

FED. RD. DIV. NO.	PROJECT NO.	SHEET NO.	
6	BR2021 (903), ETC.	1	
STATE	STATE DIST.	COUNTY	
TEXAS	YKM	FAYETTE	
CONTROL	SECTION	JOB	HIGHWAY NO.
0913	28	083, ETC	CR

INDEX OF SHEETS

SEE SHEET 2

STATE OF TEXAS TEXAS DEPARTMENT OF TRANSPORTATION

PLANS OF PROPOSED STATE HIGHWAY IMPROVEMENT

FEDERAL PROJECT NO. BR 2021(903), ETC

FOR THE CONSTRUCTION OF BRIDGE REPLACEMENT
CONSISTING OF REPLACE BRIDGE AND APPROACHES

CONTRACTOR: _____
 DATE OF LETTING: _____
 DATE WORK BEGAN: _____
 DATE WORK COMPLETED: _____
 DATE WORK ACCEPTED: _____
 FINAL CONTRACT COST: \$ _____

LIST OF APPROVED FIELD CHANGES:

THIS IS TO CERTIFY THAT THE CONSTRUCTION WORK WAS PERFORMED IN ACCORDANCE WITH THE PLANS, CONTRACT, AND LISTED FIELD CHANGES.

AREA ENGINEER _____ P. E. _____ DATE _____

- ① PROJECT NO.: BR 2021(903)
 COUNTY: FAYETTE
 CSJ: 0913-28-083
 HIGHWAY: BOEHNKE RD
 LIMITS FROM: BOEHNKE RD (CR 530) AT BUSBY BRANCH
 FUNCTIONAL CLASS: RURAL LOCAL ROAD
 DESIGN SPEED: MEETS OR IMPROVES EXISTING
 ADT: 38 VPD (2017), 53 VPD (2040)
 ROADWAY = 290.00 LF = 0.055 MI
 BRIDGE = 65.00 LF = 0.012 MI
 TOTAL = 355.00 LF = 0.067 MI

- ② PROJECT NO.: BR 2022(767)
 COUNTY: FAYETTE
 CSJ: 0913-28-068
 HIGHWAY: WALLACE RD
 LIMITS FROM: WALLACE RD CR 480) AT BUCKNERS CREEK
 FUNCTIONAL CLASS: RURAL LOCAL ROAD
 DESIGN SPEED: MEETS OR IMPROVES EXISTING
 ADT: 55 VPD (2017), 77 VPD (2040)
 ROADWAY = 310.00 LF = 0.059 MI
 BRIDGE = 105.00 LF = 0.020 MI
 TOTAL = 415.00 LF = 0.079 MI

- ③ PROJECT NO.: BR 2021(904)
 COUNTY: FAYETTE
 CSJ: 0913-28-085
 HIGHWAY: N OLD SMITHVILLE RD
 LIMITS FROM: N OLD SMITHVILLE RD (CR 483) AT BUCKNERS CREEK
 FUNCTIONAL CLASS: RURAL LOCAL ROAD
 DESIGN SPEED: MEETS OR IMPROVES EXISTING
 ADT: 101 VPD (2017), 141 VPD (2040)
 ROADWAY = 262.00 LF = 0.050 MI
 BRIDGE = 105.00 LF = 0.019 MI
 TOTAL = 367.00 LF = 0.069 MI

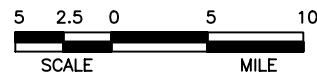
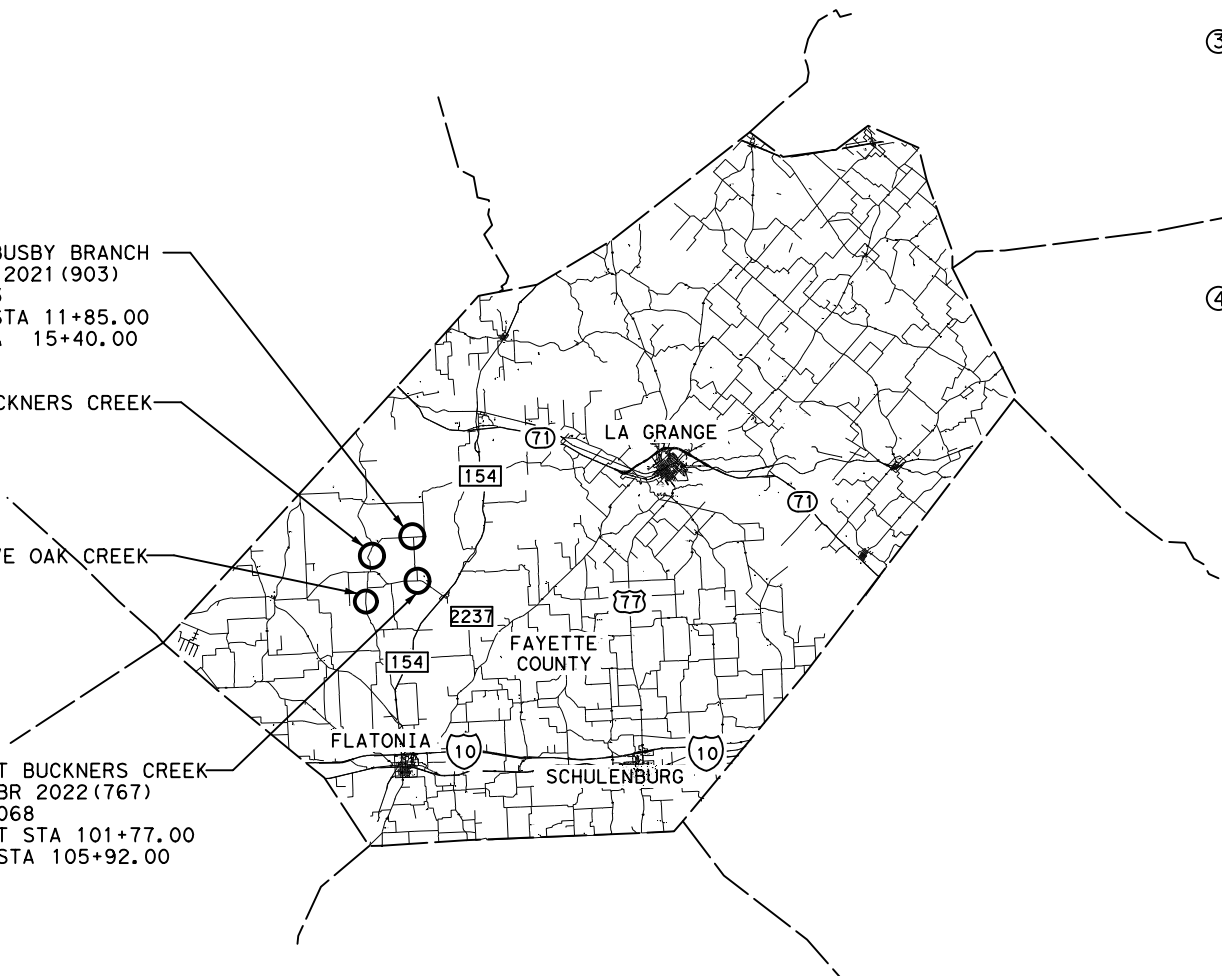
- ④ PROJECT NO.: BR 2022(779)
 COUNTY: FAYETTE
 CSJ: 0913-28-086
 HIGHWAY: S. OLD SMITHVILLE RD
 LIMITS FROM: S OLD SMITHVILLE RD (CR 477) AT LIVE OAK CREEK
 FUNCTIONAL CLASS: RURAL LOCAL ROAD
 DESIGN SPEED: MEETS OR IMPROVES EXISTING
 ADT: 32 VPD (2017), 45 VPD (2040)
 ROADWAY = 270.00 LF = 0.051 MI
 BRIDGE = 95.00 LF = 0.018 MI
 TOTAL = 365.00 LF = 0.069 MI

- ① BOEHNKE RD AT BUSBY BRANCH
 PROJECT NO. BR 2021(903)
 CSJ 0913-28-083
 BEGIN PROJECT STA 11+85.00
 END PROJECT STA 15+40.00

- ③ N. OLD SMITHVILLE RD AT BUCKNERS CREEK
 PROJECT NO. BR (2021(904)
 CSJ 0913-28-085
 BEGIN PROJECT STA 12+69.00
 END PROJECT STA 16+36.00

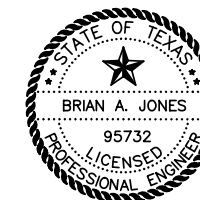
- ④ S. OLD SMITHVILLE RD AT LIVE OAK CREEK
 PROJECT NO. BR 2022(779)
 CSJ 0913-28-086
 BEGIN PROJECT STA 11+65.00
 END PROJECT STA 15+30.00

- ② WALLACE RD AT BUCKNERS CREEK
 PROJECT NO. BR 2022(767)
 CSJ 0913-28-068
 BEGIN PROJECT STA 101+77.00
 END PROJECT STA 105+92.00



FAYETTE COUNTY
YOAKUM DISTRICT

EXCEPTIONS: NONE
 RAILROAD CROSSINGS: NONE
 EQUATIONS: NONE



SUBMITTED FOR LETTING 10/14/2022

Brian A. Jones
 PROJECT MANAGER
 CP&Y, INC.

RECOMMENDED FOR LETTING 1/3/2023

DocuSigned by:
Jeffery Vinckland
 DIRECTOR OF TRANSPORTATION
 PLANNING & DEVELOPMENT

CONCURRENCE 1/3/2023

DocuSigned by:
Judge Dan Mueller
 COUNTY JUDGE, FAYETTE COUNTY

APPROVED FOR LETTING 1/3/2023

DocuSigned by:
Martin C. Horst, PE
 DISTRICT ENGINEER

10/13/2022 3:40:12 PM

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

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 pw:/Active Projects/TXY01900505.00/Plan Set 13/8.00 Plans and Drawings/8.30 Cut Sheets/8.3.01 General/51328083GNgi.dgn

SHEET NO.	DESCRIPTION
GENERAL	
1	TITLE SHEET
2	INDEX OF SHEETS
3	TYPICAL SECTIONS (BOEHNKE RD AT BUSBY BRANCH)
4	TYPICAL SECTIONS (WALLACE RD AT BUCKNERS CREEK)
5	TYPICAL SECTIONS (N. OLD SMITHVILLE AT BUCKNERS CREEK)
6	TYPICAL SECTIONS (S. OLD SMITHVILLE AT LIVE OAK CREEK)
7,7A-7D	GENERAL NOTES
8, 8A	ESTIMATE & QUANTITY SHEET
9	SUMMARY OF QUANTITIES (BOEHNKE RD AT BUSBY BRANCH)
10	SUMMARY OF QUANTITIES (WALLACE RD AT BUCKNERS CREEK)
11	SUMMARY OF QUANTITIES (N. OLD SMITHVILLE AT BUCKNERS CREEK)
12	SUMMARY OF QUANTITIES (S. OLD SMITHVILLE AT LIVE OAK CREEK)
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30 - 31	HORIZONTAL/VERTICAL CONTROL SHEET (BOEHNKE RD AT BUSBY BRANCH)
32	HORIZONTAL/VERTICAL CONTROL INDEX SHEET (WALLACE RD AT BUCKNERS CREEK)
33 - 34	HORIZONTAL/VERTICAL CONTROL SHEET (WALLACE RD AT BUCKNERS CREEK)
35	HORIZONTAL/VERTICAL CONTROL INDEX SHEET (N. OLD SMITHVILLE AT BUCKNERS CREEK)
36 - 37	HORIZONTAL/VERTICAL CONTROL SHEET (N. OLD SMITHVILLE AT BUCKNERS CREEK)
38	HORIZONTAL/VERTICAL CONTROL INDEX SHEET (S. OLD SMITHVILLE AT LIVE OAK CREEK)
39 - 40	HORIZONTAL/VERTICAL CONTROL SHEET (S. OLD SMITHVILLE AT LIVE OAK CREEK)
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42	PLAN AND PROFILE (WALLACE RD AT BUCKNERS CREEK)
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44	PLAN AND PROFILE (S. OLD SMITHVILLE AT LIVE OAK CREEK)
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59	HYDRAULIC DATA SHEET (N. OLD SMITHVILLE AT BUCKNERS CREEK)
60	HYDRAULIC DATA SHEET (S. OLD SMITHVILLE AT LIVE OAK CREEK)
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71	BRIDGE LAYOUT (N. OLD SMITHVILLE RD AT BUCKNERS CREEK)
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73	ESTIMATED QUANTITIES AND CAP ELEVATIONS (N. OLD SMITHVILLE RD AT BUCKNERS CREEK)
74	BRIDGE LAYOUT (S. OLD SMITHVILLE RD AT LIVE OAK CREEK)
75	BORING LOGS (S. OLD SMITHVILLE RD AT LIVE OAK CREEK)
76	ESTIMATED QUANTITIES AND CAP ELEVATIONS (S. OLD SMITHVILLE RD AT LIVE OAK CREEK)

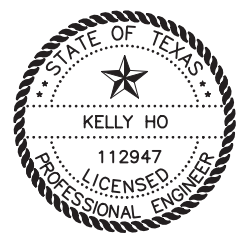
SHEET NO.	DESCRIPTION
STANDARD SHEETS	
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79 - 80	# SBBS-B20-24
81 - 83	# AIG-24
84	# BIG-24
85 - 86	# SIG-24
87	# APSB-24 (MOD)
88	# BPSB-24
89	# SPSB-24
90	# APSB-24-15
91	# BPSB-24-15
92	# SPSB-24-15
93	# AJ
94 - 96	# BB-B20
97	# BBEB
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99	# BBSDB-B20-24
100 - 101	# CSAB
102 - 103	# FD
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142	* D & OM(2)-20
143	* D & OM(3)-20
144	* D & OM(4)-20
145	* D & OM(5)-20
146	* D & OM(VIA)-20
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155	SW3P LAYOUT (BOEHNKE RD AT BUSBY BRANCH)
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159, 159A	ENVIRONMENTAL PERMITS, ISSUES & COMMITMENTS
STANDARD SHEETS	
160	* EC(1)-16



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

Sandra Morris

SANDRA GAIL MORRIS, P.E. 01/03/2023

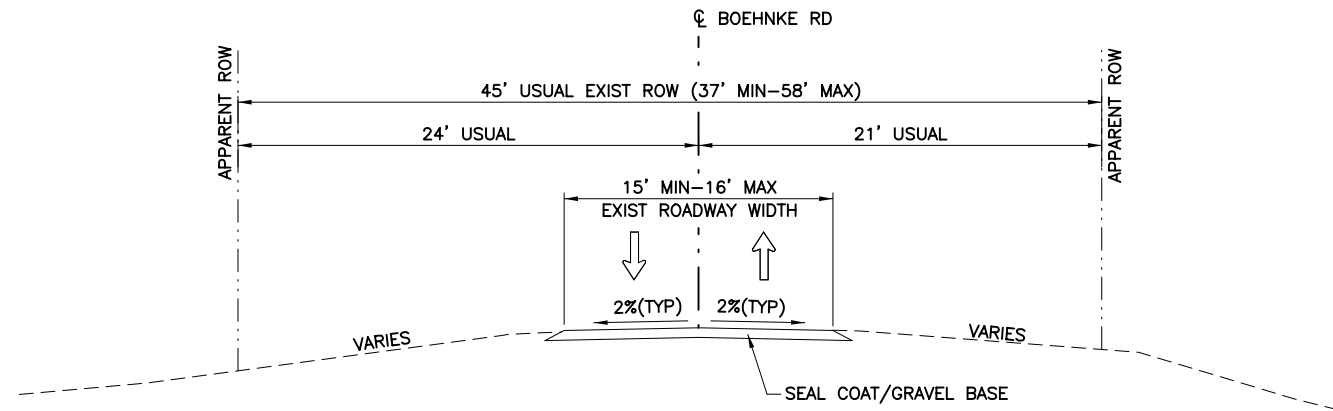


THE STANDARD SHEETS SPECIFICALLY IDENTIFIED ABOVE BY "#" HAVE BEEN SELECTED BY ME OR UNDER MY RESPONSIBLE SUPERVISION AS BEING APPLICABLE TO THIS PROJECT.

Kelly Ho

KELLY HO, P.E. 01/03/2023

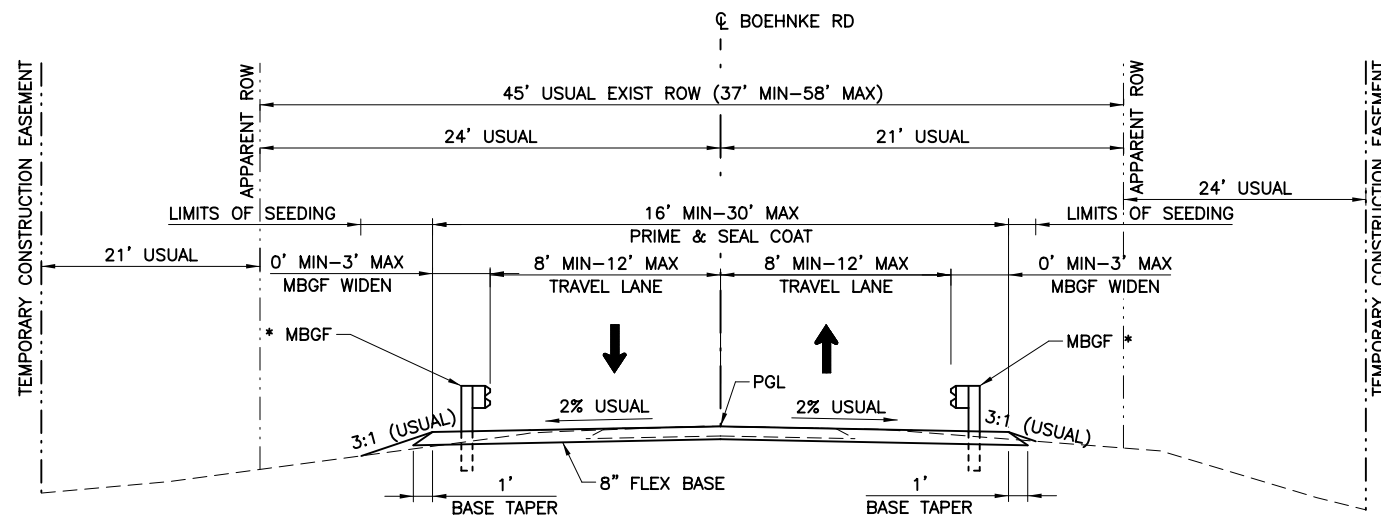
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INDEX OF SHEETS			
SHEET 1 OF 1			
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Checked:	SM	FEDERAL AID PROJECT NO.	
Drawn:	GH	DIST. COUNTY	CONTROL NO. SECTION NO. JOB NO.
Checked:	SM	YKM FAYETTE	0913 28 083,ETC.
			HIGHWAY NO. CR
			SHEET NO. 2



EXISTING ROADWAY TYPICAL SECTION

NOT TO SCALE

STA 11+85.00 TO STA 15+40.00
EXIST STRUCTURE: STA 13+50.06 TO STA 13+89.96



PROPOSED ROADWAY TYPICAL SECTION

NOT TO SCALE


STA 11+85.00 TO STA 12+35.00 16'-30'
STA 12+35.00 TO STA 13+30.00 30'
STA 13+30.00 TO STA 13+95.00 BRIDGE
STA 13+95.00 TO STA 14+90.00 30'
STA 14+90.00 TO STA 15+40.00 30'-16'

* SEE PLAN AND PROFILE FOR LIMITS OF MBGF

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Sandra Morris
10/14/2022

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TEXAS REGISTERED ENGINEERING FIRM F-1741

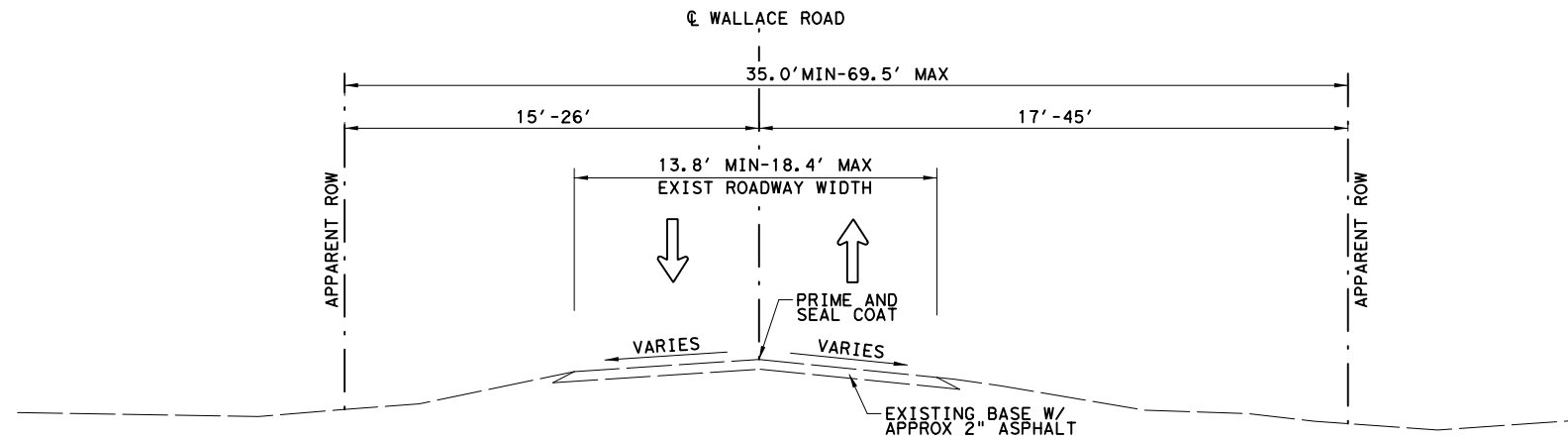


BOEHNKE RD AT BUSBY BRANCH

TYPICAL SECTIONS

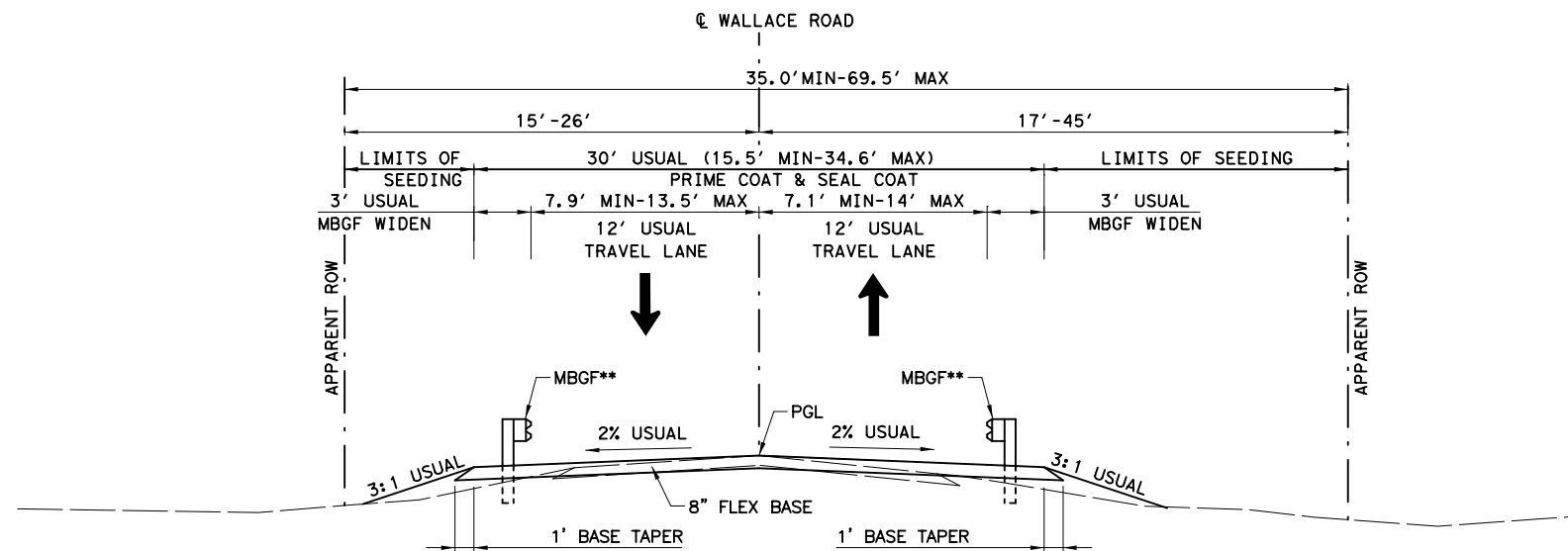
CSJ 0913-28-083 SHEET 1 OF 1

Designed:	GH	FED. RD. DIV. NO.	STATE	FEDERAL AID PROJECT NO.	HIGHWAY NO.
Checked:	SM	6	TEXAS		CR
Drawn:	GH	DIST.	COUNTY	CONTROL NO.	SECTION NO.
Checked:	SM	YKM	FAYETTE	0913	28 083,ETC



EXISTING ROADWAY TYPICAL SECTION

STA 101+77.00 TO STA 103+54.25
 STA 103+54.25 TO STA 104+46.00 (BRIDGE)
 STA 104+46.00 TO STA 105+92.00



PROPOSED ROADWAY TYPICAL SECTION

STA 101+77.00 TO STA 102+27.00 (15.5'-30') (TRANS)
 STA 102+27.00 TO STA 102+57.00 (30'-32.5')
 STA 102+57.00 TO STA 103+34.00 (32.5'-30')
 STA 103+34.00 TO STA 103+46.00 (24')
 STA 103+46.00 TO STA 104+51.00 (24') BRIDGE
 STA 104+51.00 TO STA 104+63.00 (24')
 STA 104+63.00 TO STA 105+40.50 (30'-34.5')
 STA 105+40.50 TO STA 105+92.00 (34.5'-18.4') (TRANS)

** SEE PLAN AND PROFILE SHEET FOR LIMITS OF MBGF

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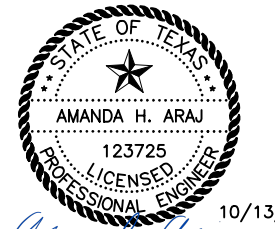
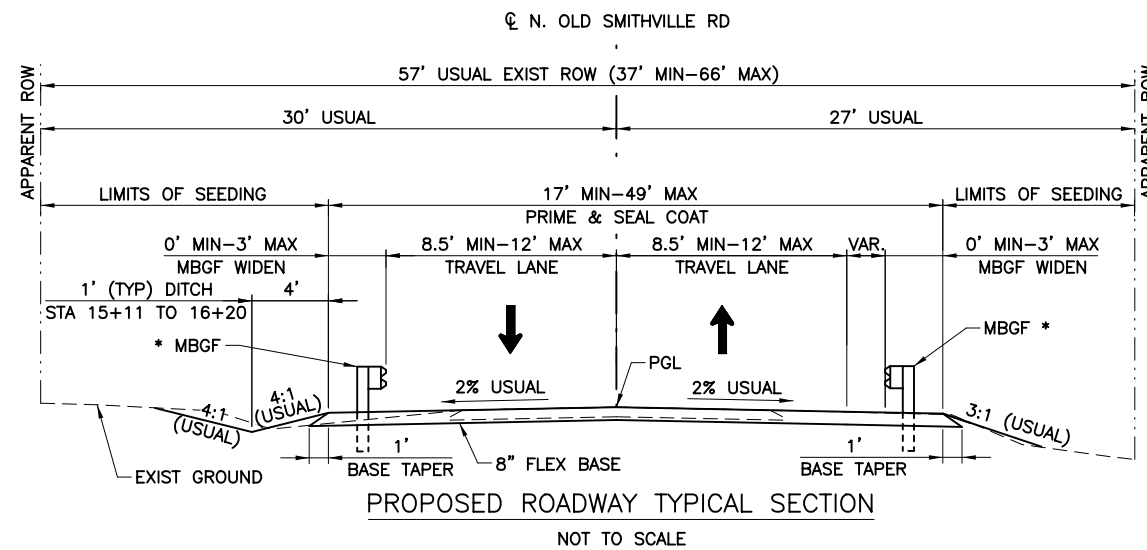
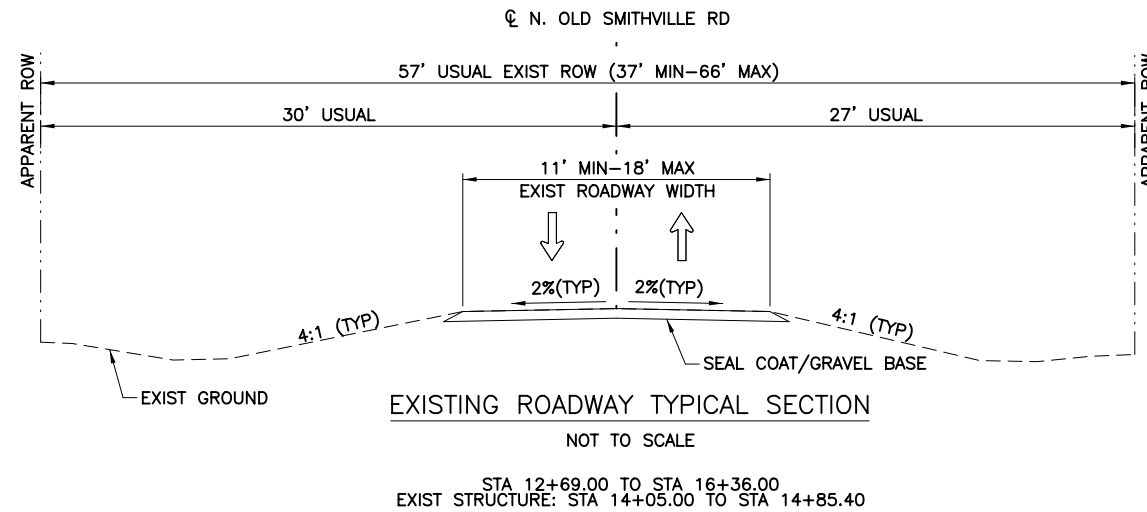
BGE, Inc.
 1701 Directors Blvd., Suite 1000, Austin, TX 78744
 Tel: 512-879-0400 • www.bgeinc.com
 TBPE Registration No. F-1046

©2022 **Texas Department of Transportation**
 WALLACE ROAD AT BUCKNERS CREEK

TYPICALS SECTIONS

CSJ 0913-28-068 SHEET 1 OF 1

Designed:	BGE	FED. RD. DIV. NO.	STATE	FEDERAL AID PROJECT NO.	HIGHWAY NO.		
Checked:	BGE	6	TEXAS		CR		
Drawn:	BGE	DIST.	COUNTY	CONTROL NO.	SECTION NO.	JOB NO.	SHEET NO.
Checked:	BGE	YKM	FAYETTE	0913	28	083,ETC.	4



10/13/2022
Amanda Araj

NO.	REVISION	BY	DATE

wsp WSP USA Inc.
 16200 Park Row, Suite 200
 Houston, TX 77084
 TBPE # F-2263

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 NORTH OLD SMITHVILLE RD (CR 483) AT BUCKNERS CREEK

TYPICAL SECTIONS

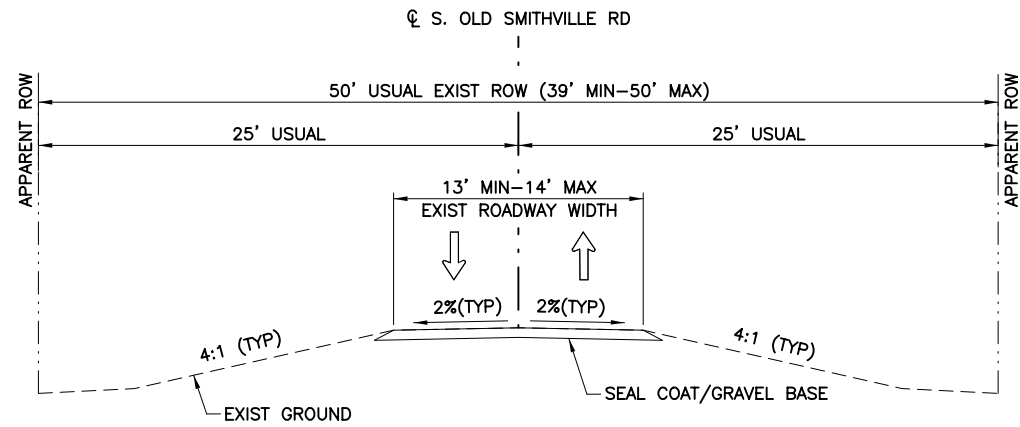
CSJ 0913-28-085 SHEET 1 OF 1

Designed:	GD	FED. RD. DIV. NO.	STATE	FEDERAL AID PROJECT NO.	HIGHWAY NO.		
Checked:	AA	6	TEXAS		CR		
Drawn:	GD	DIST.	COUNTY	CONTROL NO.	SECTION NO.	JOB NO.	SHEET NO.
Checked:	AA	YKM	FAYETTE	0913	28	083,ETC.	5

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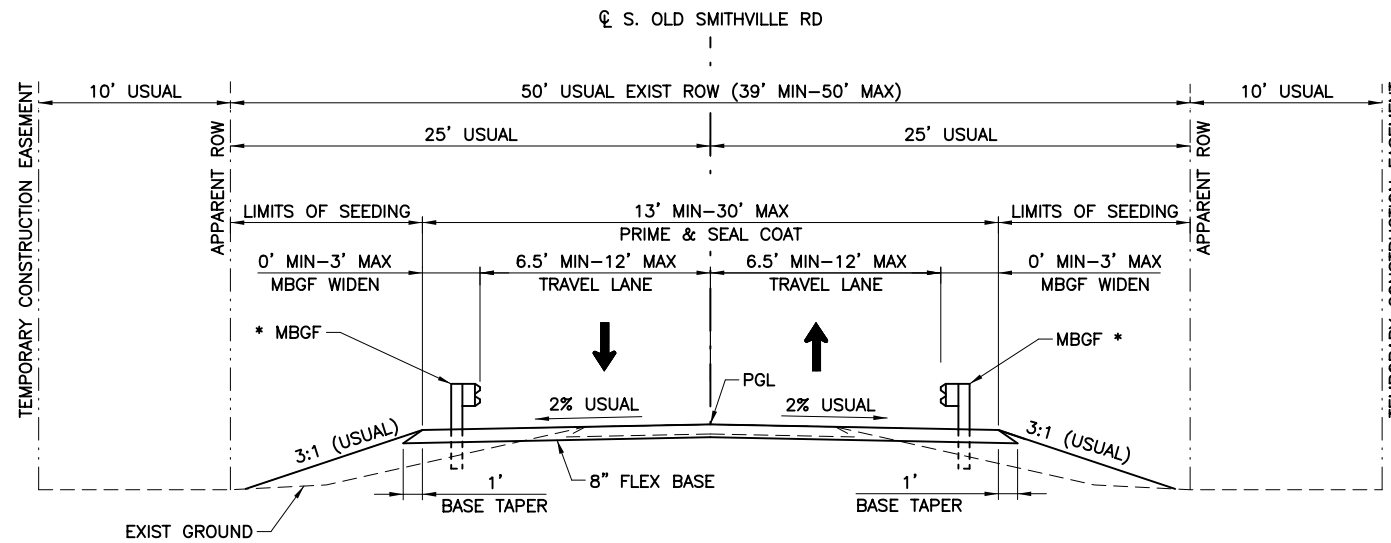
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EXISTING ROADWAY TYPICAL SECTION

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EXIST STRUCTURE: STA 13+04.98 TO STA 13+89.72

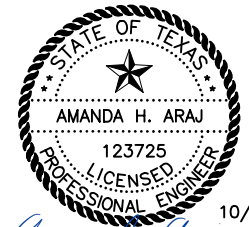


PROPOSED ROADWAY TYPICAL SECTION

NOT TO SCALE

STA 11+65.00 TO STA 12+15.00 13'-30'
STA 12+15.00 TO STA 13+00.00 30'
STA 13+00.00 TO STA 13+95.00 BRIDGE
STA 13+95.00 TO STA 14+80.00 30'
STA 14+80.00 TO STA 15+30.00 30'-14'

* SEE PLAN AND PROFILE FOR LIMITS OF MBGF



10/13/2022

NO.	REVISION	BY	DATE



WSP USA Inc.
16200 Park Row, Suite 200
Houston, TX 77084
TBPE # F-2263

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SOUTH OLD SMITHVILLE RD (CR 477) AT LIVE OAK CREEK

TYPICAL SECTIONS

CSJ 0913-28-086 SHEET 1 OF 1

Designed:	GD	FED. RD. DIV. NO.	STATE	FEDERAL AID PROJECT NO.	HIGHWAY NO.		
Checked:	AA	6	TEXAS		CR		
Drawn:	GD	DIST.	COUNTY	CONTROL NO.	SECTION NO.	JOB NO.	SHEET NO.
Checked:	AA	YKM	FAYETTE	0913	28	083, ETC.	6

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County: Fayette

Control: 0913-28-083, etc.

Highway: CR

GENERAL NOTES:**GENERAL:**

The Contractor is to take note that this project has Milestones for substantial completion. See Item 8 below for details.

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

Covey Morrow IV Covey.Morrow@txdot.gov

Chase Hermes Chase.Hermes@txdot.gov

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

Questions may be submitted via the Letting Pre-Bid Q&A web page. This webpage can be accessed from the Notice to Contractors dashboard located at the following Address:
<https://tableau.txdot.gov/views/ProjectInformationDashboard/NoticetoContractors>

All contractor questions will be reviewed by the Engineer. All questions and any corresponding responses that are generated will be posted through the same Letting Pre-Bid Q&A web page.

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

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.

The Contractor may need to make necessary accommodations to facilitate the delivery of materials and equipment to the project due to tight horizontal curves. This work is subsidiary to the pertinent bid items.

Provide a minimum two week advance notice to TxDOT prior to closing County Roads. TxDOT will notify local officials at least one week in advance.

CSJ 0913-28-086 (S. Old Smithville Road): contact Fayette County Precinct 3 at (979) 743-6405 a minimum of 7 days prior to beginning work at this location to coordinate the movement of cattle and installation of temporary fencing. Maintain pasture control for the duration of construction until work is complete and permanent fence is installed.

County: Fayette

Control: 0913-28-083, etc.

Highway: CR

Remove and replace right-of-way fences at particular work sites, where necessary, at contractor's entire expense except as shown on plans. Replace fences in a condition comparable to that at removal.

Do not work on the roadway before sunrise or after sunset unless otherwise approved.

The following standard detail sheets have been modified:

ASPB-24 (MOD)

Furnish a certified copy of the legal gross weight of each vehicle hauling materials by weight and certified measurements for all trucks hauling material by volume.

Temporary crossings have been permitted for the project locations. Contactor to provide a layout of the proposed crossing for approval before installation.

Unless otherwise approved, maintain a minimum safety clearance from the edge of the travelway for material stockpiled in proximity of traffic lanes based on the current average traffic count of the particular highway as follows:

0 - 1500 = 16 feet

Over 1500 = 30 feet

In the event the above requirements cannot be met, make arrangements to stockpile material off the right of way.

Provide temporary pipe drains or culverts and take such other measures as directed to provide for continued drainage from all abutting property, the right of way and the roadway during construction operations. Labor and materials involved in this work will not be paid for directly, but will be considered subsidiary to the various bid items of the contract.

The Department will provide the cylinder testing machine for this project. Deliver the test specimens to the engineer's curing facilities as directed.

Do not clean out concrete trucks within the right of way.

ITEM 5: CONTROL OF THE WORK

Where a precast or cast-in-place concrete bridge element is shown in the plans, Contractor may submit a precast concrete alternate in accordance with "Standard Operating Procedure for Alternate Precast Proposal Submission" found online at <https://www.txdot.gov/inside-txdot/forms-publications/consultants-contractors/publications/bridge.html#design>. Acceptance or denial of an alternate is at the sole discretion of the Department. Contractor is responsible for impacts to the project schedule and cost resulting from the denial or use of alternates.

Project Number:

Sheet: 7A

County: Fayette

Control: 0913-28-083, etc.

Highway: CR

ITEM 6: CONTROL OF MATERIALS

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

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

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

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

SPECIAL PROVISION TO ITEM 6:

CSJ: 0913-28-083 (Boehnke Rd at Busby Branch)

As reported by Burcham Environmental Services, L.L.C., in the NESHAP Asbestos/Lead Inspection Report dated December 28, 2021, the red/yellow paint on the steel piles has a lead content ranging from 0.55% to 1.7%.

CSJ: 0913-28-085 (N. Old Smithville Rd at Buckners Creek)

As reported by Burcham Environmental Services, L.L.C., in the NESHAP Asbestos/Lead Inspection Report dated December 28, 2021, the red/yellow paint on the steel rail car has a lead content ranging from 0.2% to 10%.

Provide for the safety and health of employees and abide by all OSHA standards and regulations when removing or disposing of painted steel. Obtain the Engineer's approval of the proposed removal process prior to removing steel elements.

Remove the steel rail car elements found to contain lead. Remove the steel rail car by unbolting, do not use flame cutting or any other method that would cause existing paint to vaporize. Remove and dispose of steel rail car in complete, existing length sections.

If the Contractor determines that saw or flame cutting of the steel pile is necessary to facilitate their removal, the Contractor shall excavate the material surrounding the steel pile down to the pile cut off depth. The excavation shall be adequate to allow the Engineer to verify the presence of paint. The Contractor may have to de-water the excavated area. The material used for de-watering shall be a non-erodible material. If the stream is flowing, near normal flow shall be maintained.

If no paint is present at the pile cut off depth, the Contractor may cut off, remove, and properly dispose of the pile without disturbing the lead paint.

Project Number:

Sheet: 7A

County: Fayette

Control: 0913-28-083, etc.

Highway: CR

Labor, equipment and materials needed to provide excavation or dewatering for the paint investigation or removal process will not be paid for directly, but will be considered subsidiary to Item 496 "Removing Structures".

ITEM 7: LEGAL RELATIONS AND RESPONSIBILITIES

The Contractor's attention is directed to the fact that discharge of permanent or temporary fill material into the waters of the United States (U.S.) including jurisdictional wetlands, as necessary for construction, will require specific approval of the U.S. Army Corps of Engineers (USACE) under Section 404 of the Clean Water Act.

The Department will obtain the appropriate permit(s), Nationwide or Individual, when necessary as dictated by the proposed actions for the project and its potential to affect USACE jurisdictional areas. The Contractor may review the permitted plans at the office of the Area Engineer in charge of construction. The Department will hold the Contractor responsible for following all conditions of the approved permit. If the Contractor cannot work within the limits of this permit(s), then it becomes the Contractor's entire responsibility to consult with the USACE pertaining to the need for changes or amendments to the conditions of the existing permit(s) as originally obtained by the Department.

Particular importance is stressed on the fact that any impacts to USACE jurisdictional waters of the U.S., including jurisdictional wetlands, be the minimum necessary to complete the proposed work. The Contractor shall maintain near normal flow of any jurisdictional waters of the U.S. at all times during construction. If the Contractor needs further explanation of the conditions of the permit, including means of compliance, they may contact the TXDOT Yoakum District Environmental Coordinator.

If the Contractor elects to work on a structure when the stream is flowing, near normal flow shall be maintained by a method approved by the Engineer. Labor and materials involved in this work will not be paid for directly, but will be considered subsidiary to the various bid items of the contract.

No significant traffic generator events identified.

If the contractor proposes work beyond the TxDOT obtained permit limitations, the contractor is responsible for additional costs, delays, and obtaining new or revised permits prior to construction.

Project Number:

Sheet: 7B

County: Fayette

Control: 0913-28-083, etc.

Highway: CR

All temporary construction access work and materials will not be measured or paid for directly but will be subsidiary to pertinent items. Prior to the scheduling of a Pre-Construction Meeting, submit a Temporary Construction Access Plan to the Area Engineer and to District Environmental Staff for their approval. The Construction Plan should contain a description of the equipment, such as barges, structures, etc., which may occupy waters of the US including jurisdictional wetlands, and a detailed work schedule. No work of any kind will be allowed until the pre-construction meeting has been held.

Temporary construction waterway crossings have been environmental cleared/permitted within Right of Way. Restrict construction operations in any water body to the necessary areas as shown on the plans or applicable permit, or as directed. Use temporary bridges, timber mats, or other structurally sound and non-eroding material for stream crossings. All temporary construction access materials shall be completely removed as soon as possible once temporary access is no longer required and affected areas shall be returned to preconstruction elevations and contours and revegetated in accordance with the SW3P. All work must comply with the General Conditions of the appropriate USACE permit.

ITEM 8: PROSECUTION AND PROGRESS

Construct one project location at a time through completion before moving to the next location unless otherwise approved by the Engineer.

Milestone 1 – Boehnke Road at Busby Branch

Time charges for Milestone 1 begin when Boehnke Road (CSJ: 0913-28-083) is closed to traffic. The time charges for Milestone 1 shall end when traffic is following the lane arrangement as shown on the plans for the constructed and/or existing roadway as specified in the TCP (Phase) and/or the final lane configuration. All pavement construction, traffic control devices, and safety devices shall be in their final position (or as called for in the plans for the specified phase of work) at this time.

The contractor shall have 70 working days to complete Milestone 1.

Milestone 2 – Wallace Road at Buckners Creek

Time charges for Milestone 2 begin when Wallace Road (CSJ: 0913-28-068) is closed to traffic. The time charges for Milestone 2 shall end when traffic is following the lane arrangement as shown on the plans for the constructed and/or existing roadway as specified in the TCP (Phase) and/or the final lane configuration. All pavement construction, traffic control devices, and safety devices shall be in their final position (or as called for in the plans for the specified phase of work) at this time.

Project Number:

Sheet: 7B

County: Fayette

Control: 0913-28-083, etc.

Highway: CR

The contractor shall have 75 working days to complete Milestone 2.

Milestone 3 – N. Old Smithville Road at Buckners Creek

Time charges for Milestone 3 begin when N. Old Smithville Rd (CSJ: 0913-28-085) is closed to traffic. The time charges for Milestone 3 shall end when traffic is following the lane arrangement as shown on the plans for the constructed and/or existing roadway as specified in the TCP (Phase) and/or the final lane configuration. All pavement construction, traffic control devices, and safety devices shall be in their final position (or as called for in the plans for the specified phase of work) at this time.

The contractor shall have 80 working days to complete Milestone 3.

Milestone 4 – S. Old Smithville Road at Live Oak Creek

Time charges for Milestone 4 begin when S. Old Smithville Rd (CSJ: 0913-28-086) is closed to traffic. The time charges for Milestone 4 shall end when traffic is following the lane arrangement as shown on the plans for the constructed and/or existing roadway as specified in the TCP (Phase) and/or the final lane configuration. All pavement construction, traffic control devices, and safety devices shall be in their final position (or as called for in the plans for the specified phase of work) at this time.

The contractor shall have 75 working days to complete Milestone 4.

The daily road user cost (RUC) is \$1,533.00. Liquidated damages (LD's) will be increased by the RUC. Failure to complete the above Milestones within the established number of working days will result in LD's being assessed for every working day in excess of the stated number.

After the milestone is substantially complete, the liquidated damages become those based on the contract schedule of liquidated damages.

TxDOT will supply bidders, upon written request, one electronic copy of the time determination schedule. The time determination schedule provided is for informational use only and is not intended for bidding or construction purposes.

TxDOT will not adjust the number of days for the project or milestones, if any, due to differences in opinion regarding any assumptions made in the preparation of the schedule or for errors, omissions, or discrepancies found in the time determination schedule.

Provide progress schedule as a Bar Chart.

Project Number:

Sheet: 7C

County: Fayette

Control: 0913-28-083, etc.

Highway: CR

ITEM 100: PREPARING RIGHT-OF-WAY

Removal and trimming of trees will not be quantified separately, but will be considered subsidiary to Item 100.

Dispose of trees from the right-of-way within 24 hours of removal.

ITEM 110: EXCAVATION

Remove existing vegetation, including roots and topsoil, within the grading limits to a depth of approximately 2 inches immediately before grading operations begin within any section. Place the material in a windrow on each side of the roadbed and replace as directed on the completed slopes as soon as practicable. Measurement and payment will be in accordance with Item "Excavation" for cut sections. All topsoil excavation and the work involved in replacing the topsoil will not be paid for directly but will be subsidiary to the pertinent items for fill sections.

ITEMS 110 & 132: EXCAVATION AND EMBANKMENT

Furnish Type C embankment consisting of suitable earth material such as loam, clay or other such material that will form a stable embankment and has a plasticity index of at least 15 but not more than 40. Requirements may vary for material excavated under Item 110, "Excavation", as directed.

Removal/reworking of existing pavement is included in the excavation and embankment items.

ITEM 150: BLADING

Sprinkling and rolling which may be required during the operation of Item 150 will not be measured or paid for directly, but will be considered subsidiary to this item.

ITEM 247: FLEXIBLE BASE

Unless otherwise approved, the delivered material's moisture content at most will be two percent above optimum moisture content, determined by TEX-113-E.

Compact the Type A flex base by ordinary compaction.

Project Number:

Sheet: 7C

County: Fayette

Control: 0913-28-083, etc.

Highway: CR

ITEM 302: AGGREGATES FOR SURFACE TREATMENTS

Furnish Type PE and Type E aggregate consisting of crushed slag, crushed stone or natural limestone rock asphalt.

Furnish precoated aggregate that has a residual bitumen coating target value of 1.0% by weight.

ITEM 316: SEAL COAT

Use an Emulsion instead of an Asphalt Cement as approved when the surface treatment is placed between September 15 and May 1.

The asphalt application rate shown in the plans is an average between an Asphalt Cement and an Emulsion. The type of asphalt and application rate to be used will be as directed. The approximate application rate for Asphalt Cement with a Grade 3 aggregate is 0.32 Gal/SY and with a Grade 4 aggregate is 0.27 Gal/SY. The approximate application rate for an Emulsion with a Grade 3 aggregate is 0.48 Gal/SY and with a Grade 4 aggregate is 0.40 Gal/SY.

Cure the RC-250 a minimum of seven (7) days prior to placement of the one course surface treatment. Place one course surface treatment no later than fourteen (14) days after placement of the RC-250, unless otherwise directed.

In lieu of the prime coat & final seal coat, the contractor may place 2" ACP (meeting TxDOT specifications). There will be no additional compensation for related material costs, excavation/embankment adjustments, etc. The flexible base depth shall be maintained as shown on the proposed typical section.

ITEM 400: EXCAVATION AND BACKFILL FOR STRUCTURES

Flexible base (Ty D) may be used for cement stabilized backfill aggregate, as approved.

ITEM 420: CONCRETE SUBSTRUCTURES

Concrete for pier and bent structure elements, when paid for by the cubic yard, will be measured for plans quantity payment in accordance with Article 420.5.2 of Item 420, "Concrete Substructures".

Project Number:

Sheet: 7D

County: Fayette

Control: 0913-28-083, etc.

Highway: CR

ITEM 427: SURFACE FINISHES FOR CONCRETE

Provide Surface Area II, railing, and culvert headwalls and wingwalls with a Slurry Coat Finish per 427.4.3.2 for cast-in-place concrete surfaces.

ITEM 496: REMOVING STRUCTURES

The removal of the existing concrete riprap or stone riprap protecting the existing bridge, is subsidiary to Item 496 Removing Structures, except as shown in the plans.

Material removed under this item will not be deemed salvageable.

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 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.

Provide suitable warning lights mounted high enough to be visible from all directions on all construction equipment, including pilot vehicles, and operate warning lights when the equipment is within the right of way. Equip other equipment such as trucks, trailers, autos, etc., with emergency flashers and use emergency flashers while within the work area.

No additional payment will be made for relocating existing sign assemblies to temporary mounts.

County Roads will be closed to through traffic until substantial completion as approved by the Area Engineer. Once the roadway is open to traffic, project limit signing as shown on BC(2) will be required. This will be subsidiary to Item 502.

Project Number:

Sheet: 7D

County: Fayette

Control: 0913-28-083, etc.

Highway: CR

**ITEM 506: TEMPORARY EROSION, SEDIMENTATION,
AND ENVIRONMENTAL CONTROLS**

1. See SW3P plan sheet for total disturbed acreage.
2. The disturbed area in this project, all project locations in the contract, and contractor project specific locations (PSLs), within one (1) mile of the project limits, for the contract will further establish the authorization requirements for storm water discharges.
3. 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.
4. Obtain any required authorization from the TCEQ for any contractor PSLs for construction activities on or off right-of-way (ROW).
5. When the total disturbed area for all projects in the contract and PSLs within one (1) mile of the project limits exceeds five (5) acres, provide a copy of the contractor NOI.
6. Provide a signed sketch detailing the location of any contractor's PSLs on ROW or within one (1) mile of the project.

ITEMS 540: METAL BEAM GUARD FENCE

Furnish and install only one type of timber post at each location.

Furnish Type II rail elements at all locations.



Estimate & Quantity Sheet

CONTROLLING PROJECT ID 0913-28-083

DISTRICT Yoakum
HIGHWAY CR 477, CR 480, CR 483, CR 530

COUNTY Fayette

CONTROL SECTION JOB				0913-28-068		0913-28-083		0913-28-085		0913-28-086		TOTAL EST.	TOTAL FINAL
PROJECT ID				A00101616		A00128814		A00130795		A00130796			
COUNTY				Fayette		Fayette		Fayette		Fayette			
HIGHWAY				CR 480		CR 530		CR 483		CR 477			
ALT	BID CODE	DESCRIPTION	UNIT	EST.	FINAL	EST.	FINAL	EST.	FINAL	EST.	FINAL		
	100-6002	PREPARING ROW	STA	4.150		3.550		3.520		3.650		14.870	
	110-6001	EXCAVATION (ROADWAY)	CY	61.000		76.000		206.000		166.000		509.000	
	110-6002	EXCAVATION (CHANNEL)	CY	499.000		205.000		567.000		234.000		1,505.000	
	132-6005	EMBANKMENT (FINAL)(ORD COMP)(TY C)	CY	240.000		391.000		112.000		161.000		904.000	
	150-6002	BLADING	HR	6.000		8.000		8.000		8.000		30.000	
	164-6003	BROADCAST SEED (PERM) (RURAL) (CLAY)	SY	1,094.000		602.000		913.000		573.000		3,182.000	
	164-6009	BROADCAST SEED (TEMP) (WARM)	SY	274.000		151.000		228.000		143.000		796.000	
	164-6011	BROADCAST SEED (TEMP) (COOL)	SY	274.000		151.000		228.000		143.000		796.000	
	168-6001	VEGETATIVE WATERING	MG	10.000		5.100		10.300		6.400		31.800	
	247-6366	FL BS (CMP IN PLC)(TY A GR 5)(FNAL POS)	CY	227.000		200.000		202.000		186.000		815.000	
	316-6029	ASPH (RC-250)	GAL	198.000		178.000		176.000		162.000		714.000	
	316-6202	AGGR(TY-E GR-5 SAC-B)	CY	8.000		8.000		7.000		6.000		29.000	
	316-6249	AGGR(TY-PE GR-4 SAC-B)	CY	8.000		8.000		7.000		6.000		29.000	
	316-6400	ASPH (AC-15P OR AC-10-2TR OR CRS-2P)	GAL	337.000		302.000		301.000		274.000		1,214.000	
	400-6005	CEM STABIL BKFL	CY	65.000		38.000		27.000		26.000		156.000	
	416-6002	DRILL SHAFT (24 IN)	LF					408.000		318.000		726.000	
	416-6003	DRILL SHAFT (30 IN)	LF			228.000						228.000	
	416-6004	DRILL SHAFT (36 IN)	LF	390.000								390.000	
	420-6013	CL C CONC (ABUT)	CY	38.000		27.200		18.400		18.200		101.800	
	420-6029	CL C CONC (CAP)	CY	11.100				13.200		13.800		38.100	
	420-6037	CL C CONC (COLUMN)	CY	9.400				6.600		4.500		20.500	
	422-6001	REINF CONC SLAB	SF	2,730.000								2,730.000	
	422-6005	REINF CONC SLAB (BOX BEAM)	SF			1,701.000						1,701.000	
	422-6007	REINF CONC SLAB (SLAB BEAM)	SF					2,730.000		2,470.000		5,200.000	
	422-6023	SHEAR KEY	CY			8.600						8.600	
	425-6001	PRESTR CONC BOX BEAM (4B20)	LF			258.000						258.000	
	425-6002	PRESTR CONC BOX BEAM (5B20)	LF			129.000						129.000	
	425-6010	PRESTR CONC SLAB BEAM (5SB12)	LF							467.500		467.500	
	425-6012	PRESTR CONC SLAB BEAM (5SB15)	LF					517.500				517.500	
	425-6035	PRESTR CONC GIRDER (TX28)	LF	416.000								416.000	
	432-6033	RIPRAP (STONE PROTECTION)(18 IN)	CY	475.000		357.000		334.000		239.000		1,405.000	
	450-6006	RAIL (TY T223)	LF	258.000		162.000		234.000		214.000		868.000	
	454-6004	ARMOR JOINT (SEALED)	LF	44.000		44.000		44.000		46.000		178.000	
	496-6009	REMOV STR (BRIDGE 0 - 99 FT LENGTH)	EA	1.000		1.000		1.000		1.000		4.000	
	496-6043	REMOV STR (SMALL FENCE)	LF			811.000				733.000		1,544.000	
	500-6001	MOBILIZATION	LS			1.000						1.000	
	502-6001	BARRICADES, SIGNS AND TRAFFIC HANDLING	MO	5.000		5.000		5.000		5.000		20.000	



Estimate & Quantity Sheet

CONTROLLING PROJECT ID 0913-28-083

DISTRICT Yoakum
HIGHWAY CR 477, CR 480, CR 483, CR 530

COUNTY Fayette

CONTROL SECTION JOB				0913-28-068		0913-28-083		0913-28-085		0913-28-086		TOTAL EST.	TOTAL FINAL
PROJECT ID				A00101616		A00128814		A00130795		A00130796			
COUNTY				Fayette		Fayette		Fayette		Fayette			
HIGHWAY				CR 480		CR 530		CR 483		CR 477			
ALT	BID CODE	DESCRIPTION	UNIT	EST.	FINAL	EST.	FINAL	EST.	FINAL	EST.	FINAL		
	506-6038	TEMP SEDMT CONT FENCE (INSTALL)	LF	675.000		306.000		295.000		603.000		1,879.000	
	506-6039	TEMP SEDMT CONT FENCE (REMOVE)	LF	675.000		306.000		295.000		603.000		1,879.000	
	540-6001	MTL W-BEAM GD FEN (TIM POST)	LF			50.000						50.000	
	540-6006	MTL BEAM GD FEN TRANS (THRIE-BEAM)	EA	4.000		4.000		4.000		4.000		16.000	
	544-6001	GUARDRAIL END TREATMENT (INSTALL)	EA	4.000		4.000		4.000		4.000		16.000	
	552-6001	WIRE FENCE (TY A)	LF			626.000		44.000		616.000		1,286.000	
	552-6003	WIRE FENCE (TY C)	LF			811.000				733.000		1,544.000	
	552-6008	WIRE FENCE (WATER GAP)	LF			120.000						120.000	
	658-6014	INSTL DEL ASSM (D-SW)SZ (BRF)CTB (BI)	EA	4.000		4.000		2.000		2.000		12.000	
	658-6062	INSTL DEL ASSM (D-SW)SZ 1(BRF)GF2(BI)	EA	8.000		8.000		8.000		8.000		32.000	
	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	

BOEHNKE RD AT BUSBY BRANCH

SUMMARY OF ROADWAY QUANTITIES																
ITEM DESCRIPTION	LENGTH	FLEX BASE			0100	0150	0247	0316	0316	0316	0316	0496	0496 ②	0552 ①	0552 ②	0552
		BEGIN WIDTH	END WIDTH	DEPTH	PREPARING ROW	** BLADING	FL BS (CMP IN PLC)(TY A GR 5)(FNAL POS) 8"	ASPH (RC-250)	AGGR(TY-E GR-5 SAC-B)	AGGR(TY-PE GR-4 SAC-B)	ASPH (AC-15P OR AC-10-2TR OR CRS-2P)	REMOV STR (BRIDGE 0 - 99 FT LENGTH)	REMOV STR (SMALL FENCE)	WIRE FENCE (TY A)	WIRE FENCE (TY C)	WIRE FENCE (WATER GAP)
	FT	FT	FT	IN	STA	HR	CY	GAL	CY	CY	GAL	EA	LF	LF	LF	LF
CSJ: 0913-28-083 - BOEHNKE RD																
STA 11+85.00 TO STA 12+35.00	50	16	30	8	0.50		29.0	26	1.0	1.0	43		403	100	403	
STA 12+35.00 TO STA 13+30.00	95	30	30	8	0.95		71.0	63	3.0	3.0	108			246		
BRIDGE					0.65											120
STA 13+95.00 TO STA 14+90.00	95	30	30	8	0.95		71.0	63	3.0	3.0	108		408	180	408	
STA 14+90.00 TO STA 15+40.00	50	30	16	8	0.50		29.0	26	1.0	1.0	43			100		
PROJECT TOTAL	290				3.55	8	200	178	8	8	302	1	811	626	811	120

- ** ESTIMATED QUANTITY
- ① TY A FENCE TO BE UTILIZED FOR PERMANENT CONSTRUCTION
- ② TY C FENCE TO BE UTILIZED FOR TEMPORARY CONSTRUCTION

SUMMARY OF SIGNING, DELINEATOR AND OBJECT MARKER QUANTITIES			
ITEM DESCRIPTION	0658		0658
	INSTR DEL ASSM (D-SW)SZ (BRF)CTB (BI)	INSTR DEL ASSM (D-SW)SZ 1(BRF)GF2(BI)	EA
CSJ: 0913-28-083 - BOEHNKE RD			
STA 11+85.00 TO STA 13+30.00			4
BRIDGE	4		
STA 13+95.00 TO STA 15+40.00			4
PROJECT TOTAL	4	8	



APPLICATION RATES	
PRIME:	
ASPH RC-250	0.20 GAL/SY
AGGR (TY-E GR-5 SAC-B)	1CY/ 140 SY
SEAL COAT:	
ASPH (AC-15P OR AC-10-2TR OR CRS-2P)	0.34 GAL/SY
AGGR (TY-PE GR-4 SAC-B)	1CY/ 130 SY
FERTILIZER:	500 LBS/AC
VEGETATIVE WATERING:	13.6 MG/AC/MO

SUMMARY OF GUARDRAIL QUANTITIES			
ITEM DESCRIPTION	0540	0540	0544
	MTL W-BEAM GD FEN (TIM POST)	MTL BEAM GD FEN TRANS (THRIE-BEAM)	GUARDRAIL END TREATMENT (INSTALL)
	LF	EA	EA
CSJ: 0913-28-083 - BOEHNKE RD			
STA 11+85.00 TO STA 13+30.00	25.0	2	2
BRIDGE			
STA 13+95.00 TO STA 15+40.00	25.0	2	2
PROJECT TOTAL	50	4	4

SUMMARY OF EARTHWORK QUANTITIES			
ITEM DESCRIPTION	0110	0110	0132
	EXCAVATION (ROADWAY)	EXCAVATION (CHANNEL)	EMBANKMENT (FINAL) (ORD COMP) (TY C)
	CY	CY	CY
CSJ: 0913-28-083 - BOEHNKE RD			
11+85	0		0
12+00	5		0
12+25	5		2
12+50	1		14
12+75	0		40
13+00	0		78
13+30	30		94
CHANNEL		205	
13+95	2		21
14+25	9		76
14+50	5		44
14+75	4		18
15+00	5		4
15+25	6		1
15+40	4		0
PROJECT TOTAL	76	205	391

SUMMARY OF SW3P QUANTITIES							
ITEM DESCRIPTION	0164	0164	0164	0166	0168	0506	0506
	BROADCAST SEED (PERM) (RURAL) (CLAY)	BROADCAST SEED (TEMP) (WARM)	BROADCAST SEED (TEMP) (COOL)	* FERTILIZER	VEGETATIVE WATERING	TEMP SEDMT CONT FENCE (INSTALL)	TEMP SEDMT CONT FENCE (REMOVE)
	SY	SY	SY	TON	MG	LF	LF
CSJ: 0913-28-083 - BOEHNKE RD							
STA 11+85.00 TO STA 13+30.00	316	79	79	0.01	2.7		
BRIDGE							
STA 13+95.00 TO STA 15+40.00	286	72	72	0.02	2.4		
BMP #1						70	70
BMP #2						87	87
BMP #3						83	83
BMP #4						66	66
PROJECT TOTAL	602	151	151	0.03	5.1	306	306

* FOR CONTRACTORS INFORMATION ONLY

NO.	REVISION	BY	DATE
 an STV Company		TEXAS REGISTERED ENGINEERING FIRM F-1741	
 BOEHNKE RD AT BUSBY BRANCH			
SUMMARY OF QUANTITIES			
CSJ 0913-28-083 SHEET 1 OF 1			
Designed:	GH	FED. RD. DIV. NO. 6	STATE TEXAS
Checked:	SM		
Drawn:	GH	DIST. COUNTY	CONTROL NO. SECTION NO. JOB NO.
Checked:	SM	YKM FAYETTE	0913 28 083,ETC.
			HIGHWAY NO. CR
			SHEET NO. 9

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WALLACE ROAD AT BUCKNERS CREEK

SUMMARY OF ROADWAY ITEMS

ITEM DESCRIPTION	SURFACE				FLEX BASE				100	150	247	316	316	316	316	496	
	LENGTH	BEGIN WIDTH	END WIDTH	AREA	BEGIN WIDTH	END WIDTH	AREA	AVG. DEPTH	PREPARING ROW	BLADING **	FL BS (CMP IN PLC) (TY A GR 5) (FNAL POS)	ASPH (RC-250)	AGGR (TY-E GR-5 SAC-B)	AGGR (TY-PE GR-4 SAC-B)	ASPH (AC-15P OR AC-10-2TR OR CRS-2P)	REMOV STR (BRIDGE 0 - 99 FT LENGTH)	
	FT	FT	FT	SY	FT	FT	SY	IN	STA	HR	CY	GAL	CY	CY	GAL	EA	
CSJ: 0913-28-068																	
STA 101+77.00 TO STA 102+27.00	50	15.5	30	126	16.5	31	132	8	0.50		29	25	1	1	43		
STA 102+27.00 TO STA 102+57.00	30	30	32.5	104	31	33.5	108	8	0.30		24	21	1	1	35		
STA 102+57.00 TO STA 103+34.00	77	32.5	30	267	33.5	31	276	8	0.77		61	53	2	2	91		
STA 103+34.00 TO STA 103+46.00	12	24	24	32	24	24	32	8	0.12		7	6	0.5	0.5	11		
BRIDGE	105								1.05							1	
STA 104+51.00 TO STA 104+63.00	12	24	24	32	24	24	32	8	0.12		7	6	0.5	0.5	11		
STA 104+63.00 TO STA 105+40.50	77.55	30	34.63	278	31	35.63	287	8	0.78		64	56	2	2	95		
STA 105+40.50 TO STA 105+92.00	51.45	34.63	18.36	151	35.63	19.36	157	8	0.51		35	30	1	1	51		
PROJECT TOTALS										4.15	6	227	198	8	8	337	1

**ESTIMATED QUANTITY

SUMMARY OF DELINEATORS

ITEM DESCRIPTION	658	
	INSTL DEL ASSM (D-SW) SZ (BRF) CTB (BI)	INSTL DEL ASSM (D-SW) SZ 1 (BRF) GF 2 (BI)
	EA	EA
CSJ: 0913-28-068		
BEGIN PROJECT TO END PROJECT LEFT	2	4
RIGHT	2	4
PROJECT TOTALS	4	8

SUMMARY OF GUARDRAIL QUANTITIES

ITEM DESCRIPTION	540	
	MTL BEAM GD FEN TRANS (THRIE-BEAM)	GUARDRAIL END TREATMENT (INSTALL)
	EA	EA
CSJ: 0913-28-068		
BEGIN PROJECT TO END PROJECT	4	4
PROJECT TOTALS	4	4

APPLICATION RATES	
FERTILIZER:	500 LBS / AC
VEGETATIVE WATERING	13.6 MG / AC / MO
PRIME COAT	
ASPH RC-250:	0.20 GAL / SY
AGGR (TY-E GR-5 SAC-B)	1 CY / 140 SY
SEAL COAT	
AGGR (TY-PE GR-4 SAC-B)	1 CY / 130 SY
ASPH (AC-15P OR AC-10+2TR OR CRS-2P)	0.34 GAL / SY

SUMMARY OF EROSION CONTROL ITEMS

ITEM DESCRIPTION	164	164	164	166	168	506	506
	BROADCAST SEED (PERM) (RURAL) (CLAY)	BROADCAST SEED (TEMP) (WARM)	BROADCAST SEED (TEMP) (COOL)	FERTILIZER *	VEGETATIVE WATERING	TEMP SEDMT CONT FENCE (INSTALL)	TEMP SEDMT CONT FENCE (REMOVE)
	SY	SY	SY	TON	MG	LF	LF
CSJ: 0913-28-068							
	1094	274	274	0.06	10	675	675
PROJECT TOTALS	1094	274	274	0.06	10	675	675

*FOR CONTRACTOR'S INFORMATION ONLY



SUMMARY OF EARTHWORK ITEMS

LOCATION	110		132
	EXCAVATION (ROADWAY)	EXCAVATION (CHANNEL)	EMBANKMENT (FINAL) (ORD COMP) (TY C)
	CY	CY	CY
101+77.00			0
102+00.00	8		5
102+25.00	6		18
102+50.00	3		35
102+75.00	1		53
103+00.00	0		62
103+25.00	0		14
103+34.00	1		
103+46.00		5	
103+50.00		11	
103+75.00		189	
104+00.00		133	
104+25.00		74	
104+50.00		80	
104+51.00		1	
104+63.00		6	
104+75.00	5		4
105+00.00	7		13
105+25.00	5		15
105+50.00	7		14
105+75.00	10		6
105+92.00	8		1
PROJECT TOTALS	61	499	240

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NO.	REVISION	BY	DATE
 BGE, Inc. 1701 Directors Blvd., Suite 1000, Austin, TX 78744 Tel: 512-879-0400 • www.bgeinc.com TBPE Registration No. F-1046			
©2022  Texas Department of Transportation WALLACE ROAD AT BUCKNERS CREEK			
SUMMARY OF QUANTITIES CSJ 0913-28-068			
Designed:	BGE	FED. RD. DIV. NO.	STATE
Checked:	BGE	6	TEXAS
Drawn:	BGE	DIST.	COUNTY
Checked:	BGE	YKM	FAYETTE
		CONTROL NO.	SECTION NO.
		0913	28
		JOB NO.	SHEET NO.
		083, ETC.	10

NORTH OLD SMITHVILLE RD AT BUCKNERS CREEK

SUMMARY OF ROADWAY QUANTITIES

ITEM DESCRIPTION	FLEX BASE				0100	0150	0247	0316	0316	0316	0316	0496	0552
	LENGTH	BEGIN WIDTH	END WIDTH	DEPTH	PREPARING ROW	BLADING	FL BS (CMP IN PLC) (TY A GR 5) (FNAL POS)	ASPH (RC-250)	AGGR (TY-E GR-5 SAC-B)	AGGR (TY-PE GR-4 SAC-B)	ASPH (AC-15P OR AC-10-2TR OR CRS-2P)	REMOV STR (BRIDGE 0 - 99 FT LENGTH)	WIRE FENCE (TY A)
	FT	FT	FT	IN	STA	** HR	8"	GAL	CY	CY	GAL	EA	LF
CSJ: 0913-28-085 - N. OLD						8							
STA 12+69.00 TO 13+19.00	50	18.2	30	8	0.50		31	27	1	1	46		
STA 13+19.00 TO 14+00	81	30	30	8	0.81		62	54	2	2	92		
BRIDGE	90				0.90							1	44
STA 15+05 TO 15+86.00	81	30	49	8	0.81		81	71	3	3	121		
STA 15+86.00 TO 16+36.00	50	27	17	8	0.50		28	24	1	1	42		
PROJECT TOTAL					3.52	8	202	176	7.0	7.0	301	1	44

** ESTIMATED QUANTITY

APPLICATION RATES

FERTILIZER:	500 LBS / AC
VEGETATIVE WATERING:	13.6 MG / AC / MO
PRIME COAT	
ASPH RC-250:	0.20 GAL / SY
AGGR (TY-E GR-5 SAC-B):	1 CY / 140 SY
SEAL COAT	
AGGR (TY-PE GR-4 SAC-B):	1 CY / 130 SY
ASPH (AC-15P OR AC-10-2TR OR CRS-2P):	0.34 GAL / SY

SUMMARY OF SW3P QUANTITIES

ITEM DESCRIPTION	0164	0164	0164	0166	0168	0506	0506
	BROADCAST SEED (PERM) (RURAL)	BROADCAST SEED (TEMP) (WARM)	BROADCAST SEED (TEMP) (COOL)	FERTILIZER *	VEGETATIVE WATERING	TEMP SEDMT CONT FENCE (INSTALL)	TEMP SEDMT CONT FENCE
	SY	SY	SY	TON	MG	LF	LF
CSJ: 0913-28-085 - N. OLD							
STA 12+69.00 TO STA 16+36.00	913	228	228	0.05	10.3		
BMP #1						51	51
BMP #2						40	40
BMP #3						105	105
BMP #4						99	99
PROJECT TOTAL	913	228	228	0.05	10.3	295	295

* PROVIDED FOR CONTRACTOR'S INFORMATION ONLY

SUMMARY OF SIGNING, DELINEATOR AND OBJECT MARKER QUANTITIES

ITEM DESCRIPTION	0644	0658	0658
	REMOVE SM RD SN SUP&AM *	INSTL DEL ASSM (D-SW) SZ (BRF) CTB (BI)	INSTL DEL ASSM (D-SW) SZ 1 (BRF) GF2 (BI)
	EA	EA	EA
CSJ: 0913-28-085 - N. OLD SMITHVILLE RD			
STA 12+69.00 TO STA 16+36.00			
LEFT	1	1	4
RIGHT	1	1	4
PROJECT TOTAL	2	2	8

*SIGN REMOVAL SUBSIDIARY TO ITEM 100 PREP ROW

SUMMARY OF EARTHWORK QUANTITIES

ITEM DESCRIPTION	0110	0110	0132
	EXCAVATION (ROADWAY)	EXCAVATION (CHANNEL)	EMBANKMENT (FINAL) (ORD COMP) (TY C)
	CY	CY	CY
CSJ: 0913-28-085 - N. OLD			
12+69 TO 13+00	16		5
13+00 TO 13+50	28		39
13+50 TO 14+00	52		58
BRIDGE		567	
15+05 TO 15+50	51		4
15+50 TO 16+00	39		5
16+00 TO 16+36	20		1
PROJECT TOTAL	206	567	112



SUMMARY OF GUARDRAIL QUANTITIES

ITEM DESCRIPTION	0540	0544
	MTL BEAM GD FEN TRANS (THRIE-BEAM)	GUARDRAIL END TREATMENT (INSTALL)
	EA	EA
CSJ: 0913-28-085 - N. OLD		
STA 12+69.00 TO STA 16+36.00		
LEFT	2	2
RIGHT	2	2
PROJECT TOTAL	4	4

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NO.	REVISION	BY	DATE
 WSP USA Inc. 16200 Park Row, Suite 200 Houston, TX 77084 TBPE # F-2263			
 ©2022 Texas Department of Transportation NORTH OLD SMITHVILLE RD (CR 483) AT BUCKNERS CREEK			
SUMMARY OF QUANTITIES CSJ 0913-28-085 SHEET 1 OF 1			
Designed:	GD	FED. RD. DIV. NO.	STATE
Checked:	AA	6	TEXAS
Drawn:	GD	DIST.	COUNTY
Checked:	AA	YKM	FAYETTE
		CONTROL NO.	SECTION NO.
		0913	28
		JOB NO.	SHEET NO.
		083,ETC.	11

SOUTH OLD SMITHVILLE RD AT LIVE OAK CREEK

SUMMARY OF ROADWAY QUANTITIES

ITEM DESCRIPTION	FLEX BASE				0100 PREPARING ROW	0150 BLADING ** HR	0247 FL BS (CMP IN PLC) (TY A GR 5) (FNAL POS) 8" CY	0316 ASPH (RC-250) GAL	0316 AGGR (TY-E GR-5 SAC-B) CY	0316 AGGR (TY-PE GR-4 SAC-B) CY	0316 ASPH (AC-15P OR AC-10-2TR OR CRS-2P) GAL	0496 REMOV STR (BRIDGE 0 - 99 FT LENGTH) EA	0496 ② REMOV STR (SMALL FENCE) LF	0552 ① WIRE FENCE (TY A) LF	0552 ② WIRE FENCE (TY C) LF
	LENGTH	BEGIN WIDTH	END WIDTH	DEPTH											
	FT	FT	FT	IN											
CSJ: 0913-28-086 - S. OLD						8									
STA 11+65.00 TO 12+15.00	50	13.2	30	8	0.50		28	24	1	41		101	100	101	
STA 12+15.00 TO 13+00	85	30	30	8	0.85		65	57	2	96		170	206	170	
BRIDGE	95				0.95						1	190		190	
STA 13+95 TO 14+80	85	30	30	8	0.85		65	57	2	96		170	210	170	
STA 14+80.00 TO 15+30.00	50	30	13.7	8	0.50		28	24	1	41		102	100	102	
PROJECT TOTAL					3.65	8	186	162	6	274	1	733	616	733	

** ESTIMATED QUANTITY

- ① TY A FENCE TO BE UTILIZED FOR PERMANENT CONSTRUCTION
- ② TY C FENCE TO BE UTILIZED FOR TEMPORARY CONSTRUCTION

APPLICATION RATES

FERTILIZER:	500 LBS / AC
VEGETATIVE WATERING:	13.6 MG / AC / MO
PRIME COAT	
ASPH RC-250:	0.20 GAL / SY
AGGR (TY-E GR-5 SAC-B):	1 CY / 140 SY
SEAL COAT	
AGGR (TY-PE GR-4 SAC-B):	1 CY / 130 SY
ASPH (AC-15P OR AC-10-2TR OR CRS-2P):	0.34 GAL / SY

SUMMARY OF SW3P QUANTITIES

ITEM DESCRIPTION	0164	0164	0164	0166	0168	0506	0506
	BROADCAST SEED (PERM) (RURAL)	BROADCAST SEED (TEMP) (WARM)	BROADCAST SEED (TEMP) (COOL)	FERTILIZER *	VEGETATIVE WATERING	TEMP SEDMT CONT FENCE (INSTALL)	TEMP SEDMT CONT FENCE
	SY	SY	SY	TON	MG	LF	LF
CSJ: 0913-28-086 - S. OLD							
STA 11+65.00 TO STA 15+30.00	573	143	143	0.03	6.4		
BMP #1						146	146
BMP #2						154	154
BMP #3						154	154
BMP #4						149	149
PROJECT TOTAL	573	143	143	0.03	6.4	603	603

* PROVIDED FOR CONTRACTOR'S INFORMATION ONLY

SUMMARY OF SIGNING, DELINEATOR AND OBJECT MARKER QUANTITIES

ITEM DESCRIPTION	0644	0658	0658
	REMOVE SM RD SN SUP&AM *	INSTR DEL ASSM (D-SW) SZ (BRF) CTB (BI)	INSTR DEL ASSM (D-SW) SZ 1 (BRF) GF2 (BI)
	EA	EA	EA
CSJ: 0913-28-086 - S. OLD SMITHVILLE RD			
STA 11+65.00 TO STA 15+30.00			
LEFT	1	1	4
RIGHT	1	1	4
PROJECT TOTAL	2	2	8

*SIGN REMOVAL SUBSIDIARY TO ITEM 100 PREP ROW



SUMMARY OF EARTHWORK QUANTITIES

ITEM DESCRIPTION	0110	0110	0132
	EXCAVATION (ROADWAY)	EXCAVATION (CHANNEL)	EMBANKMENT (FINAL) (ORD COMP) (TY C)
	CY	CY	CY
CSJ: 0913-28-086 - S. OLD			
11+65 TO 12+00	15		10
12+00 TO 12+50	27		40
12+50 TO 13+00	48		42
BRIDGE		234	
13+95 TO 14+00	4		2
14+00 TO 14+50	33		35
14+50 TO 15+00	25		29
15+00 TO 15+30	14		3
PROJECT TOTAL	166	234	161

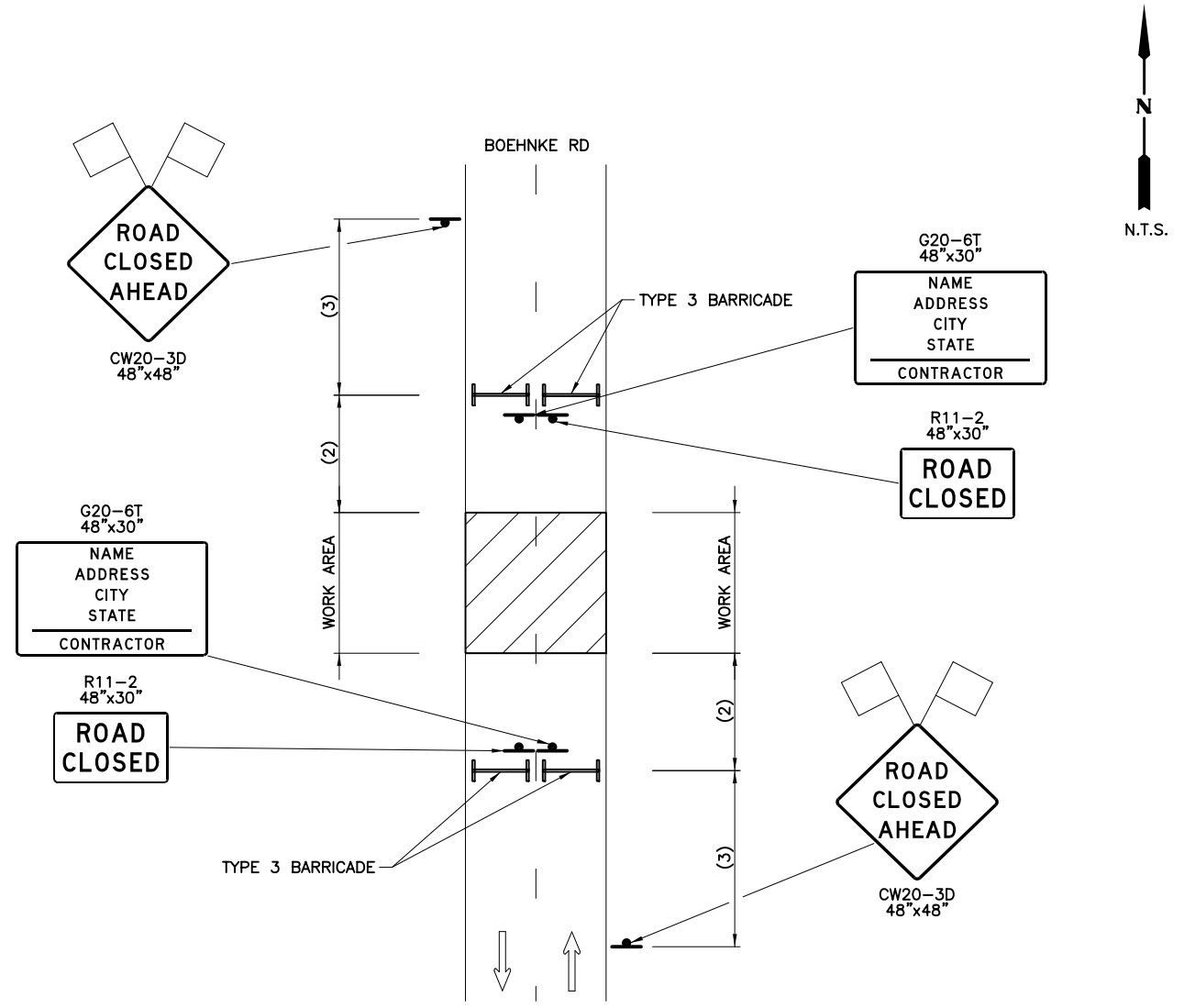
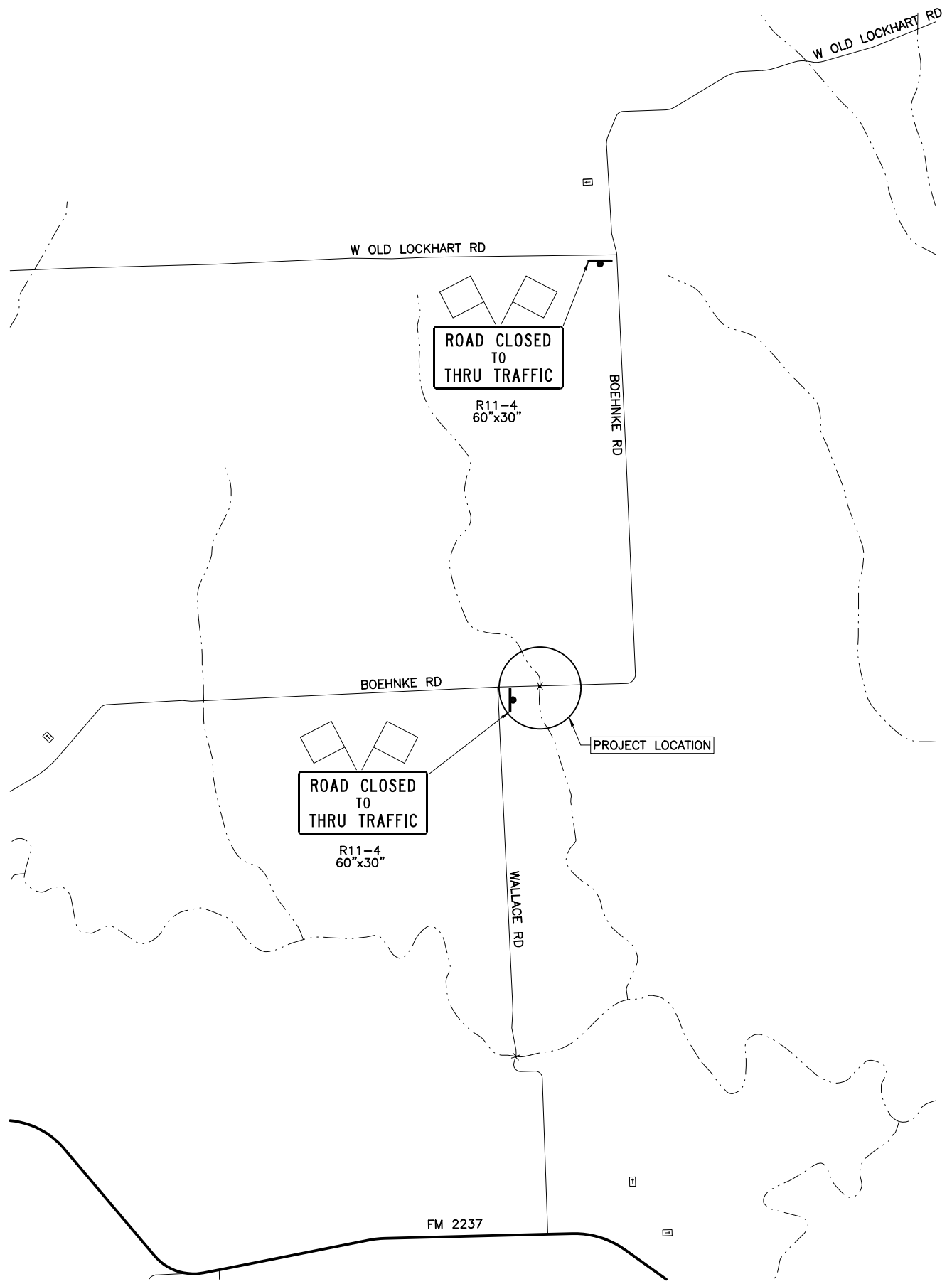
SUMMARY OF GUARDRAIL QUANTITIES

ITEM DESCRIPTION	0540	0544
	MTL BEAM GD FEN TRANS (THRIE-BEAM)	GUARDRAIL END TREATMENT (INSTALL)
	EA	EA
CSJ: 0913-28-086 - S. OLD		
STA 11+65.00 TO STA 15+30.00		
LEFT	2	2
RIGHT	2	2
PROJECT TOTAL	4	4

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NO.	REVISION	BY	DATE
 WSP USA Inc. 16200 Park Row, Suite 200 Houston, TX 77084 TBPE # F-2263			
 ©2022 Texas Department of Transportation SOUTH OLD SMITHVILLE RD (CR 477) AT LIVE OAK CREEK			
SUMMARY OF QUANTITIES CSJ 0913-28-086 SHEET 1 OF 1			
Designed:	GD	FED. RD. DIV. NO.	STATE
Checked:	AA	6	TEXAS
Drawn:	GD	DIST.	COUNTY
Checked:	AA	YKM	FAYETTE
		CONTROL NO.	SECTION NO.
		0913	28
		JOB NO.	SHEET NO.
		083.ETC.	12

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CONSTRUCTION SIGNING AT PROJECT LOCATION

- NOTES:
- (1.) BOEHNKE RD WILL BE CLOSED TO THROUGH TRAFFIC UNTIL SUBSTANTIAL COMPLETION AS APPROVED BY THE AREA ENGINEER.
 - (2.) TYPE 3 BARRICADES TO BE PLACED IN A LOCATION THAT IS SATISFACTORY TO THE ENGINEER TO ALLOW EGRESS AND INGRESS FOR LOCAL PROPERTY OWNERS.
 - (3.) SEE BC SHEETS FOR SIGN SPACING.
 - (4.) SEE ITEM 8 GENERAL NOTES REGARDING CLOSURE.

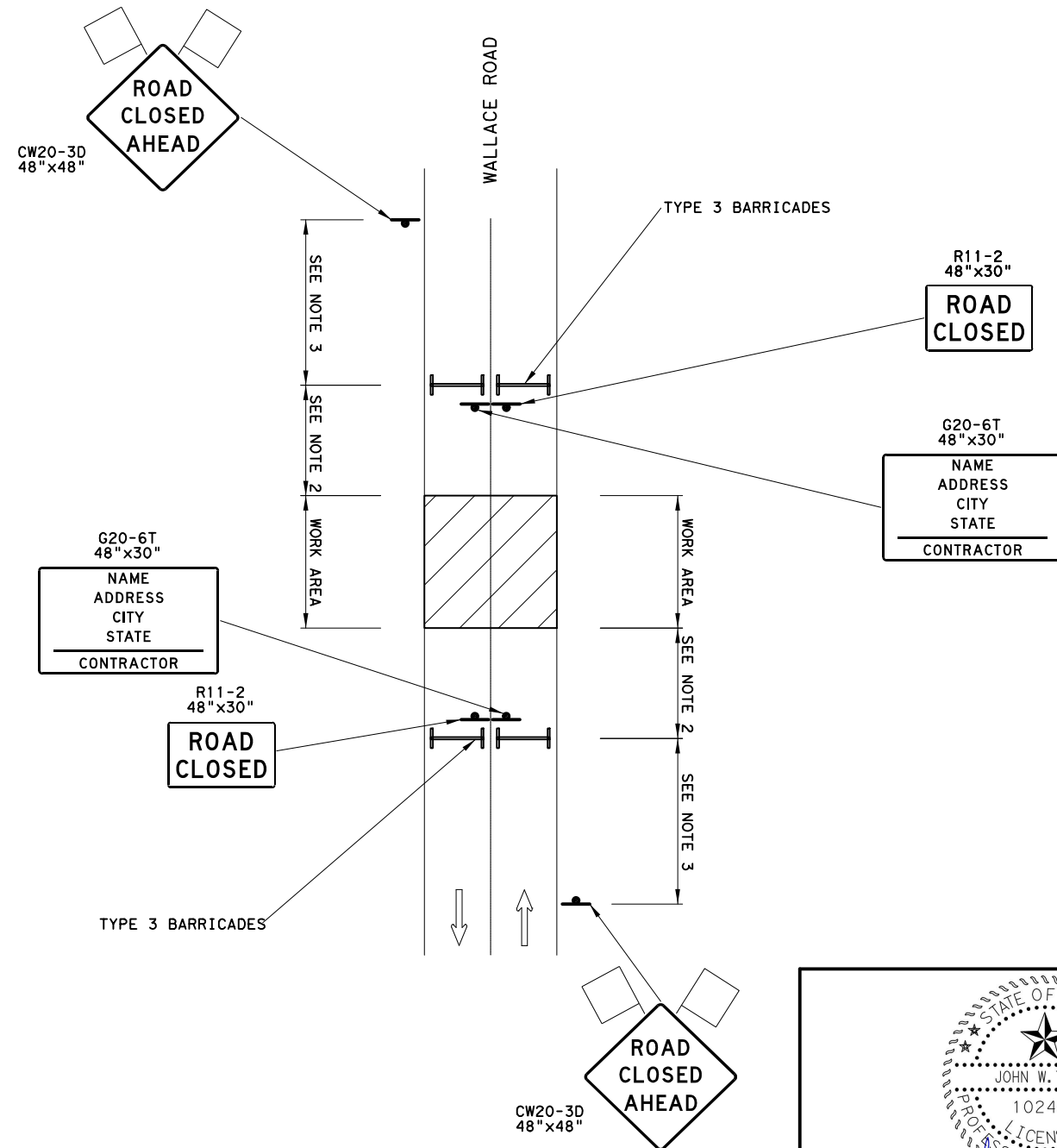
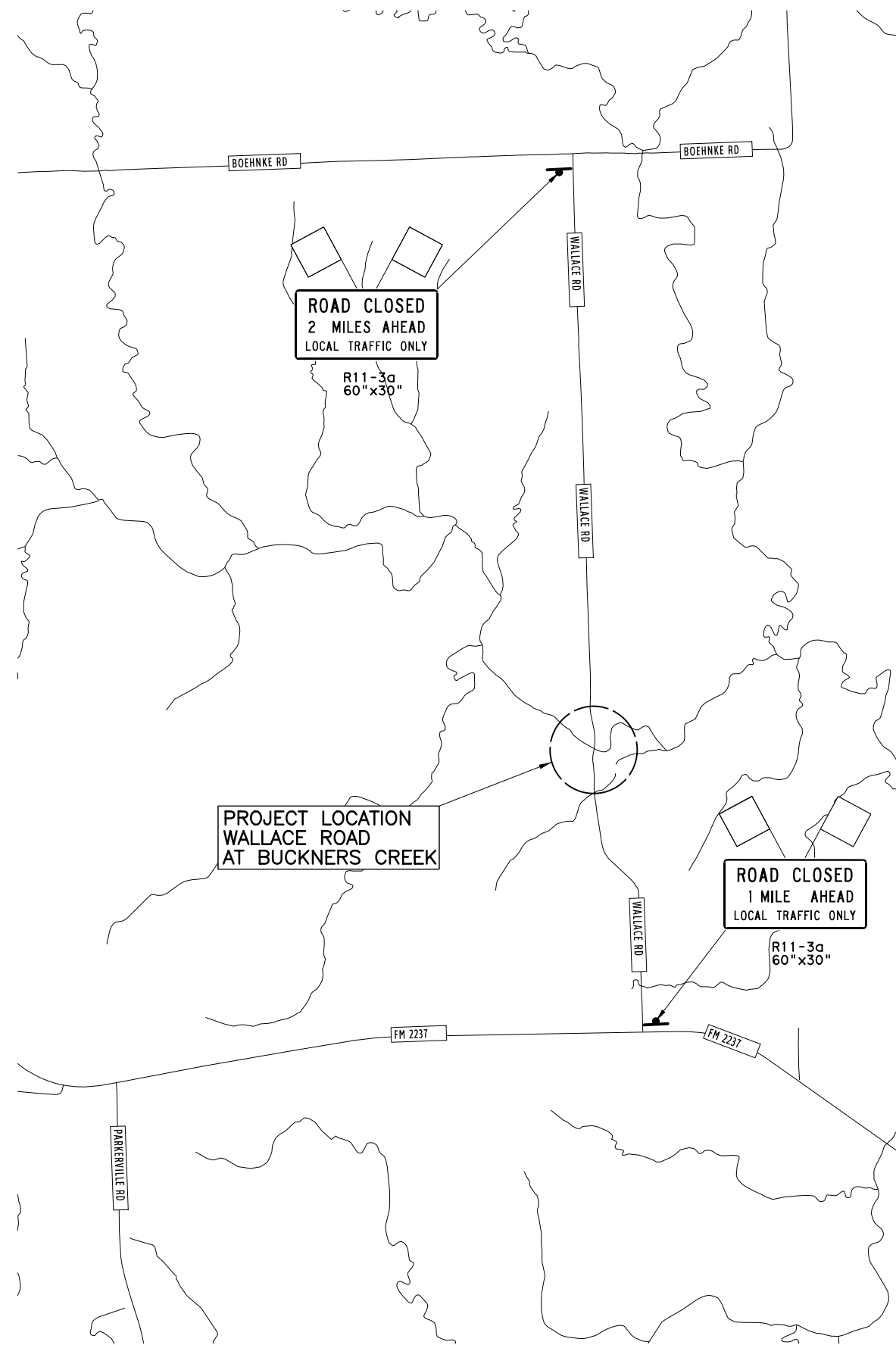
NO.	REVISION	BY	DATE

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 BOEHNKE RD AT BUSBY BRANCH

TRAFFIC CONTROL PLAN
 CSJ 0913-28-083 SHEET 1 OF 1

Designed:	GH	FED. RD. DIV. NO.	STATE	FEDERAL AID PROJECT NO.	HIGHWAY NO.		
Checked:	SM	6	TEXAS		CR		
Drawn:	GH	DIST.	COUNTY	CONTROL NO.	SECTION NO.	JOB NO.	SHEET NO.
Checked:	SM	YKM	FAYETTE	0913	28	083,ETC	13

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CONSTRUCTION SIGNING AT PROJECT LOCATION
 NTS

- NOTES:
1. WALLACE ROAD WILL BE CLOSED TO THROUGH TRAFFIC UNTIL SUBSTANTIAL COMPLETION AS APPROVED BY THE AREA ENGINEER.
 2. TYPE 3 BARRICADES TO BE PLACED IN A LOCATION THAT IS SATISFACTORY TO THE ENGINEER TO ALLOW EGRESS AND INGRESS FOR LOCAL PROPERTY OWNERS.
 3. SEE BC SHEETS FOR SIGN SPACING.
 4. SEE ITEM 8 GENERAL NOTES REGARDING CLOSURE.

10/13/2022

NO.	REVISION	BY	DATE

BGE, Inc.
 1701 Directors Blvd., Suite 1000, Austin, TX 78744
 Tel: 512-879-0400 • www.bgeinc.com
 TBPE Registration No. F-1046

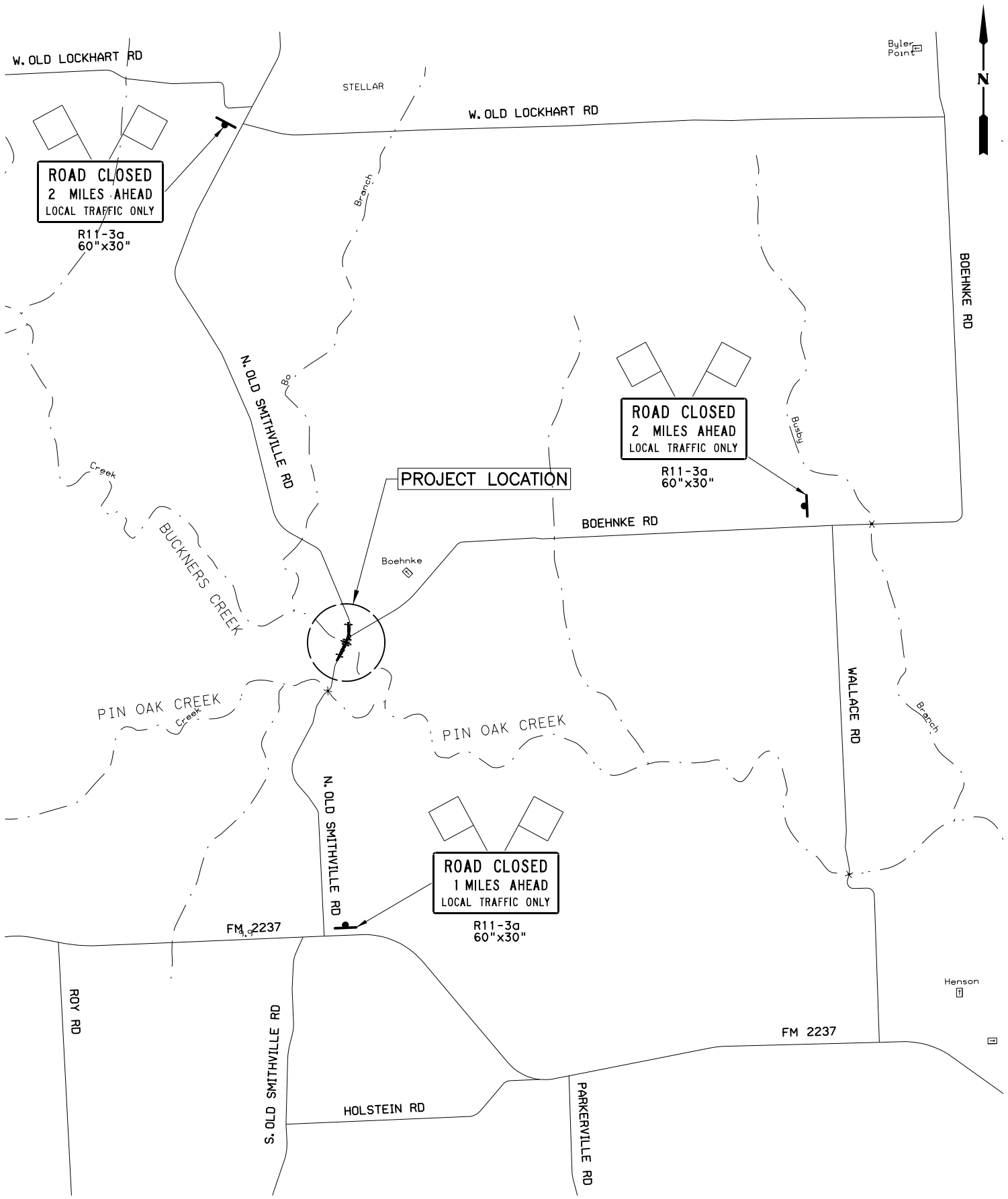
©2022 Texas Department of Transportation
 WALLACE ROAD AT BUCKNERS CREEK

TRAFFIC CONTROL PLAN

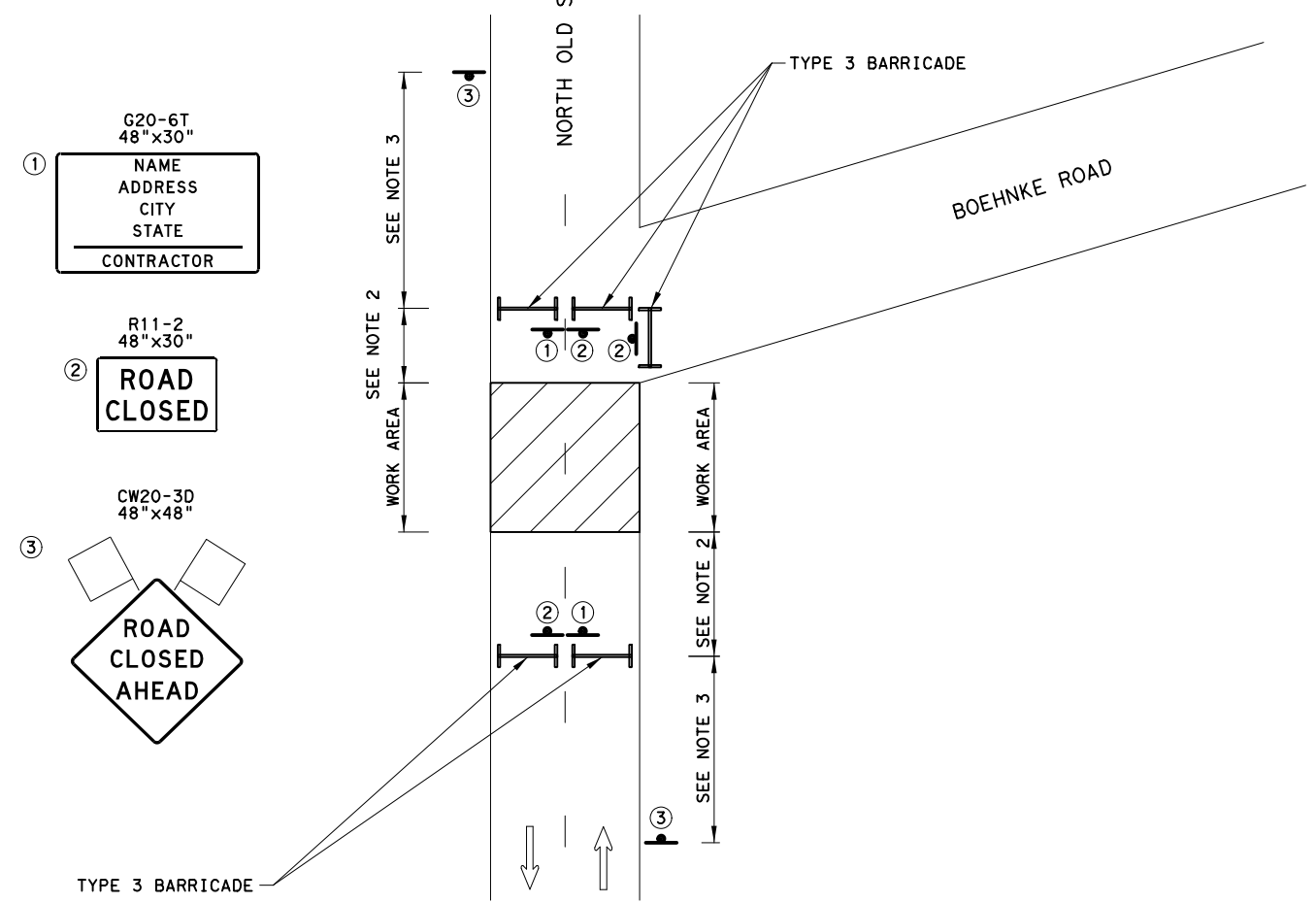
CSJ 0913-28-068 SHEET 1 OF 1

Designed: BGE	FED. RD. DIV. NO. 6	STATE TEXAS	FEDERAL AID PROJECT NO.	HIGHWAY NO.
Checked: BGE	DIST. YKM	COUNTY FAYETTE	CONTROL NO. 0913	SECTION NO. 28
Drawn: BGE	JOB NO. 083, ETC.	SHEET NO. 14		

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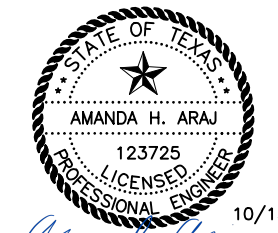


DETOUR LOCATION MAP
NTS



CONSTRUCTION SIGNING AT PROJECT LOCATION
NTS

- NOTES:**
1. NORTH OLD SMITHVILLE ROAD WILL BE CLOSED TO THROUGH TRAFFIC UNTIL SUBSTANTIAL COMPLETION AS APPROVED BY THE AREA ENGINEER.
 2. TYPE 3 BARRICADES TO BE PLACED IN A LOCATION THAT IS SATISFACTORY TO THE ENGINEER TO ALLOW EGRESS AND INGRESS FOR LOCAL PROPERTY OWNERS.
 3. SEE BC SHEETS FOR SIGN SPACING.
 4. SEE ITEM 8 GENERAL NOTES REGARDING CLOSURE.
 5. BOEHNKE ROAD SHALL REMAIN OPEN AT ALL TIMES UNLESS OTHERWISE APPROVED.

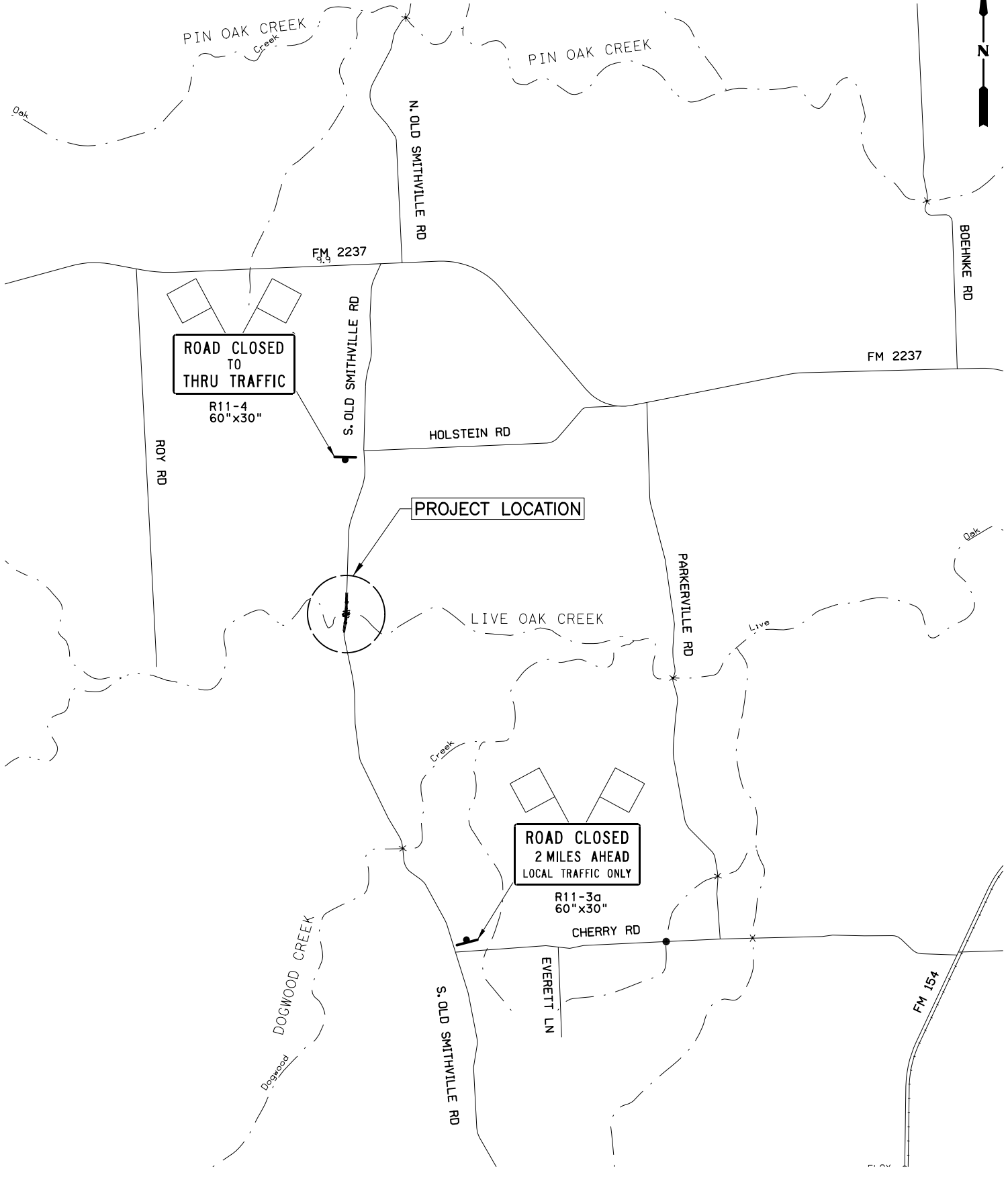


Amanda Araj 10/13/2022

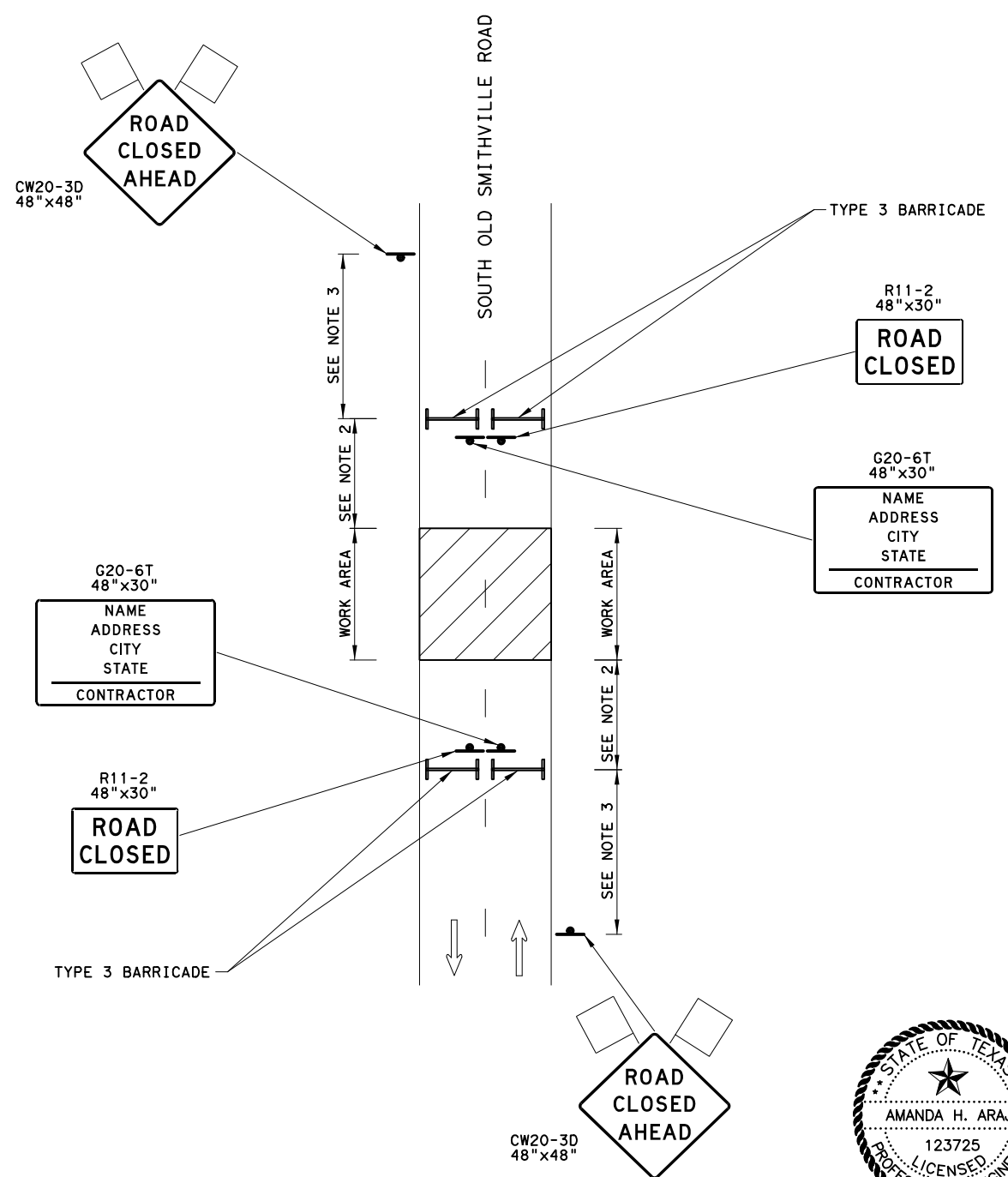
NO.	REVISION	BY	DATE

WSP		WSP USA Inc. 16200 Park Row, Suite 200 Houston, TX 77084 TBPE # F-2263	
 ©2022 Texas Department of Transportation			
NORTH OLD SMITHVILLE RD (CR 483) AT BUCKNERS CREEK			
TRAFFIC CONTROL PLAN			
CSJ 0913-28-085 SHEET 1 OF 1			
Designed:	GD	FED. RD. DIV. NO.	STATE
Checked:	AA	6	TEXAS
Drawn:	GD	DIST.	COUNTY
Checked:	AA	YKM	FAYETTE
		CONTROL NO.	SECTION NO.
		0913	28
		JOB NO.	SHEET NO.
		083, ETC.	15

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DETOUR LOCATION MAP
NTS



CONSTRUCTION SIGNING AT PROJECT LOCATION
NTS

- NOTES:
1. SOUTH OLD SMITHVILLE ROAD WILL BE CLOSED TO THROUGH TRAFFIC UNTIL SUBSTANTIAL COMPLETION AS APPROVED BY THE AREA ENGINEER.
 2. TYPE 3 BARRICADES TO BE PLACED IN A LOCATION THAT IS SATISFACTORY TO THE ENGINEER TO ALLOW EGRESS AND INGRESS FOR LOCAL PROPERTY OWNERS.
 3. SEE BC SHEETS FOR SIGN SPACING.
 4. SEE ITEM 8 GENERAL NOTES REGARDING CLOSURE.

STATE OF TEXAS
 AMANDA H. AJAJ
 123725
 LICENSED PROFESSIONAL ENGINEER
 10/13/2022
Amanda H. Araj

NO.	REVISION	BY	DATE
WSP USA Inc. 16200 Park Row, Suite 200 Houston, TX 77084 TBPE # F-2263			
SOUTH OLD SMITHVILLE RD (CR 477) AT LIVE OAK CREEK TRAFFIC CONTROL PLAN CSJ 0913-28-086 SHEET 1 OF 1			
Designed:	GD	FED. RD. DIV. NO.	STATE
Checked:	AA	6	TEXAS
Drawn:	GD	DIST.	COUNTY
Checked:	AA	YKM	FAYETTE
		CONTROL NO.	SECTION NO.
		0913	28
		JOB NO.	SHEET NO.
		083,ETC.	16

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DATE:
 FILE:

BARRICADE AND CONSTRUCTION (BC) STANDARD SHEETS GENERAL NOTES:

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


WORKER SAFETY NOTES:

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

COMPLIANT WORKZONE TRAFFIC CONTROL DEVICES

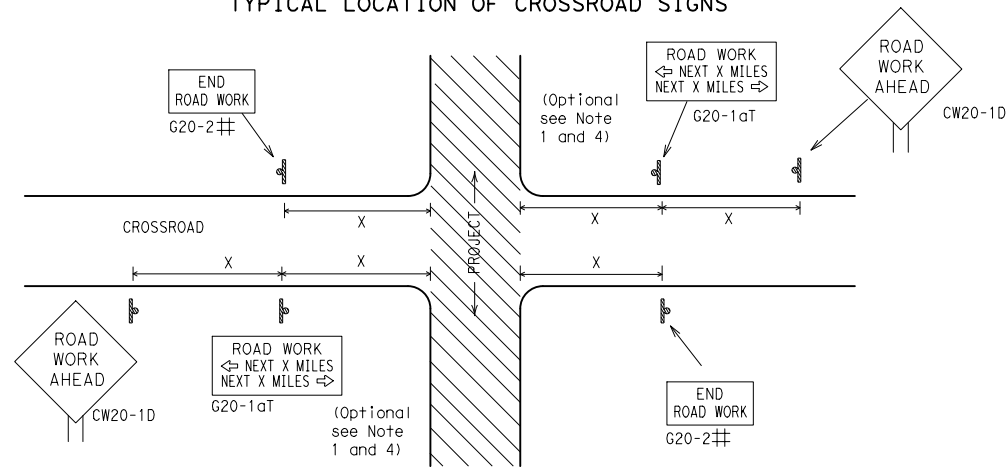
1. Only pre-qualified products shall be used. The "Compliant Work Zone Traffic Control Devices List" (CWZTCD) describes pre-qualified products and their sources.
2. Work zone traffic control devices shall be compliant with the Manual for Assessing safety Hardware (MASH).

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

		Texas Department of Transportation <i>Traffic Safety Division Standard</i>
<p>BARRICADE AND CONSTRUCTION GENERAL NOTES AND REQUIREMENTS</p> <p>BC (1) -21</p>		
FILE:	bc-21.dgn	DN: TxDOT
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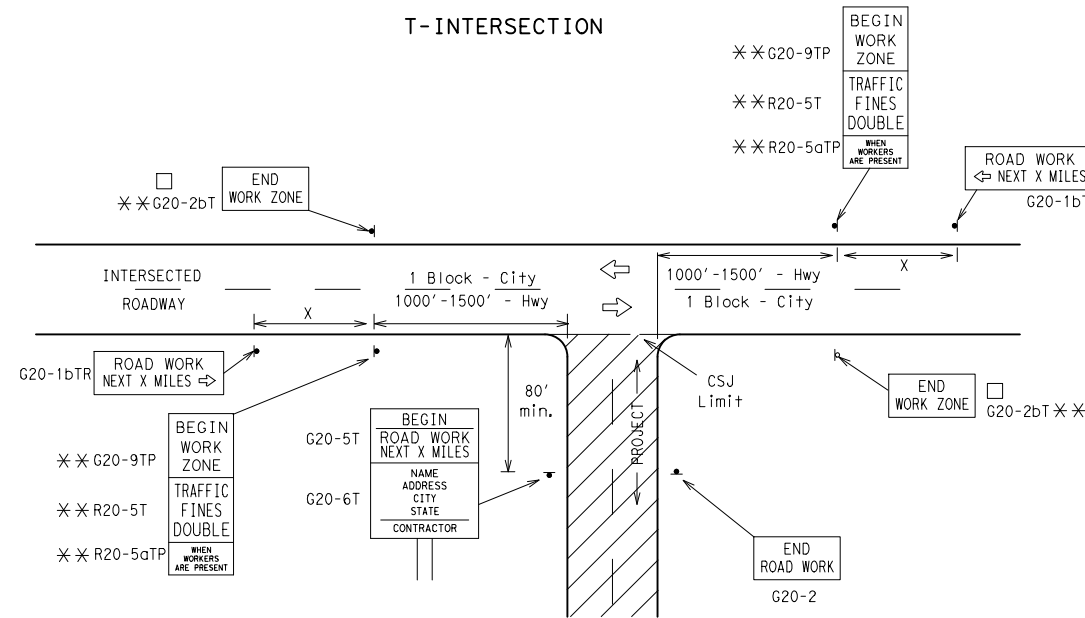
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TYPICAL LOCATION OF CROSSROAD SIGNS



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

T-INTERSECTION



CSJ LIMITS AT T-INTERSECTION

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

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

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

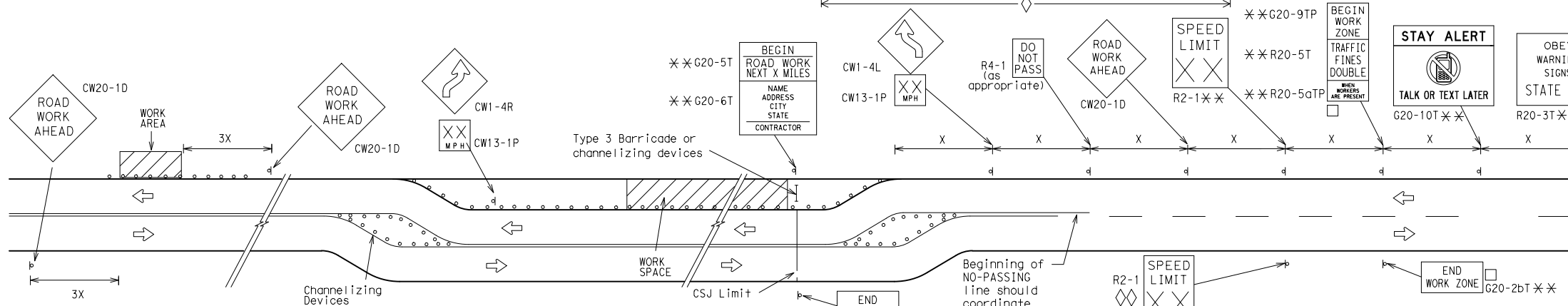
* For typical sign spacings on divided highways, expressways and freeways, see Part 6 of the "Texas Manual on Uniform Traffic Control Devices" (TMUTCD) typical application diagrams or TCP Standard Sheets.

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

GENERAL NOTES

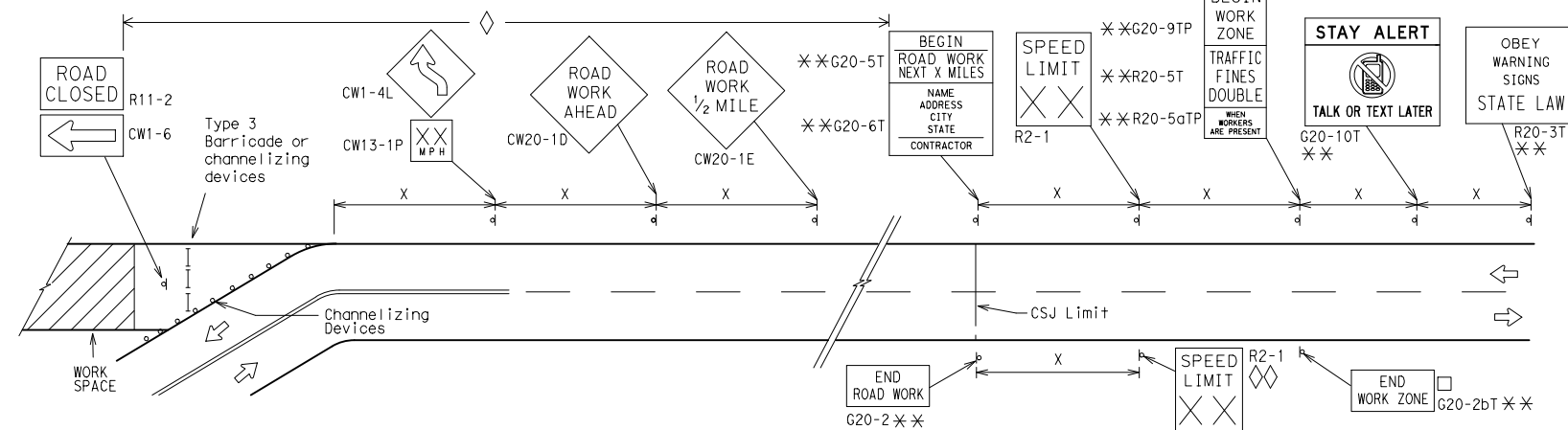
- Special or larger size signs may be used as necessary.
- Distance between signs should be increased as required to have 1500 feet advance warning.
- Distance between signs should be increased as required to have 1/2 mile or more advance warning.
- 36" x 36" "ROAD WORK AHEAD" (CW20-1D) signs may be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

WORK AREAS IN MULTIPLE LOCATIONS WITHIN CSJ LIMITS

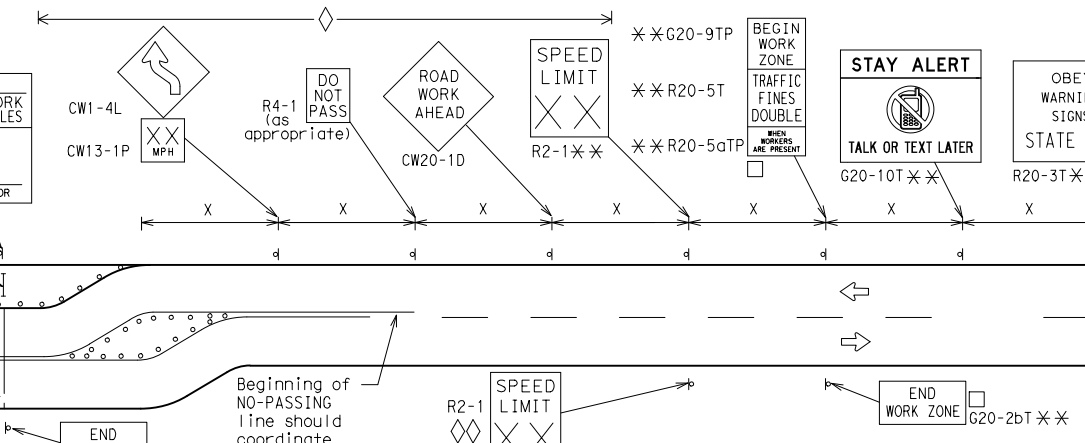


When extended distances occur between minimal work spaces, the Engineer/Inspector should ensure additional "ROAD WORK AHEAD" (CW20-1D) signs are placed in advance of these work areas to remind drivers they are still within the project limits. See the applicable TCP sheets for exact location and spacing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

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



SAMPLE LAYOUT OF SIGNING FOR WORK BEGINNING AT THE CSJ LIMITS



NOTES

- The Contractor shall determine the appropriate distance to be placed on the G20-1 series signs and "BEGIN ROAD WORK NEXT X MILES" (G20-5T) sign for each specific project. This distance shall replace the "X" and shall be rounded to the nearest whole mile with the approval of the Engineer. No decimals shall be used.
- The "BEGIN WORK ZONE" (G20-9TP) and "END WORK ZONE" (G20-2bT) shall be used as shown on the sample layout when advance signs are required outside the CSJ Limits. They inform the motorist of entering or leaving a part of the work zone lying outside the CSJ Limits where traffic fines may double if workers are present.
- CSJ limit signing is required for highway construction and maintenance work, with the exception of mobile operations.
- Area for placement of "ROAD WORK AHEAD" (CW20-1D) sign and other signs or devices as called for on the Traffic Control Plan.
- Contractor will install a regulatory speed limit sign at the end of the work zone.

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

SHEET 2 OF 12



BARRICADE AND CONSTRUCTION PROJECT LIMIT

BC(2)-21

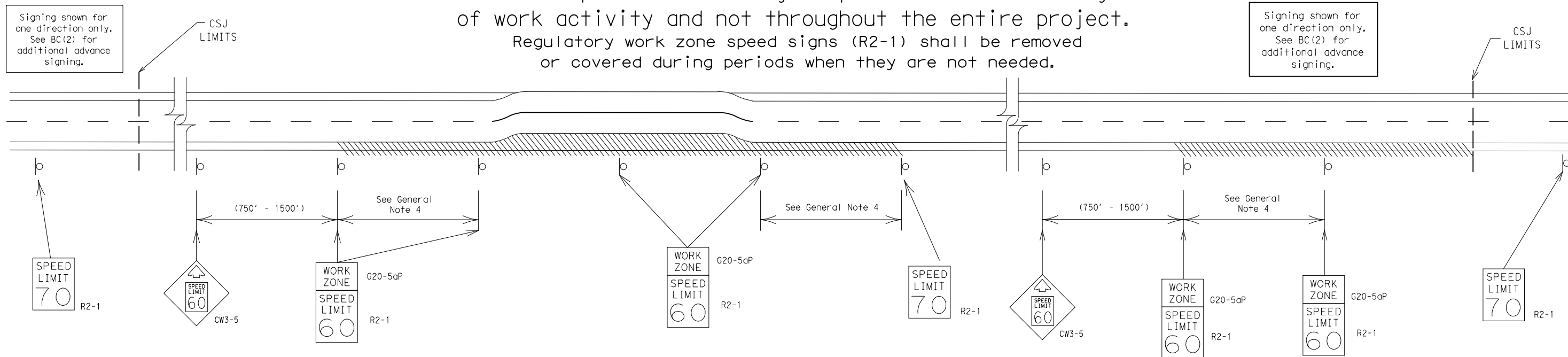
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TYPICAL APPLICATION OF WORK ZONE SPEED LIMIT SIGNS

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

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



GUIDANCE FOR USE:

LONG/INTERMEDIATE TERM WORK ZONE SPEED LIMITS

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

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

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

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

SHORT TERM WORK ZONE SPEED LIMITS

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

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

GENERAL NOTES

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

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

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SHEET 3 OF 12



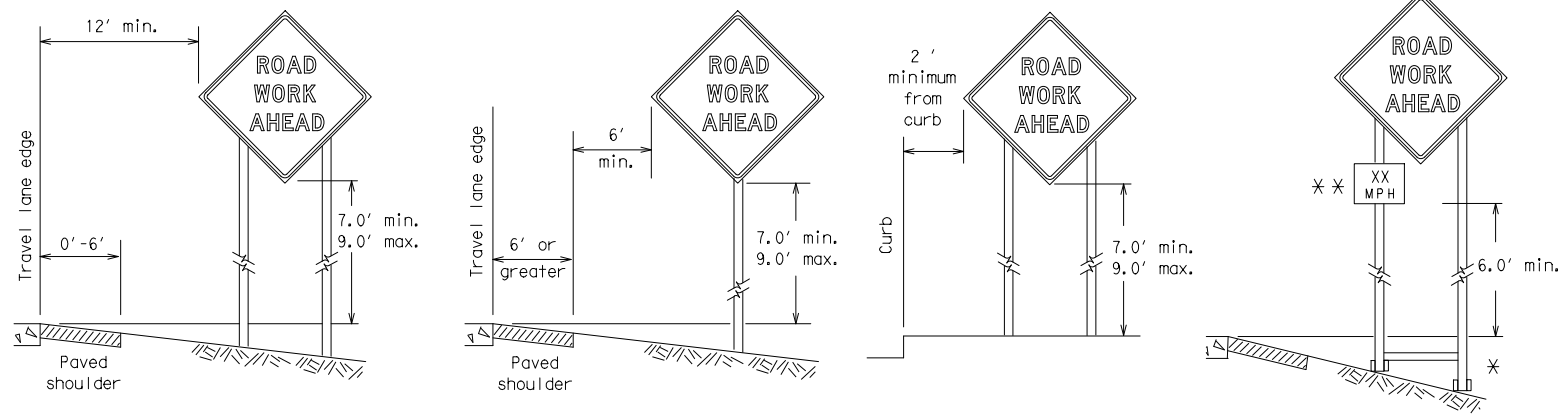
BARRICADE AND CONSTRUCTION WORK ZONE SPEED LIMIT

BC (3) -21

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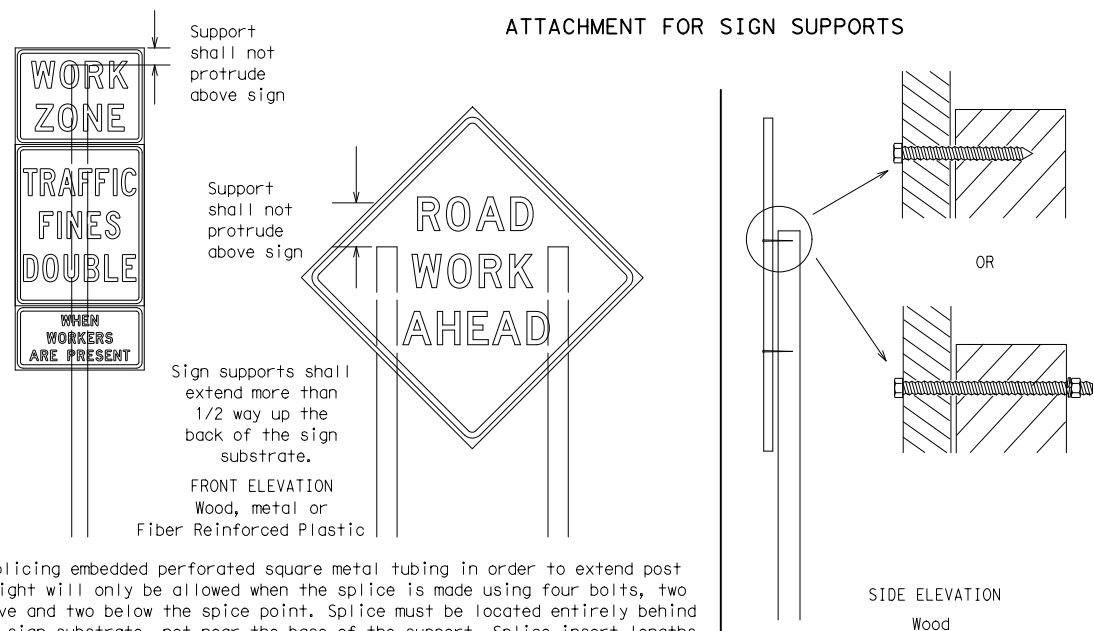
TYPICAL MINIMUM CLEARANCES FOR LONG TERM AND INTERMEDIATE TERM SIGNS



* 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) for small roadside signs. Supports for temporary large roadside signs shall meet the requirements detailed on the Temporary Large Roadside Signs (TLRS) standard sheets. The Contractor shall install the sign support in accordance with the manufacturer's recommendations. If there is a question regarding installation procedures, the Contractor shall furnish the Engineer a copy of the manufacturer's installation recommendations so the Engineer can verify the correct procedures are being followed.
- The Contractor is responsible for installing signs on approved supports and replacing signs with damaged or cracked substrates and/or damaged or marred reflective sheeting as directed by the Engineer/Inspector.
- Identification markings may be shown only on the back of the sign substrate. The maximum height of letters and/or company logos used for identification shall be 1 inch.
- The Contractor shall replace damaged wood posts. New or damaged wood sign posts shall not be spliced.

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

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

SIGN MOUNTING HEIGHT

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

SIZE OF SIGNS

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

SIGN SUBSTRATES

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

REFLECTIVE SHEETING

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

SIGN LETTERS

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

REMOVING OR COVERING

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

SIGN SUPPORT WEIGHTS

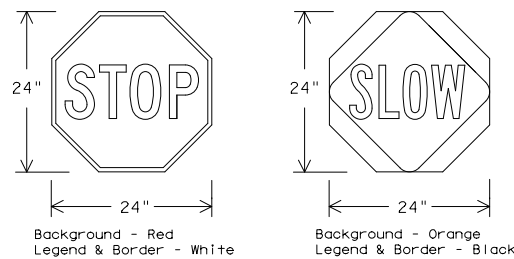
- Where sign supports require the use of weights to keep from turning over, the use of sandbags with dry, cohesionless sand should be used.
- The sandbags will be tied shut to keep the sand from spilling and to maintain a constant weight.
- Rock, concrete, iron, steel or other solid objects shall not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

FLAGS ON SIGNS

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

STOP/SLOW PADDLES

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



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

CONTRACTOR REQUIREMENTS FOR MAINTAINING PERMANENT SIGNS WITHIN THE PROJECT LIMITS

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

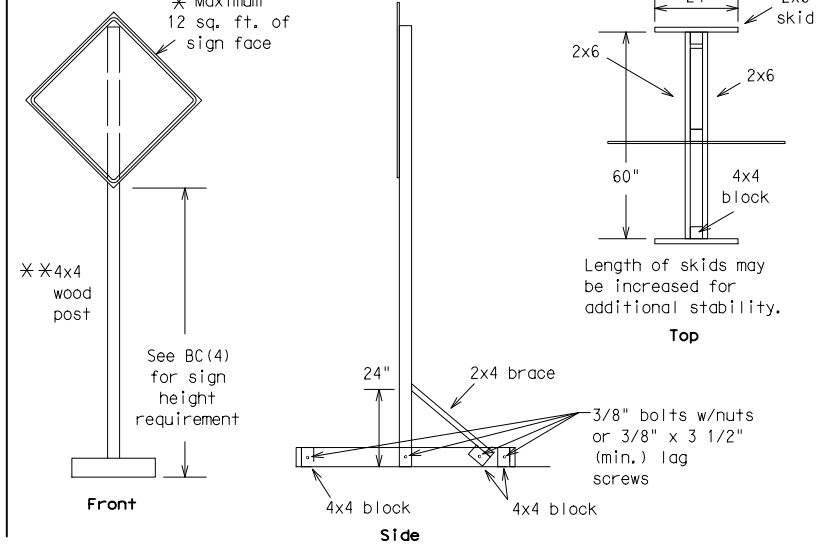
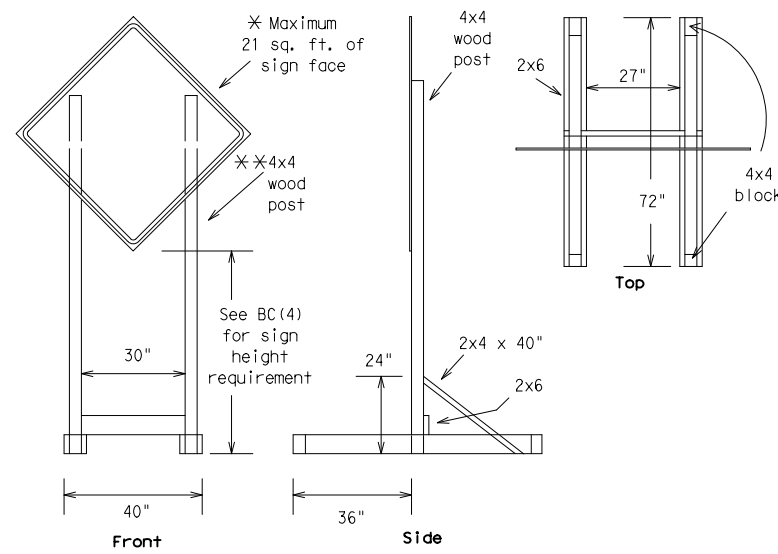


BARRICADE AND CONSTRUCTION TEMPORARY SIGN NOTES

BC (4) -21

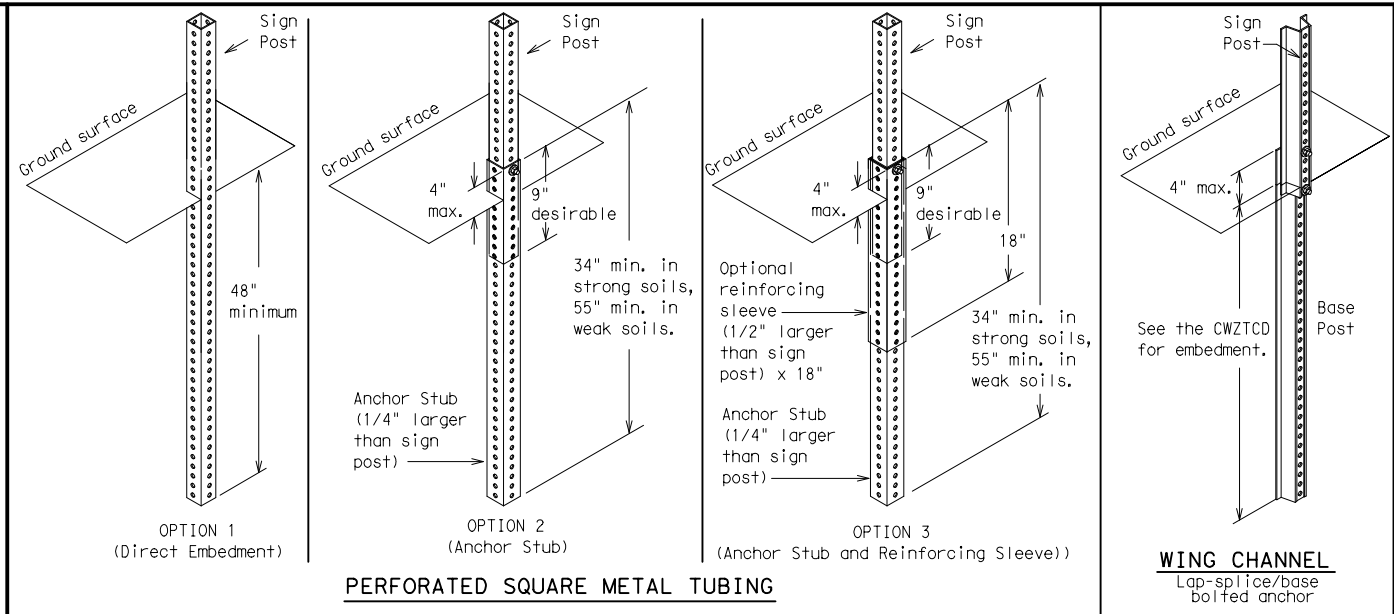
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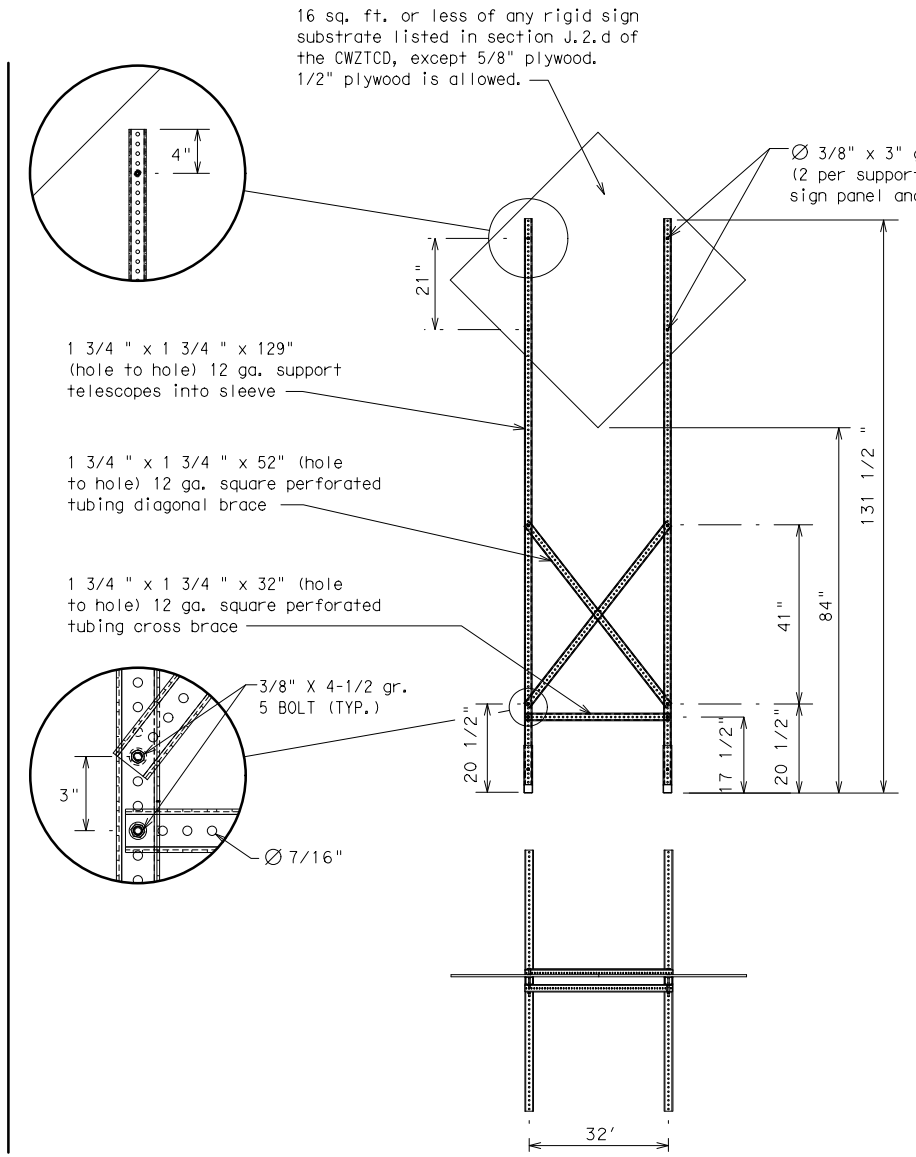
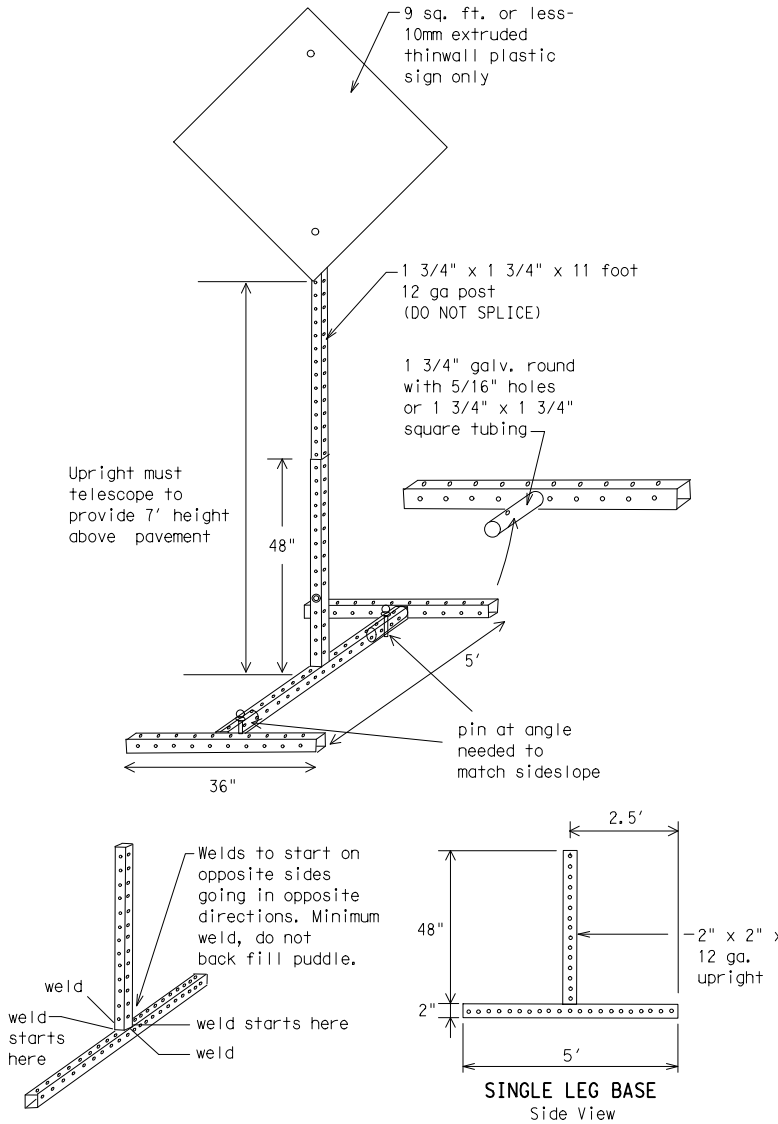
SKID MOUNTED WOOD SIGN SUPPORTS

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



GROUND MOUNTED SIGN SUPPORTS

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



SKID MOUNTED PERFORATED SQUARE STEEL TUBING SIGN SUPPORTS

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

WEDGE ANCHORS

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

OTHER DESIGNS

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

GENERAL NOTES

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

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

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BARRICADE AND CONSTRUCTION TYPICAL SIGN SUPPORT

BC(5)-21

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

RECOMMENDED PHASES AND FORMATS FOR PCMS MESSAGES DURING ROADWORK ACTIVITIES

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

PORTABLE CHANGEABLE MESSAGE SIGNS

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

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

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

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

FRONTAGE ROAD CLOSED
SHOULDER CLOSED XXX FT
RIGHT LN CLOSED XXX FT
RIGHT X LANES OPEN
DAYTIME LANE CLOSURES
I-XX SOUTH EXIT CLOSED
EXIT XXX CLOSED X MILE
RIGHT LN TO BE CLOSED
X LANES CLOSED TUE - FRI
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.

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.

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.

SHEET 6 OF 12



BARRICADE AND CONSTRUCTION PORTABLE CHANGEABLE MESSAGE SIGN (PCMS)

BC (6) - 21

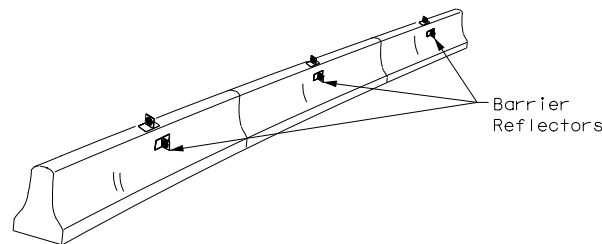
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© TxDOT November 2002	CONT	SECT	JOB	HIGHWAY
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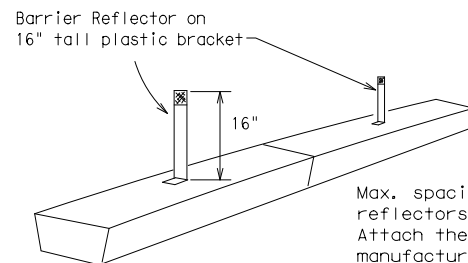
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- Barrier Reflectors shall be pre-qualified, and conform to the color and reflectivity requirements of DMS-8600. A list of prequalified Barrier Reflectors can be found at the Material Producer List web address shown on BC(1).
- Color of Barrier Reflectors 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.

