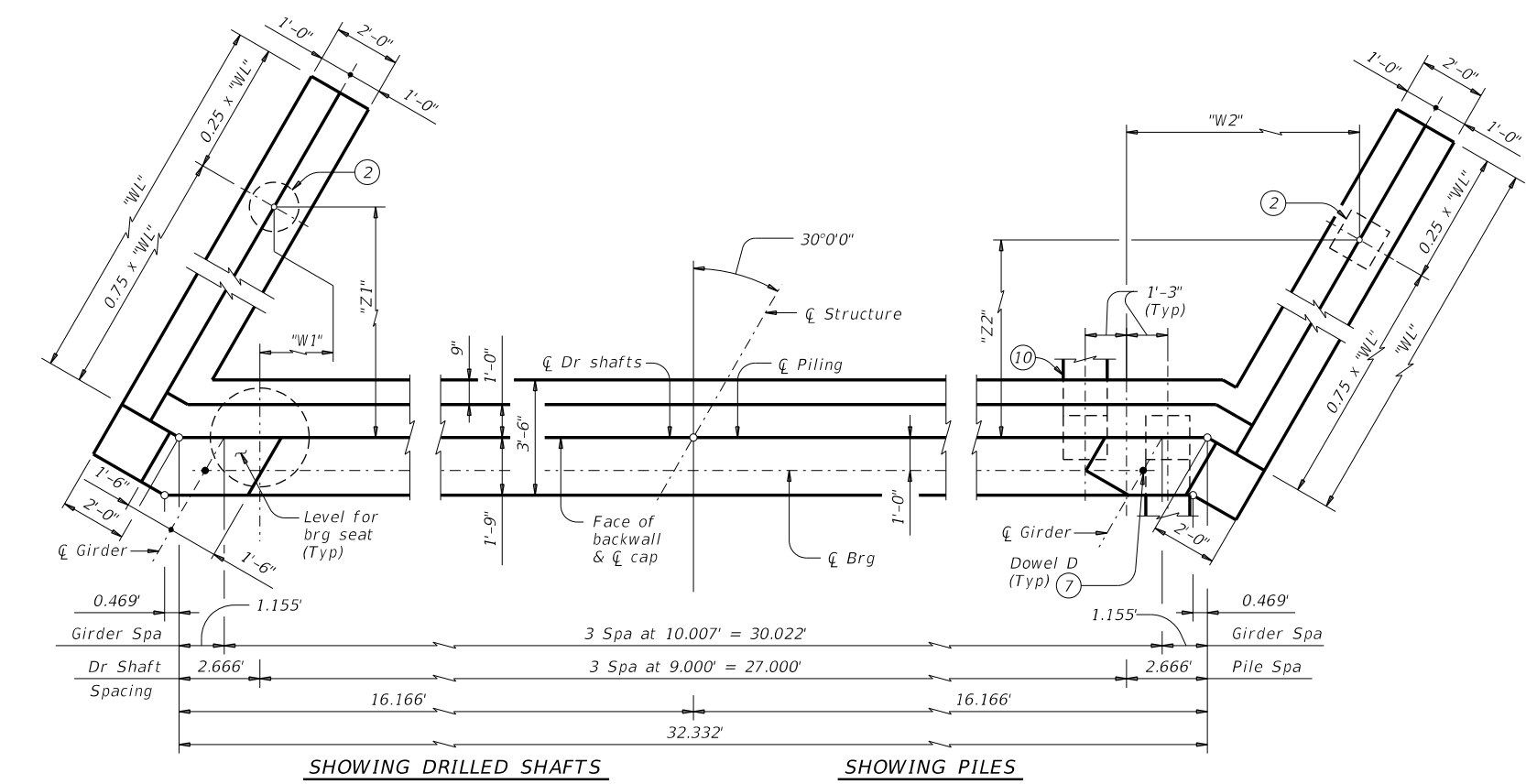
SHEET 1 OF 1

FED RD DIV NO.	FEDERAL AID PROJECT	SHEET NO.	
6	BR 2015 (333)	55	
STATE	DISTRICT	COUNTY	
TEXAS	FTW	PARKER	
CONTROL	SECTION	JOB	HIGHWAY
0902	38	120	GILLILAND RD

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TABLE OF FOUNDATION LOADS		
Span Length	All Girder Types	
	Tons/Shaft	Tons/Pile
40	53	48
45	56	50
50	60	52
55	63	54
60	66	55
65	69	57
70	72	58
75	76	60
80	79	62
85	82	63
90	85	65
95	88	66
100	91	68
105	94	70
110	97	71
115	100	73
120	103	74



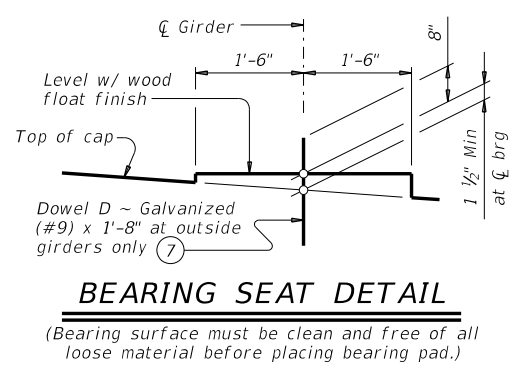
- ① See Table A for variable dimensions based on header slope and girder type.
- ② See Table A to determine if wingwall foundations are required.
- ③ For piling larger than 16" adjust Bars S spacing as required to avoid piling.
- ④ Increase as required to maintain 3" from finished grade.
- ⑤ See Span details for "Y" value.
- ⑥ See Bridge Layout to determine if approach slab is present.
- ⑦ Omit Dowels D at end of multi-span unit. Adjust reinforcing steel total accordingly.
- ⑧ With pile foundations, move Bars A shown to clear piles.
- ⑨ Spacing based on girder type:
 Tx28 ~ 3 spaces at 1'-0" Max
 Tx34 ~ 3 spaces at 1'-0" Max
 Tx40 ~ 4 spaces at 1'-0" Max
 Tx46 ~ 4 spaces at 1'-0" Max
 Tx54 ~ 5 spaces at 1'-0" Max
- ⑩ See Detail A on FD standard.
- ⑪ Field bend as needed to clear piles.

GENERAL NOTES:
 Designed according to AASHTO LRFD Bridge Design Specifications.
 See Bridge Layout for header slope and foundation type, size and length.
 See Common Foundation Details (FD) standard sheet for all foundation details and notes.
 See Concrete Riprap (CRR) standard sheet or Stone Riprap (SRR) standard sheet for riprap attachment details, if applicable.
 See applicable rail details for rail anchorage in wingwalls.
 Details are drawn showing right forward skew. See Bridge Layout for actual skew direction.
 These abutment details may be used with standard SIG-30-30 only.

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

MATERIAL NOTES:
 Provide Class C concrete ($f'_c = 3,600$ psi).
 Provide Class C (HPC) concrete if shown elsewhere in the plans.
 Provide Grade 60 reinforcing steel.
 Galvanize dowel bars D.

TABLE A							
Header Slope	Girder Type	Wingwall Type	Wingwall Lgth "WL"	"W1"	"Z1"	"W2"	"Z2"
2:1	Tx28	Cantilevered	10.000'	Not Applicable			
	Tx34	Cantilevered	11.000'	Not Applicable			
	Tx40	Cantilevered	12.000'	Not Applicable			
	Tx46	Founded	14.000'	1.718'	9.593'	8.782'	8.593'
	Tx54	Founded	15.000'	2.093'	10.243'	9.157'	9.243'
3:1	Tx28	Founded	14.000'	1.718'	9.593'	8.782'	8.593'
	Tx34	Founded	16.000'	2.468'	10.892'	9.532'	9.892'
	Tx40	Founded	18.000'	3.218'	12.191'	10.282'	11.191'
	Tx46	Founded	20.000'	3.968'	13.490'	11.032'	12.490'
	Tx54	Founded	22.000'	4.718'	14.789'	11.782'	13.789'



HL93 LOADING SHEET 1 OF 3

Texas Department of Transportation
 Bridge Division Standard

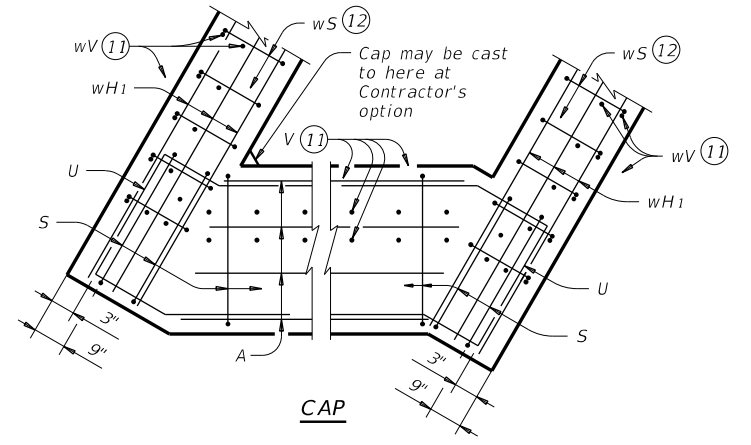
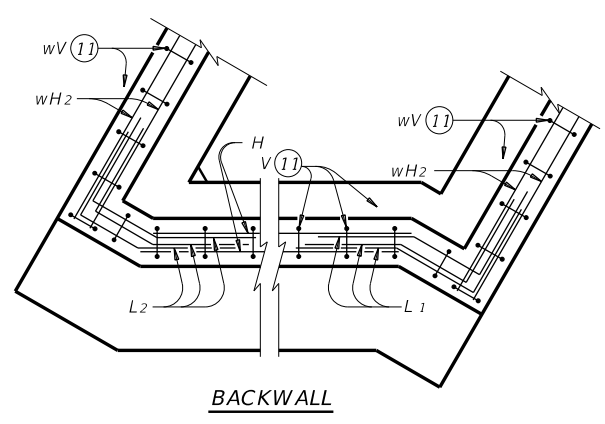
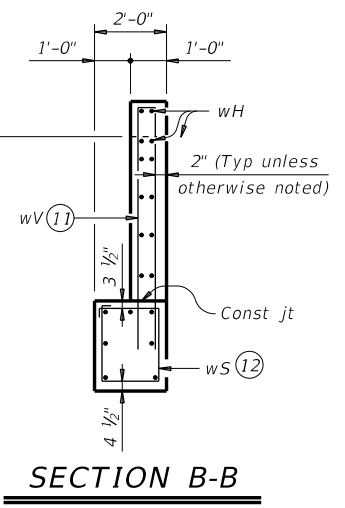
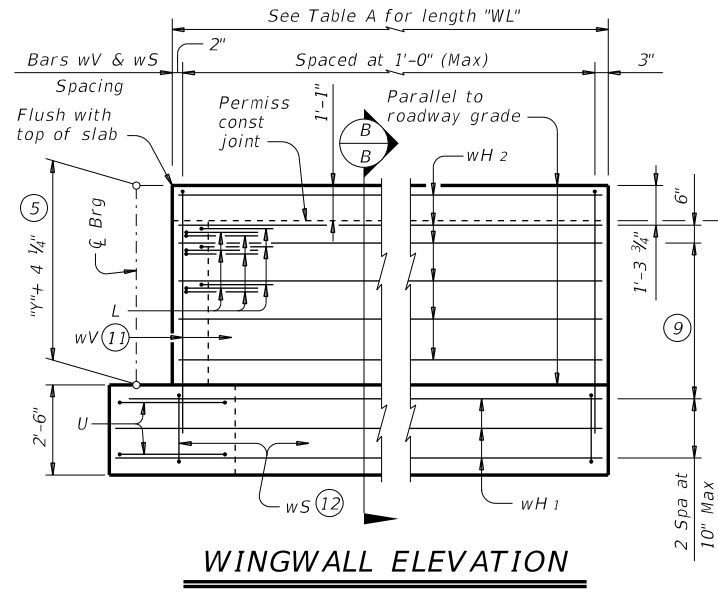
ABUTMENTS
 TYPE TX28 THRU TX54
 PRESTR CONC I-GIRDERS
 30' ROADWAY 30° SKEW

AIG-30-30

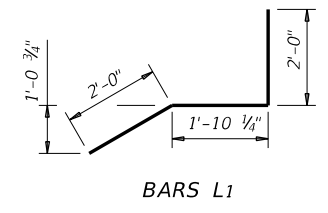
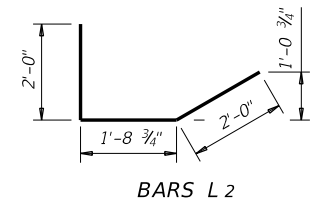
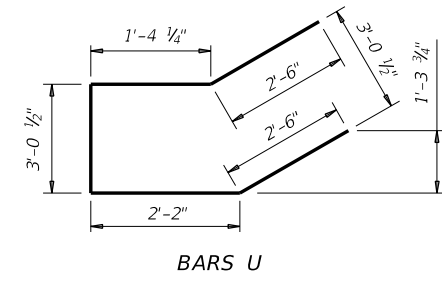
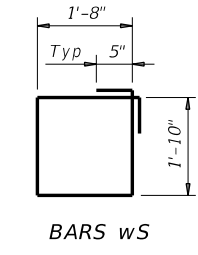
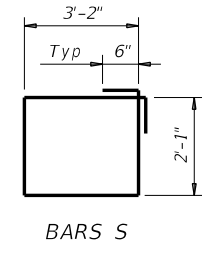
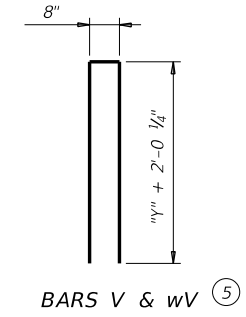
FILE: aig11sts-17.dgn	DN: TAR	CK: KCM	DW: JTR	CK: TAR
©TxDOT August 2017	CONT	SECT	JOB	HIGHWAY
REVISIONS	0902	38	120	GILLILAND RD
	DIST	COUNTY	SHEET NO.	
	FTW	PARKER	56	

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CORNER DETAILS



- ⑤ See Span details for "y" value.
- ⑨ Spacing based on girder type:
 Tx28 ~ 3 spaces at 1'-0" Max
 Tx34 ~ 3 spaces at 1'-0" Max
 Tx40 ~ 4 spaces at 1'-0" Max
 Tx46 ~ 4 spaces at 1'-0" Max
 Tx54 ~ 5 spaces at 1'-0" Max
- ⑪ Field bend as needed to clear piles.
- ⑫ Adjust as required to avoid piling.

		Bridge Division Standard	
ABUTMENTS TYPE TX28 THRU TX54 PRESTR CONC I-GIRDERS 30' ROADWAY 30° SKEW AIG-30-30			
FILE: aig11sts-17.dgn	DN: TAR	CK: KCM	DW: JTR
©TxDOT August 2017	CONT	SECT	JOB
REVISIONS	0902	38	120
DIST	COUNTY		SHEET NO.
FTW	PARKER		57

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TABLES OF ESTIMATED QUANTITIES WITH 2:1 HEADER SLOPE ⁽¹³⁾


TYPE Tx28 Girders					TYPE Tx34 Girders					TYPE Tx40 Girders					TYPE Tx46 Girders					TYPE Tx54 Girders									
Bar	No.	Size	Length	Weight	Bar	No.	Size	Length	Weight	Bar	No.	Size	Length	Weight	Bar	No.	Size	Length	Weight	Bar	No.	Size	Length	Weight					
A	10	#11	32'-4"	1,718	A	10	#11	32'-4"	1,718	A	10	#11	32'-4"	1,718	A	10	#11	32'-4"	1,718	A	10	#11	32'-4"	1,718					
D ⁽⁷⁾	2	#9	1'-8"	11	D ⁽⁷⁾	2	#9	1'-8"	11	D ⁽⁷⁾	2	#9	1'-8"	11	D ⁽⁷⁾	2	#9	1'-8"	11	D ⁽⁷⁾	2	#9	1'-8"	11					
H	8	#6	32'-4"	389	H	8	#6	32'-4"	389	H	10	#6	32'-4"	486	H	10	#6	32'-4"	486	H	12	#6	32'-4"	583					
L1	9	#6	5'-11"	80	L1	9	#6	5'-11"	80	L1	9	#6	5'-11"	80	L1	9	#6	5'-11"	80	L1	9	#6	5'-11"	80					
L2	9	#6	5'-9"	78	L2	9	#6	5'-9"	78	L2	9	#6	5'-9"	78	L2	9	#6	5'-9"	78	L2	9	#6	5'-9"	78					
S	32	#5	11'-6"	384	S	32	#5	11'-6"	384	S	32	#5	11'-6"	384	S	32	#5	11'-6"	384	S	32	#5	11'-6"	384					
U	4	#6	11'-7"	70	U	4	#6	11'-7"	70	U	4	#6	11'-7"	70	U	4	#6	11'-7"	70	U	4	#6	11'-7"	70					
V	35	#5	11'-4"	414	V	35	#5	12'-4"	450	V	35	#5	13'-4"	487	V	35	#5	14'-4"	523	V	35	#5	15'-8"	572					
wH1	14	#6	11'-5"	240	wH1	14	#6	12'-5"	261	wH1	14	#6	13'-5"	282	wH1	14	#6	15'-5"	324	wH1	14	#6	16'-5"	345					
wH2	20	#6	9'-8"	290	wH2	20	#6	10'-8"	320	wH2	24	#6	11'-8"	421	wH2	24	#6	13'-8"	493	wH2	28	#6	14'-8"	617					
wS	22	#4	7'-10"	115	wS	24	#4	7'-10"	126	wS	26	#4	7'-10"	136	wS	30	#4	7'-10"	157	wS	32	#4	7'-10"	167					
wV	22	#5	11'-4"	260	wV	24	#5	12'-4"	309	wV	26	#5	13'-4"	362	wV	30	#5	14'-4"	448	wV	32	#5	15'-8"	523					
Reinforcing Steel				Lb	4,049	Reinforcing Steel				Lb	4,196	Reinforcing Steel				Lb	4,515	Reinforcing Steel				Lb	4,772	Reinforcing Steel				Lb	5,148
Class "C" Concrete				CY	20.8	Class "C" Concrete				CY	22.5	Class "C" Concrete				CY	24.3	Class "C" Concrete				CY	26.8	Class "C" Concrete				CY	29.2

TABLES OF ESTIMATED QUANTITIES WITH 3:1 HEADER SLOPE ⁽¹³⁾

TYPE Tx28 Girders					TYPE Tx34 Girders					TYPE Tx40 Girders					TYPE Tx46 Girders					TYPE Tx54 Girders									
Bar	No.	Size	Length	Weight	Bar	No.	Size	Length	Weight	Bar	No.	Size	Length	Weight	Bar	No.	Size	Length	Weight	Bar	No.	Size	Length	Weight					
A	10	#11	32'-4"	1,718	A	10	#11	32'-4"	1,718	A	10	#11	32'-4"	1,718	A	10	#11	32'-4"	1,718	A	10	#11	32'-4"	1,718					
D ⁽⁷⁾	2	#9	1'-8"	11	D ⁽⁷⁾	2	#9	1'-8"	11	D ⁽⁷⁾	2	#9	1'-8"	11	D ⁽⁷⁾	2	#9	1'-8"	11	D ⁽⁷⁾	2	#9	1'-8"	11					
H	8	#6	32'-4"	389	H	8	#6	32'-4"	389	H	10	#6	32'-4"	486	H	10	#6	32'-4"	486	H	12	#6	32'-4"	583					
L1	9	#6	5'-11"	80	L1	9	#6	5'-11"	80	L1	9	#6	5'-11"	80	L1	9	#6	5'-11"	80	L1	9	#6	5'-11"	80					
L2	9	#6	5'-9"	78	L2	9	#6	5'-9"	78	L2	9	#6	5'-9"	78	L2	9	#6	5'-9"	78	L2	9	#6	5'-9"	78					
S	32	#5	11'-6"	384	S	32	#5	11'-6"	384	S	32	#5	11'-6"	384	S	32	#5	11'-6"	384	S	32	#5	11'-6"	384					
U	4	#6	11'-7"	70	U	4	#6	11'-7"	70	U	4	#6	11'-7"	70	U	4	#6	11'-7"	70	U	4	#6	11'-7"	70					
V	35	#5	11'-4"	414	V	35	#5	12'-4"	450	V	35	#5	13'-4"	487	V	35	#5	14'-4"	523	V	35	#5	15'-8"	572					
wH1	14	#6	15'-5"	324	wH1	14	#6	17'-5"	366	wH1	14	#6	19'-5"	408	wH1	14	#6	21'-5"	450	wH1	14	#6	23'-5"	492					
wH2	20	#6	13'-8"	411	wH2	20	#6	15'-8"	471	wH2	24	#6	17'-8"	637	wH2	24	#6	19'-8"	709	wH2	28	#6	21'-8"	911					
wS	30	#4	7'-10"	157	wS	34	#4	7'-10"	178	wS	38	#4	7'-10"	199	wS	42	#4	7'-10"	220	wS	46	#4	7'-10"	241					
wV	30	#5	11'-4"	355	wV	34	#5	12'-4"	437	wV	38	#5	13'-4"	528	wV	42	#5	14'-4"	628	wV	46	#5	15'-8"	752					
Reinforcing Steel				Lb	4,391	Reinforcing Steel				Lb	4,632	Reinforcing Steel				Lb	5,086	Reinforcing Steel				Lb	5,357	Reinforcing Steel				Lb	5,892
Class "C" Concrete				CY	23.4	Class "C" Concrete				CY	25.9	Class "C" Concrete				CY	28.6	Class "C" Concrete				CY	31.4	Class "C" Concrete				CY	34.8

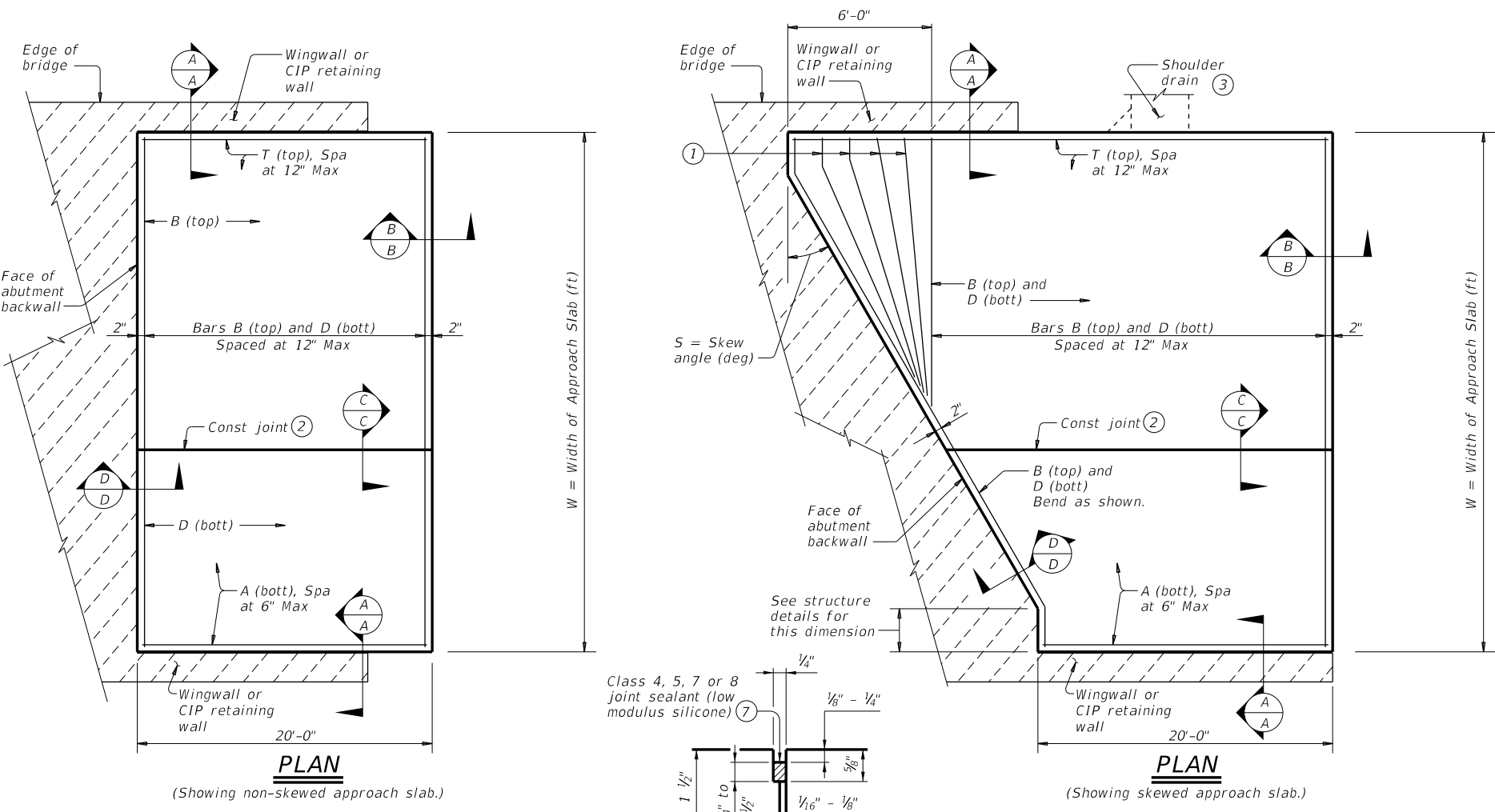
⁽⁷⁾ Omit Dowels D at end of multi-span unit. Adjust reinforcing steel total accordingly.

⁽¹³⁾ Quantities shown are for one abutment only (with approach slab). With no approach slab, add 1.4 CY Class "C" concrete and 194 lbs reinforcing steel for 4 additional Bars H.

				Bridge Division Standard	
ABUTMENTS TYPE TX28 THRU TX54 PRESTR CONC I-GIRDERS 30' ROADWAY 30° SKEW AIG-30-30					
FILE:	aig11sts-17.dgn	DN:	TAR	CK:	KCM
REV:	August 2017	DW:	JTR	CD:	TAR
CONT:	0902	SECT:	38	JOB:	120
REVISIONS:		COUNTY:	PARKER	HIGHWAY:	GILLILAND RD
DIST:		COUNTY:	PARKER	SHEET NO.:	58

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

APPROXIMATE QUANTITIES ⁽⁴⁾

Reinf steel weight = 8.5 Lbs/SF of Approach Slab

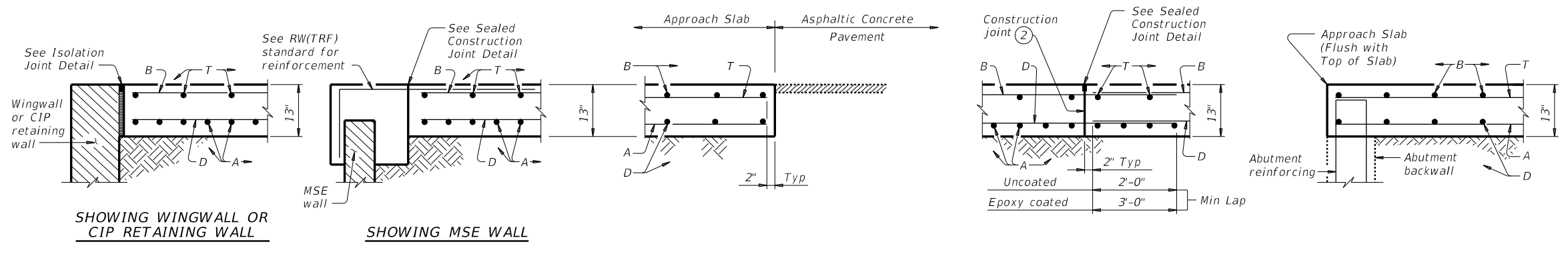
Volume of Appr Slab Conc (CY) = 0.802W + 0.02W² Tan S

W = Width of Approach Slab (ft)

S = Skew Angle (deg)

- Flare Bars B and D in this region (1'-6" Max Spa, 3" Min Spa). Minimum flared bar length = 2'-6". Bend bars as necessary.
- Provide longitudinal construction joints that align with longitudinal construction joints in the bridge slab with bridges built in stages. Other longitudinal construction joints must receive approval of the Engineer.
- See details elsewhere in plans for shoulder drain location and details.
- For Contractor's information only. Quantities shown are for one approach slab.
- Multiple piece tie bars are acceptable at longitudinal construction joints provided minimum laps shown are achieved.
- See details elsewhere in plans for required cross-slope.
- Place in accordance with Item 438.
- Provide backer rod that is 25% larger than joint opening and compatible with the sealant.
- If bridge rail is present at the wingwall or CIP retaining wall, place 1/2" rebonded recycled tire rubber between concrete railing and top of approach slab as shown when concrete railing projects over the approach slab.

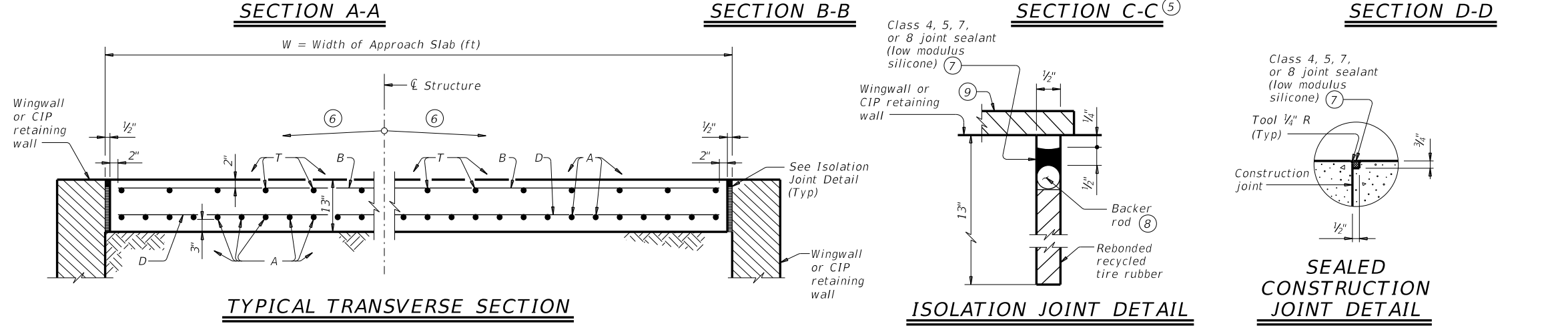
LONGITUDINAL SAW CUT JOINT DETAIL



GENERAL NOTES:

Construct approach slab in accordance with Item 422. Provide Class "S" concrete with a minimum compressive strength of 4,000 psi. Provide Grade 60 reinforcing steel. Provide longitudinal joints as shown on the Longitudinal Saw Cut Joint Detail at lane lines and shoulders when width between longitudinal construction joints or edges of approach slab exceeds 16 feet. Saw cut joints within 24 hours of concrete placement to a depth of 1 1/2" and seal in accordance with Item 438. Alternately, provide a controlled joint consisting of 1 1/2" vinyl or plastic joint former (Stress Cap, Zip Strip, Stress Lock, or equal as approved by the Engineer.) Provide rebonded recycled tire rubber joint filler that meets the requirements of DMS-6310. "Joint Sealants and Fillers." Construct the subgrade or subbase away from the bridge for a minimum distance of 100 feet prior to the approach slab, unless otherwise indicated on the plans. Compact and finish the subgrade or foundation for the approach slab to the typical cross-section and to the lines and grades shown on the plans. Cure for 4 days using water or membrane curing per Item 422. Provide a 1" (asphaltic concrete pavement or asphalt stabilized base) stress relieving pad between the approach slab and cement stabilized backfill or cement treated base. Other stress relieving pads may be used if approved by the Engineer. All details shown herein are subsidiary to bridge approach slab.

Cover dimensions are clear dimensions, unless noted otherwise.



Texas Department of Transportation Bridge Division Standard

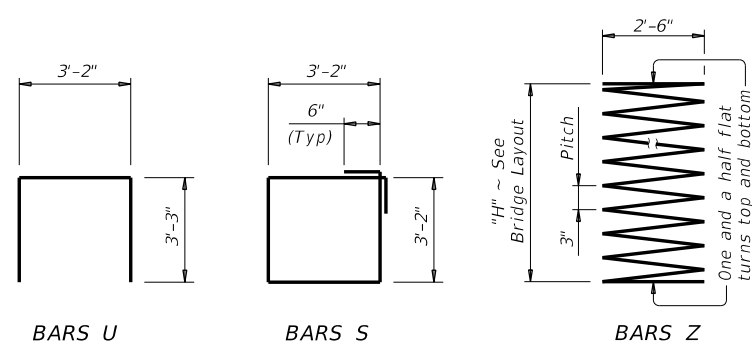
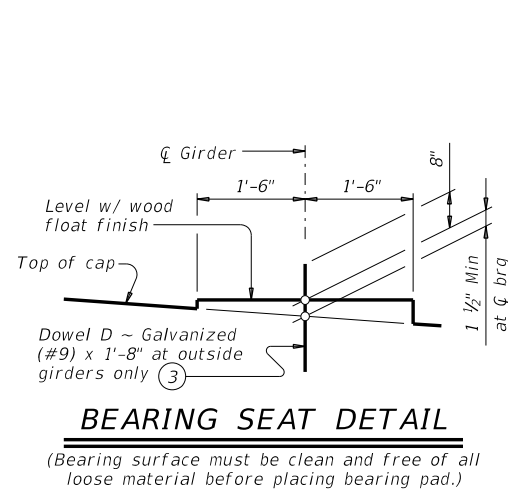
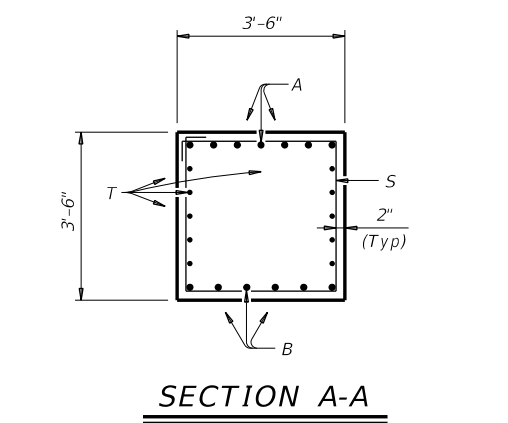
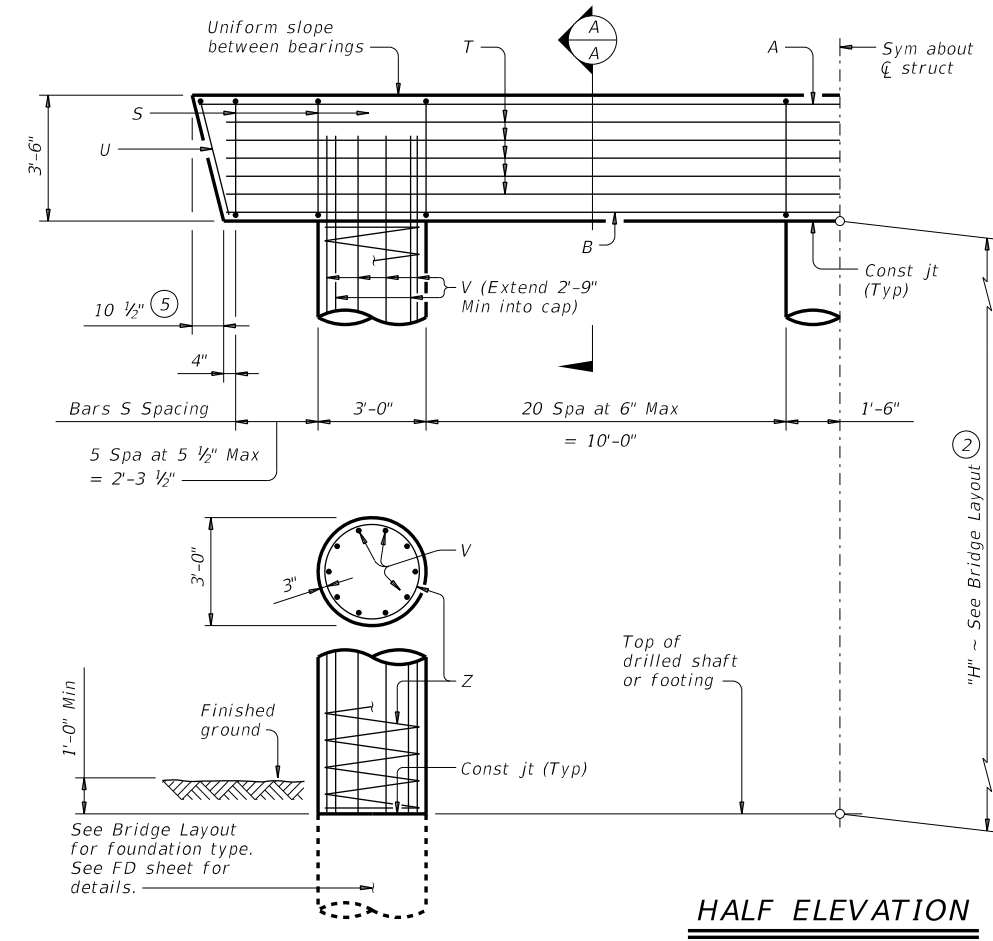
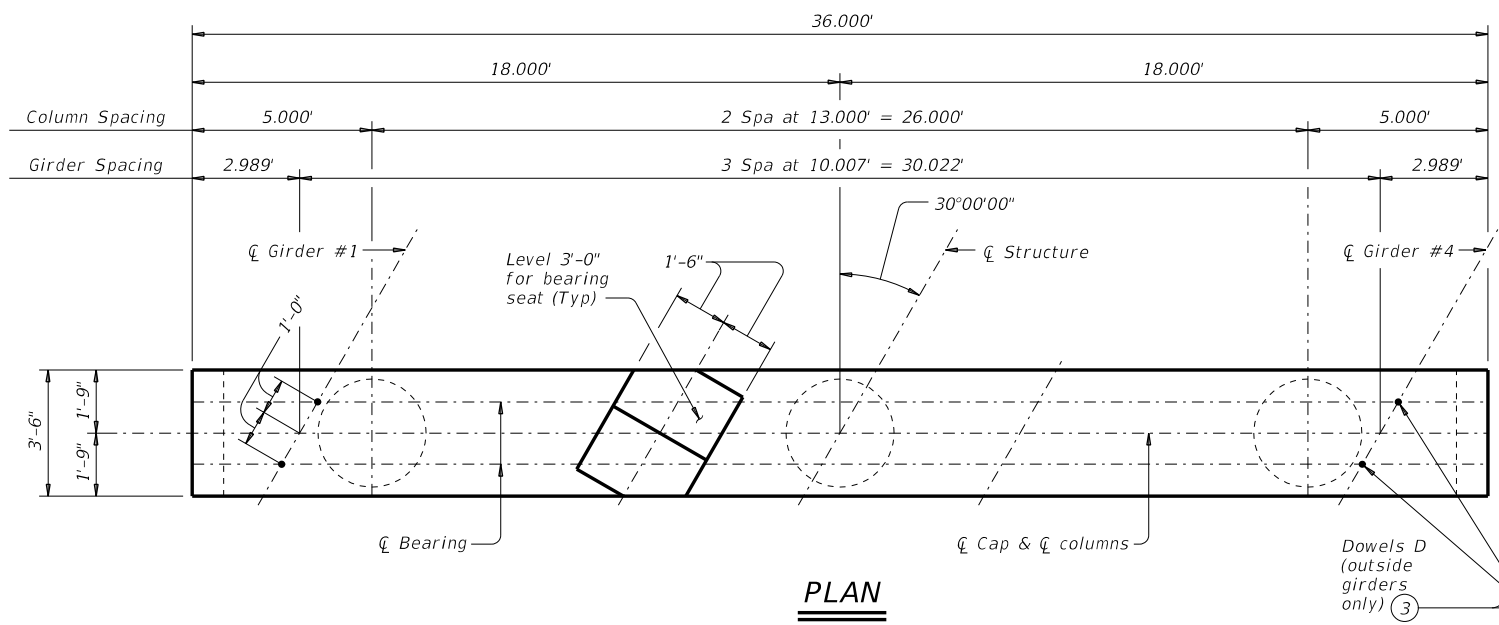
BRIDGE APPROACH SLAB ASPHALTIC CONCRETE PAVEMENT

BAS-A

FILE: basaste1-19.dgn	DN: TxDOT	CK: TxDOT	OW: TxDOT	CK: TxDOT
©TxDOT April 2019	CONT	SECT	JOB	HIGHWAY
REVISIONS	0902	38	120	GILLILAND RD
	DIST	COUNTY	SHEET NO.	
	FTW	PARKER	59	

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- Quantities shown are based on an "H" value of 36'. For each linear foot variation in "H" value, make the following adjustments:
 Bars V length, 1'-0"
 Bars Z length, 31'-5"
 Reinforcing steel, 165 Lb
 Class "C" conc (col), 0.78 CY
- This standard may not be used for "H" heights exceeding 36'. In areas of very soft soil or where scour is anticipated, allowable "H" heights must be evaluated by the Engineer prior to the use of this standard.
- Omit Dowels D at end of multi-span units. Adjust reinforcing steel total accordingly.
- Foundation Loads based on "H" = 36'.
- Measured parallel to top of cap cross-slope.

TABLE OF ESTIMATED QUANTITIES (1)				
Bar	No.	Size	Length	Weight
A	7	#11	35'-6"	1,320
B	6	#11	34'-0"	1,084
D (3)	4	#9	1'-8"	23
S	54	#5	13'-8"	770
T	10	#5	34'-0"	355
U	2	#5	9'-8"	20
V	30	#9	38'-9"	3,953
Z	3	#4	1,154'-7"	2,314
Reinforcing Steel			Lb	9,839
Class "C" Concrete (Cap)			CY	16.1
Class "C" Concrete (Col)			CY	28.3

FOUNDATION LOADS (4)				
Span Average	Drilled Shaft Loads	Pile Load (Tons/Pile)		
		3 Pile Ftg	4 Pile Ftg	5 Pile Ftg
Ft	Tons/Shaft			
40	112	41	31	26
45	121	44	33	27
50	129	46	35	29
55	137	49	37	31
60	145	52	39	32
65	154	55	42	34
70	162	57	44	36
75	170	60	46	37
80	178	63	48	39
85	186	65	50	40
90	194	68	52	42
95	202	71	54	44
100	210	73	56	45
105	218	76	58	47
110	226	79	60	48
115	234	81	62	50
120	242	84	64	52

GENERAL NOTES:
 Designed according to AASHTO LRFD Bridge Design Specifications. See Bridge Layout for foundation type, size and length. See Common Foundation Details (FD) standard sheet for all foundation details and notes. See Shear Key Details (IGSK) standard sheet for all shear key details and notes, if applicable. Bent selected must be based on the average span length rounded up to the next 5 ft increment. Details are drawn showing right forward skew. See Bridge Layout for actual skew direction. These bent details may be used with standard SIG-30-30 only.

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

MATERIAL NOTES:
 Provide Class C concrete (f'c = 3,600 psi). Provide Class C (HPC) concrete if shown elsewhere in the plans. Provide Grade 60 reinforcing steel. Galvanize dowel bars D.

HL93 LOADING

Texas Department of Transportation
 Bridge Division Standard

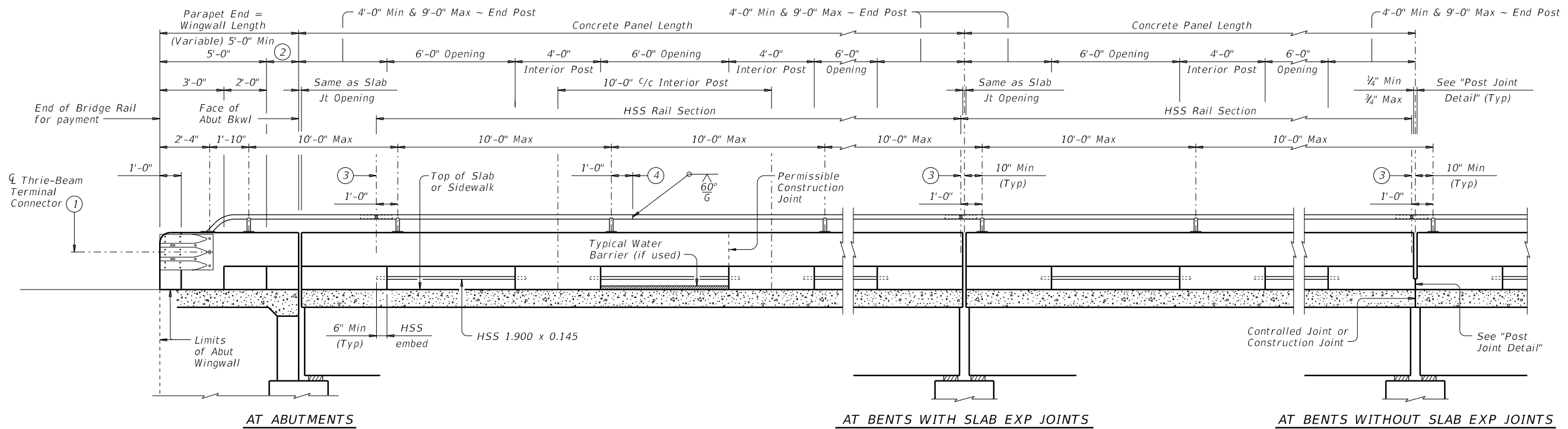
INTERIOR BENTS
 TYPE TX28 THRU TX54
 PRESTR CONC I-GIRDERS
 30' ROADWAY 30° SKEW

BIG-30-30

FILE: big11sts-17.dgn	DN: TAR	CK: SDB	DW: JTR	CK: TAR
©TxDOT August 2017	CONT	SECT	JOB	HIGHWAY
REVISIONS	0902	38	120	GILLILAND RD
	DIST	COUNTY	SHEET NO.	
	FTW	PARKER	60	

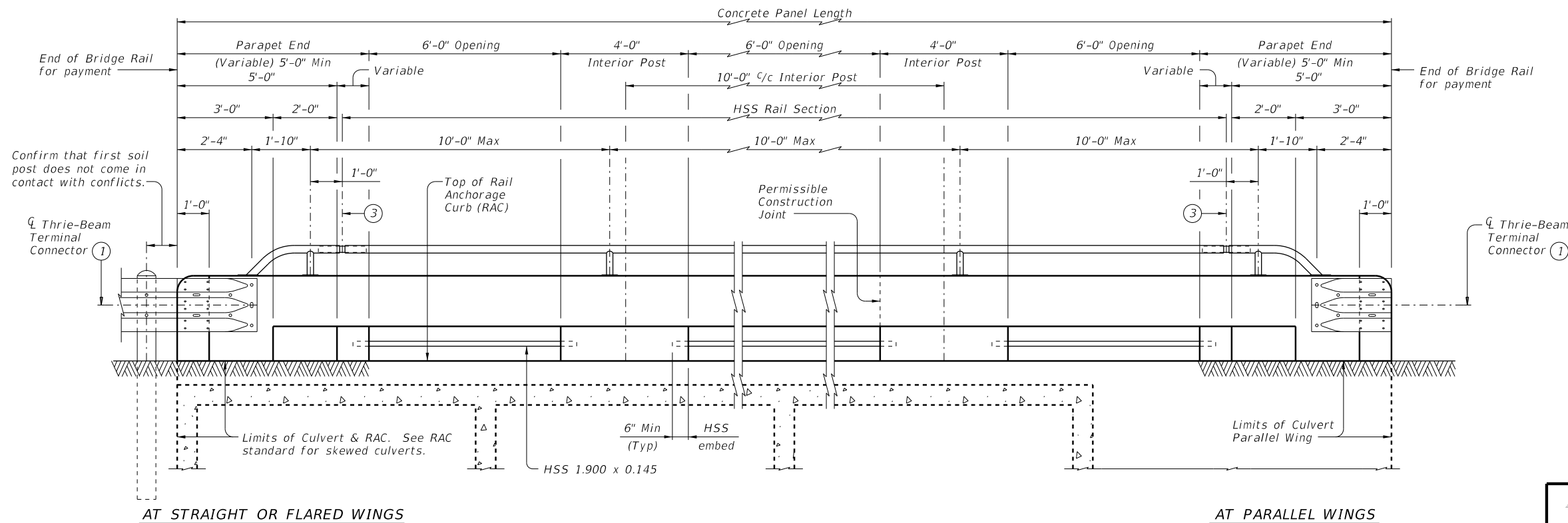
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ROADWAY ELEVATION OF RAIL ON BRIDGE

(Showing without raised sidewalk)



ROADWAY ELEVATION OF RAIL ON BOX CULVERTS

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

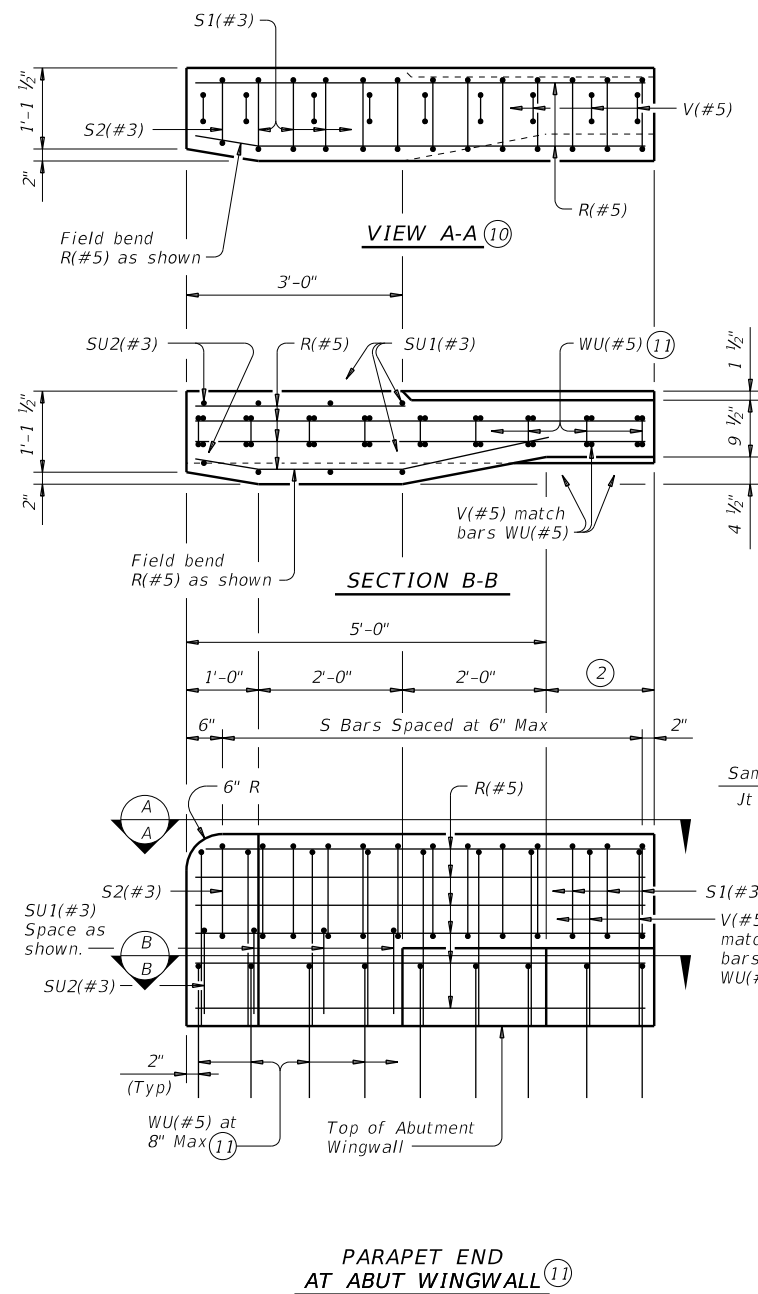
- ① Terminal Connectors and associated hardware are to be paid for under the Item "Metal Beam Guard Fence". Attach Metal Beam Guard Fence Transitions to the bridge rail and extend along the embankment unless otherwise shown in the plans.
- ② Wingwall Length minus 5'-0" (Varies)
- ③ Splice Jt or Exp Jt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

SHEET 1 OF 4

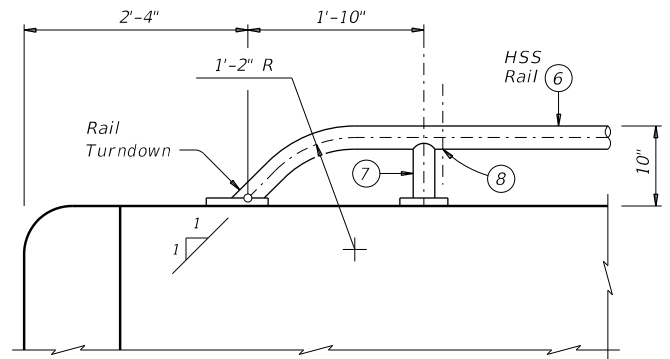
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<h2>COMBINATION RAIL</h2>			
<h3>TYPE C223</h3>			
FILE: r1std019-19.dgn	DN: TxDOT	CK: TxDOT	DW: JTR
©TxDOT September 2019	CONT SECT	JOB	HIGHWAY
REVISIONS	0902 38	120	GILLILAND RD
DIST	COUNTY	SHEET NO.	
FTW	PARKER	61	

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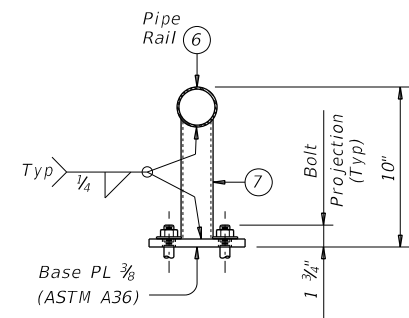


PARAPET END AT ABUT WINGWALL

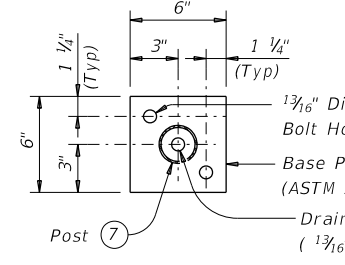


Note that at least two anchor points (as shown) are required for the Bridge Rail on the Abutment Wingwall. Longer Wingwalls may require more than two Rail anchorages.

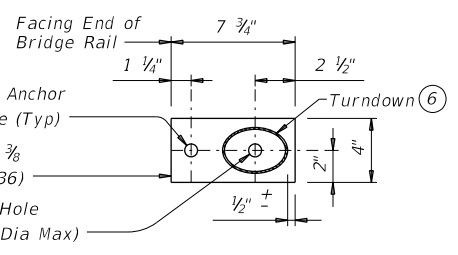
HSS RAIL TERMINAL DETAIL



TRANSVERSE SECTION

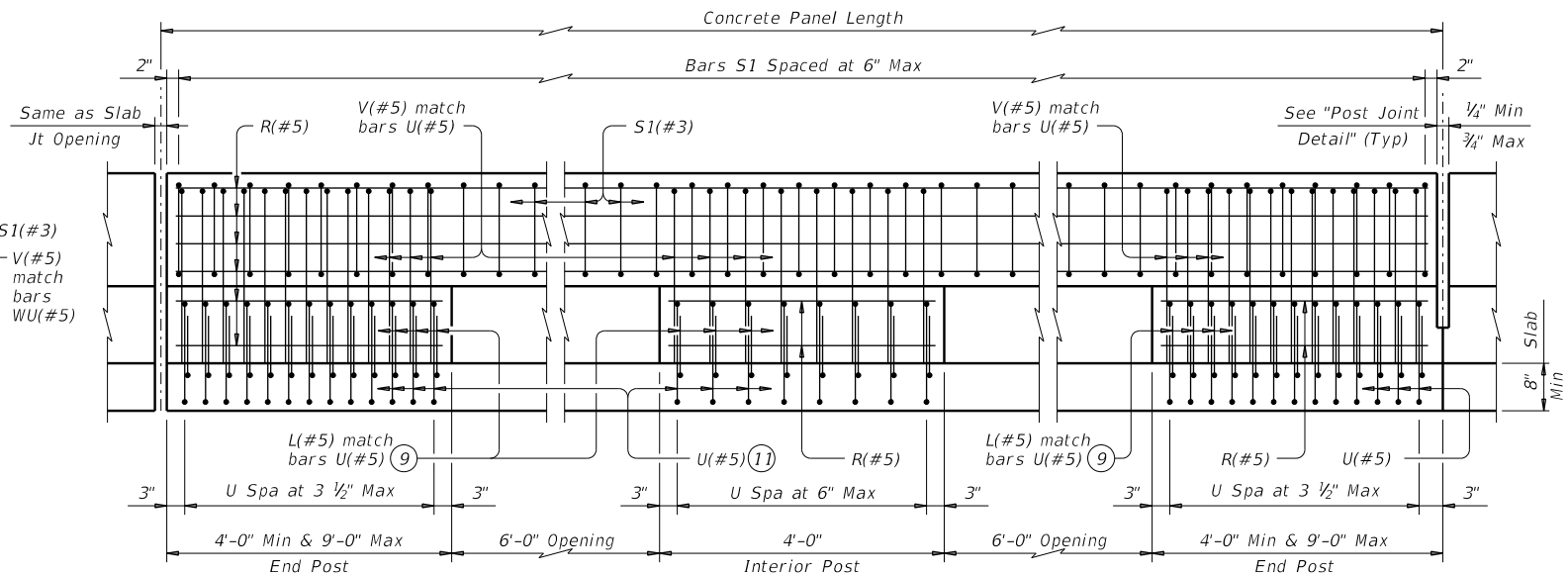


POST BASE PLATE PLAN



RAIL TURN-DOWN BASE PLATE PLAN

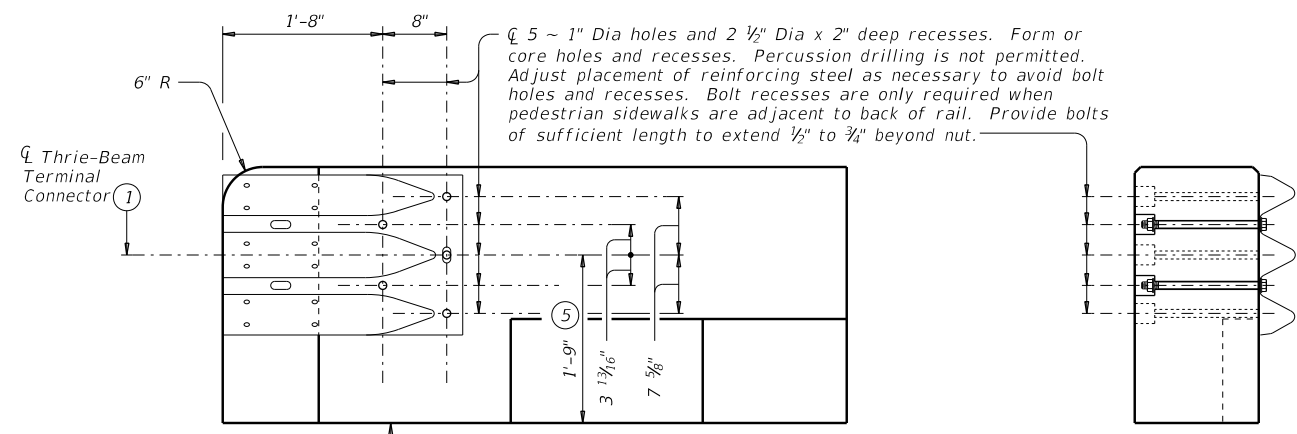
HSS RAIL DETAILS



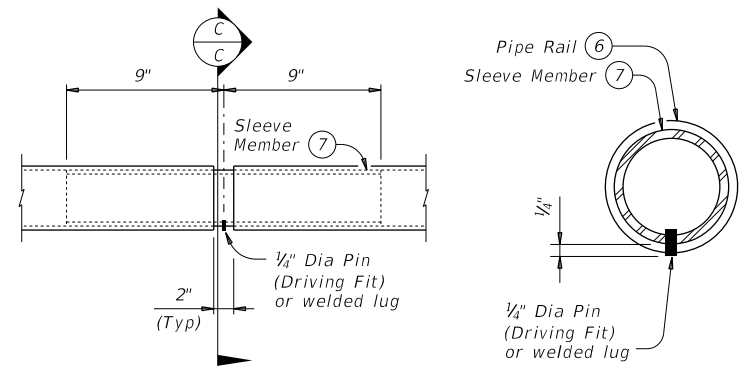
ELEVATION SHOWING TYPICAL REINFORCING PLACEMENT

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

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



TERMINAL CONNECTION DETAILS



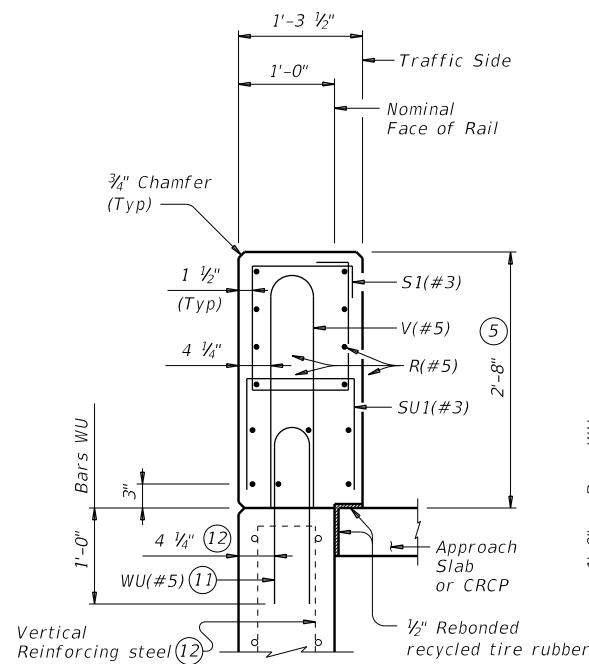
PIPE SPLICE DETAILS

SHEET 2 OF 4

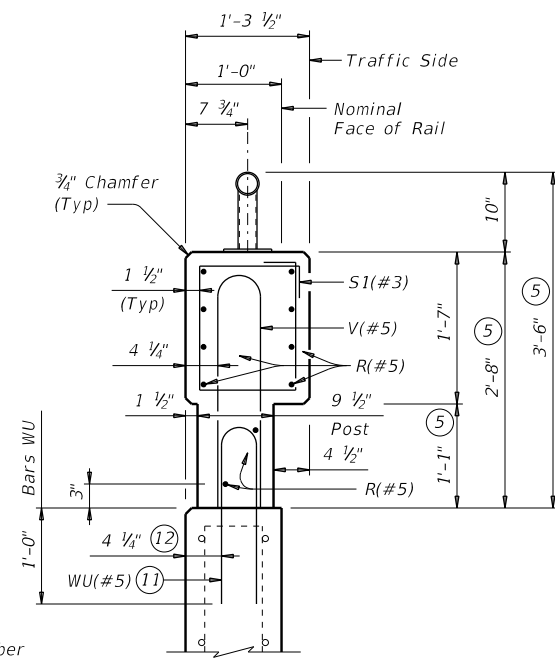
		Bridge Division Standard	
<h2>COMBINATION RAIL</h2>			
<h3>TYPE C223</h3>			
FILE: r1std019-19.dgn	DN: TxDOT	CK: TxDOT	DW: JTR
©TxDOT September 2019	CONT SECT	JOB	HIGHWAY
REVISIONS	0902 38	120	GILLILAND RD
DIST	COUNTY	SHEET NO.	
FTW	PARKER	62	

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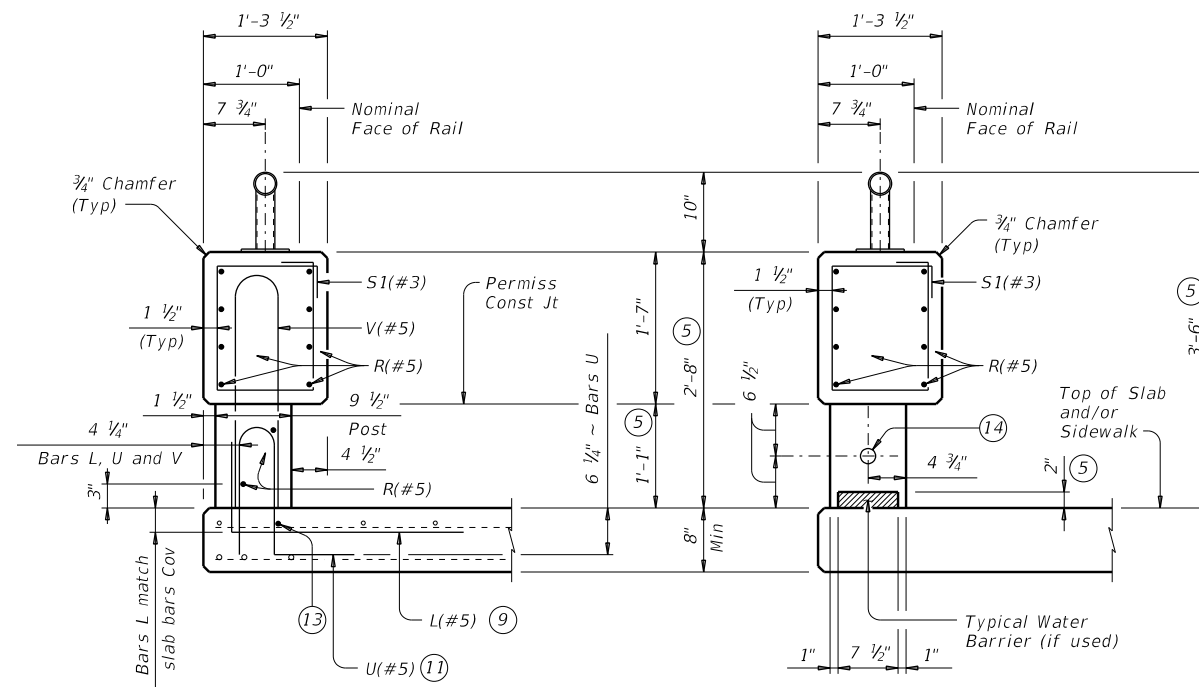
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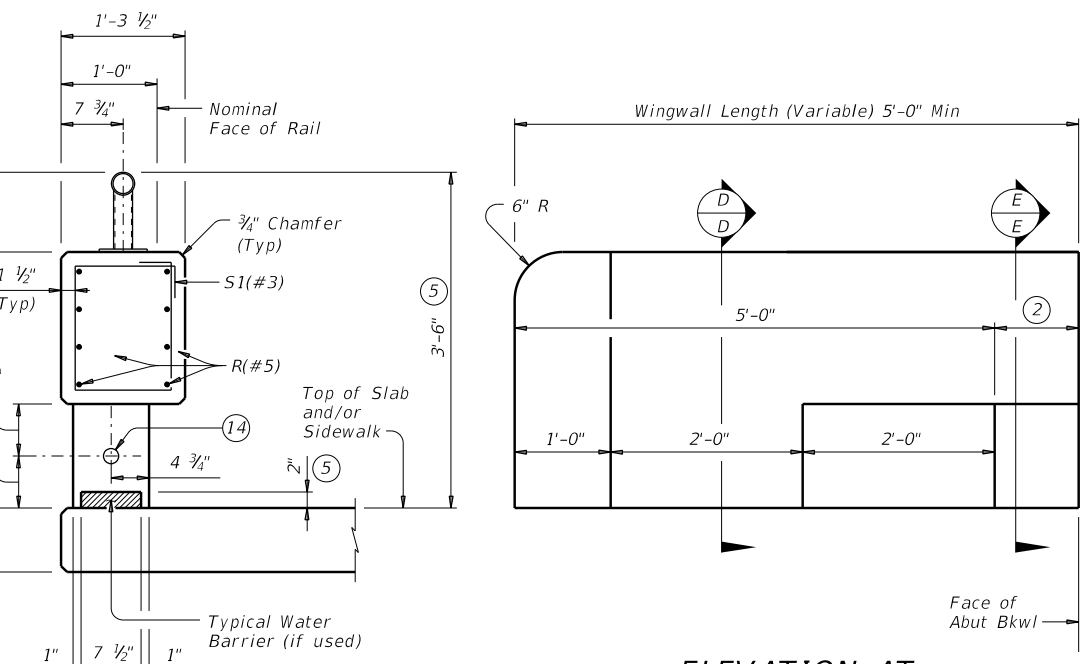
**SECTION D-D
ON ABUTMENT WINGWALLS
OR CIP RETAINING WALLS**



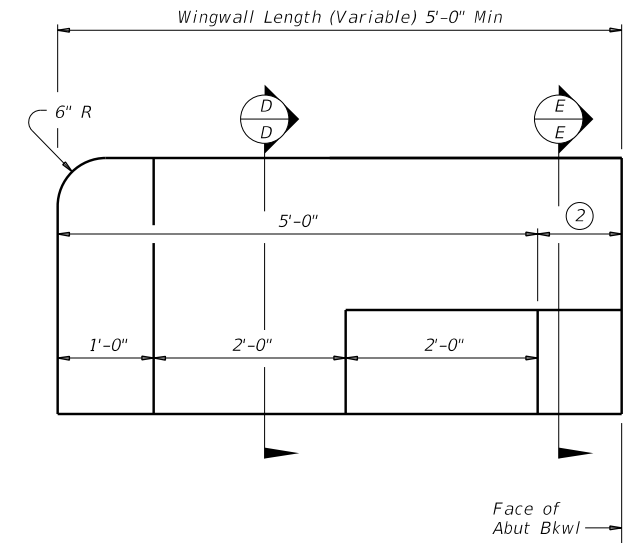
**SECTION E-E
ON ABUTMENT WINGWALLS
OR CIP RETAINING WALLS**



**AT POST
ON BRIDGE SLAB**



**AT OPENING
ON BRIDGE SLAB**

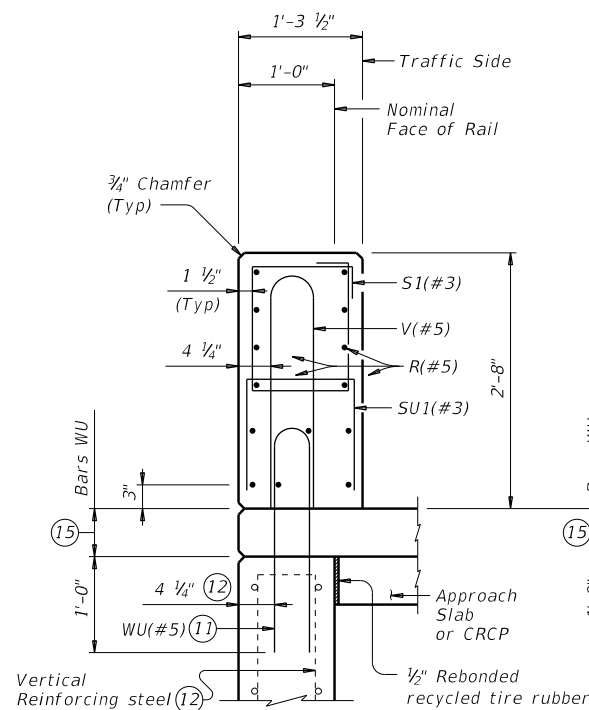


**ELEVATION AT
ABUTMENT WINGWALL**

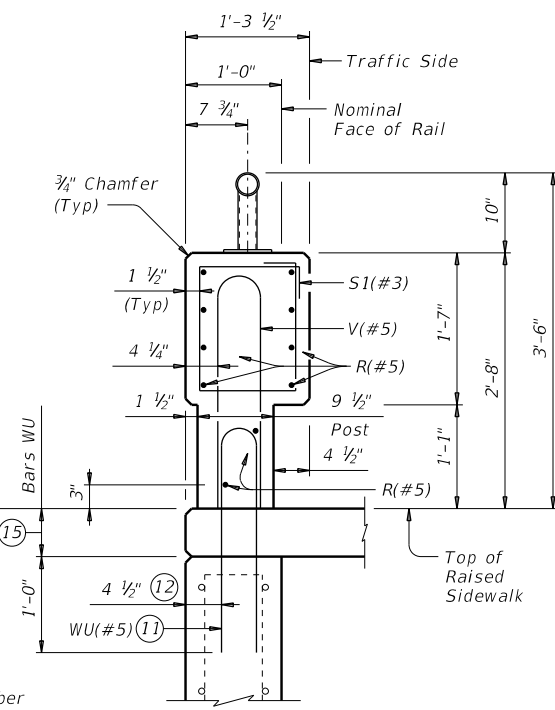
Box culvert parallel wings or rail anchorage curb similar. HSS rail not shown for clarity.