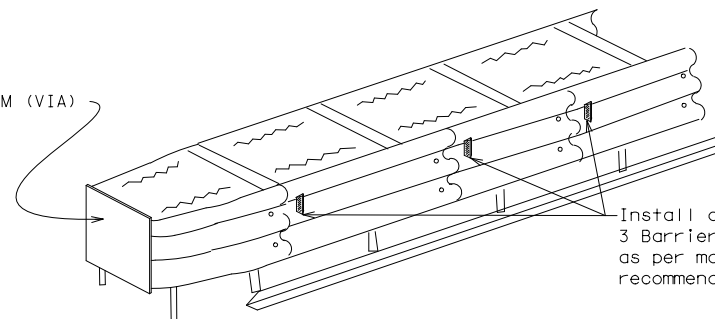


LOW PROFILE CONCRETE BARRIER (LPCB) USED IN WORK ZONES

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

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

LOW PROFILE CONCRETE BARRIER (LPCB)



DELINEATION OF END TREATMENTS

END TREATMENTS FOR CTB'S USED IN WORK ZONES

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

BARRIER REFLECTORS FOR CONCRETE TRAFFIC BARRIER AND ATTENUATORS

WARNING LIGHTS

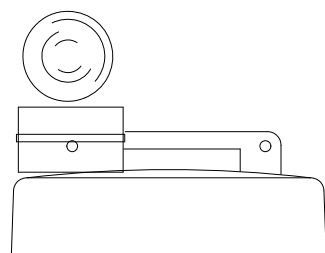
- Warning lights shall meet the requirements of the TMUTCD.
- Warning lights shall NOT be installed on barricades.
- Type A-Low Intensity Flashing Warning Lights are commonly used with drums. They are intended to warn of or mark a potentially hazardous area. Their use shall be as indicated on this sheet 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

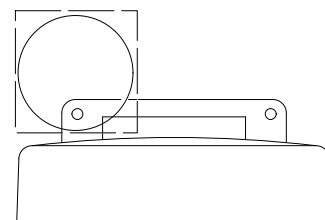
- Type A flashing warning lights are intended to warn drivers that they are approaching or are in a potentially hazardous area.
- Type A random flashing warning lights are not intended for delineation and shall not be used in a series.
- A series of sequential flashing warning lights placed on channelizing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



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

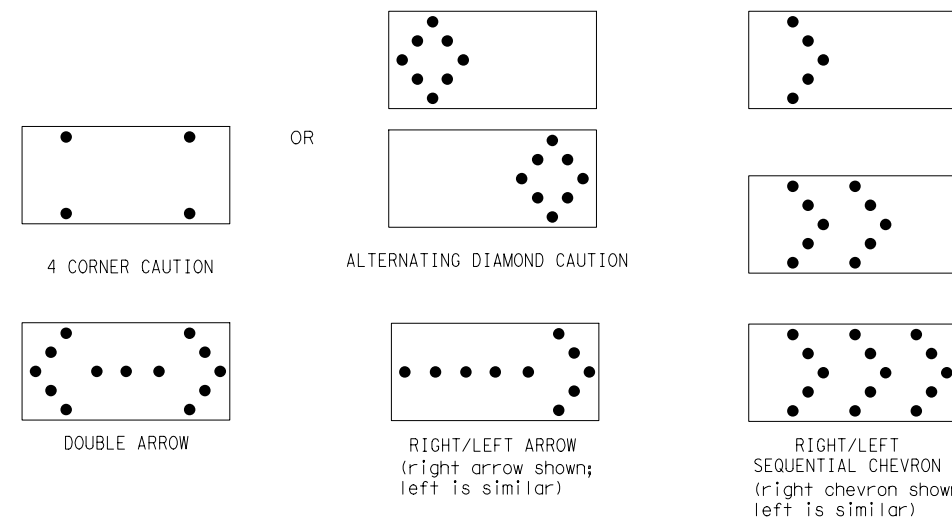


Warning reflector may be round or square. Must have a yellow reflective surface area of at least 30 square inches

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

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



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

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

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

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

FLASHING ARROW BOARDS

SHEET 7 OF 12

TRUCK-MOUNTED ATTENUATORS

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



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

BC (7) -21

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GENERAL NOTES

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

GENERAL DESIGN REQUIREMENTS

Pre-qualified plastic drums shall meet the following requirements:

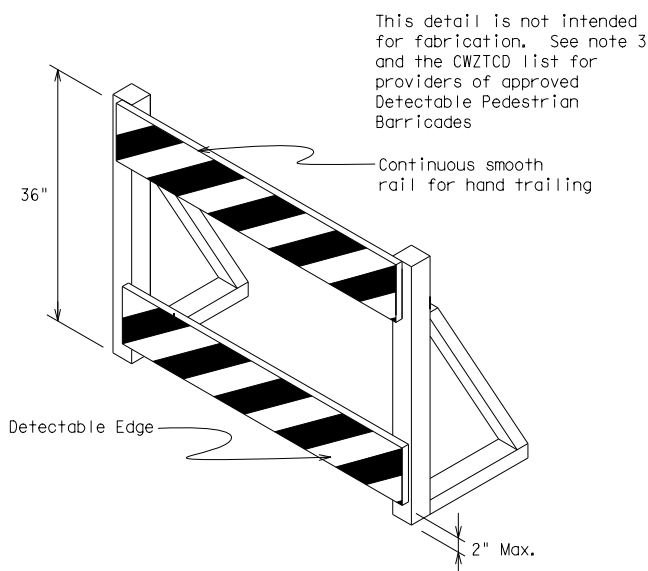
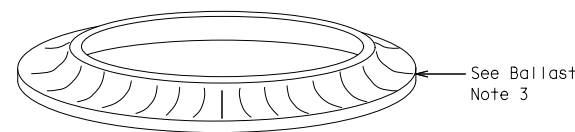
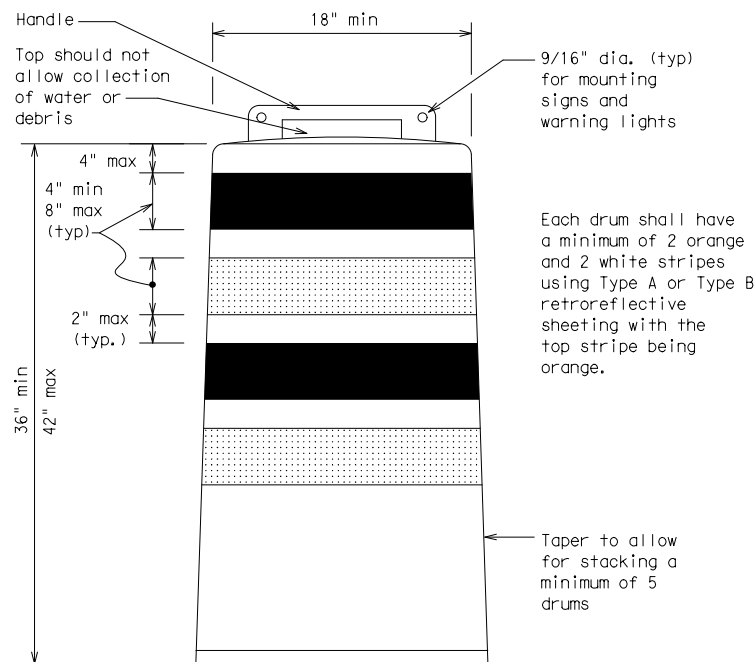
- Plastic drums shall be a two-piece design; the "body" of the drum shall be the top portion and the "base" shall be the bottom.
- The body and base shall lock together in such a manner that the body separates from the base when impacted by a vehicle traveling at a speed of 20 MPH or greater but prevents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

RETROREFLECTIVE SHEETING

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

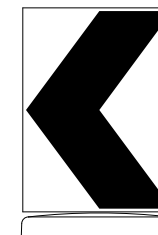
BALLAST

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

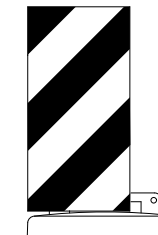


DETECTABLE PEDESTRIAN BARRICADES

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



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



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

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

SIGNS, CHEVRONS, AND VERTICAL PANELS MOUNTED ON PLASTIC DRUMS

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

SHEET 8 OF 12



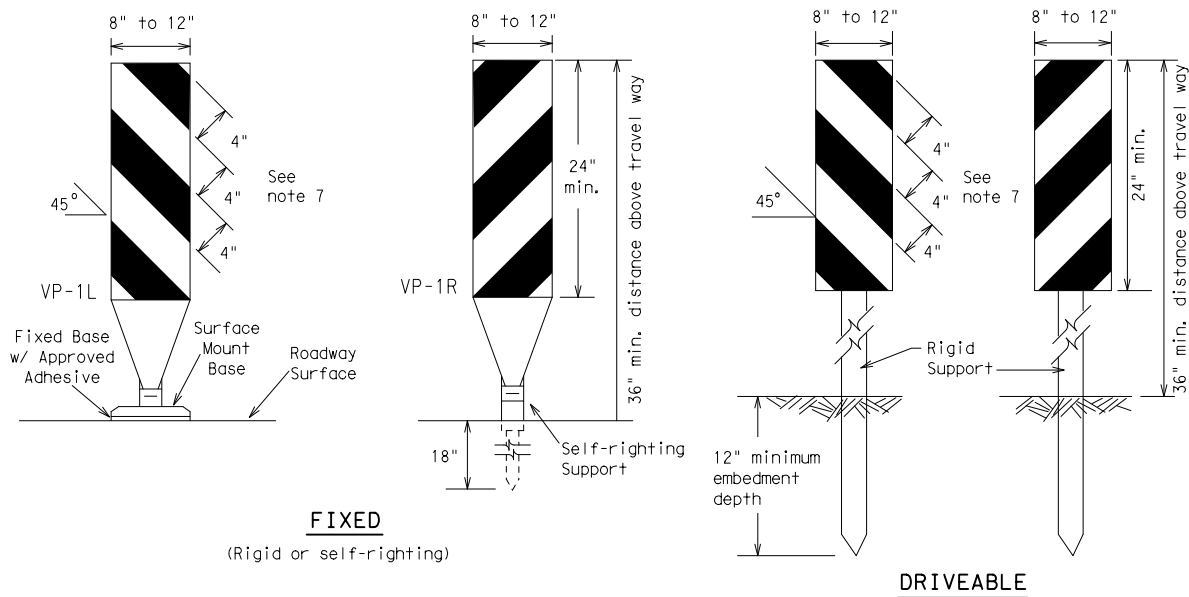
BARRICADE AND CONSTRUCTION CHANNELIZING DEVICES

BC(8)-21

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© TxDOT	November 2002	CONT	SECT	JOB	HIGHWAY				
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9-07	5-21	YKM	FAYETTE		24				
7-13									

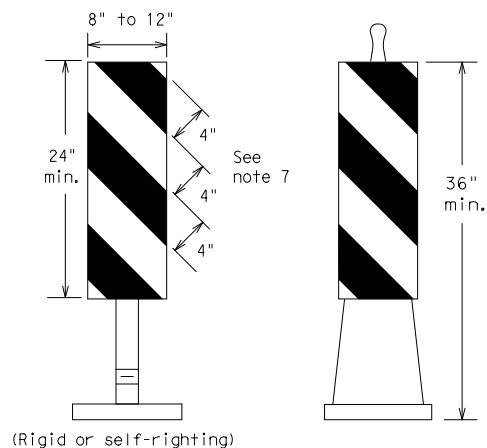
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FIXED
(Rigid or self-righting)

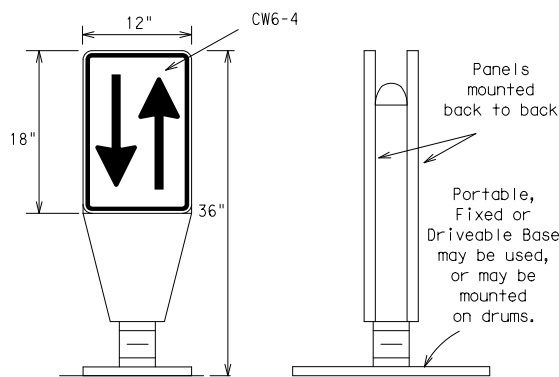
DRIVEABLE



PORTABLE

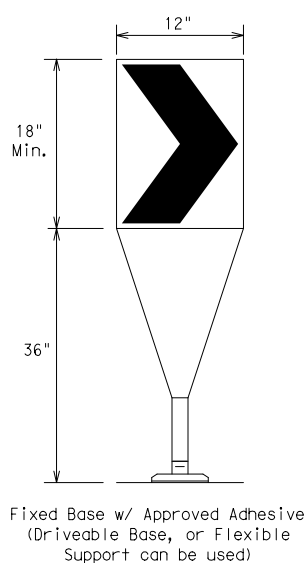
VERTICAL PANELS (VPs)

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



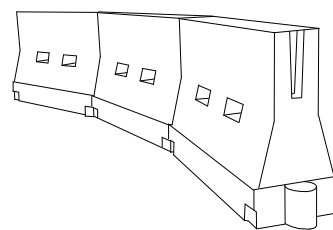
OPPOSING TRAFFIC LANE DIVIDERS (OTLD)

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



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

CHEVRONS



LONGITUDINAL CHANNELIZING DEVICES (LCD)

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

WATER BALLASTED SYSTEMS USED AS BARRIERS

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

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

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

GENERAL NOTES

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

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

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

SUGGESTED MAXIMUM SPACING OF CHANNELIZING DEVICES AND MINIMUM DESIRABLE TAPER LENGTHS

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BARRICADE AND CONSTRUCTION CHANNELIZING DEVICES

BC (9) - 21

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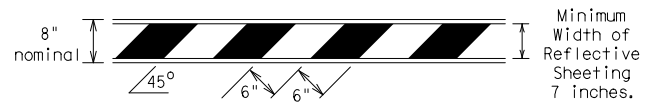
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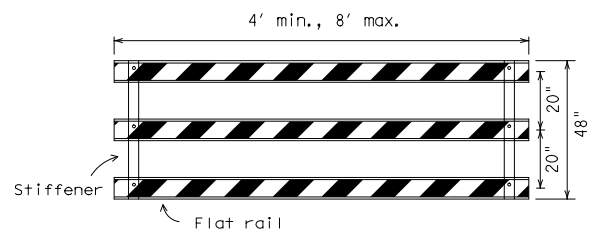
TYPE 3 BARRICADES

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

Barricades shall NOT be used as a sign support.



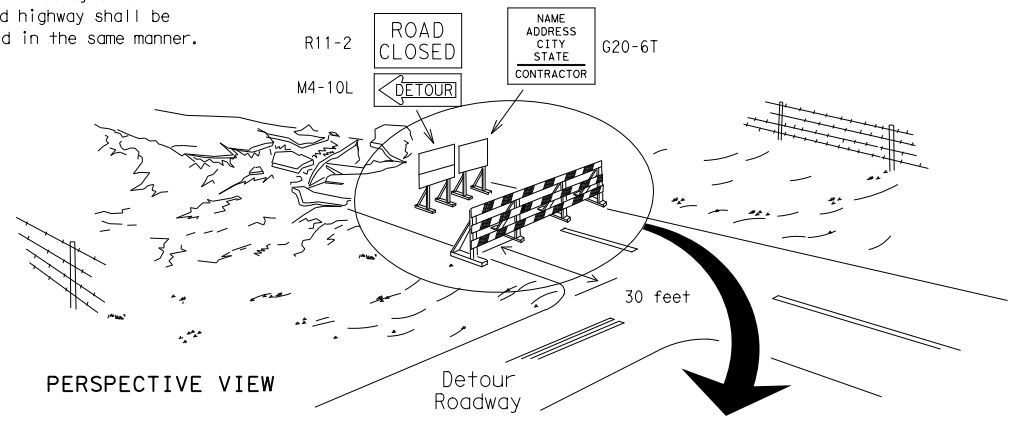
TYPICAL STRIPING DETAIL FOR BARRICADE RAIL



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

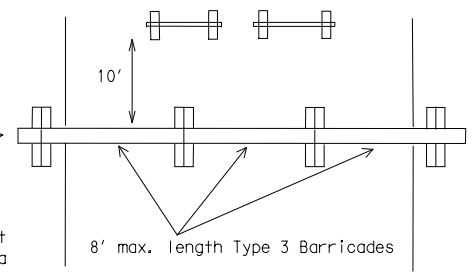
TYPICAL PANEL DETAIL FOR SKID OR POST TYPE BARRICADES

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



PERSPECTIVE VIEW

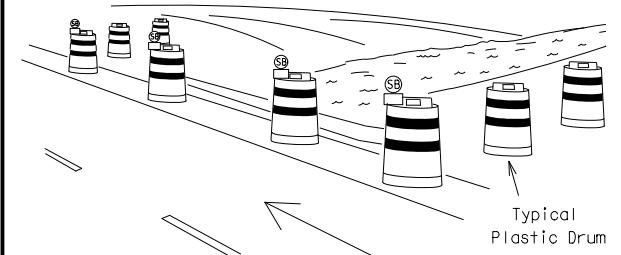
The three rails on Type 3 barricades shall be reflectorized orange and reflective white stripes on one side facing one-way traffic and both sides for two-way traffic. Barricade striping should slant downward in the direction of detour.



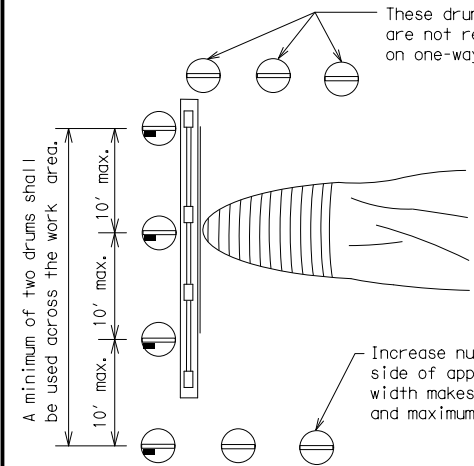
PLAN VIEW

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

TYPE 3 BARRICADE (POST AND SKID) TYPICAL APPLICATION



PERSPECTIVE VIEW



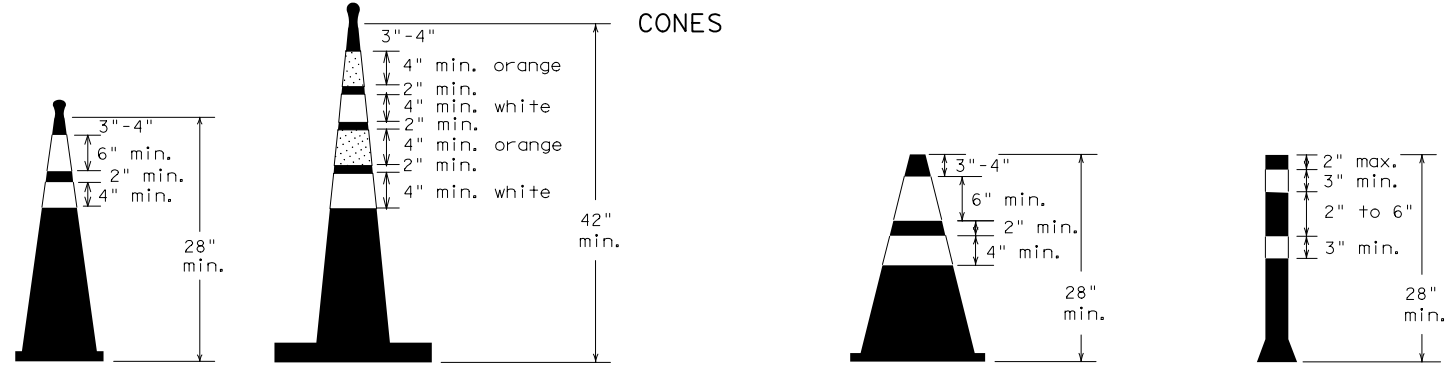
PLAN VIEW

Increase number of plastic drums on the side of approaching traffic if the crown width makes it necessary. (minimum of 2 and maximum of 4 drums)

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

CULVERT WIDENING OR OTHER ISOLATED WORK WITHIN THE PROJECT LIMITS



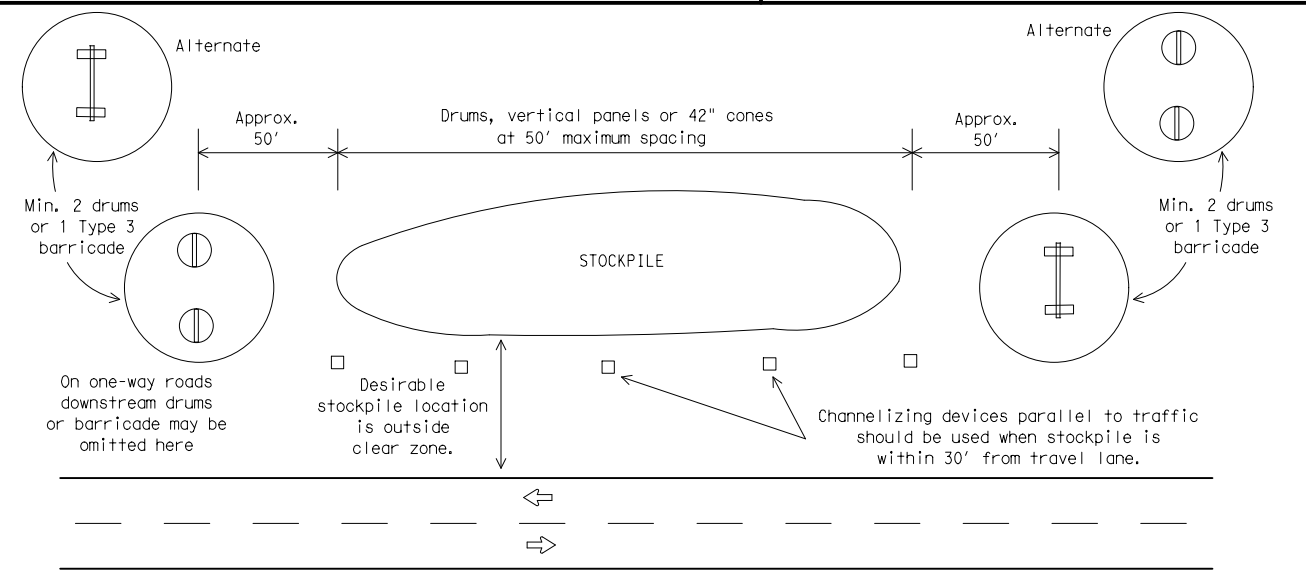
Two-Piece cones

One-Piece cones

Tubular Marker

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

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



TRAFFIC CONTROL FOR MATERIAL STOCKPILES



BARRICADE AND CONSTRUCTION CHANNELIZING DEVICES

BC(10)-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.

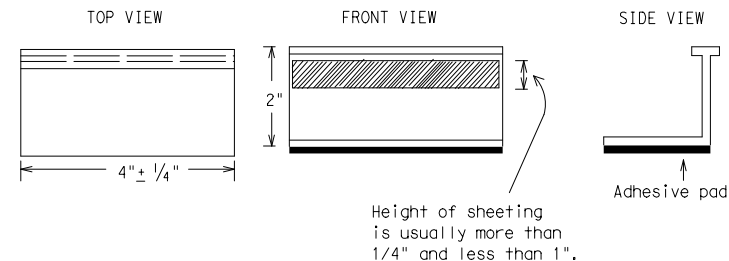
MAINTAINING WORK ZONE PAVEMENT MARKINGS

- 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

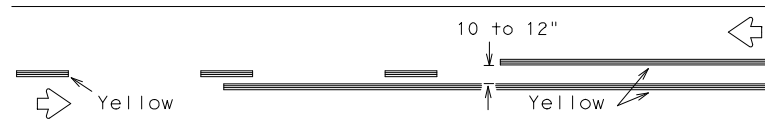
BC(11)-21

FILE: bc-21.dgn	DN: TxDOT	CK: TxDOT	DW: TxDOT	CK: TxDOT
© TxDOT February 1998	CONT	SECT	JOB	HIGHWAY
REVISIONS		0913	28	083,ETC
2-98	9-07	5-21		
1-02	7-13			
11-02	8-14			
	DIST	COUNTY		SHEET NO.
	YKM	FAYETTE		27

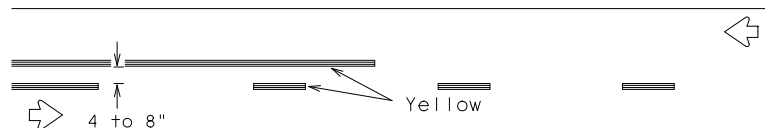
DISCLAIMER: The use of this standard is governed by the "Texas Engineering Practice Act". No warranty of any kind is made by TxDOT for any purpose whatsoever. TxDOT assumes no responsibility for the conversion of this standard to other formats or for incorrect results or damages resulting from its use.

DATE:
FILE:

PAVEMENT MARKING PATTERNS

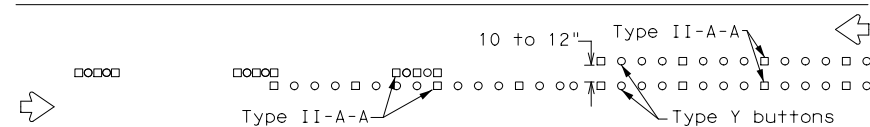


REFLECTORIZED PAVEMENT MARKINGS - PATTERN A

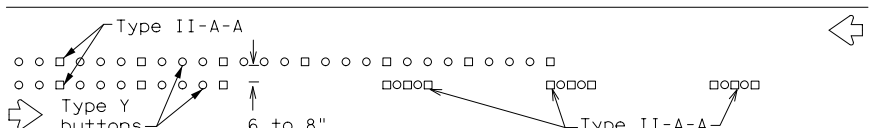


REFLECTORIZED PAVEMENT MARKINGS - PATTERN B

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

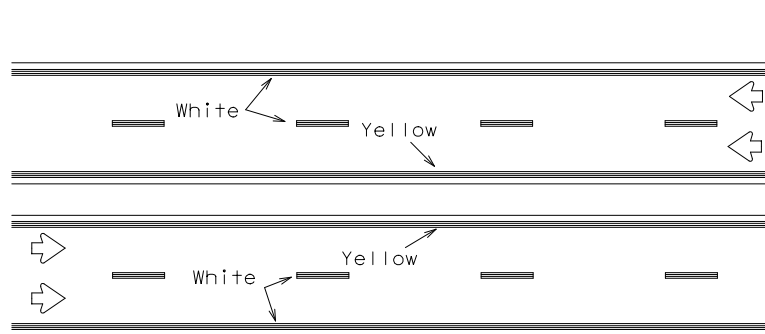


RAISED PAVEMENT MARKERS - PATTERN A



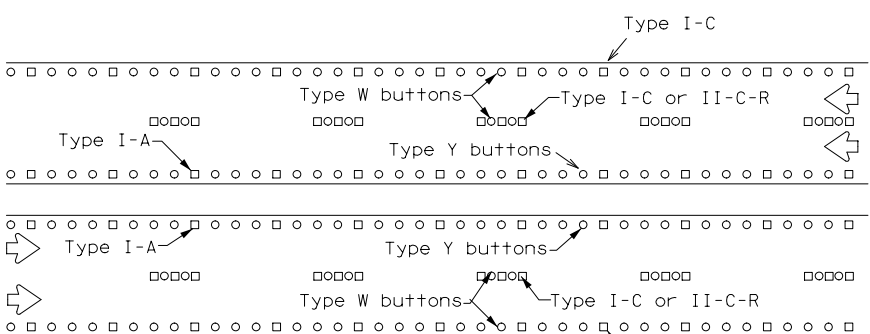
RAISED PAVEMENT MARKERS - PATTERN B

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



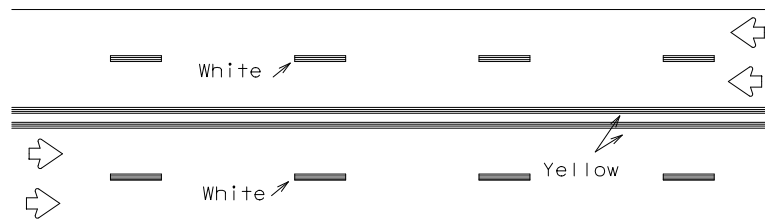
REFLECTORIZED PAVEMENT MARKINGS

Prefabricated markings may be substituted for reflectORIZED pavement markings.



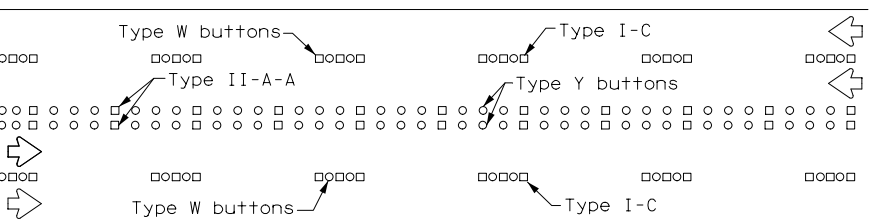
RAISED PAVEMENT MARKERS

EDGE & LANE LINES FOR DIVIDED HIGHWAY



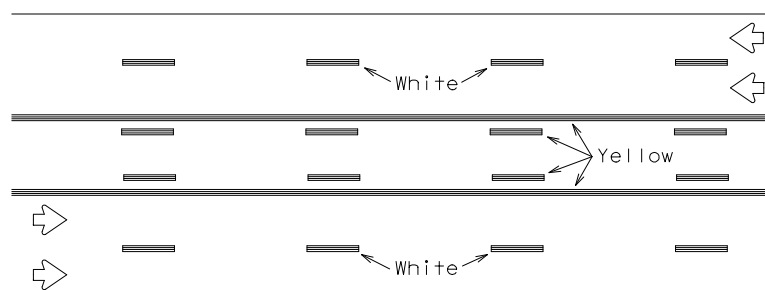
REFLECTORIZED PAVEMENT MARKINGS

Prefabricated markings may be substituted for reflectORIZED pavement markings.



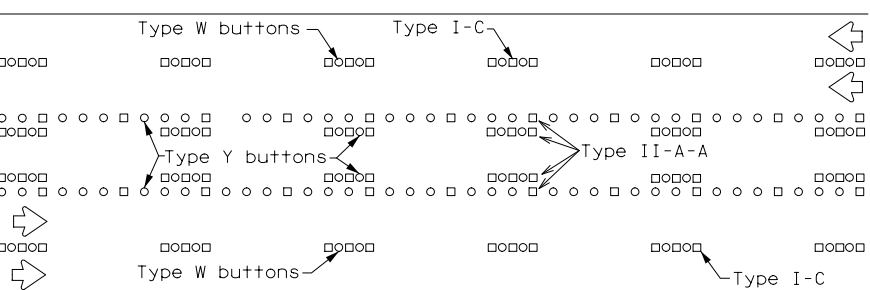
RAISED PAVEMENT MARKERS

LANE & CENTER LINES FOR MULTILANE UNDIVIDED HIGHWAYS



REFLECTORIZED PAVEMENT MARKINGS

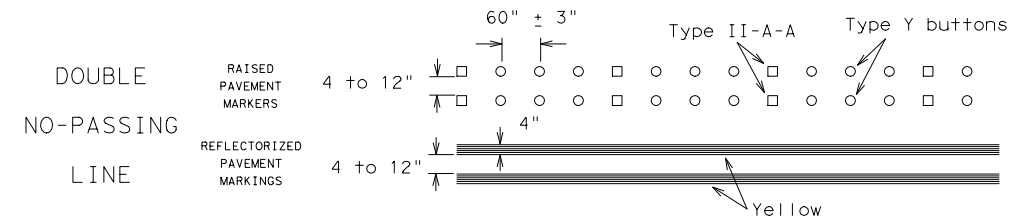
Prefabricated markings may be substituted for reflectORIZED pavement markings.



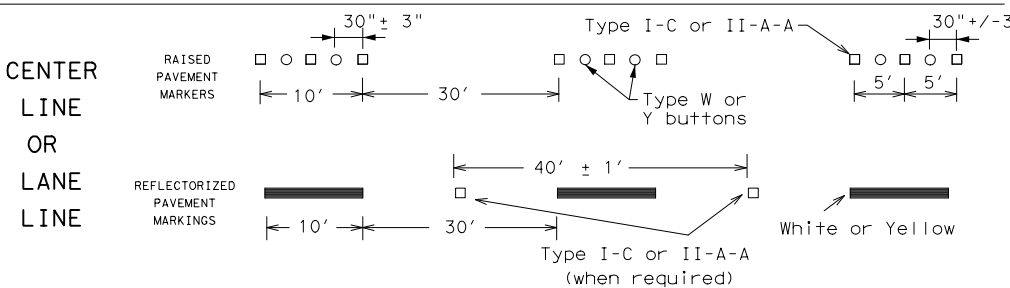
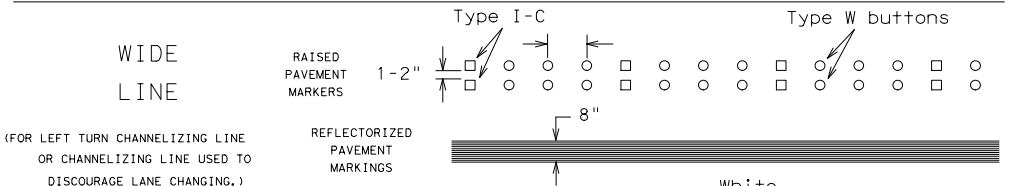
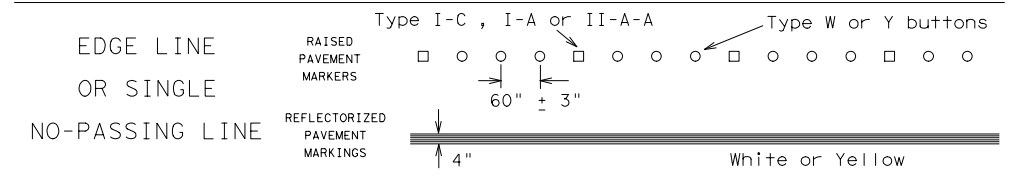
RAISED PAVEMENT MARKERS

TWO-WAY LEFT TURN LANE

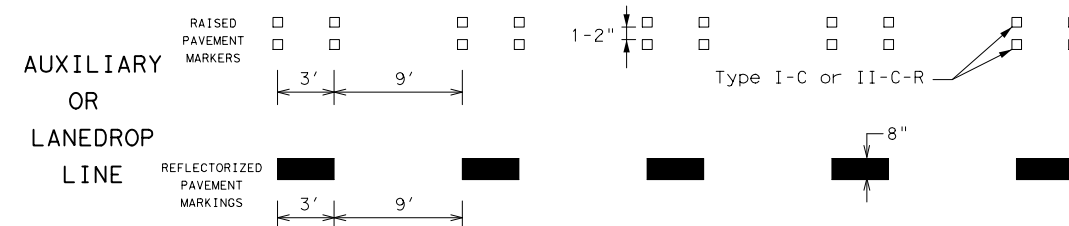
STANDARD WORK ZONE PAVEMENT MARKINGS DETAILS



SOLID LINES

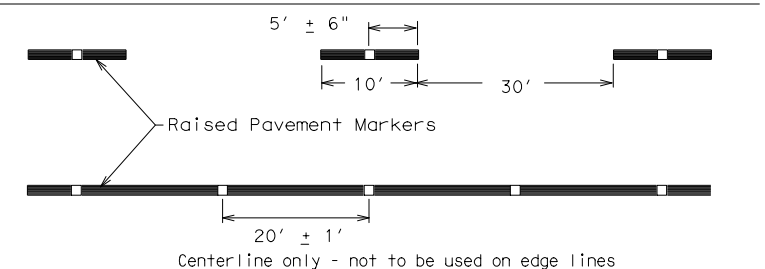


BROKEN LINES



REMOVABLE MARKINGS WITH RAISED PAVEMENT MARKERS

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



SHEET 12 OF 12



BARRICADE AND CONSTRUCTION PAVEMENT MARKING PATTERNS

BC(12)-21

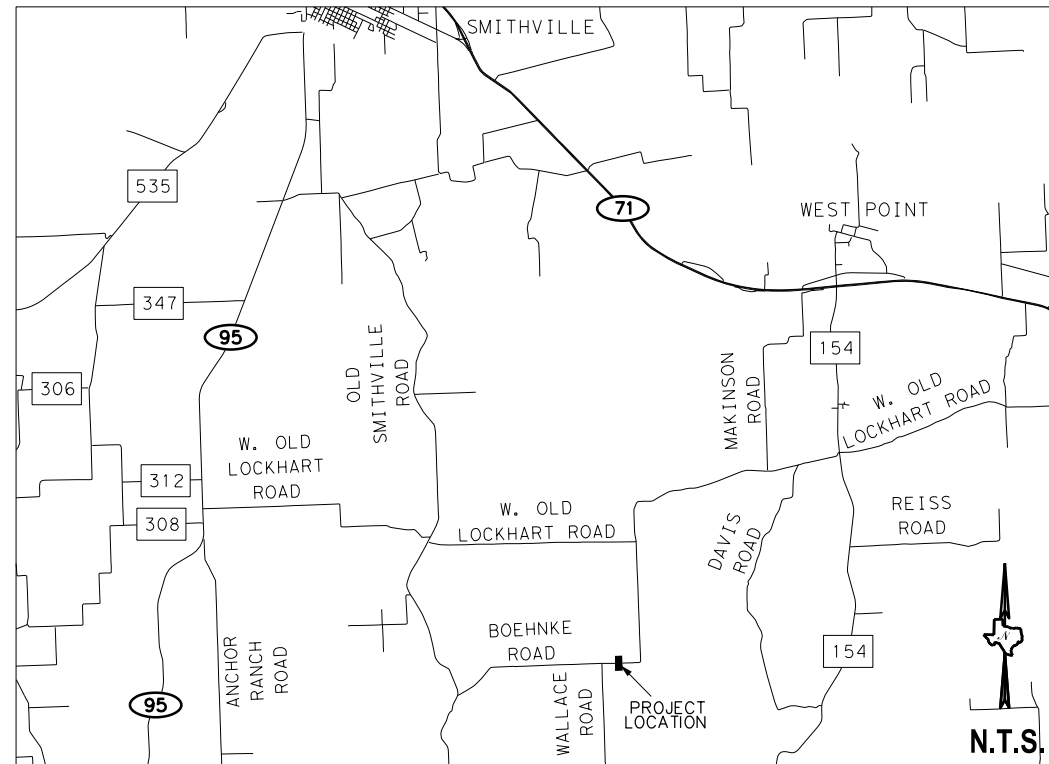
FILE: bc-21.dgn	DN: TxDOT	CK: TxDOT	DW: TxDOT	CK: TxDOT
©TxDOT February 1998	CONT	SECT	JOB	HIGHWAY
REVISIONS	0913	28	083,ETC	CR
1-97 9-07 5-21				
2-98 7-13				
11-02 8-14	DIST	COUNTY	SHEET NO.	
	YKM	FAYETTE	28	

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.

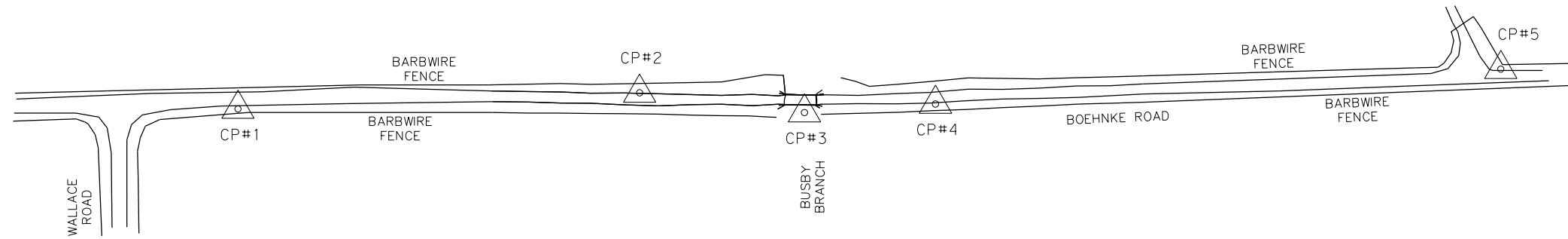
DATE: FILE:



N.T.S.



LOCATION MAP



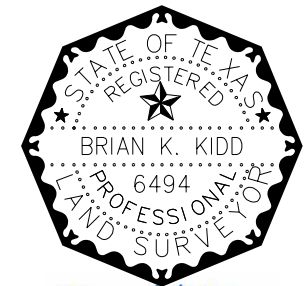
CONTROL POINT	SURFACE COORDINATES		NAVD 88 ELEVATION	GRID COORDINATES		DESCRIPTION
	NORTHING	EASTING		NORTHING	EASTING	
CP#1	13,867,342.288	2,572,332.613	359.64	13,865,539.768	2,571,998.253	5/8-IR W/ RED CAP STAMPED "CP&Y TRAV. POINT"
CP#2	13,867,364.547	2,572,888.850	337.20	13,865,562.024	2,572,554.418	5/8-IR W/ RED CAP STAMPED "CP&Y TRAV. POINT"
CP#3	13,867,337.289	2,573,117.150	331.49	13,865,534.769	2,572,782.688	5/8-IR W/ RED CAP STAMPED "CP&Y TRAV. POINT"
CP#4	13,867,349.159	2,573,298.492	340.98	13,865,546.638	2,572,964.007	5/8-IR W/ RED CAP STAMPED "CP&Y TRAV. POINT"
CP#5	13,867,397.286	2,574,081.469	358.62	13,865,594.759	2,573,746.882	5/8-IR W/ RED CAP STAMPED "CP&Y TRAV. POINT"

NOTES:
 HORIZONTAL COORDINATES SHOWN ARE IN U.S. SURVEY FEET, AND ARE BASED UPON THE TEXAS COORDINATE SYSTEM OF NAD '83 (HARN '93) TEXAS SOUTH CENTRAL ZONE 4204, WITH A SURFACE ADJUSTMENT FACTOR OF 1.00013. VALUES WERE DERIVED UTILIZING THE TXDOT STATE VIRTUAL REFERENCE STATION NETWORK IN JANUARY, 2022.

ELEVATIONS ARE BASED UPON NAVD '88 DATUM (GEOID 2012B) DERIVED FROM UTILIZING THE TXDOT STATE VIRTUAL REFERENCE STATION NETWORK IN JANUARY, 2022.

LEGEND

△ 5/8" IRON ROD W/ RED PLASTIC CAP SET "CP&Y TRAV. POINT"



Brian Kidd

10/7/2022

NO.	REVISION	BY	DATE

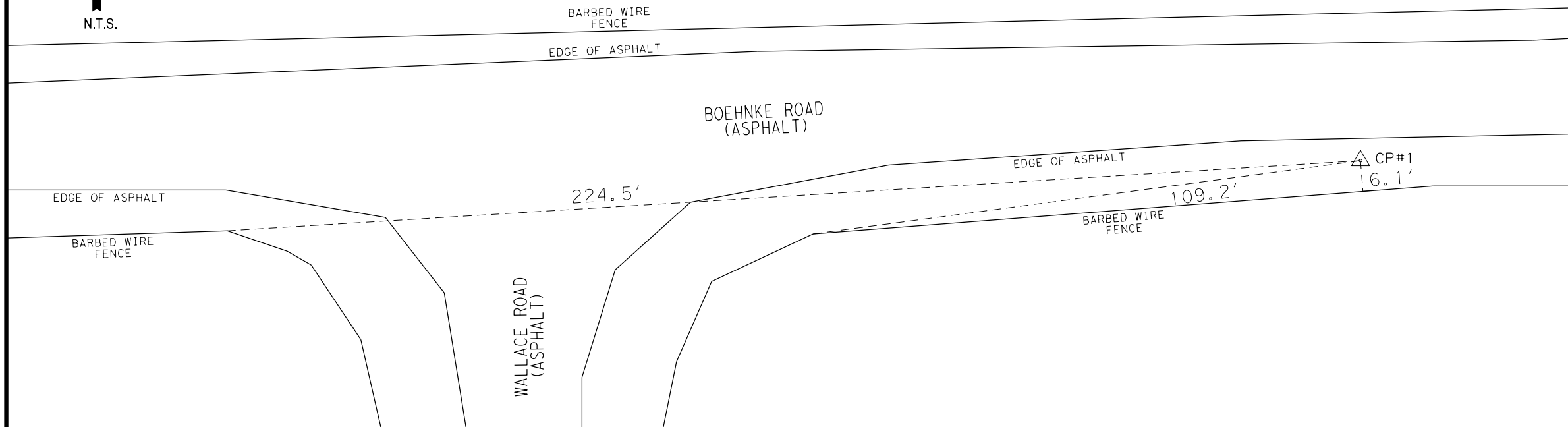
CP&Y an STV Company
 TEXAS REGISTERED ENGINEERING FIRM F-1741
 SURVEY FIRM 10194305

©2022 Texas Department of Transportation
 BOEHNKE ROAD AT BUSBY BRANCH

HORIZONTAL/VERTICAL CONTROL INDEX SHEET

CSJ 0913-28-083 SHEET 1 OF 1

Designed:	JDS	FED. RD. DIV. NO.	STATE	FEDERAL AID PROJECT NO.	HIGHWAY NO.
Checked:	BKK	6	TEXAS		CR
Drawn:	JDS	DIST.	COUNTY	CONTROL NO.	SECTION NO.
Checked:	BKK	YKM	FAYETTE	0913	28
				083,ETC.	29



CP#1 IS A 5/8-INCH IRON ROD WITH RED PLASTIC CAP STAMPED "CP&Y TRAV. POINT" LOCATED IN FAYETTE COUNTY, TX., ON THE SOUTH SIDE OF BOEHNKE ROAD, +/- 224.5' EAST FROM AN ANGLE POINT IN A BARBED WIRE FENCE AT THE SOUTHEAST CORNER OF BOEHNKE ROAD AND WALLACE ROAD, +/- 109.2' EAST FROM AN ANGLE POINT IN A BARBED WIRE FENCE AT THE SOUTHEAST CORNER OF BOEHNKE ROAD AND WALLACE ROAD AND +/- 6.1' NORTH OF A BARBED WIRE FENCE ON THE SOUTH OF BOEHNKE ROAD.




US SURVEY FEET
 DATA SET: OCTOBER 2021
 MONUMENT: 5/8" IR W/ RED PLASTIC CAP STAMPED "CP&Y TRAV. POINT"
 SURFACE ADJUSTMENT FACTOR 1.00013
 ELEVATIONS ARE NAVD 88 BASED UPON GEOID 2018
 TXDOT VRS NETWORK

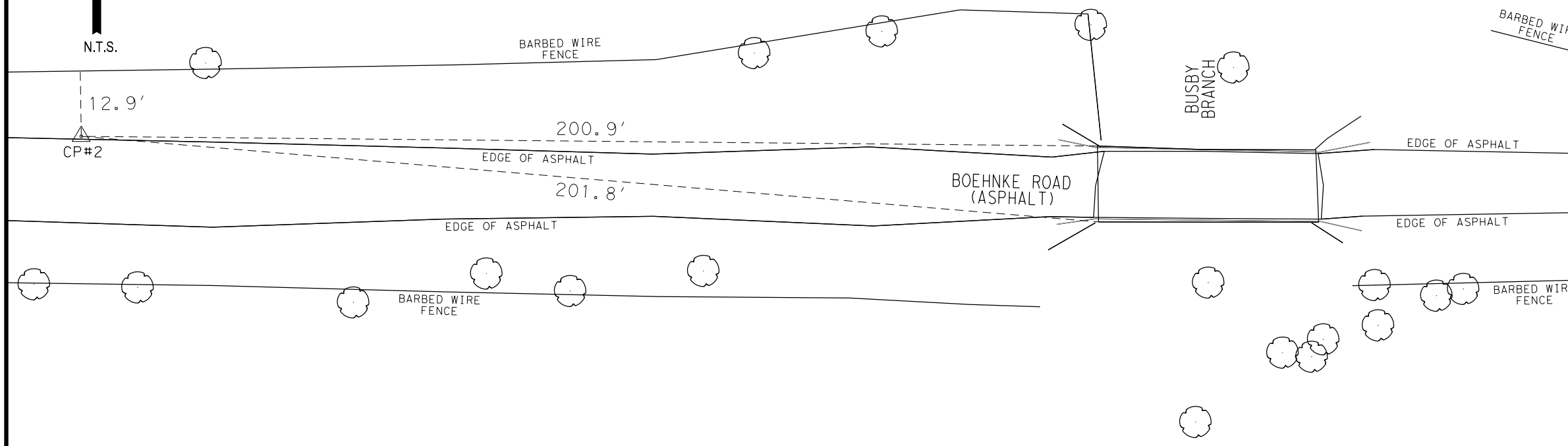
NOTES:
 HORIZONTAL COORDINATES SHOWN ARE IN U.S. SURVEY FEET, AND ARE BASED UPON THE TEXAS COORDINATE SYSTEM OF NAD '83 (HARN '93) TEXAS SOUTH CENTRAL ZONE 4204, WITH A SURFACE ADJUSTMENT FACTOR OF 1.00013. VALUES WERE DERIVED UTILIZING THE TXDOT STATE VIRTUAL REFERENCE STATION NETWORK IN DECEMBER, 2021.

GEOGRAPHIC COORDINATES SHOWN ARE BASED UPON THE TEXAS COORDINATE SYSTEM OF NAD '83 (HARN '93) TEXAS SOUTH CENTRAL ZONE 4204. VALUES WERE CONVERTED FROM GRID STATE PLANE COORDINATES.

ELEVATIONS ARE BASED UPON NAVD '88 DATUM (GEOID 2012B) DERIVED FROM UTILIZING THE TXDOT STATE VIRTUAL REFERENCE STATION NETWORK IN OCTOBER, 2021.

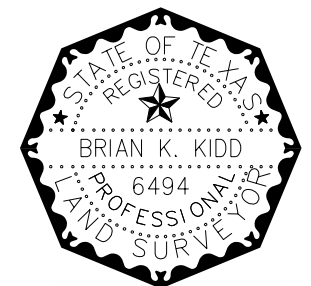
LEGEND

-  5/8" IRON ROD W/ RED PLASTIC CAP SET "CP&Y TRAV. POINT"
-  SIGN
-  TREE



CP#2 IS A 5/8-INCH IRON ROD WITH RED PLASTIC CAP STAMPED "CP&Y TRAV. POINT" LOCATED IN FAYETTE COUNTY, TX., ON THE NORTH SIDE OF BOEHNKE ROAD, +/- 200.9' WEST OF THE NORTHWEST CORNER OF THE BOEHNKE ROAD BRIDGE OVER BUSBY BRANCH, +/- 201.8' NORTHWEST OF THE SOUTHWEST CORNER OF THE BOEHNKE ROAD BRIDGE OVER BUSBY BRANCH AND +/- 12.9' SOUTH OF A BARBED WIRE FENCE ON THE NORTH SIDE OF BOEHNKE ROAD.

US SURVEY FEET
 DATA SET: OCTOBER 2021
 MONUMENT: 5/8" IR W/ RED PLASTIC CAP STAMPED "CP&Y TRAV. POINT"
 SURFACE ADJUSTMENT FACTOR 1.00013
 ELEVATIONS ARE NAVD 88 BASED UPON GEOID 2018
 TXDOT VRS NETWORK



Brian Kidd

10/7/2022

NO.	REVISION	BY	DATE

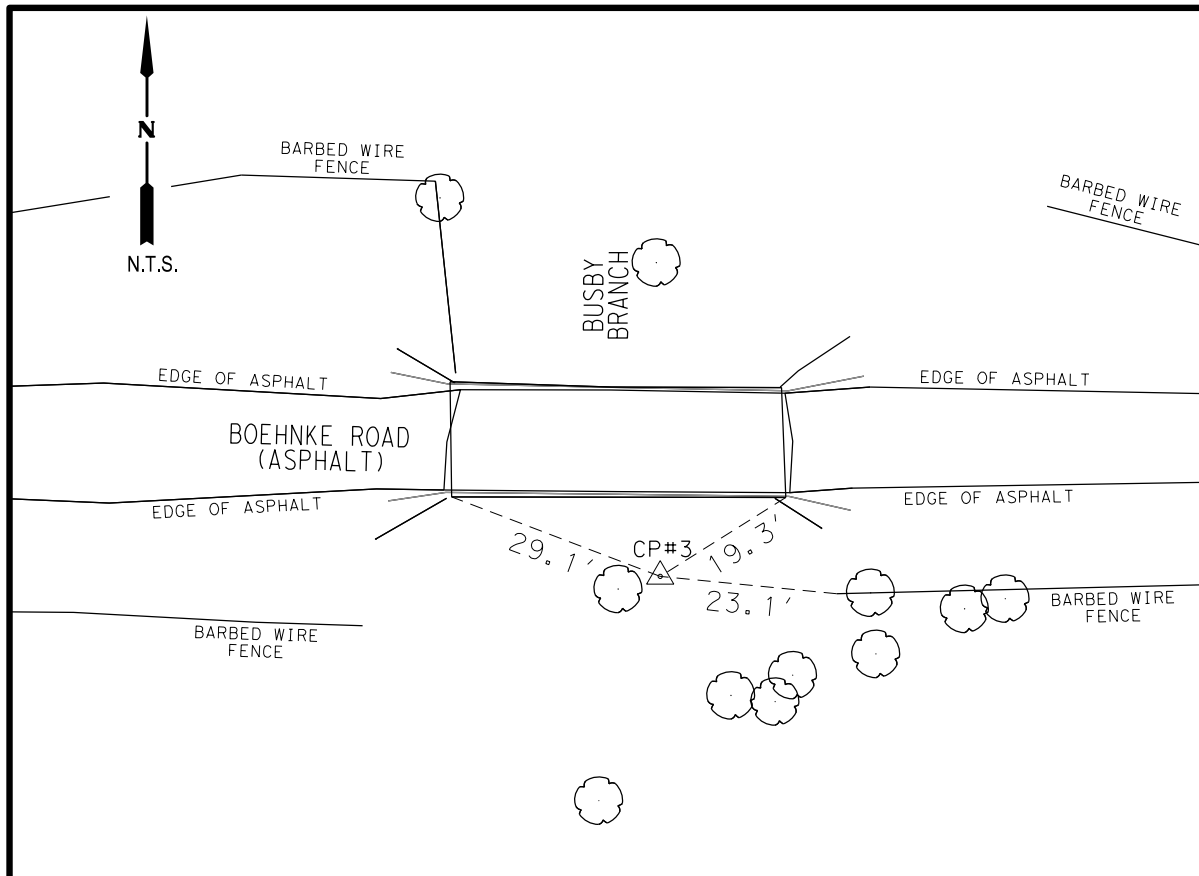
CP&Y
 an STV Company
 TEXAS REGISTERED ENGINEERING FIRM
 F-1741
 SURVEY FIRM
 10194305

©2022 Texas Department of Transportation

BOEHNKE ROAD AT BUSBY BRANCH
 HORIZONTAL/VERTICAL CONTROL SHEET

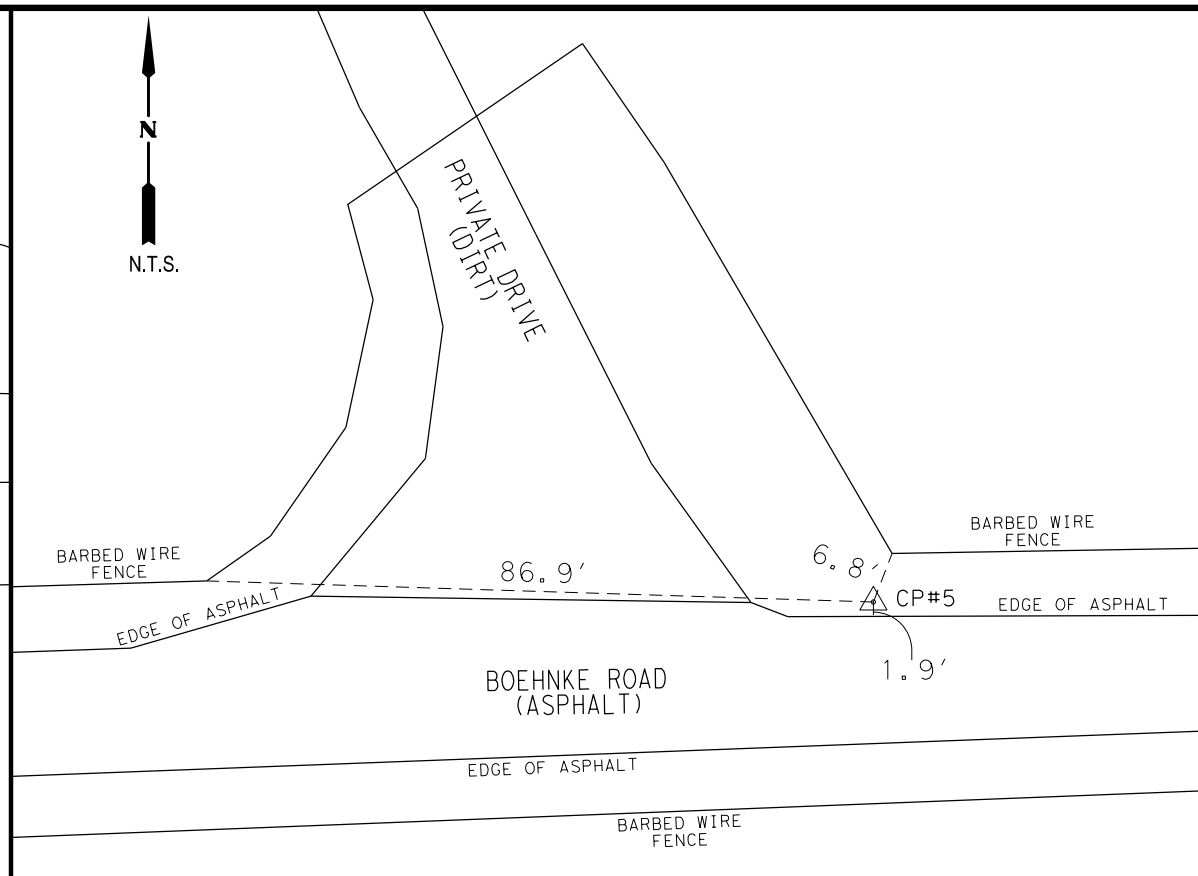
CSJ 0913-28-083 SHEET 1 OF 2

Designed:	JDS	FED. AID DIST. NO.	STATE	FEDERAL AID PROJECT NO.	HIGHWAY NO.		
Checked:	BKK	6	TEXAS		CR		
Drawn:	JDS	DIST.	COUNTY	CONTROL NO.	SECTION NO.	JOB NO.	SHEET NO.
Checked:	BKK	YKM	FAYETTE	0913	28	083, ETC.	30



CP#3 IS A 5/8-INCH IRON ROD WITH RED PLASTIC CAP STAMPED "CP&Y TRAV. POINT" LOCATED IN FAYETTE COUNTY, TX., ON THE SOUTH SIDE OF BOEHNKE ROAD, +/- 29.1' SOUTHEAST OF THE SOUTHWEST CORNER OF THE BOEHNKE ROAD BRIDGE OVER BUSBY BRANCH, +/- 19.3' SOUTHWEST OF THE SOUTHEAST CORNER OF THE BOEHNKE ROAD BRIDGE OVER BUSBY BRANCH AND +/- 23.1' WEST FROM THE END OF A BARBED WIRE FENCE ON THE SOUTH SIDE OF BOEHNKE ROAD.

US SURVEY FEET
 DATA SET: OCTOBER 2021
 MONUMENT: 5/8"-IR W/ RED PLASTIC CAP STAMPED "CP&Y TRAV. POINT"
 SURFACE ADJUSTMENT FACTOR 1.00013
 ELEVATIONS ARE NAVD 88 BASED UPON GEOID 2018
 TXDOT VRS NETWORK



CP#5 IS A 5/8-INCH IRON ROD WITH RED PLASTIC CAP STAMPED "CP&Y TRAV. POINT" LOCATED IN FAYETTE COUNTY, TX., ON THE NORTH SIDE OF BOEHNKE ROAD, +/- 86.9' EAST FROM AN ANGLE POINT IN A BARBED WIRE FENCE AT THE NORTHWEST CORNER OF BOEHNKE ROAD AND A PRIVATE DRIVE, +/- 6.8' SOUTHWEST FROM AN ANGLE POINT IN A BARBED WIRE FENCE AT THE NORTHEAST CORNER OF BOEHNKE ROAD AND A PRIVATE DRIVE AND +/- 1.9' NORTH OF THE NORTH PAVEMENT EDGE OF BOEHNKE ROAD.

US SURVEY FEET
 DATA SET: OCTOBER 2021
 MONUMENT: 5/8"-IR W/ RED PLASTIC CAP STAMPED "CP&Y TRAV. POINT"
 SURFACE ADJUSTMENT FACTOR 1.00013
 ELEVATIONS ARE NAVD 88 BASED UPON GEOID 2018
 TXDOT VRS NETWORK

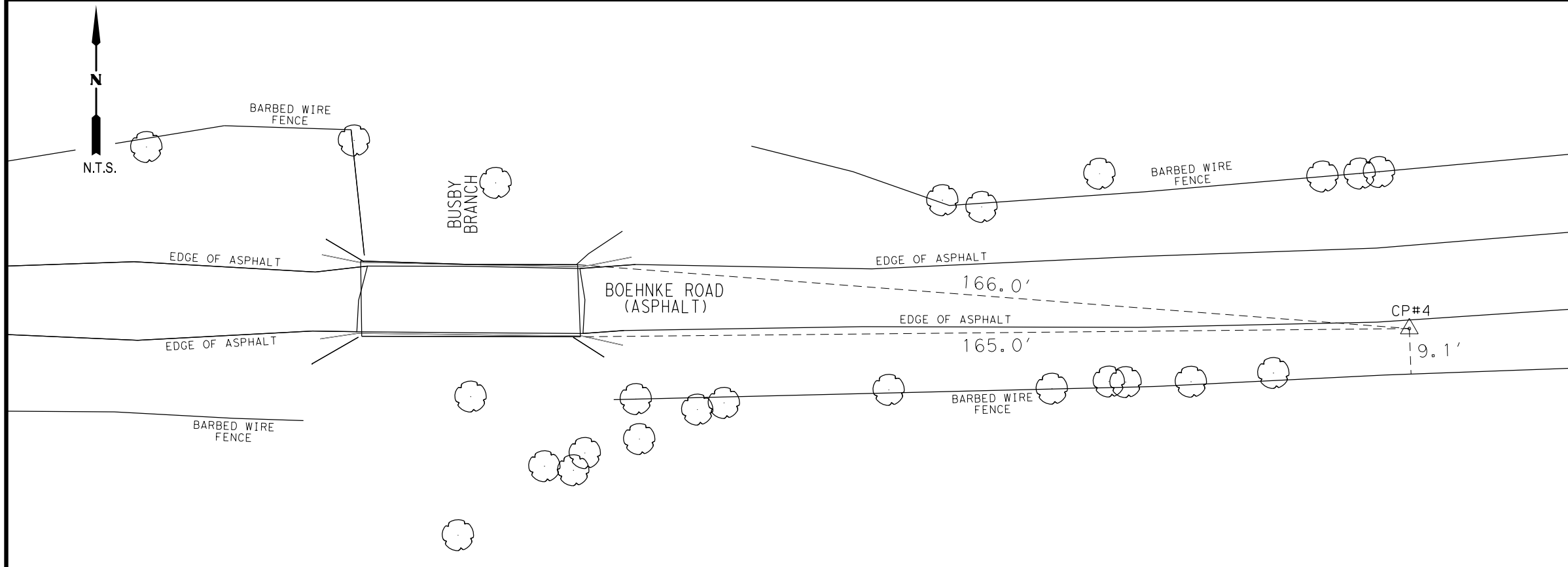
NOTES:
 HORIZONTAL COORDINATES SHOWN ARE IN U.S. SURVEY FEET, AND ARE BASED UPON THE TEXAS COORDINATE SYSTEM OF NAD '83 (HARN '93) TEXAS SOUTH CENTRAL ZONE 4204, WITH A SURFACE ADJUSTMENT FACTOR OF 1.00013. VALUES WERE DERIVED UTILIZING THE TXDOT STATE VIRTUAL REFERENCE STATION NETWORK IN DECEMBER, 2021.

GEOGRAPHIC COORDINATES SHOWN ARE BASED UPON THE TEXAS COORDINATE SYSTEM OF NAD '83 (HARN '93) TEXAS SOUTH CENTRAL ZONE 4204. VALUES WERE CONVERTED FROM GRID STATE PLANE COORDINATES.

ELEVATIONS ARE BASED UPON NAVD '88 DATUM (GEOID 2012B) DERIVED FROM UTILIZING THE TXDOT STATE VIRTUAL REFERENCE STATION NETWORK IN OCTOBER, 2021.

LEGEND

- 5/8" IRON ROD W/ RED PLASTIC CAP SET "CP&Y TRAV. POINT"
- SIGN
- TREE



CP#4 IS A 5/8-INCH IRON ROD WITH RED PLASTIC CAP STAMPED "CP&Y TRAV. POINT" LOCATED IN FAYETTE COUNTY, TX., ON THE SOUTH SIDE OF BOEHNKE ROAD, +/- 166.0' SOUTHEAST OF THE NORTHEAST CORNER OF THE BOEHNKE ROAD BRIDGE OVER BUSBY BRANCH, +/- 165.0' EAST OF THE SOUTHEAST CORNER OF THE BOEHNKE ROAD BRIDGE OVER BUSBY BRANCH AND +/- 9.1' SOUTH OF THE SOUTH PAVEMENT EDGE OF BOEHNKE ROAD.

US SURVEY FEET
 DATA SET: OCTOBER 2021
 MONUMENT: 5/8"-IR W/ RED PLASTIC CAP STAMPED "CP&Y TRAV. POINT"
 SURFACE ADJUSTMENT FACTOR 1.00013
 ELEVATIONS ARE NAVD 88 BASED UPON GEOID 2018
 TXDOT VRS NETWORK



Brian Kidd 10/7/2022

NO.	REVISION	BY	DATE

CP&Y
 an STV Company
 TEXAS REGISTERED ENGINEERING FIRM
 F-1741
 SURVEY FIRM
 10194305

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BOEHNKE ROAD AT BUSBY BRANCH

HORIZONTAL/VERTICAL CONTROL SHEET

CSJ 0913-28-083 SHEET 2 OF 2

Designed:	JDS	FED. AID DIV. NO.	STATE	FEDERAL AID PROJECT NO.	HIGHWAY NO.		
Checked:	BKK	6	TEXAS		CR		
Drawn:	JDS	DIST.	COUNTY	CONTROL NO.	SECTION NO.	JOB NO.	SHEET NO.
Checked:	BKK	YKM	FAYETTE	0913	28	083, ETC.	31

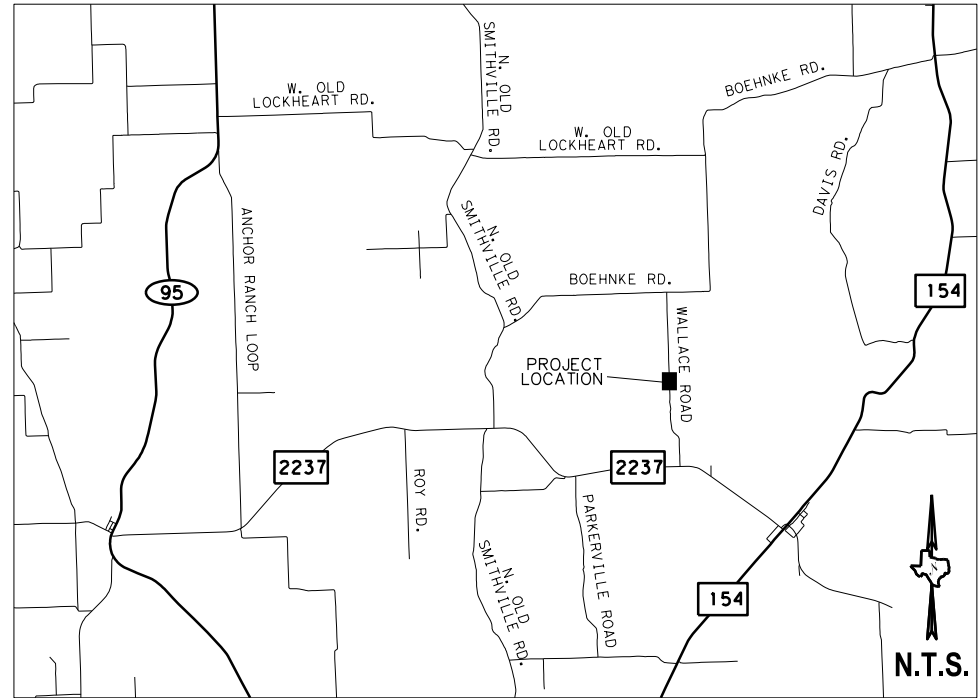
NOTES:
 HORIZONTAL COORDINATES SHOWN ARE IN U.S. SURVEY FEET, AND ARE BASED UPON THE TEXAS COORDINATE SYSTEM OF NAD '83 (2011) TEXAS SOUTH CENTRAL ZONE 4204, WITH A SURFACE ADJUSTMENT FACTOR OF 1.00013. VALUES WERE DERIVED UTILIZING THE TXDOT STATE VIRTUAL REFERENCE STATION NETWORK IN OCTOBER, 2021.

GEOGRAPHIC COORDINATES SHOWN ARE BASED UPON THE TEXAS COORDINATE SYSTEM OF NAD '83 (2011) TEXAS SOUTH CENTRAL ZONE 4204. VALUES WERE CONVERTED FROM GRID STATE PLANE COORDINATES.

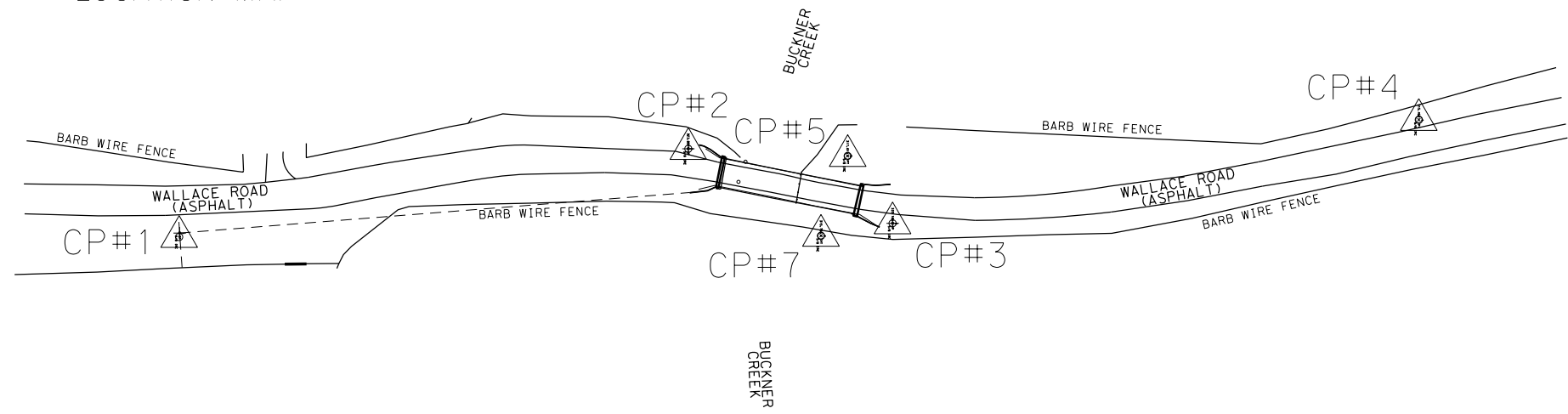
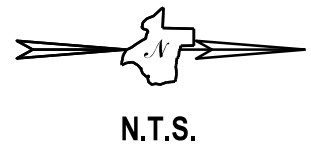
ELEVATIONS ARE BASED UPON NAVD '88 DATUM (GEOID 2018) DERIVED FROM UTILIZING THE TXDOT STATE VIRTUAL REFERENCE STATION NETWORK IN FEBRUARY, 2022.

LEGEND

△ 5/8" IRON ROD W/ RED PLASTIC CAP SET "CP&Y TRAV. POINT"



LOCATION MAP



CONTROL POINT	SURFACE COORDINATES		NAVD 88 ELEVATION	GRID COORDINATES		DESCRIPTION
	NORTHING	EASTING		NORTHING	EASTING	
CP#1	13,858,794.250	2,572,491.061	330.233	13,856,992.840	2,572,156.681	5/8-IR W/ RED CAP STAMPED "CP&Y TRAV. POINT"
CP#2	13,859,106.060	2,572,439.411	323.857	13,857,304.610	2,572,105.037	5/8-IR W/ RED CAP STAMPED "CP&Y TRAV. POINT"
CP#3	13,859,231.340	2,572,485.071	322.106	13,857,429.870	2,572,150.691	5/8-IR W/ RED CAP STAMPED "CP&Y TRAV. POINT"
CP#4	13,859,553.930	2,572,421.623	315.457	13,857,752.420	2,572,087.252	5/8-IR W/ RED CAP STAMPED "CP&Y TRAV. POINT"
CP#5	13,859,203.750	2,572,443.805	317.015	13,857,402.290	2,572,109.431	5/8-IR W/ RED CAP STAMPED "CP&Y TRAV. POINT"
CP#7	13,859,187.440	2,572,492.732	315.766	13,857,385.980	2,572,158.351	5/8-IR W/ RED CAP STAMPED "CP&Y TRAV. POINT"



Brian Kidd 10/7/2022

NO.	REVISION	BY	DATE

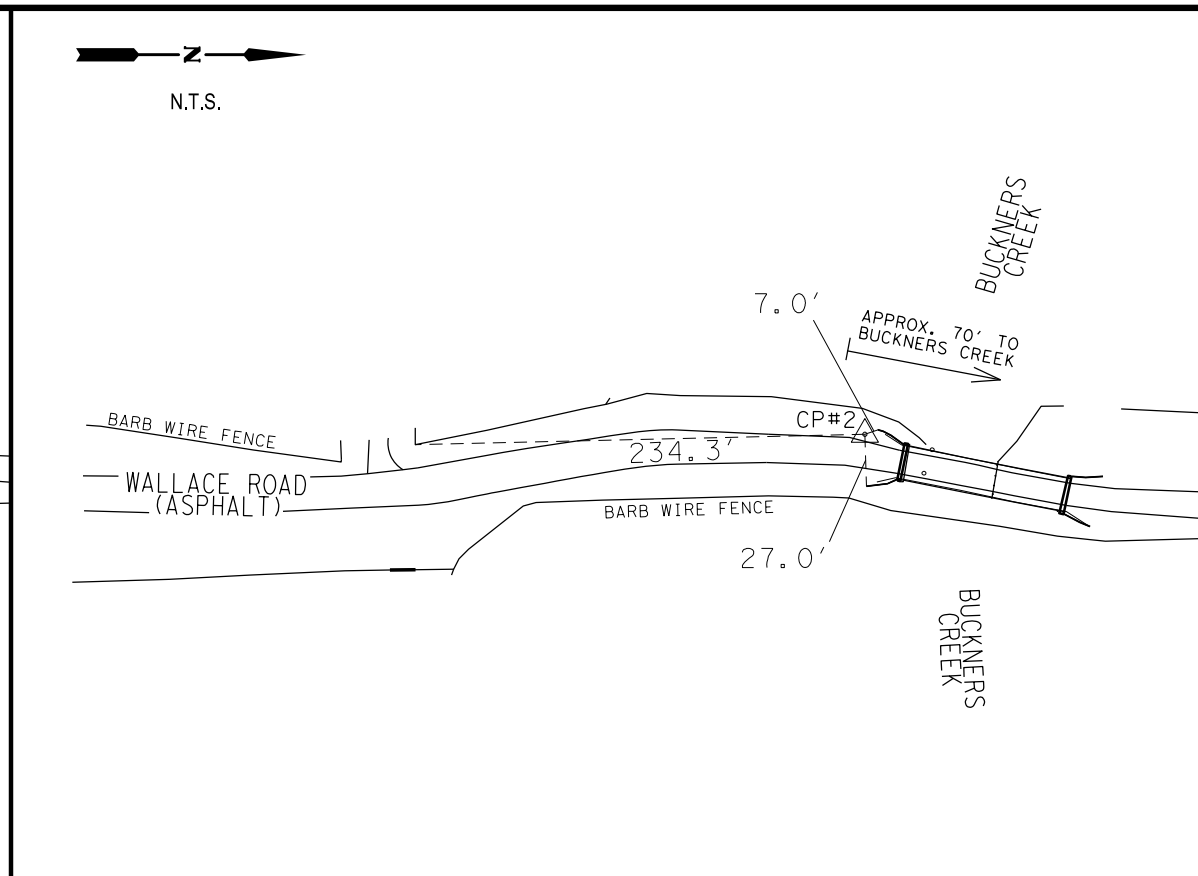
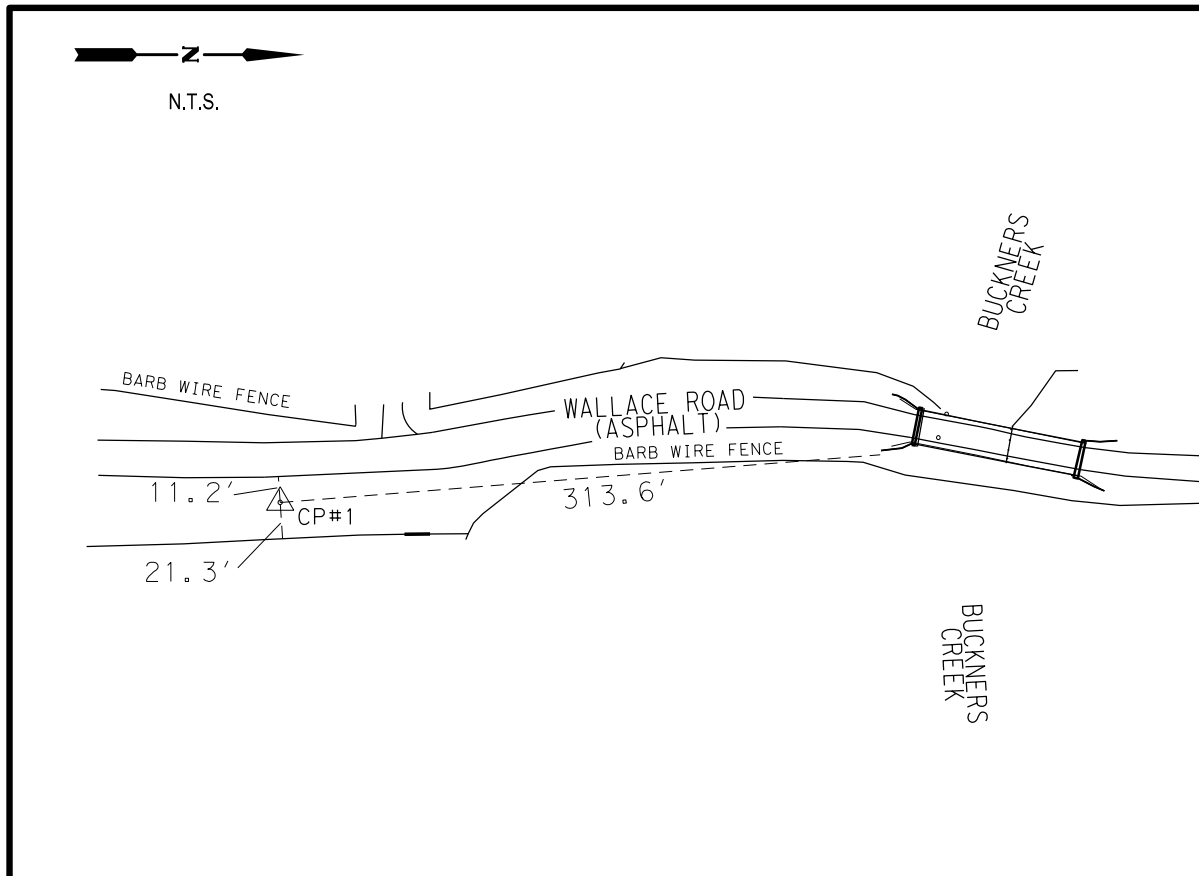
CP&Y TEXAS REGISTERED ENGINEERING FIRM F-1741 SURVEY FIRM 10194305
 an STV Company

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 WALLACE ROAD AT BUCKNERS CREEK

HORIZONTAL/VERTICAL CONTROL INDEX SHEET

CSJ 0913-28-068 SHEET 1 OF 1

Designed:	TAT	FED. RD. DIV. NO.	STATE	FEDERAL AID PROJECT NO.	HIGHWAY NO.
Checked:	BKK	6	TEXAS		CR
Drawn:	TAT	DIST.	COUNTY	CONTROL NO.	SECTION NO.
Checked:	BKK	YKM	FAYETTE	0913	28
				083,ETC.	32

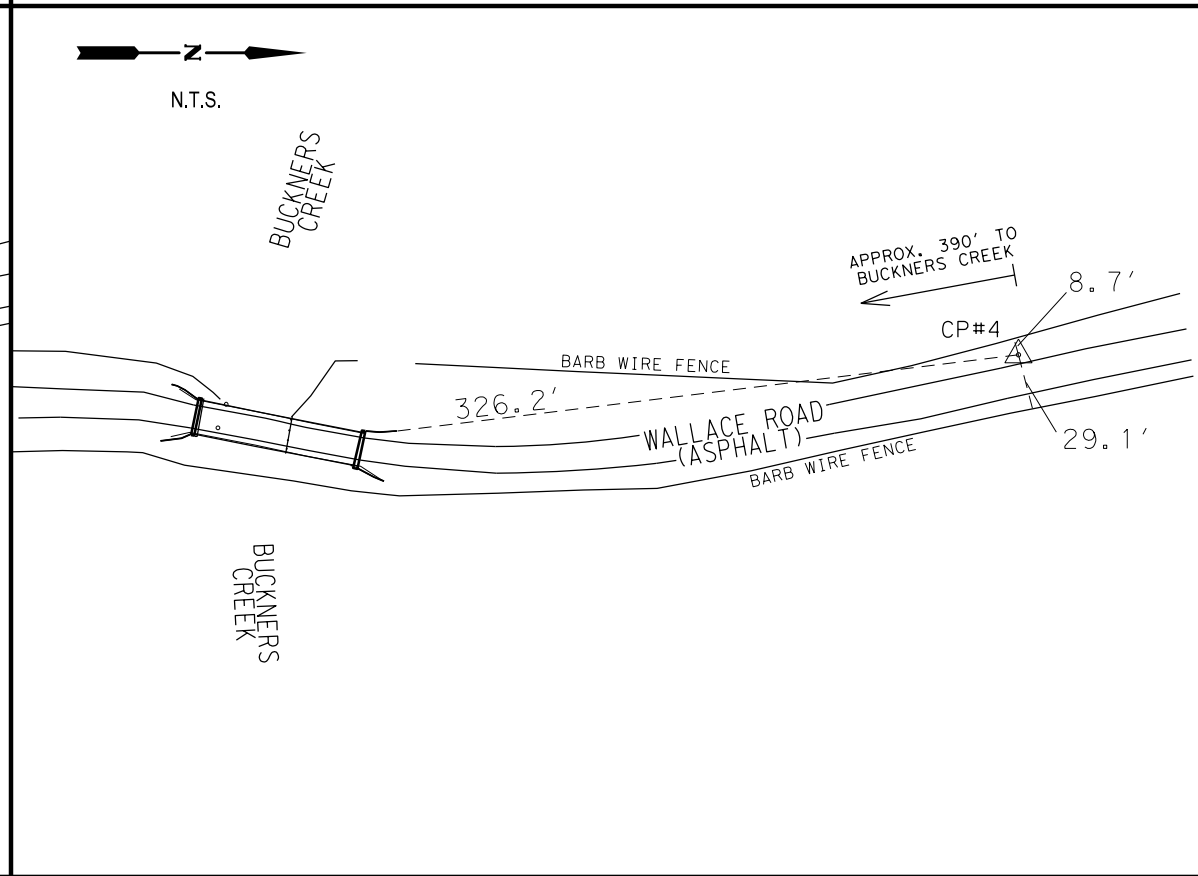
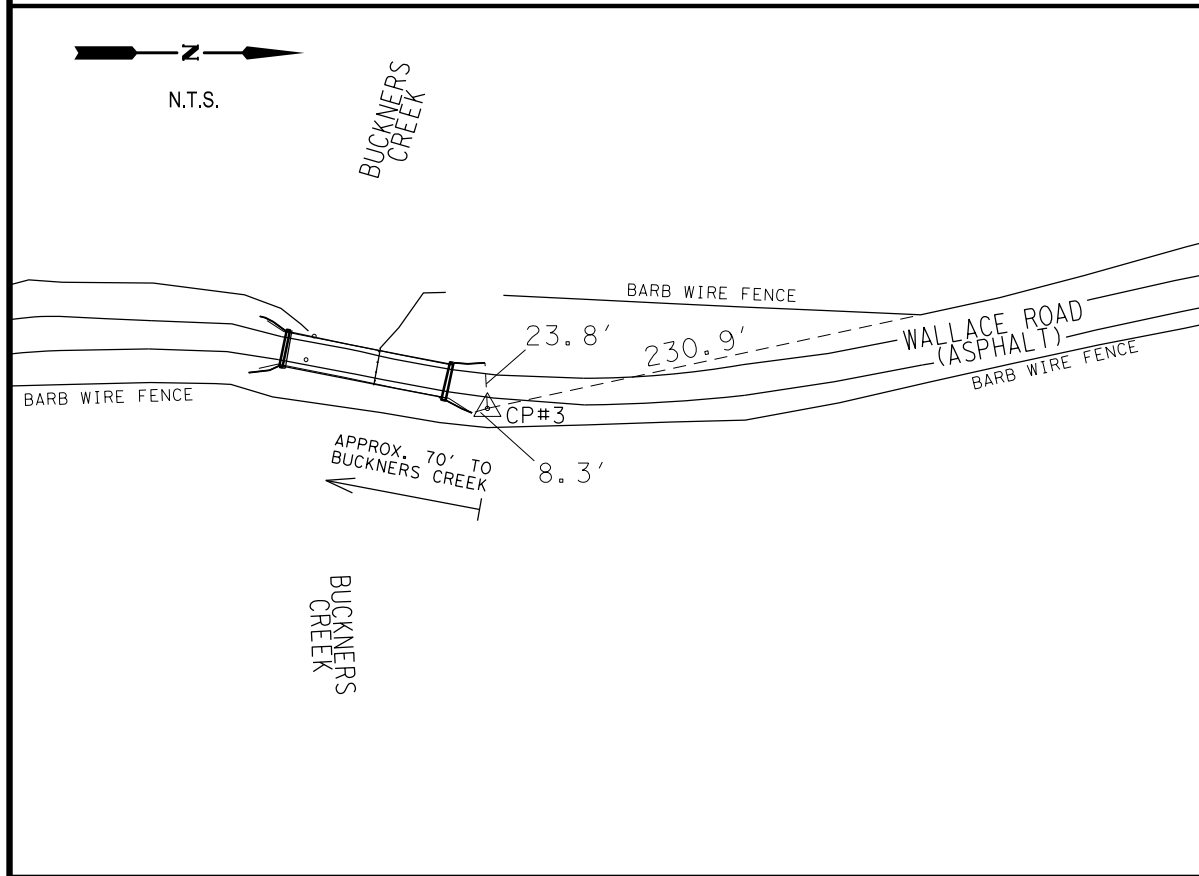


CP#1 IS A 5/8-INCH IRON ROD WITH RED PLASTIC CAP STAMPED "CP&Y TRAV. POINT" LOCATED IN FAYETTE COUNTY, TX., LOCATED IN THE EAST R.O.W. OF WALLACE ROAD, +/- 380' SOUTH OF THE CENTERLINE INTERSECTION OF WALLACE ROAD & BUCKNERS CREEK, +/- 313.6' SOUTH OF THE SOUTH ENDE OF THE SOUTHEAST WINGWALL AT BUCKNERS CREEK & +/- 11.2' EAST OF THE EAST EDGE OF GRAVEL OF WALLACE ROAD & 21.3' WEST OF A BARBED WIRE FENCE.

US SURVEY FEET
DATA SET: FEBRUARY, 2022
MONUMENT: 5/8"-IR W/ RED PLASTIC CAP STAMPED "CP&Y TRAV. POINT"
SURFACE ADJUSTMENT FACTOR 1.00013
ELEVATIONS ARE NAVD 88 BASED UPON GEOID 2018
TXDOT VRS NETWORK

CP#2 IS A 5/8-INCH IRON ROD WITH RED PLASTIC CAP STAMPED "CP&Y TRAV. POINT" LOCATED IN FAYETTE COUNTY, TX., LOCATED IN THE WEST R.O.W. OF WALLACE ROAD, +/- 7' SOUTH OF THE SOUTHWEST WINGWALL OF THE BRIDGE AT BUCKNERS CREEK, +/- 27' WEST OF THE SOUTHEAST WINGWALL OF THE BRIDGE AT BUCKNERS CREEK AND +/- 234.3' NORTH OF A FENCE CORNER POST ON THE WEST SIDE OF WALLACE ROAD AND THE NORTH SIDE OF A DRIVEWAY.

US SURVEY FEET
DATA SET: FEBRUARY, 2022
MONUMENT: 5/8"-IR W/ RED PLASTIC CAP STAMPED "CP&Y TRAV. POINT"
SURFACE ADJUSTMENT FACTOR 1.00013
ELEVATIONS ARE NAVD 88 BASED UPON GEOID 2018
TXDOT VRS NETWORK



CP#3 IS A 5/8-INCH IRON ROD WITH RED PLASTIC CAP STAMPED "CP&Y TRAV. POINT" LOCATED IN FAYETTE COUNTY, TX., LOCATED IN THE EAST R.O.W. OF WALLACE ROAD, +/- 23.8' EAST OF THE NORTHWEST WINGWALL OF THE BRIDGE AT BUCKNERS CREEK, +/- 8.3' NORTH OF THE NORTHEAST WINGWALL OF THE BRIDGE AT BUCKNERS CREEK AND +/- 230.9' SOUTH OF A FENCE CORNER AT AN ANGLE POINT IN THE WEST LINE OF SAID WALLACE ROAD.

US SURVEY FEET
DATA SET: FEBRUARY, 2022
MONUMENT: 5/8"-IR W/ RED PLASTIC CAP STAMPED "CP&Y TRAV. POINT"
SURFACE ADJUSTMENT FACTOR 1.00013
ELEVATIONS ARE NAVD 88 BASED UPON GEOID 2018
TXDOT VRS NETWORK

CP#4 IS A 5/8-INCH IRON ROD WITH RED PLASTIC CAP STAMPED "CP&Y TRAV. POINT" LOCATED IN FAYETTE COUNTY, TX., LOCATED IN THE WEST R.O.W. OF WALLACE ROAD, +/- 326.2' NORTH OF THE NORTHWEST WINGWALL OF THE BRIDGE AT BUCKNERS CREEK +/- 8.7' EAST OF THE BARB WIRE FENCE ON THE WEST SIDE OF WALLACE ROAD AND +/- 29.1' WEST OF THE BARB WIRE FENCE ON THE EAST SIDE OF WALLACE ROAD.

US SURVEY FEET
DATA SET: FEBRUARY, 2022
MONUMENT: 5/8"-IR W/ RED PLASTIC CAP STAMPED "CP&Y TRAV. POINT"
SURFACE ADJUSTMENT FACTOR 1.00013
ELEVATIONS ARE NAVD 88 BASED UPON GEOID 2018
TXDOT VRS NETWORK

NOTES:
HORIZONTAL COORDINATES SHOWN ARE IN U.S. SURVEY FEET, AND ARE BASED UPON THE TEXAS COORDINATE SYSTEM OF NAD '83 (2011) TEXAS SOUTH CENTRAL ZONE 4204, WITH A SURFACE ADJUSTMENT FACTOR OF 1.00013. VALUES WERE DERIVED UTILIZING THE TXDOT STATE VIRTUAL REFERENCE STATION NETWORK IN FEBRUARY, 2022

GEOGRAPHIC COORDINATES SHOWN ARE BASED UPON THE TEXAS COORDINATE SYSTEM OF NAD '83 (2011) TEXAS SOUTH CENTRAL ZONE 4204. VALUES WERE CONVERTED FROM GRID STATE PLANE COORDINATES.

ELEVATIONS ARE BASED UPON NAVD '88 DATUM (GEOID 2018) DERIVED FROM UTILIZING THE TXDOT STATE VIRTUAL REFERENCE STATION NETWORK IN FEBRUARY, 2022.

LEGEND

 5/8" IRON ROD W/ RED PLASTIC CAP SET "CP&Y TRAV. POINT"

Brian Kidd
10/7/2022

NO. REVISION BY DATE

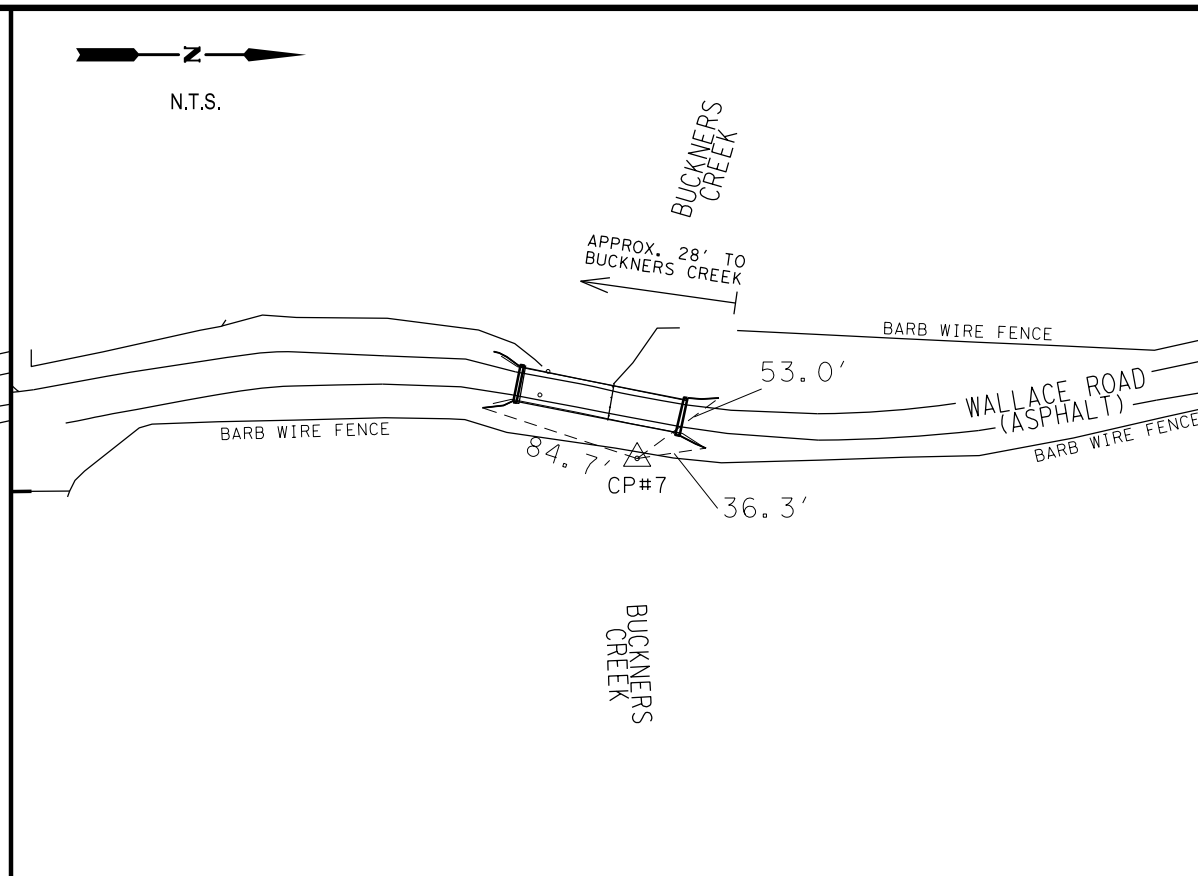
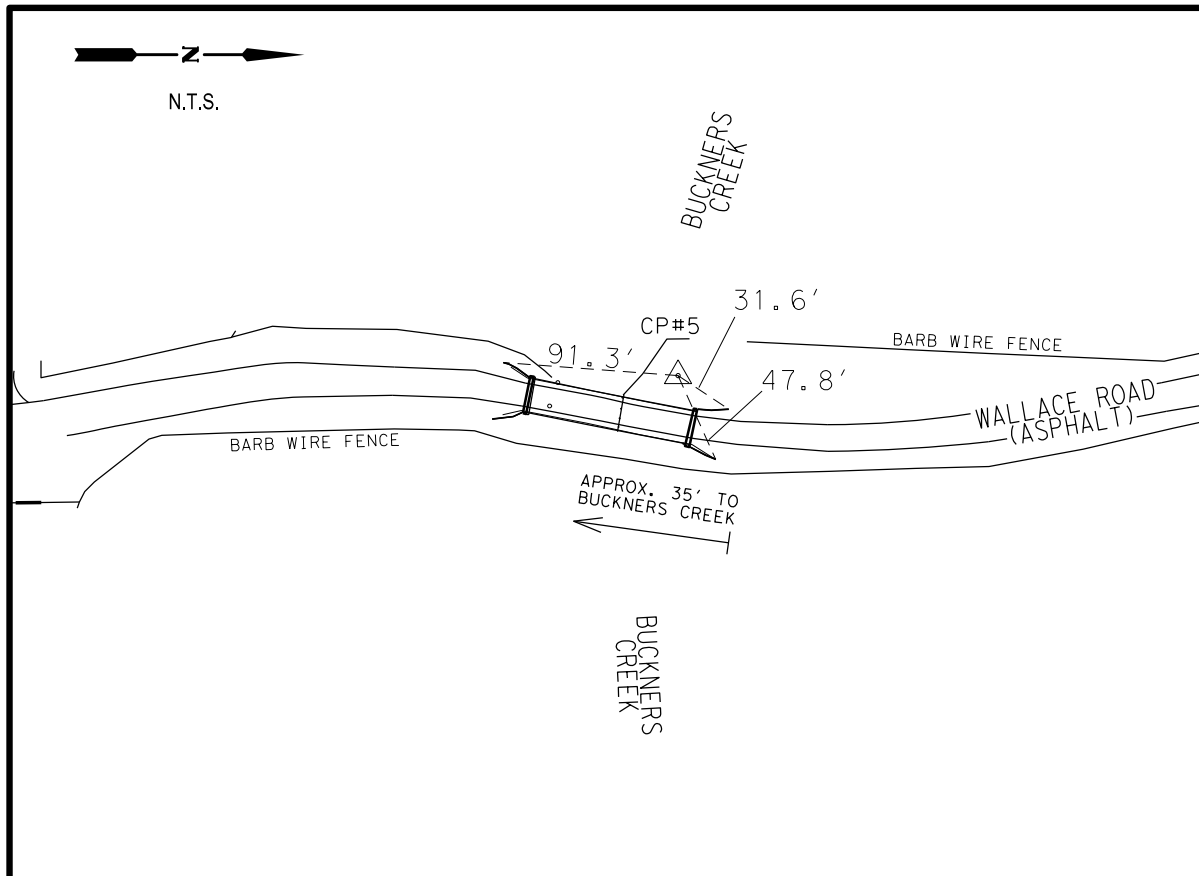
TEXAS REGISTERED ENGINEERING FIRM
F-1741
SURVEY FIRM
10194305
an STV Company

©2022 Texas Department of Transportation
WALLACE ROAD AT BUCKNERS CREEK

HORIZONTAL/VERTICAL CONTROL INDEX SHEET

CSJ 0913-28-068 SHEET 1 OF 2

Designed:	TAT	FED. RD. DIV. NO.	STATE	FEDERAL AID PROJECT NO.	HIGHWAY NO.
Checked:	BKK	6	TEXAS		CR
Drawn:	TAT	DIST.	COUNTY	CONTROL NO.	SECTION NO.
Checked:	BKK	YKM	FAYETTE	0913	28
				083, ETC.	33



CP#5 IS A 5/8-INCH IRON ROD WITH RED PLASTIC CAP STAMPED "CP&Y TRAV. POINT" LOCATED IN FAYETTE COUNTY, TX., LOCATED IN THE WEST R.O.W. OF WALLACE ROAD, +/- 91.3' NORTH OF THE SOUTH END OF THE SOUTHWEST WINGWALL OF THE THE BRIDGE AT BUCKNERS CREEK, +/- 31.6' SOUTHWEST OF THE NORTH END OF THE NORTHWEST WINGWALL OF THE THE BRIDGE AT BUCKNERS CREEK AND 47.8' SOUTHWEST OF THE NORTH END OF THE NORTHEAST WINGWALL OF THE THE BRIDGE AT BUCKNERS CREEK.

US SURVEY FEET
 DATA SET: FEBRUARY, 2022
 MONUMENT: 5/8"-IR W/ RED PLASTIC CAP STAMPED "CP&Y TRAV. POINT"
 SURFACE ADJUSTMENT FACTOR 1.00013
 ELEVATIONS ARE NAVD 88 BASED UPON GEOID 2018
 TXDOT VRS NETWORK

CP#7 IS A 5/8-INCH IRON ROD WITH RED PLASTIC CAP STAMPED "CP&Y TRAV. POINT" LOCATED IN FAYETTE COUNTY, TX., LOCATED IN THE EAST R.O.W. OF WALLACE ROAD, +/- 84.7' NORTH OF THE SOUTH END OF THE SOUTHWEST WINGWALL OF THE THE BRIDGE AT BUCKNERS CREEK, +/- 53.0' SOUTHWEST OF THE NORTH END OF THE NORTHWEST WINGWALL OF THE THE BRIDGE AT BUCKNERS CREEK AND 36.3' SOUTHWEST OF THE NORTH END OF THE NORTHEAST WINGWALL OF THE THE BRIDGE AT BUCKNERS CREEK.

US SURVEY FEET
 DATA SET: FEBRUARY, 2022
 MONUMENT: 5/8"-IR W/ RED PLASTIC CAP STAMPED "CP&Y TRAV. POINT"
 SURFACE ADJUSTMENT FACTOR 1.00013
 ELEVATIONS ARE NAVD 88 BASED UPON GEOID 2018
 TXDOT VRS NETWORK

NOTES:
 HORIZONTAL COORDINATES SHOWN ARE IN U.S. SURVEY FEET, AND ARE BASED UPON THE TEXAS COORDINATE SYSTEM OF NAD '83 (2011) TEXAS SOUTH CENTRAL ZONE 4204, WITH A SURFACE ADJUSTMENT FACTOR OF 1.00013. VALUES WERE DERIVED UTILIZING THE TXDOT STATE VIRTUAL REFERENCE STATION NETWORK IN FEBRUARY, 2022

GEOGRAPHIC COORDINATES SHOWN ARE BASED UPON THE TEXAS COORDINATE SYSTEM OF NAD '83 (2011) TEXAS SOUTH CENTRAL ZONE 4204. VALUES WERE CONVERTED FROM GRID STATE PLANE COORDINATES.

ELEVATIONS ARE BASED UPON NAVD '88 DATUM (GEOID 2018) DERIVED FROM UTILIZING THE TXDOT STATE VIRTUAL REFERENCE STATION NETWORK IN FEBRUARY, 2022.

LEGEND

5/8" IRON ROD W/ RED PLASTIC CAP SET "CP&Y TRAV. POINT"



Brian Kidd

10/7/2022

NO.	REVISION	BY	DATE

CP&Y TEXAS REGISTERED ENGINEERING FIRM
 F-1741 SURVEY FIRM 10194305
 an STV Company

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 WALLACE ROAD AT BUCKNERS CREEK

HORIZONTAL/VERTICAL CONTROL INDEX SHEET

CSJ 0913-28-068 SHEET 2 OF 2

Designed:	TAT	FED. RD. DIV. NO.	STATE	FEDERAL AID PROJECT NO.	HIGHWAY NO.		
Checked:	BKK	6	TEXAS		CR		
Drawn:	TAT	DIST.	COUNTY	CONTROL NO.	SECTION NO.	JOB NO.	SHEET NO.
Checked:	BKK	YKM	FAYETTE	0913	28	083, ETC.	34

NOTES:
 HORIZONTAL COORDINATES SHOWN ARE IN U.S. SURVEY FEET, AND ARE BASED UPON THE TEXAS COORDINATE SYSTEM OF NAD '83 (2011) TEXAS SOUTH CENTRAL ZONE 4204, WITH A SURFACE ADJUSTMENT FACTOR OF 1.00013. VALUES WERE DERIVED UTILIZING THE TXDOT STATE VIRTUAL REFERENCE STATION NETWORK IN OCTOBER, 2021.

GEOGRAPHIC COORDINATES SHOWN ARE BASED UPON THE TEXAS COORDINATE SYSTEM OF NAD '83 (2011) TEXAS SOUTH CENTRAL ZONE 4204. VALUES WERE CONVERTED FROM GRID STATE PLANE COORDINATES.

ELEVATIONS ARE BASED UPON NAVD '88 DATUM (GEOID 2018) DERIVED FROM UTILIZING THE TXDOT STATE VIRTUAL REFERENCE STATION NETWORK IN FEBRUARY, 2022.

LEGEND

△ 5/8" IRON ROD W/ RED PLASTIC CAP SET "CP&Y TRAV. POINT"



Brian Kidd

10/7/2022

NO.	REVISION	BY	DATE

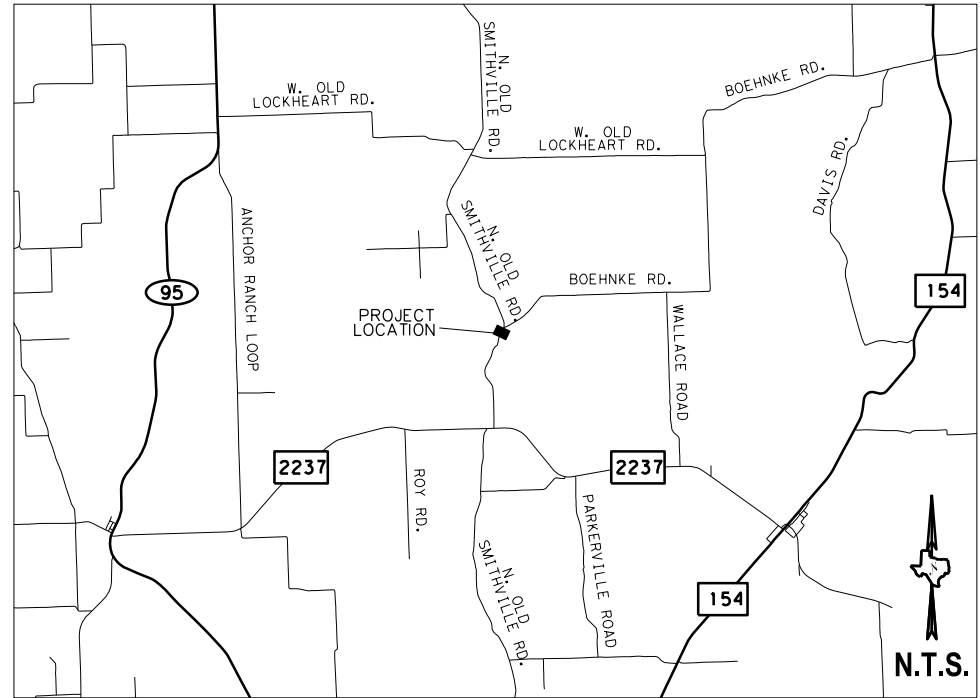
CP&Y TEXAS REGISTERED ENGINEERING FIRM F-1741
 an STV Company SURVEY FIRM 10194305

©2022 Texas Department of Transportation
 N. OLD SMITHVILLE ROAD AT BUCKNERS CREEK

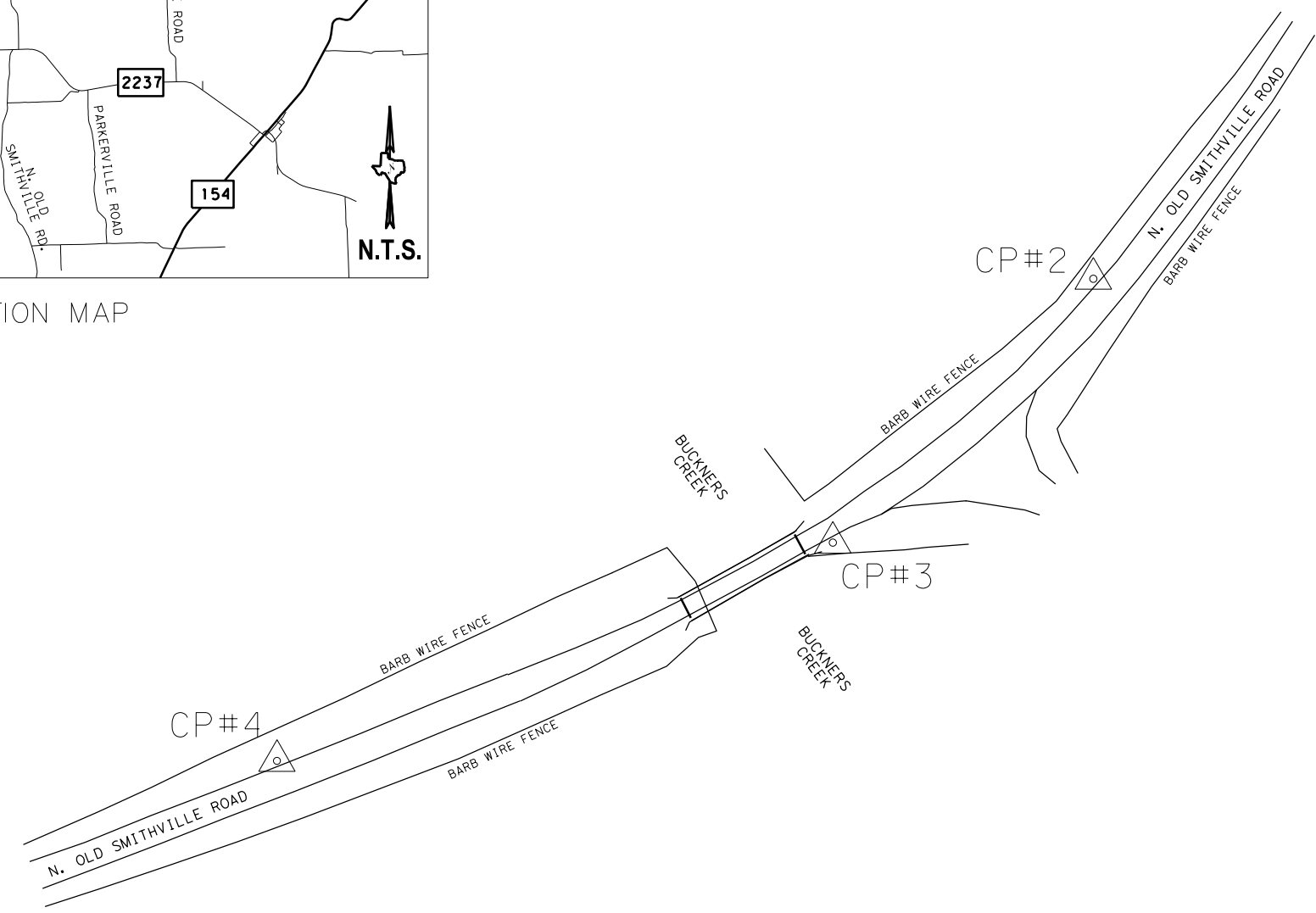
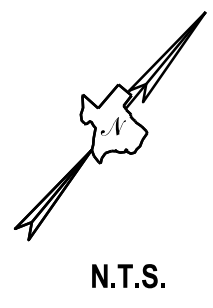
HORIZONTAL/VERTICAL CONTROL INDEX SHEET

CSJ 0913-28-085 SHEET 1 OF 1

Designed:	TAT	FED. RD. DIV. NO.	STATE	FEDERAL AID PROJECT NO.	HIGHWAY NO.		
Checked:	BKK	6	TEXAS		CR		
Drawn:	TAT	DIST.	COUNTY	CONTROL NO.	SECTION NO.	JOB NO.	SHEET NO.
Checked:	BKK	YKM	FAYETTE	0913	28	083, ETC.	35

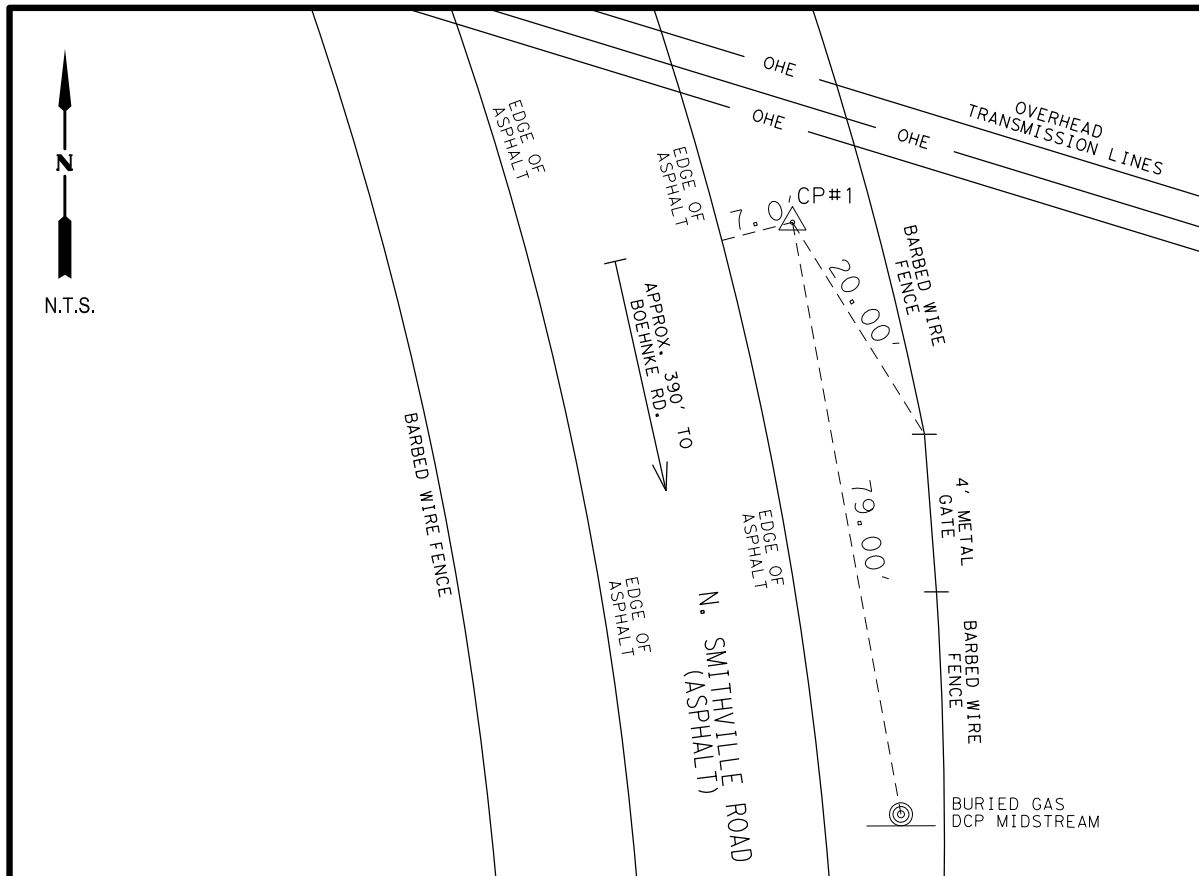


LOCATION MAP



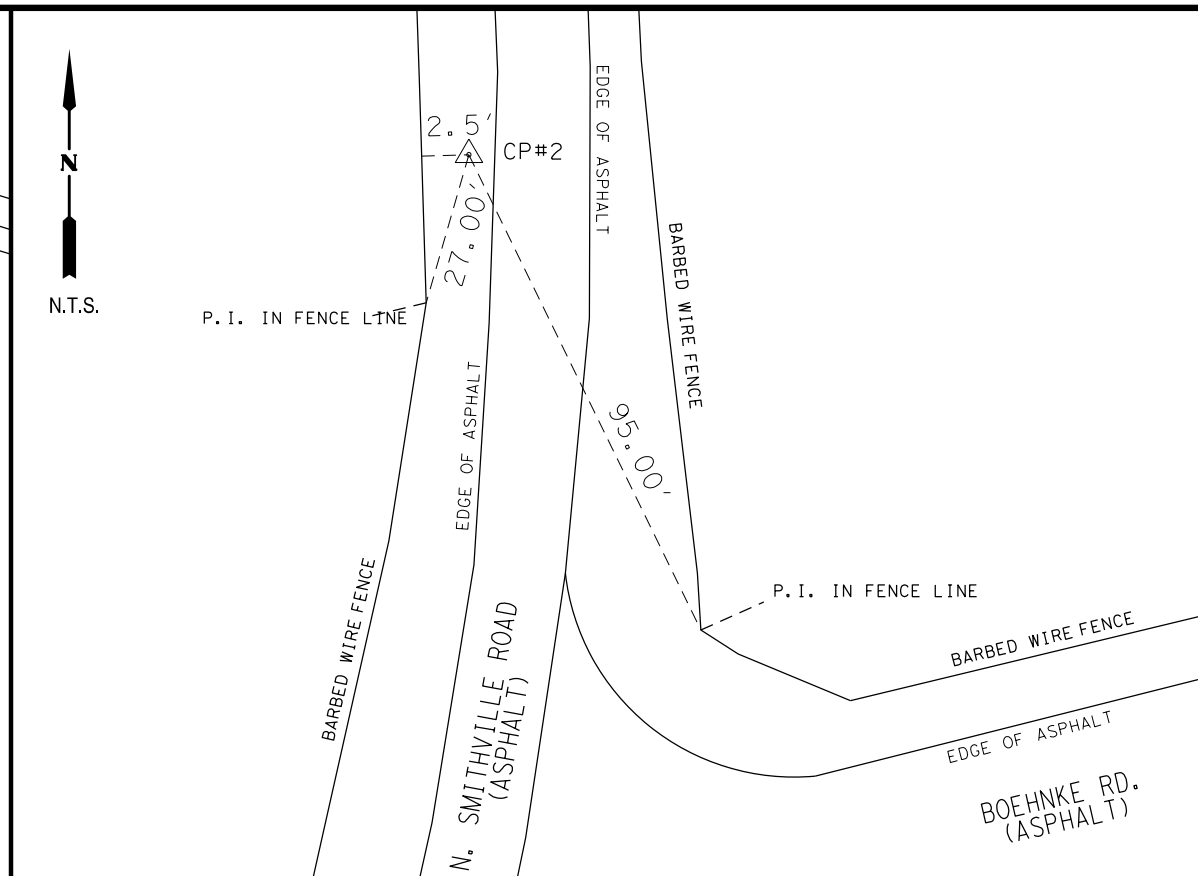
△ CP#5

CONTROL POINT	SURFACE COORDINATES		NAVD 88 ELEVATION	GRID COORDINATES		DESCRIPTION
	NORTHING	EASTING		NORTHING	EASTING	
CP#1	13,865,293.020	2,560,890.835	343.580	13,863,490.767	2,560,557.962	5/8-IR W/ RED CAP STAMPED "CP&Y TRAV. POINT"
CP#2	13,865,015.527	2,560,894.591	339.519	13,863,213.310	2,560,561.718	5/8-IR W/ RED CAP STAMPED "CP&Y TRAV. POINT"
CP#3	13,864,788.505	2,560,874.707	337.875	13,862,986.317	2,560,541.836	5/8-IR W/ RED CAP STAMPED "CP&Y TRAV. POINT"
CP#4	13,864,467.415	2,560,697.125	331.754	13,862,665.269	2,560,364.278	5/8-IR W/ RED CAP STAMPED "CP&Y TRAV. POINT"
CP#5	13,864,195.292	2,560,548.627	333.085	13,862,393.181	2,560,215.799	5/8-IR W/ RED CAP STAMPED "CP&Y TRAV. POINT"



CP#1 IS A 5/8-INCH IRON ROD WITH RED PLASTIC CAP STAMPED "CP&Y TRAV. POINT" LOCATED IN FAYETTE COUNTY, TX., LOCATED IN THE EAST R.O.W. OF N. SMITHVILLE ROAD, +/- 390' NORTH OF THE CENTERLINE INTERSECTION OF N. SMITHVILLE ROAD & BOEHNKE ROAD, +/- 20' NORTH OF THE NORTH END OF A METAL GATE LOCATED IN THE EAST R.O.W. OF N. SMITHVILLE ROAD & +/- 79' NORTH OF A MIDSTREAM BURIED GAS MARKER LOCATED IN THE EAST R.O.W. OF N. SMITHVILLE ROAD.

US SURVEY FEET
DATA SET: FEBRUARY, 2022
MONUMENT: 5/8"-IR W/ RED PLASTIC CAP STAMPED "CP&Y TRAV. POINT"
SURFACE ADJUSTMENT FACTOR 1.00013
ELEVATIONS ARE NAVD 88 BASED UPON GEOID 2018
TXDOT VRS NETWORK



CP#2 IS A 5/8-INCH IRON ROD WITH RED PLASTIC CAP STAMPED "CP&Y TRAV. POINT" LOCATED IN FAYETTE COUNTY, TX., LOCATED IN THE WEST R.O.W. OF N. SMITHVILLE ROAD, +/- 2.5' EAST OF A 4' BARBED WIRE FENCE LINE LOCATED ON THE WEST R.O.W. OF N. SMITHVILLE ROAD, +/- 27' NORTH OF A P.I. IN THE FENCE LINE LOCATED ON THE WEST R.O.W. OF N. SMITHVILLE ROAD AND +/- 95' NORTH OF P.I. IN THE FENCE LOCATED ON THE N.E. R.O.W. OF N. SMITHVILLE ROAD AND BOEHNKE ROAD.

US SURVEY FEET
DATA SET: FEBRUARY, 2022
MONUMENT: 5/8"-IR W/ RED PLASTIC CAP STAMPED "CP&Y TRAV. POINT"
SURFACE ADJUSTMENT FACTOR 1.00013
ELEVATIONS ARE NAVD 88 BASED UPON GEOID 2018
TXDOT VRS NETWORK

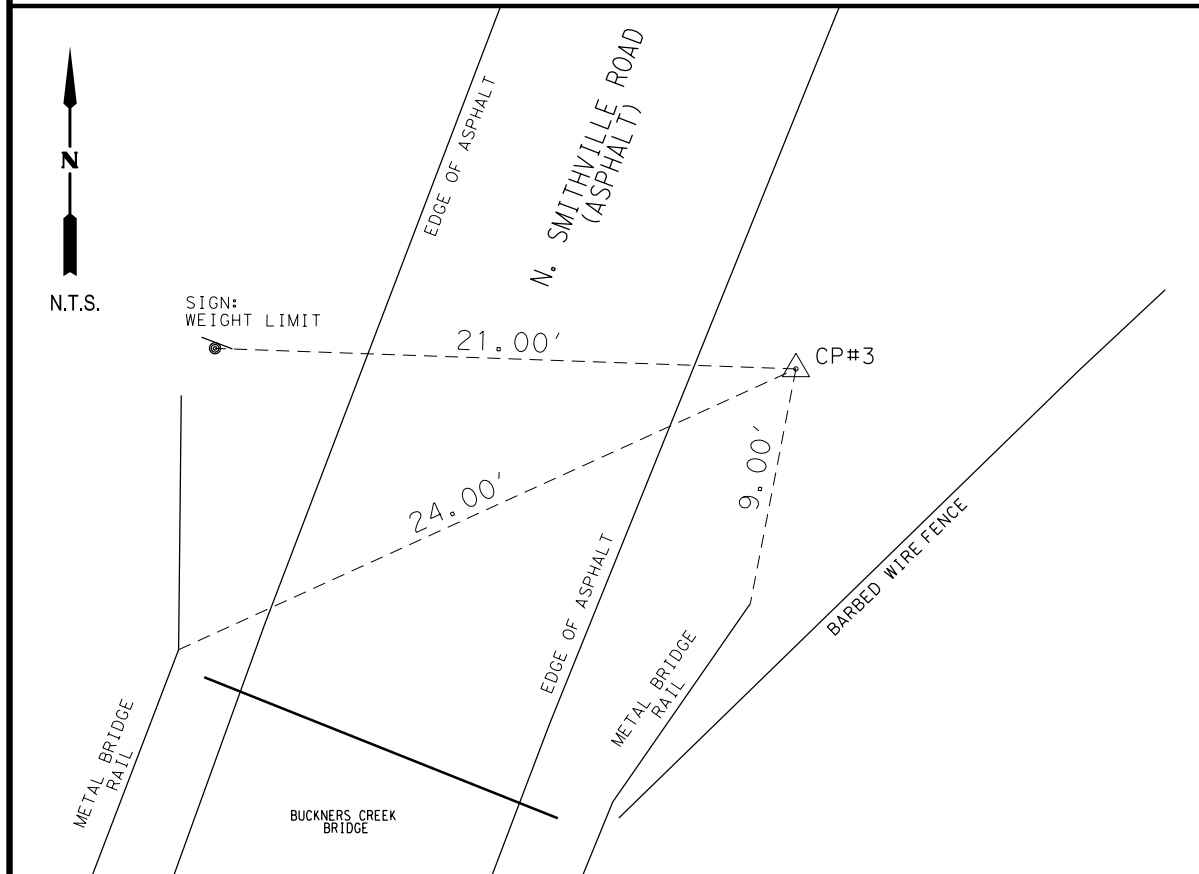
NOTES:
HORIZONTAL COORDINATES SHOWN ARE IN U.S. SURVEY FEET, AND ARE BASED UPON THE TEXAS COORDINATE SYSTEM OF NAD '83 (2011) TEXAS SOUTH CENTRAL ZONE 4204, WITH A SURFACE ADJUSTMENT FACTOR OF 1.00013. VALUES WERE DERIVED UTILIZING THE TXDOT STATE VIRTUAL REFERENCE STATION NETWORK IN OCTOBER, 2021.

GEOGRAPHIC COORDINATES SHOWN ARE BASED UPON THE TEXAS COORDINATE SYSTEM OF NAD '83 (2011) TEXAS SOUTH CENTRAL ZONE 4204. VALUES WERE CONVERTED FROM GRID STATE PLANE COORDINATES.

ELEVATIONS ARE BASED UPON NAVD '88 DATUM (GEOID 2018) DERIVED FROM UTILIZING THE TXDOT STATE VIRTUAL REFERENCE STATION NETWORK IN FEBRUARY, 2022.

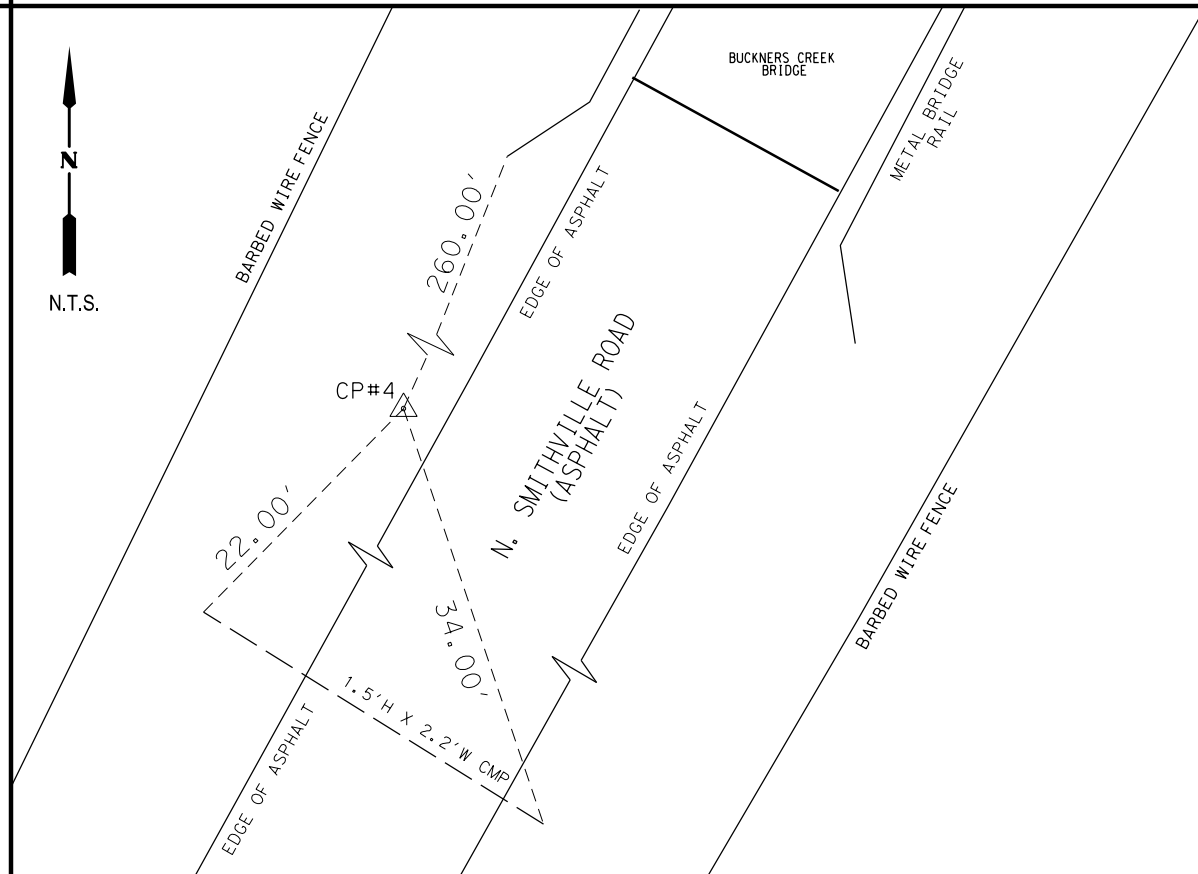
LEGEND

- 5/8" IRON ROD W/ RED PLASTIC CAP SET "CP&Y TRAV. POINT"
- SIGN



CP#3 IS A 5/8-INCH IRON ROD WITH RED PLASTIC CAP STAMPED "CP&Y TRAV. POINT" LOCATED IN FAYETTE COUNTY, TX., LOCATED IN THE EAST R.O.W. OF N. SMITHVILLE ROAD, +/- 21' EAST OF A BRIDGE WEIGHT LIMIT SIGN LOCATED IN THE WEST R.O.W. OF N. SMITHVILLE ROAD, +/- 24' N.E. OF A P.I. IN THE METAL BRIDGE GUARDRAIL LOCATED AT THE N.W. END OF THE BUCKNERS CREEK BRIDGE AND +/- 9' NORTH OF THE N.E. END OF A METAL BRIDGE GUARDRAIL LOCATED AT THE N.E. END OF THE BUCKNERS CREEK BRIDGE.

US SURVEY FEET
DATA SET: FEBRUARY, 2022
MONUMENT: 5/8"-IR W/ RED PLASTIC CAP STAMPED "CP&Y TRAV. POINT"
SURFACE ADJUSTMENT FACTOR 1.00013
ELEVATIONS ARE NAVD 88 BASED UPON GEOID 2018
TXDOT VRS NETWORK



CP#4 IS A 5/8-INCH IRON ROD WITH RED PLASTIC CAP STAMPED "CP&Y TRAV. POINT" LOCATED IN FAYETTE COUNTY, TX., LOCATED IN THE WEST R.O.W. OF N. SMITHVILLE ROAD, +/- 260' S.E. OF THE METAL BRIDGE GUARDRAIL LOCATED AT THE S.W. END OF THE BUCKNERS CREEK BRIDGE, +/- 22' N.E. OF THE N.W. END OF A 24" C.M.P. CROSSING UNDER N. SMITHVILLE ROAD AND +/- 34' N.W. OF THE S.E. END OF A 24" C.M.P. CROSSING UNDER N. SMITHVILLE ROAD.

US SURVEY FEET
DATA SET: FEBRUARY, 2022
MONUMENT: 5/8"-IR W/ RED PLASTIC CAP STAMPED "CP&Y TRAV. POINT"
SURFACE ADJUSTMENT FACTOR 1.00013
ELEVATIONS ARE NAVD 88 BASED UPON GEOID 2018
TXDOT VRS NETWORK



Brian Kidd

10/7/2022

NO.	REVISION	BY	DATE

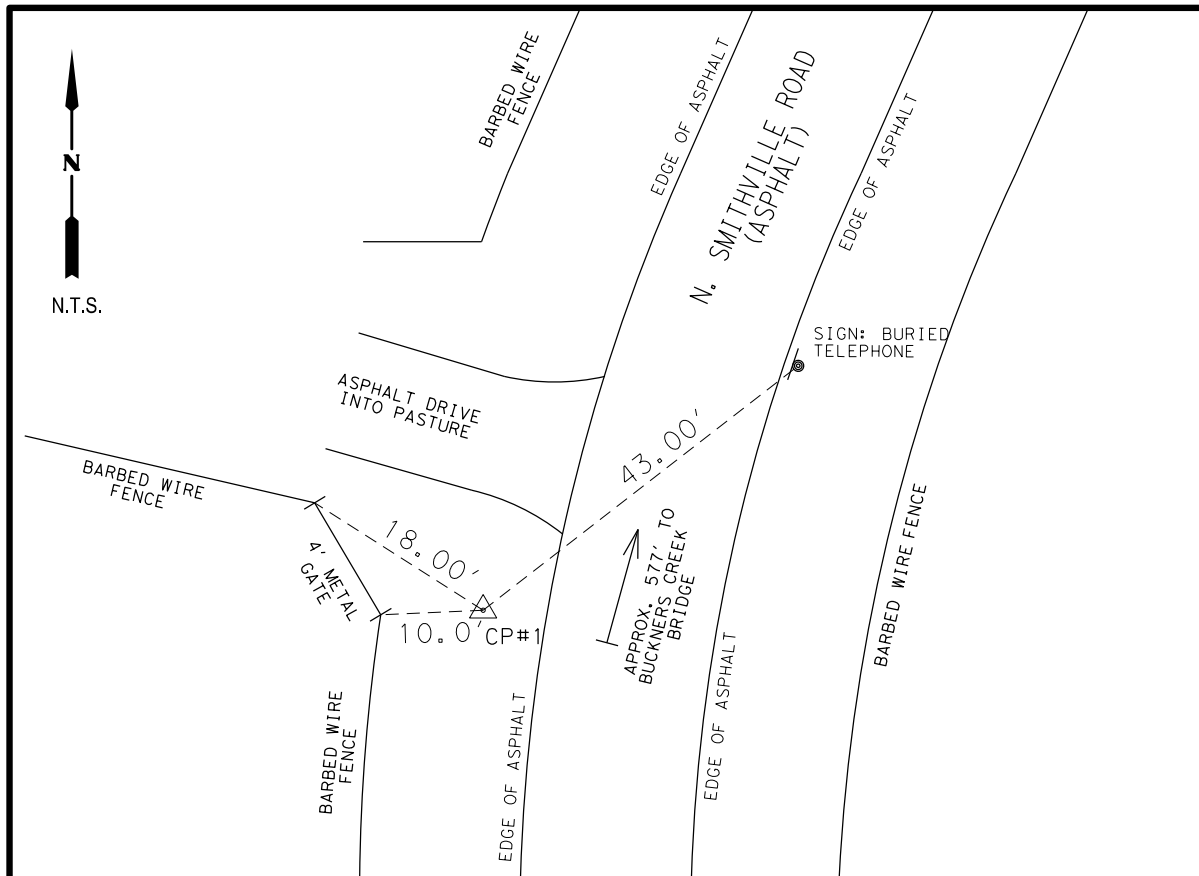
CP&Y an STV Company
TEXAS REGISTERED ENGINEERING FIRM
F-1741 SURVEY FIRM
10194305

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N. OLD SMITHVILLE ROAD AT BUCKNERS CREEK

HORIZONTAL/VERTICAL CONTROL SHEET

CSJ 0913-28-085 SHEET 1 OF 2

Designed:	TAT	FED. RD. DIST. NO.	STATE	FEDERAL AID PROJECT NO.	HIGHWAY NO.		
Checked:	BKK	6	TEXAS		CR		
Drawn:	TAT	DIST.	COUNTY	CONTROL NO.	SECTION NO.	JOB NO.	SHEET NO.
Checked:	BKK	YKM	FAYETTE	0913	28	083, ETC.	36



NOTES:
 HORIZONTAL COORDINATES SHOWN ARE IN U.S. SURVEY FEET, AND ARE BASED UPON THE TEXAS COORDINATE SYSTEM OF NAD '83 (2011) TEXAS SOUTH CENTRAL ZONE 4204, WITH A SURFACE ADJUSTMENT FACTOR OF 1.00013. VALUES WERE DERIVED UTILIZING THE TXDOT STATE VIRTUAL REFERENCE STATION NETWORK IN OCTOBER, 2021.

GEOGRAPHIC COORDINATES SHOWN ARE BASED UPON THE TEXAS COORDINATE SYSTEM OF NAD '83 (2011) TEXAS SOUTH CENTRAL ZONE 4204. VALUES WERE CONVERTED FROM GRID STATE PLANE COORDINATES.

ELEVATIONS ARE BASED UPON NAVD '88 DATUM (GEOID 2018) DERIVED FROM UTILIZING THE TXDOT STATE VIRTUAL REFERENCE STATION NETWORK IN FEBRUARY, 2022.

LEGEND

- 5/8" IRON ROD W/ RED PLASTIC CAP SET "CP&Y TRAV. POINT"
- SIGN

CP#5 IS A 5/8-INCH IRON ROD WITH RED PLASTIC CAP STAMPED "CP&Y TRAV. POINT" LOCATED IN FAYETTE COUNTY, TX., LOCATED IN THE WEST R.O.W. OF N. SMITHVILLE ROAD, +/- 577' SOUTH OF THE SOUTH END OF THE BUCKNERS CREEK BRIDGE, +/- 43' S.E. OF A BURIED TELEPHONE MARKER LOCATED IN THE EAST R.O.W. OF N. SMITHVILLE ROAD, +/- 10' EAST OF THE SOUTH END OF A 4" METAL GATE LOCATED IN THE WEST R.O.W. OF N. SMITHVILLE ROAD AND +/- 18' S.E. OF THE NORTH END OF A 4" METAL GATE LOCATED IN THE WEST R.O.W. OF N. SMITHVILLE ROAD.

US SURVEY FEET
 DATA SET: FEBRUARY, 2022
 MONUMENT: 5/8"-IR W/ RED PLASTIC CAP STAMPED "CP&Y TRAV. POINT"
 SURFACE ADJUSTMENT FACTOR 1.00013
 ELEVATIONS ARE NAVD 88 BASED UPON GEOID 2018
 TXDOT VRS NETWORK



Brian Kidd

10/7/2022

NO.	REVISION	BY	DATE

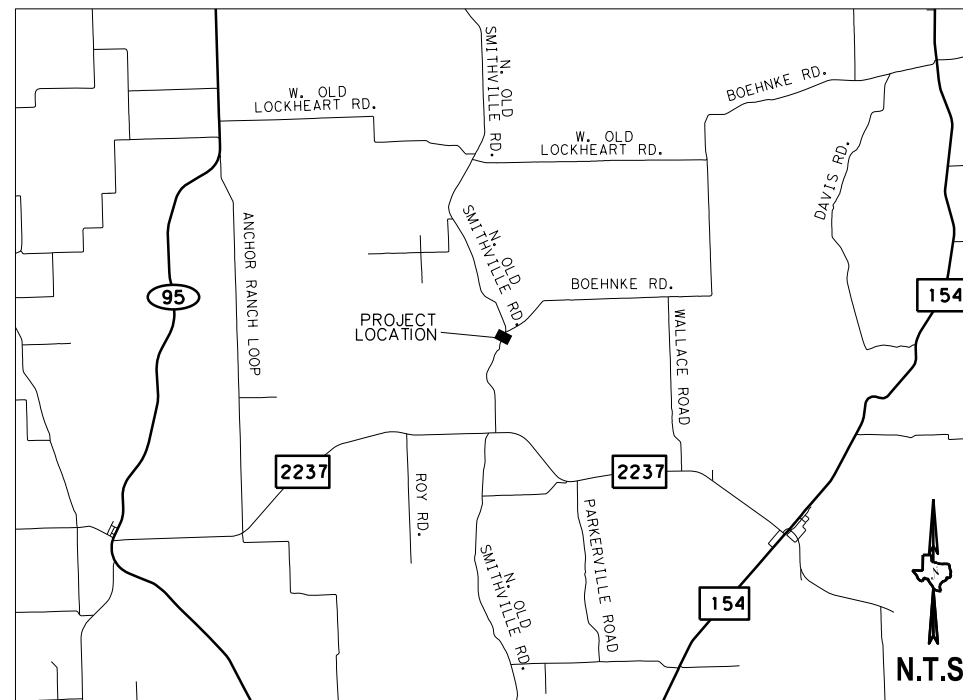
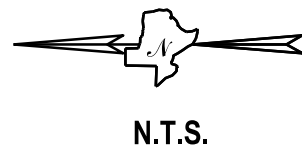
CP&Y an STV Company
 TEXAS REGISTERED ENGINEERING FIRM F-1741
 SURVEY FIRM 10194305

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 N. OLD SMITHVILLE ROAD AT BUCKNERS CREEK

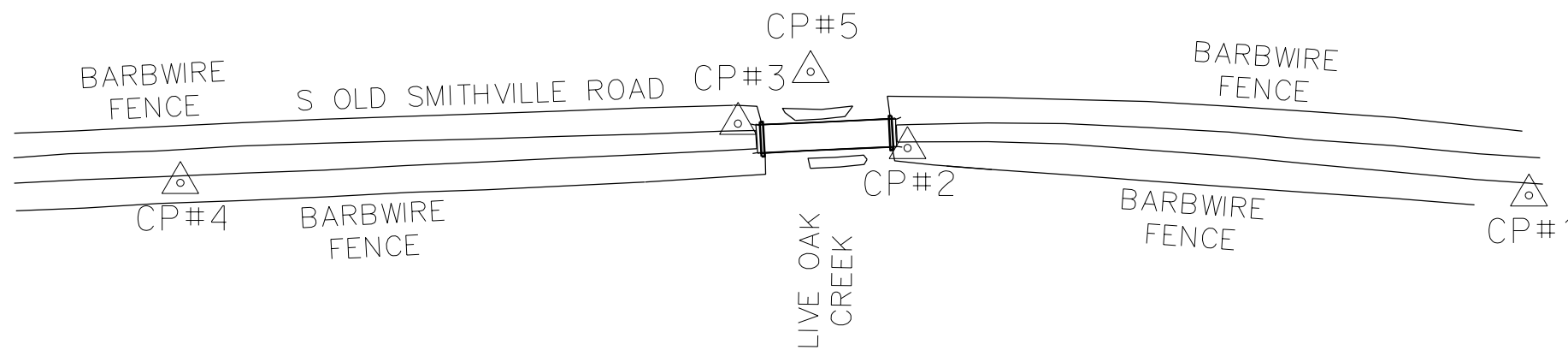
HORIZONTAL/VERTICAL CONTROL SHEET

CSJ 0913-28-085 SHEET 2 OF 2

Designed:	TAT	FED. RD. DIV. NO.	STATE	FEDERAL AID PROJECT NO.	HIGHWAY NO.		
Checked:	BKK	6	TEXAS		CR		
Drawn:	TAT	DIST.	COUNTY	CONTROL NO.	SECTION NO.	JOB NO.	SHEET NO.
Checked:	BKK	YKM	FAYETTE	0913	28	083, ETC.	37



LOCATION MAP



CONTROL POINT	SURFACE COORDINATES		NAVD 88 ELEVATION	GRID COORDINATES		DESCRIPTION
	NORTHING	EASTING		NORTHING	EASTING	
CP#1	13,849,260.828	2,558,785.293	337.13	13,847,460.658	2,558,452.694	5/8-IR W/ RED CAP STAMPED "CP&Y TRAV. POINT"
CP#2	13,849,636.137	2,558,843.414	339.69	13,847,835.918	2,558,510.808	5/8-IR W/ RED CAP STAMPED "CP&Y TRAV. POINT"
CP#3	13,849,738.016	2,558,866.208	339.04	13,847,937.785	2,558,533.598	5/8-IR W/ RED CAP STAMPED "CP&Y TRAV. POINT"
CP#4	13,850,079.673	2,558,856.639	336.64	13,848,279.396	2,558,524.031	5/8-IR W/ RED CAP STAMPED "CP&Y TRAV. POINT"
CP#5	13,849,691.479	2,558,894.206	328.06	13,847,891.253	2,558,561.593	5/8-IR W/ RED CAP STAMPED "CP&Y TRAV. POINT"

NOTES:
 HORIZONTAL COORDINATES SHOWN ARE IN U.S. SURVEY FEET, AND ARE BASED UPON THE TEXAS COORDINATE SYSTEM NAD '83 (2011) TEXAS SOUTH CENTRAL ZONE 4204, WITH A SURFACE ADJUSTMENT FACTOR OF 1.00013. VALUES WERE DERIVED UTILIZING THE TXDOT STATE VIRTUAL REFERENCE STATION NETWORK IN OCTOBER, 2021.

ELEVATIONS ARE BASED UPON NAVD '88 DATUM (GEIOD 2012B) DERIVED FROM UTILIZING THE TXDOT STATE VIRTUAL REFERENCE STATION NETWORK IN OCTOBER, 2021.

LEGEND

△ 5/8" IRON ROD W/ RED PLASTIC CAP SET "CP&Y TRAV. POINT"



Brian Kidd

10/7/2022

CP&Y
 an STV Company
 TEXAS REGISTERED ENGINEERING FIRM F-1741 SURVEY FIRM 10194305

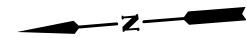
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S OLD SMITHVILLE ROAD AT LIVE OAK CREEK

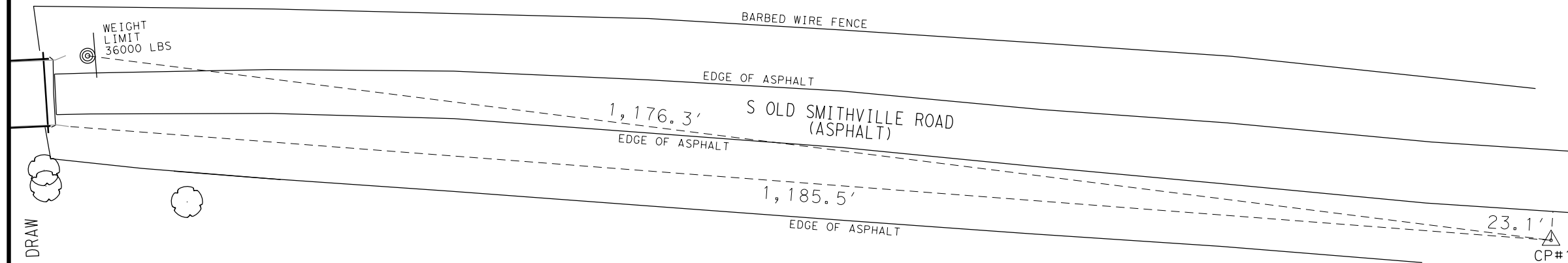
HORIZONTAL/VERTICAL CONTROL INDEX SHEET

CSJ 0913-28-086 SHEET 1 OF 1

Designed:	JDS	FED. RD. DIV. NO.	STATE	FEDERAL AID PROJECT NO.	HIGHWAY NO.
Checked:	BKK	6	TEXAS		CR
Drawn:	JDS	DIST.	COUNTY	CONTROL NO.	SECTION NO.
Checked:	BKK	YKM	FAYETTE	0913	28
				083,ETC.	38



N.T.S.



CP#1 IS A 5/8-INCH IRON ROD WITH RED PLASTIC CAP STAMPED "CP&Y TRAV. POINT" LOCATED IN FAYETTE COUNTY, TX., ON THE WEST SIDE OF S OLD SMITHVILLE ROAD, +/- 1,185.5' SOUTHWEST OF THE END OF GUARD RAIL ON THE WEST SIDE OF S OLD SMITHVILLE ROAD AT THE BRIDGE OF S OLD SMITHVILLE ROAD OVER A DRAW, +/- 1,176.3' SOUTHWEST OF A WEIGHT LIMIT 36000 LBS SIGN ON THE EAST SIDE OF S OLD SMITHVILLE ROAD AND +/- 23.1' WEST OF THE WEST EDGE OF ASPHALT OF S OLD SMITHVILLE ROAD

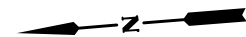
US SURVEY FEET
 DATA SET: OCTOBER, 2021
 MONUMENT: 5/8"-IR W/ RED PLASTIC CAP STAMPED "CP&Y TRAV. POINT"
 SURFACE ADJUSTMENT FACTOR 1.00013
 ELEVATIONS ARE NAVD 88 BASED UPON GEOID 2018
 TXDOT VRS NETWORK

NOTES:
 HORIZONTAL COORDINATES SHOWN ARE IN U.S. SURVEY FEET, AND ARE BASED UPON THE TEXAS COORDINATE SYSTEM NAD '83 (2011) TEXAS SOUTH CENTRAL ZONE 4204, WITH A SURFACE ADJUSTMENT FACTOR OF 1.00013. VALUES WERE DERIVED UTILIZING THE TXDOT STATE VIRTUAL REFERENCE STATION NETWORK IN OCTOBER, 2021.

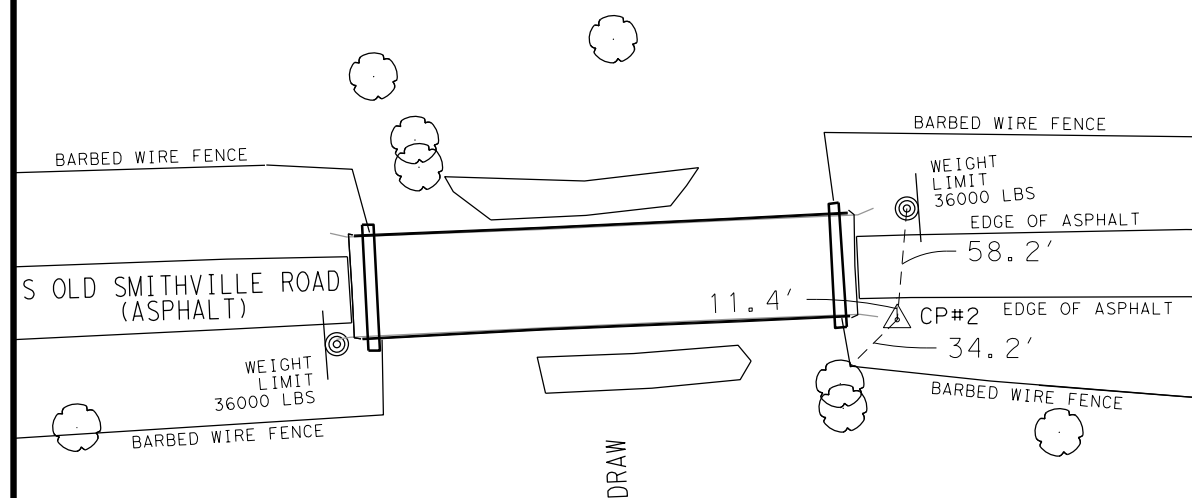
ELEVATIONS ARE BASED UPON NAVD '88 DATUM (GEOID 2012B) DERIVED FROM UTILIZING THE TXDOT STATE VIRTUAL REFERENCE STATION NETWORK IN OCTOBER, 2021.

LEGEND

- 5/8" IRON ROD W/ RED PLASTIC CAP SET "CP&Y TRAV. POINT"
- SIGN
- TREE

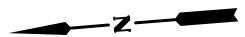


N.T.S.