SECTIONS THRU RAIL WITHOUT RAISED SIDEWALK

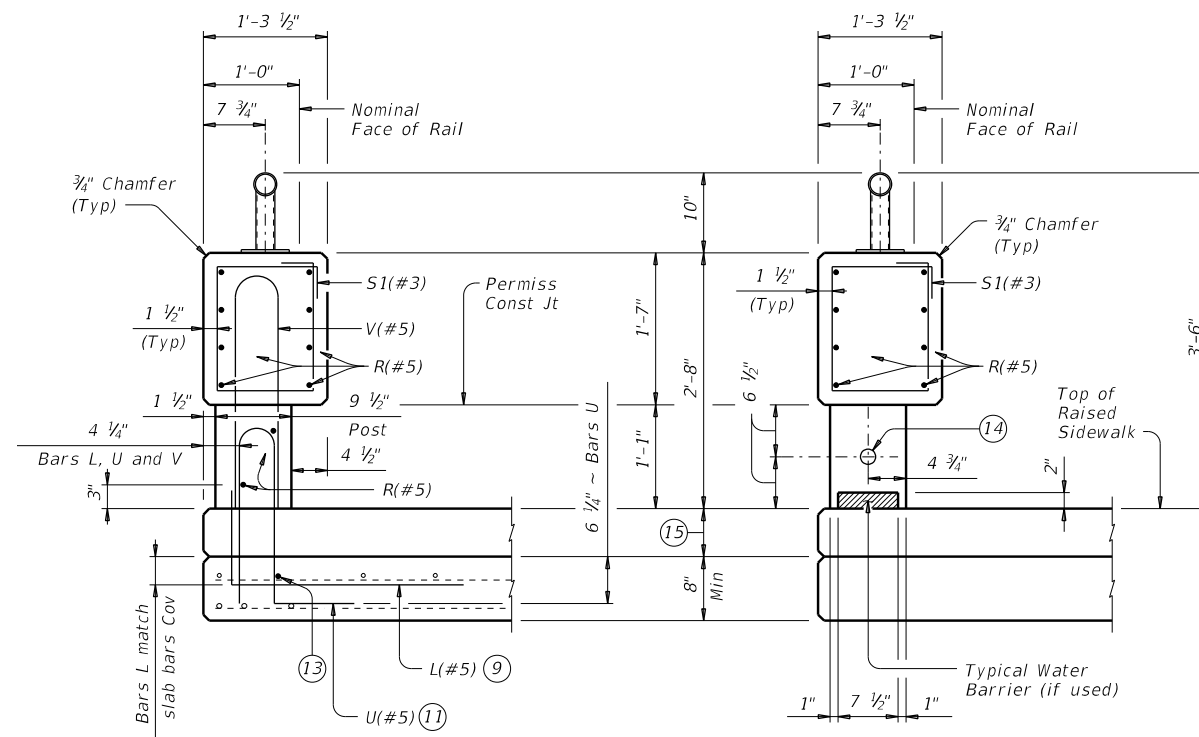
Sections on box culvert similar.



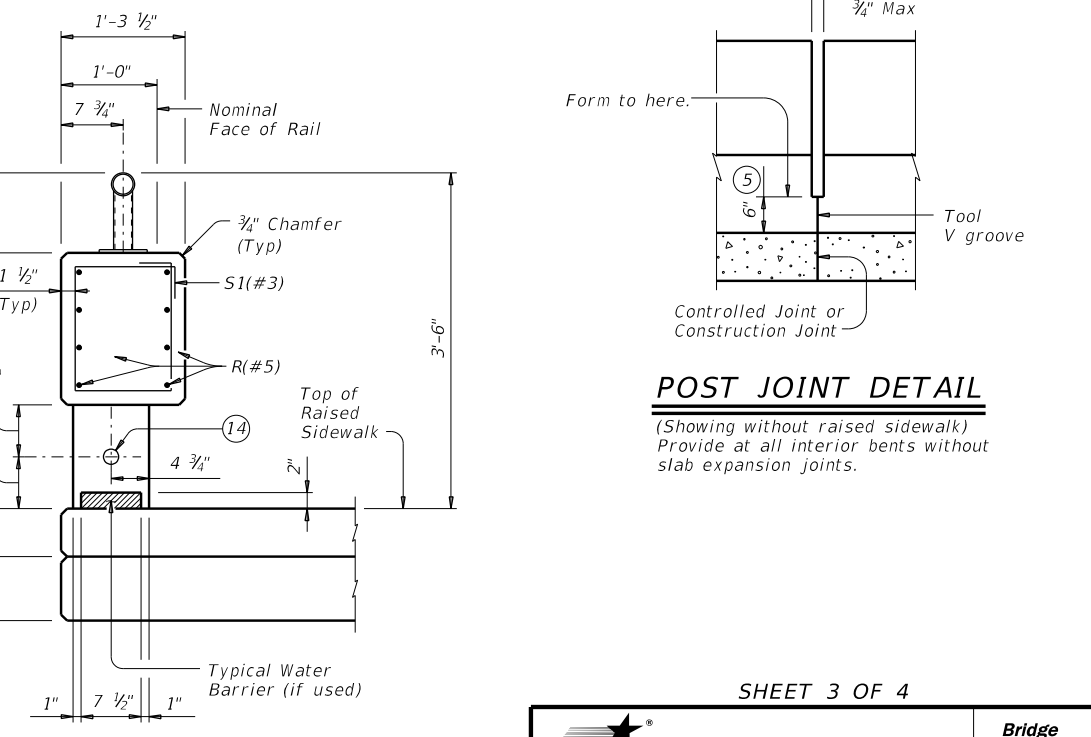
**SECTION D-D
ON ABUTMENT WINGWALLS
OR CIP RETAINING WALLS**



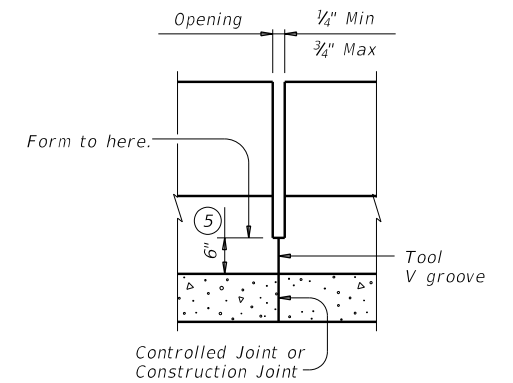
**SECTION E-E
ON ABUTMENT WINGWALLS
OR CIP RETAINING WALLS**



**AT POST
ON BRIDGE SLAB**



**AT OPENING
ON BRIDGE SLAB**



POST JOINT DETAIL

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

SECTIONS THRU RAIL WITH RAISED SIDEWALK

Sections on box culvert similar.

② Wingwall Length minus 5'-0" (Varies)

⑤ Increase 2" for structures with overlay.

⑨ Bars L(#5) are part of rail reinforcing and are included in unit price bid for railing. Space with Bars U. Bars L match slab bar cover. Bars L may be bundled with top slab reinforcing if spacing is equivalent.

⑪ Substitute Bars U(#5) for Bars WU(#5) when parapet end is located on anchorage curb over culvert top slab. Use Bars WU(#5) in culvert parallel wings.

⑫ When vertical reinforcing has closer clear cover over horizontal reinforcing in abutment wingwalls on traffic side of wall, move the horizontal wingwall/retaining wall reinforcing to the inside of Bars WU where bars conflict.

⑬ Top longitudinal slab bar may be adjusted laterally 3" plus or minus to tie reinforcing.

⑭ HSS 1.900 x 0.145

⑮ Raised Sidewalk.

SHEET 3 OF 4



COMBINATION RAIL

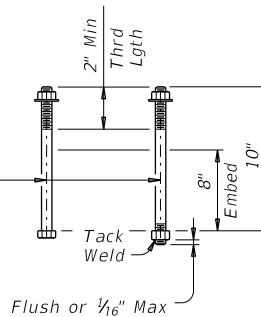
TYPE C223

FILE: r1std019-19.dgn	DN: TxDOT	CK: TxDOT	DW: JTR	CK: AES
©TxDOT September 2019	CONT	SECT	JOB	HIGHWAY
REVISIONS	0902	38	120	GILLILAND RD
DIST	COUNTY	SHEET NO.		
FTW	PARKER	63		

RAIL DATA FOR HORIZONTAL CURVES

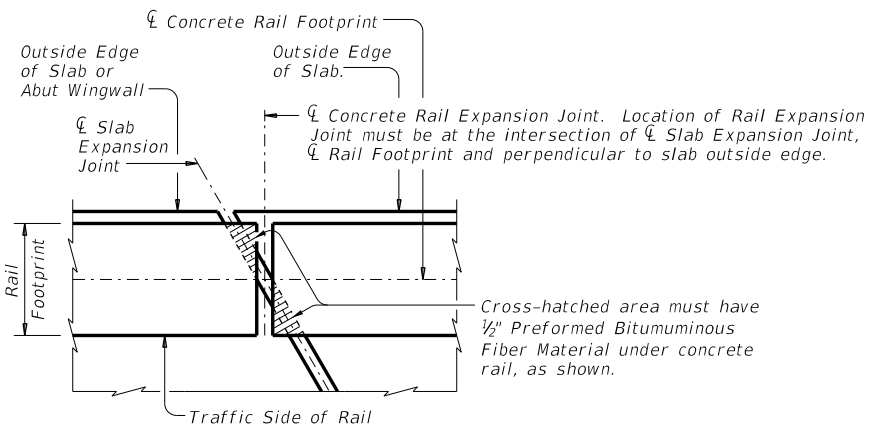
	RADIUS TO FACE OF RAIL	MAX CHORD LENGTH	CONSTRUCT OR FABRICATE
HSS Rail	Over 2800'	29'-0"	Straight rail sections
	Over 1400' thru 2800'	14'-6"	To required radius or to chords shown
	Over 700' thru 1400'	7'-3"	
	Thru 700'	Zero	To required radius

⊘ 5/8" Dia hex head anchor bolt or threaded rod (ASTM A307 Gr A) with one hardened steel washer (ASTM F436) placed under each hex nut (ASTM A563). One additional hex nut must be furnished and tack welded for each threaded rod.



CAST-IN-PLACE ANCHOR BOLT OPTIONS 16

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



PLAN OF RAIL AT EXPANSION JOINTS

Example showing Slab Expansion Joints without breakbacks.

CONSTRUCTION NOTES:

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

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

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

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

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

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

MATERIAL NOTES:

Provide Class "C" concrete. Provide Class "C" (HPC) if required elsewhere. Provide Grade 60 reinforcing steel.

Epoxy coat or galvanize all reinforcing steel if slab bars are epoxy coated or galvanized. Provide ASTM A1085, A500 Gr B or A53 Gr B for all HSS.

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

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

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

Optional cast-in-place anchor bolts must be 5/8" Dia ASTM A307 Gr A bolts (or threaded rods with one tack welded hex nut each) with one hex nut and one hardened steel washer (ASTM F436) at each bolt. Nuts must conform to ASTM A563 requirements.

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

GENERAL NOTES:

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

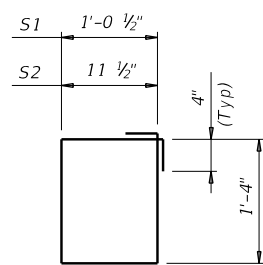
Do not use this railing on bridges with expansion joints providing more than 5" movement. Rail anchorage details shown on this standard may require modification for select structure types.

See appropriate details elsewhere in plans for these modifications.

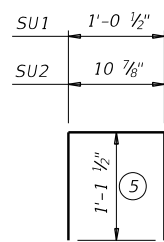
Submit erection drawings showing panel lengths, HSS rail post spacing, and anchor bolt setting to the Engineer for approval.

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

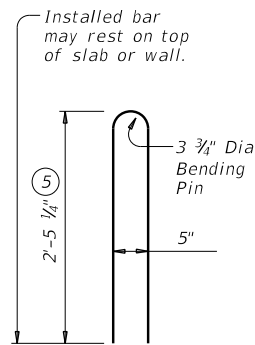
Cover dimensions are clear dimensions, unless noted otherwise. Reinforcing bar dimensions shown are out-to-out of bar.



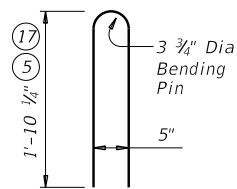
BARS S (#3)



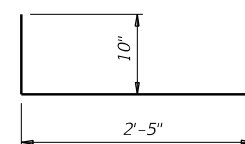
BARS SU (#3)



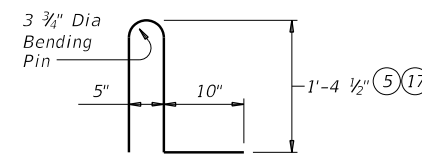
BARS V (#5) 18



BARS WU (#5)



BARS L (#5)



BARS U (#5) 18

COMBINATION RAIL

TYPE C223

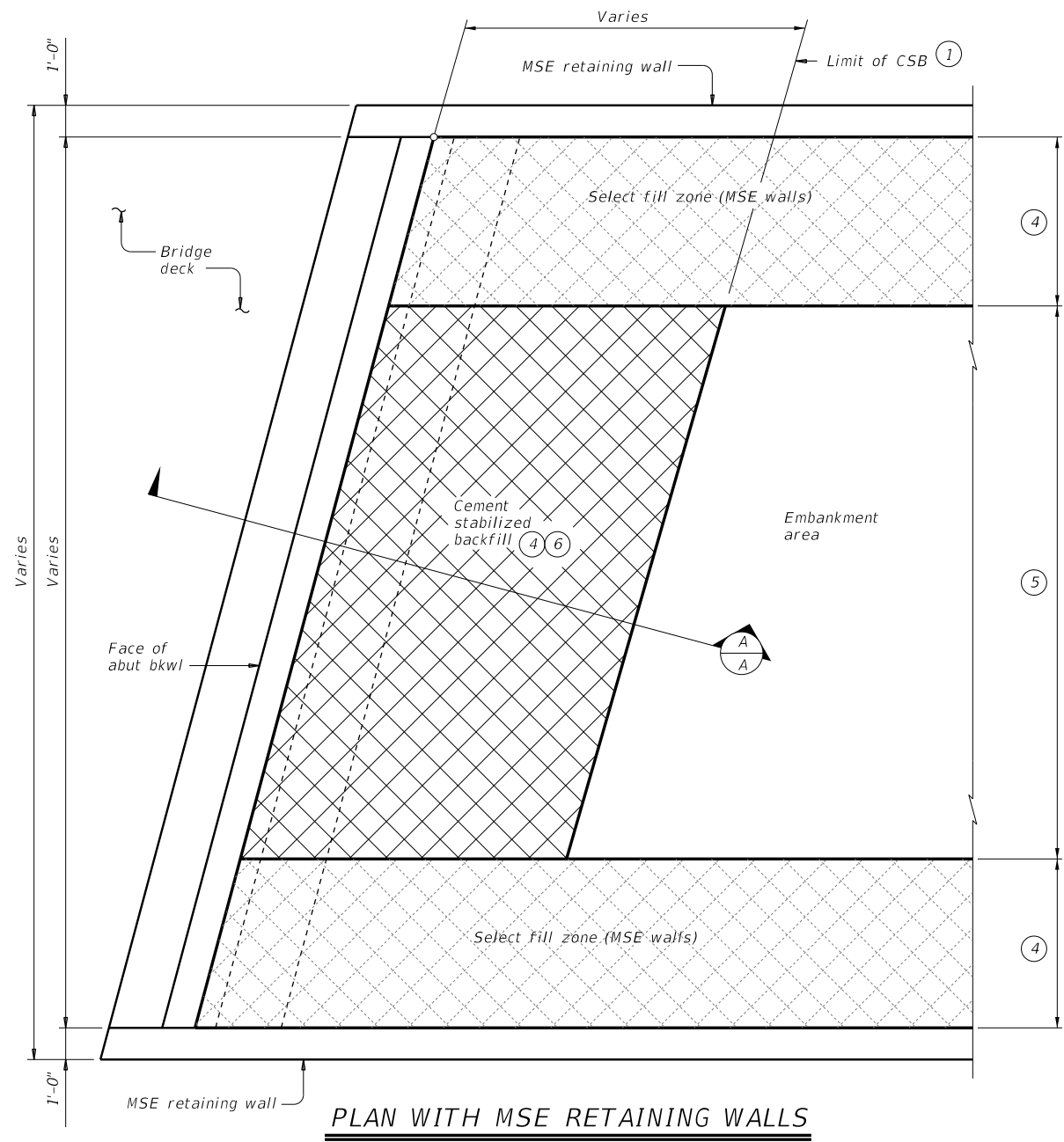
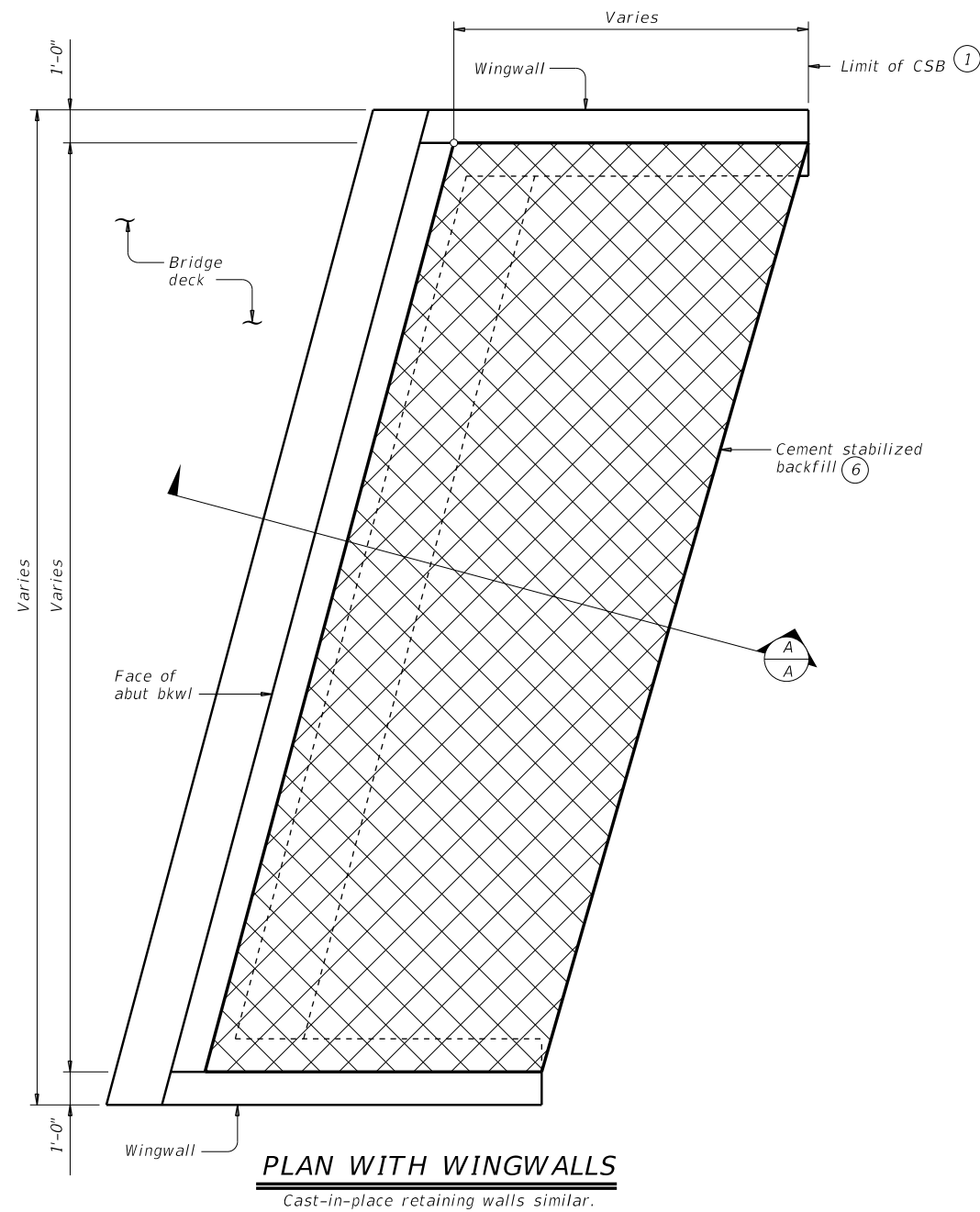
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©TxDOT September 2019	CONT	SECT	JOB	HIGHWAY
REVISIONS	0902	38	120	GILLILAND RD
DIST	COUNTY		SHEET NO.	
FTW	PARKER		64	

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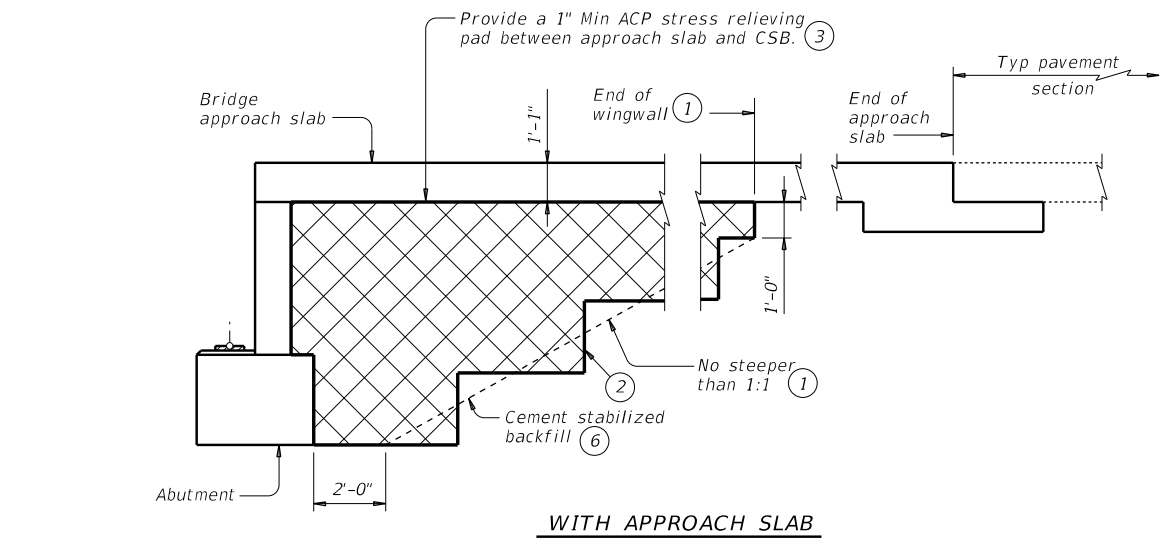
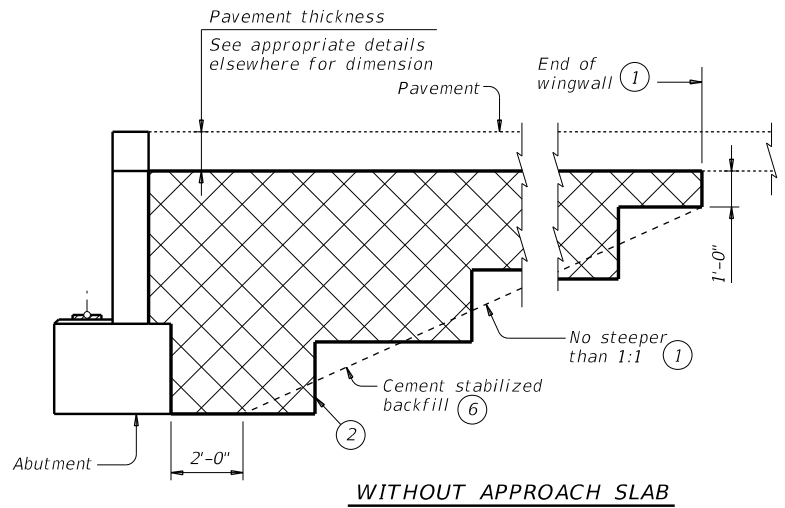
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- ① Usual limit of Cement Stabilized Backfill is at end of wingwall. Extend CSB limits as required to maintain a slope no steeper than 1:1 at bottom of backfill.
- ② Bench backfill as shown with 12" (approximate) bench depths.
- ③ Other material can be used as a stress relieving pad if approved by Engineer.
- ④ Where MSE retaining walls are present, adjust CSB limits to accommodate the select fill zone. See retaining wall details for additional information.
- ⑤ When distance between select fill zones is less than 5'-0", MSE select fill may be substituted for cement stabilized backfill with approval from the Engineer.
- ⑥ If shown in the plans flowable backfill can be used as a substitute for cement stabilized backfill with the following constraints:
 - a) If flowable backfill is to be placed over MSE backfill then a filter fabric will be placed over the MSE backfill prior to placement of the flowable fill; and
 - b) Place flowable fill in lifts not exceeding 2 feet in height, place each successive lift when the previous lift has stiffened/hardened (i.e. has lost its flowability).

GENERAL NOTES:
Provide Cement Stabilized Backfill (CSB) meeting the requirements of Item 400, "Excavation and Backfill for Structures", to the limits shown at bridge abutments.
If required elsewhere in the plans, provide Flowable Backfill meeting the requirements of Item 401, "Flowable Backfill", the limits shown at bridge abutments.
Details are drawn showing left forward skew. See Bridge Layout for actual skew direction.
These details do not apply when Concrete Block retaining walls are used in lieu of wingwalls.

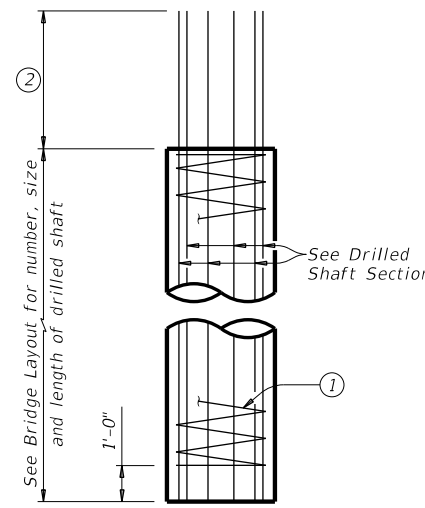


SECTION A-A

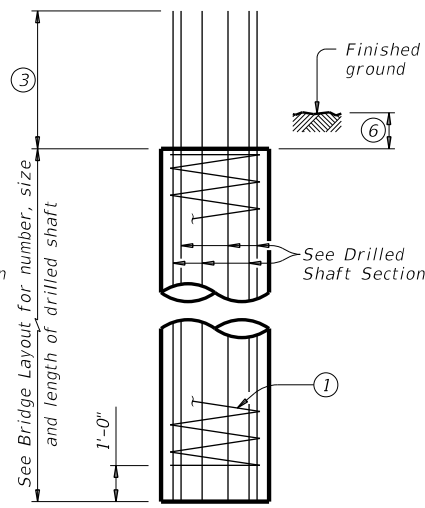
		Bridge Division Standard	
CEMENT STABILIZED ABUTMENT BACKFILL BRIDGE ABUTMENT			
CSAB			
FILE: csabste1-19.dgn	DN: TxDOT	CK: TxDOT	OW: TxDOT
©TxDOT April 2019	CONT	SECT	JOB
REVISIONS	0902	38	120 GILLILAND RD
DIST	COUNTY		SHEET NO.
FTW	PARKER		65

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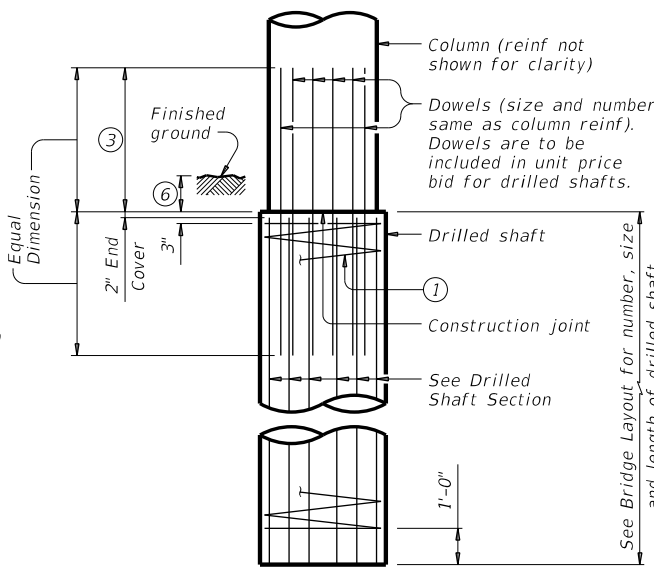
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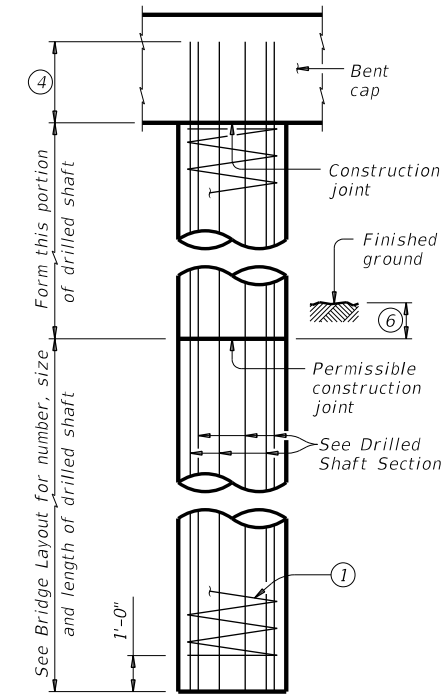
ABUTMENTS, WINGWALLS AND MULTI-DRILLED SHAFT FOOTINGS



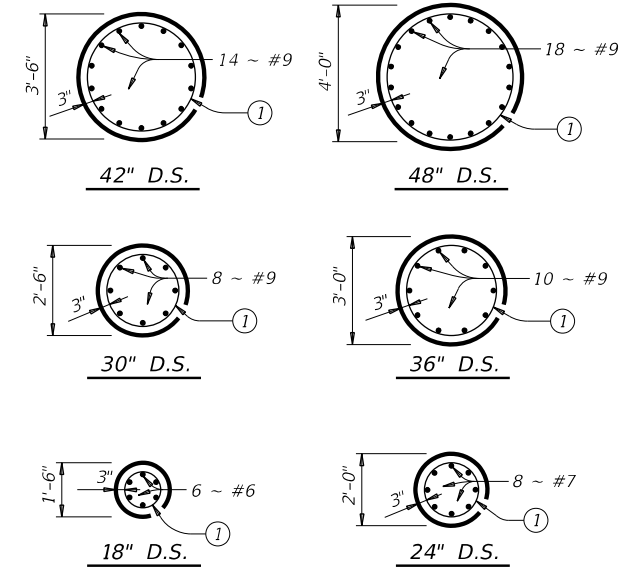
INTERIOR BENTS DRILLED SHAFT DIA EQUAL TO COLUMN DIA



INTERIOR BENTS DRILLED SHAFT DIA GREATER THAN COLUMN DIA



OPTIONAL INTERIOR BENT DRILLED SHAFT DETAIL 5

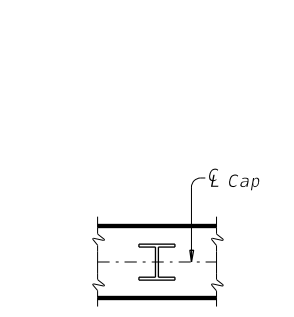


DRILLED SHAFT SECTIONS

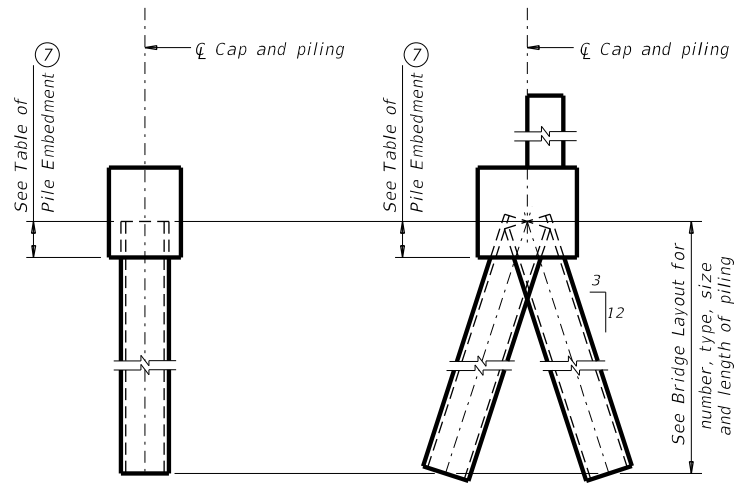
DRILLED SHAFT DETAILS

TABLE OF PILE EMBEDMENT	
Pile Type	Embedment Depth (Ft)
16" Sq Concrete 18" Sq Concrete HP14 Steel HP16 Steel	1'-0"
20" Sq Concrete 24" Sq Concrete HP18 Steel	1'-6"

See Prestressed Concrete Piling (CP) standard for additional details on concrete pile embedment.

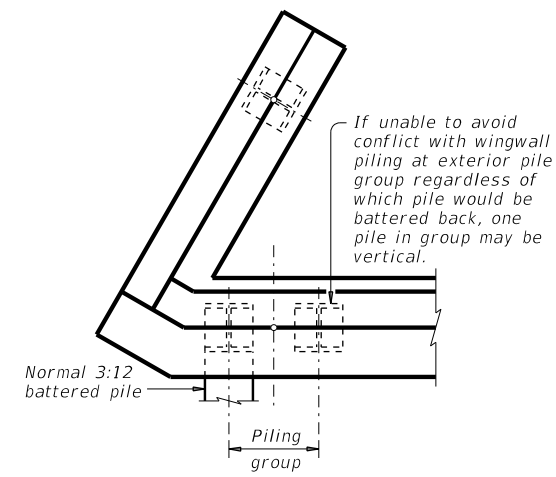


ORIENTATION OF STEEL H-PIILING



VERTICAL PILE BATTERED PILE

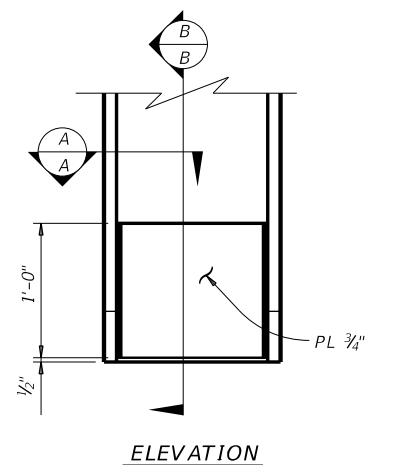
PIILING DETAILS
(Concrete or steel H)



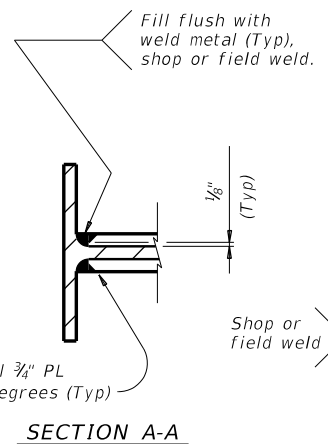
DETAIL "A"

(Showing plan view of a 30° skewed abutment)

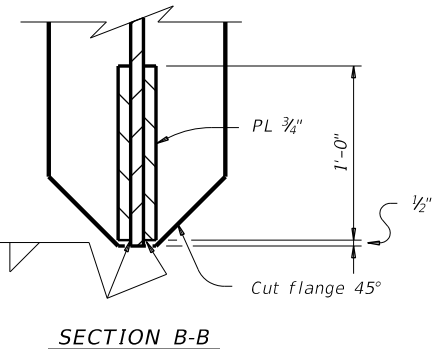
- 1 #3 spiral at 6" pitch (one and a half flat turns top and bottom).
- 2 Min extension into supported element:
#6 Bars = 1'-11"
#7 Bars = 2'-0"
#9 Bars = 2'-3"
- 3 Min lap with column reinf:
#7 Bars = 2'-11"
#9 Bars = 3'-9"
- 4 Min extension into supported element:
#6 Bars = 1'-11"
#7 Bars = 2'-3"
#9 Bars = 2'-9"
- 5 Drilled shafts may extend to the bottom of bent caps for "H" heights of 6 ft and less (as shown on the Bridge Layout), if approved. This option can only be used when the drilled shaft diameter equals the column diameter. Obtain approval of the forming method above the ground line prior to construction. No adjustments in payment will be made if this option is used.
- 6 1'-0" Min, unless shown otherwise on plans.
- 7 Or as shown on plans.



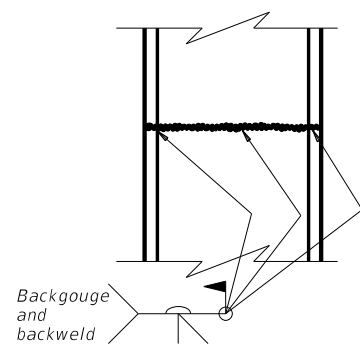
ELEVATION



SECTION A-A

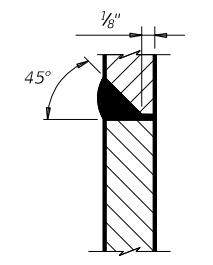


SECTION B-B



STEEL H-PILE SPLICE DETAIL

Use when required.



SECTION THRU FLANGE OR WEB

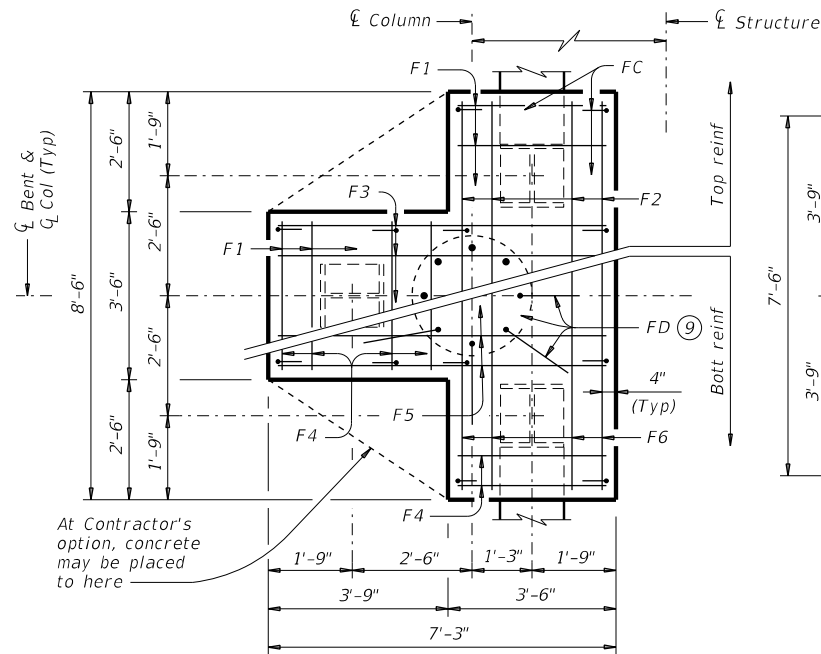
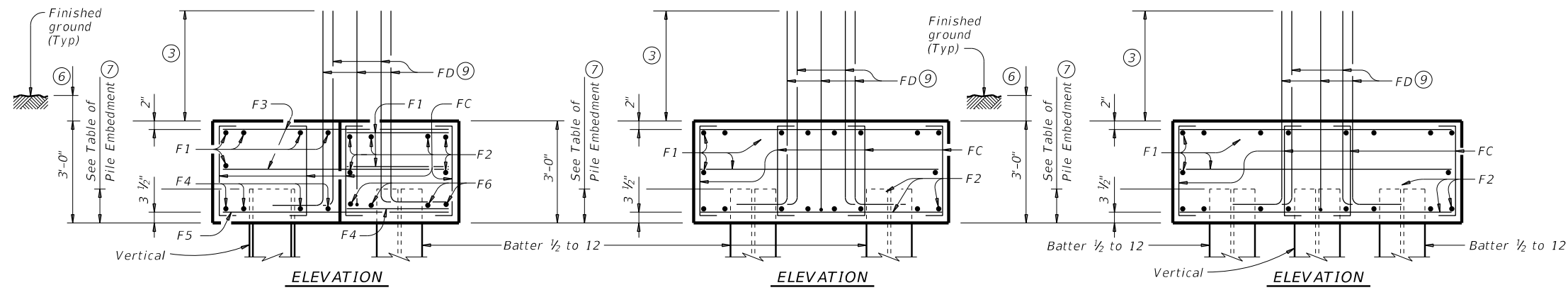
STEEL H-PILE TIP REINFORCEMENT

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

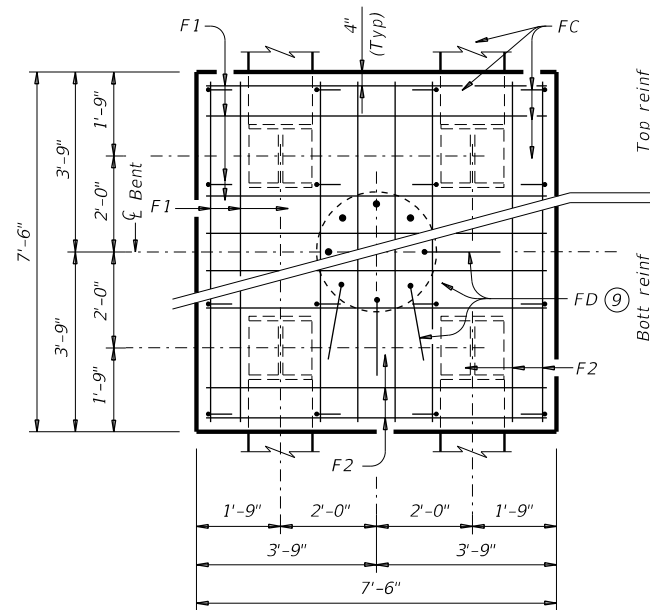
		Bridge Division Standard	
COMMON FOUNDATION DETAILS			
FD			
FILE: fdstde01-19.dgn	DN: TxDOT	CK: TxDOT	OW: TxDOT
©TxDOT April 2019	CONT	SECT	JOB
REVISIONS	0902	38	120
	DIST	COUNTY	SHEET NO.
	FTW	PARKER	66

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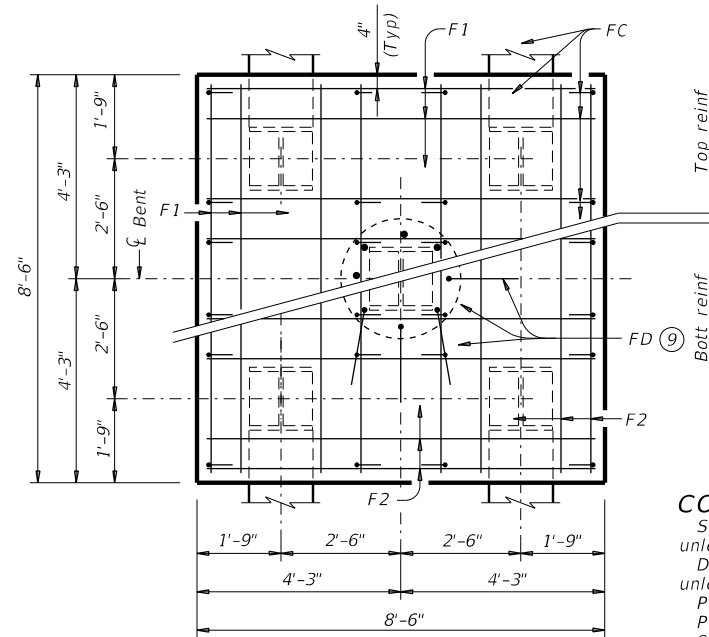
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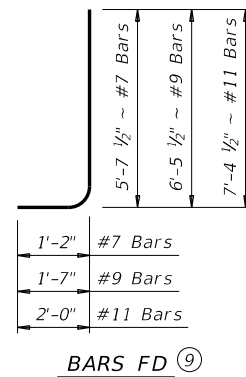
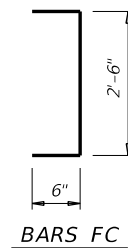
THREE PILE FOOTING^⑧
 For 36" Dia and smaller columns.



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



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



- ③ Min lap with column reinforcing:
 #7 Bars = 2'-11"
 #9 Bars = 3'-9"
 #11 Bars = 4'-8"
- ⑥ 1'-0" Min, unless shown otherwise on plans.
- ⑦ Or as shown on plans.
- ⑧ See Bridge Layout for type, size and length of piling.
- ⑨ Number and size of FD bars must match column reinforcing. Tie FD bars to the top of the bottom reinforcing mat.
- ⑩ Adjust FD quantity, size and weight as needed to match column reinforcing.

TABLE OF FOOTING QUANTITIES FOR 30" COLUMNS

ONE 3 PILE FOOTING				
Bar	No.	Size	Length	Weight
F1	11	#4	3'- 2"	23
F2	6	#4	8'- 2"	33
F3	6	#4	6'- 11"	28
F4	8	#9	3'- 2"	86
F5	4	#9	6'- 11"	94
F6	4	#9	8'- 2"	111
FC	12	#4	3'- 6"	28
FD ^⑩	8	#9	8'- 1"	220
Reinforcing Steel			Lb	623
Class "C" Concrete			CY	4.8
ONE 4 PILE FOOTING				
Bar	No.	Size	Length	Weight
F1	20	#4	7'- 2"	96
F2	16	#8	7'- 2"	306
FC	16	#4	3'- 6"	37
FD ^⑩	8	#9	8'- 1"	220
Reinforcing Steel			Lb	659
Class "C" Concrete			CY	6.3
ONE 5 PILE FOOTING				
Bar	No.	Size	Length	Weight
F1	20	#4	8'- 2"	109
F2	16	#9	8'- 2"	444
FC	24	#4	3'- 6"	56
FD ^⑩	8	#9	8'- 1"	220
Reinforcing Steel			Lb	829
Class "C" Concrete			CY	8.0

CONSTRUCTION NOTES:

See Bridge Layout for foundation type required. Use these foundation details unless shown otherwise.
 Drive piling under abutment wingwalls to a minimum resistance of 10 Tons/Pile unless shown otherwise.
 Provide Class C Concrete ($f'_c = 3,600$ psi), unless shown otherwise.
 Provide Grade 60 reinforcing steel.
 Galvanize reinforcing if shown elsewhere in the plans.
 Provide bar laps for drilled shaft reinforcing, where required, as follows:
 Uncoated or galvanized (#6) ~ 2'-6"
 Uncoated or galvanized (#7) ~ 2'-11"
 Uncoated or galvanized (#9) ~ 3'-9"

GENERAL NOTES:

Designed according to AASHTO LRFD Bridge Design Specifications.

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

DESIGNER NOTES:

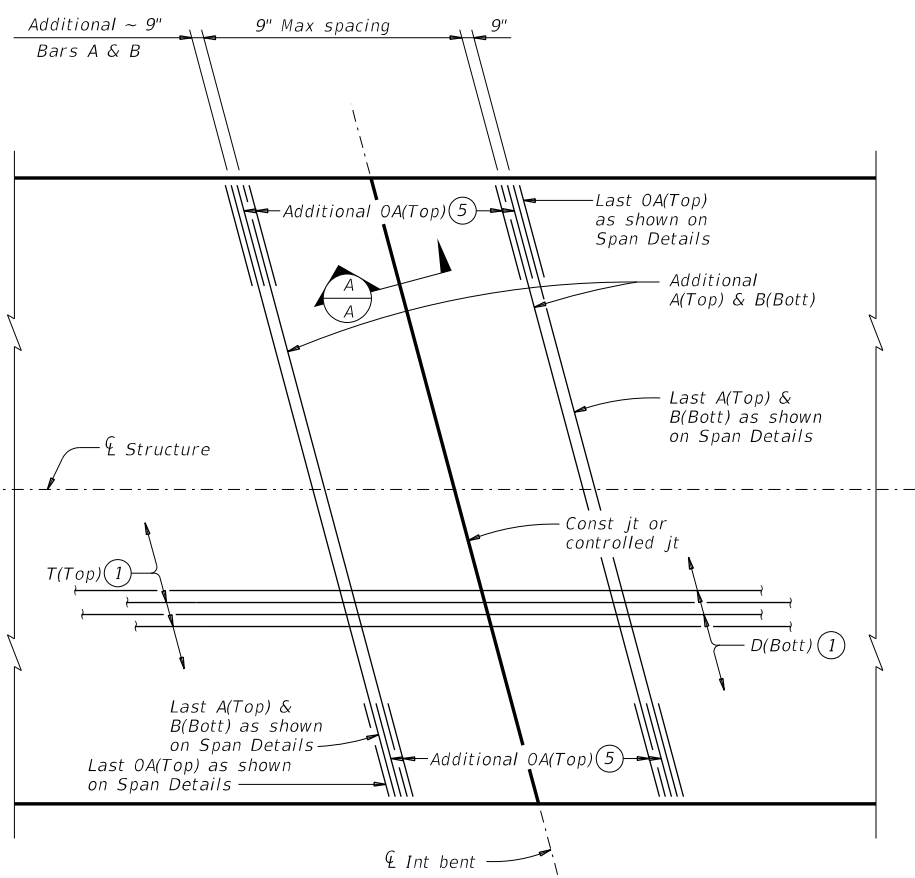
Do not use the drilled shaft details shown on this standard for retaining wall, noise wall, barrier, or sign foundations without structural evaluation.
 Do not use the footings shown on this standard in direct contact with salt water or exposed to salt water spray.
 Maximum allowable pile loads for the footings shown are:
 72 Tons/Pile with 24" Dia Columns
 80 Tons/Pile with 30" Dia Columns
 100 Tons/Pile with 36" Dia Columns
 120 Tons/Pile with 42" Dia Columns

SHEET 2 OF 2

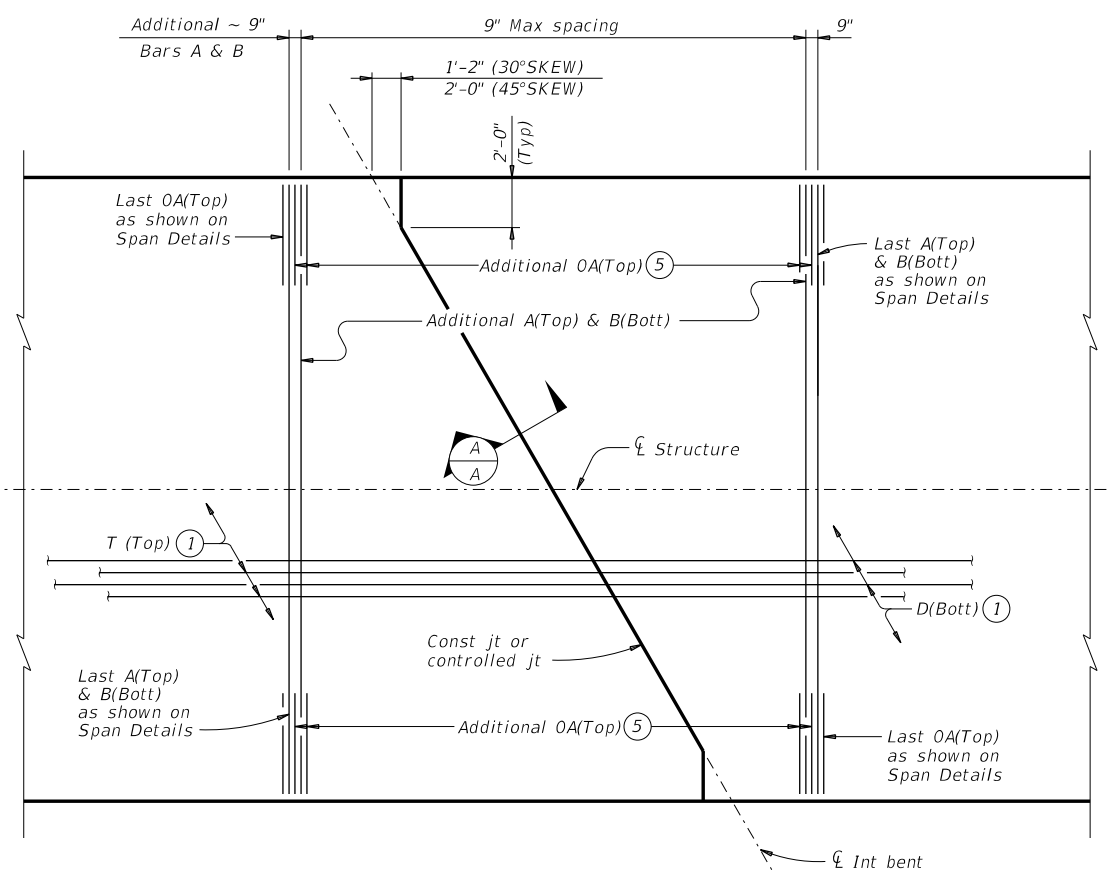
		Bridge Division Standard	
COMMON FOUNDATION DETAILS			
FD			
FILE: fdstde01-20.dgn	DN: TxDOT	CK: TxDOT	DW: TxDOT
©TxDOT April 2019	CONT	SECT	JOB
REVISIONS	0902	38	120
01-20: Added #11 bars to the FD bars.	DIST	COUNTY	SHEET NO.
	FTW	PARKER	67

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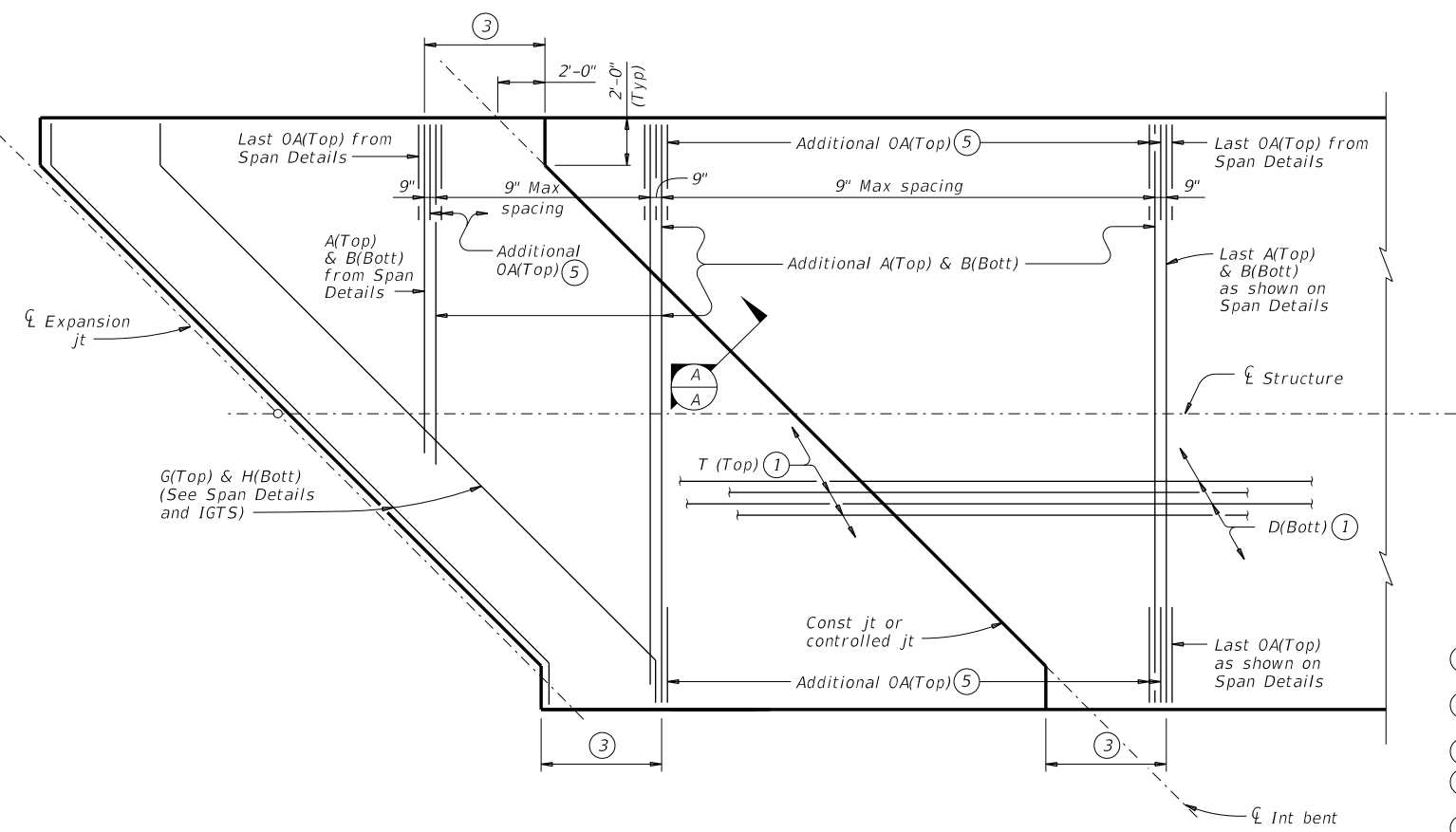
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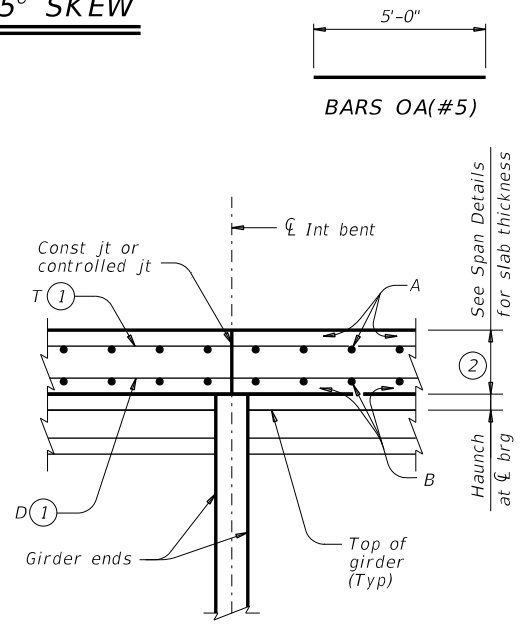
PLAN FOR 0° OR 15° SKEW
 (Showing 15°skew)



PLAN FOR 30° OR 45° SKEW
 (Showing 30°skew)



PLAN FOR 45° SKEW
 (Showing short Span condition)



SECTION A-A
 Bars OA(Top) not shown for clarity.

- ① Top and bottom mats must be continuous through joint.
- ② Maintain a constant slab thickness over the bent.
- ③ 5'-4" as shown on Span Details.
- ④ Use these details when no full slab width bars A and B are shown on Span Details.
- ⑤ Bars OA(Top) at 9" Max spacing between Bars A(Top).

TABLE OF ALLOWABLE UNIT LENGTH	
Max Rdwy Grade, Percent	Unit Length Factor
0.00	4.1
1.00	3.9
2.00	3.7
3.00	3.5
4.00	3.3
5.00	3.1

Unit length must not exceed the length of the shortest end span times the Unit Length Factor shown in table or 400', whichever is less.

BAR TABLE	
BAR	SIZE
A	#4
B	#4
D	#4
T	#4
OA	#5

The details shown on this sheet are applicable for two and three span units comprised of the same girder type. Units may be comprised of different span lengths. See "Table of Allowable Unit Length".

GENERAL NOTES:
 Designed according to AASHTO LRFD Bridge Design Specifications.
 This standard is drawn showing right forward skew. See Bridge Layout for actual skew direction.

CONSTRUCTION NOTES:
 Where multi-span units are indicated on the Bridge Layout, the thickened slab end details and reinforcement shown on IGTS standard (Bars AA, G, H, J, K, and M) and on the Span Details will be omitted where slabs are continuous over interior bents. At these locations, the slab details and reinforcement will be as shown on this sheet or on PCP standard (if using this option).
 Thickened slab end reinforcement and details still apply at expansion joint locations (ends of units).
 See Span Details for remainder of slab reinforcement and details.

MATERIAL NOTES:
 Provide Grade 60 reinforcing steel.
 Provide Class "S" concrete (f'c = 4,000 psi).
 Provide Class "S" (HPC) if shown elsewhere on the plans.
 Provide bar laps, where required, as follows:
 Uncoated ~ #4 = 1'-7"
 Epoxy Coated ~ #4 = 2'-5"

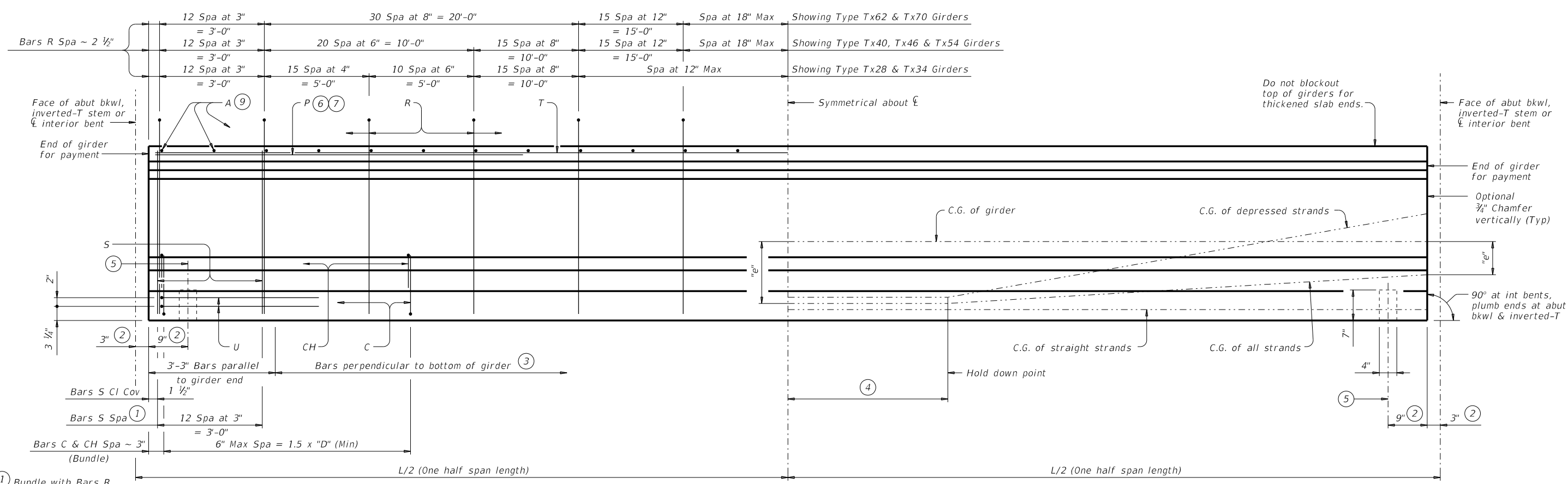
The details shown on this sheet are applicable for use only with the Prestressed Concrete I-Girder Standard Designs shown on standards IGSD-24, IGSD-28, IGSD-30, IGSD-32, IGSD-38, IGSD-40 and IGSD-44.

HL93 LOADING

Texas Department of Transportation		Bridge Division Standard
CONTINUOUS SLAB DETAILS		
PRESTR CONC I-GIRDER SPANS		
IGCS		
FILE: igcs1sts-17.dgn	DN: JMH	CK: TxDOT
©TxDOT August 2017	CONT SECT	JOB HIGHWAY
REVISIONS	0902 38	120 GILLILAND RD
	DIST COUNTY	SHEET NO.
	FTW PARKER	68

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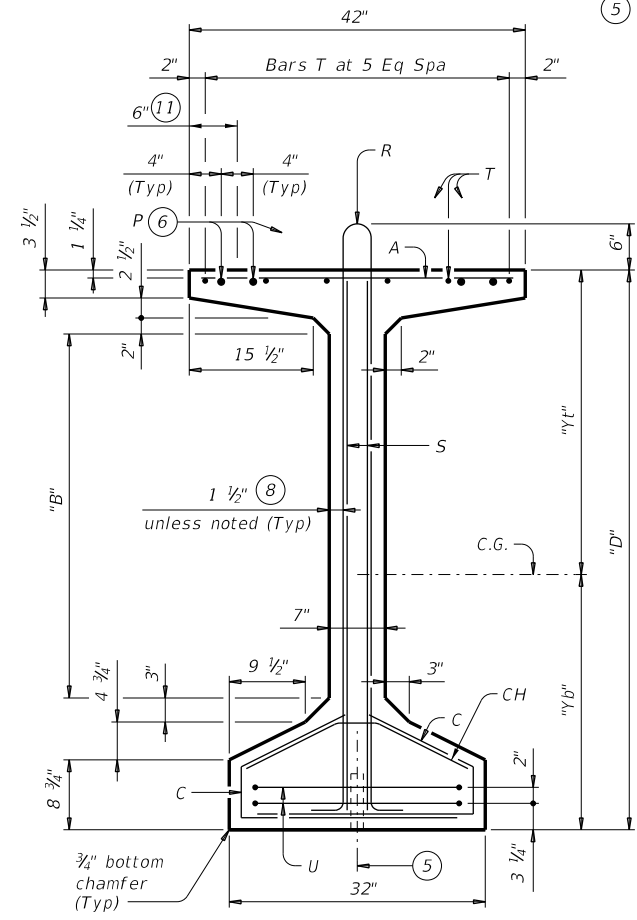
- ① Bundle with Bars R.
- ② Measured along C.G. Girder at interior bents; perpendicular to abutment bkwl or inverted-T stem.
- ③ The average of the top and bottom spacing of Bars R cannot exceed the required spacing.
- ④ L/20, but not less than 5'-0" (-0,+2).