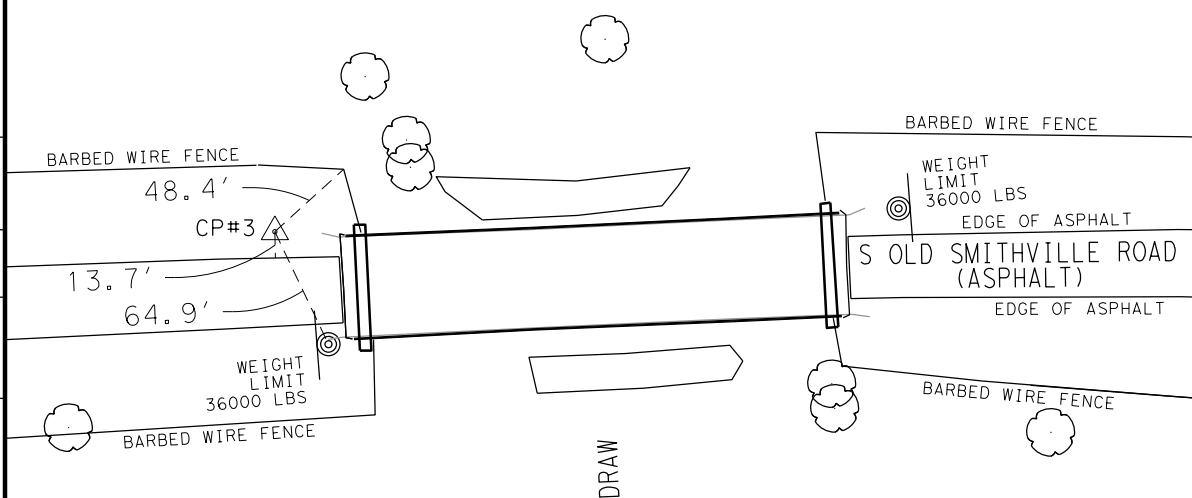


CP#2 IS A 5/8-INCH IRON ROD WITH RED PLASTIC CAP STAMPED "CP&Y TRAV. POINT" LOCATED IN FAYETTE COUNTY, TX., ON THE WEST SIDE OF S OLD SMITHVILLE ROAD, +/- 58.2' NORTHWEST OF A WEIGHT LIMIT 3600 LBS SIGN ON THE EAST SIDE OF S OLD SMITHVILLE ROAD, +/- 34.2' SOUTHWEST OF AN ANGLE POINT IN A BARBED WIRE FENCE ON THE WEST SIDE OF S OLD SMITHVILLE ROAD AND +/- 11.4' WEST OF THE WEST EDGE OF ASPHALT OF S OLD SMITHVILLE ROAD

US SURVEY FEET
 DATA SET: OCTOBER, 2021
 MONUMENT: 5/8"-IR W/ RED PLASTIC CAP STAMPED "CP&Y TRAV. POINT"
 SURFACE ADJUSTMENT FACTOR 1.00013
 ELEVATIONS ARE NAVD 88 BASED UPON GEOID 2018
 TXDOT VRS NETWORK



N.T.S.



CP#3 IS A 5/8-INCH IRON ROD WITH RED PLASTIC CAP STAMPED "CP&Y TRAV. POINT" LOCATED IN FAYETTE COUNTY, TX., ON THE EAST SIDE OF S OLD SMITHVILLE ROAD, +/- 64.9' NORTHEAST OF A WEIGHT LIMIT 3600 LBS SIGN ON THE WEST SIDE OF S OLD SMITHVILLE ROAD, +/- 48.4' NORTHWEST OF AN ANGLE POINT IN A BARBED WIRE FENCE ON THE EAST SIDE OF S OLD SMITHVILLE ROAD AND +/- 13.7' EAST OF THE EAST EDGE OF ASPHALT OF S OLD SMITHVILLE ROAD

US SURVEY FEET
 DATA SET: OCTOBER, 2021
 MONUMENT: 5/8"-IR W/ RED PLASTIC CAP STAMPED "CP&Y TRAV. POINT"
 SURFACE ADJUSTMENT FACTOR 1.00013
 ELEVATIONS ARE NAVD 88 BASED UPON GEOID 2018
 TXDOT VRS NETWORK



Brian Kidd

10/7/2022

NO.	REVISION	BY	DATE

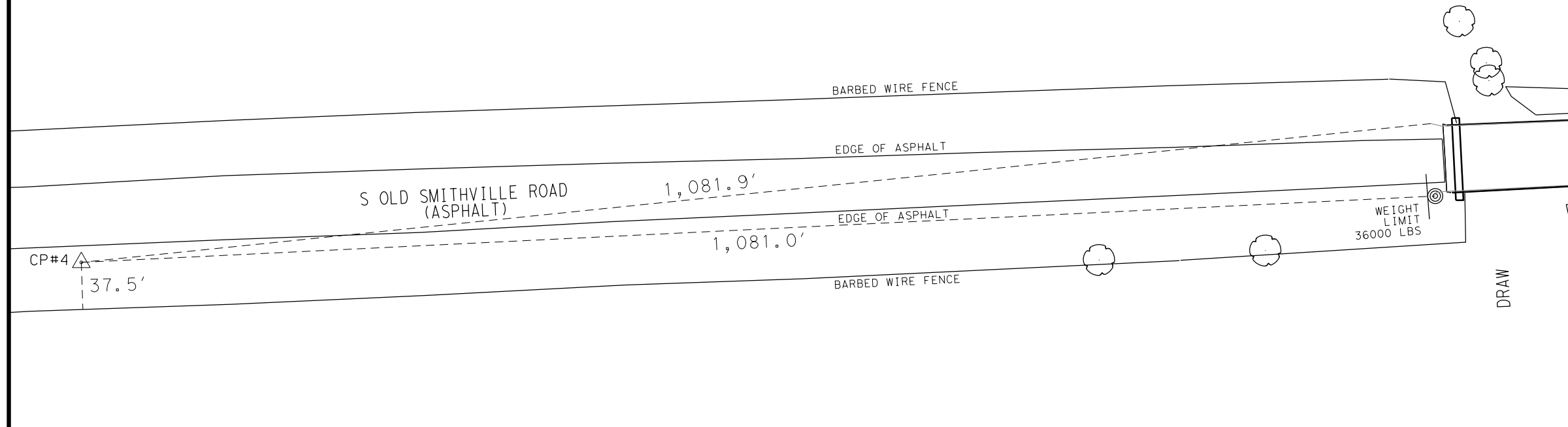
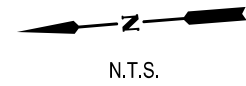
CP&Y
 an STV Company
 TEXAS REGISTERED ENGINEERING FIRM
 F-1741
 SURVEY FIRM
 10194305

©2022 Texas Department of Transportation
 S. OLD SMITHVILLE ROAD AT LIVE OAK CREEK

HORIZONTAL/VERTICAL CONTROL SHEET

CSJ 0913-28-086 SHEET 1 OF 2

Designed:	JDS	FED. RD. DIST. NO.	STATE	FEDERAL AID PROJECT NO.	HIGHWAY NO.		
Checked:	BKK	6	TEXAS		CR		
Drawn:	JDS	DIST.	COUNTY	CONTROL NO.	SECTION NO.	JOB NO.	SHEET NO.
Checked:	BKK	YKM	FAYETTE	0913	28	083, ETC.	39



CP#4 IS A 5/8-INCH IRON ROD WITH RED PLASTIC CAP STAMPED "CP&Y TRAV. POINT" LOCATED IN FAYETTE COUNTY, TX., ON THE WEST SIDE OF S OLD SMITHVILLE ROAD, +/- 1,081.9' NORTHWEST OF THE END OF GUARD RAIL ON THE EAST SIDE OF S OLD SMITHVILLE ROAD AT THE BRIDGE OF S OLD SMITHVILLE ROAD OVER A DRAW, +/- 1,081.0' NORTH OF A WEIGHT LIMIT 36000 LBS SIGN ON THE WEST SIDE OF S OLD SMITHVILLE ROAD AND +/- 37.5' EAST OF A BARBED WIRE FENCE ON THE WEST SIDE OF S OLD SMITHVILLE ROAD

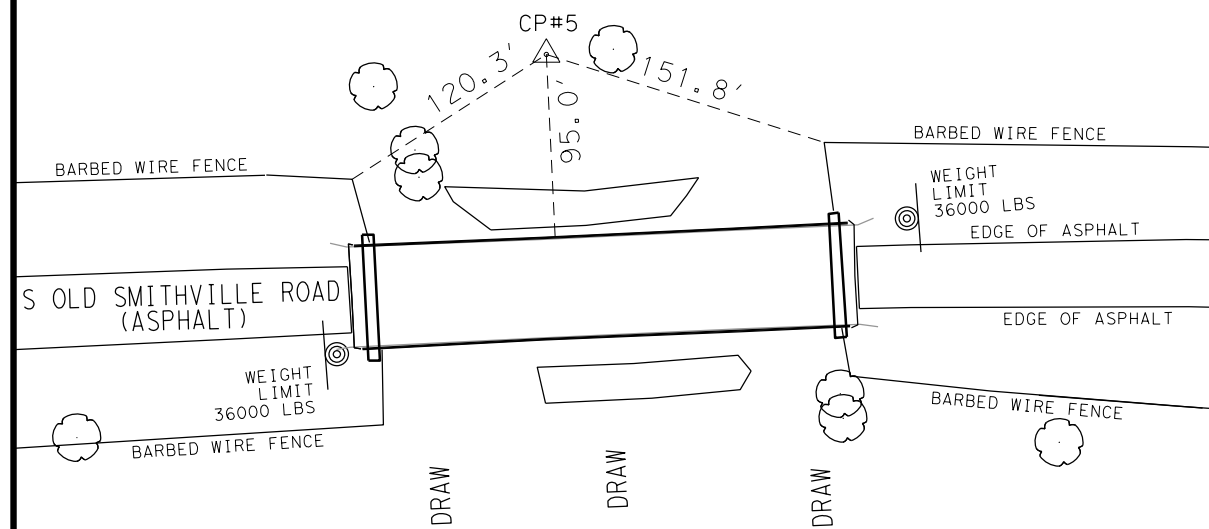
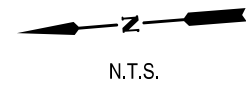
US SURVEY FEET
 DATA SET: OCTOBER, 2021
 MONUMENT: 5/8"-IR W/ RED PLASTIC CAP STAMPED "CP&Y TRAV. POINT"
 SURFACE ADJUSTMENT FACTOR 1.00013
 ELEVATIONS ARE NAVD 88 BASED UPON GEOID 2018
 TXDOT VRS NETWORK

NOTES:
 HORIZONTAL COORDINATES SHOWN ARE IN U.S. SURVEY FEET, AND ARE BASED UPON THE TEXAS COORDINATE SYSTEM NAD '83 (2011) TEXAS SOUTH CENTRAL ZONE 4204, WITH A SURFACE ADJUSTMENT FACTOR OF 1.00013. VALUES WERE DERIVED UTILIZING THE TXDOT STATE VIRTUAL REFERENCE STATION NETWORK IN OCTOBER, 2021.

ELEVATIONS ARE BASED UPON NAVD '88 DATUM (GEOID 2012B) DERIVED FROM UTILIZING THE TXDOT STATE VIRTUAL REFERENCE STATION NETWORK IN OCTOBER, 2021.

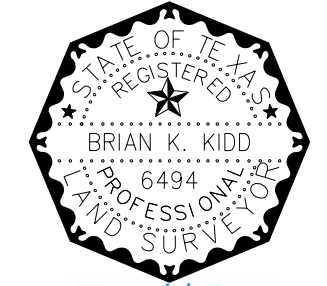
LEGEND

- 5/8" IRON ROD W/ RED PLASTIC CAP SET "CP&Y TRAV. POINT"
- SIGN
- TREE



CP#5 IS A 5/8-INCH IRON ROD WITH RED PLASTIC CAP STAMPED "CP&Y TRAV. POINT" LOCATED IN FAYETTE COUNTY, TX., ON THE EAST SIDE OF S OLD SMITHVILLE ROAD, +/- 151.8' NORTHEAST OF AN ANGLE POINT IN A BARBED WIRE FENCE ON THE EAST SIDE OF S OLD SMITHVILLE ROAD, +/- 120.3' SOUTHEAST OF AN ANGLE POINT IN A BARBED WIRE FENCE ON THE EAST SIDE OF S OLD SMITHVILLE ROAD AND +/- 95.0' EAST OF THE EAST EDGE OF THE BRIDGE OF S OLD SMITHVILLE ROAD OVER A DRAW

US SURVEY FEET
 DATA SET: OCTOBER, 2021
 MONUMENT: 5/8"-IR W/ RED PLASTIC CAP STAMPED "CP&Y TRAV. POINT"
 SURFACE ADJUSTMENT FACTOR 1.00013
 ELEVATIONS ARE NAVD 88 BASED UPON GEOID 2018
 TXDOT VRS NETWORK



Brian Kidd

10/7/2022

NO.	REVISION	BY	DATE

CP&Y an STV Company
 TEXAS REGISTERED ENGINEERING FIRM F-1741
 SURVEY FIRM 10194305

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 S. OLD SMITHVILLE ROAD AT LIVE OAK CREEK

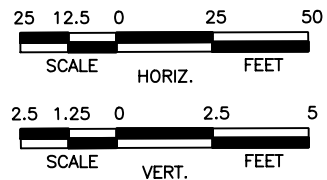
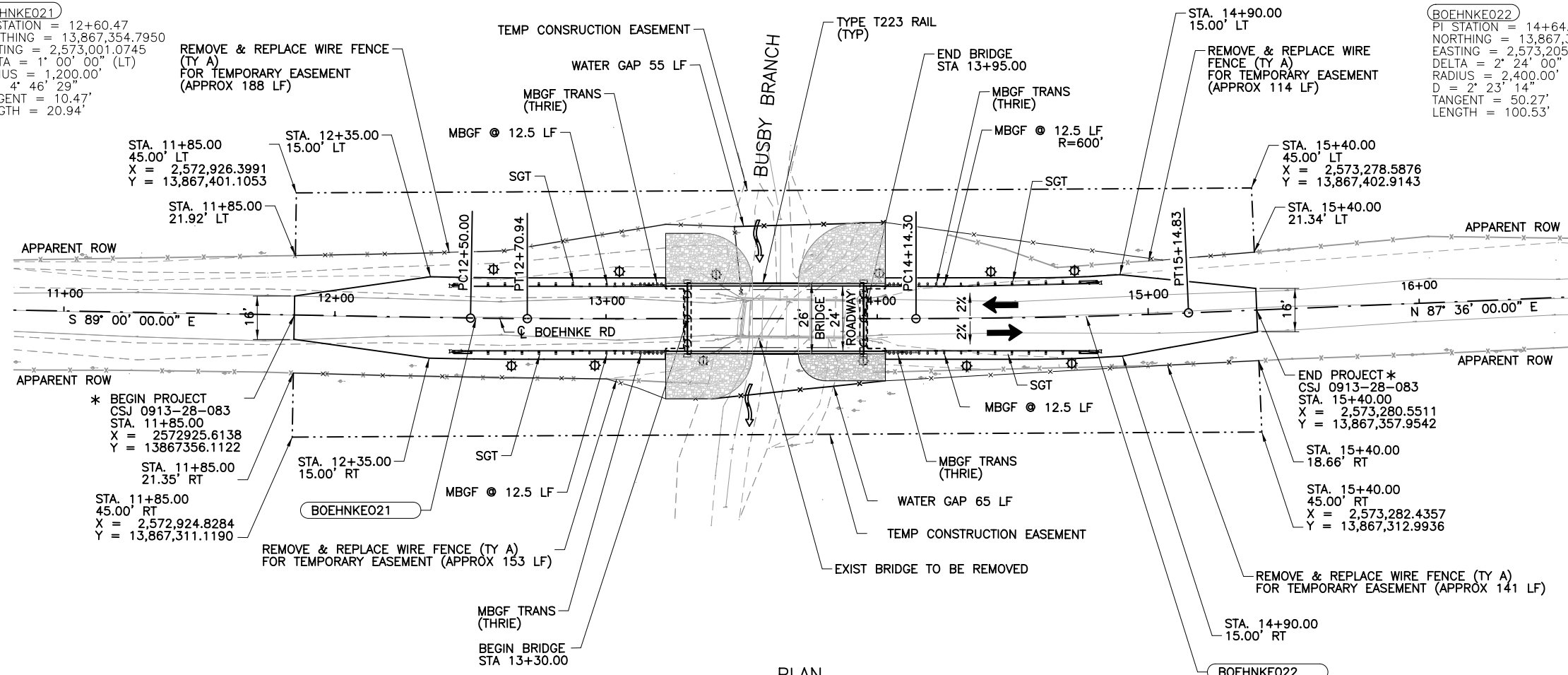
HORIZONTAL/VERTICAL CONTROL SHEET

CSJ 0913-28-086 SHEET 2 OF 2

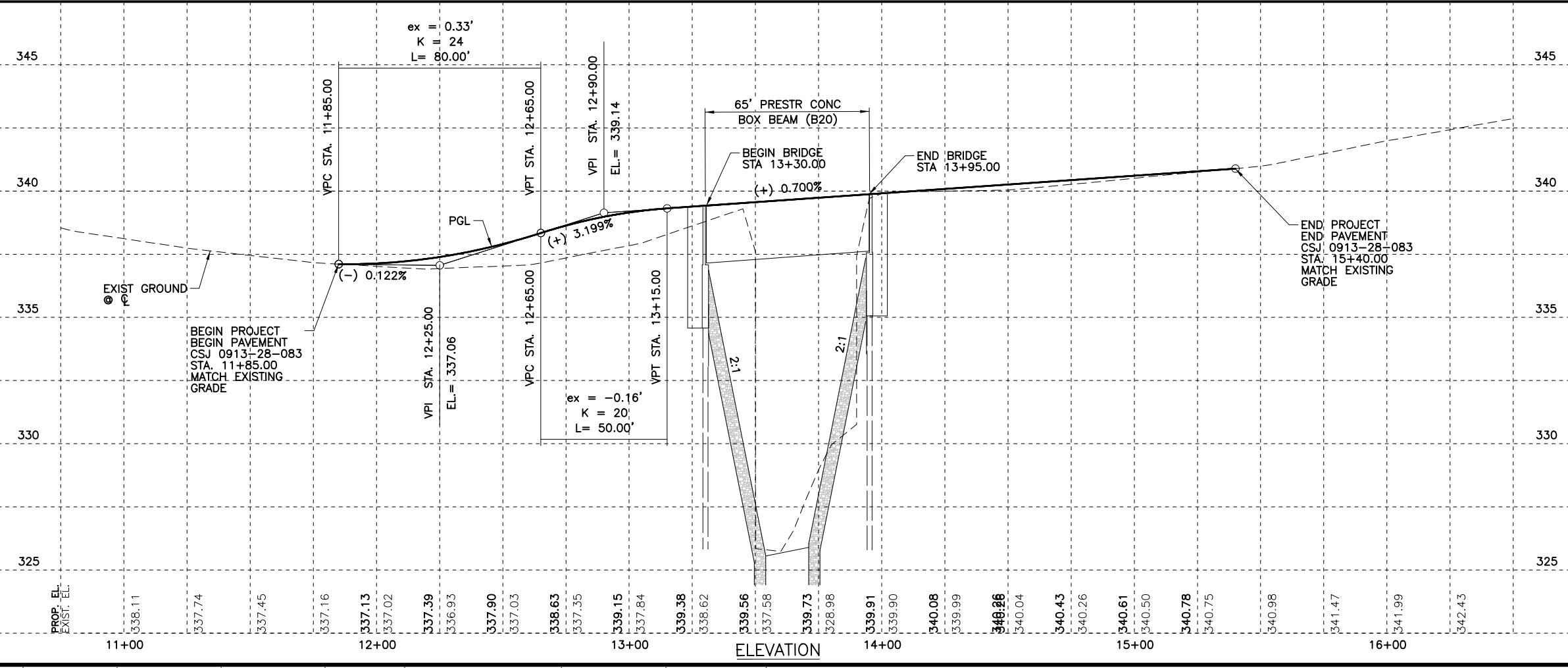
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Checked:	BKK	6	TEXAS		CR		
Drawn:	JDS	DIST.	COUNTY	CONTROL NO.	SECTION NO.	JOB NO.	SHEET NO.
Checked:	BKK	YKM	FAYETTE	0913	28	083, ETC.	40

BOEHNKE021
 PI STATION = 12+60.47
 NORTHING = 13,867,354.7950
 EASTING = 2,573,001.0745
 DELTA = 1° 00' 00" (LT)
 RADIUS = 1,200.00'
 D = 4° 46' 29"
 TANGENT = 10.47'
 LENGTH = 20.94'

BOEHNKE022
 PI STATION = 14+64.57
 NORTHING = 13,867,354.7950
 EASTING = 2,573,205.1760
 DELTA = 2° 24' 00" (LT)
 RADIUS = 2,400.00'
 D = 2° 23' 14"
 TANGENT = 50.27'
 LENGTH = 100.53'



LEGEND
 X EXISTING FENCE
 ⊕ BIDIRECTIONAL DELINEATOR



* MATCH EXISTING GRADE AND ROADWAY CROSS SLOPE.
 ** EXISTING FENCE REMOVAL, & SIGN REMOVAL ARE SUBSIDIARY TO ITEM 100' PREP ROW.

STATE OF TEXAS
 SANDRA GAIL MORRIS
 113680
 LICENSED PROFESSIONAL ENGINEER
 10/14/2022

NO.	REVISION	BY	DATE

CP&Y
 an STV Company
 TEXAS REGISTERED ENGINEERING FIRM
 F-1741

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 BOEHNKE RD AT BUSBY BRANCH

PLAN AND PROFILE

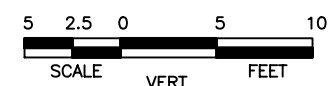
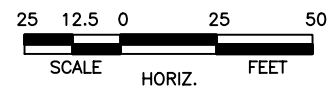
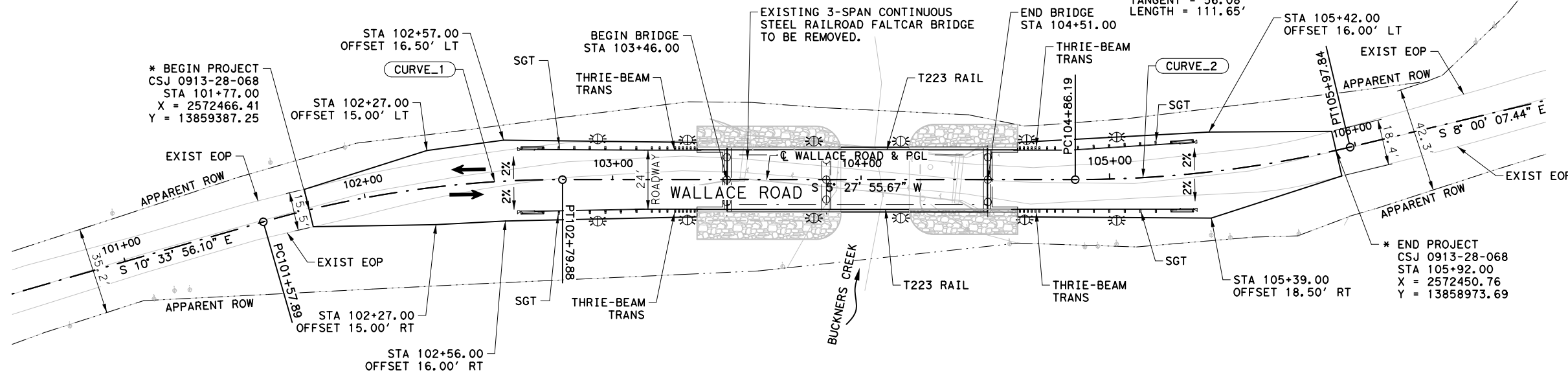
CSJ 0913-28-083 SHEET 1 OF 1

Designed: GH	FED. RD. DIV. NO. 6	STATE TEXAS	FEDERAL AID PROJECT NO.	HIGHWAY NO.
Checked: SM	6	TEXAS		CR
Drawn: GH	DIST. YKM	COUNTY FAYETTE	CONTROL NO. 0913	SECTION NO. 28
Checked: SM	YKM	FAYETTE	0913	28
			083, ETC.	41

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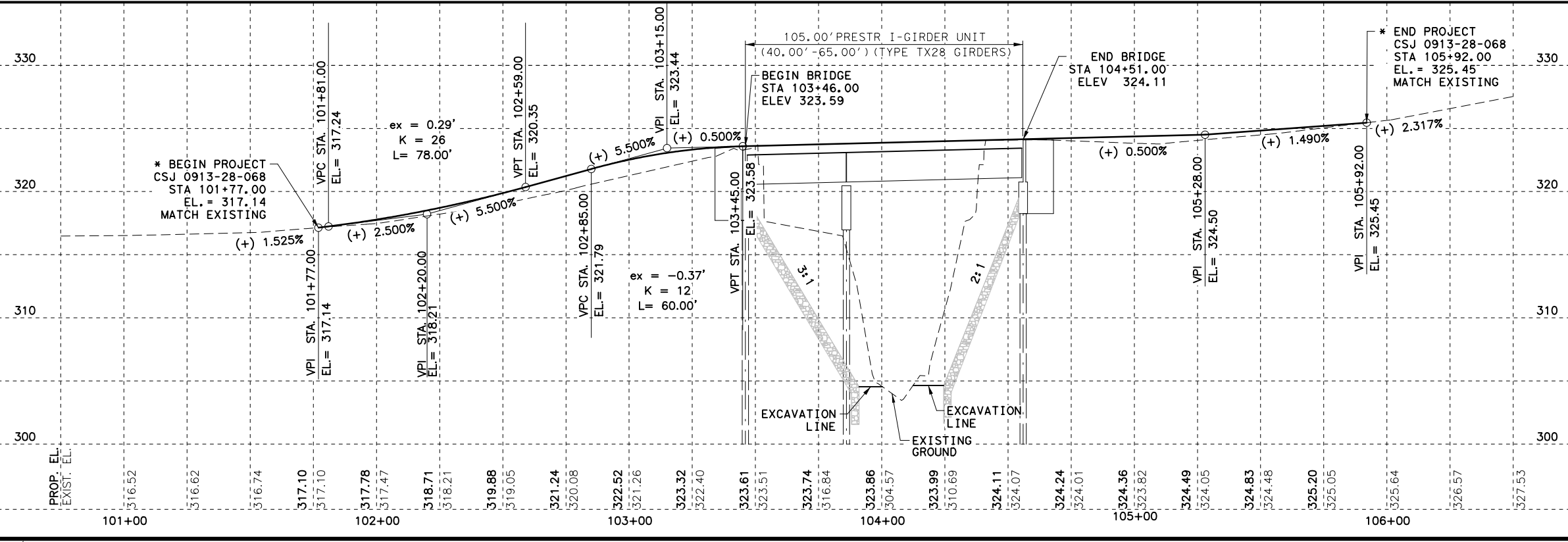
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 PI STATION = 102+19.28
 NORTHING = 13,859,345.7566
 EASTING = 2,572,474.5738
 DELTA = 16° 01' 52" (RT)
 RADIUS = 436.00'
 D = 13° 08' 28"
 TANGENT = 61.40'
 LENGTH = 121.99'

CURVE_2
 PI STATION = 105+42.27
 NORTHING = 13,859,023.4390
 EASTING = 2,572,443.7342
 DELTA = 13° 28' 03" (LT)
 RADIUS = 475.00'
 D = 12° 03' 44"
 TANGENT = 56.08'
 LENGTH = 111.65'



LEGEND
 [Symbol] BIDIRECTIONAL DELINEATORS

* MATCH EXISTING GRADE AND ROADWAY CROSS SLOPE



STATE OF TEXAS
 JOHN W. TULEY
 102441
 LICENSED PROFESSIONAL ENGINEER
 10/13/2022

NO.	REVISION	BY	DATE

BGE, Inc.
 1701 Directors Blvd., Suite 1000, Austin, TX 78744
 Tel: 512-879-0400 • www.bgeinc.com
 TBPE Registration No. F-1046

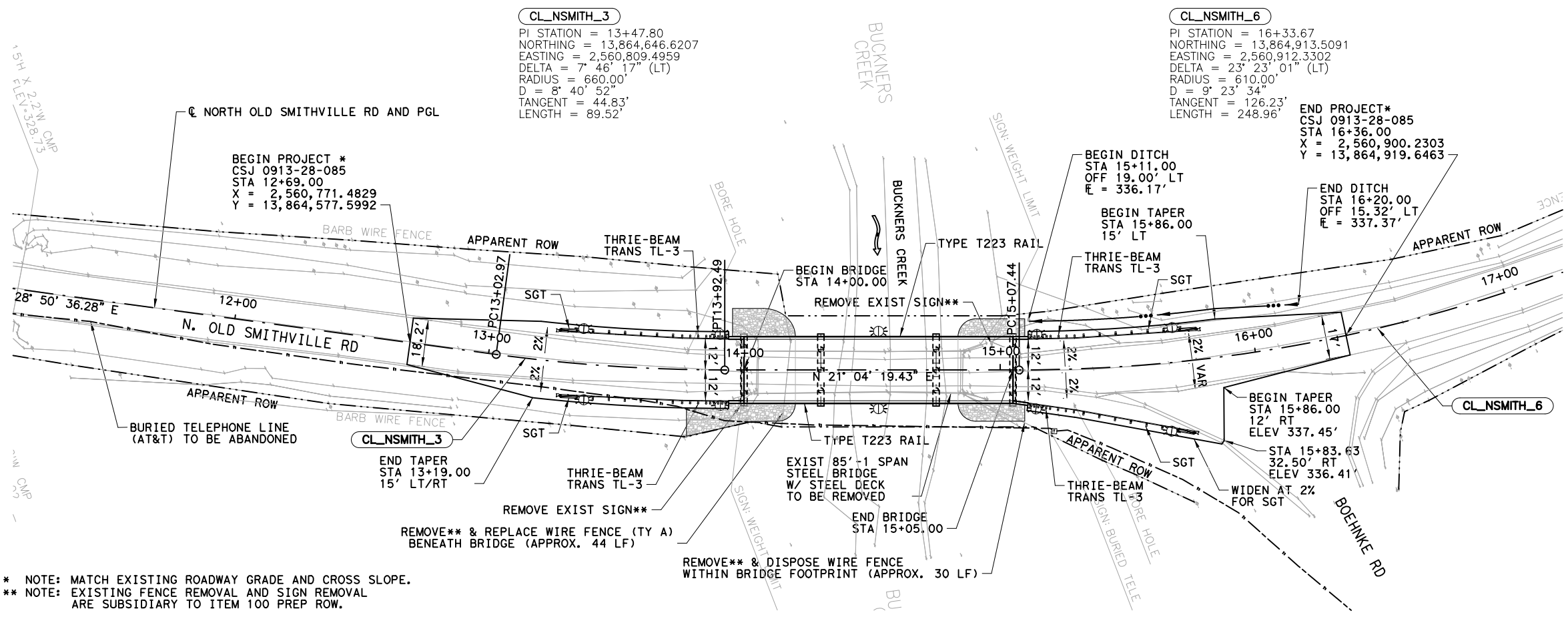
©2022 Texas Department of Transportation
 WALLACE ROAD AT BUCKNERS CREEK

PLAN AND PROFILE
 CSJ 0913-28-068 SHEET 1 OF 1

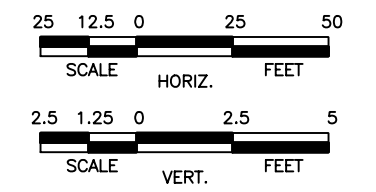
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Checked:	BGE	DIST.	YKM	COUNTY	FAYETTE	CONTROL NO.	0913	SECTION NO.	28	JOB NO.	083, ETC.	SHEET NO.	42

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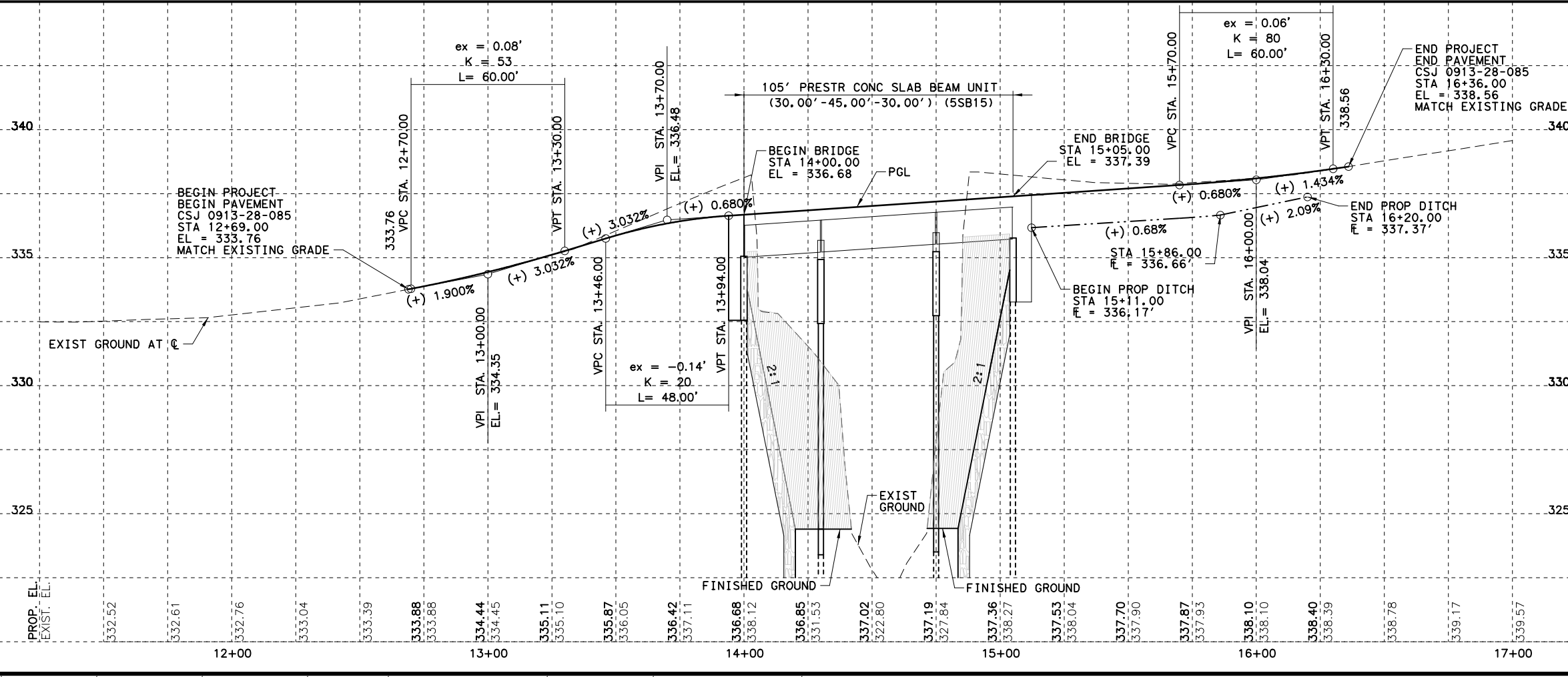


* NOTE: MATCH EXISTING ROADWAY GRADE AND CROSS SLOPE.
 ** NOTE: EXISTING FENCE REMOVAL AND SIGN REMOVAL ARE SUBSIDIARY TO ITEM 100 PREP ROW.



- LEGEND**
- EXISTING FENCE
 - ~ EXISTING CREEK FLOW
 - ▨ PROPOSED RIPRAP
 - ⚡ PROPOSED BIDIRECTIONAL DELINEATOR

STATE OF TEXAS
 AMANDA H. AJAJ
 123725
 LICENSED PROFESSIONAL ENGINEER
 11/22/2022



NO.	REVISION	BY	DATE

WSP USA Inc.
 16200 Park Row, Suite 200
 Houston, TX 77084
 TBPE # F-2263

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 NORTH OLD SMITHVILLE RD (CR 483) AT BUCKNERS CREEK

ROADWAY PLAN & PROFILE

CSJ 0913-28-085 SHEET 1 OF 1

Designed:	GD	FED. RD. DIV. NO.	6	STATE	TEXAS	FEDERAL AID PROJECT NO.		HIGHWAY NO.	CR				
Checked:	AA												
Drawn:	GD	DIST.	YKM	COUNTY	FAYETTE	CONTROL NO.	0913	SECTION NO.	28	JOB NO.	083, ETC.	SHEET NO.	43
Checked:	AA												

NOTE:
 INSTALL TEMPORARY WIRE FENCE (TY C) ALONG THE TEMPORARY CONSTRUCTION EASEMENT.
 TEMPORARY FENCE REMOVAL WILL BE PAID FOR IN ACCORDANCE WITH ITEM 496 REMOV STR (SMALL FENCE).

REMOVE & REPLACE WIRE FENCE (TY A) FOR TEMPORARY EASEMENT (APPROX. 147 LF)
 @ SOUTH OLD SMITHVILLE RD AND PGL

CONSTRUCTION EASEMENT
 STA 11+65.00, 26.07' LT
 X = 2,558,814.5120
 Y = 13,849,507.4748

BEGIN PROJECT *
 CSJ 0913-28-086
 STA 11+65.00
 X = 2,558,840.2330
 Y = 13,849,503.2475

CONSTRUCTION EASEMENT
 STA 11+65.00, 21.60' RT
 X = 2,558,861.5440
 Y = 13,849,499.7450

REMOVE** & REPLACE WIRE FENCE (TY A) FOR TEMPORARY EASEMENT (APPROX. 159 LF)
 END TAPER
 STA 12+15.00
 15' LT & RT

CONSTRUCTION EASEMENT
 STA 12+15.00, 29.81' RT
 X = 2,558,883.6281
 Y = 13,849,572.0052

INSTALL TEMP WIRE FENCE (TY C) ALONG EASEMENT FOR DURATION OF CONSTRUCTION (363 LF)

EXIST 85'-1 SPAN STEEL BRIDGE W/ STEEL DECK TO BE REMOVED

THRIE-BEAM TRANS TL-3

THRIE-BEAM TRANS TL-3

CL_SSMITH_3
 PI STATION = 12+29.65
 NORTHING = 13,849,567.0426
 EASTING = 2,558,850.7179
 DELTA = 7° 34' 35" (LT)
 RADIUS = 960.00
 D = 5° 58' 06"
 TANGENT = 63.56'
 LENGTH = 126.94'

INSTALL TEMP WIRE FENCE (TY C) ALONG EASEMENT FOR DURATION OF CONSTRUCTION (370 LF)

END PROJECT*
 CSJ 0913-28-086
 STA 15+30.00
 X = 2,558,860.9993
 Y = 13,849,867.3985

REMOVE & REPLACE WIRE FENCE (TY A) FOR TEMPORARY EASEMENT (APPROX. 158 LF)

CONSTRUCTION EASEMENT
 STA 14+80.00, 33.31' LT
 X = 2,558,825.7665
 Y = 13,849,818.7333

REMOVE EXIST** CONC SLAB/RIPRAP

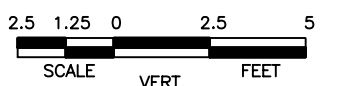
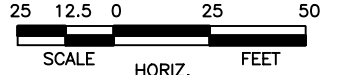
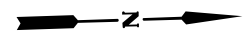
REMOVE EXIST SIGN**
 THRIE-BEAM TRANS TL-3
 TEMPORARY CONSTRUCTION EASEMENT

CONSTRUCTION EASEMENT
 STA 15+30.00, 23.78' LT
 X = 2,558,837.2420
 Y = 13,849,868.3241

REMOVE** & REPLACE WIRE FENCE (TY A) FOR TEMPORARY EASEMENT (APPROX. 152 LF)

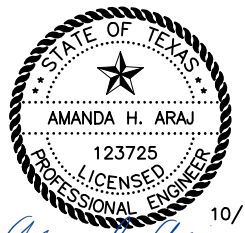
CONSTRUCTION EASEMENT
 STA 14+80.00, 32.09' RT
 X = 2,558,891.1177
 Y = 13,849,816.1870

* NOTE: MATCH EXISTING ROADWAY GRADE AND CROSS SLOPE.
 ** NOTE: EXISTING FENCE REMOVAL, SIGN REMOVAL, AND CONC SLAB/RIPRAP REMOVAL ARE SUBSIDIARY TO ITEM 100 PREP ROW.



LEGEND

- EXISTING FENCE
- EXISTING CREEK FLOW
- PROPOSED RIPRAP
- PROPOSED BIDIRECTIONAL DELINEATOR



10/13/2022
 Amanda Araj

NO.	REVISION	BY	DATE

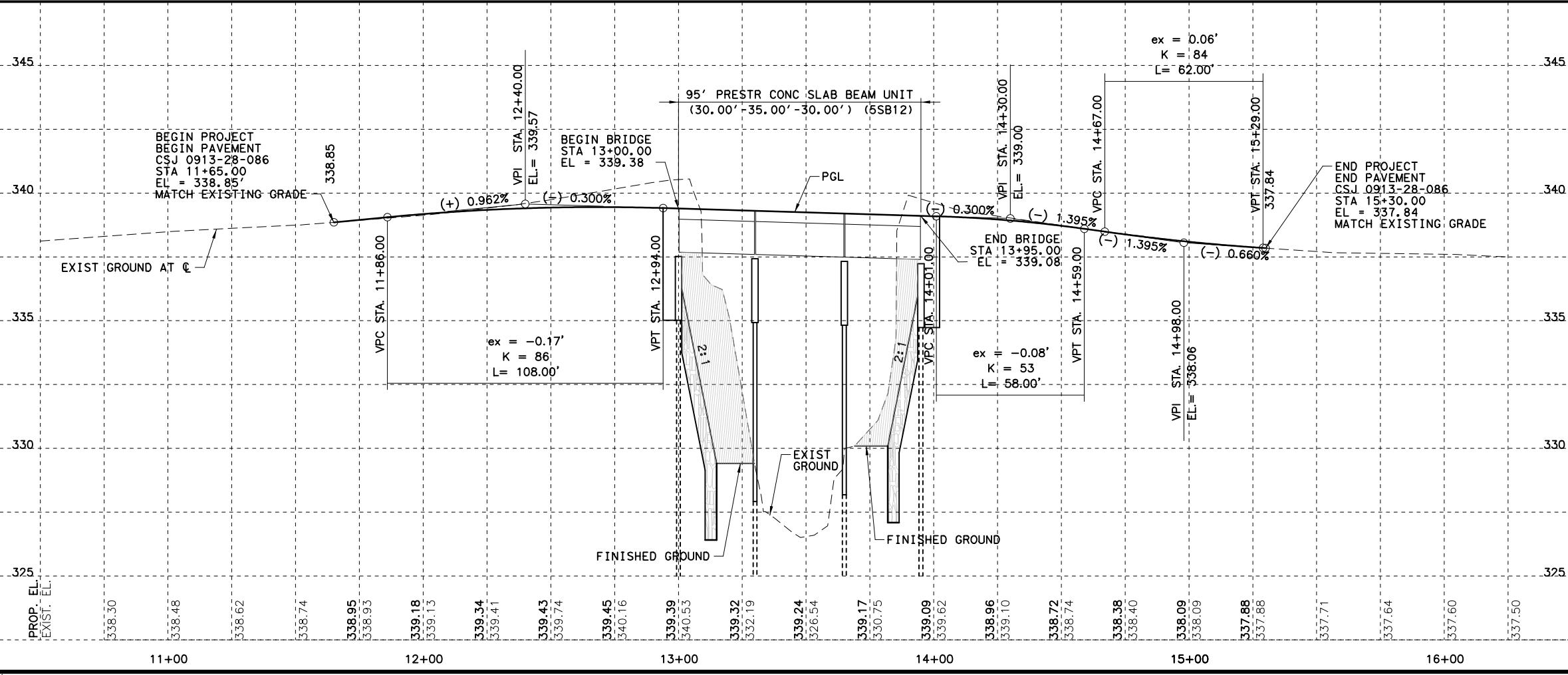
WSP WSP USA Inc.
 16200 Park Row, Suite 200
 Houston, TX 77084
 TBPE # F-2263

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 SOUTH OLD SMITHVILLE RD (CR 477) AT LIVE OAK CREEK

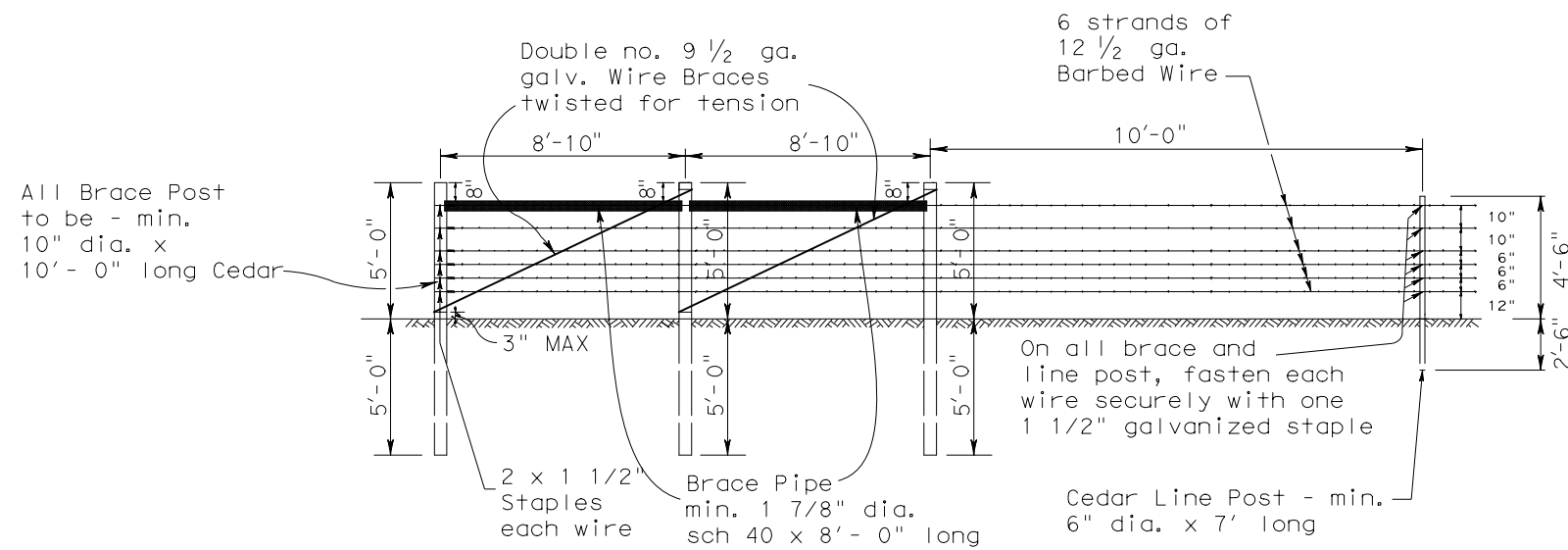
ROADWAY PLAN & PROFILE

CSJ 0913-28-086 SHEET 1 OF 1

Designed: GD	FED. RD. DIST. NO. 6	STATE TEXAS	FEDERAL AID PROJECT NO.		HIGHWAY NO.
Checked: AA	6	TEXAS			CR
Drawn: GD	DIST. YKM	COUNTY FAYETTE	CONTROL NO. 0913	SECTION NO. 28	JOB NO. 083.ETC.
Checked: AA	YKM	FAYETTE	0913	28	083.ETC.
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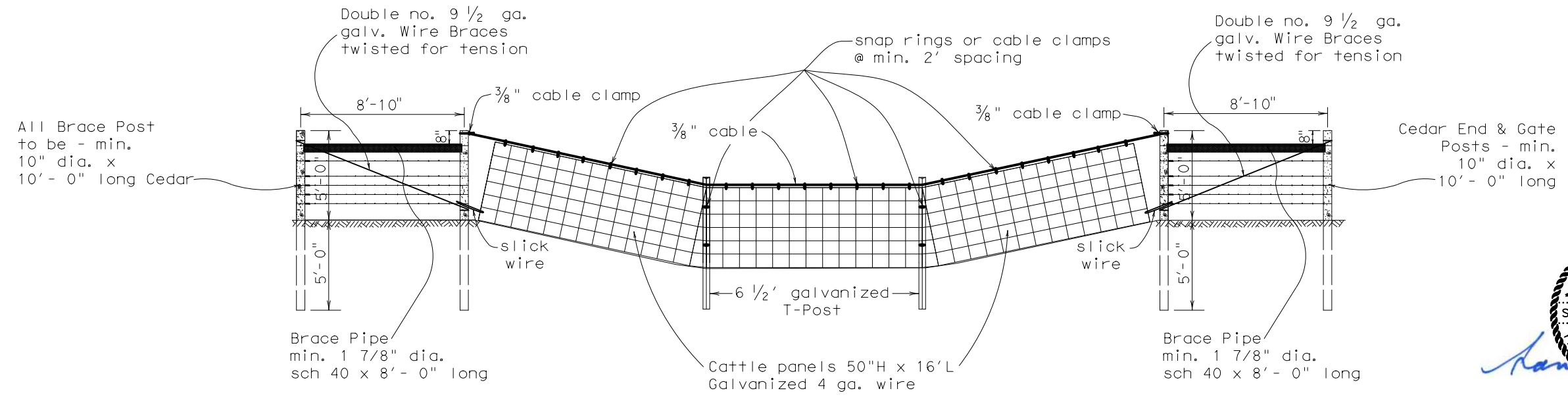


All Brace Post to be - min. 10" dia. x 10'-0" long Cedar

NOTES:

1. Twisted brace wire to be double wrapped around the bottom and top of each brace post.
2. Drive 3 - 16 penny dipped galv nails half way into each brace post on a 1 1/4" dia. to hold the 1 7/8" brace pipe in place.
3. Barbed Wire shall be mechanically stretched.
4. Braced Post and Line Post to be backfilled and tamped in 6" lifts.
5. Excess dirt to be piled up around base of each post after tamping.
6. Second brace is needed when the length of fence between PIs is greater than or equal to 200'.
7. The Type "A" Fence & Wire Gap will be paid for, under Item 552 Wire Fence (Ty A).
8. Barbed Wire shall be in accordance with ASTM A 121 (Class 1) Design designation 12-2-4-1 or 12-2-5-1 4R, or as approved by the Engineer.

TYPE "A" FENCE



All Brace Post to be - min. 10" dia. x 10'-0" long Cedar

Cedar End & Gate Posts - min. 10" dia. x 10'-0" long

DETAIL OF WIRE GAP



10/14/2022

WIRE FENCE DETAIL

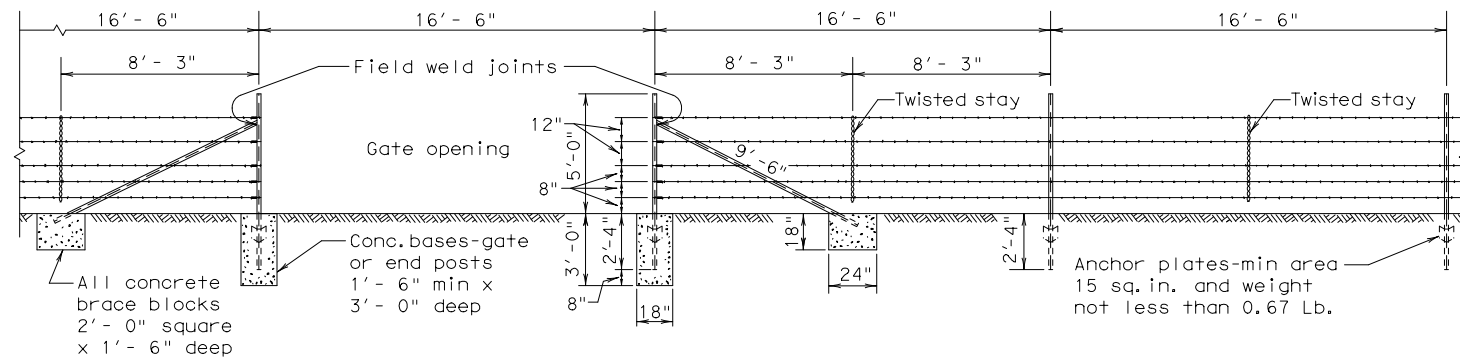
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Texas Department of Transportation
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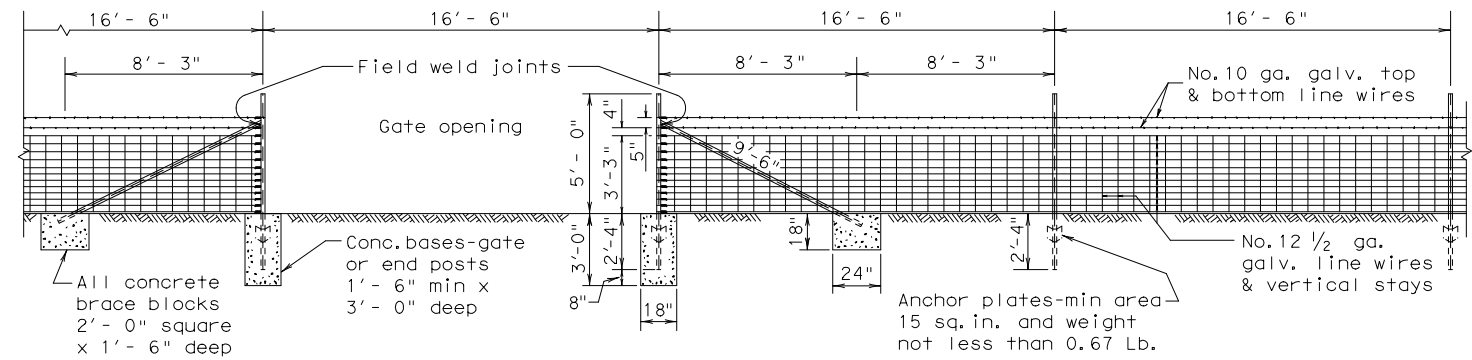
FED. RD. DIV. NO.	PROJECT NO.		SHEET NO.
6			45
STATE	DIST.	COUNTY	
TEXAS	YKM	FAYETTE	
CONT.	SECT.	JOB	HIGHWAY NO.
0913	28	083,ETC	CR

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DATE:
FILE:



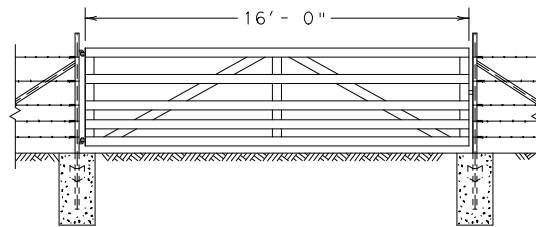
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BRACING DETAIL USED AT ENDS AND GATES
TYPE "C" FENCE
(See General Note 8)



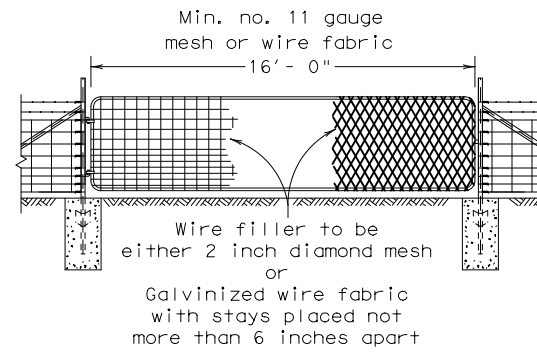
SECTION GALVANIZED WOVEN WIRE FENCE WITH METAL POSTS
BRACING DETAIL USED AT ENDS AND GATES
TYPE "D" FENCE
(See General Note 8)

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

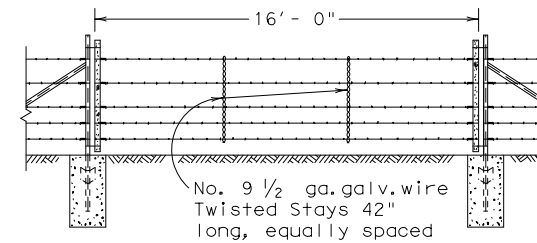
Metal gate shall consist of 5 panels not less than 4'-4" high and shall be aluminum or galvanized metal and of good quality. Gate and hardware shall meet the approval of the engineer.



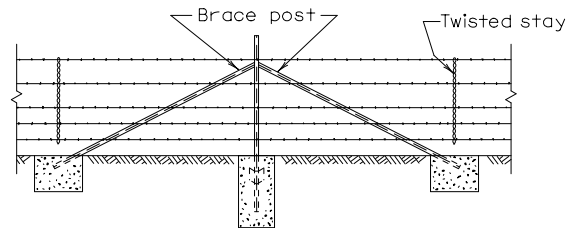
DETAIL TYPE 1 GATE



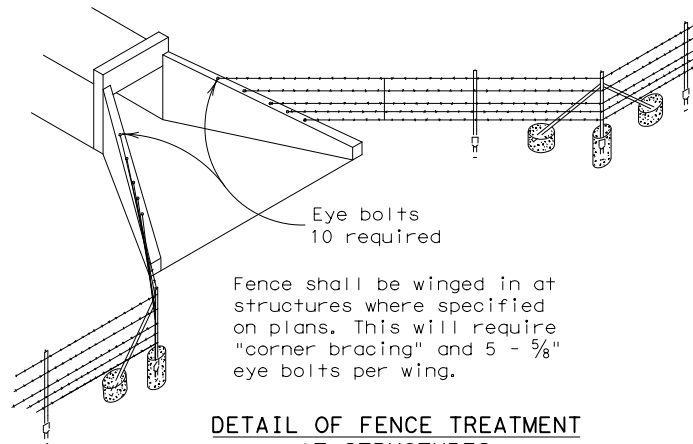
DETAIL TYPE 2 GATE



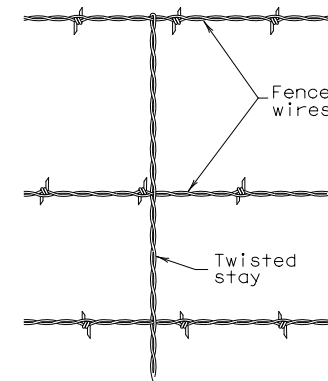
DETAIL TYPE 3 GATE



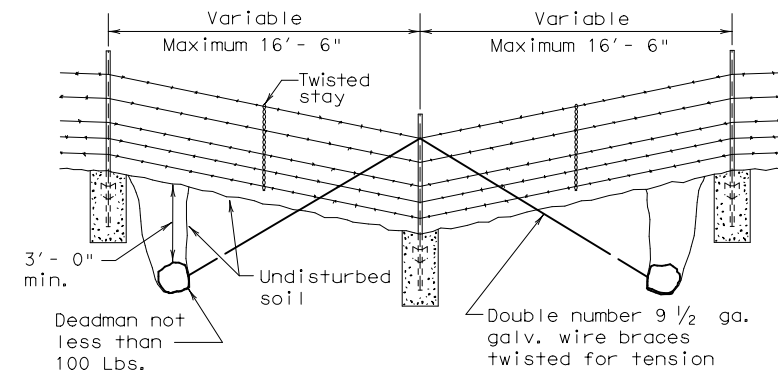
CORNER OR PULL POST ASSEMBLY



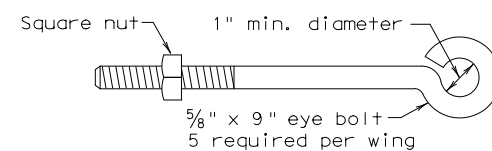
DETAIL OF FENCE TREATMENT AT STRUCTURES



DETAIL OF STAY (Barbed Wire Fence)



DETAIL OF FENCE SAG



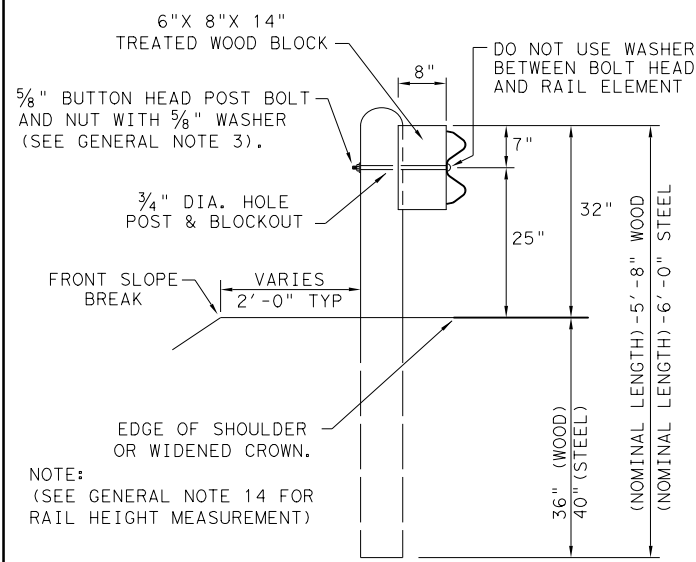
DETAIL OF EYE BOLT

GENERAL NOTES

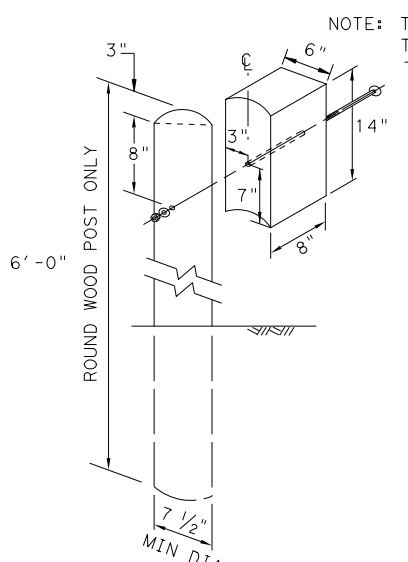
- Any high point which interferes with the placing of wire mesh shall be excavated to provide a 2 inch clearance.
- Latches for Type 1 and Type 2 gates shall be good commercial quality and design latch of the spring, fork or chain type. All latches shall be suitable to the gate and shall be approved 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.

				Design Division Standard	
BARBED WIRE AND WOVEN WIRE FENCE (STEEL POSTS) WF (2) - 10					
FILE:	wf210.dgn	DN:	TxDOT	CK:	AM
DESIGNER:	0913	SECT:	28	JOB:	083,ETC
REVISIONS:		DIST:		COUNTY:	
		YKM:	FAYETTE	SHEET NO.:	46

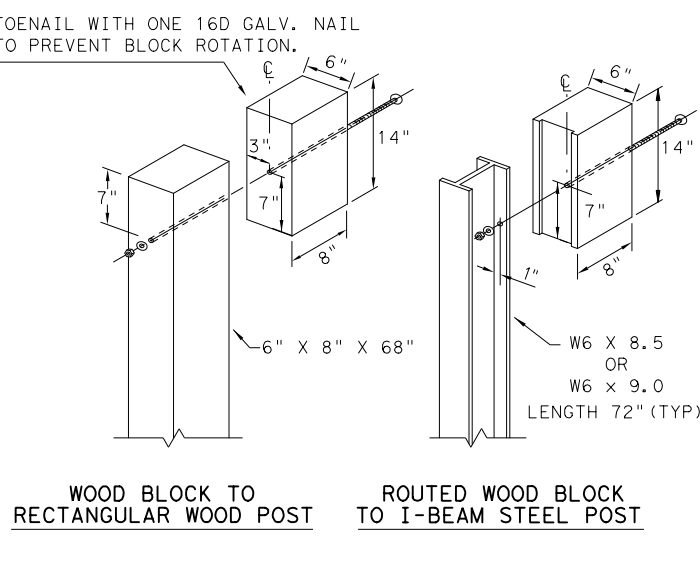
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TYPICAL POST PLACEMENT

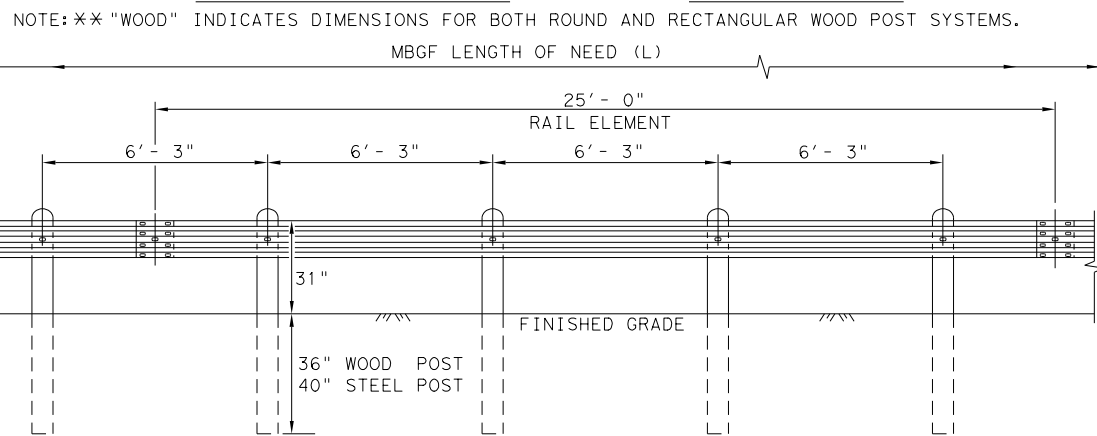


WOOD BLOCK TO ROUND WOOD POST



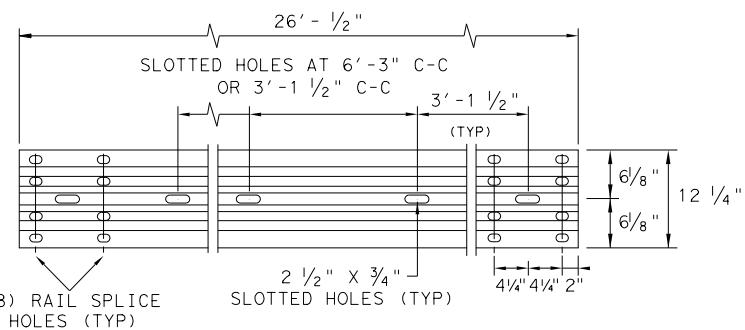
WOOD BLOCK TO RECTANGULAR WOOD POST **ROUTED WOOD BLOCK TO I-BEAM STEEL POST**

- 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 (FWC16d) 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.



ELEVATION MID-SPAN RAIL SPLICE

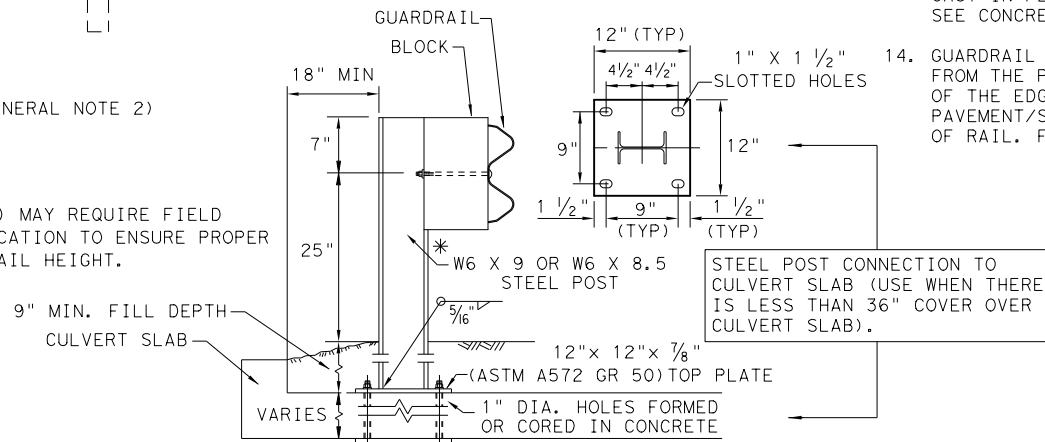
NOTE: ** "WOOD" INDICATES DIMENSIONS FOR BOTH ROUND AND RECTANGULAR WOOD POST SYSTEMS.



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

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

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



LOW FILL CULVERT POST

NOTE: TWO INSTALLATION OPTIONS.

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.

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

SPLICE BOLT LENGTH VARIES

FBB01 = 1 1/4"

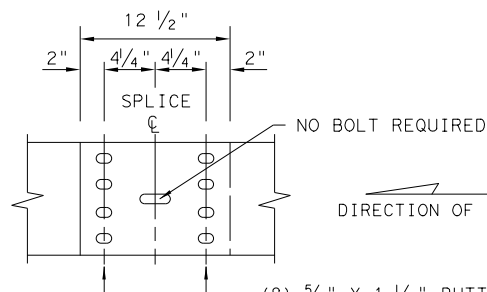
FBB02 = 2"

POST & BLOCK LENGTH

FBB03 = 10"

FBB04 = 18"

BUTTON HEAD BOLT



MID-SPAN RAIL SPLICE DETAIL

(8) 5/8" X 1 1/4" BUTTON HEAD SPLICE BOLTS WITH RECESSED NUTS.

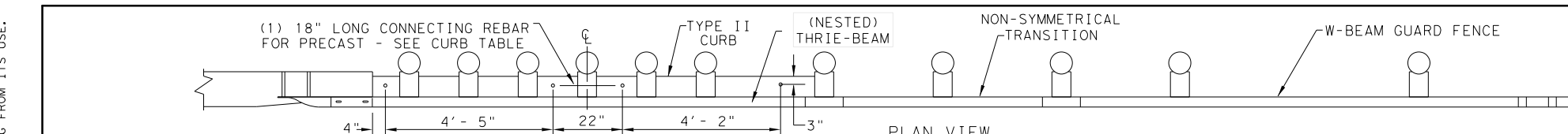
NOTE: GF(31), MID-SPAN RAIL SPLICES ARE REQUIRED WITH 6'-3" POST SPACINGS.

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

				Design Division Standard	
METAL BEAM GUARD FENCE TL-3 MASH COMPLIANT GF(31)-19					
FILE: gf3119.dgn	DN: TXDOT	CK: KM	DW: VP	CK: CGL/AG	
© TXDOT: NOVEMBER 2019	CONT	SECT	JOB	HIGHWAY	
REVISIONS					
	0913	28	083,ETC	CR	
	DIST	COUNTY	SHEET NO.		
	YKM	FAYETTE	47		

DATE: FILE:

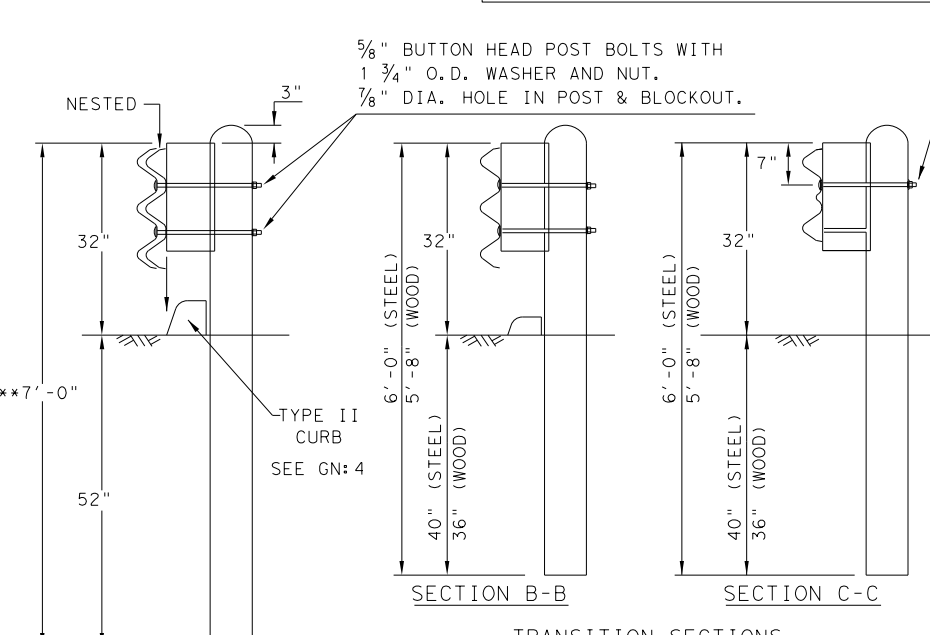
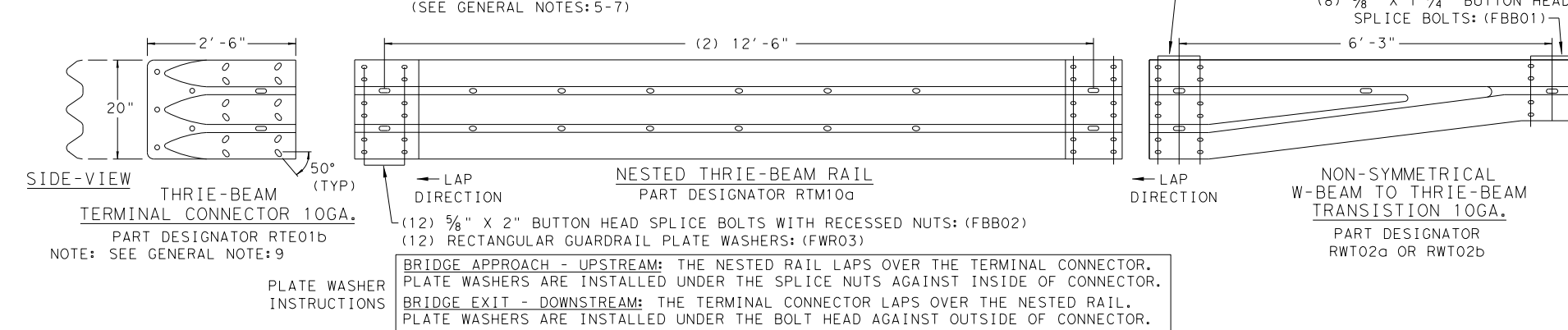
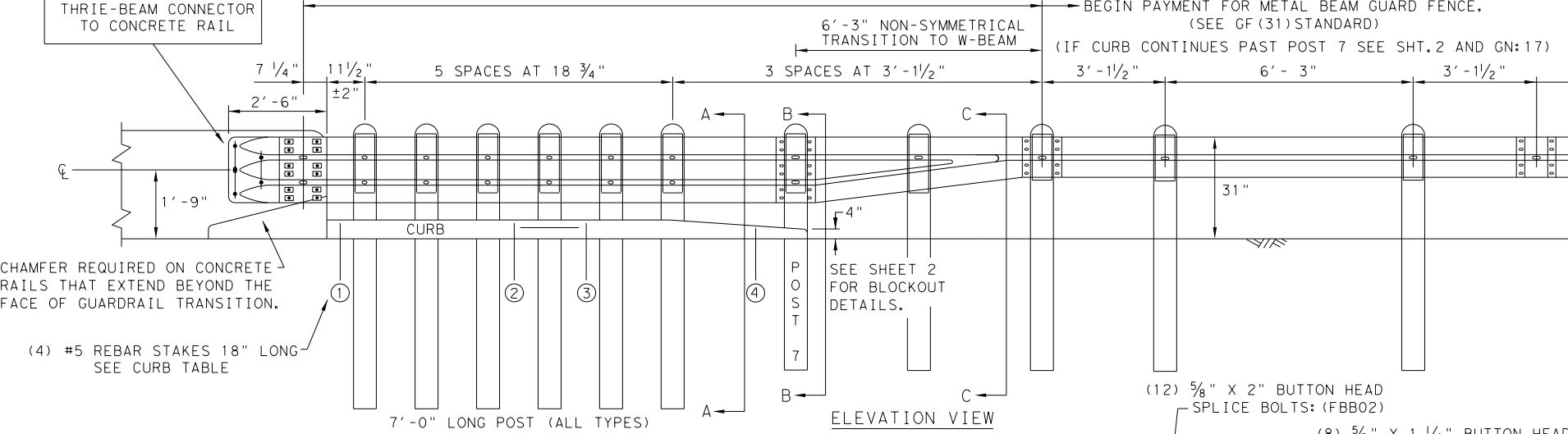
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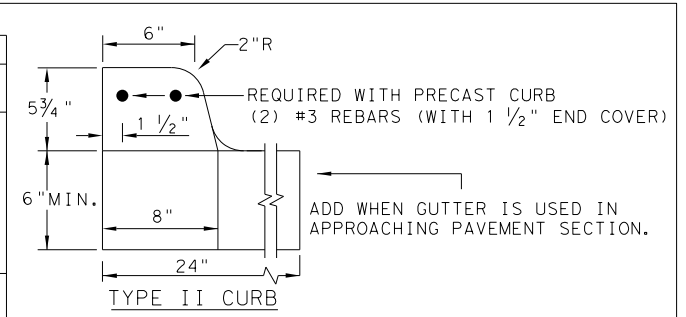
- (5) 1" DIA. HOLES.
- (5) 7/8" DIA. HEAVY HEX HEAD BOLTS (FACING TRAFFIC SIDE) (ASTM F3125 GR A325 OR A449).
- (10) 1 3/4" O.D. WASHER UNDER EACH HEX BOLT HEAD AND NUT.
- (5) 7/8" DIA. HEAVY HEX NUTS (ASTM A194 OR A563).

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



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

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 MATERIALS AND TESTS DIVISION MAINTAINS A MATERIAL PRODUCER LIST (MPL) FOR PRODUCERS OF MATERIALS CONFORMING TO DMS-7210. ONLY PRODUCERS ON THE MPL CAN FURNISH COMPOSITE MATERIAL BLOCKS.
15. REFER TO GF (31) STANDARD SHEET & BRIDGE RAILING DETAILS FOR ADDITIONAL DETAILS.
16. THE INSTALLATION OF THE TYPE II CURB IS CRITICAL FOR THE PERFORMANCE OF THE THRIE-BEAM TRANSITION SYSTEM. THE CURB PREVENTS (VEHICLE WHEEL SNAGGING) AT THE CONCRETE RAIL AND IS REQUIRED TO MEET MASH CRASH TEST CRITERIA.
17. IF CURB EXTENDS BEYOND POST 7, 25' OF NESTED W-BEAM GUARDRAIL SHALL BE INSTALLED BEYOND THE PAY LIMITS OF THRIE-BEAM TRANSITION SECTION, (SEE SHT.2). PAYMENT FOR THIS 25' SECTION WILL BE BY LINEAR FOOT, PAY ITEM "0540 6XXX MTL W-BEAM GD FEN (NESTED) (TIM POST)" OR "540 6XXX MTL W-BEAM GD FEN (NESTED) (STEEL POST)" AS APPLICABLE FOR POST TYPE. SEE SHT.2 FOR ADDITIONAL INFORMATION.

HIGH-SPEED TRANSITION
SHEET 1 OF 2



METAL BEAM GUARD FENCE
THRIE-BEAM TRANSITION
TL-3 MASH COMPLIANT
GF (31) TR TL3-20

FILE: gf31tr+1320.dgn	DN: TxDOT	CK: KM	DW: VP	CK: CGL/AG
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	DIST	COUNTY	SHEET NO.	
	YKM	FAYETTE	48	

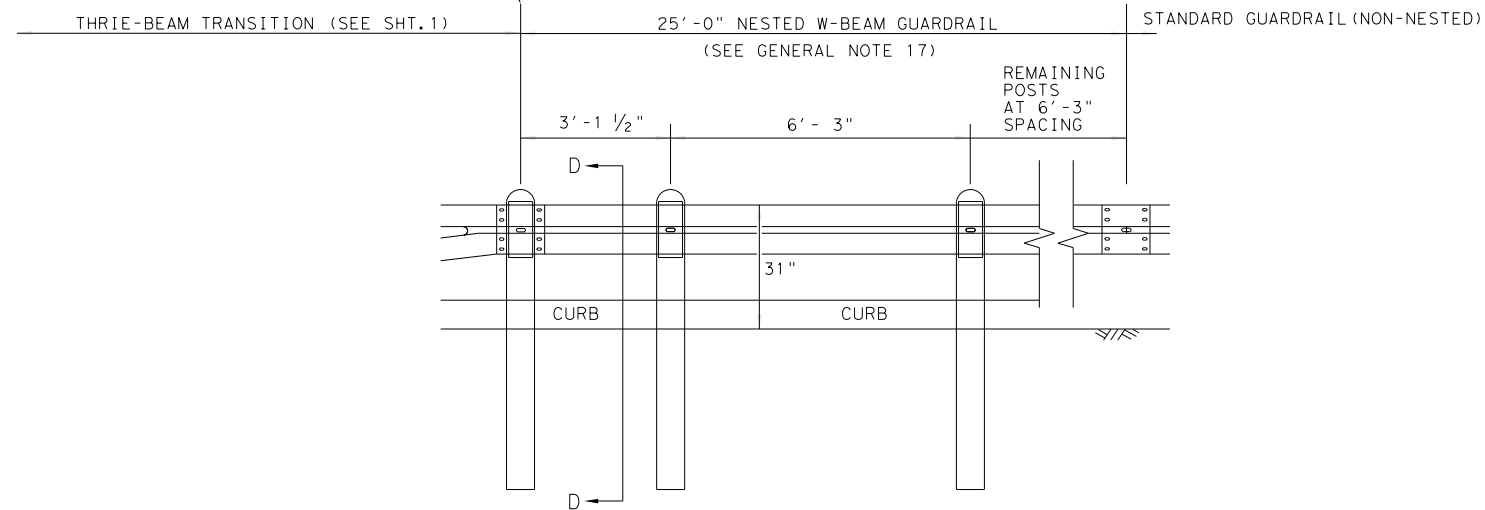
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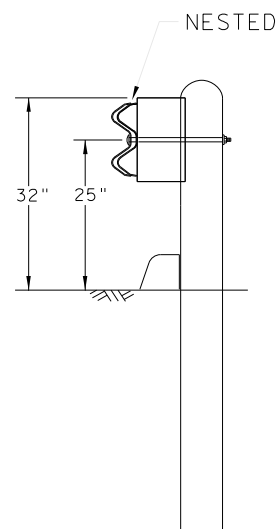
REQUIRED ALTERNATIVE FOR CONTINUOUS CURB EXTENDING PAST POST 7 (SEE SHT. 1 GENERAL NOTE 17)

END PAYMENT FOR METAL BEAM GUARD FENCE TRANSITION.
BEGIN PAYMENT FOR METAL BEAM GUARD FENCE.

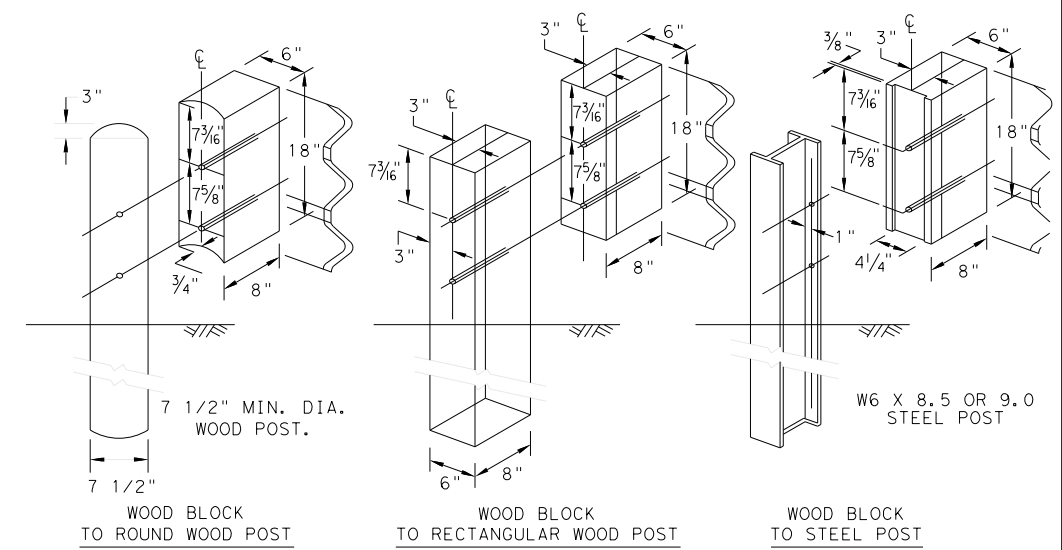
(SEE GF (31) STANDARD SHEET)



ELEVATION VIEW



SECTION D-D



THREE BEAM TRANSITION BLOCKOUT DETAILS

HIGH-SPEED TRANSITION

SHEET 2 OF 2

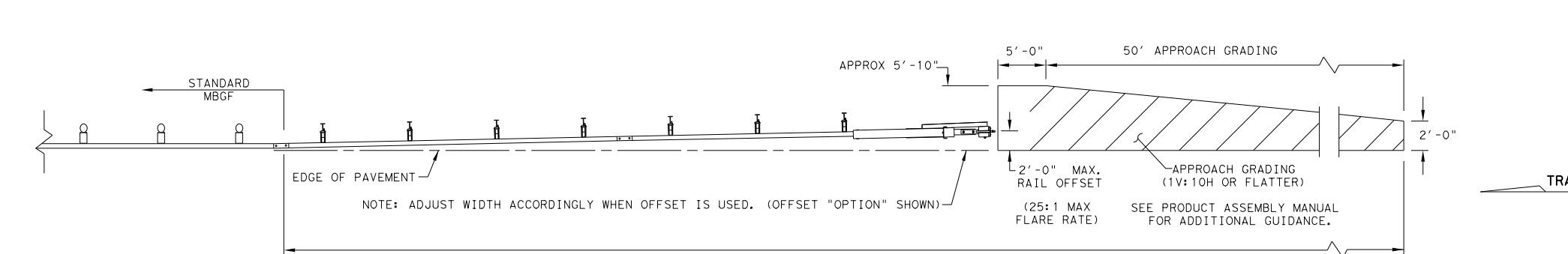
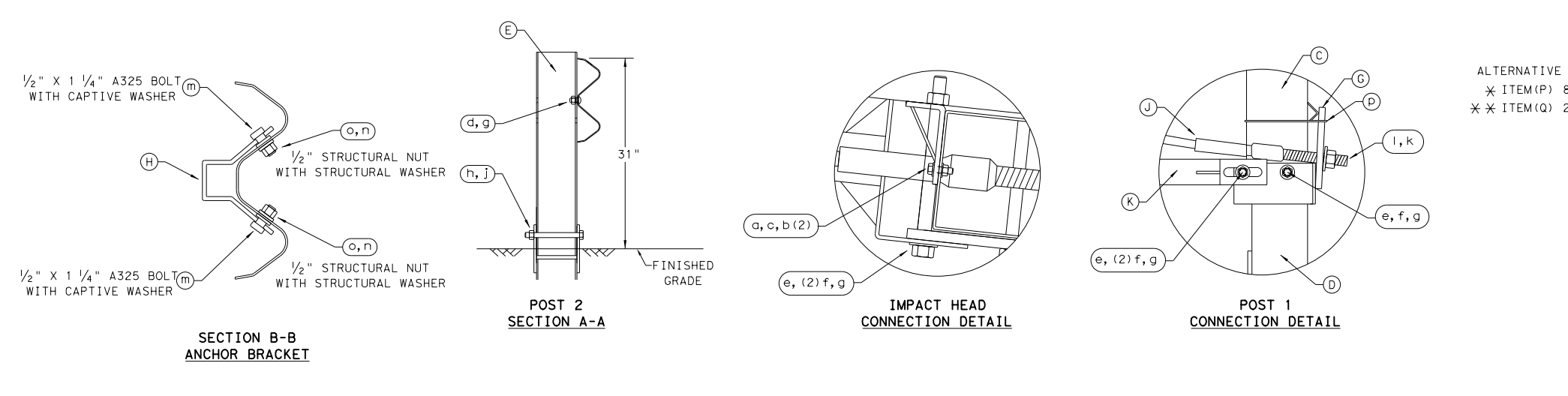
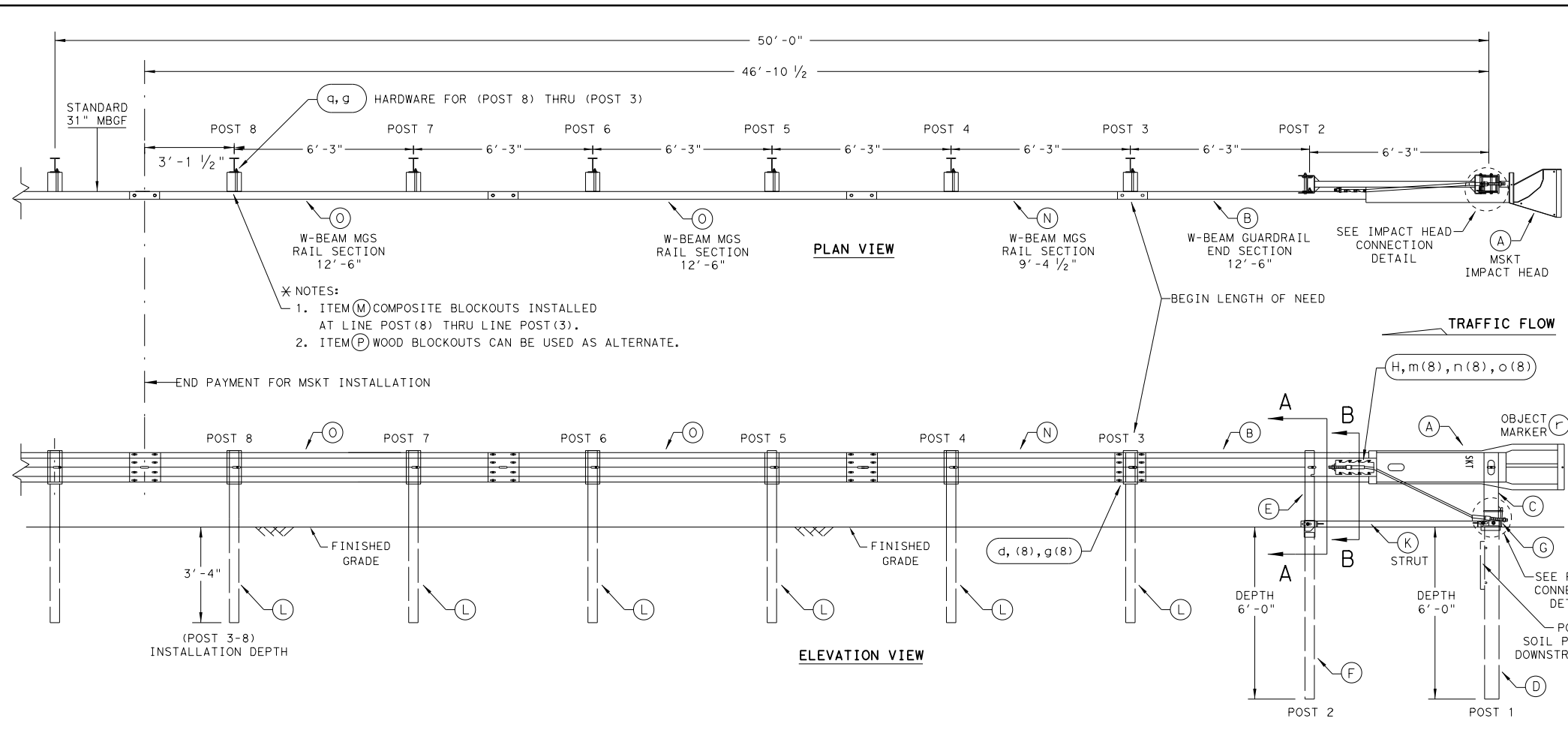


METAL BEAM GUARD FENCE
THREE-BEAM TRANSITION
TL-3 MASH COMPLIANT
GF (31) TR TL3-20

FILE: gf31tr+1320.dgn	DN: TXDOT	CK: KM	DW: KM	CK: CGL/AG
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REVISIONS	0913	28	083,ETC	CR
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	YKM	FAYETTE		49

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DATE: _____
 FILE: _____



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

ITEM	QTY	MAIN SYSTEM COMPONENTS	ITEM NUMBERS
A	1	MSKT IMPACT HEAD	MS3000
B	1	W-BEAM GUARDRAIL END SECTION, 12 Ga.	SF1303
C	1	POST 1 - TOP (6" X 6" X 1/8" TUBE)	MTPHP1A
D	1	POST 1 - BOTTOM (6' W6X15)	MTPHP1B
E	1	POST 2 - ASSEMBLY TOP	UHP2A
F	1	POST 2 - ASSEMBLY BOTTOM (6' W6X9)	HP2B
G	1	BEARING PLATE	E750
H	1	CABLE ANCHOR BOX	S760
J	1	BCT CABLE ANCHOR ASSEMBLY	E770
K	1	GROUND STRUT	MS785
L	6	W6X9 OR W6X8.5 STEEL POST	P621
M	6	COMPOSITE BLOCKOUTS	CBSP-14
N	1	W-BEAM MGS RAIL SECTION (9'-4 1/2")	G12025
O	2	W-BEAM MGS RAIL SECTION (12'-6")	G1203A
P	6	WOOD BLOCKOUT 6" X 8" X 14"	P675
Q	1	W-BEAM MGS RAIL SECTION (25'-0")	G1209
SMALL HARDWARE			
a	2	5/16" X 1" HEX BOLT (GRD 5)	B5160104A
b	4	5/16" WASHER	W0516
c	2	5/16" HEX NUT	N0516
d	25	5/8" Dia. x 1 1/4" SPLICE BOLT (POST 2)	B580122
e	2	5/8" Dia. x 9" HEX BOLT (GRD A449)	B580904A
f	3	5/8" WASHER	W050
g	33	5/8" Dia. H.G.R NUT	N050
h	1	3/4" Dia. x 8 1/2" HEX BOLT (GRD A449)	B340854A
j	1	3/4" Dia. HEX NUT	N030
k	2	1 ANCHOR CABLE HEX NUT	N100
l	2	1 ANCHOR CABLE WASHER	W100
m	8	1/2" x 1 1/4" A325 BOLT WITH CAPTIVE WASHER	SB12A
n	8	1/2" STRUCTURAL NUTS	N012A
o	8	1 1/16" O.D. x 3/16" I.D. STRUCTURAL WASHERS	W012A
p	1	BEARING PLATE RETAINER TIE	CT-100ST
q	6	5/8" x 10" H.G.R. BOLT	B581002
r	1	OBJECT MARKER 18" X 18"	E3151

NOTE: SEE (GENERAL NOTE 14) FOR DRIVING CAP INFORMATION.
 SEE NOTES: ✕
 ALTERNATIVE ITEMS NOT SHOWN. ✕ ✕
 ✕ ITEM(P) 8" WOOD-BLOCKOUT
 ✕ ✕ ITEM(Q) 25' GUARD FENCE PANEL

Design Division Standard

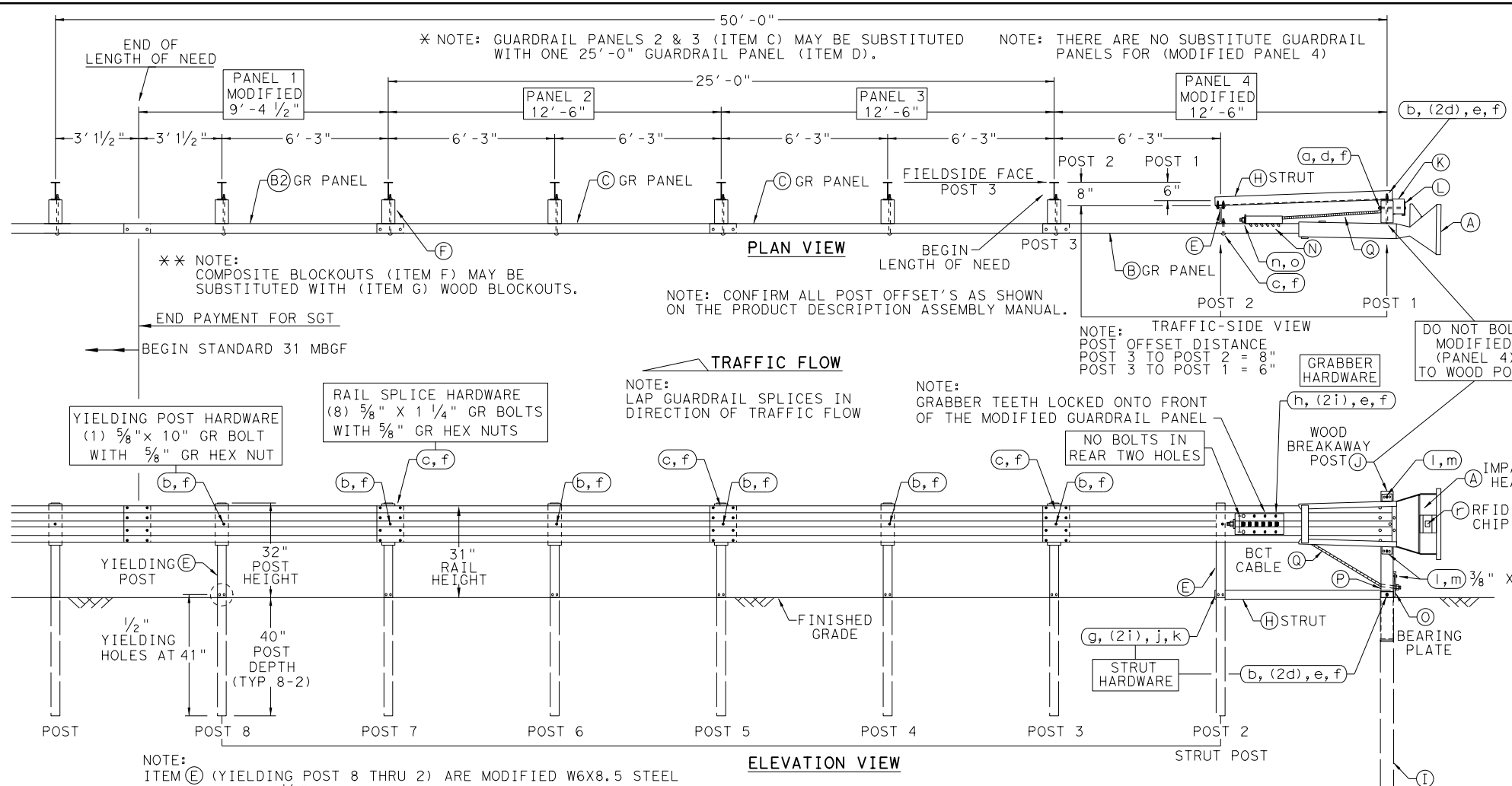
SINGLE GUARDRAIL TERMINAL
 MSKT-MASH-TL-3
 SGT (12S) 31-18

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© TxDOT: APRIL 2018	CONT SECT	JOB	HIGHWAY	
REVISIONS		0913 28	083.ETC	CR
DIST	YKM	COUNTY	FAYETTE	SHEET NO. 50

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

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

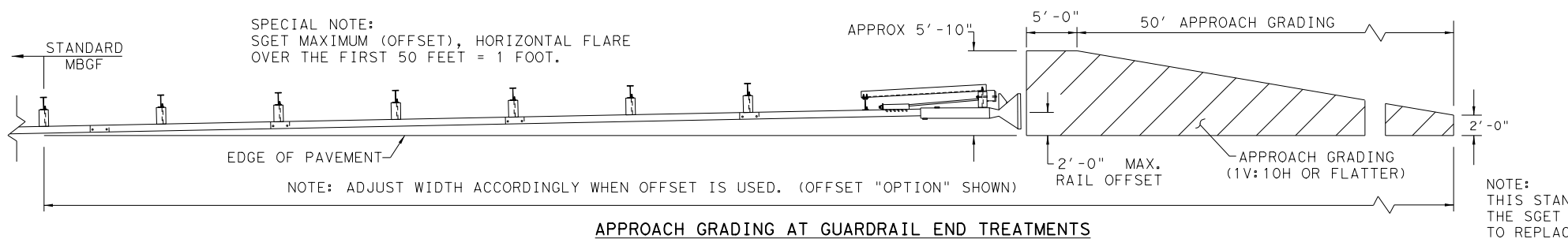
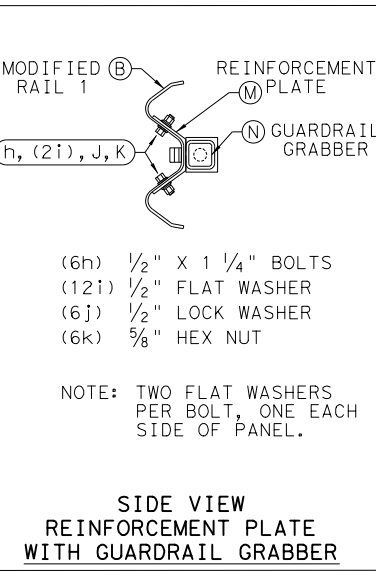
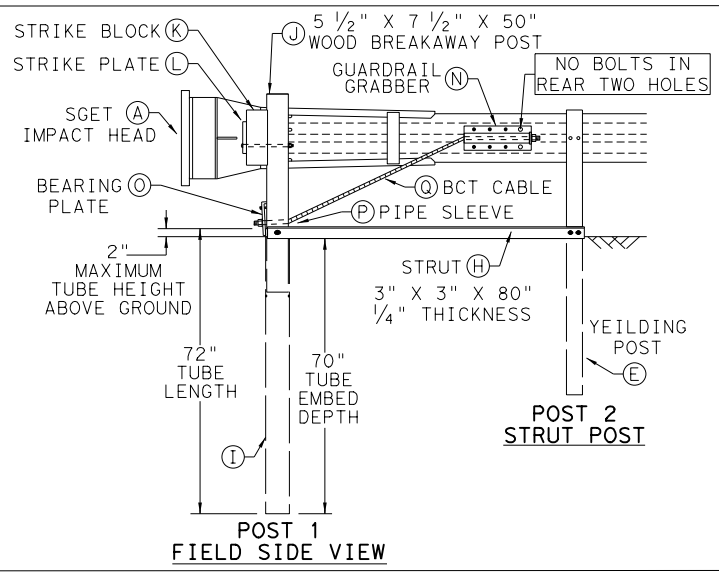
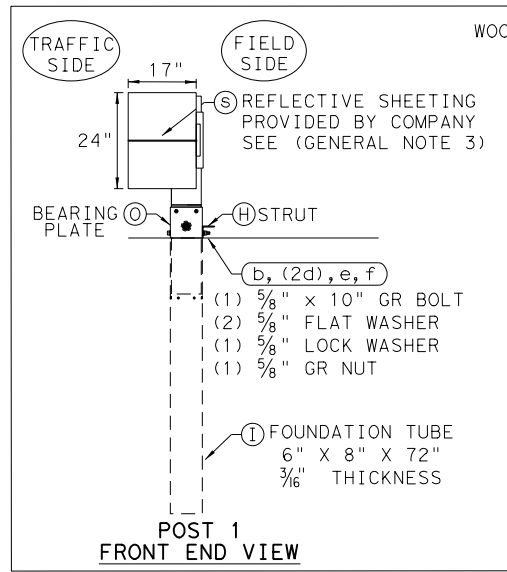
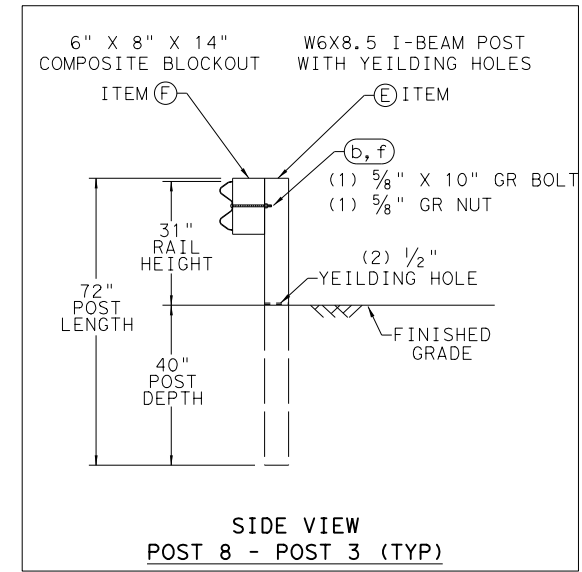
DISCLAIMER: THE USE OF THIS STANDARD IS GOVERNED BY THE "TEXAS ENGINEERING PRACTICE ACT". NO WARRANTY OF ANY KIND IS MADE BY TXDOT FOR ANY PURPOSE WHATSOEVER. TXDOT ASSUMES NO RESPONSIBILITY FOR THE CONVERSION OF THIS STANDARD TO OTHER FORMATS OR FOR INCORRECT RESULTS OR DAMAGES RESULTING FROM ITS USE.



- ### GENERAL NOTES
- FOR SPECIFIC INFORMATION REGARDING INSTALLATION AND TECHNICAL GUIDANCE OF THE SYSTEM, CONTACT: SPIG INDUSTRY, INC. AT 1(267) 644-9510. 14675 INDUSTRIAL PARK RD; BRISTOL, VA 24202
 - FOR INSTALLATION, REPAIR AND MAINTENANCE REFER TO THE MANUFACTURER'S; SGET END TERMINAL, PRODUCT DESCRIPTION ASSEMBLY MANUAL.
 - MANUFACTURER WILL APPLY HIGH INTENSITY REFLECTIVE SHEETING, "OBJECT MARKER" TO THE FACE PLATE OF THE DEVICE PER MANUFACTURER'S RECOMMENDATIONS. THE OBJECT MARKER SHALL CONFORM TO THE STANDARDS REQUIRED IN TEXAS MUTCD.
 - THE NOMINAL HEIGHT OF THE GUARDRAIL BEAM IS 31 INCHES WITH A TOLERANCE OF +/- ONE INCH.
 - FOR POST (LEAVE-OUT) INSTALLATION AND GUIDANCE SEE TXDOT'S LATEST ROADWAY MOW STRIP STANDARD.
 - (POST 2 THROUGH POST 8) ARE MODIFIED STEEL-YIELDING POSTS WITH YIELDING HOLES AT GROUND LEVEL. THERE ARE NO SUBSTITUTE POSTS.
 - POSTS SHALL NOT BE SET IN CONCRETE.
 - IF SOLID ROCK IS ENCOUNTERED FOR ANY OF THE POSTS IN THE SYSTEM, CONTACT THE MANUFACTURER FOR SPECIFIC INSTALLATION GUIDANCE.
 - 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 DMS-7210 REQUIREMENTS MAY BE SUBSTITUTED FOR AN APPROVED WOOD BLOCKOUT. SEE CONSTRUCTION DIVISION MATERIAL PRODUCER LIST (MPL) FOR CERTIFIED PRODUCERS.
 - THE ENTIRE SYSTEM MUST BE INSTALLED IN A STRAIGHT LINE WITHOUT ANY CURVE. HOWEVER, THE SYSTEM CAN BE OFFSET BY TWO FEET AS SHOWN ON THE APPROACH GRADING DETAIL TO HELP OFF-SET THE IMPACT HEAD FROM SHOULDER OF THE ROAD.

ITEM	QTY	MAIN SYSTEM COMPONENTS	ITEM #
A	1	SGET IMPACT HEAD	SIH1A
B	1	MODIFIED GUARDRAIL PANEL 12'-6" 12GA	126SPZGP
B2	1	MODIFIED GUARDRAIL PANEL 9'-4 1/2" 12GA	GP94
C	2	STANDARD GUARDRAIL PANEL 12'-6" 12GA	GP126
D	1	STANDARD GUARDRAIL PANEL 25'-0" 12GA	GP25
E	7	MODIFIED YIELDING I-BEAM POST W6x8.5	YP6MOD
F	6	COMPOSITE BLOCKOUT 6" X 8" X 14"	CBO8
G	6	WOOD BLOCKOUT 6" X 8" X 14"	WB08
H	1	STRUT 3" X 3" X 80" X 1/4" A36 ANGLE	STR80
I	1	FOUNDATION TUBE 6" X 8" X 72" X 3/16"	FNDT6
J	1	WOOD BREAKAWAY POST 5 1/2" X 7 1/2" X 50"	WBRK50
K	1	WOOD STRIKE BLOCK	WSBLK14
L	1	STRIKE PLATE 1/4" A36 BENT PLATE	SPLT8
M	1	REINFORCEMENT PLATE 12 GA. GR55	REPLT17
N	1	GUARDRAIL GRABBER 2 1/2" X 2 1/2" X 16 1/2"	GR17
O	1	BEARING PLATE 8" X 8 5/8" X 5/8" A36	BPLT8
P	1	PIPE SLEEVE 4 1/4" X 2 3/8" O.D. (2 1/8" I.D.)	PSLV4
Q	1	BCT CABLE 3/4" X 81" LENGTH	CBL81

SMALL HARDWARE			
a	1	5/8" X 12" GUARDRAIL BOLT 307A HDG	12GRBLT
b	7	5/8" X 10" GUARDRAIL BOLT 307A HDG	10GRBLT
c	33	5/8" X 1 1/4" GR SPLICE BOLTS 307A HDG	1GRBLT
d	3	5/8" FLAT WASHER F436 A325 HDG	58FW436
e	1	5/8" LOCK WASHER HDG	58LW
f	39	5/8" GUARDRAIL HEX NUT HDG	58HN563
g	2	1/2" X 2" STRUT BOLT A325 HDG	2BLT
h	6	1/2" X 1 1/4" PLATE BOLT A325 HDG	125BLT
i	16	1/2" FLAT WASHER F436 A325 HDG	12FWF436
j	8	1/2" LOCK WASHER HDG	12LW
k	8	1/2" HEX NUT A563 HDG	12HN563
l	4	3/8" X 3" HEX LAG SCREW GR5 HDG	38LS
m	4	3/8" FLAT WASHER F436 A325 HDG	38FW844
n	2	1" FLAT WASHER F436 A325 HDG	1FWF436
o	2	1" HEX NUT A563HD HDG	1HN563
p	1	18" TO 24" LONG ZIP TIE RATED 175-200LB	ZPT18
q	1	1 1/2" X 4" SCH-40 PVC PIPE	PSPCR4
r	1	RFID CHIP RATED MIL-STD-810F	RFID810F
s	1	IMPACT HEAD REFLECTIVE SHEETING	RS30M



ALTERNATIVE ITEMS
 NOTE: SEE PLAN VIEW

DO NOT BOLT (PANEL 4) TO WOOD POST

GRABBER HARDWARE

WOOD BREAKAWAY POST

IMPACT HEAD

RFID CHIP

BEARING PLATE

STRUT POST

POST 1 TRAFFIC SIDE VIEW

POST 2 STRUT POST

FIELD SIDE VIEW

SIDE VIEW REINFORCEMENT PLATE WITH GUARDRAIL GRABBER

(6h) 1/2" X 1 1/4" BOLTS
 (12i) 1/2" FLAT WASHER
 (6j) 1/2" LOCK WASHER
 (6k) 5/8" HEX NUT

NOTE: TWO FLAT WASHERS PER BOLT, ONE EACH SIDE OF PANEL.

Texas Department of Transportation

Design Division Standard

SPIG INDUSTRY, LLC

SINGLE GUARDRAIL TERMINAL

SGET - TL-3 - MASH

SGT (15) 31-20

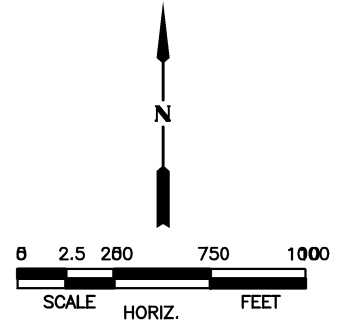
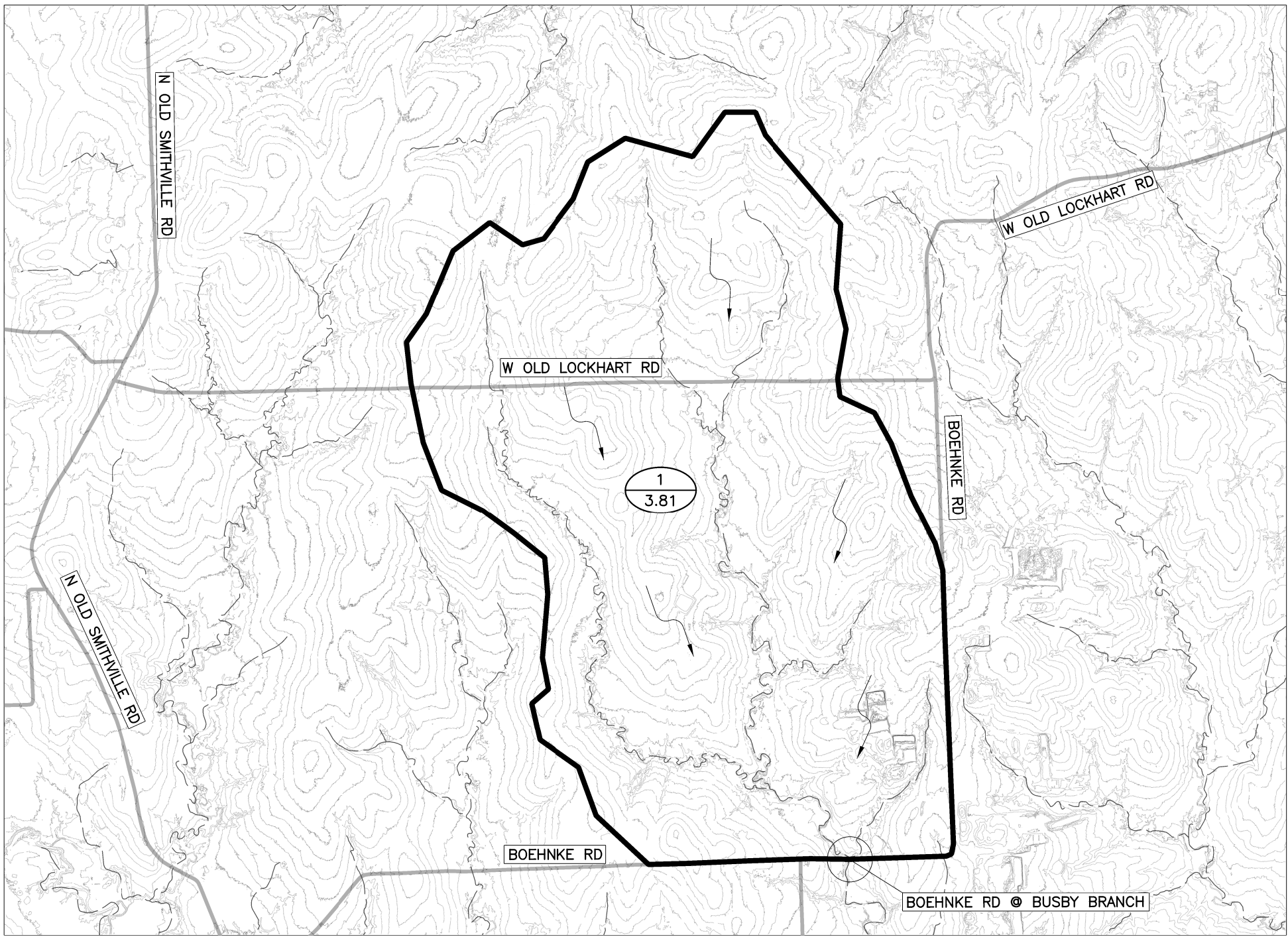
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©TXDOT: APRIL 2020	CONT	SECT	JOB	HIGHWAY
REVISIONS	0913	28	083,ETC	CR
	DIST	COUNTY	SHEET NO.	
	YKM	FAYETTE	51	

NOTE: THIS STANDARD IS A BASIC REPRESENTATION OF THE SGET TERMINAL SYSTEM AND IS NOT INTENDED TO REPLACE THE MANUFACTURER'S ASSEMBLY MANUAL.

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10/12/2022 11:20:17 AM kwayner



- LEGEND**
- FLOW DIRECTION
 - NHD FLOWLINE
 - DRAINAGE AREA BOUNDARY
 - AREA I.D.
 - AREA IN SQ. MI.

- NOTES:**
1. DRAINAGE AREA DELINEATED BASED ON LIDAR DATA (2018) SOURCED FROM TNRS.
 2. FOR A DRAINAGE AREA LESS THAN 10 SQMI, PEAK FLOWS WERE CALCULATED USING THE NRCS CN METHOD PER TXDOT'S HYDRAULIC DESIGN MANUAL (SEPTEMBER 2019).



Leon B. Sparks 10/12/2022

NO.	REVISION	BY	DATE

Basin Name	Parameters	Q 50% AEP	Q 20% AEP	Q 10% AEP	Q 4% AEP	Q 2% AEP	Q 1% AEP
Boehnke Rd @ Busby Branch	A (mi ²)	3.81					
	CN	85	1597 cfs	2250 cfs	2828 cfs	3649 cfs	4291 cfs
	Tc (min)	126.46					
	Impervious %	0					

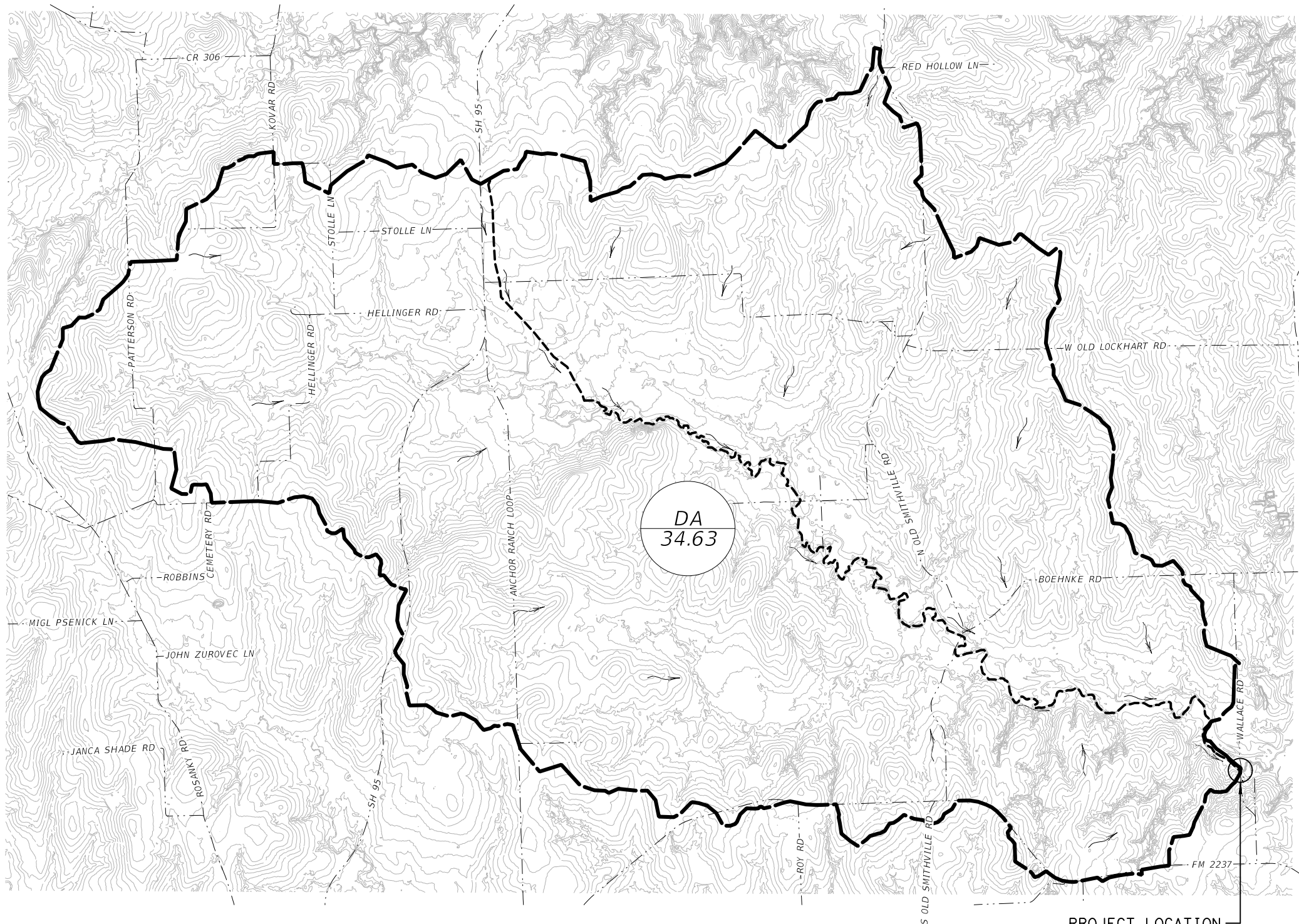


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BOEHNKE RD AT BUSBY BRANCH

DRAINAGE AREA MAP

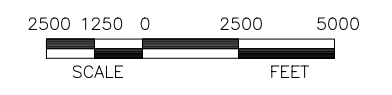
CSJ 0913-28-083 SHEET 1 OF 1

Designed:	KW	FED. RD. DIV. NO.	6	STATE	TEXAS	FEDERAL AID PROJECT NO.		HIGHWAY NO.	
Checked:	LBS								CR
Drawn:	KW	DIST.		COUNTY	FAYETTE	CONTROL NO.	0913	SECTION NO.	28
Checked:	LBS							JOB NO.	083,ETC.
								SHEET NO.	52



LEGEND

- DRAINAGE AREA BOUNDARY
- EXIST 5-FT CONTOUR
- PATH OF CONCENTRATION
- DIRECTION OF FLOW
- DRAINAGE ID
DRAINAGE AREA (SQ MILES)



PROJECT LOCATION
WALLACE RD AT
BUCKNERS CREEK

DRAINAGE AREA	AREA (AC)	Tc Calculations									
		Sheet Flow Travel Times			SCF Travel Times			Channel Flow Travel Times			Total Tc Time (min)
		Length (ft)	Slope (%)	Time (min)	Length (ft)	Slope (%)	Time (min)	Length (ft)	Slope (%)	Time (min)	
DA-1	22166.22	100	0.002	20	10380	0.006	138	53150	0.001185	246	404

DRAINAGE AREA	AREA (AC)	Frequency Storm Method Calculations - NRCS Curve Number Loss Model									
		HEC-HMS INPUT DATA					HEC-HMS OUTPUT DATA				
		AREA (SQ-MI)	NRCS CN	TC (MIN.)	LAG (MIN.)	Q2 (CFS)	Q5 (CFS)	Q10 (CFS)	Q25 (CFS)	Q50 (CFS)	Q100 (CFS)
DA-1	22166.22	34.63	76	404	243	4971.6	9055.9	12591.0	17770.1	22003.3	26651.7

NOTES:

- DRAINAGE AREA DELINEATED BASED ON LIDAR DATA (2017) SOURCED FROM TNRIS.
- PEAK FLOWS WERE COMPUTED USING THE HYDROGRAPH METHOD - NRCS CURVE NUMBER LOSS MODEL AS REFERENCED IN THE TXDOT 2019 HDM.

10/13/2022

NO.	REVISION	BY	DATE

BGE, Inc.
1701 Directors Blvd., Suite 1000, Austin, TX 78744
Tel: 512-879-0400 • www.bgeinc.com
TBPE Registration No. F-1046

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WALLACE ROAD AT BUCKNERS CREEK

DRAINAGE AREA MAP

CSJ 0913-28-068 SHEET 1 OF 1

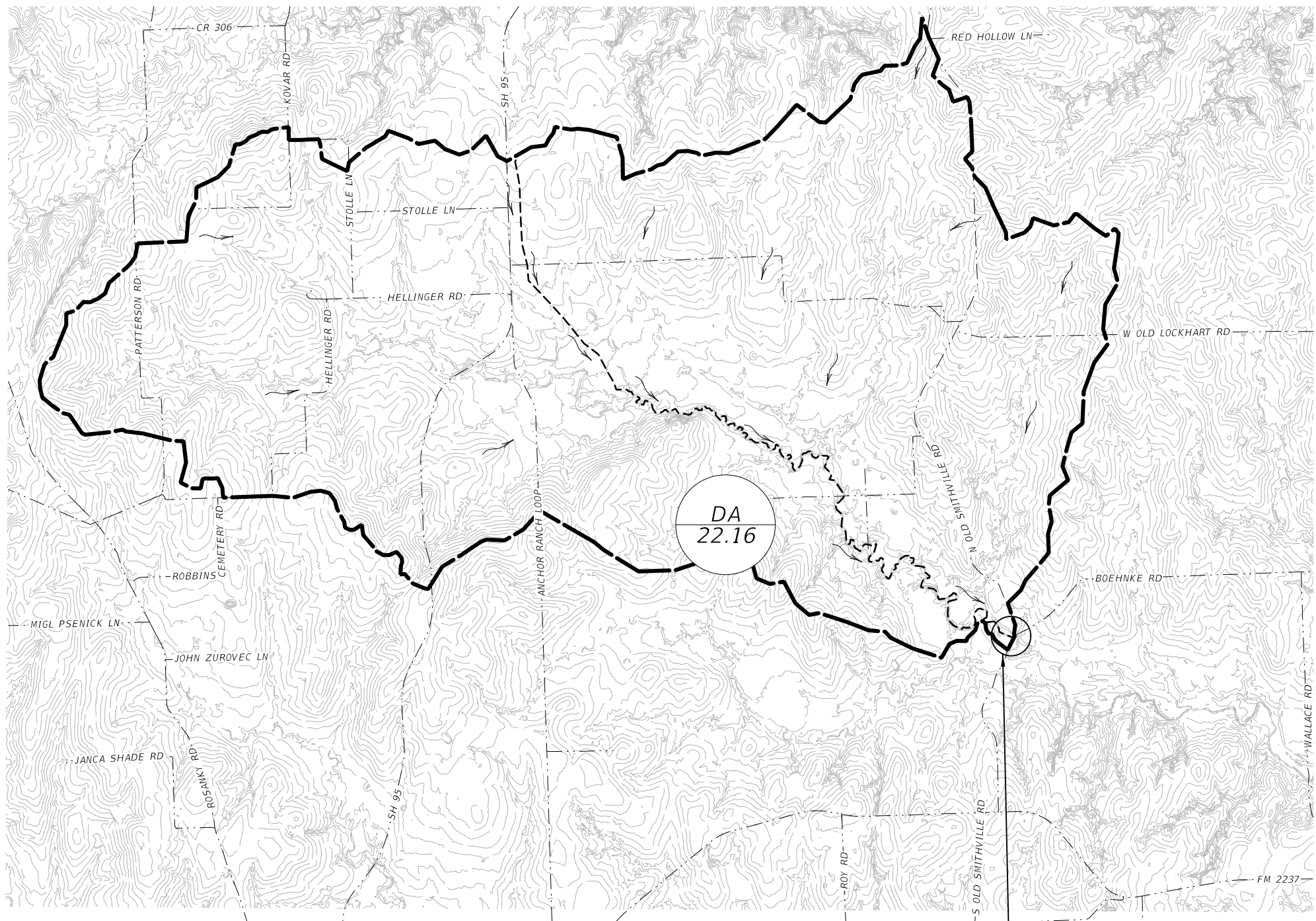
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Drawn: CJC	JOB NO. 083, ETC.	SHEET NO. 53		

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PROJECT LOCATION
 NORTH OLD SMITHVILLE RD AT
 BUCKNERS CREEK

**FLOW AT FACE OF BRIDGE
 (TXDOT REGRESSION EQUATION)**

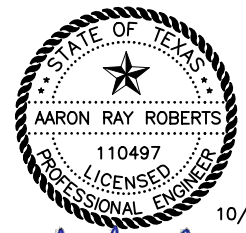
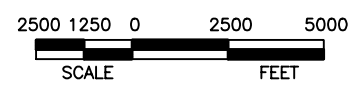
EVENT (year)	FLOW (cfs)
2	1516
5	3205
10	4518
25	6610
50	8435
100	10569
200	12955
250	13814
500	16621

DRAINAGE AREA (A) = 22.16 mi²
 ANNUAL PRECIPITATION (P) = 36.5 in
 WATERSHED SLOPE (S) = 0.0027 ft+/ft
 OMEGA EM FACTOR = 0.147

NOTES:
 REGRESSION EQUATIONS USED FROM TXDOT
 HYDRAULIC DESIGN MANUAL, SEPT 2019,
 CHAPTER 4, SECTION 10, TABLE 4-4

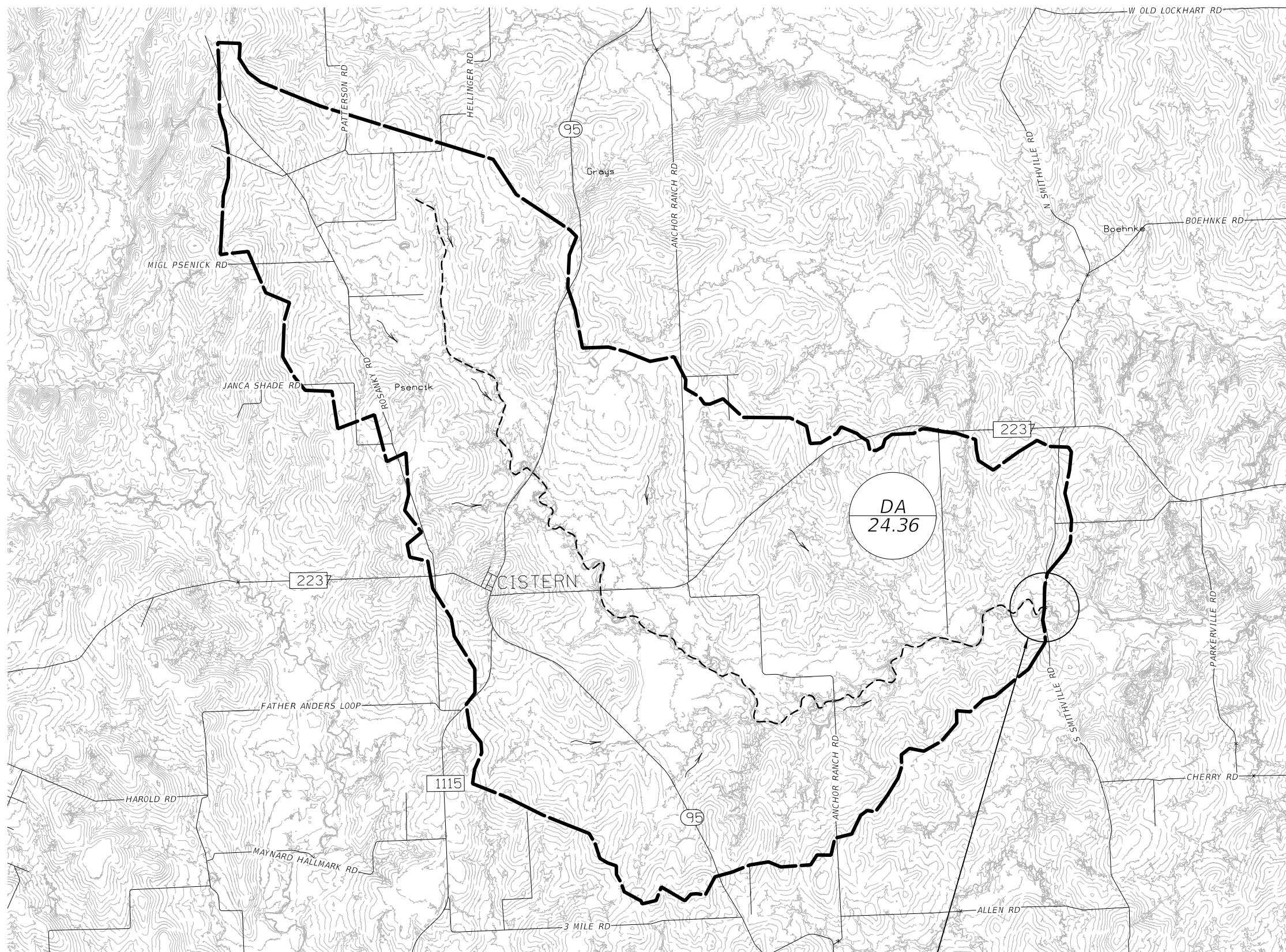
LEGEND

- DRAINAGE AREA BOUNDARY
- EXIST 5-FT CONTOUR
- PATH OF CONCENTRATION
- DIRECTION OF FLOW
- DRAINAGE ID
DRAINAGE AREA (SQ MILES)



10/13/2022
AR

NO.	REVISION	BY	DATE
WSP USA Inc. 16200 Park Row, Suite 200 Houston, TX 77084 TBPE # F-2263			
N. OLD SMITHVILLE RD AT BUCKNERS CREEK DRAINAGE AREA MAP CSJ 0919-28-085 SHEET 1 OF 1			
Designed:	JS	FED. RD. DIV. NO. 6	STATE TEXAS
Checked:	AR	FEDERAL AID PROJECT NO.	
Drawn:	JS	DIST. YKM	COUNTY FAYETTE
Checked:	AR	DIST. YKM	COUNTY FAYETTE
		CONTROL NO. 0913	SECTION NO. 28
		JOB NO. 083, ETC.	SHEET NO. 54



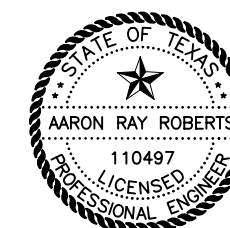
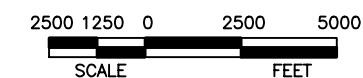
FLOW AT FACE OF BRIDGE (TXDOT REGRESSION EQUATION)	
EVENT (year)	FLOW (cfs)
2	1515
5	3142
10	4405
25	6395
50	8117
100	10112
200	12341
250	13134
500	15719

DRAINAGE AREA (A) = 24.36 mi²
 ANNUAL PRECIPITATION (P) = 36.5 in
 WATERSHED SLOPE (S) = 0.0021 ft/ft
 OMEGA EM FACTOR = 0.147

NOTES:
 REGRESSION EQUATIONS USED FROM TXDOT
 HYDRAULIC DESIGN MANUAL, SEPT 2019,
 CHAPTER 4, SECTION 10, TABLE 4-4

LEGEND

- DRAINAGE AREA BOUNDARY
- EXIST 5-FT CONTOUR
- PATH OF CONCENTRATION
- DIRECTION OF FLOW
- DRAINAGE ID
DRAINAGE AREA (SQ MILES)



A. R. Roberts

NO.	REVISION	BY	DATE

wsp WSP USA Inc.
 16200 Park Row, Suite 200
 Houston, TX 77084
 TBPE # F-2263

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S. OLD SMITHVILLE RD AT LIVE OAK CREEK

DRAINAGE AREA MAP

CSJ 0919-28-086 SHEET 1 OF 1

Designed:	JS	FED. RD. DIV. NO.	STATE	FEDERAL AID PROJECT NO.	HIGHWAY NO.		
Checked:	AR	6	TEXAS		CR		
Drawn:	JS	DIST.	COUNTY	CONTROL NO.	SECTION NO.	JOB NO.	SHEET NO.
Checked:	AR	YKM	FAYETTE	0913	28	083, ETC.	55

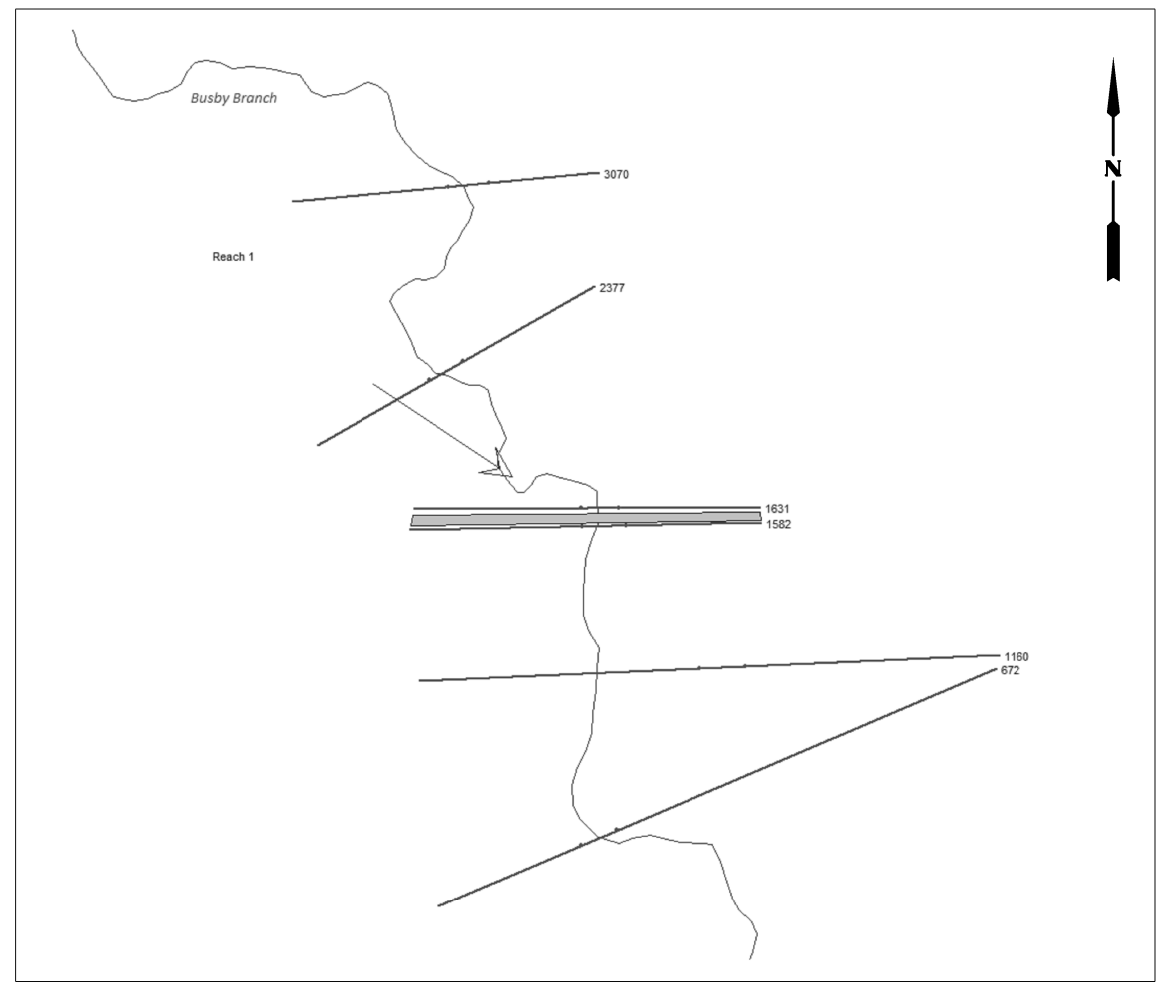
PROJECT LOCATION
 SOUTH OLD SMITHVILLE RD AT
 LIVE OAK CREEK

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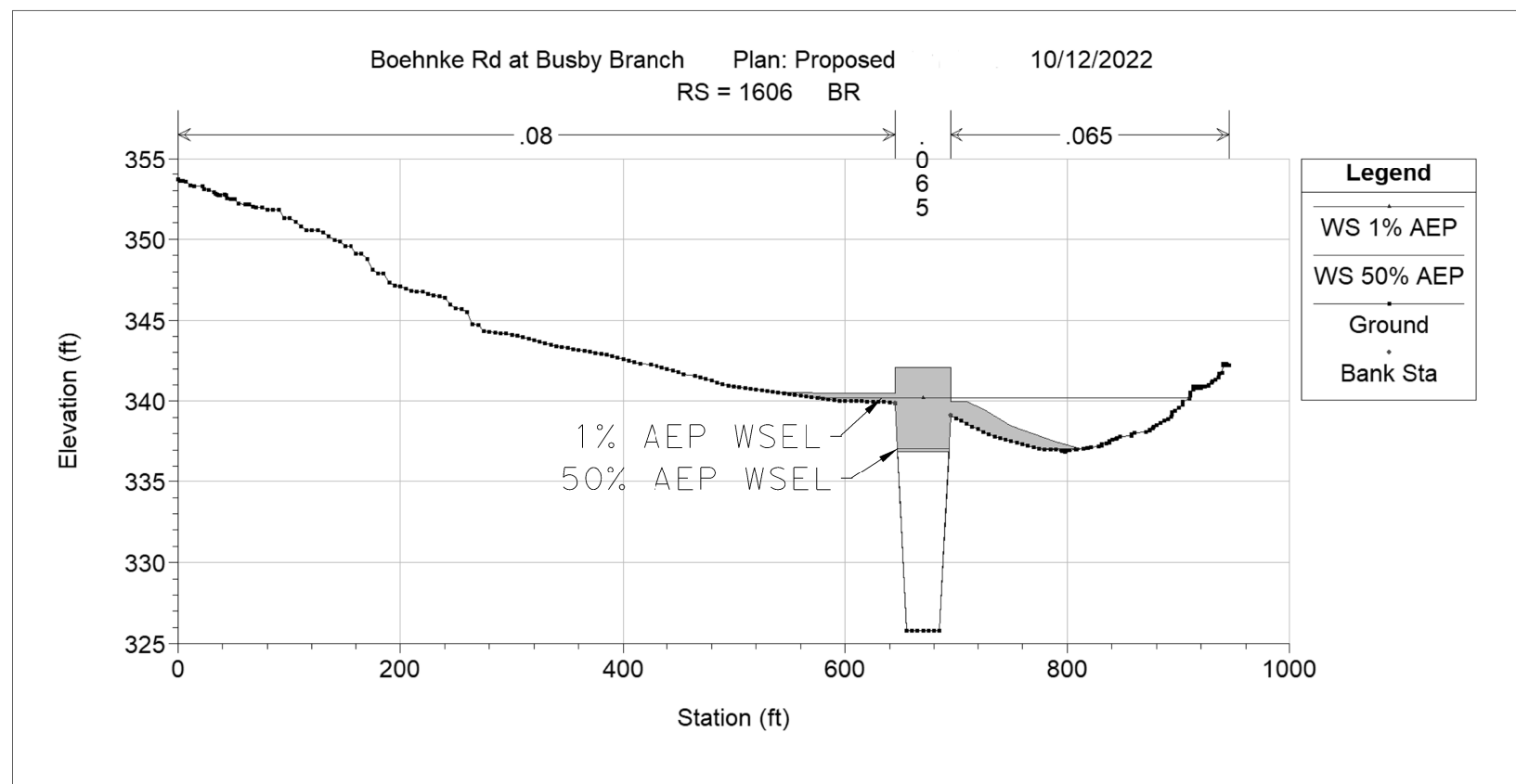
HEC-RAS CROSS SECTION LOCATION MAP

50% AEP HYDRAULIC DATA

River Station	Existing			Proposed		
	Q (cfs)	WSEL (ft)	Vel (fps)	Q (cfs)	WSEL (ft)	Vel (fps)
3070	1597	339.41	3.2	1597	339.38	3.24
2377	1597	338.12	2.55	1597	337.98	2.65
1631	1597	337.56	1.67	1597	337.31	1.81
1606	Bridge			Bridge		
1582	1597	336.92	3.97	1597	336.92	3.97
1160	1597	335.32	3.30	1597	335.32	3.30
672	1597	334.00	3.29	1597	334.00	3.29

1% AEP HYDRAULIC DATA

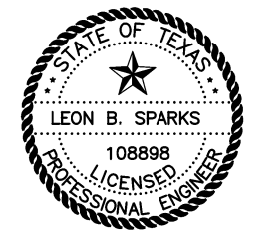
River Station	Existing			Proposed		
	Q (cfs)	WSEL (ft)	Vel (fps)	Q (cfs)	WSEL (ft)	Vel (fps)
3070	4986	342.80	3.66	4986	342.79	3.65
2377	4986	341.55	3.85	4986	341.53	3.82
1631	4986	340.96	2.42	4986	340.93	2.38
1606	Bridge			Bridge		
1582	4986	339.26	5.46	4986	339.26	5.46
1160	4986	337.07	4.72	4986	337.07	4.72
672	4986	335.69	3.80	4986	335.69	3.80



STREAM CROSS SECTION AT ROAD PROFILE

NOTES:

- HEC-RAS VERSION 6.1 WAS USED FOR THE BRIDGE ANALYSIS.
- DRAINAGE AREA WAS DELINEATED USING FAYETTE COUNTY LIDAR DATA (2018) SOURCED FROM TNRS.
- COORDINATION WITH THE FAYETTE COUNTY FLOODPLAIN ADMINISTRATOR OCCURRED ON OCTOBER 3, 2022.
- THE PROJECT LOCATION IS IN AN UNSTUDIED AREA PER FEMA FIRM PANEL NUMBER 48149C0400C. EFFECTIVE DATE: OCTOBER 17, 2006.
- THE PROPOSED SINGLE SPAN BRIDGE HAS A LEVEL OF SERVICE LESS THAN 50% AEP BASED ON WSEL IMPINGING ON THE BRIDGE.
- NORMAL DEPTH TAILWATER CONDITION OF 0.002 FT/FT WAS USED IN THE HYDRAULIC MODEL.



Leon B. Sparks 10/12/2022

NO.	REVISION	BY	DATE



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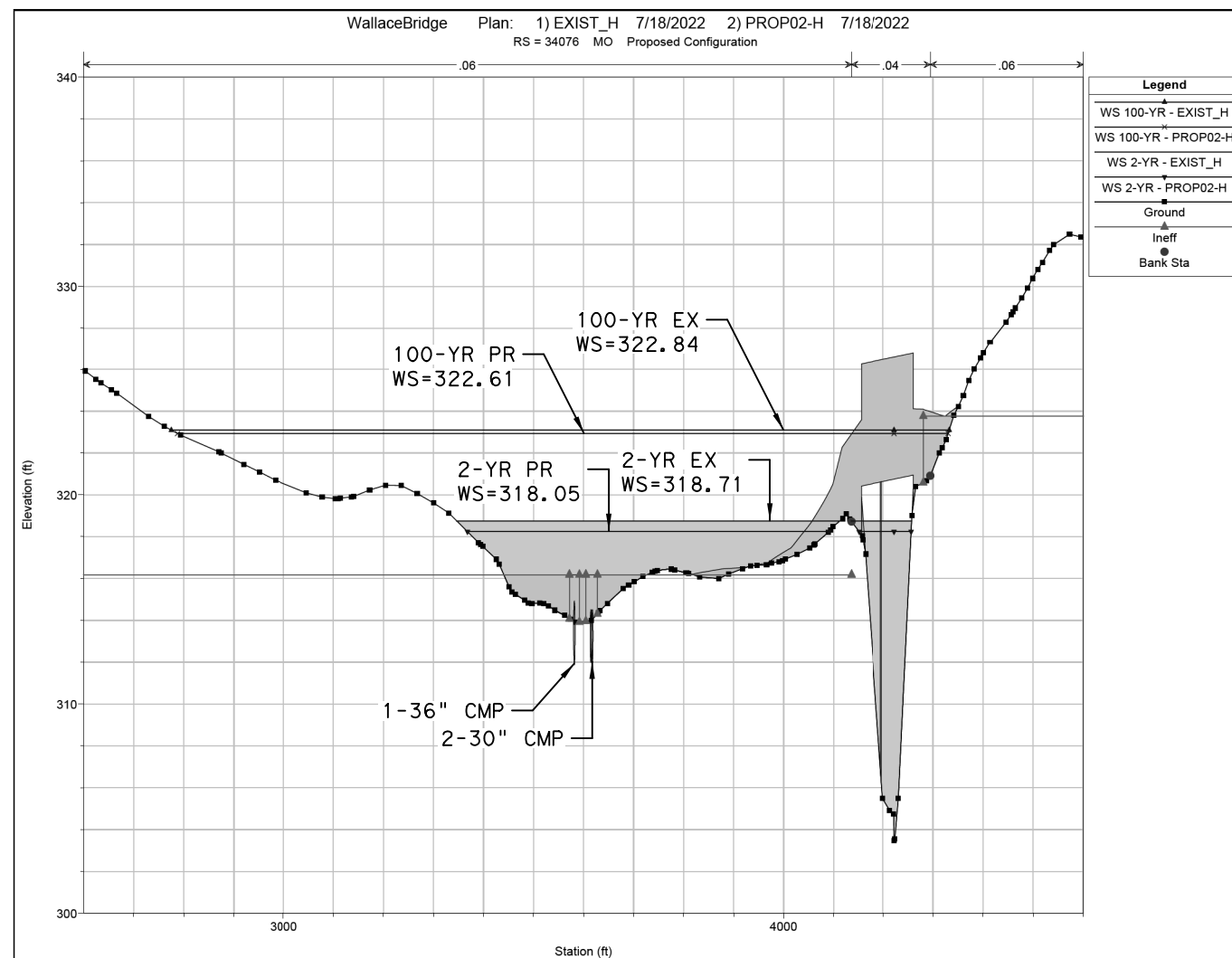
BOEHNKE RD AT BUSBY BRANCH

HYDRAULIC DATA SHEET

CSJ 0913-28-083 SHEET 1 OF 1

Designed:	KW	FED. RD. DIV. NO.	STATE	FEDERAL AID PROJECT NO.	HIGHWAY NO.		
Checked:	LBS	6	TEXAS		CR		
Drawn:	KW	DIST.	COUNTY	CONTROL NO.	SECTION NO.	JOB NO.	SHEET NO.
Checked:	LBS	YKM	FAYETTE	0913	28	083,ETC.	56

10/13/2022 12:43:45 PM mbaker
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NOTES:

- HEC-RAS VERSION 6.2 USED FOR HYDRAULIC EVALUATION AND DESIGN OF THE BRIDGE.
- NORMAL DEPTH COMPUTATION USED FOR THE DOWNSTREAM BOUNDARY CONDITION. A SLOPE OF 0.01 FT/FT WAS USED FOR EXISTING AND PROPOSED CONDITIONS.
- COORDINATION WITH THE FAYETTE COUNTY FLOOD PLAIN ADMINISTRATOR OCCURRED ON OCTOBER 5, 2022.
- THE PROJECT LOCATION LIES IN A FEMA ZONE A FLOODPLAIN. FEMA FIRM PANEL NUMBER 48149C0400C, EFFECTIVE OCTOBER 17, 2006.
- THE COORDINATE SYSTEM IS HORIZONTAL DATUM NAD1983 (1993 ADJUSTMENT), TEXAS STATE PLANE SOUTH CENTRAL ZONE. THE VERTICAL DATUM IS NAVD88 (1991 ADJUSTMENT).

Matt Baker
 10/13/2022

NO.	REVISION	BY	DATE

BGE, Inc.
 1701 Directors Blvd., Suite 1000, Austin, TX 78744
 Tel: 512-879-0400 • www.bgeinc.com
 TBPE Registration No. F-1046

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 WALLACE ROAD AT BUCKNERS CREEK

HYDRAULIC DATA SHEET

CSJ 0913-28-068 SHEET 1 OF 2

Designed:	MEB	FED. RD. DIV. NO.	STATE	FEDERAL AID PROJECT NO.	HIGHWAY NO.		
Checked:	MEB	6	TEXAS		CR		
Drawn:	MEB	DIST.	COUNTY	CONTROL NO.	SECTION NO.	JOB NO.	SHEET NO.
Checked:	MEB	YKM	FAYETTE	0913	28	083,ETC.	57

WALLACE RD BRIDGE STRUCTURE (EXISTING CONDITIONS)					
Plan: EXIST_H	River 1	Reach 1	RS: 34076	Open#2: Bridge	Profile: 50% AEP
E.G. US. (ft)	318.83	Element	Inside BR US	Inside BR DS	
W.S. US. (ft)	318.76	E.G. Elev (ft)	318.82	318.81	
Q Total (cfs) *	1070.71	W.S. Elev (ft)	318.74	318.73	
Q Bridge (cfs)	1070.71	Crit W.S. (ft)	308.92	308.91	
Q Weir (cfs)		Max Chl Dpth (ft)	15.28	15.27	
Weir Sta Lft (ft)		Vel Total (ft/s)	2.17	2.18	
Weir Sta Rgt (ft)		Flow Area (sq ft)	492.29	491.26	
Weir Submerg		Froude # Chl	0.1	0.16	
Weir Max Depth (ft)		Specif Force (cu ft)	2829.5	2824.85	
Min El Weir Flow (ft)		Hydr Depth (ft)	5.86	5.85	
Min El Prs (ft)	321.74	W.P. Total (ft)	118.33	117.22	
Delta EG (ft)	0.03	Conv. Total (cfs)	47304.4	47439.4	
Delta WS (ft)	0.04	Top Width (ft)	84	83.93	
BR Open Area (sq ft)	685.56	Frcn Loss (ft)	0.01	0.01	
BR Open Vel (ft/s)	2.18	C & E Loss (ft)	0	0	
BR Sluice Coef		Shear Total (lb/sq ft)	0.13	0.13	
BR Sel Method	Energy only	Power Total (lb/ft s)	0.29	0.29	

WALLACE RD BRIDGE STRUCTURE (EXISTING CONDITIONS)					
Plan: EXIST_H	River 1	Reach 1	RS: 34076	Open#2: Bridge	Profile: 1% AEP
E.G. US. (ft)	323.13	Element	Inside BR US	Inside BR DS	
W.S. US. (ft)	323.09	E.G. Elev (ft)	323.13	323.04	
Q Total (cfs) *	1770.5	W.S. Elev (ft)	323.09	322.98	
Q Bridge (cfs)	1697.73	Crit W.S. (ft)	310.48	310.47	
Q Weir (cfs)	72.77	Max Chl Dpth (ft)	19.63	19.52	
Weir Sta Lft (ft)	4135	Vel Total (ft/s)	2.48	2.48	
Weir Sta Rgt (ft)	4166.76	Flow Area (sq ft)	685.79	685.56	
Weir Submerg	0.84	Froude # Chl	0.1	0.1	
Weir Max Depth (ft)	1.44	Specif Force (cu ft)	5640.6	5561.48	
Min El Weir Flow (ft)	321.72	Hydr Depth (ft)			
Min El Prs (ft)	321.74	W.P. Total (ft)	216.93	216.69	
Delta EG (ft)	0.11	Conv. Total (cfs)	54873.9	54884.9	
Delta WS (ft)	0.11	Top Width (ft)			
BR Open Area (sq ft)	685.56	Frcn Loss (ft)			
BR Open Vel (ft/s)	2.48	C & E Loss (ft)			
BR Sluice Coef		Shear Total (lb/sq ft)	0.21	0.21	
BR Sel Method	Press/Weir	Power Total (lb/ft s)	0.51	0.51	

* = REMAINING FLOW DIVERGES BEYOND PROJECT LIMITS.

WALLACE RD BRIDGE STRUCTURE (PROPOSED CONDITIONS)					
Plan: PROP02-H	River 1	Reach 1	RS: 34076	Open#2: Bridge	Profile: 50% AEP
E.G. US. (ft)	318.3	Element	Inside BR US	Inside BR DS	
W.S. US. (ft)	318.08	E.G. Elev (ft)	318.28	318.27	
Q Total (cfs) *	3109.25	W.S. Elev (ft)	318.04	318.02	
Q Bridge (cfs)	3109.25	Crit W.S. (ft)	310.9	310.93	
Q Weir (cfs)		Max Chl Dpth (ft)	14.58	14.56	
Weir Sta Lft (ft)		Vel Total (ft/s)	3.92	3.94	
Weir Sta Rgt (ft)		Flow Area (sq ft)	792.65	788.32	
Weir Submerg		Froude # Chl	0.24	0.24	
Weir Max Depth (ft)		Specif Force (cu ft)	4681.6	4647.2	
Min El Weir Flow (ft)		Hydr Depth (ft)	8.54	8.51	
Min El Prs (ft)	320.94	W.P. Total (ft)	121.77	121.29	
Delta EG (ft)	0.05	Conv. Total (cfs)	102652.9	101990.8	
Delta WS (ft)	0.06	Top Width (ft)	92.77	92.61	
BR Open Area (sq ft)	1051.1	Frcn Loss (ft)	0.02	0.01	
BR Open Vel (ft/s)	3.94	C & E Loss (ft)	0	0.01	
BR Sluice Coef		Shear Total (lb/sq ft)	0.37	0.38	
BR Sel Method	Energy only	Power Total (lb/ft s)	1.46	1.49	

WALLACE RD BRIDGE STRUCTURE (PROPOSED CONDITIONS)					
Plan: PROP02-H	River 1	Reach 1	RS: 34076	Open#2: Bridge	Profile: 1% AEP
E.G. US. (ft)	322.98	Element	Inside BR US	Inside BR DS	
W.S. US. (ft)	322.93	E.G. Elev (ft)	322.98	322.98	
Q Total (cfs) *	2627.91	W.S. Elev (ft)	322.93	322.93	
Q Bridge (cfs)	2627.9	Crit W.S. (ft)	310.34	310.37	
Q Weir (cfs)	0.01	Max Chl Dpth (ft)	19.47	19.47	
Weir Sta Lft (ft)	4124	Vel Total (ft/s)	2.49	2.5	
Weir Sta Rgt (ft)	4125.12	Flow Area (sq ft)	1053.66	1051.1	
Weir Submerg	0	Froude # Chl	0.1	0.1	
Weir Max Depth (ft)	0.04	Specif Force (cu ft)	9302.98	9270.01	
Min El Weir Flow (ft)	322.95	Hydr Depth (ft)			
Min El Prs (ft)	320.94	W.P. Total (ft)	242.09	241.8	
Delta EG (ft)	0.1	Conv. Total (cfs)	104342	104000.8	
Delta WS (ft)	0.1	Top Width (ft)			
BR Open Area (sq ft)	1051.1	Frcn Loss (ft)			
BR Open Vel (ft/s)	2.5	C & E Loss (ft)			
BR Sluice Coef		Shear Total (lb/sq ft)	0.17	0.17	
BR Sel Method	Press/Weir	Power Total (lb/ft s)	0.43	0.43	

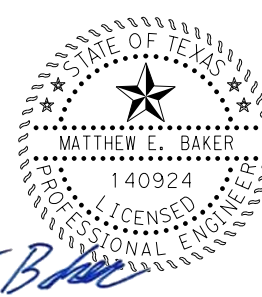
* = REMAINING FLOW DIVERGES BEYOND PROJECT LIMITS.

50% AEP - HYDRAULIC RESULTS OF CONVERGING XS						
RIVER STATION	EXISTING			PROPOSED		
	Q (CFS)	WSEL (FT)	V (FPS)	Q (CFS)	WSEL (FT)	V (FPS)
45087	4971.6	328.53	3.58	4971.6	328.53	3.58
43553	4971.6	327.17	2.92	4971.6	327.17	2.92
42340	4971.6	325.7	4.12	4971.6	325.7	4.12
41535	4971.6	324.44	4.65	4971.6	324.43	4.67
40488	4971.6	323.64	2.78	4971.6	323.62	2.8
39053	4971.6	323.08	2.18	4971.6	323.06	2.2
38068	4971.6	322.62	2.77	4971.6	322.59	2.8
36884	4971.6	321.65	3.85	4971.6	321.57	3.92
35277	4971.6	320.18	3.58	4971.6	319.55	4.35
34101	4971.6	318.71	3.88	4971.6	318.05	4.51
34076			MULT OPEN			
34051	4971.6	318.65	4.24	4971.6	318.01	4.51
33021	4971.6	316.62	5	4971.6	316.62	5

1% AEP - HYDRAULIC RESULTS OF CONVERGING XS						
RIVER STATION	EXISTING			PROPOSED		
	Q (CFS)	WSEL (FT)	V (FPS)	Q (CFS)	WSEL (FT)	V (FPS)
45087	26651.7	333.97	6.28	26651.7	333.97	6.28
43553	26651.7	332.49	5.07	26651.7	332.48	5.07
42340	26651.7	331.22	5.76	26651.7	331.21	5.77
41535	26651.7	330.68	4.53	26651.7	330.67	4.54
40488	26651.7	330.04	4.89	26651.7	330.02	4.9
39053	26651.7	329.51	3.37	26651.7	329.49	3.38
38068	26651.7	329.03	4.61	26651.7	329.01	4.62
36884	26651.7	327.8	7.32	26651.7	327.76	7.36
35277	26651.7	325.16	7.88	26651.7	324.9	8.27
34101	26651.7	322.84	6.35	26651.7	322.61	7.05
34076			MULT OPEN			
34051	26651.7	322.74	6.2	26651.7	322.53	6.88
33021	26651.7	320.74	6.51	26651.7	320.74	6.51


NOTES:

- HEC-RAS VERSION 6.2 USED FOR HYDRAULIC EVALUATION AND DESIGN OF THE BRIDGE.
- NORMAL DEPTH COMPUTATION USED FOR THE DOWNSTREAM BOUNDARY CONDITION. A SLOPE OF 0.01 FT/FT WAS USED FOR EXISTING AND PROPOSED CONDITIONS.
- COORDINATION WITH THE FAYETTE COUNTY FLOOD PLAIN ADMINISTRATOR OCCURRED ON OCTOBER 5, 2022.
- THE PROJECT LOCATION LIES IN A FEMA ZONE A FLOODPLAIN. FEMA FIRM PANEL NUMBER 48149C0400C, EFFECTIVE OCTOBER 17, 2006.
- THE COORDINATE SYSTEM IS HORIZONTAL DATUM NAD1983 (1993 ADJUSTMENT), TEXAS STATE PLANE SOUTH CENTRAL ZONE. THE VERTICAL DATUM IS NAVD88 (1991 ADJUSTMENT).




10/13/2022

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TBPE Registration No. F-1046



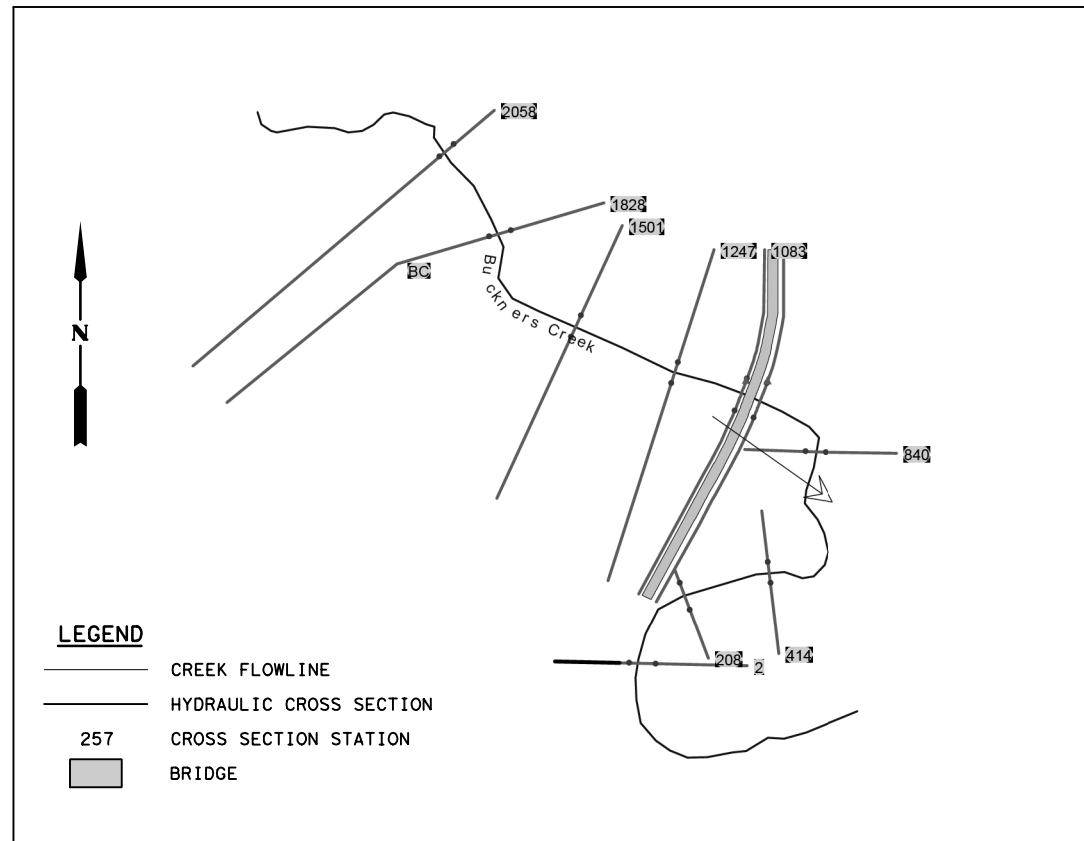
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WALLACE ROAD AT BUCKNERS CREEK

HYDRAULIC DATA SHEET

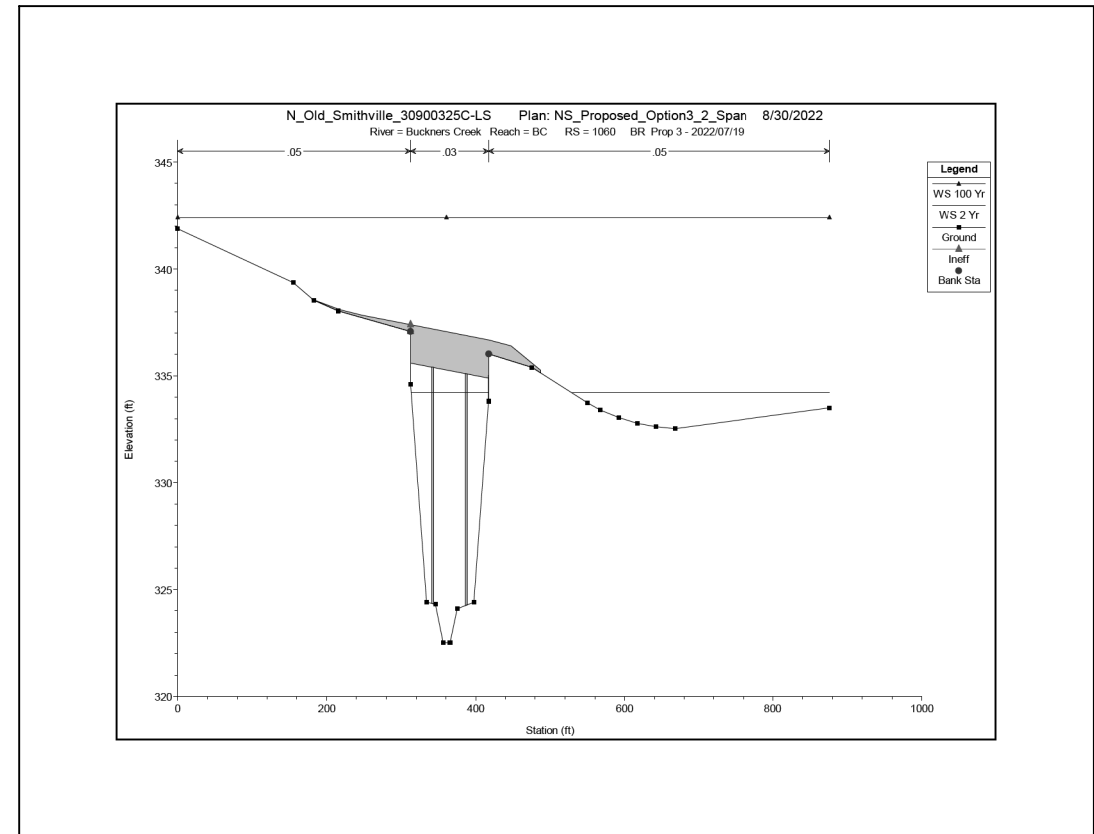
CSJ 0913-28-068 SHEET 2 OF 2

Designed: MEB	FED. RD. DIST. NO.: 6	STATE: TEXAS	FEDERAL AID PROJECT NO.:	HIGHWAY NO.:
Checked: MEB				CR
Drawn: MEB	DIST.:	COUNTY:	CONTROL NO.:	SECTION NO.:
Checked: MEB	YKM	FAYETTE	0913	28 083,ETC.

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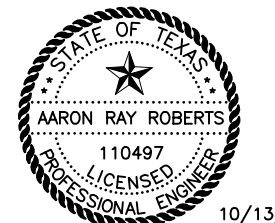
HEC-RAS CROSS SECTIONS LOCATION
NTS



BRIDGE TYPICAL CROSS SECTION - U/S CONFIGURATION
NTS

BUCKNERS CREEK - WATER SURFACE COMPARISON 2-YR STORM EVENT						
RIVER STATION	FLOWS (cfs)	PROPOSED		EXISTING		Pro-Ex (ft)
		VEL (fps)	WSEL (ft)	VEL (fps)	WSEL (ft)	
2058	1516	3.23	334.85	3.19	334.85	0.00
1828	1516	3.70	334.47	3.66	334.51	-0.04
1501	1516	2.57	334.40	2.53	334.44	-0.04
1247	1516	1.53	334.27	1.50	334.31	-0.04
1084	1516	1.63	334.23	1.81	334.27	-0.04
1060		PROPOSED BRIDGE				
1036	1516	1.33	334.22	1.35	334.22	0.00
840	1516	5.14	333.72	5.14	333.72	0.00
414	1516	3.87	333.73	3.87	333.73	0.00
208	1516	2.55	333.56	2.55	333.56	0.00
2	1516	5.24	332.75	5.24	332.75	0.00

BUCKNERS CREEK - WATER SURFACE COMPARISON 100-YR STORM EVENT						
RIVER STATION	FLOWS (cfs)	PROPOSED		EXISTING		Pro-Ex (ft)
		VEL (fps)	WSEL (ft)	VEL (fps)	WSEL (ft)	
2058	10569	1.29	342.58	1.29	342.58	0.00
1828	10569	2.65	342.54	2.65	342.54	0.00
1501	10569	2.29	342.49	2.29	342.50	-0.01
1247	10569	1.48	342.45	1.48	342.45	0.00
1084	10569	2.75	342.40	2.67	342.41	-0.01
1060		PROPOSED BRIDGE				
1036	10569	2.26	342.40	2.37	342.40	0.00
840	10569	16.70	338.12	16.70	338.12	0.00
414	10569	8.24	339.71	8.24	339.71	0.00
208	10569	5.04	339.33	5.04	339.33	0.00
2	10569	7.67	338.71	7.67	338.71	0.00




10/13/2022


AARON RAY ROBERTS

NOTES:

- HEC-RAS VERSION 6.0.0 USED FOR HYDRAULIC EVALUATION AND DESIGN OF THE BRIDGE.
- NORMAL DEPTH COMPUTATION USED FOR THE DOWNSTREAM BOUNDARY CONDITIONS. SLOPE = 0.00263 FT/FT FOR EXISTING AND PROPOSED CONDITIONS.
- THE FAYETTE COUNTY FLOODPLAIN ADMINISTRATOR HAS BEEN INFORMED OF THE PROPOSED PROJECT AND PROVIDED WITH A SUMMARY OF THE HYDRAULIC IMPACTS.
- THE PROJECT LOCATION LIES IN A FEMA ZONE A FLOODPLAIN. FEMA FIRM PANELS NUMBER 48149C0450C, EFFECTIVE OCTOBER 17, 2006.
- THE COORDINATE SYSTEM IS HORIZONTAL DATUM NAD1983 (1993 ADJUSTMENT), TEXAS STATE PLANE SOUTH CENTRAL ZONE. THE VERTICAL DATUM IS NAVD88 (1991 ADJUSTMENT).

NO.	REVISION	BY	DATE


WSP USA Inc.
 16200 Park Row, Suite 200
 Houston, TX 77084
 TBPE # F-2263


Texas Department of Transportation
 N. OLD SMITHVILLE AT BUCKNERS CREEK

HYDRAULIC DATA SHEET

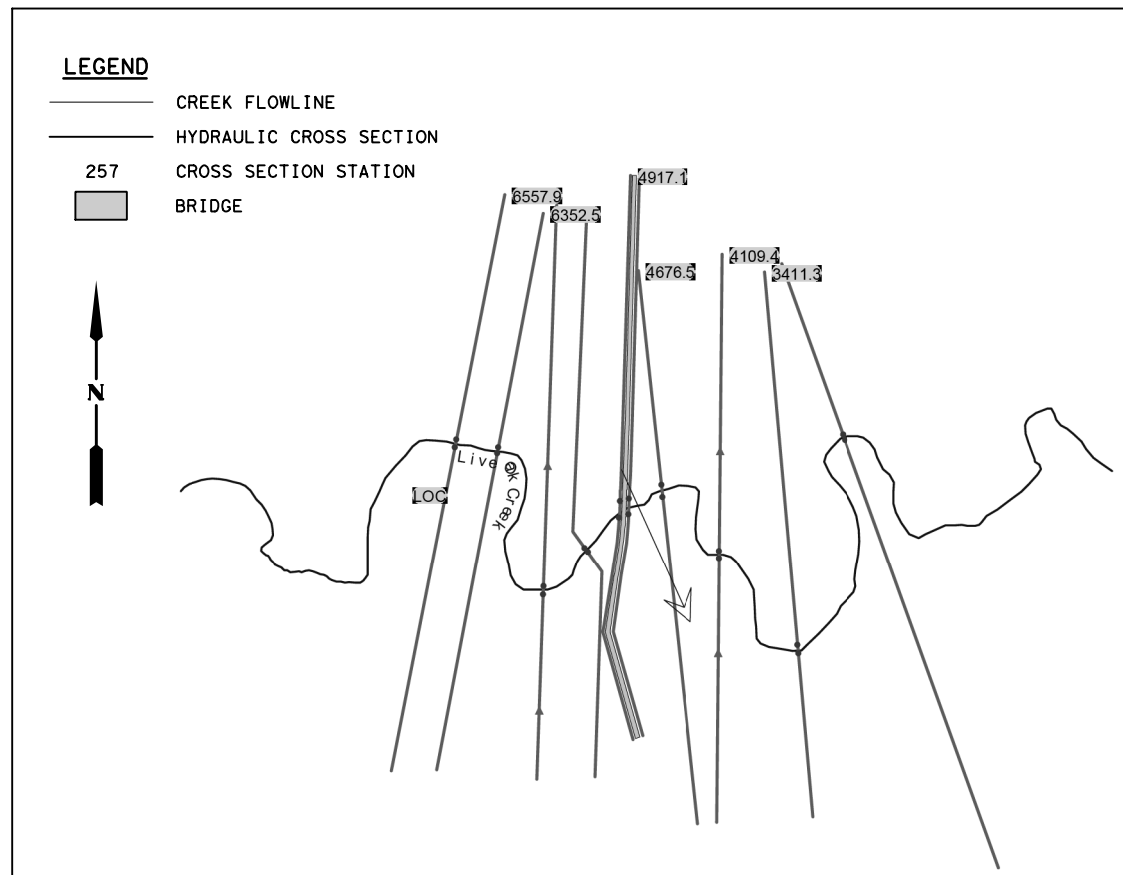
CSJ 0919-28-085 SHEET 1 OF 1

Designed:	AR	FED. RD. DIV. NO.	STATE	FEDERAL AID PROJECT NO.	HIGHWAY NO.
Checked:	EB	6	TEXAS		CR
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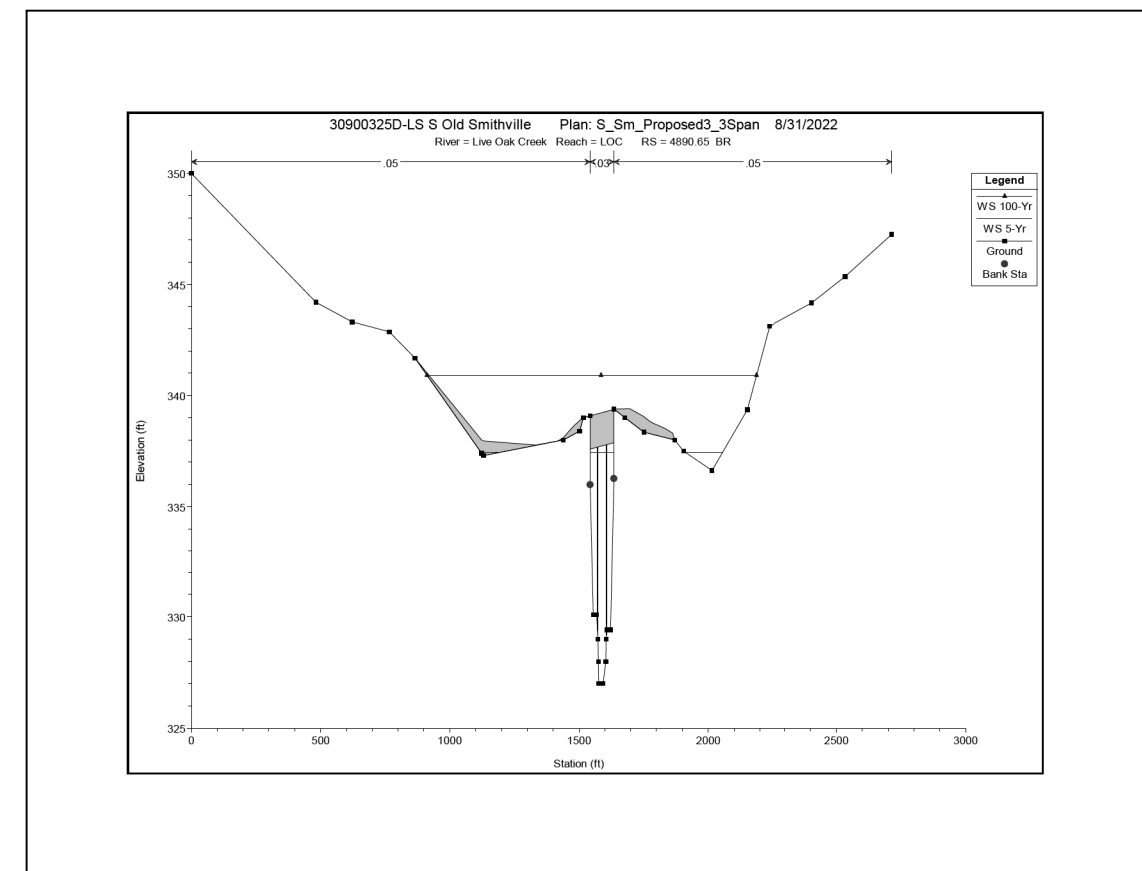
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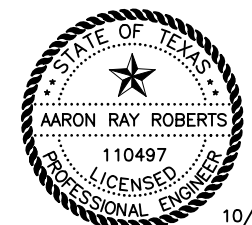
HEC-RAS CROSS SECTIONS LOCATION
NTS



BRIDGE TYPICAL CROSS SECTION - U/S CONFIGURATION
NTS

LIVE OAK CREEK - WATER SURFACE COMPARISON 5-YR STORM EVENT						
RIVER STATION	FLOWS (cfs)	PROPOSED		EXISTING		Pro-Ex (ft)
		VEL (fps)	WSEL (ft)	VEL (fps)	WSEL (ft)	
6352	3142	3.69	339.58	3.69	339.58	0.00
5455	3142	5.98	338.78	5.98	338.78	0.00
5156	3142	8.65	337.88	8.65	337.88	0.00
4917	3142	3.64	337.69	3.42	337.90	-0.21
4891		PROPOSED BRIDGE				
4864	3142	4.14	337.47	4.75	337.47	0.00
4677	3142	3.43	337.45	7.79	337.45	0.00
4109	3142	4.45	337.09	4.45	337.09	0.00
3411	3142	3.45	336.84	3.45	336.84	0.00

LIVE OAK CREEK - WATER SURFACE COMPARISON 100-YR STORM EVENT						
RIVER STATION	FLOWS (cfs)	PROPOSED		EXISTING		Pro-Ex (ft)
		VEL (fps)	WSEL (ft)	VEL (fps)	WSEL (ft)	
6352	10112	5.57	342.40	5.57	342.40	0.00
5455	10112	8.60	341.28	8.65	341.26	0.02
5156	10112	7.60	341.03	7.63	341.01	0.02
4917	10112	5.17	340.89	5.19	340.87	0.02
4891		PROPOSED BRIDGE				
4864	10112	5.61	340.71	5.61	340.71	0.00
4677	10112	4.38	340.70	4.38	340.70	0.00
4109	10112	5.67	340.35	5.67	340.35	0.00
3411	10112	5.56	339.96	5.56	339.96	0.00



10/13/2022

A. R. Roberts

NOTES:

- HEC-RAS VERSION 6.0.0 USED FOR HYDRAULIC EVALUATION AND DESIGN OF THE BRIDGE.
- NORMAL DEPTH COMPUTATION USED FOR THE DOWNSTREAM BOUNDARY CONDITIONS. SLOPE = 0.00085 FT/FT FOR EXISTING AND PROPOSED CONDITIONS.
- THE FAYETTE COUNTY FLOODPLAIN ADMINISTRATOR HAS BEEN INFORMED OF THE PROPOSED PROJECT AND PROVIDED WITH A SUMMARY OF THE HYDRAULIC IMPACTS.
- THE PROJECT LOCATION LIES IN A FEMA ZONE A FLOODPLAIN. FEMA FIRM PANELS NUMBER 48149C0450C, EFFECTIVE OCTOBER 17, 2006.
- THE COORDINATE SYSTEM IS HORIZONTAL DATUM NAD1983 (1993 ADJUSTMENT), TEXAS STATE PLANE SOUTH CENTRAL ZONE. THE VERTICAL DATUM IS NAVD88 (1991 ADJUSTMENT).

NO.	REVISION	BY	DATE

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 Houston, TX 77084
 TBPE # F-2263

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 S. OLD SMITHVILLE AT LIVE OAK CREEK

HYDRAULIC DATA SHEET
 CSJ 0919-28-086 SHEET 1 OF 1

Designed:	AR	FED. RD. DIV. NO.	6	STATE	TEXAS	FEDERAL AID PROJECT NO.	0913 28 083, ETC.	HIGHWAY NO.	CR
Checked:	EB	DIST.	YKM	COUNTY	FAYETTE	CONTROL NO.	0913 28 083, ETC.	JOB NO.	60
Drawn:	MB	SHEET NO.	60						

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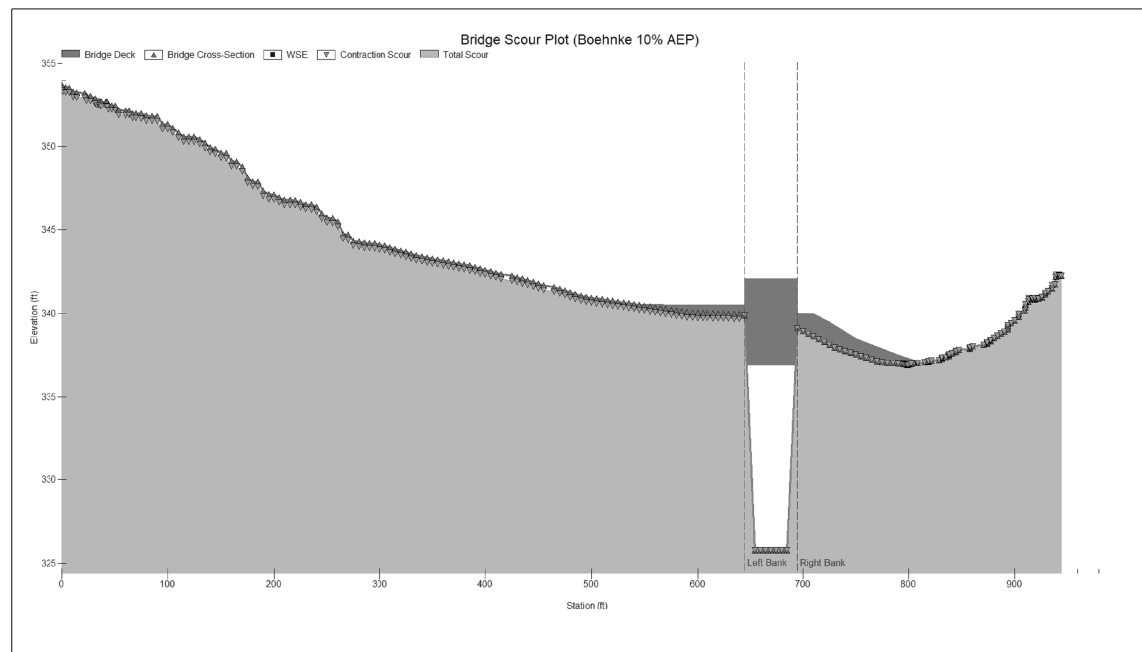
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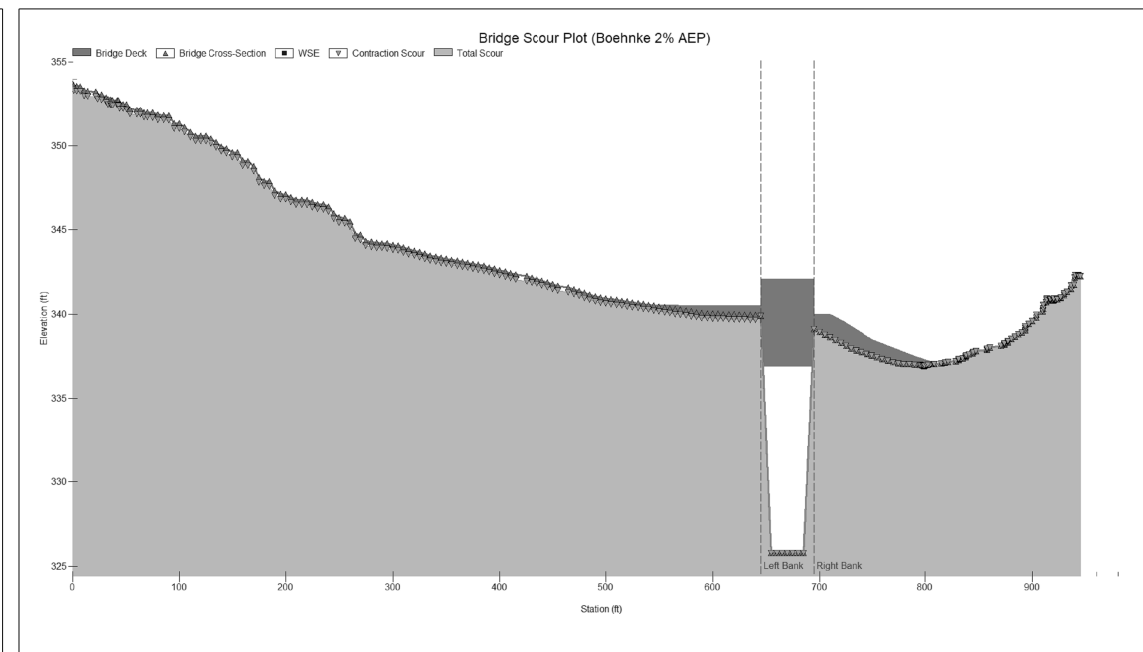
FHWA HYDRAULIC TOOLBOX 5.0				
Scenario	10% AEP	2% AEP	Units	Method
Contraction Scour				
Clear Water Contraction Scour Depth	3.72	11.77	FT	Clear-Water and Live-Bed Scour
Live Bed Contraction Scour Depth	-2.95	-2.30	FT	Clear-Water and Live-Bed Scour
Applied Contraction Scour Elevation with LTD	325.79	325.79	FT-MSL	Clear-Water and Live-Bed Scour

NOTES:

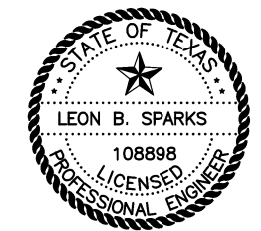
1. FHWA HYDRAULIC TOOLBOX VERSION 5.0 WAS USED FOR THE SCOUR ANALYSIS.
2. A GRAIN SIZE OF 0.2MM WAS USED FOR THE D50 AS THE MINIMUM REQUIREMENT PER TXDOT'S SCOUR EVALUATION GUIDE (AUGUST 2020).
3. THE BRIDGE DESIGN IS AT 50% AEP BASED ON THE FUNCTIONAL CLASSIFICATION OF A SMALL, LOCAL BRIDGE PER THE TXDOT HYDRAULIC DESIGN MANUAL (SEPTEMBER 2019).
4. THE 10% AEP STORM EVENT WAS USED IN THE ANALYSIS AND THE 2% AEP STORM EVENT WAS USED AS A CHECK BASED ON CRITERIA LISTED IN TXDOT'S SCOUR EVALUATION GUIDE (AUGUST 2020).
5. CRITICAL VELOCITY WAS DETERMINED TO BE LESS THAN MEAN VELOCITY UPSTREAM OF THE BRIDGE OPENING. THEREFORE, LIVE BED RESULTS WERE USED.
6. NEGATIVE VALUES IMPLY "ZERO" SCOUR DEPTH.



SCOUR ENVELOPE AT BRIDGE – 10% AEP



SCOUR ENVELOPE AT BRIDGE – 2% AEP



Leon B. Sparks 10/14/2022

NO.	REVISION	BY	DATE

CP&Y
 an STV Company
 TEXAS REGISTERED ENGINEERING FIRM
 F-1741

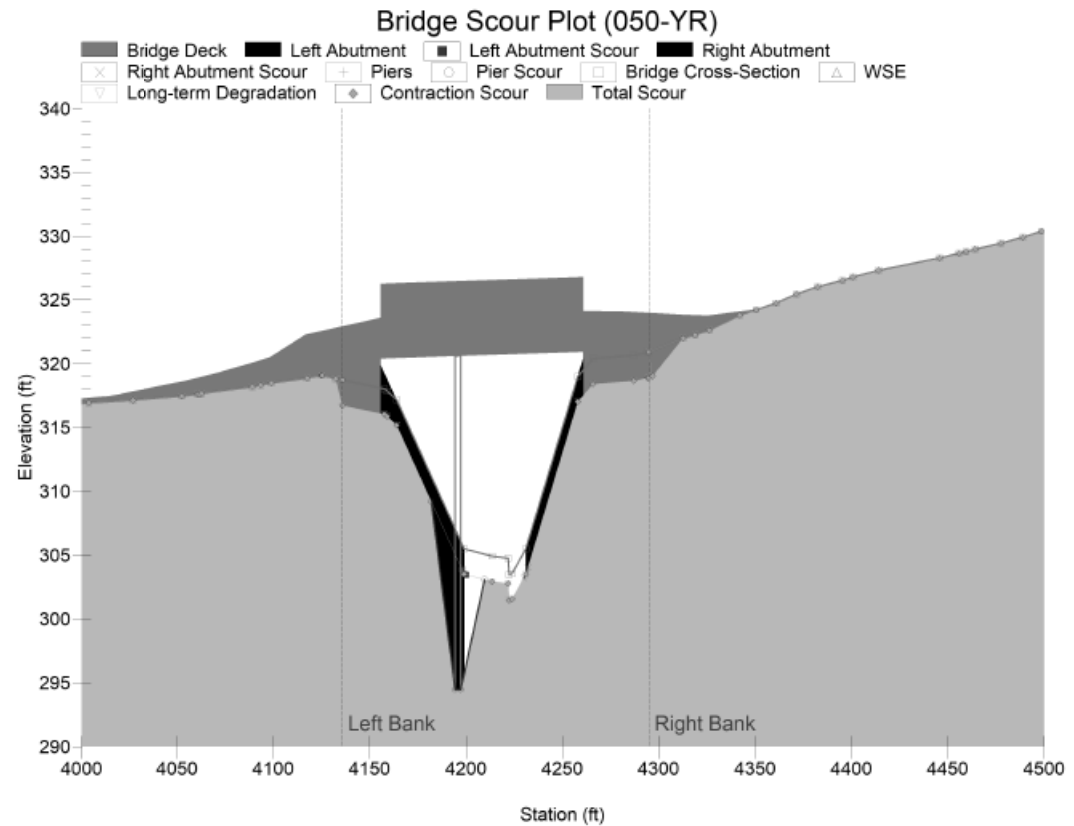
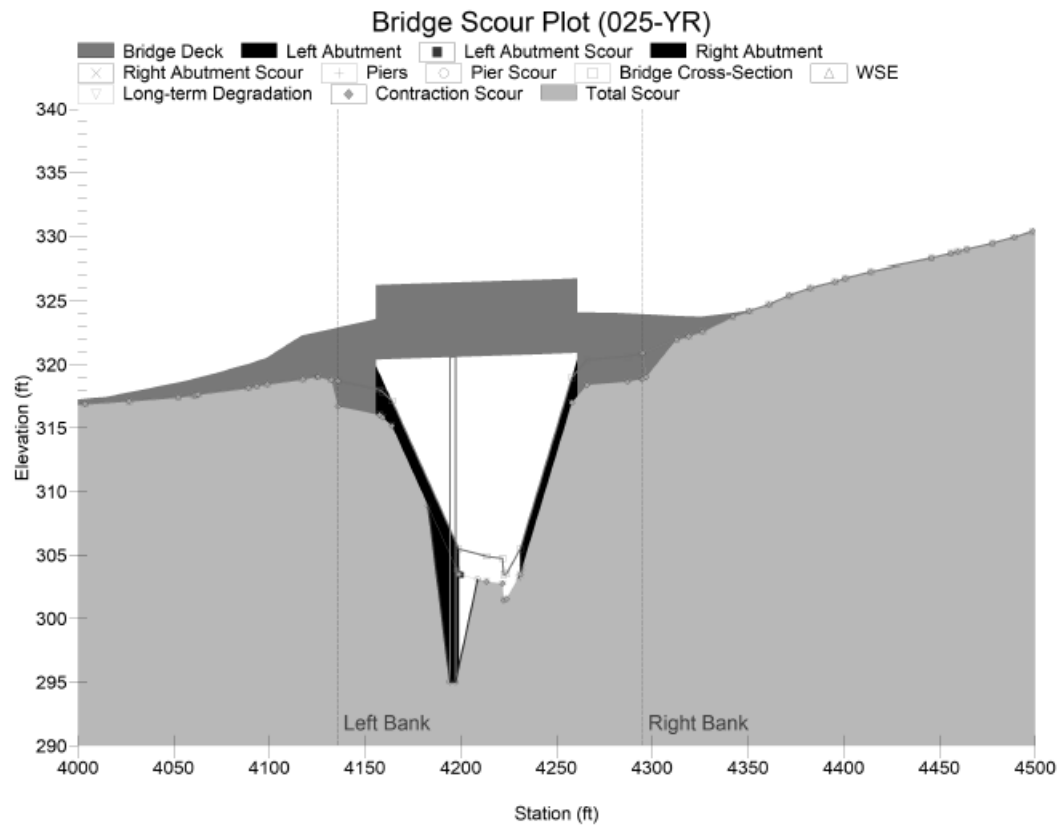
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 BOEHNKE RD AT BUSBY BRANCH

SCOUR DATA SHEET

CSJ 0913-28-083 SHEET 1 OF 1

Designed:	KW	FED. RD. DIV. NO.	STATE	FEDERAL AID PROJECT NO.	HIGHWAY NO.		
Checked:	LBS	6	TEXAS		CR		
Drawn:	KW	DIST.	COUNTY	CONTROL NO.	SECTION NO.	JOB NO.	SHEET NO.
Checked:	LBS	YKM	FAYETTE	0913	28	083,ETC.	61

SCENARIO	FHWA HYDRAULIC TOOLBOX 5.1.4					UNITS	METHOD
	2-YR	5-YR	10-YR	25-YR	50-YR		
MINIMUM CHANNEL ELEVATION (UNDER BRIDGE)	303.46	303.46	303.46	303.46	303.46	FT-MSL	
LONGTERM DEGREDDATION (LTD)	2.00	2.00	2.00	2.00	2.00	FT	USER-SPECIFIED SCOUR DEPTH
MINIMUM CHANNEL ELEVATION WITH LTD	301.46	301.46	301.46	301.46	301.46	FT-MSL	USER-SPECIFIED SCOUR DEPTH
CONTRACTION SCOUR							
CLEAR WATER CONTRACTION SCOUR DEPTH	2.69	0.00	5.71	0.00	1.07	FT	CLEAR WATER AND LIVE BED SCOUR
LIVE BED CONTRACTION SCOUR DEPTH	0.00	0.00	0.00	0.00	0.00	FT	CLEAR WATER AND LIVE BED SCOUR
APPLIED CONTRACTION SCOUR CONDITION (LB OR CW)	LB	LB	LB	LB	LB		
APPLIED CONTRACTION SCOUR ELEVATION WITH LTD	301.46	301.46	301.46	301.46	301.46	FT-MSL	CLEAR WATER AND LIVE BED SCOUR
PIER SCOUR DEPTH	5.01	5.54	5.96	6.43	7.02	FT	
FINAL SCOUR ELEVATION WITH LTD AND PIER	296.45	295.92	295.5	295.03	294.44	FT-MSL	



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- NOTES:
1. FHWA HYDRAULIC TOOLBOX WAS USED TO CHECK SCOUR ANALYSIS.
 2. D50 LIMITED TO 0.2 MM PER TXDOT SCOUR EVALUATION GUIDE, AUGUST 2020, PDF PG-22, SHT PG-19.
 3. THE 2, 5, 10, AND 25-YEAR STORM EVENTS WERE USED IN THE SCOUR ANALYSIS AND THE 50-YEAR STORM WAS USED AS A CHECK.
 4. LIVE BED METHOD WAS IMPLEMENTED PER HEC-18 GUIDANCE.

10/13/2022

NO.	REVISION	BY	DATE

BGE, Inc.
 1701 Directors Blvd., Suite 1000, Austin, TX 78744
 Tel: 512-879-0400 • www.bgeinc.com
 TBPE Registration No. F-1046

Texas Department of Transportation
 WALLACE ROAD AT BUCKNERS CREEK

SCOUR DATA SHEET

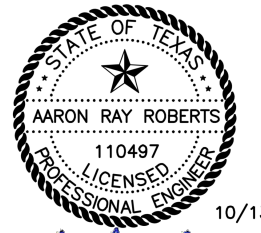
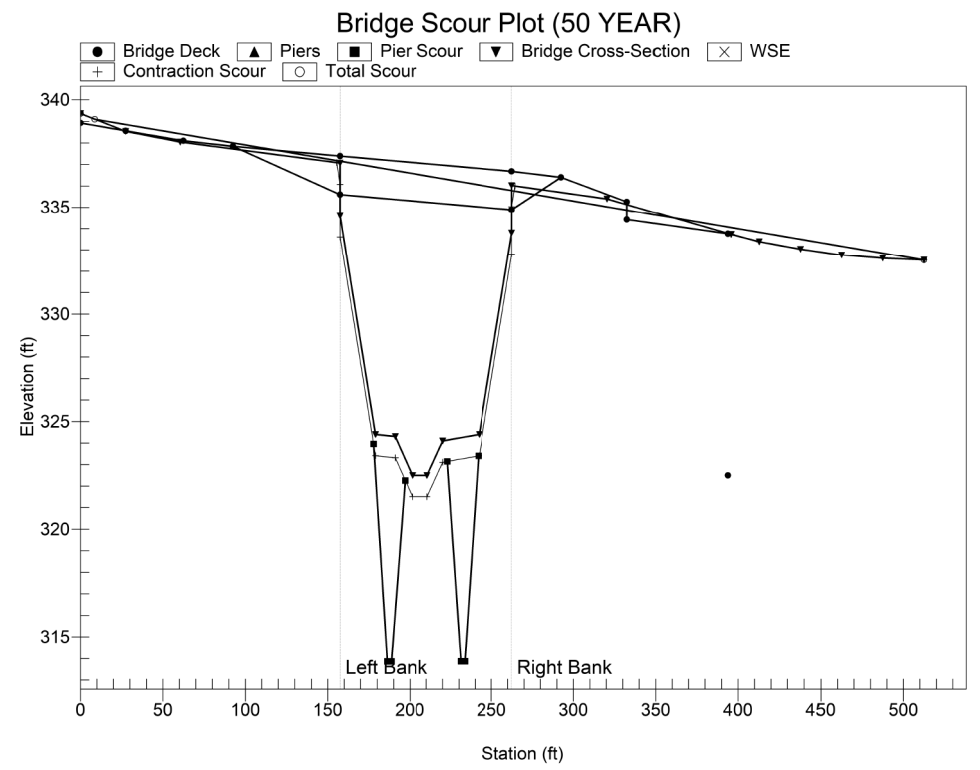
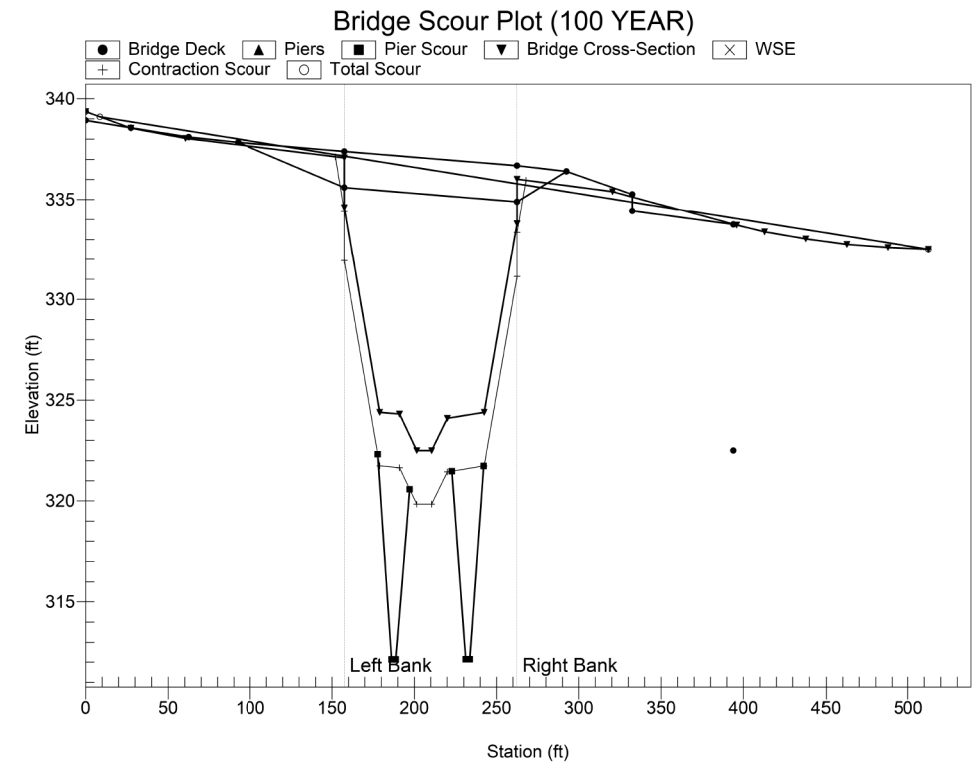
CSJ 0913-28-068 SHEET 1 OF 1

Designed: MEB	FED. RD. DIV. NO. 6	STATE TEXAS	FEDERAL AID PROJECT NO.			HIGHWAY NO.
Checked: MEB	DIST. YKM	COUNTY FAYETTE	CONTROL NO. 0913	SECTION NO. 28	JOB NO. 083, ETC.	SHEET NO. 62

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Scenario	50 Year	100 Year	Units	Method
Contraction Scour				
Clear Water Contraction Scour Depth	86.88	108.67	FT	Clear-Water and Live-Bed Scour
Live Bed Contraction Scour Depth	0.99	2.66	FT	Clear-Water and Live-Bed Scour
Recommended Scour Depth	0.99	2.66	FT	Live-Bed Scour
Applied Contraction Scour Elevation with LTD	321.51	319.84	FT-MSL	Live-Bed Scour
Pier Scour				
Pier 1 Scour	7.70	7.65	FT	Clear-Water Scour
Pier 2 Scour	7.70	7.65	FT	Clear-Water Scour

- NOTES:
1. FHWA HYDRAULIC TOOLBOX VERSION 5.0 WAS USED FOR THE SCOUR ANALYSIS.
 2. A GRAIN SIZE OF 2.0MM WAS USED FOR D50 AS THE MINIMUM REQUIREMENT PER TXDOT'S SCOUR EVALUATION GUIDE (AUGUST 2020).
 3. THE BRIDGE ABUTMENTS WILL BE PROTECTED AGAINST POTENTIAL SCOUR.
 4. CRITICAL VELOCITY WAS DETERMINED TO BE LESS THAN MEAN VELOCITY UPSTREAM OF THE BRIDGE OPENING, THEREFORE, LIVE BED RESULTS WERE USED.



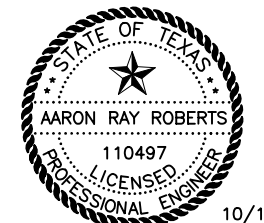
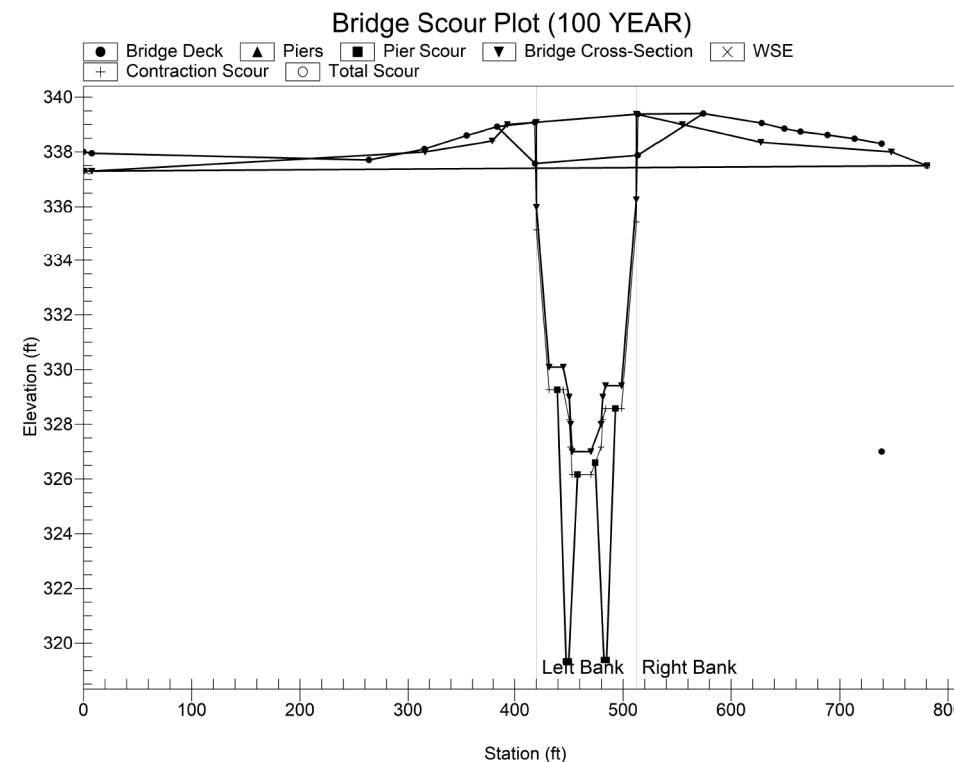
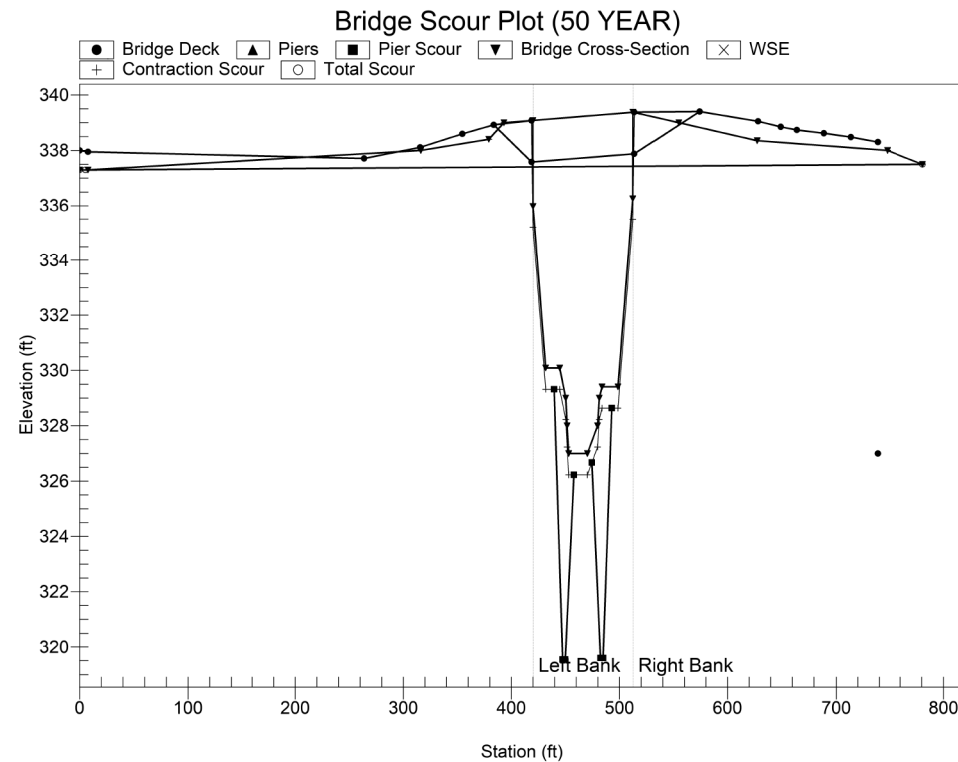
10/13/2022
Aaron Ray Roberts

NO.	REVISION	BY	DATE
WSP USA Inc. 16200 Park Row, Suite 200 Houston, TX 77084 TBPE # F-2263			
N. OLD SMITHVILLE RD AT BUCKNERS CREEK SCOUR DATA SHEET CSJ 0919-28-085 SHEET 1 OF 1			
Designed:	JS	FED. RD. DIV. NO. 6	STATE TEXAS
Checked:	AR	FEDERAL AID PROJECT NO.	
Drawn:	JS	DIST. COUNTY	CONTROL NO. SECTION NO. JOB NO.
Checked:	AR	YKM FAYETTE	0913 28 083, ETC.
			HIGHWAY NO. CR SHEET NO. 63

Scenario	50 Year	100 Year	Units	Method
Contraction Scour				
Clear Water Contraction Scour Depth	80.61	98.82	FT	Clear-Water and Live-Bed Scour
Live Bed Contraction Scour Depth	0.77	0.86	FT	Clear-Water and Live-Bed Scour
Recommended Scour Depth	0.77	0.83	FT	Live-Bed Scour
Applied Contraction Scour Elevation with LTD	326.23	326.17	FT-MSL	Live-Bed Scour
Pier Scour				
Pier 1 Scour	6.68	6.84	FT	Clear-Water Scour
Pier 2 Scour	6.63	6.79	FT	Clear-Water Scour

NOTES:

1. FHWA HYDRAULIC TOOLBOX VERSION 5.0 WAS USED FOR THE SCOUR ANALYSIS.
2. A GRAIN SIZE OF 2.0MM WAS USED FOR D50 AS THE MINIMUM REQUIREMENT PER TXDOT'S SCOUR EVALUATION GUIDE (AUGUST 2020).
3. THE BRIDGE ABUTMENTS WILL BE PROTECTED AGAINST POTENTIAL SCOUR.
4. CRITICAL VELOCITY WAS DETERMINED TO BE LESS THAN MEAN VELOCITY UPSTREAM OF THE BRIDGE OPENING, THEREFORE, LIVE BED RESULTS WERE USED.



10/13/2022

AARON RAY ROBERTS

NO.	REVISION	BY	DATE
		WSP USA Inc. 16200 Park Row, Suite 200 Houston, TX 77084 TBPE # F-2263	
 S. OLD SMITHVILLE RD AT LIVE OAK CREEK			
SCOUR DATA SHEET			
CSJ 0919-28-086 SHEET 1 OF 1			
Designed:	JS	FED. RD. DIV. NO. 6	STATE TEXAS
Checked:	AR	FEDERAL AID PROJECT NO.	
Drawn:	JS	DIST. COUNTY	CONTROL NO. SECTION NO. JOB NO.
Checked:	AR	YKM FAYETTE	0913 28 083,ETC.
HIGHWAY NO.			CR
SHEET NO.			64

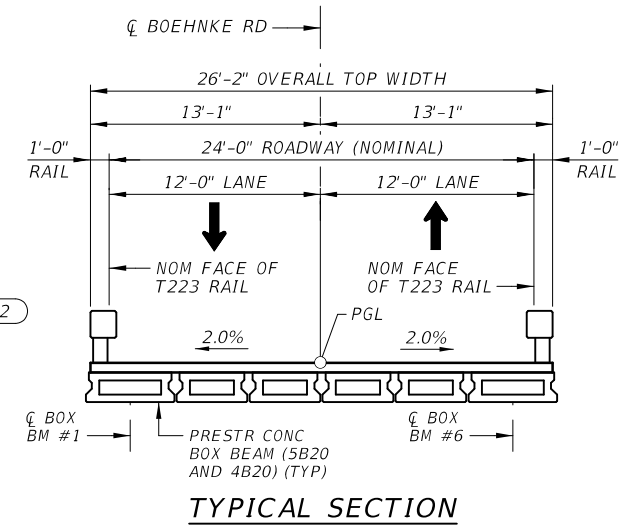
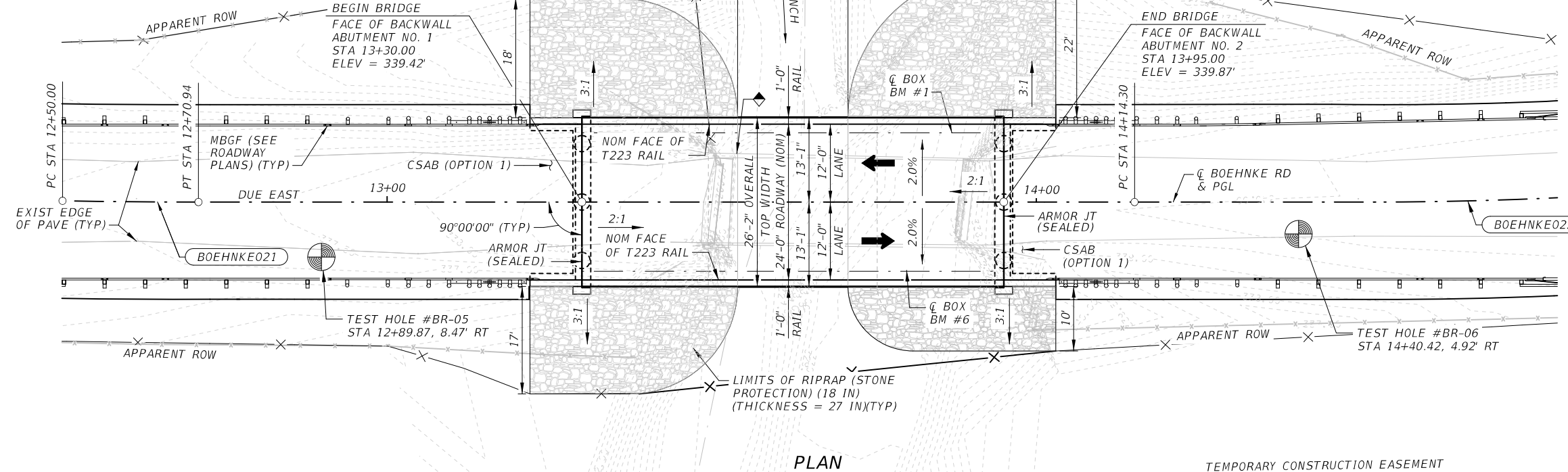
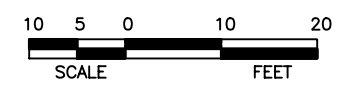
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BOEHNKE021
 P.I. STATION = 12+60.47
 DELTA = 1°00'00" (LT)
 DEGREE = 4°46'29"
 TANGENT = 10.47'
 LENGTH = 20.94'
 RADIUS = 1,200.00'
 P.C. STATION = 12+50.00
 P.T. STATION = 12+70.94
 BACK = S 89°00'00" E
 AHEAD = DUE EAST

BOEHNKE022
 P.I. STATION = 14+64.57
 DELTA = 2°24'00" (LT)
 DEGREE = 2°23'14"
 TANGENT = 50.27'
 LENGTH = 100.53'
 RADIUS = 2,400'
 P.C. STATION = 14+14.30
 P.T. STATION = 15+14.83
 BACK = DUE EAST
 AHEAD = N 87°36'00" E



- GENERAL NOTES:**
- DESIGNED ACCORDING TO AASHTO LRFD BRIDGE DESIGN SPECIFICATIONS, 9TH EDITION (2020) AND TXDOT BRIDGE DESIGN MANUAL (NOV 2021).
 - USE OPTION 1 FOR CONFIGURATION OF CEMENT STABILIZED BACKFILL BEHIND ABUTMENTS. SEE CSAB STANDARD FOR DETAILS.
 - SEE BRIDGE BORING LOG SHEET FOR GEOTECHNICAL INFORMATION.

HYDRAULIC DATA TABLE

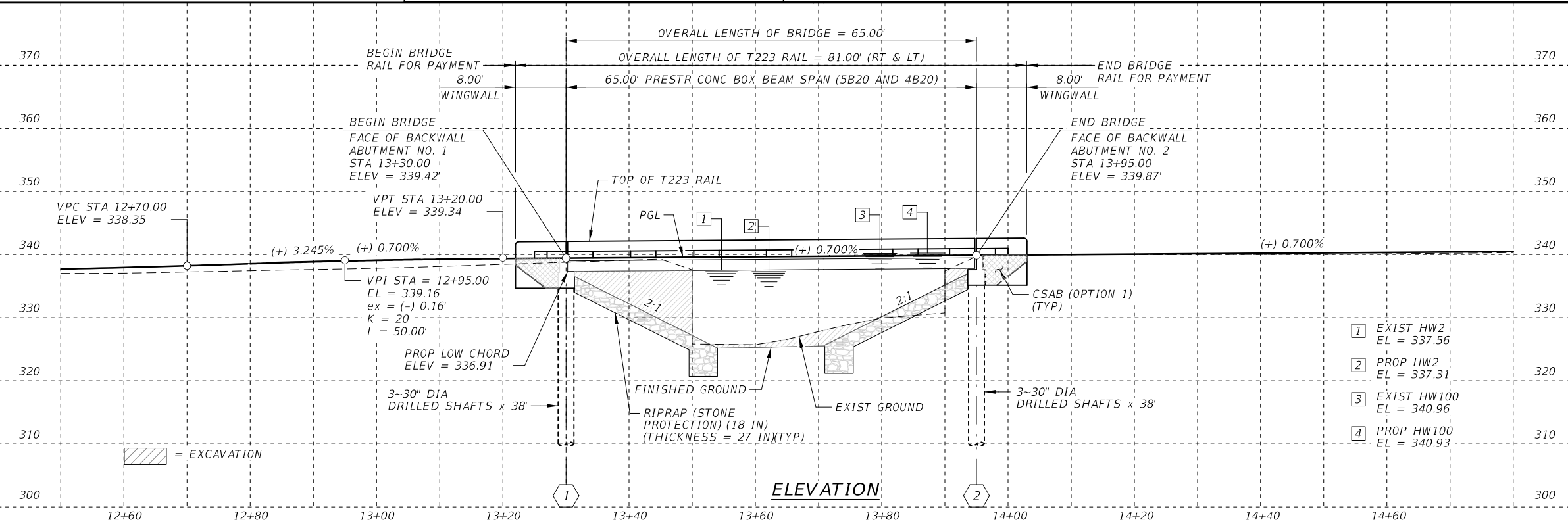
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EXIST Q2 = 1,597 cfs	PROP Q2 = 1,597 cfs
EXIST V2 = 3.97 ft/s	PROP V2 = 3.97 ft/s
EXIST HW100 = 340.96	PROP HW100 = 340.93
EXIST Q100 = 4,986 cfs	PROP Q100 = 4,986 cfs
EXIST V100 = 5.46 ft/s	PROP V100 = 5.46 ft/s

ALL ABUTMENTS ON BEARING DUE NORTH

EXISTING SINGLE SPAN STEEL RAILROAD FLATCAR BRIDGE (45'-0" LENGTH X 14'-1" WIDTH) TO BE REMOVED. CONCRETE ABUTMENTS AND WINGWALLS TO BE REMOVED. FOUNDATIONS TO BE REMOVED TO 2'-0" MINIMUM BELOW FINISHED GROUND. EXISTING CONCRETE SLAB IN CHANNEL TO BE REMOVED OR, AT CONTRACTOR'S OPTION, CAN BE BROKEN UP TO BE USED WITH STONE PROTECTION RIPRAP.

EXIST NBI NUMBER: 13-076-0-AA01-14-001
 PROP NBI NUMBER: 13-076-0-AA05-30-001
 FUNCTIONAL CLASSIFICATION: LOCAL RURAL ROAD
 DESIGN SPEED: MEETS OR IMPROVES EXISTING ADT: 38 VPD (2017), 53 VPD (2040)

SUPERSTRUCTURE INV/OPR RATINGS: 1.34/1.73
 HL93 LOADING



- | | |
|---|----------------------------|
| 1 | EXIST HW2
EL = 337.56 |
| 2 | PROP HW2
EL = 337.31 |
| 3 | EXIST HW100
EL = 340.96 |
| 4 | PROP HW100
EL = 340.93 |



Kelly Ho
 10/13/2022

NO. REVISION BY DATE

CP&Y
 an STV Company

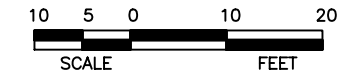
TEXAS REGISTERED ENGINEERING FIRM
 F-1741

©2022 Texas Department of Transportation
 BOEHNKE RD AT BUSBY BRANCH
 BRIDGE LAYOUT
 BUSBY BRANCH BRIDGE

CSJ 0913-28-083 SHEET 1 OF 1

Designed:	KAD	FED. RD. DIV. NO.	6	STATE	TEXAS	FEDERAL AID PROJECT NO.		HIGHWAY NO.	CR
Checked:	KH	DIST.	YK	COUNTY	FAYETTE	CONTROL NO.	0913	SECTION NO.	28
Drawn:	NKB	JOB NO.	083, ETC.	SHEET NO.	65				

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GENERAL NOTES:

1. BORE HOLES REPLICATED FROM CORSAIR CONSULTING, LLC. BORINGS TAKEN JANUARY 12 AND 25, 2022.
 2. GROUNDWATER ENCOUNTERED AT DEPTHS OF 11 FEET FOR BR-05 AND 23 FEET FOR BR-06.
- ANY GROUNDWATER ELEVATION INFORMATION IS REPRESENTATIVE OF CONDITIONS EXISTING ON THE DAY AND FOR THE SPECIFIC LOCATION WHERE THIS INFORMATION WAS COLLECTED.
- ACTUAL GROUNDWATER ELEVATION MAY FLUCTUATE DUE TO TIME, CLIMATE CONDITIONS, AND/OR CONSTRUCTION ACTIVITY.
3. CONTRACTOR'S ATTENTION IS BROUGHT TO WATER BEARING SANDY SOILS SHOWN IN BORING LOGS. THE USE OF TEMPORARY CASING AND/OR DRILLING SLURRY MAY BE NECESSARY TO INSTALL DRILLED SHAFT TO REQUIRED LENGTH AS SHOWN.

≡ = GROUNDWATER



Kelly Ho
10/13/2022

NO.	REVISION	BY	DATE



TEXAS REGISTERED ENGINEERING FIRM F-1741

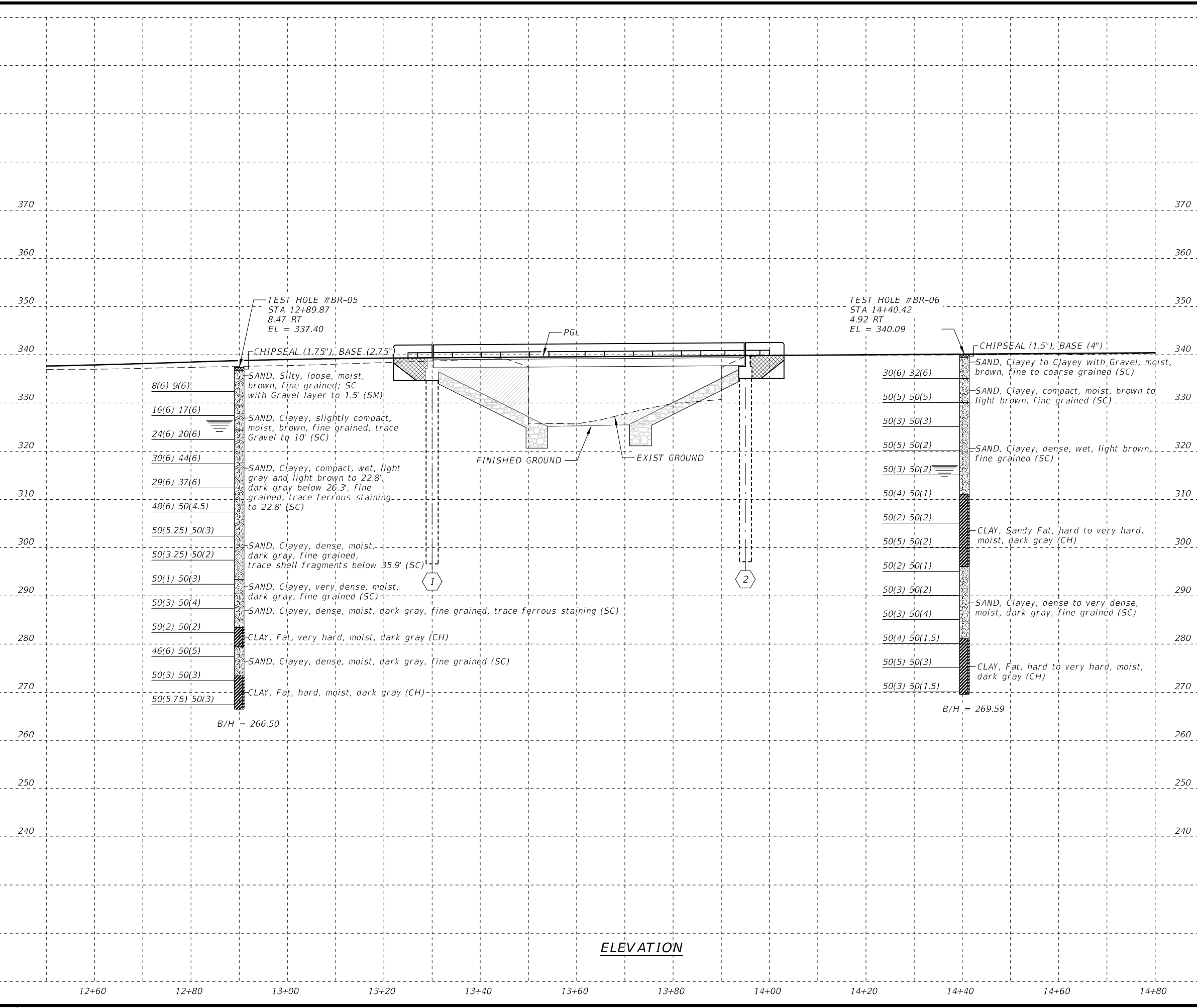
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BOEHNKE RD AT BUSBY BRANCH
BORING LOGS
BUSBY BRANCH BRIDGE

CSJ 0913-28-083 SHEET 1 OF 1

Designed: KAD	FED. RD. DIST. NO. 6	STATE TEXAS	FEDERAL AID PROJECT NO.	HIGHWAY NO.
Checked: KH	DIST. YKM	COUNTY FAYETTE	CONTROL NO. 0913	SECTION NO. 28
Drawn: RAM	JOB NO. 083, ETC.	SHEET NO. 66		
Checked: KH				

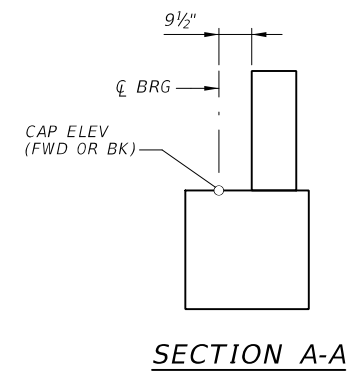
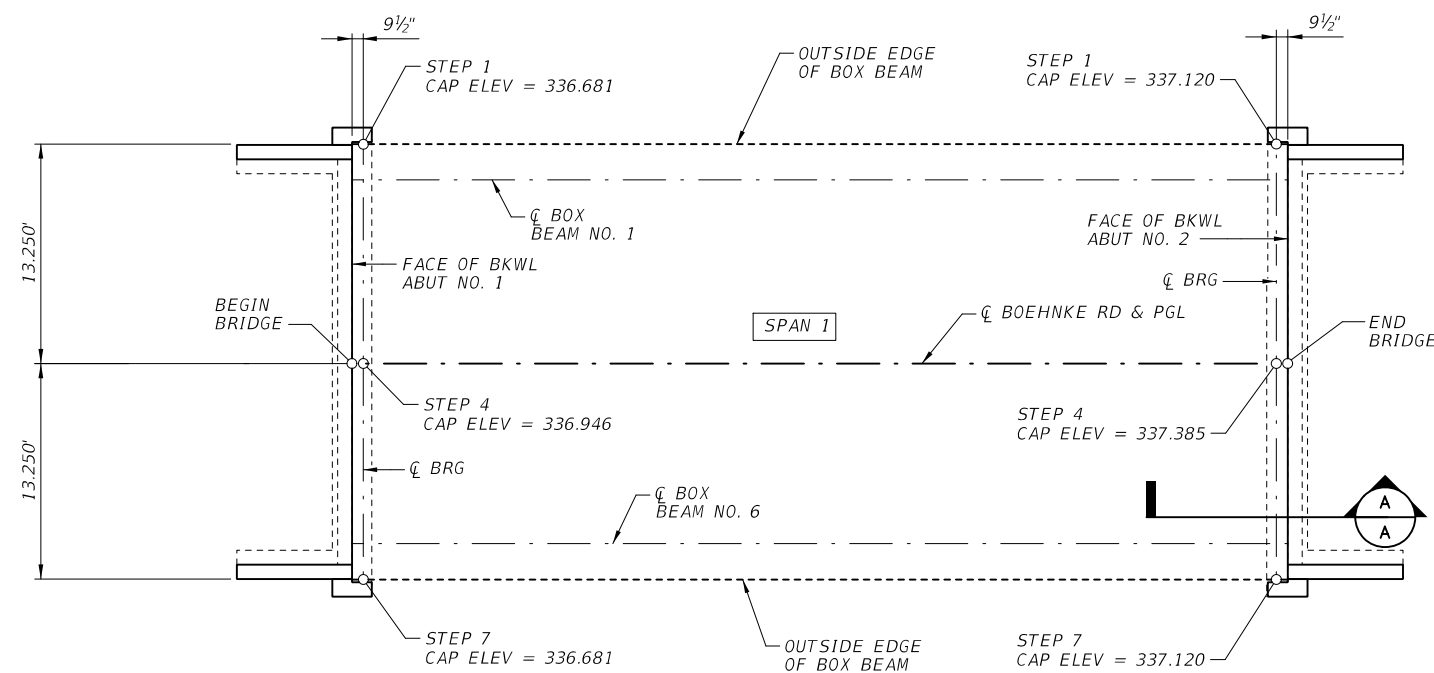
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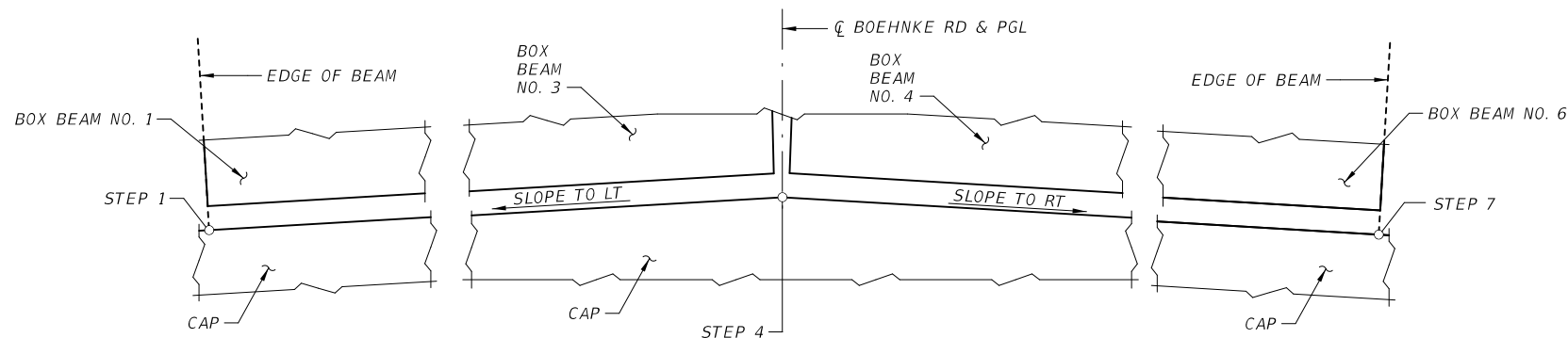
ELEVATION

SUMMARY OF ESTIMATED QUANTITIES - BOEHNKE RD AT BUSBY BRANCH

BID ITEM	400 6005	416 6003	420 6013	422 6005	422 6023	425 6001	425 6002	432 6033	450 6006	454 6004
BID ITEM DESCRIPTION	CEM STABIL BKFL	DRILL SHAFT (30 IN)	CL C CONC (ABUT)	REINF CONC SLAB (BOX BEAM)	SHEAR KEY	PRESTR CONC BOX BEAM (4B20)	PRESTR CONC BOX BEAM (5B20)	RIPRAP (STONE PROTECTION) (18 IN)	RAIL (TY T223)	ARMOR JOINT (SEALED)
BRIDGE ELEMENT	CY	LF	CY	SF	CY	LF	LF	CY	LF	LF
2 - ABUTMENTS	38	228	27.2					357	32.0	44
1 - 65.00' PRESTRESSED CONCRETE BOX BEAM SPAN				1,701	8.6	258.00	129.00		130.0	
TOTAL	38	228	27.2	1,701	8.6	258.00	129.00	357	162.0	44



PLAN OF STEP LOCATIONS



COMMON TRANSVERSE SECTIONS AT STEP LOCATIONS



Kelly Ho
10/13/2022

NO.	REVISION	BY	DATE



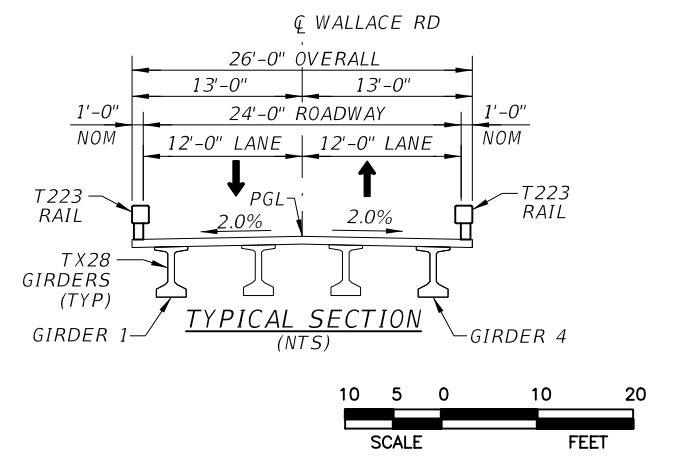
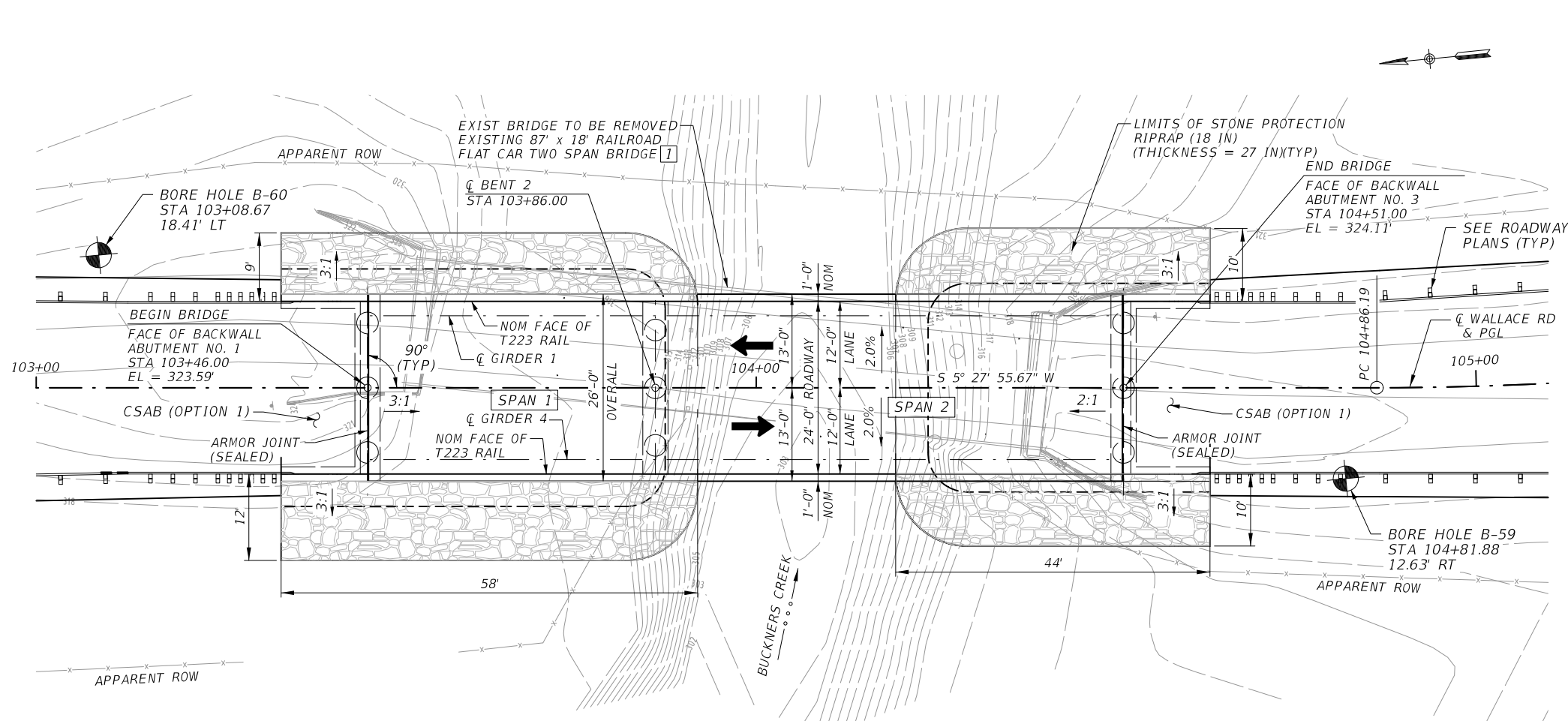
©2022 Texas Department of Transportation
 BOEHNKE RD AT BUSBY BRANCH
 ESTIMATED QUANTITIES
 AND CAP ELEVATIONS
 BUSBY BRANCH BRIDGE
 CSJ 0913-28-083 SHEET 1 OF 1

Designed:	KAD	FED. RD. DIV. NO.	STATE	FEDERAL AID PROJECT NO.	HIGHWAY NO.		
Checked:	KH	6	TEXAS		CR		
Drawn:	BT	DIST.	COUNTY	CONTROL NO.	SECTION NO.	JOB NO.	SHEET NO.
Checked:	KH	YKM	FAYETTE	0913	28	083, ETC.	67

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GENERAL NOTES:

DESIGNED ACCORDING TO AASHTO LRFD BRIDGE DESIGN SPECIFICATIONS, 9th EDITION (2020) AND TxDOT BRIDGE DESIGN MANUAL (NOV 2021).

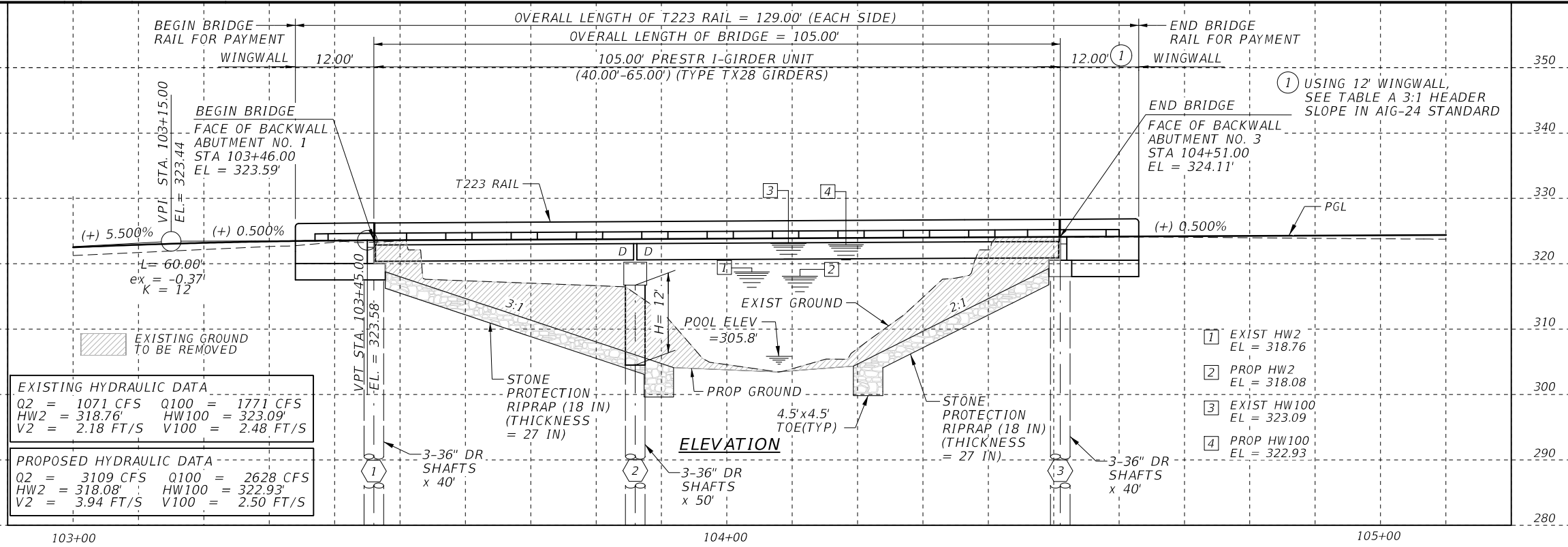
ALL DIMENSIONS ARE EITHER HORIZONTAL OR VERTICAL AND MUST BE CORRECTED FOR GRADE, CROWN AND/OR SUPERELEVATIONS.

CONTRACTOR SHALL VERIFY LOCATIONS OF UTILITIES PRIOR TO CONSTRUCTION, EXCAVATION OR DRILLING.

"D" DENOTES DOWELS IN THE OUTSIDE GIRDER, UNLESS SPECIFIED OTHERWISE ON BENT DETAIL SHEETS.

THE "H" VALUES SHOWN ARE ESTIMATED COLUMN HEIGHTS. THE CONTRACTOR IS RESPONSIBLE FOR CALCULATING ACTUAL COLUMN HEIGHTS BASED ON FIELD CONDITIONS.

DRILLED SHAFTS HAVE BEEN DESIGNED FOR BOTH END BEARING AND SKIN FRICTION. ALL DRILLED SHAFTS SHALL BE FOUNDED AT THE ELEVATIONS SHOWN OR DEEPER.



HL93 LOADING SUPERSTRUCTURE INV/OPR RATINGS: 1.55/2.00

STATE OF TEXAS
 EMILY PETROSKY
 141948
 LICENSED PROFESSIONAL ENGINEER
 Emily Petrosky
 10/13/2022

NO.	REVISION	BY	DATE

BGE, Inc.
 1701 Directors Blvd., Suite 1000, Austin, TX 78744
 Tel: 512-879-0400 • www.bgeinc.com
 TBPE Registration No. F-1046

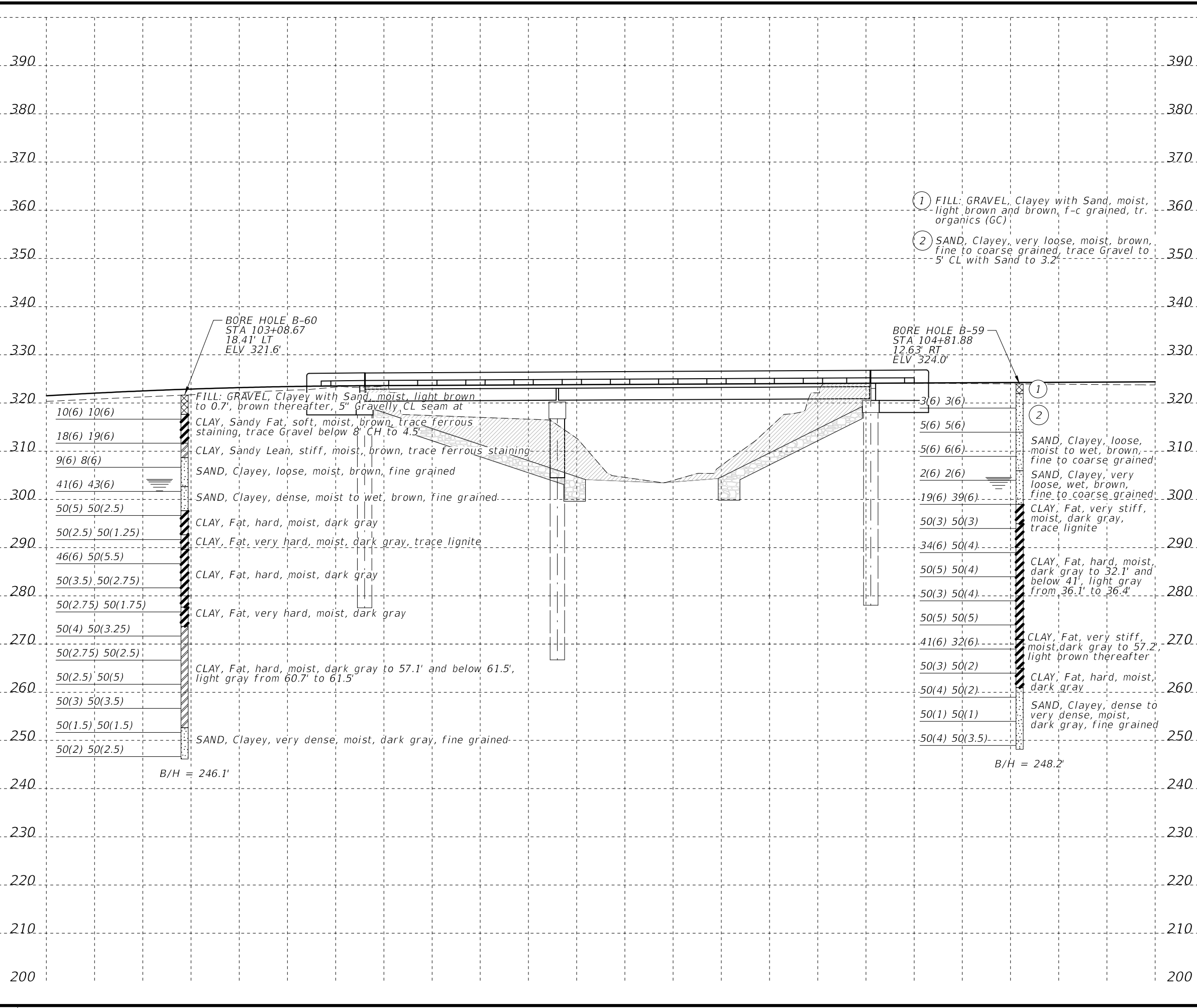
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 WALLACE ROAD AT BUCKNERS CREEK

BRIDGE LAYOUT
 CSJ 0913-28-068 SHEET 1 OF 1

Designed:	BGE	FED. RD. DIV. NO.	STATE	FEDERAL AID PROJECT NO.	HIGHWAY NO.		
Checked:	BGE	6	TEXAS		CR		
Drawn:	BGE	DIST.	COUNTY	CONTROL NO.	SECTION NO.	JOB NO.	SHEET NO.
Checked:	BGE	YKM	FAYETTE	0913	28	083.ETC.	68

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- ① FILL: GRAVEL, Clayey with Sand, moist, light brown and brown, f-c grained, tr. organics (GC)
- ② SAND, Clayey, very loose, moist, brown, fine to coarse grained, trace Gravel to 5' CL with Sand to 3.2'

GENERAL NOTES:

1. DRILLING CONTRACTOR: CORSAIR CONSULTING, LLC. DRILLING DATE: 5/13/22
 2. GROUNDWATER ENCOUNTERED AT A DEPTH OF 19.4' FOR BR-59 AND 17.5' FOR BR-60.
- ANY GROUNDWATER ELEVATION INFORMATION IS REPRESENTATIVE OF CONDITIONS EXISTING ON THE DAY AND FOR THE SPECIFIC LOCATION WHERE THIS INFORMATION WAS COLLECTED.
- ACTUAL GROUNDWATER ELEVATION MAY FLUCTUATE DUE TO TIME, CLIMATE CONDITIONS, AND/OR CONSTRUCTION ACTIVITY.
3. CONTRACTOR'S ATTENTION IS BROUGHT TO WATER BEARING SANDY SOILS SHOWN IN BORING LOGS. THE USE OF TEMPORARY CASING AND/OR DRILLING SLURRY MAY BE NECESSARY TO INSTALL DRILLED SHAFT TO REQUIRED LENGTH AS SHOWN.

≡ = GROUNDWATER



NO.	REVISION	BY	DATE

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 1701 Directors Blvd., Suite 1000, Austin, TX 78744
 Tel: 512-879-0400 • www.bgeinc.com
 TBPE Registration No. F-1046

©2022 **Texas Department of Transportation**
 WALLACE ROAD AT BUCKNERS CREEK

BORING LOG

CSJ 0913-28-068

Designed:	BGE	FED. RD. DIV. NO.	STATE	FEDERAL AID PROJECT NO.	HIGHWAY NO.
Checked:	BGE	6	TEXAS		CR
Drawn:	BGE	DIST.	COUNTY	CONTROL NO.	SECTION NO.
Checked:	BGE	YKM	FAYETTE	0913	28
				083,ETC.	69

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SUMMARY OF ESTIMATED QUANTITIES - WALLACE RD AT BUCKNERS CREEK										
BID ITEM	400 6005	416 6004	420 6013	420 6029	420 6037	422 6001	425 6035	432 6033	450 6006	454 6004
BRIDGE ELEMENT	CEM STABIL BKFL	DRILL SHAFT (36 IN)	CL C CONC (ABUT) *	CL C CONC (CAP) *	CL C CONC (COLUMN)	REINF CONC SLAB	PRESTR CONC GIRDER (TX28)	RIPRAP (STONE PROTECTION) (18 IN)	RAIL (TY T223)	ARMOR JOINT (SEALED)
	CY	LF	CY	CY	CY	SF	LF	CY	LF	LF
2 ~ ABUTMENTS	65	240	38.0					475	48	44
1 ~ 105.00' PRESTR I-GIRDER UNIT		150		11.1	9.4	2730	416.00		210	
TOTAL	65	390	38.0	11.1	9.4	2730	416.00	475	258	44

* INCLUDES QUANTITY FOR SHEAR KEY


BEARING SEAT ELEVATIONS (FT)

	GIRDER 1	GIRDER 2	GIRDER 3	GIRDER 4
ABUT (FWD)	319.832	319.966	319.966	319.832
BENT (BK)	320.022	320.156	320.156	320.022
(FWD)	320.032	320.166	320.166	320.032
ABUT (BK)	320.348	320.481	320.481	320.348

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Emily Petrosky
10/20/2022

NO.	REVISION	BY	DATE



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1701 Directors Blvd., Suite 1000, Austin, TX 78744
Tel: 512-879-0400 • www.bgeinc.com
TBPE Registration No. F-1046

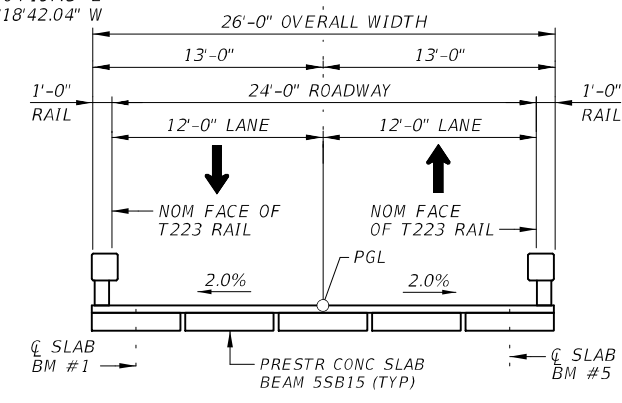
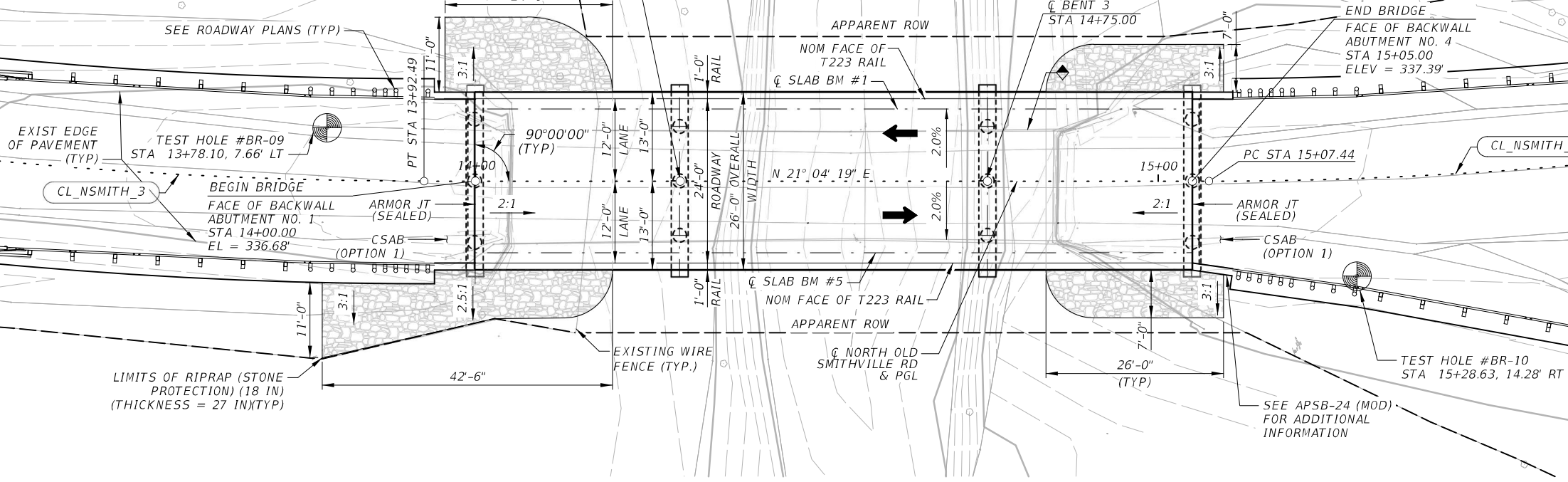
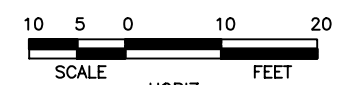


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WALLACE ROAD AT BUCKNERS CREEK
ESTIMATED QUANTITIES AND BEARING SEAT ELEVATIONS
CSJ 0913-28-068 SHEET 1 OF 1

Designed:	BGE	FED. RD. DIV. NO.	STATE	FEDERAL AID PROJECT NO.	HIGHWAY NO.
Checked:	BGE	6	TEXAS		CR
Drawn:	BGE	DIST.	COUNTY	CONTROL NO.	SECTION NO.
Checked:	BGE	YKM	FAYETTE	0913	28
				083,ETC.	JOB NO.
					SHEET NO.
					70

CL_NSMITH_3
 P.I. STATION = 13+47.80
 DELTA = 7°46'17" (LT)
 DEGREE = 8°40'52"
 TANGENT = 44.83'
 LENGTH = 89.52'
 RADIUS = 660.00'
 P.C. STATION = 13+02.97
 P.T. STATION = 13+92.49
 BACK = N 28°50'36.28" E
 AHEAD = N 21°04'19.43" E

CL_NSMITH_6
 P.I. STATION = 16+33.67
 DELTA = 23°23'01" (LT)
 DEGREE = 9°23'34"
 TANGENT = 126.23'
 LENGTH = 248.96'
 RADIUS = 610.00'
 P.C. STATION = 15+07.44
 P.T. STATION = 17+56.39
 BACK = N 21°04'19.43" E
 AHEAD = N 02°18'42.04" W



- GENERAL NOTES:
- DESIGNED ACCORDING TO AASHTO LRFD BRIDGE DESIGN SPECIFICATIONS, 9TH EDITION (2020) AND TXDOT BRIDGE DESIGN MANUAL (NOV 2021).
 - USE OPTION 1 FOR CONFIGURATION OF CEMENT STABILIZED BACKFILL BEHIND ABUTMENTS. SEE CSAB STANDARD FOR DETAILS.
 - SEE BRIDGE BORING LOG SHEET FOR GEOTECHNICAL INFORMATION.
 - THE "H" VALUES SHOWN ARE ESTIMATED COLUMN HEIGHTS. THE CONTRACTOR IS RESPONSIBLE FOR CALCULATING ACTUAL COLUMN HEIGHTS BASED ON FIELD CONDITIONS.

HYDRAULIC DATA TABLE

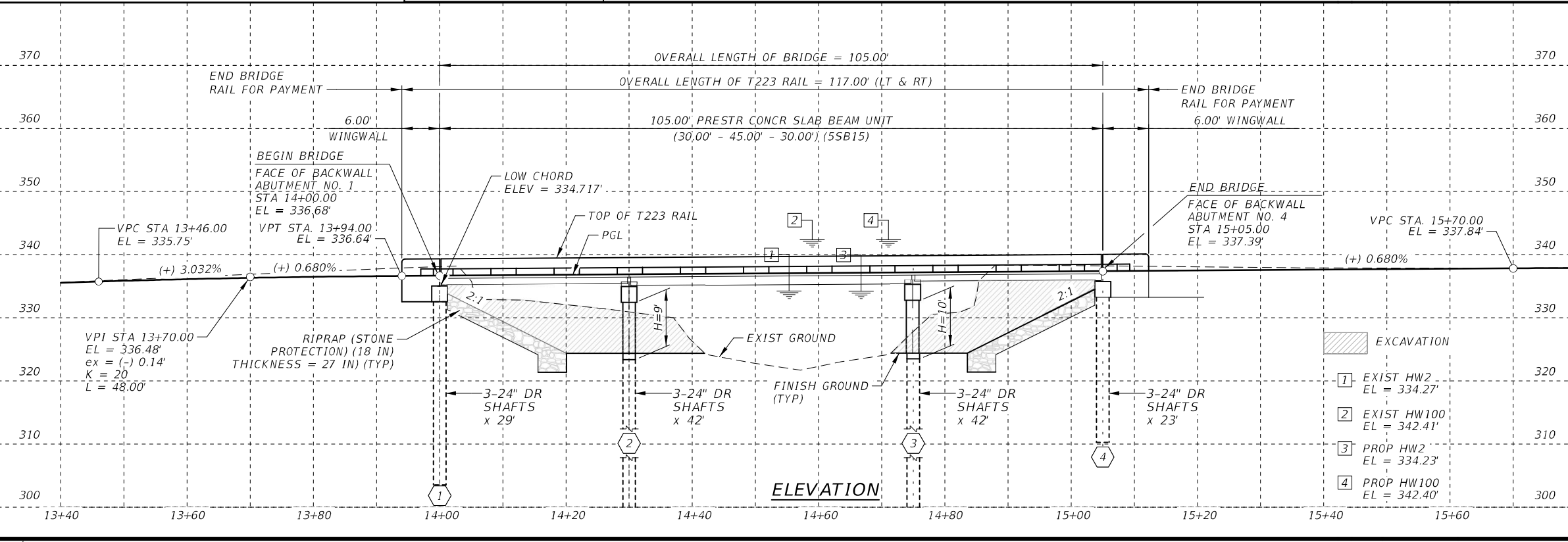
EXIST HW2 = 334.27 ft	PROP HW2 = 334.23 ft
EXIST Q2 = 1,516 cfs	PROP Q2 = 1,516 cfs
EXIST V2 = 1.81 ft/s	PROP V2 = 1.63 ft/s
EXIST HW100 = 342.41 ft	PROP HW100 = 342.40 ft
EXIST Q100 = 10,569 cfs	PROP Q100 = 10,569 cfs
EXIST V100 = 2.67 ft/s	PROP V100 = 2.75 ft/s

ALL ABUTS AND BENTS ARE ON BEARING N 68°55'41" W

EXISTING SINGLE SPAN STEEL RAILROAD FLATCAR BRIDGE (85'-0" LENGTH X 17'-0" WIDTH) TO BE REMOVED. STEEL ABUTMENT CAPS AND CONCRETE WINGWALLS TO BE REMOVED. FOUNDATIONS TO BE REMOVED TO 2'-0" MINIMUM BELOW FINISHED GROUND.

EXIST NBI NUMBER: 13-076-0-AA01-15-002
 PROP NBI NUMBER: 13-076-0-AA04-83-002
 FUNCTIONAL CLASSIFICATION: LOCAL RURAL ROAD
 DESIGN SPEED: MEETS OR IMPROVES EXISTING
 ADT: 101 VPD (2017), 141 VPD (2040)

HL93 LOADING
 SUPERSTRUCTURE INV/OPR RATINGS: 1.23/1.59



10/12/2022

NO.	REVISION	BY	DATE

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 TBPE # F-2263

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 NORTH OLD SMITHVILLE RD (CR483) AT BUCKNERS CREEK
 BRIDGE LAYOUT
 BUCKNERS CREEK BRIDGE

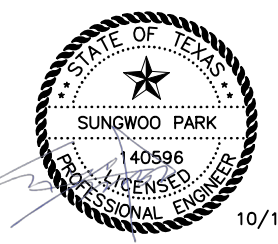
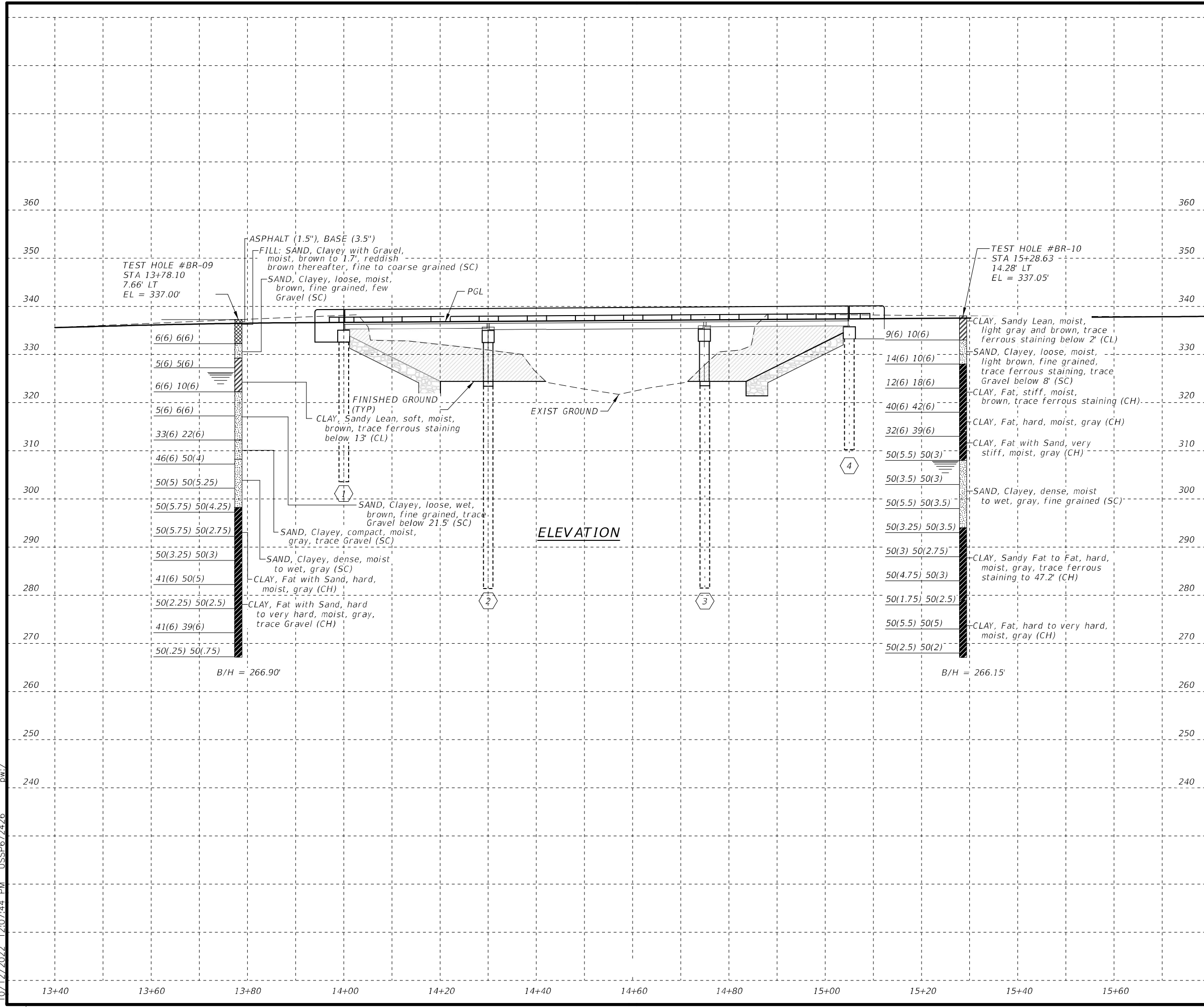
CSJ 0913-28-085 SHEET 1 OF 1

Designed:	SP	FED. RD. DIV. NO.	6	STATE	TEXAS	FEDERAL AID PROJECT NO.		HIGHWAY NO.	CR
Checked:	CF	DIST.	YKM	COUNTY	FAYETTE	CONTROL NO.	0913	SECTION NO.	28
Drawn:	DDE	JOB NO.	083.ETC.	SHEET NO.	71				



GENERAL NOTES:

- BORING LOGS REPLICATED FROM CORSAIR CONSULTING,LLC. BORINGS TAKEN ON JANUARY 26, 2022 AND FEBRUARY 17, 2022.
- GROUNDWATER ENCOUNTERED AT DEPTHS OF 11 FEET FOR BR-09 AND 30 FEET FOR BR-10.
- ANY GROUNDWATER ELEVATION INFORMATION IS REPRESENTATIVE OF CONDITIONS EXISTING ON THE DAY AND FOR THE SPECIFIC LOCATION WHERE THIS INFORMATION WAS COLLECTED.
- ACTUAL GROUNDWATER ELEVATION MAY FLUCTUATE DUE TO TIME, CLIMATE CONDITIONS, AND/OR CONSTRUCTION ACTIVITY.
- CONTRACTOR'S ATTENTION IS BROUGHT TO WATER BEARING SANDY SOILS SHOWN IN BORING LOGS. THE USE OF TEMPORARY CASING AND/OR DRILLING SLURRY MAY BE NECESSARY TO INSTALL DRILLED SHAFT TO REQUIRED LENGTH AS SHOWN.



10/12/2022

NO.	REVISION	BY	DATE

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NORTH OLD SMITHVILLE RD (CR483) AT BUCKNERS CREEK
BRIDGE BORING LOGS
BUCKNERS CREEK BRIDGE

CSJ 0913-28-085 SHEET 1 OF 1

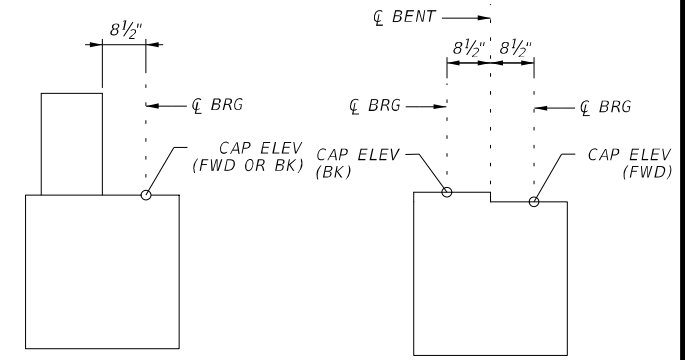
Designed:	SP	FED. RD. DIV. NO.	6	STATE	TEXAS	FEDERAL AID PROJECT NO.		HIGHWAY NO.	CR
Checked:	CF	DIST.	YKM	COUNTY	FAYETTE	CONTROL NO.	0913	SECTION NO.	28
Drawn:	DQ	JOB NO.	083,ETC.	SHEET NO.	72				
Checked:	SP								

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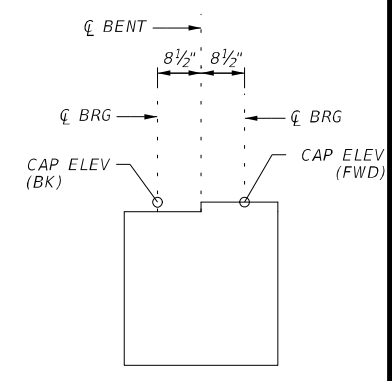
SUMMARY OF ESTIMATED QUANTITIES

ITEM DESCRIPTION	400 6005	416 6002	420 6013	420 6029	420 6037	422 6007	425 6012	432 6033	450 6006	454 6004
BID ITEM DESCRIPTION	CEM STABIL BKFL	DRILL SHAFT (24 IN)	CL C CONC (ABUT)	CL C CONC (CAP)	CL C CONC (COLUMN)	REINF CONC SLAB (SLAB BEAM)	PRESTR CONC SLAB BEAM (5SB15)	RIPRAP (STONE PROTECTION) (18 IN)	RAIL (TY T223)	ARMOR JOINT (SEALED)
BRIDGE ELEMENT										
2 - ABUTMENTS	CY	LF	CY	CY	CY	SF	LF	CY	LF	LF
2 - INTERIOR BENTS	27	156	18.4	13.2	6.6			334	24.0	44
1 - 105.00' PRESTR CONC SLAB BEAM UNIT		252				2,730	517.5		210.0	
TOTAL	27	408	18.4	13.2	6.6	2,730	517.5	334	234.0	44

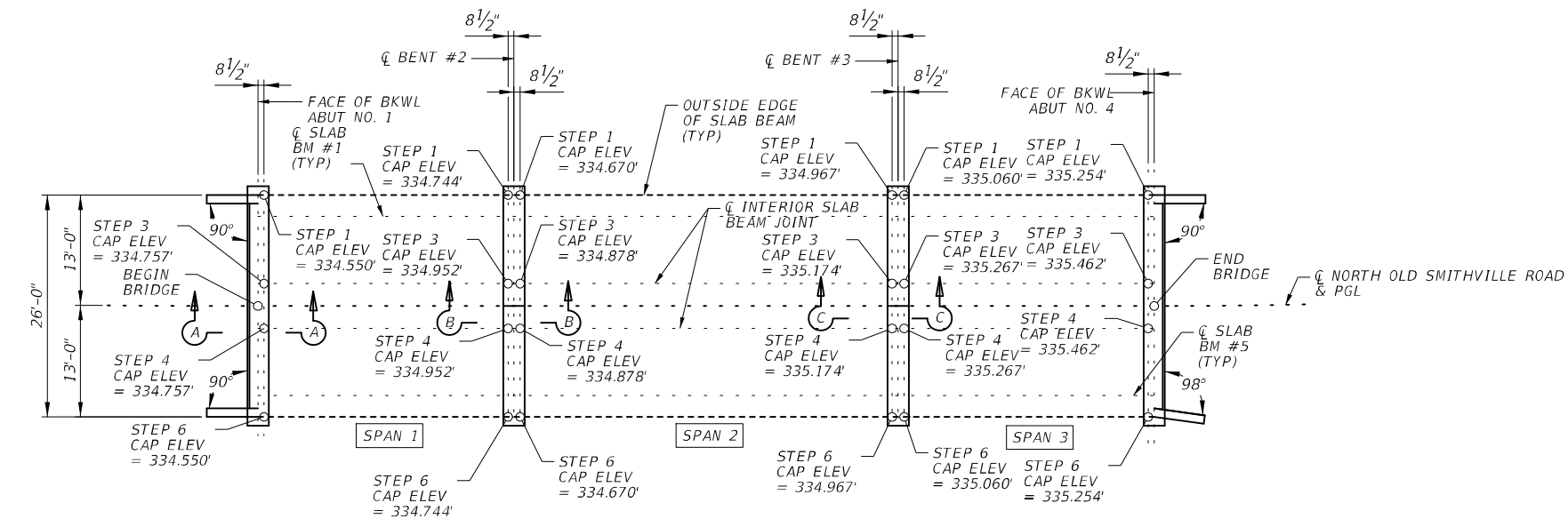


SECTION A-A

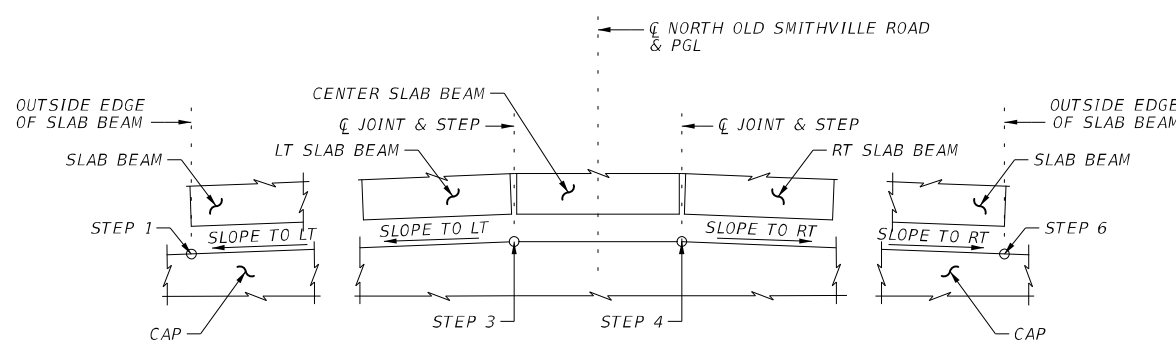
SECTION B-B



SECTION C-C



PLAN OF STEP LOCATIONS



COMMON TRANSVERSE SECTION AT STEP LOCATIONS

10/12/2022

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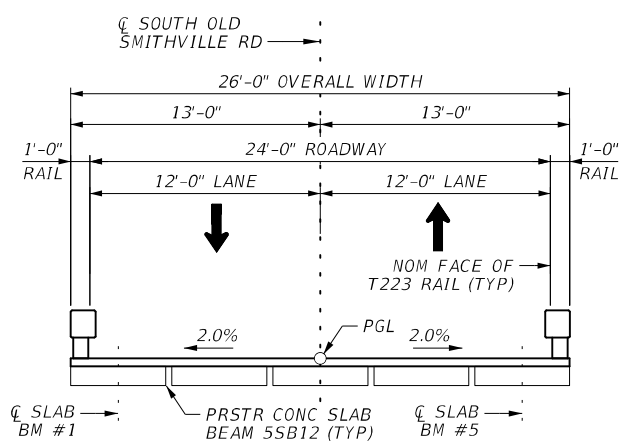
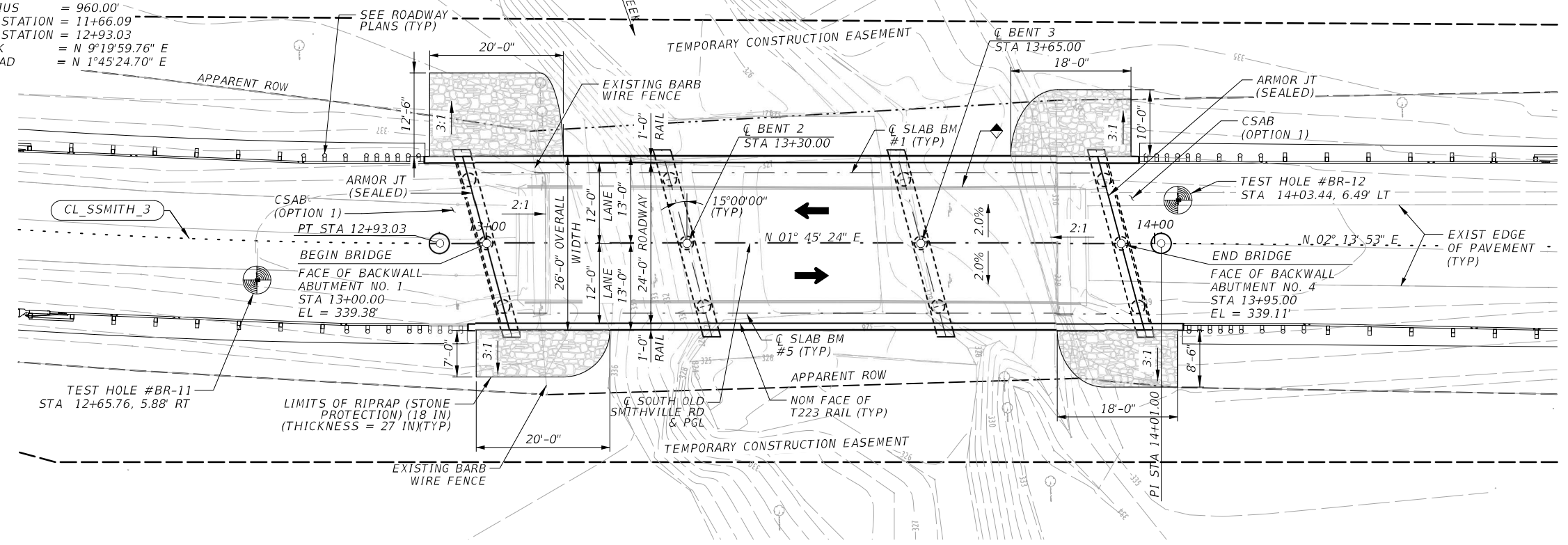
NORTH OLD SMITHVILLE RD (CR483) AT BUCKNERS CREEK
ESTIMATED QUANTITIES &
CAP ELEVATIONS
BUCKNERS CREEK BRIDGE
CSJ 0913-28-085 SHEET 1 OF 1

Designed:	FED. RD. DIV. NO.	STATE	FEDERAL AID PROJECT NO.	HIGHWAY NO.
Checked:	6	TEXAS		CR
Drawn:	DIST.	COUNTY	CONTROL NO.	SECTION NO.
Checked:	YKM	FAYETTE	0913	28
			083, ETC.	73

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CL_SSMITH_3

P.I. STATION = 12+29.65
 DELTA = 7°34'35" (LT)
 DEGREE = 5°58'05"
 TANGENT = 63.56'
 LENGTH = 126.94'
 RADIUS = 960.00'
 P.C. STATION = 11+66.09
 P.T. STATION = 12+93.03
 BACK = N 9°19'59.76" E
 AHEAD = N 1°45'24.70" E



HYDRAULIC DATA TABLE

EXIST HW2 = 336.12 ft	PROP HW2 = 336.17 ft
EXIST Q2 = 1,515 cfs	PROP Q2 = 1,515 cfs
EXIST V2 = 3.52 ft/s	PROP V2 = 2.72 ft/s
EXIST HW100 = 340.87 ft	PROP HW100 = 340.89 ft
EXIST Q100 = 10,112 cfs	PROP Q100 = 10,112 cfs
EXIST V100 = 5.19 ft/s	PROP V100 = 5.17 ft/s

ALL ABUTS AND BENTS ARE ON BEARING N 76°45'25" E

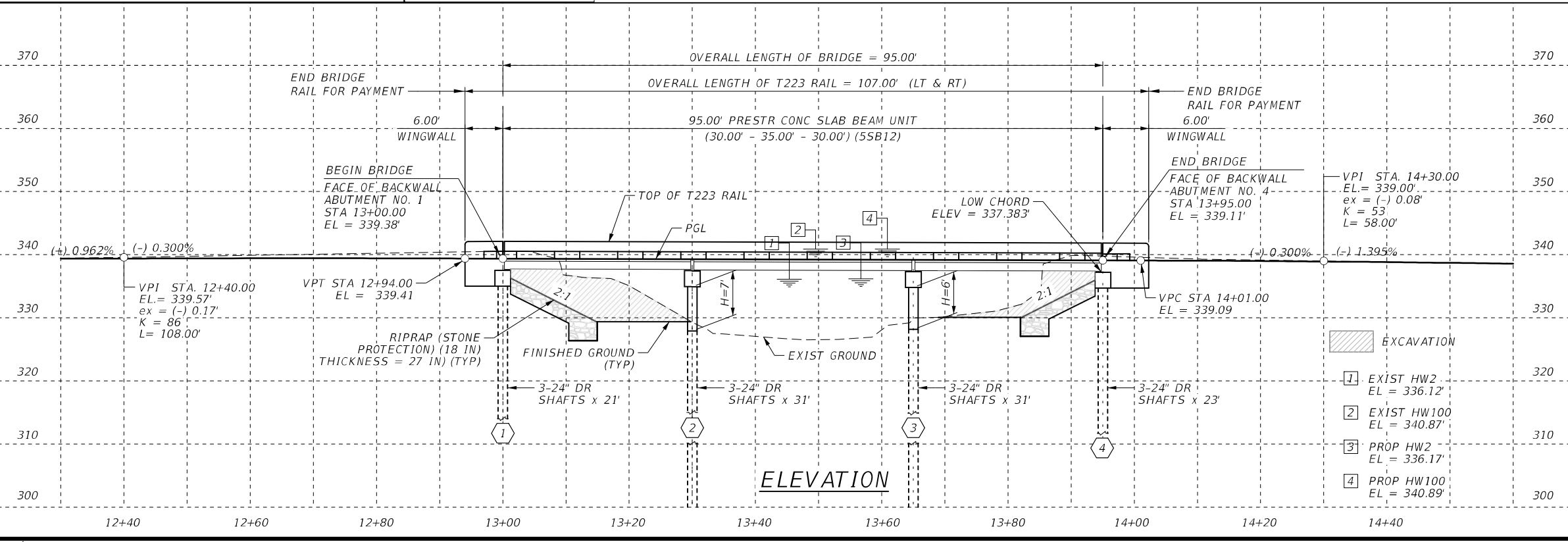
EXISTING SINGLE SPAN STEEL RAILROAD FLATCAR BRIDGE (85'-0" LENGTH X 17.8' WIDTH) TO BE REMOVED. CONCRETE ABUTMENTS AND WINGWALLS TO BE REMOVED. FOUNDATIONS TO BE REMOVED TO 2'-0" MINIMUM BELOW FINISHED GROUND.

EXIST NBI NUMBER: 13-076-0-AA01-27-002
 PROP NBI NUMBER: 13-076-0-AA04-77-002
 FUNCTIONAL CLASSIFICATION: LOCAL RURAL ROAD
 DESIGN SPEED: MEETS OR IMPROVES EXISTING ADT: 32 VPD (2017), 45 VPD (2040)

GENERAL NOTES:

- DESIGNED ACCORDING TO AASHTO LRFD BRIDGE DESIGN SPECIFICATIONS, 9TH EDITION (2020) AND TXDOT BRIDGE DESIGN MANUAL (NOV 2021).
- USE OPTION 1 FOR CONFIGURATION OF CEMENT STABILIZED BACKFILL BEHIND ABUTMENTS. SEE CSAB STANDARD FOR DETAILS.
- SEE BRIDGE BORING LOG SHEET FOR GEOTECHNICAL INFORMATION.
- THE "H" VALUES SHOWN ARE ESTIMATED COLUMN HEIGHTS. THE CONTRACTOR IS RESPONSIBLE FOR CALCULATING ACTUAL COLUMN HEIGHTS BASED ON FIELD CONDITIONS.

HL93 LOADING
 SUPERSTRUCTURE INV/OPR RATINGS: 1.25/1.62



10/12/2022

NO.	REVISION	BY	DATE

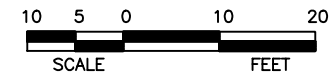
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 Houston, TX 77084
 TBPE # F-2263

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 SOUTH OLD SMITHVILLE RD (CR477) AT LIVE OAK CREEK
 BRIDGE LAYOUT
 LIVE OAK CREEK BRIDGE

CSJ 0913-28-086 SHEET 1 OF 1

Designed: SP	FED. RD. DIV. NO. 6	STATE TEXAS	FEDERAL AID PROJECT NO.	HIGHWAY NO. CR
Checked: CF	DIST. YKM	COUNTY FAYETTE	CONTROL NO. 0913	SECTION NO. 28
Drawn: DQ	JOB NO. 083, ETC.	SHEET NO. 74		

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GENERAL NOTES:

1. BORING LOGS REPLICATED FROM CORSAIR CONSULTING, LLC. BORINGS TAKEN ON MAY 14 AND 15, 2022.

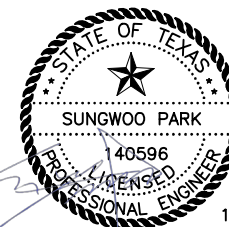
2. GROUNDWATER ENCOUNTERED AT DEPTHS OF 15 FEET FOR BR-11 AND 13 FEET FOR BR-12.

ANY GROUNDWATER ELEVATION INFORMATION IS REPRESENTATIVE OF CONDITIONS EXISTING ON THE DAY AND FOR THE SPECIFIC LOCATION WHERE THIS INFORMATION WAS COLLECTED.

ACTUAL GROUNDWATER ELEVATION MAY FLUCTUATE DUE TO TIME, CLIMATE CONDITIONS, AND/OR CONSTRUCTION ACTIVITY.

3. CONTRACTOR'S ATTENTION IS BROUGHT TO WATER BEARING SANDY SOILS SHOWN IN BORING LOGS.

= GROUNDWATER



NO.	REVISION	BY	DATE

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Houston, TX 77084
TBPE # F-2263

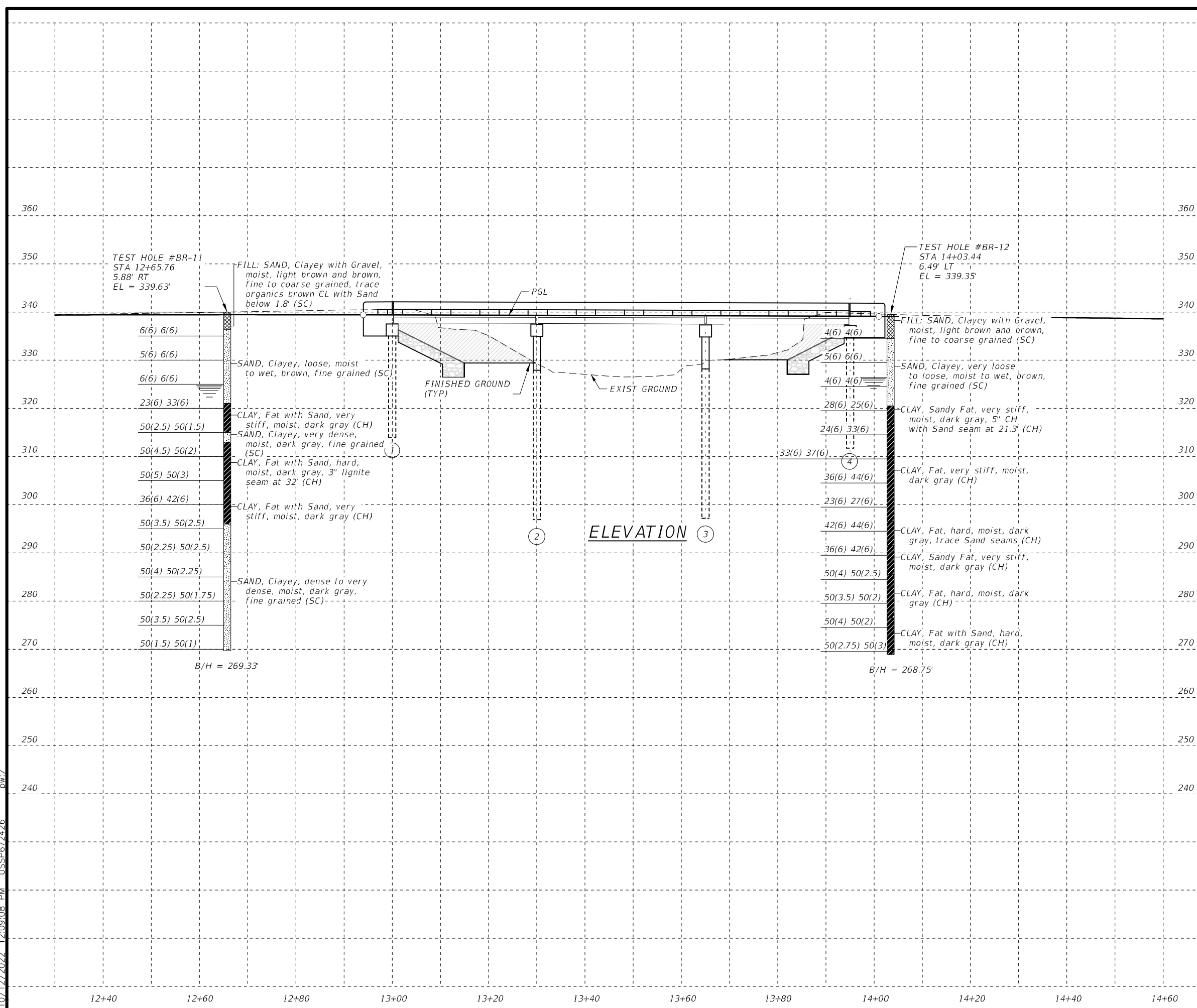
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SOUTH OLD SMITHVILLE RD (CR477) AT LIVE OAK CREEK

**BRIDGE BORING LOGS
LIVE OAK CREEK BRIDGE**

CSJ 0913-28-086 SHEET 1 OF 1

Designed:	SP	FED. RD. DIV. NO.	STATE	FEDERAL AID PROJECT NO.	HIGHWAY NO.
Checked:	CF	6	TEXAS		CR
Drawn:	DQ	DIST.	COUNTY	CONTROL NO.	SECTION NO.
Checked:	SP	YKM	FAYETTE	0913	28
				083, ETC.	75



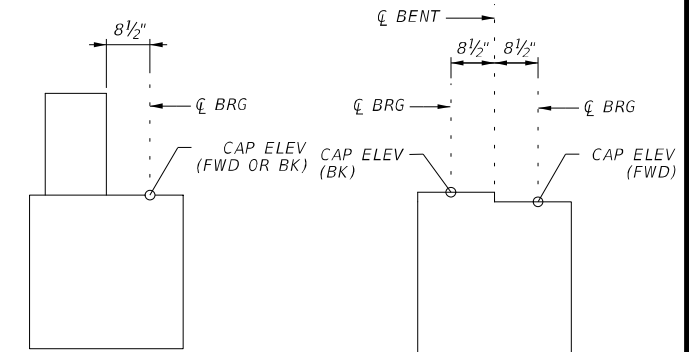
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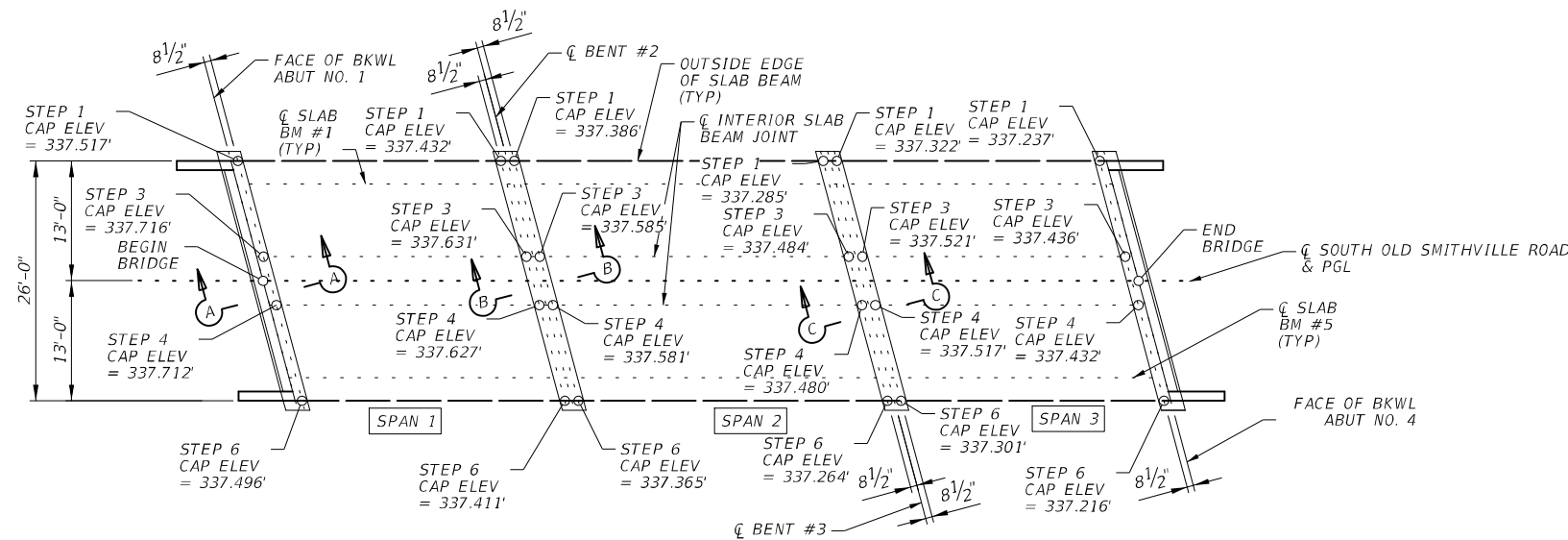
SUMMARY OF ESTIMATED QUANTITIES

ITEM DESCRIPTION	400 6005	416 6002	420 6013	420 6029	420 6037	422 6007	425 6010	432 6033	450 6006	454 6004
BID ITEM DESCRIPTION	CEM STABIL BKFL	DRILL SHAFT (24 IN)	CL C CONC (ABUT)	CL C CONC (CAP)	CL C CONC (COLUMN)	REINF CONC SLAB (SLAB BEAM)	PRESTR CONC SLAB BEAM (55B12)	RIPRAP (STONE PROTECTION) (18 IN)	RAIL (TY T223)	ARMOR JOINT (SEALED)
BRIDGE ELEMENT										
2 - ABUTMENTS	CY 26	LF 132	CY 18.2	CY 13.8	CY 4.5	SF	LF	CY 239	LF 24.0	LF 46
2 - INTERIOR BENTS		186								
1 - 95.00' PRESTR CONC SLAB BEAM UNIT						2,470	467.5		190.0	
TOTAL	26	318	18.2	13.8	4.5	2,470	467.5	239	214.0	46

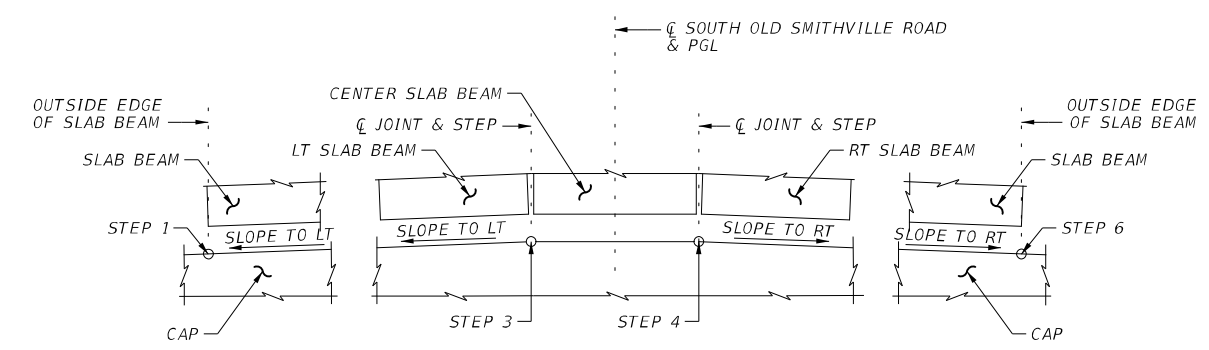


SECTION A-A

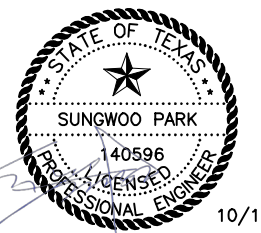
SECTION B-B



PLAN OF STEP LOCATIONS



COMMON TRANSVERSE SECTION AT STEP LOCATIONS



10/12/2022

NO.	REVISION	BY	DATE

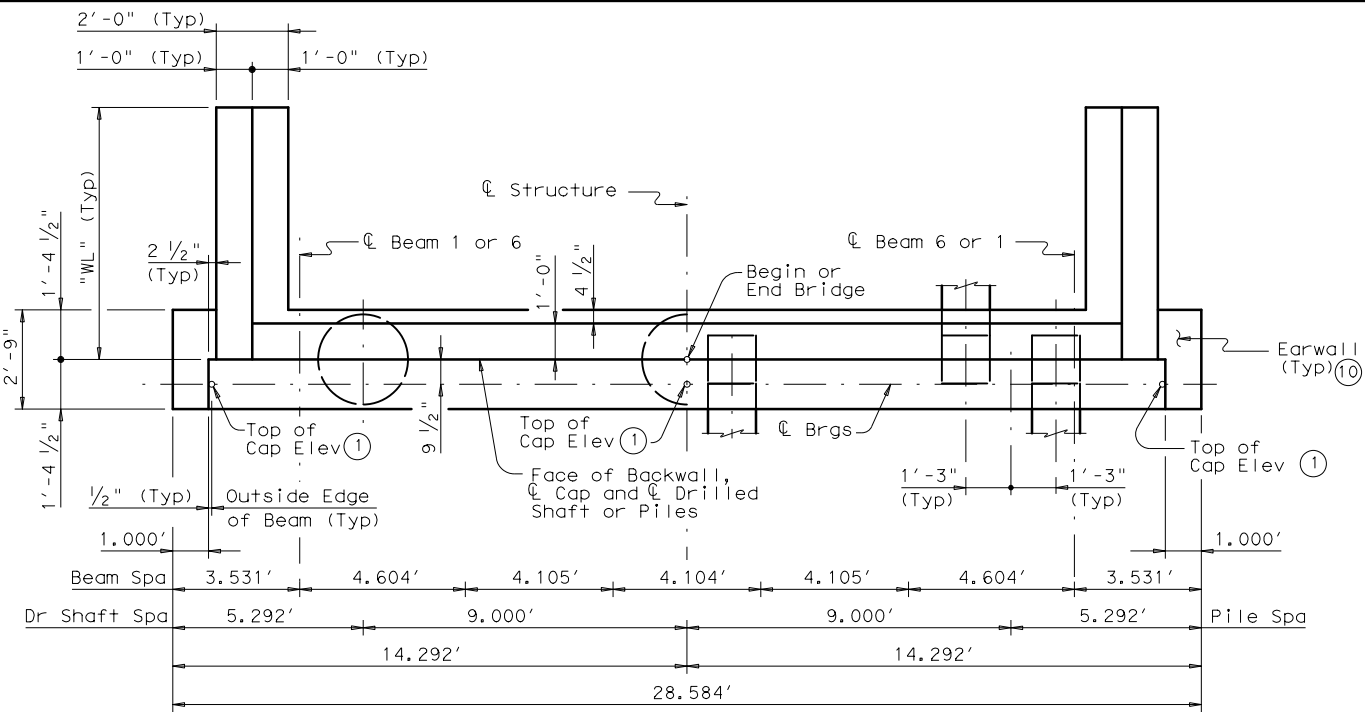
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Houston, TX 77084
TBPE # F-2263

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SOUTH OLD SMITHVILLE RD (CR477) AT LIVE OAK CREEK
ESTIMATED QUANTITIES & CAP ELEVATIONS
LIVE OAK CREEK BRIDGE
CSJ 0913-28-086 SHEET 1 OF 1

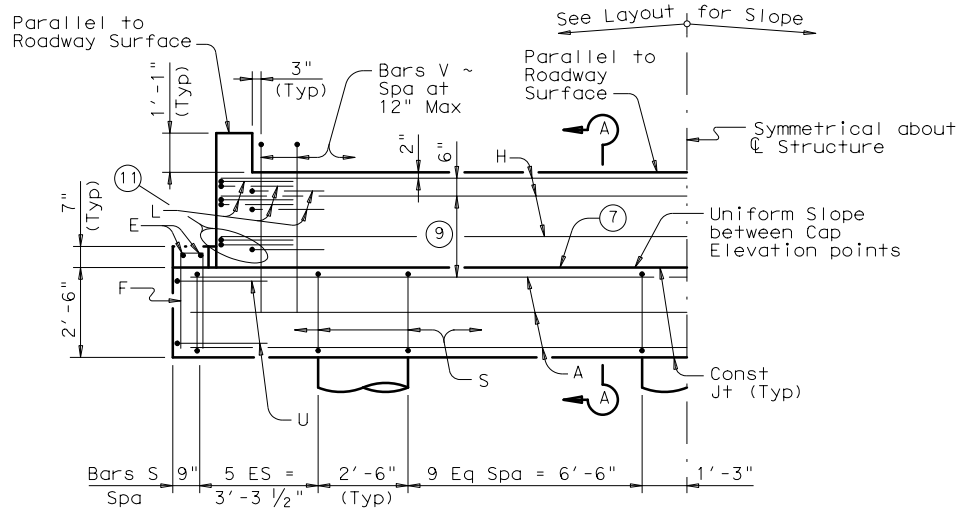
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Checked:	6	TEXAS		CR		
Drawn:	DIST.	COUNTY	CONTROL NO.	SECTION NO.	JOB NO.	SHEET NO.
Checked:	YKM	FAYETTE	0913	28	083, ETC.	76

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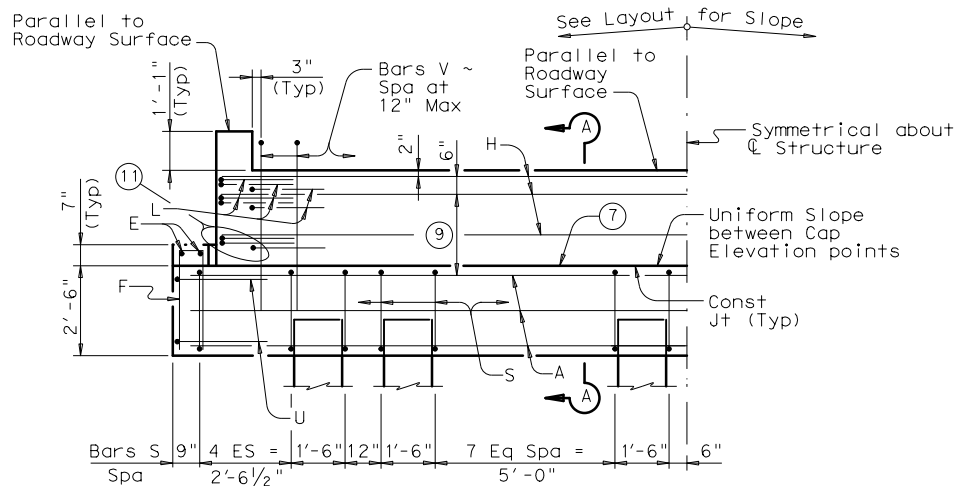
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SHOWING DRILLED SHAFTS **PLAN** SHOWING BATTERED PILES

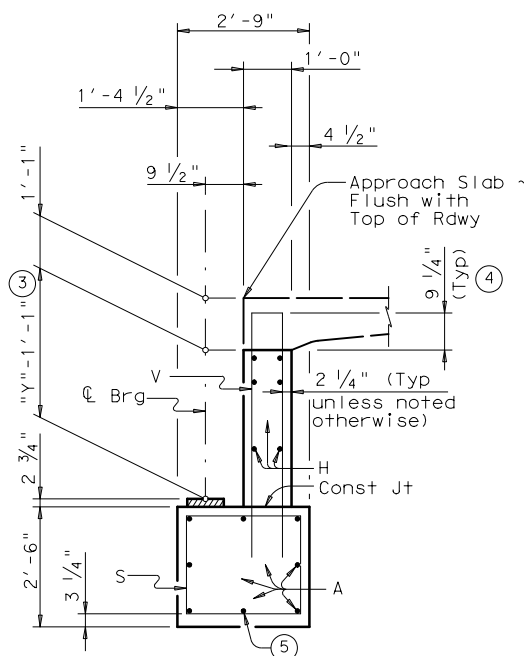


HALF ELEVATION ~ DRILLED SHAFT ABUTMENT

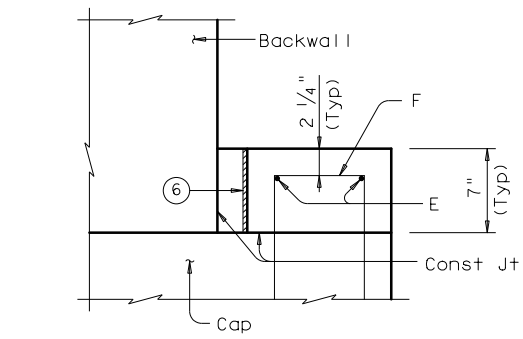


HALF ELEVATION ~ PILE ABUTMENT

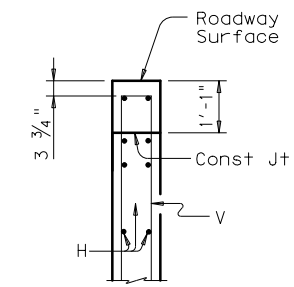
(Showing 16" Piles ~ for Piles larger than 16", adjust Bars S spacing as required to avoid Piling)



SECTION A-A
(Showing Approach Slab) 2



EARWALL ELEVATION DETAIL 10
(Slope top of earwall away from beams)



BACKWALL DETAIL
(Without Approach Slab) 2

TABLE OF WINGWALL LENGTHS "WL"	
Beam Type	"WL"
B20	8.000'
B28	10.000'
B34	11.000'

TABLE OF FOUNDATION LOADS 8		
Span Length	Drilled Shaft Load	Battered Pile Load
Ft	Tons/DS	Tons/Pile
30	50	38
35	55	41
40	60	43
45	64	45
50	68	47
55	73	50
60	77	52
65	81	54
70	85	56
75	89	58
80	93	60
85	97	62
90	101	64
95	105	66

- 1 Top of Cap Elevations are based on section depths shown on Span Details.
- 2 See Bridge Layout for Joint type and to determine if Approach Slab is present.
- 3 See Span details for "Y" value.
- 4 Increase as required to maintain 3 3/4" from Finished Grade.
- 5 With pile foundations, replace Bar A, located at bottom centerline of cap with 2 ~ #1 x 5'-0" bars placed between pile groups. Deduct 93 Lbs from reinforcing steel total.
- 6 1/2" Preformed Bituminous Fiber material between beam and earwall. Bond to beam with an approved adhesive. Inside face of earwall to be cast with vertical side of beam.
- 7 Surface finish for the top of Cap will be a textured wood float finish. The surface must be level in the direction of the centerline of Beams.
- 8 Foundation loads are based on B34 beams.
- 9 Use 2 Eq Spa for B28 and B34 beams. Use 1 space for B20 beams.
- 10 Do not cast earwalls until beams are erected in their final position.
- 11 This set of Bars L only required for B28 and B34 beams.