GIRDER ELEVATION

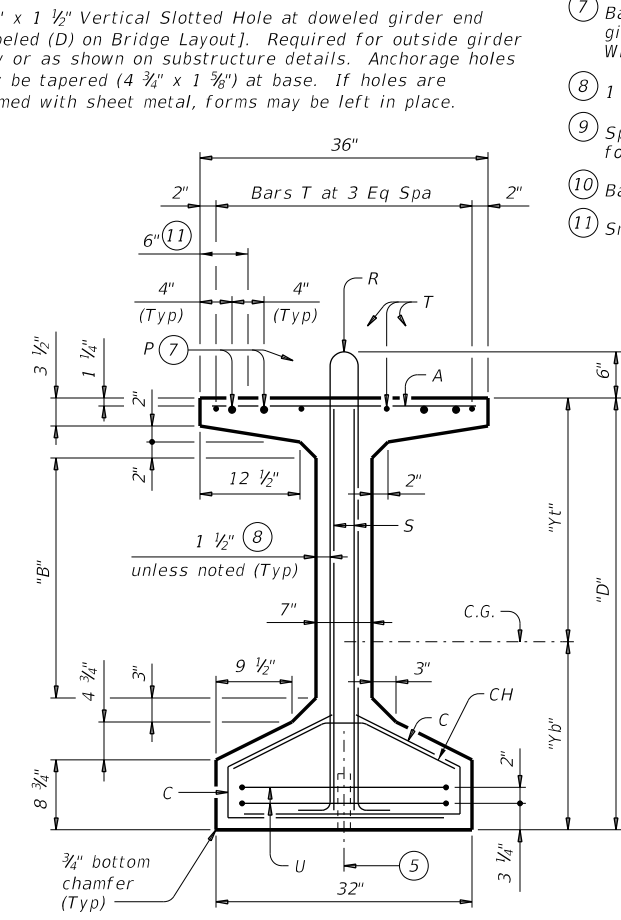
- ⑥ Bars P (#6 x 15'-0") required in Tx62 and Tx70 girders. At the fabricator's option bars larger than #6 may be used. When L is less than 50 ft, Bars P are to be the same length as Bars T.
- ⑦ Bars P (#6 x 15'-0") are only required in Tx28, Tx34, Tx40, Tx46, and Tx54 girders when "e" at girder ends exceeds 0.25 x "D". At the fabricator's option bars larger than #6 may be used. When L is less than 50 ft, Bars P are to be the same length as Bars T.
- ⑧ 1 3/8" Clear Cover to Bars S.
- ⑨ Space Bars A at 6" Max for girders requiring overhang bracket hangers. Space at 12" Max for all other girders. Tie to Bars R as necessary. See standard IGMS for "Deck Forming Notes".
- ⑩ Based on 155 pcf total weight of concrete and reinforcing steel.
- ⑪ Smooth trowel finish on the slab overhang side of exterior girder.

GIRDER DIMENSIONS AND SECTION PROPERTIES								
Girder Type	"D" (in.)	"B" (in.)	"Yt" (in.)	"Yb" (in.)	Area (in. ²)	"Ix" (in. ⁴)	"Iy" (in. ⁴)	Weight (plf)
Tx28	28	6	15.02	12.98	585	52,772	40,559	630
Tx34	34	12	18.49	15.51	627	88,355	40,731	675
Tx40	40	18	21.90	18.10	669	134,990	40,902	720
Tx46	46	22	25.90	20.10	761	198,089	46,478	819
Tx54	54	30	30.49	23.51	817	299,740	46,707	880
Tx62	62	37 1/2	33.72	28.28	910	463,072	57,351	980
Tx70	70	45 1/2	38.09	31.91	966	628,747	57,579	1,040

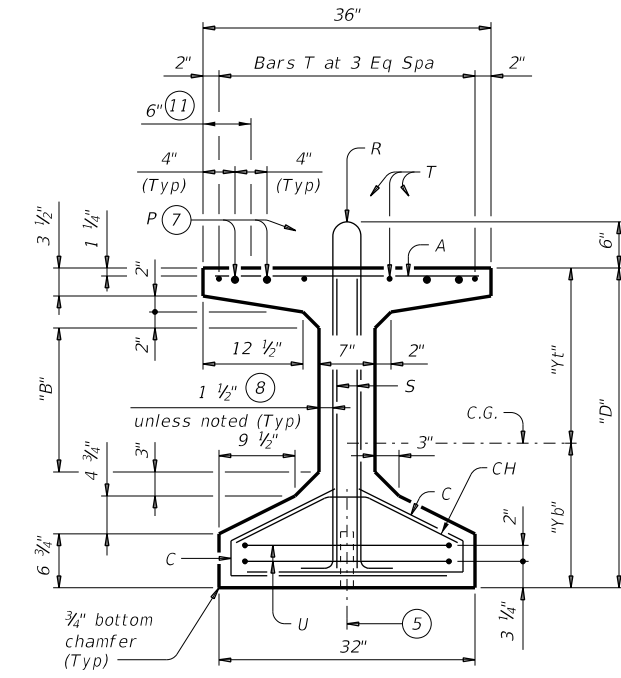
GENERAL NOTES:
 Designed according to AASHTO LRFD Bridge Design Specifications. Provide Class H concrete. Provide Grade 60 reinforcing steel. An equal area of deformed Welded Wire Reinforcement (WWR) (ASTM A1064) may be substituted for Bars A, C, R or T unless otherwise noted. It is permissible for bars or strands to come in contact with materials used in forming anchor holes.
 Cover dimensions are clear dimensions, unless noted otherwise. Reinforcing bar dimensions shown are out-to-out of bar.



TYPE Tx62 & Tx70



TYPE Tx46 & Tx54



TYPE Tx28, Tx34 & Tx40

HL93 LOADING SHEET 1 OF 2

Texas Department of Transportation
 Bridge Division Standard

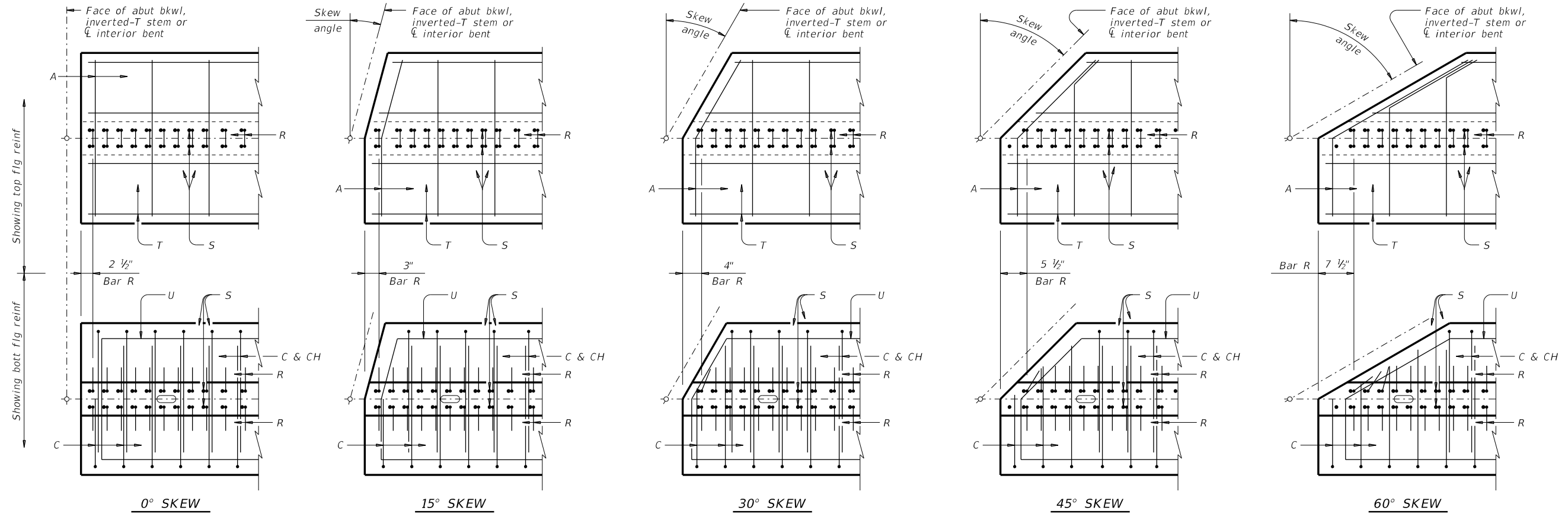
PRESTRESSED CONCRETE I-GIRDER DETAILS

IGD

FILE: igdstds1-17.dgn	DN: TxDOT	CK: JMH	DW: JTR	CK: JMH
©TxDOT August 2017	CONT	SECT	JOB	HIGHWAY
REVISIONS	0902	38	120	GILLILAND RD
	DIST	COUNTY	SHEET NO.	
	FTW	PARKER	69	

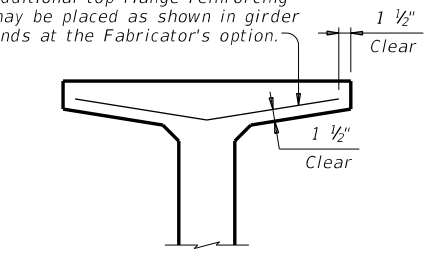
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DATE: 11/5/2020 5:30:31 PM
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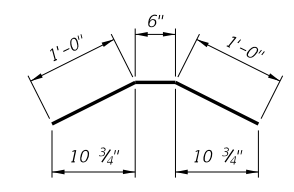


PLAN OF GIRDER ENDS (12)

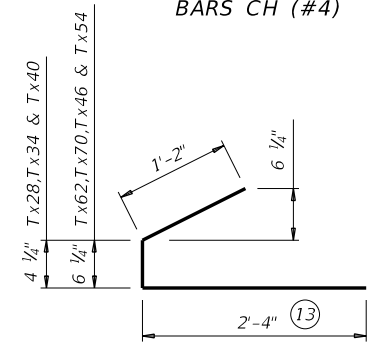
To control top flange cracking that may occur during form removal, additional top flange reinforcing may be placed as shown in girder ends at the Fabricator's option.



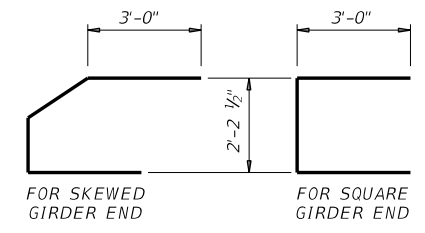
OPTIONAL TOP FLANGE REINFORCING DETAIL



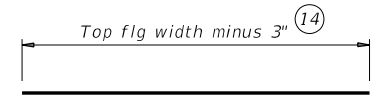
BARS CH (#4)



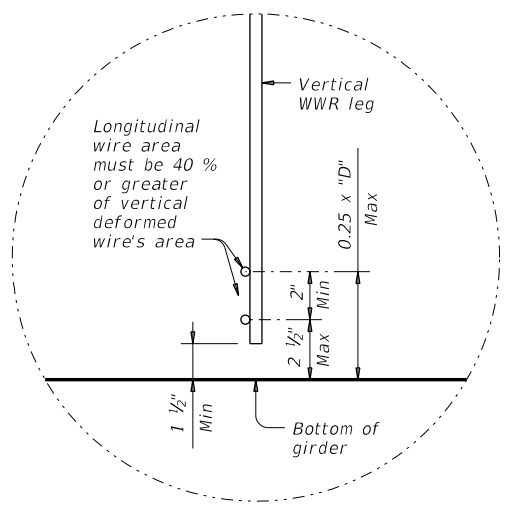
BARS C (#4)



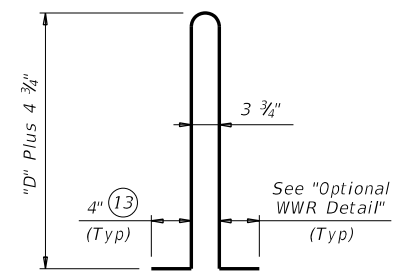
BARS U (#5)



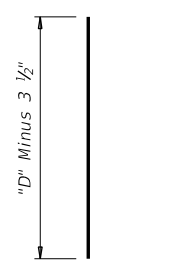
BARS A (#3)



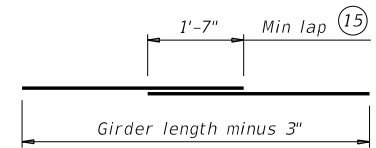
OPTIONAL WELDED WIRE REINFORCEMENT (WWR) DETAIL



BARS R (#4) (16)



BARS S (#6)



BARS T (#4)

- (12) Reinforcing patterns shown are provided as guides to determine reinforcement placement in skewed ends. Place Bars S as close to girder end as cover requirements permit, which may prevent them to be bundled with Bars R.
- (13) Bars may be cut or bent at skewed end as required.
- (14) Increase as necessary for bars at skewed end.
- (15) No portion of bar less than 10 ft.
- (16) For Welded Wire Reinforcement (WWR) option, area of Bars R may be reduced in proportion to the increase in reinforcement yield strength over 60 ksi. Yield strength of WWR is limited to 75 ksi.



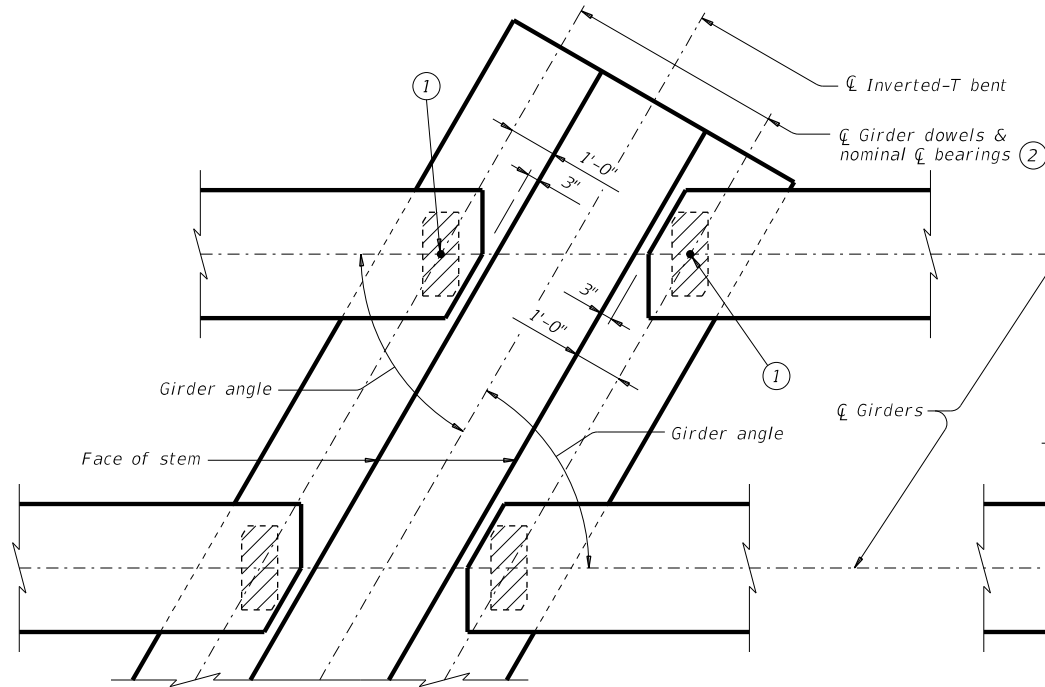
PRESTRESSED CONCRETE I-GIRDER DETAILS

IGD

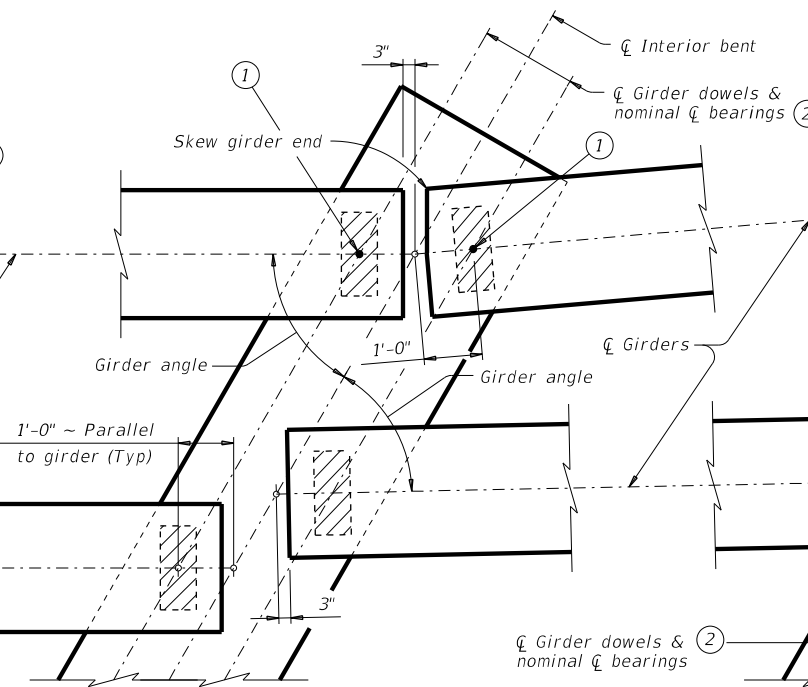
FILE: igdstds1-17.dgn	DN: TxDOT	CK: JMH	DW: JTR	CK: JMH
©TxDOT August 2017	CONT	SECT	JOB	HIGHWAY
REVISIONS	0902	38	120	GILLILAND RD
	DIST	COUNTY	SHEET NO.	
	FTW	PARKER	70	

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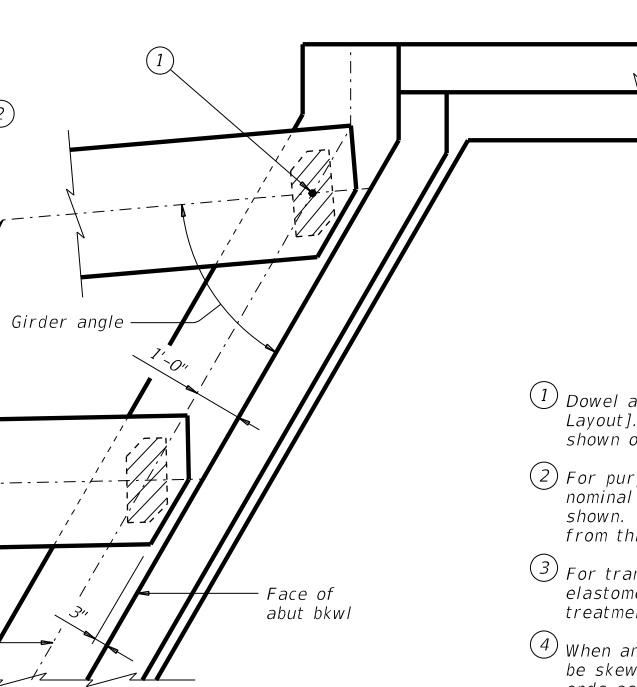
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AT INVERTED-T BENT W/SKEW

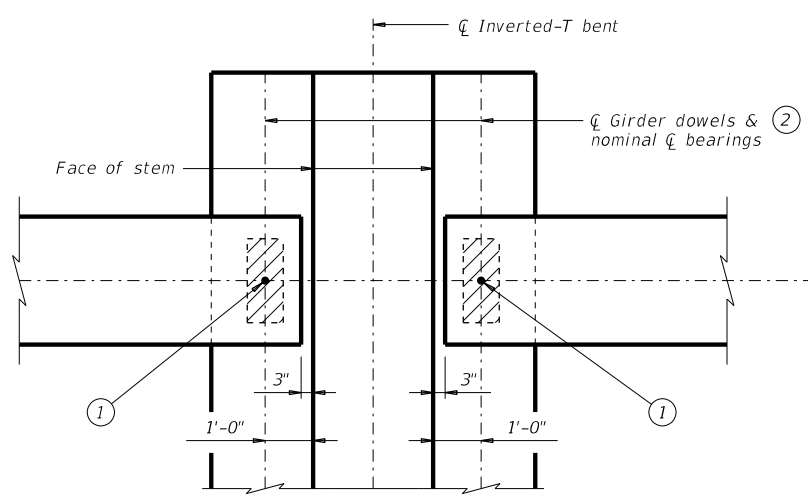


AT CONVENTIONAL INTERIOR BENT W/SKEW

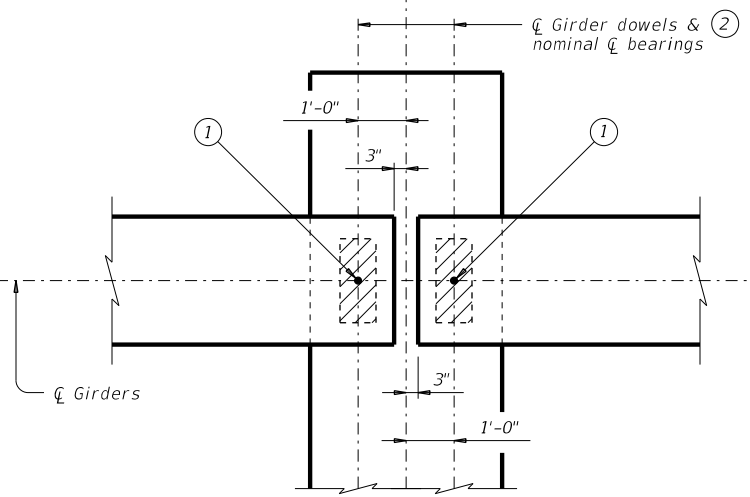


AT ABUTMENT W/SKEW

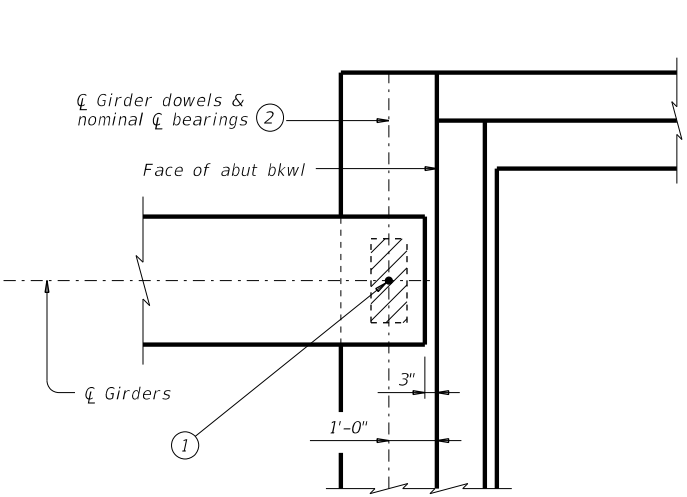
- ① Dowel at doweled girder end [labeled (D) on Bridge Layout]. Required for outside girder only or as shown on substructure details.
- ② For purposes of computing bearing seat elevations, nominal centerline of bearing must be defined as shown. The actual center of bearing pad may vary from this line.
- ③ For transition bents with backwall, girder and elastomeric bearings must receive the same treatment as shown for abutments.
- ④ When angle exceeds 0°, one or both girder ends must be skewed to maintain the clearance between girder ends as shown in view.
- ⑤ See Table of Bearing Pad Dimensions for bearing size. Girder end skew angles in Table not applicable for this situation. Table reflects girder conflicts of this type on radial bents only.



AT INVERTED-T BENT



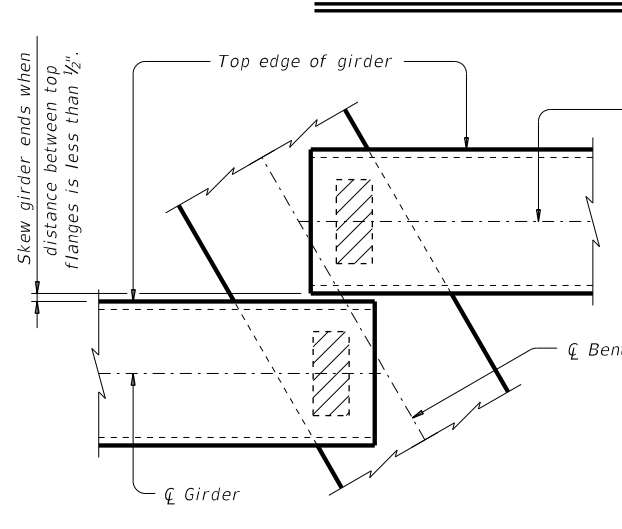
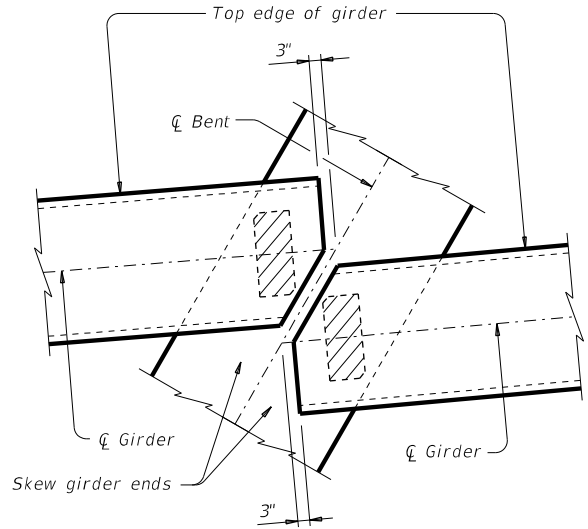
AT CONVENTIONAL INTERIOR BENT



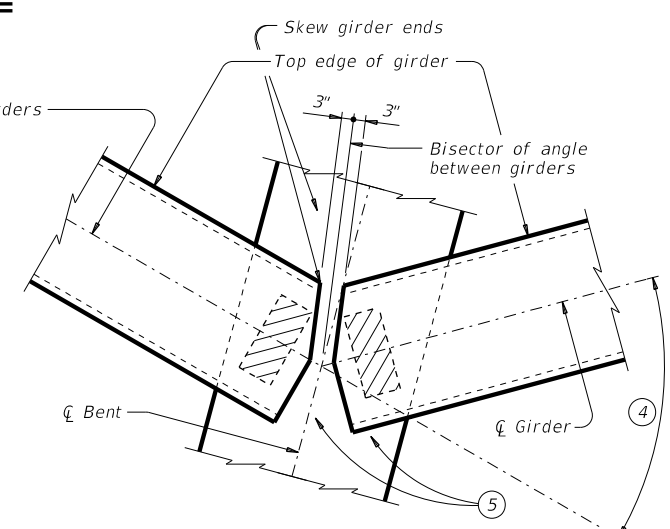
AT ABUTMENT

GENERAL NOTES:
 These details accommodate skew angles up to 60°. Shop drawings for approval are required. A bearing layout which identifies location and orientation of all bearings must be developed by the bearing fabricator. Permanently mark each bearing in accordance with the bearing layout. A copy of the bearing layout is to be provided to the Engineer. Cost of furnishing and installing elastomeric bearings, including beveled and embedded steel plates, must be included in unit price bid for "Prestressed Concrete Girders".

GIRDER END DETAILS



GIRDER CONFLICT DETAILS



HL93 LOADING SHEET 1 OF 3

Texas Department of Transportation Bridge Division Standard

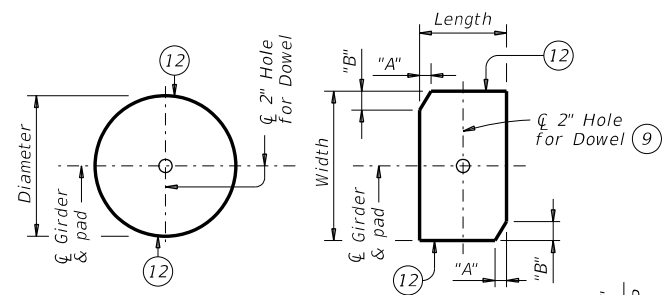
ELASTOMERIC BEARING AND GIRDER END DETAILS
 PRESTR CONCRETE I-GIRDERS

IGEB

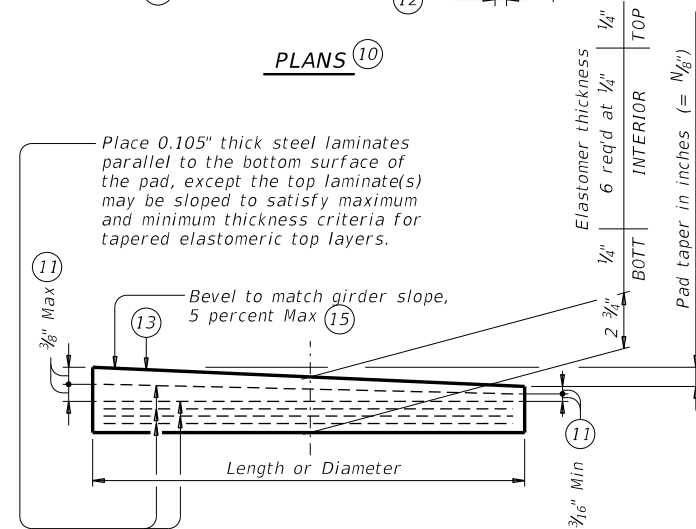
FILE: igebs1-17.dgn	DN: AEE	CK: JMH	DW: JTR	CK: TxDOT
©TxDOT August 2017	CONT	SECT	JOB	HIGHWAY
REVISIONS	0902	38	120	GILLILAND RD
	DIST	COUNTY	SHEET NO.	
	FTW	PARKER	71	

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 FILE: H:\TXPROJ\TX2495-01\DWG\Standards\BRIDGE\IGEB-2.dgn



PLANS (10)



ELEVATION

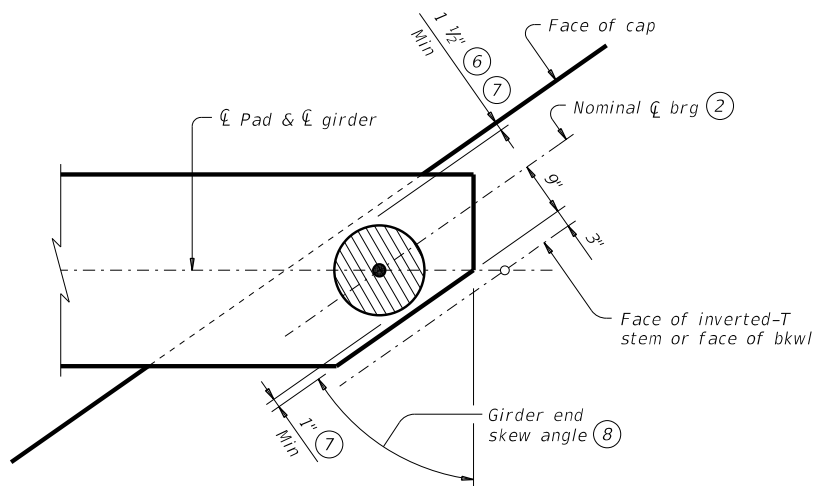
LAMINATED ELASTOMERIC BEARING PAD
 (50 DUROMETER)

TABLE OF MINIMUM SUBSTRUCTURE DIMENSIONS (14)

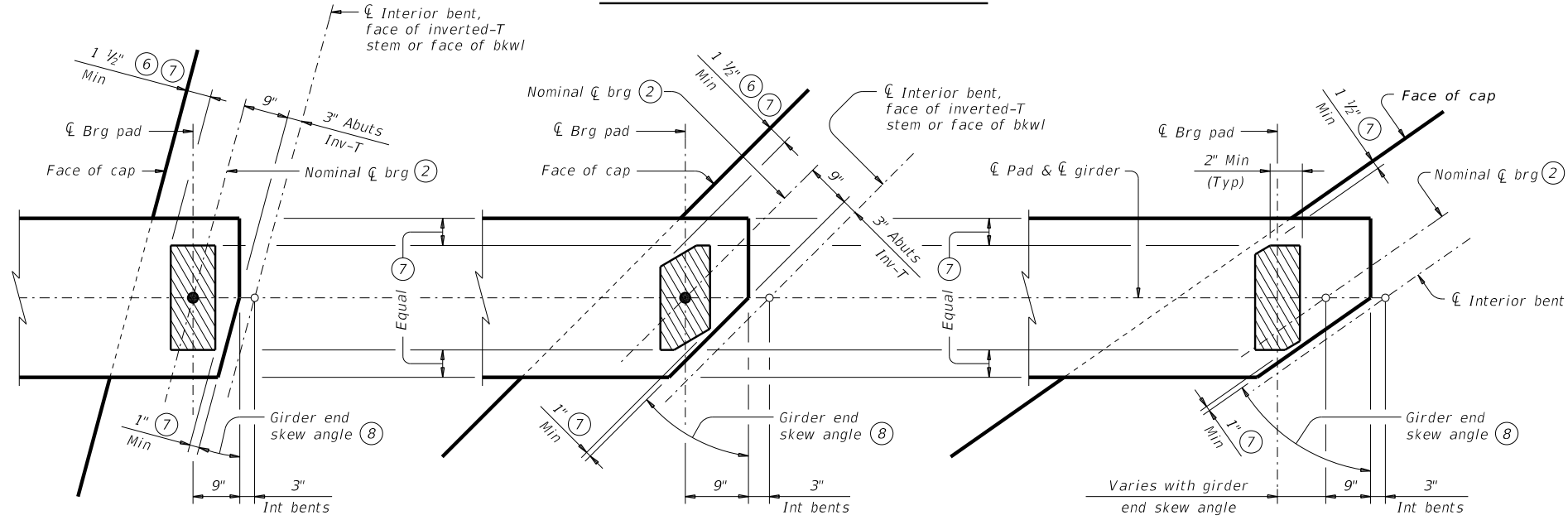
Girder Type	Abutments	Int Bents	Inv-T Bents
	Face of Bkwl to Face of Cap	Overall Cap Width	Corbel Width
Tx28 thru Tx54	1'-9"	3'-6"	1'-10 1/2"
Tx62 & Tx70	2'-0"	4'-0"	2'-1 1/2"

TABLE OF BEARING PAD DIMENSIONS

Bent Type	Girder Type	Bearing Type (13)	Girder End Skew Angle Range	Pad Size Lgth x Wdth	Pad Clip Dimensions	
					"A"	"B"
ABUTMENTS, INVERTED-T AND TRANSITION BENTS WITH BACKWALLS	Tx28, Tx34, Tx40, Tx46 & Tx54	G-1-"N"	0° thru 21°	8" x 21"	---	---
		G-2-"N"	21°+ thru 30°	8" x 21"	1 1/2"	2 1/2"
		G-3-"N"	30°+ thru 45°	9" x 21"	4 1/2"	4 1/2"
		G-4-"N"	45°+ thru 60°	15" Dia	---	---
	Tx62 & Tx70	G-5-"N"	0° thru 21°	9" x 21"	---	---
		G-6-"N"	21°+ thru 30°	9" x 21"	1 1/2"	2 1/2"
		G-7-"N"	30°+ thru 45°	10" x 21"	4 1/2"	4 1/2"
		G-8-"N"	45°+ thru 60°	10" x 21"	7 1/4"	4 1/4"
CONVENTIONAL INTERIOR BENTS	Tx28, Tx34, Tx40, Tx46 & Tx54	---	---	---	---	---
	Tx62 & Tx70	G-1-"N"	0° thru 60°	8" x 21"	---	---
CONVENTIONAL INTERIOR BENTS WITH SKEWED GIRDER ENDS (GIRDER CONFLICTS) (16)	Tx28, Tx34, Tx40, Tx46 & Tx54	G-1-"N"	0° thru 18°	8" x 21"	---	---
		G-2-"N"	18°+ thru 30°	8" x 21"	1 1/2"	2 1/2"
		G-9-"N"	30°+ thru 45°	8" x 21"	3"	3"
		G-10-"N"	45°+ thru 60°	9" x 21"	6"	3 1/2"
	Tx62 & Tx70	G-5-"N"	0° thru 18°	9" x 21"	---	---
		G-5-"N"	18°+ thru 30°	9" x 21"	---	---
		G-11-"N"	30°+ thru 45°	9" x 21"	1 1/2"	1 1/2"
		G-12-"N"	45°+ thru 60°	9" x 21"	3"	1 3/4"



ROUND BEARINGS FOR SKEWED GIRDER ENDS AT FACE OF INVERTED-T STEM OR FACE OF BKWL



SKewed GIRDER ENDS AT INT BENTS, FACE OF INVERTED-T STEM OR FACE OF BKWL

SKewed GIRDER ENDS AT CONVENTIONAL INTERIOR BENTS (NO GIRDER DOWELS)

BEARING PAD PLACEMENT DIAGRAMS

- (2) For purposes of computing bearing seat elevations, nominal centerline of bearing must be defined as shown. The actual center of bearing pad may vary from this line.
- (6) 3" for inverted-T.
- (7) Place centerline pad as near nominal centerline bearing as possible between limits shown.
- (8) Girder end skew angle is equal to 90° minus the girder angle except at some conflicting girders.
- (9) Provide 2" dia hole only at locations required. See Substructure details for location.
- (10) See Table of Bearing Pad Dimensions for dimensions.
- (11) Maximum and minimum layer thicknesses shown are for elastomer only, on tapered layers.
- (12) Locate Permanent Mark here.
- (13) Indicate BEARING TYPE on all pads. For tapered pads, locate BEARING TYPE on the high side. The Fabricator must include the value of "N" (amount of taper in 1/8" increments) in this mark.
 Examples: N=0, (for 0° taper)
 N=1, (for 1/8" taper)
 N=2, (for 1/4" taper)
 (etc.)
 Fabricated pad top surface slope must not vary from plan girder slope by more than (0.0625" / IN) / IN.
- (14) Substructure dimensions must satisfy the minimums provided to accommodate the elastomeric bearings shown on this standard.
- (15) See sheet 3 of 3 for beveled plate use when slopes exceed 5 percent.
- (16) If girder end is skewed for a girder conflict at an interior bent and a beveled sole plate is required, use bearing type for abutments at this location. Location of bearing centerline is to be set as for abutments in this case.

HL93 LOADING SHEET 2 OF 3

Texas Department of Transportation
 Bridge Division Standard

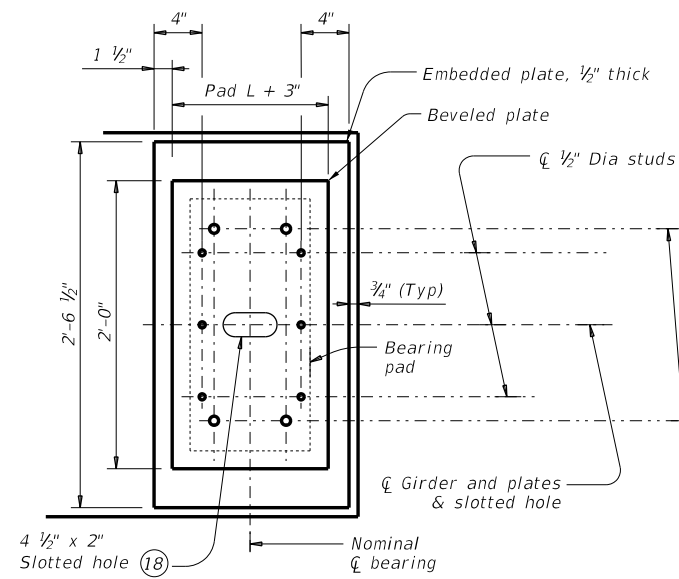
ELASTOMERIC BEARING AND GIRDER END DETAILS PRESTR CONCRETE I-GIRDERS

IGEB

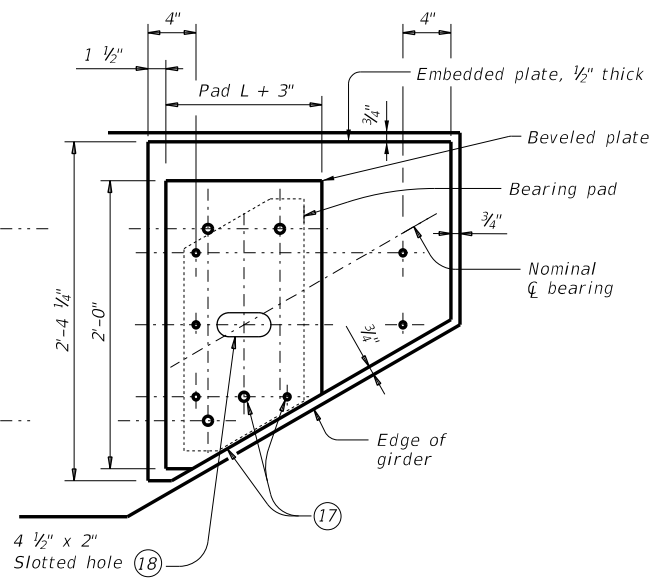
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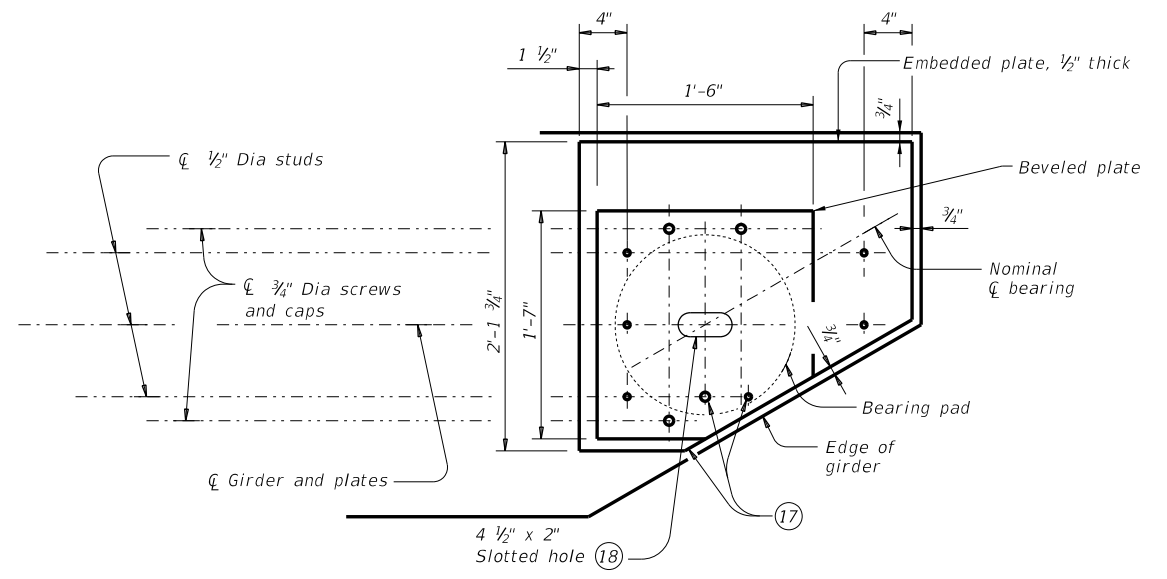
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NORMAL GIRDER END
RECTANGULAR BEARING PAD

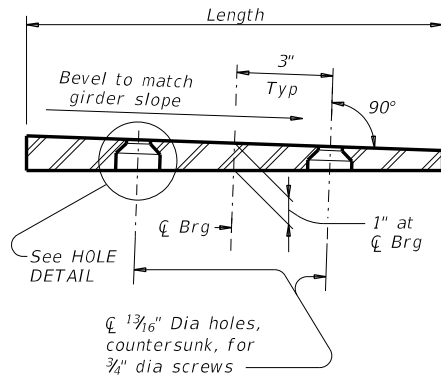


SKewed GIRDER END
CLIPPED RECTANGULAR BEARING PAD

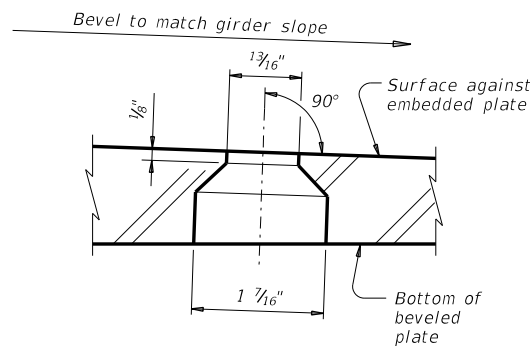


SKewed GIRDER END
15" DIA BEARING PAD

PLAN VIEW OF SOLE PLATE DETAILS



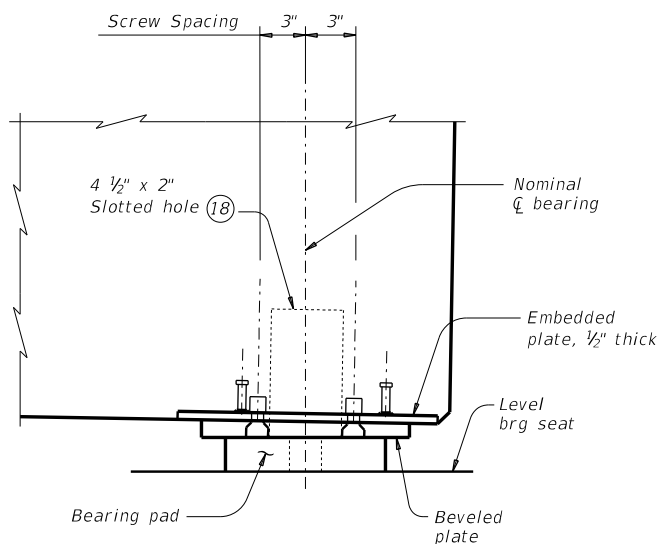
SECTION



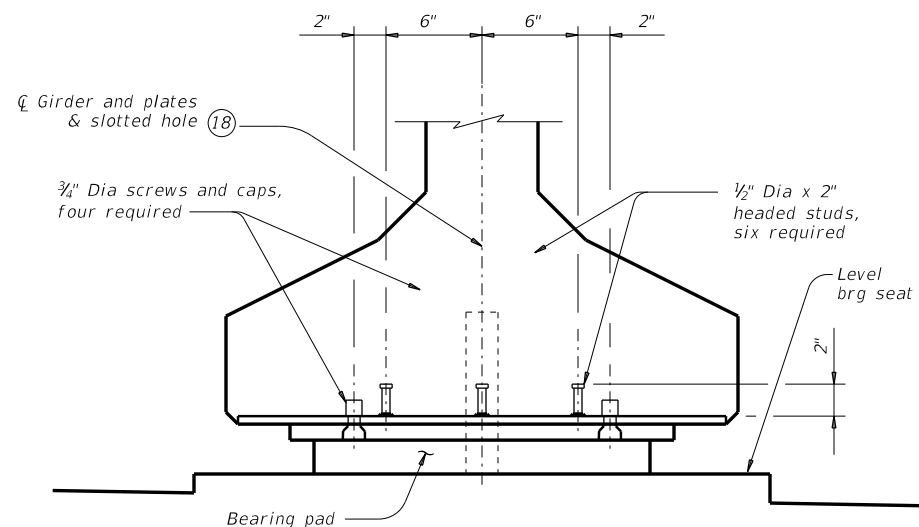
HOLE DETAIL

BEVELED PLATE DETAILS

- (17) Cut beveled and embedded plates to match girder end skew. Adjust location of screw and stud as shown when necessary.
- (18) Slotted hole is required at doweled girder end locations.



SIDE ELEVATION



END ELEVATION
 Showing normal girder end.

GIRDER DETAILS

SOLE PLATE NOTES:

Provide constant thickness elastomeric bearings with beveled and embedded steel sole plates in accordance with these details when the girder slope exceeds 5 percent or if otherwise required in the plans. Provide for all girders in the span.

On the shop drawings, dimension sole plates to the nearest 1/16" based on required thickness at centerline of bearing and slope of girder. Thickness tolerance variation from the approved shop drawings is 1/16" +/-, except variation from a plane parallel to the theoretical top surface can not exceed 1/16" total. Bearing surface tolerances listed in Item 424 apply to embedded and beveled plates.

Steel plate must conform to ASTM A36, A572 Gr 50, or A709 Gr 36 or Gr 50. Hot dip galvanize both the embedded plate and beveled sole plate after fabrication. Seal weld caps to embedded plate before galvanizing.

When determining if relocation of screw holes and studs are necessary for skewed girder ends, minimum clearance from screw or stud centerline to plate edge is 1.25".

Tap threads in the embedded plate only. Drill and tap prior to galvanizing.

3/4" Dia screws must be electroplated, socket flat head countersunk cap screws conforming to ASTM F835. Electroplating must conform to ASTM B633, SC 2, Type I. Provide screws long enough to maintain a 3/4" minimum embedment into the embedded plate and galvanized cap. Provide galvanized steel caps (16 ga Min) with a nominal 1" inside diameter and deep enough to accommodate the screws, but not less than 1/2" deep or deeper than 1".

Install beveled sole plates prior to shipping girders. Installed screw heads must not protrude below the bottom of the beveled plate.

HL93 LOADING SHEET 3 OF 3



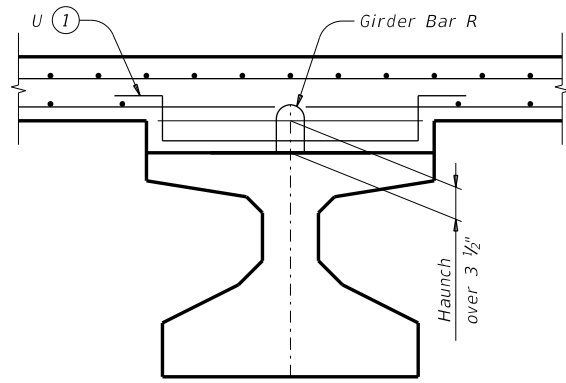
ELASTOMERIC BEARING AND GIRDER END DETAILS
PRESTR CONCRETE I-GIRDERS

IGEB

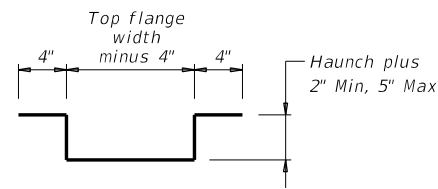
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	FTW	PARKER	73	

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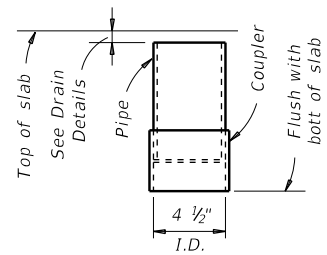
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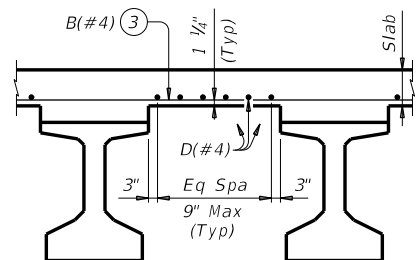
HAUNCH REINFORCING DETAIL



BARS U (#4)

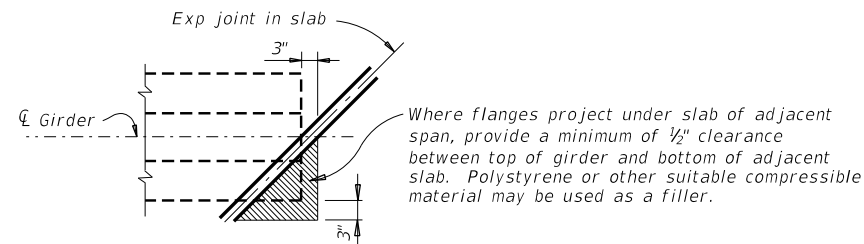


C-I-P DRAIN DETAIL (2)

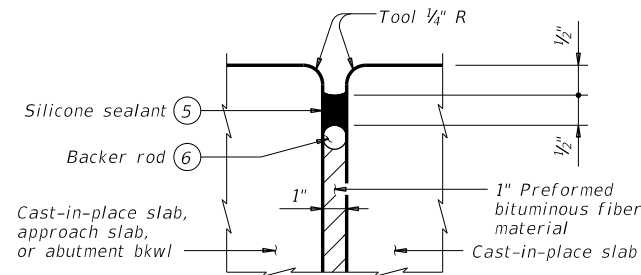


TYPICAL PART TRANSVERSE SLAB SECTION WITHOUT PCP (4)

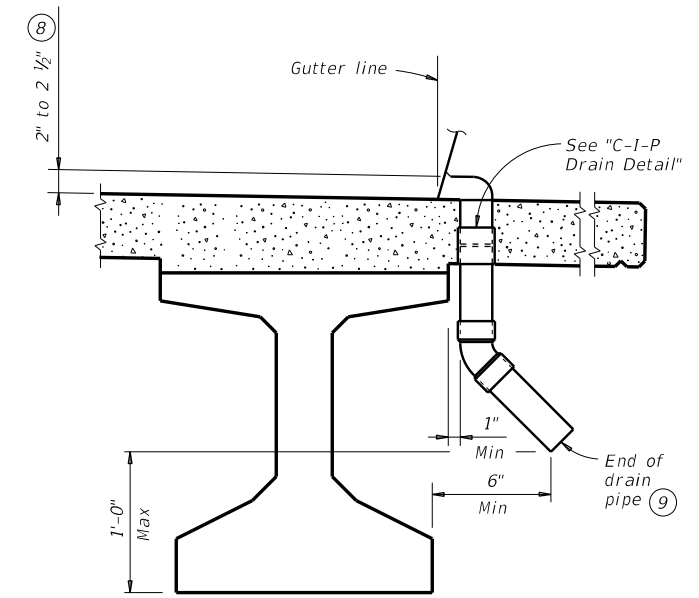
Top reinforcing steel not shown for clarity.



TREATMENT AT GIRDER END FOR SKEWED SPANS



TYPE A JOINT DETAIL (7)



DRAIN DETAIL (10)

GENERAL NOTES:
 Designed according to AASHTO LRFD Bridge Design Specifications.
 All items (reinforcing steel, drains, joint formers, etc.) shown on this sheet are subsidiary to other bid items.

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

DECK FORMWORK NOTES:
 Overhang bracket hangers are limited to a safe working load of 3,600 lbs, applied to and along the axis of a coil rod at 45 degrees from vertical, regardless of higher loads permitted by hanger manufacturers. Do not place a hanger less than 12" from girder end. Space hangers accordingly.

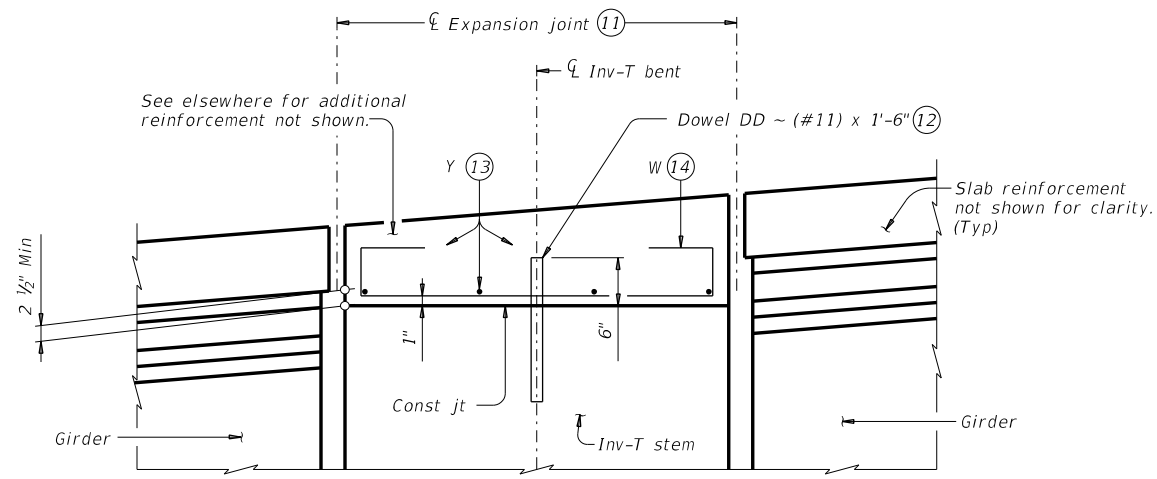
- (1) Space Bars U with girder Bars R in all areas where measured haunch exceeds 3 1/2".
- (2) Roughen outside of PVC with coarse rasp or equal to ensure bond with cast-in-place concrete.
- (3) Bars B(#4) spaced at 9" Max with 2" end cover. Overhang option, Contractor's may end alternating bars B(#4) at centerline outside girder.
- (4) Provide Grade 60 reinforcing steel. Provide bar laps, where required, as follows:
 Uncoated ~ #4 = 1'-7"
 Epoxy coated ~ #4 = 2'-5"
- (5) Class 7 silicone sealant that conforms to DMS-6310. Install when ambient temperature is between 55°F and 85°F and rising. Engineer to determine allowable hours for sealant application.
- (6) 1 1/4" backer rod must be compatible with joint sealant. Use of multiple pieces to create a backer rod cross section is not permitted. Top of backer rod must be convex as shown.
- (7) The maximum distance between Type A expansion joints is 100'. See Bridge Layout for location of joints. Type A joints are subsidiary to Item 422, "Concrete Superstructures".
- (8) Drain entrance formed in rail or sidewalk.
- (9) Water may not be discharged onto girders.
- (10) All drain pipe and fittings to be 4" diameter (Sch 40) PVC. See Item 481 "Pipe for Drains" for pipe, connections and solvent welding. Bend reinforcing steel to clear PVC 1". Drain length and location is as directed by the Engineer. Drains are not permitted over roadways or railroads, or within 10'-0" of bent caps. Degrease outside of exposed PVC, apply acrylic water base primer, then coat with same surface finishing material as used for outside girder face. Variations of the above designs, as required for the type of rail used and its location on the structure, may be installed with the approval and direction of the Engineer.

SHEET 1 OF 2

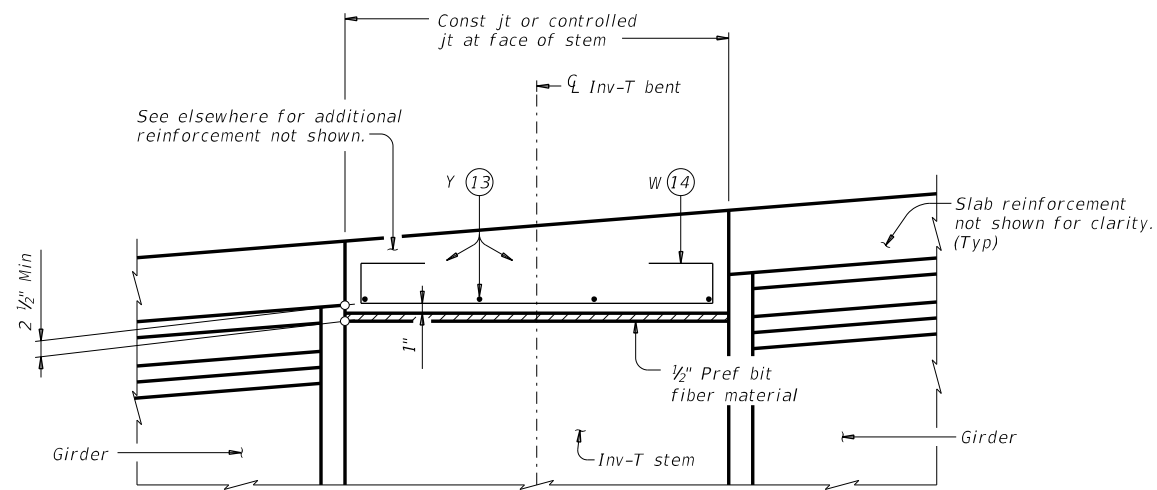
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MISCELLANEOUS SLAB DETAILS PRESTR CONCRETE I-GIRDERS					
IGMS					
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	FTW	PARKER	74		

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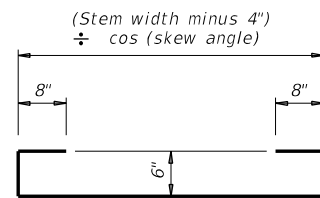
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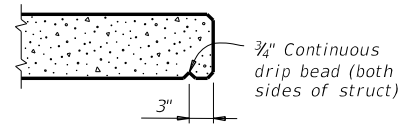
SHOWING EXPANSION JOINTS



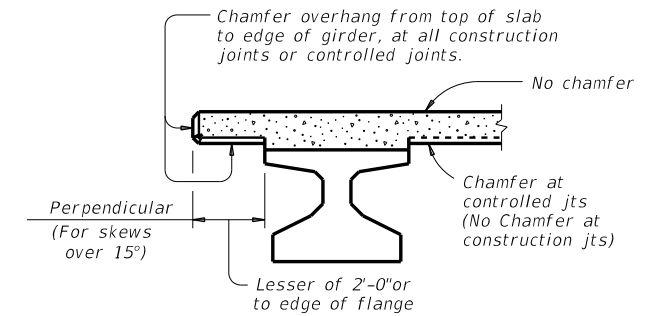
**SHOWING CONST JTS OR CONTROLLED JTS
 REINFORCEMENT OVER INV-T BENTS**



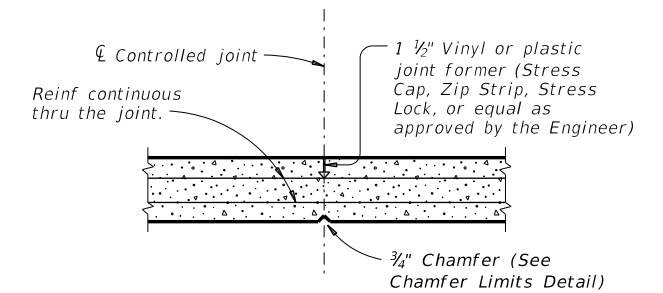
BARS W (#4)



DRIP BEAD DETAIL



CHAMFER LIMITS DETAIL (15)



CONTROLLED JOINT DETAIL

(Saw-cutting is not allowed)

- (11) See Layout for joint type.
- (12) Dowels DD (#11) spaced at 5 Ft Max. See Inv-T bents for quantity and location.
- (13) Space Bars Y (#4) at 12" Max. Use 2" end cover. Number of Bars Y must satisfy spacing limit. Place parallel to bent.
- (14) Space Bars W at 12" Max (3" from end of cap). Tilt if necessary to maintain cover requirements. Place parallel to longitudinal slab reinforcement.
- (15) See Span details for type of joint and joint locations.

SHEET 2 OF 2



**MISCELLANEOUS
 SLAB DETAILS
 PRESTR CONCRETE I-GIRDERS**

IGMS

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STRUCTURE	DESIGNED GIRDERS									STRAIGHT STRAND PATTERN						DEPRESSED STRAND PATTERN ①			CONCRETE		OPTIONAL DESIGN				
	SPAN LENGTH	GIRDER NO.	GIRDER TYPE	PRESTRESSING STRANDS					TOT NO. DEB	DEBONDED STRANDS PER ROW					NO.	TO END (in)	TO ζ (in)	RELEASE STRENGTH f'_c (ksi)	MINIMUM 28 DAY COMP STRENGTH f'_c (ksi)	DESIGN LOAD COMP STRESS (TOP ζ) (SERVICE I)	DESIGN LOAD TENSILE STRESS (BOTT ζ) (SERVICE III)	REQUIRED MINIMUM ULTIMATE MOMENT CAPACITY (STRENGTH I)	LIVE LOAD DISTRIBUTION FACTOR ③		
				NON-STD STRAND PATTERN	TOTAL NO.	SIZE (in)	STRGTH f_{pu} (ksi)	"e" ζ (in)		"e" END (in)	DIST FROM BOTTOM (in)	NO. OF STRANDS	DE-BONDED	NUMBER OF STRANDS DEBONDED TO (ft from end)									Moment	Shear	
Type Tx28 Girders 30' Roadway 8.5" Slab	40	ALL	Tx28		10	0.6	270	10.48	10.48									4.000	5.000	1.114	-1.596	1398	0.810	1.020	
	45	ALL	Tx28		12	0.6	270	10.48	10.48									4.500	5.000	1.410	-1.945	1616	0.780	1.020	
	50	ALL	Tx28		16	0.6	270	7.73	7.73									4.000	5.800	1.746	-2.359	1923	0.760	1.030	
	55	ALL	Tx28		20	0.6	270	7.88	7.88									4.400	6.200	2.115	-2.800	2238	0.740	1.030	
	60	ALL	Tx28		22	0.6	270	7.93	7.93									5.300	6.600	2.518	-3.268	2561	0.720	1.040	
	65	ALL	Tx28		26	0.6	270	8.02	8.02									6.000	7.000	2.955	-3.763	2892	0.700	1.040	
	70	ALL	Tx28		32	0.6	270	7.98	7.62	4	2.5	14	4	0	2	0	2	0	6.000	7.400	3.429	-4.305	3257	0.690	1.040
Type Tx34 Girders 30' Roadway 8.5" Slab	40	ALL	Tx34		10	0.6	270	13.01	13.01									4.000	5.000	0.879	-1.226	1769	0.840	1.000	
	45	ALL	Tx34		10	0.6	270	13.01	13.01									4.000	5.000	1.108	-1.492	1722	0.810	1.000	
	50	ALL	Tx34		12	0.6	270	13.01	13.01									4.000	5.000	1.369	-1.807	1990	0.790	1.010	
	55	ALL	Tx34		14	0.6	270	13.01	13.01									4.900	5.000	1.653	-2.131	2297	0.760	1.010	
	60	ALL	Tx34		16	0.6	270	12.76	12.76									5.700	5.700	1.967	-2.497	2653	0.750	1.010	
	65	ALL	Tx34		22	0.6	270	9.92	9.92									4.500	5.800	2.305	-2.872	2996	0.730	1.020	
	70	ALL	Tx34		24	0.6	270	10.01	10.01									5.100	6.400	2.670	-3.281	3375	0.720	1.020	
	75	ALL	Tx34		28	0.6	270	10.15	10.15									5.700	6.600	3.058	-3.696	3737	0.700	1.030	
	80	ALL	Tx34		34	0.6	270	10.07	9.68	4	2.5	14	4	0	2	0	0	2	5.900	6.800	3.476	-4.149	4139	0.690	1.030
Type Tx40 Girders 30' Roadway 8.5" Slab	40	ALL	Tx40		10	0.6	270	15.60	15.60									4.000	5.000	0.726	-0.993	1943	0.870	0.980	
	45	ALL	Tx40		10	0.6	270	15.60	15.60									4.000	5.000	0.912	-1.207	2103	0.840	0.990	
	50	ALL	Tx40		12	0.6	270	15.60	15.60									4.000	5.000	1.123	-1.453	2304	0.810	0.990	
	55	ALL	Tx40		12	0.6	270	15.60	15.60										4.000	5.000	1.356	-1.722	2376	0.790	1.000
	60	ALL	Tx40		14	0.6	270	15.60	15.60										4.200	5.000	1.609	-2.006	2721	0.770	1.000
	65	ALL	Tx40		16	0.6	270	15.35	15.35										5.000	5.000	1.882	-2.305	3075	0.750	1.000
	70	ALL	Tx40		18	0.6	270	15.16	15.16										5.900	5.900	2.179	-2.632	3465	0.740	1.010
	75	ALL	Tx40		24	0.6	270	12.10	12.10										4.600	5.500	2.492	-2.963	3837	0.720	1.010
	80	ALL	Tx40		26	0.6	270	12.22	12.22										5.200	6.200	2.830	-3.325	4252	0.710	1.010
	85	ALL	Tx40		30	0.6	270	12.40	12.40										5.700	6.700	3.188	-3.704	4679	0.700	1.010
	90	ALL	Tx40		34	0.6	270	12.31	11.74	6	2.5	14	4	0	0	2	0	2	5.400	7.300	3.567	-4.100	5120	0.690	1.020
		95	ALL	Tx40		38	0.6	270	12.23	11.73	6	2.5	14	2	2	0	0	0	2	6.000	7.900	3.967	-4.514	5573	0.680
Type Tx46 Girders 30' Roadway 8.5" Slab	40	ALL	Tx46		10	0.6	270	17.60	17.60									4.000	5.000	0.638	-0.791	2021	0.900	0.970	
	45	ALL	Tx46		10	0.6	270	17.60	17.60									4.000	5.000	0.800	-0.962	2391	0.870	0.970	
	50	ALL	Tx46		12	0.6	270	17.60	17.60									4.000	5.000	0.983	-1.159	2811	0.840	0.980	
	55	ALL	Tx46		12	0.6	270	17.60	17.60										4.000	5.000	1.186	-1.373	2760	0.820	0.980
	60	ALL	Tx46		12	0.6	270	17.60	17.60										4.000	5.000	1.405	-1.601	2841	0.800	0.980
	65	ALL	Tx46		14	0.6	270	17.60	17.60										4.000	5.000	1.642	-1.840	3213	0.780	0.990
	70	ALL	Tx46		16	0.6	270	17.35	17.35										4.600	5.000	1.899	-2.102	3622	0.770	0.990
	75	ALL	Tx46		18	0.6	270	17.16	17.16										5.600	5.600	2.170	-2.367	4014	0.750	0.990
	80	ALL	Tx46		24	0.6	270	13.60	13.60										4.000	5.000	2.462	-2.657	4450	0.740	0.990
	85	ALL	Tx46		28	0.6	270	13.89	13.89										4.700	5.500	2.772	-2.960	4899	0.730	1.000
	90	ALL	Tx46		30	0.6	270	14.00	14.00										5.000	5.900	3.094	-3.263	5322	0.710	1.000
	95	ALL	Tx46		34	0.6	270	13.96	13.96									5.600	6.700	3.439	-3.593	5796	0.700	1.000	
	100	ALL	Tx46		38	0.6	270	13.92	13.35	6	2.5	14	4	0	0	2	0	2	5.300	6.200	3.801	-3.938	6284	0.690	1.000
	105	ALL	Tx46		42	0.6	270	13.89	13.38	6	2.5	14	4	0	0	2	0	2	5.800	6.900	4.187	-4.313	6837	0.690	1.010

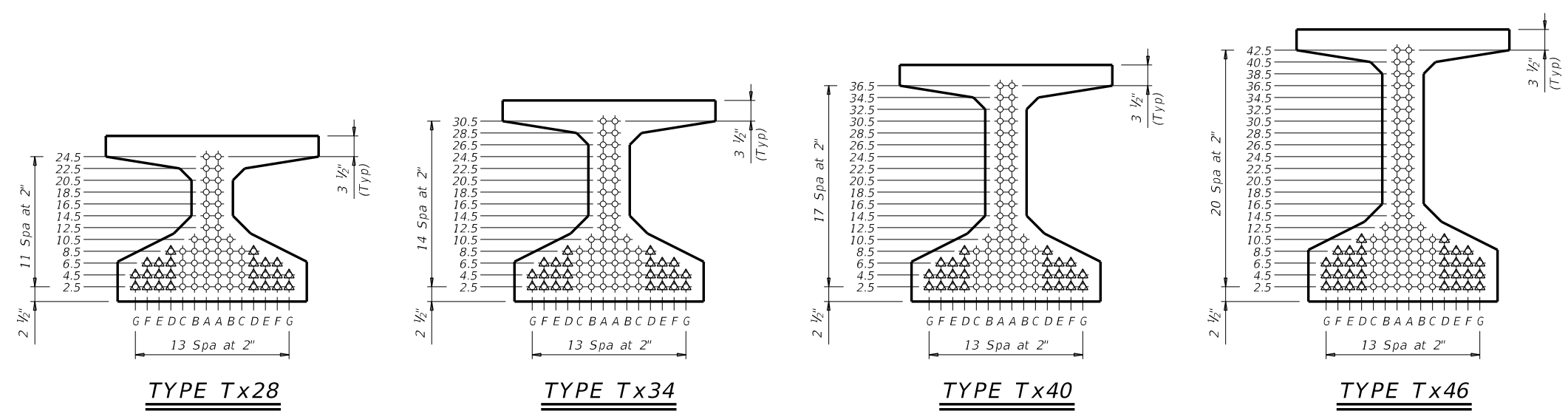
- ① When TO END (in) equals TO ζ (in), place these straight strands at the defined TO values. Fill the lower rows with the remainder of the total number of strands in accordance with the Debonded Strand Designs notes.
- ② Based on the following allowable stresses (ksi):
 Compression = 0.65 f'_c
 Tension = $0.24 \sqrt{f'_c}$
 Optional designs must likewise conform.
- ③ Portion of full HL93.

DESIGN NOTES:
 Designed according to AASHTO LRFD Bridge Design Specifications. Optional designs for girders 120 feet or longer must have a calculated residual camber equal to or greater than that of the designed girder. Prestress losses for the designed girders have been calculated for a relative humidity of 60 percent. Optional designs must likewise conform.

FABRICATION NOTES:
 Provide Class H concrete.
 Provide Grade 60 reinforcing steel bars.
 Use low relaxation strands, each pretensioned to 75 percent of f_{pu} .
 Strand debonding must comply with Item 424.4.2.2.4. Full-length debonded strands are only permitted in positions marked Δ . Double wrap full-length debonded strands in outer most position of each row.
 When shown on this sheet, the Fabricator has the option of furnishing either the designed girder or an approved optional design. All optional design submittals must be signed, sealed and dated by a Professional Engineer registered in the State of Texas.

DEBONDED STRAND DESIGNS:
 Locate strands for the designed girder as low as possible on the 2" grid system unless a non-standard strand pattern is indicated. Fill row "2.5", then row "4.5", then row "6.5", etc. Place strands within a row as follows:
 1) Locate a strand in each "A" and "G" positions.
 2) Place strand symmetrically about vertical centerline of girder.
 3) Space strands as equally as possible across the entire width.
 Do not debond strands in position "G". Distribute debonded strands symmetrically about the vertical centerline. Increase debonded lengths working outward, with debonding staggered in each row.

DEPRESSED STRAND DESIGNS:
 Locate strands for the designed girder as low as possible on the 2" grid system unless a non-standard strand pattern is indicated. Fill row "2.5", then row "4.5", then row "6.5", etc., beginning each row in the "A" position and working outward until the required number of strands is reached. All strands in the "A" position must be depressed, maintaining the 2" spacing so that, at the girder ends, the upper two strands are in the position shown in the table.



HL93 LOADING SHEET 1 OF 2

 Bridge Division Standard
PRESTRESSED CONCRETE I-GIRDER STANDARD DESIGNS
 30' ROADWAY
IGSD-30

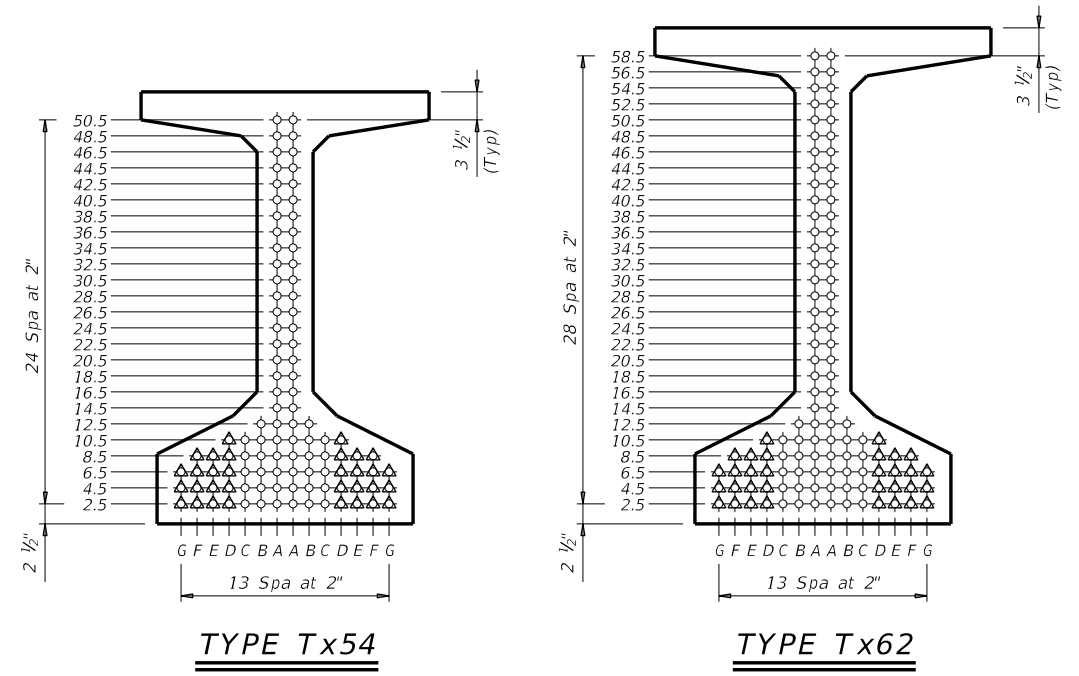
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©TxDOT August 2017	CONT	SECT	JOB	HIGHWAY
REVISIONS	0902	38	120	GILLILAND RD
	DIST	COUNTY	SHEET NO.	
	FTW	PARKER	76	

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STRUCTURE	DESIGNED GIRDERS									STRAIGHT STRAND PATTERN						DEPRESSED STRAND PATTERN			CONCRETE		OPTIONAL DESIGN						
	SPAN LENGTH	GIRDER NO.	GIRDER TYPE	PRESTRESSING STRANDS					DEBONDED STRANDS PER ROW						NO.	TO END (in)	TO \bar{c} (in)	RELEASE STRGTH (2) f'ci (ksi)	MINIMUM 28 DAY COMP STRGTH f'c (ksi)	DESIGN LOAD COMP STRESS (TOP \bar{c}) (SERVICE I) fct(ksi)	DESIGN LOAD TENSILE STRESS (BOTT \bar{c}) (SERVICE III) fcb(ksi)	REQUIRED MINIMUM ULTIMATE MOMENT CAPACITY (STRENGTH I) (kip-ft)	LIVE LOAD DISTRIBUTION FACTOR (3)				
				NON-STD STRAND PATTERN	TOTAL NO.	SIZE (in)	STRGTH fpu (ksi)	"e" \bar{c} (in)	"e" END (in)	DIST FROM BOTTOM (in)	NO. OF STRANDS		NUMBER OF STRANDS DEBONDED TO (ft from end)										Moment	Shear			
											TOTAL	DE-BONDED	3	6											9	12	15
Type Tx54 Girders 30' Roadway 8.5" Slab	40	ALL	Tx54	8	0.6	270	21.01	21.01										4.000	5.000	0.530	-0.644	2086	0.930	0.960			
	45	ALL	Tx54	10	0.6	270	21.01	21.01										4.000	5.000	0.662	-0.783	2471	0.900	0.960			
	50	ALL	Tx54	12	0.6	270	21.01	21.01										4.000	5.000	0.813	-0.943	2924	0.870	0.960			
	55	ALL	Tx54	12	0.6	270	21.01	21.01										4.000	5.000	0.979	-1.117	3366	0.850	0.970			
	60	ALL	Tx54	12	0.6	270	21.01	21.01										4.000	5.000	1.159	-1.302	3316	0.830	0.970			
	65	ALL	Tx54	12	0.6	270	21.01	21.01										4.000	5.000	1.353	-1.496	3326	0.810	0.970			
	70	ALL	Tx54	14	0.6	270	21.01	21.01										4.000	5.000	1.560	-1.701	3722	0.790	0.980			
	75	ALL	Tx54	16	0.6	270	20.76	20.76										4.100	5.000	1.785	-1.923	4159	0.780	0.980			
	80	ALL	Tx54	18	0.6	270	20.56	20.56										5.000	5.000	2.020	-2.148	4576	0.760	0.980			
	85	ALL	Tx54	18	0.6	270	20.56	20.56										5.900	5.900	2.272	-2.393	5040	0.750	0.980			
	90	ALL	Tx54	26	0.6	270	16.55	16.55							2	50.5	50.5	4.100	5.000	2.539	-2.649	5519	0.740	0.990			
	95	ALL	Tx54	28	0.6	270	16.72	16.72							2	50.5	50.5	4.400	5.200	2.819	-2.916	6011	0.730	0.990			
100	ALL	Tx54	32	0.6	270	16.88	16.88							2	50.5	50.5	5.000	5.900	3.114	-3.194	6519	0.720	0.990				
105	ALL	Tx54	34	0.6	270	16.89	16.89							2	50.5	50.5	5.500	6.400	3.423	-3.483	7040	0.710	0.990				
110	ALL	Tx54	38	0.6	270	16.90	16.26							2	50.5	50.5	5.000	6.400	3.747	-3.784	7575	0.700	0.990				
115	ALL	Tx54	42	0.6	270	16.91	16.34	6	2.5	14	4	0	0	2	0	2	2	50.5	50.5	4.084	-4.095	8124	0.690	0.990			
120	ALL	Tx54	46	0.6	270	16.83	16.31	6	4.5	14	2	2	0	0	0	0	2	50.5	50.5	4.435	-4.417	8686	0.680	1.000			
115	ALL	Tx54	42	0.6	270	16.91	16.34	6	2.5	14	4	0	0	2	0	2	2	50.5	50.5	4.084	-4.095	8124	0.690	0.990			
120	ALL	Tx54	46	0.6	270	16.83	16.31	6	4.5	14	2	2	0	0	0	0	2	50.5	50.5	4.435	-4.417	8686	0.680	1.000			
Type Tx62 Girders 30' Roadway 8.5" Slab	60	ALL	Tx62	14	0.6	270	25.78	25.78										4.000	5.000	0.906	-1.084	4040	0.850	0.960			
	65	ALL	Tx62	14	0.6	270	25.78	25.78										4.000	5.000	1.056	-1.245	4276	0.830	0.960			
	70	ALL	Tx62	14	0.6	270	25.78	25.78										4.000	5.000	1.218	-1.421	4230	0.820	0.970			
	75	ALL	Tx62	14	0.6	270	25.78	25.78											4.000	5.000	1.389	-1.599	4305	0.800	0.970		
	80	ALL	Tx62	16	0.6	270	25.53	25.53											4.000	5.000	1.573	-1.794	4775	0.790	0.970		
	85	ALL	Tx62	18	0.6	270	25.33	25.33											4.000	5.000	1.764	-1.989	5223	0.770	0.970		
	90	ALL	Tx62	18	0.6	270	25.33	25.33											4.200	5.000	1.969	-2.201	5722	0.760	0.970		
	95	ALL	Tx62	20	0.6	270	25.18	25.18											5.300	5.300	2.185	-2.422	6236	0.750	0.980		
	100	ALL	Tx62	22	0.6	270	25.05	25.05											6.000	6.000	2.411	-2.653	6764	0.740	0.980		
	105	ALL	Tx62	30	0.6	270	21.11	21.11											4.400	5.300	2.648	-2.892	7308	0.730	0.980		
	110	ALL	Tx62	32	0.6	270	21.15	21.15											2	58.5	58.5	2.896	-3.141	7867	0.720	0.980	
	115	ALL	Tx62	36	0.6	270	21.22	21.22											2	58.5	58.5	3.155	-3.399	8440	0.710	0.980	
120	ALL	Tx62	40	0.6	270	18.78	18.78											4	58.5	58.5	3.424	-3.666	9028	0.700	0.980		
125	ALL	Tx62	42	0.6	270	21.30	20.67											2	58.5	58.5	3.710	-3.957	9696	0.700	0.990		
130	ALL	Tx62	44	0.6	270	23.60	14.50	6	2.5	14	4	0	0	2	0	2	8	58.5	8.5	4.000	-4.242	10315	0.690	0.990			
135	ALL	Tx62	48	0.6	270	23.28	14.94	6	4.5	14	2	0	2	0	0	8	58.5	8.5	4.301	-4.537	10949	0.680	0.990				

- ① When TO END (in) equals TO \bar{c} (in), place these straight strands at the defined TO values. Fill the lower rows with the remainder of the total number of strands in accordance with the Debonded Strand Designs notes.
- ② Based on the following allowable stresses (ksi):
 Compression = 0.65 f'ci
 Tension = 0.24 $\sqrt{f'ci}$
 Optional designs must likewise conform.
- ③ Portion of full HL93.



HL93 LOADING SHEET 2 OF 2

Texas Department of Transportation
 Bridge Division Standard

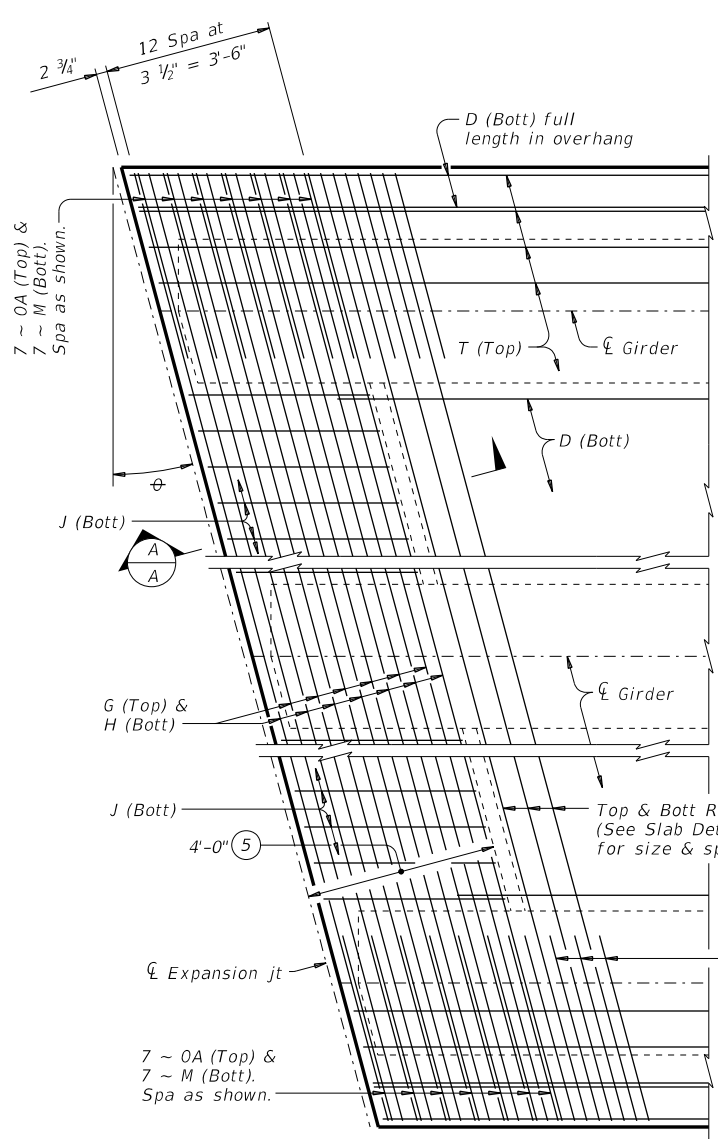
PRESTRESSED CONCRETE I-GIRDER STANDARD DESIGNS
 30' ROADWAY

IGSD-30

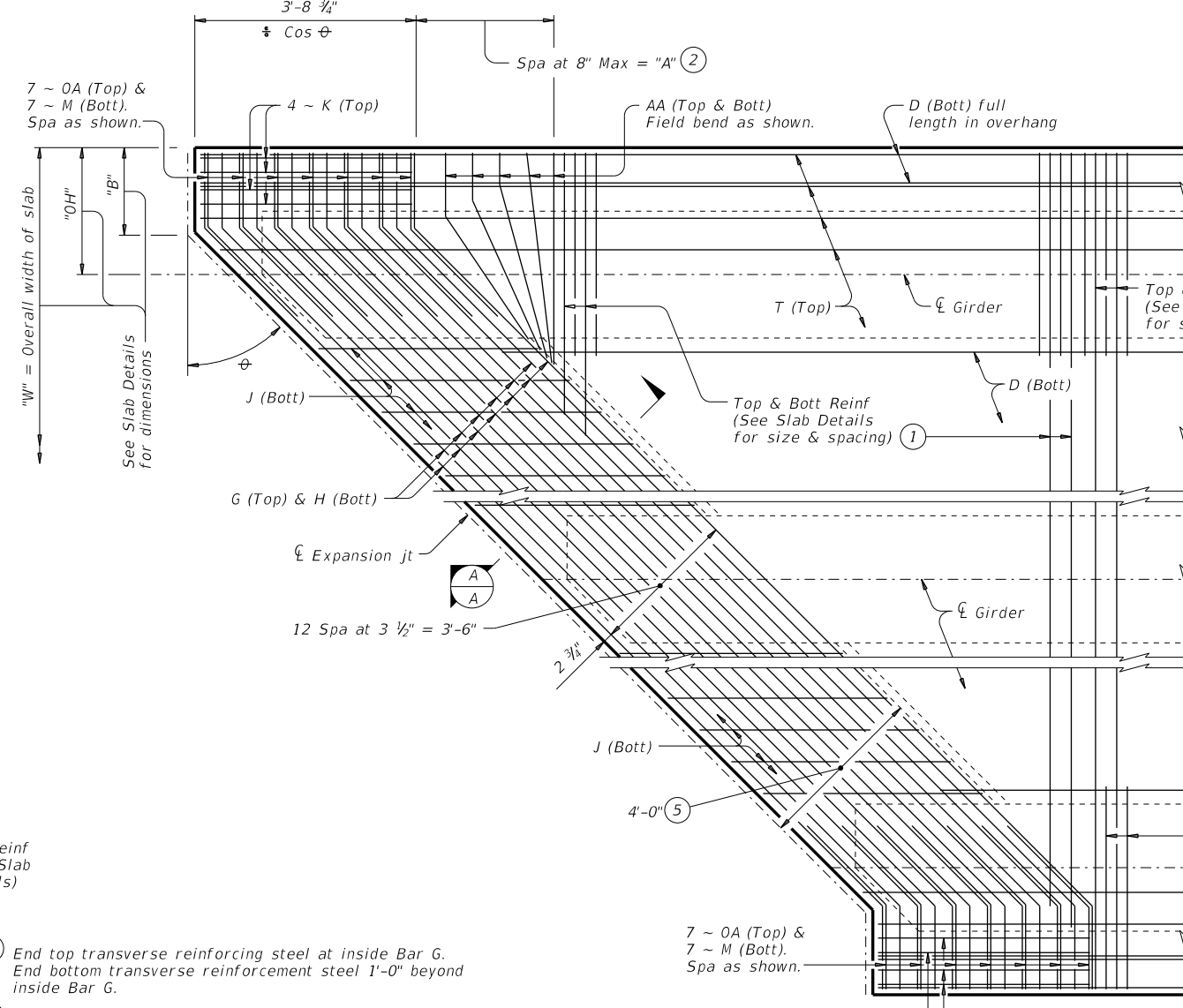
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©TxDOT August 2017	CONT	SECT	JOB	HIGHWAY
REVISIONS	0902	38	120	GILLILAND RD
	DIST	COUNTY	SHEET NO.	
	FTW	PARKER	77	

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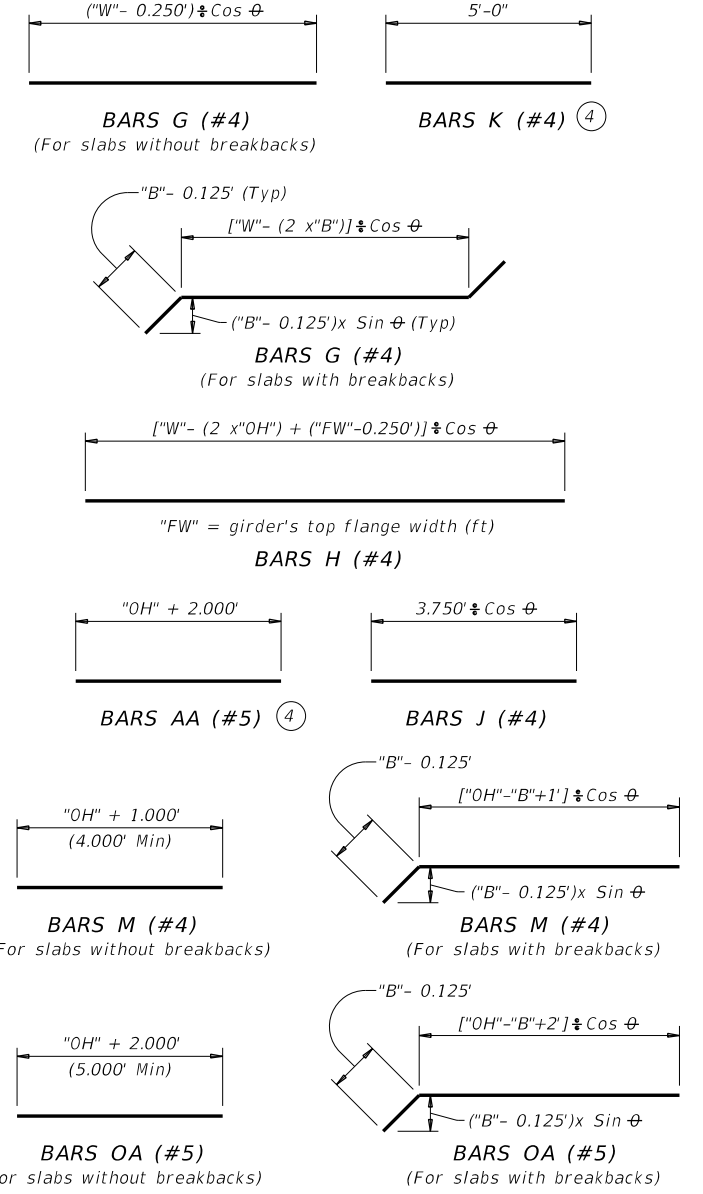


PARTIAL PLAN FOR SLABS WITHOUT BREAKBACK



PARTIAL PLAN FOR SLABS WITH BREAKBACK

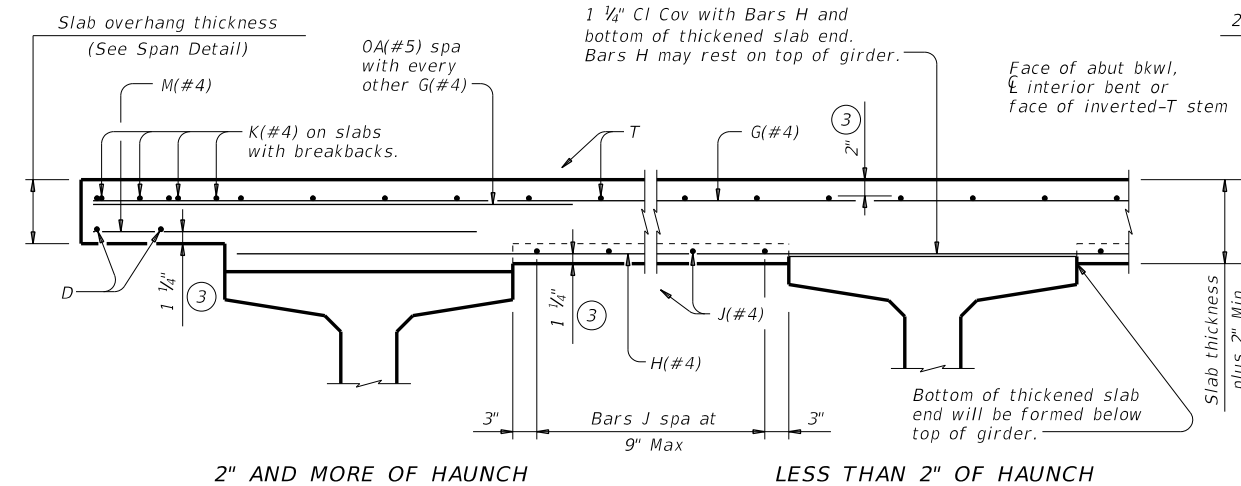
- ① End top transverse reinforcing steel at inside Bar G. End bottom transverse reinforcement steel 1'-0" beyond inside Bar G.
- ② "A" = ("OH" + 2.333 "B") x Tan ϕ
- ③ Provide clear cover as indicated unless otherwise shown on Span Details.
- ④ Only required on slabs with breakbacks.
- ⑤ Thickened slab end dimensioned perpendicular to face of bkwl, centerline interior bent or face of inverted-T stem.



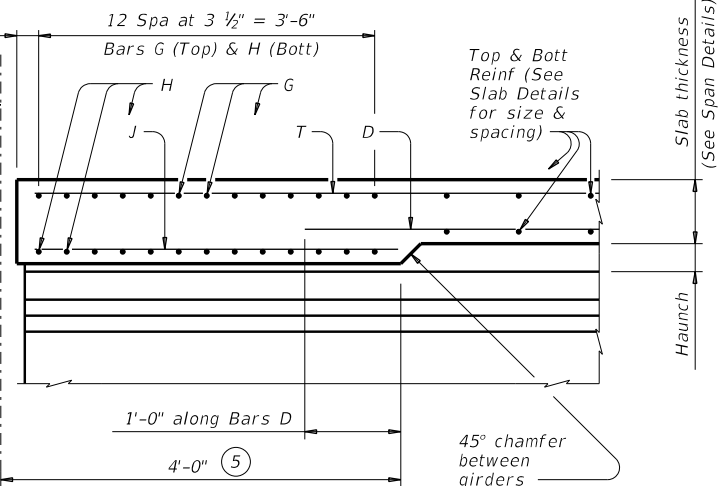
GENERAL NOTES:
 Designed according to AASHTO LRFD Bridge Design Specifications. These details are restricted to Prestressed Concrete I-Girder Spans. These details are to be used in conjunction with the Span Details and PCP standard (if prestressed concrete panels are used). When Option 2 from PCP standard is used, provide Bars AA, G, K and OA in the slab.

MATERIAL NOTES:
 Provide Grade 60 reinforcing steel.
 If slab reinforcing steel is shown on the Slab Details to be epoxy coated, then Bars AA, G, K, H, J, M and OA must be epoxy coated.
 Provide bar laps, where required, as follows:
 Uncoated ~ #4 = 1'-7"
 Epoxy Coated ~ #4 = 2'-5"

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



TYPICAL TRANSVERSE SECTION
 (Showing Prestressed Conc I-Girders at ϕ Brg)

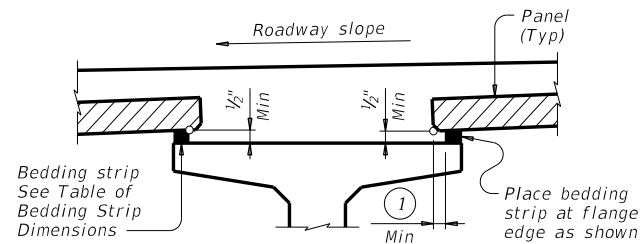


SECTION A-A
 (Showing with 2" and more of haunch)

Texas Department of Transportation		Bridge Division Standard	
THICKENED SLAB END DETAILS			
PRESTRESSED CONCRETE I-GIRDER SPANS			
IGTS			
FILE: igtsts1-17.dgn	DN: TxDOT	CK: TxDOT	DW: JTR
©TxDOT August 2017	CONT	SECT	JOB
REVISIONS	0902	38	120
DIST	COUNTY		SHEET NO.
FTW	PARKER		78

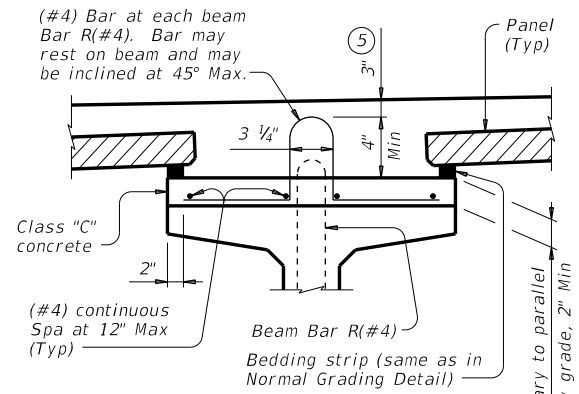
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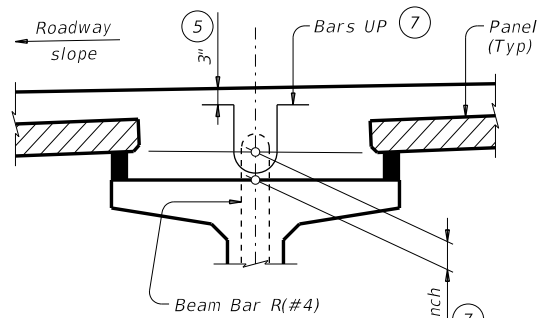
NORMAL GRADING DETAIL ③

Showing prestressed concrete I-girders.
 (Other beam types similar)



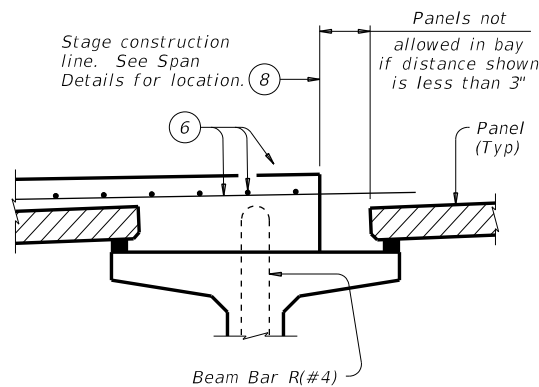
SPECIAL GRADING DETAIL FOR CONCRETE BEAMS

Showing prestressed concrete I-girders.
 (Other beam types similar)



HAUNCH REINFORCING DETAIL

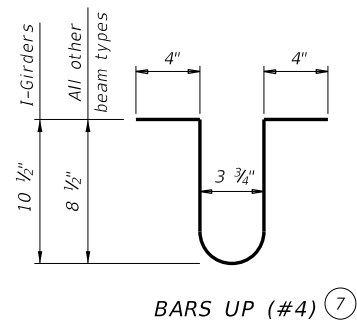
Showing prestressed concrete I-girders.
 (Other beam types similar)



PRESTR CONC I-GIRDERS

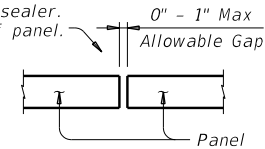
WIDTH	HEIGHT ④	
	Min	Max
1" (Min)	1/2"	2"
1 1/4"	1/2"	2 1/2"
1 1/2"	1/2"	3"
1 3/4"	1/2"	3 1/2"
2"	1/2"	4"
2 1/4"	1/2"	4 1/2" ②
2 1/2"	1/2"	5" ②
2 3/4"	1/2"	5 1/2" ②
3" (Max)	1/2"	6" ②

- ① 2" Min for I-girders, 1 1/2" Min for all other beam types.
- ② Allowed for I-girders, not allowed on other beam types.
- ③ To reduce the quantity of cast-in-place concrete, bedding strip thickness may be increased in 1/4" increments. Bedding strips must be comprised of one layer. Bond bedding strips to the beams with an adhesive compatible with bedding strips. Bedding strips over 2.5" high may need to be bonded to panels. The same thickness strip must be used under any one panel edge and the maximum change in thickness between adjacent panels is 1/4". Alternatively, bedding strips may be cut to grade. Panels may be supported by an alternate method, using a commercial product, if approved by the Engineer of Bridge Design, Bridge Division. If bedding strips exceed 6" high for I-Girders, 4" high for all other beam types, use Special Grading Detail for Concrete Beams or submit an alternate method to the Bridge Division for approval.
- ④ Height must not exceed twice the width.
- ⑤ Provide clear cover as indicated unless otherwise shown on Span Details.
- ⑥ See Span Details and Thickened Slab End Details for top slab reinforcement and clear cover. Transverse top slab reinforcement may rest on top of prestressed concrete panels if necessary to maintain clear cover.
- ⑦ Space Bars UP(#4) with Beam Bars R(#4) in all areas where measured haunch exceeds 3 1/2" with I-girders, and 3" for all other beam types. Epoxy coating for Bars UP is not required.
- ⑧ Do not locate construction joints on top of a panel.
- ⑨ Butt adjacent bedding strips together with adhesive. Cut v-notches, approx 1/4" deep, in the top of the bedding strips at 8' o.c..



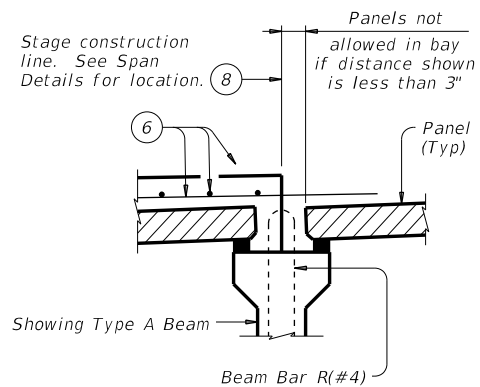
BARS UP (#4) ⑦

Seal joint between panels when gap exceeds 1/4" with polyurethane sealant or expanding foam sealer. Make seal flush with top of panel.

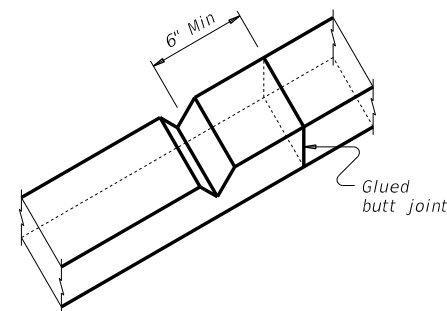


PANEL JOINTS

(Panel reinforcing not shown for clarity. The gap cannot be considered as a panel fabrication tolerance. Adjust panel placement to minimize joint openings.)



PRESTR CONC I-BEAMS



BEDDING STRIP DETAIL ⑨

CONSTRUCTION NOTES:
 Erected panels must bear uniformly on bedding strips of extruded polystyrene placed along top flange edges. Placing panels to minimize joint openings is recommended. If additional blocking is needed, special grading details for supporting the panels and extra reinforcing between beam and slab will be considered subsidiary to deck construction. Bars U, shown on PCP-FAB, may be bent over or cut off if necessary. Care must be taken to ensure proper cleaning of construction debris and consolidation of concrete material under the edges of the panels. Bedding strips must be placed at beam flange edges so that adequate space is provided for the mortar to flow a minimum of 1 1/2" under the panels as the slab concrete is placed. To allow the proper amount of mortar to flow between beam and panel, the minimum vertical opening must be at least 1/2". Roadway cross-slope reduces the opening available for entry of the mortar. Bedding strips varying in thickness across the beam are therefore required. For clear span between U-beams less than or equal to 18", see Permissible Slab Forming Detail on Miscellaneous Slab Detail sheets, UBMS.

MATERIAL NOTES:
 Provide Grade 60 reinforcing steel in the cast-in-place slab. See Table of Reinforcing Steel for size and spacing of reinforcement. If the top and bottom layer of reinforcing steel is shown on the Span Details to be epoxy coated, then the D, E, P, & Z bars must be epoxy coated. Provide bar Laps, where required, as follows:
 Uncoated ~ #4 = 1'-7"
 Epoxy Coated ~ #4 = 2'-5"

GENERAL NOTES:
 Designed according to AASHTO LRFD Bridge Design Specifications. Panel placement may follow either Option 1 or Option 2 except Option 1 must be used if the skew exceeds 45 degrees. Use of Prestressed Concrete Panels is not permitted for horizontally curved steel plate or tub girders. See Span Details for other possible restrictions on their use. These details are to be used in conjunction with the Span Details, PCP-FAB and other applicable standard drawings. When panel support (bedding strips) deviates from what is shown herein, provide details signed and sealed by a professional Engineer. Any additional reinforcing or concrete required on this standard is considered subsidiary to the bid item "Reinforced Concrete Slab".

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

HL93 LOADING SHEET 1 OF 4

Texas Department of Transportation Bridge Division Standard

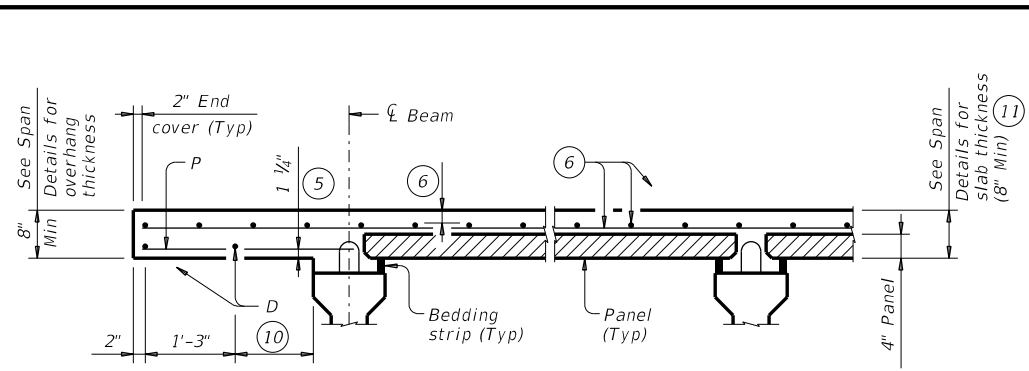
PRESTRESSED CONCRETE PANELS DECK DETAILS

PCP

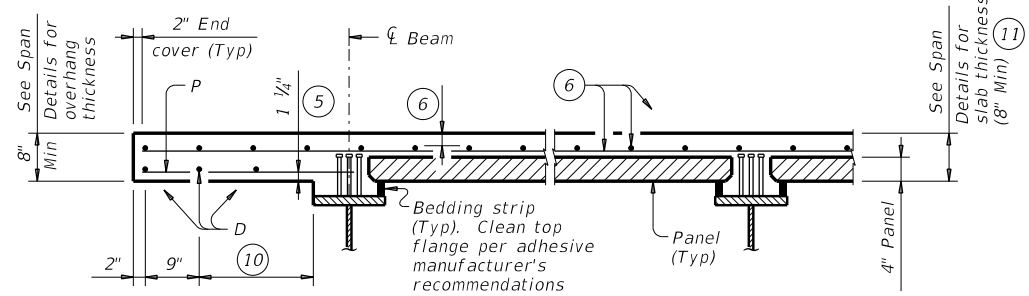
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©TxDOT April 2019	CONT	SECT	JOB	HIGHWAY
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	DIST	COUNTY	SHEET NO.	
	FTW	PARKER	79	

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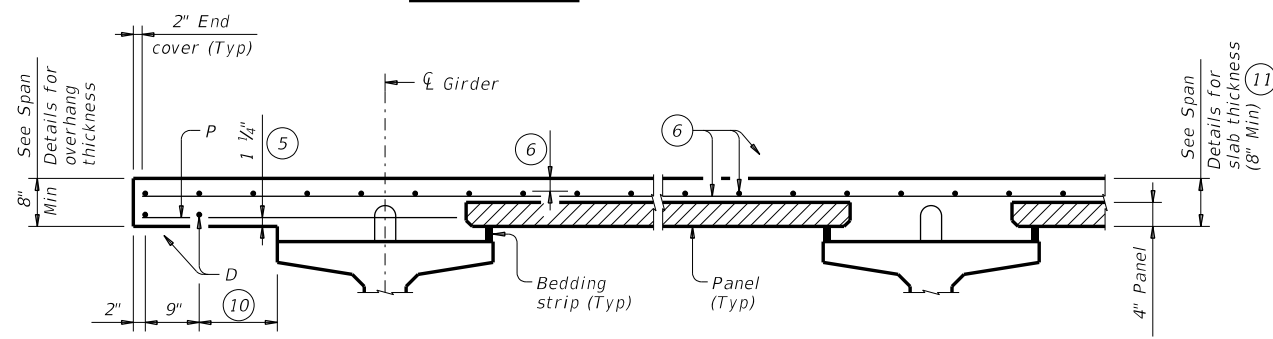
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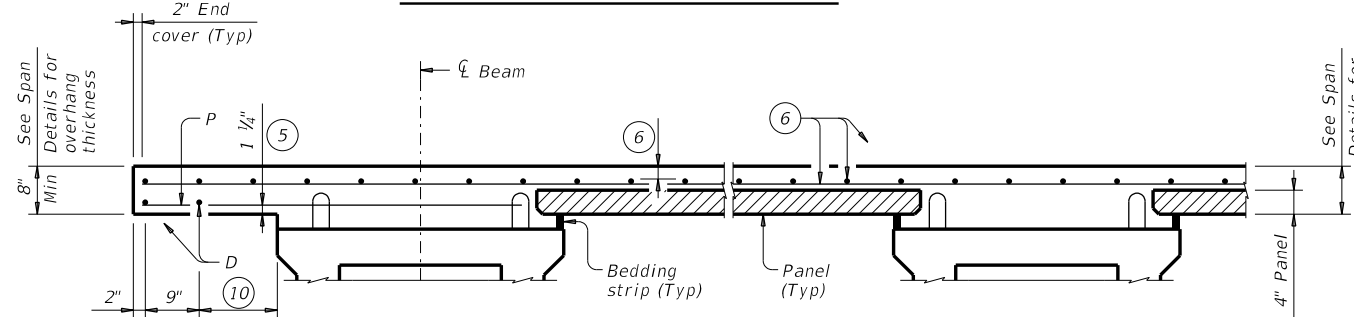
PRESTRESSED CONCRETE I-BEAMS



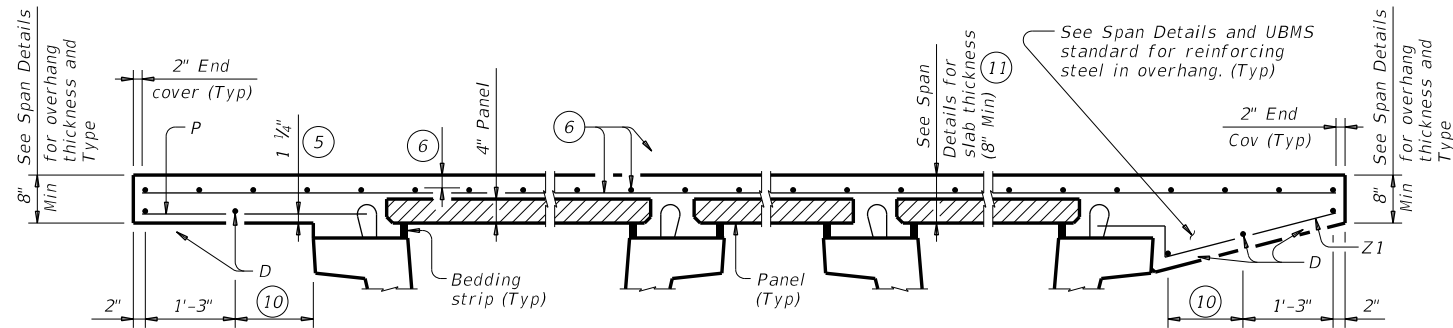
STEEL BEAMS



PRESTRESSED CONCRETE I-GIRDERS



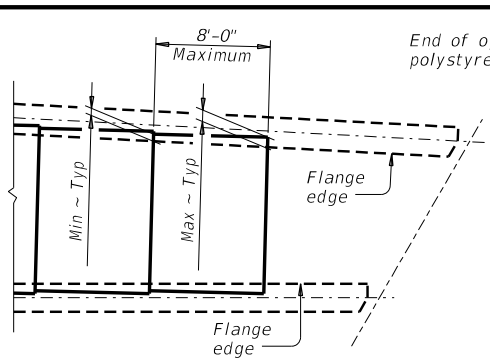
PRESTRESSED CONCRETE X-BEAMS



NORMAL OVERHANG WITH PRESTR CONC U-BEAMS

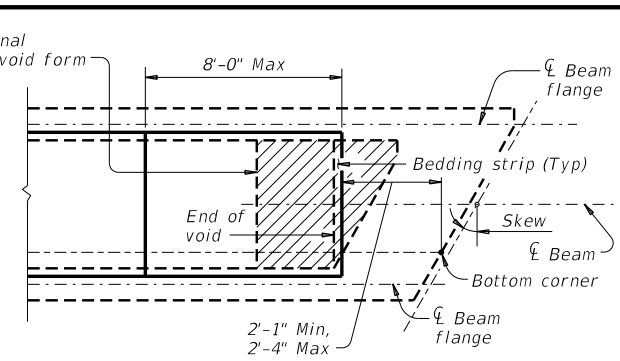
TYPICAL PART TRANSVERSE SECTIONS

SLOPED OVERHANG WITH PRESTR CONC U-BEAMS



AT FLARED BEAMS OR GIRDERS

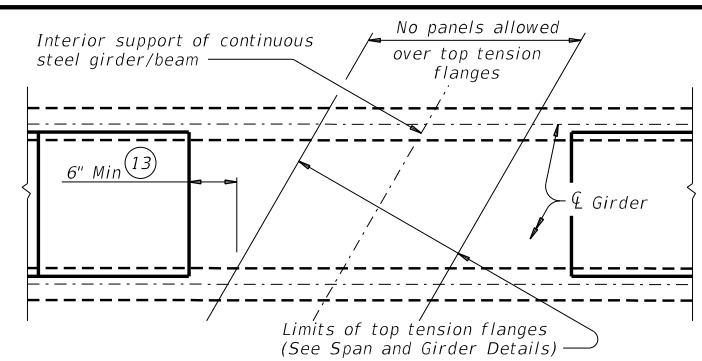
See PCP-FAB standard for Min and Max dimensions based on beam/girder type.



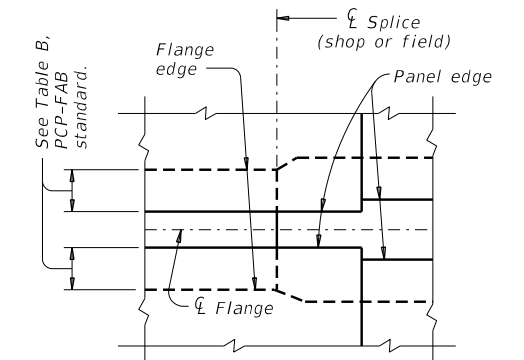
OVER CONC U-BEAMS

PART PLANS OF PANEL PLACEMENT

- 5 Provide clear cover as indicated unless otherwise shown on Span Details.
- 6 See Span Details and Thickened Slab End Details for top slab reinforcement and clear cover. Transverse top slab reinforcement may rest on top of prestressed concrete panels if necessary to maintain clear cover.
- 9 Butt adjacent bedding strips together with adhesive. Cut v-notches, approx 1/4" deep, in the top of the bedding strips at 8' o.c..
- 10 Equally space additional bar if more than 1'-3" Max.
- 11 The actual thickness constructed may exceed the slab thickness shown on the Span Details but the extra thickness may be no more than 2" (1" for prestressed concrete U-beams and steel beams). Bearing seat elevations or finished grade may be adjusted.
- 12 Field adjust Bars Z1(#4) to match actual slope of slab overhangs. Width of slab overhang will vary along span with curved slab edges. Adjust Bar Z1(#4) dimensions to maintain proper cover. Bars Z2(#4) are located at Inverted-Tee stems only.
- 13 Location of concrete placement sequence boundaries and bolted field splices should be considered by the contractor in determining panel limits.



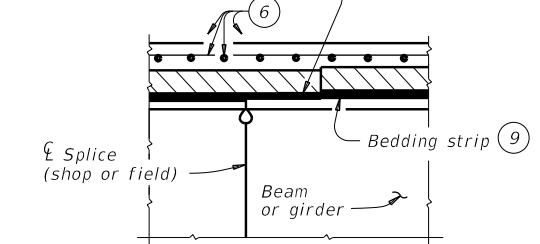
AT INT SUPPORTS OF CONTINUOUS STEEL GIRDERS



PLAN AT SPLICE

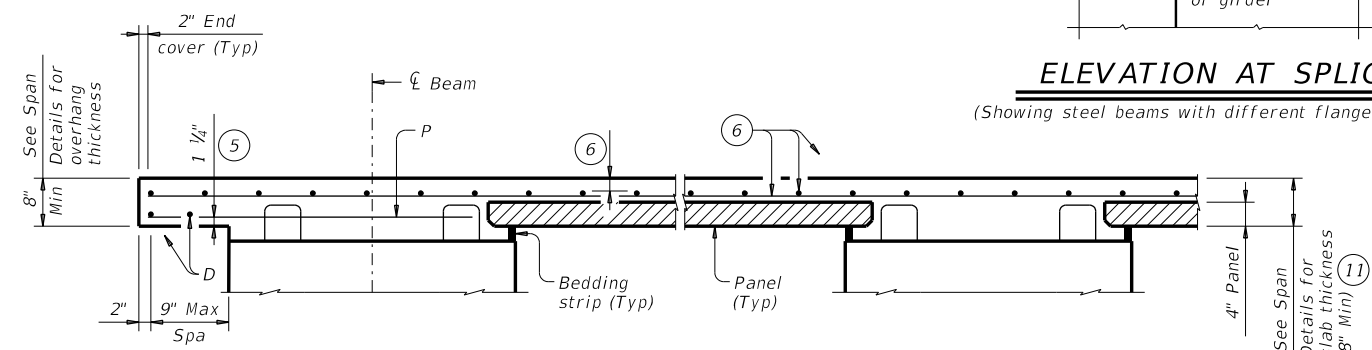
(Showing steel beams with flange width transition)

Cut bedding strip to adjust for difference in flange thickness.



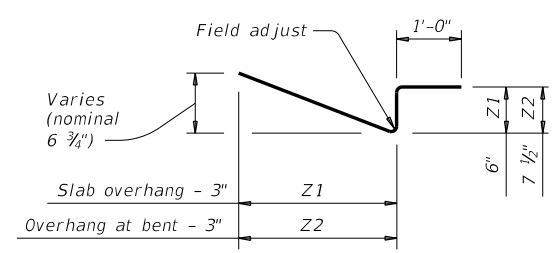
ELEVATION AT SPLICE

(Showing steel beams with different flange thickness)



PRESTRESSED CONCRETE SPREAD SLAB BEAMS

Bars P over exterior beams are still required when no overhang is used. In this case, only one Bar D, 2" from slab edge, is required.



BARS Z (#4) (12)

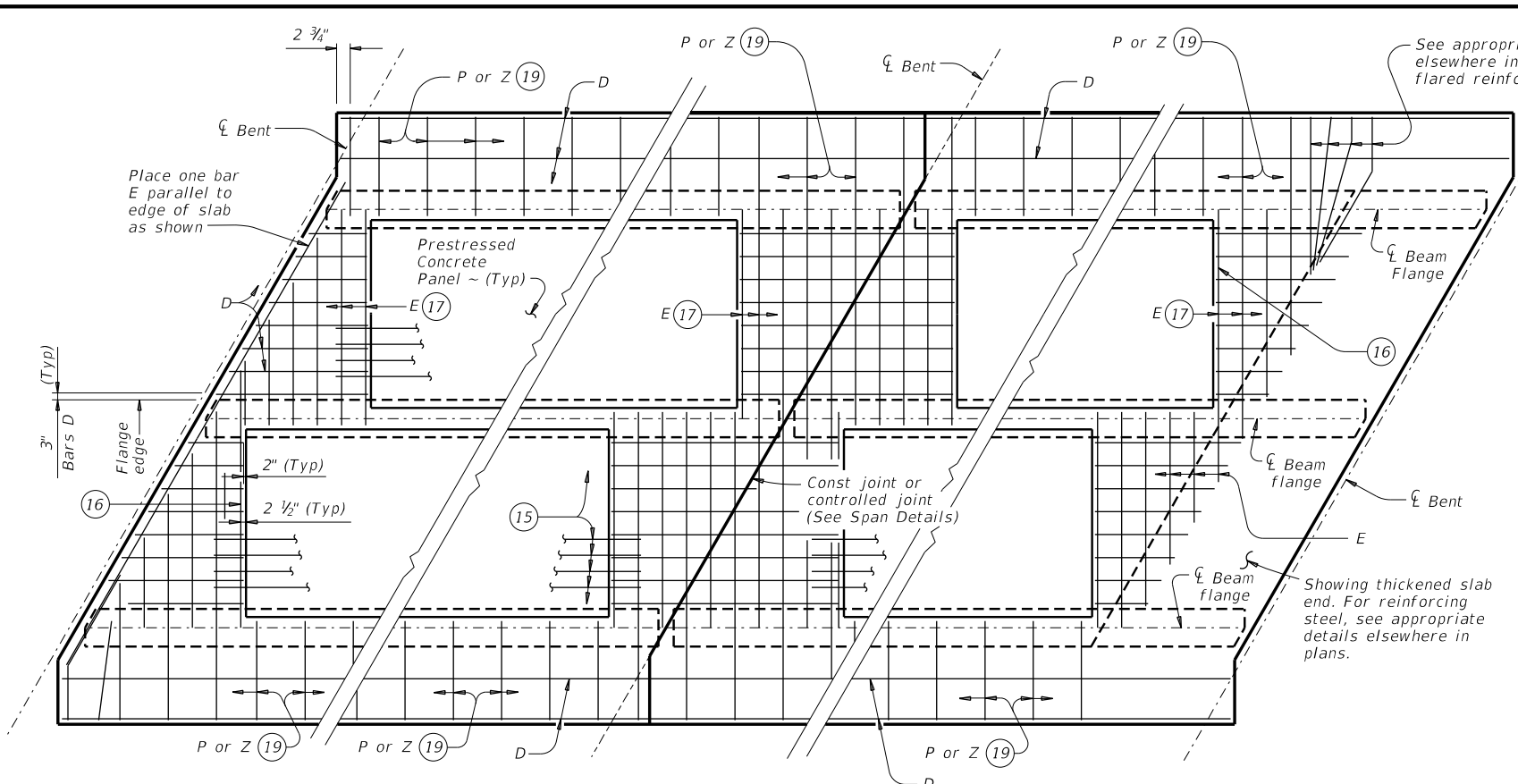
PRESTRESSED CONCRETE PANELS DECK DETAILS

PCP

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©TxDOT April 2019	CONT	SECT	JOB	HIGHWAY
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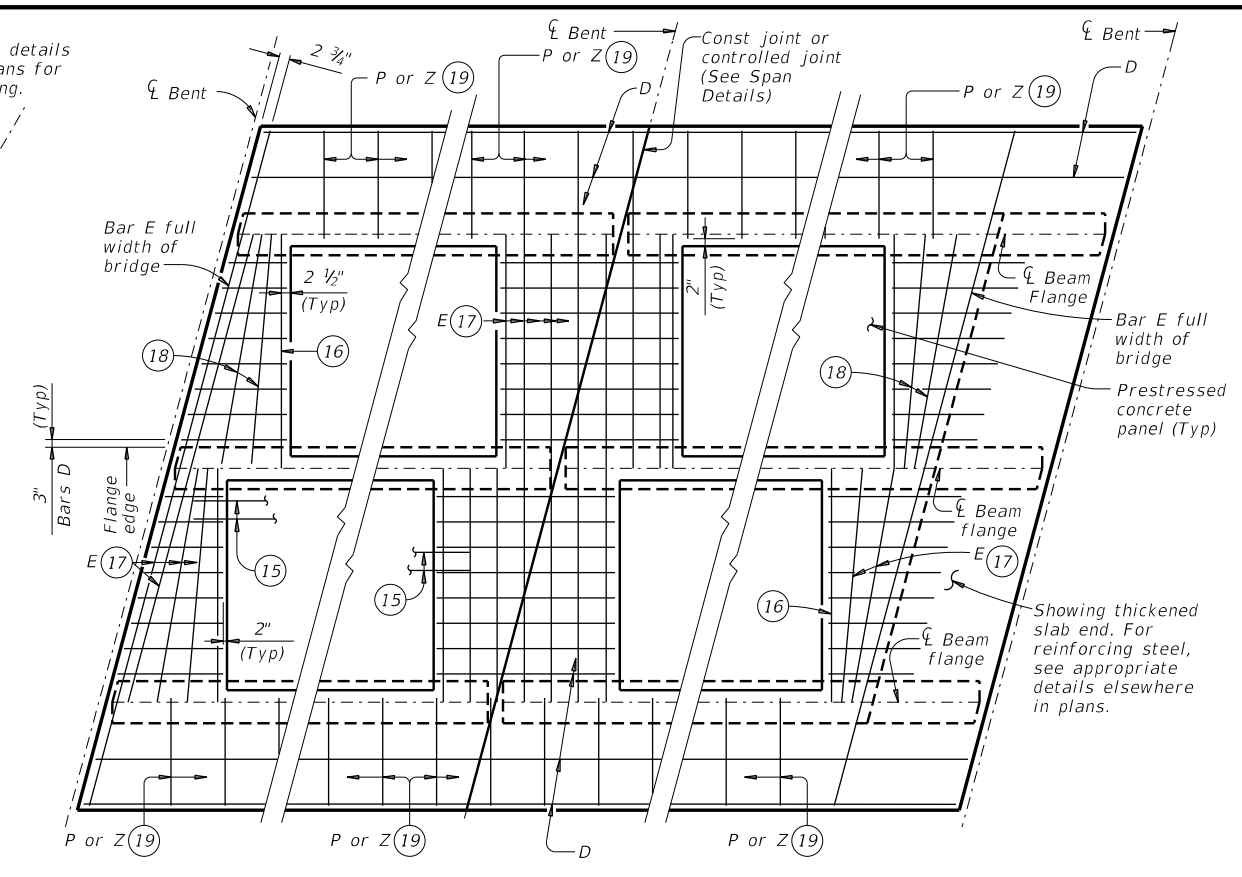
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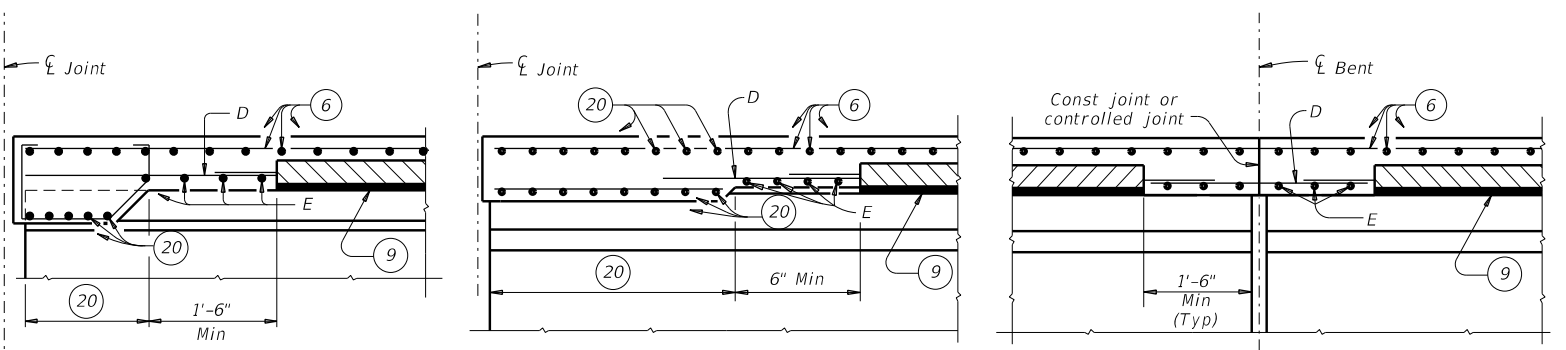
AT ALL SPAN ENDS UNLESS NOTED OTHERWISE
 AT INTERIOR BENTS
 AT THICKENED END SLABS

OPTION 1 ~ PLAN OF SLABS WITH NORMAL REINFORCEMENT

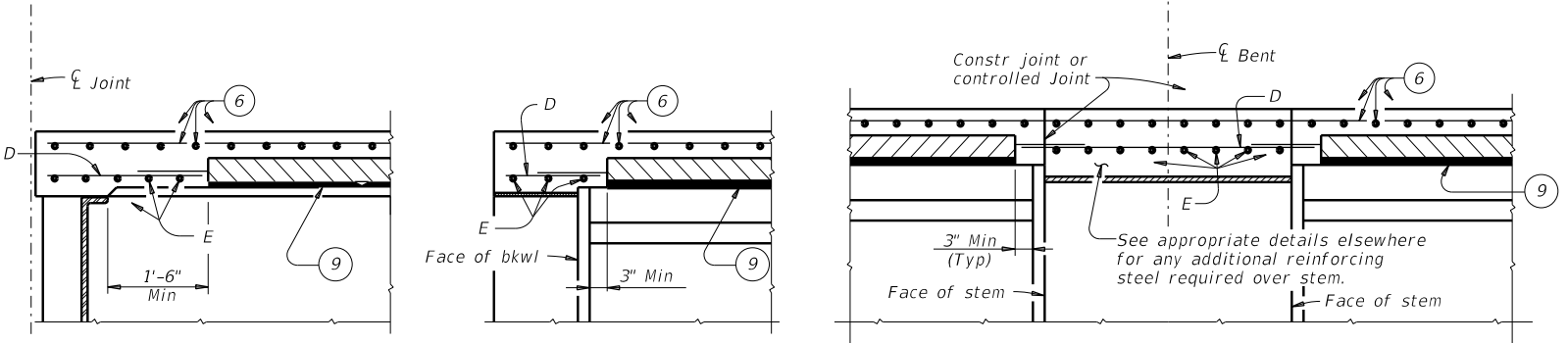


AT ALL SPAN ENDS UNLESS NOTED OTHERWISE
 AT INTERIOR BENTS
 AT THICKENED END SLABS

OPTION 1 ~ PLAN OF SLABS WITH SKEWED REINFORCEMENT



AT THICKENED SLAB ENDS FOR PRESTR CONC U-BMS
 AT THICKENED SLAB ENDS FOR PRESTR CONC I-BMS AND STEEL BMS
 AT SLAB CONTINUOUS OVER CONVENTIONAL INTERIOR BENTS FOR ALL SIMPLE SPAN BMS



AT CONVENTIONAL END DIAPHRAGMS FOR STEEL BMS
 AT SLAB OVER ABUTMENT BACKWALL FOR ALL BMS
 AT SLAB CONTINUOUS OVER INVERTED-T BENTS FOR ALL BMS

OPTION 1 ~ ELEVATIONS AT BEAM ENDS

- 6 See Span Details and Thickened Slab End Details for top slab reinforcement and clear cover. Transverse top slab reinforcement may rest on top of prestressed concrete panels if necessary to maintain clear cover.
- 9 Butt adjacent bedding strips together with adhesive. Cut v-notches, approx 1/4" deep, in the top of the bedding strips at 8" o.c.
- 14 Max Spacing as listed unless otherwise shown.
- 15 At connection with cast-in-place slab, extend longitudinal panel reinforcement. See PCP-FAB for details.
- 16 Maintain one Bar E(#4) parallel to panel ends (Typ).
- 17 Bars E(#4) not continuous over beam flanges must overlap beam flange 6" Min.
- 18 Add flared Bars E(#4) (Min Spa = 6", Max Spa = 12") as required at panel ends.
- 19 Where possible, Bars E(#4) may be extended into overhangs to replace Bars P(#4). Bars Z(#4) are required for sloped overhangs with U-Beams.
- 20 See appropriate thickened slab end details for reinforcing and limits of thickened slab end.