GENERAL NOTES:
 Designed according to AASHTO LRFD Specifications.
 Concrete strength $f'_c = 3,600$ psi.
 All reinforcing must be Grade 60.
 Designed for normal embankment header slope of 3:1 or 2:1.
 See Bridge Layout for beam type and foundation type, size and length.
 See standard FD for all foundation details and notes.
 See applicable rail details for rail anchorage cast in wingwalls.
 See standard CRR for riprap attachment details, if applicable.
 These abutment details may be used only with the following standards:
 SBBS-B20-24 or SBBO-B20-24
 SBBS-B28-24 or SBBO-B28-24
 SBBS-B34-24 or SBBO-B34-24

ABUTMENTS
PRESTR CONC BOX BEAMS
24' RDWY

ABB-24

FILE: bbstde17.dgn	DN: TxDOT	CK: TxDOT	DW: TxDOT	CK: TxDOT
©TxDOT December, 2006	CONT	SECT	JOB	HIGHWAY
REVISIONS	0913	28	083, ETC	CR
04-11: Span length.	DIST	COUNTY	SHEET NO.	
	YKM	FAYETTE	77	

Bridge Division Standard

DATE: FILE:

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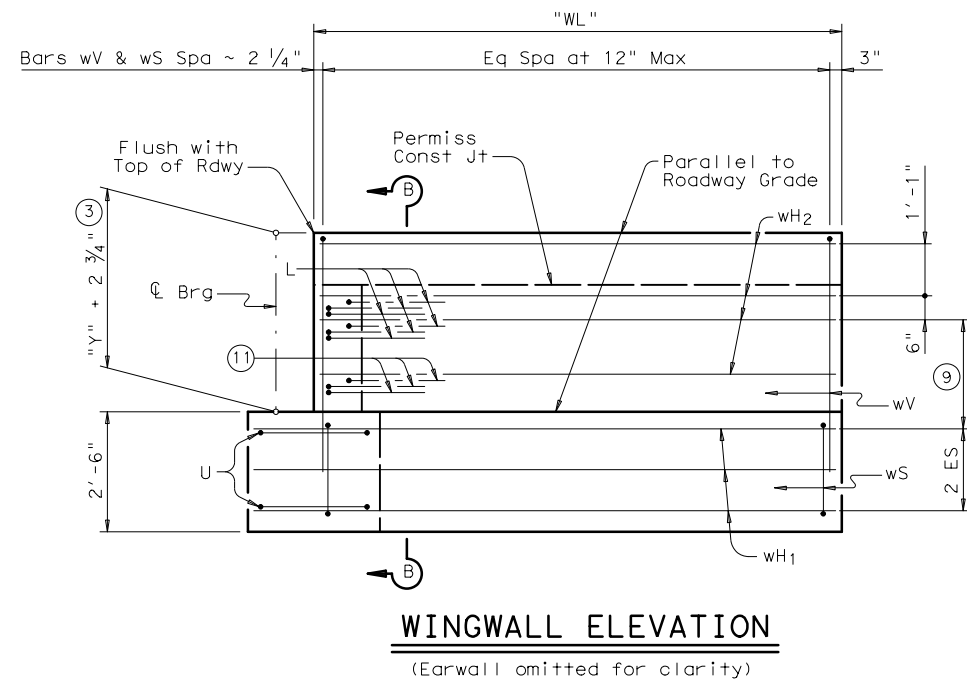
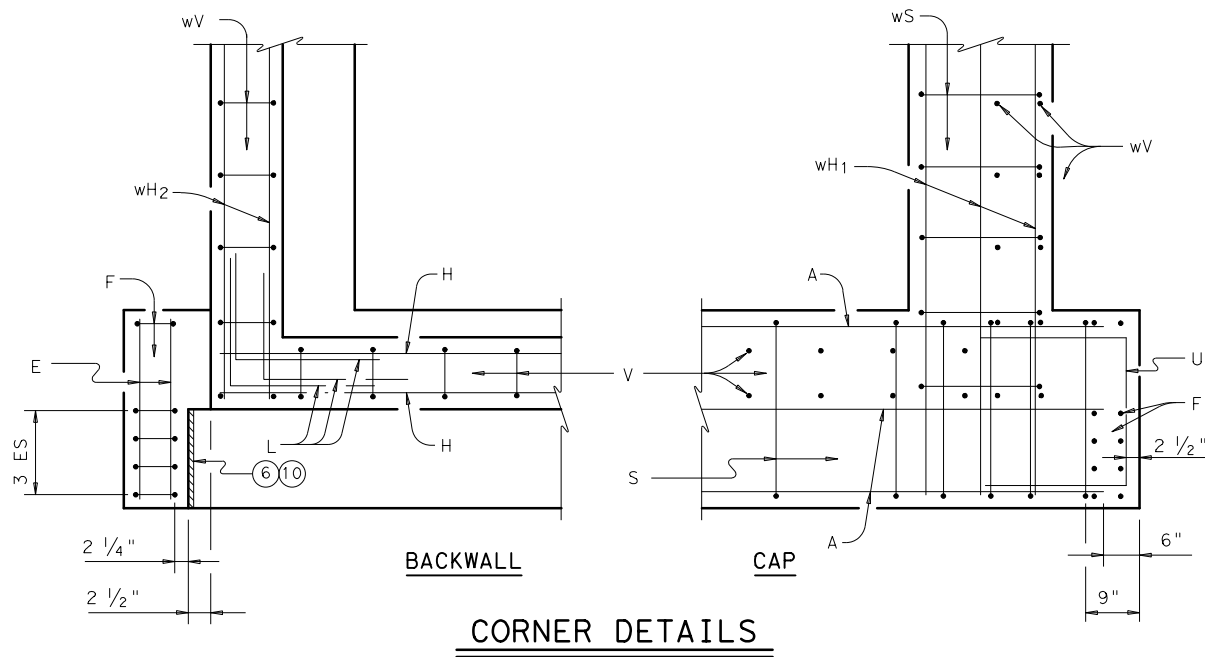


TABLE OF ESTIMATED QUANTITIES (TYPE B20 BEAMS)⁽¹²⁾

BAR	NO.	SIZE	LENGTH	WEIGHT
A (5)	8	#11	27'- 7"	1,172
E	4	# 5	2'- 5"	10
F	10	# 5	6'- 1"	63
H	4	# 6	25'-10"	155
L	12	# 6	4'- 0"	72
S	32	# 4	9'- 8"	207
U	4	# 6	7'- 3"	44
V	25	# 5	7'- 6"	191
wH1	14	# 6	9'- 0"	189
wH2	12	# 6	7'- 8"	138
wS	18	# 4	7'- 9"	93
wV	18	# 5	7'- 9"	145
Reinforcing Steel			Lb	2,479
Class "C" Concrete (w/Slab)			CY	12.6
Class "C" Concrete (w/ACP)			CY	12.3

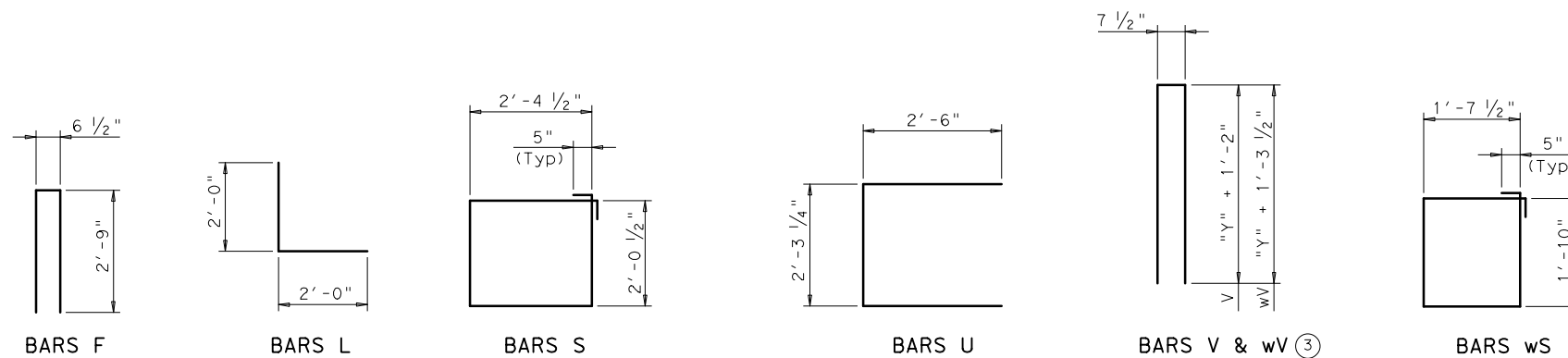
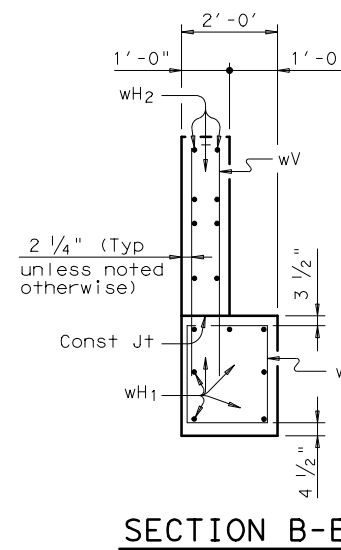
TABLE OF ESTIMATED QUANTITIES (TYPE B28 BEAMS)⁽¹²⁾

BAR	NO.	SIZE	LENGTH	WEIGHT
A (5)	8	#11	27'- 7"	1,172
E	4	# 5	2'- 5"	10
F	10	# 5	6'- 1"	63
H	6	# 6	25'-10"	233
L	18	# 6	4'- 0"	108
S	32	# 4	9'- 8"	207
U	4	# 6	7'- 3"	44
V	25	# 5	8'- 9"	226
wH1	14	# 6	11'- 0"	231
wH2	16	# 6	9'- 8"	232
wS	22	# 4	7'- 9"	114
wV	22	# 5	9'- 0"	207
Reinforcing Steel			Lb	2,847
Class "C" Concrete (w/Slab)			CY	14.7
Class "C" Concrete (w/ACP)			CY	14.4

TABLE OF ESTIMATED QUANTITIES (TYPE B34 BEAMS)⁽¹²⁾

BAR	NO.	SIZE	LENGTH	WEIGHT
A (5)	8	#11	27'- 7"	1,172
E	4	# 5	2'- 5"	10
F	10	# 5	6'- 1"	63
H	6	# 6	25'-10"	233
L	18	# 6	4'- 0"	108
S	32	# 4	9'- 8"	207
U	4	# 6	7'- 3"	44
V	25	# 5	9'-10"	254
wH1	14	# 6	12'- 0"	252
wH2	16	# 6	10'- 8"	256
wS	24	# 4	7'- 9"	124
wV	24	# 5	10'- 1"	252
Reinforcing Steel			Lb	2,975
Class "C" Concrete (w/Slab)			CY	16.2
Class "C" Concrete (w/ACP)			CY	15.9

- (3) See Span details for "Y" value.
- (5) With pile foundations, replace Bar A, located at bottom centerline of cap, with 2 ~ #11 x 5'-0" bars placed between pile groups. Deduct 93 Lbs from reinforcing steel total.
- (6) 1/2" Preformed Bituminous Fiber material between beam and earwall. Bond to beam with an approved adhesive. Inside face of earwall to be cast with vertical side of beam.
- (9) Use 2 Eq Spa for B28 and B34 beams and 1 space for B20 beams.
- (10) Do not cast earwalls until beams are erected in their final position.
- (11) This set of Bars L only required for B28 and B34 beams.
- (12) Quantities shown are for one Abutment only (with Approach Slab). With no Approach Slab, add 1.0 CY Class "C" concrete and 78 Lb reinforcing steel for 2 additional Bars H.



HL93 LOADING SHEET 2 OF 2

Texas Department of Transportation Bridge Division Standard

ABUTMENTS
PRESTR CONC BOX BEAMS
24' RDWY

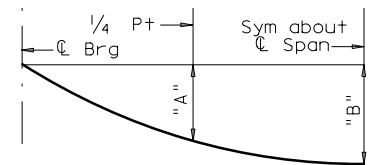
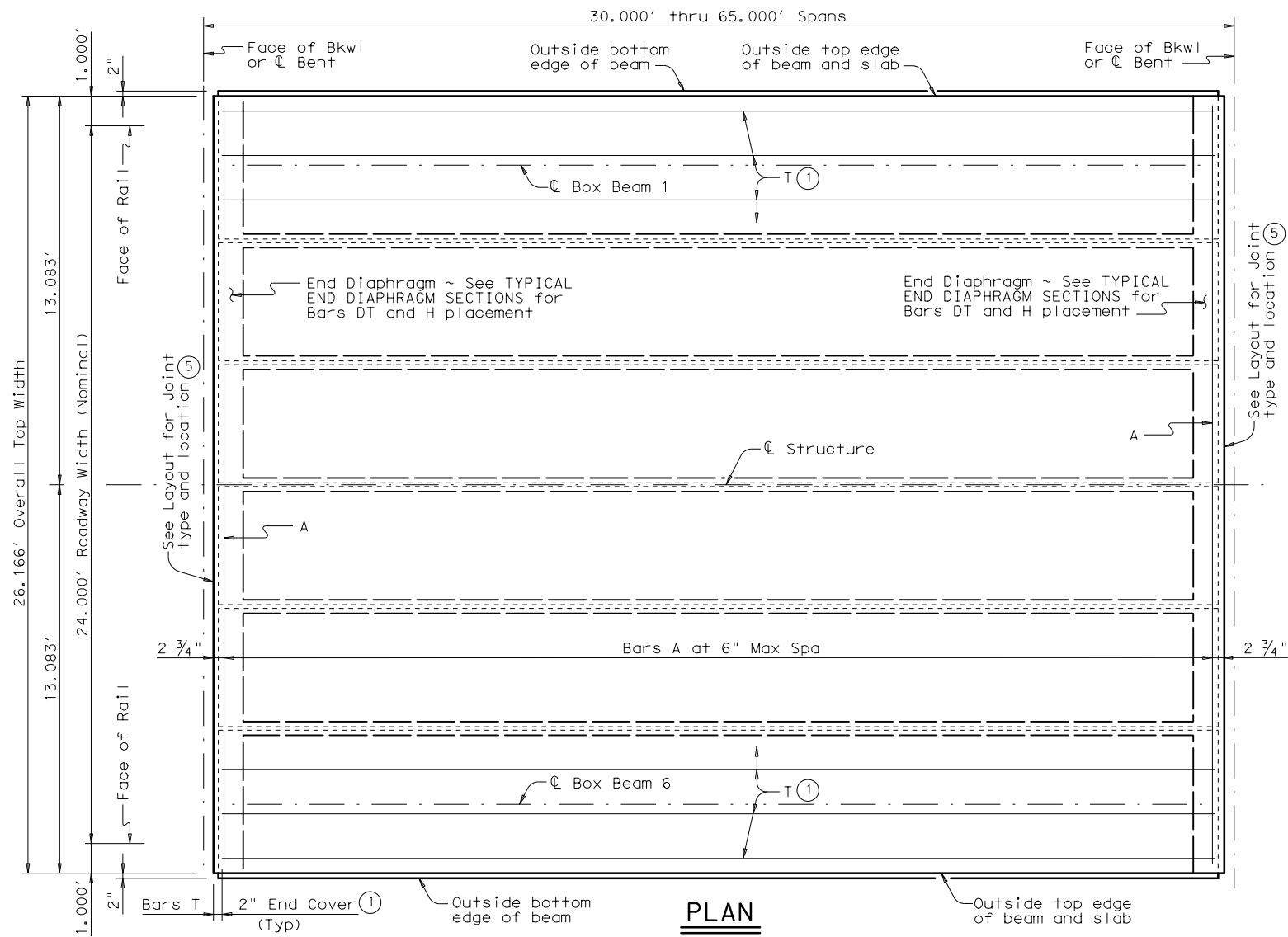
ABB-24

FILE: bbstde17.dgn	DN: TxDOT	CK: TxDOT	DW: TxDOT	CK: TxDOT
REVISIONS	CONT	SECT	JOB	HIGHWAY
0913	28	083, ETC	CR	
04-11: Span length.	DIST	COUNTY	SHEET NO.	
	YKM	FAYETTE	78	

DATE:
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Note: Deflections shown are due to shear key and concrete slab only, ($E_c = 5 \times 10^3$ ksi). Calculated deflections shown are theoretical and actual dimension may be less. Deflections may be adjusted based on field observation.

DEAD LOAD DEFLECTION DIAGRAM

TABLE OF DEFLECTIONS AND SECTION DEPTHS

SPAN LENGTH (FT)	BEAM NO.	POINT	DEAD LOAD DEFLECTIONS (FT)			SECTION DEPTHS	
			SHEAR KEY	SLAB	TOTAL	"X" AT \ominus BRG (2)	"Y" AT \ominus BRG (2)
30	ALL	"A"	0.000	0.002	0.002	5 $\frac{1}{4}$ "	2'-1 $\frac{1}{4}$ "
		"B"	0.001	0.002	0.003	5 $\frac{1}{4}$ "	2'-1 $\frac{1}{4}$ "
35	ALL	"A"	0.001	0.003	0.004	5 $\frac{1}{4}$ "	2'-1 $\frac{1}{4}$ "
		"B"	0.001	0.004	0.005	5 $\frac{1}{4}$ "	2'-1 $\frac{1}{4}$ "
40	ALL	"A"	0.002	0.005	0.007	5 $\frac{1}{4}$ "	2'-1 $\frac{1}{4}$ "
		"B"	0.003	0.007	0.010	5 $\frac{1}{4}$ "	2'-1 $\frac{1}{4}$ "
45	ALL	"A"	0.003	0.009	0.012	5 $\frac{1}{2}$ "	2'-1 $\frac{1}{2}$ "
		"B"	0.004	0.012	0.016	5 $\frac{1}{2}$ "	2'-1 $\frac{1}{2}$ "
50	ALL	"A"	0.005	0.013	0.018	5 $\frac{3}{4}$ "	2'-1 $\frac{3}{4}$ "
		"B"	0.006	0.019	0.025	5 $\frac{3}{4}$ "	2'-1 $\frac{3}{4}$ "
55	ALL	"A"	0.007	0.019	0.026	6 $\frac{1}{4}$ "	2'-2 $\frac{1}{4}$ "
		"B"	0.010	0.027	0.037	6 $\frac{1}{4}$ "	2'-2 $\frac{1}{4}$ "
60	ALL	"A"	0.010	0.028	0.038	6 $\frac{3}{4}$ "	2'-2 $\frac{3}{4}$ "
		"B"	0.014	0.039	0.053	6 $\frac{3}{4}$ "	2'-2 $\frac{3}{4}$ "
65	ALL	"A"	0.013	0.039	0.052	7"	2'-3"
		"B"	0.019	0.054	0.073	7"	2'-3"

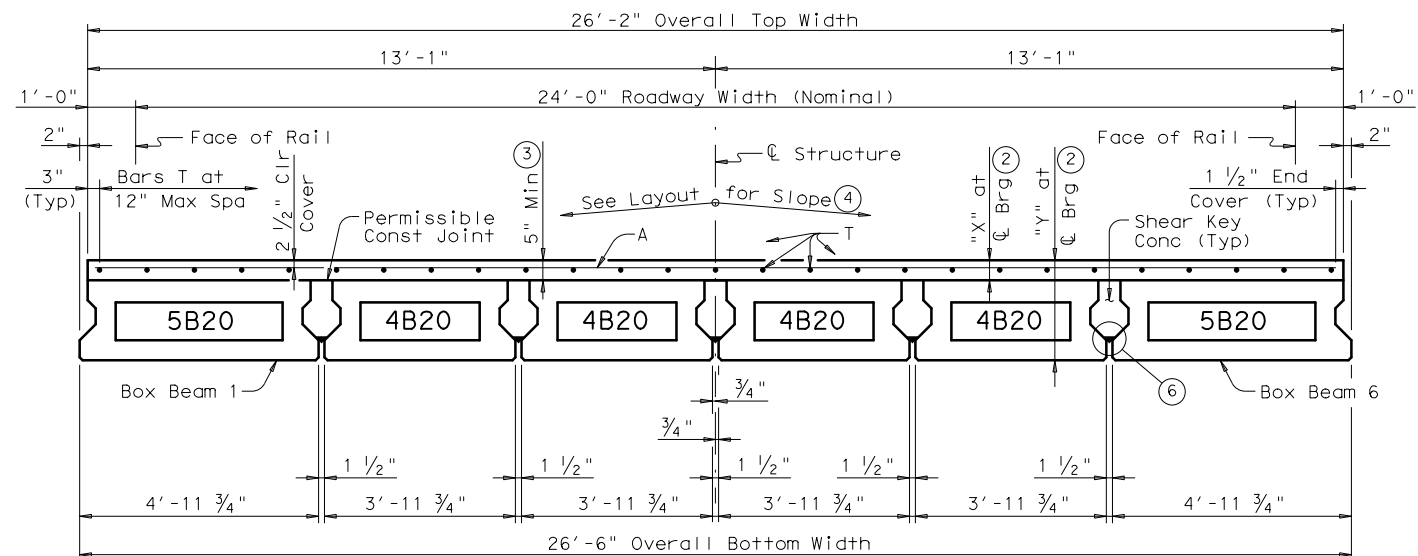
- (1) If multi-span units (with slab continuous over interior Bents) are indicated on the Bridge Layout, Bars T must be continuous through joint. See Continuous Slab Detail.
- (2) Based on theoretical beam camber, dead load deflections of 5" Cast-in-place slab, shear key dead load and a constant grade. The contractor must adjust these values for any vertical curve.
- (3) Slab thickness at midspan of Beams may not exceed 7 inches.
- (4) This standard does not provide for changes in roadway cross slopes within the structure.
- (5) If using Type A expansion joints, the maximum distance between joints is 100 feet.
- (6) Form bottom of shear keys with foam backer rod or other material acceptable to the Engineer.

BAR TABLE

BAR	SIZE
A	#4
DT	#4
H	#5
T	#4

GENERAL NOTES:

Designed according to AASHTO LRFD Specifications.
 Provide Class S concrete ($f'c = 4,000$ psi) for slab and shear key.
 Provide Class S (HPC) concrete if shown elsewhere in the plans.
 All reinforcing must be Grade 60.
 Two-span or three-span units, with the slab continuous over Interior Bents, may be formed with the details on this standard. Unit Length cannot exceed 3.5 times length of the shortest end span.
 Bar laps, where required, will be as follows:
 Uncoated ~ #4 = 1'-5"
 Epoxy coated ~ #4 = 2'-1"
 It is recommended, with crown cross-slope, to erect beams adjacent to crown point first. For structures without a crown point, it is recommended to erect beams on the high side of cross-slope first and progress to the low side.
 This sheet does not support the use of Transition Bents.
 See railing details and standard BBRAS for rail anchorage.



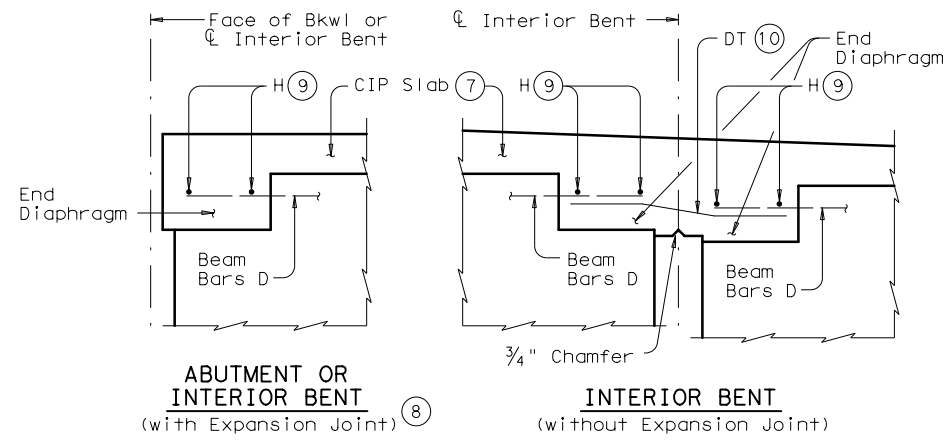
Texas Department of Transportation
 Bridge Division Standard

PRESTRESSED CONCRETE BOX BEAM SPANS
 TYPE B20 24' RDWY (WITH SLAB)
SBBS-B20-24

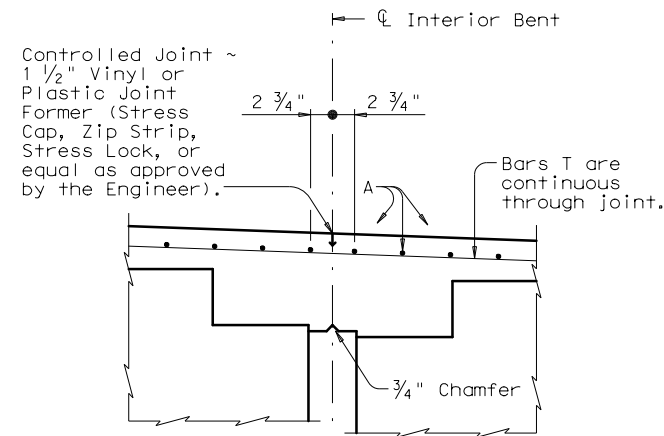
FILE: bbstds19.dgn	DN: TxDOT	CK: TxDOT	DW: TxDOT	CK: TxDOT
©TxDOT December, 2006	CONT	SECT	JOB	HIGHWAY
REVISIONS	0913	28	083, ETC	CR
01-12: Cover	DIST	COUNTY	SHEET NO.	
10-15: Table of Est Quantities, Notes.	YKM	FAYETTE	79	

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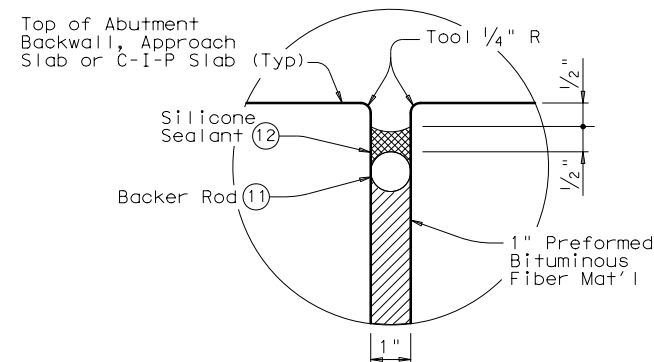
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TYPICAL END DIAPHRAGM SECTIONS
(along centerline of Box Beam)



CONTINUOUS SLAB DETAIL
(Diaphragm reinforcing not shown for clarity)



TYPE A JOINT DETAIL 5

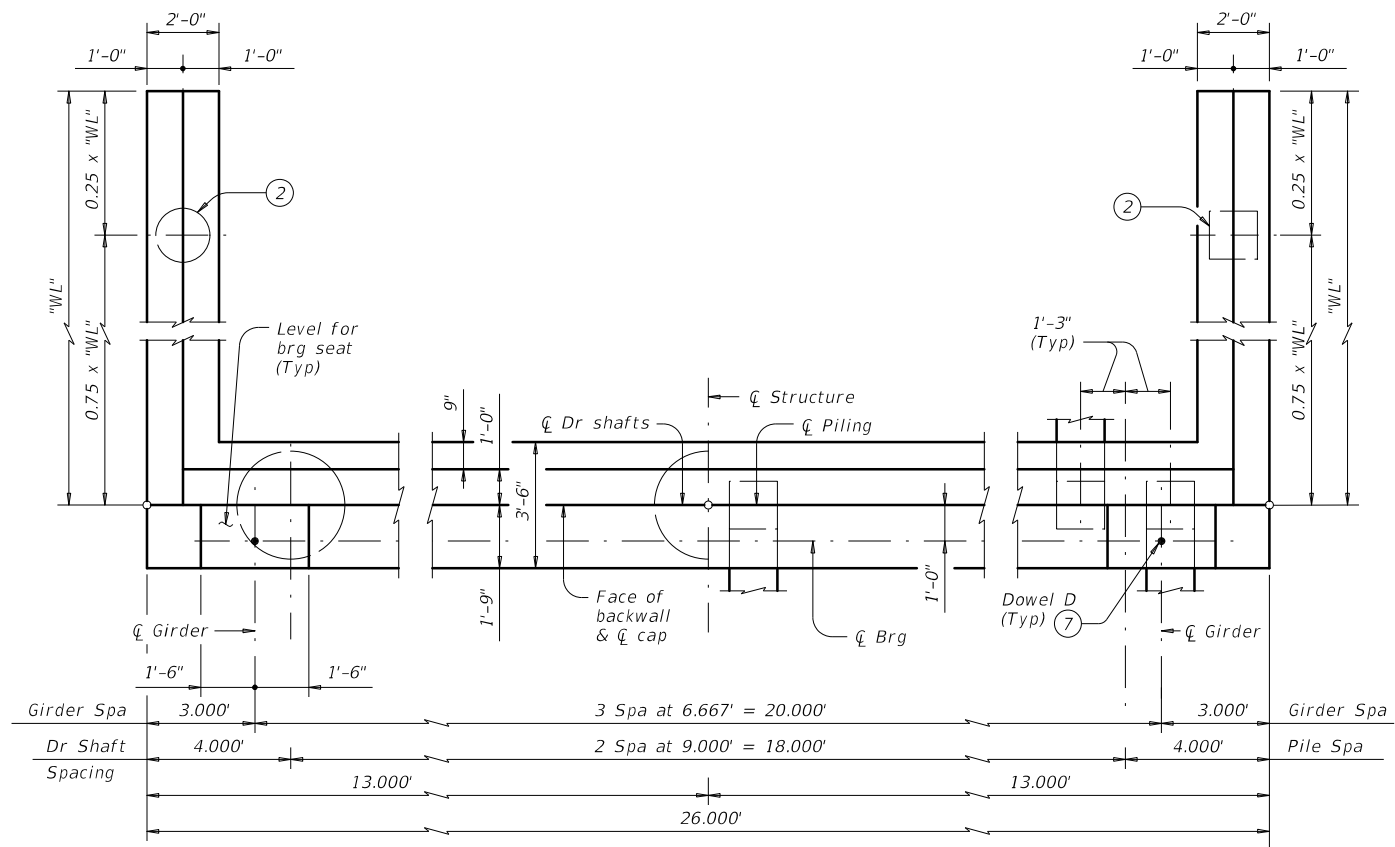
TABLE OF ESTIMATED QUANTITIES					
SPAN LENGTH	SHEAR KEY	REINF CONC SLAB (BOX BEAM)	PRESTR CONCRETE BOX BEAMS (TY 4B20) 13	PRESTR CONCRETE BOX BEAMS (TY 5B20) 13	TOTAL REINF STEEL 14
FT	CY	SF	LF	LF	Lb
30	4.0	785	118.00	59.00	1,570
35	4.6	916	138.00	69.00	1,832
40	5.3	1,047	158.00	79.00	2,094
45	6.0	1,177	178.00	89.00	2,354
50	6.6	1,308	198.00	99.00	2,616
55	7.3	1,439	218.00	109.00	2,878
60	8.0	1,570	238.00	119.00	3,140
65	8.6	1,701	258.00	129.00	3,402

- 5 If using Type A expansion joints, the maximum distance between joints is 100 ft.
- 7 Slab reinforcing omitted for clarity.
- 8 See Bridge Layout for Joint type.
- 9 Provide 1 1/2" end cover to Bars H. After all beams have been placed, weld one Bar H to two Bars D at each end of all beams.
- 10 Lap Bars DT 9" Min with each Beam Bar D at Interior Bents without Expansion Joints. Bars DT shown bent for clarity only.
- 11 Backer rod must be 25% larger than joint opening and must be compatible with the sealant.
- 12 Use Class 7 silicone sealant. Prepare joint and seal in accordance with Item 438 "Cleaning and Sealing Joints".
- 13 Fabricator must adjust beam lengths for beam slopes as required.
- 14 Reinforcing steel weight is based on an approximate factor of 2.0 lbs per square foot of slab.

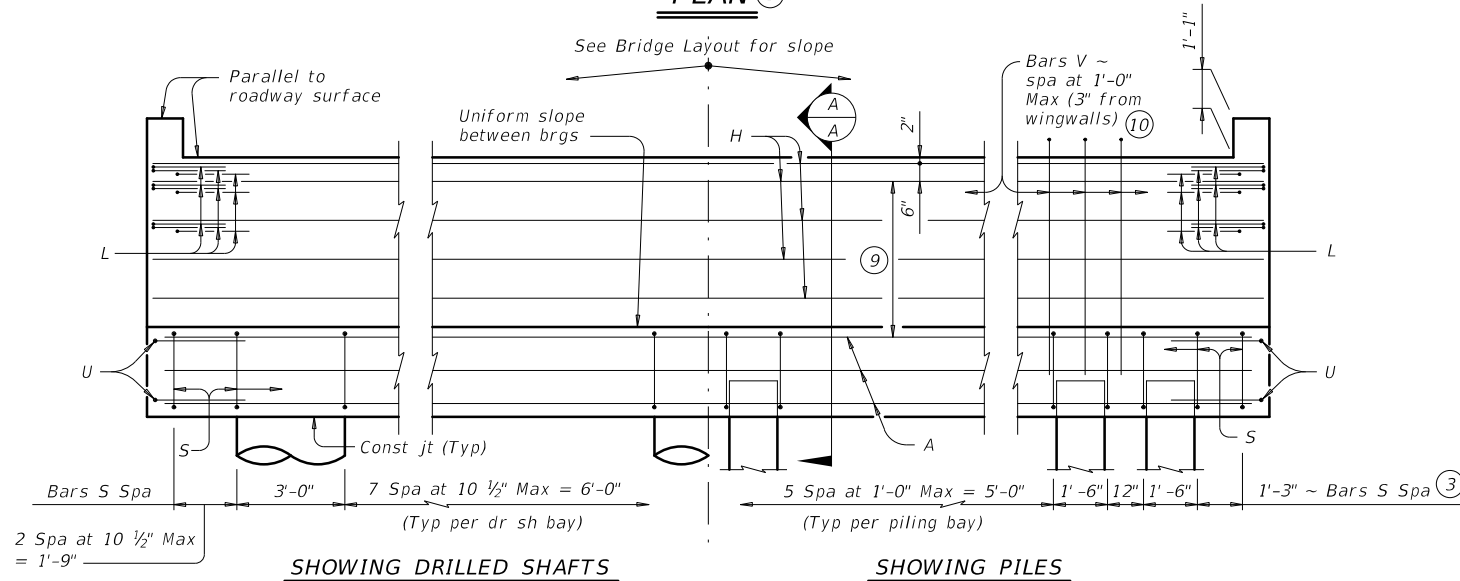
		Bridge Division Standard	
PRESTRESSED CONCRETE BOX BEAM SPANS TYPE B20 24' RDWY (WITH SLAB) SBBS-B20-24			
FILE: bbstds19.dgn	DN: TxDOT	CK: TxDOT	DW: TxDOT
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REVISIONS	0913	28	083, ETC
01-12: Cover, 10-15: Table of Est Quantities, Notes.	DIST	COUNTY	SHEET NO.
	YKM	FAYETTE	80

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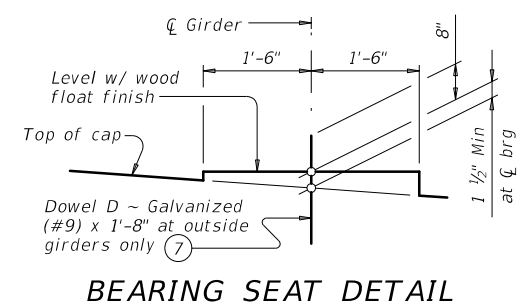


SHOWING DRILLED SHAFTS **PLAN 1** SHOWING PILES



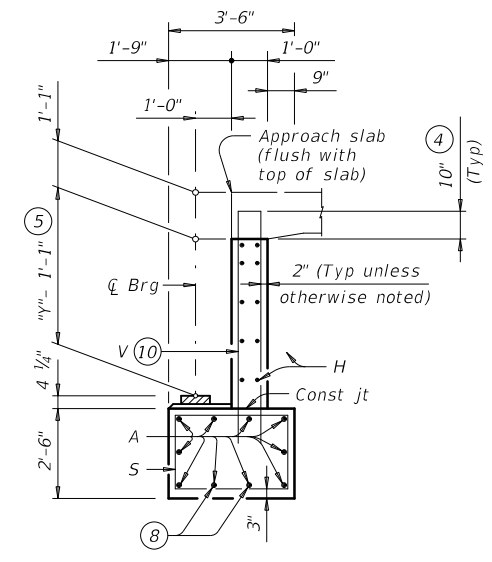
SHOWING DRILLED SHAFTS **ELEVATION** SHOWING PILES

Header Slope	Girder Type	Wingwall Type	Wingwall Lgth "WL"
2:1	Tx28	Cantilevered	8.000'
	Tx34	Cantilevered	9.000'
	Tx40	Cantilevered	10.000'
	Tx46	Cantilevered	11.000'
3:1	Tx54	Cantilevered	12.000'
	Tx28	Cantilevered	12.000'
	Tx34	Founded	13.000'
	Tx40	Founded	15.000'
	Tx46	Founded	16.000'
	Tx54	Founded	18.000'



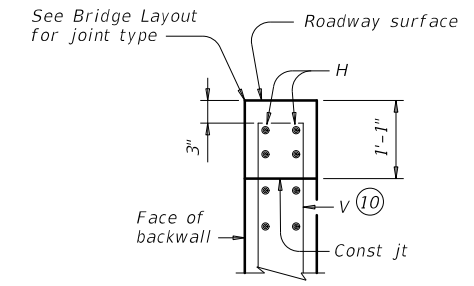
BEARING SEAT DETAIL

(Bearing surface must be clean and free of all loose material before placing bearing pad.)



SECTION A-A

(With approach slab) 6



BACKWALL DETAIL

(Without approach slab) 6

TABLE OF FOUNDATION LOADS

Span Length	All Girder Types	
	Tons/Shaft	Tons/Pile
40	64	54
45	69	56
50	73	59
55	77	61
60	81	63
65	85	65
70	88	67
75	92	69
80	96	71
85	100	73
90	104	75
95	108	77
100	111	79
105	115	80
110	119	82
115	123	84
120	126	86
125	130	88

- 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 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.
 These abutment details may be used with standard SIG-24 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.

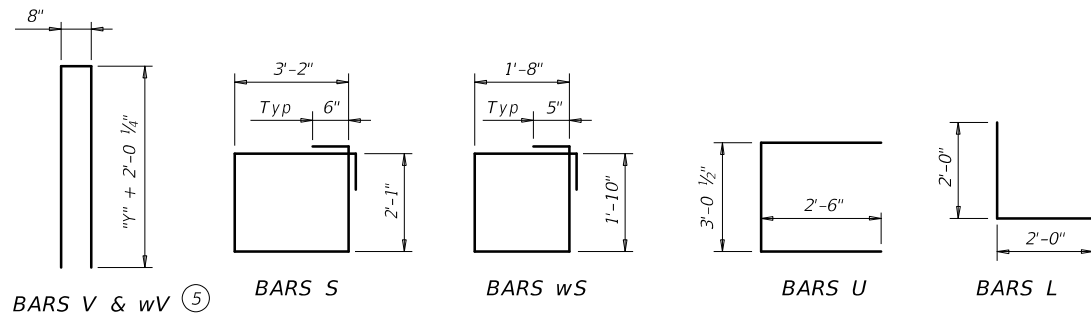
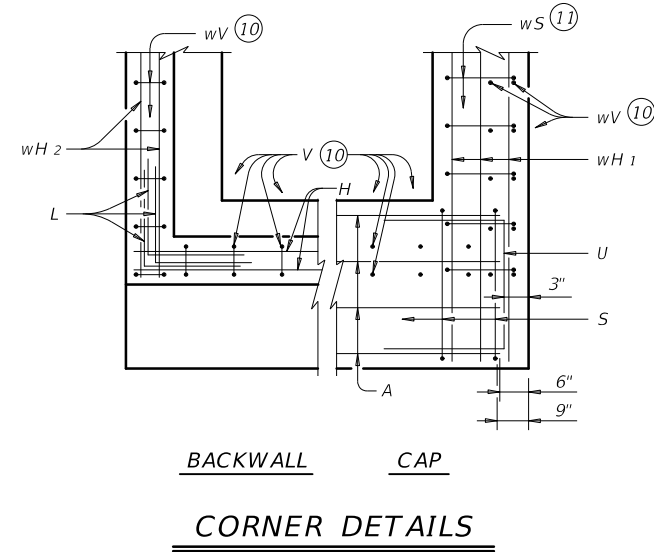
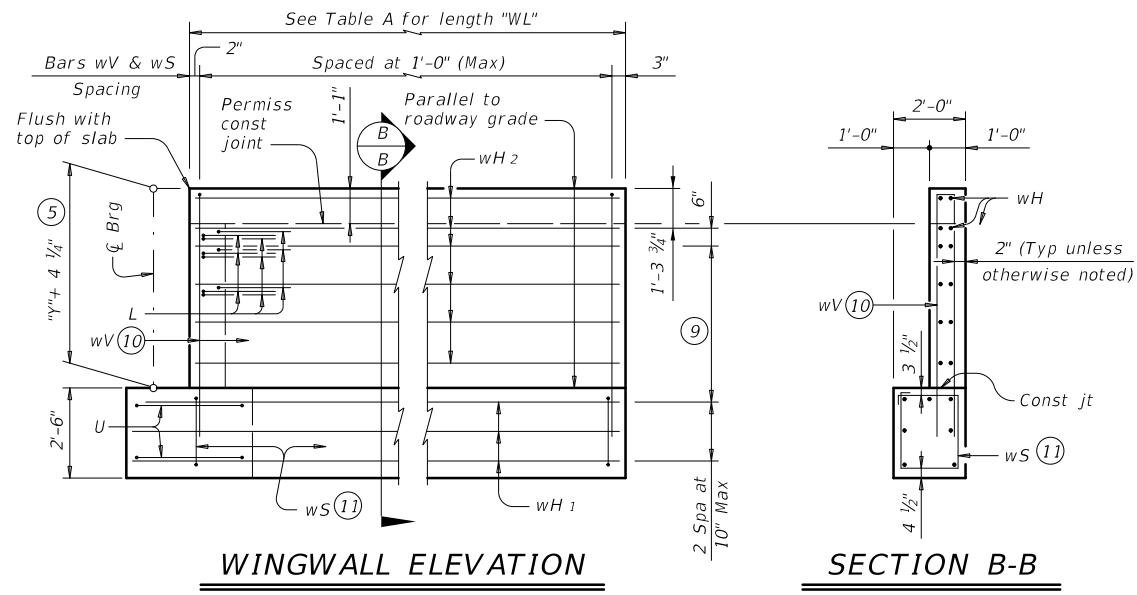


ABUTMENTS
 TYPE TX28 THRU TX54
 PRESTR CONC I-GIRDERS
 24' ROADWAY

FILE: aig01sts-17.dgn	DN: TAR	CK: KCM	DW: JTR	CK: TAR
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REVISIONS	0913	28	083, ETC	CR
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	YKM	FAYETTE	81	

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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

⑩ Field bend as needed to clear piles.

⑪ Adjust as required to avoid piling.

ABUTMENTS TYPE TX28 THRU TX54 PRESTR CONC I-GIRDERS 24' ROADWAY			
AIG-24			
FILE: aig01sts-17.dgn	DN: TAR	CK: KCM	DW: JTR
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REVISIONS	0913 28	083, ETC	CR
DIST	COUNTY	SHEET NO.	
YKM	FAYETTE	82	

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TABLES OF ESTIMATED QUANTITIES WITH 2:1 HEADER SLOPE ⁽¹²⁾

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	25'-0"	1,328	A	10	#11	25'-0"	1,328	A	10	#11	25'-0"	1,328	A	10	#11	25'-0"	1,328	A	10	#11	25'-0"	1,328					
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	25'-8"	308	H	8	#6	25'-8"	308	H	10	#6	25'-8"	386	H	10	#6	25'-8"	386	H	12	#6	25'-8"	463					
L	18	#6	4'-0"	108	L	18	#6	4'-0"	108	L	18	#6	4'-0"	108	L	18	#6	4'-0"	108	L	18	#6	4'-0"	108					
S	22	#5	11'-6"	264	S	22	#5	11'-6"	264	S	22	#5	11'-6"	264	S	22	#5	11'-6"	264	S	22	#5	11'-6"	264					
U	4	#6	8'-1"	49	U	4	#6	8'-1"	49	U	4	#6	8'-1"	49	U	4	#6	8'-1"	49	U	4	#6	8'-1"	49					
V	25	#5	11'-4"	296	V	25	#5	12'-4"	322	V	25	#5	13'-4"	348	V	25	#5	14'-4"	374	V	25	#5	15'-8"	409					
wH1	14	#6	9'-5"	198	wH1	14	#6	10'-5"	219	wH1	14	#6	11'-5"	240	wH1	14	#6	12'-5"	261	wH1	14	#6	13'-5"	282					
wH2	20	#6	7'-8"	230	wH2	20	#6	8'-8"	260	wH2	24	#6	9'-8"	348	wH2	24	#6	10'-8"	385	wH2	28	#6	11'-8"	491					
wS	18	#4	7'-10"	94	wS	20	#4	7'-10"	105	wS	22	#4	7'-10"	115	wS	24	#4	7'-10"	126	wS	26	#4	7'-10"	136					
wV	18	#5	11'-4"	213	wV	20	#5	12'-4"	257	wV	22	#5	13'-4"	306	wV	24	#5	14'-4"	359	wV	26	#5	15'-8"	425					
Reinforcing Steel				Lb	3,099	Reinforcing Steel				Lb	3,231	Reinforcing Steel				Lb	3,503	Reinforcing Steel				Lb	3,651	Reinforcing Steel				Lb	3,966
Class "C" Concrete				CY	15.2	Class "C" Concrete				CY	16.6	Class "C" Concrete				CY	18.1	Class "C" Concrete				CY	19.7	Class "C" Concrete				CY	21.6

TABLES OF ESTIMATED QUANTITIES WITH 3:1 HEADER SLOPE ⁽¹²⁾

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	25'-0"	1,328	A	10	#11	25'-0"	1,328	A	10	#11	25'-0"	1,328	A	10	#11	25'-0"	1,328	A	10	#11	25'-0"	1,328					
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	25'-8"	308	H	8	#6	25'-8"	308	H	10	#6	25'-8"	386	H	10	#6	25'-8"	386	H	12	#6	25'-8"	463					
L	18	#6	4'-0"	108	L	18	#6	4'-0"	108	L	18	#6	4'-0"	108	L	18	#6	4'-0"	108	L	18	#6	4'-0"	108					
S	22	#5	11'-6"	264	S	22	#5	11'-6"	264	S	22	#5	11'-6"	264	S	22	#5	11'-6"	264	S	22	#5	11'-6"	264					
U	4	#6	8'-1"	49	U	4	#6	8'-1"	49	U	4	#6	8'-1"	49	U	4	#6	8'-1"	49	U	4	#6	8'-1"	49					
V	25	#5	11'-4"	296	V	25	#5	12'-4"	322	V	25	#5	13'-4"	348	V	25	#5	14'-4"	374	V	25	#5	15'-8"	409					
wH1	14	#6	13'-5"	282	wH1	14	#6	14'-5"	303	wH1	14	#6	16'-5"	345	wH1	14	#6	17'-5"	366	wH1	14	#6	19'-5"	408					
wH2	20	#6	11'-8"	350	wH2	20	#6	12'-8"	381	wH2	24	#6	14'-8"	529	wH2	24	#6	15'-8"	565	wH2	28	#6	17'-8"	743					
wS	26	#4	7'-10"	136	wS	28	#4	7'-10"	147	wS	32	#4	7'-10"	167	wS	34	#4	7'-10"	178	wS	38	#4	7'-10"	199					
wV	26	#5	11'-4"	307	wV	28	#5	12'-4"	360	wV	32	#5	13'-4"	445	wV	34	#5	14'-4"	508	wV	38	#5	15'-8"	621					
Reinforcing Steel				Lb	3,439	Reinforcing Steel				Lb	3,581	Reinforcing Steel				Lb	3,980	Reinforcing Steel				Lb	4,137	Reinforcing Steel				Lb	4,603
Class "C" Concrete				CY	17.8	Class "C" Concrete				CY	19.3	Class "C" Concrete				CY	21.7	Class "C" Concrete				CY	23.4	Class "C" Concrete				CY	26.4

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

⁽¹²⁾ Quantities shown are for one abutment only (with approach slab). With no approach slab, add 1.0 CY Class "C" concrete and 154 lbs reinforcing steel for 4 additional Bars H.

Bridge Division Standard

ABUTMENTS

TYPE TX28 THRU TX54

PRESTR CONC I-GIRDERS

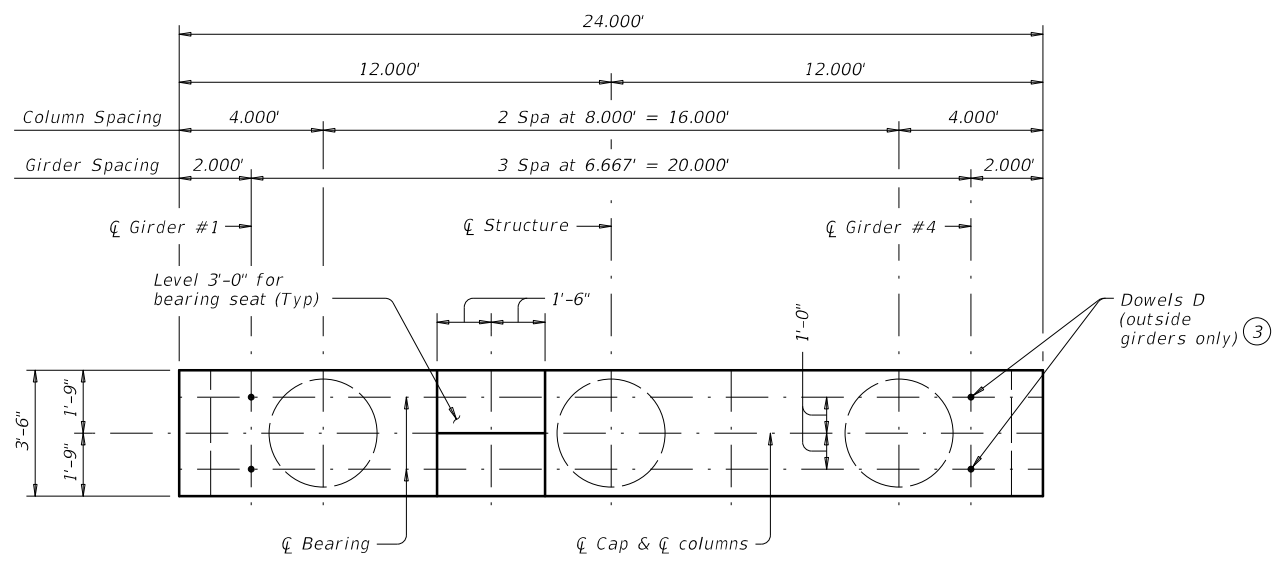
24' ROADWAY

AIG-24

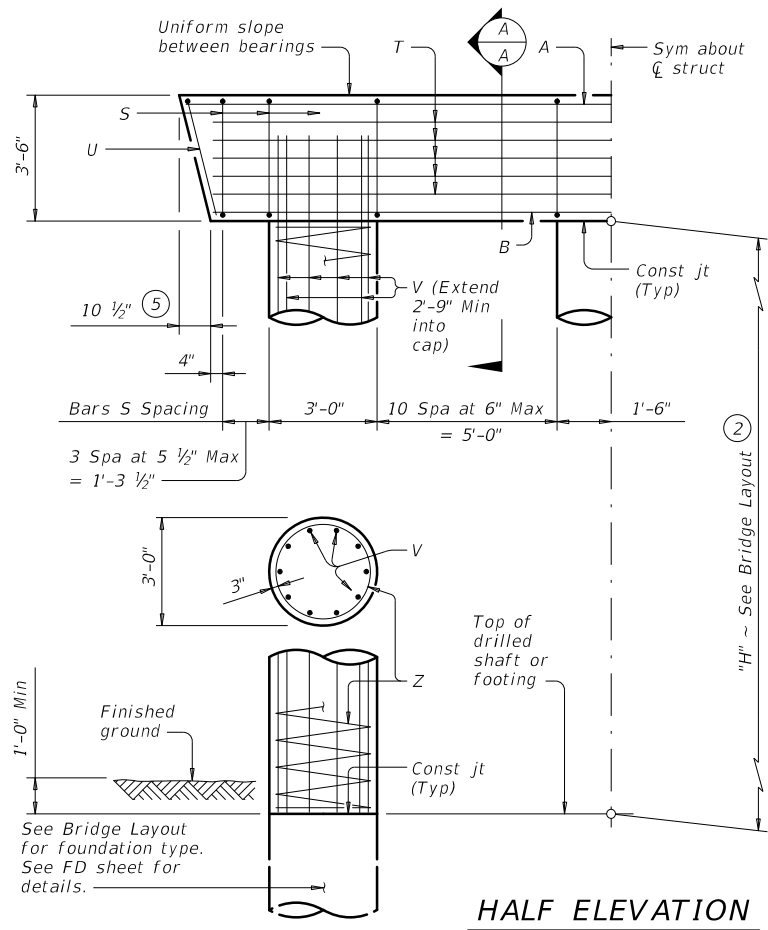
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©TxDOT August 2017	CONT	SECT	JOB	HIGHWAY
REVISIONS	0913	28	083, ETC	CR
	DIST	COUNTY		SHEET NO.
	YKM	FAYETTE		83

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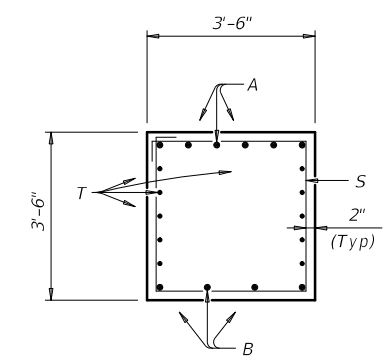
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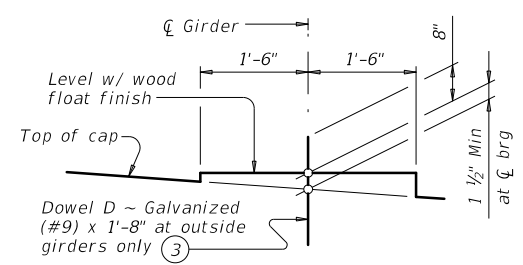
PLAN



HALF ELEVATION

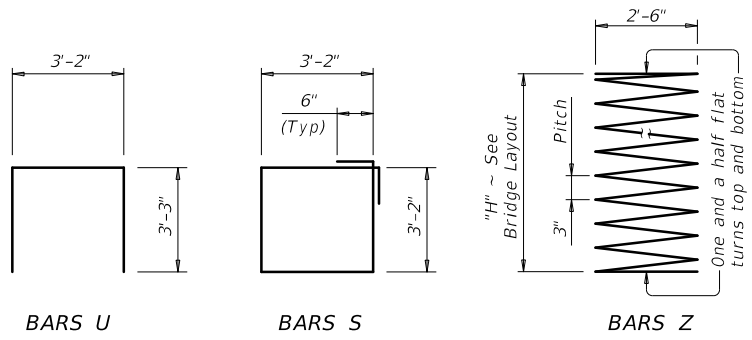


SECTION A-A



BEARING SEAT DETAIL

(Bearing surface must be clean and free of all loose material before placing bearing pad.)



BARS U

BARS S

BARS Z

- ① 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
- ② 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.
- ③ Omit Dowels D at end of multi-span units. Adjust reinforcing steel total accordingly.
- ④ Foundation Loads based on "H" = 36'.
- ⑤ Measured parallel to top of cap cross-slope.

TABLE OF ESTIMATED QUANTITIES ①				
Bar	No.	Size	Length	Weight
A	6	#11	23'- 6"	749
B	4	#11	22'- 0"	468
D ③	4	#9	1'- 8"	23
S	30	#5	13'- 8"	428
T	10	#5	22'- 0"	229
U	2	#5	9'- 8"	20
V	30	#9	38'- 9"	3,953
Z	3	#4	1,154'- 7"	2,314
Reinforcing Steel			Lb	8,184
Class "C" Concrete (Cap)			CY	10.7
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
Ft	Tons/Shaft		
40	104	38	29
45	112	41	31
50	119	43	33
55	127	46	35
60	134	48	37
65	142	51	39
70	149	53	40
75	157	56	42
80	164	58	44
85	172	61	46
90	179	63	48
95	187	66	50
100	194	68	52
105	201	70	53
110	209	73	55
115	216	75	57
120	223	78	59
125	231	80	61

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 (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. These bent details may be used with standard SIG-24 only.

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

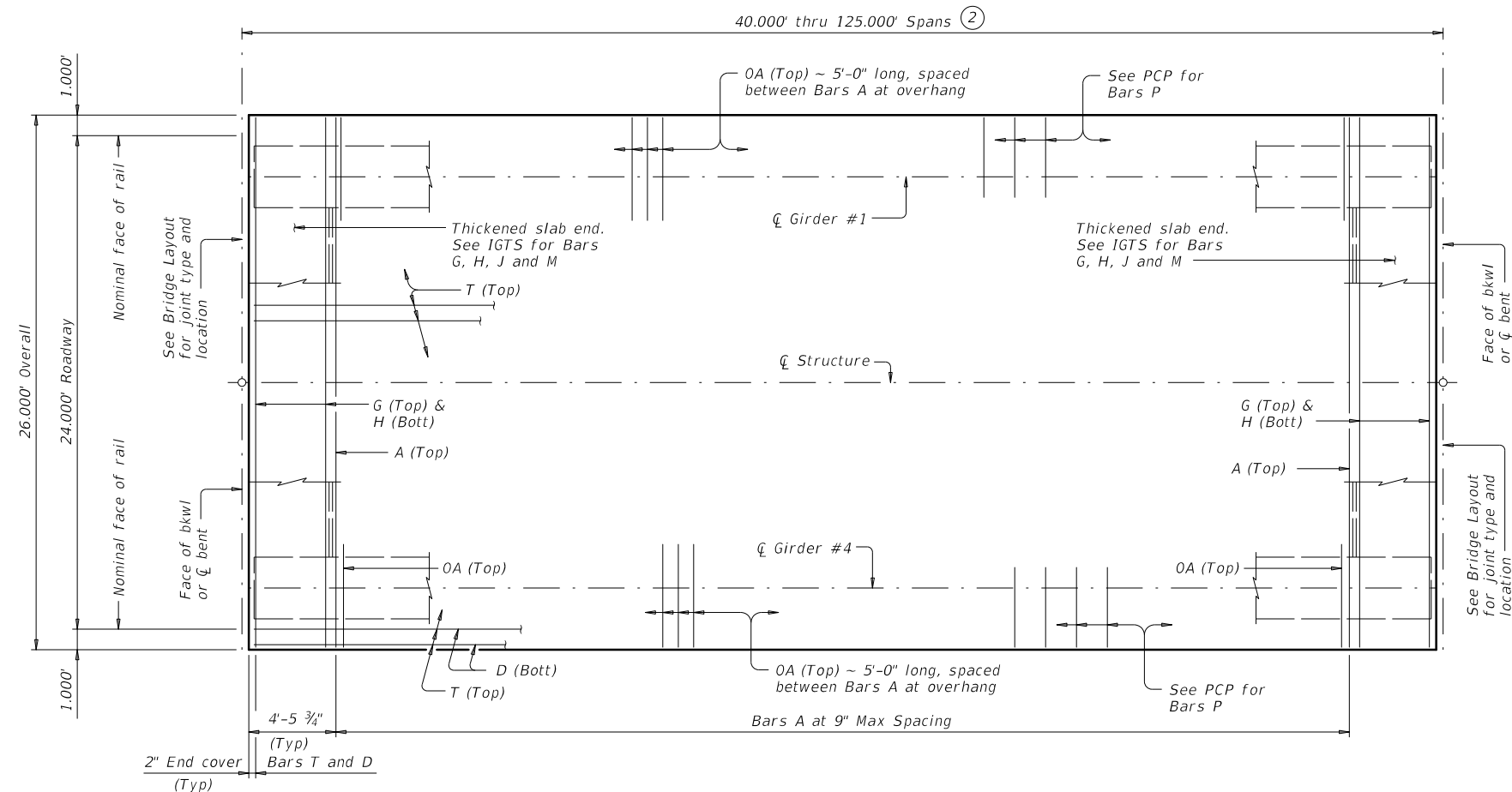
MATERIAL NOTES:
 Provide Class C concrete (f'c = 3,600 psi). Provide Class C (HPC) concrete if shown elsewhere in the plans. Provide Grade 60 reinforcing steel. Galvanize dowel bars D.

HL93 LOADING

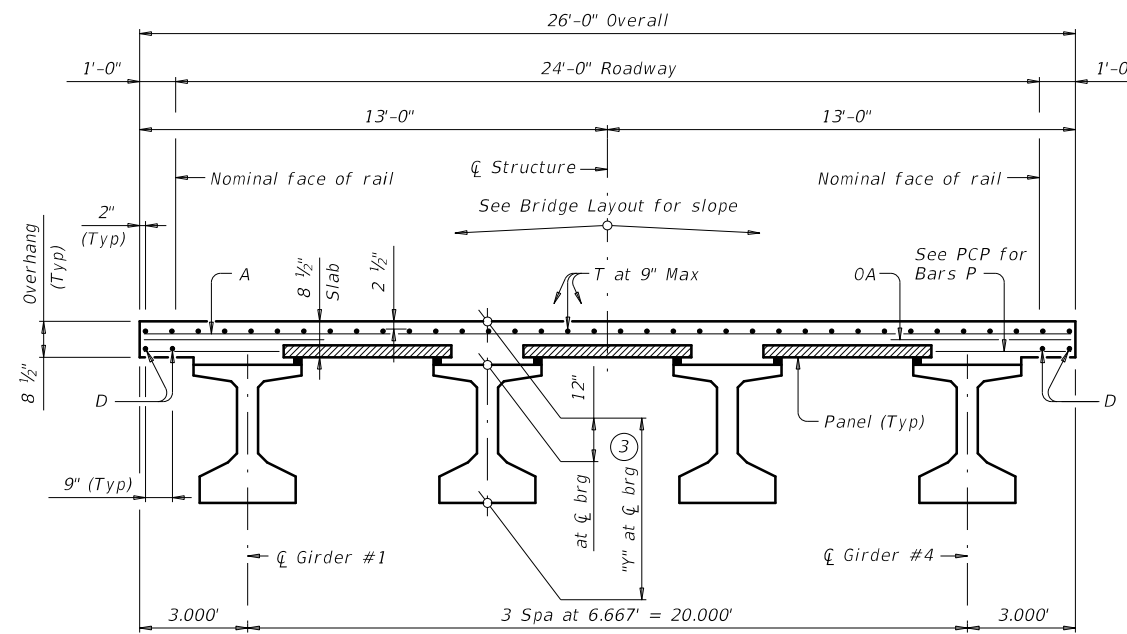
		Bridge Division Standard	
INTERIOR BENTS TYPE TX28 THRU TX54 PRESTR CONC I-GIRDERS 24' ROADWAY			
BIG-24			
FILE: big01sts-17.dgn	DN: TAR	CK: SDB	DW: JTR
©TxDOT August 2017	CONTRACT	SECTION	JOB
REVISIONS	0913	28	083, ETC
DIST	COUNTY		SHEET NO.
YKM	FAYETTE		84

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DATE: FILE:



PLAN ①



TYPICAL TRANSVERSE SECTION
(Showing girder type Tx46)

TABLE OF SECTION DEPTHS	
GIRDER TYPE	"Y" AT Q BRG ③
	Ft/In
Tx28	3'-4"
Tx34	3'-10"
Tx40	4'-4"
Tx46	4'-10"
Tx54	5'-6"

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

- 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 75.000'.
 Type Tx34 for spans lengths 40.000' thru 85.000'.
 Type Tx40 for spans lengths 40.000' thru 100.000'.
 Type Tx46 for spans lengths 40.000' thru 115.000'.
 Type Tx54 for spans lengths 40.000' thru 125.000'.
- 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 precast overhang panel (PCP(0)) option is use.

HL93 LOADING SHEET 1 OF 2



PRESTRESSED CONCRETE I-GIRDER SPANS (TYPE Tx28 THRU Tx54) 24' ROADWAY

SIG-24

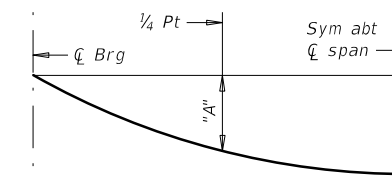
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©TxDOT August 2017	CONT	SECT	JOB	HIGHWAY
REVISIONS	0913	28	083, ETC	CR
10-19: Increased "X" and "Y" Values	DIST	COUNTY	SHEET NO.	
	YKM	FAYETTE	85	

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DATE: FILE:

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	0.007	0.010	40	0.004	0.006	40	0.003	0.004	40	0.002	0.003	40	0.001	0.002
45	0.012	0.017	45	0.007	0.010	45	0.005	0.007	45	0.004	0.005	45	0.002	0.003
50	0.019	0.027	50	0.011	0.016	50	0.007	0.010	50	0.005	0.007	50	0.004	0.005
55	0.028	0.040	55	0.017	0.024	55	0.011	0.016	55	0.008	0.011	55	0.005	0.007
60	0.041	0.057	60	0.024	0.034	60	0.016	0.022	60	0.011	0.015	60	0.007	0.010
65	0.056	0.079	65	0.033	0.047	65	0.022	0.031	65	0.015	0.021	65	0.010	0.014
70	0.077	0.108	70	0.046	0.064	70	0.030	0.042	70	0.021	0.029	70	0.014	0.019
75	0.102	0.143	75	0.061	0.085	75	0.040	0.056	75	0.027	0.038	75	0.018	0.025
			80	0.079	0.111	80	0.052	0.073	80	0.036	0.050	80	0.024	0.033
			85	0.102	0.143	85	0.066	0.093	85	0.046	0.064	85	0.030	0.042
						90	0.084	0.118	90	0.057	0.080	90	0.038	0.053
						95	0.105	0.147	95	0.071	0.100	95	0.047	0.066
						100	0.130	0.182	100	0.088	0.124	100	0.058	0.082
									105	0.108	0.151	105	0.071	0.100
									110	0.130	0.182	110	0.086	0.121
									115	0.156	0.219	115	0.103	0.144
									120			120	0.123	0.172
									125			125	0.145	0.203



DEAD LOAD DEFLECTION DIAGRAM

Calculated deflections shown are due to the concrete slab on interior girders only (Ec = 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	1,040	158.00	158.00	158.00	2,392
45	1,170	178.00	178.00	178.00	2,691
50	1,300	198.00	198.00	198.00	2,990
55	1,430	218.00	218.00	218.00	3,289
60	1,560	238.00	238.00	238.00	3,588
65	1,690	258.00	258.00	258.00	3,887
70	1,820	278.00	278.00	278.00	4,186
75	1,950	298.00	298.00	298.00	4,485
80	2,080	318.00	318.00	318.00	4,784
85	2,210	338.00	338.00	338.00	5,083
90	2,340	358.00	358.00	358.00	5,382
95	2,470	378.00	378.00	378.00	5,681
100	2,600	398.00	398.00	398.00	5,980
105	2,730	418.00	418.00	418.00	6,279
110	2,860	438.00	438.00	438.00	6,578
115	2,990	458.00	458.00	458.00	6,877
120	3,120	478.00	478.00	478.00	7,176
125	3,250	498.00	498.00	498.00	7,475

- 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(0) and PCP(0)-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 does not support the use of transition bents.

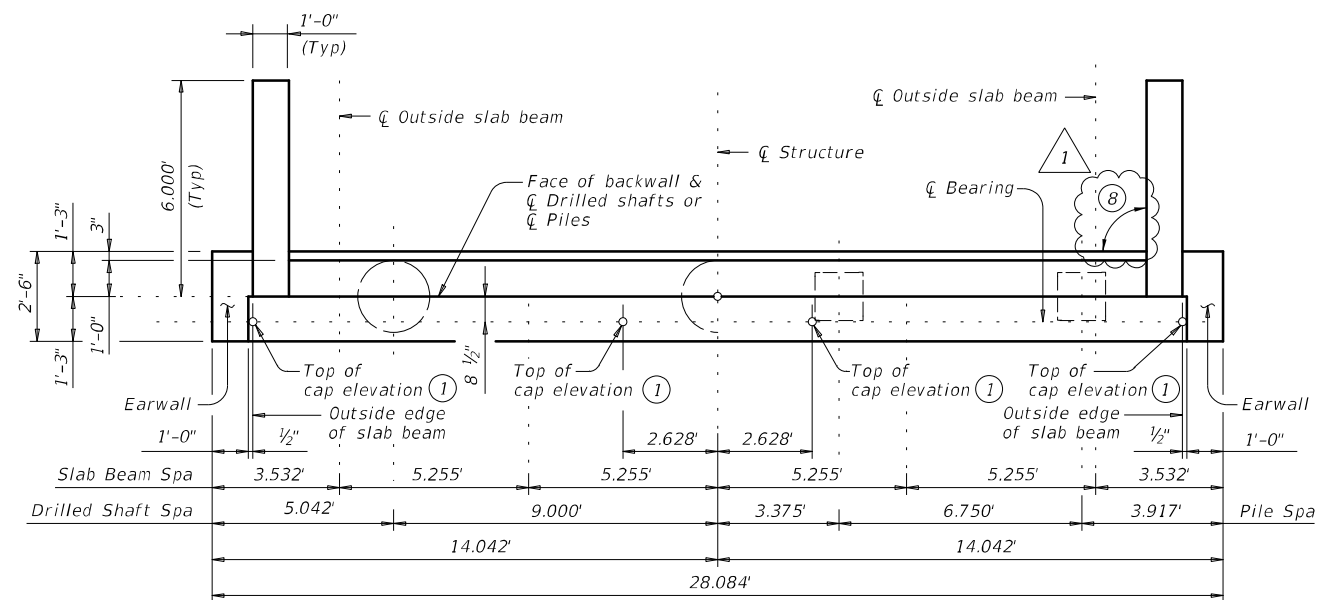
Cover dimensions are clear dimensions, unless noted otherwise.

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, D, OA, P or T unless noted otherwise.

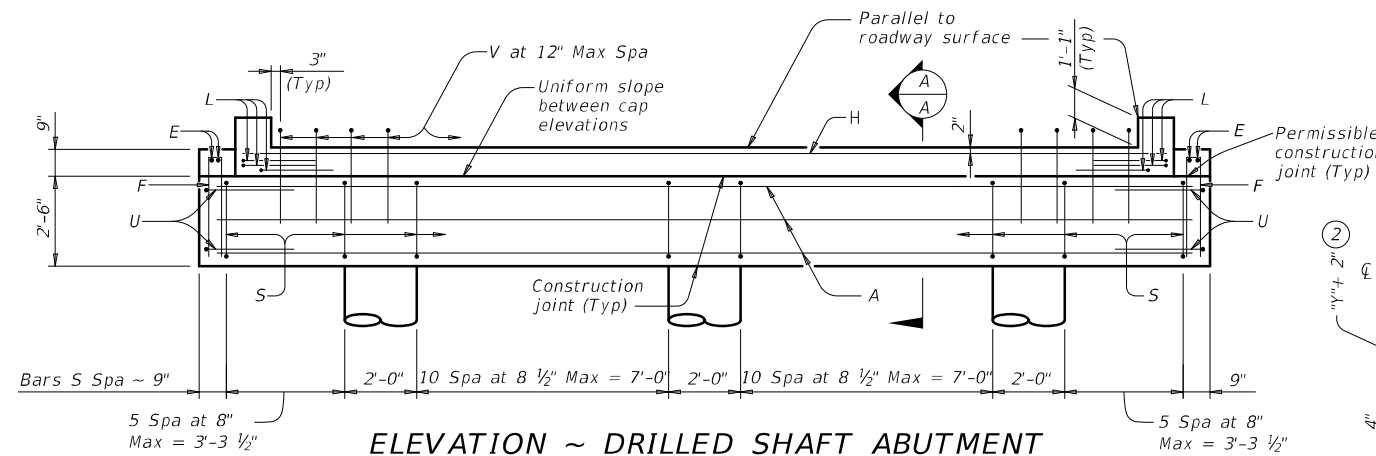
				Bridge Division Standard	
PRESTRESSED CONCRETE I-GIRDER SPANS (TYPE Tx28 THRU Tx54) 24' ROADWAY					
SIG-24					
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©TxDOT August 2017	CONT	SECT	JOB	HIGHWAY	
REVISIONS	0913	28	083, ETC	CR	
10-19: Increased "X" and "Y" Values	DIST	COUNTY	SHEET NO.		
	YKM	FAYETTE	86		

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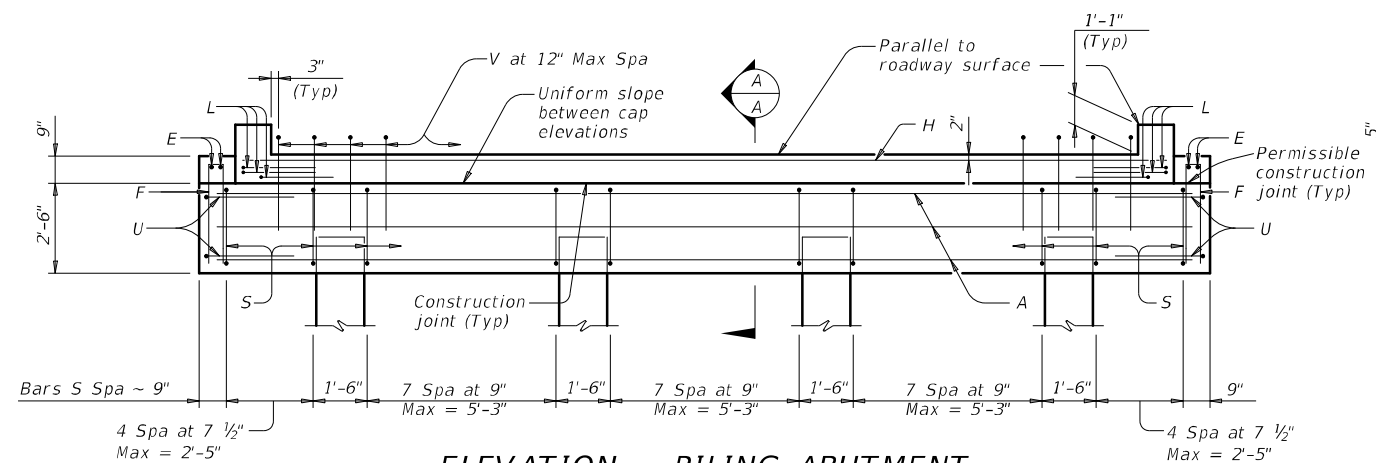
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SHOWING DRILLED SHAFTS PLAN SHOWING PILES

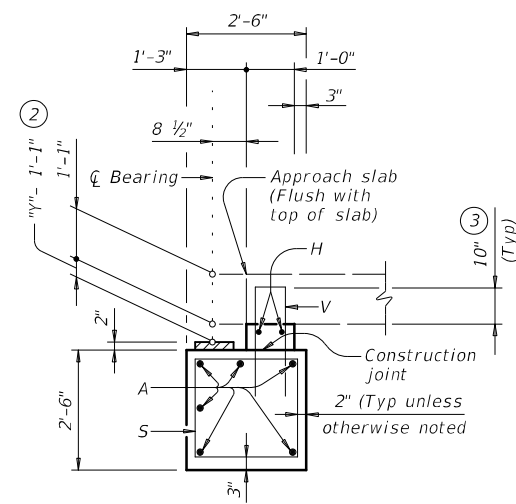
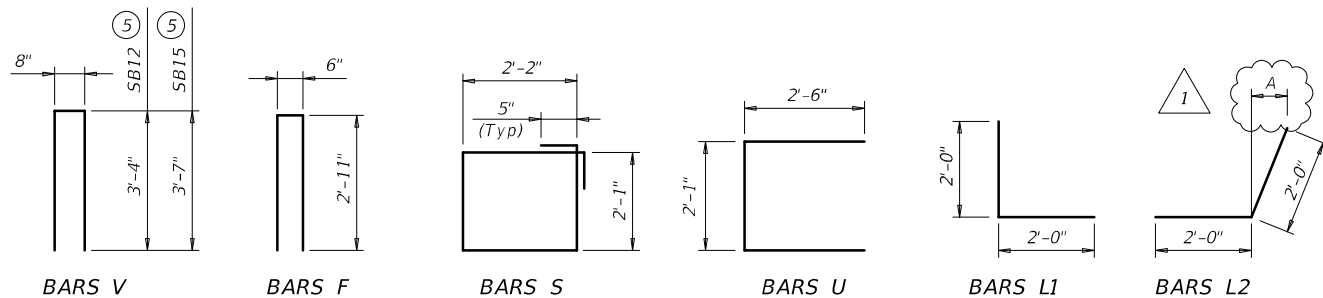


ELEVATION ~ DRILLED SHAFT ABUTMENT



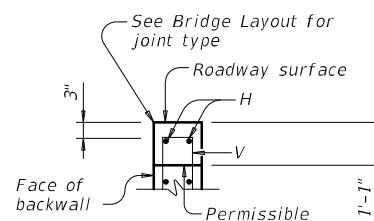
ELEVATION ~ PILING ABUTMENT

Note: For piles larger than 16", adjust Bars S spacing as required to avoid piles.



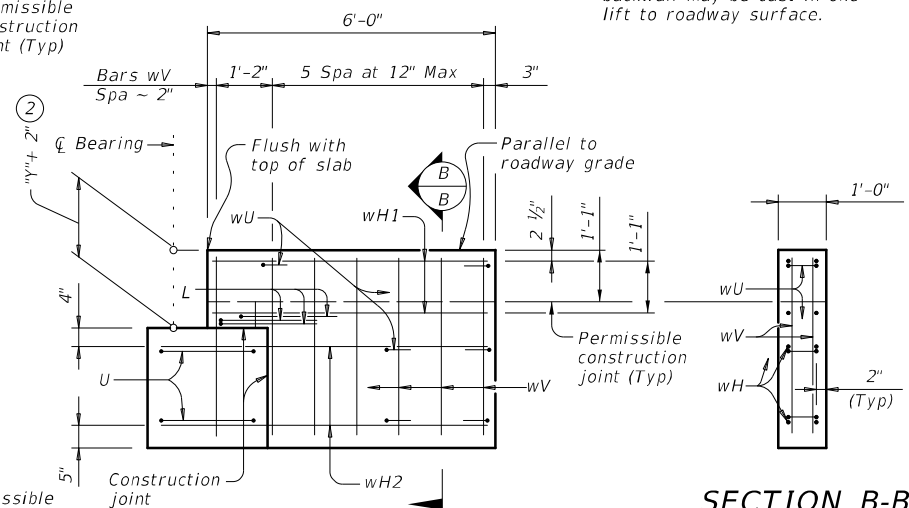
SECTION A-A

(With approach slab)
Note: At Contractor's option, backwall may be cast with approach slab.



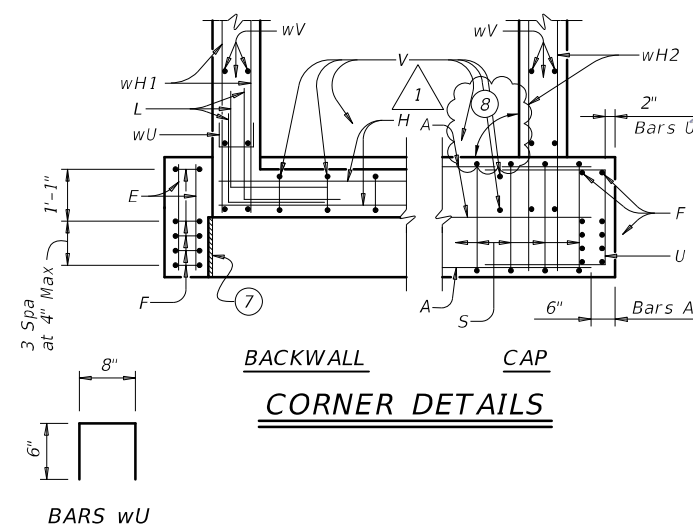
BACKWALL DETAIL

(Without approach slab)
Note: At Contractor's option, backwall may be cast in one lift to roadway surface.



WINGWALL ELEVATION

(Earwall not shown for clarity.)



BACKWALL CAP CORNER DETAILS

FOUNDATION LOADS

Span Length	Drilled Shaft Loads		Vertical Pile Loads	
	5SB12	5SB15	5SB12	5SB15
Ft	Tons/DS	Tons/DS	Tons/Pile	Tons/Pile
25	39	41	29	31
30	43	46	33	34
35	48	51	36	38
40	52	55	39	41
45		59		44
50		63		47

TABLE OF ESTIMATED QUANTITIES

Bar	No.	Size	Length (5)		Weight (5)		
			5SB12	5SB15	5SB12	5SB15	
A	6	#11	27'-1"	27'-1"	863	863	
E	4	#4	2'-2"	2'-2"	6	6	
F	10	#4	6'-4"	6'-4"	43	43	
H	2	#5	25'-8"	25'-8"	54	54	
L	6	#6	4'-0"	4'-0"	36	36	
S	34	#4	9'-4"	9'-4"	212	212	
U	4	#6	7'-1"	7'-1"	43	43	
V	25	#5	7'-4"	7'-10"	191	204	
wH1	8	#6	5'-8"	5'-8"	68	68	
wH2	8	#6	6'-11"	6'-11"	83	83	
wU	12	#4	1'-8"	1'-8"	14	14	
wV	28	#5	3'-10"	4'-1"	112	119	
Reinforcing Steel					Lb	1,725	1,745
CI "C" Conc (Abut)					CY	8.8	9.2

- Top of cap elevations are based on section depths shown on Span Details.
- See Span Details for "Y".
- Increase as required to maintain 3" from finished grade.
- See Bridge Layout to determine if approach slab is present.
- See Bridge Layout for beam type used in the superstructure.
- Quantities shown are for one abutment only (with approach slab). Without approach slab, add 1.0 CY Class "C" concrete and 54 Lb reinforcing steel for 2 additional Bars H.
- 1/2" preformed bituminous fiber material between slab beam and earwall. Bond to earwall with an approved adhesive. Cast inside face of earwall perpendicular to cap. (Typ)

GENERAL NOTES:
Designed according to AASHTO LRFD Bridge Design Specifications.
Designed for a normal embankment header slope of 3:1 and a maximum span length of 50 feet.
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.
These abutment details may be used with standard SPSB-24 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.

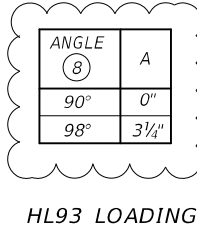


10/12/2021

Texas Department of Transportation
Bridge Division Standard

ABUTMENTS
PRESTR CONCRETE SLAB BEAM
24' ROADWAY
APSB-24 (MOD)

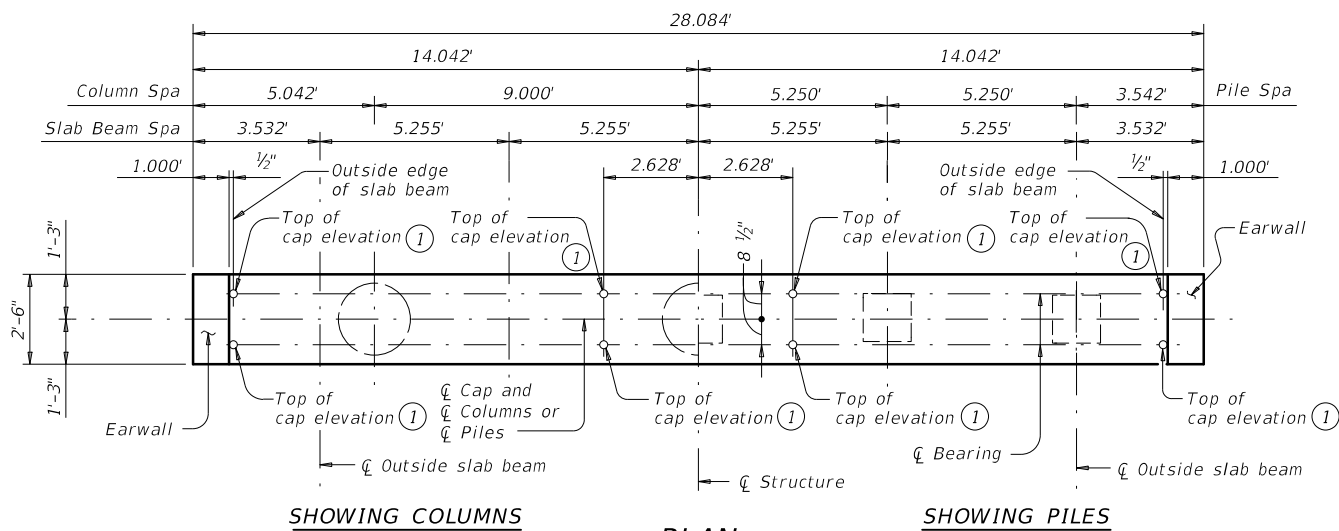
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REVISIONS	CONTRACT	SECTION	JOB	HIGHWAY
0913	28	083, ETC.	CR	
DIST	COUNTY	SHEET NO.		
YKM	FAYETTE	87		



HL93 LOADING

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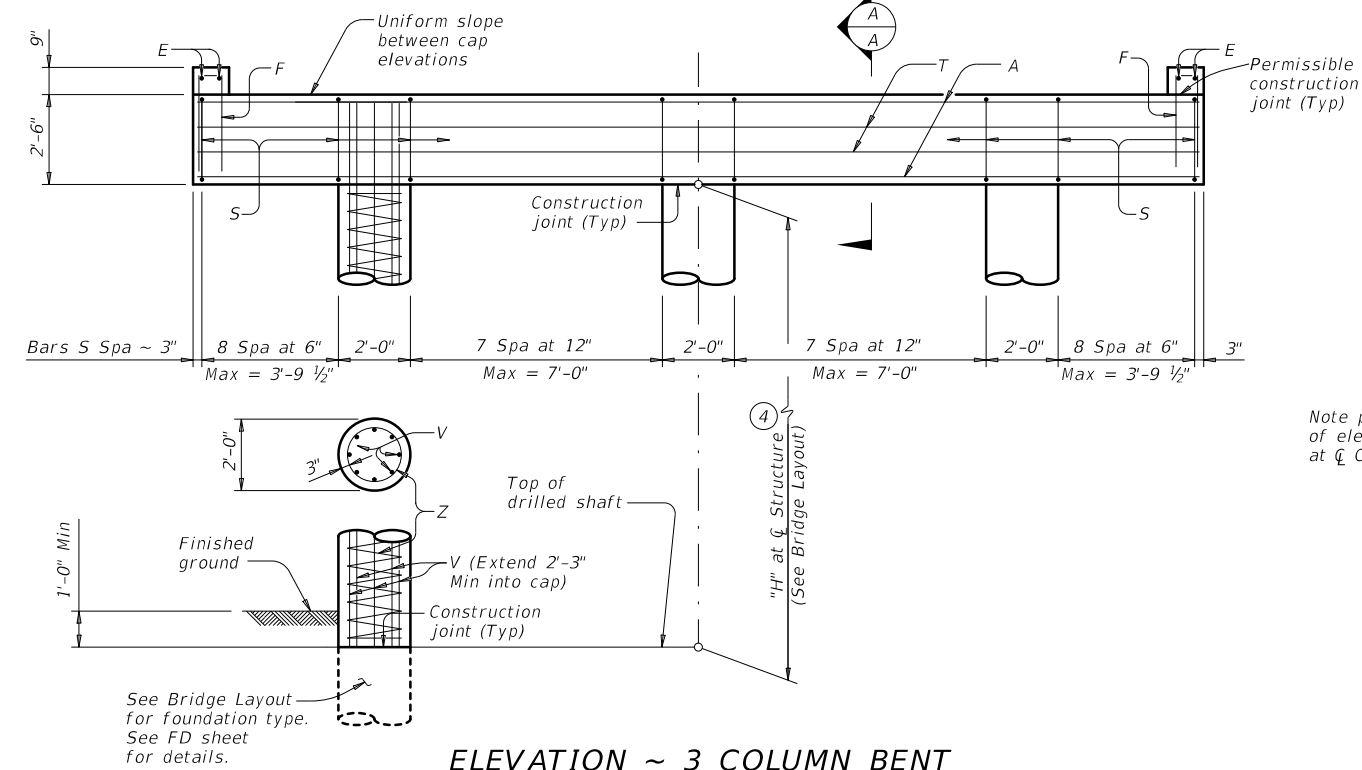
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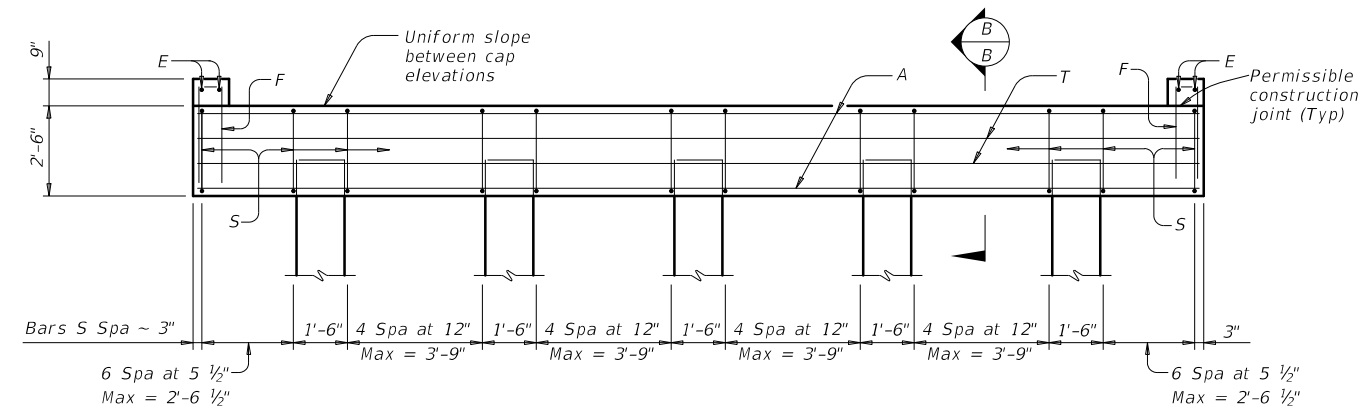
SHOWING COLUMNS

SHOWING PILES

PLAN



ELEVATION ~ 3 COLUMN BENT



ELEVATION ~ 5 PILE BENT

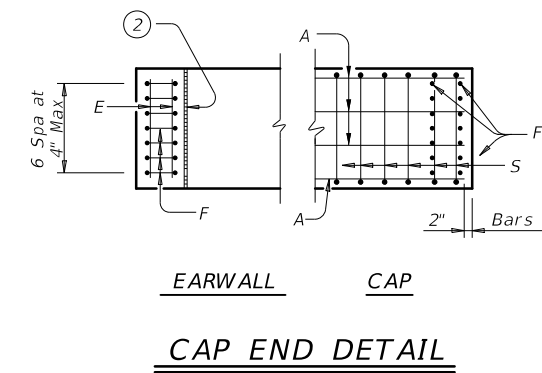
Note: For piles larger than 16", adjust Bars S spacing as required to avoid piles.

FOUNDATION LOADS				
Average Span Length	Drilled Shaft Loads (5)		Vertical Pile Loads	
	5SB12	5SB15	5SB12	5SB15
Ft				
25	57	61	34	37
30	66	71	40	42
35	73	79	44	47
40	80	87	48	52
45		94		57
50		102		61

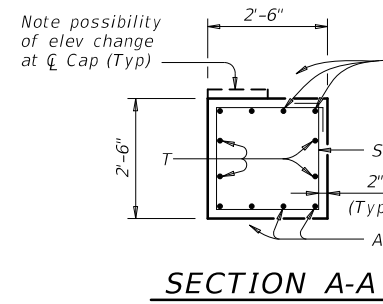
TABLE OF ESTIMATED QUANTITIES (3)					
3 COLUMN BENT					
Bar	No.	Size	Length	Weight	
A	8	#11	27'-9"	1,180	
E	4	#4	2'-2"	6	
F	14	#4	6'-6"	61	
S	34	#5	9'-8"	343	
T	4	#5	27'-9"	116	
V	24	#7	26'-3"	1,288	
Z	3	#3	242'-2"	273	
Reinforcing Steel				Lb	3,267
CI "C" Conc (Cap)				CY	6.6
CI "C" Conc (Column)				CY	8.4

TABLE OF ESTIMATED QUANTITIES					
5 PILE BENT					
Bar	No.	Size	Length	Weight	
A	5	#11	27'-9"	737	
E	4	#4	2'-2"	6	
F	14	#4	6'-6"	61	
S	34	#5	9'-8"	343	
T	4	#5	27'-9"	116	
Reinforcing Steel				Lb	1,263
CI "C" Conc (Cap)				CY	6.6

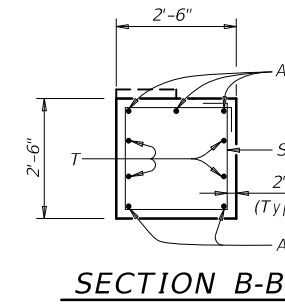
TABLE OF MAXIMUM ALLOWABLE EXPOSED PILE HEIGHTS AND PILE LOADS (4)			
Pile Type		Max Ht	Max Load
Concrete	Steel	Ft	Tons/Pile
16" Sq	HP14x73	16	75
18" Sq	HP14x117 (6)	20	90



CAP END DETAIL

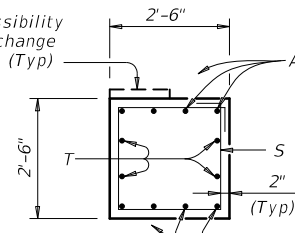


SECTION A-A

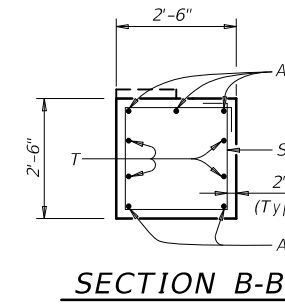


SECTION B-B

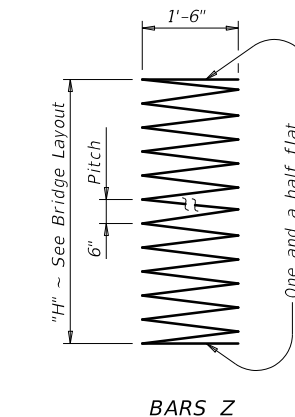
Note possibility of elev change at Cap (Typ)



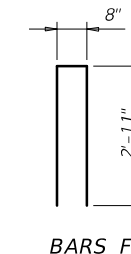
SECTION A-A



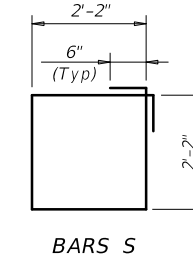
SECTION B-B



BARS Z



BARS F



BARS S

- Top of cap elevations are based on section depths shown on Span Details.
- 1/2" preformed bituminous fiber material between slab beam and earwall. Bond to earwall with an approved adhesive. Cast inside face of earwall perpendicular to cap. (Typ)
- Quantities shown are based on an "H" value of 24 feet. For each linear foot variation in "H" value, make the following adjustments:
Bars V length, 1'-0"
Bars Z length, 9'-6"
Reinforcing Steel, 60 Lb
Class "C" conc (column), 0.35 CY
- This standard may not be used for "H" heights exceeding 24 feet or exposed pile heights exceeding the values shown in the table. In areas of very soft soil or where scour is anticipated, allowable "H" heights or exposed pile heights must be evaluated by the Engineer prior to the use of this standard.
- Foundation Loads based on "H" = 24 feet.
- When HP14x117 steel piling is specified in the plans, the Contractor has the option of furnishing either HP14x117 or HP16x101 steel piling.

GENERAL NOTES:

Designed according to AASHTO LRFD Bridge Design Specifications. Bent selected must be based on the average span length rounded up to the next 5-foot increment. For pile bents supporting unequal spans, the shorter span cannot be less than 80 percent of the longer span. See Bridge Layout for foundation type, size, and length. See Common Foundation Details (FD) standard sheet for all foundation details and notes. These bent details do not support the use of multi-pile footings shown on the FD standard. These bent details may be used with standard SPSB-24 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.

HL93 LOADING

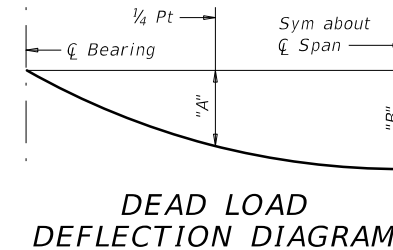
Texas Department of Transportation		Bridge Division Standard	
INTERIOR BENTS			
PRESTR CONCRETE SLAB BEAM			
24' ROADWAY			
BPSB-24			
FILE: pbsbte21-17.dgn	DN: TxDOT	CK: TxDOT	DW: TxDOT
©TxDOT January 2017	CON: 0913	SECT: 28	JOB: 083, ETC
REVISIONS			CR
DIST: YKM	COUNTY: FAYETTE	SHEET NO. 88	

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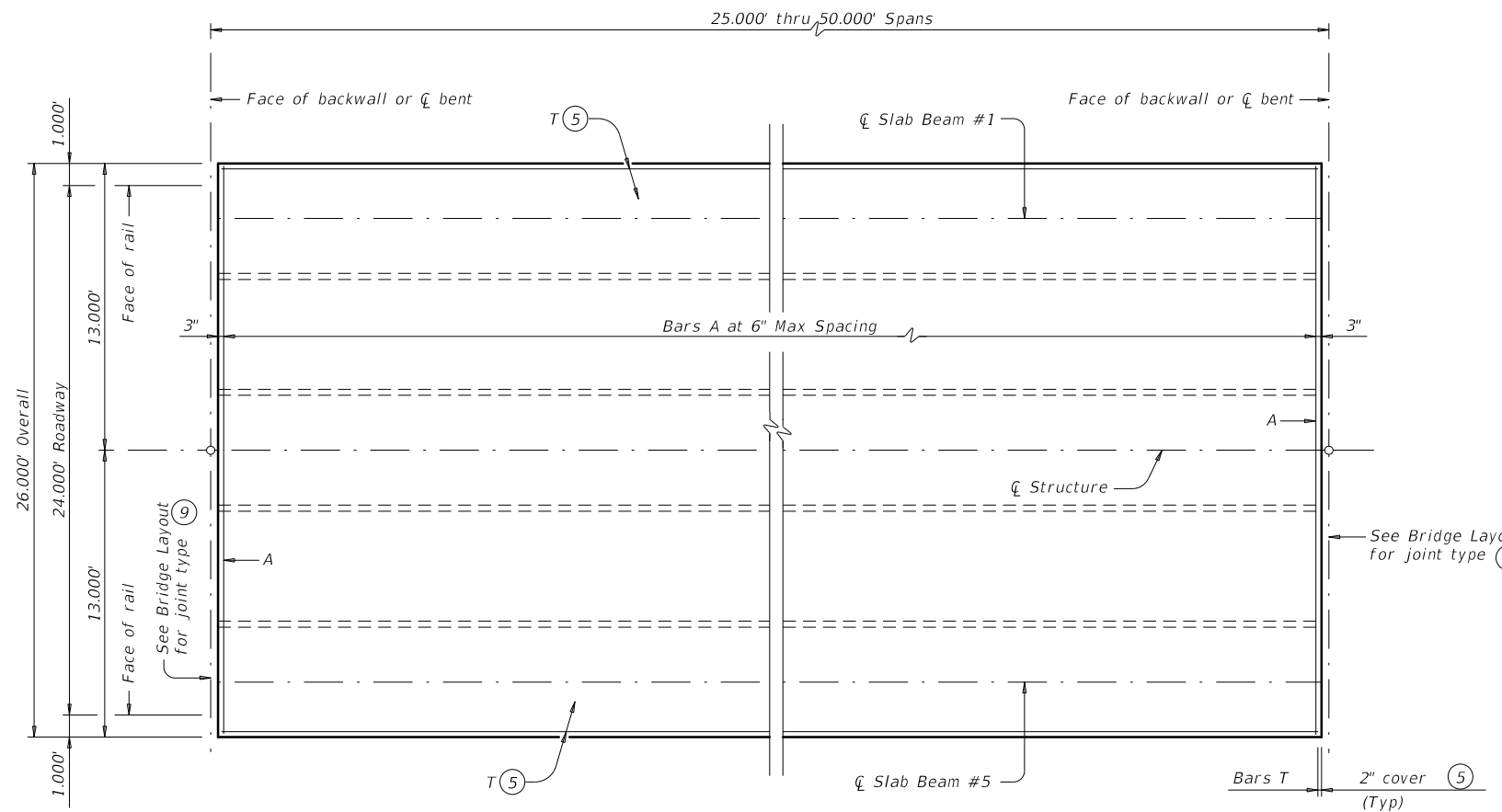
DATE: FILE:

TABLE OF VARIABLE VALUES

Span Length	Beam Type	Dead Load Deflection		Section Depths ⁽³⁾	
		"A"	"B"	"x"	"y"
Ft	(1)	Ft	Ft	In	Ft/In
25	5SB12	0.004	0.005	5 1/4"	1'-5 1/4"
30	5SB12	0.008	0.011	5 1/2"	1'-5 1/2"
35	5SB12	0.015	0.021	6"	1'-6"
40	5SB12	0.026	0.036	6 1/2"	1'-6 1/2"
25	5SB15	0.002	0.003	5 1/4"	1'-8 1/4"
30	5SB15	0.004	0.006	5 1/2"	1'-8 1/2"
35	5SB15	0.008	0.011	5 1/2"	1'-8 1/2"
40	5SB15	0.013	0.019	5 3/4"	1'-8 3/4"
45	5SB15	0.022	0.030	6 1/2"	1'-9 1/2"
50	5SB15	0.034	0.047	7"	1'-10"



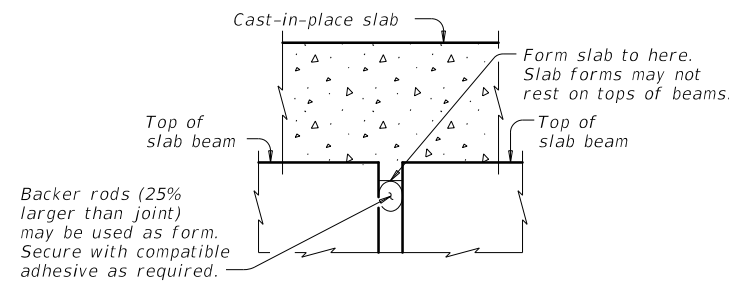
NOTE: Deflections shown are due to concrete slab only ($E_c = 5,000$ ksi). Calculated deflections shown are theoretical and actual dimensions may vary. Adjust based on field verification.



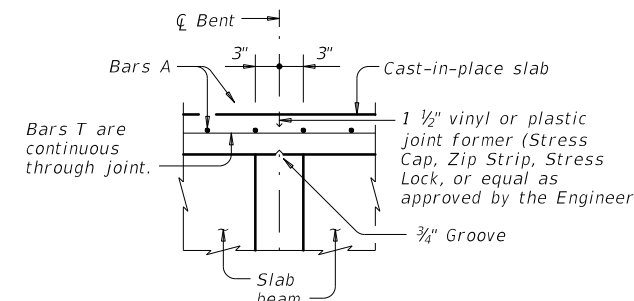
PLAN

BAR TABLE

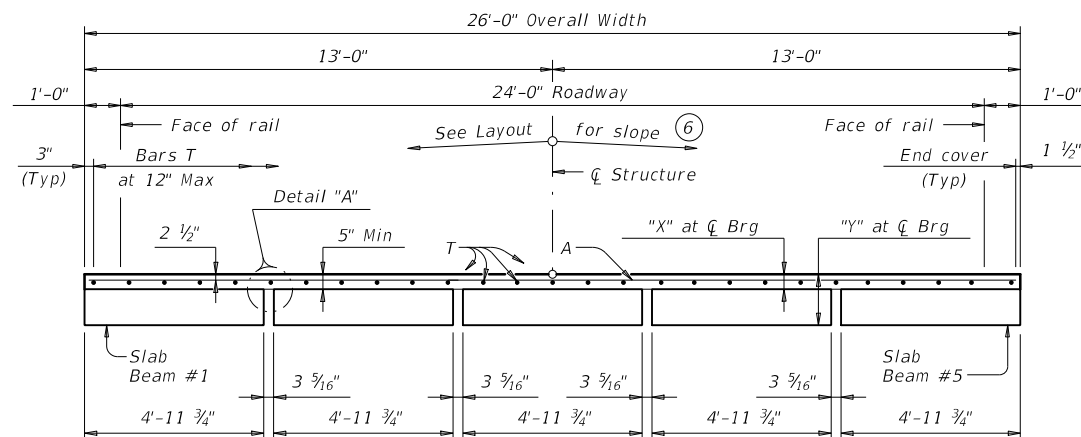
BAR	SIZE
A	#5
T	#4



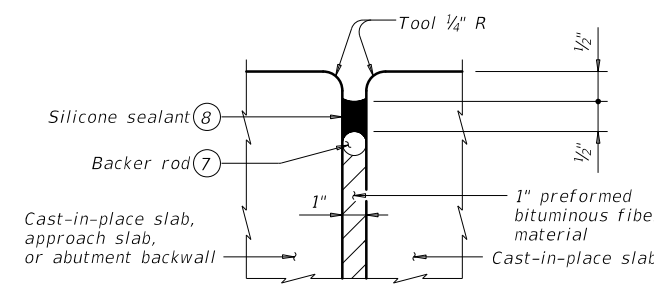
DETAIL "A"



CONTINUOUS SLAB DETAIL



TYPICAL TRANSVERSE SECTION



TYPE A JOINT DETAIL (9)

TABLE OF ESTIMATED QUANTITIES

SPAN LENGTH	REINF CONCRETE SLAB (SLAB BEAM)	PRESTR CONC SLAB BEAM (5SB12 OR 5SB15) (1)			TOTAL REINF STEEL (2)
		ABUT TO INT BT	INT BT TO INT BT	ABUT TO ABUT	
Ft	SF	LF (4)	LF (4)	LF (4)	Lb
25	650	122.50	122.50	122.50	1,820
30	780	147.50	147.50	147.50	2,180
35	910	172.50	172.50	172.50	2,550
40	1,040	197.50	197.50	197.50	2,910
45	1,170	222.50	222.50	222.50	3,280
50	1,300	247.50	247.50	247.50	3,640

- See Bridge Layout for beam type used in the superstructure. These standards do not provide for the use of both SB12 and SB15 beams within the same structure.
- Reinforcing steel weight is calculated using an approximate factor of 2.8 Lbs/SF.
- Based on theoretical beam camber, dead load deflections of 5" cast-in-place concrete slab and a constant grade. The Contractor will adjust these values for any vertical curve.
- Fabricator will adjust beam lengths for beam slopes as required.
- Where slab is continuous over Interior Bents, Bars T are continuous through Joint. See "Continuous Slab Detail".
- This standard does not provide for changes in roadway cross-slopes within the structure.
- 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.
- 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.
- See Bridge Layout for expansion joint locations. If using Type A expansion joints, the maximum distance between joints is 100 feet. Type A joints are subsidiary to Item 422, "Concrete Superstructures".

GENERAL NOTES:

Designed according to AASHTO LRFD Bridge Design Specifications. Two- or three-span units, with slab continuous over interior bents, may be formed with the details shown on this sheet. See applicable rail details for rail anchorage in slab. This standard does not support the use of transition bents.

Cover dimensions are clear dimensions, unless noted otherwise.

MATERIAL NOTES:

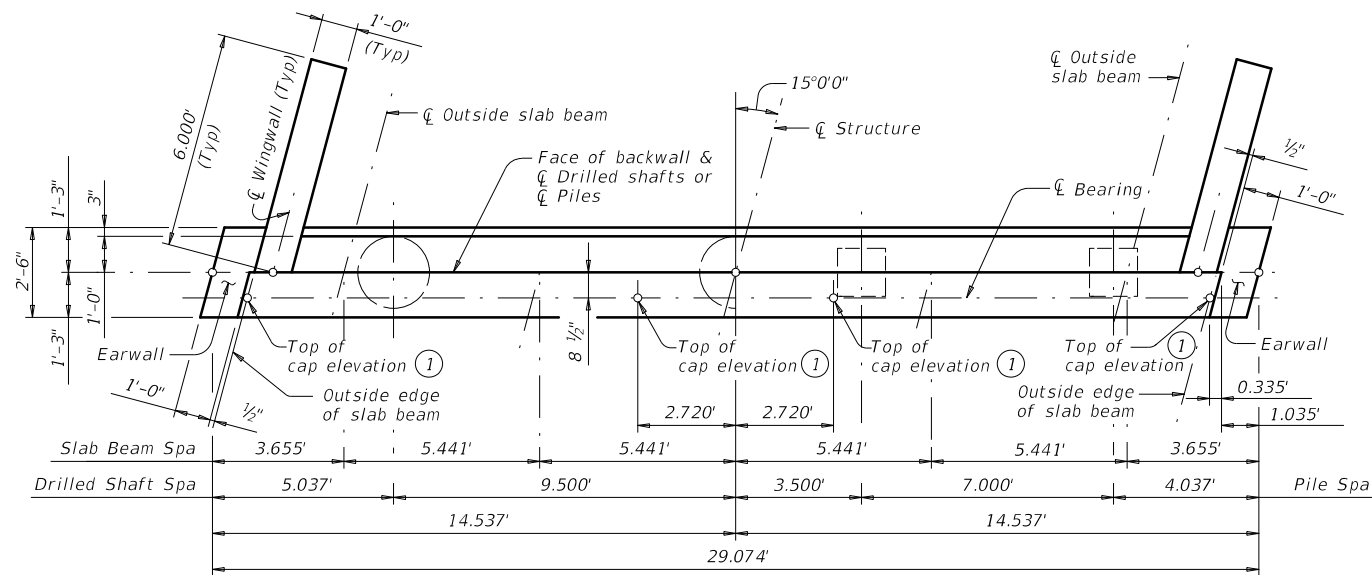
Provide Class S concrete ($f'_c = 4,000$ psi).
Provide Class S (HPC) concrete if shown elsewhere in the plans.
Provide Grade 60 reinforcing steel.
Provide bar laps, where required, as follows:
Uncoated ~ #4 = 1'-7"
~ #5 = 2'-0"
Epoxy coated ~ #4 = 2'-5"
~ #5 = 3'-0"
Deformed welded wire reinforcement (WWR) (ASTM A1064) of equal size and spacing may be substituted for Bars A or T unless noted otherwise.

HL93 LOADING

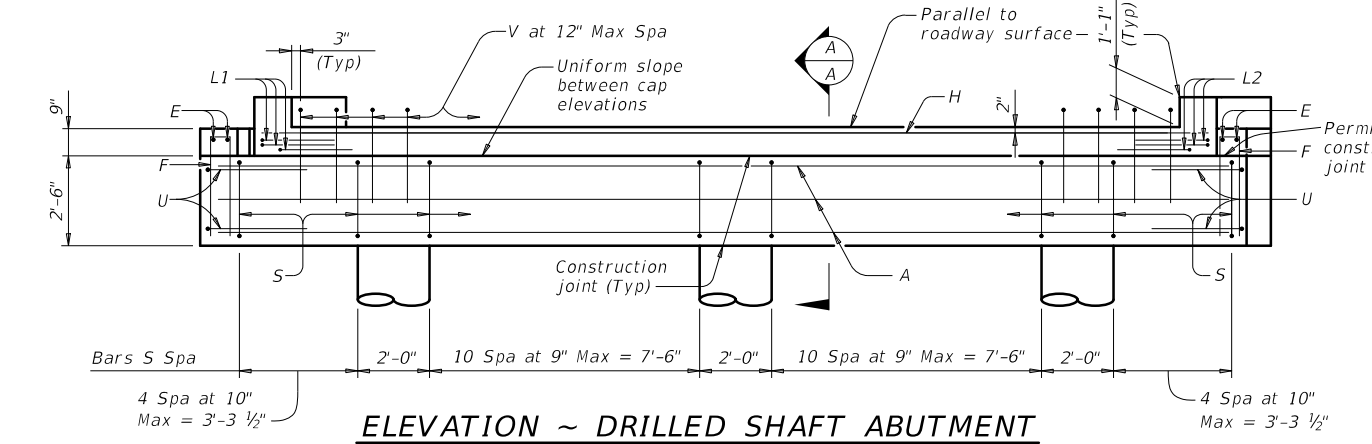
				Bridge Division Standard	
PRESTRESSED CONCRETE SLAB BEAM SPANS (TY SB12 OR SB15) 24' ROADWAY					
SPSB-24					
FILE: psbste30-17.dgn	DN: TxDOT	CK: TxDOT	DW: TxDOT	CK: TxDOT	
©TxDOT January 2017	CONT 0913	SECT 28	JOB 083, ETC	HIGHWAY CR	
	DIST YKM	COUNTY FAYETTE	SHEET NO. 89		

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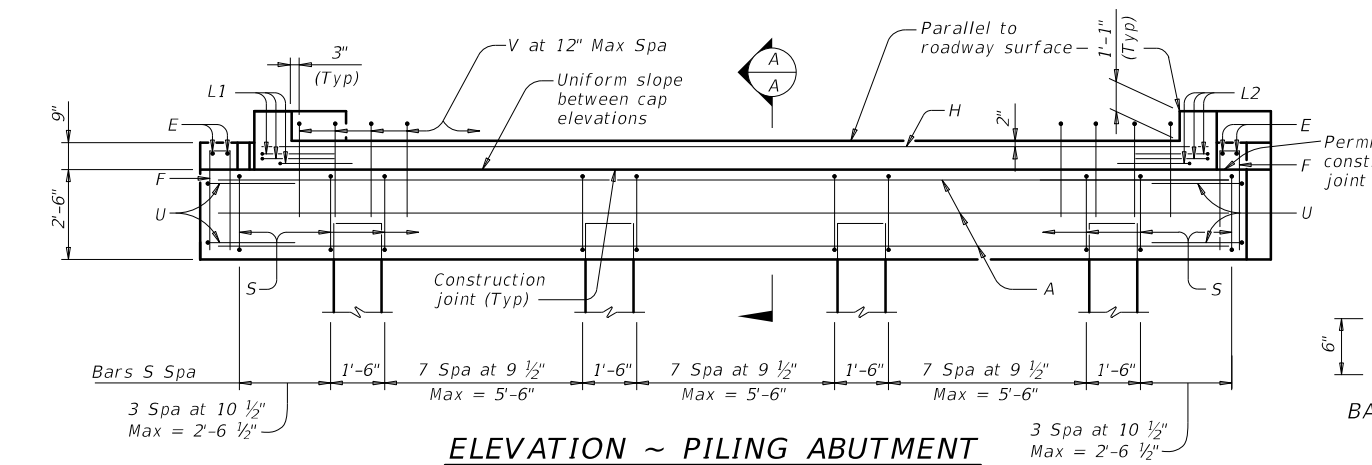
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SHOWING DRILLED SHAFTS PLAN SHOWING PILES

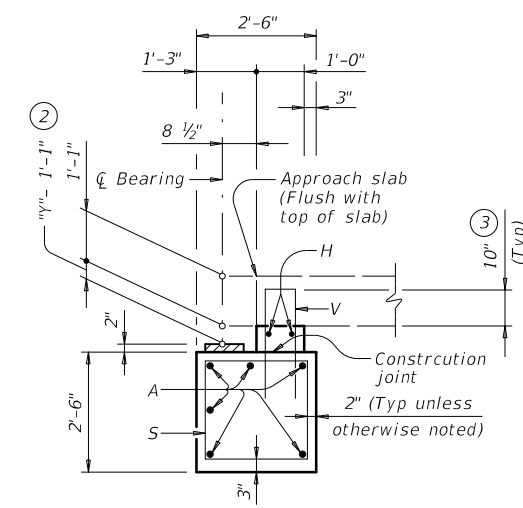
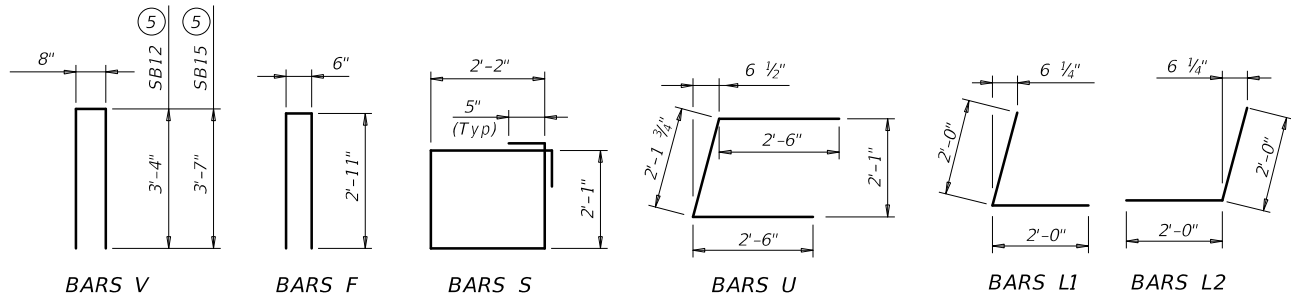


ELEVATION ~ DRILLED SHAFT ABUTMENT



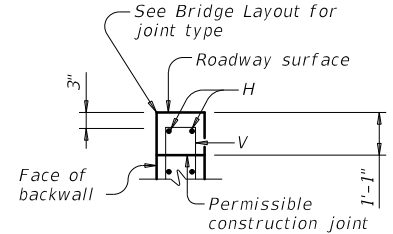
ELEVATION ~ PILING ABUTMENT

Note: For piles larger than 16", adjust Bars S spacing as required to avoid piles.



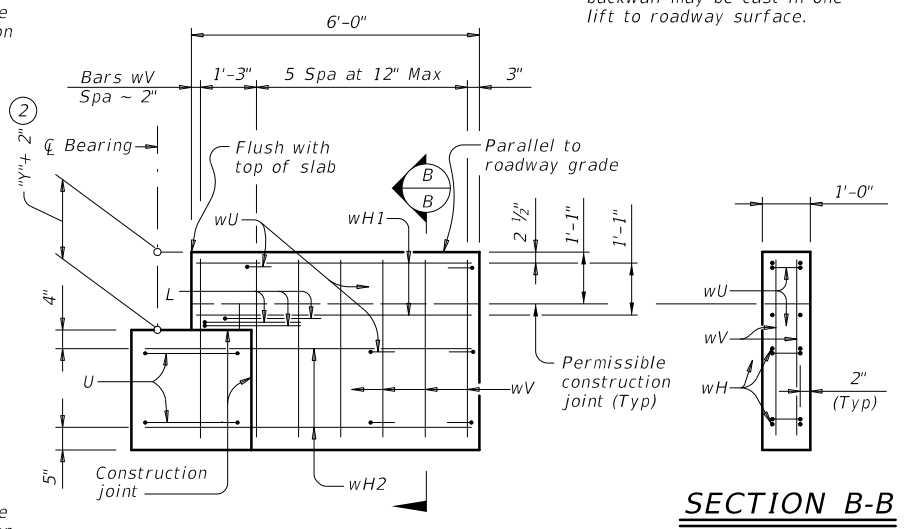
SECTION A-A

(With approach slab)
Note: At Contractor's option, backwall may be cast with approach slab.



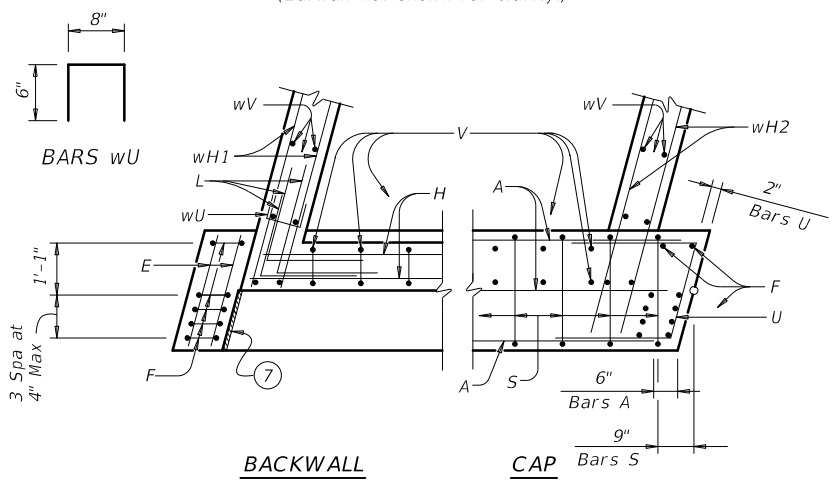
BACKWALL DETAIL

(Without approach slab)
Note: At Contractor's option, backwall may be cast in one lift to roadway surface.



WINGWALL ELEVATION

(Earwall not shown for clarity.)



CORNER DETAILS

FOUNDATION LOADS

Span Length	Drilled Shaft Loads		Vertical Pile Loads	
	5SB12	5SB15	5SB12	5SB15
Ft	Tons/DS	Tons/Pile		
25	39	41	29	31
30	44	46	33	35
35	48	51	36	38
40	52	55	39	41
45		59		45
50		63		48

TABLE OF ESTIMATED QUANTITIES

Bar	No.	Size	Length (5)		Weight (5)	
			5SB12	5SB15	5SB12	5SB15
A	6	#11	28'-1"	28'-1"	895	895
E	4	#4	2'-3"	2'-3"	6	6
F	10	#4	6'-4"	6'-4"	43	43
H	2	#5	26'-7"	26'-7"	56	56
L1	3	#6	4'-0"	4'-0"	18	18
L2	3	#6	4'-0"	4'-0"	18	18
S	32	#4	9'-4"	9'-4"	200	200
U	4	#6	7'-2"	7'-2"	43	43
V	26	#5	7'-4"	7'-10"	199	212
wH1	8	#6	5'-8"	5'-8"	68	68
wH2	8	#6	6'-11"	6'-11"	83	83
wU	12	#4	1'-8"	1'-8"	14	14
wV	28	#5	3'-10"	4'-1"	112	119
Reinforcing Steel				Lb	1,755	1,775
Cl "C" Conc (Abut)				CY	9.1	9.5

- Top of cap elevations are based on section depths shown on Span Details.
- See Span Details for "γ".
- Increase as required to maintain 3" from finished grade.
- See Bridge Layout to determine if approach slab is present.
- See Bridge Layout for beam type used in the superstructure.
- Quantities shown are for one abutment only (with approach slab). Without approach slab, add 1.0 CY Class "C" concrete and 56 Lb reinforcing steel for 2 additional Bars H.
- 1/2" preformed bituminous fiber material between slab beam and earwall. Bond to earwall with an approved adhesive. Cast inside face of earwall perpendicular to cap. (Typ)

GENERAL NOTES:
Designed according to AASHTO LRFD Bridge Design Specifications.
Designed for a normal embankment header slope of 3:1 and a maximum span length of 50 feet.
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 SPSB-24-15 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.

HL93 LOADING

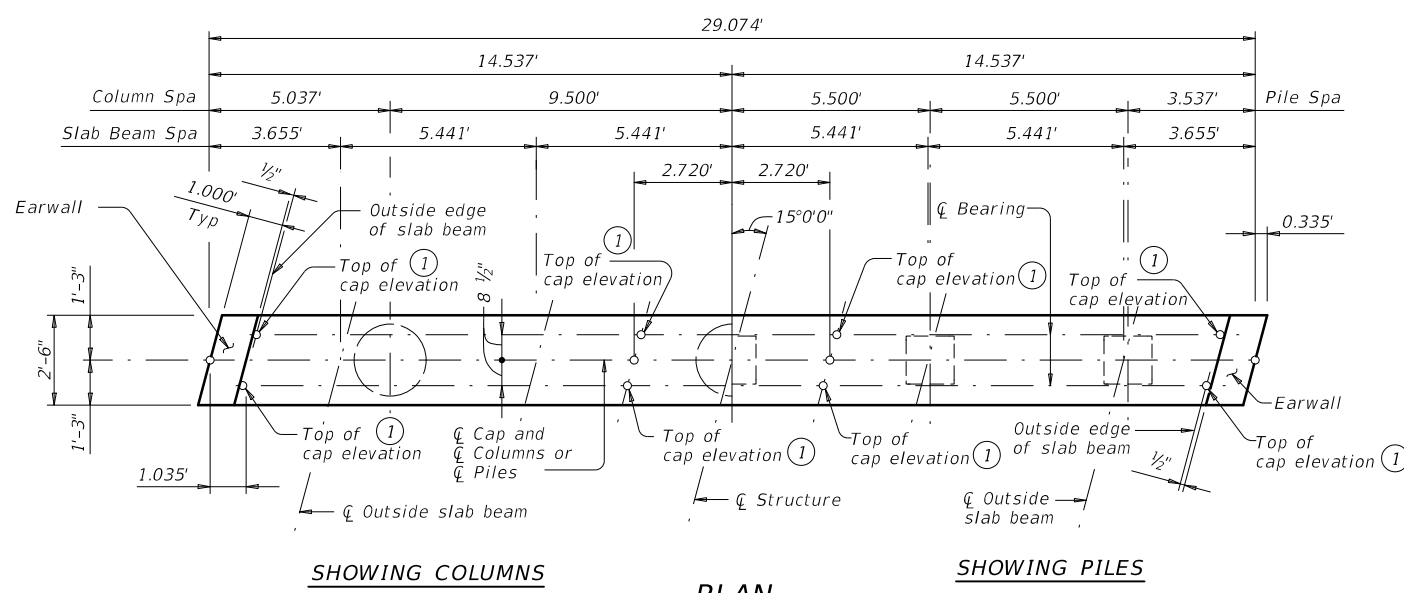
Texas Department of Transportation Bridge Division Standard

ABUTMENTS
PRESTR CONCRETE SLAB BEAM
24' ROADWAY 15° SKEW
APSB-24-15

FILE: psbste10-17.dgn	DN: TxDOT	CK: TxDOT	DW: TxDOT	CK: TxDOT
REVISIONS	0913	28	083, ETC	CR
	DIST	COUNTY	SHEET NO.	
	YKM	FAYETTE	90	

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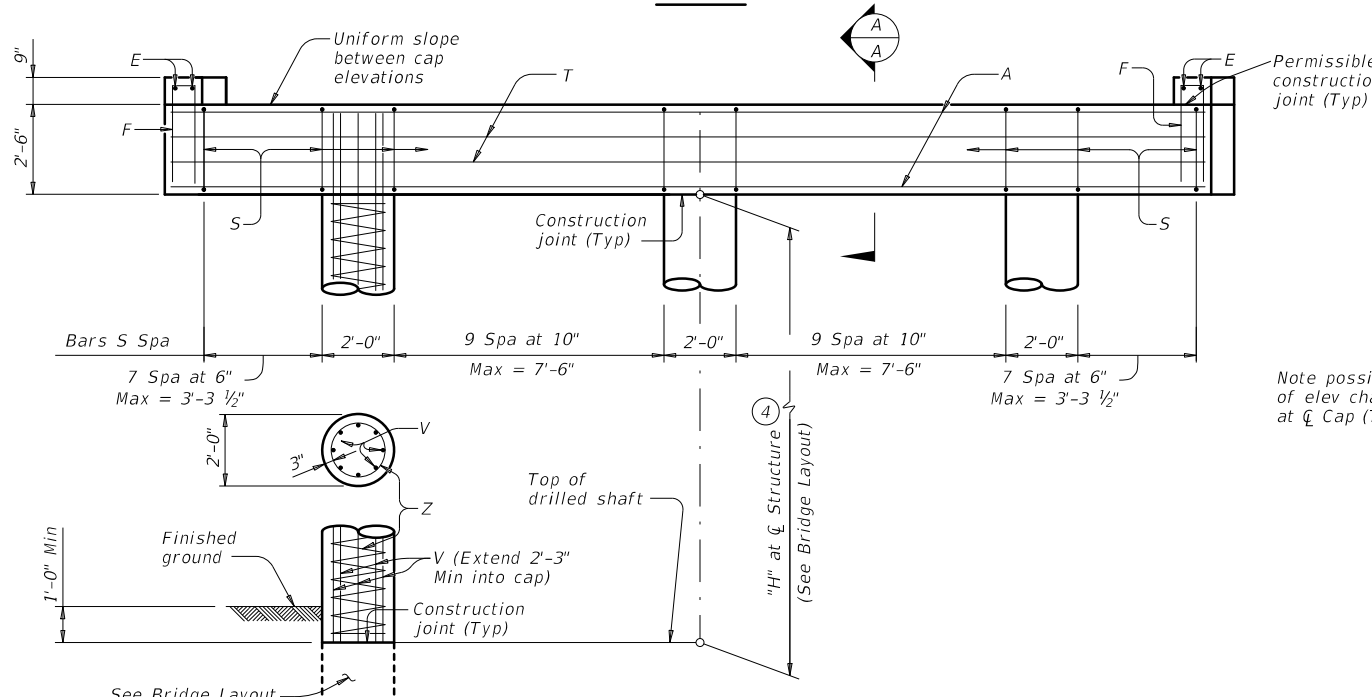
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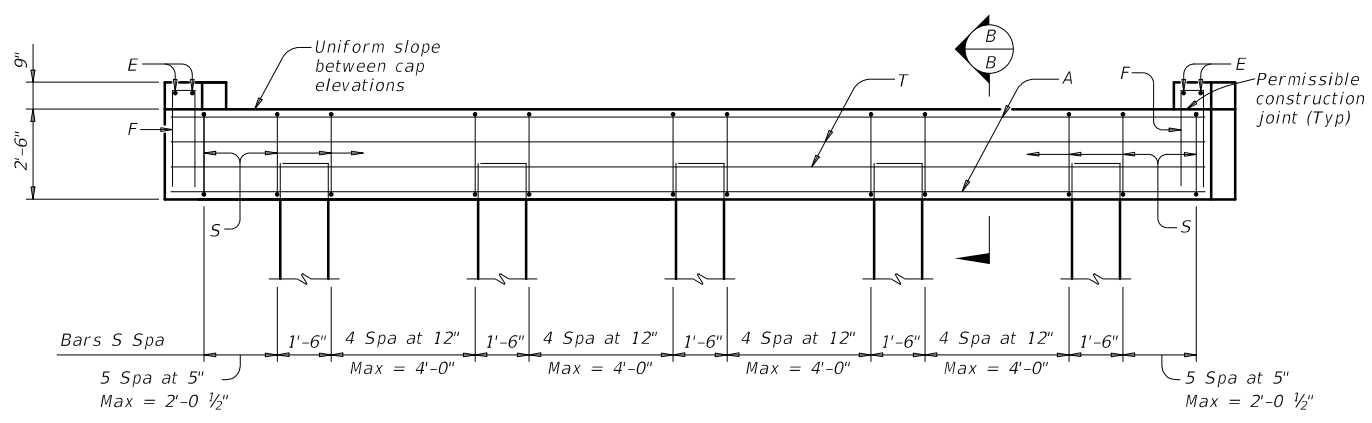
SHOWING COLUMNS

SHOWING PILES

PLAN



ELEVATION ~ 3 COLUMN BENT



ELEVATION ~ 5 PILE BENT

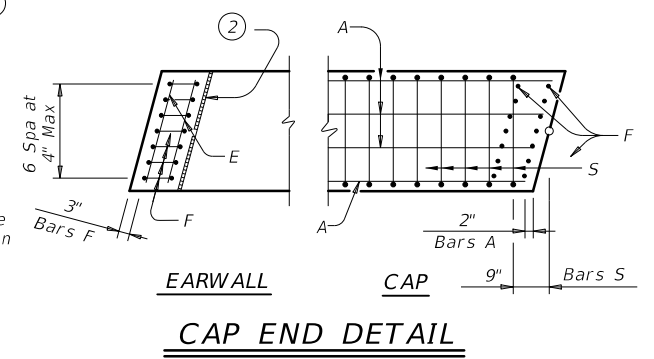
Note: For piles larger than 16", adjust Bars S spacing as required to avoid piles.

FOUNDATION LOADS				
Average Span Length	Drilled Shaft Loads ⑤		Vertical Pile Loads	
	5SB12	5SB15	5SB12	5SB15
Ft				
25	58	61	35	37
30	66	71	40	43
35	74	79	44	47
40	81	87	48	52
45		94		57
50		102		61

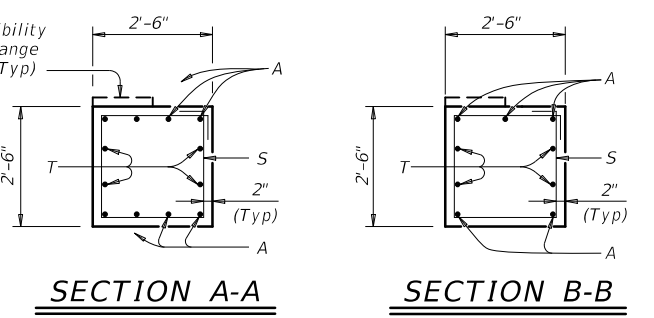
TABLE OF ESTIMATED QUANTITIES ③				
3 COLUMN BENT				
Bar	No.	Size	Length	Weight
A	8	#11	28'-9"	1,222
E	4	#4	2'-3"	6
F	14	#4	6'-4"	61
S	36	#5	9'-8"	363
T	4	#5	28'-9"	120
V	24	#7	26'-3"	1,288
Z	3	#3	242'-2"	273
Reinforcing Steel			Lb	3,333
CI "C" Conc (Cap)			CY	6.9
CI "C" Conc (Column)			CY	8.4

TABLE OF ESTIMATED QUANTITIES				
5 PILE BENT				
Bar	No.	Size	Length	Weight
A	5	#11	28'-9"	764
E	4	#4	2'-3"	6
F	14	#4	6'-6"	61
S	32	#5	9'-8"	323
T	4	#5	28'-9"	120
Reinforcing Steel			Lb	1,274
CI "C" Conc (Cap)			CY	6.9

TABLE OF MAXIMUM ALLOWABLE EXPOSED PILE HEIGHTS AND PILE LOADS ④			
Pile Type		Max Ht	Max Load
Concrete	Steel	Ft	Tons/Pile
16" Sq	HP14x73	16	75
18" Sq	HP14x117 ⑥	20	90

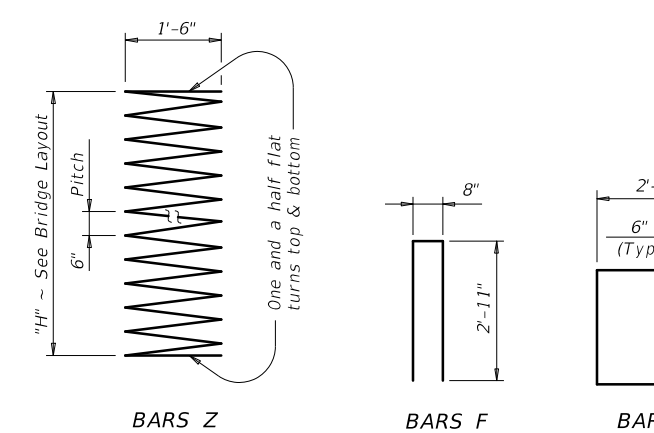


CAP END DETAIL



SECTION A-A

SECTION B-B



BARS Z

BARS F

BARS S

- ① Top of cap elevations are based on section depths shown on Span Details.
- ② 1/2" preformed bituminous fiber material between slab beam and earwall. Bond to earwall with an approved adhesive. Cast inside face of earwall perpendicular to cap. (Typ)
- ③ Quantities shown are based on an "H" value of 24 feet. For each linear foot variation in "H" value, make the following adjustments:
 Bars V length, 1'-0"
 Bars Z length, 9'-6"
 Reinforcing Steel, 60 Lb
 Class "C" conc (column), 0.35 CY
- ④ This standard may not be used for "H" heights exceeding 24 feet or exposed pile heights exceeding the values shown in the table. In areas of very soft soil or where scour is anticipated, allowable "H" heights or exposed pile heights must be evaluated by the Engineer prior to the use of this standard.
- ⑤ Foundation Loads based on "H" = 24 feet.
- ⑥ When HP14x117 steel piling is specified in the plans, the Contractor has the option of furnishing either HP14x117 or HP16x101 steel piling.

GENERAL NOTES:
 Designed according to AASHTO LRFD Bridge Design Specifications.
 Bent selected must be based on the average span length rounded up to the next 5-foot increment.
 For pile bents supporting unequal spans, the shorter span cannot be less than 80 percent of the longer span.
 See Bridge Layout for foundation type, size, and length.
 See Common Foundation Details (FD) standard sheet for all foundation details and notes.
 These bent details do not support the use of multi-pile footings shown on the FD standard.
 Details are drawn showing right forward skew. See Bridge Layout for actual skew direction.
 These bent details may be used with standard SPSB-24-15 only.

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

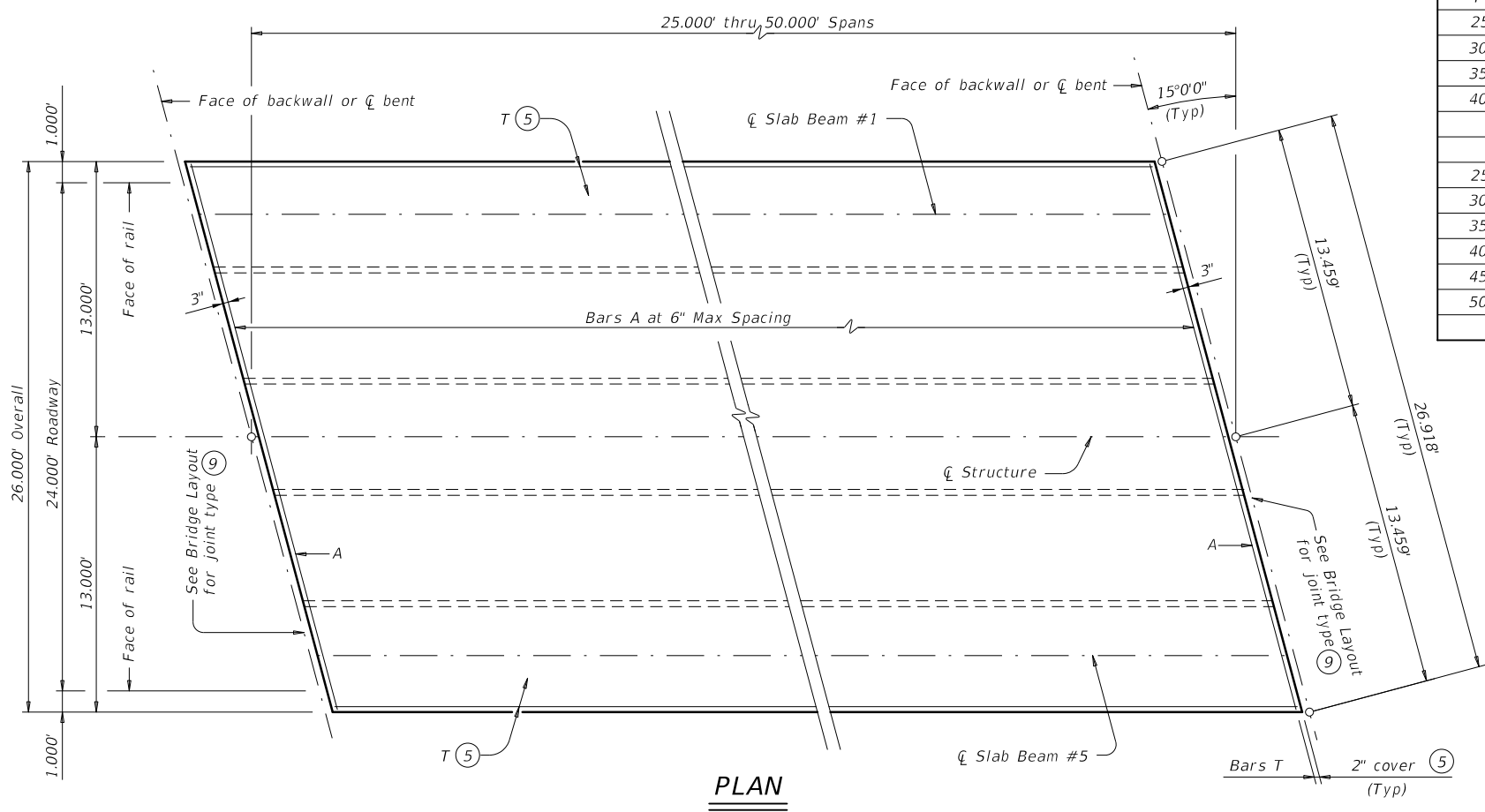
MATERIAL NOTES:
 Provide Class C concrete (f'c = 3,600 psi).
 Provide Class C (HPC) concrete if shown elsewhere in the plans.
 Provide Grade 60 reinforcing steel.

HL93 LOADING

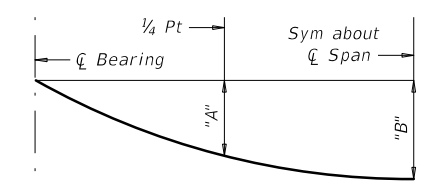
Texas Department of Transportation		Bridge Division Standard	
INTERIOR BENTS			
PRESTR CONCRETE SLAB BEAM			
24' ROADWAY		15° SKEW	
BPSB-24-15			
FILE: psbste22-17.dgn	DN: TxDOT	CK: TxDOT	DW: TxDOT
©TxDOT January 2017	CON: 0913	SECT: 28	JOB: 083, ETC
REVISIONS	DIST: YKM	COUNTY: FAYETTE	SHEET NO: 91

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DATE: FILE:

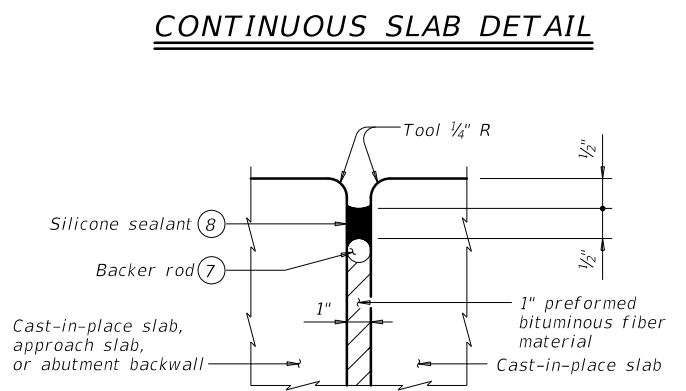
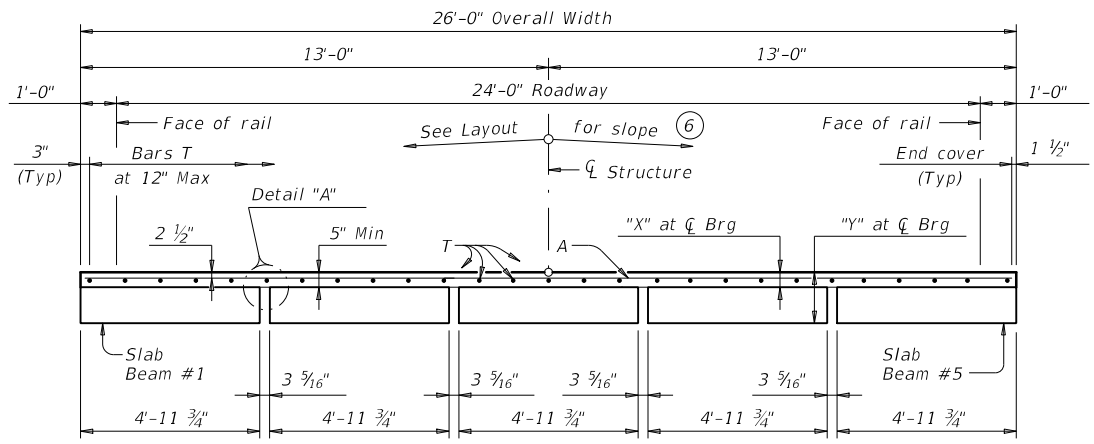
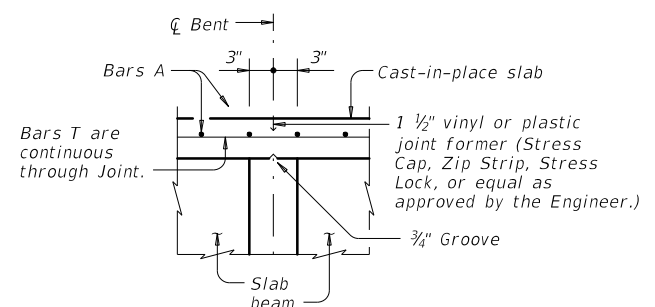
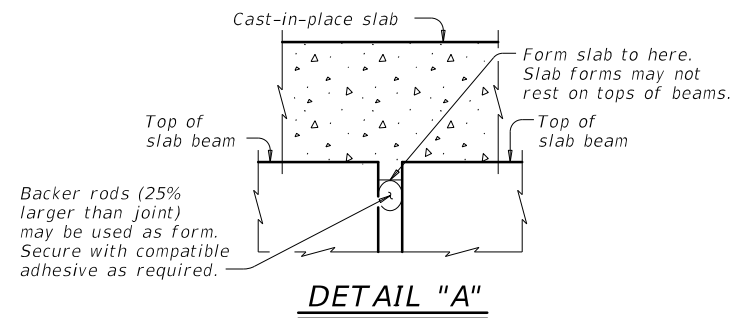


Span Length	Beam Type	Dead Load Deflection		Section Depths (3)	
		"A"	"B"	"X"	"Y"
Ft	(1)	Ft	Ft	In	Ft/In
25	5SB12	0.004	0.005	5 1/4"	1'-5 1/4"
30	5SB12	0.008	0.011	5 1/2"	1'-5 1/2"
35	5SB12	0.015	0.021	6"	1'-6"
40	5SB12	0.026	0.036	6 1/2"	1'-6 1/2"
25	5SB15	0.002	0.003	5 1/4"	1'-8 1/4"
30	5SB15	0.004	0.006	5 1/2"	1'-8 1/2"
35	5SB15	0.008	0.011	5 1/2"	1'-8 1/2"
40	5SB15	0.013	0.019	5 3/4"	1'-8 3/4"
45	5SB15	0.022	0.030	6 1/2"	1'-9 1/2"
50	5SB15	0.034	0.047	7"	1'-10"



NOTE: Deflections shown are due to concrete slab only ($E_c = 5,000$ ksi). Calculated deflections shown are theoretical and actual dimensions may vary. Adjust based on field verification.

BAR	SIZE
A	#5
T	#4



SPAN LENGTH	REINF CONCRETE SLAB (SLAB BEAM)	PRESTR CONC SLAB BEAM (5SB12 OR 5SB15) (1)			TOTAL REINF STEEL (2)
		ABUT TO INT BT	INT BT TO INT BT	ABUT TO ABUT	
Ft	SF	LF (4)	LF (4)	LF (4)	Lb
25	650	122.46	122.50	122.41	1,820
30	780	147.46	147.50	147.41	2,180
35	910	172.46	172.50	172.41	2,550
40	1,040	197.46	197.50	197.41	2,910
45	1,170	222.46	222.50	222.41	3,280
50	1,300	247.46	247.50	247.41	3,640

- See Bridge Layout for beam type used in the superstructure. These standards do not provide for the use of both SB12 and SB15 beams within the same structure.
- Reinforcing steel weight is calculated using an approximate factor of 2.8 Lbs/SF.
- Based on theoretical beam camber, dead load deflections of 5" cast-in-place concrete slab and a constant grade.
- Fabricator will adjust beam lengths for beam slopes as required.
- Where slab is continuous over Interior Bents, Bars T are continuous through Joint. See "Continuous Slab Detail".
- This standard does not provide for changes in roadway cross-slopes within the structure.
- 1 1/2" 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.
- 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.
- See Bridge Layout for expansion joint locations. If using Type A expansion joints, the maximum distance between joints is 100 feet. Type A joints are subsidiary to Item 422, "Concrete Superstructures".

GENERAL NOTES:
 Designed according to AASHTO LRFD Bridge Design Specifications. This standard does not provide for vertical curves in roadway grade within the structure.
 Two- or three-span units, with slab continuous over interior bents, may be formed with the details shown on this sheet. See applicable rail details for rail anchorage in slab. Details are drawn showing right forward skew. See Bridge Layout for actual skew direction.
 This standard does not support the use of transition bents.

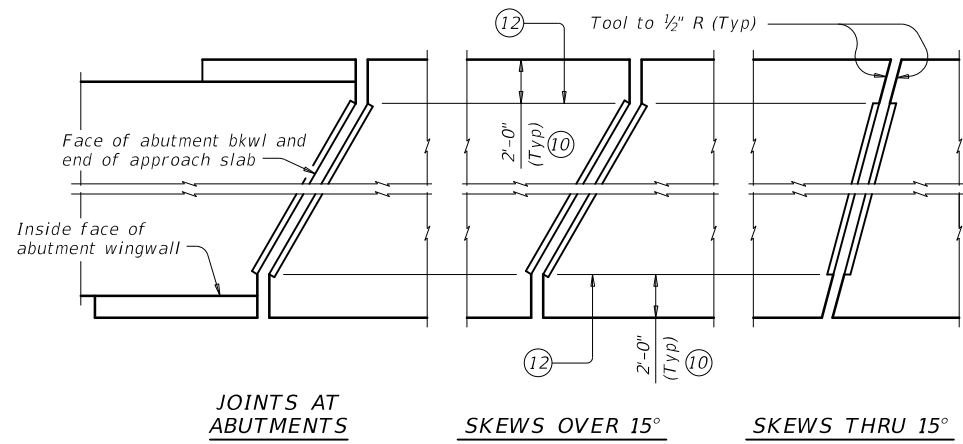
Cover dimensions are clear dimensions, unless noted otherwise.