TABLE OF REINFORCING STEEL (14)		
BAR	SIZE	Max Spa (in.)
D	#4	9
E	#4	9
P	#4	18
UP	#4	~
Z	#4	18

HL93 LOADING SHEET 3 OF 4



PRESTRESSED CONCRETE PANELS DECK DETAILS

PCP

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DIST	COUNTY		SHEET NO.	
FTW	PARKER		81	

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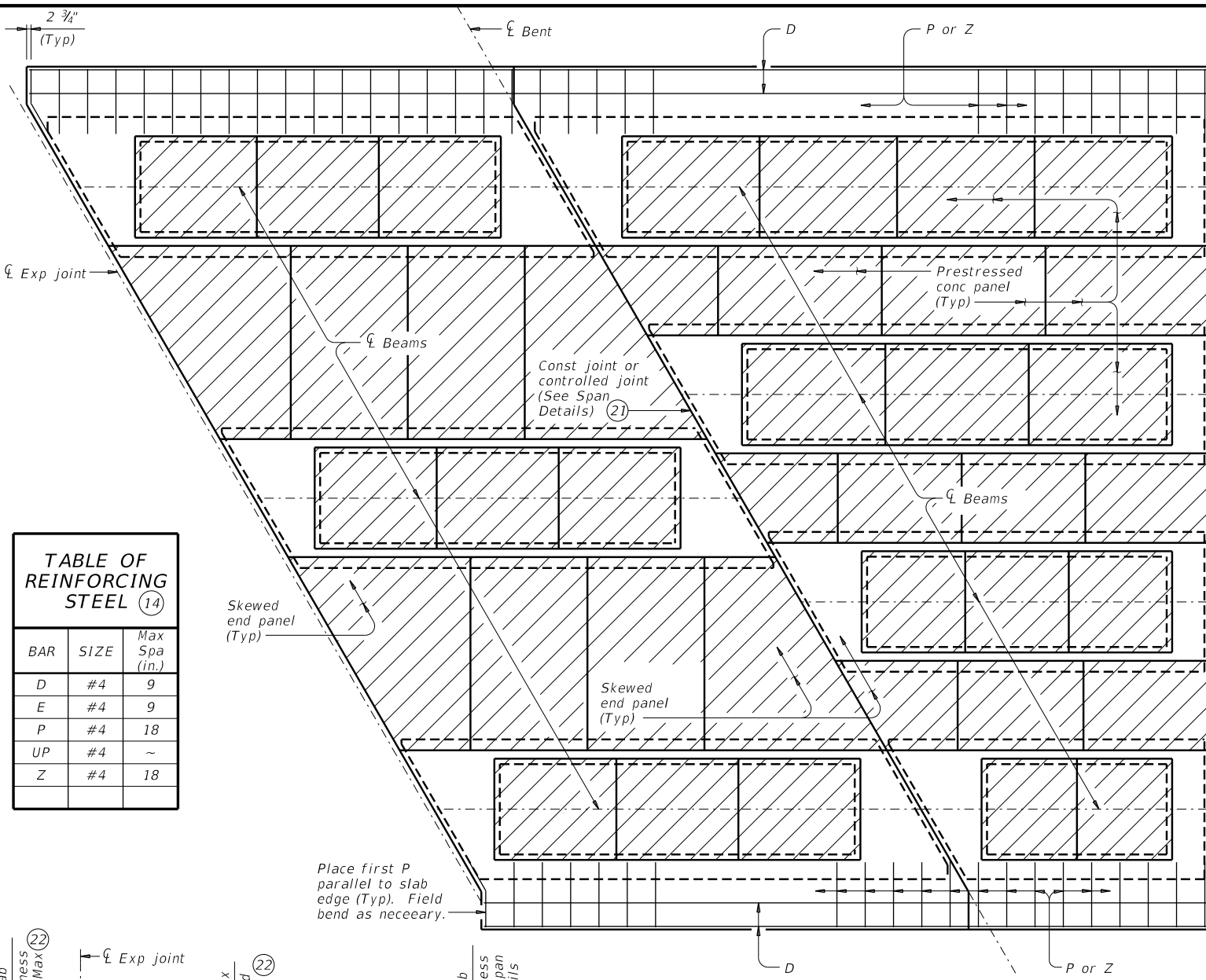
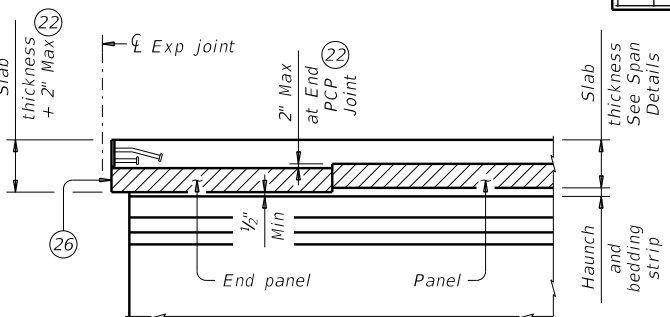
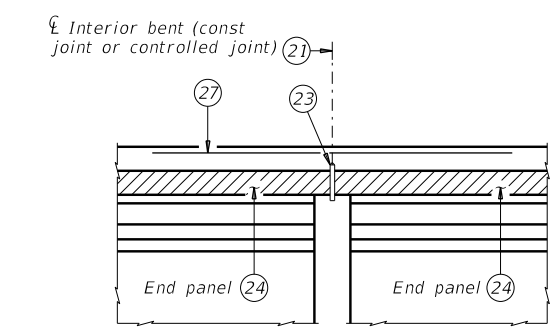


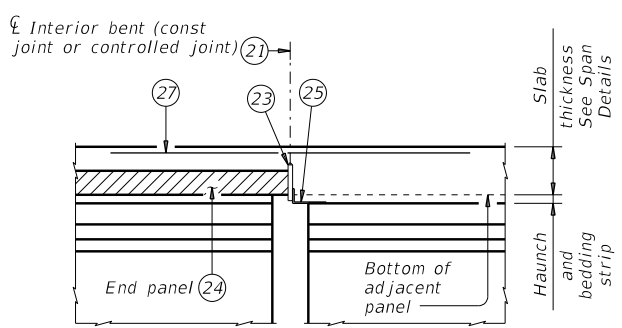
TABLE OF REINFORCING STEEL (14)		
BAR	SIZE	Max Spa (in.)
D	#4	9
E	#4	9
P	#4	18
UP	#4	~
Z	#4	18



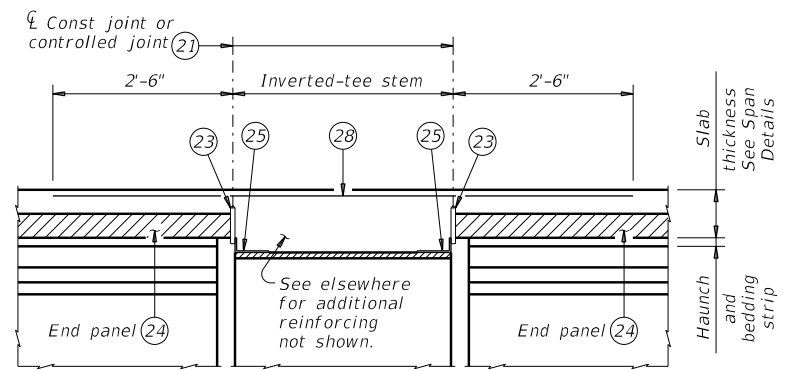
JOINTS (BETWEEN BEAMS/GIRDERS OR AT INV-T STEM)
 For SEJ-A, SEJ-S(0), AJ, and Type A expansion joints only.



CONVENTIONAL INTERIOR BENT
 Panel against panel between beams/girders.



CONVENTIONAL INTERIOR BENT
 Panel against beam/girder end in adjacent span.



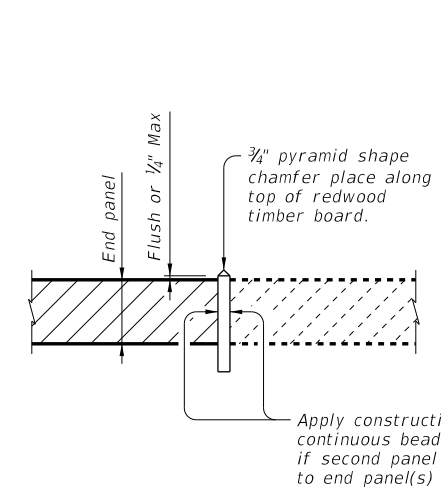
INVERTED-T BENT
 Panels against inverted-tee stem

OPTION 2 ~ ELEVATIONS AT BEAM ENDS (6)

ELEVATION EXAMPLE OF END PANEL AND TIMBER BOARD (23)

See "Option 2 ~ Elevation At Beam Ends".

- (6) See Span Details and Thickened Slab End Details for top slab reinforcement and clear cover. Transverse top slab reinforcement may rest on top of prestressed concrete panels if necessary to maintain clear cover.
- (14) Max Spacing as listed unless otherwise shown.
- (21) 1 1/2" Vinyl or plastic joint former at controlled joints (Stress Cap, Zip Strip, Stress Lock, or equal as approved by the Engineer.)
- (22) End panel may be set up to 2" lower to accommodate expansion joint hardware, provided bedding strip is not less than 1/2" thick.
- (23) 3/4" thick redwood timber board, leave in place. Redwood timber board placed flush with top of panel or within 1/4" Max above panel. Place 3/4" pyramid shape chamfer along top of timber board. See "Elevation Example of End Panel and Timber Board". Place straight, within 1/4" of centerline of bent or face of inverted-tee, across bridge width and end board at exterior flange edge of fascia beams/girders. Do not extend into overhang.
- (24) Place panel within 1/2" of 3/4" thick board.
- (25) Permanent galvanized steel sheet form. Removable formwork is acceptable.
- (26) Place end panel within 1/2" of expansion joint opening. End panel cannot encroach on required expansion joint opening.
- (27) Place additional (#4) bar 5'-0" in length between every slab bars T. Center (#4) bar on joint.
- (28) Place additional (#4) bar continuous 2'-6" beyond each side of Inverted-T Stem between every slab bars T.

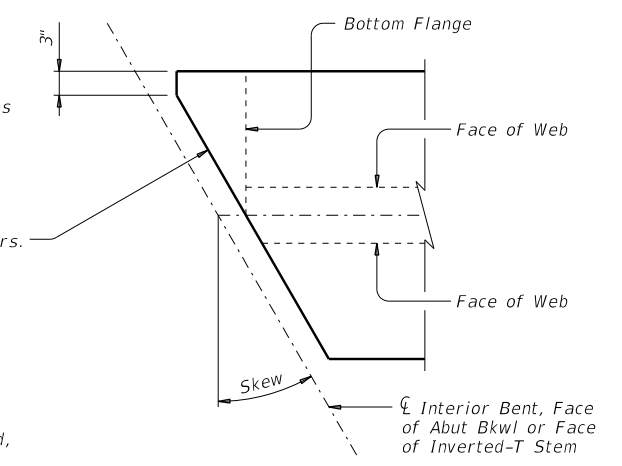


Skew top flange of Bms/Girders as shown for flange edge supporting a panel. Not applicable to flange edges on exterior side of fascia Bms/Girders.

Apply construction adhesive in a continuous bead to both sides of board, if second panel is present, to adhere to end panel(s) and seal interface.

OPTION 2 ~ SHOWING MODIFICATION TO BEAM/GIRDER TOP FLANGE FOR SKEWS OVER 5°

Showing I-Bm/I-Girder, U-Bms and Steel Bms similar.



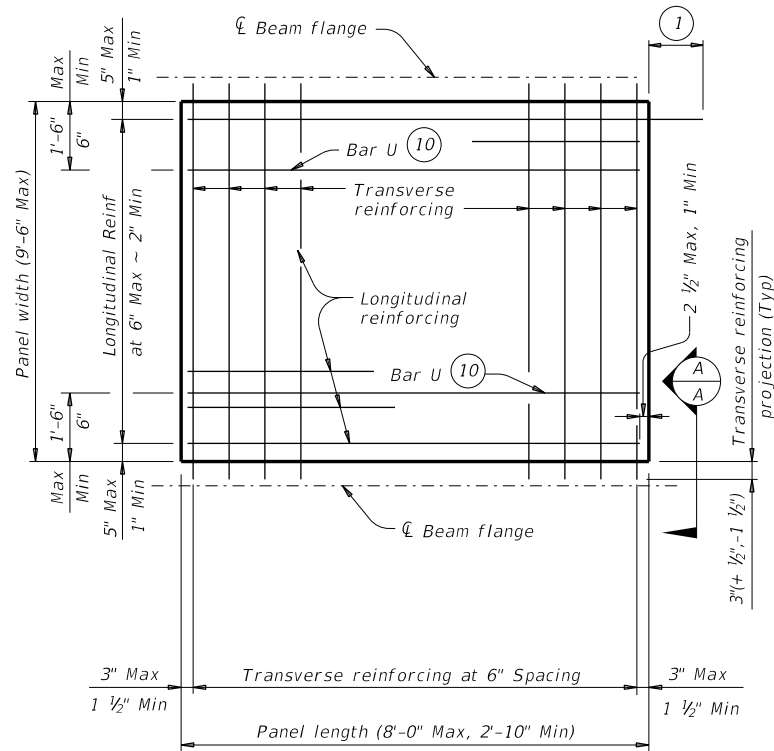
SPECIAL OPTION 2 CONSTRUCTION NOTES:

- When Option 2 is chosen bottom mat of thickened end slab reinforcing is not required. Use the same top mat as shown on the Thickened Slab End Details sheet.
- Placing panels adjacent to expansion joints and bent centerlines prior to completing interior panel placement is recommended. Saw cutting panels to fit is acceptable when approved by the Engineer. Minimum distance from a saw cut edge to a panel strand is 1 1/2".
- Do not extend the longitudinal panel reinforcement into the cast-in-place slab.
- Top flanges of beams and girders on skewed bridges must be modified as shown on this drawing. The Contractor is responsible for coordinating this modification with the beam fabricator prior to submitting shop drawings for approval.
- Fabricator may optionally skew the whole end. When electing to skew whole end, girder end details and bearing type at conventional interior bent must be changed to use condition at abutment. Fabricator must coordinate change in bearing type, bearing centerline location, and dowel location with Engineer and Contractor. Show appropriate changes on girder and bearing shop drawings.
- Bending of anchor studs of expansion joints shown on standards AJ, SEJ-A and SEJ-S(0) is permissible if necessary to clear top of end panels. The Contractor is responsible for coordinating modifications with the joint fabricator. Submit shop drawings for approval when modifications to expansion joint hardware are made.
- Bedding strips under skewed end panels must conform to the requirements of Item 422 except their minimum compressive strength must be 60 psi.
- Provide Bars AA, G, K and OA from standard IGTS in the slab.

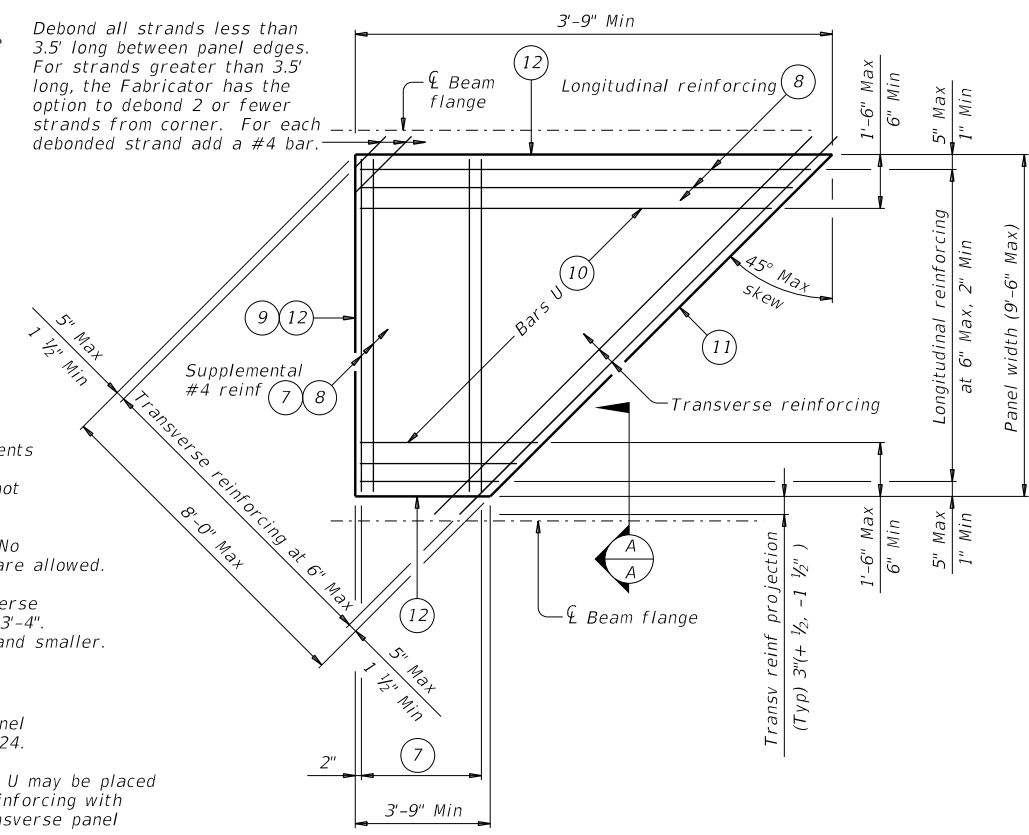
		Bridge Division Standard	
PRESTRESSED CONCRETE PANELS DECK DETAILS			
PCP			
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	FTW	PARKER	82

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TYPICAL NON-SKEWED PANEL PLAN



TYPICAL SKEWED END PANEL PLAN

(Only to be used with details shown elsewhere in the plans.)

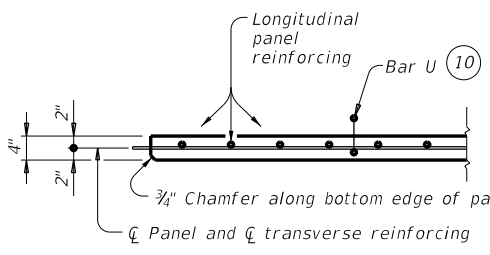
- 1 At connection with cast-in-place slab, extend longitudinal panel reinforcement 1'-0" (+2", -0") past panel end. Alternatively, provide (#3) x 2'-0" dowels at 6" Max Spacing and extend dowels 1'-0" past panel end.
- 2 Four loops required per panel.
- 3 Four loops required per panel. 3/8" or 1/2" strands may be used.
- 4 Normal dimensions must be used on spans with parallel beams. Maximum and Minimum dimensions apply only to spans with flared beams.
- 5 See Normal Grading Detail on PCP standard for lap requirements and bedding strip dimensions. Some laps shown in tables cannot utilize all bedding strip widths.
- 6 One Splice allowed per panel. No more than two sheets of WWR are allowed.
- 7 Provide (#4) bars under transverse reinforcing, 10 Spaces at 4" = 3'-4". Omit for 5 degree (1:12) skew and smaller.
- 8 End Cover 2 1/2" Max, 1" Min.
- 9 Recess strands on indicated panel edge in accordance with Item 424.
- 10 At the fabricator's option, Bars U may be placed parallel to transverse panel reinforcing with horizontal legs in plane of transverse panel reinforcing.
- 11 Use length of indicated panel edge as panel width for purpose of determining type of transverse reinforcing.
- 12 Timber form work permissible this edge.

TABLE A (4) (5)				TABLE B (4) (5)			
Beam Type	Normal (In.)	Min (In.)	Max (In.)	Top Flange Width	Normal (In.)	Min (In.)	Max (In.)
A	3	2 1/2	3 1/2	11" to 12"	2 3/4	2 1/2	2 3/4
B	3	2 1/2	3 1/2	Over 12" to 15"	3 1/4	3	3 1/4
C	4	3	4 1/2	Over 15" to 18"	4	3	4 3/4
IV	6	4	7 1/2	Over 18"	5	3 1/2	6 1/4
VI	6 1/2	4 1/2	8 1/2				
U40 - 54	5 1/2	5 1/2	7				
Tx28-70	6	5	7 1/2				
XB20 - 40	4	3	4 1/2				
XSB12 - 15	4	3	4 1/2				

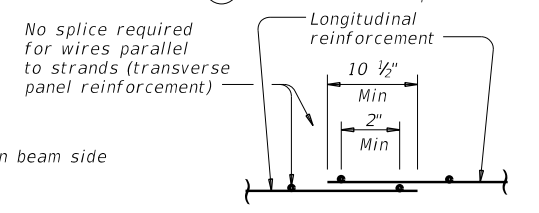
GENERAL NOTES:
 Provide Class H concrete for panels. Release strength $f'c=3,500$ psi. Minimum 28 day strength $f'c=5,000$ psi.
 Provide 3/4" chamfer along bottom edge of panel on beam side. Do not use epoxy-coated reinforcing steel bar or strand in panels. Remove laitance from top panel surface.
 Finish top of panel to a roughness between a No. 6 and No. 9 concrete surface profile, inclusive, as specified by the International Concrete Repair Institute (ICRI).
 Shop drawings for the fabrication of panels will not require the Engineer's approval if fabrication is in accordance with the details shown on this standard.
 A panel layout which identifies location of each panel must be developed by the Fabricator. Permanently mark each panel in accordance with the panel layout. A copy of the layout is to be provided to the Engineer.

TRANSVERSE PANEL REINFORCEMENT:
 For panel widths over 5', use 3/8" or 1/2" Dia (270k) prestressing strands with a tension of 14.4 kips per strand.
 For panel widths over 3'-6" up to and including 5', use 3/8" or 1/2" Dia (270k) prestressing strands with a tension of 14.4 kip per strand. Optionally, (#4) Grade 60 reinforcing bars may be used in lieu of prestressed strands.
 For panel widths up to 3'-6", use (#4) Grade 60 reinforcing bars (prestressed strands alone are not allowed).
 Place transverse panel reinforcement at panel centroid and space at 6" Max.

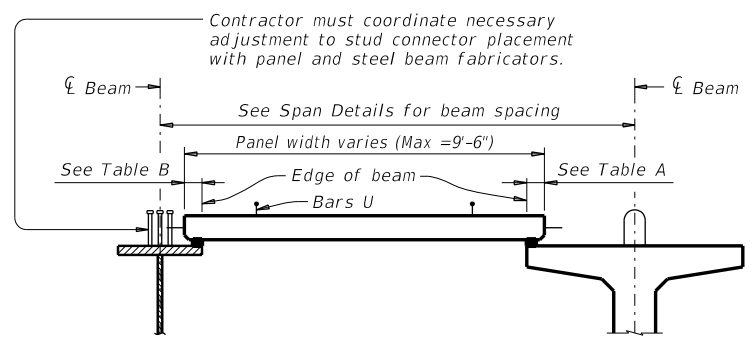
LONGITUDINAL PANEL REINFORCEMENT:
 Any of the following options may be used for longitudinal panel reinforcement:
 1. (#3) Grade 60 reinforcing steel at 6" Max Spacing. No splices allowed.
 2. 3/8" Dia prestressing strands at 4 1/2" Max Spacing (unstressed). No splices allowed.
 3. 1/2" Dia prestressing strands at 6" Max Spacing (unstressed). No splices allowed.
 4. Deformed Welded Wire Reinforcement (WWR) (ASTM A1064) providing 0.22 sq in per foot of panel width. Wires larger than D11 not permitted. Provide transverse wires to ensure proper handling of reinforcing. One splice per panel is allowed. See WWR Splice Detail.
 No combination of longitudinal reinforcement options in a panel is allowed. Place longitudinal panel reinforcement above or below transverse panel reinforcement. Must be placed above transverse panel reinforcement for skewed end panels with supplemental (#4) reinforcement.



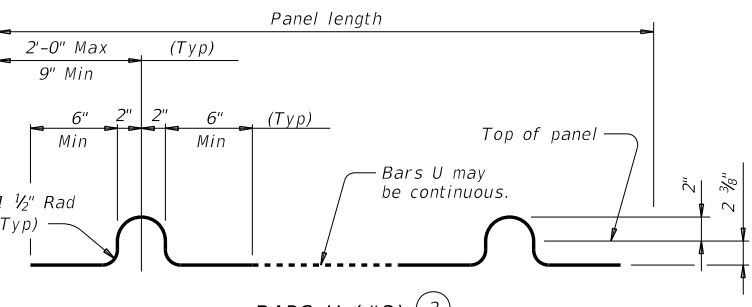
SECTION A-A
 (Not showing supplemental #4 bars for skewed end panels.)



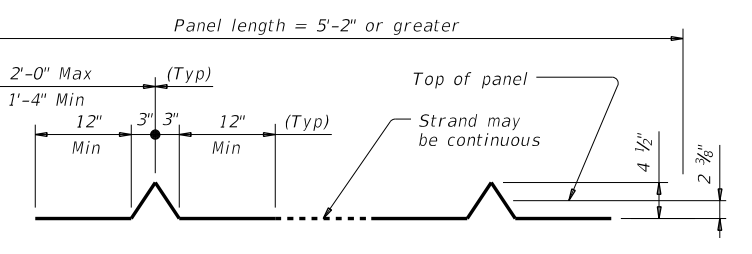
WELDED WIRE REINFORCEMENT (WWR) SPLICE DETAIL (6)



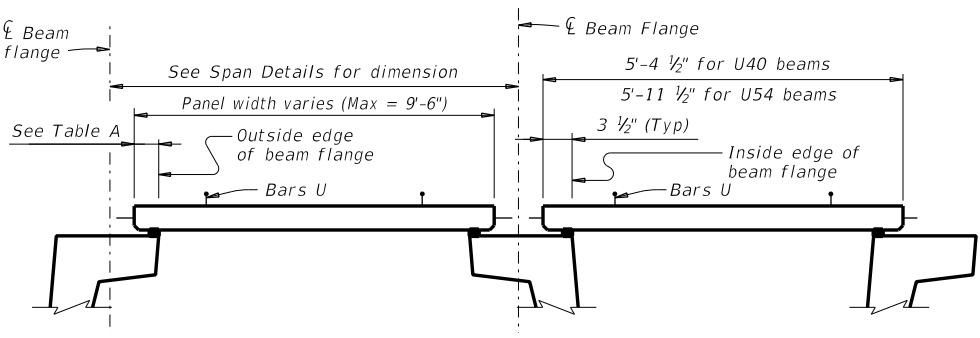
TYPICAL SECTIONS FOR DETERMINING PANEL WIDTH



BARS U (#3) (2)



OPTIONAL STRAND FOR BARS U (3)



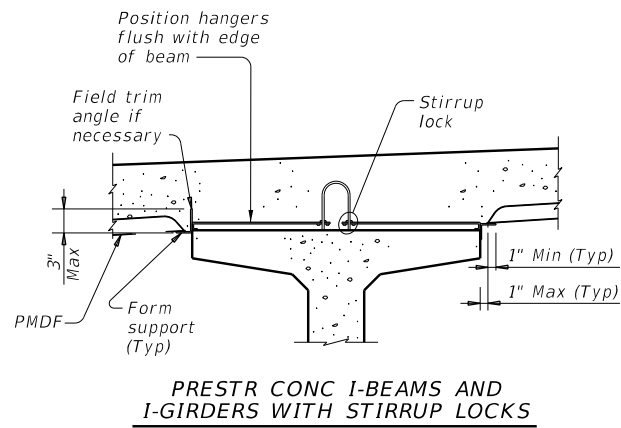
PRESTRESSED CONCRETE U-BEAMS

HL93 LOADING

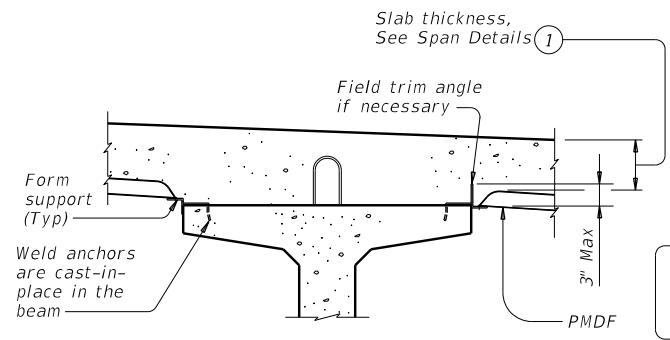
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PRESTRESSED CONCRETE PANEL FABRICATION DETAILS			
PCP-FAB			
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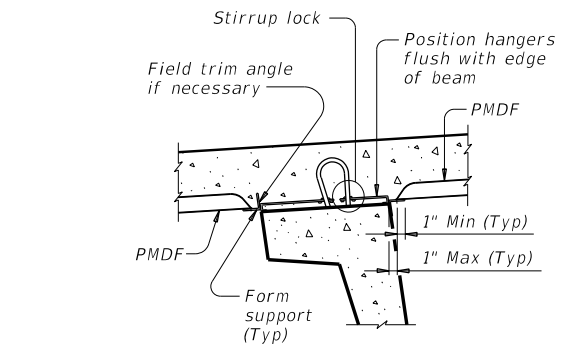
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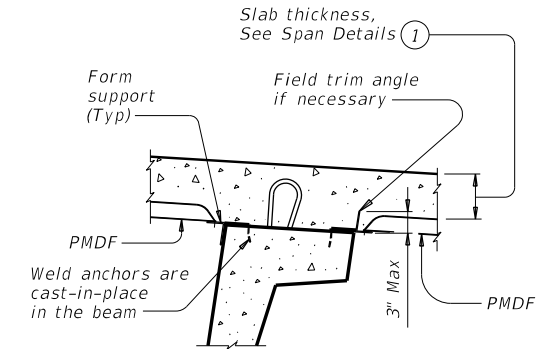
PRESTR CONC I-BEAMS AND I-GIRDERS WITH STIRRUP LOCKS



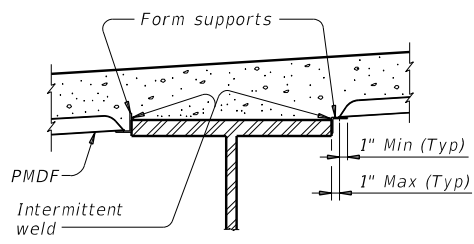
PRESTR CONC I-BEAMS AND I-GIRDERS WITH WELD ANCHORS



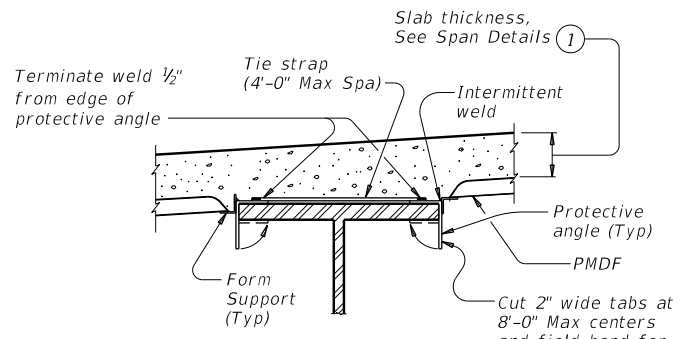
U-BEAMS WITH STIRRUP LOCKS



U-BEAMS WITH WELD ANCHORS

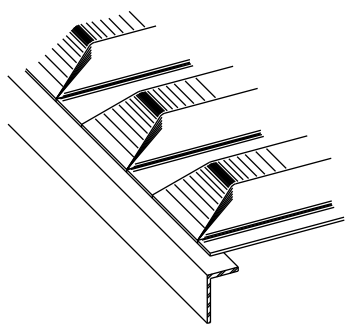


STEEL BEAMS AT COMPRESSION FLANGES

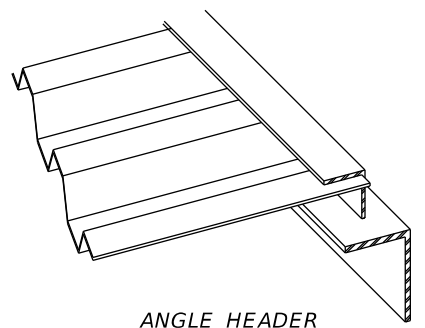


STEEL BEAMS AT TENSION FLANGES

TYPICAL TRANSVERSE SECTIONS



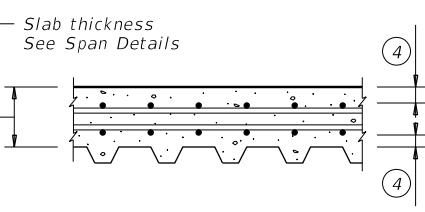
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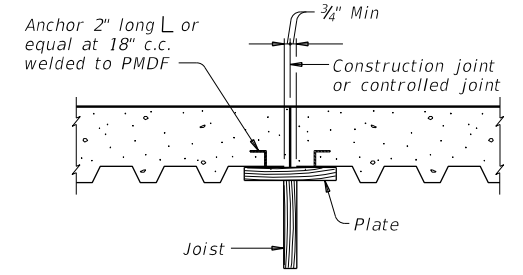
ANGLE HEADER

NOTE: This type is to be used for skewed ends only.

TYPES OF END CLOSURES



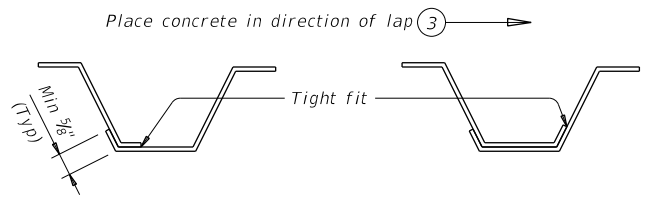
TYP LONGITUDINAL SLAB SECTION



Note: In spans where PMD forms are used, timber forms must be used at construction joints. Adequate provision must be made to support edge of metal form and to provide anchorage of metal form to slab concrete where joined to wood forms.

SECTION THRU CONSTRUCTION JOINT

FOR PRESTR CONC U-BEAM BRIDGES:
 Size, spacing, and orientation of bottom mat of slab reinforcement must match the top mat of reinforcing shown on the span details except all bottom mat bars are to be #5.
FOR PRESTR CONC TX-GIRDER BRIDGES:
 See Miscellaneous Slab Details, Prestr Concrete I-Girders (IGMS) standard sheet for bottom mat reinforcing.



SIDE LAP DETAILS

- 1 Slab thickness minus 5/8" if corrugations match reinforcing bars.
- 2 Welding of form supports to tension flanges will not be permitted. Other methods of providing wind hold down resistance for PMDF in tension flange zones will be considered. At least one layer of sheet metal must be provided between the flange and the weld joint.
- 3 The direction of concrete placement will be such that the upper layer of the form overlap is loaded first.
- 4 See Span details for cover requirements.

GENERAL NOTES:

Steel for Permanent Metal Deck Forms (PMDF) and support angles shall conform to ASTM A653, structural steel (SS), with coating designation G165. Steel must have a minimum yield strength of 33 ksi. Minimum thickness of PMDF is 20 gage and that of support angles and protective angles is 12 gage.
 Submit two copies of forming plans for PMDF to the Engineer. These plans must show all essential details of proposed form sheets, closures, fasteners, supports, connectors, special conditions and size and location of welds. These plans must clearly show areas of tension flanges for steel beams and provisions for protecting the tension flanges from welding notch effects by inclusion of separating sheet metal or other positive method. These plans must be designed, signed, and sealed by a licensed professional engineer. Department approval of these plans is not required, but the Department reserves the right to require modifications to the plans. The Contractor is responsible for the adequacy of these plans. The details and notes shown on this standard are to be used as a guide in preparation of the forming plans.
 All material, labor, tools and incidentals necessary to form a bridge deck with Permanent Metal Deck Forms is considered subsidiary to Item 422, "Concrete Superstructures".

DESIGN NOTES:
 As a minimum, PMDF and support angles must be designed for the dead load of the form, reinforcement and concrete plus 50 psf for construction loads. Flexural stresses due to these design loads must not exceed 75 percent of the yield strength of the steel. Allowable stress for weld metal must be 12,400 psi.
 Maximum deflection under the weight of forms, reinforcement and concrete or 120 psf, whichever is greater, shall not exceed the following:

- 1/180 of the form design span, but not more than 0.50", for design spans of 10' or less.
 - 1/240 of the form design span, but not more than 0.75", for design spans greater than 10'.
- The form design span must not be less than the clear distance between beam flanges, measured parallel to the form flutes, minus 2".

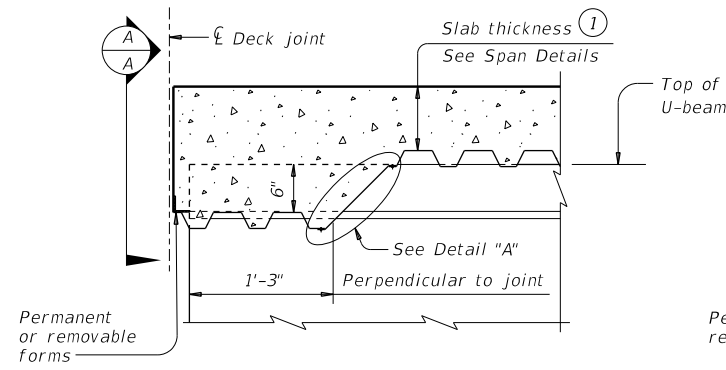
CONSTRUCTION NOTES:

Form sheets must not be permitted to rest directly on the top of beam flanges. Form sheets must be securely fastened to form supports and must have a minimum bearing length of one inch at each end. Form supports must be placed in direct contact with beam flanges.
 All attachments must be made by permissible welds, screws, bolts, clips or other means shown on the the forming plans. All sheet metal assembly screws must be installed with torque-limiting devices to prevent stripping. Only welds or bolts must be used to support vertical loads.
 Welding and welds must be in accordance with the provisions of Item 448, "Structural Field Welding", pertaining to fillet welds. All welds must be made by a qualified welder in accordance with Item 448.
 All permanently exposed form metal, where the galvanized coating has been damaged, must be thoroughly cleaned and repaired in accordance with Item 445, "Galvanizing". Minor heat discoloration in areas of welds need not be touched up.
 Flutes must line up uniformly across the entire width of the structure where main reinforcing steel is located in the flute.
 Construction joints will not be permitted unless shown on the plans. The location of and forming details for any construction joint used must be shown on the forming plans. Forms below a construction joint must be removed after curing of the slab.
 A sequence for uniform vibration of concrete must be approved by the Engineer prior to concrete placement. Attention must be given to prevent damage to the forms, yet provide proper vibration to prevent voids or honeycomb in the flutes and at headers and/or construction joints.

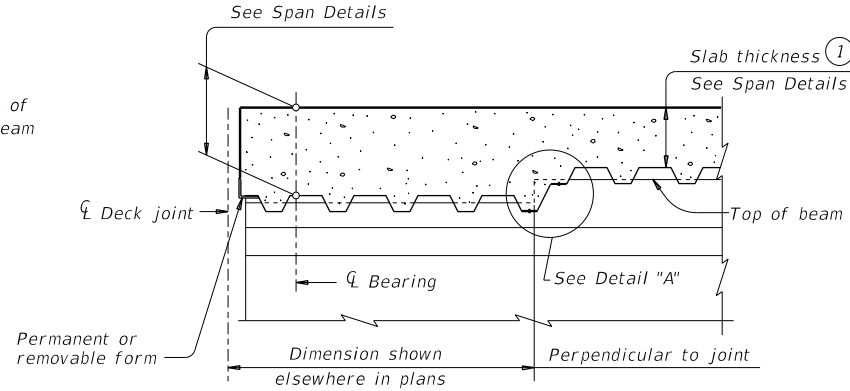
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PERMANENT METAL DECK FORMS					
PMDF					
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©TxDOT	April 2019	CONT	SECT	JOB	HIGHWAY
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		DIST	COUNTY	SHEET NO.	
		FTW	PARKER	84	

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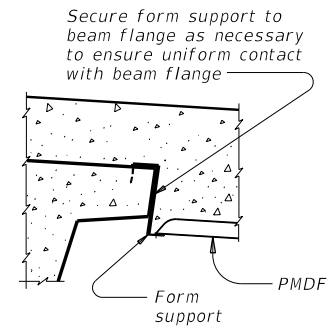
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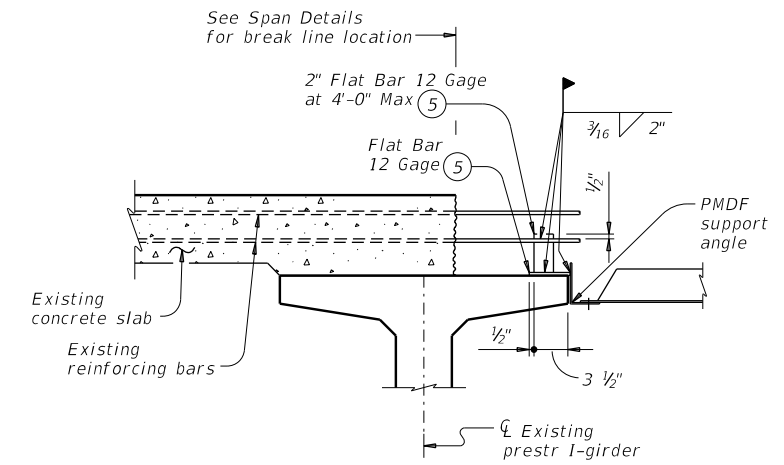
AT THICKENED SLAB END FOR U-BEAMS



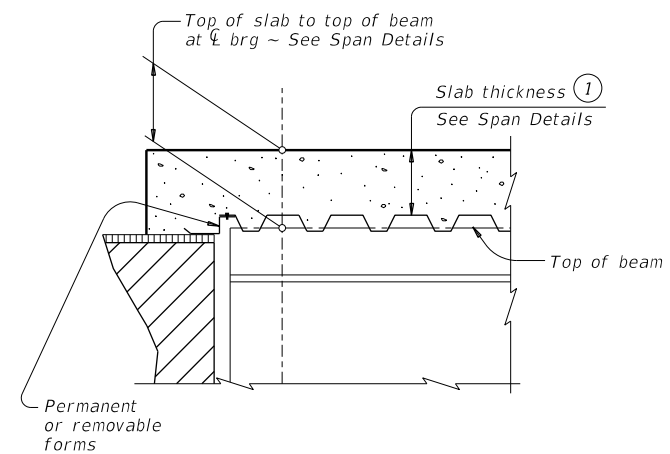
AT THICKENED SLAB END FOR PRESTRESSED I-BEAMS, I-GIRDERS AND STEEL BEAMS
 Showing I-beam block-out. No block-out for I-girders or steel beams.



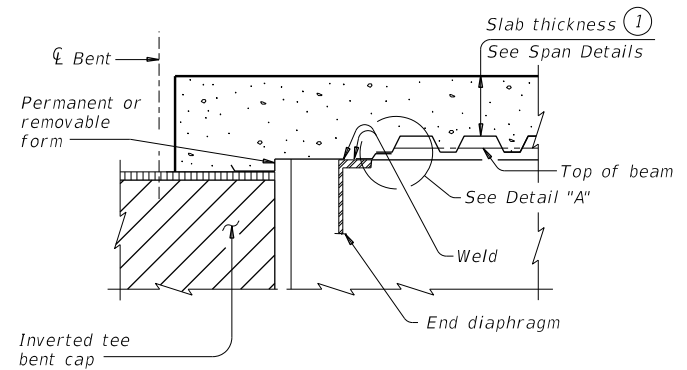
SECTION A-A



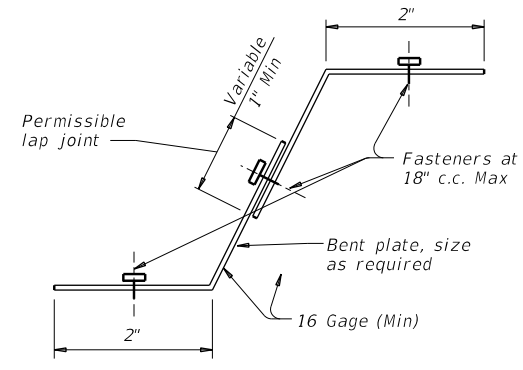
SHOWING PRESTRESSED CONCRETE I-BEAMS, I-GIRDERS AND U-BEAMS



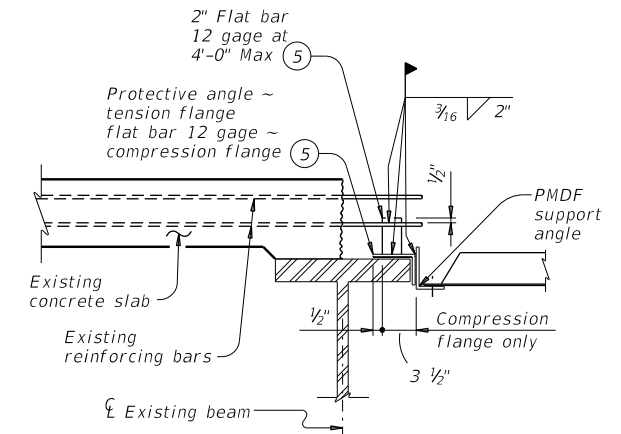
AT SLAB OVER ABUT BKWL OR INV TEE STEM FOR CONC BEAMS WITHOUT THICKENED SLAB END



AT SLAB OVER INV TEE STEM FOR STEEL BEAMS WITHOUT THICKENED SLAB END

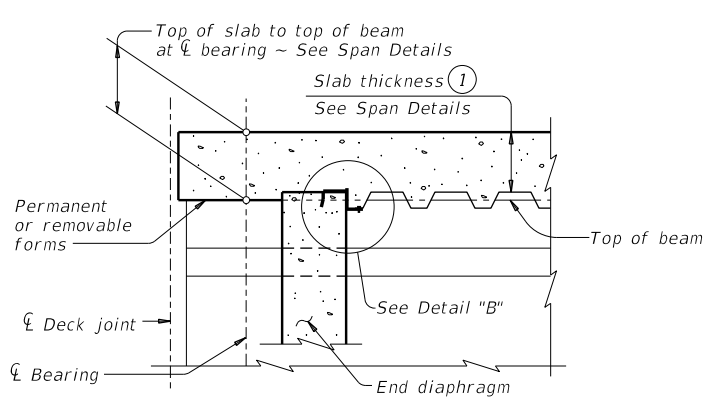


DETAIL "A"

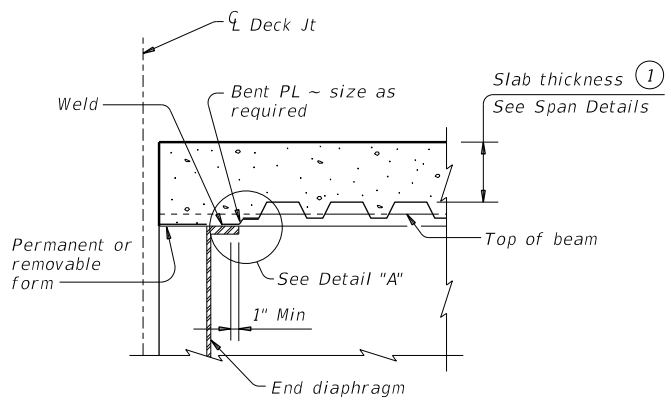


SHOWING STEEL BEAMS

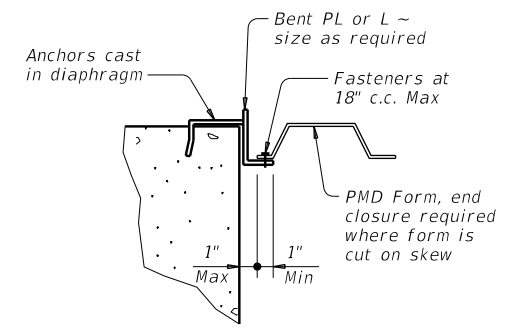
WIDENING DETAILS



AT CONC END DIAPHRAGM FOR PRESTRESSED I-BEAMS AND STEEL BEAMS



AT END DIAPHRAGM FOR STEEL BEAMS WITHOUT THICKENED SLAB END



DETAIL "B"

- (1) Slab thickness minus 5/16" if corrugations match reinforcing bars
- (5) Minimum yield stress of 12 gage bars shall be 40 ksi

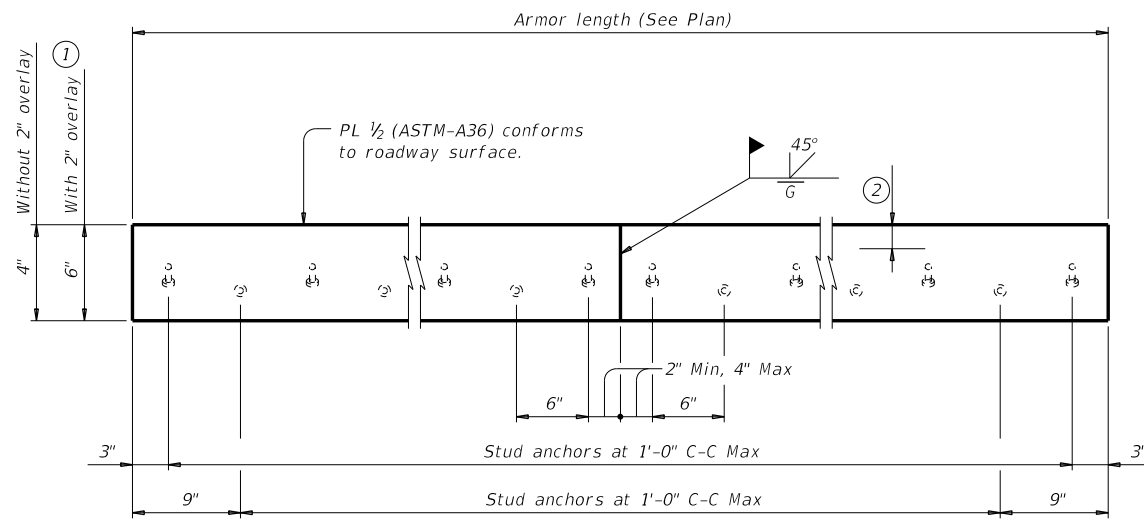
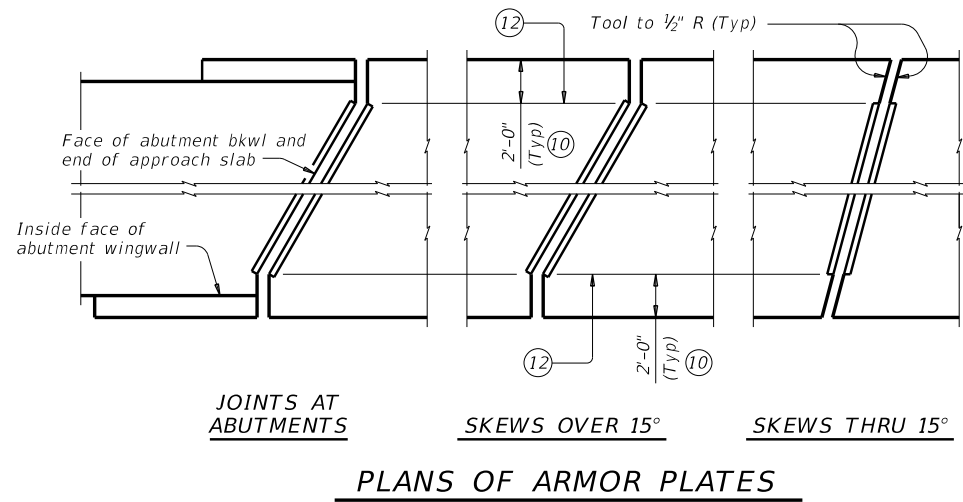
DETAILS AT ENDS OF BEAMS

SHEET 2 OF 2

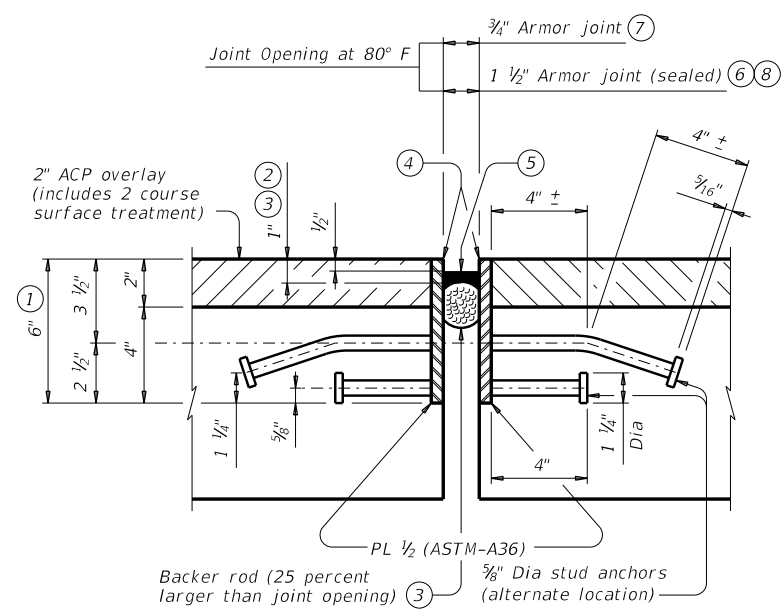
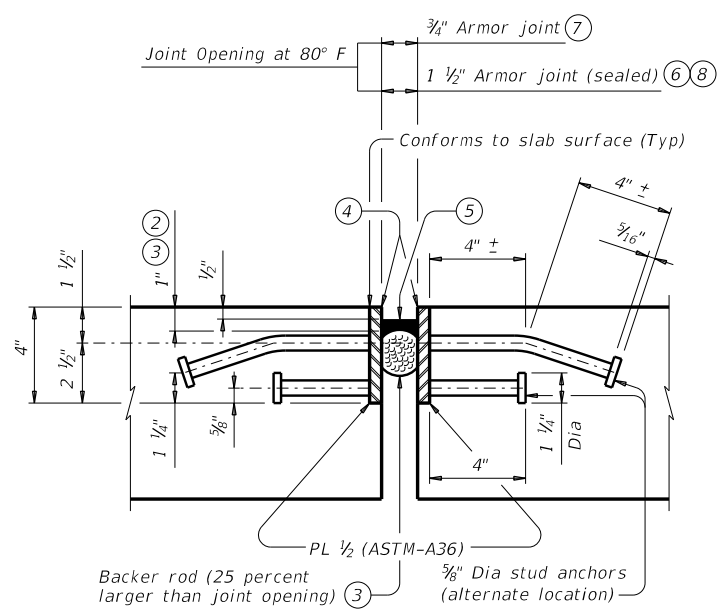
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PERMANENT METAL DECK FORMS			
PMDF			
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©TxDOT April 2019	CONT	SECT	JOB
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- ① Adjust 6" plate height for overlay thicknesses other than the 2" shown. Adjust weight by 1.70 plf for each 1/2" variation in thickness.
- ② Do not paint top 1/2" of plate if using sealed armor joint.
- ③ Set top of backer rod 1" below top of armor plate. Backer rod must be compatible with joint sealant. Use of multiple pieces to create a backer rod cross section is not permitted. Top of backer rod must be convex as shown.
- ④ Blast clean entire contact area between sealant and plate (SSPC-SP10) before installing sealant. Light brush blast and thoroughly clean all dust and debris from concrete surfaces in contact with joint sealant before application of silicone seal.
- ⑤ Use Class 7 joint sealant that conforms to DMS-6310.
- ⑥ Place sealant while ambient temperature is between 55°F and 80°F and is rising.
- ⑦ Armor joint does not include joint sealant or backer rod.
- ⑧ Armor joint (sealed) includes Class 7 joint sealant and backer rod.
- ⑨ Form vertical leg of seal as per the Manufacturer's recommendations. Use Class 4 joint sealant if Class 7 cannot be installed correctly. Install according to Manufacturer's recommendations.
- ⑩ Unless shown otherwise, terminate armor plate at slab break point if break is more than 2'-0" from slab edge.
- ⑪ See "Plans of Armor Plates".
- ⑫ At Fabricator's option, armor plate may extend up to 6" beyond this point for skews through 15°.
- ⑬ Align shipping angle perpendicular to joint.

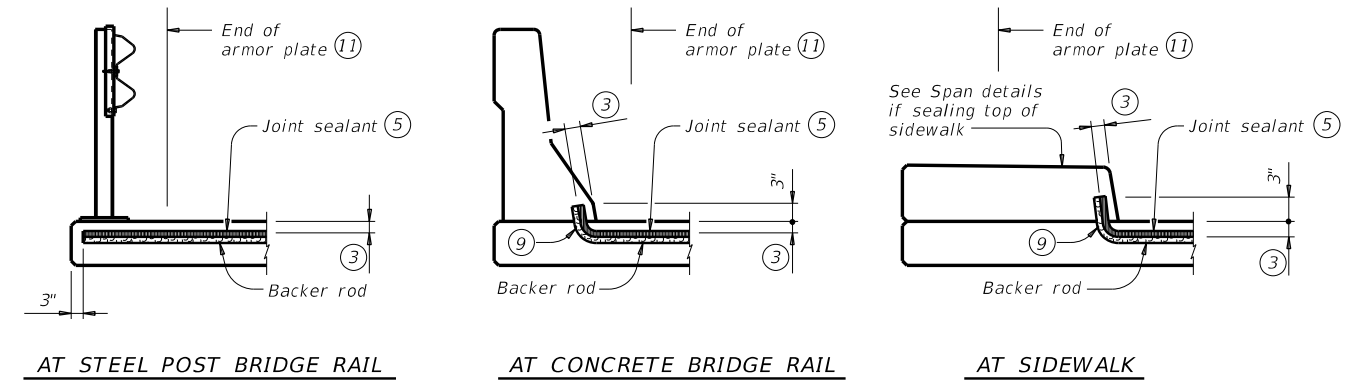


ARMOR JOINT SECTIONS
 Showing Armor Joint (Sealed)

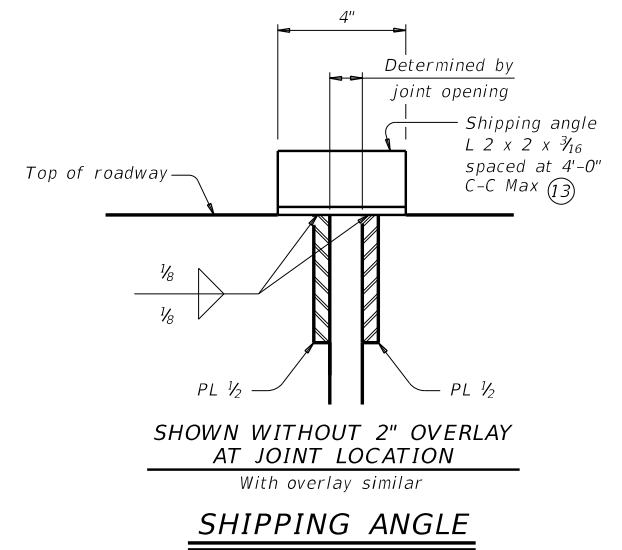
FABRICATION NOTES:
 Match mark corresponding plate sections and secure together for shipment with shipping angle. Do not use erection bolts.
 Ship armor joints in convenient lengths of 10'-0" Min and 24'-0" Max unless necessary for stage construction or widenings. One shop splice is permitted in each shipping length provided no piece is less than 2'-0" long and sufficient studs are added to limit the stud to shop splice distance to 2" Min and 4" Max.
 Weld studs in accordance with AWS D1.1.
 Use groove welds for all shop and field butt splices. Grind smooth areas in contact with seal. Make all necessary field splice joint preparations in the shop.
 Paint the entire steel section, except as stated in Note 2, with System II or IV primer in accordance with Item 446 "Field Cleaning and Painting Steel." Provide paints in accordance with Item 446.2. Prepare steel and apply paint in accordance with Items 446.4.7.3 and 446.4.7.4.
 Shop drawings for the fabrication of armor joints will not require the Engineer's approval if fabrication is in accordance with the details shown on this standard.

CONSTRUCTION NOTES:
 Secure armor joints in position and place to proper grade and alignment by welding braces to adjacent reinforcing steel, to prestressed beam stirrups, or to anchors cast in concrete diaphragms. Include cost of temporary bracing in the price bid for Armor Joint.
 Remove shipping angle immediately after each joint half is secured in place. Grind smooth, and touch up with organic zinc-rich paint.

GENERAL NOTES:
 Provide armor joints at locations shown on the plans. Provide the seal when "Armor Joint (Sealed)" is noted on the plans. These joint details accommodate a joint movement range of 1 3/8" (3/4" opening movement and 5/8" closure movement).
 Payment for armor joint, with or without seal, is based on length of armor plate.



JOINT SEALANT TERMINATION DETAILS
 Armor joint (sealed) only. Armor plate is not shown for clarity.



WEIGHTS FOR ONE ARMOR JOINT (2 PLATES)	
WITHOUT OVERLAY	16.10 plf
WITH 2" OVERLAY ①	22.90 plf

Texas Department of Transportation **Bridge Division Standard**

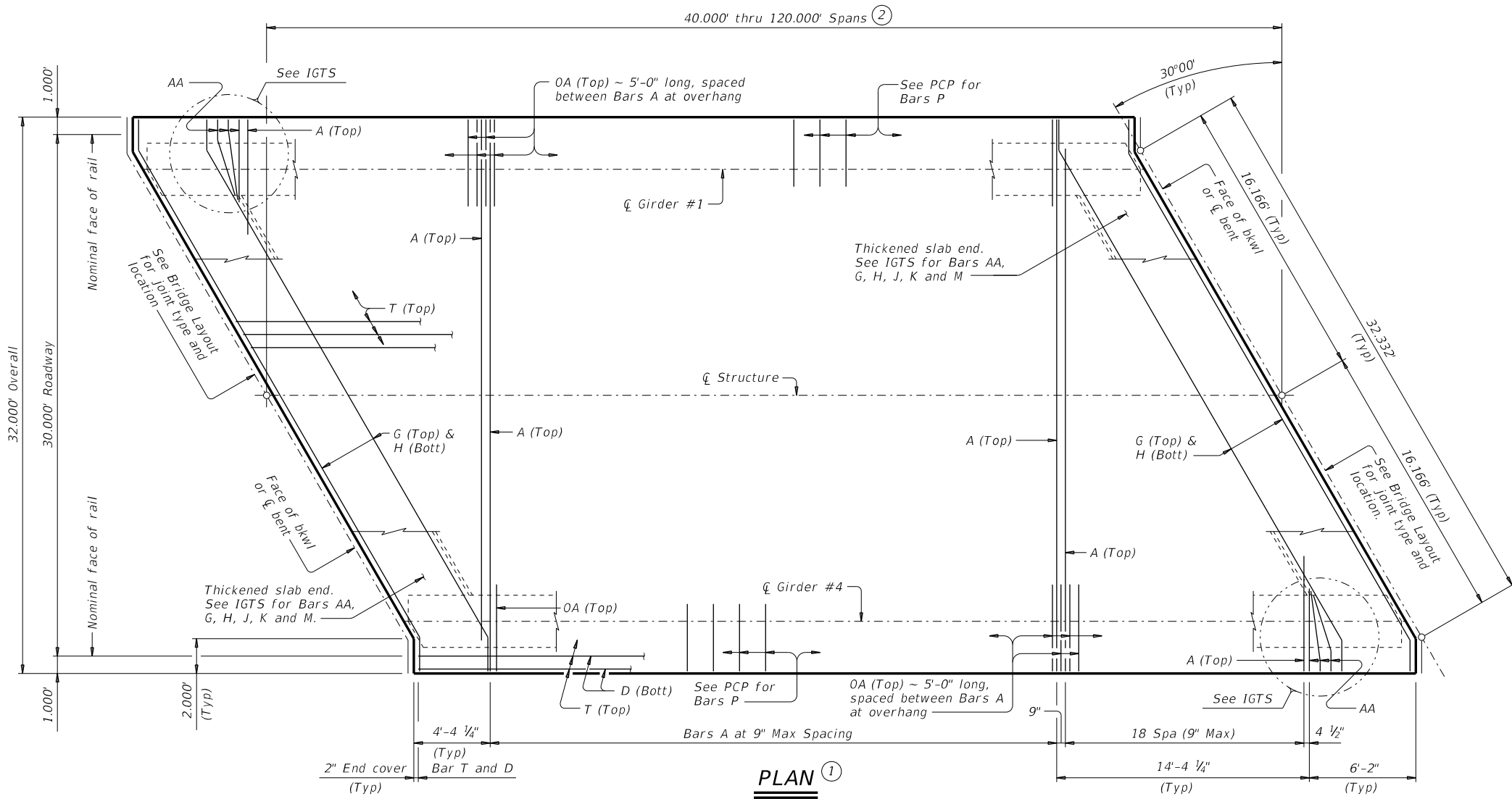
ARMOR JOINT DETAILS

AJ

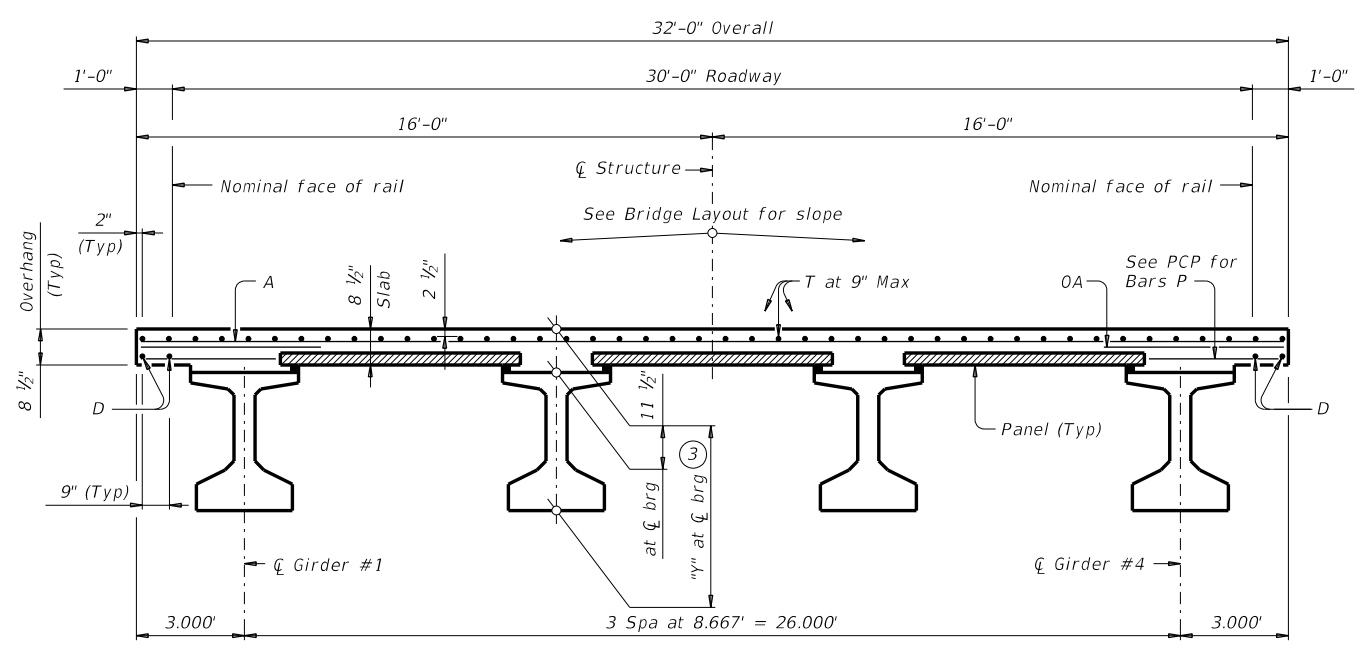
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PLAN ①



TYPICAL TRANSVERSE SECTION
 (Showing girder type Tx46)

TABLE OF SECTION DEPTHS	
GIRDER TYPE	"Y" AT CL BRG ③
	Ft/In
Tx28	3'-3 1/2"
Tx34	3'-9 1/2"
Tx40	4'-3 1/2"
Tx46	4'-9 1/2"
Tx54	5'-5 1/2"

- ① If multi-span units (with slab continuous over interior bents) are indicated on the Bridge Layout, see standard IGCS for adjustment to slab reinforcement and quantities.
- ② Span lengths for prestressed concrete I-Girder type:
 Type Tx28 for spans lengths 40,000' thru 70,000'.
 Type Tx34 for spans lengths 40,000' thru 80,000'.
 Type Tx40 for spans lengths 40,000' thru 95,000'.
 Type Tx46 for spans lengths 40,000' thru 105,000'.
 Type Tx54 for spans lengths 40,000' thru 120,000'.
- ③ "Y" value shown is based on theoretical girder camber, dead load deflection from an 8 1/2" concrete slab, a constant roadway grade, and using precast panels (PCP). The Contractor will adjust this value as necessary for any roadway vertical curve and/or if the precast overhang panel (PCP(0)) option is used.

BAR TABLE	
BAR	SIZE
A	#4
AA	#5
D	#4
G	#4
H	#4
J	#4
K	#4
M	#4
OA	#5
P	#4
T	#4

HL93 LOADING SHEET 1 OF 2

Texas Department of Transportation
 Bridge Division Standard

PRESTRESSED CONCRETE I-GIRDER SPANS
 (TYPE Tx28 THRU Tx54)
 30' ROADWAY 30° SKEW

SIG-30-30

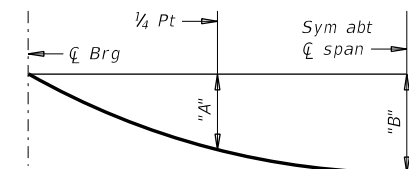
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FTW	PARKER			87

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TABLE OF DEAD LOAD DEFLECTIONS

TYPE Tx28 GIRDERS			TYPE Tx34 GIRDERS			TYPE Tx40 GIRDERS			TYPE Tx46 GIRDERS			TYPE Tx54 GIRDERS		
SPAN LENGTH	"A"	"B"	SPAN LENGTH	"A"	"B"	SPAN LENGTH	"A"	"B"	SPAN LENGTH	"A"	"B"	SPAN LENGTH	"A"	"B"
Ft	Ft	Ft	Ft	Ft	Ft	Ft	Ft	Ft	Ft	Ft	Ft	Ft	Ft	Ft
40	0.010	0.014	40	0.006	0.008	40	0.004	0.005	40	0.003	0.004	40	0.001	0.002
45	0.016	0.022	45	0.009	0.013	45	0.006	0.009	45	0.004	0.006	45	0.003	0.004
50	0.025	0.035	50	0.015	0.021	50	0.010	0.014	50	0.006	0.009	50	0.004	0.006
55	0.037	0.052	55	0.022	0.031	55	0.014	0.020	55	0.010	0.014	55	0.006	0.009
60	0.053	0.074	60	0.031	0.044	60	0.021	0.029	60	0.014	0.020	60	0.009	0.013
65	0.073	0.103	65	0.044	0.062	65	0.028	0.040	65	0.019	0.027	65	0.013	0.018
70	0.100	0.140	70	0.060	0.084	70	0.039	0.055	70	0.026	0.037	70	0.018	0.025
			75	0.079	0.111	75	0.052	0.073	75	0.036	0.050	75	0.024	0.033
			80	0.103	0.145	80	0.068	0.095	80	0.046	0.065	80	0.031	0.043
						85	0.086	0.121	85	0.059	0.083	85	0.039	0.055
						90	0.109	0.153	90	0.075	0.105	90	0.049	0.069
						95	0.136	0.191	95	0.093	0.130	95	0.061	0.086
									100	0.115	0.161	100	0.076	0.106
									105	0.140	0.196	105	0.093	0.130
									110			110	0.112	0.157
									115			115	0.134	0.188
									120			120	0.159	0.223



DEAD LOAD DEFLECTION DIAGRAM

Calculated deflections shown are due to the concrete slab on interior girders only ($E_c = 5000$ ksi). Adjust values as required for exterior girders and if optional slab forming is used. These values may require field verification.