MATERIAL NOTES:
 Provide Class 5 concrete ($f'_c = 4,000$ psi).
 Provide Class 5 (HPC) concrete if shown elsewhere in the plans.
 Provide Grade 60 reinforcing steel.
 Provide bar laps, where required, as follows:
 Uncoated ~ #4 = 1'-0"
 ~ #5 = 2'-0"
 Epoxy coated ~ #4 = 2'-5"
 ~ #5 = 3'-0"
 Deformed welded wire reinforcement (WWR) (ASTM A1064) of equal size and spacing may be substituted for Bars A or T unless noted otherwise.
 HL93 LOADING

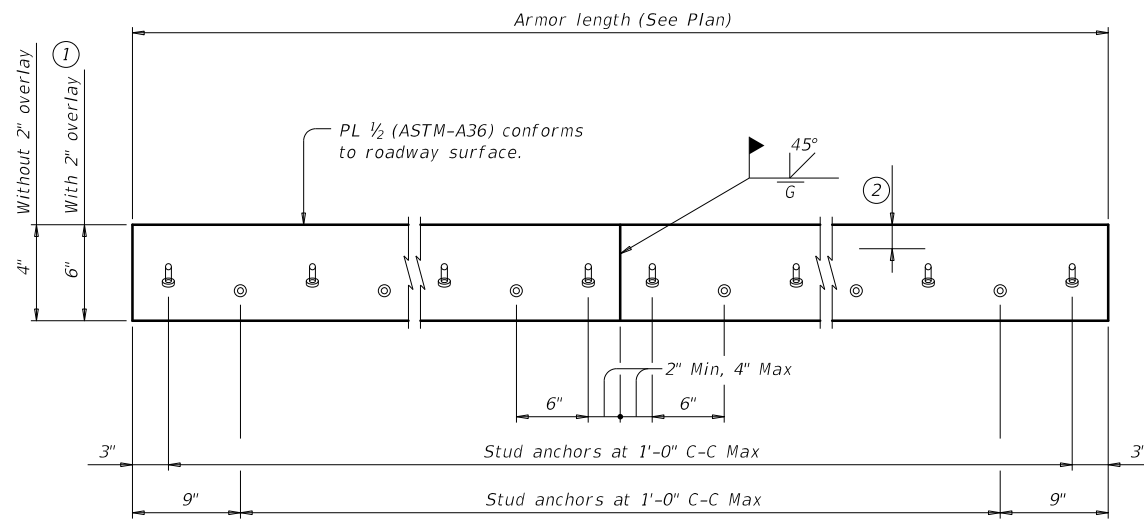
				Bridge Division Standard	
PRESTRESSED CONCRETE SLAB BEAM SPANS (TY SB12 OR SB15)					
24' ROADWAY				15° SKEW	
SPSB-24-15					
FILE: pbsste31-17.dgn	DN: TxDOT	CK: TxDOT	DW: TxDOT	CK: TxDOT	
©TxDOT January 2017	CONV	SECT	JOB	HIGHWAY	
REVISIONS	0913	28	083, ETC	CR	
	DIST	COUNTY	SHEET NO.		
	YKM	FAYETTE	92		

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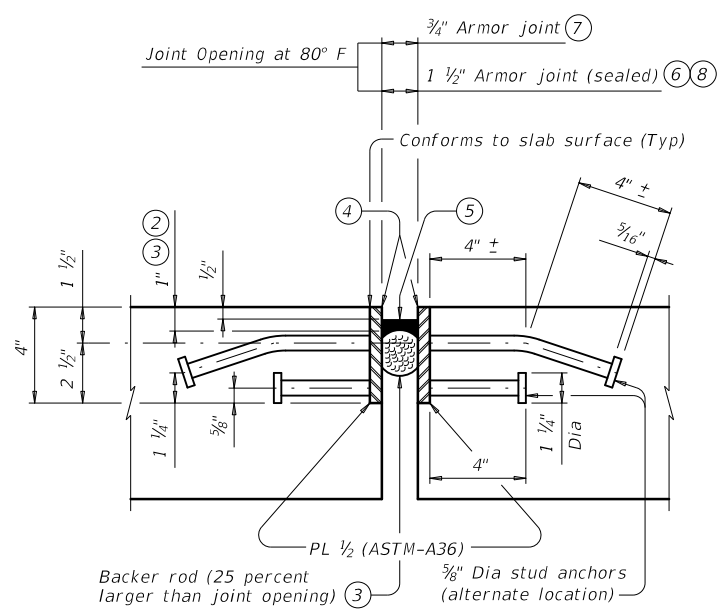


JOINTS AT ABUTMENTS **SKEWS OVER 15°** **SKEWS THRU 15°**
PLANS OF ARMOR PLATES

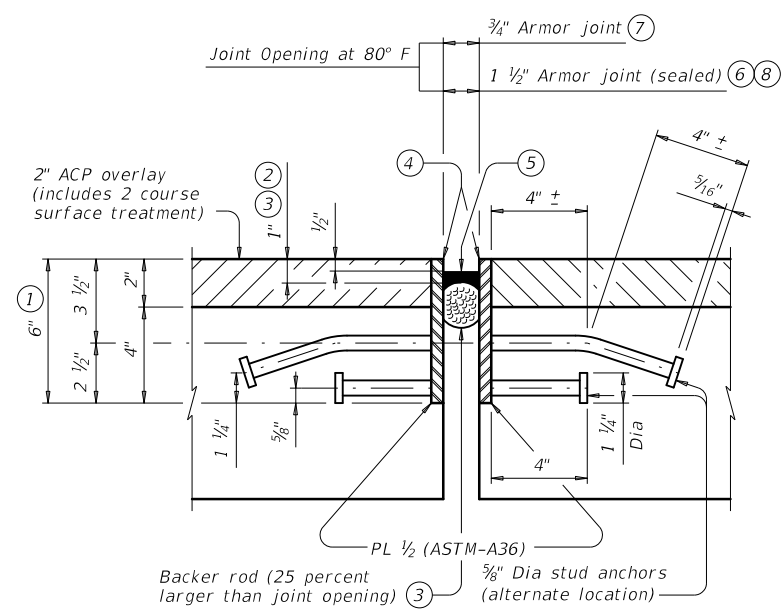


ELEVATION OF BASIC ARMOR PLATE

- 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.



SHOWN WITHOUT 2" OVERLAY AT JOINT LOCATION



SHOWN WITH 2" OVERLAY AT JOINT LOCATION

ARMOR JOINT SECTIONS
 Showing Armor Joint (Sealed)

FABRICATION NOTES:

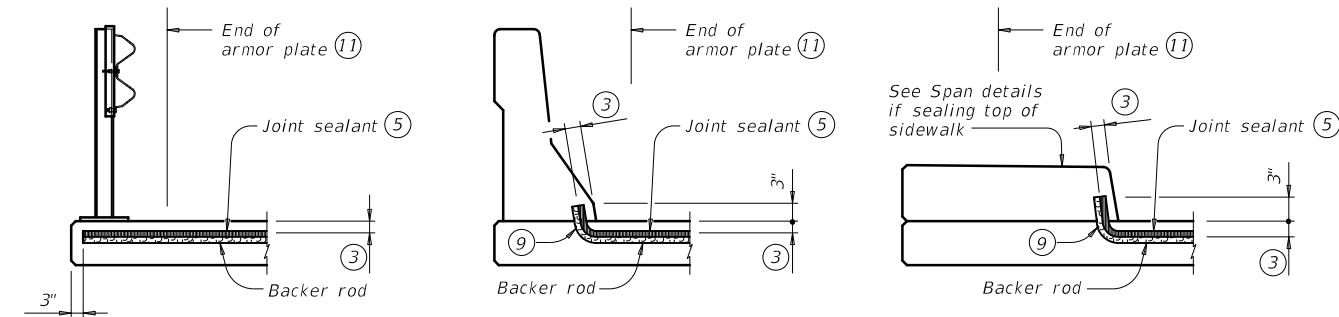
Match mark corresponding plate sections and secure together for shipment with shipping angle. Do not use erection bolts. Ship armor joints in convenient lengths of 10'-0" Min and 24'-0" Max unless necessary for stage construction or widenings. One shop splice is permitted in each shipping length provided 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.

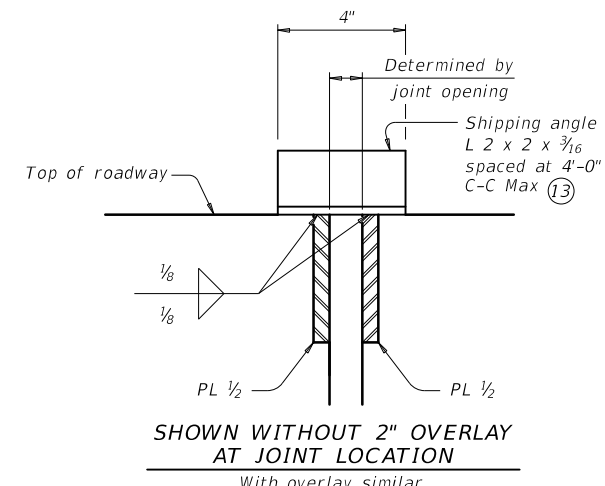
GENERAL NOTES:

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.



AT STEEL POST BRIDGE RAIL **AT CONCRETE BRIDGE RAIL** **AT SIDEWALK**

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



SHIPPING ANGLE

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

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

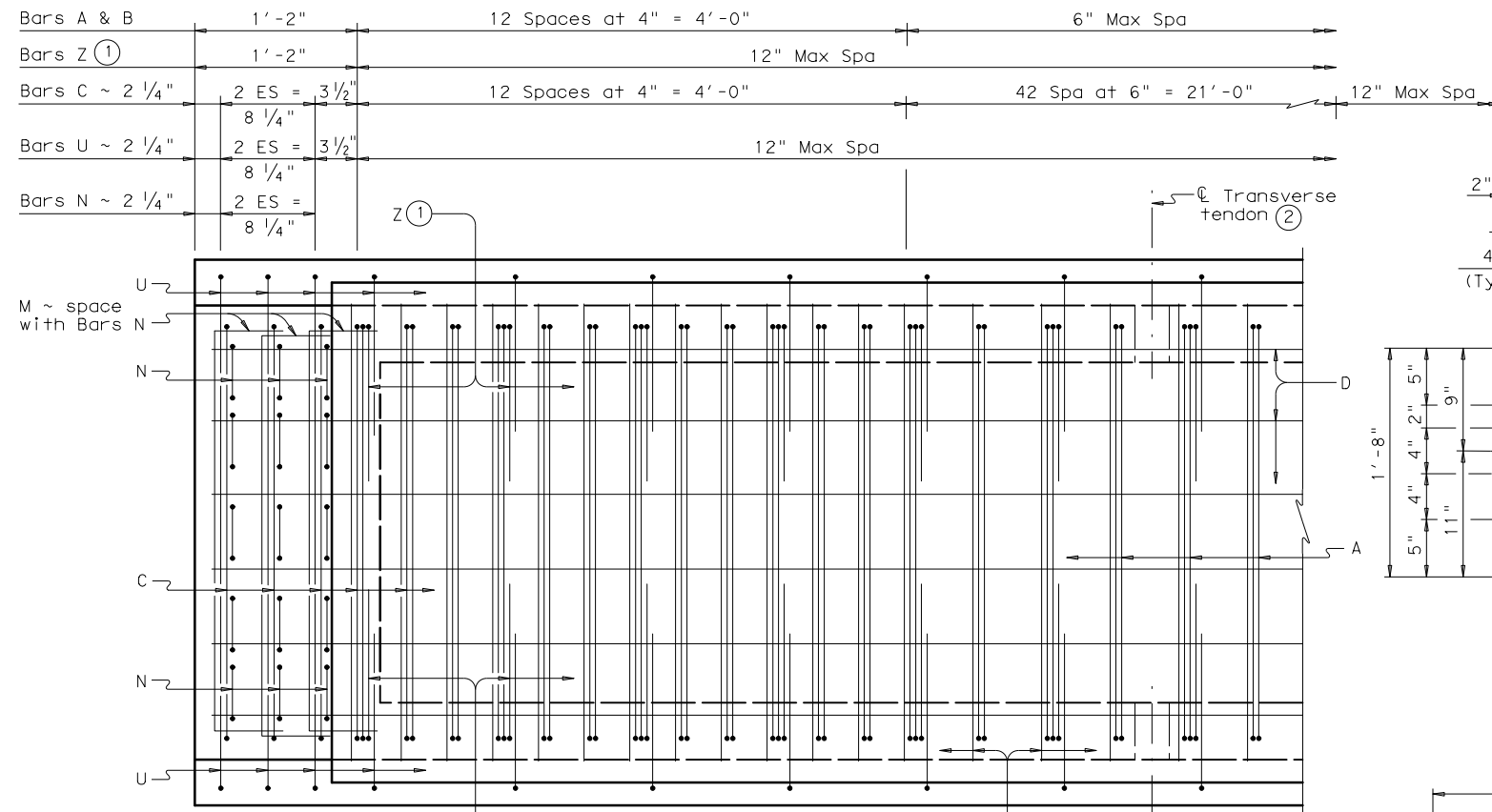
Texas Department of Transportation **Bridge Division Standard**

ARMOR JOINT DETAILS

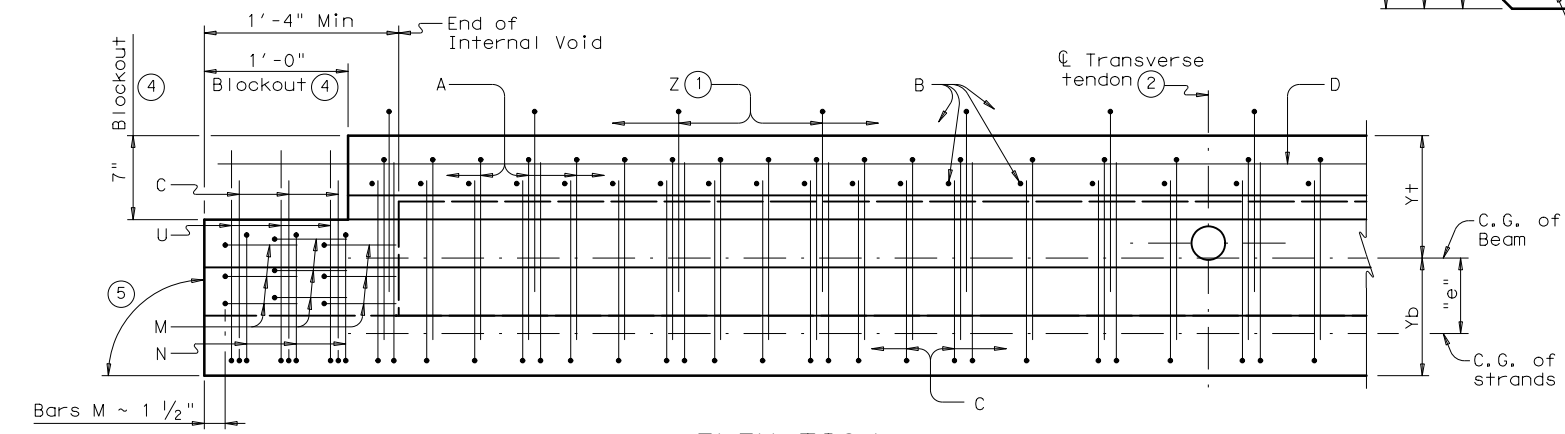
AJ

FILE: ajstd01-19.dgn	DN: TxDOT	CK: TxDOT	DW: TxDOT	CK: TxDOT
©TxDOT April 2019	CONT	SECT	JOB	HIGHWAY
REVISIONS	0913	28	083, ETC	CR
	DIST	COUNTY	SHEET NO.	
	YKM	FAYETTE	93	

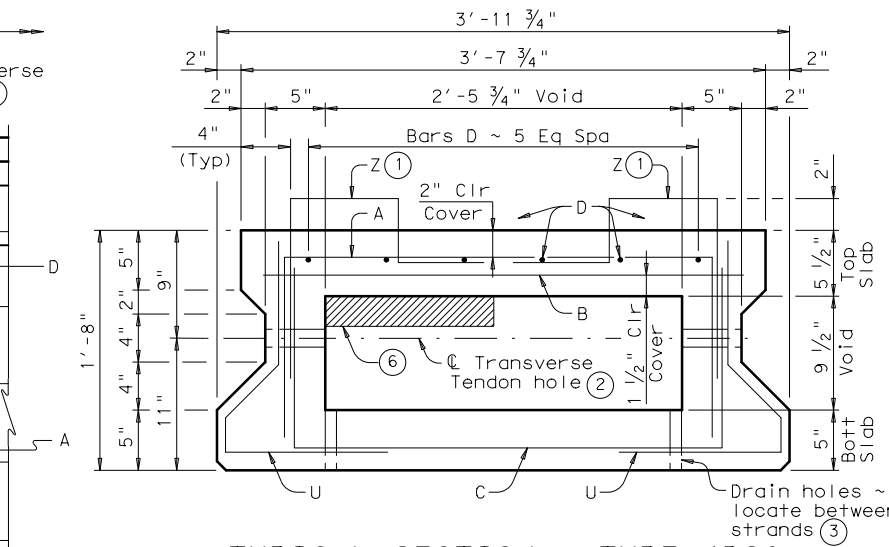
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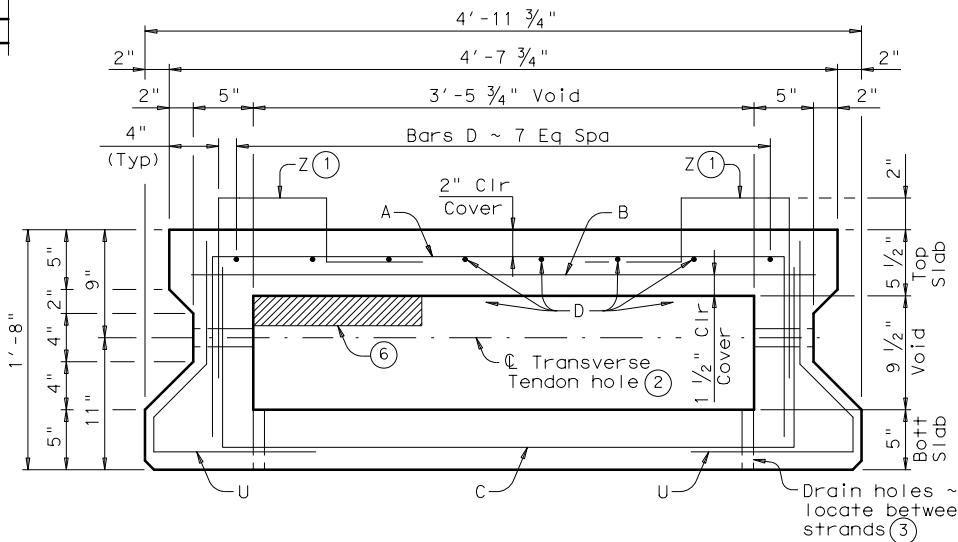
PARTIAL PLAN
(Showing Type 4B20)



ELEVATION



TYPICAL SECTION ~ TYPE 4B20



TYPICAL SECTION ~ TYPE 5B20

BEAM PROPERTIES			
		Type 4B20	Type 5B20
Area	in ²	591.8	717.8
Y top	in	10.19	10.12
Y bott	in	9.81	9.88
I	in ⁴	28,086	35,234
Weight (7)	lb/ft	616	748

- Bars Z are required for beams topped with a cast-in-place concrete slab only.
- Post-tensioning tendons are required for beams not topped with a Min 5" cast-in-place concrete slab. See span details for number and spacing of transverse tendons. Cast interior diaphragms in exterior beams and beams that serve temporarily as exterior beams in staged constructed bridges. See "Blockout, Interior Diaphragm, and Drain Details". Form 3" Dia holes in interior beams. See standard BBPT for details.
- Place drain holes (1" Dia PVC Sch 40 Pipe) as shown in all beam void corners including each side of interior diaphragms. See "Blockout, Interior Diaphragm, and Drain Details".
- Blockouts required at ends of all beams. Extend beam reinforcement into blockouts.
- 90° at conventional Interior Bents. Ends of beams shall be vertical at Abutment backwall and Inverted Tee Bent Stems.
- Showing void modification required in exterior beams not topped with a Min 5" cast-in-place concrete slab. See standard BBRAO for void modification dimensions.
- Based on 150 pcf weight density of concrete. Weight of end blocks and interior diaphragms is not included.

GENERAL NOTES:

Designed according to AASHTO LRFD Specifications. Use Class H concrete. Use Class H (HPC) if required elsewhere in plans. All reinforcing steel must be Grade 60. Two-stage monolithic casting is required. The concrete in the first stage cast (bottom beam flange) must remain plastic until the second stage cast (webs and top beam flange) is placed. Vibrate as required to ensure consolidation between the two casts. 1/4" clear cover to reinforcement is required unless noted otherwise. See standard BBRAS or BBRAO for railing anchorage at bridge edges to be cast in beams. An equal area of welded wire reinforcement (WWR) meeting the requirements of ASTM A1064 may be substituted for Bars A, B, C, and D. These details are applicable for skews up to 30 degrees only. Chamfer bottom beam corners 3/4" or round to a 3/4" radius.

HL93 LOADING

SHEET 1 OF 3



PRESTRESSED CONCRETE BOX BEAM DETAILS (TYPE B20)

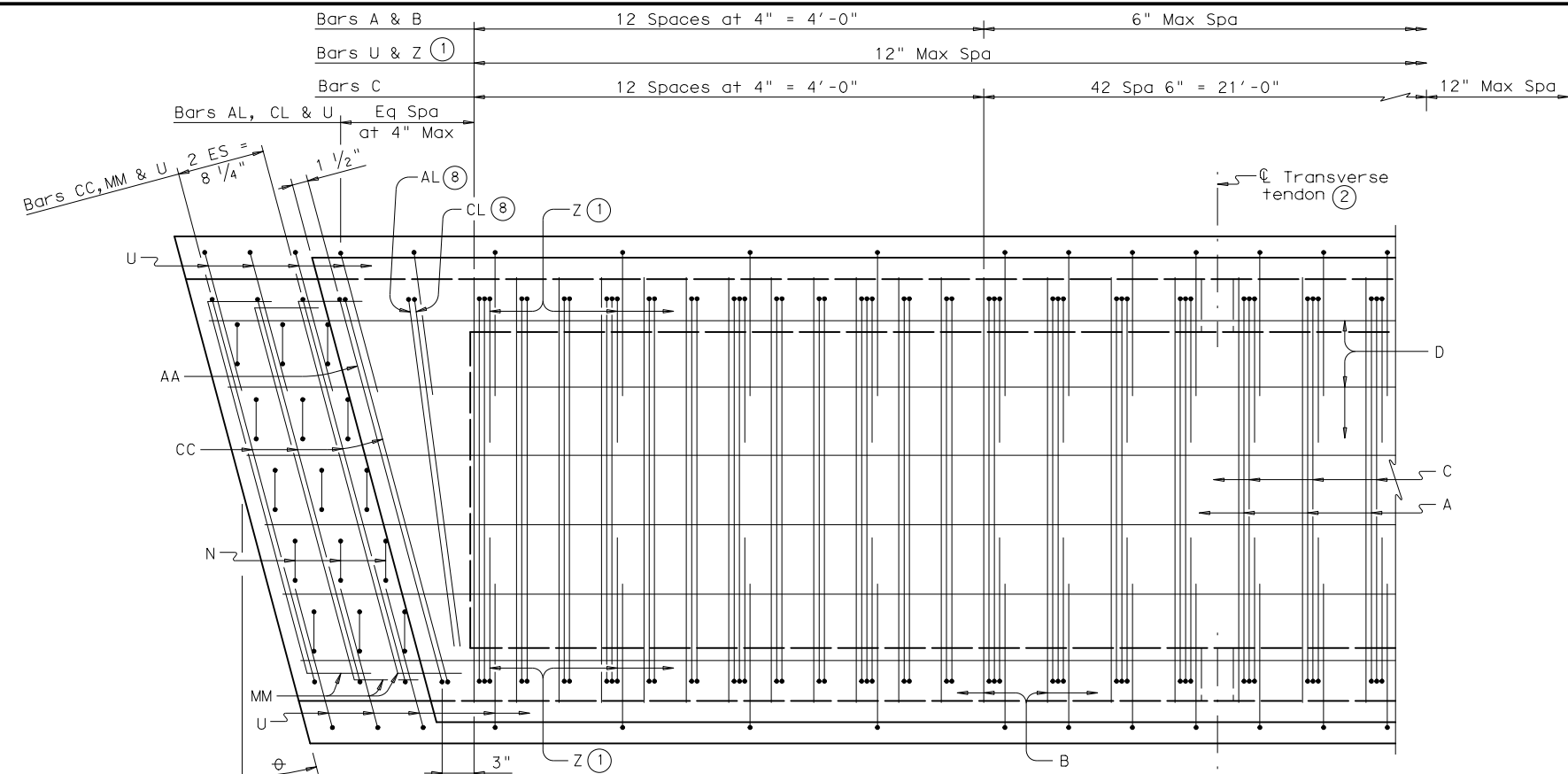
BB-B20

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©TxDOT December, 2006	CONT	SECT	JOB	HIGHWAY
REVISIONS	0913	28	083, ETC	CR
01-12: Bars Z.	DIST	COUNTY	SHEET NO.	
	YKM	FAYETTE	94	

DATE: FILE:

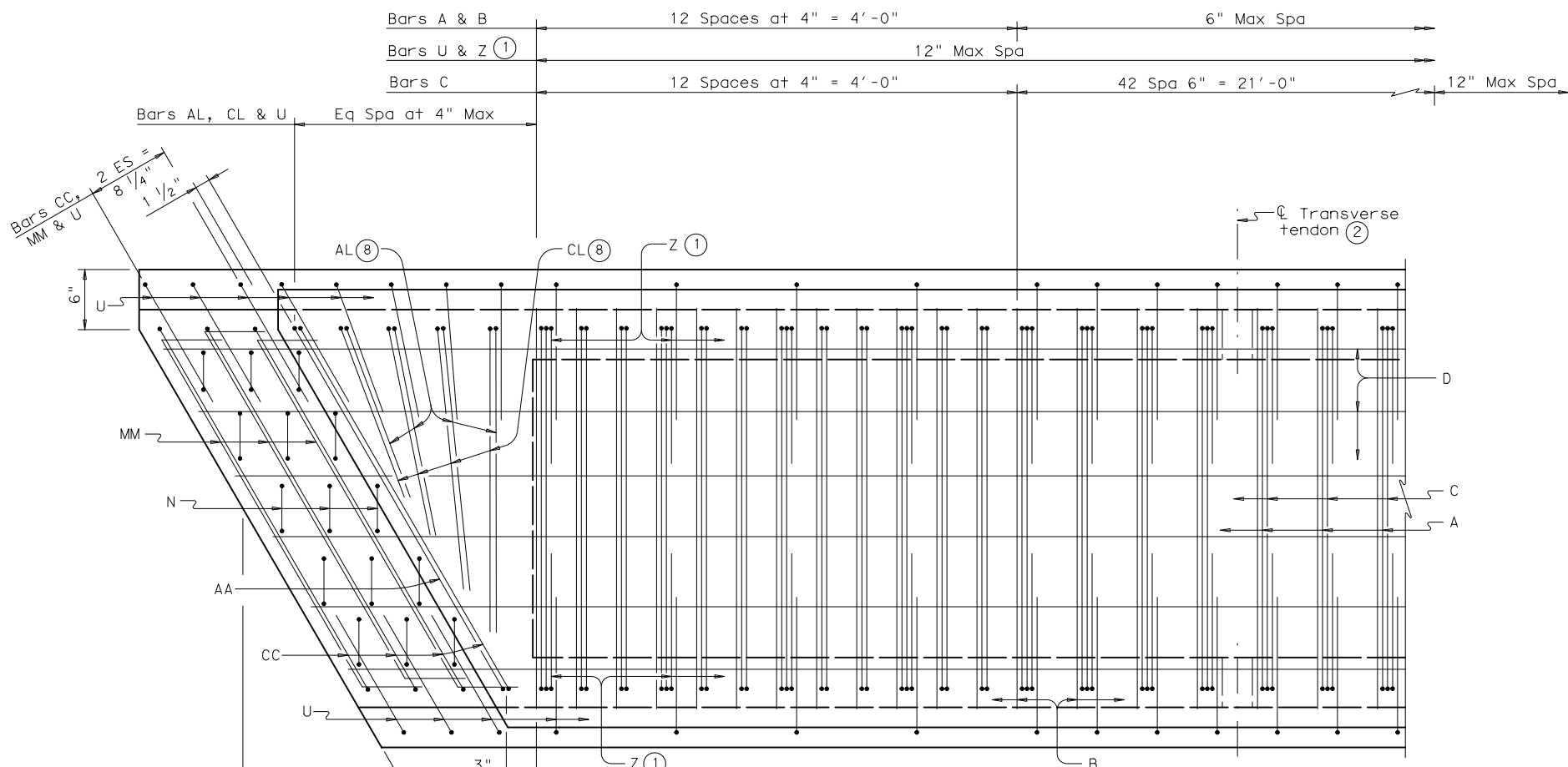
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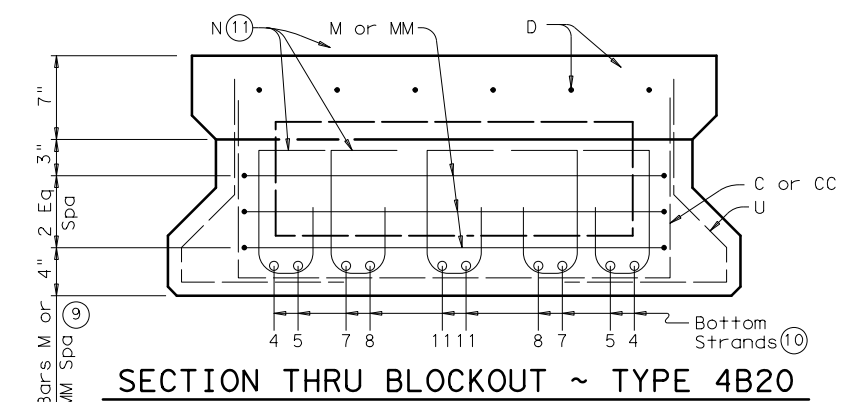
PARTIAL PLAN ~ 15° SKEW

(Showing Type 4B20)
(use for skew angles of 15° or less)



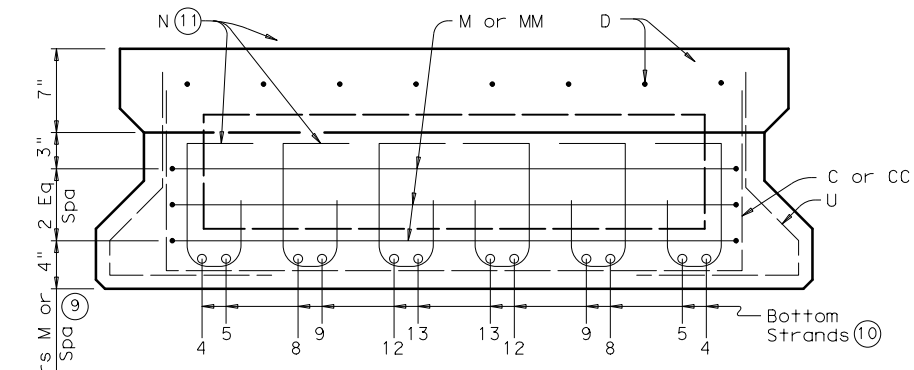
PARTIAL PLAN ~ 30° SKEW

(Showing Type 4B20)
(use for skew angles greater than 15° and less than or equal to 30°)



SECTION THRU BLOCKOUT ~ TYPE 4B20

(Showing End Mat Reinforcing)



SECTION THRU BLOCKOUT ~ TYPE 5B20

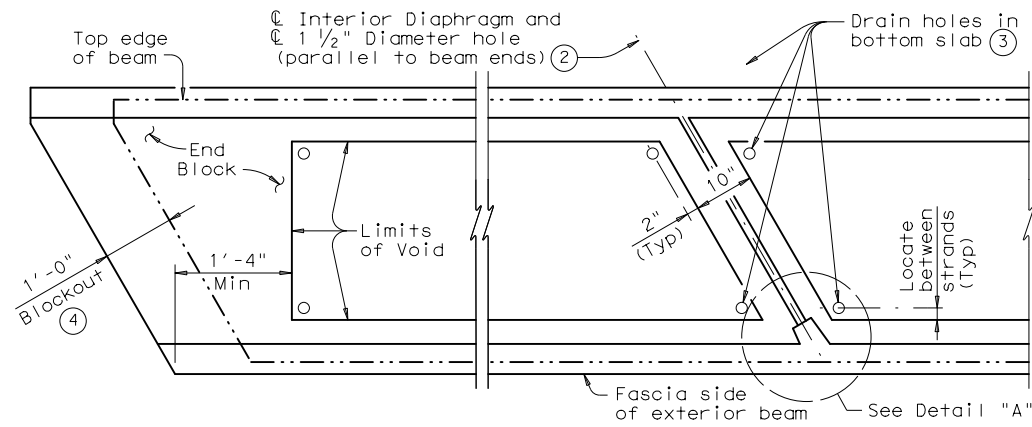
(Showing End Mat Reinforcing)

- ① Bars Z are required for beams topped with a cast-in-place concrete slab only.
- ② Post-tensioning tendons are required for beams not topped with a Min 5" cast-in-place concrete slab. See span details for number and spacing of transverse tendons. Cast interior diaphragms in exterior beams and beams that serve temporarily as exterior beams in staged constructed bridges. See "Blockout, Interior Diaphragm, and Drain Details". Form 3" Dia hole in interior beams. See standard BBPT for details.
- ⑧ Cut as required to maintain one inch clear between bars.
- ⑨ Bars M may be adjusted vertically as required to avoid pretensioning strands in web.
- ⑩ See standard BBND or appropriate Prestressed Concrete Box Beam Standard Designs sheet for locations of pretensioning strands.
- ⑪ For Type 4B20 Box Beams: Bars N may be reduced to 4 bars per row when beam design contains fewer than 22 strands. In this case, place Bars N at the 5-6 and 8-9 strand locations.
For Type 5B20 Box Beams: Bars N may be reduced to 5 bars per row when beam design contains fewer than 28 strands. In this case, place Bars N at the 4-5, 9-10 and 14-14 strand locations.

		Bridge Division Standard	
PRESTRESSED CONCRETE BOX BEAM DETAILS (TYPE B20)			
BB-B20			
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©TxDOT December, 2006	CONT	SECT	JOB
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REVISIONS	DIST		COUNTY
01-12: Bars Z.	YKM		FAYETTE
			SHEET NO. 95

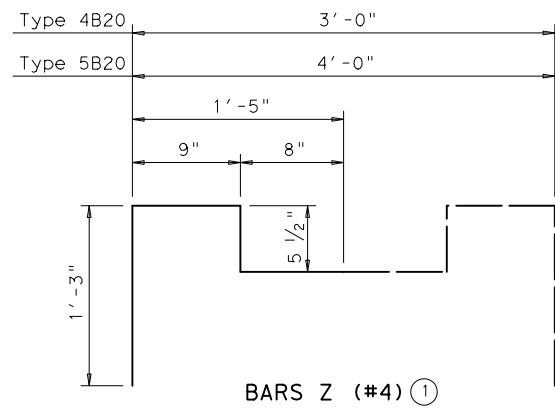
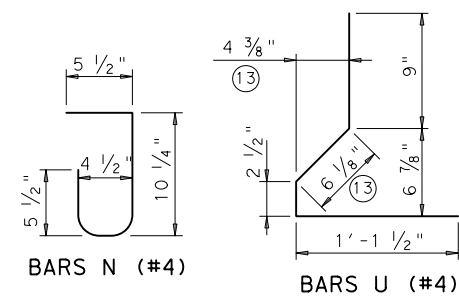
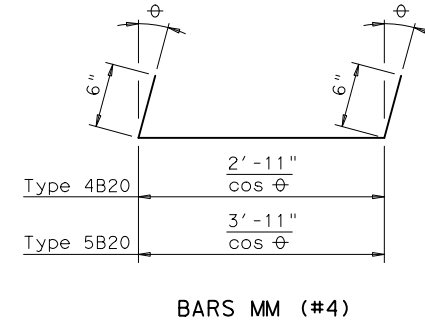
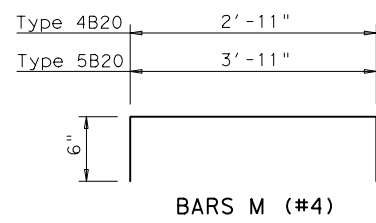
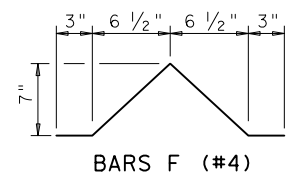
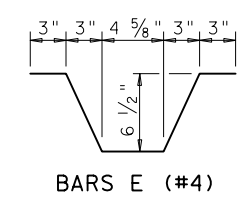
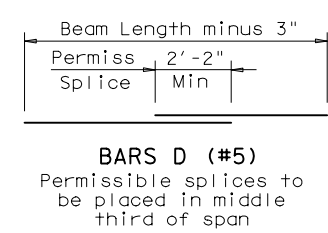
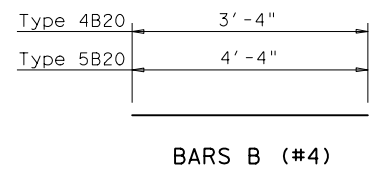
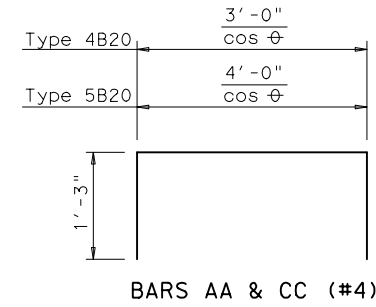
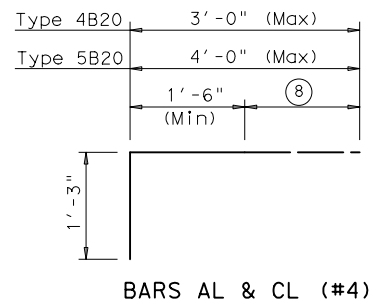
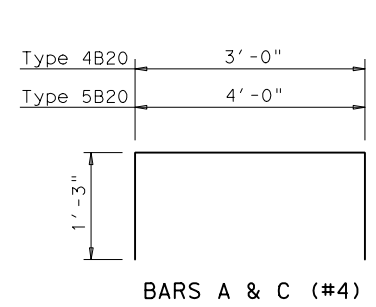
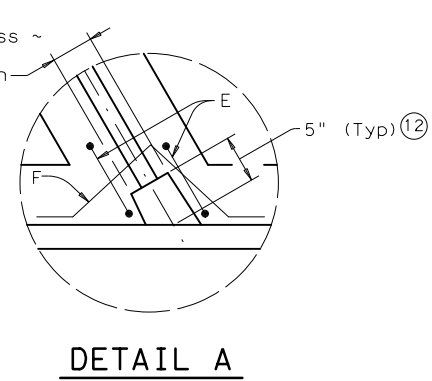
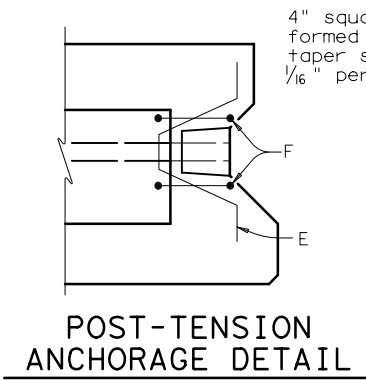
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BLOCKOUT, INTERIOR DIAPHRAGM AND DRAIN DETAILS

(Showing 30° skew)



- ① Bars Z are required for beams topped with a cast-in-place concrete slab only.
- ② Post-tensioning tendons are required for beams not topped with a Min 5" cast-in-place concrete slab. See span details for number and spacing of transverse tendons. Cast interior diaphragms in exterior beams and beams that serve temporarily as exterior beams in staged constructed bridges. Form 3" Dia holes in interior beams. See "Blockout, Interior Diaphragm, and Drain Details". See standard BBPT for details.
- ③ Place drain holes (1" Dia PVC Sch 40 Pipe) as shown in all beam void corners including each side of interior diaphragms. See "Blockout, Interior Diaphragm, and Drain Details".
- ④ Blockouts required at ends of all beams. Extend beam reinforcement into blockouts.
- ⑧ Cut as required to maintain one inch clear between bars.
- ⑫ 5" (Typ) or sufficient depth to provide 1" Cover on cut-off tendon. See BBPT for details.
- ⑬ Dimension will vary slightly with skew. Adjust as necessary.

At fabricator's option, Bars Z pairs may be fabricated using one continuous bar. If this option is used, Bars B at Bar Z locations (only) may be omitted.



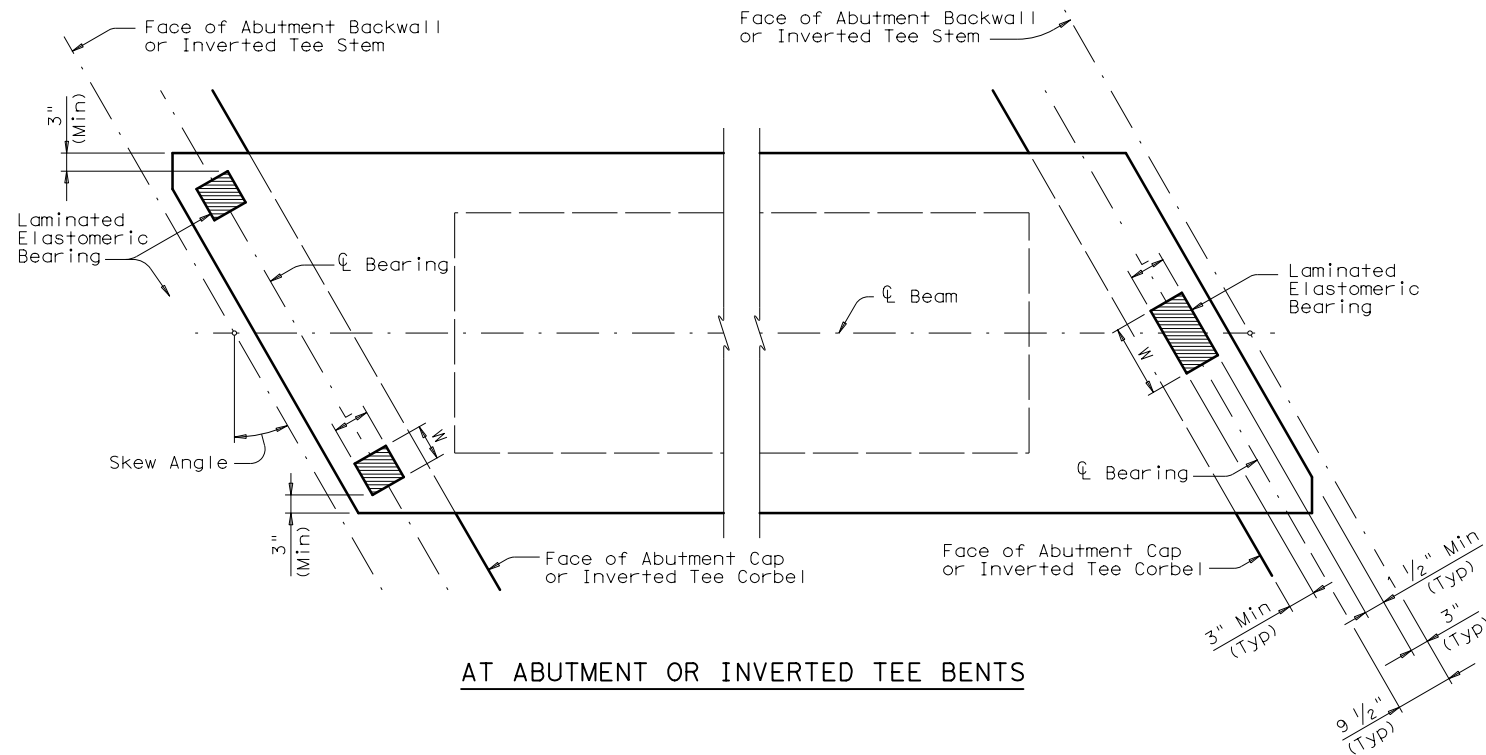
PRESTRESSED CONCRETE BOX BEAM DETAILS (TYPE B20)

BB-B20

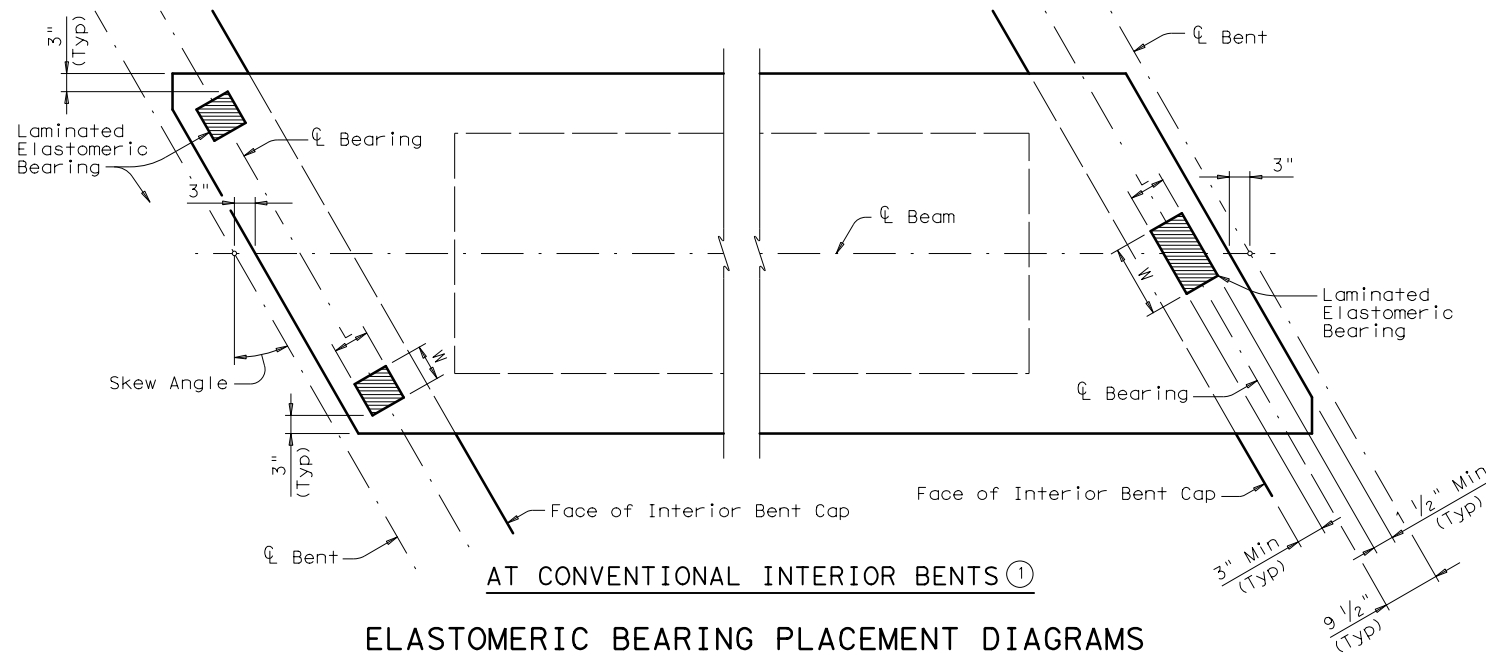
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01-12: Bars Z.	DIST	COUNTY	SHEET NO.	
	YKM	FAYETTE	96	

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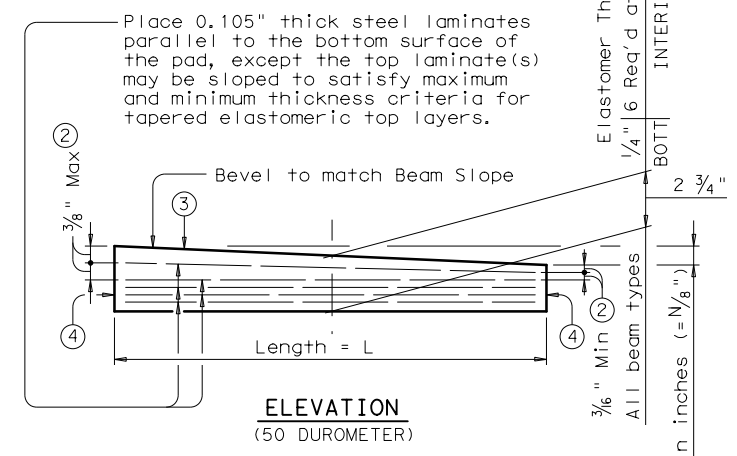
AT ABUTMENT OR INVERTED TEE BENTS



AT CONVENTIONAL INTERIOR BENTS ①

ELASTOMERIC BEARING PLACEMENT DIAGRAMS

The Forward Station Beam End will have one bearing and the Back Station Beam End will have two bearings.



ELASTOMERIC BEARING SECTION

(50 DUROMETER)
The use of Polyisoprene (natural rubber), for the manufacture of bearing pads, is not permitted.

- ① For Transition Bents with backwall, beams and elastomeric bearings will receive the same treatment as shown for Abutment Bents.
- ② Maximum and minimum layer thicknesses shown are for elastomer only, on tapered layers.
- ③ Indicate BEARING TYPE on all pads. For tapered pads, BEARING TYPE will be located on the high side. The Fabricator will include the value of "N" (amount of taper in 1/8" increments) in this mark. Examples: N=0, (for 0" taper)
N=1, (for 1/8" taper)
N=2, (for 1/4" taper)
(etc.)
Fabricated pad top surface slope must not vary from plan beam slope by more than (0.0625" / Length) IN/IN.
- ④ Locate Permanent Mark here.

ELASTOMERIC BEARING DIMENSIONS					
BEARING TYPE	BEAM TYPE	ONE BEARING		TWO BEARINGS	
		L	W	L	W
B20-"N"	4B20	6"	12"	6"	6"
	5B20	6"	12"	6"	6"
B28-"N"	4B28	6"	14"	6"	7"
	5B28	6"	14"	6"	7"
B34-"N"	4B34	6"	16"	6"	8"
	5B34	6"	16"	6"	8"
B40-"N"	4B40	6"	20"	6"	10"
	5B40	6"	20"	6"	10"

GENERAL NOTES:

Set beams on elastomeric bearings of the dimensions shown. Center bearings as near nominal bearing as possible within limits shown.
Constant thickness bearings may be used for moderate beam slopes up to 0.0113 ft/ft.
For skewed supports, Bearings beveled for beam slope may not provide uniform contact. However, predicted contact is considered within allowable tolerances.
Shop drawings for approval are required.
A bearing layout which identifies location and orientation of all bearings will 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 is to be included in unit price bid for "Prestressed Concrete Box Beams".
Details are drawn showing right forward skew. See Bridge Layout for actual direction.
These details are applicable for skews up to 30 degrees only.

HL93 LOADING

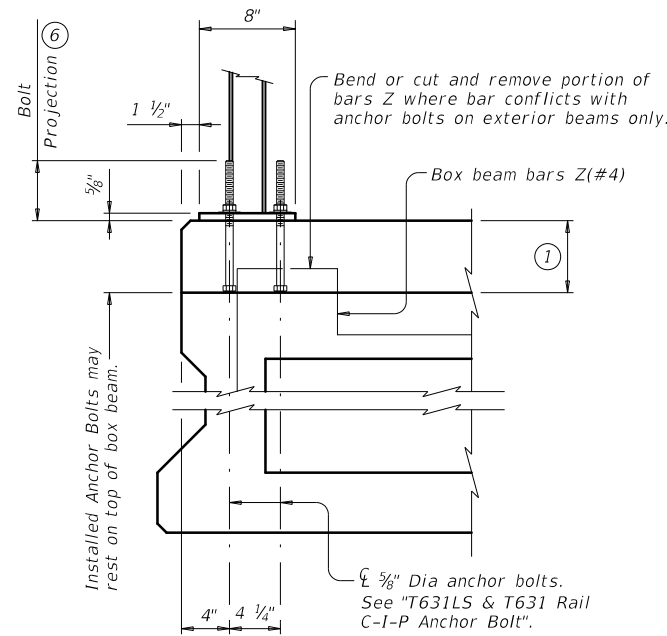
Texas Department of Transportation
Bridge Division Standard

**ELASTOMERIC BEARING DETAILS
PRESTR CONC BOX BEAMS**

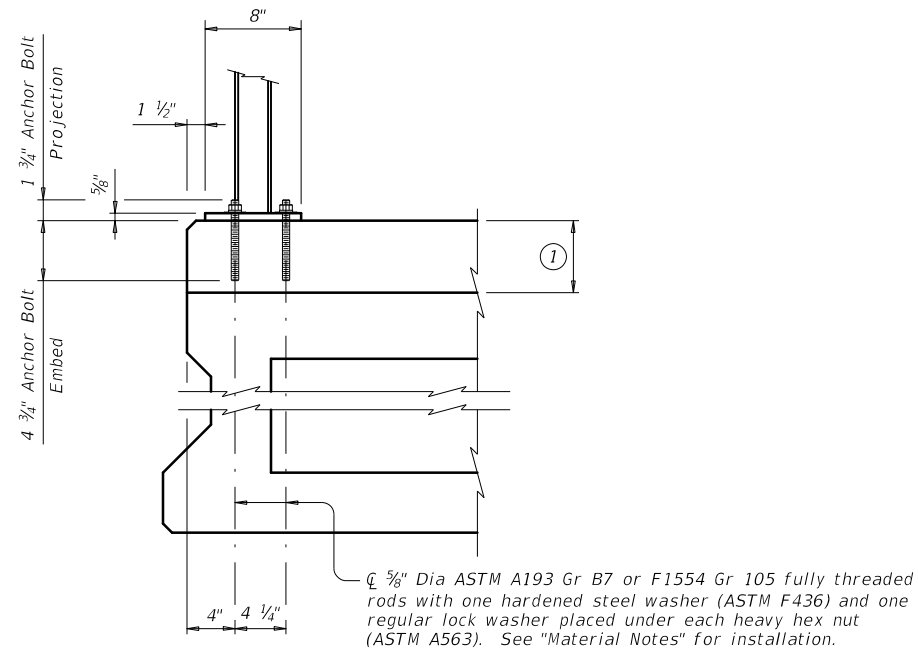
BBEB

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	YKM	FAYETTE	97	

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CAST-IN-PLACE ANCHORAGE OPTION



ADHESIVE ANCHORAGE OPTION

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

- ① Cast-in-place slab thickness varies due to beam camber (5" minimum).
- ② Replace cast-in-place anchor bolts shown on T631LS or T631 Rail standard with an adhesive anchor system or cast-in-place anchor bolts shown on this sheet.
- ③ Bar length shown on rail standard, minus 1 1/4". Adjust bar length for a raised sidewalk.
- ④ See Rail standard for projection from finished grade or top of sidewalk.
- ⑤ Place additional (#5) longitudinal bar.
- ⑥ Excess bolt length has been provided to accommodate a variable slab thickness due to beam camber. If slab thickness on span details exceed 10", bolt length must be increased accordingly. After posts have been set and bolts tightened, bolt projection above nuts of more than 1/2" must be cut off and painted with two coats of zinc-rich paint conforming to the Item 445 "Galvanizing".
- ⑦ Distance from end of top outside edge of slab to center of first bolt group can not be less than 9", except: 15° Skew: 1'-0" (acute corner only) 30° Skew: 1'-3" (acute corner only)
- ⑧ Location of Rail Expansion Joint must be at the intersection of C Slab Expansion Joint, C Rail Footprint and perpendicular to slab outside edge.
- ⑨ Cross-hatched area must have 1/2" Preformed Bituminous Fiber Material under concrete rail, as shown.

CONSTRUCTION NOTES:

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

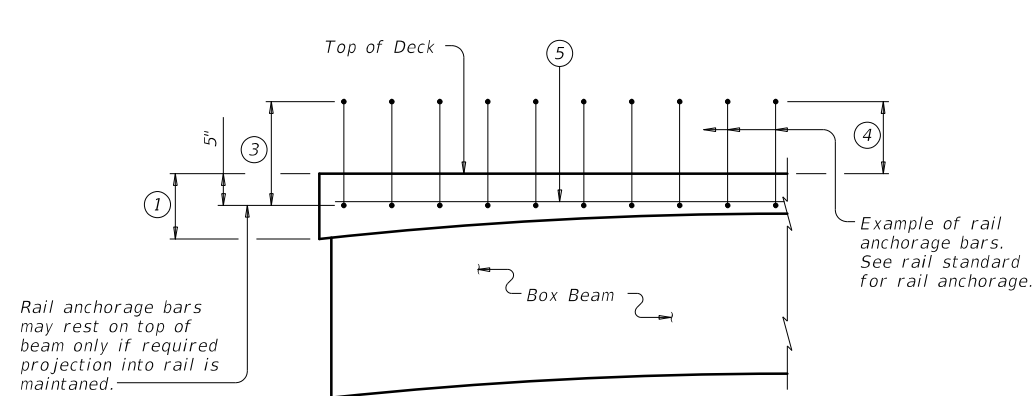
MATERIAL NOTES:

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

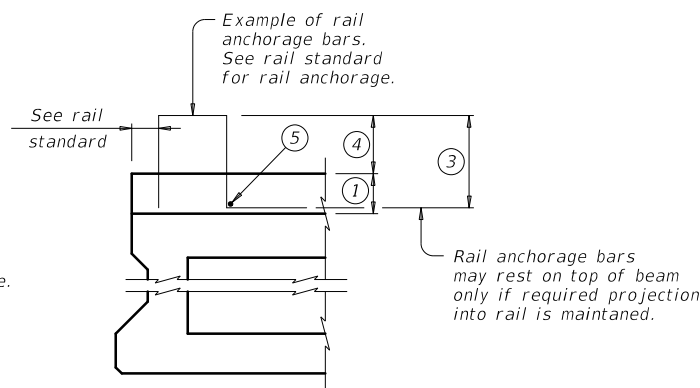
GENERAL NOTES:

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

Cover dimensions are clear dimensions, unless noted otherwise.



PART SPAN ELEVATION

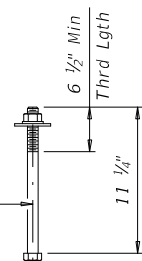


SECTION

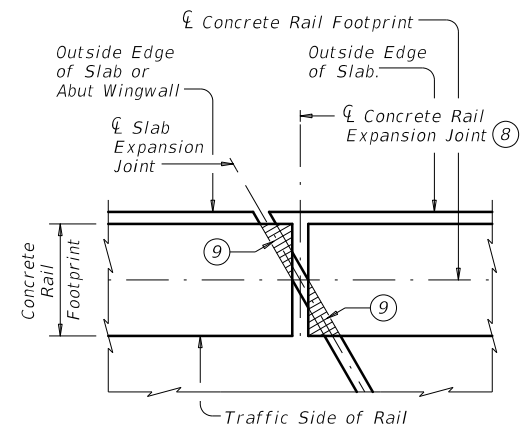
TYPICAL CONCRETE RAIL ANCHORAGE

(Showing typical concrete rail anchorage)

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



T631LS & T631 RAIL C-I-P ANCHOR BOLT



PLAN OF CONCRETE RAILS AT EXPANSION JOINTS

				Bridge Division Standard	
RAIL ANCHORAGE DETAILS PRESTR CONC BOX BEAMS (WITH SLAB) BBRAS					
FILE: bstde09-18.dgn	DN: TxDOT	CK: TxDOT	DW: JTR	CK: JMH	
0913	28	083, ETC	CR		
REVISIONS 04-90: Updated for new rails. 01-12: rails anchor bars. 07-14: Removed T101 & T16. Added T631. 03-16: Class D, E, or F epoxy in material notes. T221P & T224 in general notes. 03-18: Updated adhesive anchor notes.		DIST	COUNTY	SHEET NO.	
YKM		FAYETTE	98		

DATE: FILE:

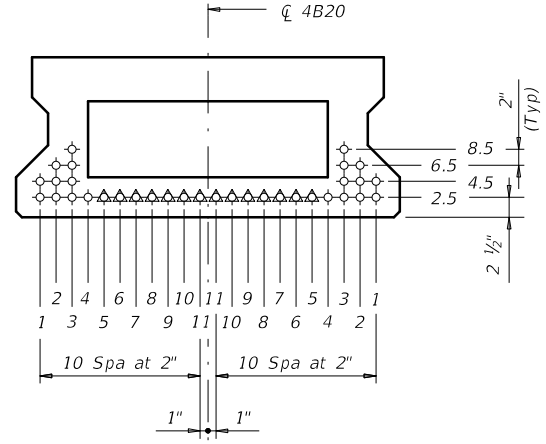
DISCLAIMER: The use of this standard is governed by the "Texas Engineering Practice Act". No warranty of any kind is made by TxDOT for any purpose whatsoever. TxDOT assumes no responsibility for the conversion of this standard to other formats or for incorrect results or damages resulting from its use.

DATE: FILE:

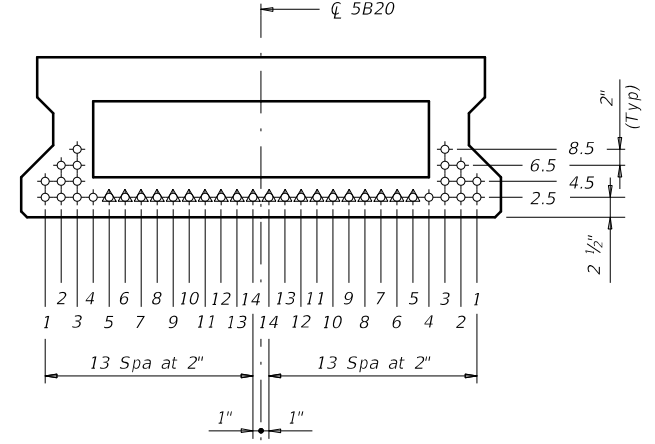
STANDARD SBBS-B20-24	DESIGNED BEAMS (STRAIGHT STRANDS)															OPTIONAL DESIGN									
	SPAN LENGTH (ft)	BEAM NO.	BEAM TYPE	PRESTRESSING STRANDS					DEBONDED STRAND PATTERN PER ROW					CONCRETE		DESIGN LOAD COMP STRESS (TOP ϵ) (SERVICE I)	DESIGN LOAD TENSILE STRESS (BOTT ϵ) (SERVICE III)	REQUIRED MINIMUM ULTIMATE MOMENT CAPACITY (STRENGTH I)	LIVE LOAD DISTRIBUTION FACTOR						
				NON- STD STRAND PATTERN	TOTAL NO.	SIZE (in)	STRGTH f_{pu} (ksi)	"e" \bar{c} (in)	"e" END (in)	TOT NO. DEB	DIST FROM BOTTOM (in)	NO. OF STRANDS		NUMBER OF STRANDS DEBONDED TO (ft from end)					RELEASE STRGTH f_{ci} (ksi)	MINIMUM 28 DAY COMP STRGTH f'_c (ksi)	②				
												TOTAL	DE- BONDED	3	6						9	12	15	Moment	Shear
24' Roadway 5" Slab	30	1&6	5B20		8	0.6	270	7.38	7.38	0	2.50	8	0	0	0	0	0	0	4.000	5.000	0.640	-0.808	704	0.454	0.691
	30	2-5	4B20		6	0.6	270	7.31	7.31	0	2.50	6	0	0	0	0	0	0	4.000	5.000	0.693	-0.860	601	0.379	0.511
	35	1&6	5B20		8	0.6	270	7.38	7.38	0	2.50	8	0	0	0	0	0	0	4.000	5.000	0.838	-1.041	795	0.440	0.680
	35	2-5	4B20		6	0.6	270	7.31	7.31	0	2.50	6	0	0	0	0	0	0	4.000	5.000	0.911	-1.111	615	0.367	0.498
	40	1&6	5B20		10	0.6	270	7.38	7.38	0	2.50	10	0	0	0	0	0	0	4.000	5.000	1.061	-1.297	889	0.427	0.671
	40	2-5	4B20		8	0.6	270	7.31	7.31	0	2.50	8	0	0	0	0	0	0	4.000	5.000	1.156	-1.388	712	0.356	0.488
	45	1&6	5B20		10	0.6	270	7.38	7.38	0	2.50	10	0	0	0	0	0	0	4.000	5.000	1.316	-1.590	960	0.417	0.663
	45	2-5	4B20		10	0.6	270	7.31	7.31	0	2.50	10	0	0	0	0	0	0	4.000	5.000	1.437	-1.706	824	0.348	0.481
	50	1&6	5B20		12	0.6	270	7.38	7.38	0	2.50	12	0	0	0	0	0	0	4.000	5.000	1.606	-1.927	1147	0.408	0.655
	50	2-5	4B20		12	0.6	270	7.31	7.31	0	2.50	12	0	0	0	0	0	0	4.000	5.000	1.755	-2.070	985	0.340	0.476
	55	1&6	5B20		16	0.6	270	7.38	7.38	0	2.50	16	0	0	0	0	0	0	4.000	5.000	1.921	-2.289	1344	0.400	0.649
	55	2-5	4B20		14	0.6	270	7.31	7.31	0	2.50	14	0	0	0	0	0	0	4.000	5.000	2.104	-2.464	1157	0.334	0.471
	60	1&6	5B20		18	0.6	270	7.38	7.38	0	2.50	18	0	0	0	0	0	0	4.000	5.000	2.262	-2.677	1551	0.393	0.643
	60	2-5	4B20		18	0.6	270	7.31	7.31	2	2.50	18	2	0	2	0	0	0	4.000	5.000	2.487	-2.899	1347	0.333	0.467
	65	1&6	5B20		24	0.6	270	7.38	7.38	6	2.50	24	6	2	2	0	2	0	4.000	5.000	2.627	-3.091	1769	0.387	0.638
	65	2-5	4B20		20	0.6	270	7.31	7.31	4	2.50	20	4	0	2	0	2	0	4.000	5.800	2.903	-3.368	1551	0.333	0.463

DESIGN NOTES:
 Designed in accordance with AASHTO LRFD Bridge Design Specifications.
 Prestress losses for the designed beams have been calculated for a relative humidity of 60 percent. Optional designs must likewise conform.
 Beam designs are applicable for 5" concrete slabs without overlay and 0 degree skew.

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



TxDOT 4B20 BOX BEAM



TxDOT 5B20 BOX BEAM

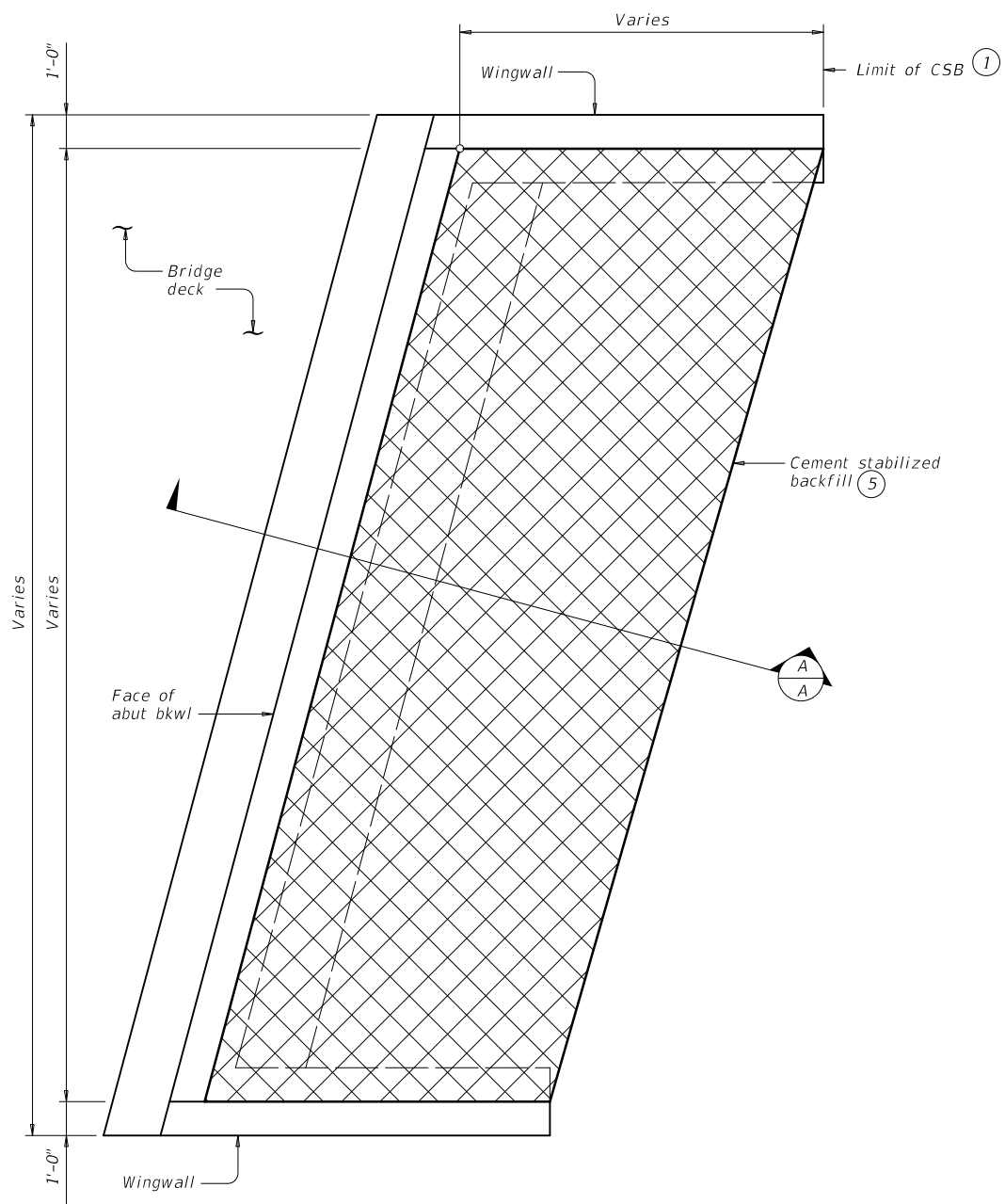
- ① Based on the following allowable stresses (ksi):
 Compression = $0.65 f'_{ci}$
 Tension = $0.24 \sqrt{f'_{ci}}$
 Optional designs must likewise conform.
- ② Portion of full HL93.

HL93 LOADING

		Bridge Division Standard	
PRESTR CONC BOX BEAM STANDARD DESIGNS TYPE B20 24' RDWY (WITH SLAB)			
BBSDS-B20-24			
FILE: bbstds11.dgn	DN: SRW	CK: BMP	DW: SFS
©TxDOT December 2006	CONT	SECT	JOB
REVISIONS	0913	28	083, ETC
04-11: f'_{ci} and LLDF. 01-16: Notes, 0.6" strand designs.	DIST	COUNTY	SHEET NO.
	YKM	FAYETTE	99

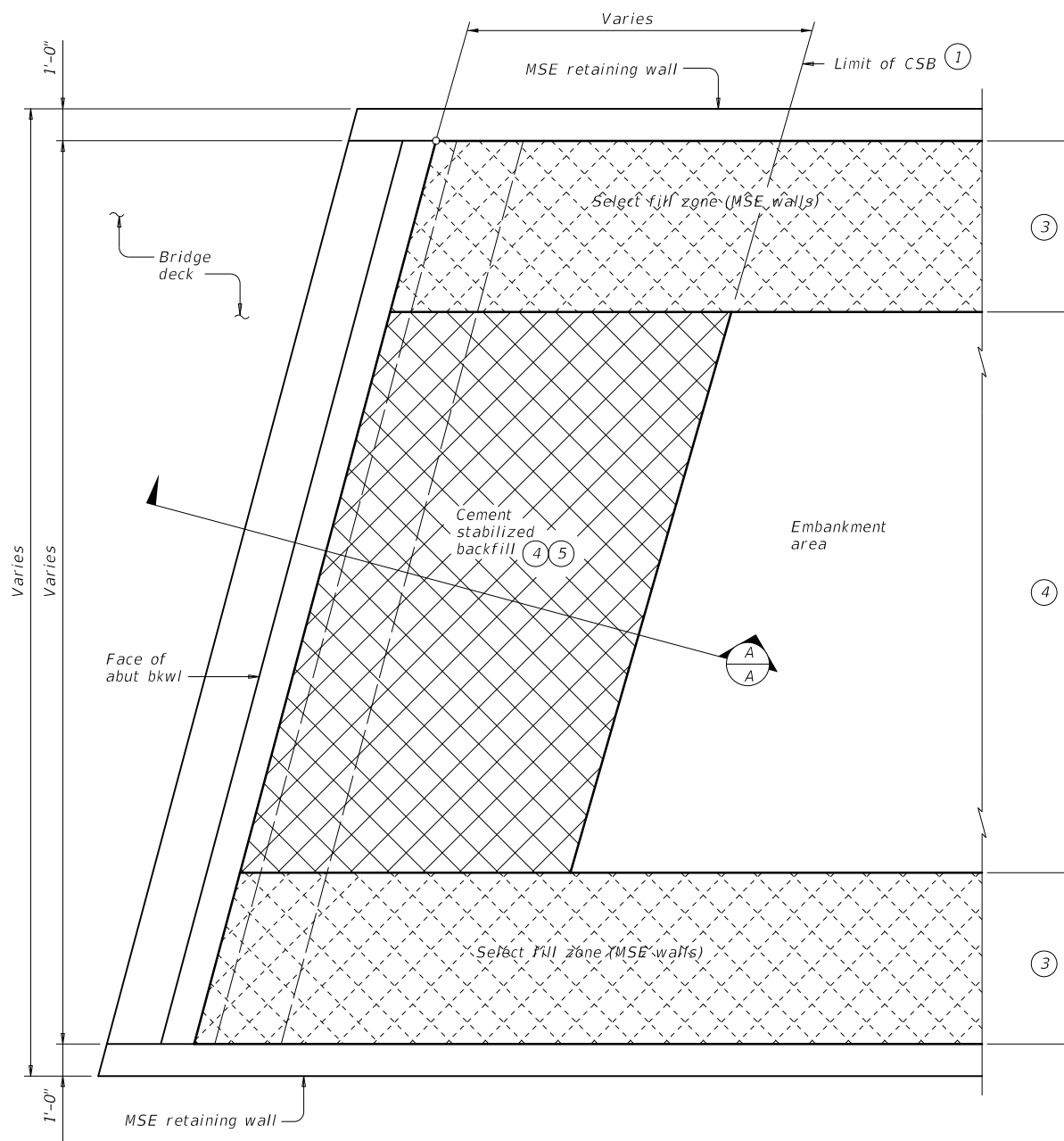
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DATE: FILE:



OPTION 1 ~ PLAN WITH WINGWALLS

Cast-in-place retaining walls similar.

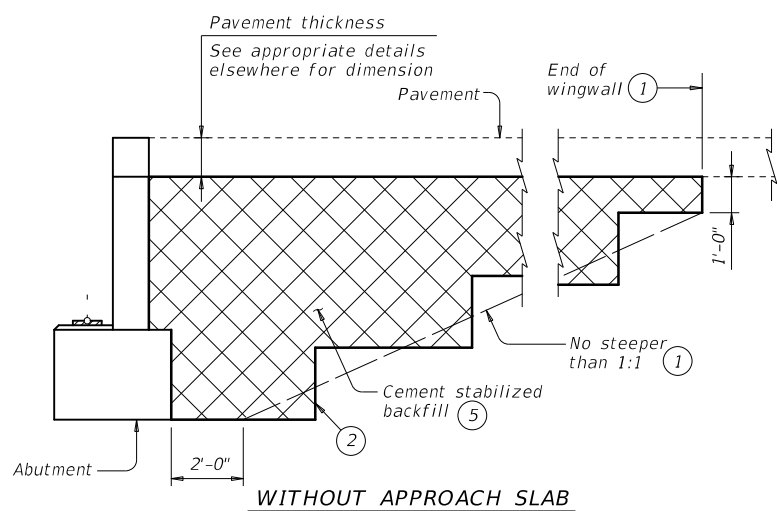


OPTION 1 ~ PLAN WITH MSE RETAINING WALLS

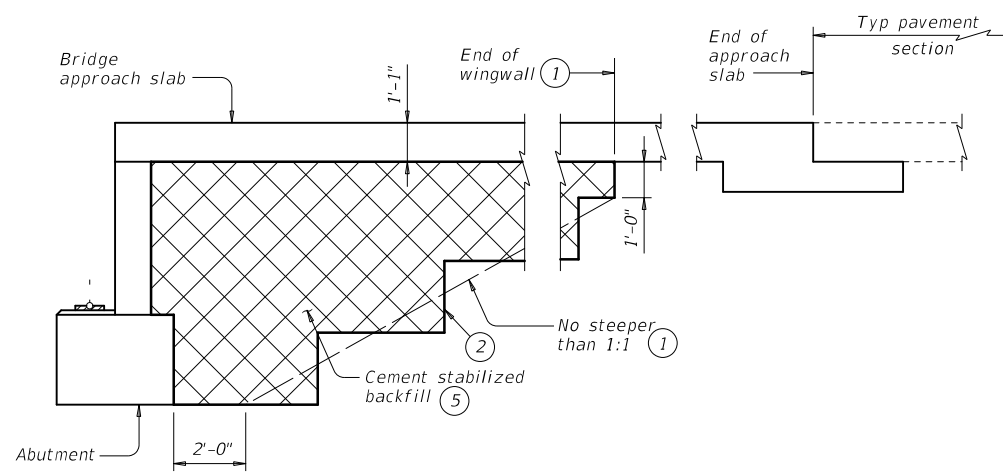
- 1 Usual limit of Cement Stabilized Backfill is at end of wingwall. Extend CSB limits as required to maintain a slope no steeper than 1:1 at bottom of backfill.
- 2 Bench backfill as shown with 12" (approximate) bench depths.
- 3 Where MSE retaining walls are present, adjust CSB limits to accommodate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

GENERAL NOTES:

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



WITHOUT APPROACH SLAB



WITH APPROACH SLAB

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

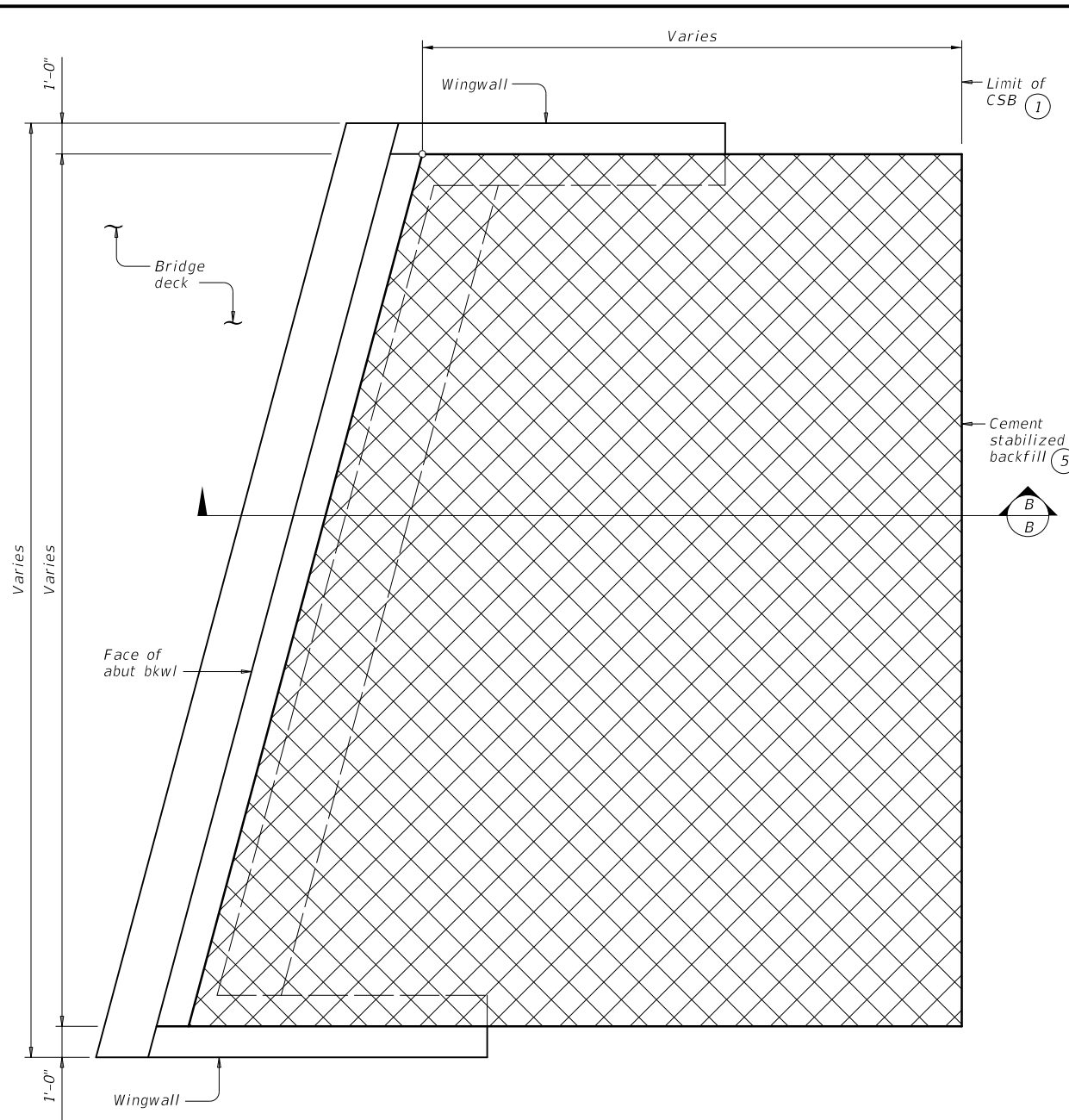
SECTION A-A

CEMENT STABILIZED ABUTMENT BACKFILL BRIDGE ABUTMENT

CSAB

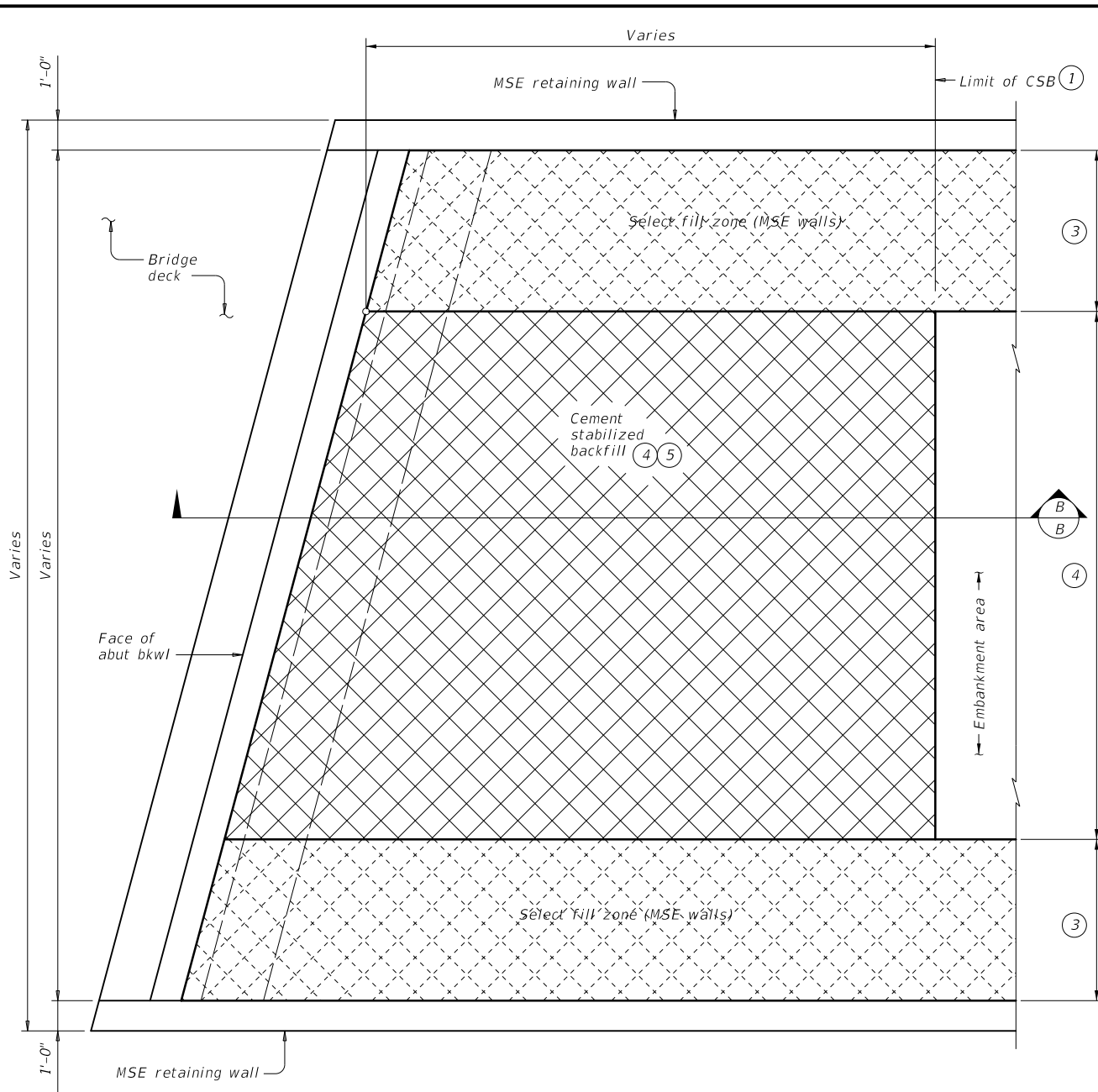
FILE: csabste1-20.dgn	DN: TxDOT	CK: TxDOT	DW: TxDOT	CK: TxDOT
©TxDOT	REVISIONS	CONTRACT	SECTION	HIGHWAY
0913	28	083, ETC		CR
02-20: Added Option 2.	DIST	COUNTY	SHEET NO.	
	YKM	FAYETTE	100	

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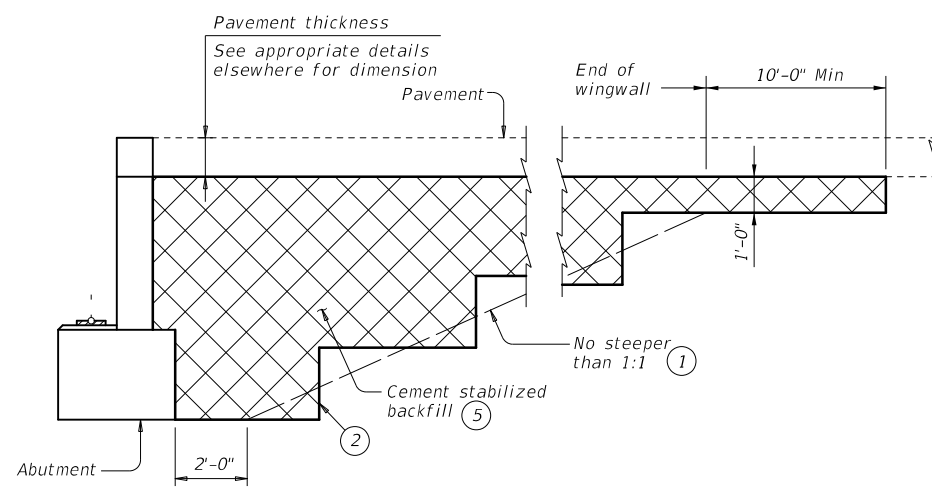
OPTION 2 ~ PLAN WITH WINGWALLS

Cast-in-place retaining walls similar.

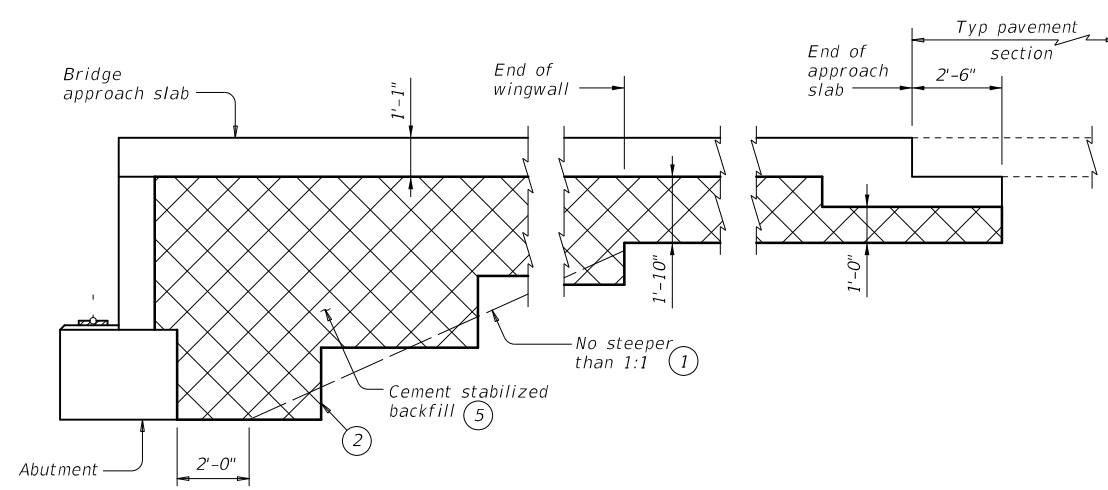


OPTION 2 ~ PLAN WITH MSE RETAINING WALLS

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



WITHOUT APPROACH SLAB



SECTION B-B

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

SHEET 2 OF 2



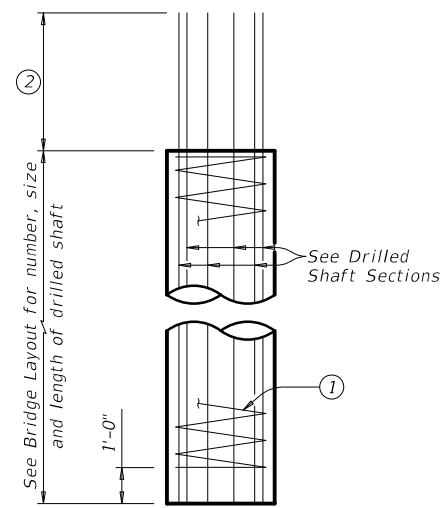
**CEMENT STABILIZED
ABUTMENT BACKFILL
BRIDGE ABUTMENT**

CSAB

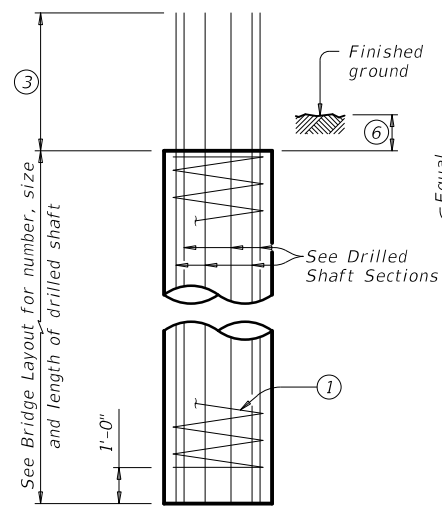
FILE: csabste1-20.dgn	DN: TxDOT	CK: TxDOT	DW: TxDOT	CK: TxDOT
©TxDOT April 2019	CONV	SECT	JOB	HIGHWAY
REVISIONS	0913	28	083, ETC	CR
02-20: Added Option 2.	DIST	COUNTY	SHEET NO.	
	YKM	FAYETTE	101	

DATE:
FILE:

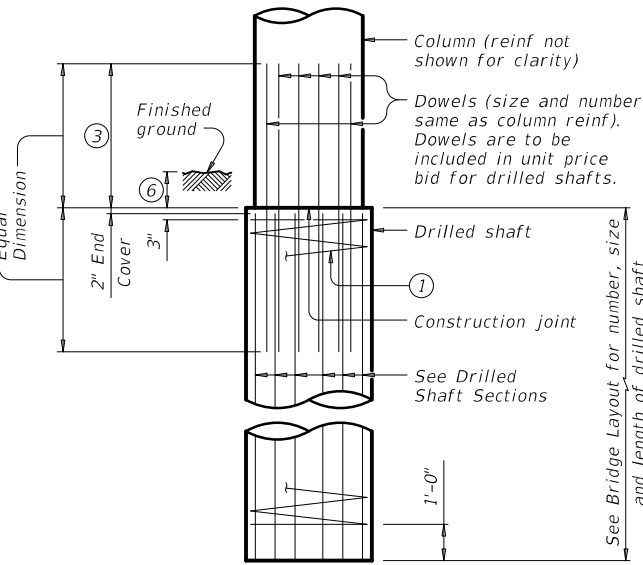
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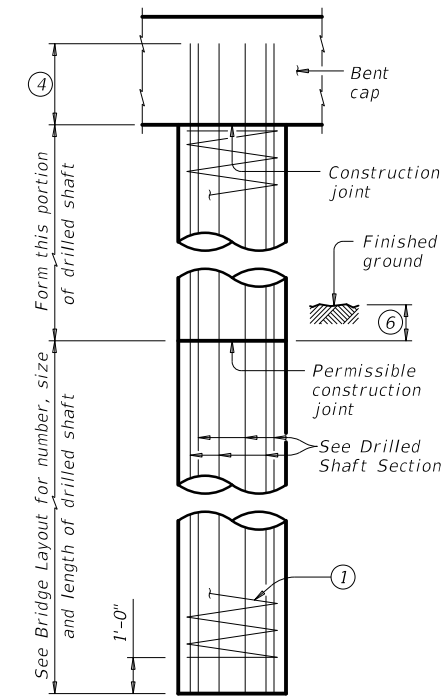
ABUTMENTS, WINGWALLS AND MULTI-DRILLED SHAFT FOOTINGS



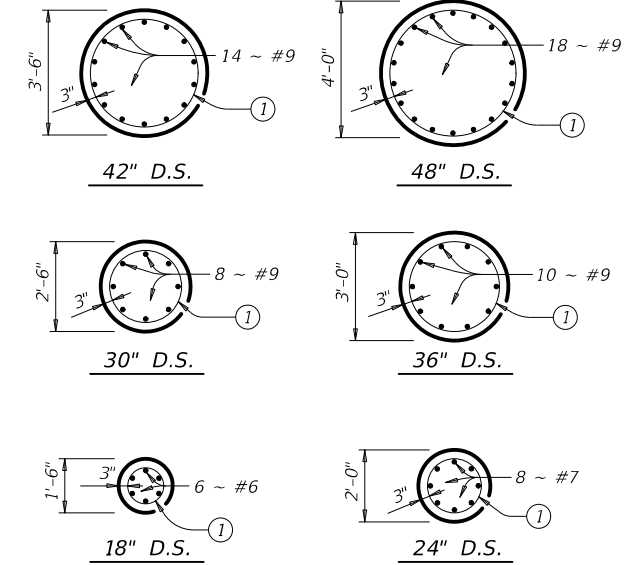
INTERIOR BENTS DRILLED SHAFT DIA EQUAL TO COLUMN DIA



INTERIOR BENTS DRILLED SHAFT DIA GREATER THAN COLUMN DIA



OPTIONAL INTERIOR BENT DRILLED SHAFT DETAIL 5



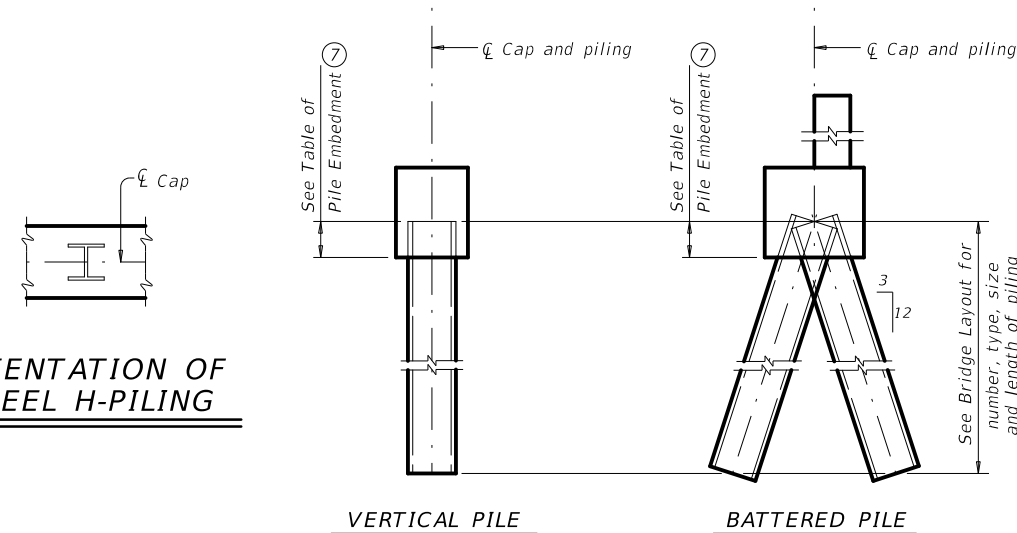
DRILLED SHAFT SECTIONS

DRILLED SHAFT DETAILS

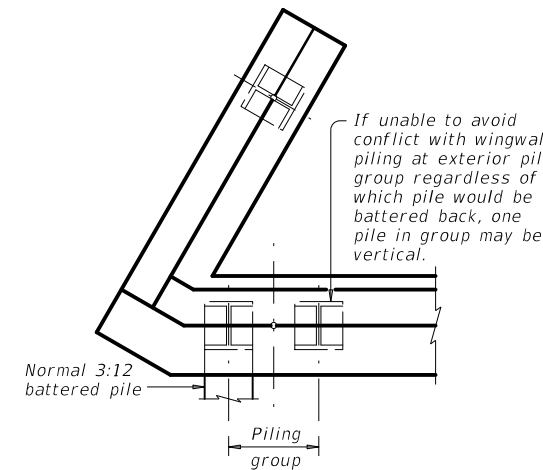
TABLE OF PILE EMBEDMENT	
Pile Type	Embedment Depth (Ft)
16" Sq Concrete 18" Sq Concrete HP14 Steel HP16 Steel	1'-0"
20" Sq Concrete 24" Sq Concrete HP18 Steel	1'-6"

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

ORIENTATION OF STEEL H-PILING

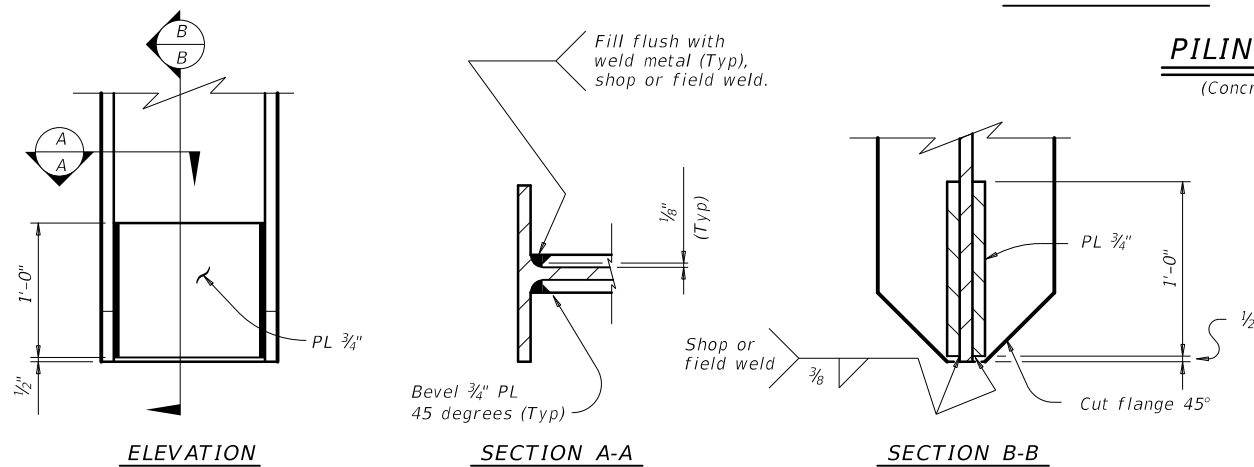


PILING DETAILS (Concrete or steel H)



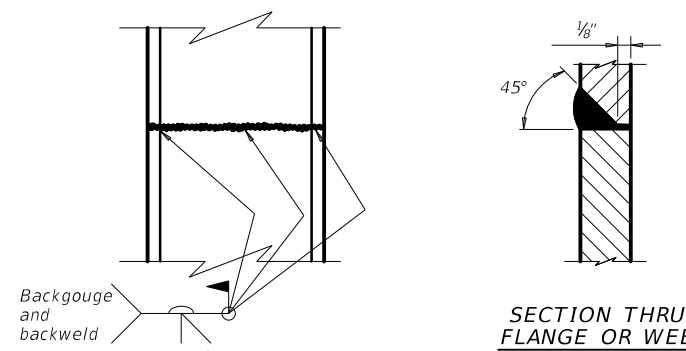
DETAIL "A"

(Showing plan view of a 30° skewed abutment)



STEEL H-PILE TIP REINFORCEMENT

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



STEEL H-PILE SPLICE DETAIL

Use when required.

- 1 #3 spiral at 6" pitch (one and a half flat turns top and bottom).
- 2 Min extension into supported element:
#6 Bars = 1'-11"
#7 Bars = 2'-0"
#9 Bars = 2'-3"
- 3 Min lap with column reinf:
#7 Bars = 2'-11"
#9 Bars = 3'-9"
#11 Bars = 4'-8"
- 4 Min extension into supported element:
#6 Bars = 1'-11"
#7 Bars = 2'-3"
#9 Bars = 2'-9"
- 5 Drilled shafts may extend to the bottom of bent caps for "H" heights of 6 ft and less (as shown on the Bridge Layout), if approved. This option can only be used when the drilled shaft diameter equals the column diameter. Obtain approval of the forming method above the ground line prior to construction. No adjustments in payment will be made if this option is used.
- 6 1'-0" Min, unless shown otherwise on plans.
- 7 Or as shown on plans.

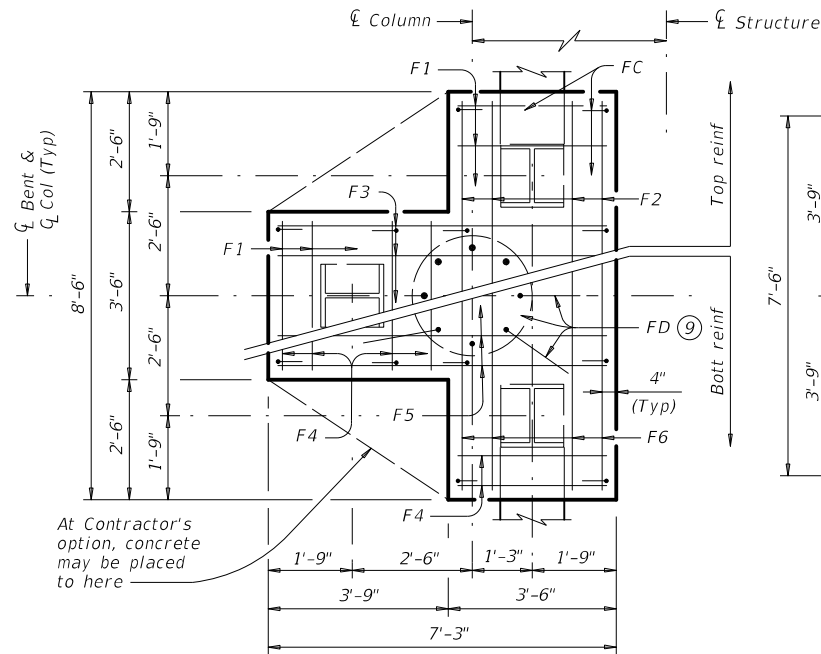
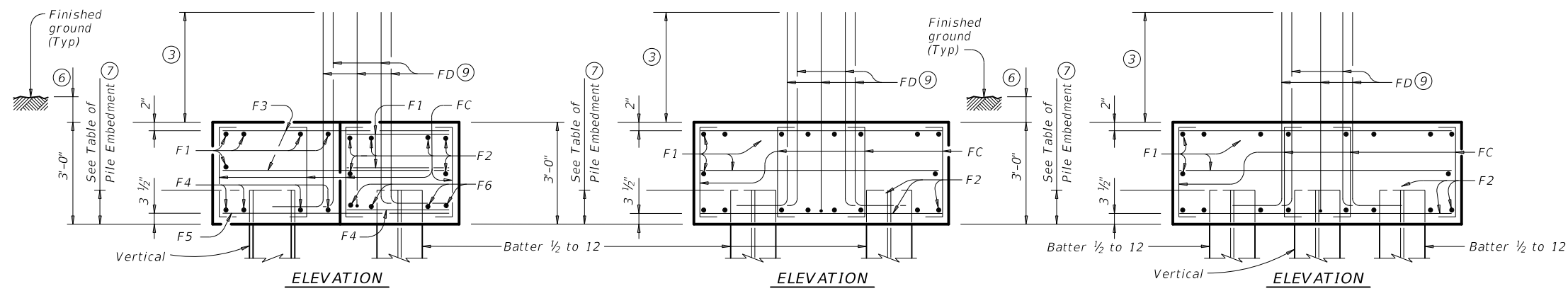
SHEET 1 OF 2

				Bridge Division Standard
<h2>COMMON FOUNDATION DETAILS</h2>				
FD				
FILE: fdstoe01-20.dgn	DN: TxDOT	CK: TxDOT	DW: TxDOT	CK: TxDOT
©TxDOT April 2019	CONV	SECT	JOB	HIGHWAY
REVISIONS	0913	28	083, ETC	CR
01-20: Added #11 bars to the FD bars.	DIST	COUNTY	SHEET NO.	
	YKM	FAYETTE	102	

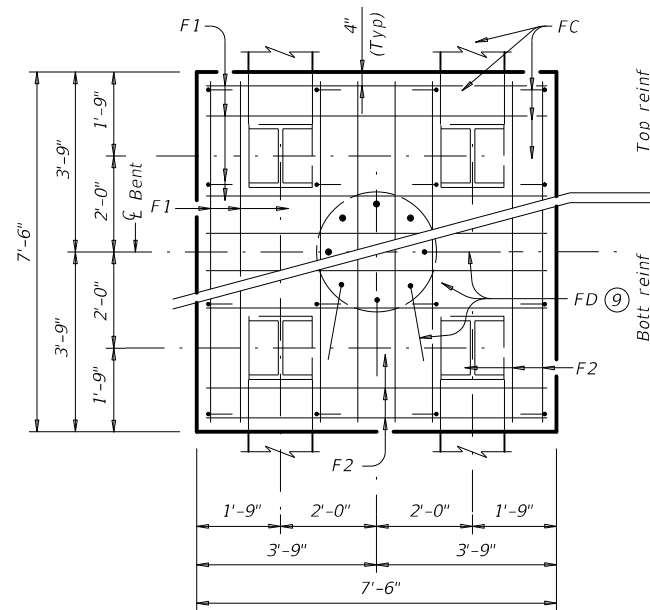
DATE: FILE:

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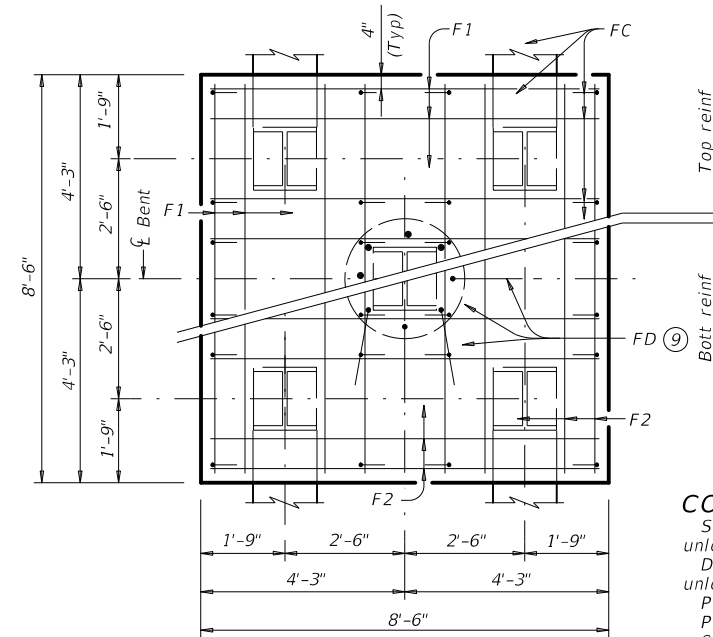
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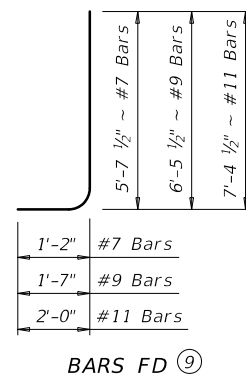
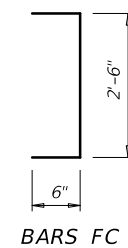
THREE PILE FOOTING^⑧
For 36" Dia and smaller columns.



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



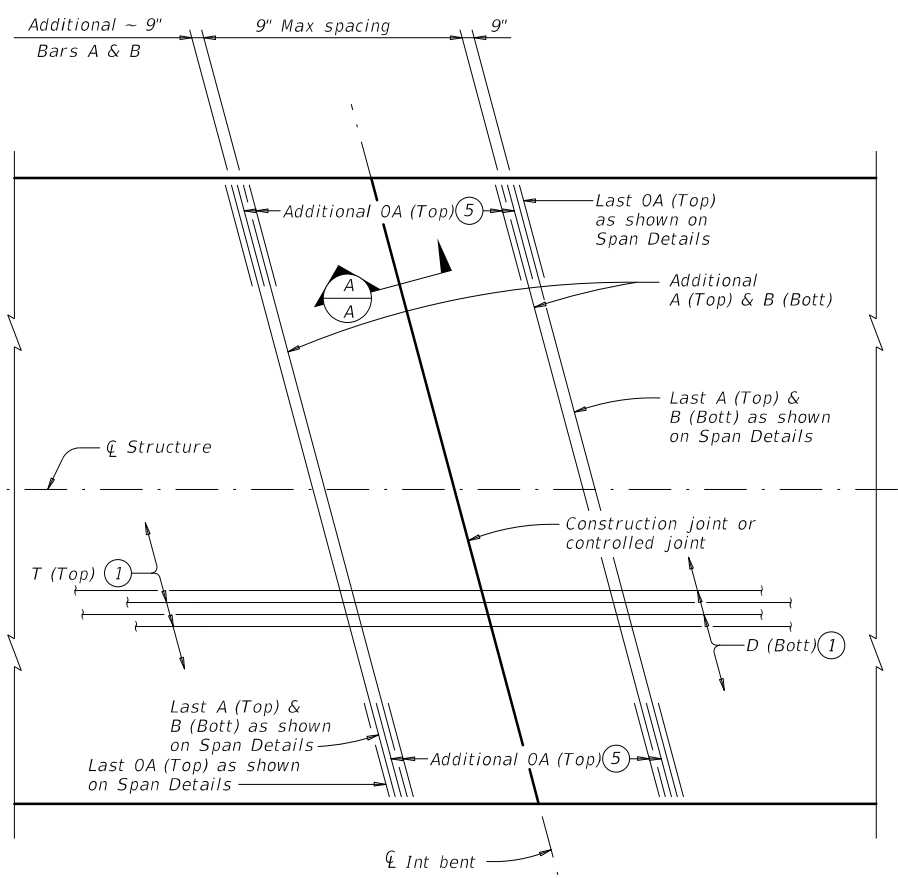
COMMON FOUNDATION DETAILS

FD

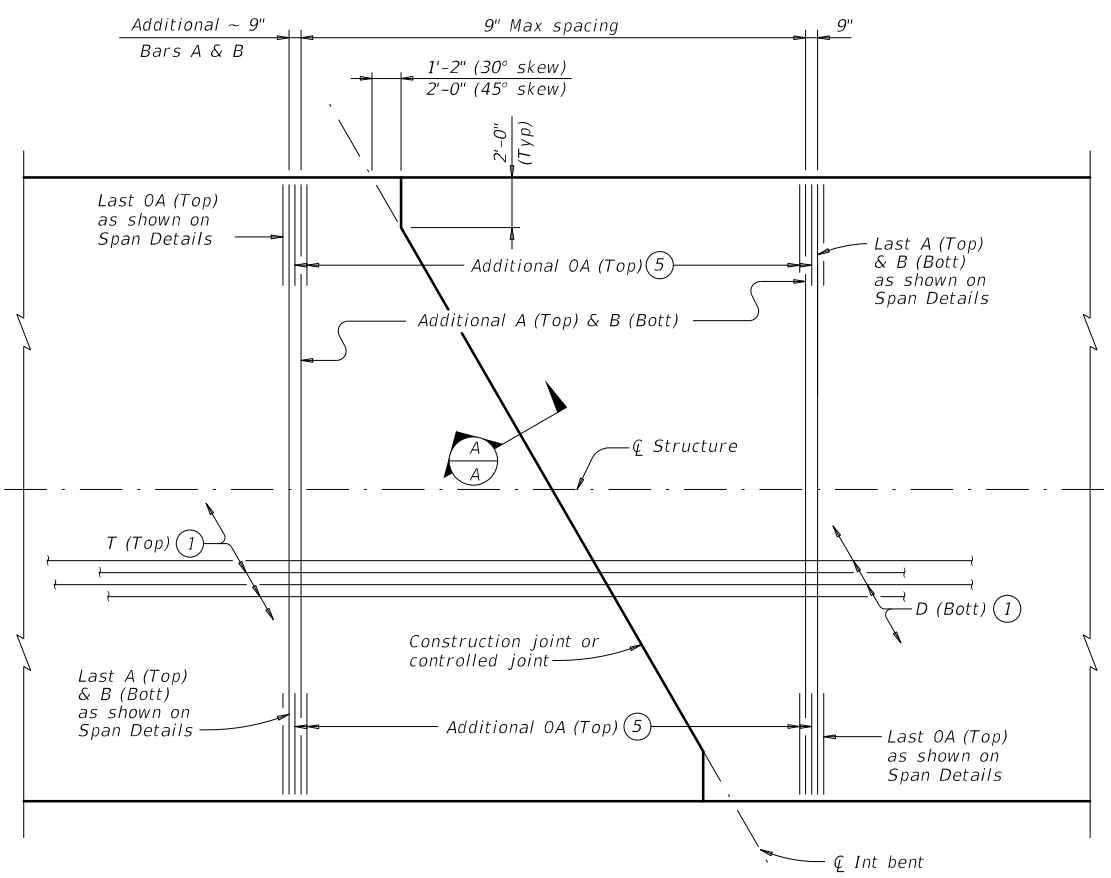
FILE: fdstoe01-20.dgn	DN: TxDOT	CK: TxDOT	DW: TxDOT	CK: TxDOT
©TxDOT April 2019	CONT	SECT	JOB	HIGHWAY
REVISIONS	0913	28	083, ETC	CR
01-20: Added #11 bars to the FD bars.	DIST	COUNTY	SHEET NO.	
	YKM	FAYETTE	103	

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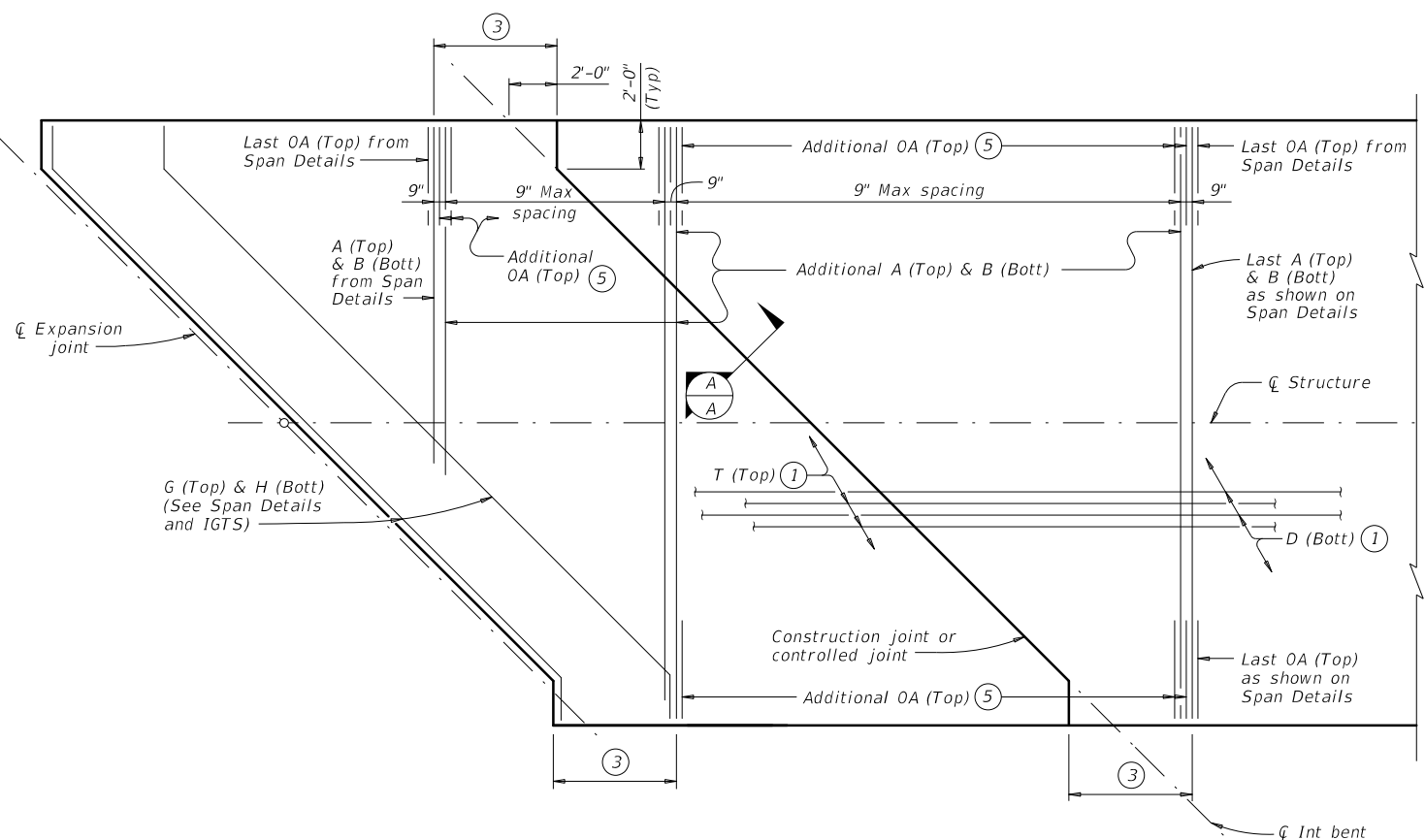
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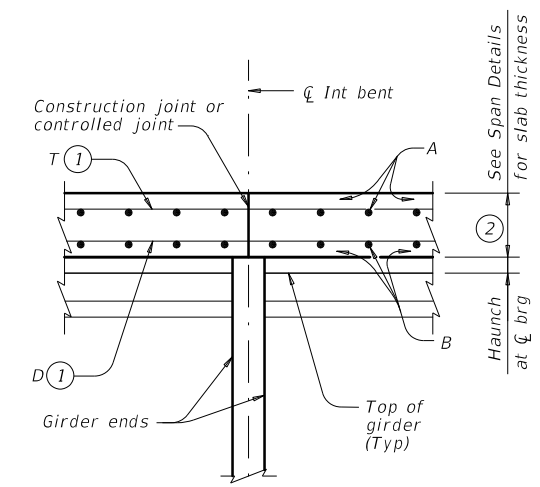
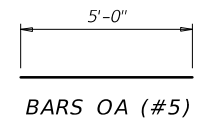
PLAN FOR 0° OR 15° SKEW
(Showing 15° skew)



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



PLAN FOR 45° SKEW (4)
(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).
- ⑥ Values in table assume a temperature change of 70° F after erection when calculating thermal movement in one direction (not total).

TABLE OF (6) 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

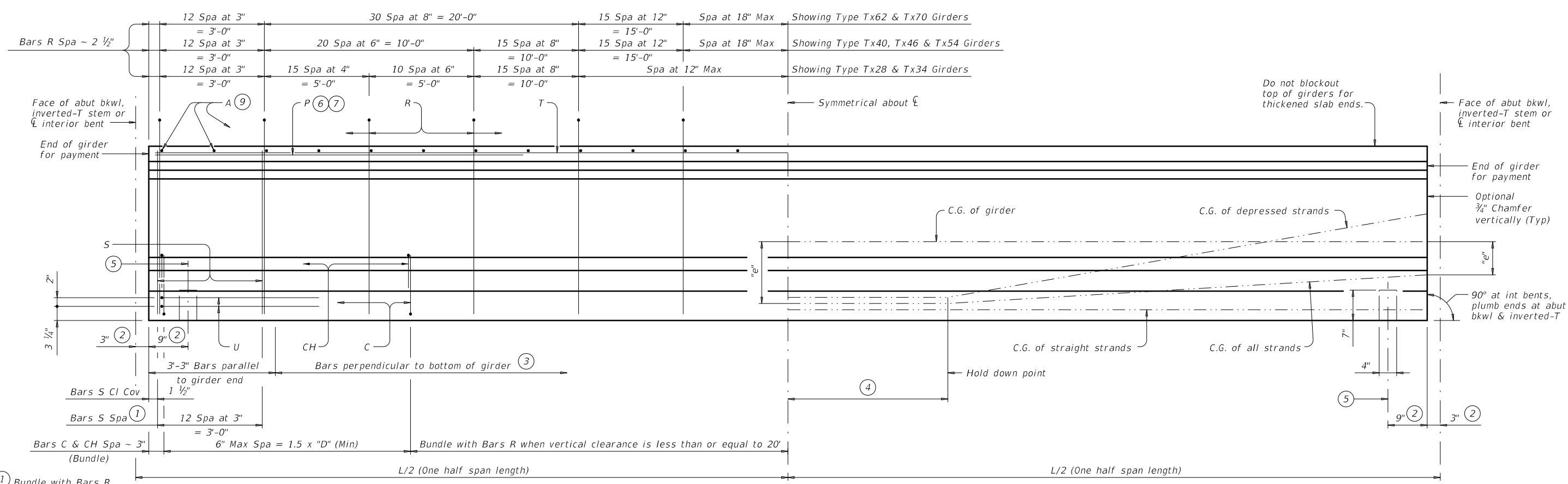
CONTINUOUS SLAB DETAILS PRESTR CONC I-GIRDER SPANS

IGCS

FILE: igcs1sts-19.dgn	DN: JMH	CK: TxDOT	DW: JTR	CK: TxDOT
0913	August 2017	CONV	SECT	HIGHWAY
28	083, ETC	CR		
10-19: Added bubble note 6.	DIST	COUNTY	SHEET NO.	
	YKM	FAYETTE	104	

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DATE: FILE:



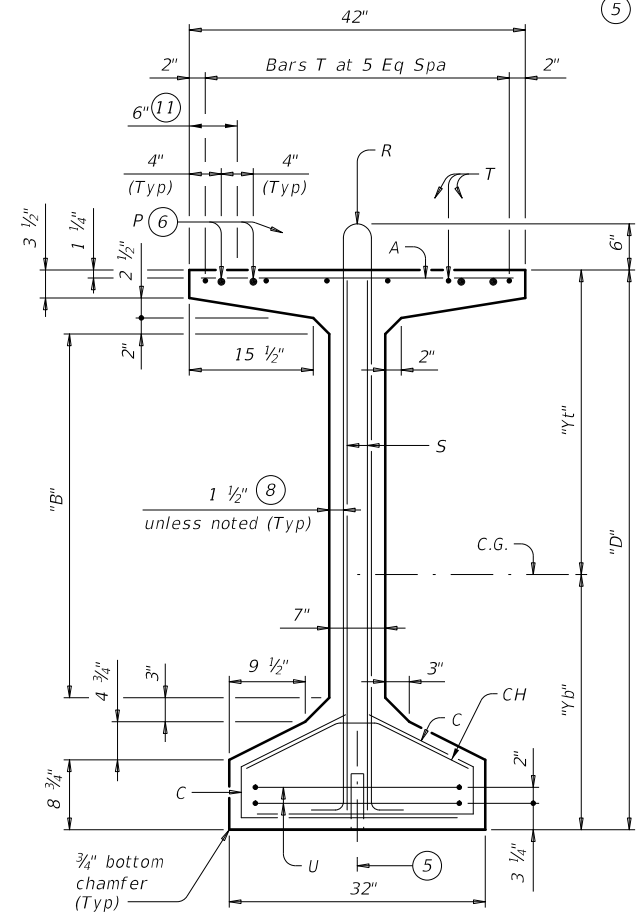
- ① Bundle with Bars R.
- ② Measured along ξ Girder at interior bents; perpendicular to abutment bkwl or inverted-T stem.
- ③ The average of the top and bottom spacing of Bars R cannot exceed the required spacing.
- ④ L/20, but not less than 5'-0" (-0,+2').

GIRDER ELEVATION

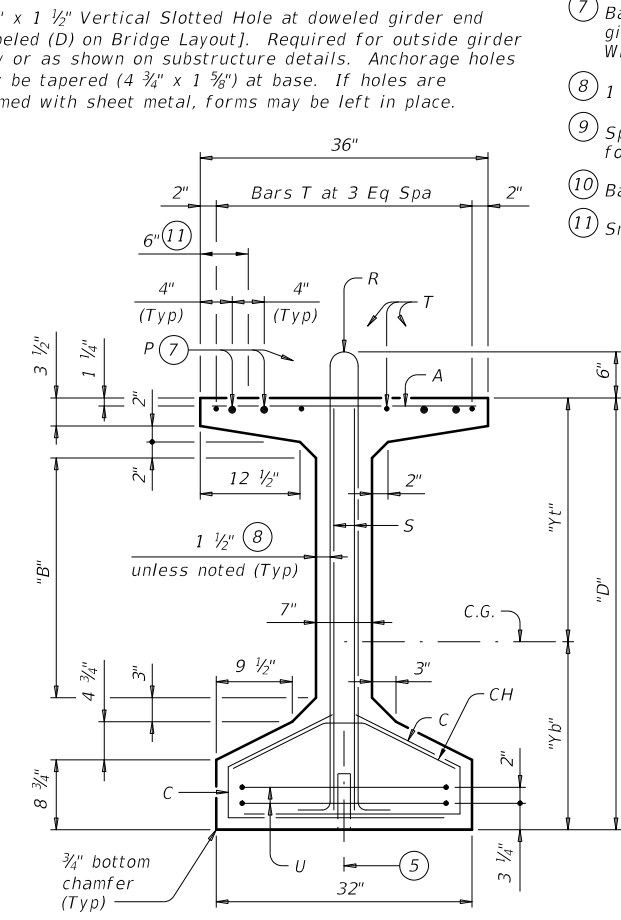
- ⑥ Bars P (#6 x 15'-0") required in Tx62 and Tx70 girders. At the fabricator's option bars larger than #6 may be used. When L is less than 50 ft, Bars P are to be the same length as Bars T.
- ⑦ Bars P (#6 x 15'-0") are only required in Tx28, Tx34, Tx40, Tx46, and Tx54 girders when "e" at girder ends 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"	"B"	"Yt"	"Yb"	Area	"Ix"	"Iy"	Weight (10)
	(in.)	(in.)	(in.)	(in.)	(in. ²)	(in. ⁴)	(in. ⁴)	(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

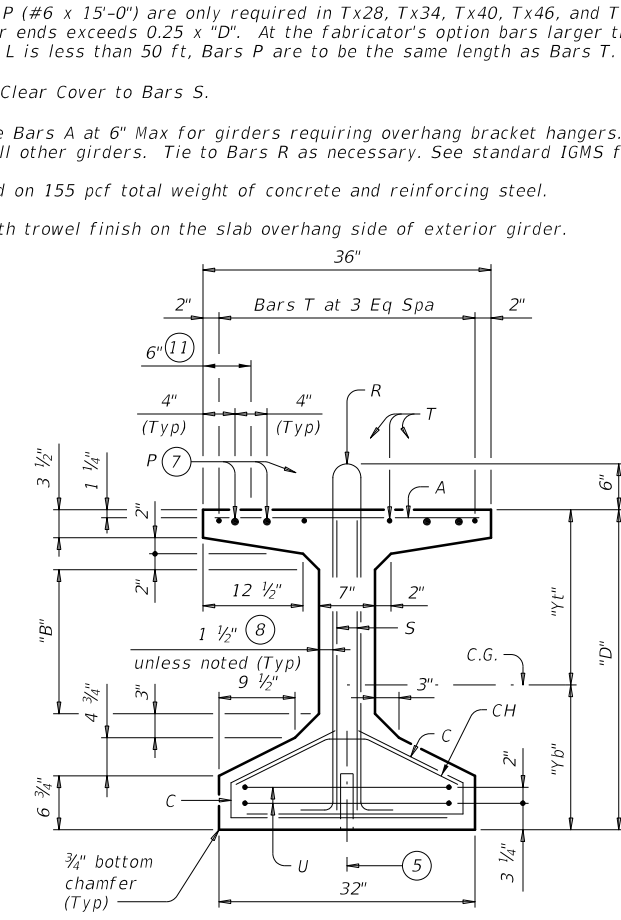
GENERAL NOTES:
 Designed according to AASHTO LRFD Bridge Design Specifications. Provide Class H concrete. Provide Grade 60 reinforcing steel. An equal area of deformed Welded Wire Reinforcement (WWR) (ASTM A1064) may be substituted for Bars A, C, R or T unless otherwise noted. It is permissible for bars 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

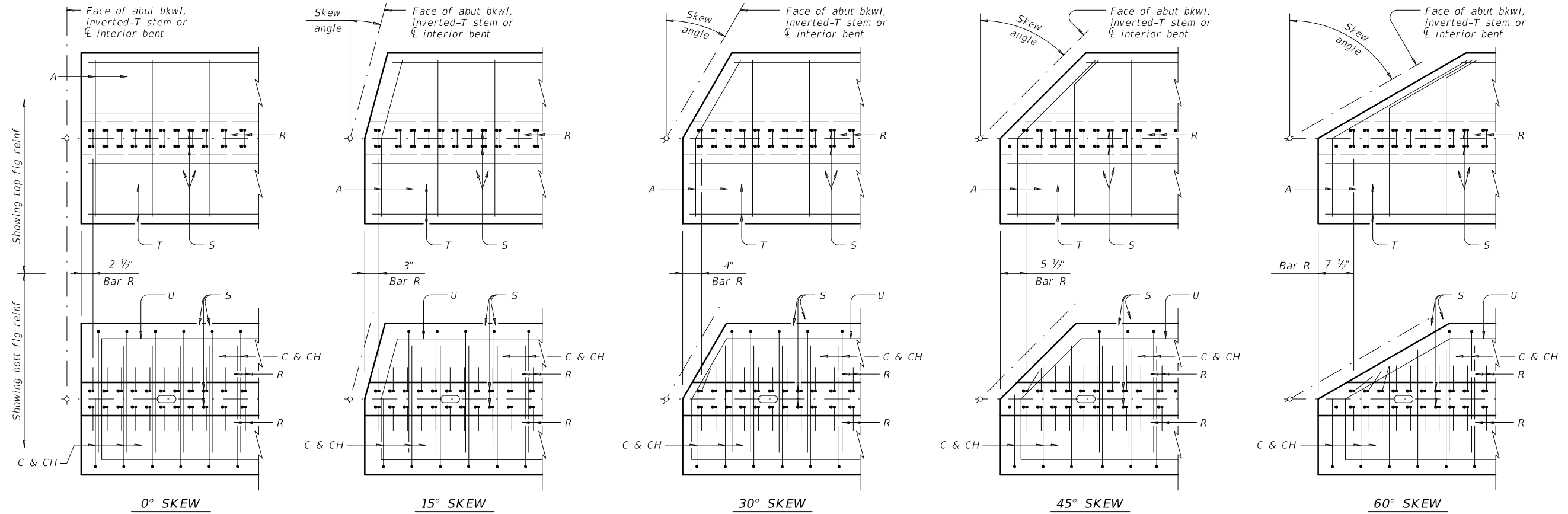


PRESTRESSED CONCRETE I-GIRDER DETAILS

IGD

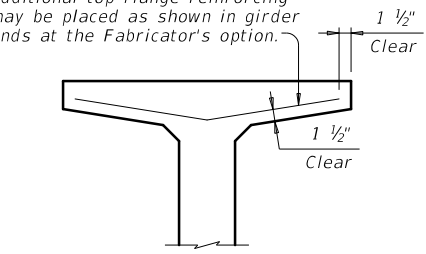
FILE: igdstds1-19.dgn	DN: TxDOT	CK: JMH	DW: JTR	CK: TAR
©TxDOT August 2017	CONT	SECT	JOB	HIGHWAY
REVISIONS	0913	28	083, ETC	CR
10-19: Added Bars C and CH full length for VC <= 20'	DIST	COUNTY	SHEET NO.	
	YKM	FAYETTE	105	

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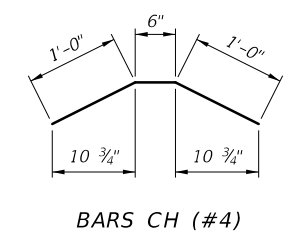


PLAN OF GIRDER ENDS (12)

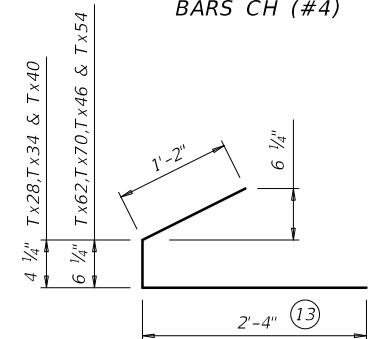
To control top flange cracking that may occur during form removal, additional top flange reinforcing may be placed as shown in girder ends at the Fabricator's option.



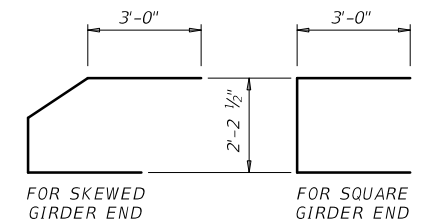
OPTIONAL TOP FLANGE REINFORCING DETAIL



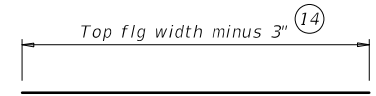
BARS CH (#4)



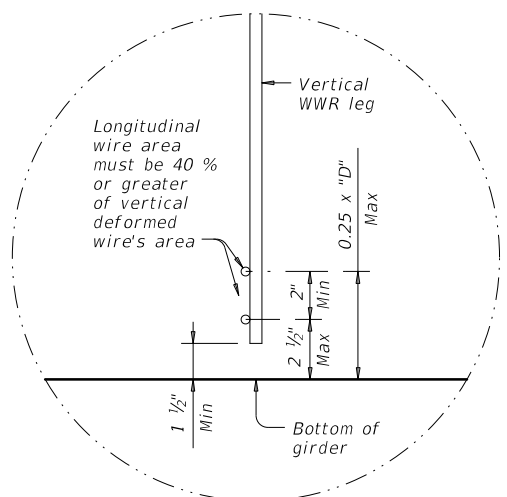
BARS C (#4)



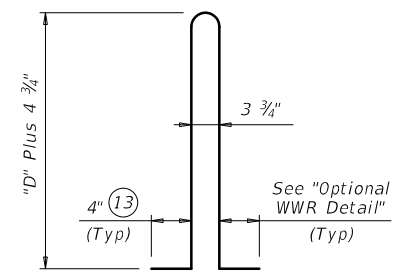
BARS U (#5)



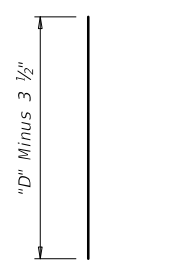
BARS A (#3)



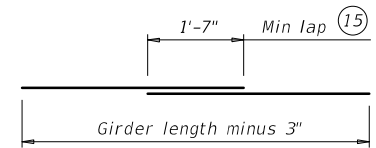
OPTIONAL WELDED WIRE REINFORCEMENT (WWR) DETAIL



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

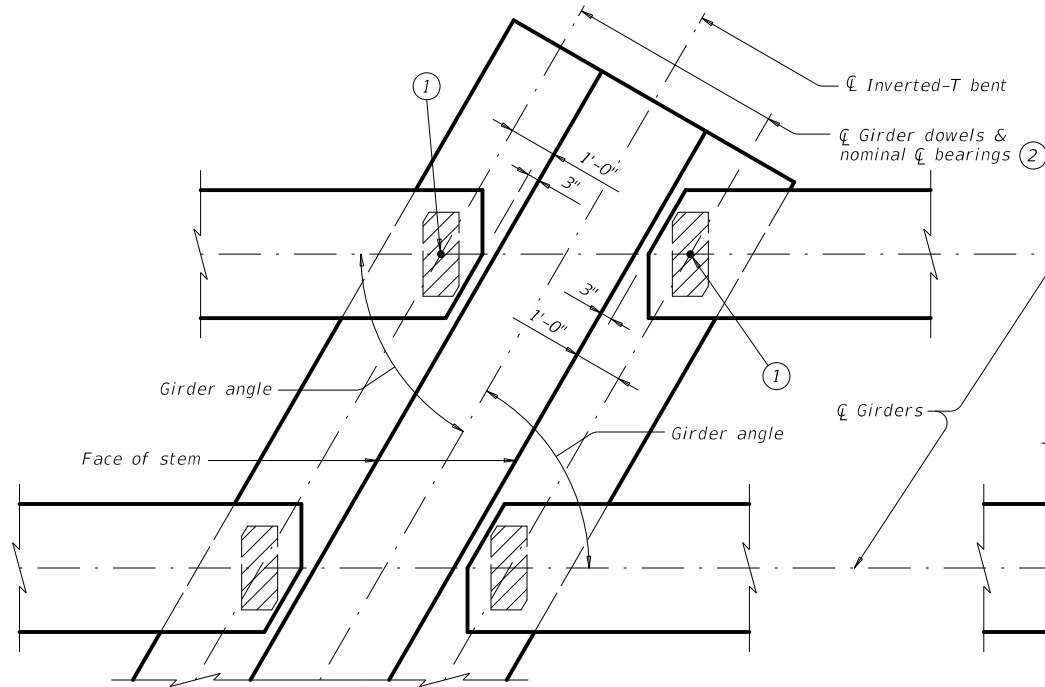
IGD

FILE: igdstds1-19.dgn	DN: TxDOT	CK: JMH	DW: JTR	CK: TAR
©TxDOT August 2017	CONT	SECT	JOB	HIGHWAY
REVISIONS	0913	28	083, ETC	CR
10-19: Added Bars C and CH full length for VC <= 20'	DIST	COUNTY	SHEET NO.	
	YKM	FAYETTE	106	

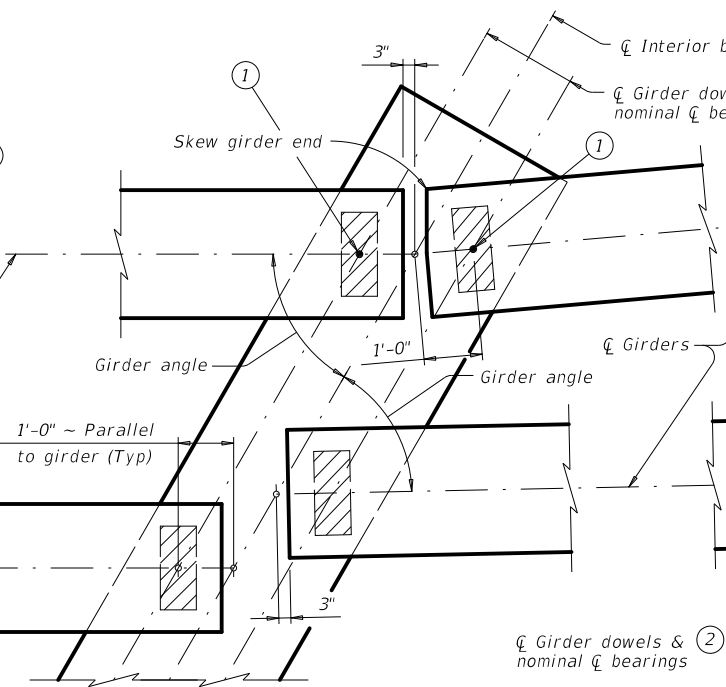
DATE: FILE:

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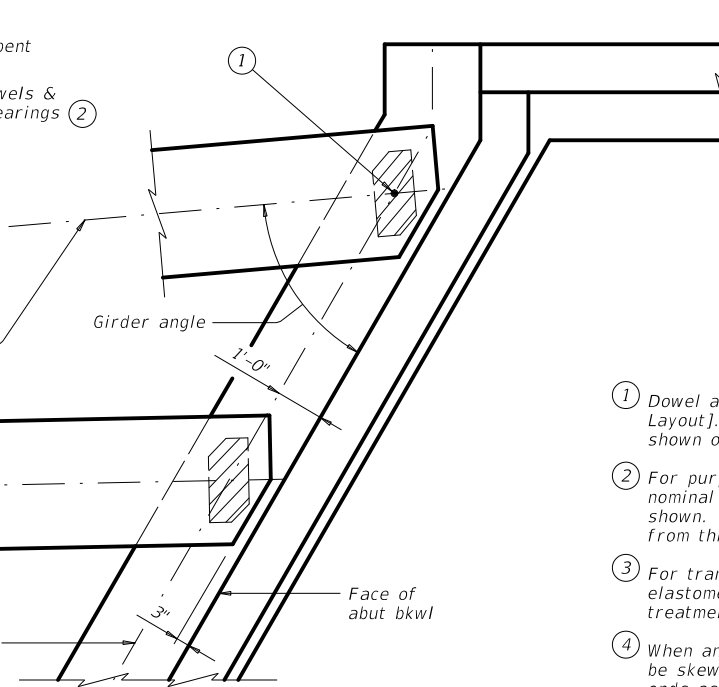
DATE: FILE:



AT INVERTED-T BENT W/SKEW

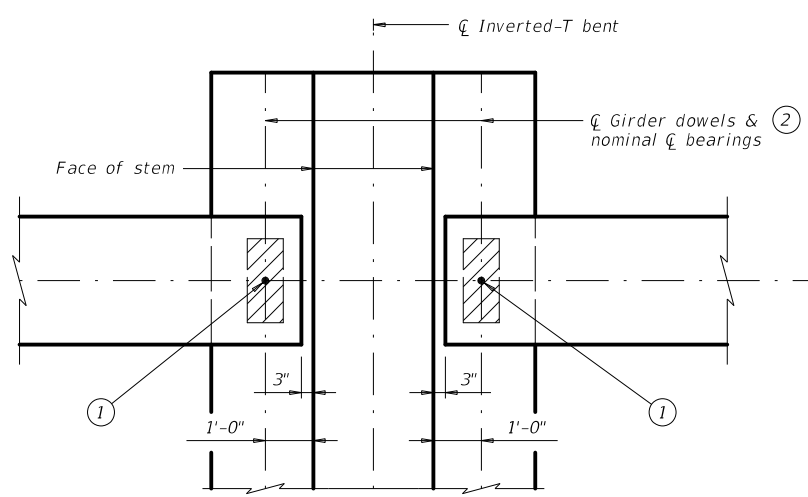


AT CONVENTIONAL INTERIOR BENT W/SKEW

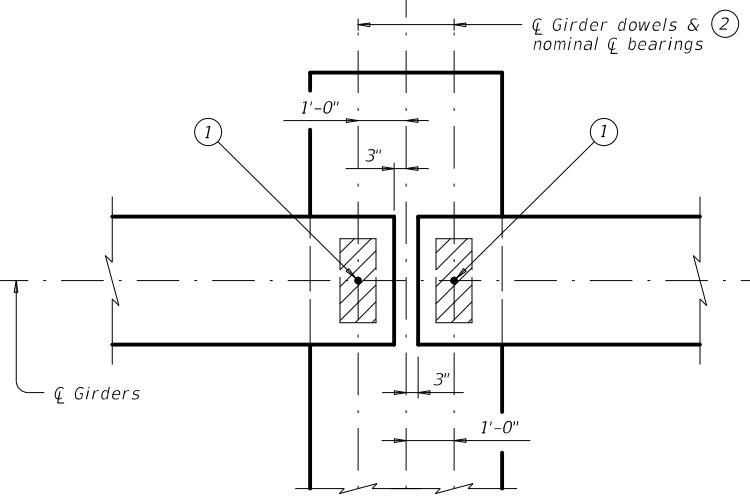


AT ABUTMENT W/SKEW

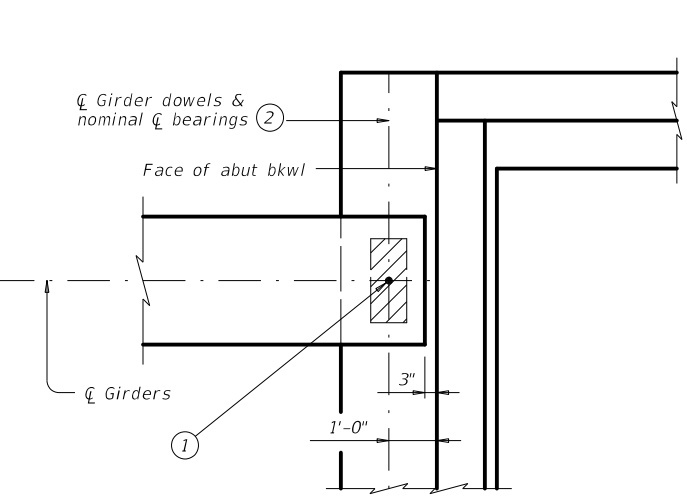
- ① Dowel at doweled girder end [labeled (D) on Bridge Layout]. Required for outside girder only or as shown on substructure details.
- ② For purposes of computing bearing seat elevations, nominal centerline of bearing must be defined as shown. The actual center of bearing pad may vary from this line.
- 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



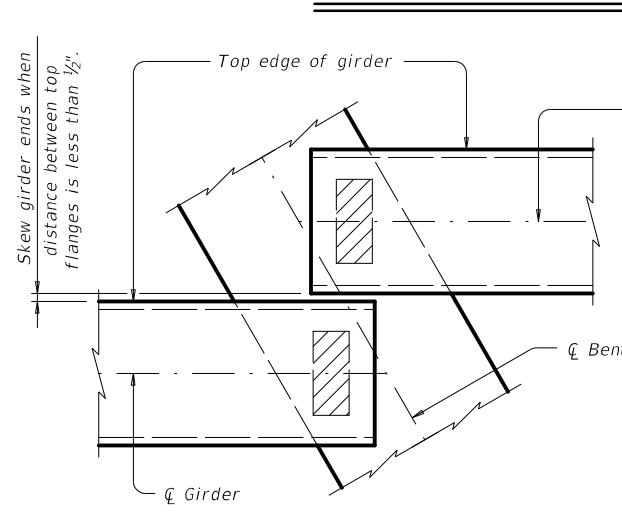
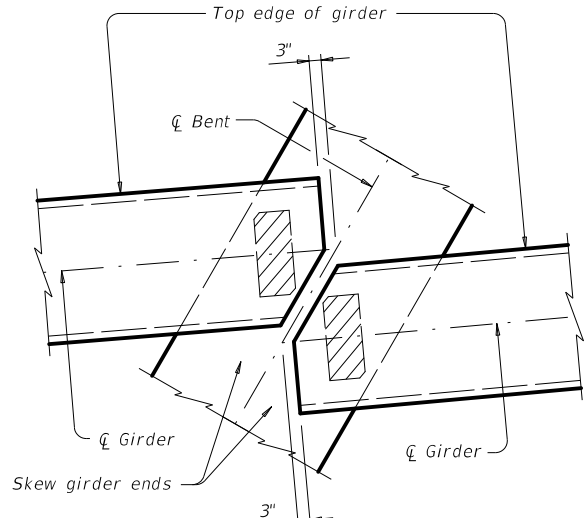
AT CONVENTIONAL INTERIOR BENT



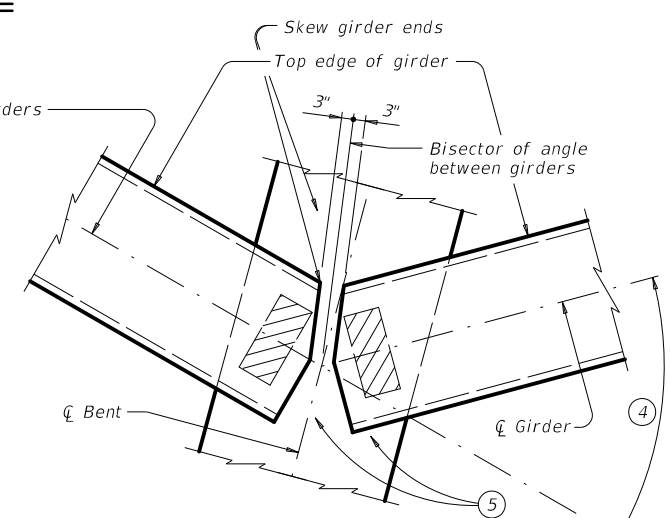
AT ABUTMENT

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

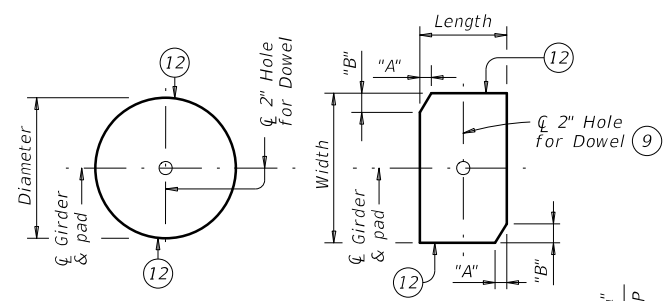


ELASTOMERIC BEARING AND GIRDER END DETAILS PRESTR CONCRETE I-GIRDERS

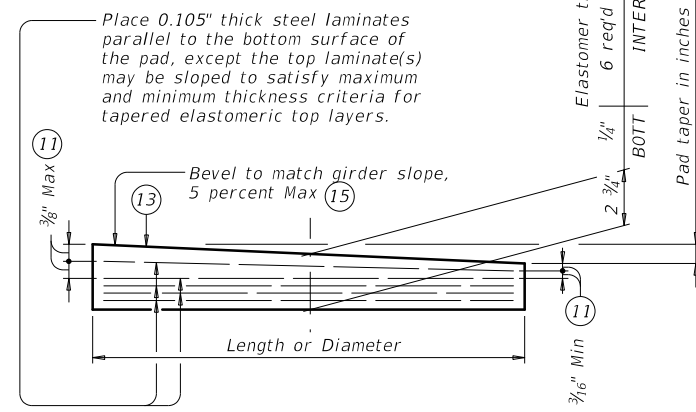
IGEB

FILE: igebs1-17.dgn	DN: AEE	CK: JMH	DW: JTR	CK: TxDOT
©TxDOT August 2017	CONT	SECT	JOB	HIGHWAY
REVISIONS	0913	28	083, ETC	CR
	DIST	COUNTY	SHEET NO.	
	YKM	FAYETTE	107	

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PLANS (10)



ELEVATION

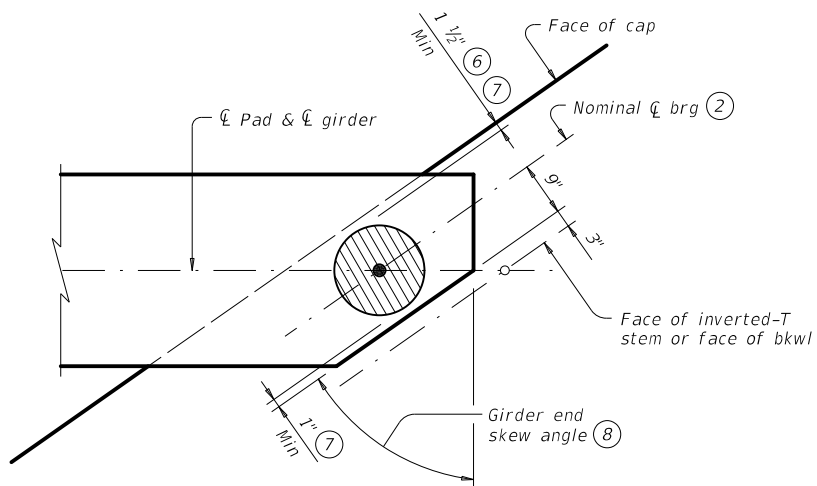
LAMINATED ELASTOMERIC BEARING PAD
(50 DUROMETER)

TABLE OF MINIMUM SUBSTRUCTURE DIMENSIONS (14)

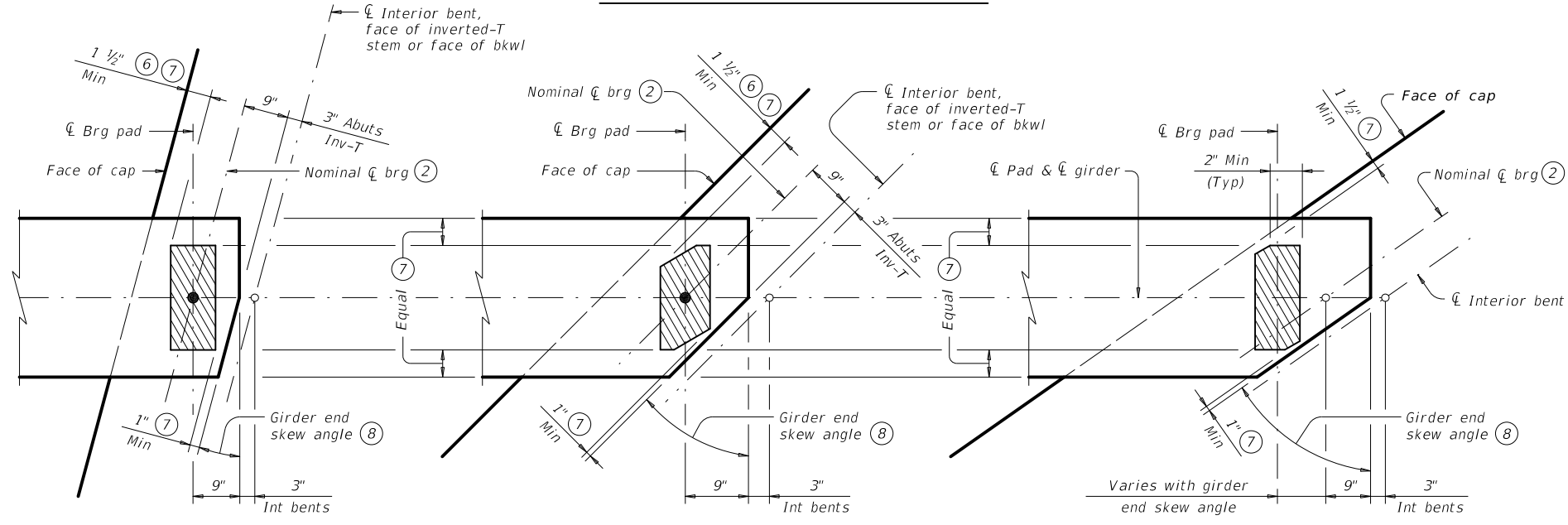
Girder Type	Abutments	Int Bents	Inv-T Bents
	Face of Bkwl to Face of Cap	Overall Cap Width	Corbel Width
Tx28 thru Tx54	1'-9"	3'-6"	1'-10 1/2"
Tx62 & Tx70	2'-0"	4'-0"	2'-1 1/2"

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	---	---	---	---	---
		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) (Length or Dia)
- (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.