TABLE OF ESTIMATED QUANTITIES

SPAN LENGTH	REINF CONCRETE SLAB	Prestressed Concrete Girders			TOTAL REINF STEEL ⁵
		ABUT TO INT BT ⁴	INT BT TO INT BT ⁴	ABUT TO ABUT ⁴	
Ft	SF	LF	LF	LF	Lb
40	1,280	157.85	158.00	157.69	2,944
45	1,440	177.85	178.00	177.69	3,312
50	1,600	197.85	198.00	197.69	3,680
55	1,760	217.85	218.00	217.69	4,048
60	1,920	237.85	238.00	237.69	4,416
65	2,080	257.85	258.00	257.69	4,784
70	2,240	277.85	278.00	277.69	5,152
75	2,400	297.85	298.00	297.69	5,520
80	2,560	317.85	318.00	317.69	5,888
85	2,720	337.85	338.00	337.69	6,256
90	2,880	357.85	358.00	357.69	6,624
95	3,040	377.85	378.00	377.69	6,992
100	3,200	397.85	398.00	397.69	7,360
105	3,360	417.85	418.00	417.69	7,728
110	3,520	437.85	438.00	437.69	8,096
115	3,680	457.85	458.00	457.69	8,464
120	3,840	477.85	478.00	477.69	8,832

- ⁴ Fabricator will adjust lengths for girder slopes as required.
- ⁵ Reinforcing steel weight is calculated using an approximate factor of 2.3 lbs/SF.

GENERAL NOTES:
 Designed according to AASHTO LRFD Bridge Design Specifications.
 Multi-span units, with slab continuous over interior bents, may be formed with the details shown on this sheet and standard IGCS.
 See IGTS standard for Thickened Slab End details and quantity adjustments.
 See PCP and PCP-FAB for panel details not shown.
 See PCP(O) and PCP(O)-FAB for precast overhang panel details if this option is used.
 See IGMS standard for miscellaneous details.
 See applicable rail details for rail anchorage in slab.
 See PMDF standard for details and quantity adjustments if this option is used.
 This standard is drawn showing right forward skew. See Bridge Layout for actual skew direction.
 This standard does not support the use of transition bents.

Cover dimensions are clear dimensions, unless noted otherwise.

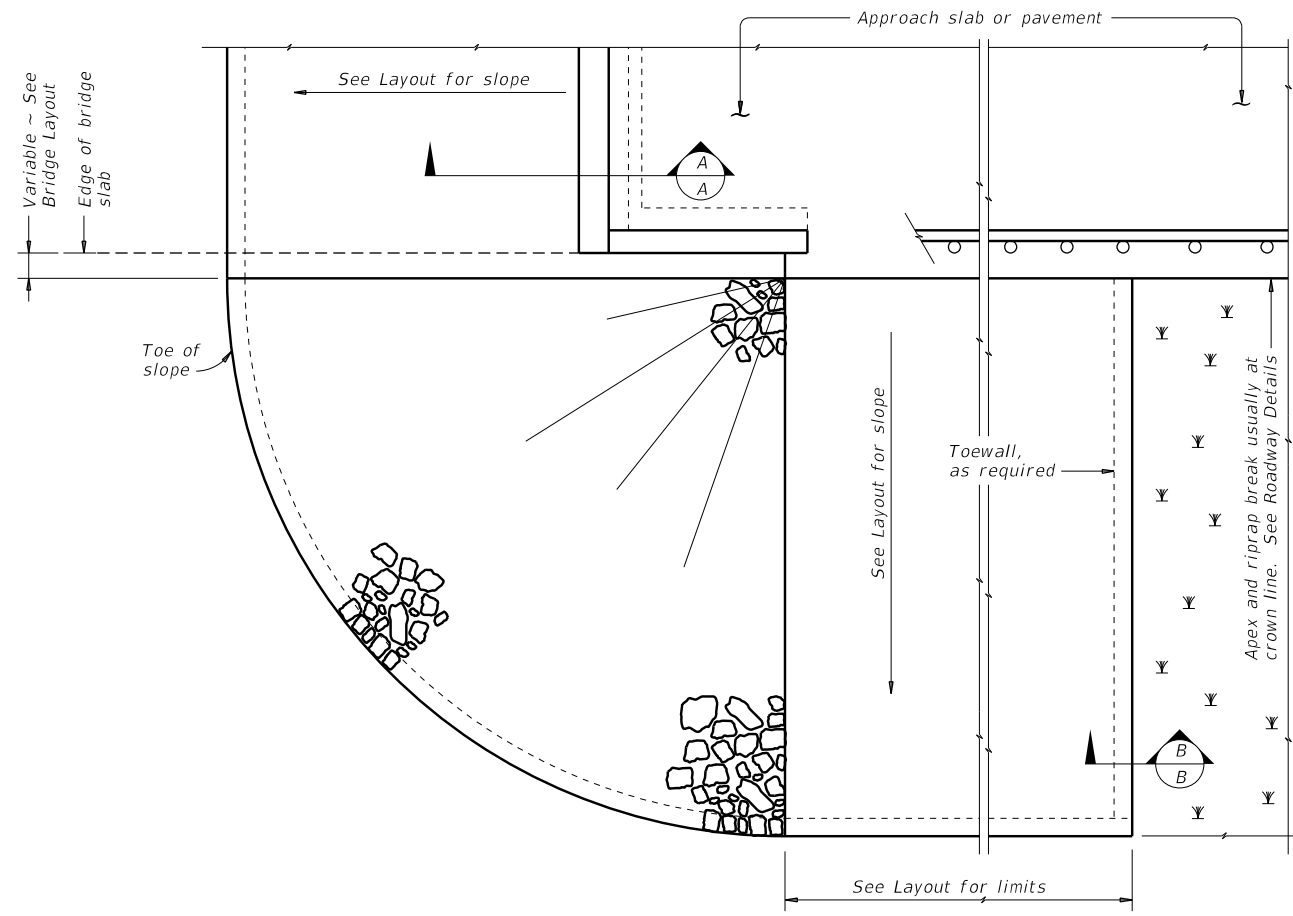
MATERIAL NOTES:
 Provide Class S concrete ($f'_c = 4,000$ psi).
 Provide Class S (HPC) concrete if shown elsewhere in the plans.
 Provide Grade 60 reinforcing steel.
 Provide bar laps, where required, as follows:
 Uncoated ~ #4 = 1'-7"
 Epoxy coated ~ #4 = 2'-5"
 Deformed Welded Wire Reinforcement (WWR) (ASTM A1064) of equal size and spacing may be substituted for Bars A, AA, D, OA, P or T unless noted otherwise.

HL93 LOADING SHEET 2 OF 2

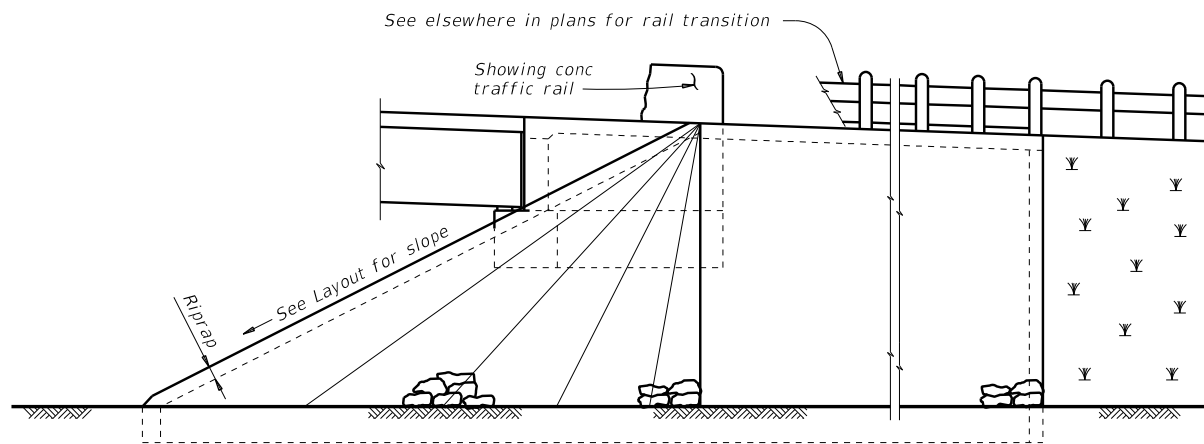
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SIG-30-30			
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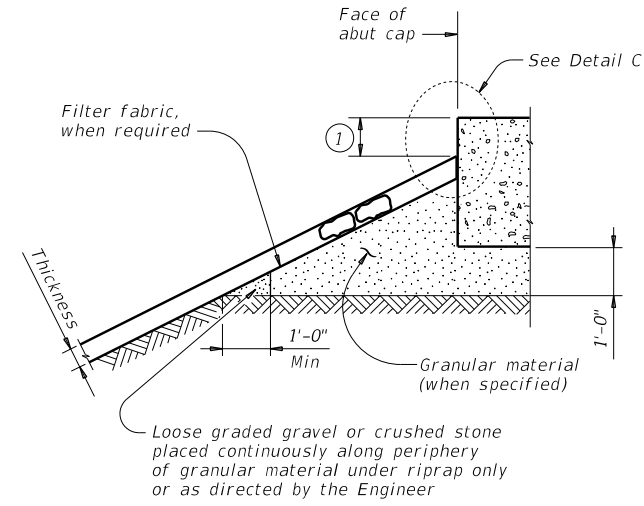
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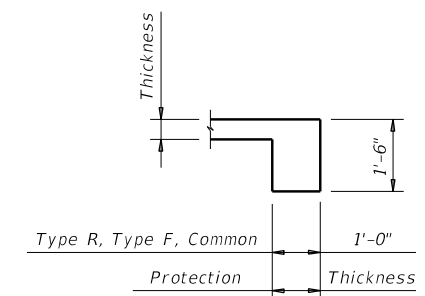
PLAN



ELEVATION

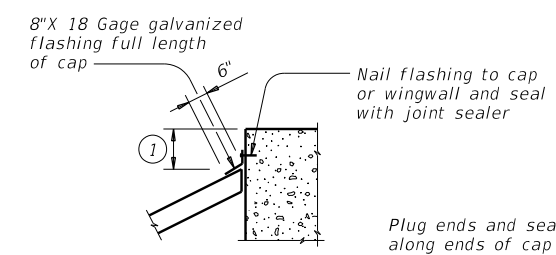


SECTION A-A AT CAP

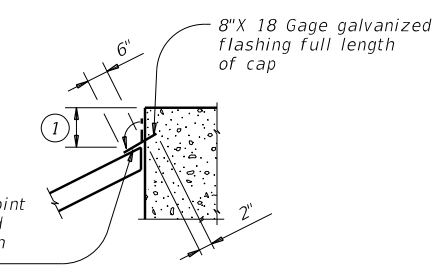


SECTION B-B

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



CAP OPTION A



CAP OPTION B

DETAIL C

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

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

SHEET 1 OF 2

		Bridge Division Standard	
<h2>STONE RIPRAP</h2>			
<h3>SRR</h3>			
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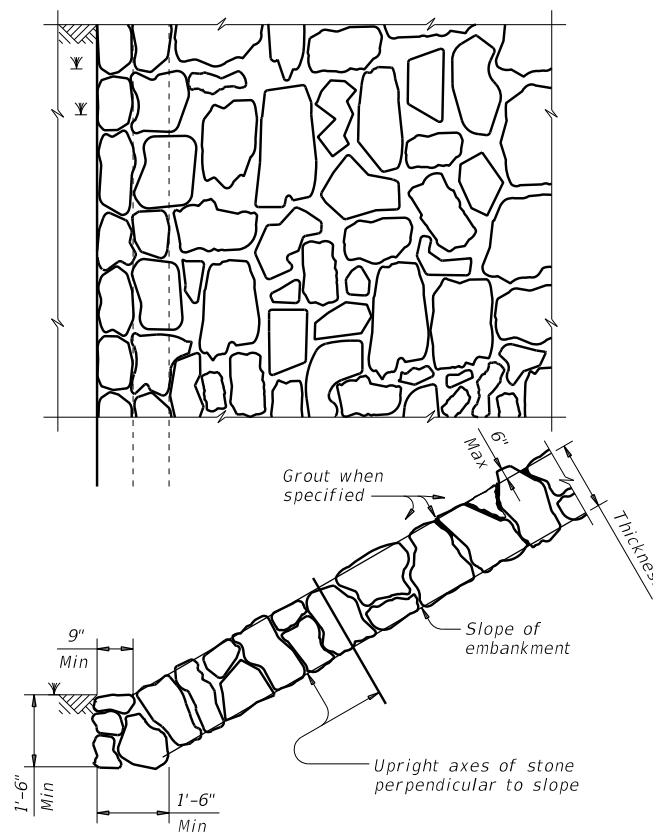


FIGURE 1 ~ TYPE R STONE RIPRAP
dry or grouted

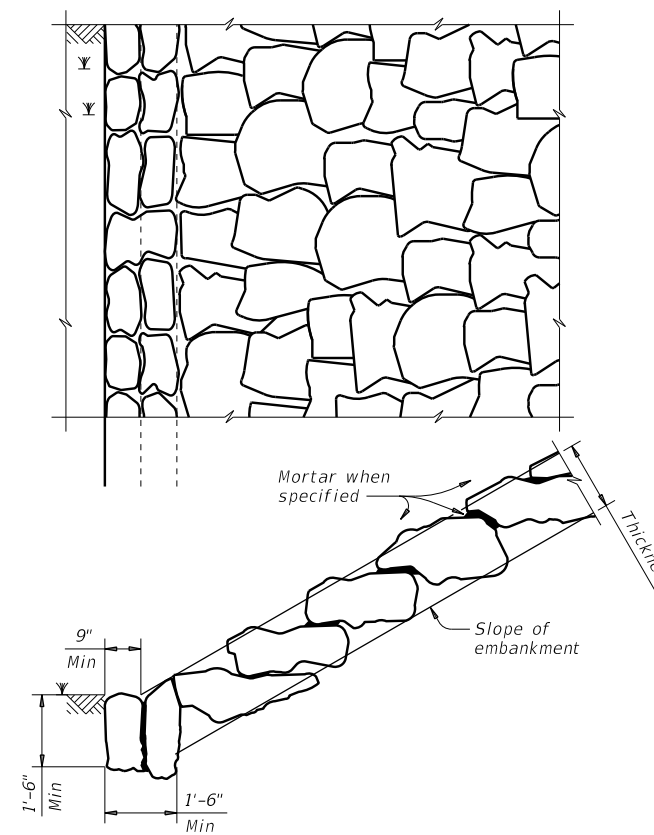


FIGURE 2 ~ TYPE F STONE RIPRAP
dry or mortared

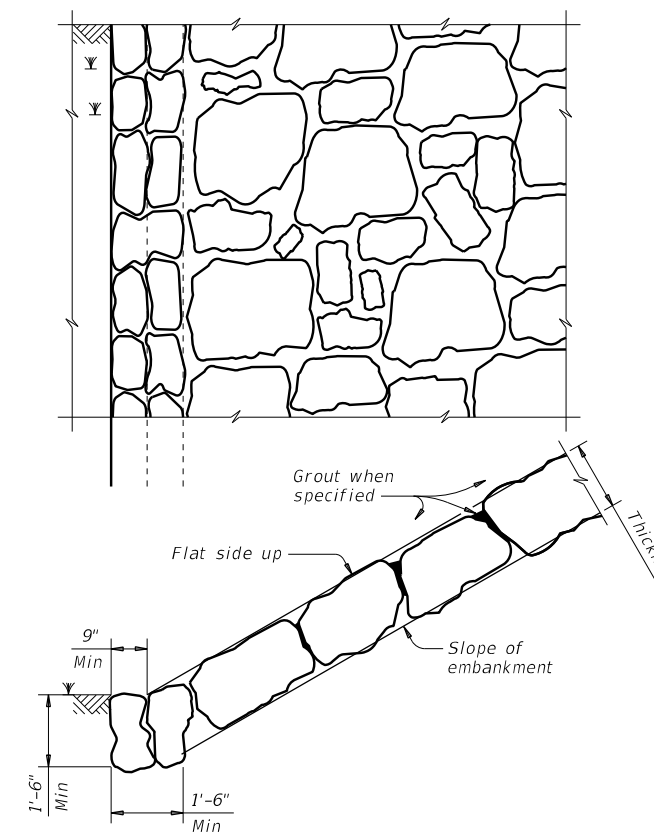


FIGURE 3 ~ TYPE F STONE RIPRAP
grouted

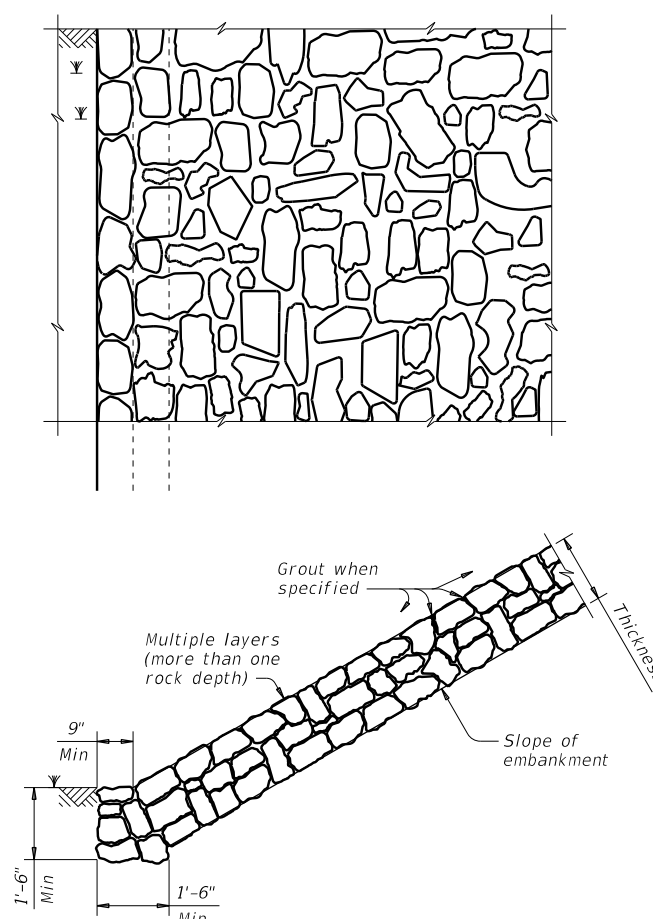


FIGURE 4 ~ COMMON STONE RIPRAP
dry or grouted

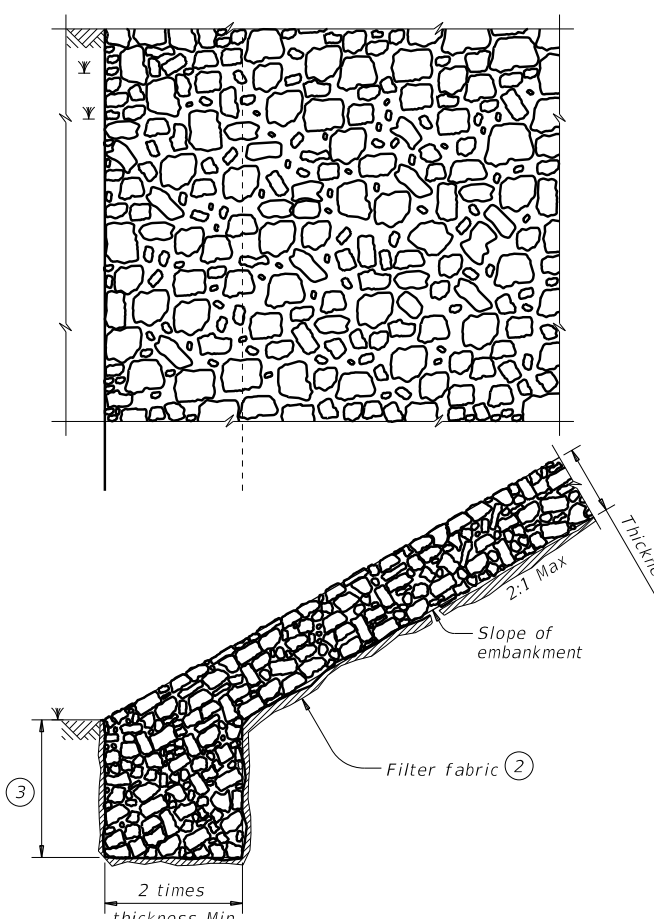
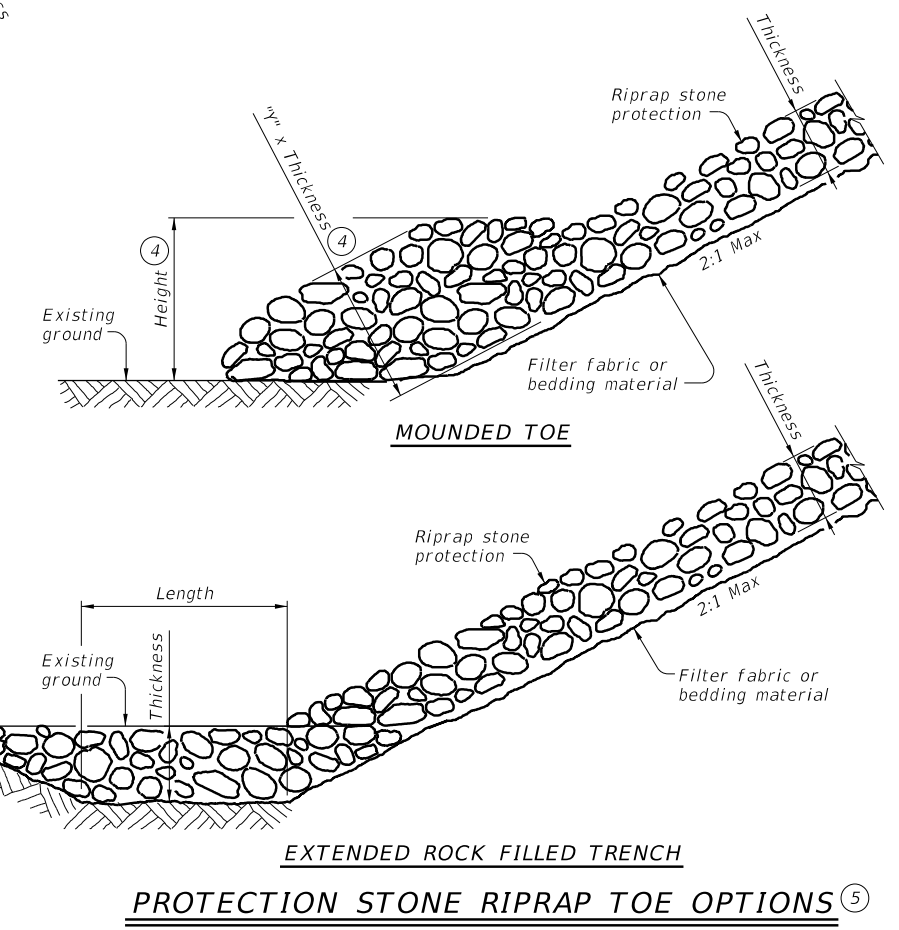


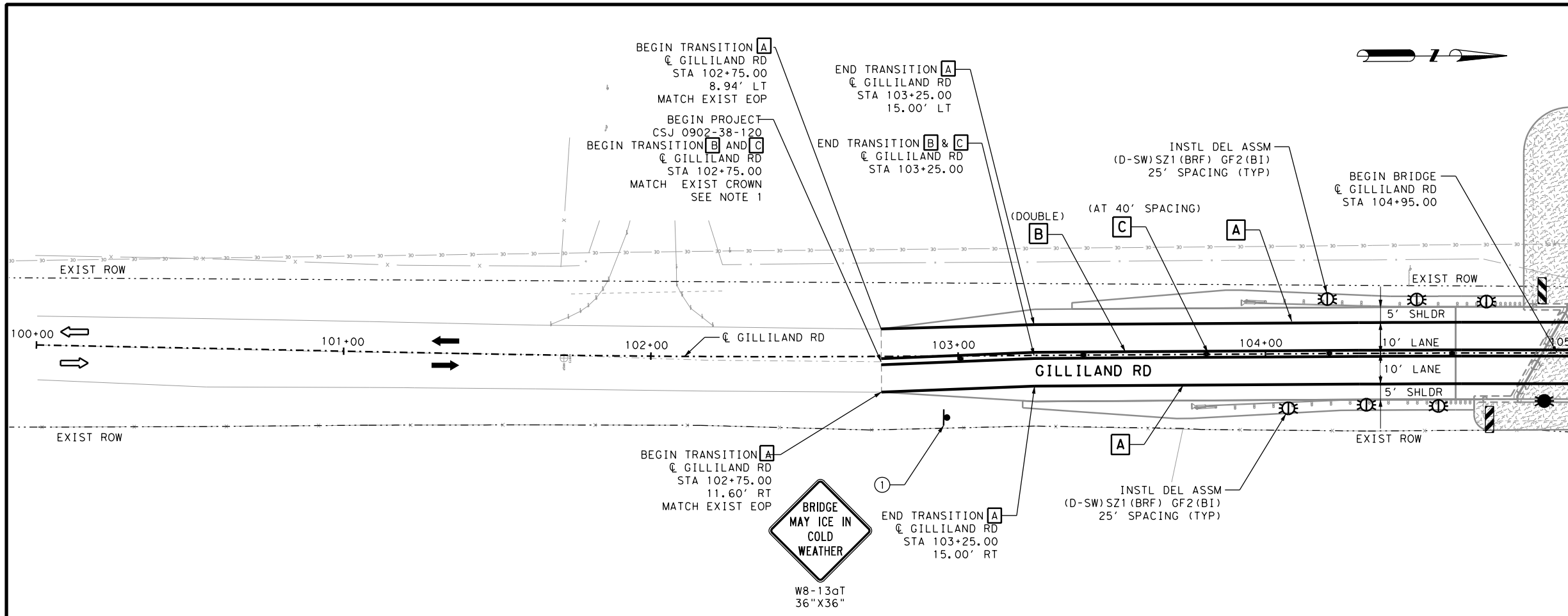
FIGURE 5 ~ PROTECTION STONE RIPRAP 5

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



PROTECTION STONE RIPRAP TOE OPTIONS 5

		Bridge Division Standard	
<h2>STONE RIPRAP</h2>			
<h3>SRR</h3>			
FILE: srrstde1-19.dgn	DN: AES	CK: JGD	DW: BWH
©TxDOT April 2019	CONT SECT	JOB	HIGHWAY
REVISIONS	0902 38	120	GILLILAND RD
	DIST	COUNTY	SHEET NO.
	FTW	PARKER	90

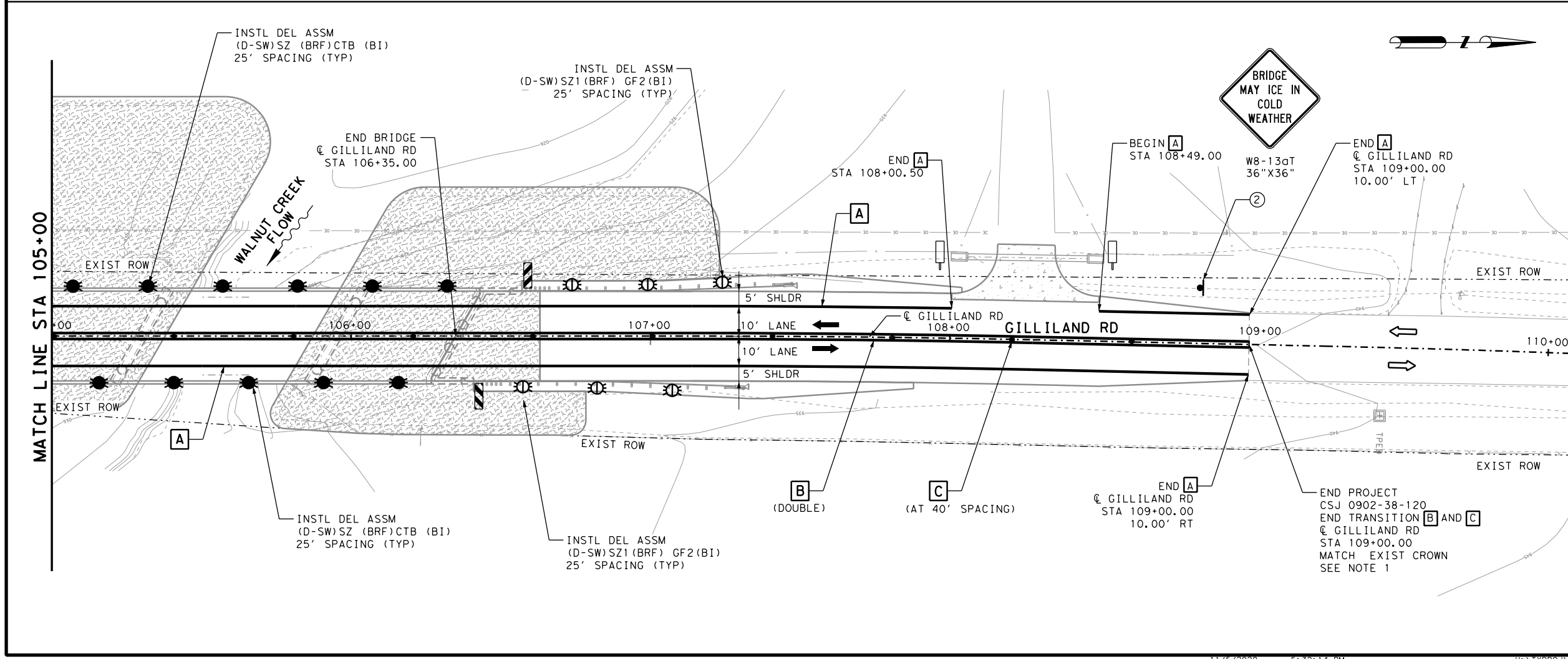


LEGEND

- ➔ PROP TRAFFIC
- ➔ EXIST TRAFFIC
- A RE PM W/RET REQ TY I (W)4" (SLD) (90MIL)
- B RE PM W/RET REQ TY I (Y)4" (SLD) (90MIL)
- C REFL PAV MRKR TY II-A-A
- ➔ PROP SIGN
- ▭ INSTL OM ASSM (OM-2Z) (FLX)GRD
- ▨ INSTL OM ASSM (OM-3R) (FLX)SRF
- ▨ INSTL OM ASSM (OM-3L) (FLX)SRF
- ⊙ INSTL DEL ASSM (D-SW)SZ1 (BRF) GF2(BI)
- ⊙ INSTL DEL ASSM (D-SW)SZ (BRF)CTB (BI)
- ⊕ SIGN NUMBER

NOTES:

- CONTRACTOR WILL END PAVEMENT MARKING TO MATCH EXISTING ROADWAY CROWN AT THE BEGINNING AND END OF THE PROJECT.



0 20' 40'
SCALE: 1" = 40'

STATE OF TEXAS
RICARDO A. PRIETO
91123
LICENSED PROFESSIONAL ENGINEER

11/5/2020

CONSOR
F-12040

2020
Texas Department of Transportation

GILLILAND ROAD AT WALNUT CREEK
SIGNING & PAVEMENT MARKING LAYOUT
BEGIN CSJ TO END CSJ

SHEET 1 OF 1

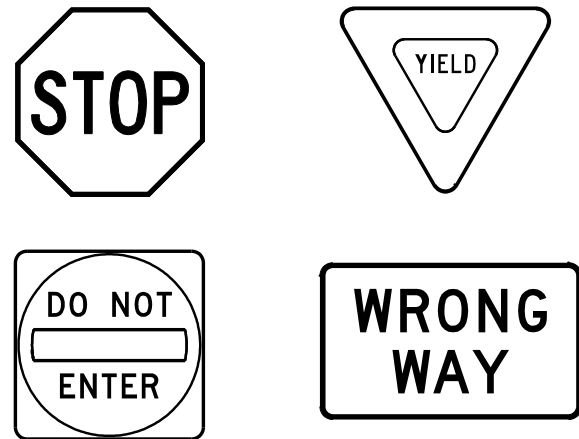
FED RD DIV NO.	FEDERAL AID PROJECT	SHEET NO.	
6	SEE TITLE SHEET	91	
STATE	DISTRICT	COUNTY	
TEXAS	FTW	PARKER	
CONTROL	SECTION	JOB	HIGHWAY
0902	38	120	GILLILAND RD

H:\TXPROJ\TX2495-01\DWG\GN\Signing_Pvmt_Mrk\A_GILLILAND_SPM01.dgn
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11/5/2020

DATE: 11/5/2020 5:32:19 PM
 FILE: H:\TXPROJ\TX2495-01\Drawings\Standards\PAVEMENT MARKING\2_TSR(4)-13.dwg
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REQUIREMENTS FOR RED BACKGROUND REGULATORY SIGNS

(STOP, YIELD, DO NOT ENTER AND WRONG WAY SIGNS)



REQUIREMENTS FOR FOUR SPECIFIC SIGNS ONLY

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

REQUIREMENTS FOR WHITE BACKGROUND REGULATORY SIGNS

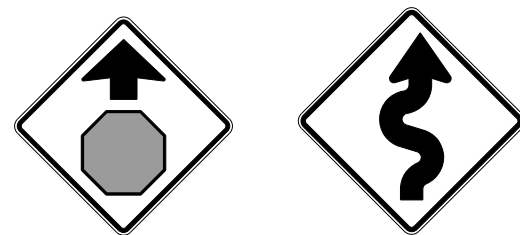
(EXCLUDING STOP, YIELD, DO NOT ENTER AND WRONG WAY SIGNS)



TYPICAL EXAMPLES

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

REQUIREMENTS FOR WARNING SIGNS



TYPICAL EXAMPLES

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

REQUIREMENTS FOR SCHOOL SIGNS



TYPICAL EXAMPLES

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

GENERAL NOTES

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

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

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

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

				<i>Traffic Operations Division Standard</i>	
<h2>TYPICAL SIGN REQUIREMENTS</h2> <h3>TSR(4) - 13</h3>					
FILE:	tsr4-13.dgn	DN:	TxDOT	CK:	TxDOT
© TxDOT	October 2003	CONT	SECT	JOB	HIGHWAY
REVISIONS		0902	38	120	GILLILAND RD
12-03	7-13	DIST	COUNTY	SHEET NO.	
9-08		FTW	PARKER	92	

DATE: 11/5/2020 5:32:21 PM
 FILE: H:\TXPROJ\TX2495-01\DWG\DGN\Standards\PAVEMENT MARKING\4 D&OM(1)-15.dgn
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REFLECTOR UNIT SIZES FOR DELINEATORS AND OBJECT MARKERS				DELINEATORS				D & OM DESCRIPTIVE CODES		
DEVICE	SIZE 1	SIZE 2	SIZE 3	SIZE 4	SINGLE		DOUBLE			
SHEETING	Yellow, White or Red Type B or C reflective sheeting				Yellow, White or Red Type B or C Reflective Sheeting				INSTL DEL ASSM (D-XX)SZ X (XXX)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 FLX = 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	
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.				POST TYPE	WC	FLX	WC		FLX
					MOUNT TYPE	GND	GND, SRF	GND		GND, SRF

OBJECT MARKERS								
DEVICE	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
SHEETING	Yellow-Type B _{FL} or C _{FL} Sheeting		Yellow - Type B or C Sheeting			Alternating acrylic black and retroreflective yellow - Type B _{FL} or C _{FL} Sheeting		Red -Type B _{FL} or C _{FL} Sheeting
POST TYPE	TWT		WC	WC	FLX	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)			CHEVRONS				ONE DIRECTION LARGE ARROW						
DEVICE	GF1	GF2	CTB	W1-8				W1-6					
SHEETING	Yellow, White, Red			18" x 24" (Conventional)				24" x 30" (Conventional Oversize)	30" x 36" (Expressway)	36" x 48" (Freeway)	48" x 24" (Conventional)	60" x 30" (Expressway & Freeway)	
NOTE	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.			MOUNTING HEIGHT				4'-0" or 7'-0"	7'-0" Only	MOUNTING HEIGHT			7'-0"
				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. The Texas version of the ONE DIRECTION LARGE ARROW sign (W1-9T) may be used instead of the ONE DIRECTIONAL LARGE ARROW (W1-6).					

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

Traffic Operations Division Standard

DELINEATOR & OBJECT MARKER MATERIAL DESCRIPTION

D & OM(1)-15

FILE: dcm1-15.dgn	DN: TXDOT	CK: TXDOT	DN: TXDOT	CK: TXDOT
© TXDOT August 2004	CONT	SECT	JOB	HIGHWAY
REVISIONS	0902	38	120	GILLILAND RD
10-09 3-15	DIST	COUNTY	SHEET NO.	
4-10	FTW	PARKER	93	

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 FILE: H:\TXPROJ\TX2495-01\DWG\Standards\PAVEMENT MARKING\5 D&OM(2)-15.dwg

POST TYPE AND SUPPORT FOUNDATION DETAILS

TYPE OF BARRIER MOUNTS

WING CHANNEL (WC)

FLEXIBLE POSTS (FLX)

WEDGE ANCHOR SYSTEMS

GUARD FENCE ATTACHMENT

GND

GND

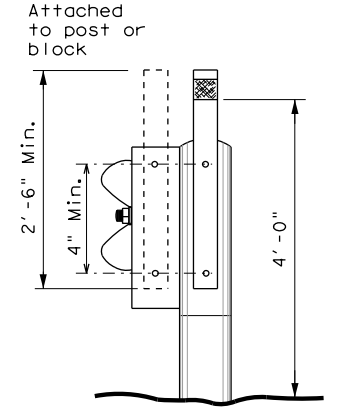
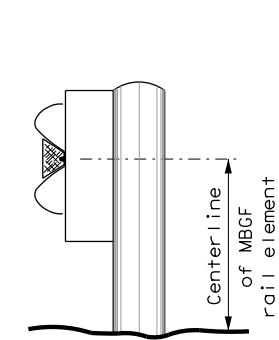
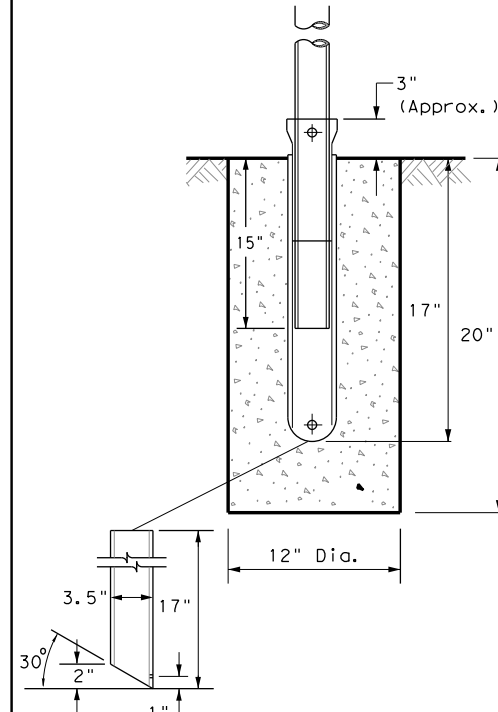
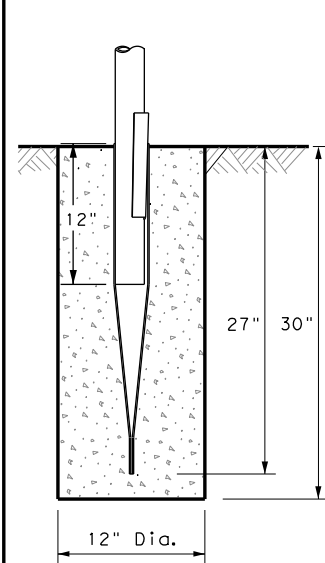
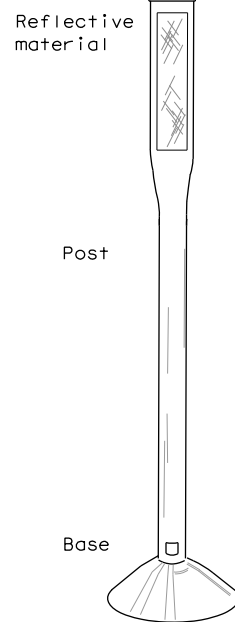
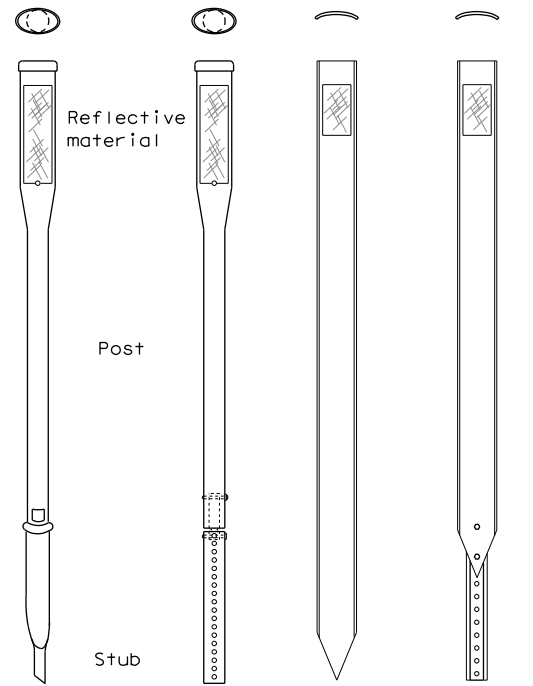
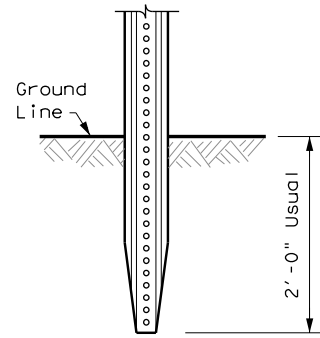
SRF

WAS

WAP

GF 1

GF 2



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.

EMBEDDED **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.

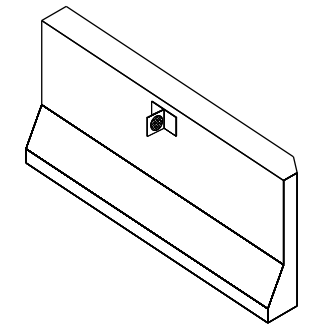
STEEL **PLASTIC**

NOTE

1. Install per manufacturer's recommendations.

CONCRETE BARRIER / BRIDGE RAIL

CTB



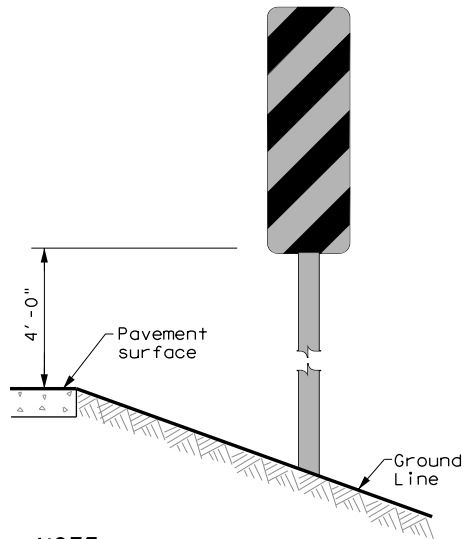
TYPES 1,3, AND 4 OBJECT MARKERS AND CHEVRONS

CHEVRONS AND ONE DIRECTION LARGE ARROW SIGN

DELINEATORS AND TYPE 2 OBJECT MARKERS

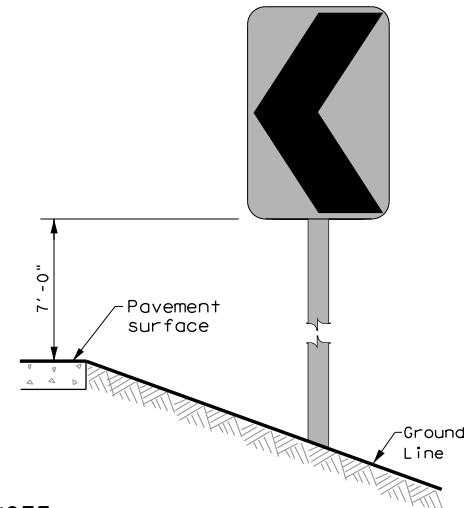
GENERAL NOTES

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.



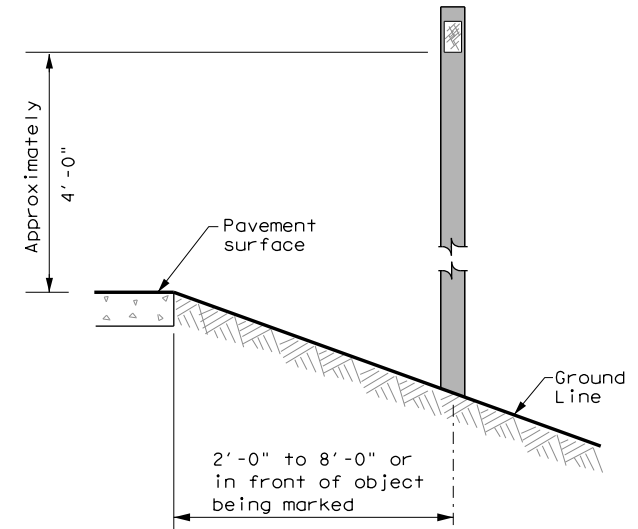
NOTE

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)



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 DIRECTIONAL LARGE ARROW sign (W1-9T) shall be installed per SMD standard sheets and paid under item 644.



See general notes 1, 2 and 3.



DELINEATOR & OBJECT MARKER INSTALLATION

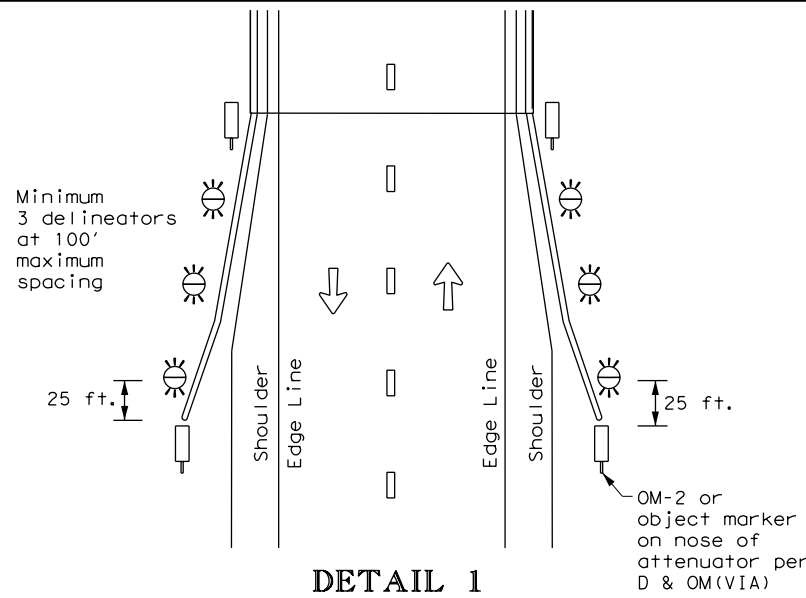
D & OM(2)-15

FILE: dcm2-15.dgn	DN: TxDOT	CK: TxDOT	DW: TxDOT	CK: TxDOT
© TxDOT August 2004	CONT	SECT	JOB	HIGHWAY
REVISIONS	0902	38	120	GILLILAND RD
10-09 3-15	DIST	COUNTY	SHEET NO.	
4-10	FTW	PARKER	94	

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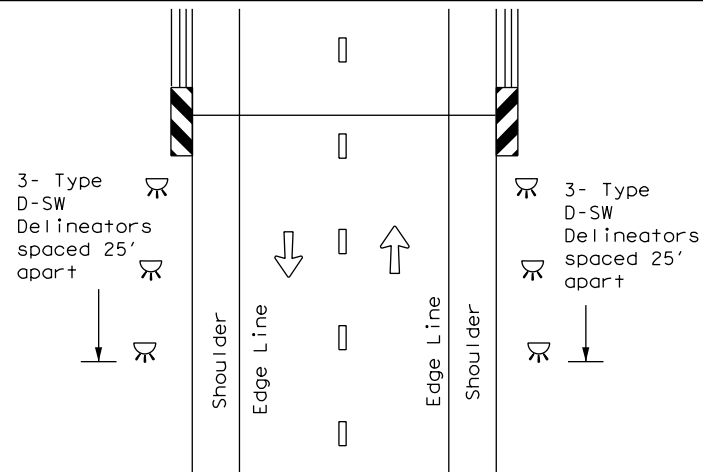
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TWO-WAY, TWO LANE ROADWAY WITH REDUCED WIDTH APPROACH



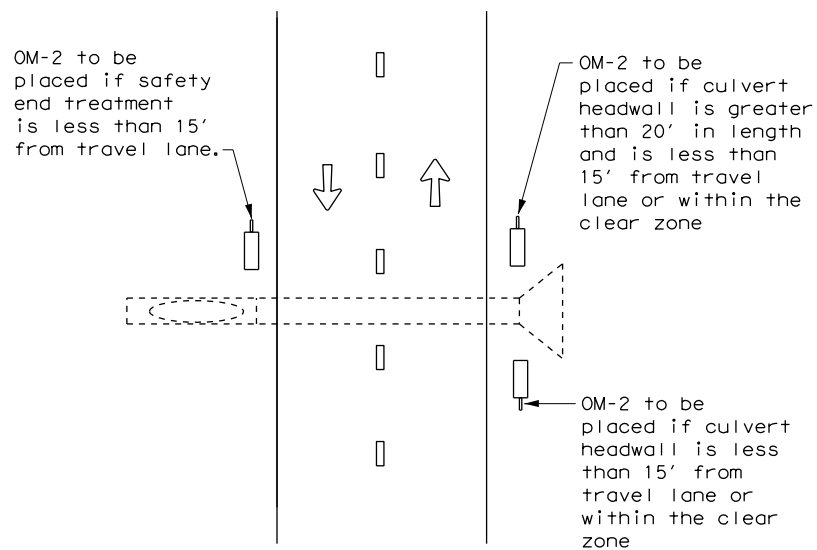
DETAIL 1

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



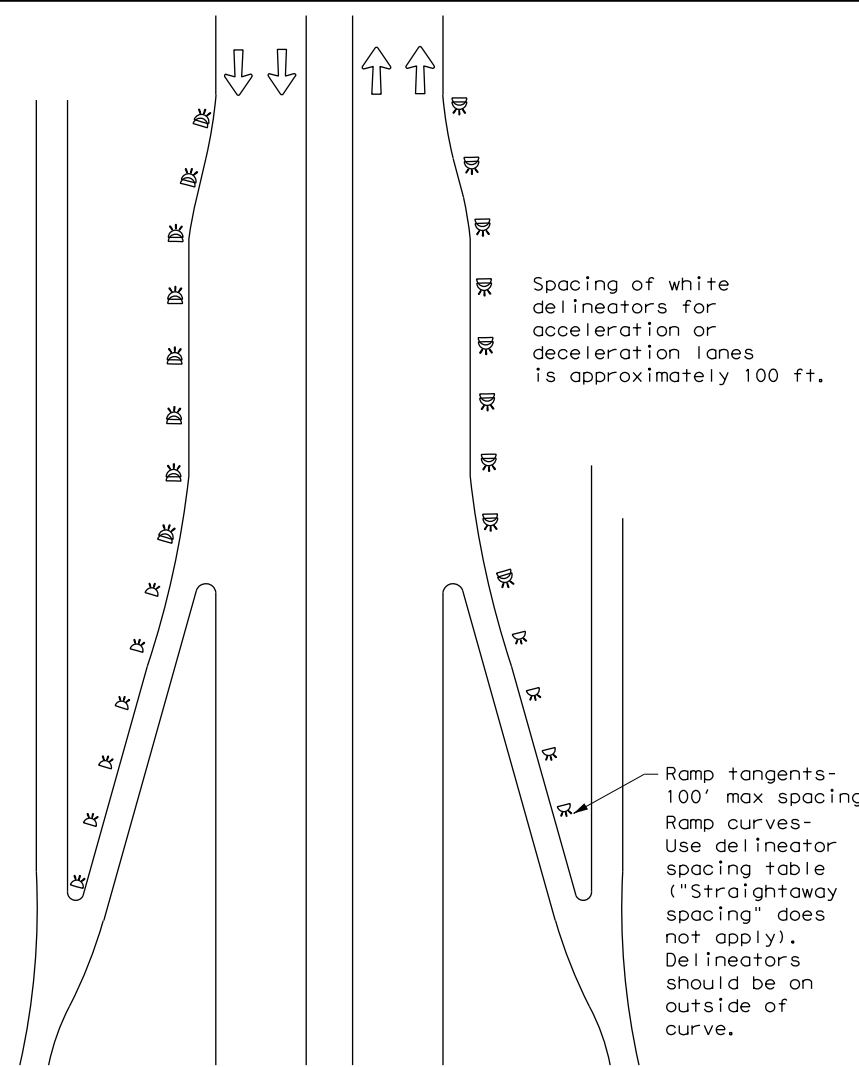
DETAIL 2

FOR CULVERTS WITHOUT MBGF



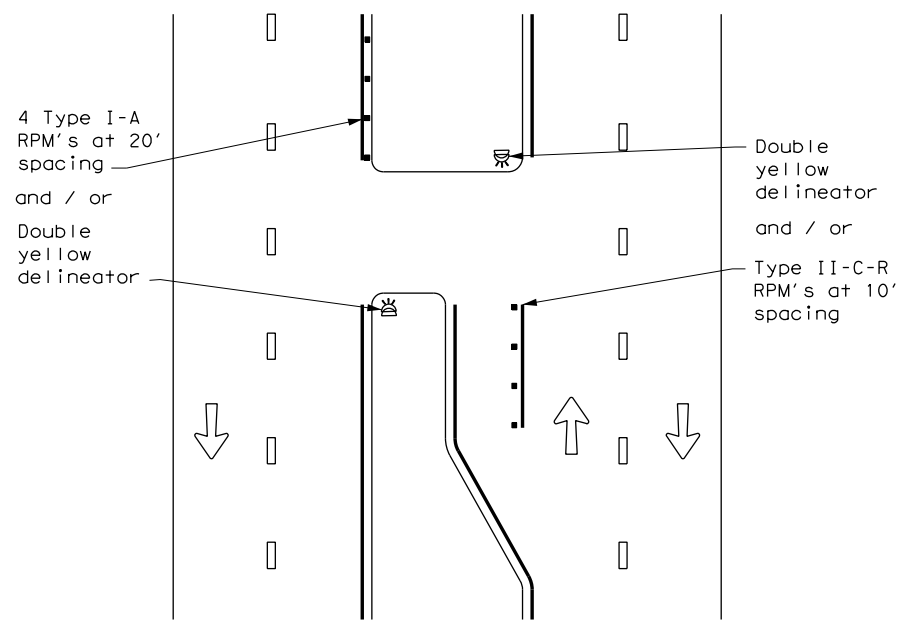
DETAIL 3

FREEWAY DELINEATION FOR RAMPS AND ACCELERATION/DECELERATION LANES



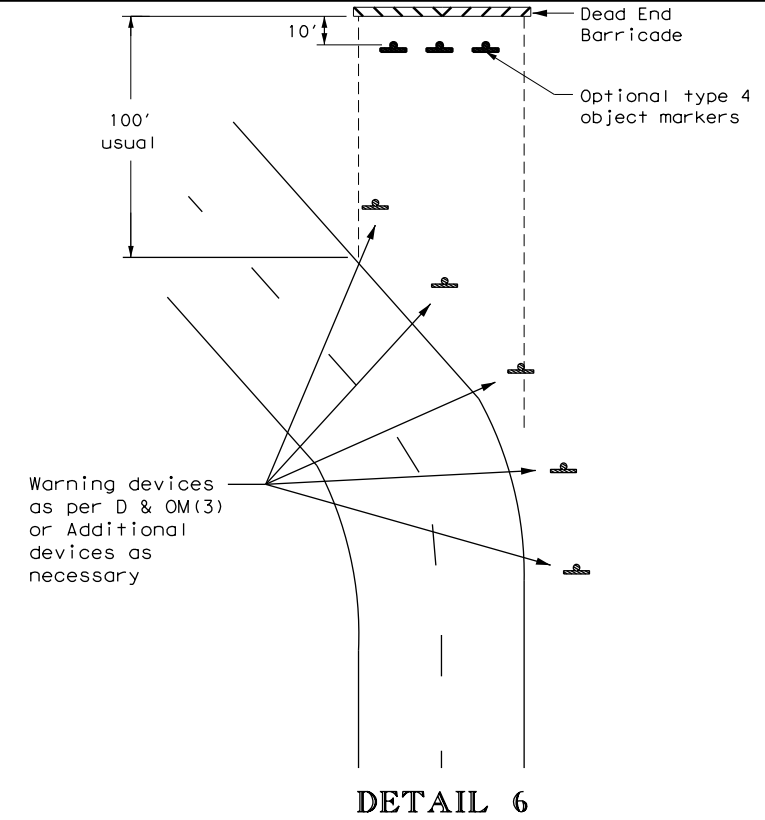
DETAIL 4

CROSSOVERS



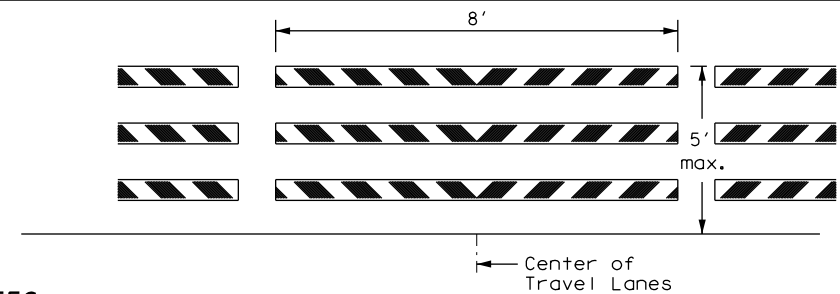
DETAIL 5

TYPICAL APPLICATION OF DEAD END BARRICADE



DETAIL 6

TYPICAL DEAD END BARRICADE INSTALLATION



NOTES

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

DETAIL 7

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

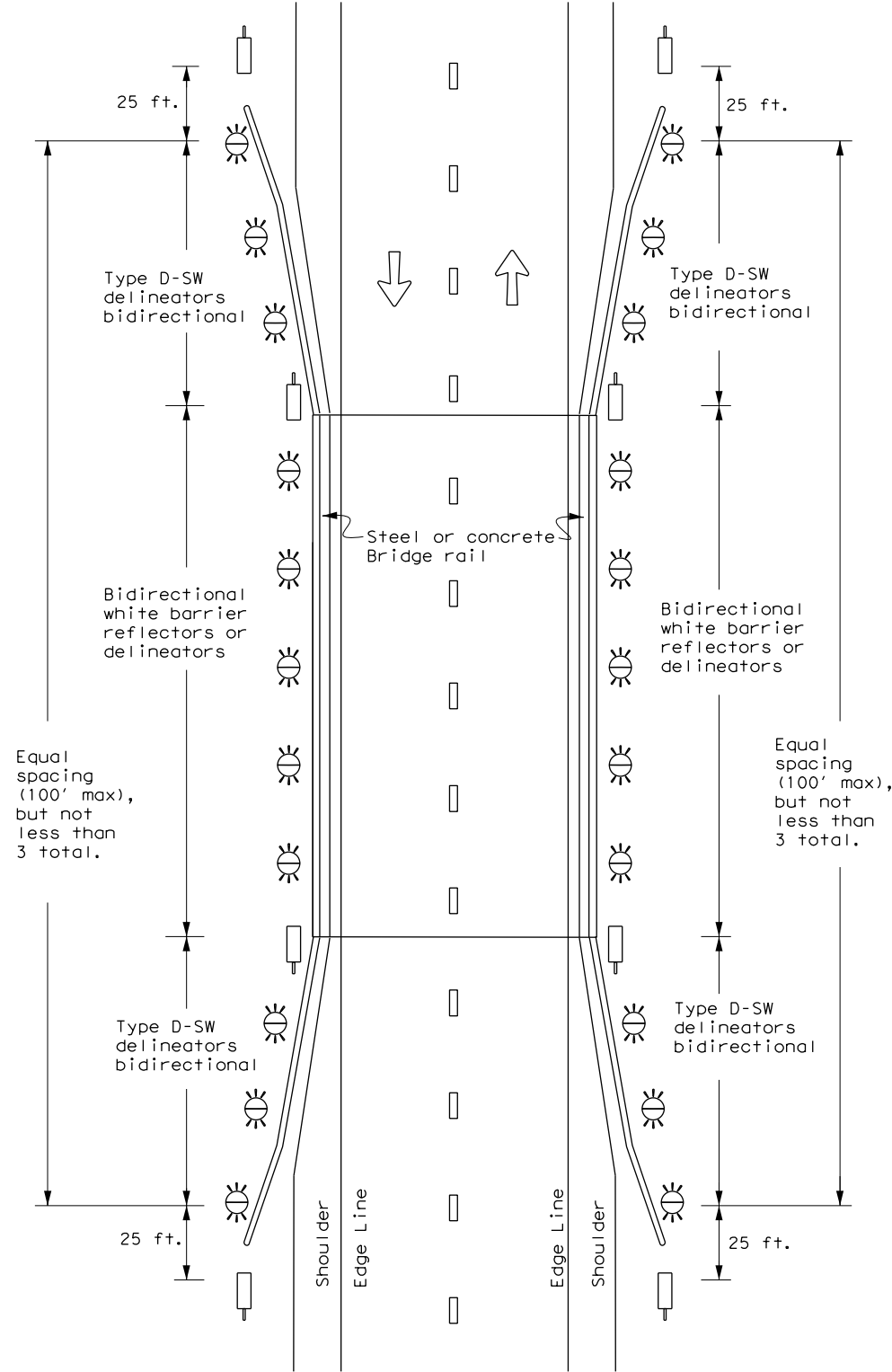


DELINEATOR & OBJECT MARKER PLACEMENT DETAILS

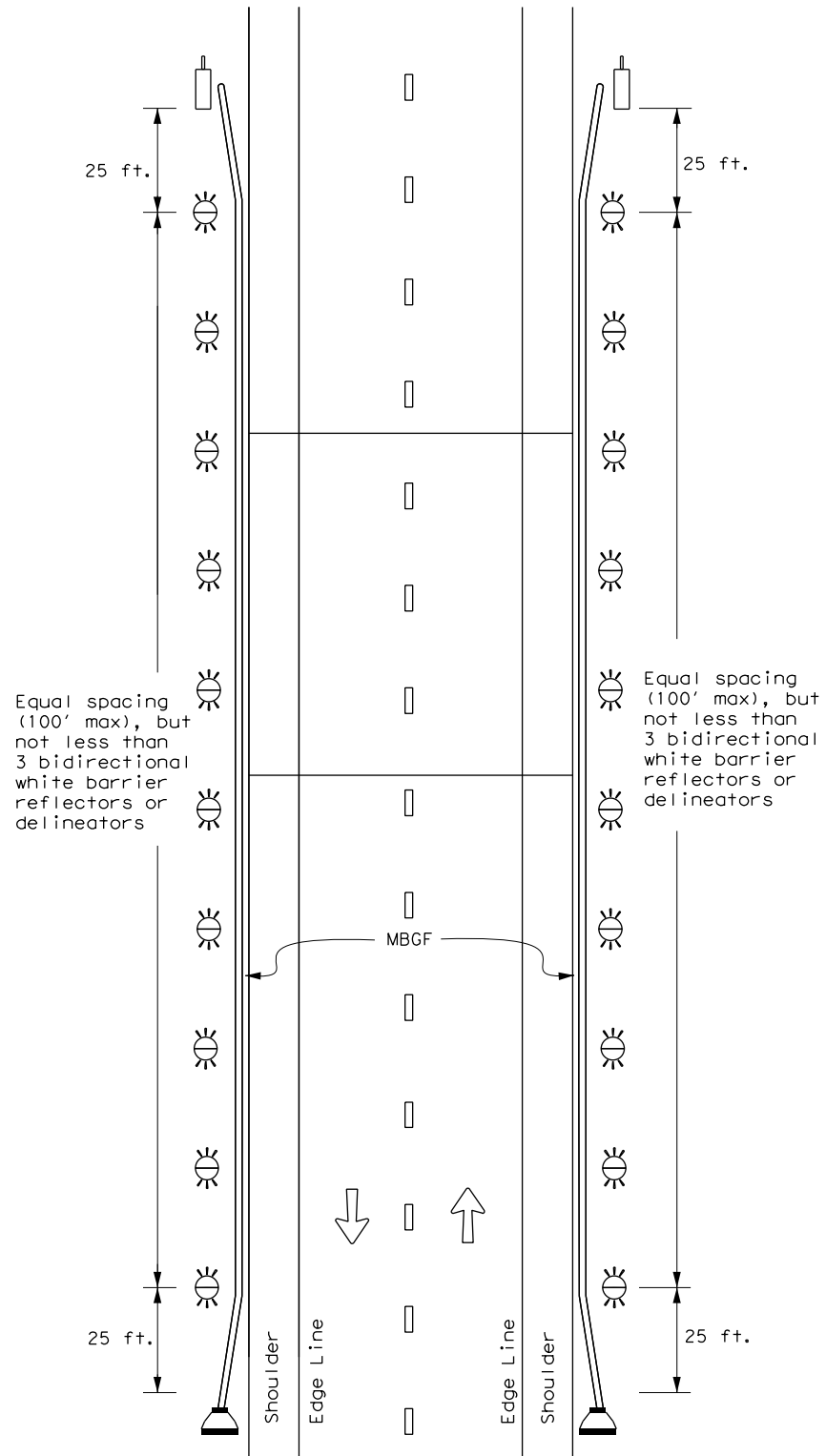
D & OM(4)-15

FILE: dom4-15.dgn	DN: TXDOT	CK: TXDOT	DN: TXDOT	CK: TXDOT
© TXDOT August 2004	CONT	SECT	JOB	HIGHWAY
3-15	0902	38	120	GILLILAND RD
	DIST	COUNTY	SHEET NO.	
	FTW	PARKER	95	

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

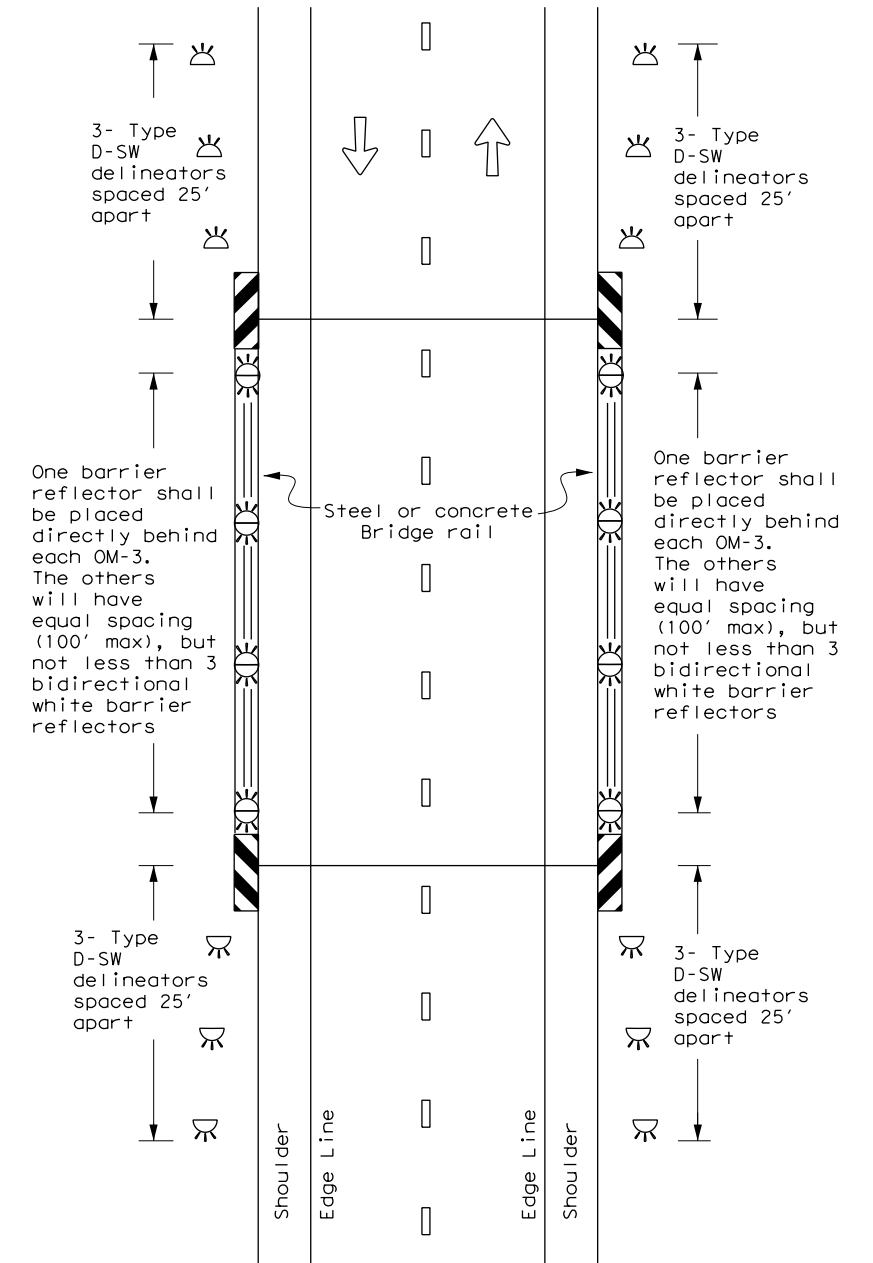


**TWO-WAY, TWO LANE ROADWAY
WITH METAL BEAM GUARD FENCE (MBGF)**



NOTE:
If terminal ends include an object marker, there is no need to install an OM-2 in front of terminal.