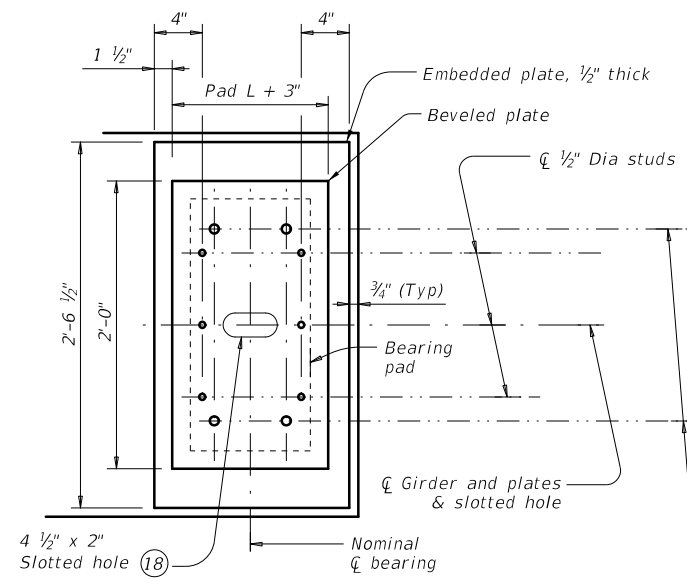
ELASTOMERIC BEARING AND GIRDER END DETAILS PRESTR CONCRETE I-GIRDERS

IGEB

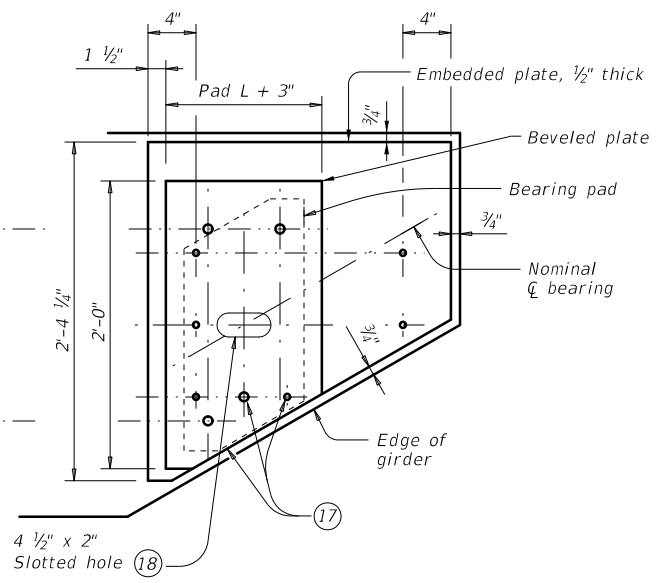
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©TxDOT August 2017	CONT	SECT	JOB	HIGHWAY
REVISIONS	0913	28	083, ETC	CR
	DIST	COUNTY	SHEET NO.	
	YKM	FAYETTE	108	

DATE: FILE:

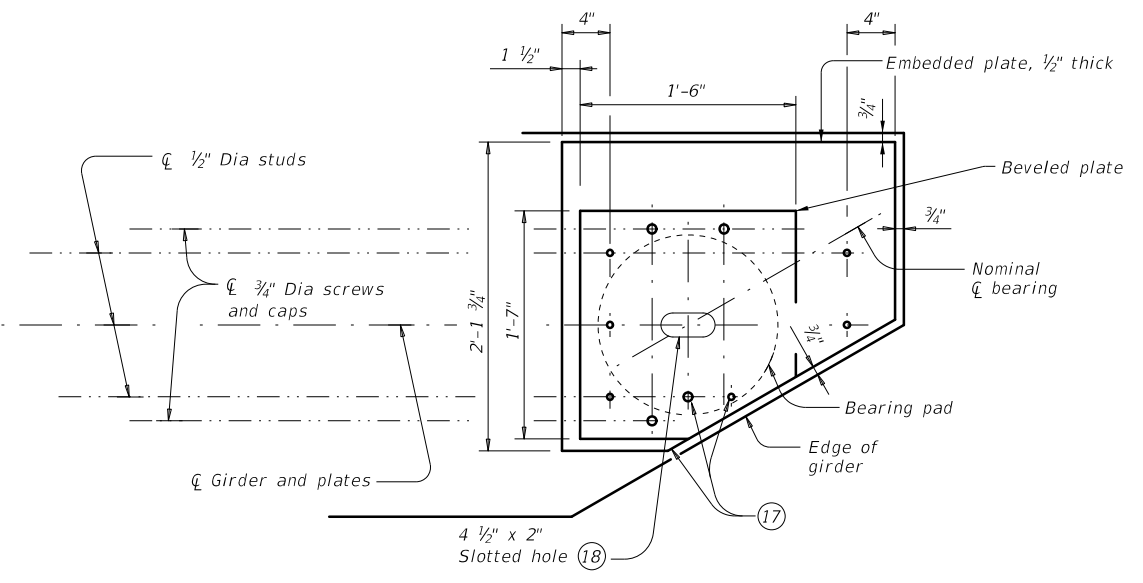
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**NORMAL GIRDER END
RECTANGULAR BEARING PAD**

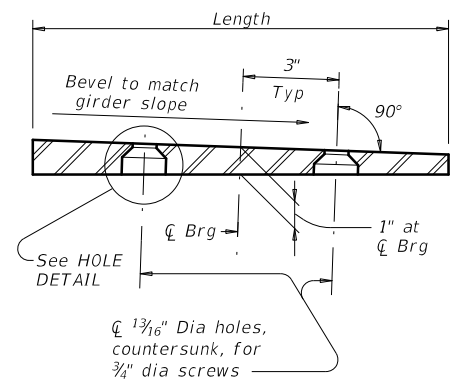


**SKewed GIRDER END
CLIPPED RECTANGULAR BEARING PAD**

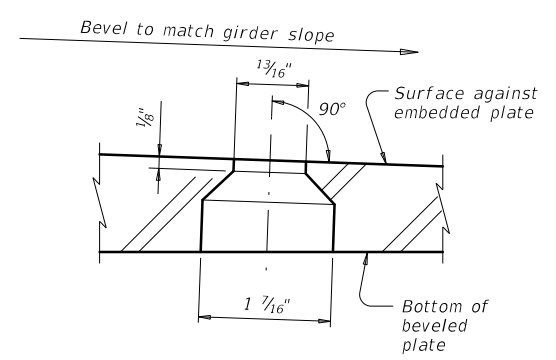


**SKewed GIRDER END
15" DIA BEARING PAD**

PLAN VIEW OF SOLE PLATE DETAILS



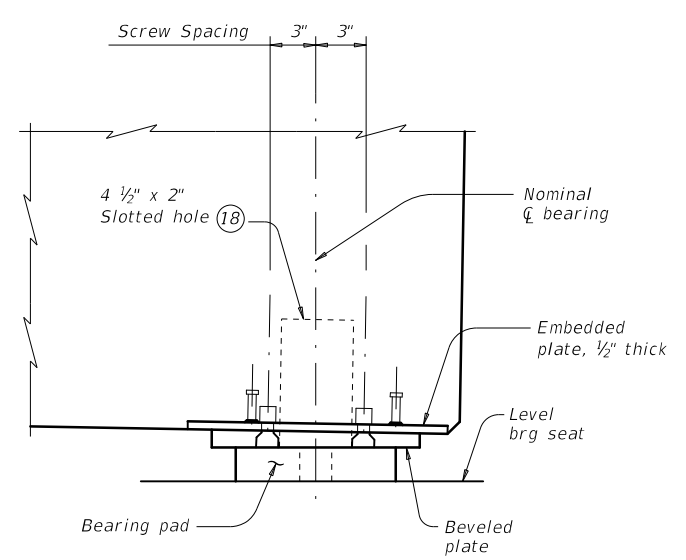
SECTION



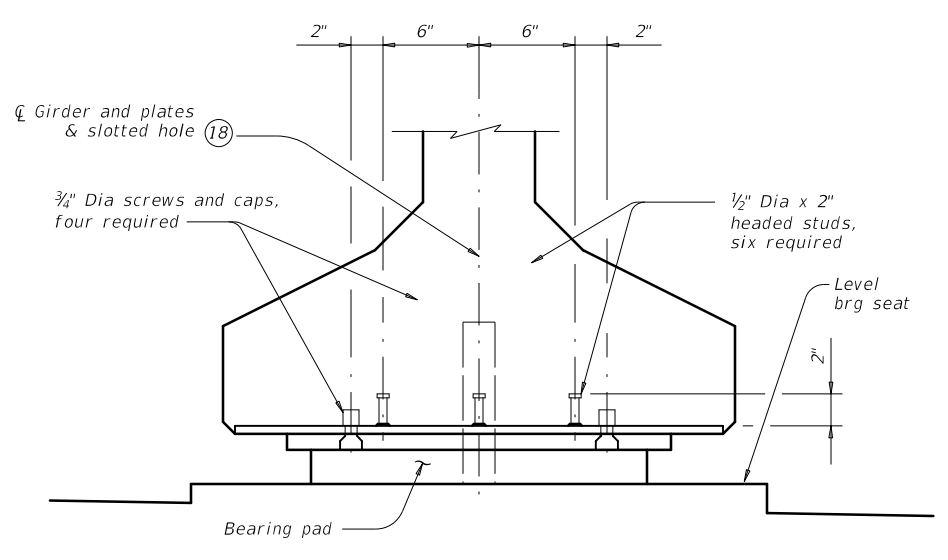
HOLE DETAIL

- (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.

BEVELED PLATE DETAILS



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.



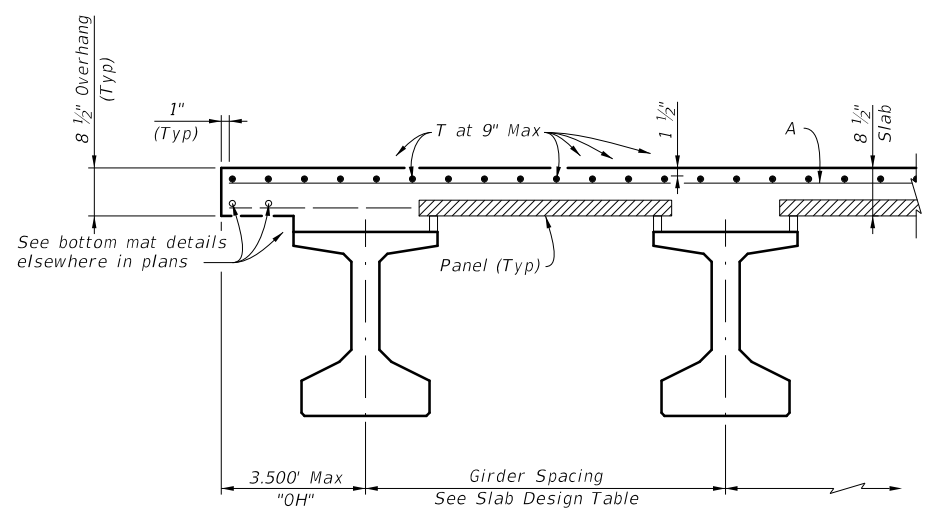
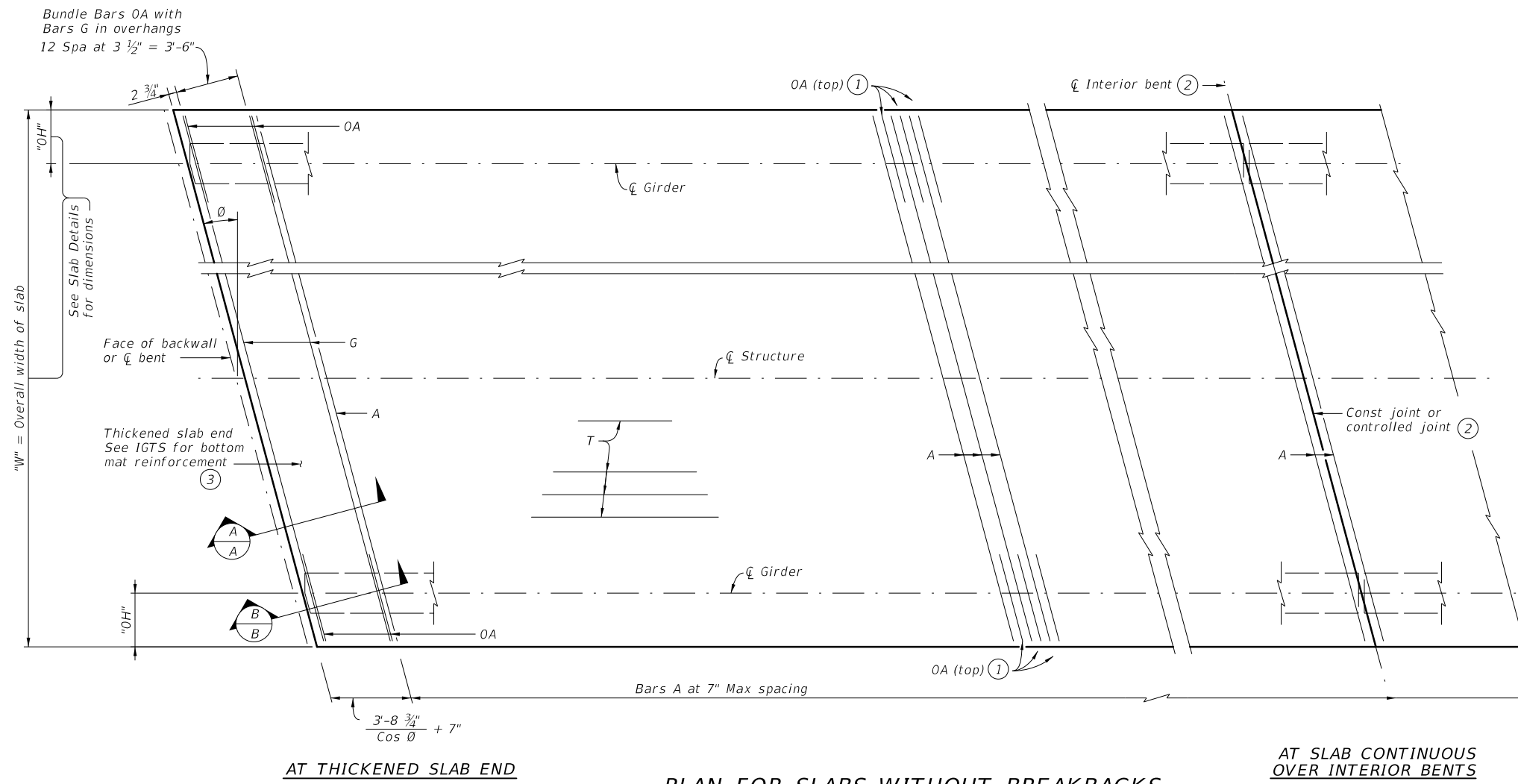
**ELASTOMERIC BEARING
AND GIRDER END DETAILS
PRESTR CONCRETE I-GIRDERS**

IGEB

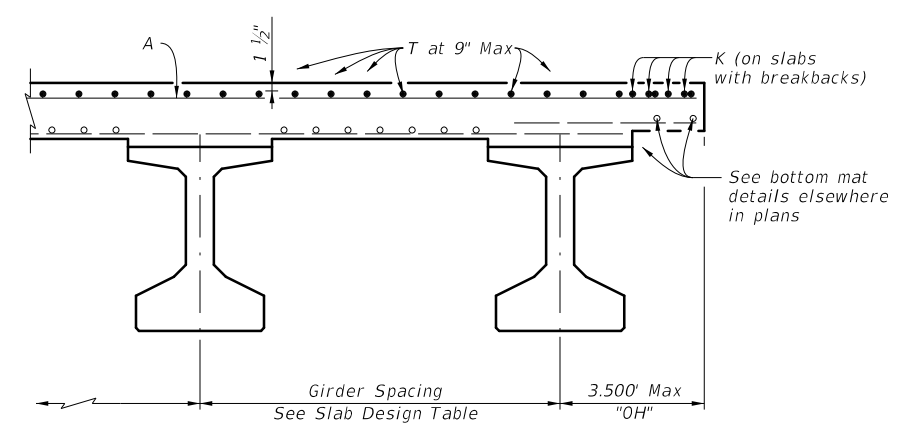
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©TxDOT August 2017	CONT	SECT	JOB	HIGHWAY
REVISIONS	0913	28	083, ETC	CR
	DIST	COUNTY	SHEET NO.	
	YKM	FAYETTE	109	

DATE:
FILE:

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PARTIAL TYPICAL TRANSVERSE SECTION



SECTION OF THICKENED SLAB END
Showing PCP Option 1. Option 2 similar.

- ① Place Bars OA midway between Bars A at overhang.
- ② Bars are continuous through joint.
- ③ Thickened slab end dimensioned perpendicular to face of bkwl, centerline interior bent or face of inverted-T stem.

HL93 LOADING SHEET 1 OF 2

Texas Department of Transportation Bridge Division Standard

GFRP SLAB TOP MAT REINFORCEMENT
PRESTRESSED CONC I-GIRDER SPANS

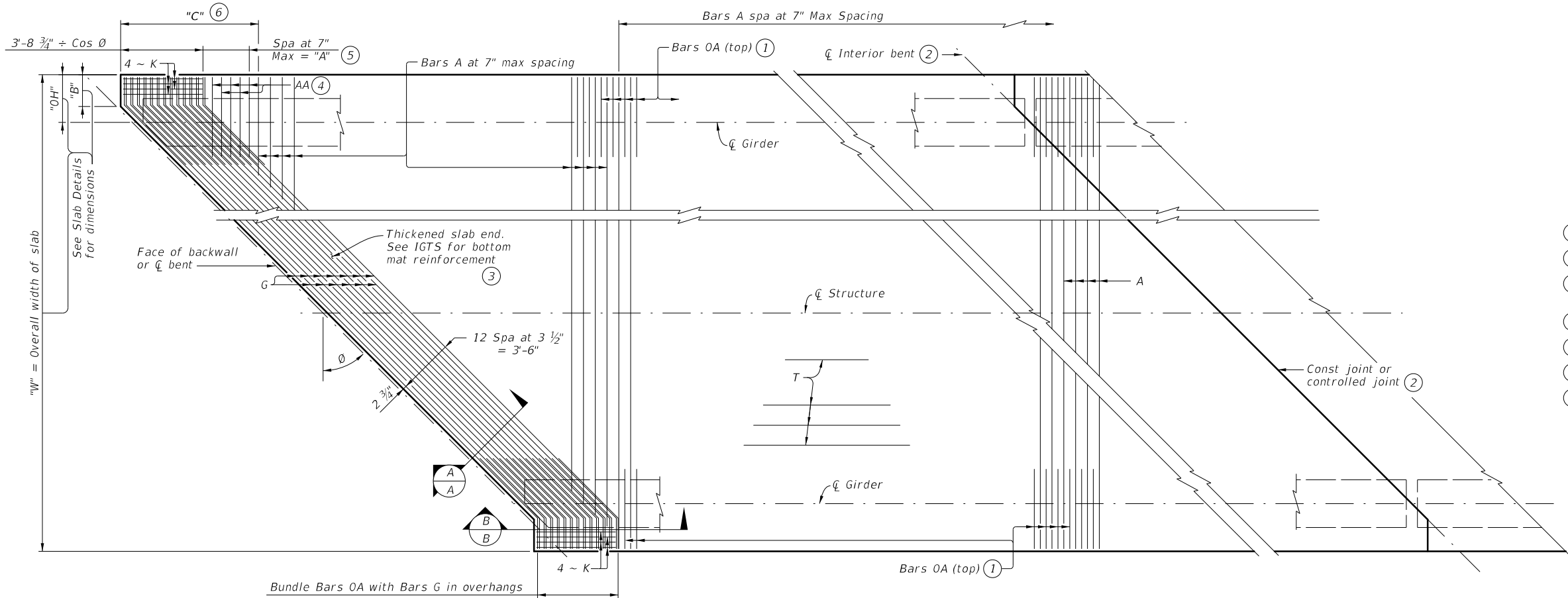
IGFRP

FILE: igfrp001-19.dgn	DN: TxDOT	CK: TxDOT	DW: TxDOT	CK: TxDOT
©TxDOT August 2017	CONT	SECT	JOB	HIGHWAY
REVISIONS	0913	28	083, ETC	CR
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	YKM	FAYETTE	110	

DATE:
FILE:

BAR TABLE

BAR	SIZE
A	#5
AA	#5
G	#5
K	#5
OA	#5
T	#5



- ① Place Bars OA midway between Bars A at overhang.
- ② Bars are continuous through joint.
- ③ Thickened slab end dimensioned perpendicular to face of bkwl, centerline interior bent or face of inverted-T stem.
- ④ Tie Bars AA to bottom of Bars G in this location.
- ⑤ $A = ("OH" + 2.333' - "B") \times \tan \theta$
- ⑥ $C = \frac{3.729'}{\cos \theta} + "A" + \text{Bar A spacing}$
- ⑦ Only required on slabs with breakbacks.

GENERAL NOTES:
 Designed according to AASHTO LRFD Bridge Design Specifications and AASHTO LRFD Bridge Design Guide Specifications for GFRP-Reinforced Concrete, 2nd Edition. These details are restricted to Prestressed Concrete I-Girder spans with an 8 1/2" slab and up to a 10'-0" girder spacing. These details are to be used in conjunction with the Span Details and PCP Standard (if prestressed concrete panels are used). This standard provides Glass Fiber Reinforced Polymer (GFRP) reinforcement details for the top mat of slab reinforcement. The bottom mat reinforcement and other slab details are as shown elsewhere in the plans. The Contractor has the option to provide GFRP reinforcement, in accordance with the details shown, when epoxy-coated steel bars are specified for the deck slab. The Contractor may provide an alternate GFRP slab design with calculations signed and sealed by a Professional Engineer.

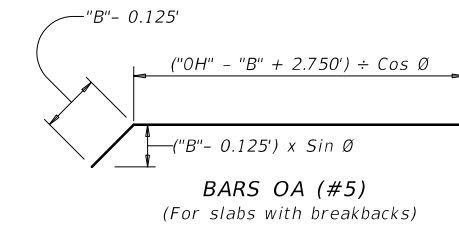
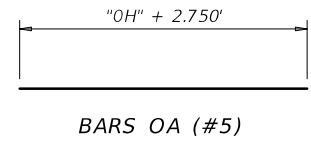
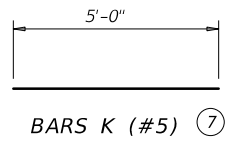
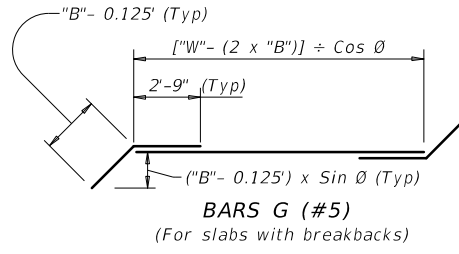
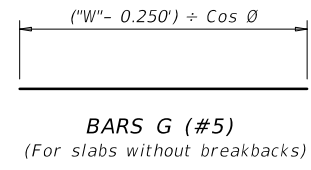
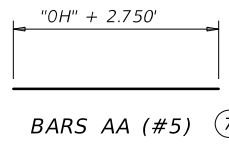
Cover dimensions are clear dimensions, unless noted otherwise.
 Reinforcing bar dimensions shown are out-to-out of bar.

MATERIAL NOTES:
 Provide GFRP bars, conforming to ASTM D7957/7957M, except provide a minimum modulus of elasticity of 7,500 ksi. Provide Grade 60 steel bars for all bottom mat reinforcement as shown elsewhere in plans. Provide bar laps, where required, as follows:
 #5 GFRP bar = 2'-9"

AT THICKENED SLAB END **AT SLAB CONTINUOUS OVER INTERIOR BENTS**

PLAN FOR SLABS WITH BREAKBACKS

Showing top mat reinforcement only.



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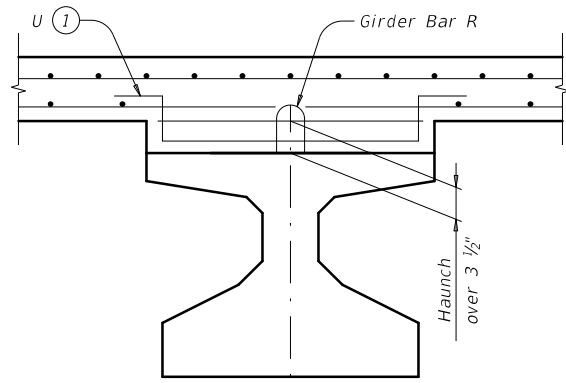
GFRP SLAB TOP MAT REINFORCEMENT PRESTRESSED CONC I-GIRDER SPANS

IGFRP

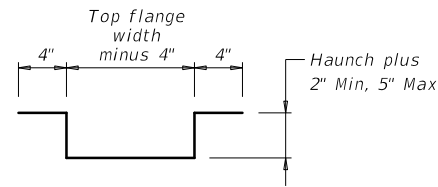
FILE: igfrp001-19.dgn	DN: TxDOT	CK: TxDOT	DW: TxDOT	CK: TxDOT
©TxDOT August 2017	CONT	SECT	JOB	HIGHWAY
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	YKM	FAYETTE	111	

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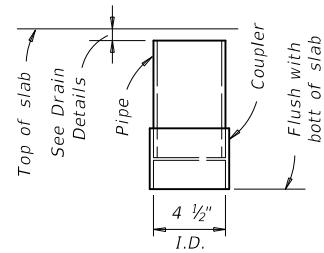
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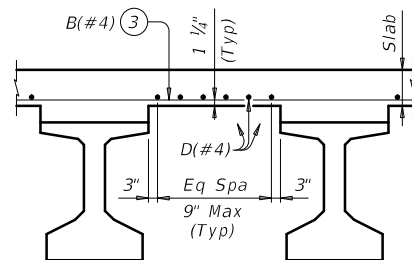
HAUNCH REINFORCING DETAIL



BARS U (#4)

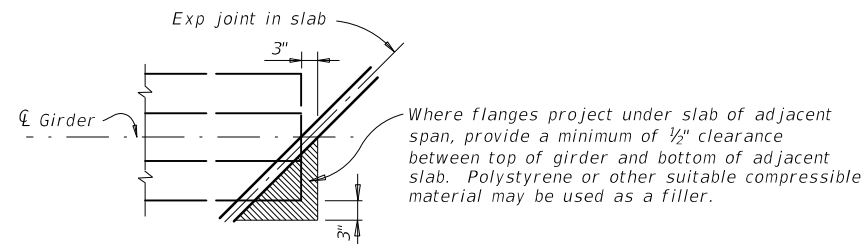


C-I-P DRAIN DETAIL

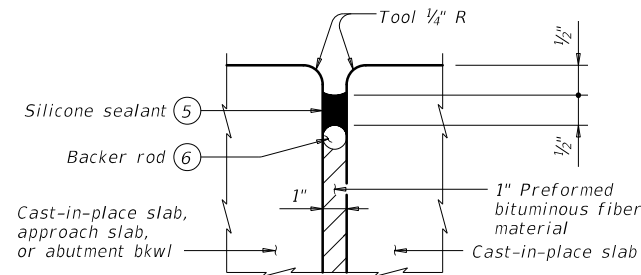


TYPICAL PART TRANSVERSE SLAB SECTION WITHOUT PCP

Top reinforcing steel not shown for clarity.

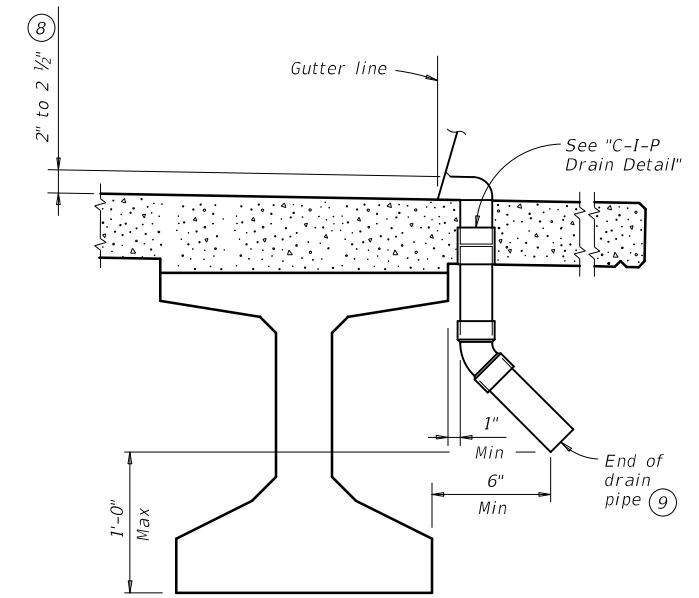


TREATMENT AT GIRDER END FOR SKEWED SPANS



TYPE A JOINT DETAIL

- 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.
- 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.



DRAIN DETAIL

GENERAL NOTES:
Designed according to AASHTO LRFD Bridge Design Specifications.
Payment for Type A joint will be as per Item 454, "Bridge Expansion Joints."
All other items (reinforcing steel, drains, 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.

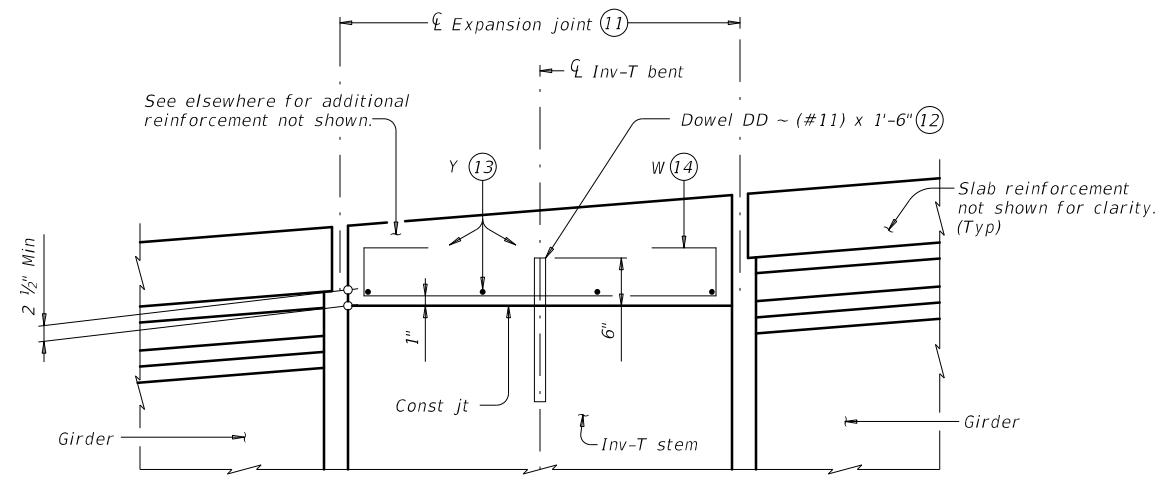
DECK FORMWORK NOTES:
Overhang bracket hangers are limited to a safe working load of 3,600 lbs, applied to and along the axis of a coil rod at 45 degrees from vertical, regardless of higher loads permitted by hanger manufacturers. Do not place a hanger less than 12" from girder end. Space hangers accordingly.

SHEET 1 OF 2

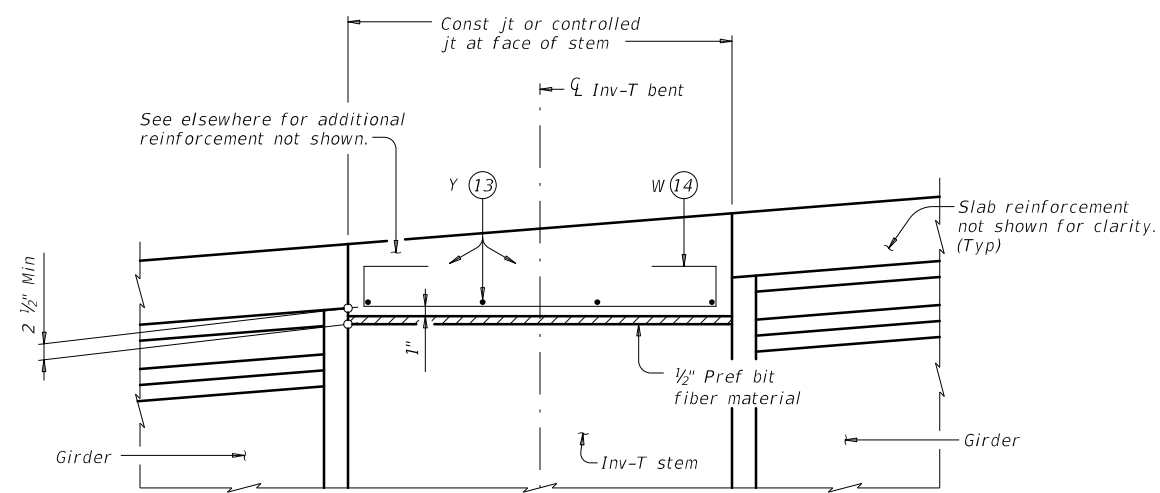
				Bridge Division Standard	
MISCELLANEOUS SLAB DETAILS PRESTR CONCRETE I-GIRDERS					
IGMS					
FILE: igmsts1-19.dgn	DN: TxDOT	CK: TxDOT	DW: JTR	CK: TxDOT	
©TxDOT August 2017	CONT	SECT	JOB	HIGHWAY	
REVISIONS	0913	28	083, ETC	CR	
10-19: Modified Note 7. Type A now a pay item.	DIST	COUNTY	SHEET NO.		
	YKM	FAYETTE	112		

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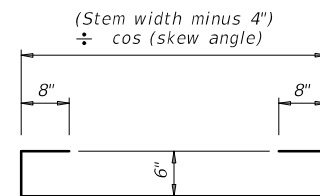
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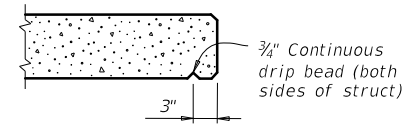
SHOWING EXPANSION JOINTS



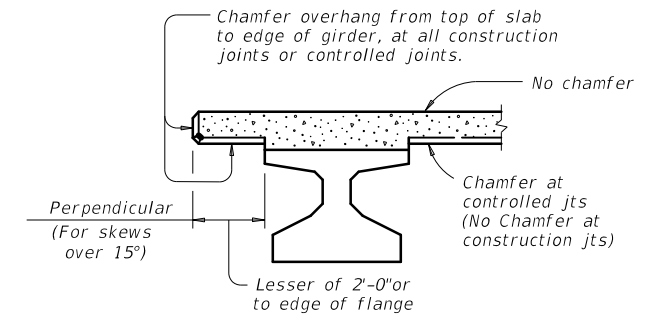
**SHOWING CONST JTS OR CONTROLLED JTS
REINFORCEMENT OVER INV-T BENTS**



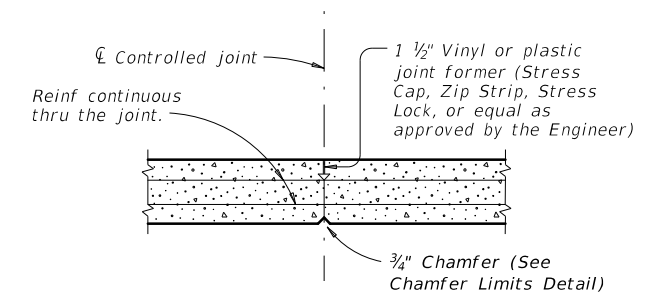
BARS W (#4)



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.

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

IGMS

FILE: igmsts1-19.dgn	DN: TxDOT	CK: TxDOT	DW: JTR	CK: TxDOT
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REVISIONS	0913	28	083, ETC	CR
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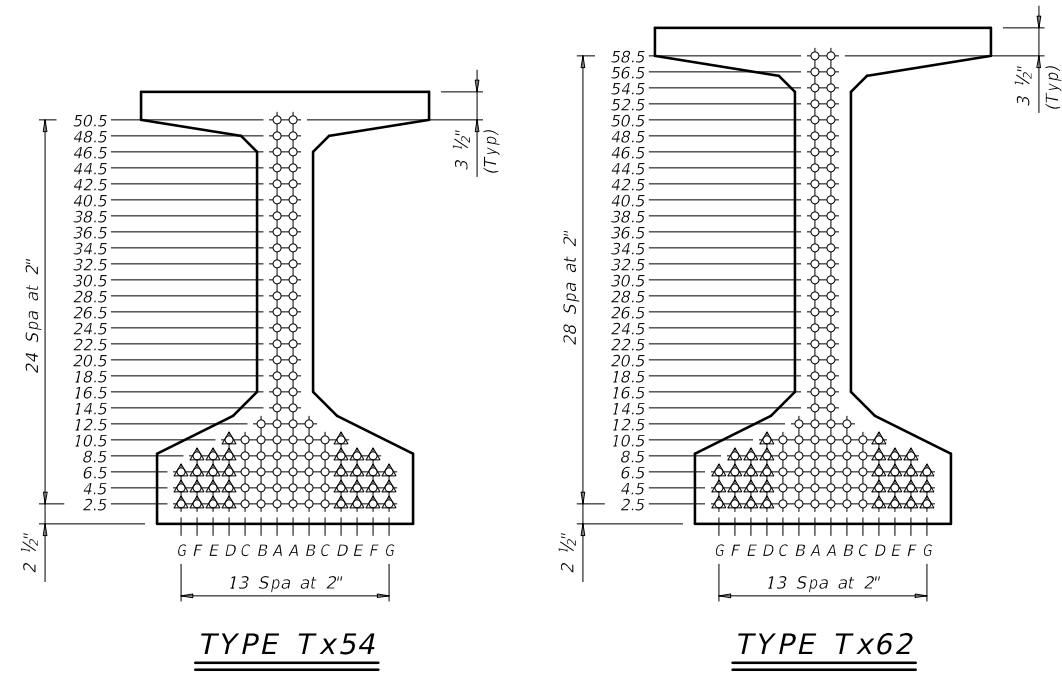
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DATE: FILE:

STRUCTURE	DESIGNED GIRDERS								DEPRESSED STRAND PATTERN		CONCRETE		OPTIONAL DESIGN				LOAD RATING FACTORS				
	SPAN NO.	GIRDER NO.	GIRDER TYPE	PRESTRESSING STRANDS									DESIGN LOAD COMP STRESS (TOP ϵ) (SERVICE I) $f_{ct}(ksi)$	DESIGN LOAD TENSILE STRESS (BOT ϵ) (SERVICE III) $f_{cb}(ksi)$	REQUIRED MINIMUM ULTIMATE MOMENT CAPACITY (STRENGTH I) (kip-ft)	LIVE LOAD DISTRIBUTION FACTOR		STRENGTH I		SERVICE III	
				NON-STD STRAND PATTERN	TOTAL NO.	SIZE (in)	STRGTH f_{pu} (ksi)	"e" $\bar{\epsilon}$ (in)								"e" END (in)	Moment	Shear	Inv	Opr	Inv
Type Tx54 Girders 24' Roadway 8.5" Slab	40	ALL	Tx54		8	0.6	270	21.01	21.01			4.000	5.000	0.511	-0.578	1798	0.770	0.800	2.05	2.66	3.76
	45	ALL	Tx54		10	0.6	270	21.01	21.01			4.000	5.000	0.636	-0.703	2126	0.740	0.800	2.24	2.90	3.69
	50	ALL	Tx54		12	0.6	270	21.01	21.01			4.000	5.000	0.781	-0.850	2533	0.720	0.810	1.81	2.35	2.91
	55	ALL	Tx54		12	0.6	270	21.01	21.01			4.000	5.000	0.938	-1.007	2951	0.700	0.810	1.90	2.46	2.79
	60	ALL	Tx54		12	0.6	270	21.01	21.01			4.000	5.000	1.108	-1.173	3271	0.680	0.810	1.60	2.07	2.25
	65	ALL	Tx54		14	0.6	270	21.01	21.01			4.000	5.000	1.285	-1.348	3547	0.670	0.810	1.66	2.16	2.16
	70	ALL	Tx54		14	0.6	270	21.01	21.01			4.000	5.000	1.482	-1.540	3502	0.660	0.820	1.41	1.82	1.73
	75	ALL	Tx54		16	0.6	270	20.76	20.26	4	6.5	4.000	5.000	1.689	-1.733	3745	0.640	0.820	1.47	1.91	1.66
	80	ALL	Tx54		16	0.6	270	20.76	20.76	4	8.5	4.000	5.000	1.912	-1.944	4001	0.630	0.820	1.26	1.63	1.30
	85	ALL	Tx54		18	0.6	270	20.56	19.67	4	10.5	4.000	5.000	2.148	-2.166	4406	0.620	0.820	1.07	1.39	1.00
	90	ALL	Tx54		20	0.6	270	20.41	19.21	4	14.5	4.000	5.000	2.379	-2.384	4806	0.610	0.820	1.33	1.73	1.16
	95	ALL	Tx54		22	0.6	270	20.28	18.46	4	18.5	4.000	5.000	2.639	-2.624	5234	0.600	0.820	1.35	1.75	1.07
	100	ALL	Tx54		26	0.6	270	20.08	16.39	4	28.5	4.000	5.000	2.896	-2.871	5699	0.600	0.830	1.52	1.97	1.14
	105	ALL	Tx54		30	0.6	270	19.81	12.21	6	44.5	4.000	5.000	3.180	-3.130	6153	0.590	0.830	1.51	1.96	1.02
	110	ALL	Tx54		32	0.6	270	19.63	11.38	6	50.5	4.100	5.000	3.477	-3.400	6619	0.580	0.830	1.63	2.12	1.03
115	ALL	Tx54		36	0.6	270	19.34	12.01	6	50.5	4.700	5.500	3.786	-3.679	7096	0.570	0.830	1.60	2.07	1.00	
120	ALL	Tx54		38	0.6	270	19.22	13.22	6	44.5	5.200	6.100	4.116	-3.985	7646	0.570	0.830	1.65	2.14	1.01	
125	ALL	Tx54		42	0.6	270	19.01	12.72	6	50.5	5.600	6.600	4.415	-4.257	8113	0.560	0.830	1.71	2.24	1.09	
Type Tx62 Girders 24' Roadway 8.5" Slab	60	ALL	Tx62		12	0.6	270	25.78	25.78			4.000	5.000	0.878	-0.986	3525	0.700	0.800	1.81	2.35	2.73
	65	ALL	Tx62		12	0.6	270	25.78	25.78			4.000	5.000	1.016	-1.133	3847	0.690	0.800	1.89	2.45	2.64
	70	ALL	Tx62		14	0.6	270	25.78	25.78			4.000	5.000	1.171	-1.293	4173	0.680	0.810	1.61	2.08	2.16
	75	ALL	Tx62		14	0.6	270	25.78	25.78			4.000	5.000	1.332	-1.455	4132	0.660	0.810	1.68	2.18	2.10
	80	ALL	Tx62		16	0.6	270	25.53	25.53			4.000	5.000	1.506	-1.633	4429	0.650	0.810	1.45	1.88	1.72
	85	ALL	Tx62		16	0.6	270	25.53	25.53			4.000	5.000	1.691	-1.819	4610	0.640	0.810	1.24	1.61	1.37
	90	ALL	Tx62		16	0.6	270	25.53	25.53			4.000	5.000	1.885	-2.013	5051	0.630	0.810	1.29	1.68	1.31
	95	ALL	Tx62		20	0.6	270	25.18	24.78	4	6.5	4.000	5.000	2.081	-2.209	5493	0.620	0.820	1.11	1.44	1.02
	100	ALL	Tx62		22	0.6	270	25.05	23.96	4	10.5	4.000	5.000	2.295	-2.420	5959	0.610	0.820	1.16	1.50	1.01
	105	ALL	Tx62		24	0.6	270	24.94	23.28	4	14.5	4.000	5.000	2.514	-2.642	6475	0.610	0.820	1.37	1.78	1.10
	110	ALL	Tx62		26	0.6	270	24.85	22.70	4	18.5	4.000	5.000	2.723	-2.850	6936	0.600	0.820	1.39	1.80	1.03
	115	ALL	Tx62		30	0.6	270	24.58	17.78	6	40.5	4.000	5.000	2.963	-3.083	7440	0.590	0.820	1.56	2.02	1.09
	120	ALL	Tx62		34	0.6	270	24.25	15.07	6	58.5	4.200	5.000	3.213	-3.325	7957	0.580	0.820	1.55	2.01	1.00
	125	ALL	Tx62		36	0.6	270	24.11	17.11	6	48.5	4.700	5.600	3.480	-3.591	8551	0.580	0.820	1.64	2.13	1.04
	130	ALL	Tx62		40	0.6	270	23.88	16.68	6	54.5	5.100	6.100	3.733	-3.836	9072	0.570	0.820	1.52	2.09	1.02
135	ALL	Tx62		42	0.6	270	23.78	16.35	6	58.5	5.300	6.300	4.002	-4.104	9676	0.570	0.830	1.61	2.18	1.05	

NON-STANDARD STRAND PATTERNS	
PATTERN	STRAND ARRANGEMENT AT $\bar{\epsilon}$ OF GIRDER

- ① Based on the following allowable stresses (ksi):
 Compression = $0.65 f'_{ci}$
 Tension = $0.24 \sqrt{f'_{ci}}$
 Optional designs must likewise conform.
- ② Portion of full HL93.



HL93 LOADING SHEET 2 OF 2

Bridge Division Standard

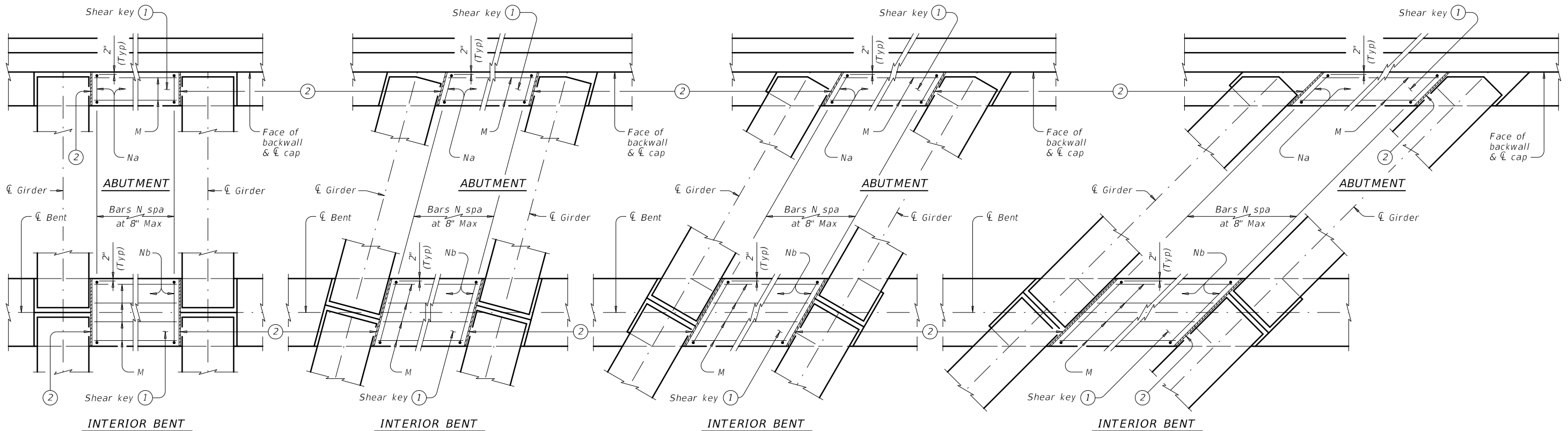
PRESTRESSED CONCRETE I-GIRDER STANDARD DESIGNS

24' ROADWAY

IGSD-24

FILE: ig01stds-21.dgn	DN: EFC	CK: AJF	DW: EFC	CK: TAR
©TxDOT August 2017	CONT	SECT	JOB	HIGHWAY
REVISIONS	0913	28	083, ETC	CR
10-19: Redesign girders. 1-21: Added load rating.	DIST	COUNTY		SHEET NO.
	YKM	FAYETTE		115

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PARTIAL PLANS WITH NO SKEW

Showing shear keys on 3'-6" wide caps. 4'-0" caps similar.

PARTIAL PLANS WITH 15° SKEW

Showing shear keys on 3'-6" wide caps. 4'-0" caps similar.

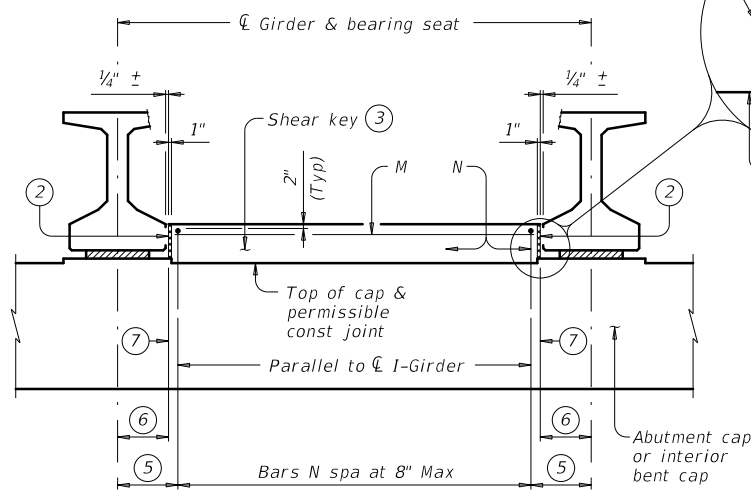
PARTIAL PLANS WITH 30° SKEW

Showing shear keys on 3'-6" wide caps. 4'-0" caps similar.

PARTIAL PLANS WITH 45° SKEW

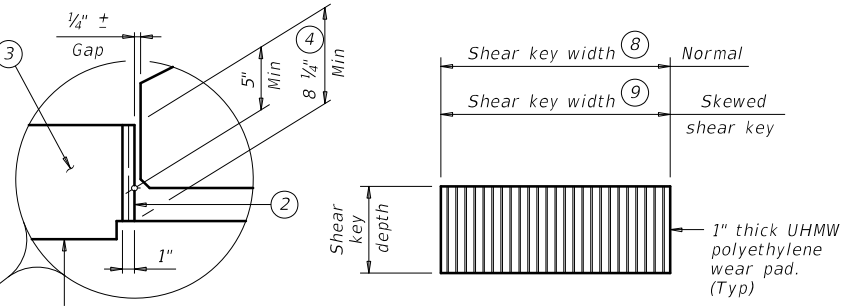
Showing shear keys on 3'-6" wide caps. 4'-0" caps similar.

- ① Place shear keys on the upstream side of structure between outside girder and next adjacent girder, unless shown otherwise on plans.
- ② UHMW polyethylene wear pad. (Typ)
- ③ Leave a 1/4" gap plus or minus between girder and face of wear pad. Cast wear pad with shear key, smooth side facing girder. Care must be taken to keep concrete from flowing under girder. Slope top of shear keys in accordance with Item 420.4.9, "Treatment and Finishing of Horizontal Surfaces."
- ④ Measure at higher bearing seat elevation forward or back. Dimension based on typical bearing pad and bearing seat. Increase as necessary to maintain 5" overlap.
- ⑤ With No Skew = 1'-8 1/4", measured along cap. With Skew = 1'-8 1/4" ÷ Cos Skew, measured along cap.
- ⑥ With No Skew = 1'-4 1/4", measured along cap. With Skew = 1'-4 1/4" ÷ Cos Skew, measured along cap.
- ⑦ Face of UHMW polyethylene wear pad. Smooth side of pad facing girder.
- ⑧ Abutments = 1/2 Cap width. Interior bents = Cap width.
- ⑨ Abutments = 1/2 Cap width ÷ Cos Skew. Interior bents = Cap width ÷ Cos Skew.

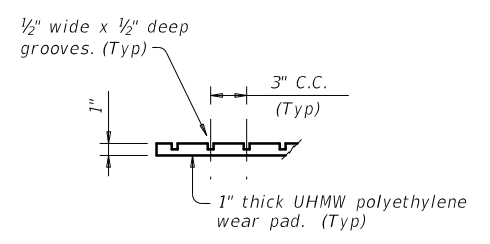


PARTIAL ELEVATION OF ABUTMENT OR INTERIOR BENT CAP

Showing shear key with girder Type Tx46. Other I-Girder types similar.

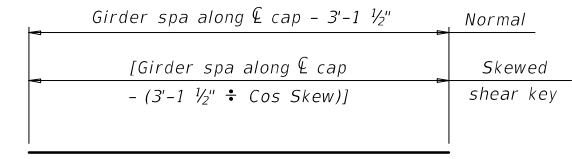


ELEVATION

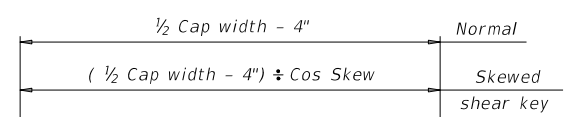


PART SECTION

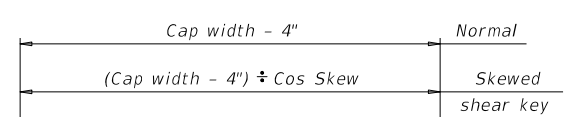
ULTRA HIGH MOLECULAR WEIGHT (UHMW) POLYETHYLENE WEAR PAD DETAILS



BARS M (#5)



BARS Na (#5) (For abutments)



BARS Nb (#5) (For interior bents)

CONSTRUCTION NOTES:
 Provide Class "C" concrete (f'c = 3,600 psi). Provide Class "C" (HPC) if shown elsewhere on the plans.
 Provide Grade 60 reinforcing steel.
 Provide epoxy coated reinforcing steel for shear key if abutment or interior bent reinforcing steel is epoxy coated.
 Provide Ultra High Molecular Weight (UHMW) polyethylene wear pads in accordance with ASTM D6712.

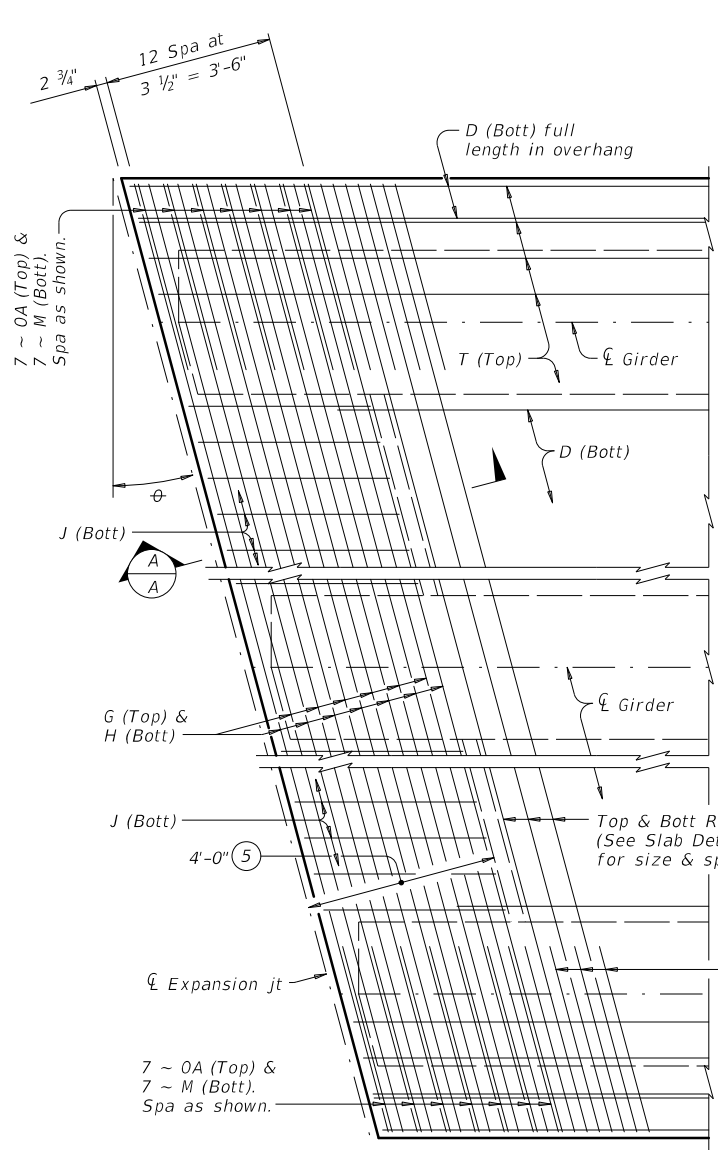
GENERAL NOTES:
 Designed according to AASHTO LRFD Bridge Design Specifications. Details showing skew are drawn showing right forward skew. See Bridge Layout for actual skew direction.
 These details are limited to bridges skewed 45 degrees and less. This standard is only applicable for I-Girders.
 Modify details for bearing conditions, and girder spacing not shown on this standard. Details do not account for sole plate or pedestal bearing seat.
 Include shear key concrete in abutment or bent concrete for payment.
 UHMW polyethylene wear pads are subsidiary to Class "C" concrete.

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

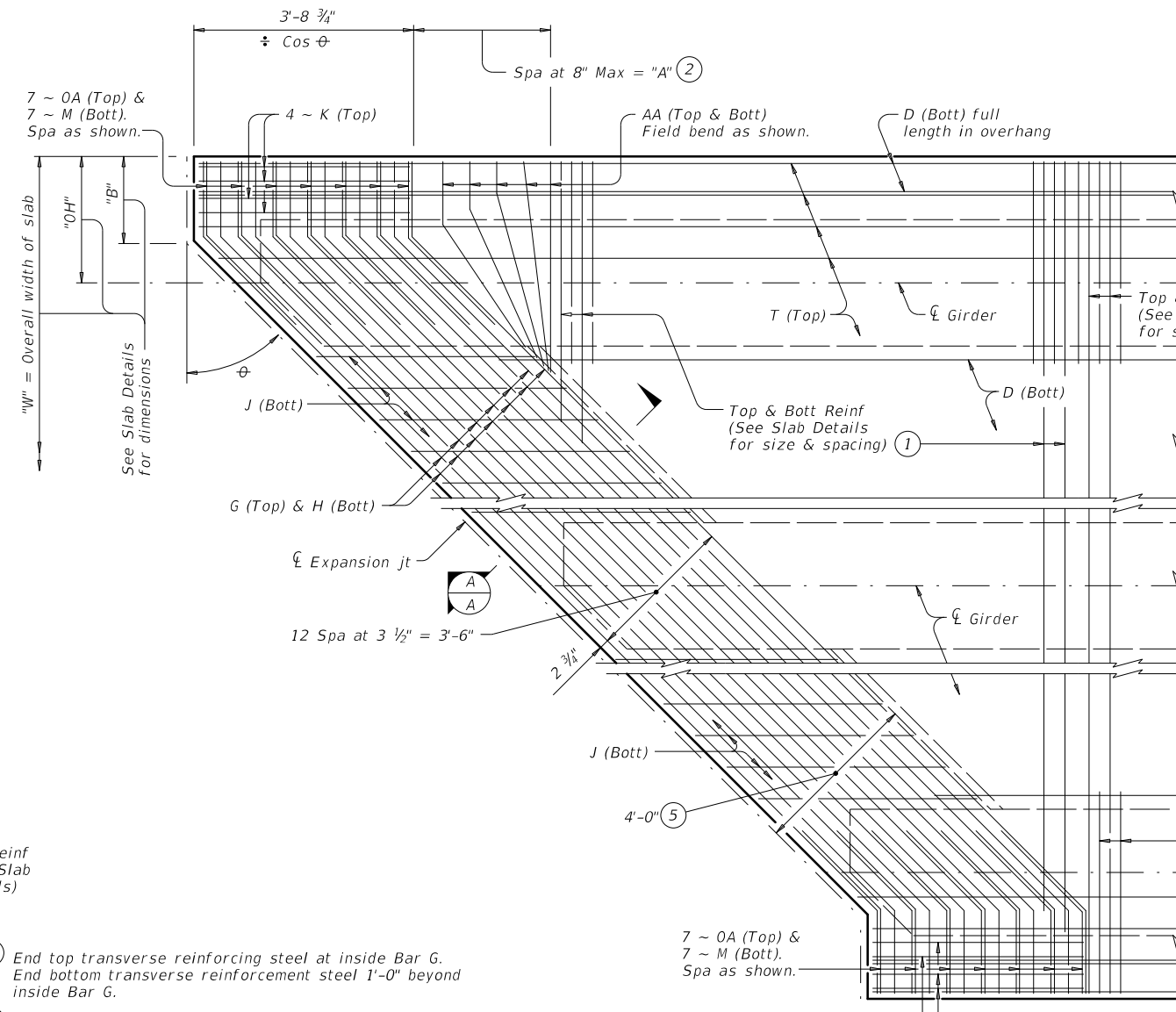
		Bridge Division Standard	
SHEAR KEY DETAILS PRESTR CONCRETE I-GIRDERS			
IGSK			
FILE: igskstds-17.dgn	DN: TxDOT	CK: TxDOT	DW: JTR
©TxDOT August 2017	CONV	SECT	HIGHWAY
REVISIONS	0913	28	083, ETC
	DIST	COUNTY	SHEET NO.
	YKM	FAYETTE	116

DATE: FILE:

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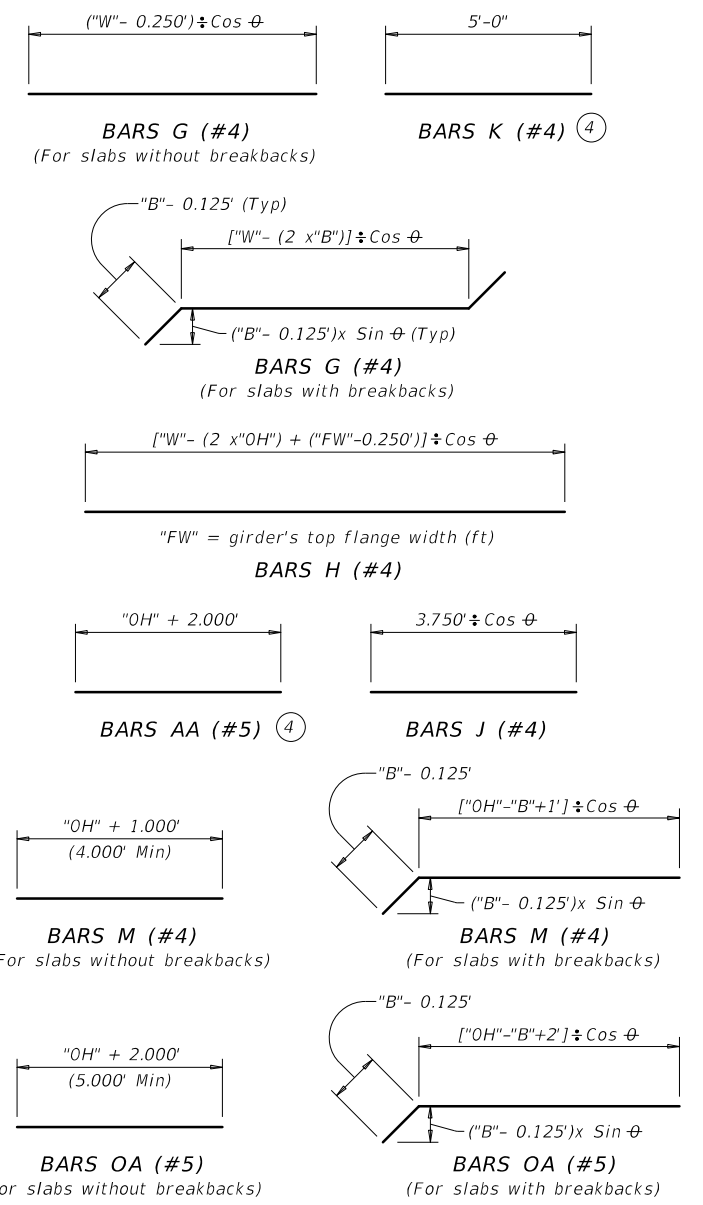


PARTIAL PLAN FOR SLABS WITHOUT BREAKBACK



PARTIAL PLAN FOR SLABS WITH BREAKBACK

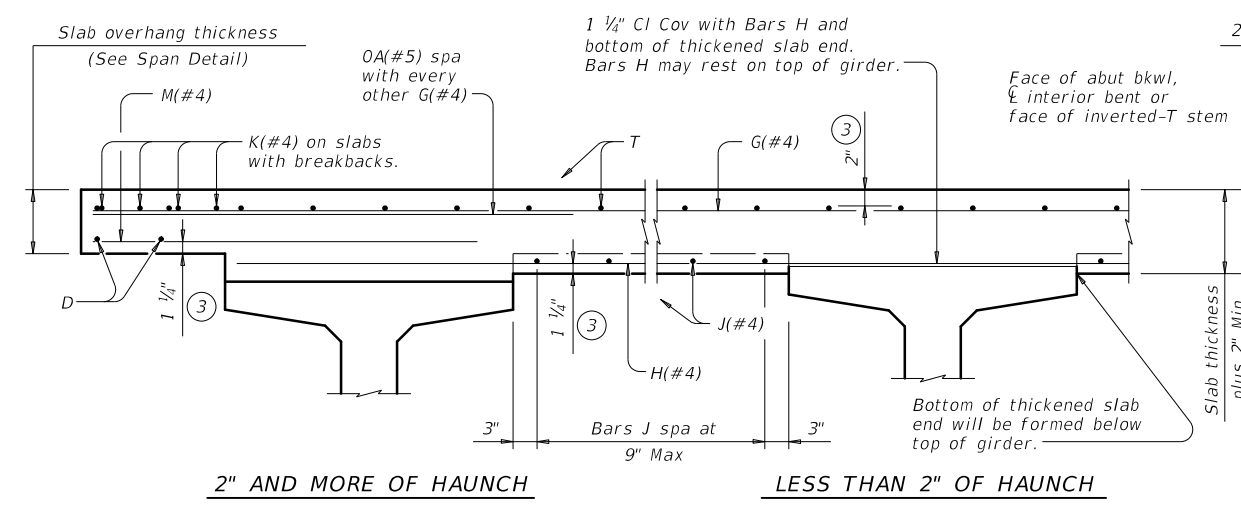
- ① End top transverse reinforcing steel at inside Bar G. End bottom transverse reinforcement steel 1'-0" beyond inside Bar G.
- ② "A" = ("OH" + 2.333' - "B") x Tan θ
- ③ Provide clear cover as indicated unless otherwise shown on Span Details.
- ④ Only required on slabs with breakbacks.
- ⑤ Thickened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



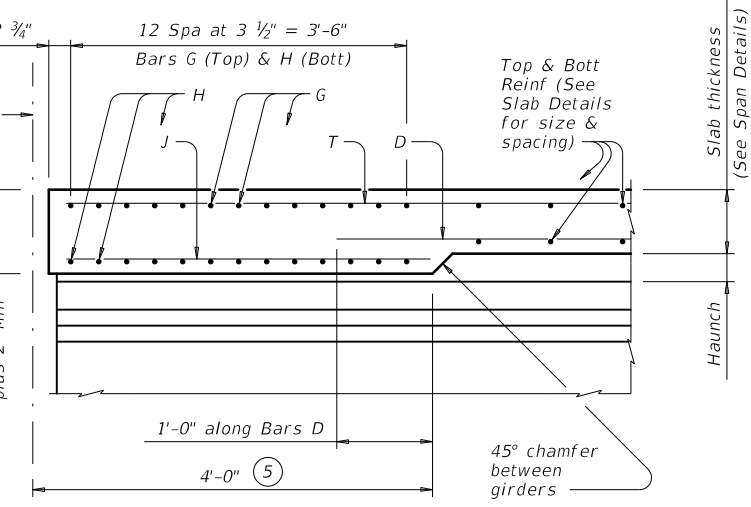
GENERAL NOTES:
 Designed according to AASHTO LRFD Bridge Design Specifications. These details are restricted to Prestressed Concrete I-Girder Spans. These details are to be used in conjunction with the Span Details and PCP standard (if prestressed concrete panels are used). When Option 2 from PCP standard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



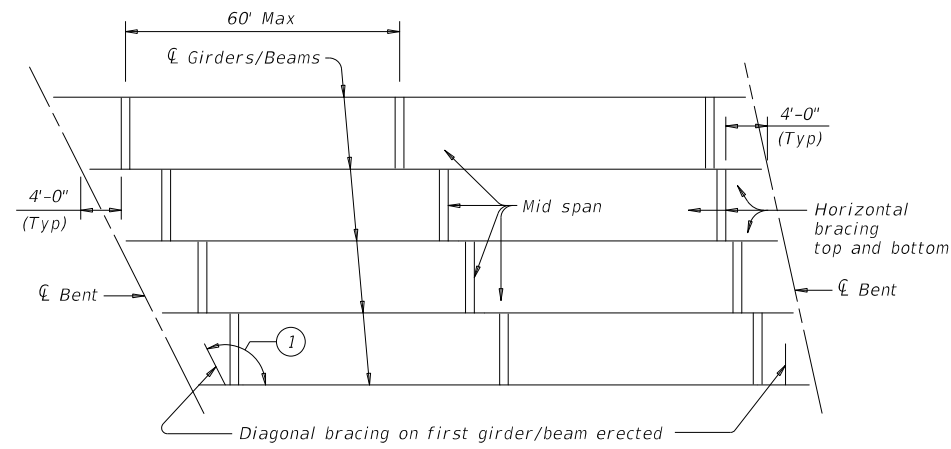
SECTION A-A
 (Showing with 2" and more of haunch)

HL93 LOADING		Bridge Division Standard	
THICKENED SLAB END DETAILS			
PRESTRESSED CONCRETE I-GIRDER SPANS			
IGTS			
FILE: igtss1-17.dgn	DN: TxDOT	CK: TxDOT	DW: JTR
©TxDOT August 2017	CONV: 0913	SECT: 28	JOB: 083, ETC
REVISIONS			HIGHWAY: CR
	DIST: YKM	COUNTY: FAYETTE	SHEET NO: 117

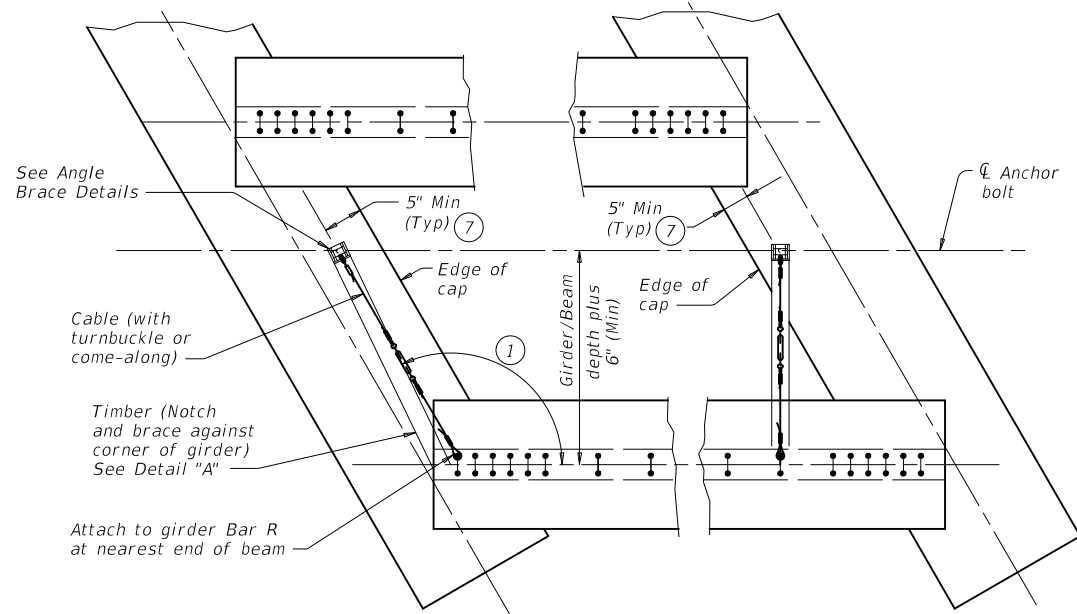
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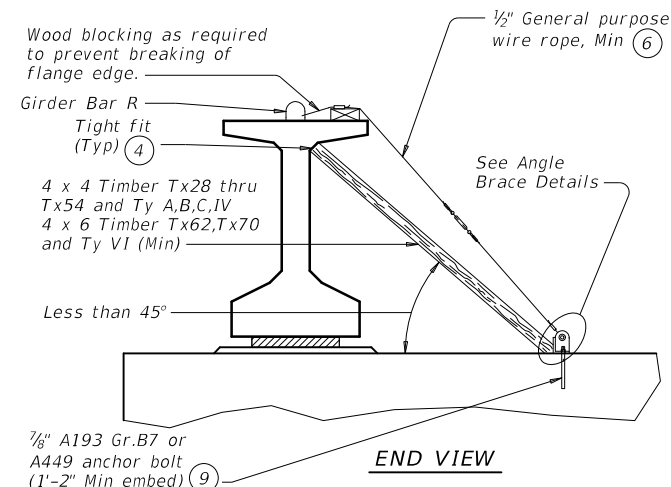
DATE: FILE:



ERECTION BRACING



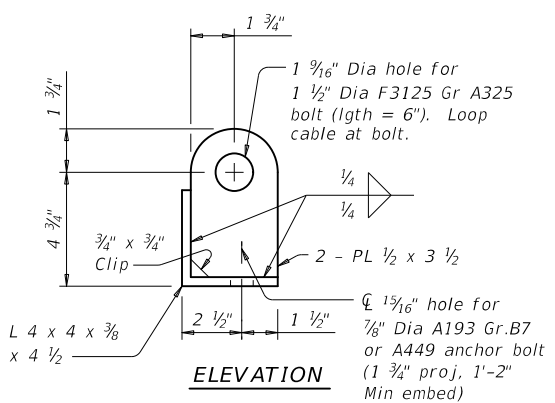
PLAN



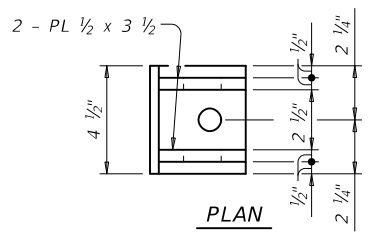
END VIEW

DIAGONAL BRACING DETAILS (5)

(To be used on both ends of the first girder/beam erected in the span in each phase.)



ELEVATION



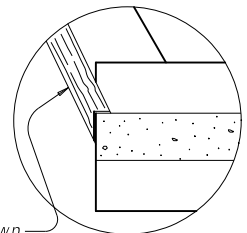
PLAN

ANGLE BRACE DETAILS

HAULING & ERECTION:
 The Contractor's attention is directed to the possible lateral instability of prestressed concrete girders and beams over 130' long, especially during hauling and erection. The use of the following methods to improve stability is encouraged: Locate lifting devices at the maximum practical distance from girder ends; use external lateral stiffening devices during hauling and erection; lift with vertical lines using two machines; and take care in handling to minimize inertial and impact forces.

ERECTION BRACING:
 Erection bracing details shown are considered the minimum for fulfilling the bracing requirements of Item 425. Required erection bracing must be placed immediately after erection of each girder and remain in place until additional bracing as required for slab placement is in place. This standard is needed in all cases to meet requirements for Slab Placement Bracing.

PHASED CONSTRUCTION:
 Place erection and slab placement bracing for all girders in a phase as shown in these details. For phases after first, also place erection and slab placement bracing between outer girder of completed phase and adjacent girder of current phase. When the phase construction joint is between girders, top bracing can be omitted.



DETAIL "A"

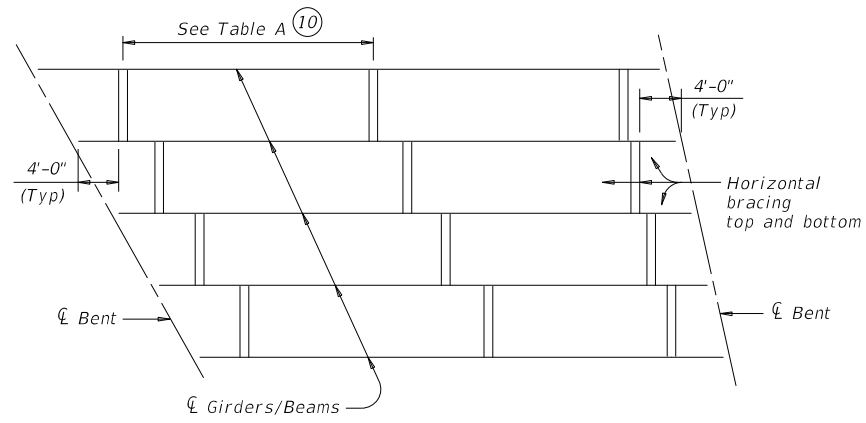
- 1 If angle shown exceeds 120 degrees, move diagonal brace to other side of girder/beam and place square to girder/beam. This may prevent exterior girder from being erected first.
- 2 Place and weld #5 bars as shown during erection. If forming deck with prestressed panels, bars can be temporarily removed, one at a time, during panel erection. Re-install bar prior to additional panel erection. Bars can rest on panels and be bent down and welded to girder Bars R (See Sheet 2 of 2).
- 3 Clear distance between spacers must not exceed 3. Nail together with 16d nails.
- 4 Use wedges as necessary to obtain tight fit. Nail wedges to timbers.
- 5 Pressure treated landscape timbers can not be used.
- 6 All hardware used with cable must be able to develop a minimum 25 kips breaking strength. Use thimbles at all loops in cable. Install cable clamps with saddles bearing against the live end and U-bolts bearing against the dead end.
- 7 It is acceptable to tie anchor bolts to cap reinforcement.
- 8 Prior to installing, field bend strap to lay flush on both girders' top flange and slope between flange tips.
- 9 Anchor bolt may be drilled and epoxied in place. Provide 25k minimum pullout. Core drill hole.

SHEET 1 OF 2

				Bridge Division Standard	
MINIMUM ERECTION AND BRACING REQUIREMENTS PRESTRESSED CONCRETE I-GIRDERS AND I-BEAMS					
MEBR(C)					
FILE: mebcsts1-17.dgn	DN: TxDOT	CK: TxDOT	DW: TxDOT	CK: TxDOT	
©TxDOT August 2017	CONTRACT NO. 0913	SECTION 28	JOB NO. 083, ETC	HIGHWAY	CR
	DIST. YKM	COUNTY	FAYETTE	SHEET NO.	118

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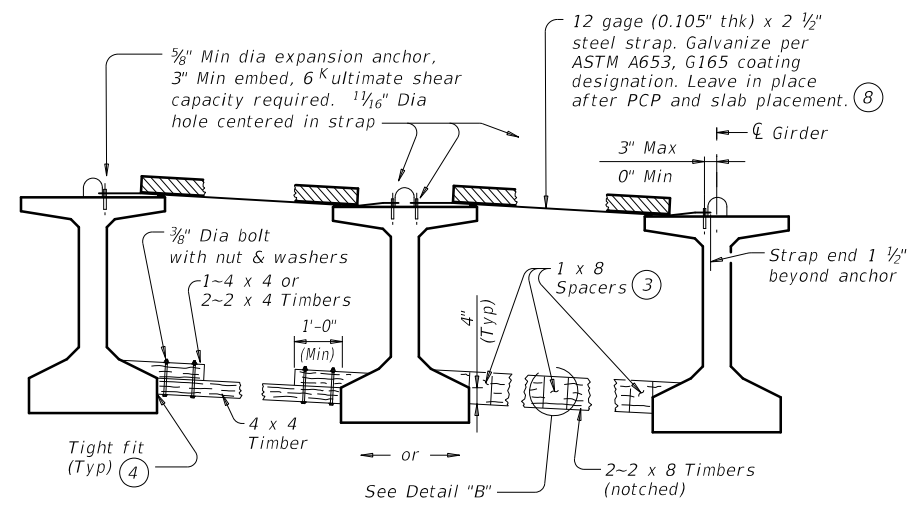
DATE: FILE:



SLAB PLACEMENT BRACING

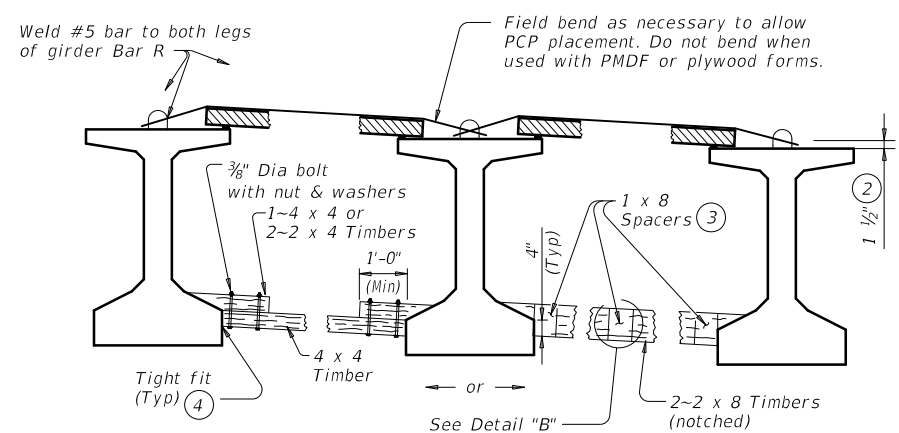
TABLE A		
Girder or Beam Type	OPTION 1-RIGID BRACING (STEEL STRAP)	
	Slab Overhang less than 4'-0" (11)	Slab Overhang 4'-0" and greater (11)
Tx28	1/4 points	1/4 points
Tx34	1/4 points	1/4 points
Tx40	1/4 points	1/8 points
Tx46	1/4 points	1/8 points
Tx54	1/4 points	1/8 points
Tx62	1/4 points	1/8 points
Tx70	1/4 points	1/8 points
A	1/8 points	1/8 points
B	1/8 points	1/8 points
C	1/8 points	1/8 points
IV	1/4 points	1/8 points
VI	1/4 points	1/8 points

Girder or Beam Type	OPTION 2-FLEXIBLE BRACING (NO. 5 OVER PCP)	
	Slab Overhang less than 4'-0" (11)	Slab Overhang 4'-0" and greater (11)
Tx28	1/4 points	1/8 points
Tx34	1/4 points	1/8 points
Tx40	1/4 points	1/8 points
Tx46	1/4 points	1/8 points
Tx54	1/4 points	1/8 points
Tx62	1/4 points	1/8 points
Tx70	1/4 points	1/8 points
A	2.0 ft	1.5 ft
B	3.0 ft	2.0 ft
C	4.5 ft	2.0 ft
IV	1/4 points	4.0 ft
VI	1/4 points	4.0 ft



FOR SLAB PLACEMENT BRACING, OPTION 1 - RIGID

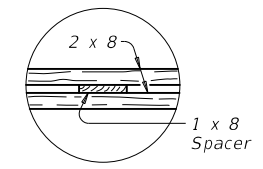
(Showing slab formed with PCP. This option is not allowed when slab is formed with PMDF or plywood.)



FOR SLAB PLACEMENT BRACING, OPTION 2 - FLEXIBLE

(Showing slab formed with PCP.)

HORIZONTAL BRACING DETAILS (5)



**PLAN
DETAIL "B"**

- (2) Place and weld #5 bars as shown during erection. If forming deck with prestressed panels, bars can be temporarily removed, one at a time, during panel erection. Re-install bar prior to additional panel erection. Bars can rest on panels and be bent down and welded to girder Bars R.
- (3) Clear distance between spacers must not exceed 3'. Nail together with 16d nails.
- (4) Use wedges as necessary to obtain tight fit. Nail wedges to timbers.
- (5) Pressure treated landscape timbers can not be used.
- (8) Prior to installing, field bend strap to lay flush on both girders' top flange and slope between flange tips.
- (10) Bracing spacing (1/4 and 1/8 points) measured between first and last typical brace location.
- (11) Measure slab overhang from centerline of girder or beam. When overhang varies in span, determine bracing spacing based on largest overhang.

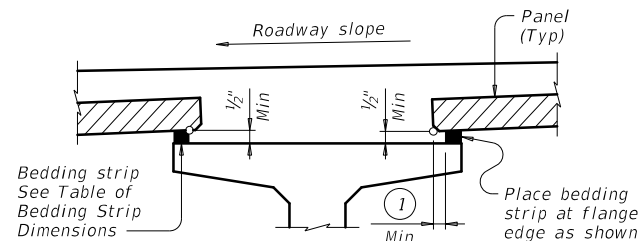
SLAB PLACEMENT BRACING:
The details for slab placement bracing are considered minimum for fulfilling the requirements of Specification Items 422 and 425. Required slab placement bracing must remain in place until slab concrete has attained a compressive strength of 3000 psi.

GENERAL NOTES:
Bracing details for spans longer than 150' are not provided. The Contractor must submit proposed bracing details for such conditions to the Engineer for approval prior to erection. Systems equal to or better than those shown may be used provided details of such systems are submitted to and approved by the Engineer prior to erection. Use of these systems or details does not relieve the Contractor of the responsibility for the adequacy of the bracing and the safety of the structure. Removal of bracing for short periods of time to align girders and beams is permissible. All turn-buckles, come-alongs, anchors and other connections must be capable of developing the full strength of the cable shown. Furnish anchor bolts and nuts in accordance with Item 449, "Anchor Bolts".

		Bridge Division Standard	
MINIMUM ERECTION AND BRACING REQUIREMENTS PRESTRESSED CONCRETE I-GIRDERS AND I-BEAMS			
MEBR(C)			
FILE: mebcsts1-17.dgn	DN: TxDOT	CK: TxDOT	OW: TxDOT
©TxDOT August 2017	CONTRACT	SECTION	JOB
REVISIONS	0913	28	083, ETC
	DIST	COUNTY	SHEET NO.
	YKM	FAYETTE	119

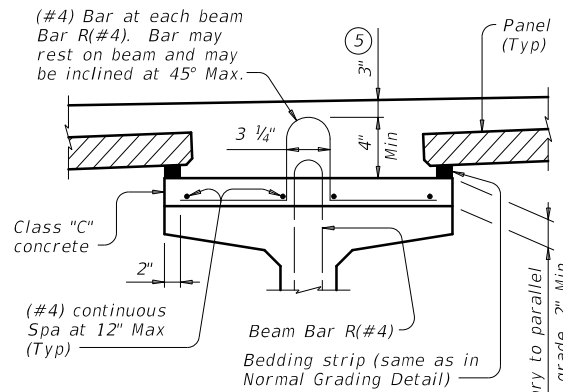
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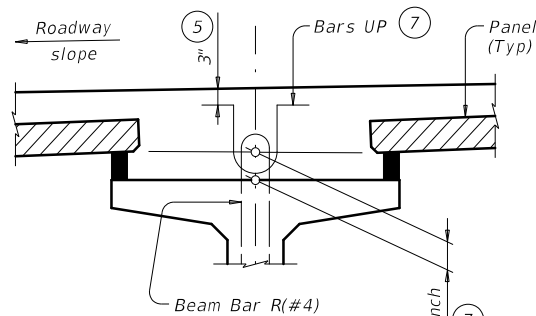
NORMAL GRADING DETAIL ③

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



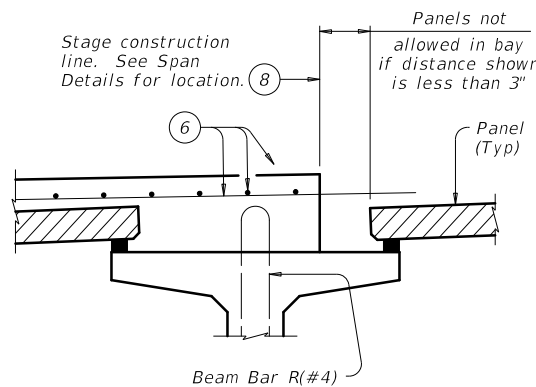
SPECIAL GRADING DETAIL FOR CONCRETE BEAMS

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



HAUNCH REINFORCING DETAIL

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

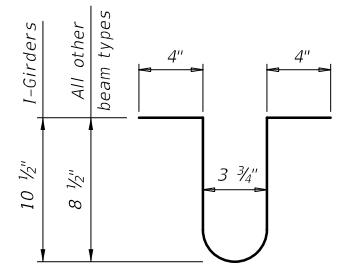


PRESTR CONC I-GIRDERS

TABLE OF BEDDING STRIP DIMENSIONS

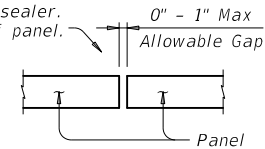
WIDTH	HEIGHT ④	
	Min	Max
1" (Min)	1/2"	2"
1 1/4"	1/2"	2 1/2"
1 1/2"	1/2"	3"
1 3/4"	1/2"	3 1/2"
2"	1/2"	4"
2 1/4"	1/2"	4 1/2" ②
2 1/2"	1/2"	5" ②
2 3/4"	1/2"	5 1/2" ②
3" (Max)	1/2"	6" ②

- 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..



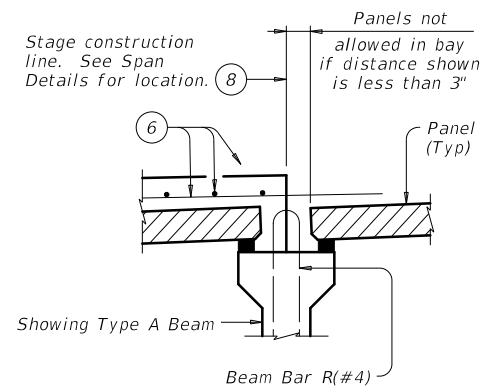
BARS UP (#4) ⑦

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

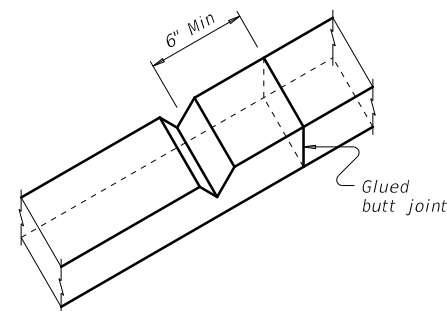


PANEL JOINTS

(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 reinforcement or concrete required on this standard is considered subsidiary to the bid item "Reinforced Concrete Slab".

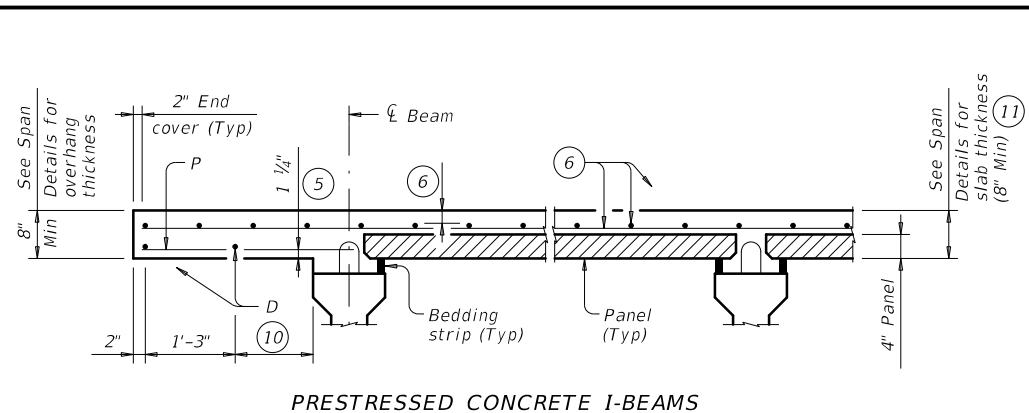
Cover dimensions are clear dimensions, unless noted otherwise. Reinforcing bar dimensions shown are out-to-out of bar.

HL93 LOADING SHEET 1 OF 4

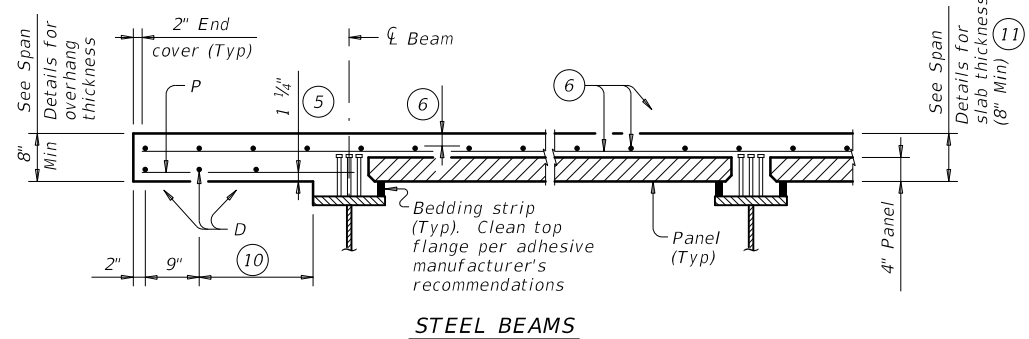
		Bridge Division Standard	
<h2>PRESTRESSED CONCRETE PANELS DECK DETAILS</h2>			
<h3>PCP</h3>			
FILE: pcpstde1-19.dgn	DN: TxDOT	CK: TxDOT	DW: JTR
REV: 0913	SECT: 28	JOB: 083, ETC	HIGHWAY: CR
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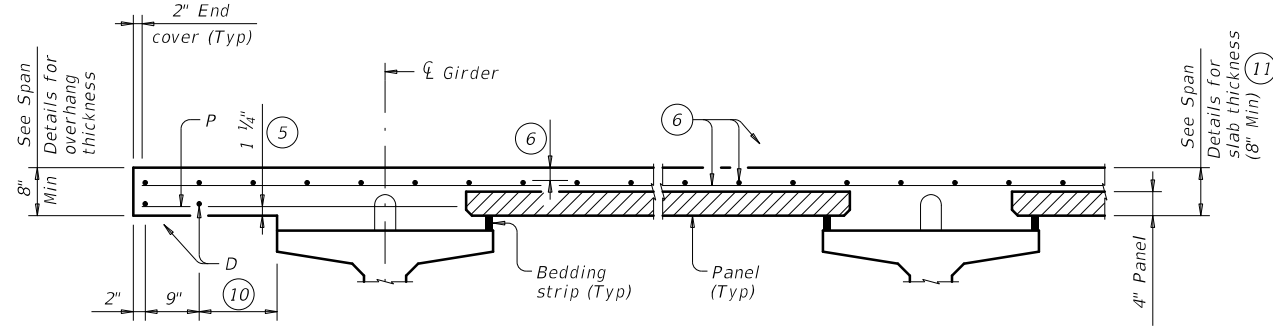
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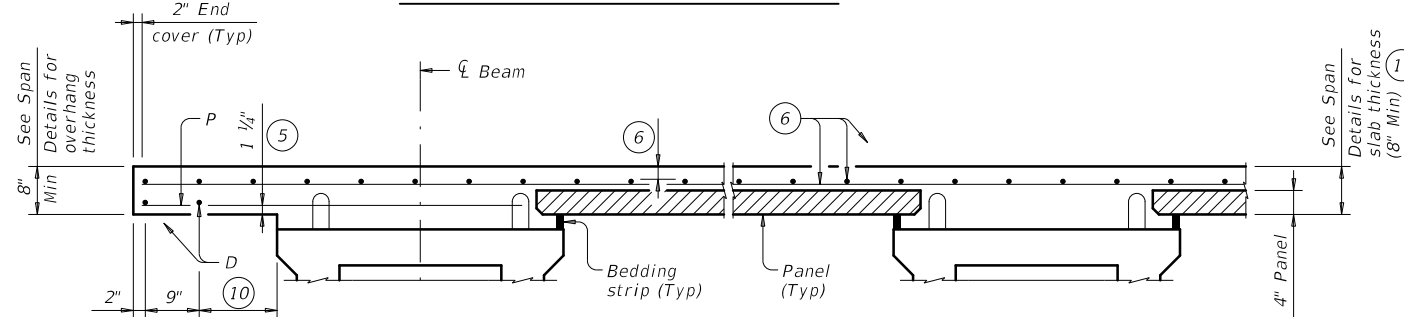
PRESTRESSED CONCRETE I-BEAMS



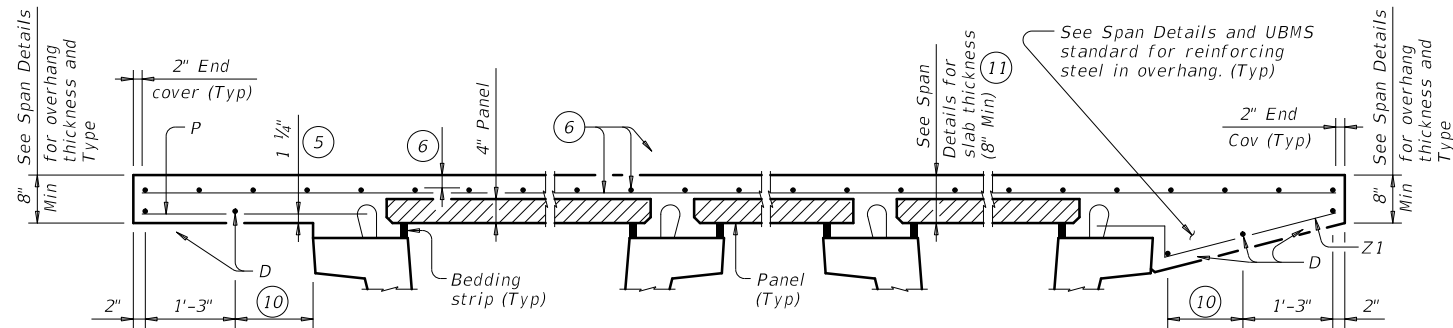
STEEL BEAMS



PRESTRESSED CONCRETE I-GIRDERS



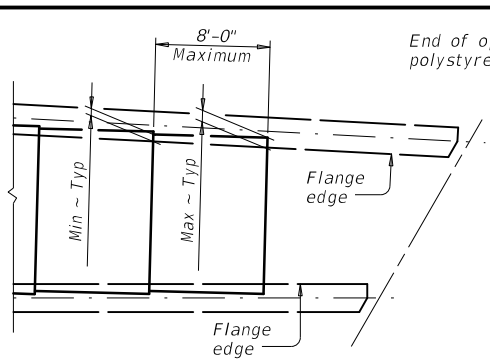
PRESTRESSED CONCRETE X-BEAMS



NORMAL OVERHANG WITH PRESTR CONC U-BEAMS

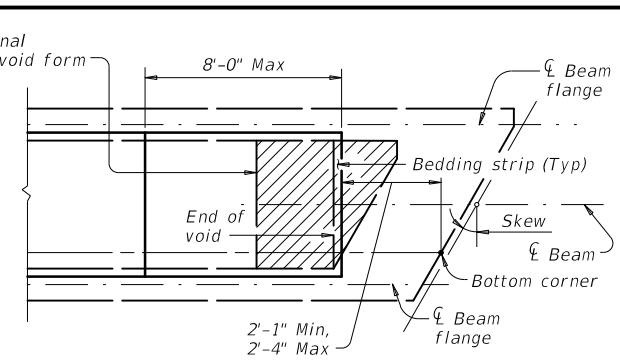
TYPICAL PART TRANSVERSE SECTIONS

SLOPED OVERHANG WITH PRESTR CONC U-BEAMS

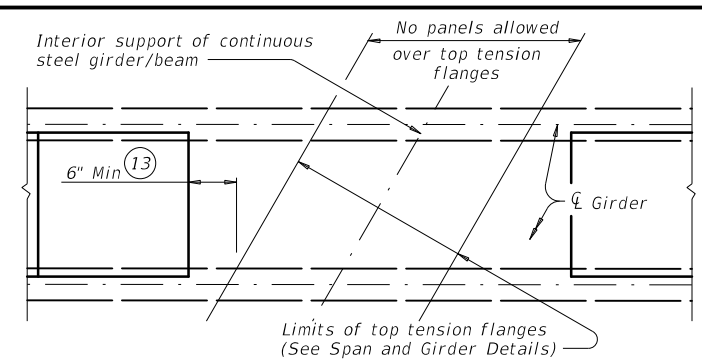


AT FLARED BEAMS OR GIRDERS

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



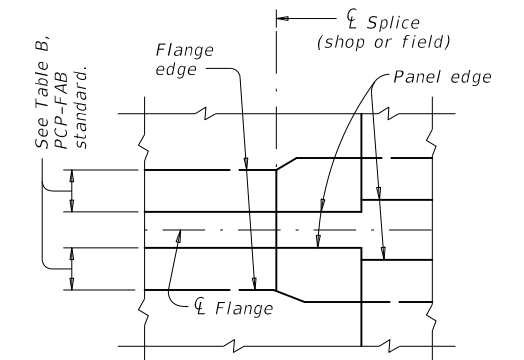
OVER CONC U-BEAMS



AT INT SUPPORTS OF CONTINUOUS STEEL GIRDERS

PART PLANS OF PANEL PLACEMENT

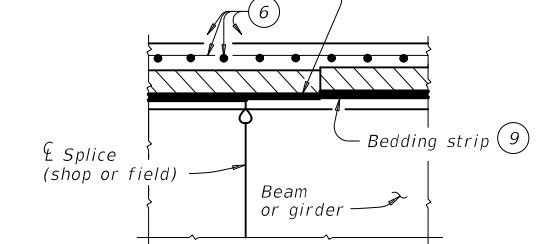
- 5 Provide clear cover as indicated unless otherwise shown on Span Details.
- 6 See Span Details and Thickened Slab End Details for top slab reinforcement and clear cover. Transverse top slab reinforcement may rest on top of prestressed concrete panels if necessary to maintain clear cover.
- 9 Butt 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.



PLAN AT SPLICE

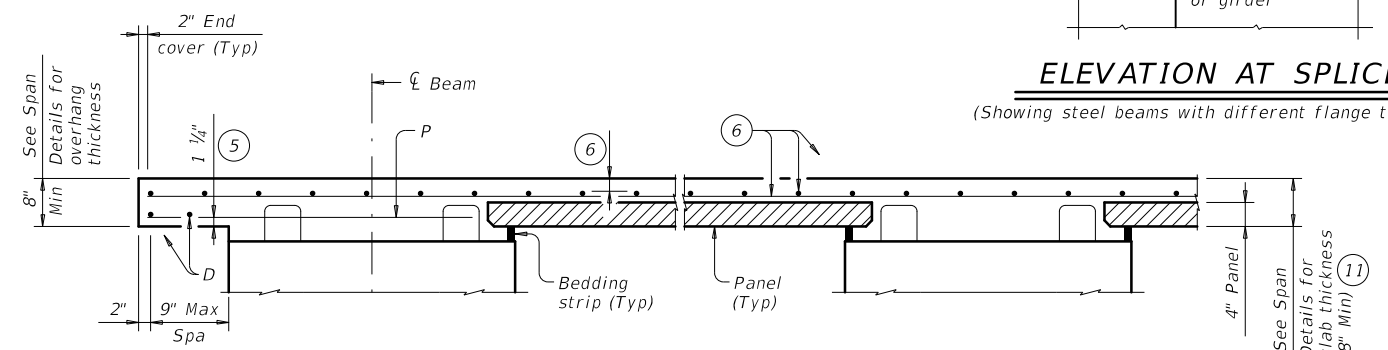
(Showing steel beams with flange width transition)

Cut bedding strip to adjust for difference in flange thickness.



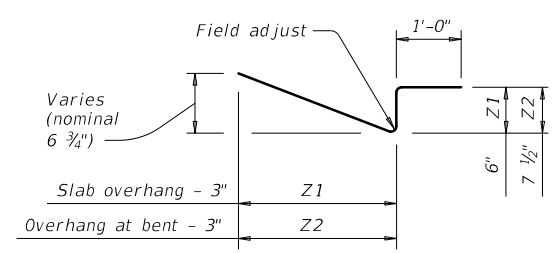
ELEVATION AT SPLICE

(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.



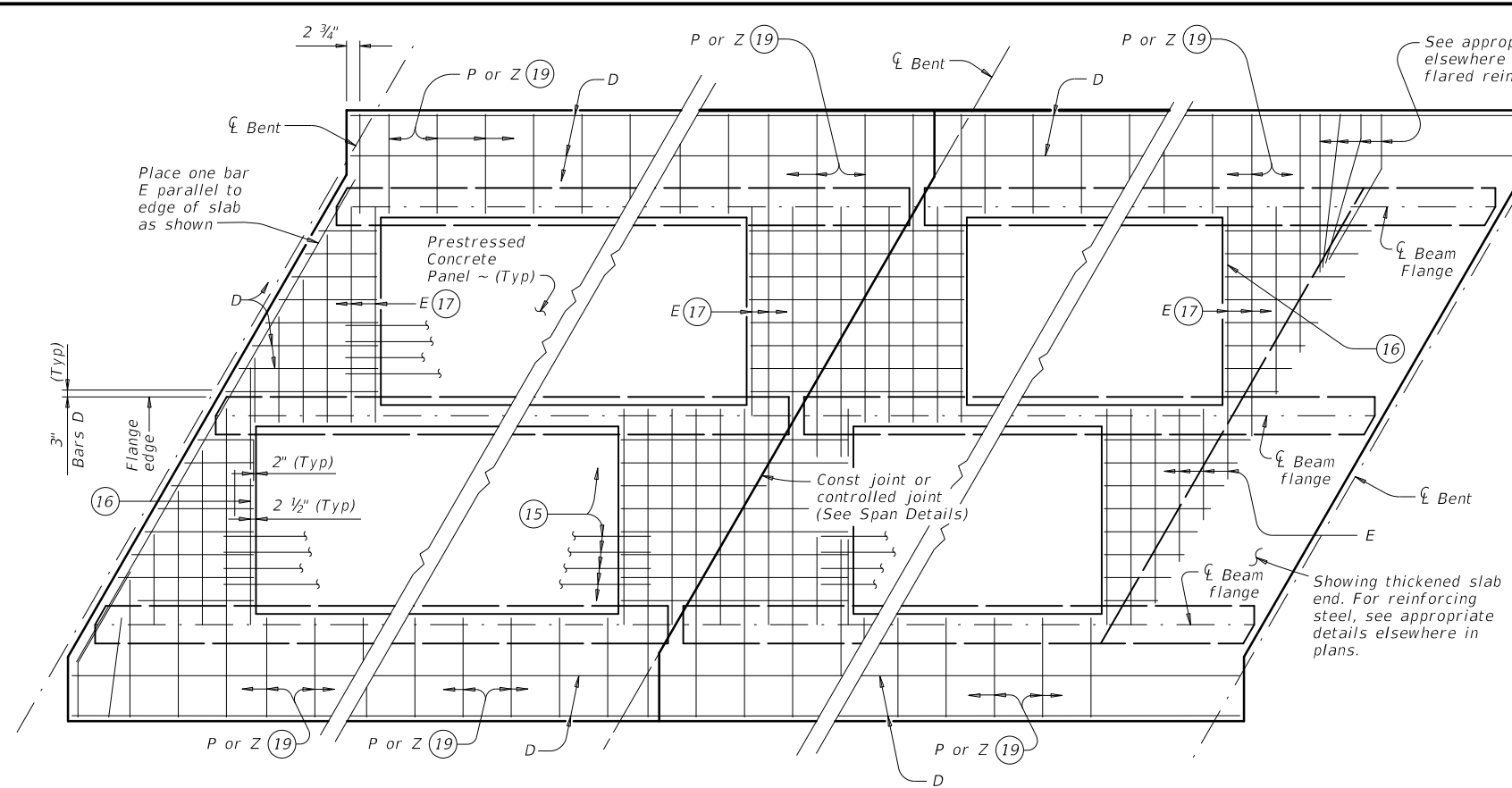
BARS Z (#4) (12)

PRESTRESSED CONCRETE PANELS DECK DETAILS

PCP

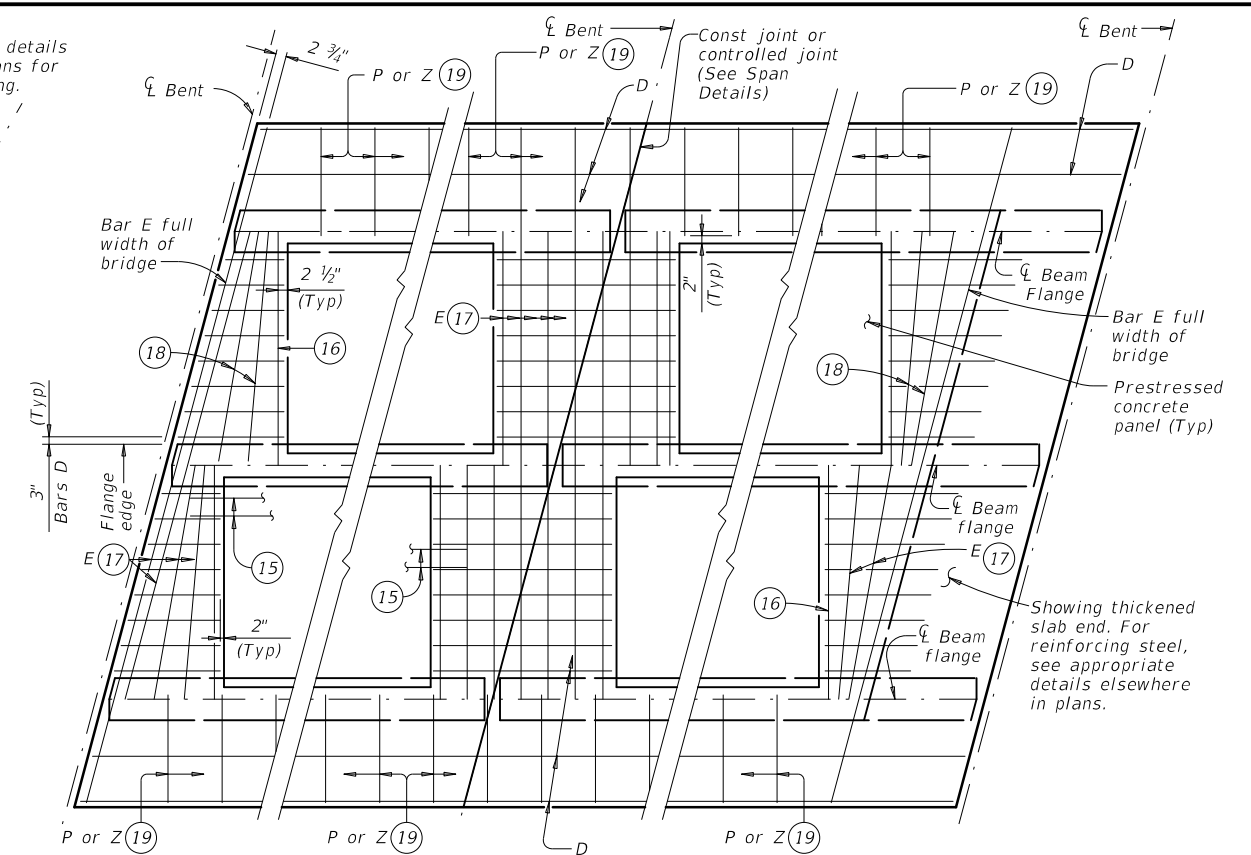
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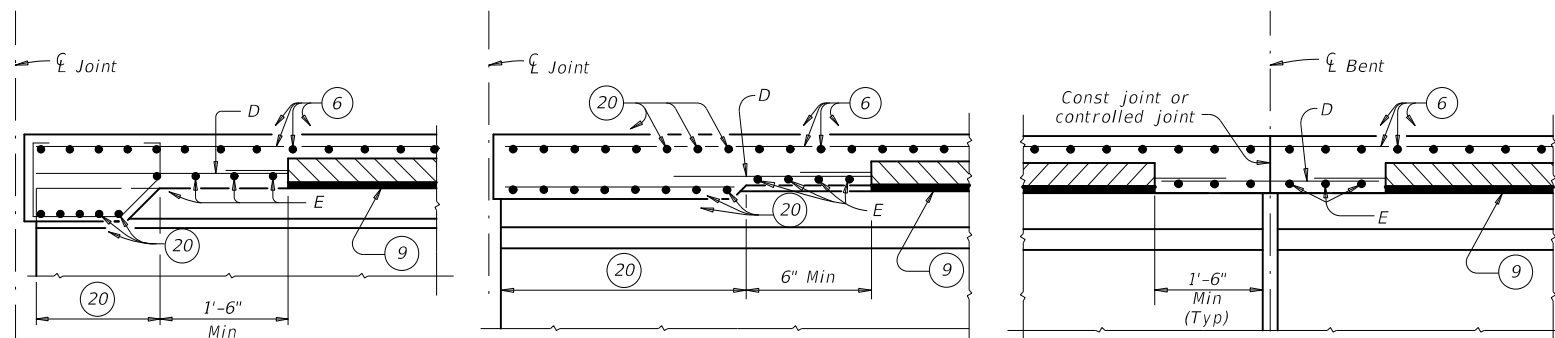
AT ALL SPAN ENDS UNLESS NOTED OTHERWISE
 AT INTERIOR BENTS
 AT THICKENED END SLABS

OPTION 1 ~ PLAN OF SLABS WITH NORMAL REINFORCEMENT

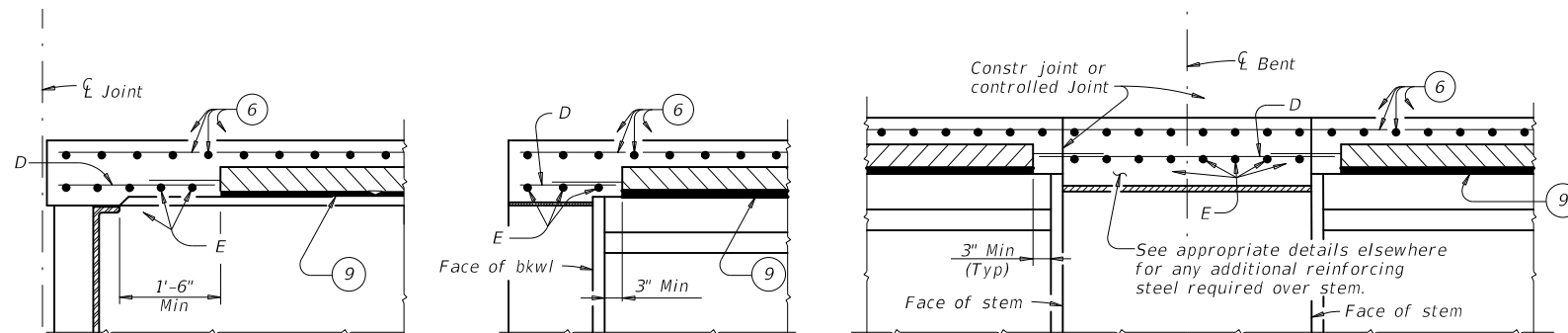


AT ALL SPAN ENDS UNLESS NOTED OTHERWISE
 AT INTERIOR BENTS
 AT THICKENED END SLABS

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



PRESTRESSED CONCRETE PANELS DECK DETAILS

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	YKM	FAYETTE	122	

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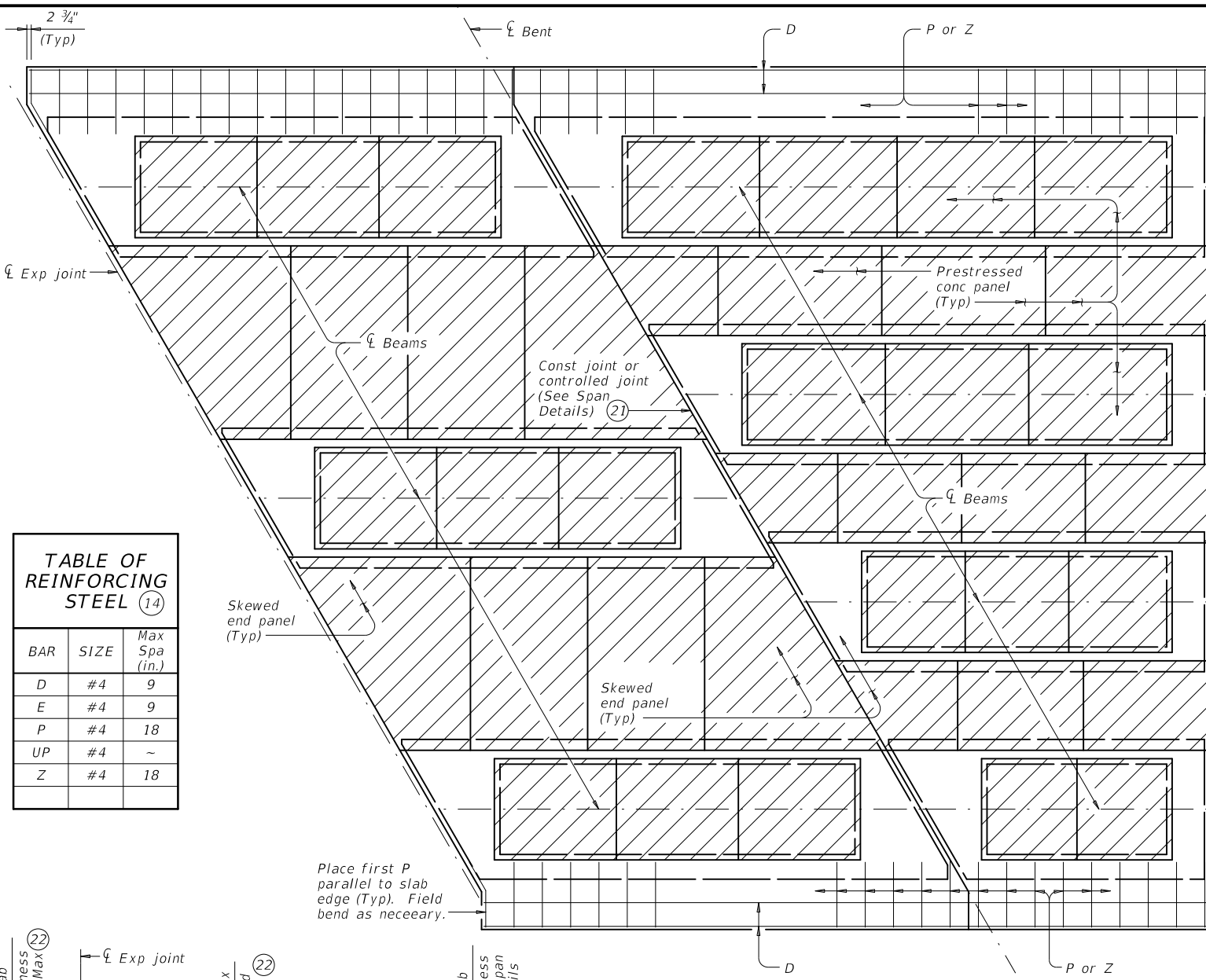
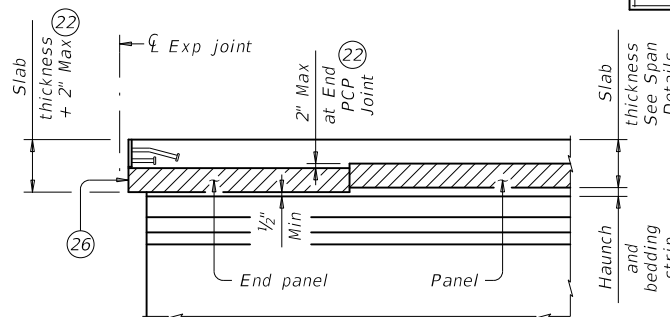
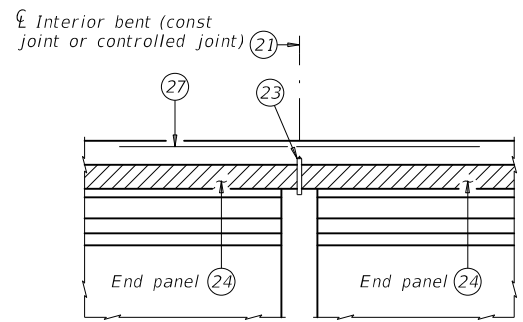


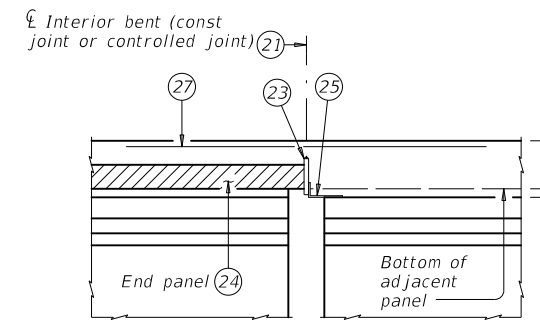
TABLE OF REINFORCING STEEL (14)		
BAR	SIZE	Max Spa (in.)
D	#4	9
E	#4	9
P	#4	18
UP	#4	~
Z	#4	18



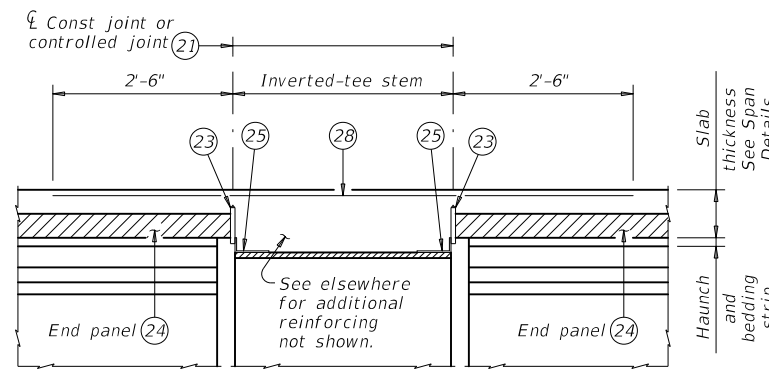
JOINTS (BETWEEN BEAMS/GIRDERS OR AT INV-T STEM)
For SEJ-B, SEJ-M, SEJ-S(0), AJ, and Type A expansion joints only.



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

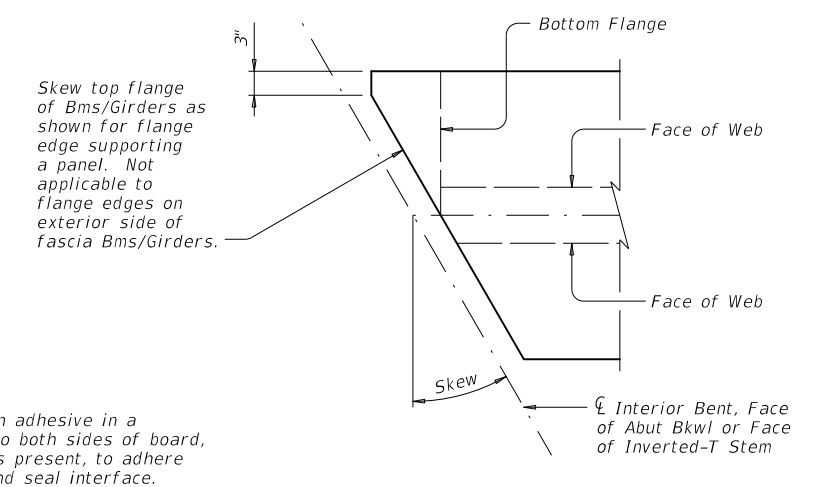
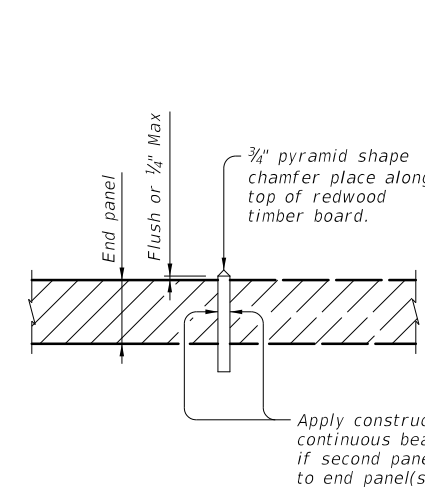
OPTION 2 ~ ELEVATIONS AT BEAM ENDS (6)

OPTION 2 ~ PLAN OF SLAB
(Showing U-Beams; other beams similar)

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.



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:

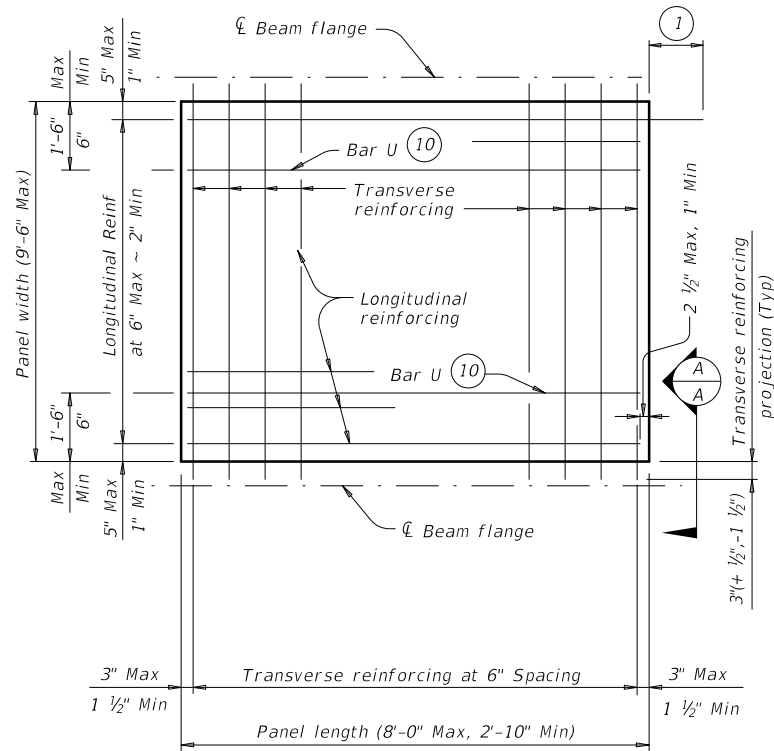
- When Option 2 is chosen bottom mat of thickened slab reinforcing is not required. Use the same top mat as shown on the Thickened Slab End Details sheet.
- Placing panels adjacent to expansion joints and bent centerlines prior to completing interior panel placement is recommended. Saw cutting panels 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-B, SEJ-M, 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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	DIST: YKM	COUNTY: FAYETTE	SHEET NO: 123

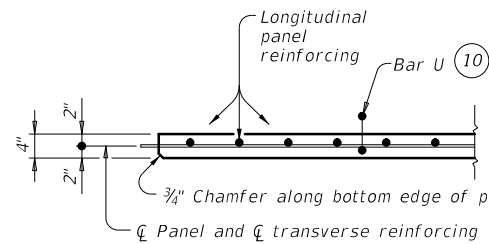
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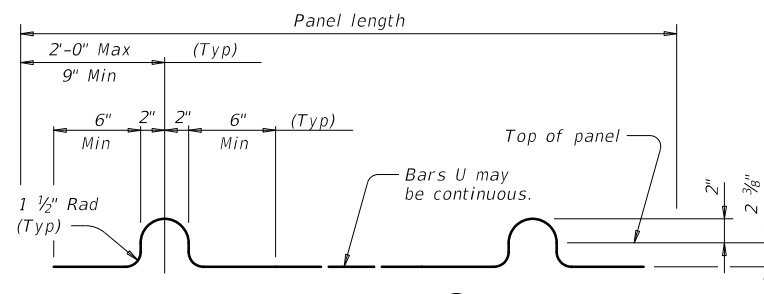


TYPICAL NON-SKEWED PANEL PLAN

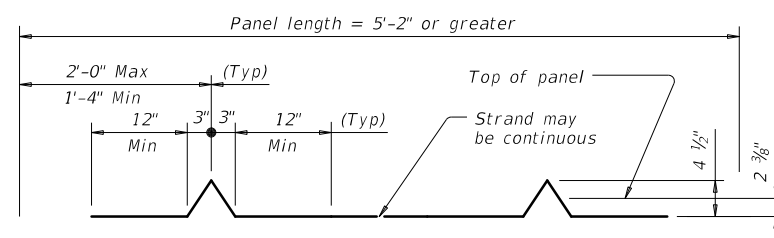


SECTION A-A

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



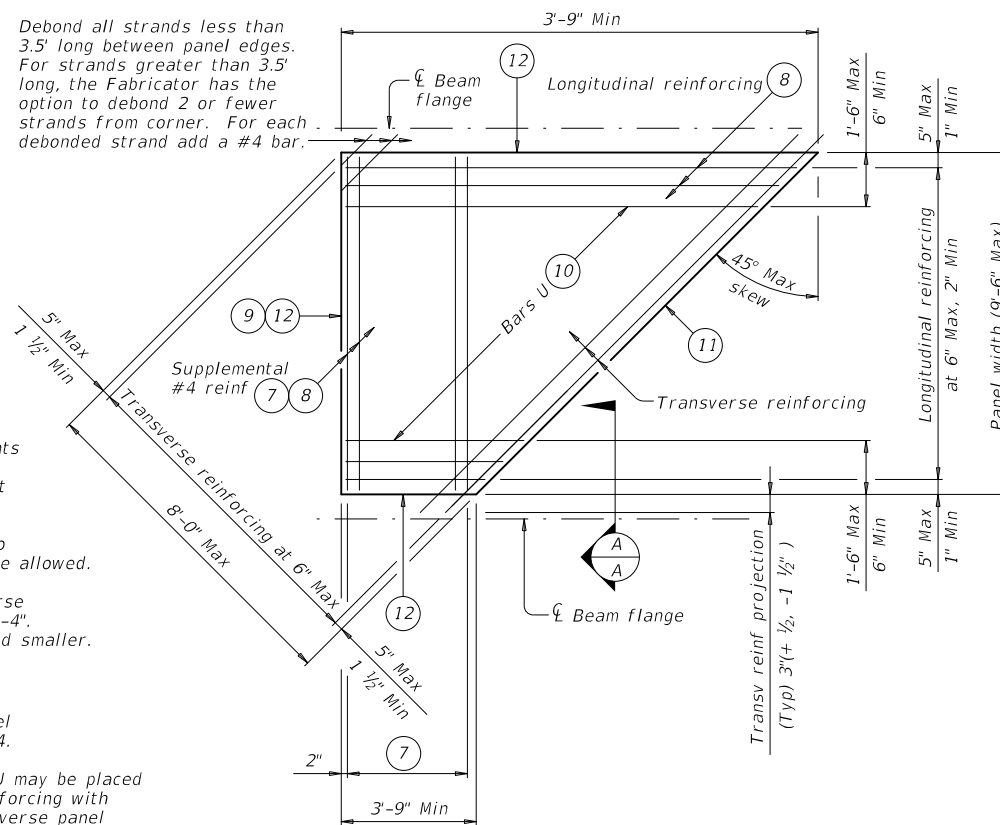
BARS U (#3) (2)



OPTIONAL STRAND FOR BARS U (3)

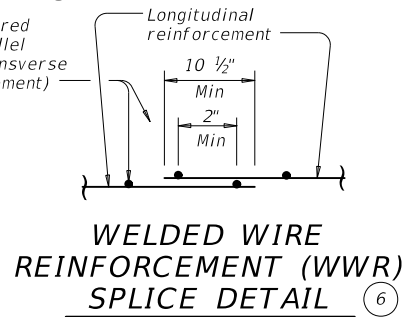
- 1 At connection with cast-in-place slab, extend longitudinal panel reinforcement 1'-0" (+2", -0") past panel end. Alternatively, provide (#3) x 2'-0" dowels at 6" Max Spacing and extend dowels 1'-0" past panel end.
- 2 Four loops required per panel.
- 3 Four loops required per panel. 3/8" or 1/2" strands 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.

Debond all strands less than 3.5' long between panel edges. For strands greater than 3.5' long, the Fabricator has the option to debond 2 or fewer strands from corner. For each debonded strand add a #4 bar.

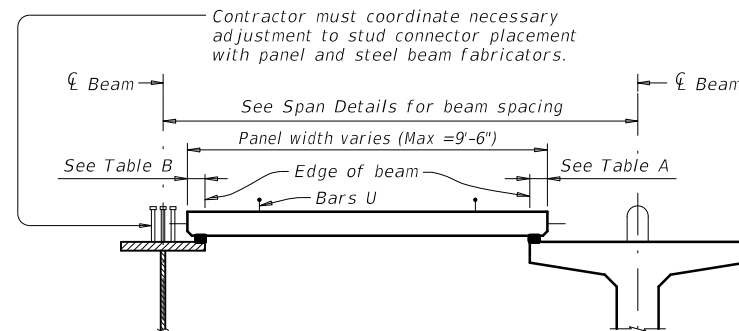


TYPICAL SKEWED END PANEL PLAN

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

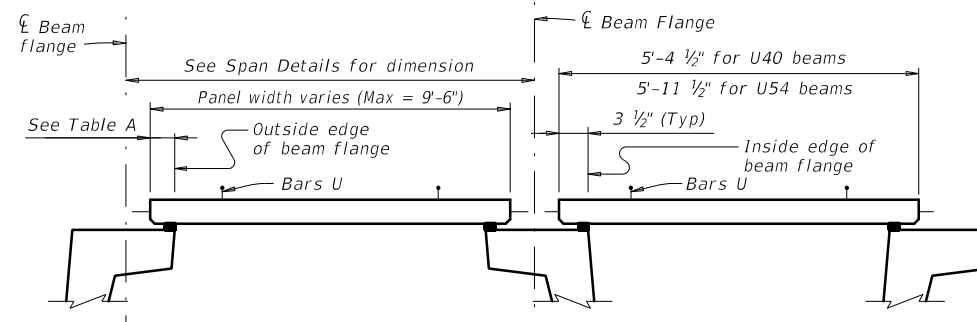


WELDED WIRE REINFORCEMENT (WWR) SPLICE DETAIL (6)



STEEL BEAMS

PRESTRESSED CONCRETE BEAMS OR GIRDERS
Typ unless noted otherwise



PRESTRESSED CONCRETE U-BEAMS

TYPICAL SECTIONS FOR DETERMINING PANEL WIDTH

Beam Type	TABLE A (4) (5)		
	Normal (In.)	Min (In.)	Max (In.)
A	3	2 1/2	3 1/2
B	3	2 1/2	3 1/2
C	4	3	4 1/2
IV	6	4	7 1/2
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

Top Flange Width	TABLE B (4) (5)		
	Normal (In.)	Min (In.)	Max (In.)
11" to 12"	2 3/4	2 1/2	2 3/4
Over 12" to 15"	3 1/4	3	3 1/4
Over 15" to 18"	4	3	4 3/4
Over 18"	5	3 1/2	6 1/4

GENERAL NOTES:

- Provide Class H concrete for panels. Release strength $f'_{ci}=3,500$ 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:

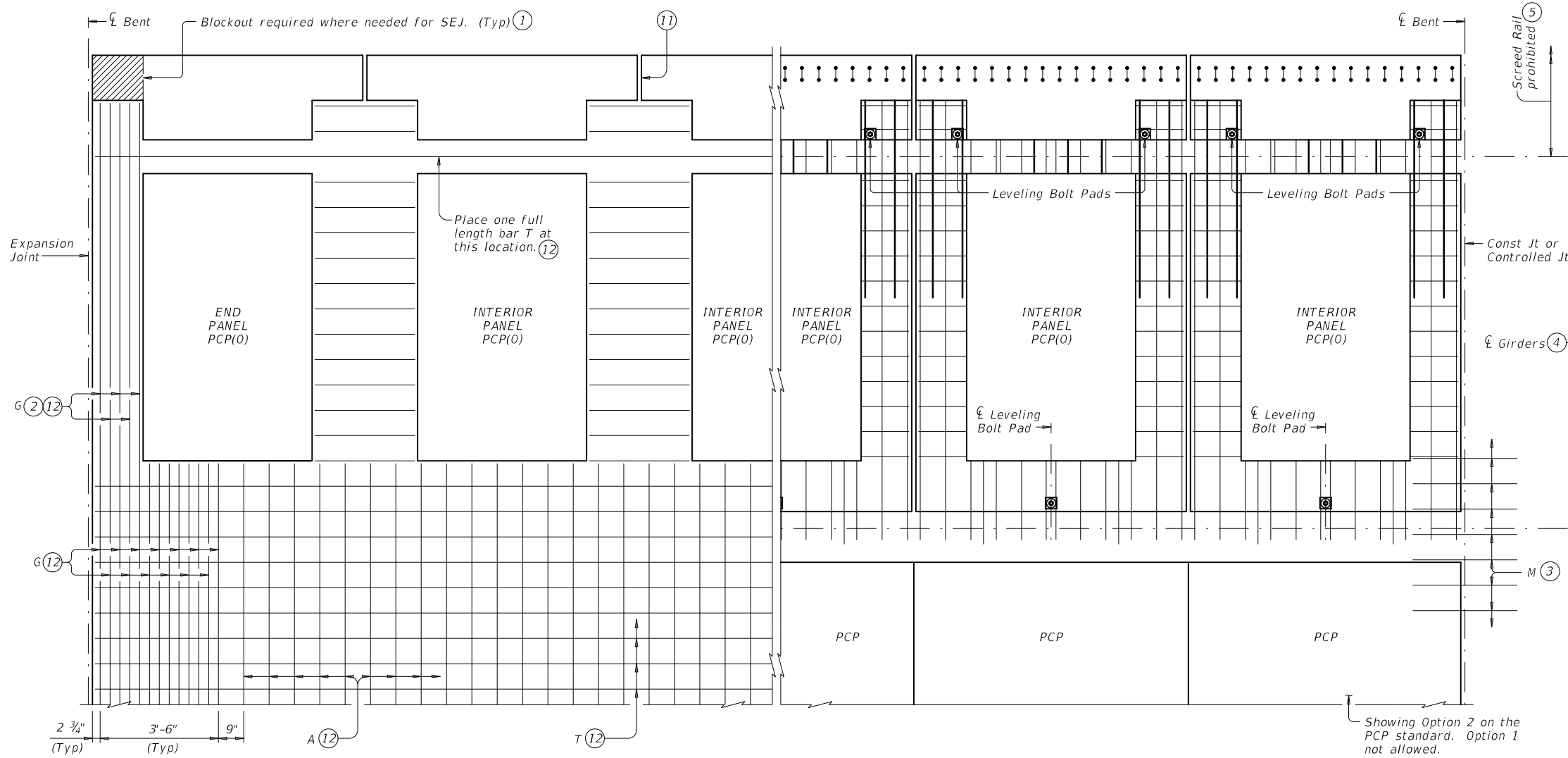
- Any of the following options may be used for longitudinal panel reinforcement:
 1. (#3) Grade 60 reinforcing steel at 6" Max Spacing. No splices allowed.
 2. 3/8" Dia prestressing strands at 4 1/2" Max Spacing (unstressed). No splices allowed.
 3. 1/2" Dia prestressing strands at 6" Max Spacing (unstressed). 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.

HL93 LOADING

		Bridge Division Standard	
PRESTRESSED CONCRETE PANEL FABRICATION DETAILS			
PCP-FAB			
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REVISIONS	DIST: YKM	COUNTY: FAYETTE	SHEET NO: 124

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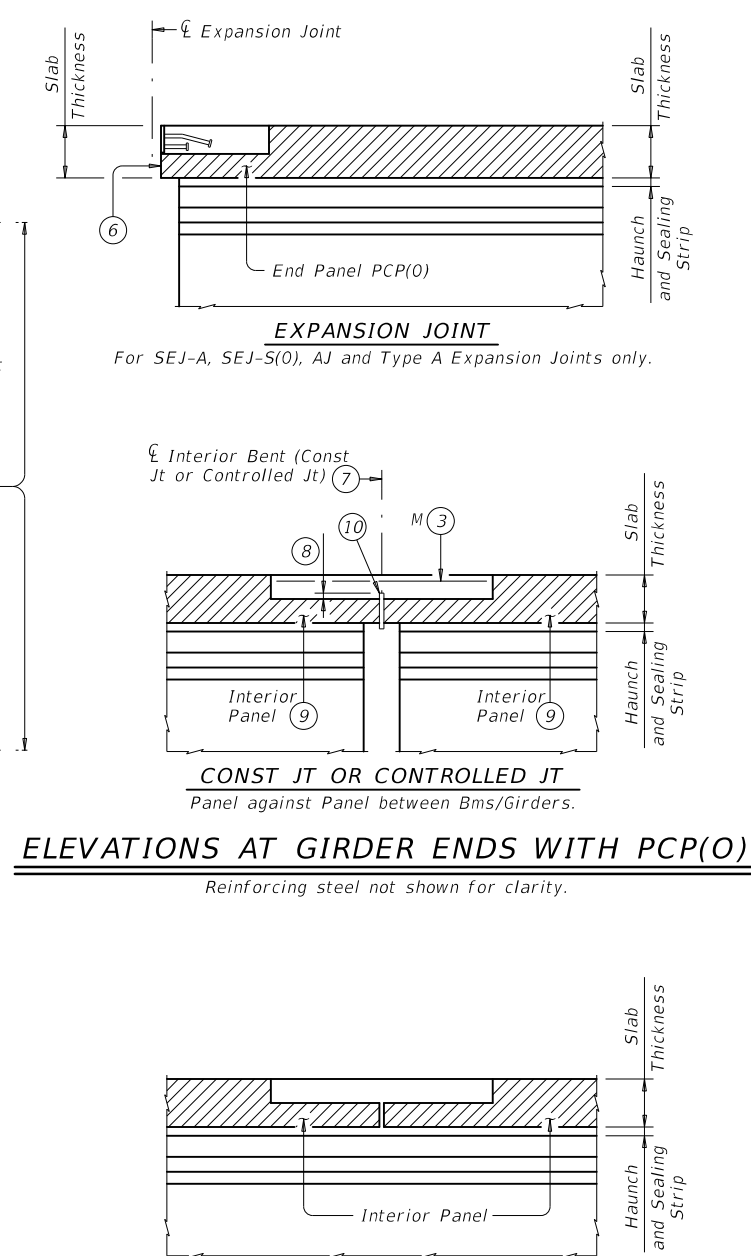
SHOWING FIELD PLACEMENT OF TOP REINFORCING STEEL

SHOWING PCP(O) EXPOSED REINFORCING STEEL

PANEL LAYOUT

PCP(O) shown with gaps between panels for clarity. The gap cannot be considered as a panel fabrication tolerance.

- 1 1'-4" x 1'-6" x 4 1/2" blockout to accommodate SEJ that require an upturn. Contractor to communicate with fabricator the location and type of SEJ to be utilized.
- 2 When blockout is required, extend bars G into blockout.
- 3 Place additional bars M 2'-11" in length on top of bars A and between every bar T. Center bars M at center of bent. Located at bents with construction joints or controlled joints only. Bars M may replace additional (#4) bars 5'-0" in length as shown on PCP standard in Option 2 - Elevations At Beam Ends. Option 1 not allowed.
- 4 It is recommended to profile every 4 ft by surveying each girder under PCP(O) for proper grading of panels.
- 5 Screed rail used to set grade for paving machine is not allowed past exterior girder as shown.
- 6 Place end panel PCP(O) within 1/2" of expansion joint opening. Do not encroach on required expansion joint opening.
- 7 Top Plastic Joint Former at Controlled Joints (Stress Cap, Zip Strip, Stress Lock, etc.) is not required with these Details.
- 8 0" Min, 3/4" Max, support as necessary.
- 9 Place panel within 1/2" of 3/4" thick board.
- 10 3/4" thick wood/timber board, leave in place. Place straight, within 1/4" of Centerline of Bent, across bridge width and end board at exterior flange edge of fascia girders. Do not extend into overhang.
- 11 Seal top of panel only, with a Class 4 sealant prior to rail construction. Typical between panels. Do not seal at Expansion Joints.
- 12 1 1/2" End Cover. (Typ)



ELEVATIONS AT GIRDER ENDS WITH PCP(O)

Reinforcing steel not shown for clarity.

ELEVATION BETWEEN PCP(O)

The gap cannot be considered as a panel fabrication tolerance. Reinforcing steel not shown for clarity.



PRECAST CONCRETE PANELS FOR OVERHANGS

PCP(O)

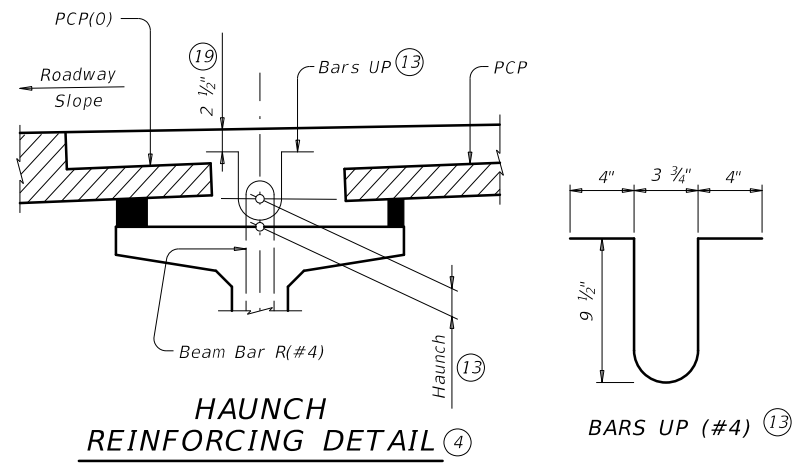
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©TxDOT August 2017	CONT	SECT	JOB	HIGHWAY
REVISIONS	0913	28	083, ETC	CR
	DIST	COUNTY	SHEET NO.	
	YKM	FAYETTE	125	

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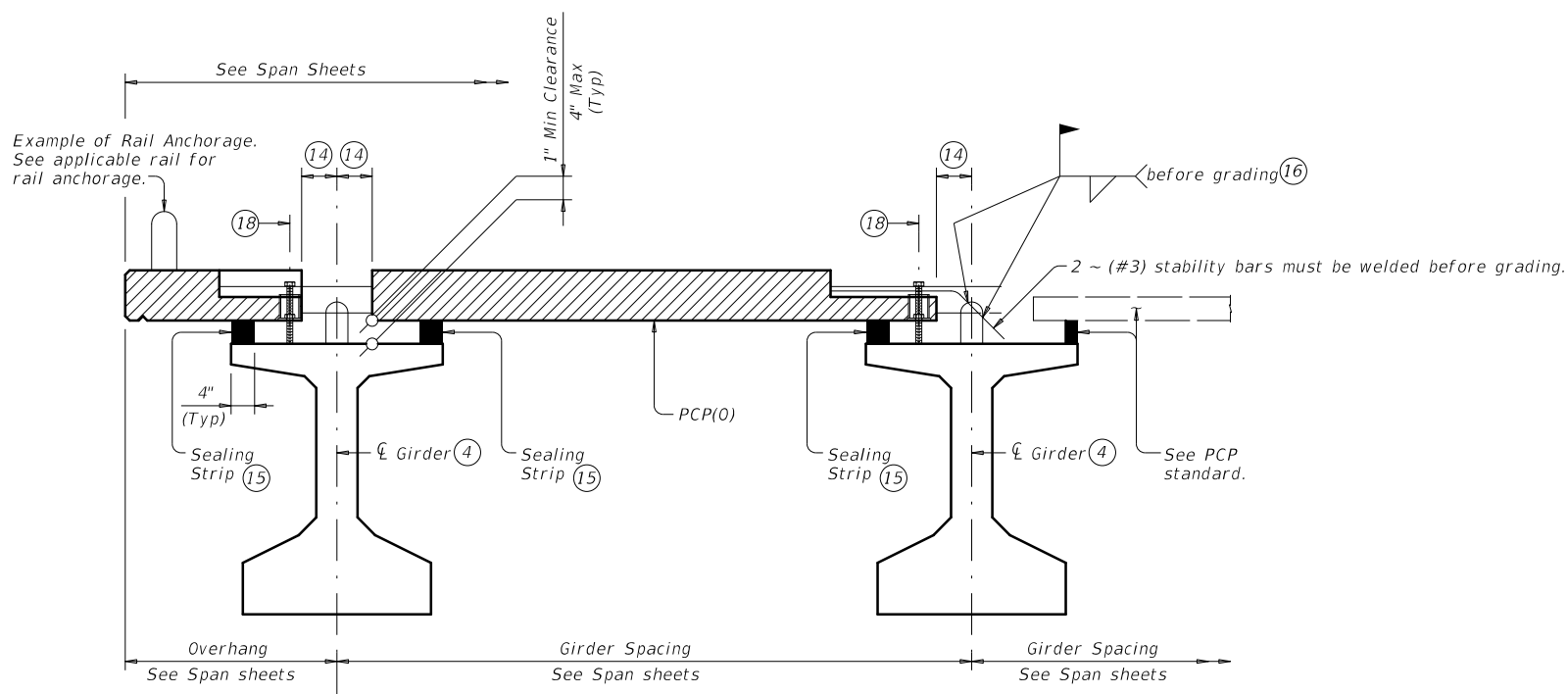
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BAR TABLE		
BAR	SIZE	MAX SPA (IN)
A (12)(17)	#4	9"
G (12)(17)	#4	3 1/2"
M	#4	9"
T (12)(17)	#4	9"

- ④ It is recommended to profile every 4 ft by surveying each girder under PCP(0) for proper grading of panels.
- ⑤ Screed rail used to set grade for paving machine is not allowed past exterior girder as shown.
- ⑫ 1 1/2" End Cover on bars. (Typ)
- ⑬ Space bars UP(#4) with girder bars R(#4) in all areas where measured haunch exceeds 3 1/2" with Prestressed Concrete I-Girders. Epoxy coating for Bars UP is not required.
- ⑭ 6" plus or minus.
- ⑮ Place sealing strip at flange edge as shown. Butt adjacent sealing strips longitudinally together with adhesive. Use pencil vibrators with concrete placement over girder and between sealing strips to avoid rupturing sealing strips. Cut sealing strips 2" higher than anticipated haunch thickness and compress to grade.
- ⑯ (#3) Panel bars F must be field bent and welded to the R bars in girder. Two bars F per panel.
- ⑰ Field placed bars that are allowed to be lapped. Reinforcing steel that protrudes from panels are not considered bars to be lapped. See "Material Notes" for applicable bar laps.
- ⑱ Leveling Bolt Pad. 1" Dia Coil Rod or 1" Dia Coil Bolt shown, are furnished by the contractor. After grading each PCP(0) panel with the 1" Dia coil rods or coil bolts, secure each panel in its final resting position (plastic shims, welding, etc) and remove all 1" Dia coil rods or coil bolts for the cast-in-place concrete. Coil rods/bolts may be left in place at contractor's option. If coil rods/bolts are left in place, coil rods/bolts must have at least 2 1/2" of cover to top of finish grade. Grading bolts are inadequate to carry all conceivable screed/construction loads. Panel support method must be calculated, location identified, and placed on shop drawings. Method chosen to support panels must be adequate for all construction loads. Panel support method must be placed/constructed after final grading and before screed rail placement.
- ⑲ Unless shown otherwise on Span Details.