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



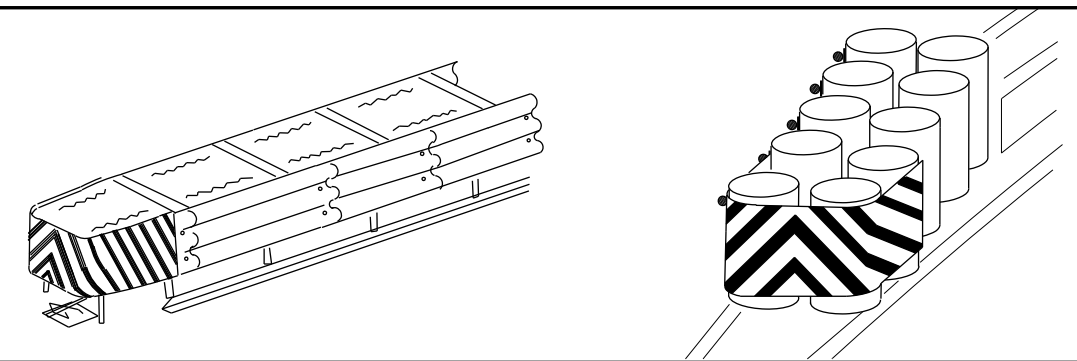
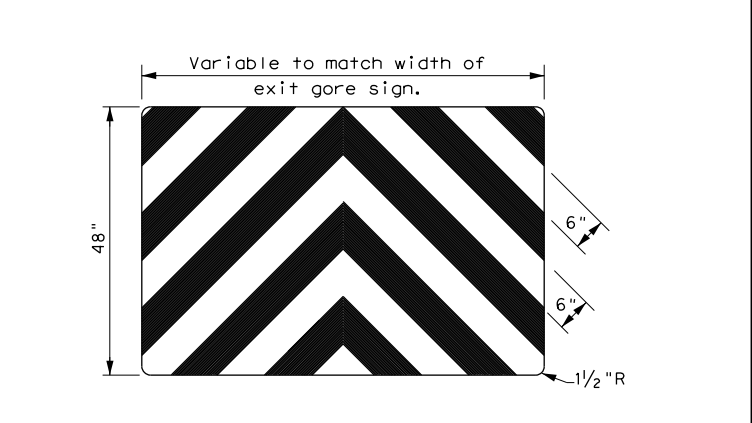
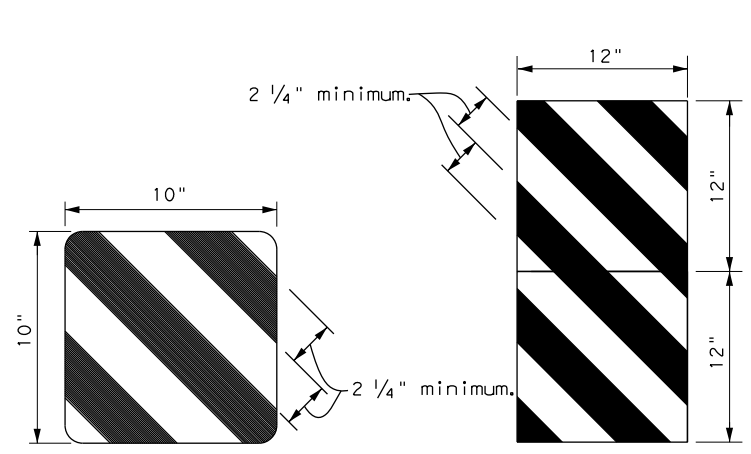
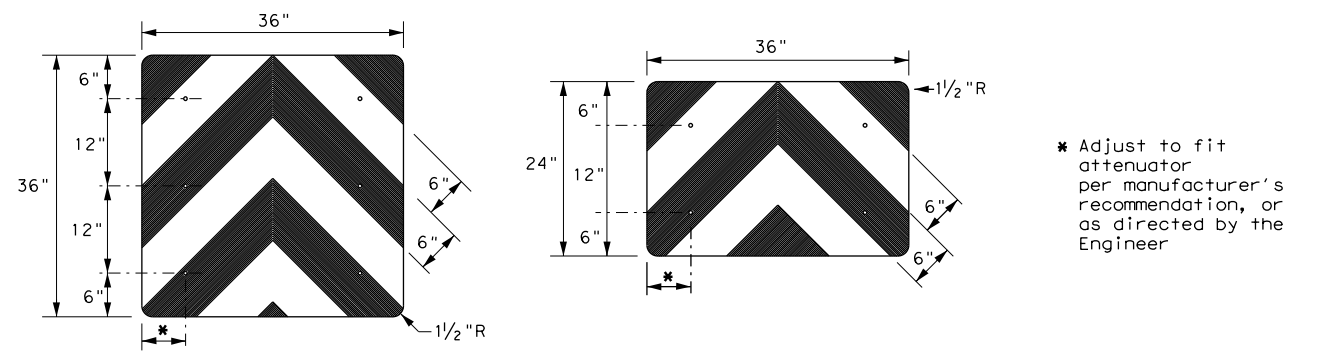
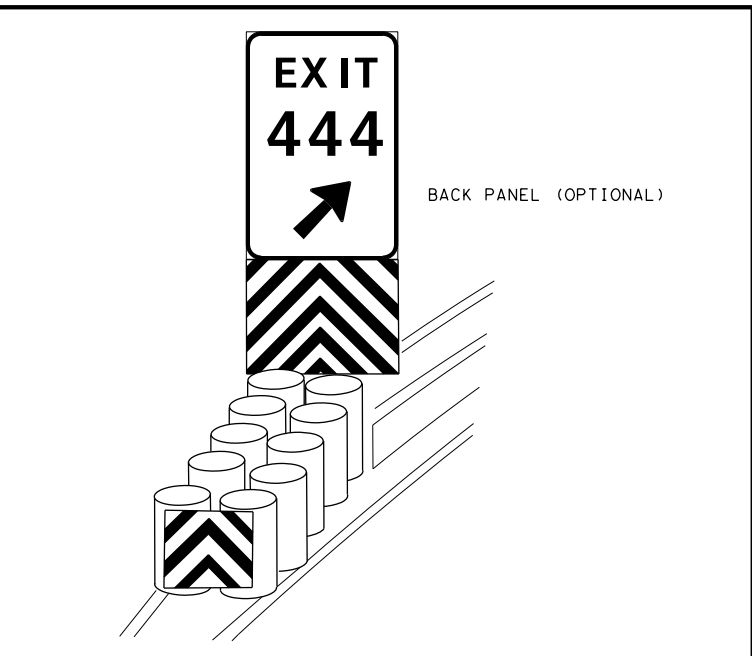
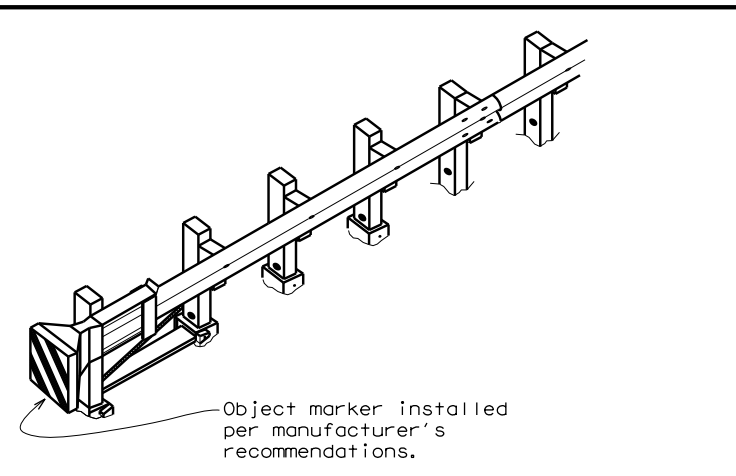
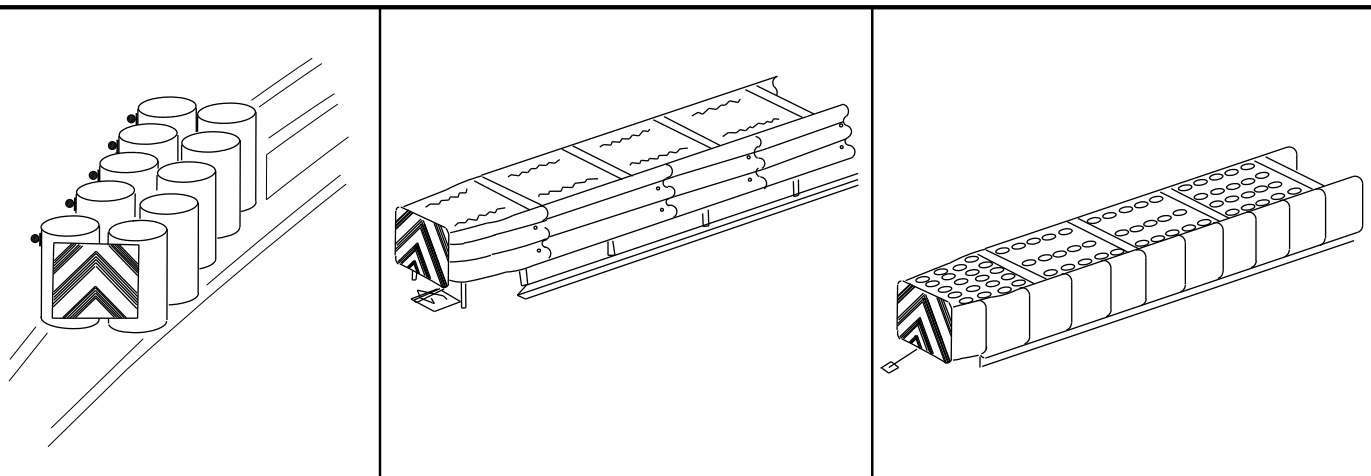
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LEGEND		Texas Department of Transportation		Traffic Operations Division Standard			
	Bidirectional Delineator	DELINEATOR & OBJECT MARKER PLACEMENT DETAILS D & OM(5) - 15					
	Delineator						
	OM-3						
	OM-2						
	Terminal End						
	TRAFFIC FLOW	FILE: dom5-15.dgn	DN: TxDOT	CK: TxDOT	DW: TxDOT	CK: TxDOT	
		© TxDOT August 2015		CON: 0902	SECT: 38	JOB: 120	HIGHWAY: GILLILAND RD
		REVISIONS		DIST: FTW	COUNTY: PARKER	SHEET NO. 96	

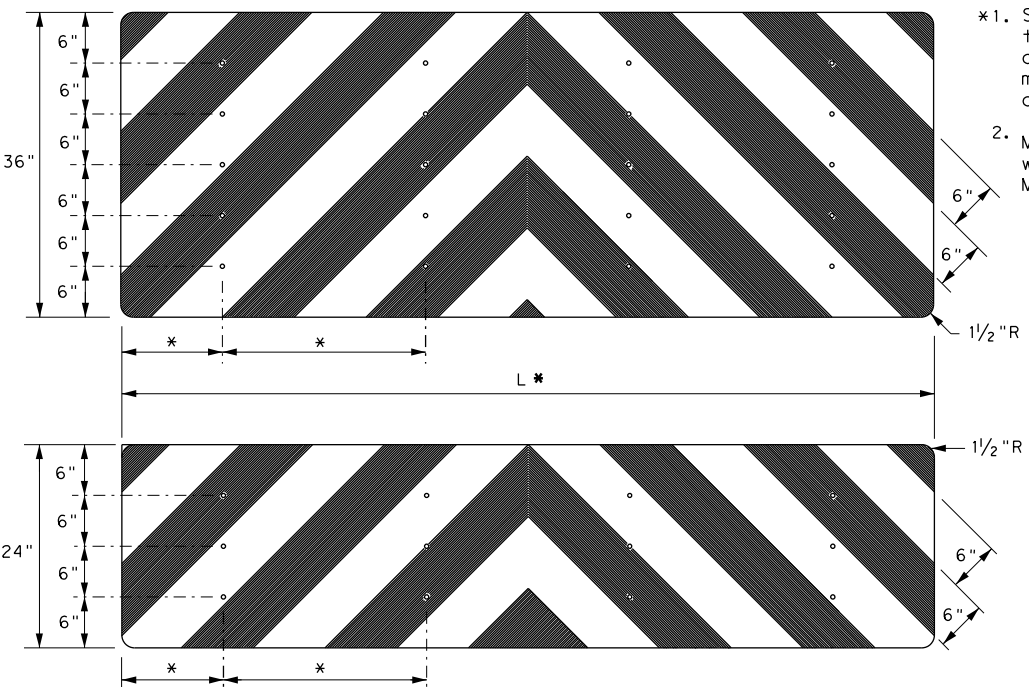
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DATE: 11/5/2020 5:32:30 PM
 FILE: H:\TXPROJ\TX2495-01\Drawings\Standards\PAVEMENT MARKING\7 D&OM(VIA)-15.dwg



OBJECT MARKERS SMALLER THAN 3 FT²

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



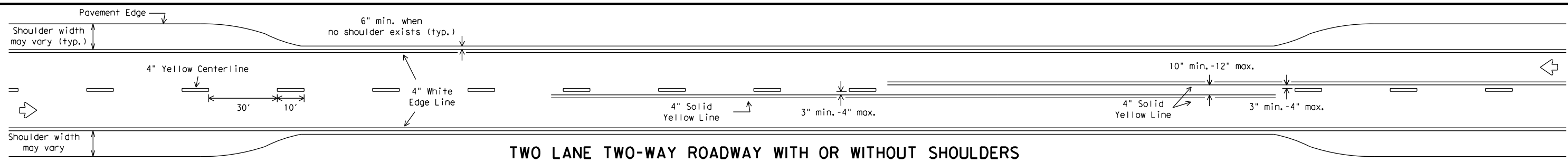
NOTES

1. Object Markers shall conform to the Texas MUTCD and meet the color and reflectivity requirement of Department Material Specification DMS 8300. Background shall be yellow reflective sheeting (Type B or C) and Chevron shall be black.
2. Object Markers may be fabricated from adhesive backed reflective sheeting applied directly to guardrail end treatment, or applied directly to an "end cap" as per the manufacturer's recommendation. Direct applied sheeting shall provide a smooth surface and have no wrinkles, air bubbles, cuts or tears. A radius at the corners is not required for direct applied sheeting.
3. Object Marker size may be reduced to fit smaller devices. Width of alternating black and yellow stripes are typically 6". Object Markers smaller than 3ft may have reduced width stripes of a minimum of 2 1/4".
4. Pop rivets, screws, or nuts and bolts may be used to attach object markers and reflectors. Holes, slots or other openings may be cut or drilled through object markers to allow cable or other attachments.
5. Object Marker at nose of attenuator is subsidiary to the attenuator.
6. See D & OM (1-4) for required barrier reflectors.

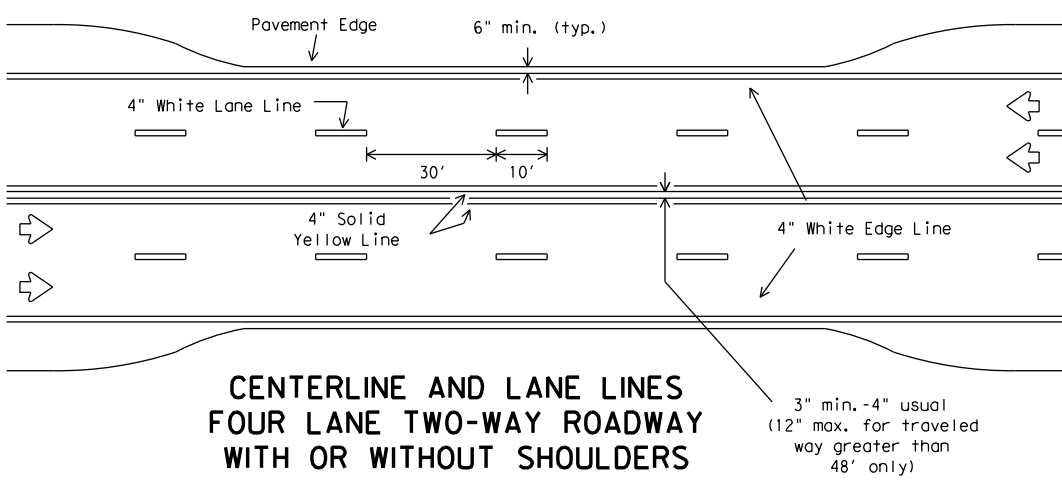
<p>DELINEATOR & OBJECT MARKER FOR VEHICLE IMPACT ATTENUATORS</p> <p>D & OM(VIA)-15</p>			
FILE: domv15.dgn	DN: TxDOT	CK: TxDOT	OW: TxDOT
© TxDOT December 1989	CONT	SECT	JOB
REVISIONS		120	GILLILAND RD
4-92 8-04	DIST	COUNTY	SHEET NO.
8-95 3-15	FTW	PARKER	97
4-98			
20E			

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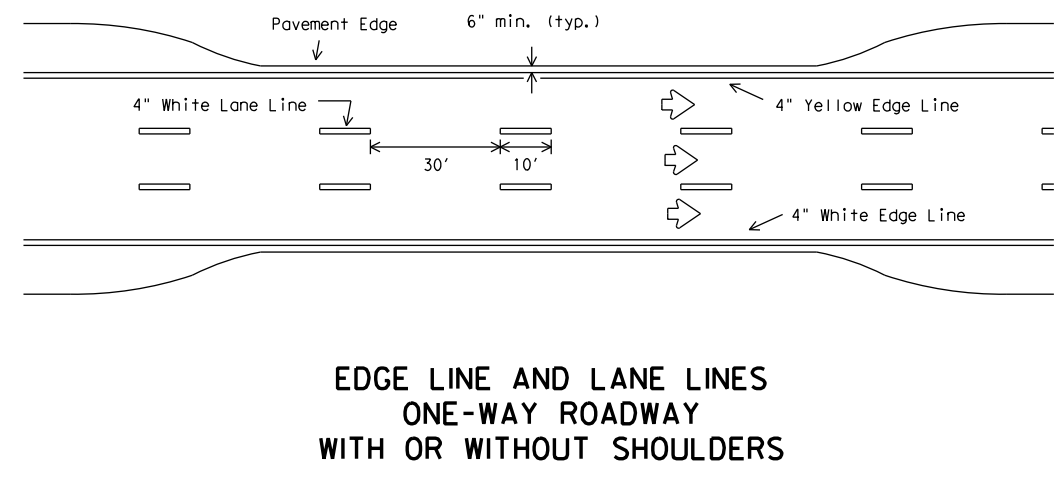
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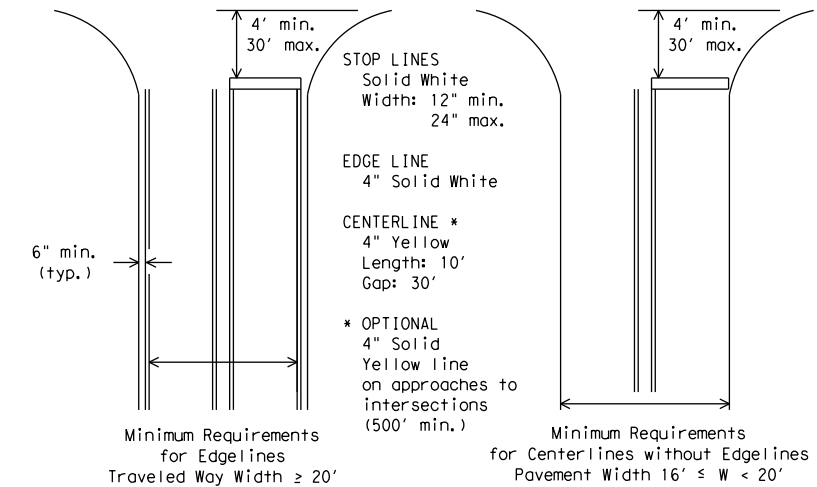
TWO LANE TWO-WAY ROADWAY WITH OR WITHOUT SHOULDERS



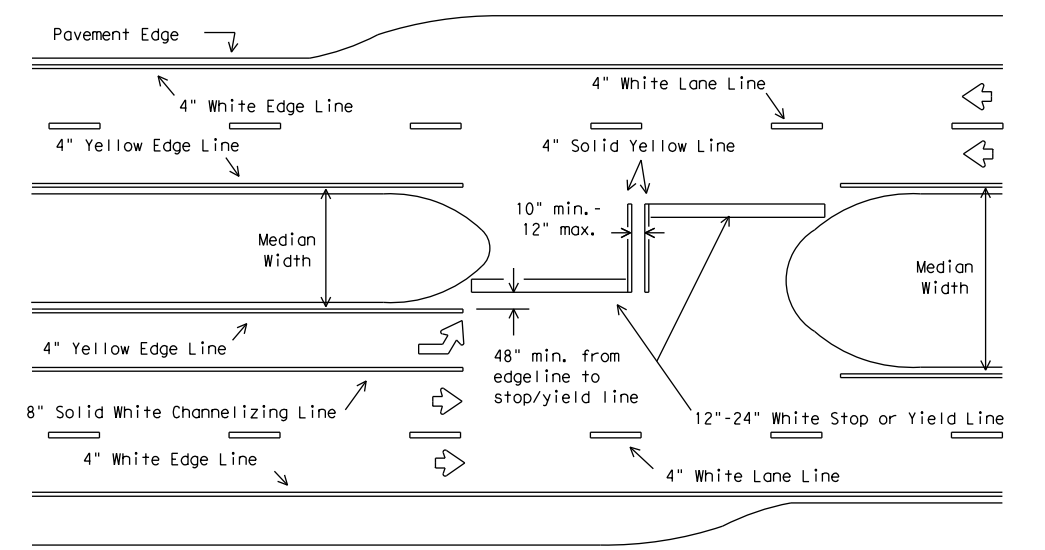
**CENTERLINE AND LANE LINES
 FOUR LANE TWO-WAY ROADWAY
 WITH OR WITHOUT SHOULDERS**



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

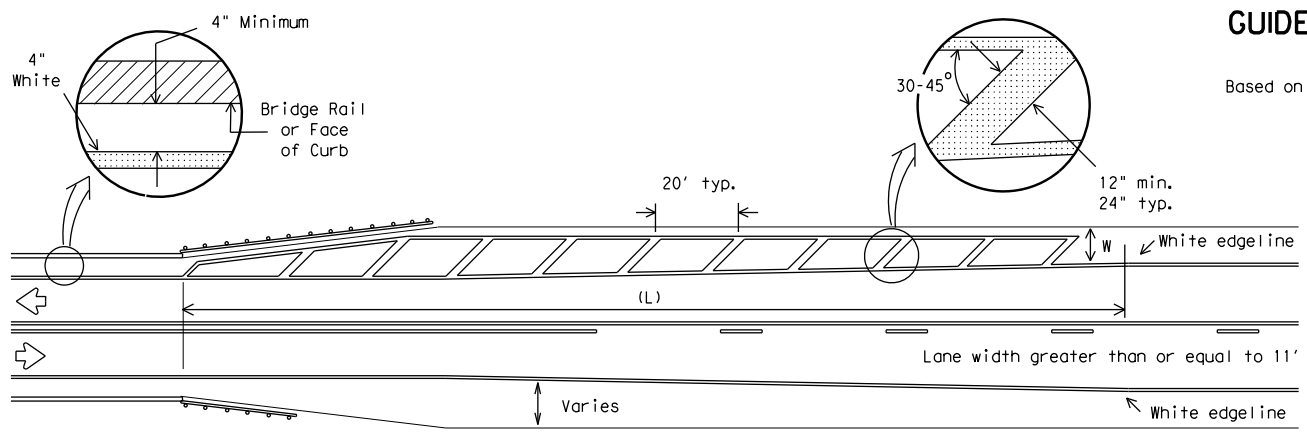


**GUIDE FOR PLACEMENT OF STOP LINES,
 EDGE LINE & CENTERLINE**
 Based on Traveled Way and Pavement Widths for Undivided Highways



All medians shall be field measured to determine the location of necessary striping. Stop/Yield bars and centerlines shall be placed when the median width is greater than 30 ft. The median width is defined as the area between two roadways of a divided highway measured from edge of traveled way to edge of traveled way. The median excludes turn lanes. The median width might be different between intersections, interchanges and of opposite approaches of the same intersection. The narrow median width will be the controlling width to determine if markings are required.

FOUR LANE DIVIDED ROADWAY INTERSECTIONS



NOTES:

1. No-passing zone on bridge approach is optional but if used, it shall be a minimum 500 feet long.
2. For crosshatching length (L) see Table 1.
3. The width of the offset (W) and the required crosshatching width is the full shoulder width in advance of the bridge.
4. The crosshatching is not required if delineators or barrier reflectors are used along the structure.
5. For guard fence details, refer elsewhere in the plans.

**ROADWAYS WITH REDUCED SHOULDER
 WIDTHS ACROSS BRIDGE OR CULVERT**

TABLE 1 - TYPICAL LENGTH (L)

Posted Speed *	Formula
≤ 40	$L = \frac{WS^2}{60}$
≥ 45	$L = WS$

* 85th Percentile Speed may be used on roads where traffic speeds normally exceed the posted speed limit. Crosshatching length should be rounded up to nearest 5 foot increment.
 L=Length of Crosshatching (FT.) W=Width of Offset (FT.)
 S=Posted Speed (MPH)

EXAMPLES:

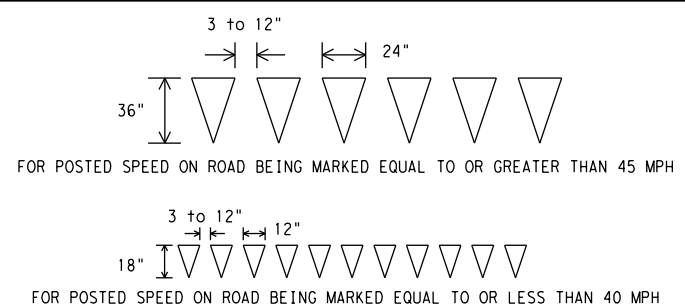
An 8 foot shoulder in advance of a bridge reduces to 4 feet on a 70 MPH roadway. The length of the cross-hatching should be:
 $L = 8 \times 70 = 560$ ft.
 A 4 foot shoulder in advance of a bridge reduces to 2 feet on a 40 MPH roadway. The length of the cross-hatching should be:
 $L = 4(40)^2 / 60 = 106.67$ ft. rounded to 110 ft.

GENERAL NOTES

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

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

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



YIELD LINES

Texas Department of Transportation
 Traffic Operations Division

**TYPICAL STANDARD
 PAVEMENT MARKINGS**

PM(1)-12

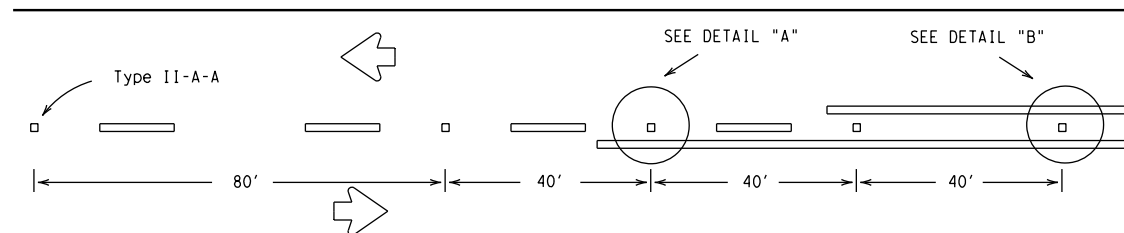
© TxDOT November 1978		DN: TxDOT	CK: TxDOT	DW: TxDOT	CK: TxDOT
REVISONS					
8-95	2-12	CONT	SECT	JOB	HIGHWAY
5-00		0902	38	120	GILLILAND RD
8-00		DIST	COUNTY		SHEET NO.
3-03		FTW	PARKER		98
22A					

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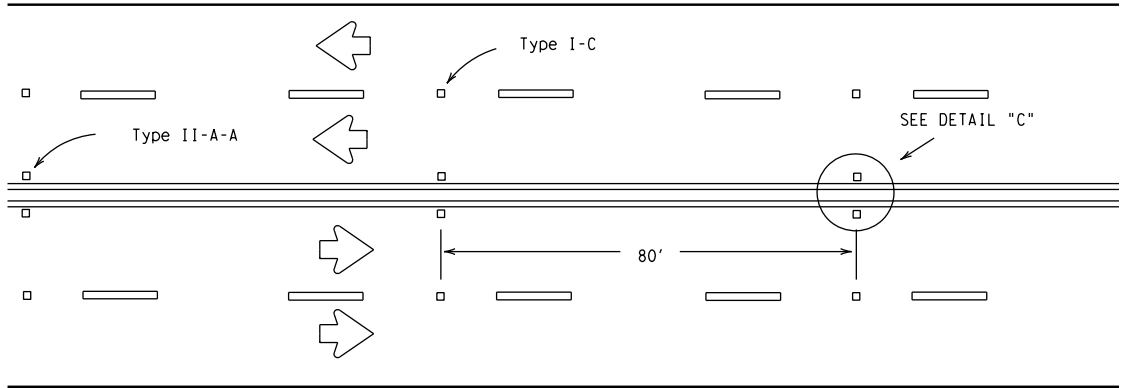
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REFLECTIVE RAISED PAVEMENT MARKERS FOR VEHICLE POSITIONING GUIDANCE

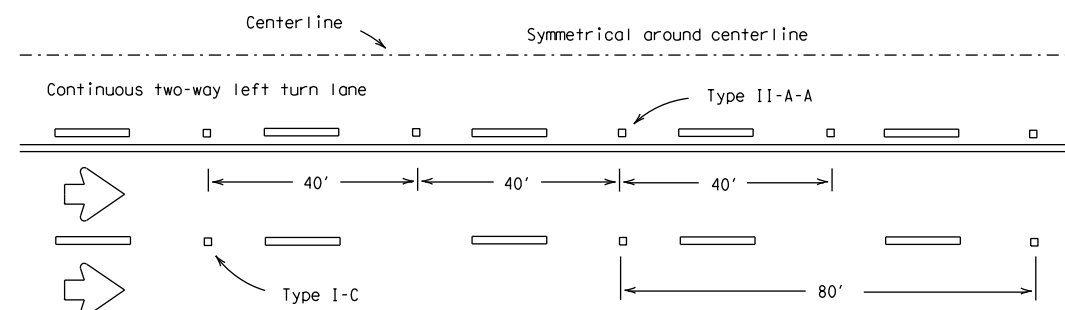


CENTERLINE FOR ALL TWO LANE ROADWAYS

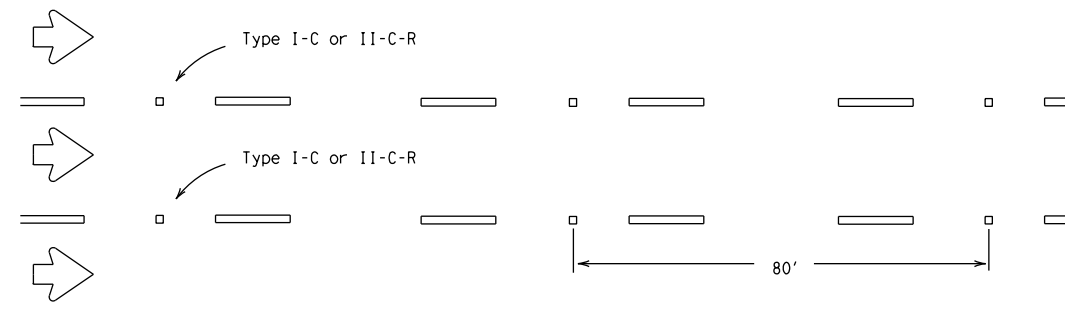


CENTERLINE & LANE LINES FOR FOUR LANE TWO-WAY HIGHWAYS

Raised pavement marker Type I-C, clear face toward normal traffic, shall be placed on 80-foot centers.

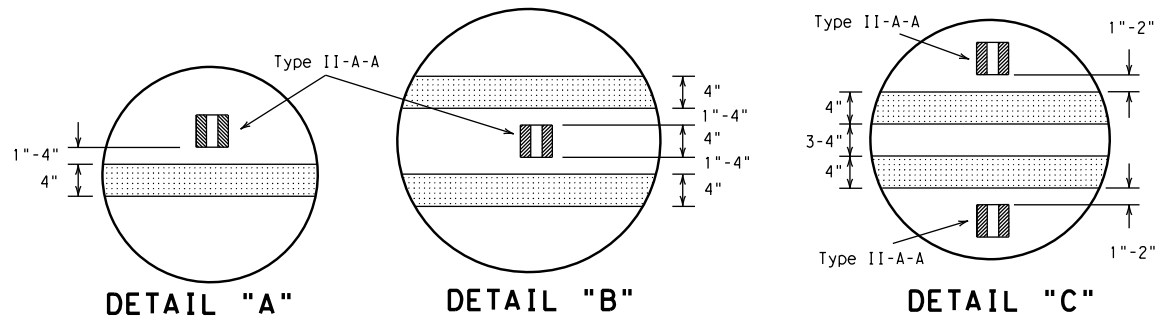


CENTERLINE AND LANE LINES FOR TWO-WAY LEFT TURN LANE



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

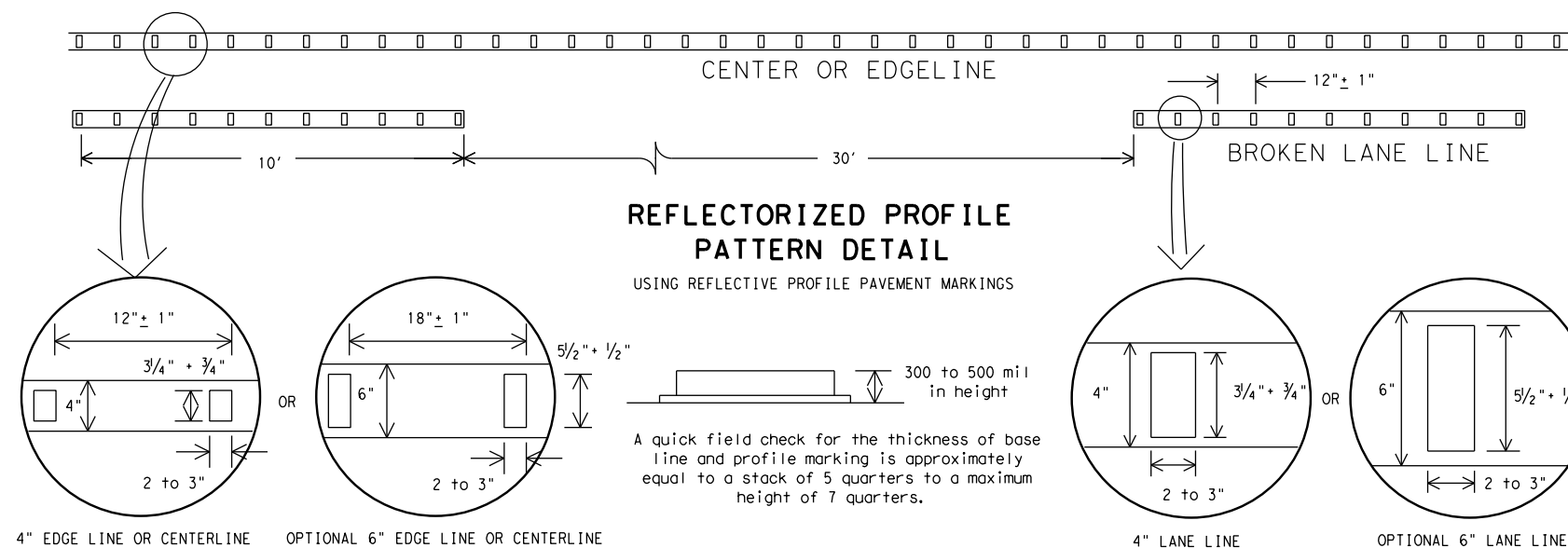
Raised pavement markers Type II-C-R shall have clear face toward normal traffic and red face toward wrong-way traffic.



DETAIL "A"

DETAIL "B"

DETAIL "C"



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.

NOTE:

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

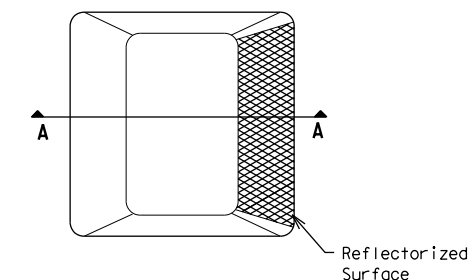
GENERAL NOTES

All raised pavement markers placed in broken lines shall be placed in line with and midway between the stripes.

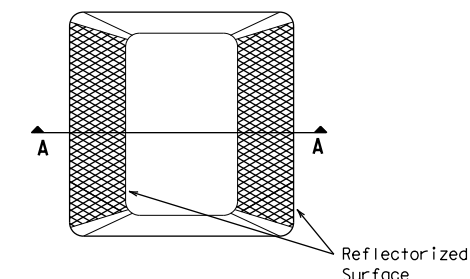
On concrete pavements the raised pavement markers should be placed to one side of the longitudinal joints.

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

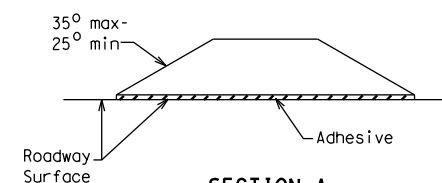
All pavement marking materials shall meet the required Departmental Material Specifications as specified by the plans.



Type I (Top View)



Type II (Top View)



SECTION A

RAISED PAVEMENT MARKERS

Texas Department of Transportation
Traffic Operations Division

POSITION GUIDANCE USING RAISED MARKERS REFLECTORIZED PROFILE MARKINGS

PM(2)-12

© TxDOT April 1977		DN: TxDOT	CK: TxDOT	DW: TxDOT	CK: TxDOT
REVISONS					
4-92	2-10	CONT	SECT	JOB	HIGHWAY
5-00	2-12	0902	38	120	GILLILAND RD
8-00		DIST		COUNTY	SHEET NO.
2-08		FTW		PARKER	99

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SIGN SUPPORT DESCRIPTIVE CODES

(Descriptive Codes correspond to project estimate and quantities sheets)

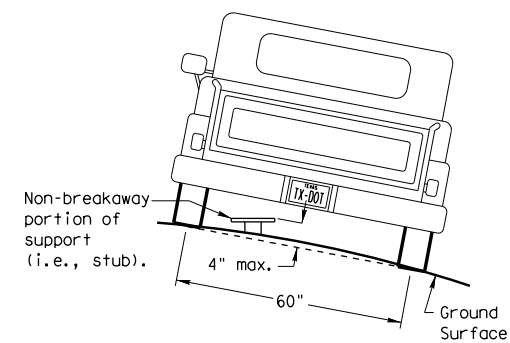
SM RD SGN ASSM TY XXXXX (X) XX (X-XXXX)

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

Number of Posts (1 or 2)
Anchor Type
 UA = Universal Anchor - Concreted (see SMD (FRP) and (TWT))
 UB = Universal Anchor - Bolted down (see SMD (FRP) and (TWT))
 WS = Wedge Anchor Steel - (see SMD (TWT))
 WP = Wedge Anchor Plastic (see SMD (TWT))
 SA = Slipbase - Concreted (see SMD (SLIP-1) to (SLIP-3))
 SB = Slipbase - Bolted Down (see SMD (SLIP-1) to (SLIP-3))

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

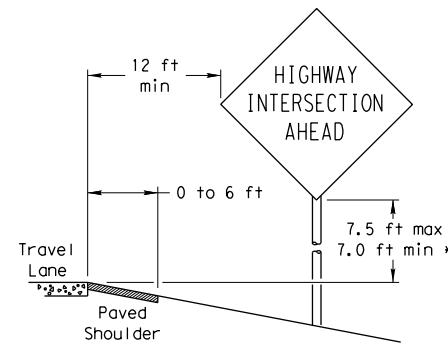
REQUIRED CLEARANCE FOR BREAKAWAY SUPPORT



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

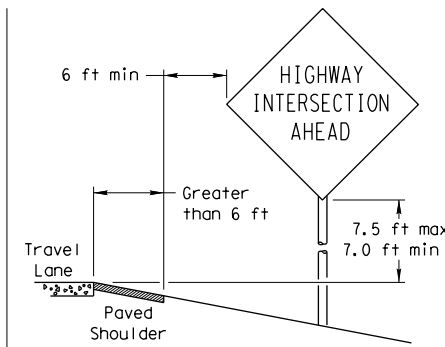
SIGN LOCATION

PAVED SHOULDERS



LESS THAN 6 FT. WIDE

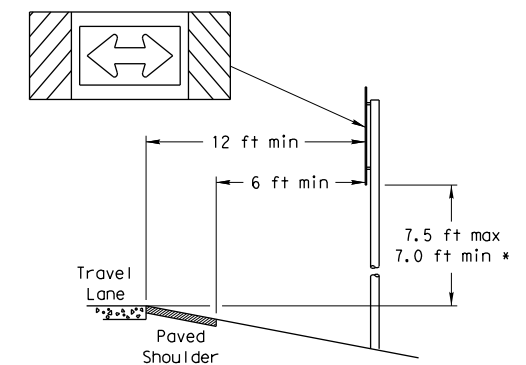
When the shoulder is 6 ft. or less in width, the sign must be placed at least 12 ft. from the edge of the travel lane.



GREATER THAN 6 FT. WIDE

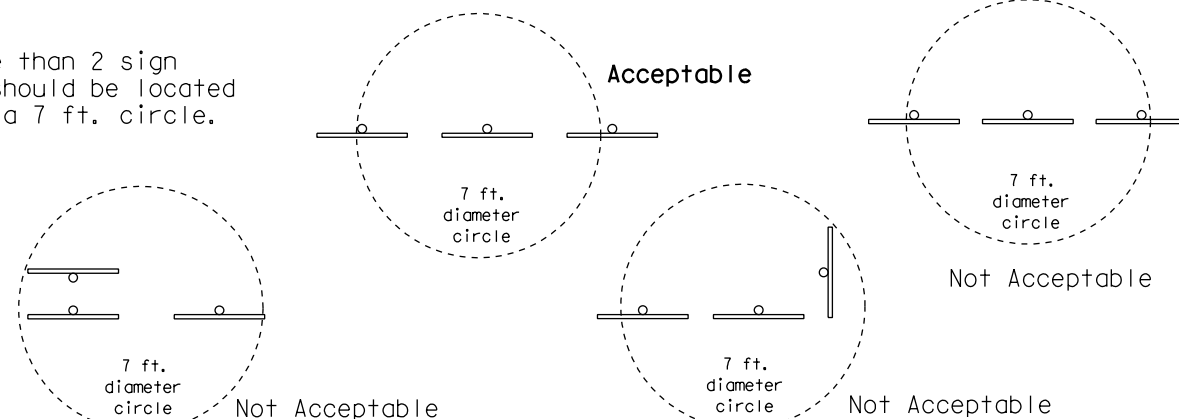
When the shoulder is greater than 6 ft in width, the sign must be placed at least 6 ft. from the edge of the shoulder.

T-INTERSECTION

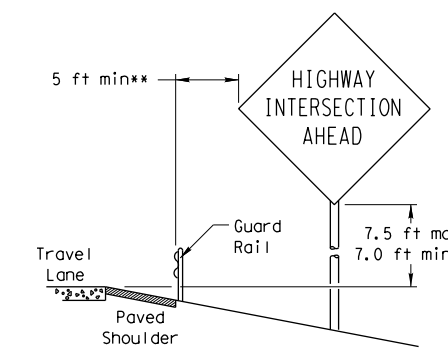


When this sign is needed at the end of a two-lane, two way roadway, the right edge of the sign should be in line with the centerline of the roadway. Place as close to ROW as practical.

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

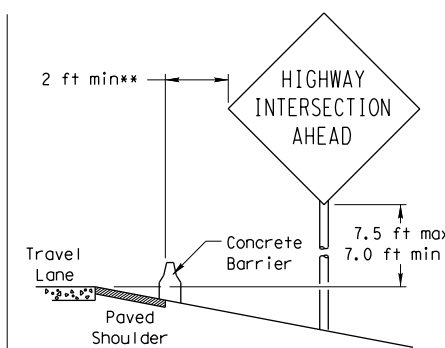


BEHIND BARRIER



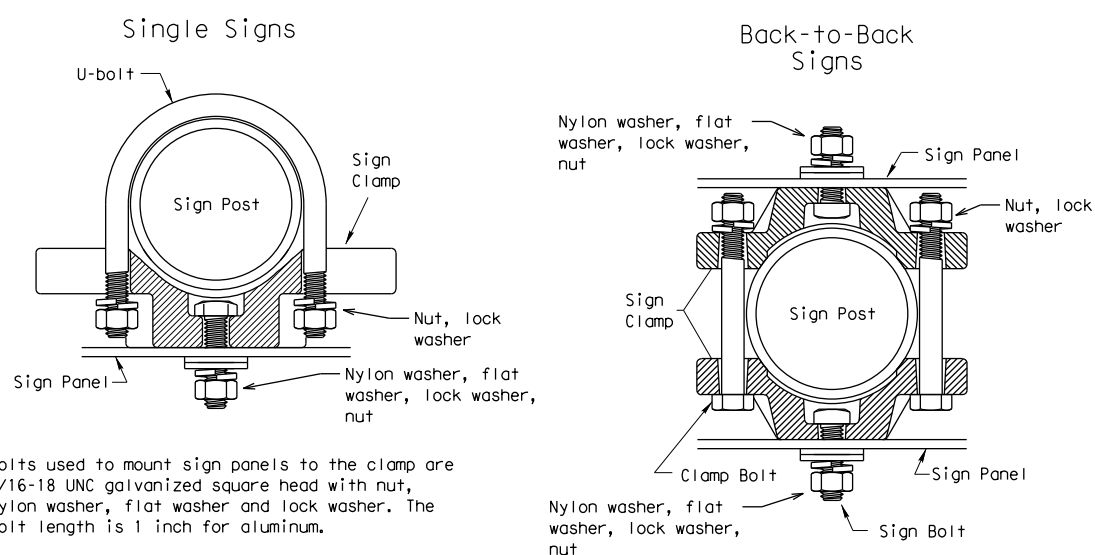
BEHIND GUARDRAIL

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



BEHIND CONCRETE BARRIER

TYPICAL SIGN ATTACHMENT DETAIL



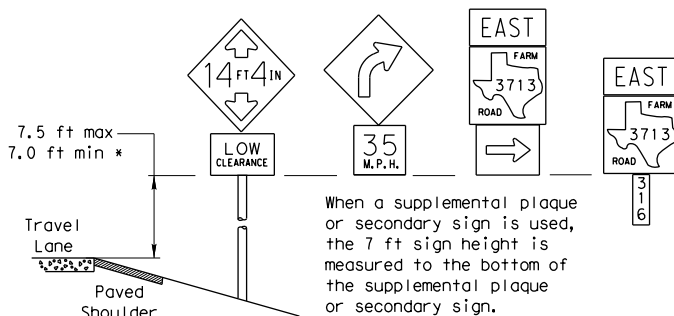
Bolts used to mount sign panels to the clamp are 5/16-18 UNC galvanized square head with nut, nylon washer, flat washer and lock washer. The bolt length is 1 inch for aluminum.

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

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

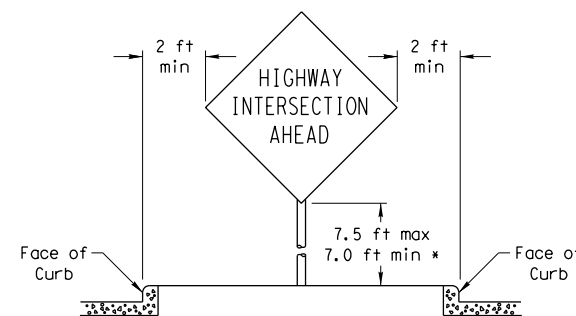
Pipe Diameter	Approximate Bolt Length	
	Specific Clamp	Universal Clamp
2" nominal	3"	3 or 3 1/2"
2 1/2" nominal	3 or 3 1/2"	3 1/2 or 4"
3" nominal	3 1/2 or 4"	4 1/2"

SIGNS WITH PLAQUES

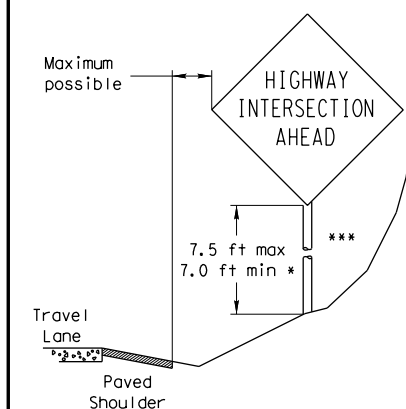


When a supplemental plaque or secondary sign is used, the 7 ft sign height is measured to the bottom of the supplemental plaque or secondary sign.

CURB & GUTTER OR RAISED ISLAND



RESTRICTED RIGHT-OF-WAY (When 6 ft min. is not possible.)



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

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

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

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



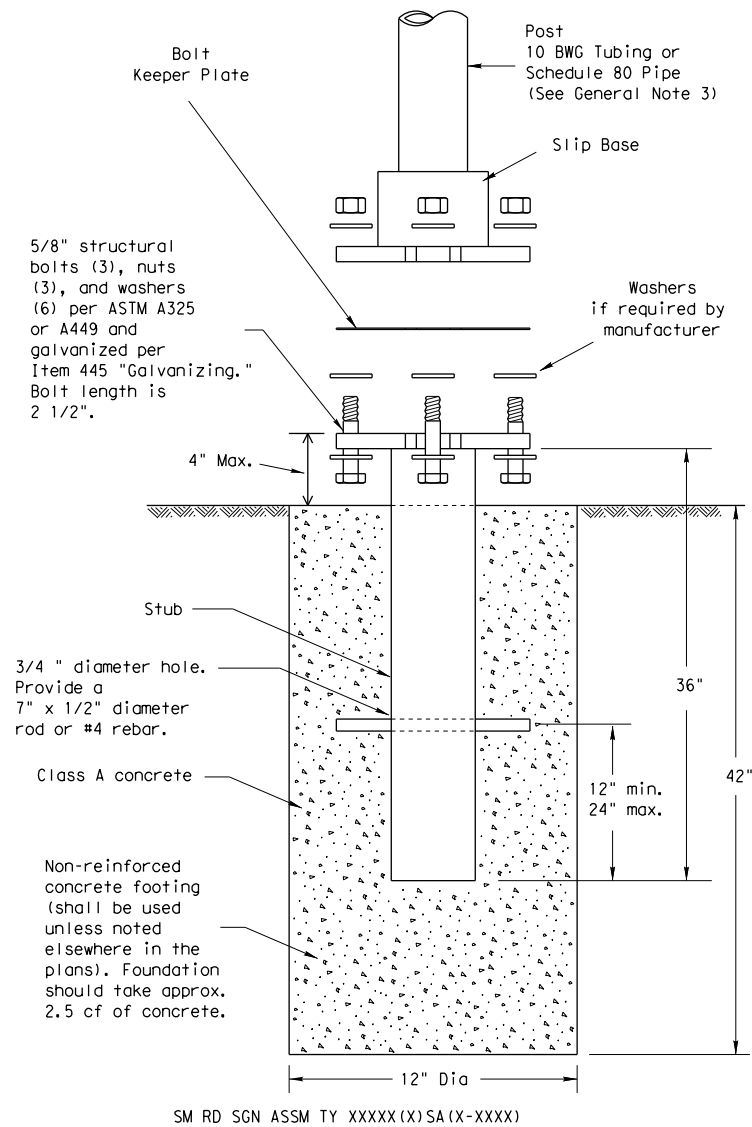
SIGN MOUNTING DETAILS SMALL ROADSIDE SIGNS GENERAL NOTES & DETAILS SMD (GEN) -08

© TxDOT July 2002		DN: TxDOT	CK: TxDOT	DN: TxDOT	CK: TxDOT
9-08	REVISIONS	CONT	SECT	JOB	HIGHWAY
		0902	38	120	GILLILAND RD
		DIST	COUNTY		SHEET NO.
		FTW	PARKER		100

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TRIANGULAR SLIPBASE INSTALLATION GENERAL REQUIREMENTS



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

NOTE

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

GENERAL NOTES:

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

ASSEMBLY PROCEDURE

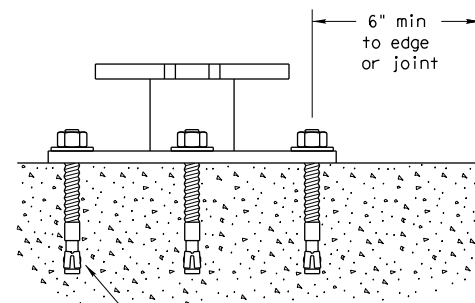
Foundation

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

Support

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

CONCRETE ANCHOR



5/8" diameter Concrete Anchor - 8 places (embed a minimum of 5 1/2" and torque to min. of 50 ft-lbs). Anchor may be expansion or adhesive type.

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

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



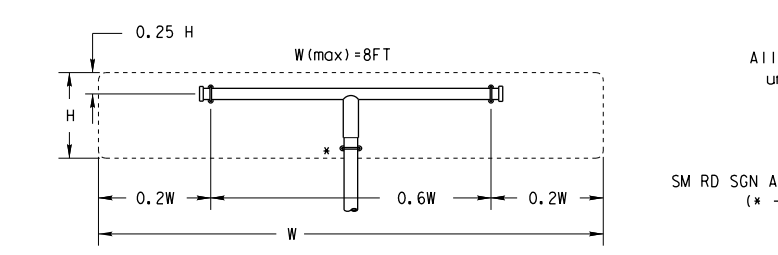
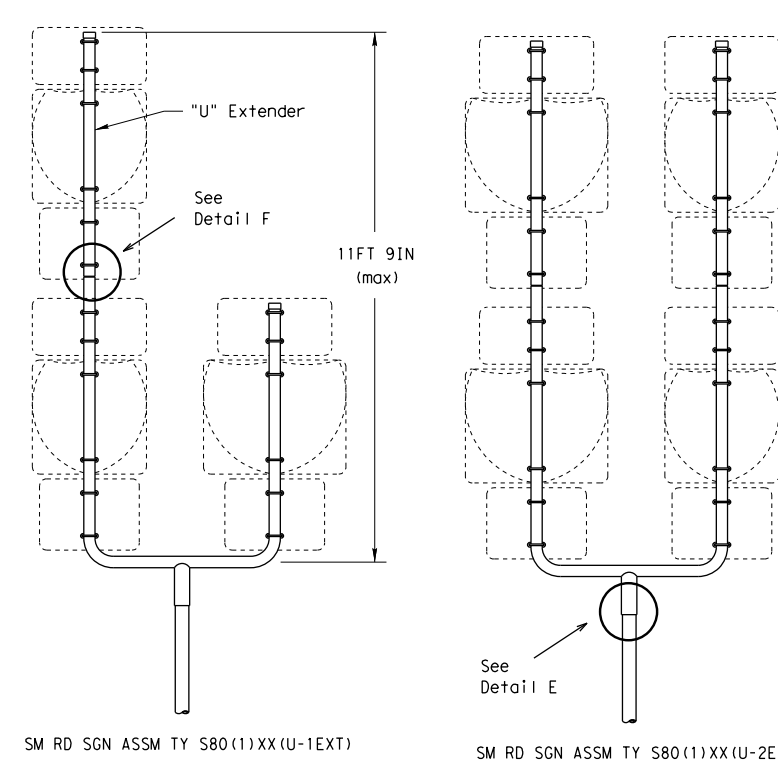
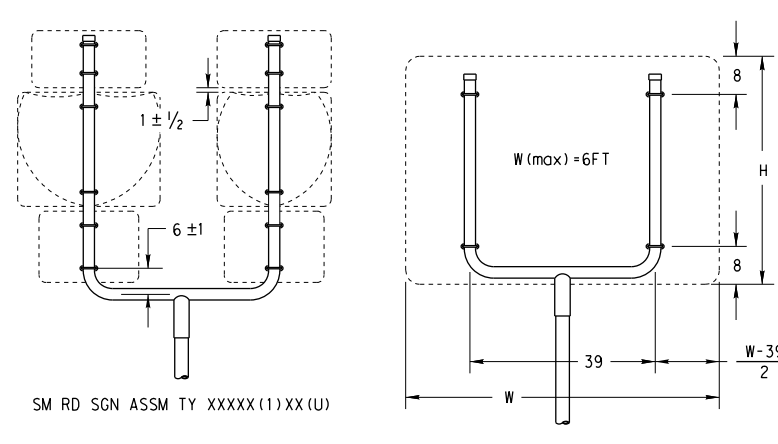
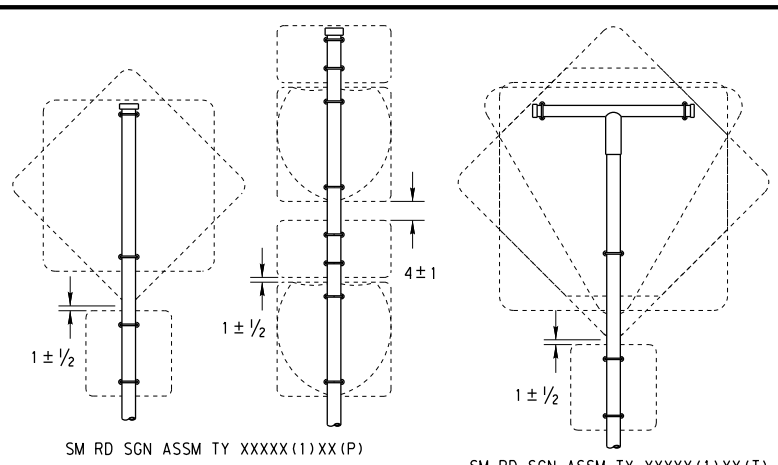
SIGN MOUNTING DETAILS SMALL ROADSIDE SIGNS TRIANGULAR SLIPBASE SYSTEM

SMD(SLIP-1)-08

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9-08	REVISIONS		CONT	SECT	JOB	HIGHWAY
			0902	38	120	GILLILAND RD
			DIST	COUNTY	SHEET NO.	
		FTW	PARKER	101		

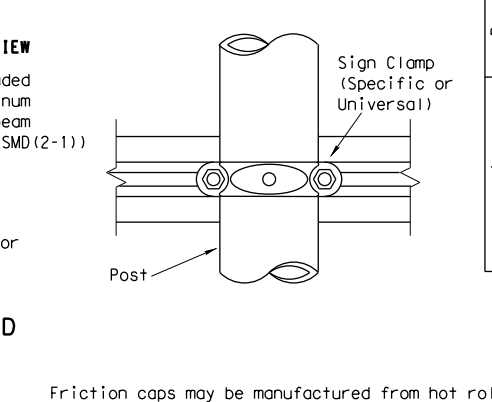
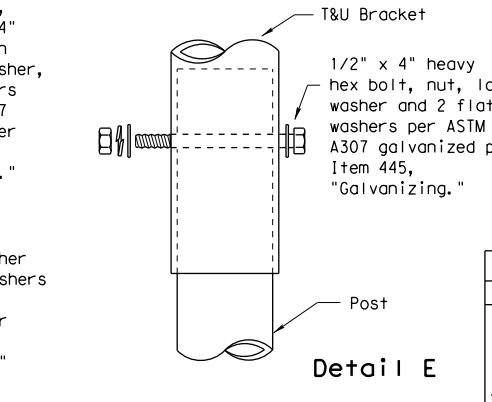
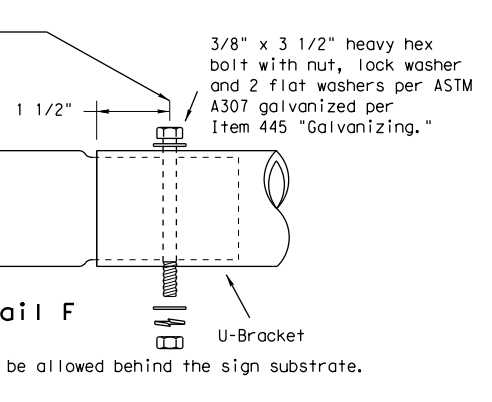
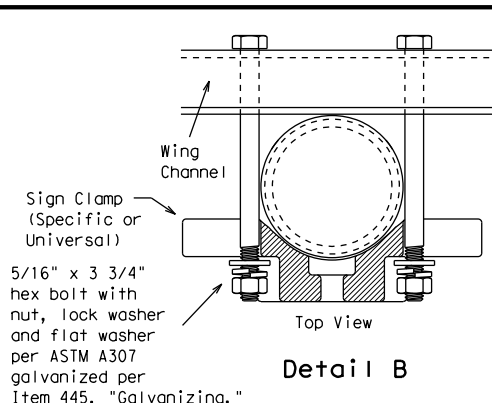
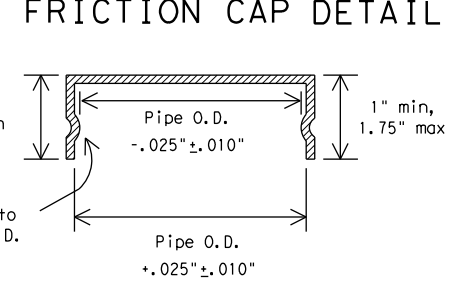
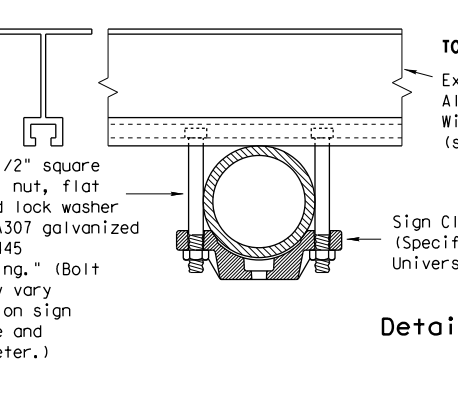
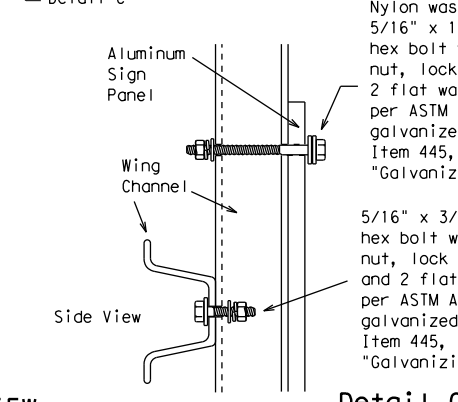
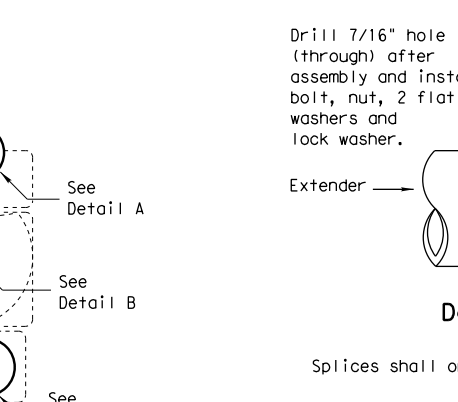
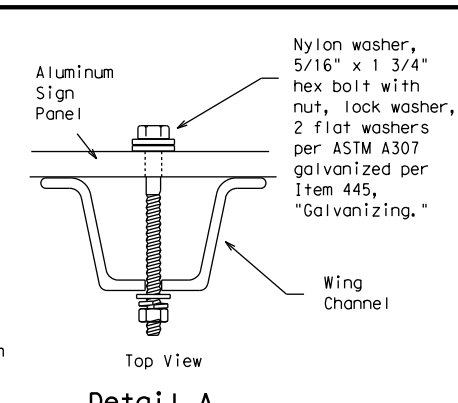
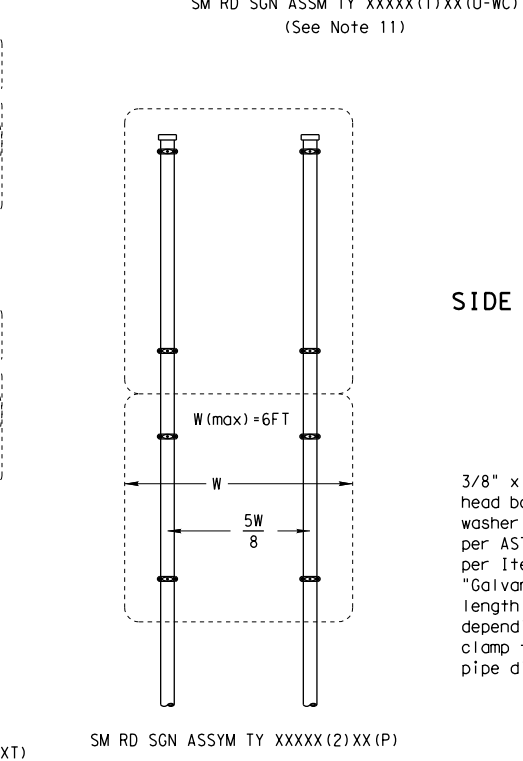
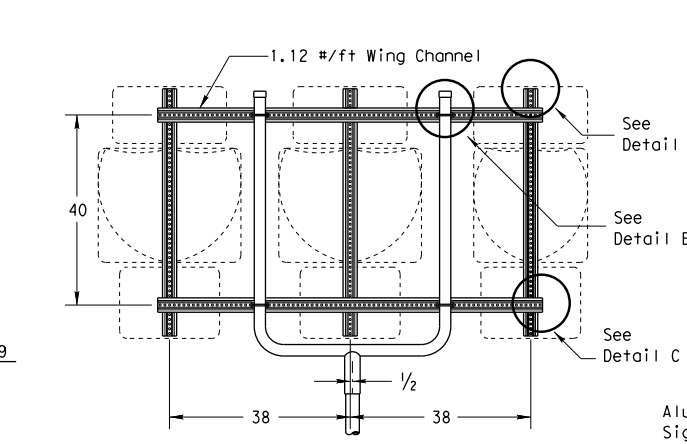
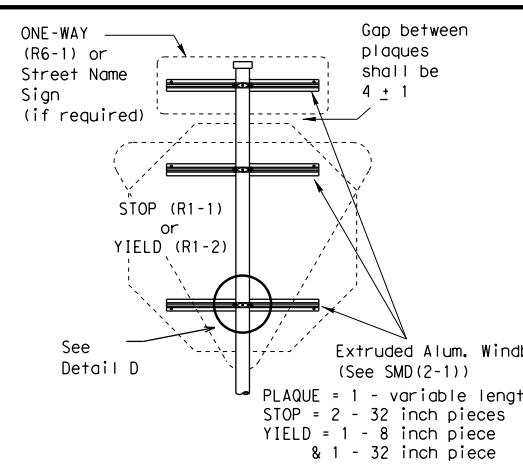
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All dimensions are in english unless detailed otherwise.

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



Friction caps may be manufactured from hot rolled or cold rolled steel sheets. The minimum sheet metal thickness shall be 24 gauge for all cap sizes. The rim edges shall be reasonably straight and smooth. Caps shall be sized and formed in such a manner as to produce a drive-on friction fit and have no tendency to rock when seated on the pipe. The depth shall be sufficient to give positive protection against entrance of rainwater. They shall be free of sharp creases or indentations and show no evidence of metal fracture. Caps shall have an electrodeposited coating of zinc in accordance with the requirements of ASTM B633 Class FE/ZN 8.

- GENERAL NOTES:**
- SIGN SUPPORT # OF POSTS MAX. SIGN AREA

10 BWG	1	16 SF
10 BWG	2	32 SF
Sch 80	1	32 SF
Sch 80	2	64 SF
 - The Engineer may require that a Schedule 80 post be used in place of a 10 BWG where a sign height is abnormally high due to a fill slope.
 - Sign supports shall not be spliced except where shown. Sign support posts shall not be spliced.
 - Aluminum sign blanks shall conform to Departmental Material Specifications DMS-7110 and shall have the following minimum thicknesses: 0.080 for signs less than 7.5 sq. ft., 0.100 for signs 7.5 to 15 sq. ft., and 0.125 for signs greater than 15 sq. ft.
 - Signs that require specific supports due to reasons in addition to windloading are indicated on the "REQUIRED SUPPORT" table on this sheet.
 - For horizontal rectangular signs fabricated from flat aluminum, T-brackets are used for signs 24 inches or less in height. U-brackets are used for signs of greater height.
 - When two triangular slipbase supports are used to support a single sign, they shall not be "rigidly" connected to each other except through the sign panel. This will allow each support to act independently when impacted by an errant vehicle.
 - Wing channel shall meet ASTM A 1011 SS Gr 50 and be galvanized per ASTM A 123.
 - Excess pipe, wing channel, or windbeam shall be cut off so that it does not extend beyond the sign panel (i.e., excess support shall not be visible when the sign is viewed from the front.) Repair galvanized coating at cut support ends per Item 445, "Galvanizing."
 - Additional route markers may be added vertically, provided the total sign area does not exceed the maximum allowable amount per Note 1.
 - Additional sign clamp required on the "T-bracket" post for 24 inch height signs. Place the clamp 3 inches above bottom of sign when possible.
 - Post open ends shall be fitted with Friction Caps.
 - Sign blanks shall be the sizes and shapes shown on the plans.

REQUIRED SUPPORT		
SIGN DESCRIPTION	SUPPORT	
Regulatory	48-inch STOP sign (R1-1)	TY 10BWG(1)XX(T) TY 10BWG(1)XX(P-BM)
	60-inch YIELD sign (R1-2)	TY 10BWG(1)XX(T) TY 10BWG(1)XX(P-BM)
	48x16-inch ONE-WAY sign (R6-1)	TY 10BWG(1)XX(T) TY 10BWG(1)XX(P-BM)
Warning	36x48, 48x36, and 48x48-inch signs	TY 10BWG(1)XX(T)
	48x60-inch signs	TY S80(1)XX(T)
	48x48-inch signs (diamond or square)	TY 10BWG(1)XX(T)
	48x60-inch signs	TY S80(1)XX(T)
	48-inch Advance School X-ing sign (S1-1)	TY 10BWG(1)XX(T)
48-inch School X-ing sign (S2-1)	TY 10BWG(1)XX(T)	
Large Arrow sign (W1-6 & W1-7)	TY 10BWG(1)XX(T)	

Texas Department of Transportation
 Traffic Operations Division

SIGN MOUNTING DETAILS
SMALL ROADSIDE SIGNS
TRIANGULAR SLIPBASE SYSTEM
SMD(SLIP-2)-08

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9-08	REVISONS	CONT	SECT	JOB	HIGHWAY
		0902	38	120	GILLILAND RD
		DIST	COUNTY		SHEET NO.
		FTW	PARKER		102

A. GENERAL SITE DATA

1. **PROJECT LIMITS:** Highway: Gilliland Road
From:
To: at Walnut Creek

PROJECT BEGIN: LATITUDE: 32°59'18.30" N LONGITUDE: 97°59'18.30" W
PROJECT END: LATITUDE: 32°59'24.29" N LONGITUDE: 97°43'35.70" W

2. **PROJECT SITE MAPS:**

- * Project Location Map: Title Sheet (Sheet 1)
- * Drainage Patterns: Drainage Area Maps (Sheets 48)
- * Approx. Slopes Anticipated After Major Grading and Areas of Soil Disturbance: Typical Sections (Sheets 4)
- * Major Controls and Locations of Stabilization Practices: (Sheets 104) SW3P Site Map Sheets
- * Project Specific Locations: To be specified by Project Field Office and located in the Project SW3P File

3. **PROJECT DESCRIPTION:**

For the construction of bridges and approaches. Consisting of grading, base, surfacing and pavement markings.

4. **MAJOR SOIL DISTURBING ACTIVITIES:**

1. Install erosion control devices as shown in SW3P plan.
2. Complete excavation, embankment, and removal.
3. Maintain erosion control devices throughout all construction activities.
4. Complete bridge and roadway construction.
5. Complete temporary and/or permanent seeding on all sloped and disturbed areas.
6. When all construction activities are complete and the site is established and approved by the project engineer, then remove all erosion control devices and reseed any areas disturbed by their removal.

5. **EXISTING CONDITION OF SOIL & VEGETATIVE COVER AND % OF EXISTING VEGETATIVE COVER:**

The project location is in a rural setting. The amount of vegetative cover is approximately 75% of the total. The existing vegetative cover consists primarily of trees and grasses.

6. **TOTAL PROJECT AREA:** 1.71 Acres

7. **TOTAL AREA TO BE DISTURBED:** 1.54 Acres (90 % OF TOTAL PROJECT AREA)

8. **WEIGHTED RUNOFF COEFFICIENT**

BEFORE CONSTRUCTION: 0.47
AFTER CONSTRUCTION: 0.49

9. **NAME OF RECEIVING WATERS:**

Walnut Creek

10. **ENDANGERED SPECIES, DESIGNATED CRITICAL HABITAT AND HISTORIC PROPERTY:**

A. No Endangered Species, Designated Critical Habitat or Historic Property has been found on this project site.

The documentation satisfying TPDES Construction General Permit eligibility pertaining to the existence or of any protective action taken with regards to endangered species or designated critical habitat or historical property in this project area is contained in the project's Environmental document (EA or EIS) and can be viewed under the State Open Records Act at the address shown below:

TEXAS DEPARTMENT OF TRANSPORTATION
FORT WORTH DISTRICT HEADQUARTERS
DISTRICT DESIGN SECTION
2501 SW LOOP
FORT WORTH, TX 76133
PHONE: 817-370-6500

B. EROSION AND SEDIMENT CONTROLS

1. **SOIL STABILIZATION PRACTICES:**

(Select T = Temporary or P = Permanent, as applicable)

- TEMPORARY SEEDING
- MULCHING (Hay or Straw)
- BUFFER ZONES
- PLANTING
- SEEDING
- SODDING
- PRESERVATION OF NATURAL RESOURCES
- FLEXIBLE CHANNEL LINER
- RIGID CHANNEL LINER
- SOIL RETENTION BLANKET
- COMPOST MANUFACTURED TOPSOIL
- OTHER: (Specify Practice)

2. **STRUCTURAL PRACTICES:**

(Select T = Temporary or P = Permanent, as applicable)

- SILT FENCES
- HAY BALES
- ROCK FILTER DAMS
- PIPE SLOPE DRAINS
- PAVED FLUMES
- CHANNEL LINERS
- SEDIMENT TRAPS
- SEDIMENT BASINS
- STORM SEWERS
- OTHER: (Specify Practice)
- BIODEG EROSION CONTROL LOGS
- DIVERSION, INTERCEPTOR, OR PERIMETER DIKES
- DIVERSION, INTERCEPTOR, OR PERIMETER SWALES
- DIVERSION DIKE AND SWALE COMBINATIONS
- ROCK BEDDING AT CONSTRUCTION EXIT
- TIMBER MATTING AT CONSTRUCTION EXIT
- STONE OUTLET STRUCTURES
- VELOCITY CONTROL DEVICES
- CURBS AND GUTTERS
- STORM INLET SEDIMENT TRAP

3. **STORM WATER MANAGEMENT:**

1. Storm water drainage will be provided by the ditches, inlets and storm water systems that will carry drainage within the R.O.W. to the low points within the roadway and project site which drain to natural facilities.

2. Other permanent erosion controls include hydraulic design to limit structure outlet velocities and grading design generally consisting of 4:1 or flatter slopes with permanent vegetative cover.

4. **STORM WATER MANAGEMENT ACTIVITIES:** (Sequence of Construction)

1. Place advance warning signs and barricades.
2. Place erosion and sediment control devices.
3. Prepare right of way, from row line to row line.
4. Remove existing bridge and other facilities as shown in the removal plan as needed.
5. Place embankment and cut grade under and around proposed bridge.
6. Place drill shaft, bents and abutments.
7. Grade and place riprap under bridge.
8. Complete the bridge and roadway items as shown in the plans. Contractor shall develop phasing/sequencing plan with required signs and top devices for maintaining access to and from adjacent properties and submit to the Engineer for approval before beginning any roadway work. Developing these plans and implementing them during construction will not be paid separately and will be considered subsidiary to item 502.
9. Place signing and pavement markings.
10. Remove erosion and sediment control devices.
11. Final clean up. Remove barricades and open roadway.

5. **NON-STORM WATER DISCHARGES:**

Non-storm water discharges should be filtered, or held in retention basins, before being allowed to mix with storm water. These discharges consist of non-polluted ground water, spring water, foundation and/or footing drain water, and water used for dust control, pavement washing and vehicle washwater containing no detergents.

C. OTHER REQUIREMENTS & PRACTICES

1. **MAINTENANCE:**

All erosion and sediment controls shall be maintained in good working order. If a repair is necessary, it shall be performed at the earliest date possible but no later than 7 calendar days after the surrounding exposed ground has dried sufficiently to prevent further damage from heavy equipment. Disturbed areas on which construction activities have ceased, temporarily or permanently, shall be stabilized within 14 calendar days unless they are scheduled to and do resume within 21 calendar days. The areas adjacent to creeks and drainageways shall have priority followed by devices protecting storm sewer inlets.

2. **INSPECTION:**

An inspection shall be performed by a TxDOT Inspector every every 14 calendar days as well as within 24 hours after any rainfall of one-half inch or more is recorded on a non-freezing rain gauge to be located at the project site, or every 7 calendar days. An Inspection and Maintenance Report shall be filed for each inspection. Based on the inspection results, the controls shall be revised in accordance with the inspection report.

3. **WASTE MATERIALS:**

Except as noted below, all waste materials shall be collected in a metal dumpster having a secure cover. The dumpster shall meet all state and local solid waste management regulations. All trash and debris from construction shall be deposited in the dumpster. The dumpster shall be emptied, as necessary or as required by local regulation, and hauled to a local approved land fill site. The burying of construction waste on the project site shall not be permitted.

Concrete washout areas shall be required and shall consist of a pit, lined with an impervious material, of sufficient size to contain, until evaporation, all water used and washout material produced during concrete washout operations. The concrete washout locations shall be as directed by the engineer.

Lime slaking tanks shall be surrounded by an earthen berm, capable of containing any overflow.

4. **HAZARDOUS WASTE (INCLUDING SPILL REPORTING):**

As a minimum, any products in the following categories are considered to be hazardous: paints, acids, solvents, asphalt products, chemical additives for soil stabilization and concrete curing compounds or additives. In the event of a spill which may be hazardous, the spill coordinator shall be contacted immediately.

5. **SANITARY WASTE:**

All sanitary waste shall be collected from the portable units, as necessary or as required by local regulation, by a licensed sanitary waste management contractor.

6. **OFFSITE VEHICLE TRACKING:**

The Contractor shall be required, on a regular basis or as may be directed by the Engineer, to dampen haul roads for dust control, stabilize construction entrances and to remove excess dirt from the roadway.

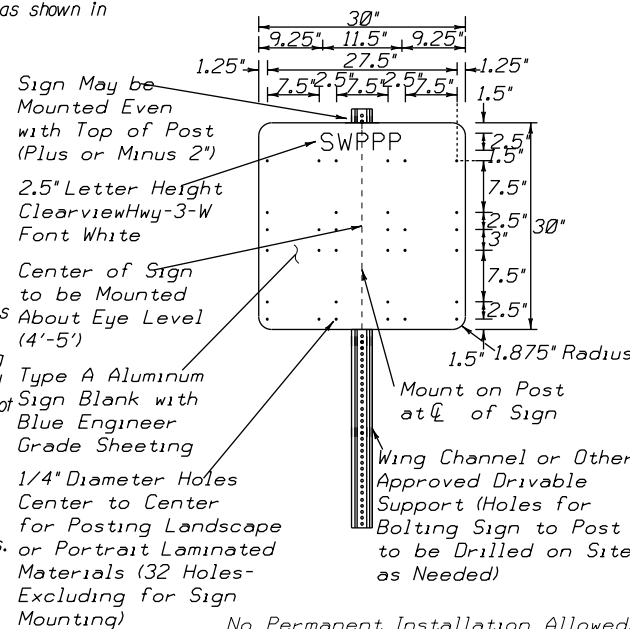
7. **MANAGEMENT PRACTICES:**

1. Disposal areas, stockpiles and haul roads shall be constructed in a manner that will minimize and control the amount of sediment that may enter receiving waters. Disposal areas shall not be located in any wetland, waterbody or streambed.
2. Construction staging areas and vehicle maintenance areas shall be constructed by the Contractor in a manner to minimize the runoff of pollutants.
3. All temporary fills placed in waterways shall be built of erosion resistant material. (NWP 14)
4. All waterways shall be cleared as soon as practicable of temporary embankment, temporary bridges, matting, falsework, piling, debris or other obstructions placed during construction operations that are not a part of the finished work.

8. **OTHER:**

1. Listing of construction materials stored on site to be provided by Project Field Office.
2. The Project SW3P File located at the project field office shall contain the N.O.J., CGP Coverage Notice, TCEQ TPDES Form, Signature Authorization, Certification/Qualification Statements, Inspection Reports, Required Maps, and a copy of the TPDES General Permit No. TXRI50000.

STORM WATER POLLUTION PREVENTION PLAN PERMIT POSTING



No Permanent Installation Allowed. Sign to be Removed After Project Completion.



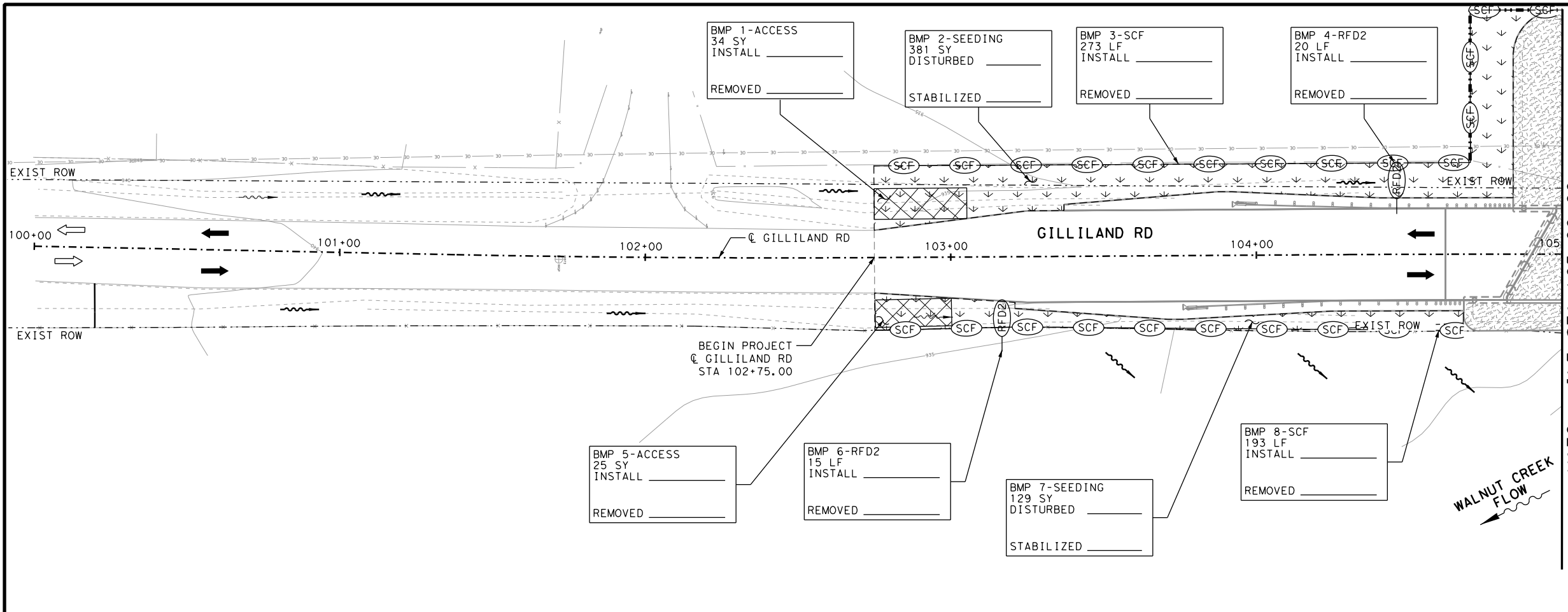
Signature _____ Date _____, P. E. 11/6/2020



Texas Department of Transportation
Fort Worth District

STORM WATER POLLUTION PREVENTION PLAN (SW3P)

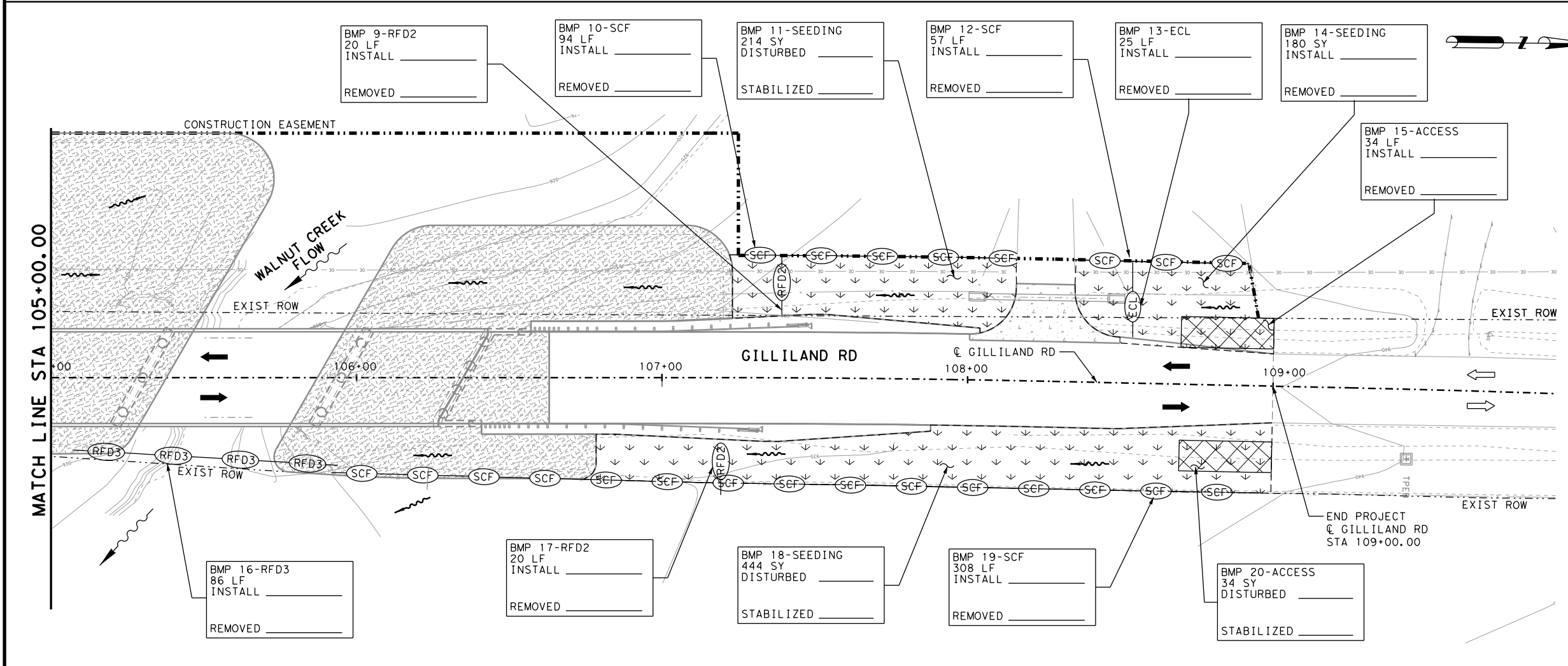
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REVISIONS 9/2008 NPBES to TPDES (1 for 1) Note C.2.	STATE TEXAS	DISTRICT FTW	COUNTY PARKER	SHEET NO. 103
Added sign. 8/2013	CONTROL 0902	SECTION 38	JOB 120	



LEGEND

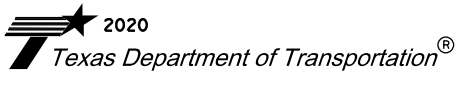
- DIRECTION OF FLOW
- TEMPORARY SEDIMENT CONTROL FENCE
- EROSION CONTROL LOG
- TYPE 2 ROCK FILTER DAM
- TYPE 3 ROCK FILTER DAM
- SEEDING
- CONSTRUCTION ACCESS

- NOTES:**
- ① LOCATION OF STABILIZATION DEVICES ON THE SITE PLAN ARE FOR CLARITY PURPOSES ONLY. NO WORK SHALL BE PERFORMED BEYOND THE LIMITS OF CONSTRUCTION EASEMENT.
 - ② SEDIMENT CONTROL FENCE SHOWN ON THE PLAN ARE AT LOCATIONS WHERE A PARALLEL DRAINAGE DITCH DOES NOT EXIST OR AS A BOUNDARY FOR DISTURBED AREA LIMITS.
 - ③ REFER TO CONSTRUCTION EASEMENT SHEETS FOR LOCATIONS OF TEMPORARY WIRE FENCE.



0 20' 40'
SCALE: 1" = 40'

11/5/2020



GILLILAND ROAD AT WALNUT CREEK
SW3P LAYOUT
BEGIN PROJECT TO END PROJECT

SHEET 1 OF 1

FED RD DIV NO.	FEDERAL AID PROJECT		SHEET NO.
6	SEE TITLE SHEET		104
STATE	DISTRICT	COUNTY	
TEXAS	FTW	PARKER	
CONTROL	SECTION	JOB	HIGHWAY
0902	38	120	GILLILAND RD

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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.
- 3.

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:

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. Crossing 1: Walnut Creek
- 2.
- 3.
- 4.

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

Best Management Practices:

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

III. CULTURAL RESOURCES

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

No Action Required Required Action

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. Areas within the existing ROW, but outside the limits of construction, shall not be disturbed.
2. Every effort shall be made to preserve trees where they would neither compromise safety nor substantially interfere with the proposed projects.

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. Be advised of potential occurrence in the project area and avoid harm for the following species:
 - * Amphibians - Strecker's chorus frog and Woodhouse's toad;
 - * Mammals - Big brown bat, Eastern red bat, Mexican free-tailed bat, Eastern spotted skunk, Long-tailed weasel, Swamp rabbit, Western hog-nosed skunk, and the Woodland vole;
 - * Mollusks - Texas fawnsfoot;
 - * Reptiles - Eastern box turtle, Slender glass lizard, Texas garter snake, Timber rattlesnake, Western box turtle, and the Western hognose snake;
 - * Insects - American bumblebee and the Comanche harvester ant

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.
2. If caves or sinkholes are discovered, cease work in the immediate area, and contact the Engineer immediately.
3. For birds, implement the following BMPs:
 - a) Do not collect, capture, relocate, or transport birds, eggs, young, or active nests without a permit.
 - b) During the nesting season (approximately between October 1 and February 15), the contractor would remove all old migratory bird nests from any structure that would be affected by the proposed project, and complete any bridge work/demolition and /or vegetation clearing. In addition, the contractor would be prepared to prevent migratory birds from building nests by utilizing nest prevention methods, such as bird-deterrent netting and bird-repelling sprays and/or gels, during the nesting season.
 - * In the event that migratory birds are encountered on-site during project construction, adverse impacts on protected birds, active nests, eggs, and/or young would be avoided.
 - * Do not disturb, destroy, or remove active nests, including ground nesting birds, during the nesting season.
 - * Avoid the removal of unoccupied, inactive nests, as practicable.
 - c) The Eagle Protection Act prohibits the taking or possession of and commerce in eagles, parts, feathers, nests, or eggs with limited exceptions. The definition of take includes pursue, shoot, shoot at, poison, wound, kill, capture, trap, collect, molest or disturb. Eagles may not be taken for any purpose unless a permit is issued prior to the taking.

CONTINUED ON EPIC SHEET 2

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
NMP: Nationwide Permit	USACE: U.S. Army Corps of Engineers
NOI: Notice of Intent	USFWS: U.S. Fish and Wildlife Service

VI. HAZARDOUS MATERIALS OR CONTAMINATION ISSUES

General (applies to all projects):

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

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

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

Contact the Engineer if any of the following are detected:

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

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

Yes No

If "No", then no further action is required.

If "Yes", then TxDOT is responsible for completing asbestos assessment/inspection.

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

Yes No

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

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

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

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

No Action Required Required Action

Action No.

1. Lead based paint will be mitigated within the construction process in accordance with Standard Specification Item 6.10 (and applicable Provisions), and the TxDOT guidance document: guidance for Handling Asbestos in Construction Projects, dated January 26, 2007.

VII. OTHER ENVIRONMENTAL ISSUES

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

No Action Required Required Action

Action No.

- 1.
- 2.
- 3.



Signature: *[Handwritten Signature]*, P.E. 11/5/2020
Date

		Design Division Standard	
ENVIRONMENTAL PERMITS, ISSUES AND COMMITMENTS EPIC			
SHEET 1 of 2 SHEETS			
FILE: epic.dgn	DN: TxDOT	CK: RG	DN: VP
©TxDOT: January 2020	CONT	SECT	JOB
12-12-2011 (DS) REVISIONS	0902	38	120
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	PARKER	105

DATE: 1/9/2020 9:25:13 AM
 FILE: T:\Environmental\COUNTIES\PARKER\0902-38-120 (Putnam)\Draft - Epic
 Sheets (0902-38-120).dgn

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

4. If bats are present or recent signs of occupation (i.e., piles of guano, distinct musky odor, or staining and rub marks at potential entry points) are observed, take appropriate measures to ensure that bats are not harmed, such as implementing non-lethal exclusion activities or timing or phasing of construction.
 - a) Exclusion devices can be installed by a qualified individual between September 1st and March 31st. Exclusion devices should be used for a minimum of seven days when minimum nighttime temperatures are above 50°F AND minimum daytime temperatures are above 70°F.
 - b) Before excluding bats from any occupied structure, bat species, weather, temperature, season, and geographic location must be incorporated into any exclusion plans to avoid unnecessary harm or death to bats. Winter exclusion must entail a survey to confirm either, 1) bats are absent or 2) present but active (i.e. continuously active - not intermittently active due to arousals from hibernation).
 - c) Avoid using materials that degrade quickly, like paper, steel wool or rags, to close holes.
 - d) Avoid using chemical and ultrasonic repellents.
 - e) Avoid the use of flexible netting attached with duct tape.
 - f) In order to avoid entombing bats, exclusion activities should be only implemented by a qualified individual. A qualified individual or company should possess at least the following minimum qualifications:
 - * Experience in bat exclusion (the individual, not just the company).
 - * Proof of rabies pre-exposure vaccinations.
 - * Demonstrated knowledge of the relevant bat species, including maternity season date range and habitat requirements.
 - * Demonstrated knowledge of rabies and histoplasmosis in relation to bat roosts.
 - g) Conversion of property containing cave or cliff features to transportation purposes should be avoided where feasible.
 - h) Large hollow trees, snags (dead standing trees), and trees with shaggy bark should be surveyed for colonies and, if found, should not be disturbed until the bats are no longer occupying these features. Post-occupancy surveys should be conducted by a qualified biologist prior to tree removal from the landscape.
 - i) Retain mature, large diameter hardwood forest species and native/ornamental palm trees where feasible.
 - j) In all instances, avoid harm or death to bats. Bats should only be handled as a last resort and after communication with TPWD. If bats are present or recent signs of occupation (i.e., piles of guano, distinct musky odor, or staining and rub marks at potential entry points) are observed, take appropriate measures to ensure that bats are not harmed, such as implementing non-lethal exclusion activities or timing or phasing of construction.
5. Apply hydromulching and/or hydroseeding in areas for soil stabilization and/or revegetation of disturbed areas where feasible. If hydromulching and/or hydroseeding are not feasible due to site conditions, utilize erosion control blankets or mats that contain no netting or contain loosely woven, natural fiber netting is preferred. Plastic netting should be avoided to the extent practicable.
6. For open trenches and excavated pits, install escape ramps at an angle of less than 45 degrees (1:1) in areas left uncovered. Visually inspect excavation areas for trapped wildlife prior to backfilling.
7. If reptiles are found on project site allow species to safely leave the project area.
8. Avoid or minimize disturbing or removing downed trees, rotting stumps, and leaf litter where feasible.
9. Project specific locations (PSLs) proposed within state-owned ROW should be located in uplands away from aquatic features.
10. When work is directly adjacent to the water, minimize impacts to shoreline basking sites (e.g., downed trees, sand bars, exposed bedrock) and overwinter sites (e.g., brush and debris piles, crayfish burrows) where feasible.
11. Minimize impacts to wetland, temporary and permanent open water features, including depressions, and riverine habitats.
12. Minimize the use of equipment in streams and riparian areas during construction. When possible, equipment access should be from banks, bridge decks, or barges.
13. When temporary stream crossings are unavoidable, remove stream crossings once they are no longer needed and stabilize banks and soils around the crossing.
14. When work is in the water; survey project footprints for state listed species where appropriate habitat exists.
15. When work is in the water and mussels are discovered during surveys; relocate state listed and SGCN mussels under TPWD authorization.



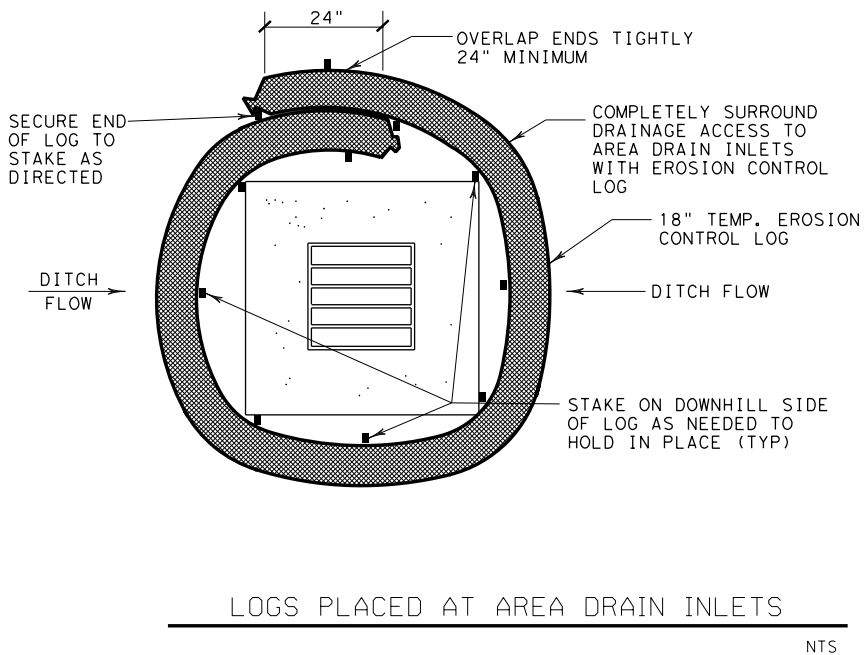
[Signature], P.E. 11/5/2020
 Signature Date

		Design Division Standard	
ENVIRONMENTAL PERMITS, ISSUES AND COMMITMENTS EPIC			
SHEET 2 of 2 SHEETS			
FILE: epic.dgn	DN: TxDOT	CK: RG	DW: VP
© TxDOT: January 2020	CONT	SECT	JOB
12-12-2011 (DS) REVISIONS	0902	38	120
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	PARKER	106

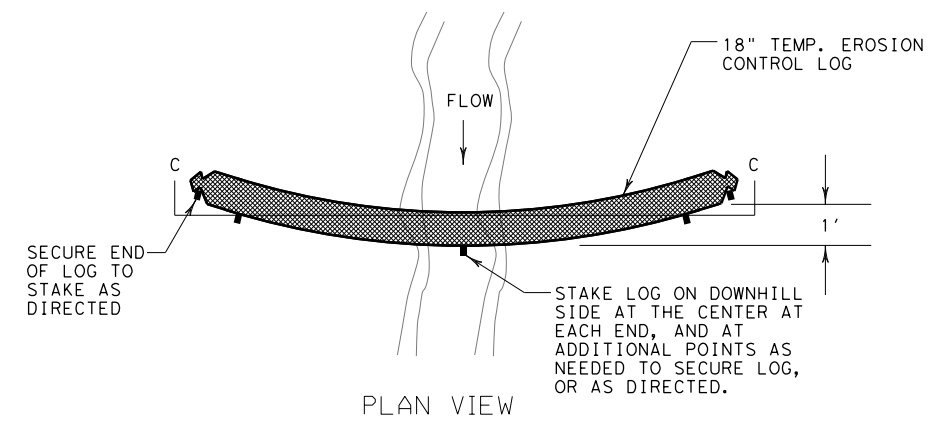
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http://www.dot.state.tx.us/ftw/specinfo/standard.htm <teclfw.dgn>

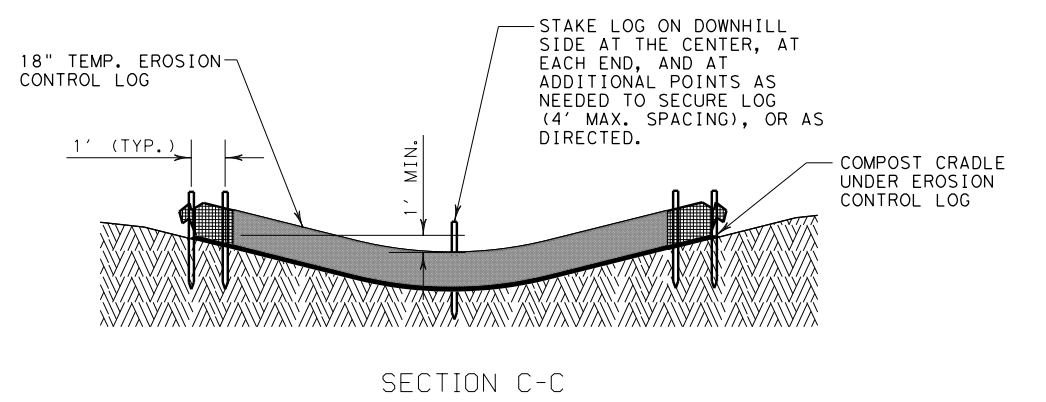
LEVELS DISPLAYED
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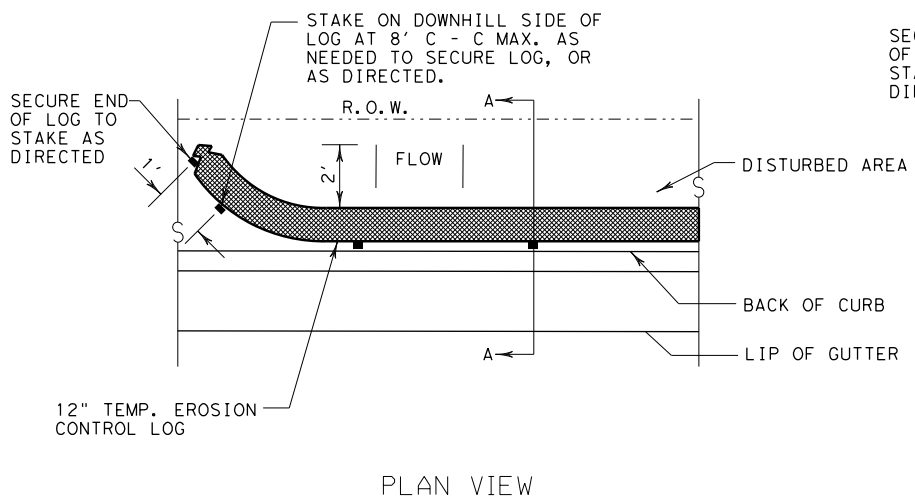
LOGS PLACED AT AREA DRAIN INLETS
 NTS



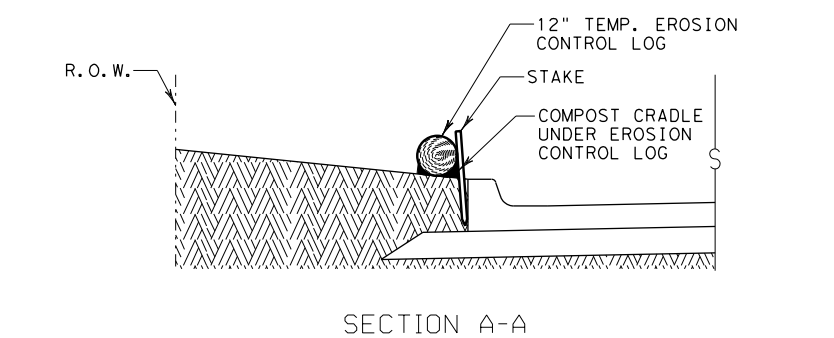
EROSION CONTROL LOG CHECK DAM
 NTS



SECTION C-C

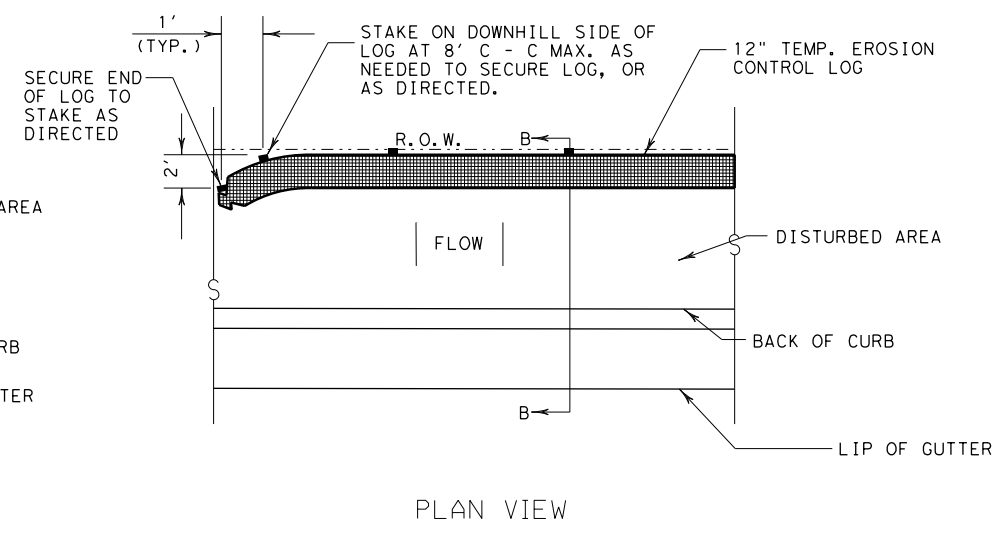


PLAN VIEW

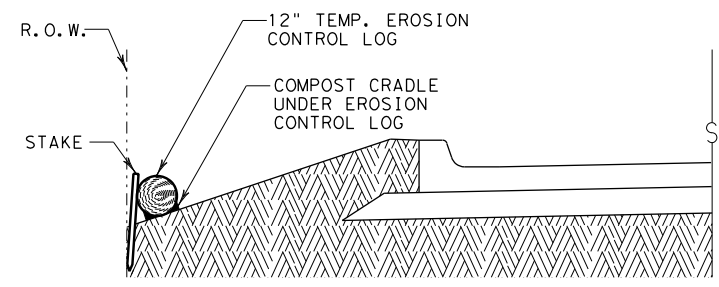


SECTION A-A

LOG PLACED AT BACK OF CURB
 NTS

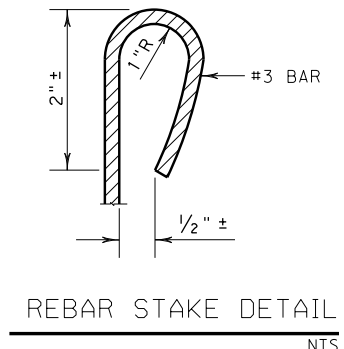


PLAN VIEW

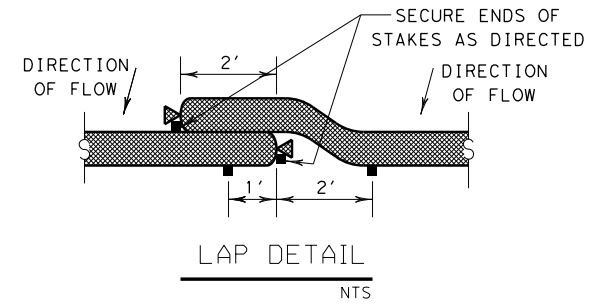


SECTION B-B

LOG PLACED AT EDGE OF RIGHT-OF-WAY
 NTS



REBAR STAKE DETAIL
 NTS



LAP DETAIL
 NTS

GENERAL NOTES:

1. LENGTHS OF EROSION CONTROL LOGS SHALL BE IN ACCORDANCE WITH MANUFACTURER'S RECOMMENDATIONS AND AS REQUIRED FOR THE PURPOSE INTENDED. MAXIMUM LENGTH OF LOGS SHALL BE 60' FOR 18" DIAMETER OR 30' FOR 12" DIAMETER LOGS.
2. 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.
3. STUFF LOGS WITH SUFFICIENT FILTER MATERIAL TO ACHIEVE DENSITY THAT WILL HOLD SHAPE WITHOUT EXCESSIVE DEFORMATION.
4. STAKES SHALL BE 2" X 2" WOOD OR #3 REBAR, 4' LONG, EMBEDDED SUCH THAT 2" PROTRUDES ABOVE LOG, OR AS DIRECTED.
5. DO NOT PLACE STAKES THROUGH CONTAINMENT MESH.

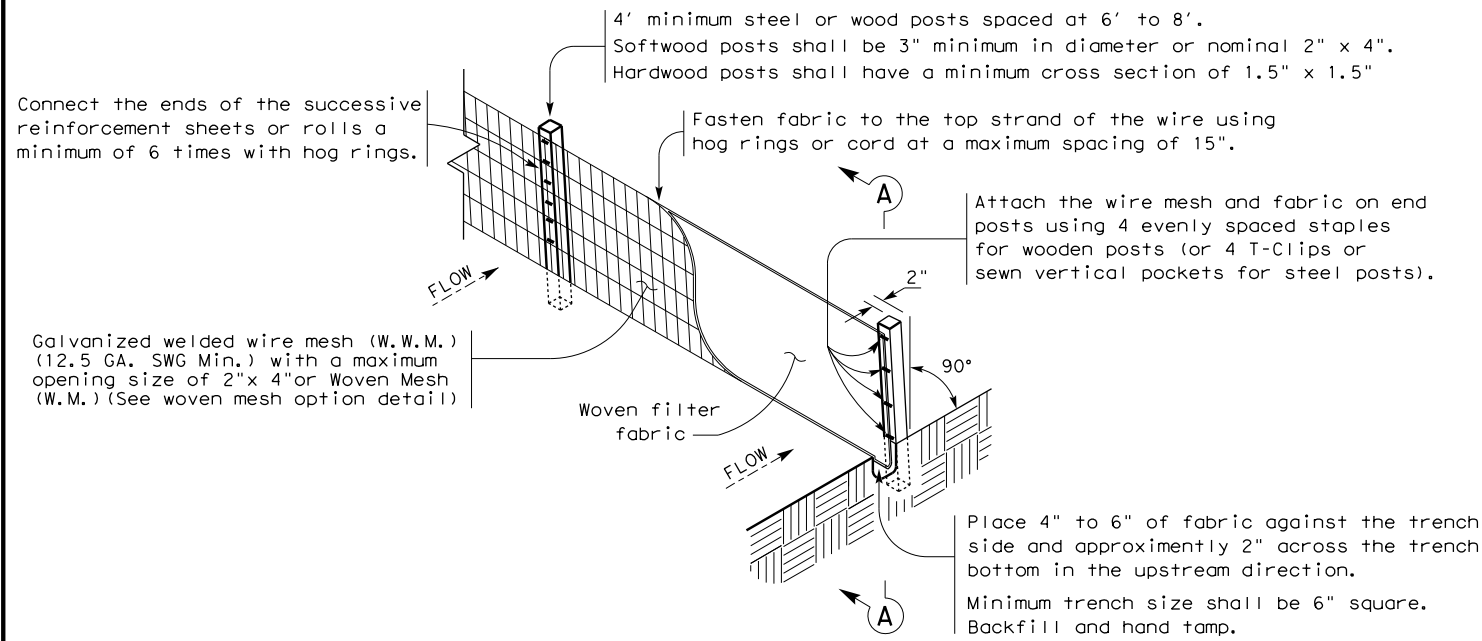
Texas Department of Transportation
 FORT WORTH DISTRICT

TEMPORARY EROSION CONTROL LOGS
 TECL-04 (FW)

FED. RD. DIV. NO. 6	FEDERAL AID PROJECT NO. SEE TITLE SHEET		HIGHWAY NO. GILLILAND RD
STATE TEXAS	DISTRICT FTW	COUNTY PARKER	SHEET NO. 107
CONTROL 0902	SECTION 38	JOB 120	

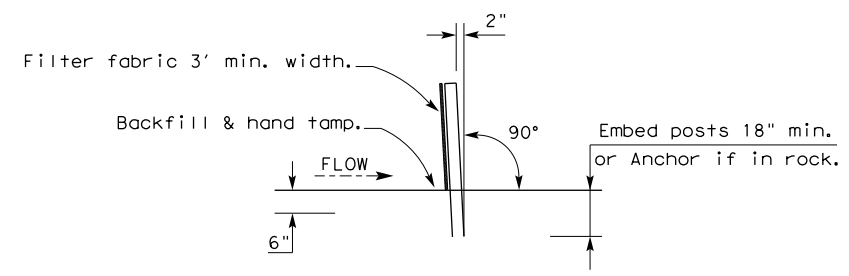
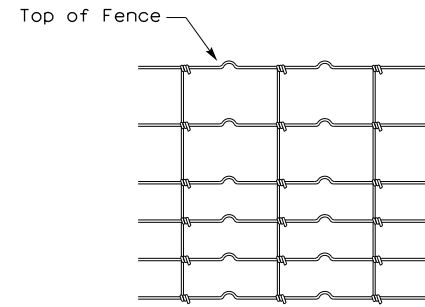
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TEMPORARY SEDIMENT CONTROL FENCE

SCF



SECTION A-A

HINGE JOINT KNOT WOVEN MESH (OPTION) DETAIL

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

SEDIMENT CONTROL FENCE USAGE GUIDELINES

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

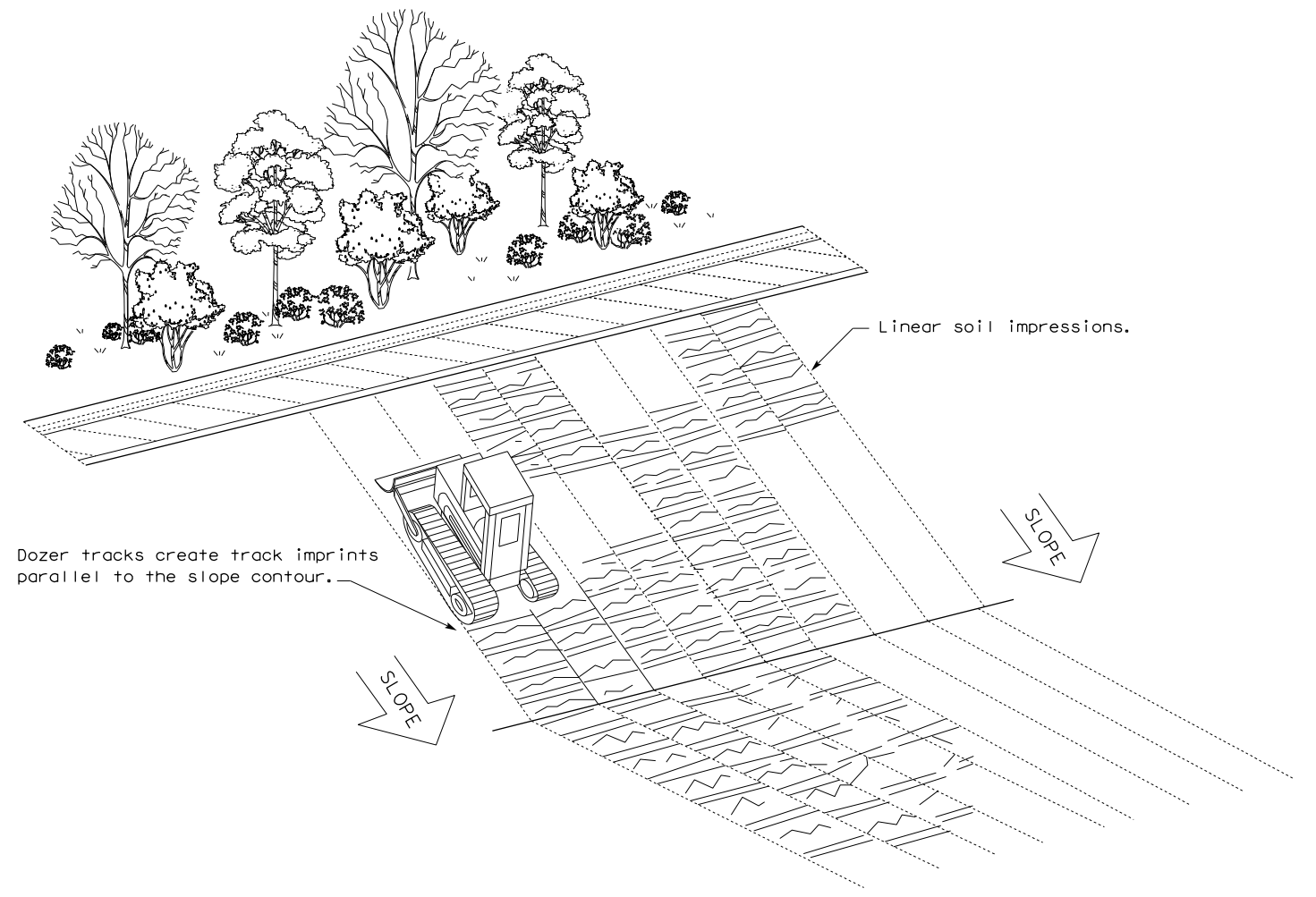
Sediment control fence should be sized to filter a maximum flow through rate of 100 GPM/FT². Sediment control fence is not recommended to control erosion from a drainage area larger than 2 acres.

LEGEND

Sediment Control Fence
 SCF

GENERAL NOTES

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

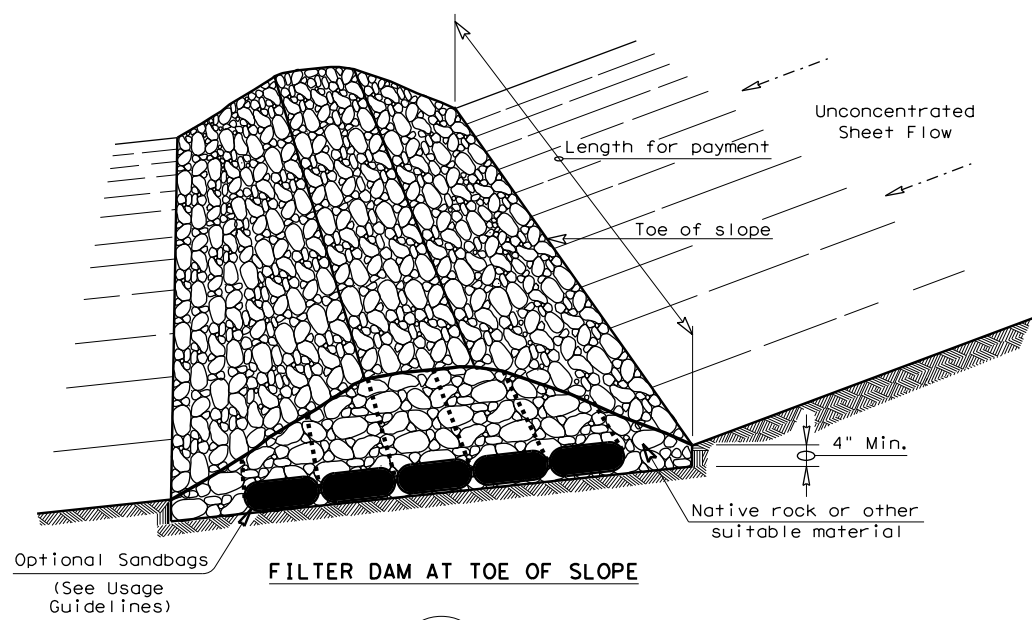


VERTICAL TRACKING

				Design Division Standard	
TEMPORARY EROSION, SEDIMENT AND WATER POLLUTION CONTROL MEASURES FENCE & VERTICAL TRACKING EC(1)-16					
FILE: ec116	DN: TxDOT	CK: KM	DW: VP	DN/CK: LS	
© TxDOT: JULY 2016	CONT	SECT	JOB	HIGHWAY	
REVISIONS		0902	38	120	GILLILAND RD
	DIST	COUNTY		SHEET NO.	
	FTW	PARKER		108	

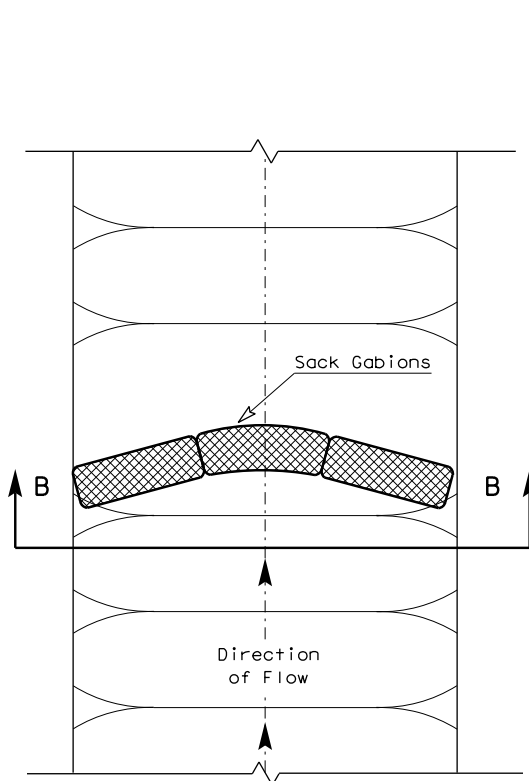
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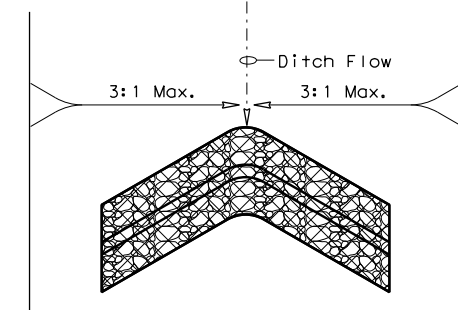


FILTER DAM AT TOE OF SLOPE

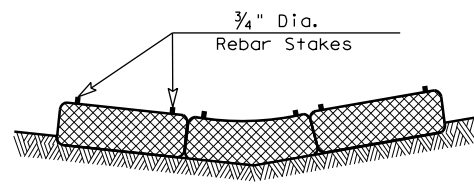
(RFD1)



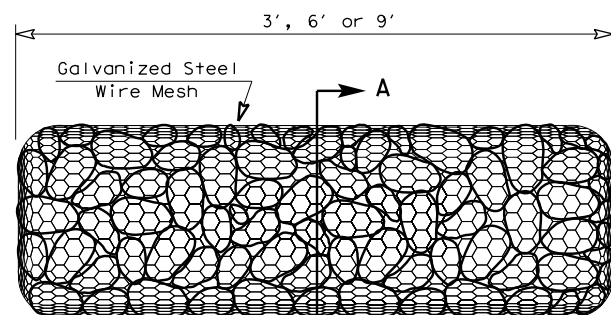
PLAN VIEW



"V" SHAPE PLAN VIEW

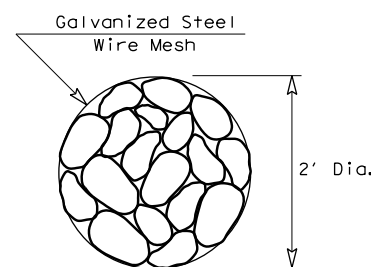


SECTION B-B

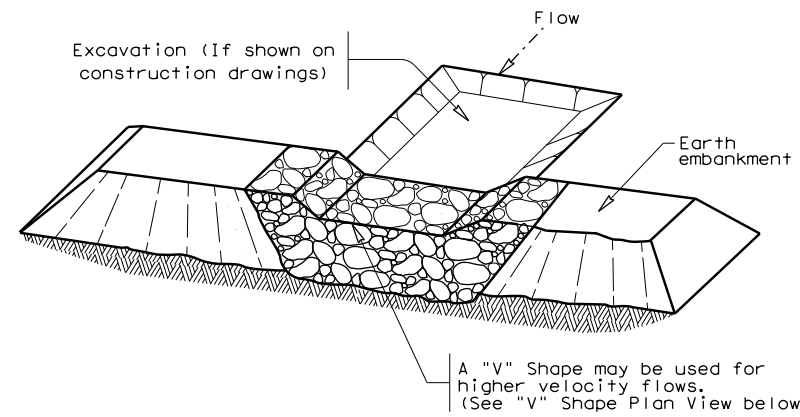


TYPE 4 (SACK GABIONS)

(RFD4)

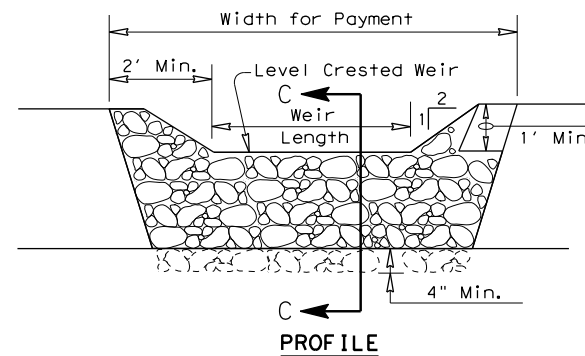


SECTION A-A

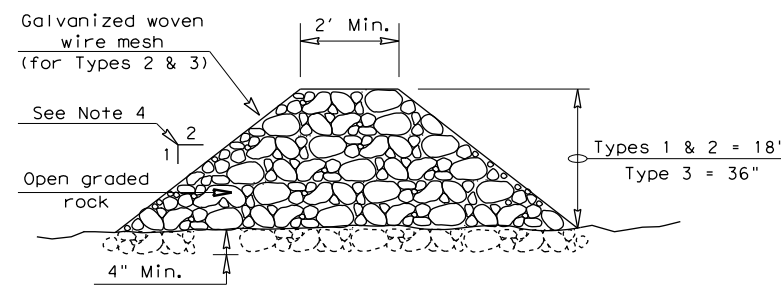


FILTER DAM AT SEDIMENT TRAP

(RFD1) OR (RFD2)



PROFILE



SECTION C-C

ROCK FILTER DAM USAGE GUIDELINES

Rock Filter Dams should be constructed downstream from disturbed areas to intercept sediment from overland runoff and/or concentrated flow. The dams should be sized to filter a maximum flow through rate of 60 GPM/FT² of cross sectional area. A 2 year storm frequency may be used to calculate the flow rate.

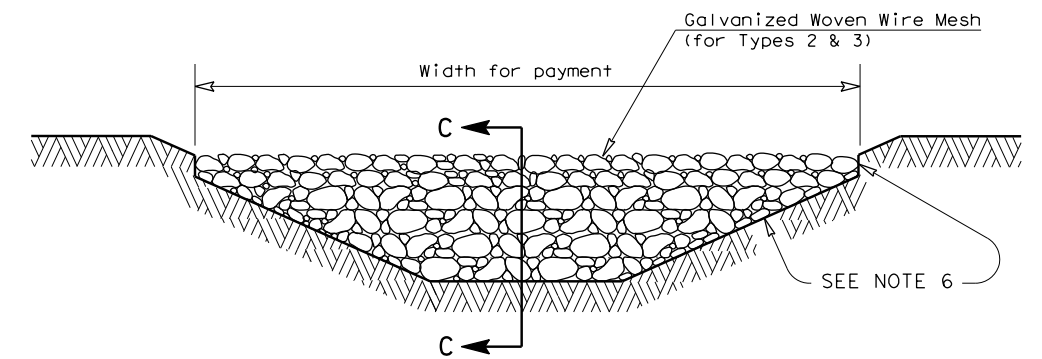
Type 1 (18" high with no wire mesh) (3" to 6" aggregate): Type 1 may be used at the toe of slopes, around inlets, in small ditches, and at dike or swale outlets. This type of dam is recommended to control erosion from a drainage area of 5 acres or less. Type 1 may not be used in concentrated high velocity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

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

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

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

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



FILTER DAM AT CHANNEL SECTIONS

(RFD1) OR (RFD2) OR (RFD3)

GENERAL NOTES

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

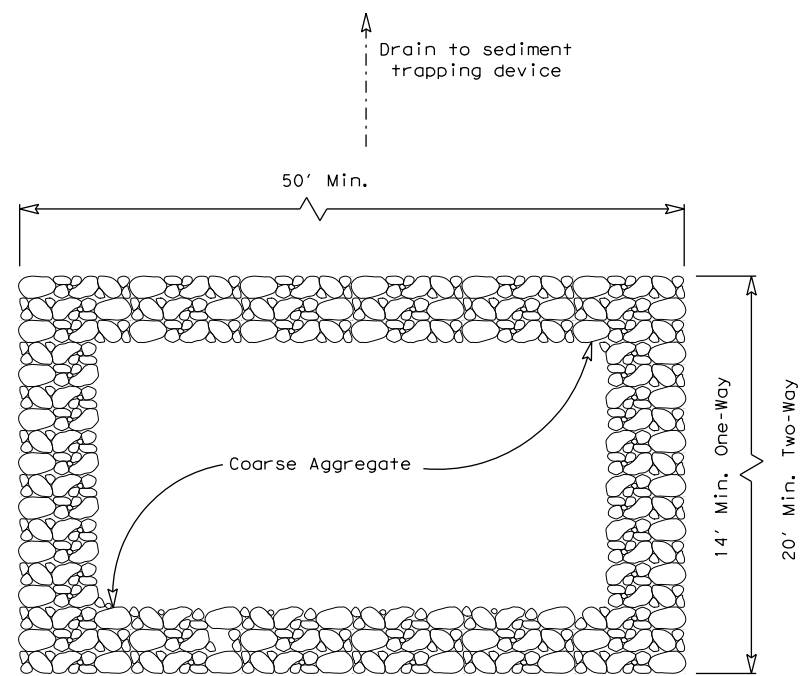
PLAN SHEET LEGEND

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

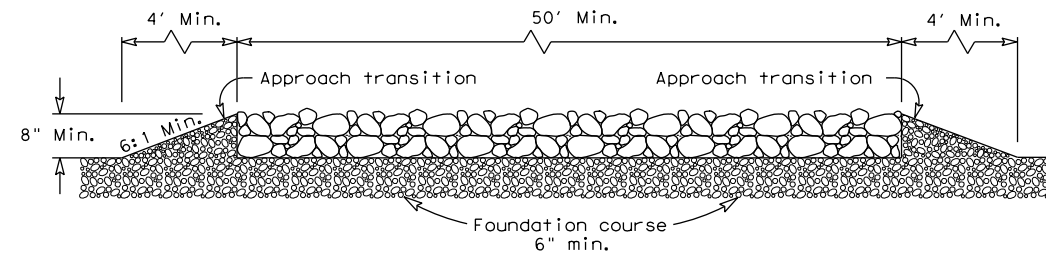
		Design Division Standard	
TEMPORARY EROSION, SEDIMENT AND WATER POLLUTION CONTROL MEASURES			
ROCK FILTER DAMS			
EC (2) - 16			
FILE: ec216	DN: TxDOT	CK: KM	DW: VP
© TxDOT: JULY 2016	CONT: 0902	SECT: 38	JOB: 120
REVISIONS		GILLILAND RD	
DIST: FTW	COUNTY: PARKER	SHEET NO. 109	

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PLAN VIEW

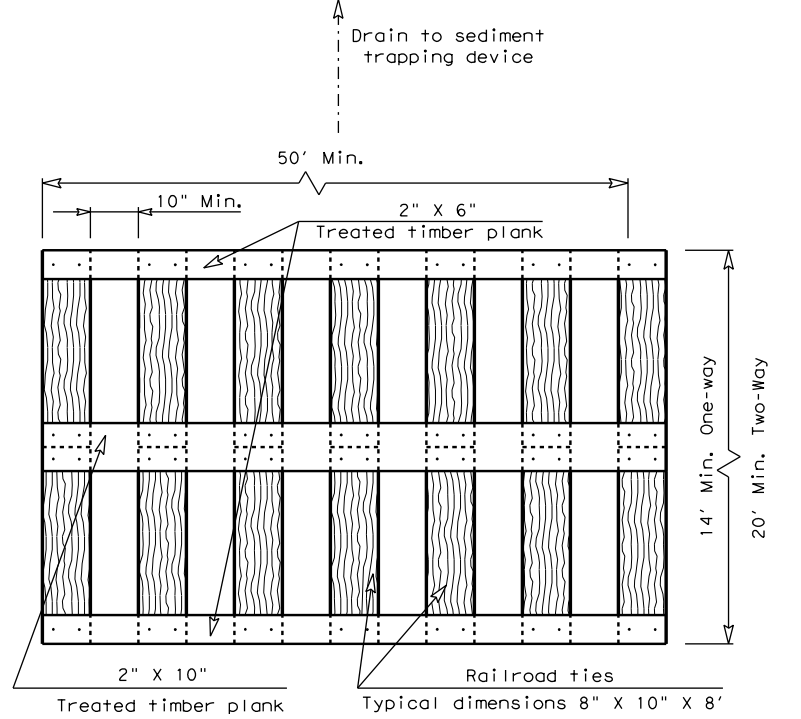


ELEVATION VIEW

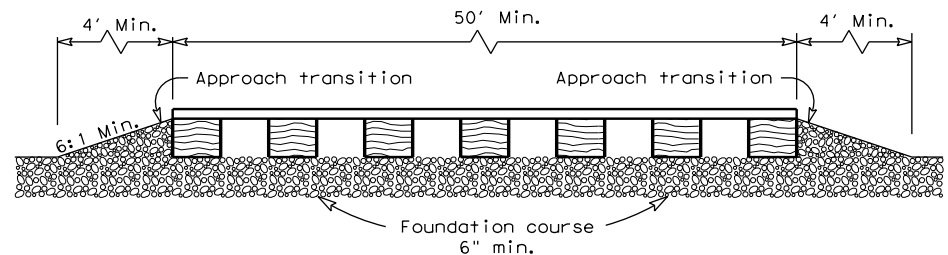
CONSTRUCTION EXIT (TYPE 1)
 ROCK CONSTRUCTION (LONG TERM)

GENERAL NOTES (TYPE 1)

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



PLAN VIEW

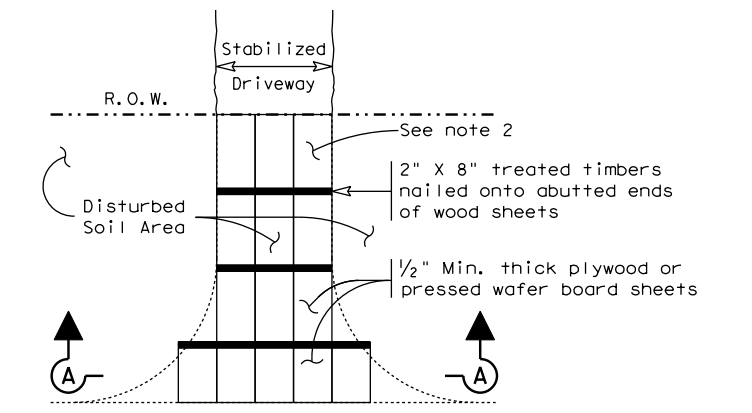


ELEVATION VIEW

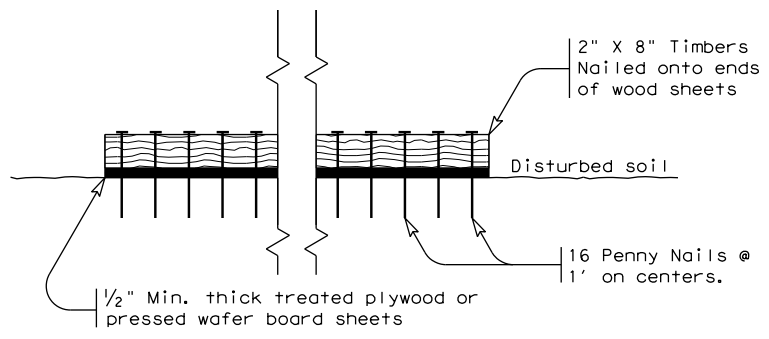
CONSTRUCTION EXIT (TYPE 2)
 TIMBER CONSTRUCTION (LONG TERM)

GENERAL NOTES (TYPE 2)

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



PLAN VIEW



SECTION A-A
 CONSTRUCTION EXIT (TYPE 3)
 SHORT TERM

GENERAL NOTES (TYPE 3)

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

		Design Division Standard	
TEMPORARY EROSION, SEDIMENT AND WATER POLLUTION CONTROL MEASURES CONSTRUCTION EXITS			
EC (3) - 16			
FILE: ec316	DN: TxDOT	CK: KM	DW: VP
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REVISIONS		120	GILLILAND RD
DIST	COUNTY	SHEET NO.	
FTW	PARKER	110	