TYPICAL TRANSVERSE SECTION
(Showing Girder Type Tx46)



CONSTRUCTION NOTES:
 Placing panels adjacent to expansion joints and bent centerlines prior to completing interior panel placement is recommended.
 Ensure proper cleaning of construction debris and consolidation of concrete mortar under the edges of the panels. Place sealing strips at girder flange edges so that adequate space is provided for the mortar to flow a minimum of 8" transversely under the panels as the slab concrete is placed.
 Panel placement with Option 1 on the PCP standard is not allowed. It is recommended to profile every 4 ft by surveying each girder under PCP(0) for proper grading of panels.
 To allow the proper amount of mortar to flow between girder and panel, maintain a minimum vertical opening of 1". Roadway cross-slope reduces the opening available for entry of the mortar. Sealing strips vary in thickness along girder are therefore required.
 Seal the top panel with a Class 4 sealant as shown in the Panel Layout.

MATERIAL NOTES:
 Provide Grade 60 reinforcing steel in cast-in-place slab. See Table of Reinforcing Steel for size and spacing of reinforcement.
 If the reinforcing steel is shown on the Span Details to be epoxy coated, then epoxy coat bars A, G, M, & T.
 Provide bar laps, where required, as follows:
 Uncoated ~ #4 = 1'-7"
 Epoxy Coated ~ #4 = 2'-5"
 Provide sealing strips comprised of one layer low density polyurethane (1.0 Lbs density) foam sealing strips or equivalent. Oversize the height of sealing strips by 2". Bond sealing strips to the girder with 3M Scotch® 4693 or equivalent adhesive compatible with sealing strips.

GENERAL NOTES:
 Designed according to AASHTO LRFD Specifications.
 These details can be used as an option to construct the deck overhang when noted on the Span details and in conjunction with the PCP(0)-FAB, PCP and applicable Standard sheets.
 These details are only applicable for Prestr Conc I-Girders.
 Any additional reinforcement or concrete required on these details is 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 2 OF 2

Texas Department of Transportation Bridge Division

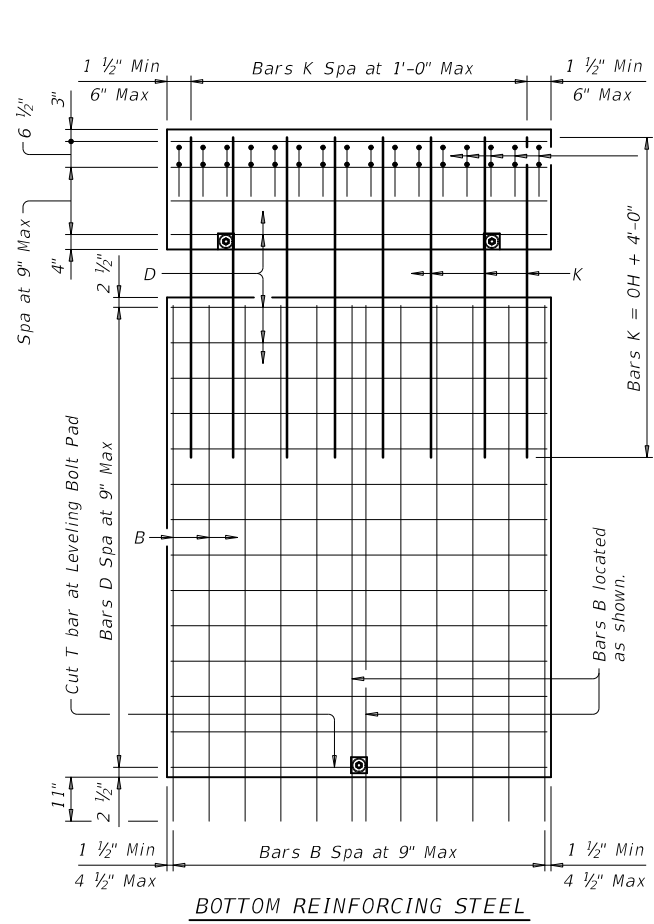
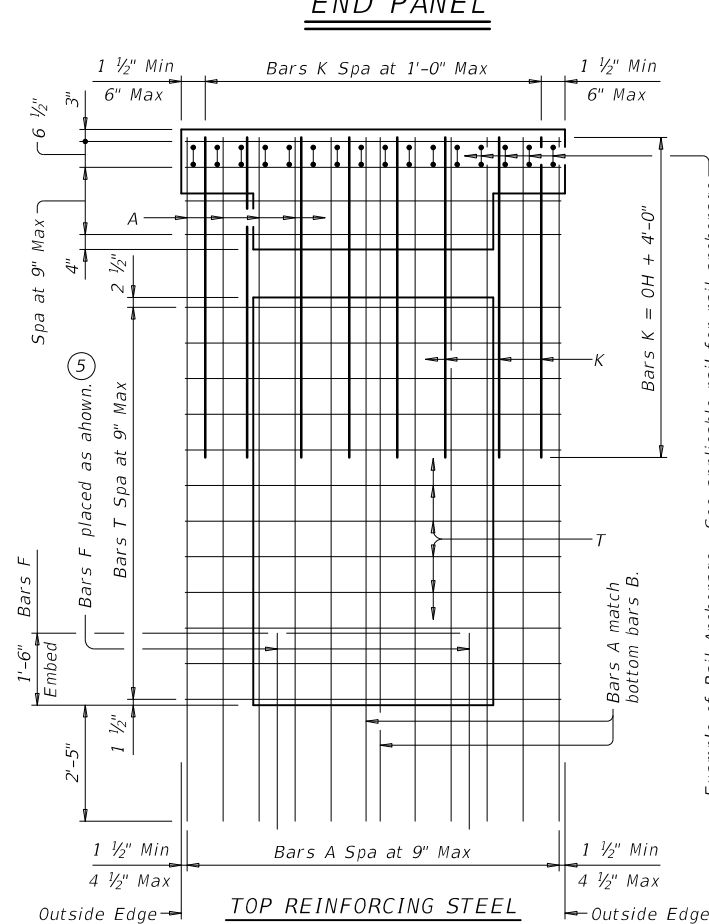
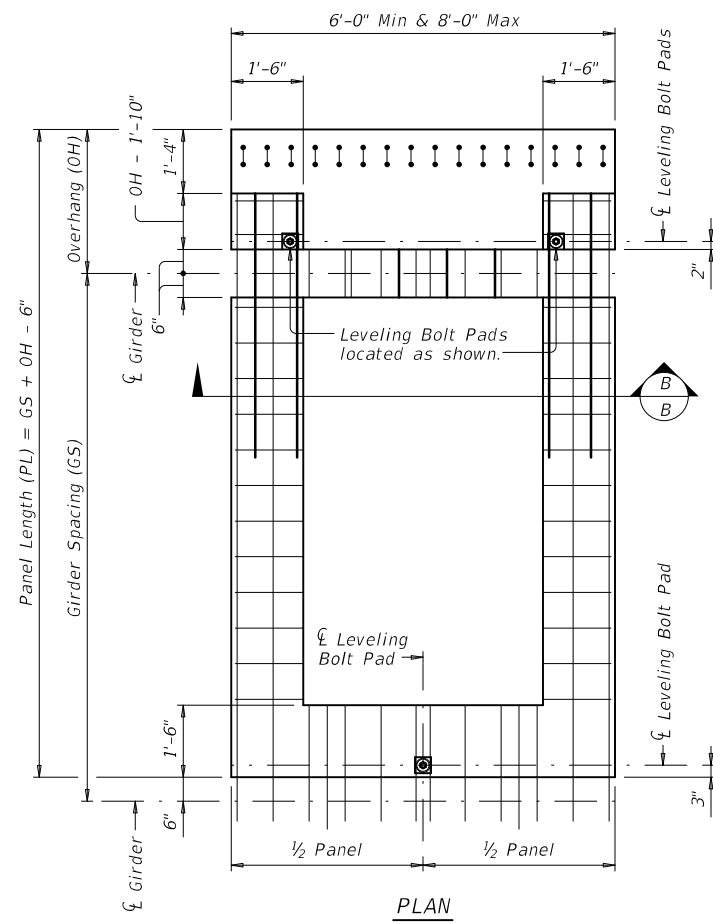
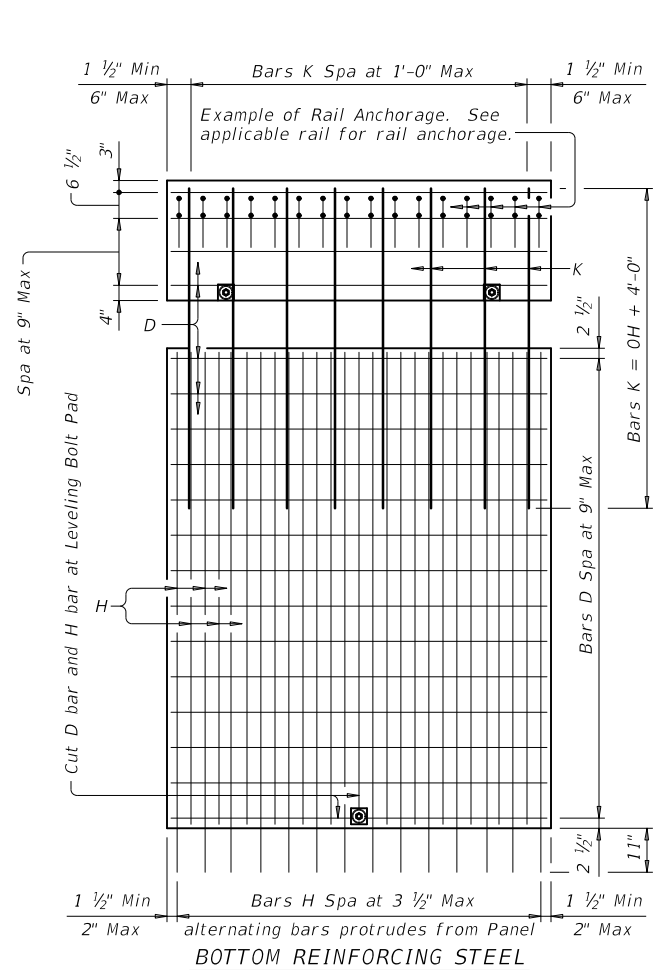
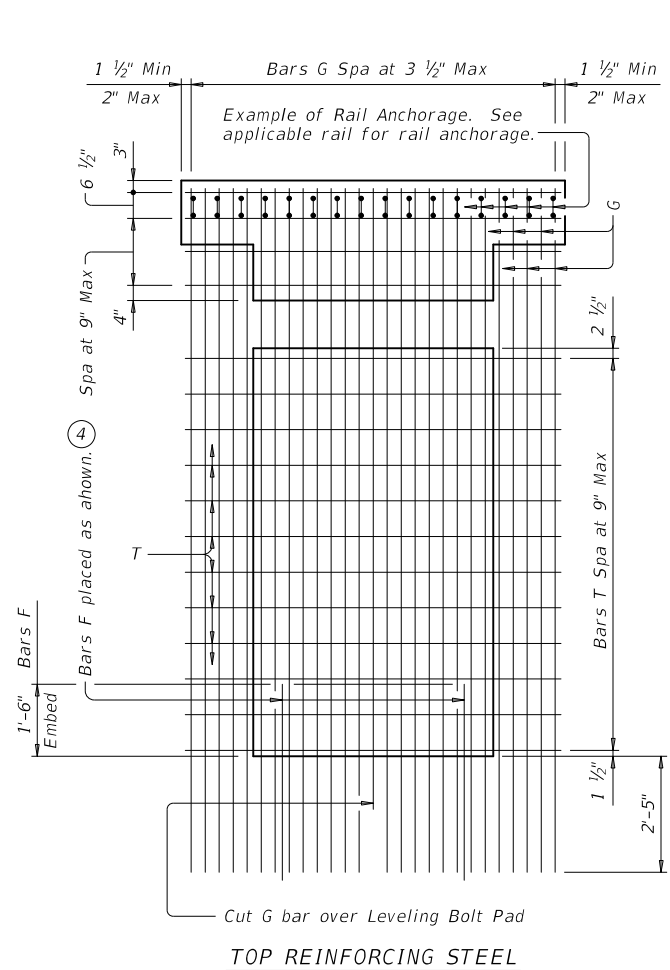
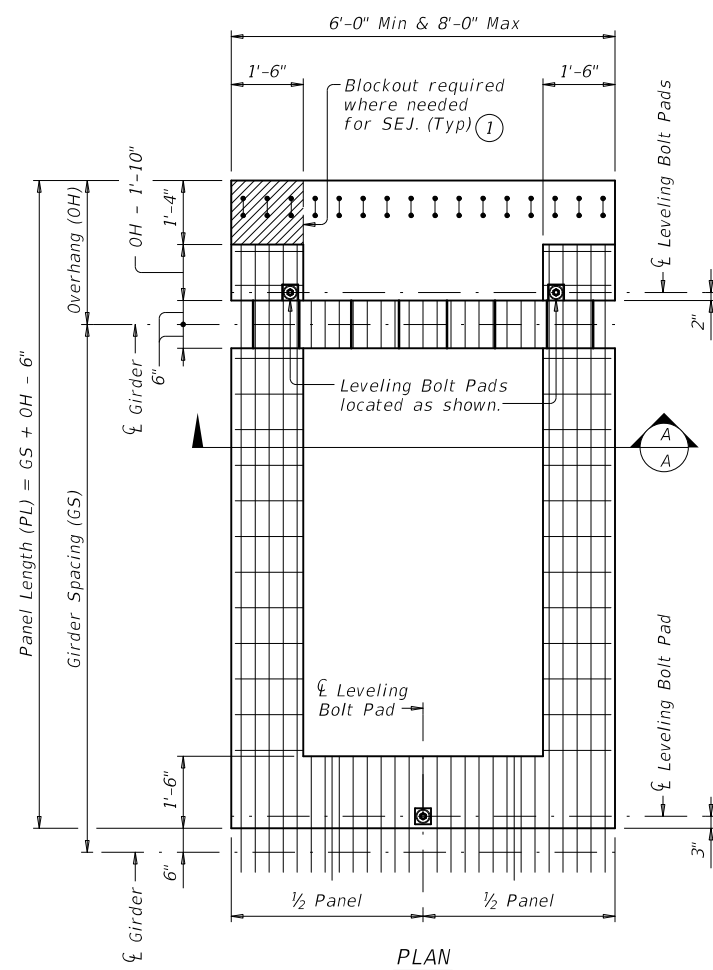
PRECAST CONCRETE PANELS FOR OVERHANGS

PCP(0)

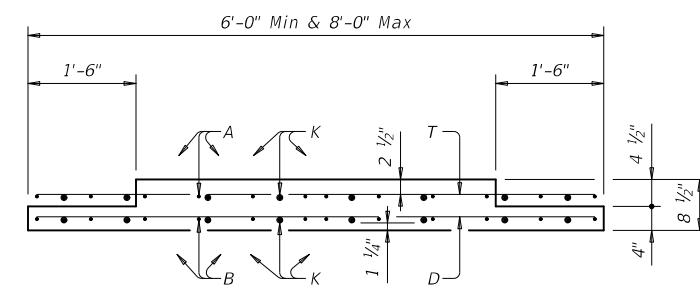
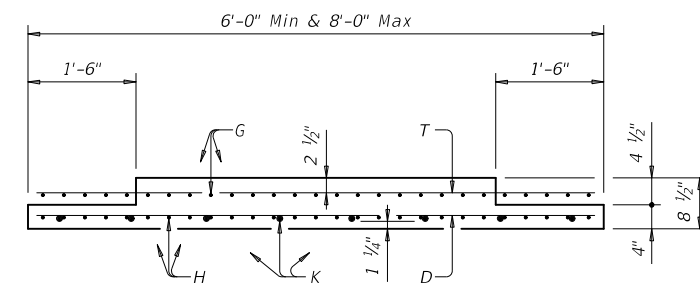
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	DIST	COUNTY	SHEET NO.	
	YKM	FAYETTE	126	

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- ① 1'-4" x 1'-6" x 1/2" blockout to accommodate SEJ that require an upturn. Contractor to communicate with fabricator the location and type of SEJ to be utilized.
- ② 1 1/2" End Cover on bars. (Typ)
- ③ Bars that are not allowed to have lap splices.
- ④ Place F bars under bars T and against bars G.
- ⑤ Place F bars under bars T and between bars A.



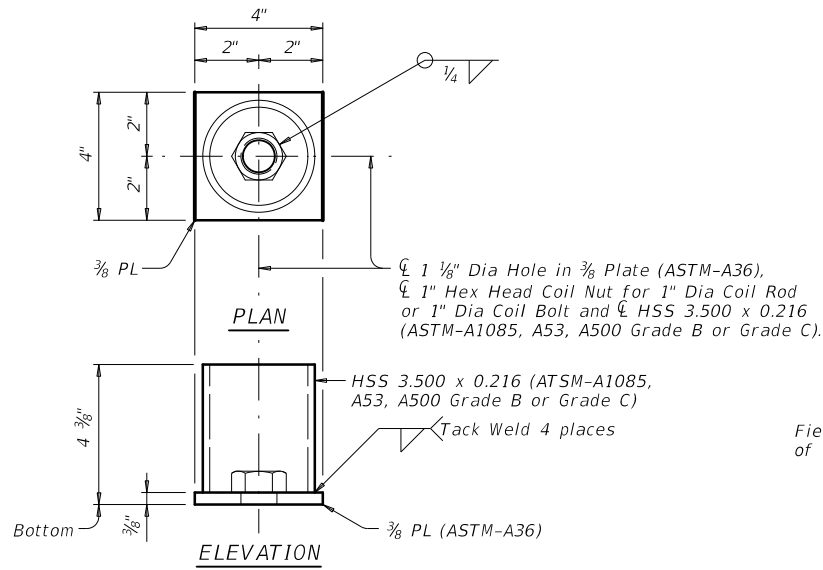
BAR TABLE	
BAR	SIZE
A (2)	#4
B (2)	#4
D (2, 3)	#4
F (3)	#3
G (2)	#4
H (2)	#4
K (2, 3)	#8
T (2, 3)	#4

PRECAST CONCRETE PANELS FOR OVERHANGS FABRICATION DETAILS

PCP(O)-FAB

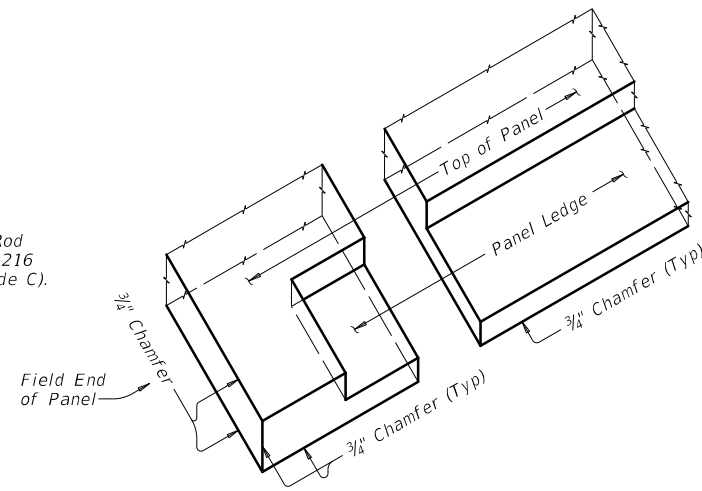
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REVISIONS	CONT	SECT	JOB	HIGHWAY
	0913	28	083, ETC	CR
	DIST	COUNTY	CITY	SHEET NO.
	YKM	FAYETTE		127

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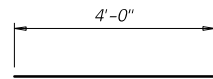
LEVELING BOLT PAD DETAILS

Galvanize if epoxy coated reinforcing steel is used in slab. Do not oil this assembly.

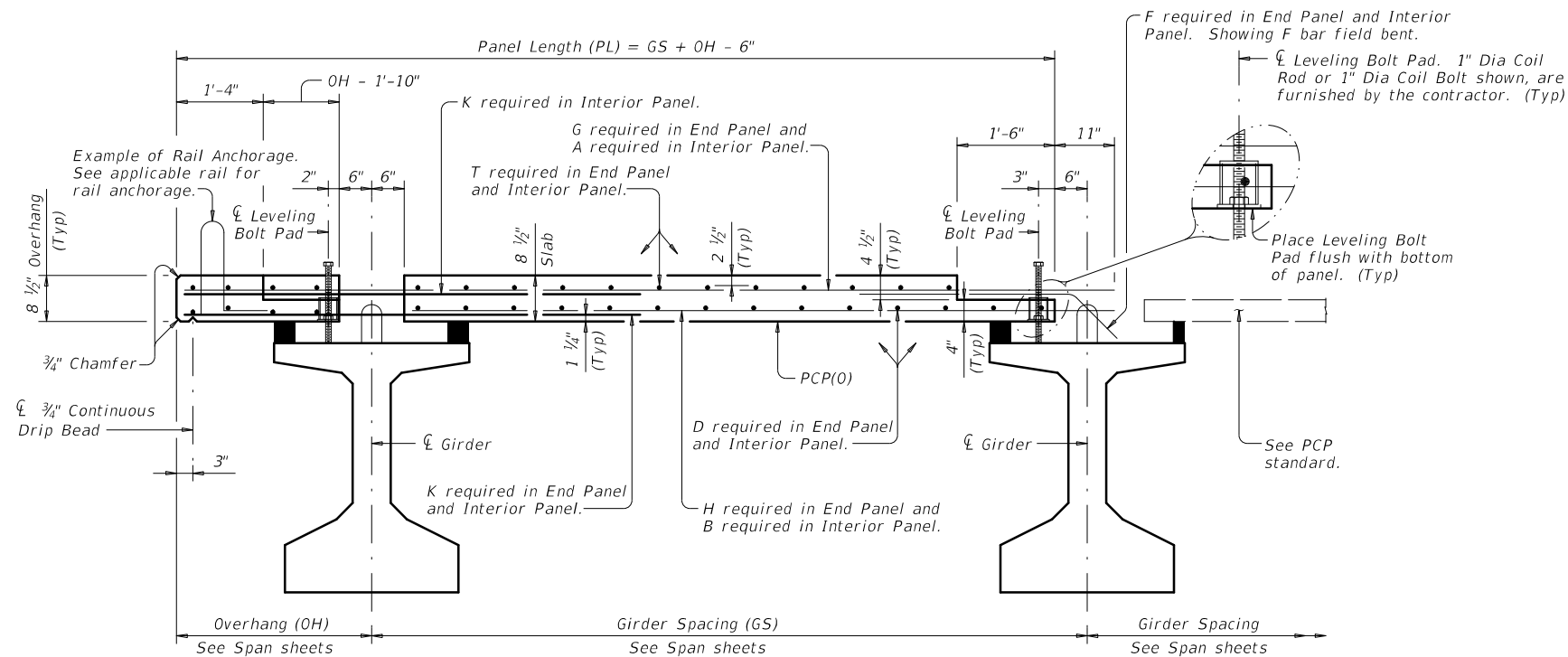


ISOMETRIC VIEW AT CORNER OF PANEL

Showing Typical Chamfers on Panel. Drip Bead and reinforcing steel not shown for clarity.



BARS F



TYPICAL TRANSVERSE SECTION

(Showing Girder Type Tx46)

CONSTRUCTION/FABRICATION NOTES:

Remove laitance from top panel surface.
 Finish top surface area of panel with a broom finish.
 Finish top ledge 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).
 Provide 3/4" concrete chamfers as shown on these details.
 Do not lap splice bars D, F, K & T. Bars A, B, G & H, may be spliced with only one lap splice allowed on each bar.
 Panels must be fabricated by a fabricator meeting the requirements of DMS 7300 for Multi-Project Nonstressed Member Fabrication Plant.

MATERIAL NOTES:

Provide Class H concrete ($f'c=4000$ psi) in panels. Provide Class H (HPC) concrete for panels if required elsewhere in plans. Maximum large aggregate size is 1".
 Provide material as shown on this standard for the Leveling Bolt Pad.
 Provide Grade 60 conventional reinforcing steel.
 Provide epoxy coated reinforcement for bars A, B, D, G, H, K & T if slab reinforcement is epoxy coated.
 An equal area and spacing of deformed Welded Wire Reinforcement (WWR) ASTM-A1064 may be substituted for bars A, B, D, G, H & T, unless otherwise noted. Bars F and K can not be replaced with WWR.
 Galvanize leveling bolt pad assembly if epoxy-coated reinforcing steel is used in slab.

GENERAL NOTES:

Designed according to AASHTO LRFD Specifications.
 These details are only applicable for Prestr Conc I-Girders.
 Any additional reinforcement, lifting devices or epoxy coated reinforcement required on these details are subsidiary to the bid Item "Reinforced Concrete Slab".
 See railing details for rail anchorage in panel overhang.
 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.
 Submit stable lifting methods and devices to the Engineer for approval.
 Shop drawings for the fabrication of panels will require the Engineer's approval.

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



PRECAST CONCRETE PANELS FOR OVERHANGS FABRICATION DETAILS

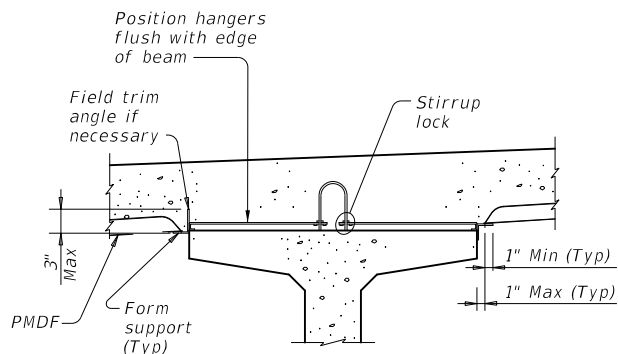
PCP(O)-FAB

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REVISIONS	0913	28	083, ETC	CR
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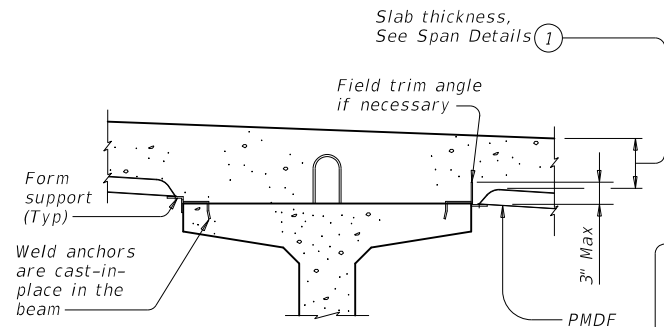
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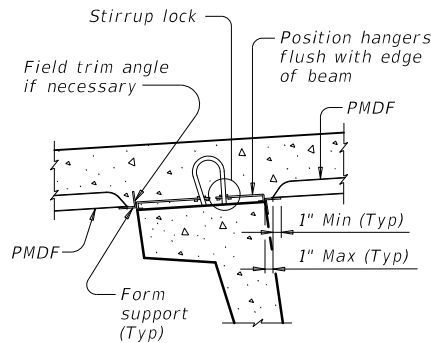
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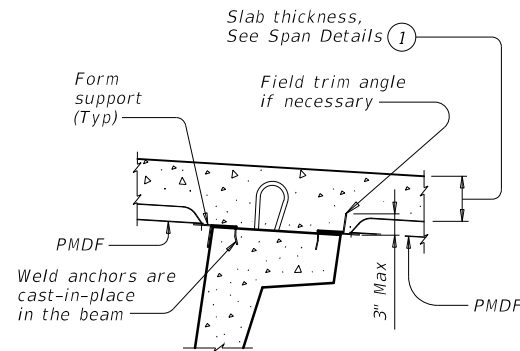
PRESTR CONC I-BEAMS AND I-GIRDERS WITH STIRRUP LOCKS



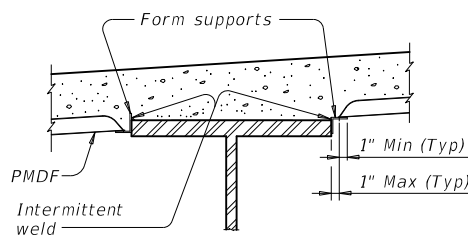
PRESTR CONC I-BEAMS AND I-GIRDERS WITH WELD ANCHORS



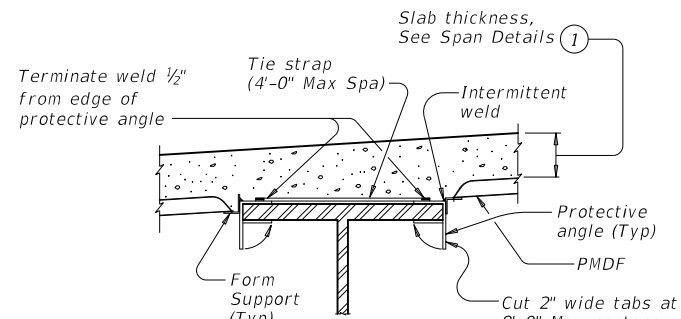
U-BEAMS WITH STIRRUP LOCKS



U-BEAMS WITH WELD ANCHORS

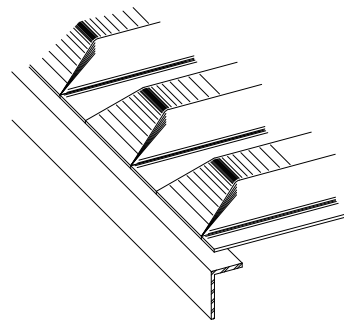


STEEL BEAMS AT COMPRESSION FLANGES

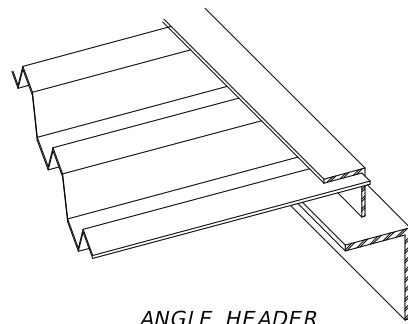


STEEL BEAMS AT TENSION FLANGES

TYPICAL TRANSVERSE SECTIONS



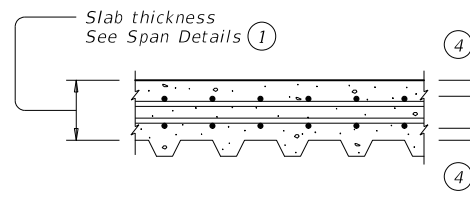
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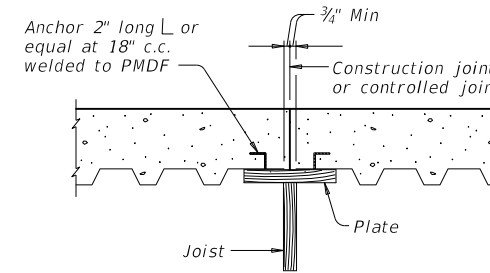
ANGLE HEADER

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

TYPES OF END CLOSURES



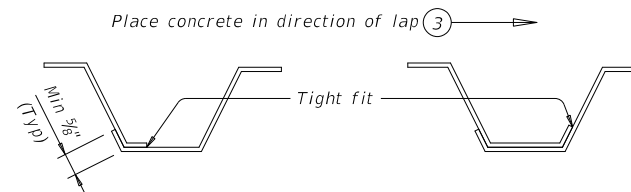
TYP LONGITUDINAL SLAB SECTION



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 AND STEEL GIRDER BRIDGES:
Unless shown elsewhere in the plans, 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. Bottom mat reinforcement and additional concrete is subsidiary to Item 422 "Concrete Superstructures."
FOR PRESTR CONC TX-GIRDER BRIDGES:
See Miscellaneous Slab Details, Prestr Concrete I-Girders (IGMS) standard sheet for bottom mat reinforcing.



SIDE LAP DETAILS

- Slab thickness minus 5/8" if corrugations match reinforcing bars.
- 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.
- The direction of concrete placement will be such that the upper layer of the form overlap is loaded first.
- 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'.

1/240 of the form design span, but not more than 0.75", for all design spans of railroad overpass bridge spans fully or partially over railroad right-of-way, and for all bridge spans of railroad underpass structures.

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.

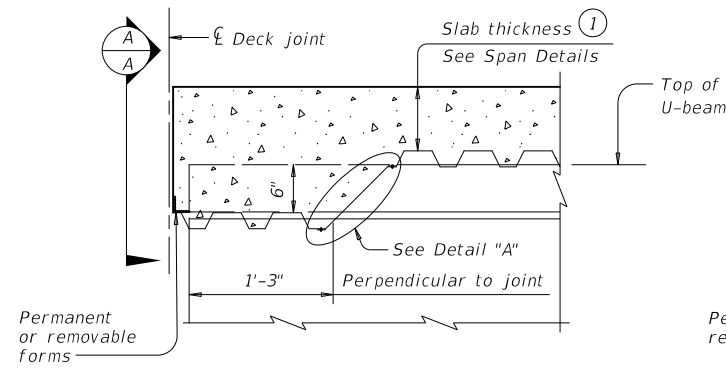
Construction joints will not be permitted unless shown on the plans. The location of and forming details for any construction joint used must be shown on the forming plans. Forms below a construction joint must be removed after curing of the slab.

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.

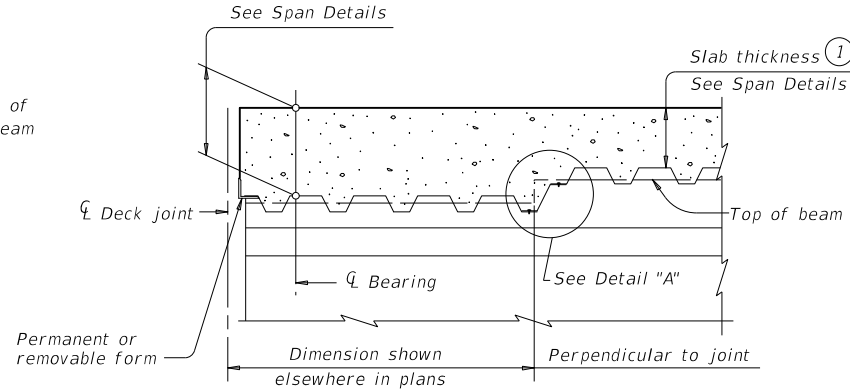
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PERMANENT METAL DECK FORMS					
PMDF					
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©TxDOT April 2019	CONT	SECT	JOB	HIGHWAY	
REVISIONS	0913	28	083, ETC	CR	
02-20: Modified box note by adding steel beams/girders and subsidiary	DIST	COUNTY		SHEET NO.	
12-21: Updated max deflection for RR.	YKM	FAYETTE		129	

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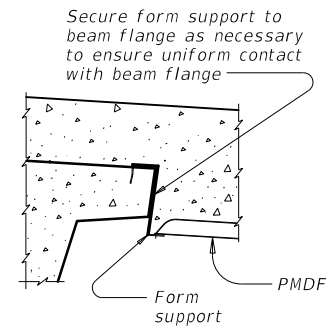
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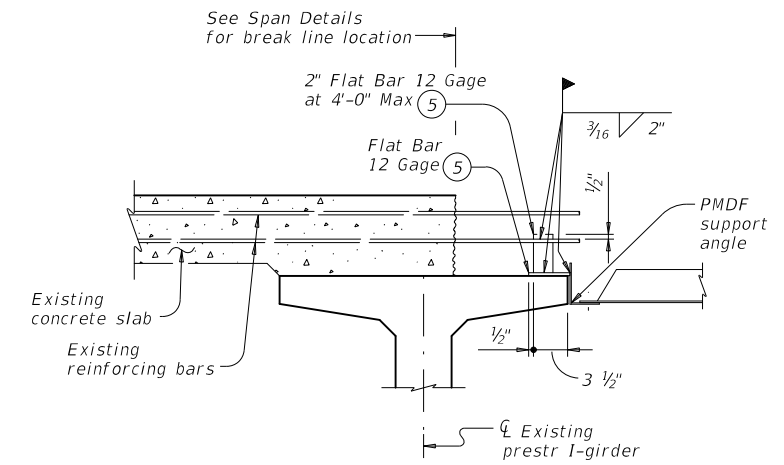
AT THICKENED SLAB END FOR U-BEAMS



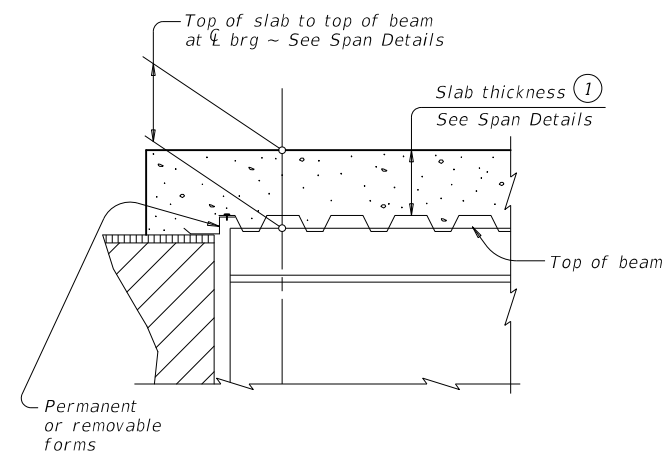
AT THICKENED SLAB END FOR PRESTRESSED I-BEAMS, I-GIRDERS AND STEEL BEAMS
Showing I-beam block-out. No block-out for I-girders or steel beams.



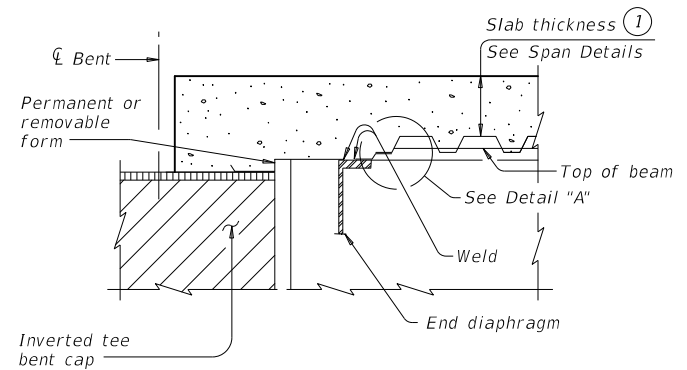
SECTION A-A



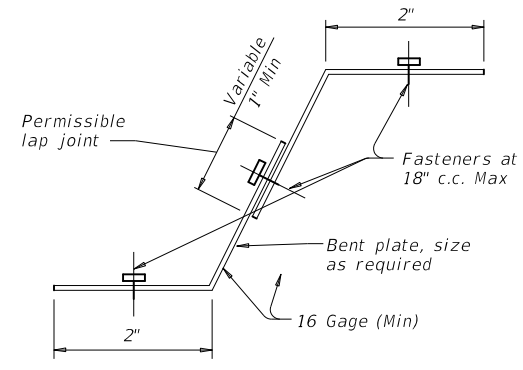
SHOWING PRESTRESSED CONCRETE I-BEAMS, I-GIRDERS AND U-BEAMS



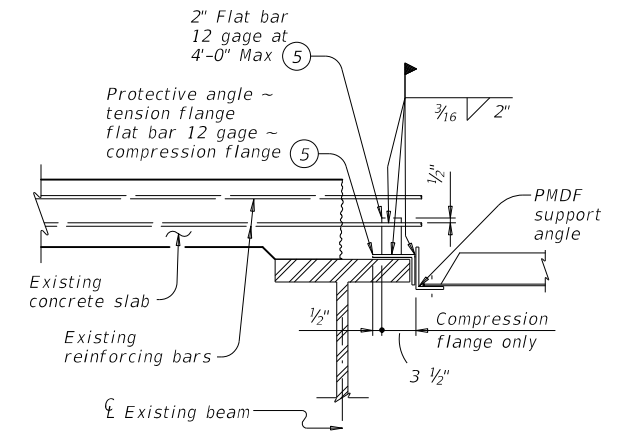
AT SLAB OVER ABUT BKWL OR INV TEE STEM FOR CONC BEAMS WITHOUT THICKENED SLAB END



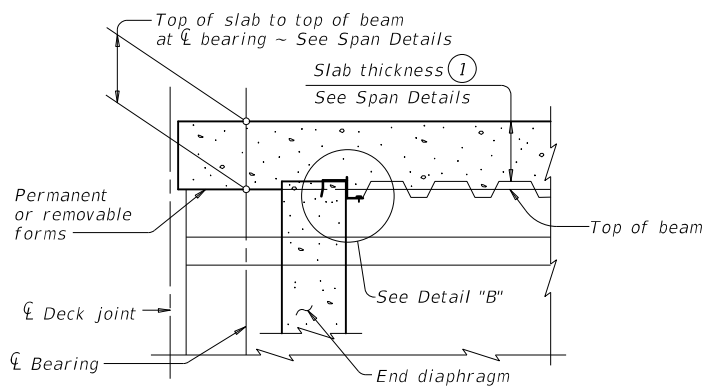
AT SLAB OVER INV TEE STEM FOR STEEL BEAMS WITHOUT THICKENED SLAB END



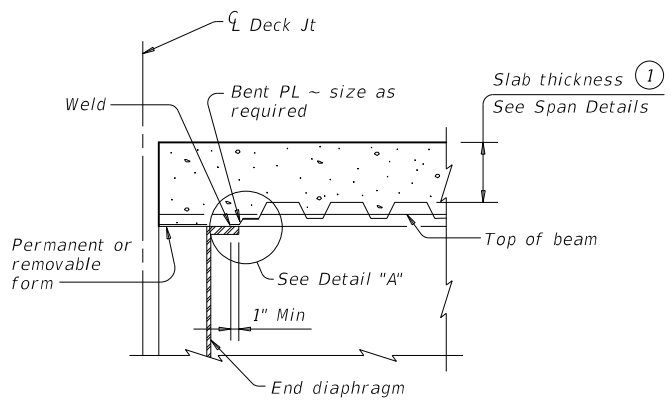
DETAIL "A"



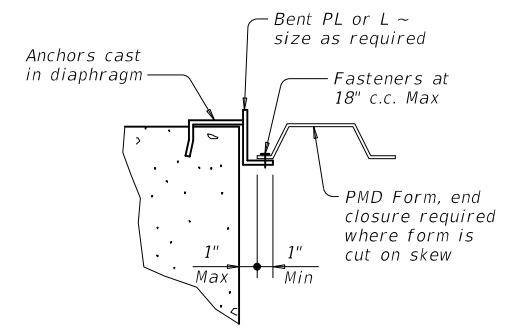
SHOWING STEEL BEAMS



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



AT END DIAPHRAGM FOR STEEL BEAMS WITHOUT THICKENED SLAB END



DETAIL "B"

WIDENING DETAILS

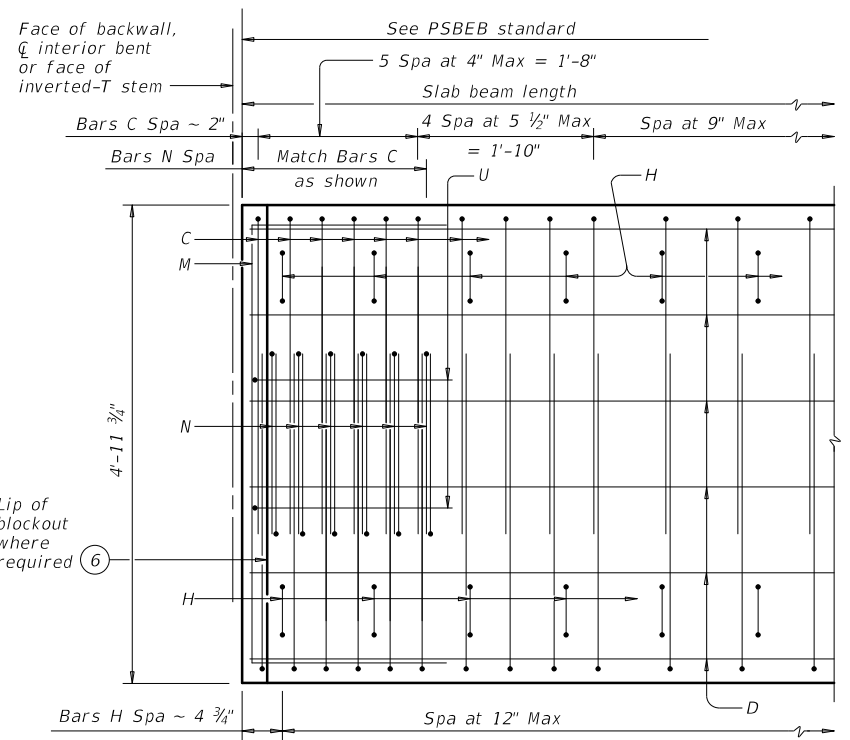
DETAILS AT ENDS OF BEAMS

- ① Slab thickness minus 3/8" if corrugations match reinforcing bars
- ⑤ Minimum yield stress of 12 gage bars shall be 40 ksi

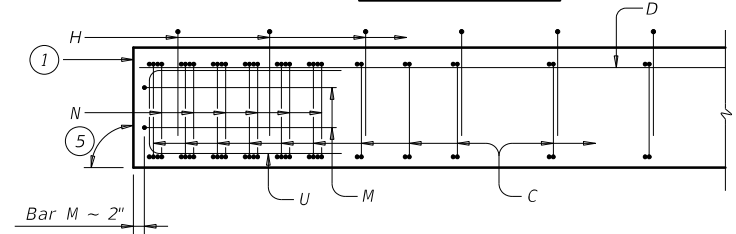
SHEET 2 OF 2

		Bridge Division Standard	
<h2>PERMANENT METAL DECK FORMS</h2>			
PMDF			
FILE: pmdfste1-21.dgn	DN: TxDOT	CK: TxDOT	DW: TxDOT
0913	28	083, ETC	CR
02-20: Modified box note by adding steel beams/girders and subsidiary	DIST	COUNTY	SHEET NO.
12-21: Updated max deflection for RR.	YKM	FAYETTE	130

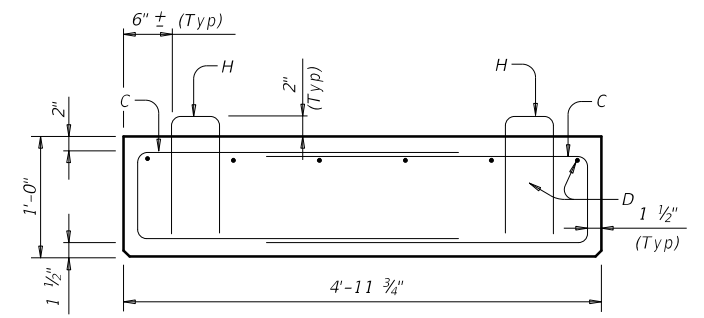
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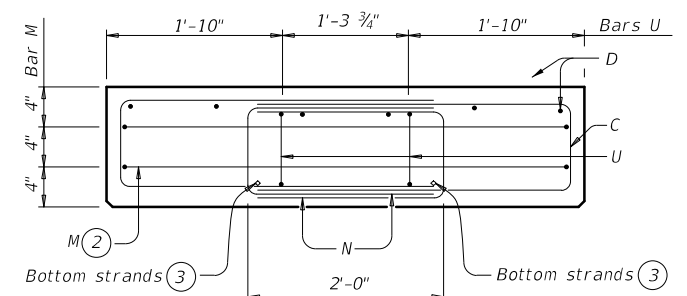
PART PLAN



ELEVATION

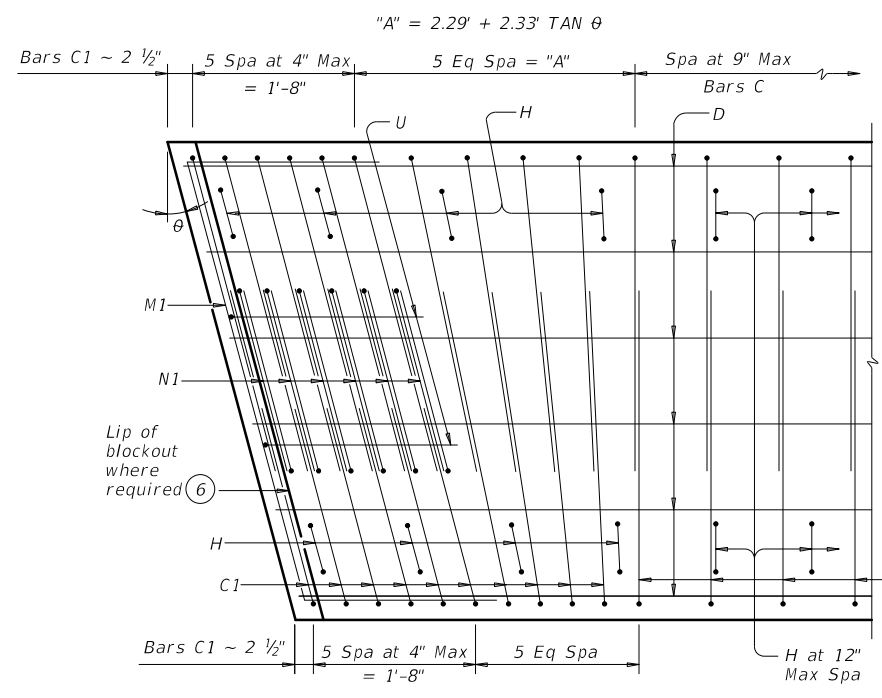


SECTION



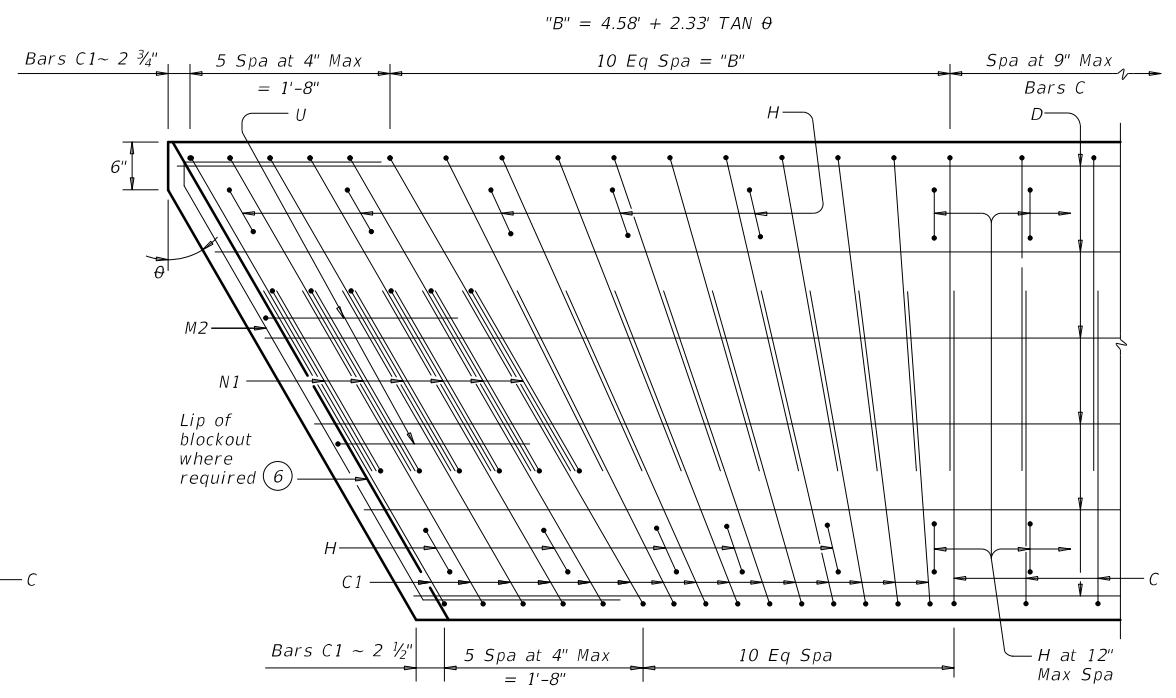
END MAT REINFORCING

Bars H not shown for clarity.



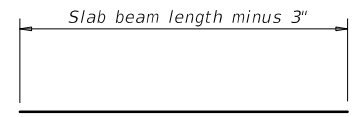
PART SKEW PLAN

(Showing θ over 0° to 15° Skew)

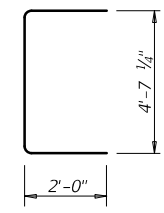


PART SKEW PLAN

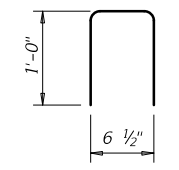
(Showing θ over 15° to 30° Skew)



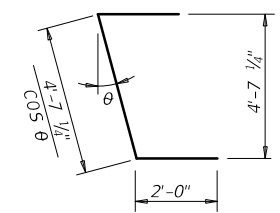
BARS D(#6)



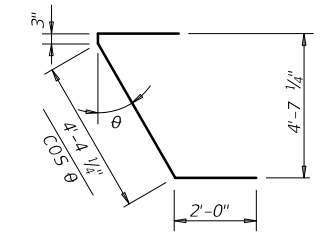
BARS M(#4)



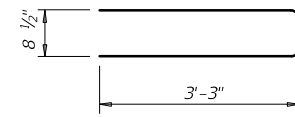
BARS H(#4)



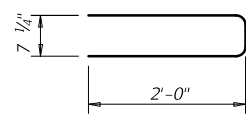
BARS M1(#4)



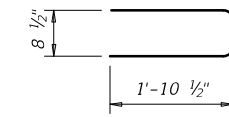
BARS M2(#4)



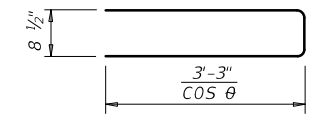
BARS C(#4)



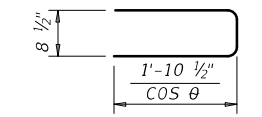
BARS U(#5)



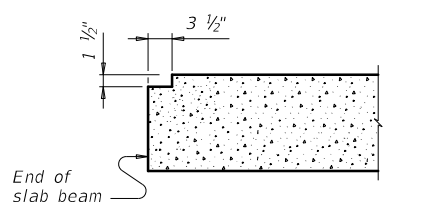
BARS N(#4)



BARS C1(#4)



BARS N1(#4)



ELEVATION OF BLOCKOUT

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

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

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

- ① See End Mat Reinforcing detail.
- ② Adjust bars M vertically to avoid strands.
- ③ See sheet PSBND or PSBSD for strand locations.
- ④ Assumes 150 pcf weight density of concrete.
- ⑤ 90° at conventional interior bents. End of beam must be vertical at abutment backwall and inverted-T stem.
- ⑥ Blockout required at armor joint (AJ) and sealed expansion joint (SEJ) locations to accommodate joint anchorage.

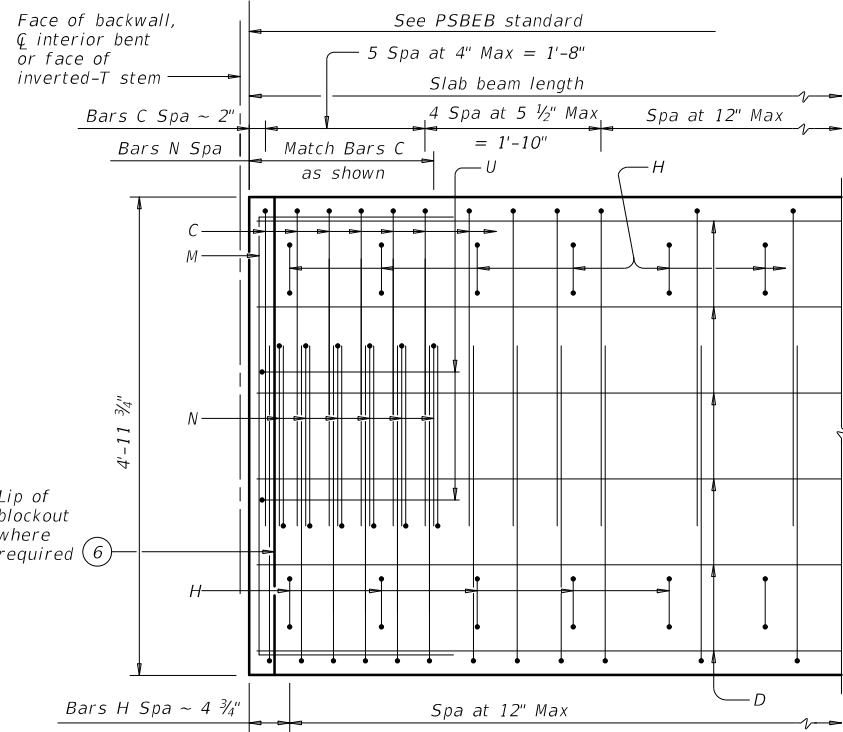
HL93 LOADING

		Bridge Division Standard	
PRESTRESSED CONCRETE SLAB BEAM DETAILS			
(TYPE 5SB12)			
PSB-5SB12			
FILE: psbsts03-17.dgn	DN: TxDOT	CK: TxDOT	DW: TxDOT
REV: 0913	SECT: 28	JOB: 083, ETC	HIGHWAY: CR
DIST: YKM	COUNTY: FAYETTE	SHEET NO. 131	

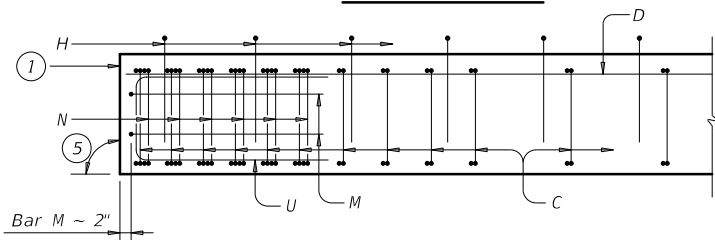
DATE: FILE:

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.

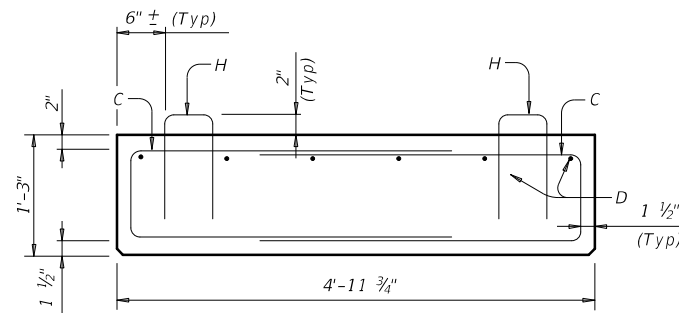
DATE: FILE:



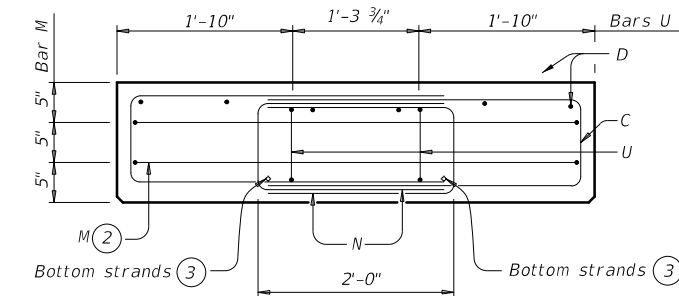
PART PLAN



ELEVATION

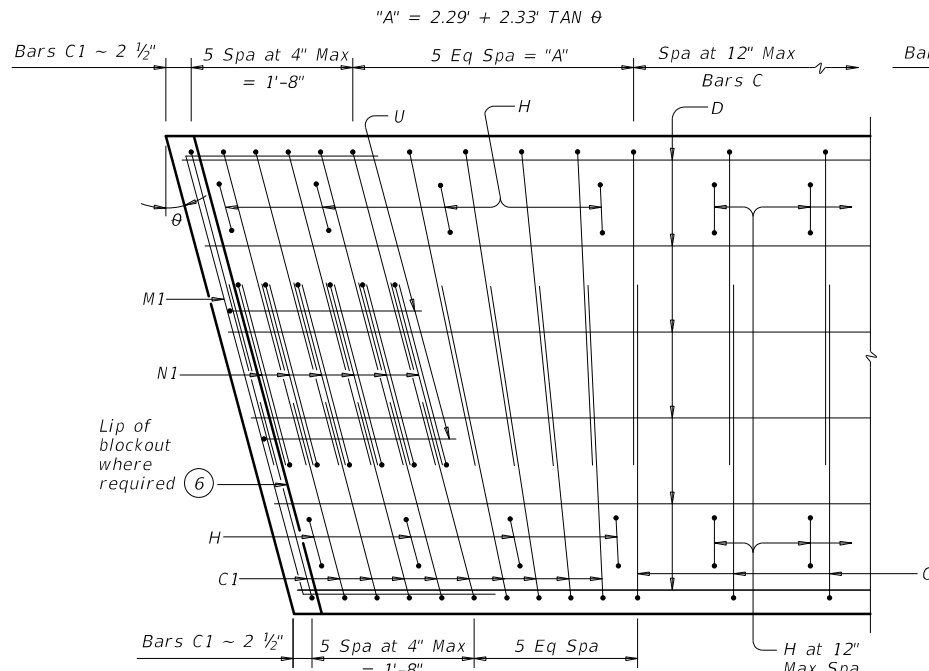


SECTION



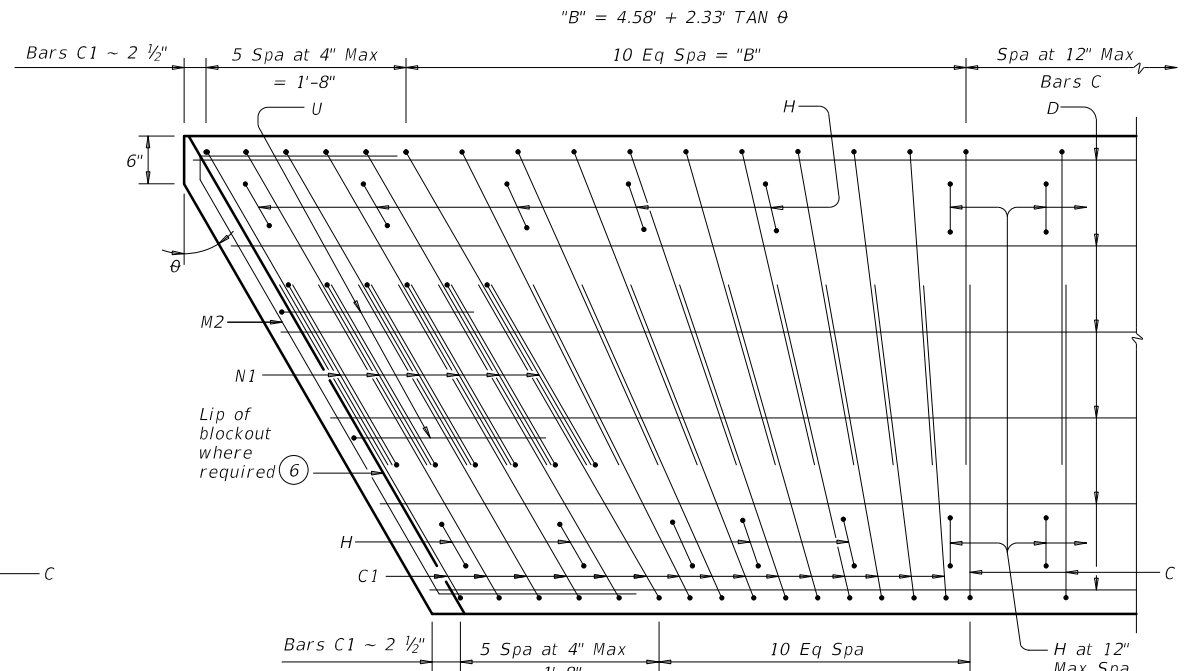
END MAT REINFORCING

Bars H not shown for clarity.



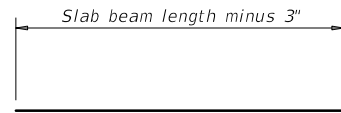
PART SKEW PLAN

(Showing θ over 0° to 15° skew)

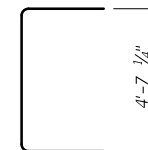


PART SKEW PLAN

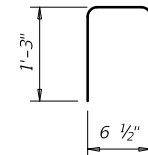
(Showing θ over 15° to 30° skew)



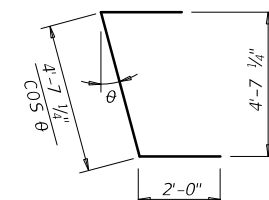
BARS D(#6)



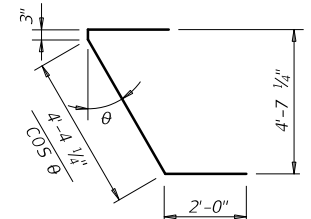
BARS M(#4)



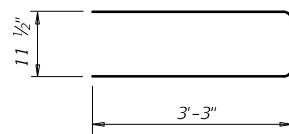
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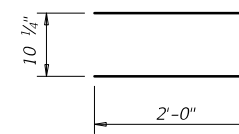
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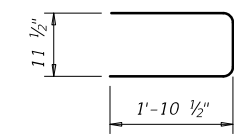
BARS M2(#4)



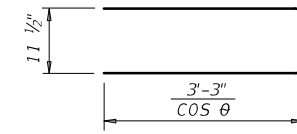
BARS C(#4)



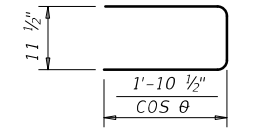
BARS U(#5)



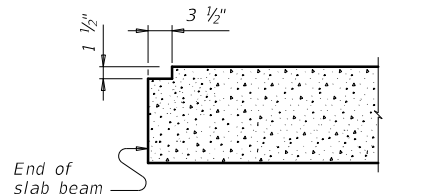
BARS N(#4)



BARS C1(#4)



BARS N1(#4)



ELEVATION OF BLOCKOUT

BEAM PROPERTIES		
Area	in ²	896.2
Y top	in	7.50
Y bott	in	7.50
I	in ⁴	16,805
Weight	lb/ft	934

GENERAL NOTES:

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

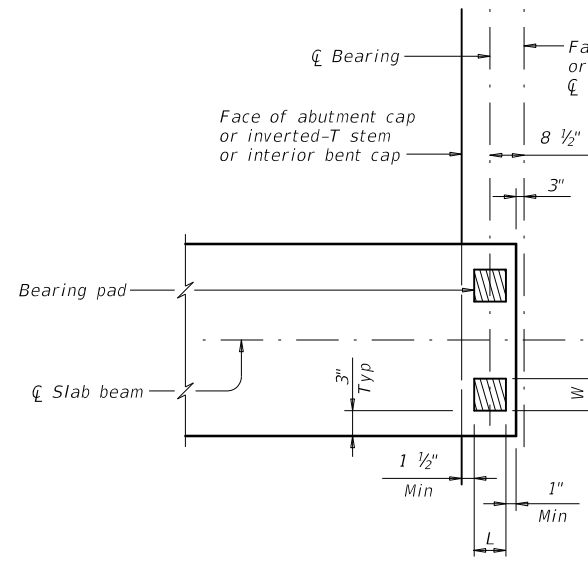
Cover dimensions are clear dimensions, unless noted otherwise.
Reinforcing bar dimensions shown are out-to-out of bar.

- ① See End Mat Reinforcing detail.
- ② Adjust bars M vertically to avoid strands.
- ③ See sheet PSBND or PSBSD for strand locations.
- ④ Assumes 150 pcf weight density of concrete.
- ⑤ 90° at conventional interior bents. End of beam must be vertical at abutment backwall and inverted-T stem.
- ⑥ Blockout required at armor joint (AJ) and sealed expansion joint (SEJ) locations to accommodate joint anchorage.

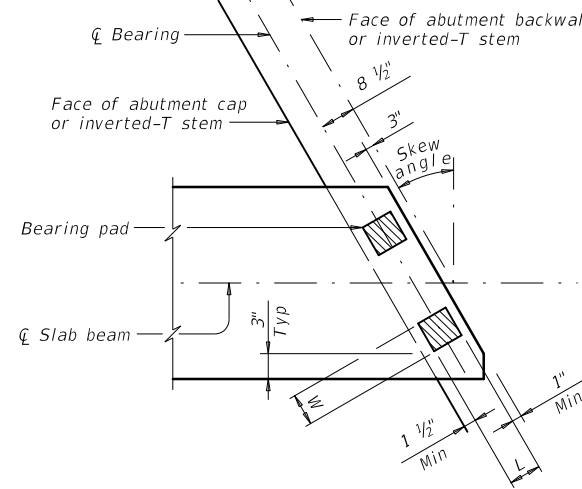
HL93 LOADING

		Bridge Division Standard	
PRESTRESSED CONCRETE SLAB BEAM DETAILS			
(TYPE 5SB15)			
PSB-5SB15			
FILE: psbsts04-17.dgn	DN: TxDOT	CK: TxDOT	DW: TxDOT
REV: 0913	SECT: 28	JOB: 083, ETC	HIGHWAY: CR
DIST: YKM	COUNTY: FAYETTE	SHEET NO. 132	

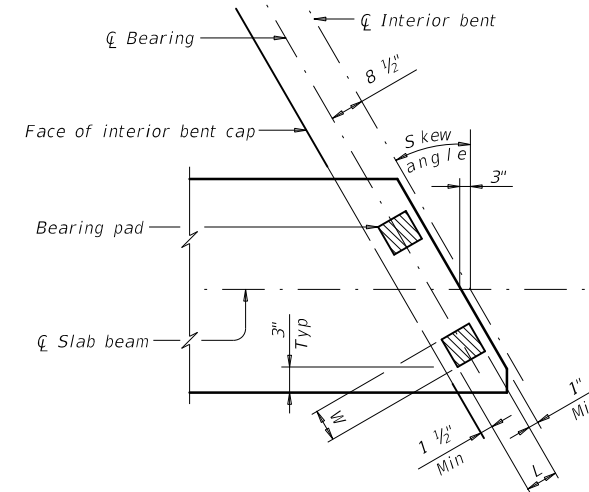
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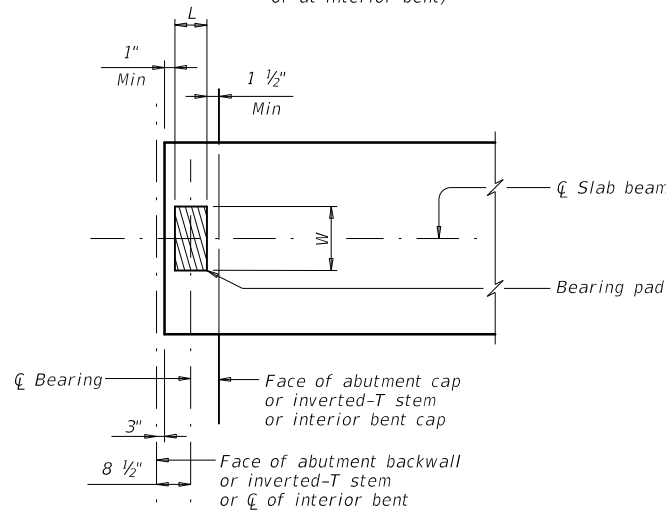
TWO-PAD DETAIL PLAN
(At abutment or inverted-T cap or at interior bent)



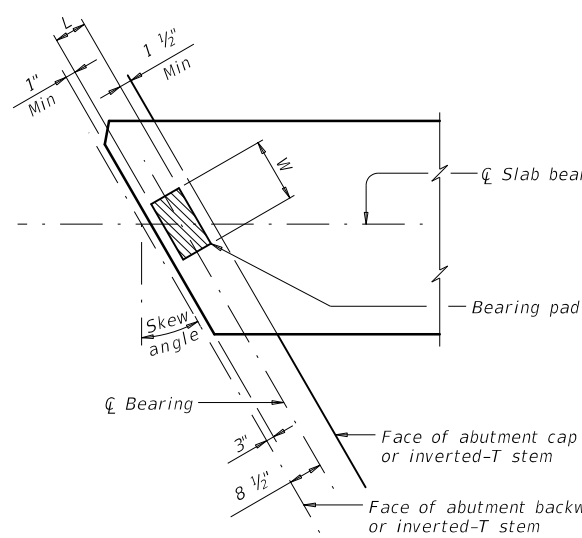
TWO-PAD DETAIL SKEW PLAN
(At abutment or inverted-T cap)



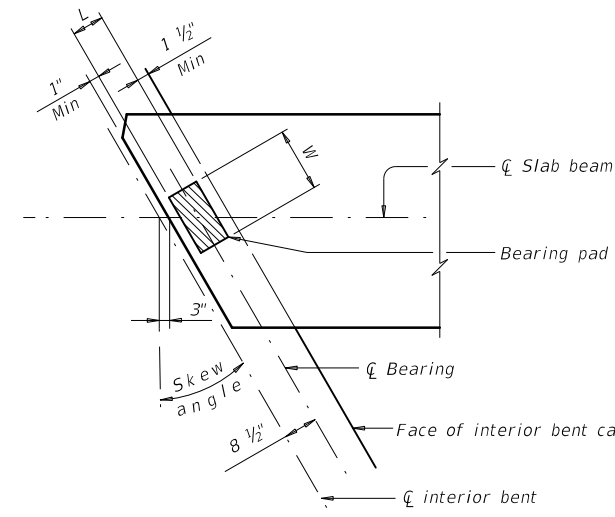
TWO-PAD DETAIL SKEW PLAN
(At interior bent)



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



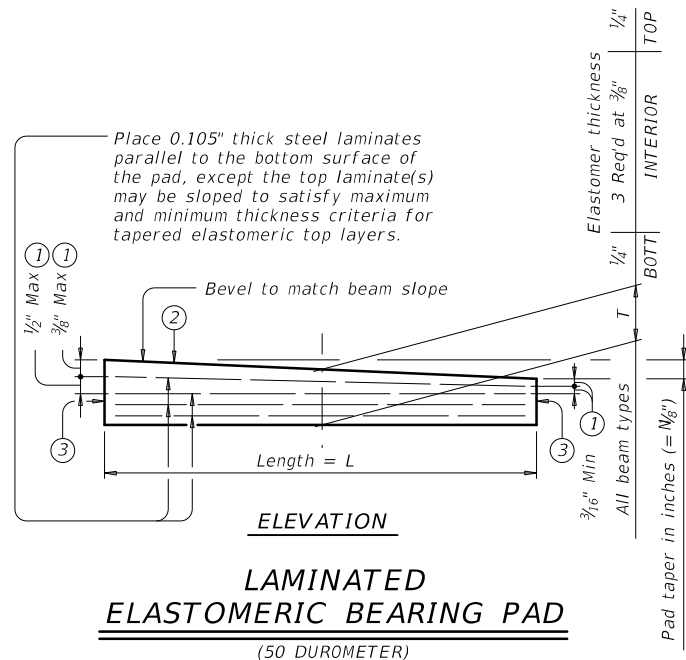
ONE-PAD DETAIL SKEW PLAN
(At abutment or inverted-T cap)



ONE-PAD DETAIL SKEW PLAN
(At interior bent)

ELASTOMERIC BEARING PAD PLACEMENT AND BEAM END DIAGRAMS

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



LAMINATED ELASTOMERIC BEARING PAD
(50 DUROMETER)

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

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

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

Pad sizes shown are applicable for the following conditions:

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

GENERAL NOTES:

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

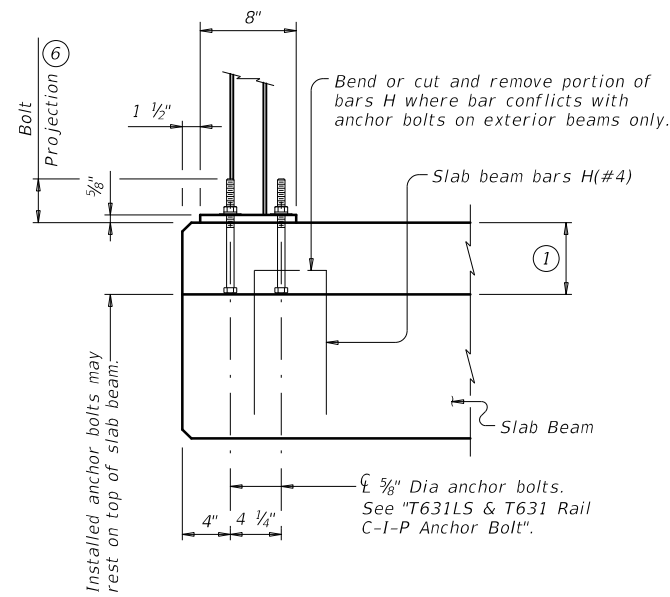
HL93 LOADING

		Bridge Division Standard	
ELASTOMERIC BEARING AND BEAM END DETAILS			
PRESTR CONCRETE SLAB BEAM			
PSBEB			
FILE: psbste06-17.dgn	DN: TxDOT	CK: TxDOT	OW: TxDOT
©TxDOT January 2017	CONT	SECT	JOB
REVISIONS	0913	28	083, ETC
DIST	COUNTY		SHEET NO.
YKM	FAYETTE		133

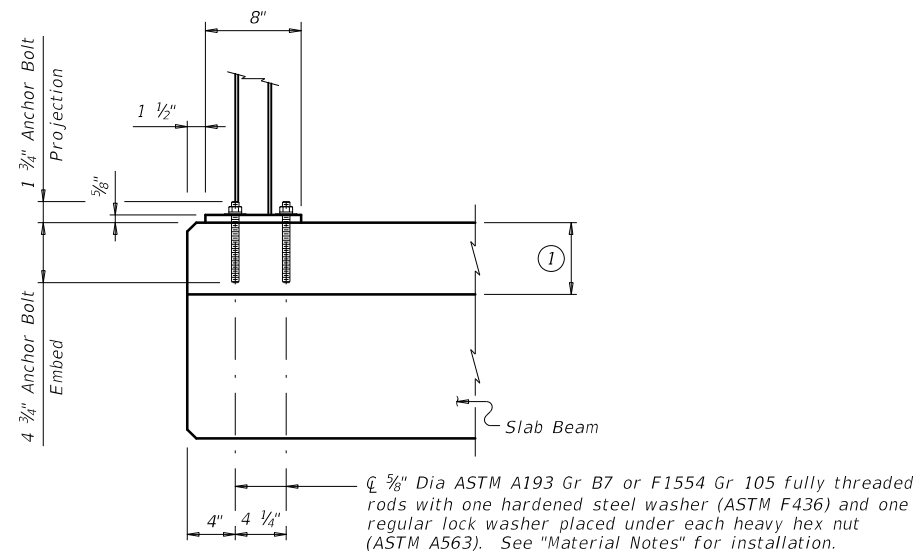
DATE:
FILE:

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: FILE:

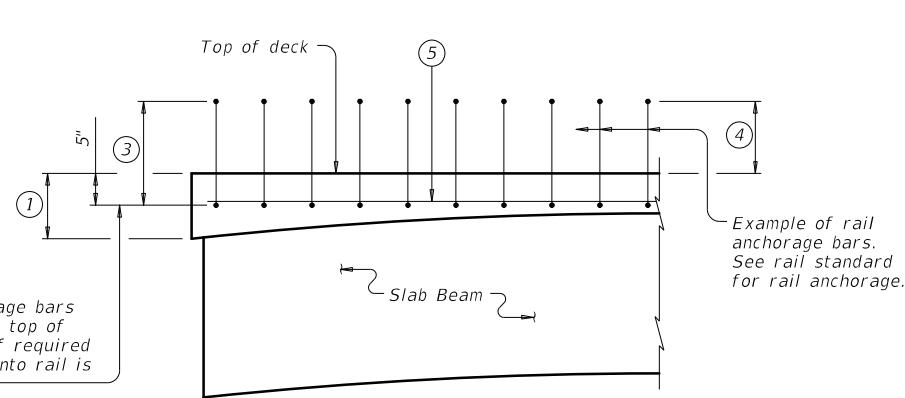


CAST-IN-PLACE ANCHORAGE OPTION

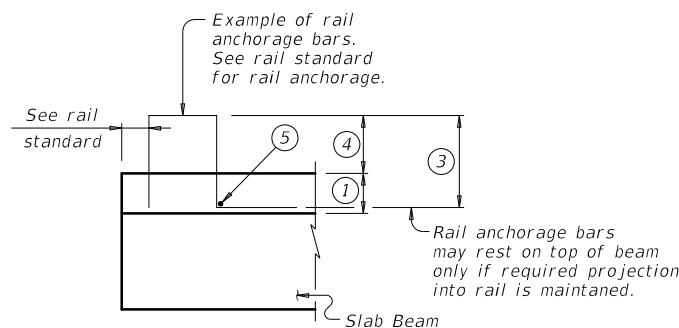


ADHESIVE ANCHORAGE OPTION

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



PART SPAN ELEVATION

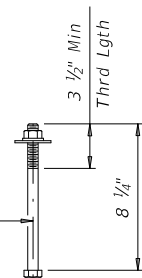


SECTION

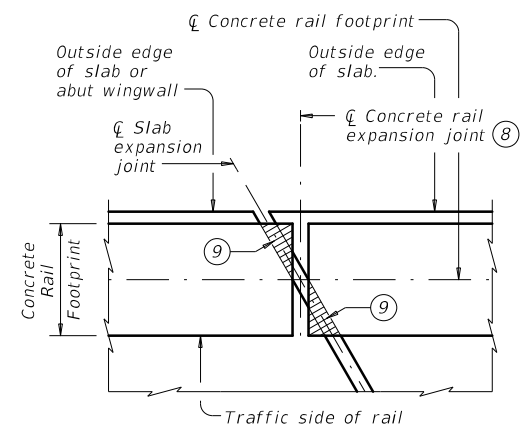
TYPICAL CONCRETE RAIL ANCHORAGE

(Showing typical concrete rail anchorage)

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



T631LS & T631 RAIL C-I-P ANCHOR BOLT



PLAN OF CONCRETE RAILS AT EXPANSION JOINTS

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

CONSTRUCTION NOTES:

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

MATERIAL NOTES:

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

GENERAL NOTES:

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

Cover dimensions are clear dimensions, unless noted otherwise.

				Bridge Division Standard	
RAIL ANCHORAGE DETAILS					
PRESTR CONCRETE SLAB BEAMS					
PSBRA					
FILE: pbsste07-18.dgn	DN: TxDOT	CK: TxDOT	DW: JTR	CK: JMH	
©TxDOT January 2017	CONV	SECT	JOB	HIGHWAY	
REVISIONS	0913	28	083, ETC	CR	
03-18: Updated adhesive anchor notes.	DIST	COUNTY	SHEET NO.		
	YKM	FAYETTE	134		

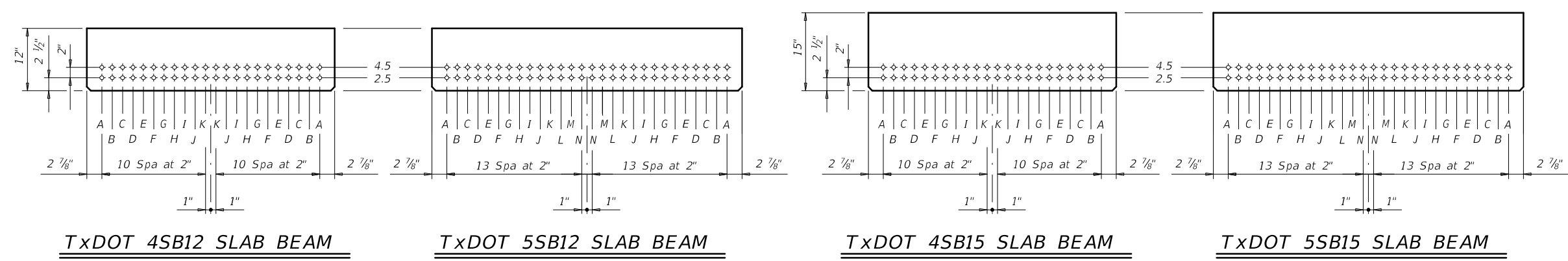
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STRUCTURE	DESIGNED BEAMS (STRAIGHT STRANDS)																			OPTIONAL DESIGN					LOAD RATING FACTORS			
	SPAN LENGTH (ft)	BEAM NO.	BEAM TYPE	PRESTRESSING STRANDS							DEBONDED STRANDS PER ROW					CONCRETE		DESIGN LOAD COMP STRESS (TOP ϵ) (SERVICE I) fct (ksi)	DESIGN LOAD TENSILE STRESS (BOT ϵ) (SERVICE III) fcb (ksi)	REQUIRED MINIMUM ULTIMATE MOMENT CAPACITY (STRENGTH I) (kip-ft)	LIVE LOAD DISTRIBUTION FACTOR		STRENGTH I			SERVICE III		
				NON-STD STRAND PATTERN	TOTAL NO.	SIZE (in)	STRGTH fpu (ksi)	"e" \bar{c} (in)	"e" END (in)	TOT NO. DEB	DIST FROM BOTTOM (in)	NO. OF STRANDS		NUMBER OF STRANDS DEBONDED TO (ft from end)							RELEASE STRGTH f'_{ci} (ksi)	MINIMUM 28 DAY COMP STRGTH f'_c (ksi)	②		Inv	Opr	Inv	
												TOTAL	DE-BONDED	3	6	9	12						15	Moment				Shear
24' ROADWAY SB12 BEAM	25	ALL	5SB12		8	0.6	270	3.50	3.50	0	2.5	8	0	0	0	0	0	4.000	5.000	0.914	-1.217	448	0.450	0.450	1.40	1.82	1.71	
	30	ALL	5SB12		10	0.6	270	3.50	3.50	0	2.5	10	0	0	0	0	0	4.000	5.000	1.292	-1.685	530	0.450	0.450	1.25	1.62	1.29	
	35	ALL	5SB12		14	0.6	270	3.50	3.50	0	2.5	14	0	0	0	0	0	4.000	5.000	1.730	-2.219	675	0.450	0.450	1.33	1.73	1.23	
	40	ALL	5SB12		18	0.6	270	3.50	3.50	0	2.5	18	0	0	0	0	0	4.000	5.000	2.218	-2.796	820	0.440	0.440	1.34	1.74	1.12	
24' ROADWAY SB15 BEAM	25	ALL	5SB15		8	0.6	270	5.00	5.00	0	2.5	8	0	0	0	0	0	4.000	5.000	0.725	-0.897	551	0.450	0.450	1.77	2.29	2.41	
	30	ALL	5SB15		8	0.6	270	5.00	5.00	0	2.5	8	0	0	0	0	0	4.000	5.000	1.020	-1.244	574	0.450	0.450	1.23	1.59	1.45	
	35	ALL	5SB15		10	0.6	270	5.00	5.00	0	2.5	10	0	0	0	0	0	4.000	5.000	1.361	-1.640	708	0.450	0.450	1.15	1.49	1.14	
	40	ALL	5SB15		14	0.6	270	5.00	5.00	0	2.5	14	0	0	0	0	0	4.000	5.000	1.739	-2.068	864	0.440	0.440	1.32	1.71	1.19	
	45	ALL	5SB15		18	0.6	270	5.00	5.00	2	2.5	18	2	2	0	0	0	4.000	5.000	2.179	-2.574	1054	0.440	0.440	1.34	1.73	1.08	
50	ALL	5SB15		24	0.6	270	5.00	5.00	8	2.5	24	8	4	4	0	0	0	4.000	5.000	2.680	-3.153	1276	0.440	0.440	1.33	1.72	1.11	
28' ROADWAY SB12 BEAM	25	ALL	5SB12		8	0.6	270	3.50	3.50	0	2.5	8	0	0	0	0	0	4.000	5.000	0.903	-1.184	444	0.430	0.430	1.47	1.91	1.80	
	30	ALL	5SB12		10	0.6	270	3.50	3.50	0	2.5	10	0	0	0	0	0	4.000	5.000	1.276	-1.639	508	0.430	0.430	1.32	1.71	1.37	
	35	ALL	5SB12		12	0.6	270	3.50	3.50	0	2.5	12	0	0	0	0	0	4.000	5.000	1.708	-2.159	647	0.430	0.430	1.18	1.53	1.02	
	40	ALL	5SB12		18	0.6	270	3.50	3.50	0	2.5	18	0	0	0	0	0	4.000	5.000	2.200	-2.744	799	0.430	0.430	1.37	1.78	1.17	
28' ROADWAY SB15 BEAM	25	ALL	5SB15		8	0.6	270	5.00	5.00	0	2.5	8	0	0	0	0	0	4.000	5.000	0.716	-0.874	529	0.430	0.430	1.85	2.40	2.53	
	30	ALL	5SB15		8	0.6	270	5.00	5.00	0	2.5	8	0	0	0	0	0	4.000	5.000	1.007	-1.212	570	0.430	0.430	1.29	1.67	1.53	
	35	ALL	5SB15		10	0.6	270	5.00	5.00	0	2.5	10	0	0	0	0	0	4.000	5.000	1.343	-1.598	680	0.430	0.430	1.21	1.57	1.22	
	40	ALL	5SB15		14	0.6	270	5.00	5.00	0	2.5	14	0	0	0	0	0	4.000	5.000	1.725	-2.032	842	0.430	0.430	1.36	1.76	1.24	
	45	ALL	5SB15		18	0.6	270	5.00	5.00	2	2.5	18	2	2	0	0	0	4.000	5.000	2.149	-2.508	1013	0.420	0.420	1.41	1.82	1.16	
50	ALL	5SB15		22	0.6	270	5.00	5.00	6	2.5	22	6	4	2	0	0	0	4.000	5.000	2.643	-3.073	1227	0.420	0.420	1.33	1.72	1.01	
30' ROADWAY SB12 BEAM	25	ALL	4SB12		6	0.6	270	3.50	3.50	0	2.5	6	0	0	0	0	0	4.000	5.000	0.904	-1.187	341	0.340	0.340	1.38	1.79	1.67	
	30	ALL	4SB12		8	0.6	270	3.50	3.50	0	2.5	8	0	0	0	0	0	4.000	5.000	1.277	-1.646	407	0.340	0.340	1.32	1.71	1.37	
	35	ALL	4SB12		10	0.6	270	3.50	3.50	0	2.5	10	0	0	0	0	0	4.000	5.000	1.711	-2.169	518	0.340	0.340	1.24	1.60	1.08	
	40	ALL	4SB12		14	0.6	270	3.50	3.50	0	2.5	14	0	0	0	0	0	4.000	5.000	2.205	-2.758	640	0.340	0.340	1.34	1.73	1.11	
30' ROADWAY SB15 BEAM	25	ALL	4SB15		6	0.6	270	5.00	5.00	0	2.5	6	0	0	0	0	0	4.000	5.000	0.723	-0.888	431	0.350	0.350	1.69	2.19	2.32	
	30	ALL	4SB15		6	0.6	270	5.00	5.00	0	2.5	6	0	0	0	0	0	4.000	5.000	1.017	-1.231	438	0.350	0.350	1.16	1.50	1.37	
	35	ALL	4SB15		8	0.6	270	5.00	5.00	0	2.5	8	0	0	0	0	0	4.000	5.000	1.346	-1.605	545	0.340	0.340	1.21	1.57	1.21	
	40	ALL	4SB15		12	0.6	270	5.00	5.00	0	2.5	12	0	0	0	0	0	4.000	5.000	1.729	-2.043	675	0.340	0.340	1.47	1.91	1.38	
	45	ALL	4SB15		14	0.6	270	5.00	5.00	2	2.5	14	2	2	0	0	0	4.000	5.000	2.166	-2.542	823	0.340	0.340	1.33	1.73	1.06	
50	ALL	4SB15		18	0.6	270	5.00	5.00	4	2.5	18	4	2	2	0	0	0	4.000	5.000	2.665	-3.115	998	0.340	0.340	1.32	1.71	1.02	

① Based on the following allowable stresses (ksi):
 Compression = 0.65 f'_{ci}
 Tension = 0.24 $\sqrt{f'_{ci}}$
 Optional designs must likewise conform.
 ② Portion of full HL93.

DESIGN NOTES:
 Designed according to AASHTO LRFD Bridge Design Specifications. Load rated using Load and Resistance Factor Rating according to AASHTO Manual for Bridge Evaluation. Prestress losses for the designed beams have been calculated for a relative humidity of 60 percent. Optional designs must likewise conform.

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



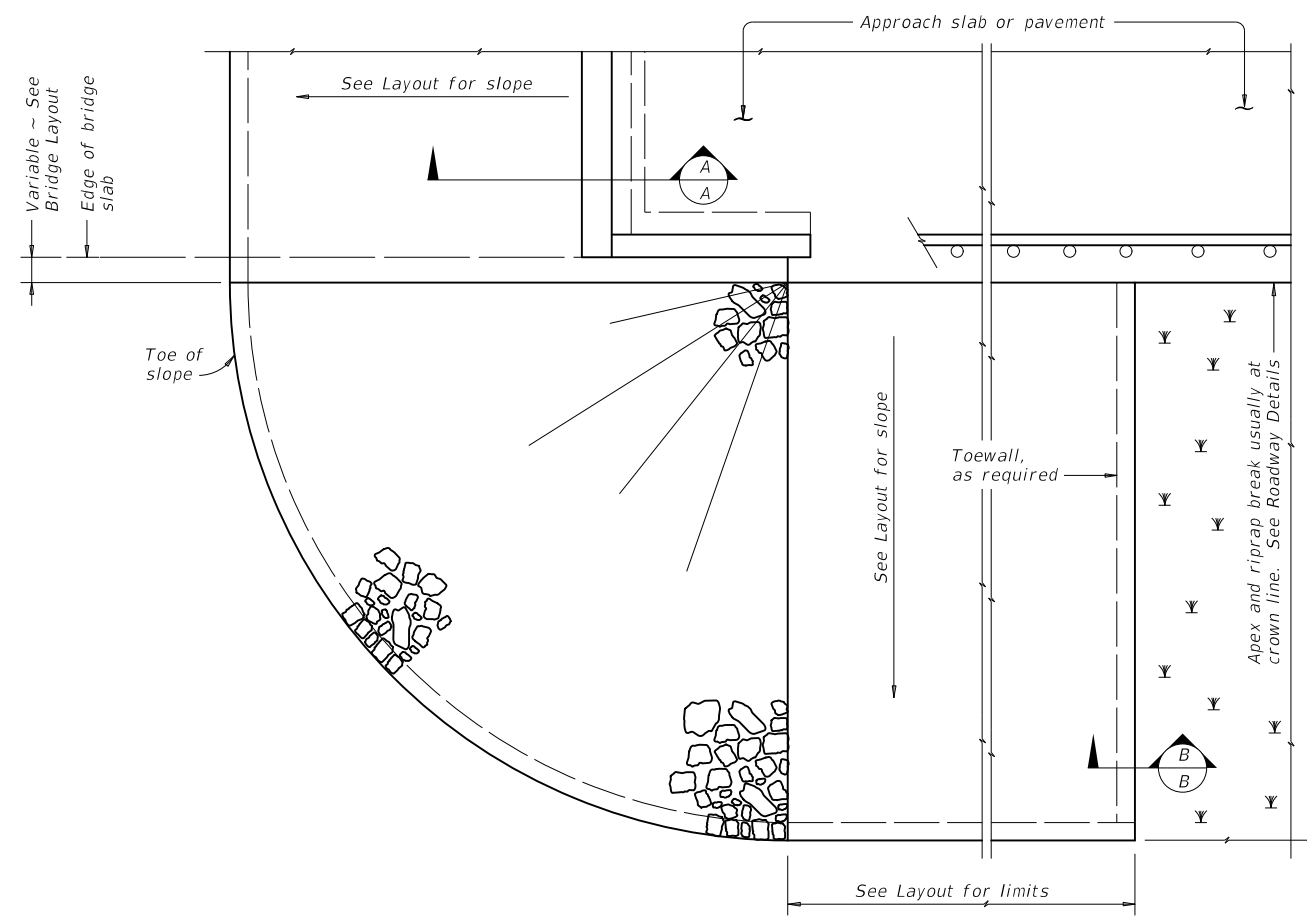
HL93 LOADING

		Bridge Division Standard	
PRESTRESSED CONCRETE SLAB BEAM STD DESIGNS (TY SB12 OR SB15) 24', 28' & 30' ROADWAY PSBSD			
FILE: psbstd08-21.dgn	DN: SRW	CK: BMP	DW: SFS
0913	28	083, ETC	CR
DIST: COUNTY		SHEET NO.	
YKM		FAYETTE 135	

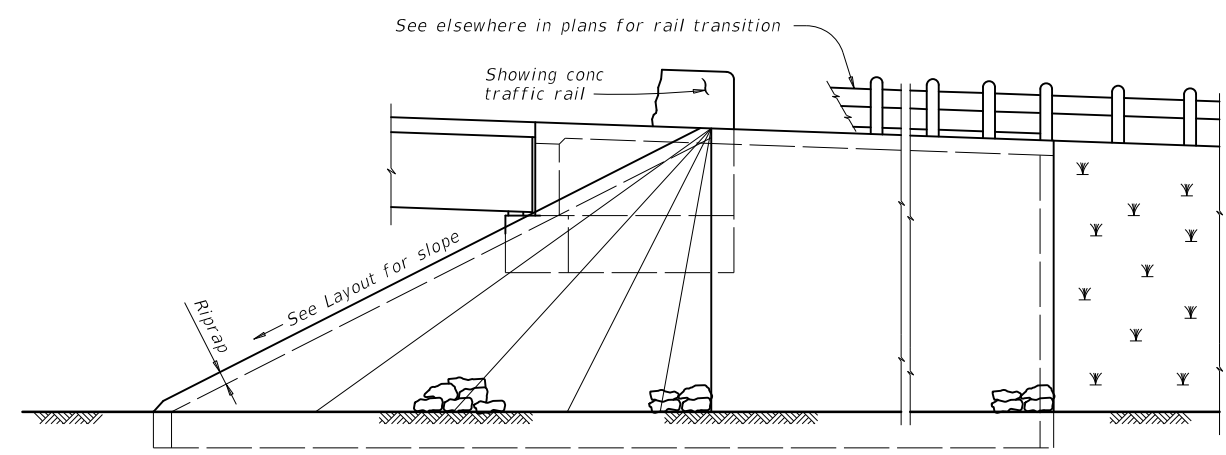
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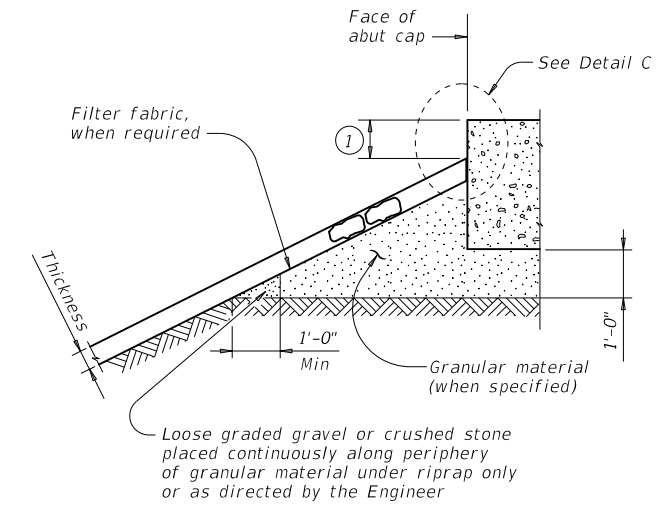
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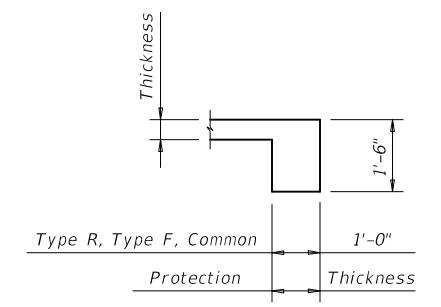
PLAN



ELEVATION

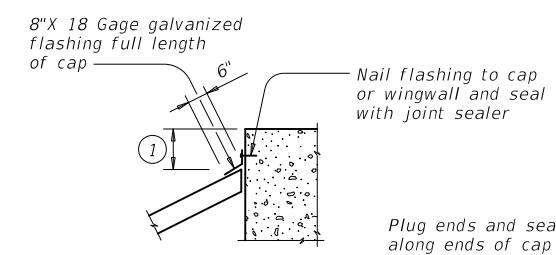


SECTION A-A AT CAP

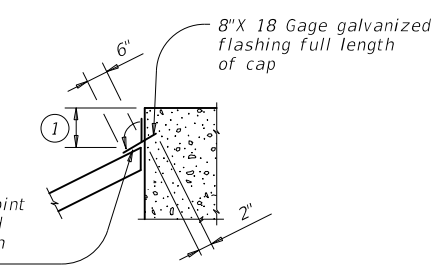


SECTION B-B

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.

		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	0913 28	083, ETC	CR
	DIST	COUNTY	SHEET NO.
	YKM	FAYETTE	136

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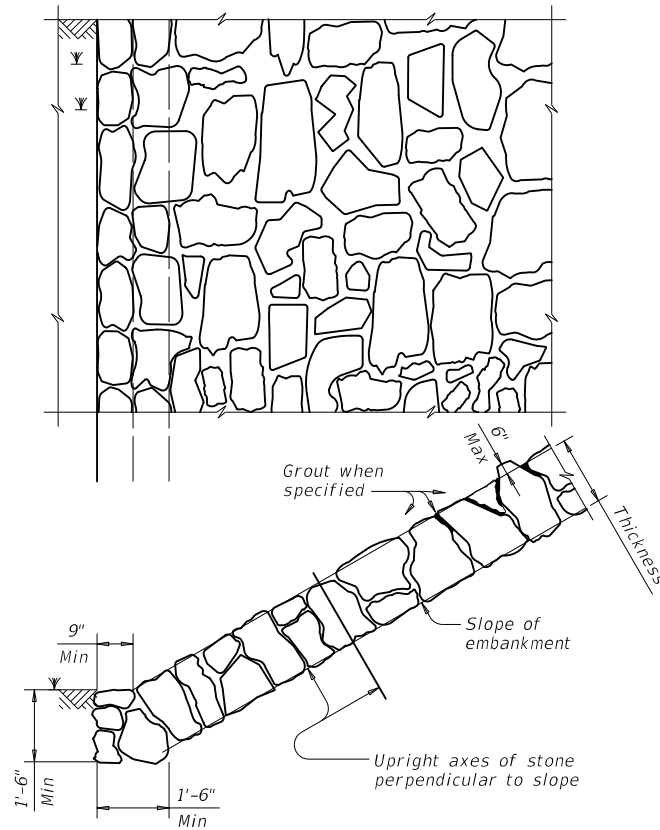


FIGURE 1 ~ TYPE R STONE RIPRAP
dry or grouted

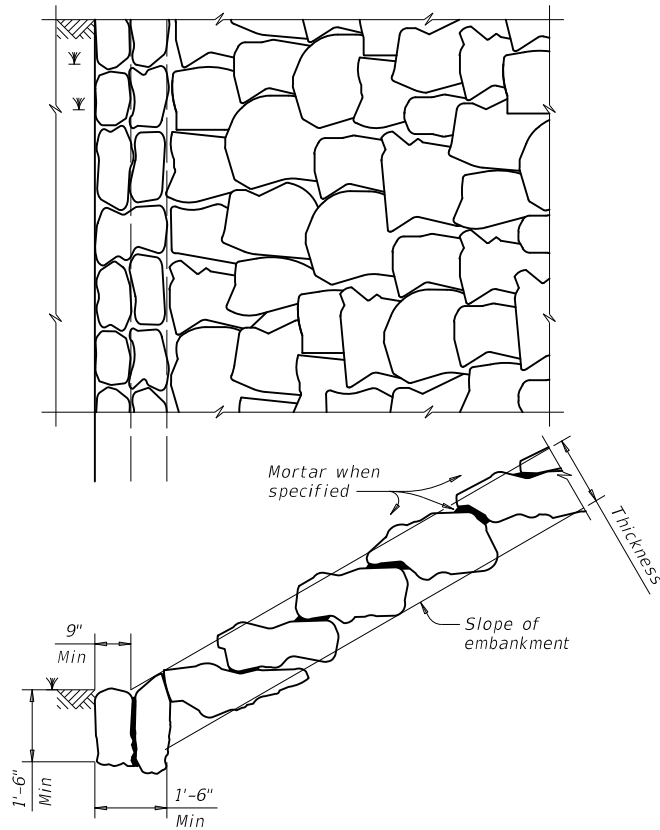


FIGURE 2 ~ TYPE F STONE RIPRAP
dry or mortared

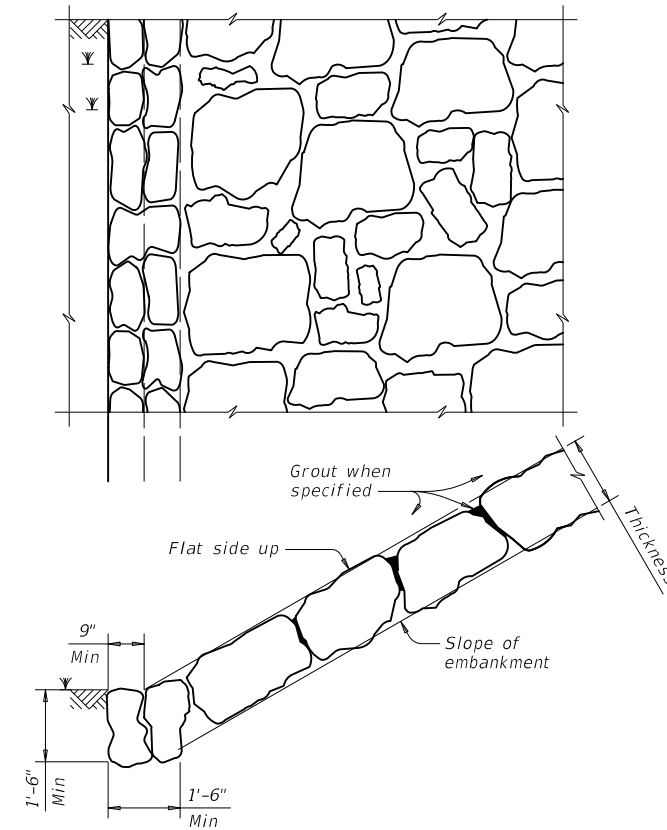
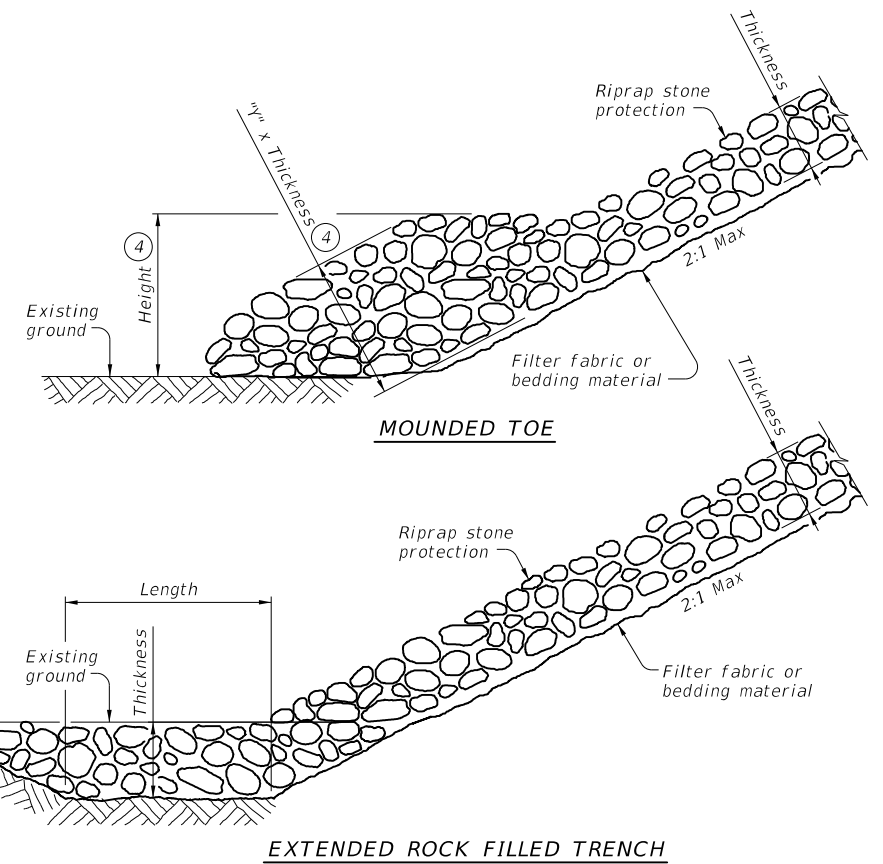


FIGURE 3 ~ TYPE F STONE RIPRAP
grouted

- 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

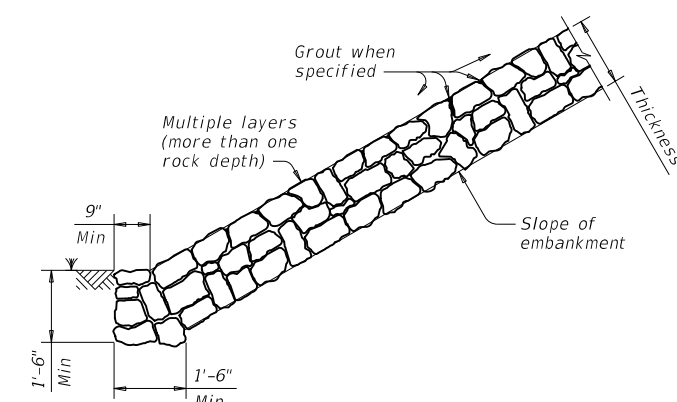
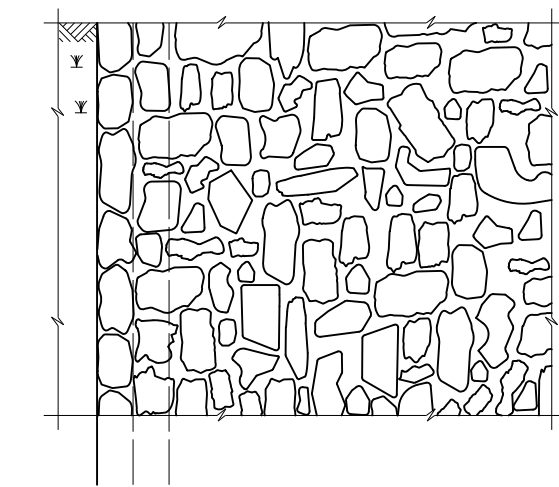


FIGURE 4 ~ COMMON STONE RIPRAP
dry or grouted

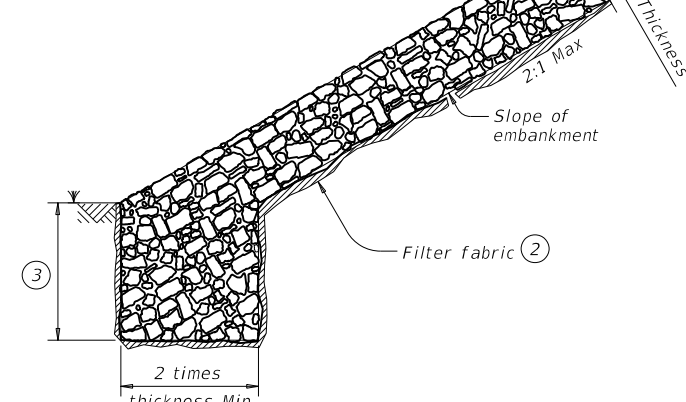
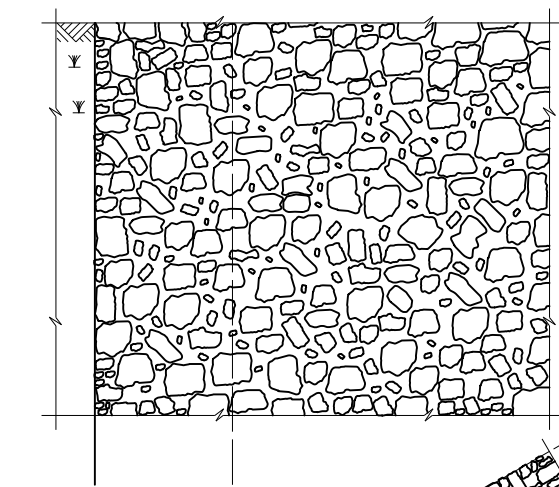


FIGURE 5 ~ PROTECTION STONE RIPRAP ⑤

STONE RIPRAP

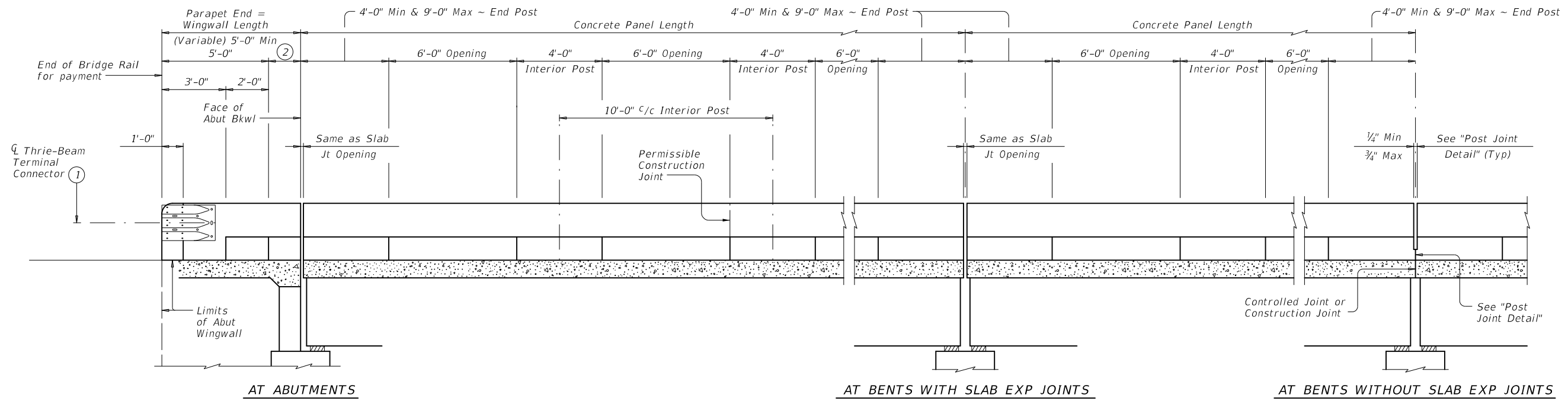
SRR

FILE: srrside1-19.dgn	DN: AES	CK: JGD	DW: BWH	CK: AES
©TxDOT April 2019	CONT	SECT	JOB	HIGHWAY
REVISIONS	0913	28	083, ETC	CR
	DIST	COUNTY	SHEET NO.	
	YKM	FAYETTE	137	

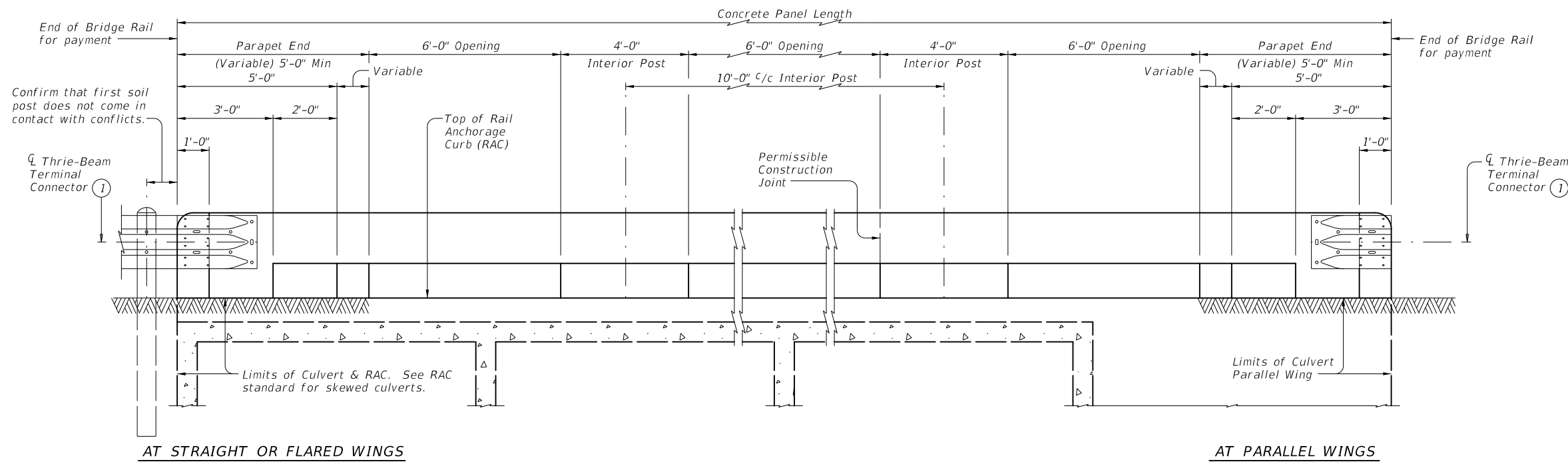
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FILE:

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DATE:
FILE:



ROADWAY ELEVATION OF RAIL ON BRIDGE



ROADWAY ELEVATION OF RAIL ON BOX CULVERTS

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

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

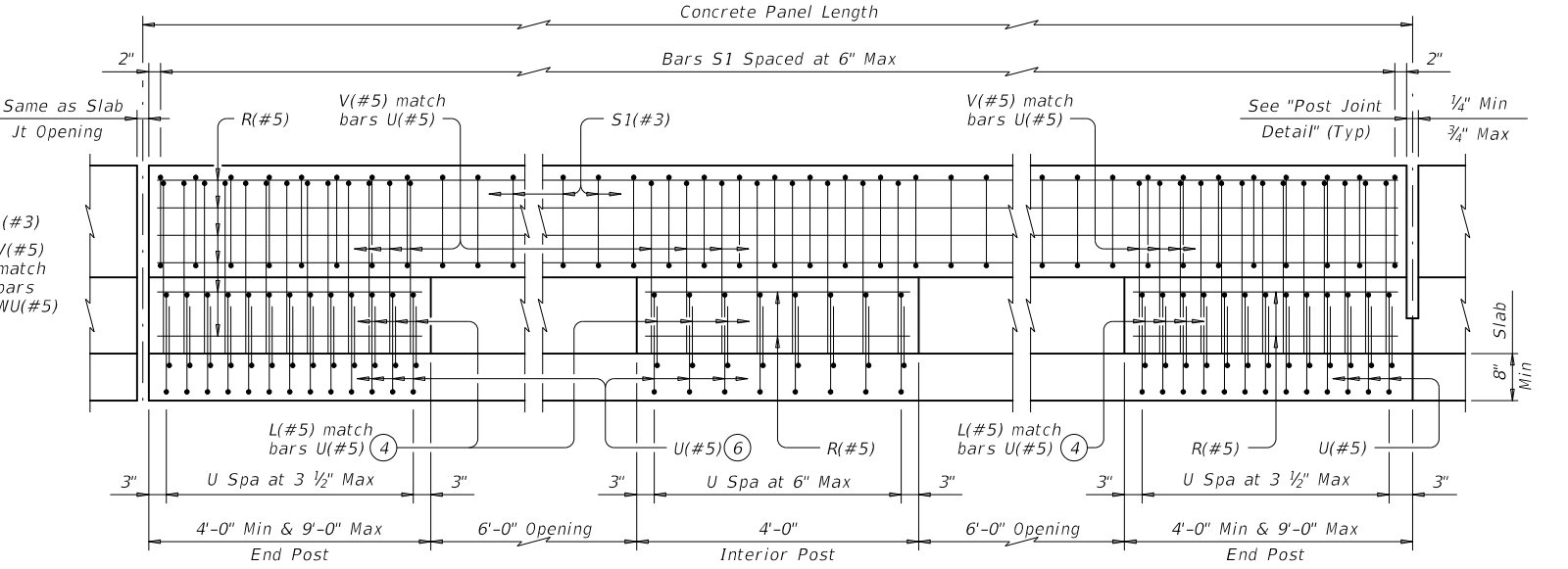
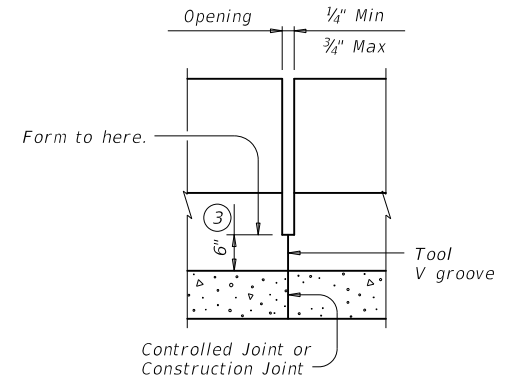
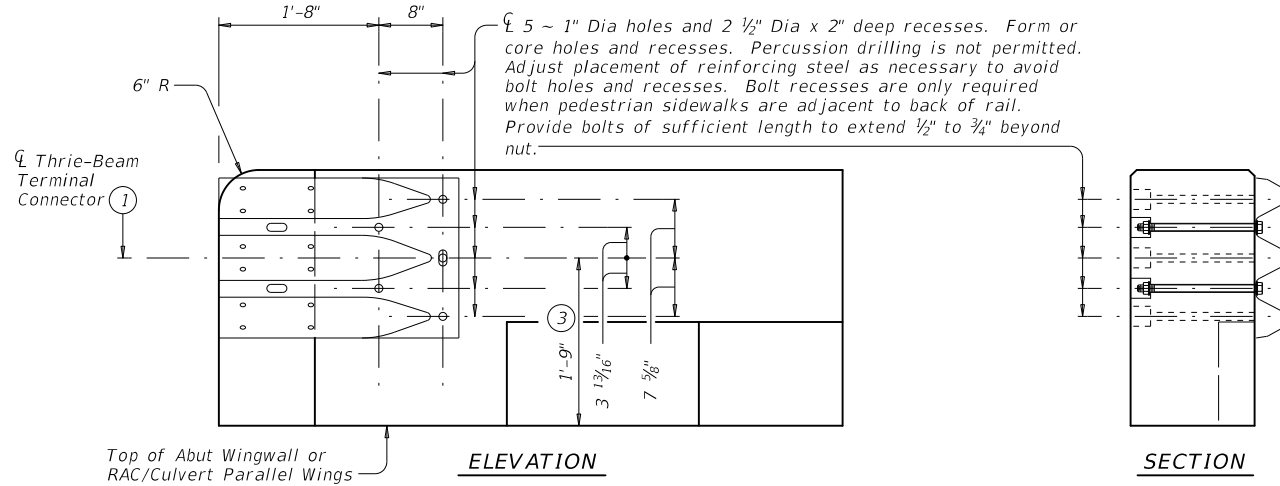
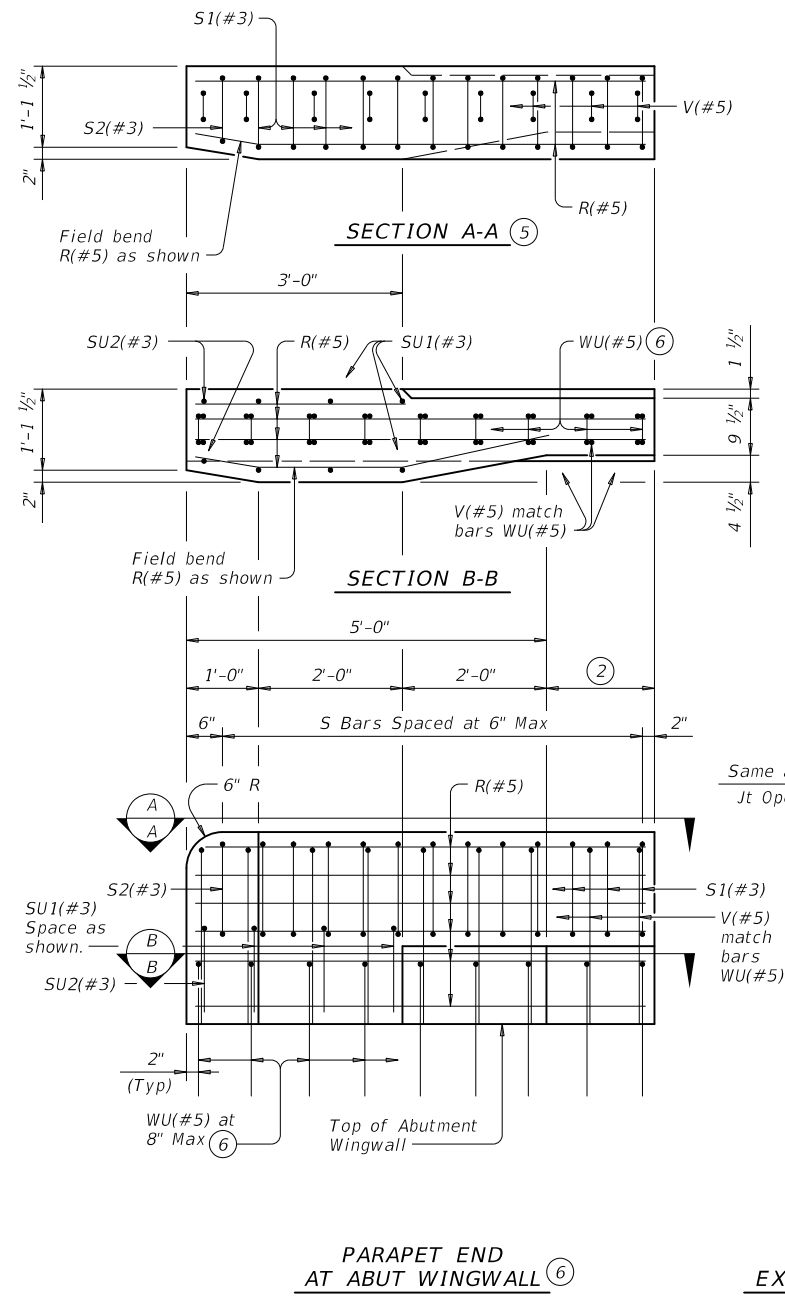
TRAFFIC RAIL

TYPE T223

FILE: r1std005-19.dgn	DN: TxDOT	CK: TxDOT	DW: JTR	CK: AES
©TxDOT September 2019	CONT	SECT	JOB	HIGHWAY
REVISIONS	0913	28	083, ETC	CR
	DIST	COUNTY	SHEET NO.	
	YKM	FAYETTE	138	

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

SHEET 2 OF 3

Texas Department of Transportation Bridge Division Standard

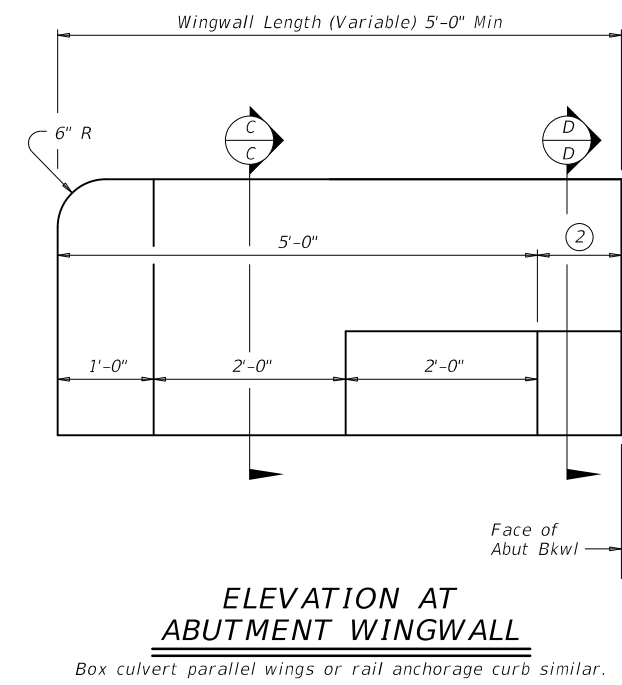
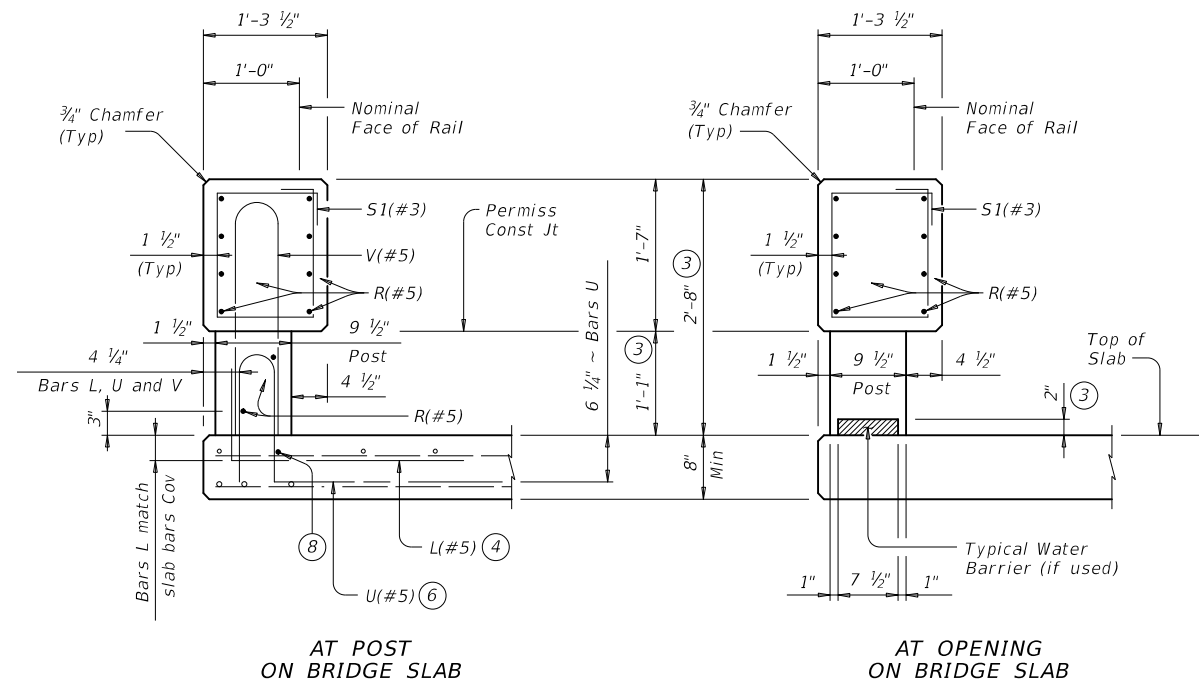
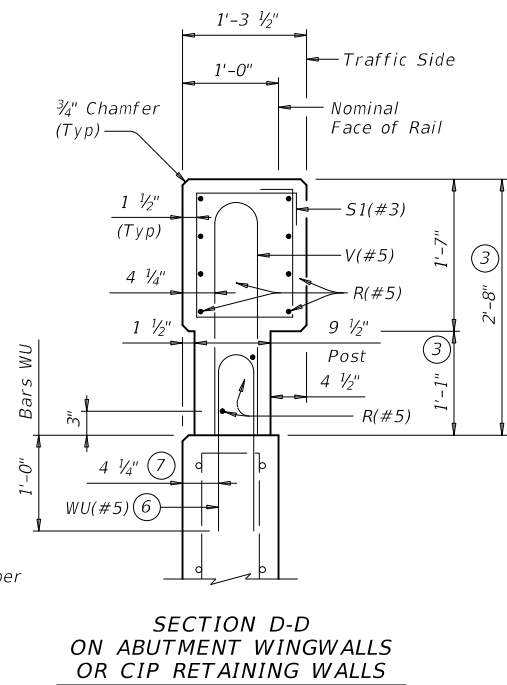
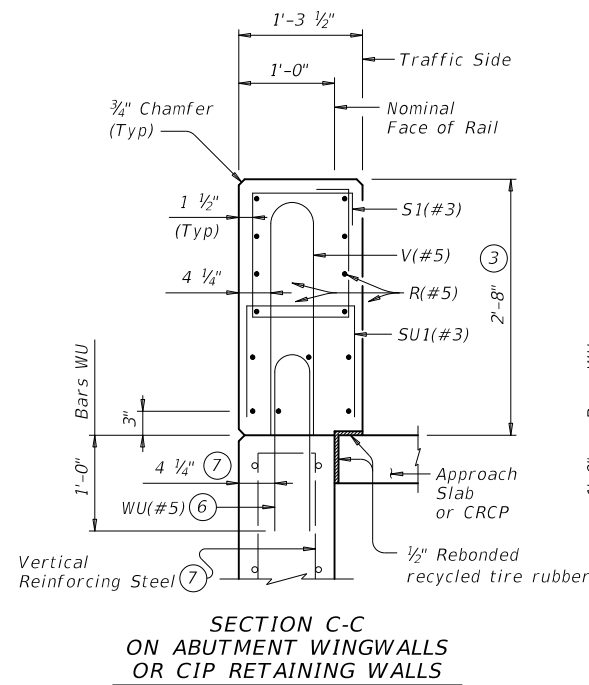
TRAFFIC RAIL

TYPE T223

FILE: r1std005-19.dgn	DN: TxDOT	CK: TxDOT	DW: JTR	CK: AES
©TxDOT September 2019	CONT	SECT	JOB	HIGHWAY
REVISIONS	0913	28	083, ETC	CR
	DIST	COUNTY	SHEET NO.	
	YKM	FAYETTE	139	

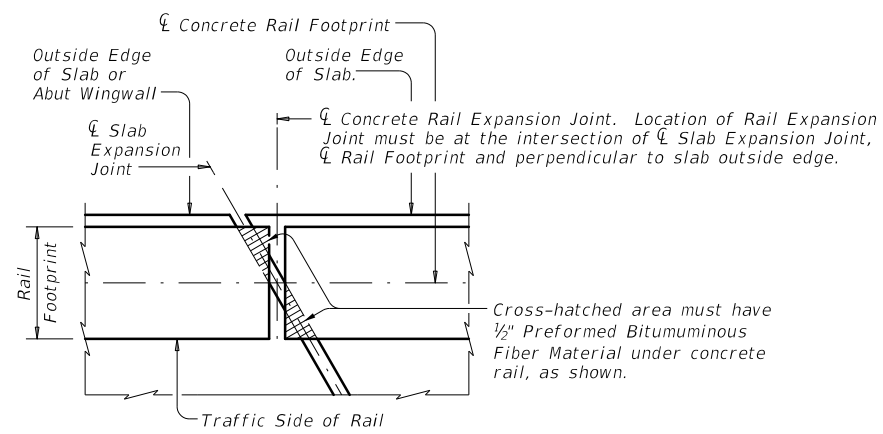
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DATE: FILE:



SECTIONS THRU RAIL
Sections on box culverts similar.

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



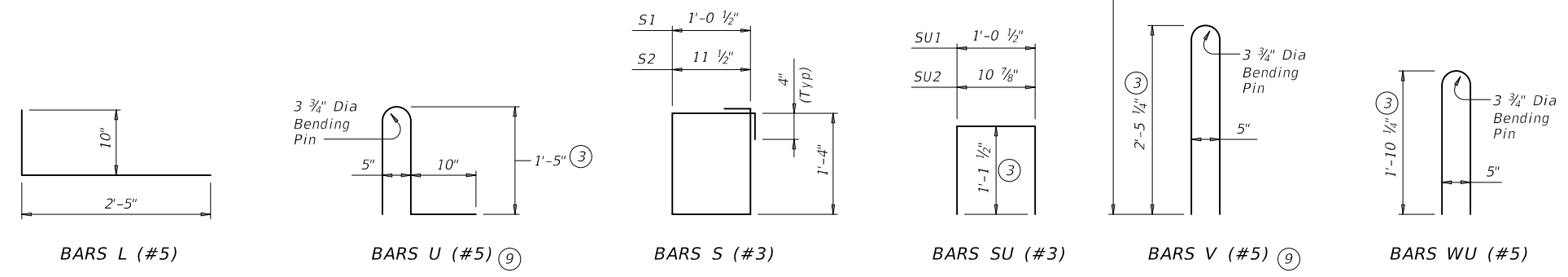
PLAN OF RAIL AT EXPANSION JOINTS
Example showing Slab Expansion Joints without breakbacks.

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

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

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

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



		Bridge Division Standard	
<h1>TRAFFIC RAIL</h1>			
<h2>TYPE T223</h2>			
FILE: r1std005-19.dgn	DN: TxDOT	CK: TxDOT	DW: JTR
©TxDOT September 2019	CONV: 0913	SECT: 28	JOB: 083, ETC
REVISIONS			CR
	DIST: YKM	COUNTY: FAYETTE	SHEET NO: 140

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DATE: FILE:

REFLECTOR UNIT SIZES FOR DELINEATORS AND OBJECT MARKERS				DELINEATORS				D & OM DESCRIPTIVE CODES	
DEVICE	SIZE 1	SIZE 2	SIZE 3	SIZE 4	SINGLE		DOUBLE		INSTL DEL ASSM (D-XX)SZ X (XXXX)XXX (XX) NUMBER OF REFLECTORS S = Single D = Double COLOR OF REFLECTORS W = White Y = Yellow R = Red REFLECTOR UNIT SIZE 1 or 2 TYPE OF POST OR DELINEATOR WC = Wing Channel Post YFLX = Yellow Flexible Post WFLX = White Flexible Post BRFL = 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
SHEETING	Yellow, White or Red Type B or C reflective sheeting				Yellow, White or Red Type B or C Reflective Sheeting				
NOTE	1. Size 1 and 4 - Direct applied reflective sheeting for use on flexible post (flx). 2. Size 2 and 3 - For use on wing channel (wc) post only. Use approved metal, plastic or fiberglass backplate with 17/64" mounting holes.				POST TYPE	WC	YFLX, WFLX	WC	YFLX, WFLX
					MOUNT TYPE	GND	GND, SRF	GND	GND, SRF

OBJECT MARKERS								D & OM DESCRIPTIVE CODES	
DEVICE	Type 1 (OM-1)	Type 2 (OM-2)			Type 3 (OM-3)			Type 4 (OM-4)	INSTL OM ASSM (OM-XX) (XXXX)XXX (XX) TYPE OF OBJECT MARKER 1, 2, 3, or 4 NUMBER OF REFLECTORS OR DIRECTION X = 3-Size 2 reflector unit (Type 2 only) Y = 1-Size 3 reflector unit (Type 2 only) Z = 3-Size 1 or 1-Size 4 reflector unit(s) (Type 2 only) L = Left Side (Type 3 Object Marker only) R = Right Side (Type 3 Object Marker only) C = Center (Type 3 Object Marker only) TYPE OF POST WC = Wing Channel Post WFLX = White Flexible Post TWT = Thin Walled Tubing TYPE OF MOUNT GND = Embedded (drivable) SRF = Surface Mount WAS = Wedge Anchor Steel WAP = Wedge Anchor Plastic DIRECTION If Required BI = Bi-Directional
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	WFLX	TWT			TWT	
MOUNT TYPE	WAS, WAP	GND	GND	GND, SRF	WAS, WAP			WAS, WAP	

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

BARRIER REFLECTORS (BRF)			CHEVRONS				ONE DIRECTION LARGE ARROW		NOTE: Delineator and object marker substrates and sign substrates shall be 0.080" Aluminum sign blank to conform to ASTM B-209 Alloy 6061-T6 or approved alternative.	
DEVICE	GF1	GF2	CTB	 W1-8				 W1-6		
	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.		SIZE (W x L)	18" x 24" (Conventional)	24" x 30" (Conventional Oversize)	30" x 36" (Expressway)	36" x 48" (Freeway)	SIZE (W x L)	48" x 24" (Conventional)	60" x 30" (Expressway & Freeway)
			MOUNTING HEIGHT	4'-0" or 7'-0"		7'-0" Only		MOUNTING HEIGHT	7'-0"	
SHEETING	Yellow, White, Red			NOTE				1. CHEVRON (W1-8) signs and ONE DIRECTION LARGE ARROW (W1-6) Signs shall be installed per Sign Mounting Details (SMD) Standard Sheets and paid under Item 644 (Small Roadside Sign Assemblies). 2. When there is a need to increase conspicuity, the Texas version of the ONE DIRECTION LARGE ARROW sign (W1-9T) may be used instead of the ONE DIRECTION LARGE ARROW (W1-6).		
NOTE	1. Reflective sheeting shall have a minimum dimension of 3 inches and minimum surface area of 9 square inches.									

Texas Department of Transportation

Traffic Safety Division Standard

DELINEATOR & OBJECT MARKER MATERIAL DESCRIPTION

D & OM(1)-20

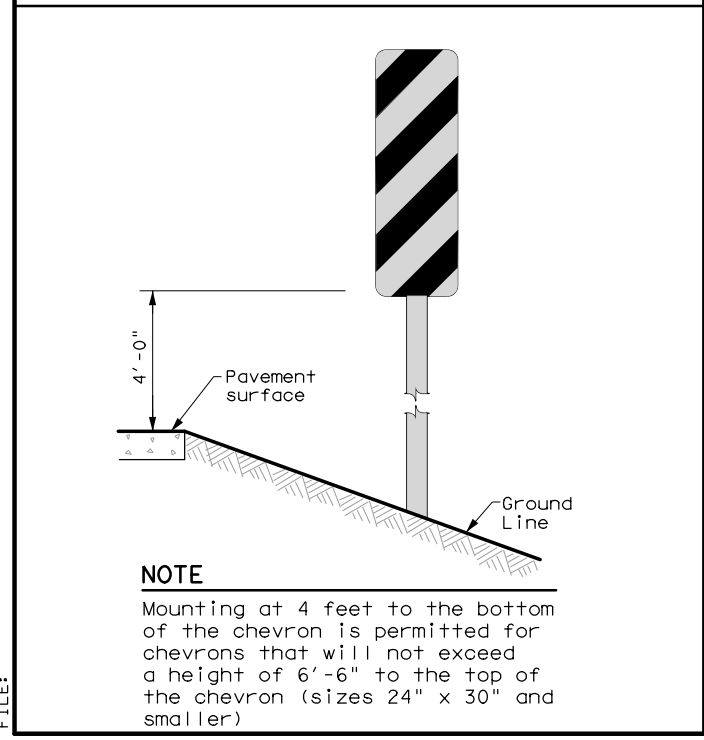
FILE: dom1-20.dgn	DN: TXDOT	CK: TXDOT	DW: TXDOT	CK: TXDOT
© TXDOT August 2004	CONT	SECT	JOB	HIGHWAY
REVISIONS	0913	28	083,ETC	CR
10-09 3-15	DIST	COUNTY		SHEET NO.
4-10 7-20	YKM	FAYETTE		141

20A

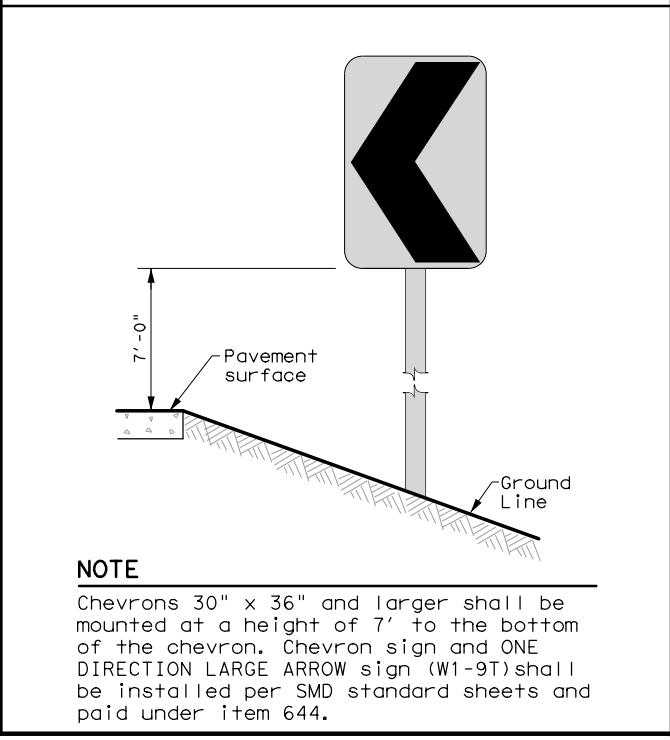
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POST TYPE AND SUPPORT FOUNDATION DETAILS				TYPE OF BARRIER MOUNTS	
WING CHANNEL (WC)	FLEXIBLE POSTS (YFLX, WFLX)		WEDGE ANCHOR SYSTEMS		GUARD FENCE ATTACHMENT
GND	GND	SRF	WAS	WAP	GF1
	EMBEDDED		SURFACE MOUNT	STEEL	PLASTIC
NOTES 1. Embedded Wing Channel (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.	NOTES 1. See "Flexible Delineator and Object Marker Posts" Material Producer List for approved devices. 2. Install per manufacturer's recommendations. 3. Post length may vary to meet field conditions. 4. When using yellow delineators with flexible posts to separate opposing direction of travel, such as centerline or median use, the flexible posts shall be yellow.		NOTE 1. Install per manufacturer's recommendations.		
CONCRETE TRAFFIC BARRIER (CTB)					
GENERAL NOTES					
1. Place delineators on a section of roadway at a consistent distance from the edge of pavement. 2. Where a restriction prevents consistent placement from the pavement edge, place the affected object markers in line with the innermost edge of the obstruction. 3. When Type 2 object markers and delineators are more than 8'-0" from the edge of the pavement, it may not be possible to maintain a height of approximately 4'-0". If this is the case, place the object marker or delineator as close to the desired height as possible. 4. Install all delineators, object markers and barrier reflectors in accordance with the manufacturer's recommendation. 5. Barrier reflectors should be installed a minimum of 18 inches above the edge of the pavement surface. 6. Diagonal stripes on Type 3 object markers shall slope down toward the intended travel lane.					

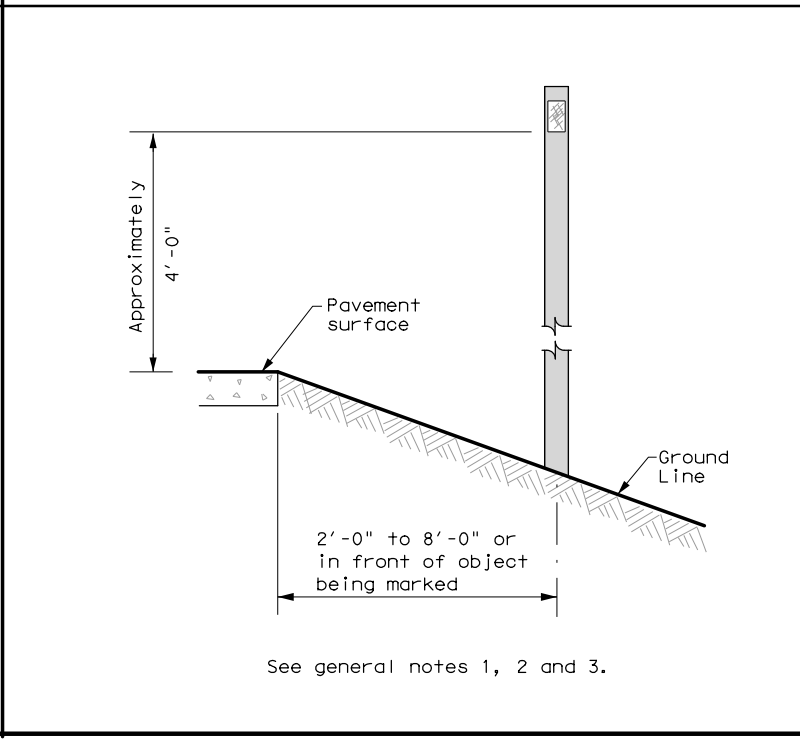
TYPES 1,3, AND 4 OBJECT MARKERS AND CHEVRONS



CHEVRONS AND ONE DIRECTION LARGE ARROW SIGN



DELINEATORS AND TYPE 2 OBJECT MARKERS



Texas Department of Transportation

Traffic Safety Division Standard

DELINEATOR & OBJECT MARKER INSTALLATION

D & OM(2)-20

FILE: dom2-20.dgn	DN: TxDOT	CK: TxDOT	DW: TxDOT	CK: TxDOT
© TxDOT August 2004	CONT	SECT	JOB	HIGHWAY
REVISIONS	0913	28	083,ETC	CR
10-09 3-15	DIST	COUNTY	SHEET NO.	
4-10 7-20	YKM	FAYETTE	142	

20B

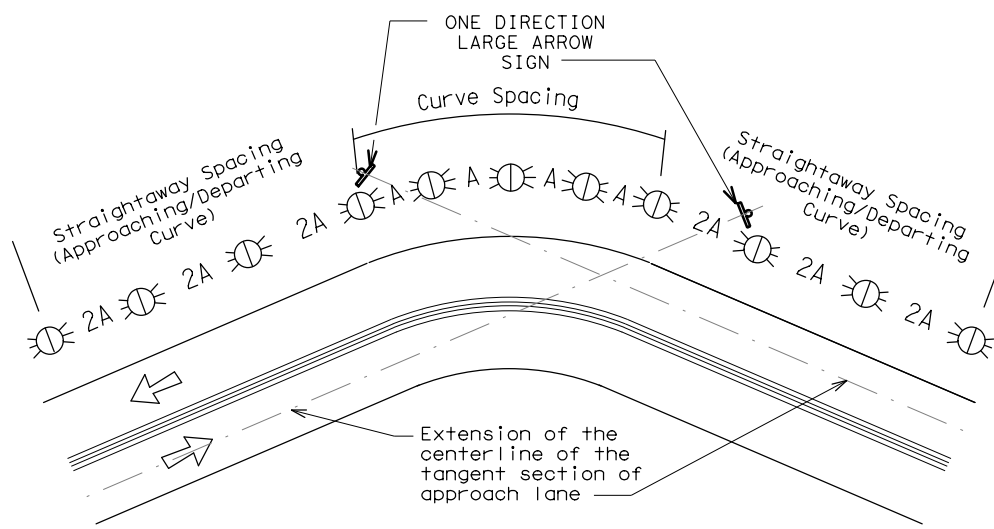
DATE: FILE:

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MINIMUM WARNING DEVICES AT CURVES WITH ADVISORY SPEEDS

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

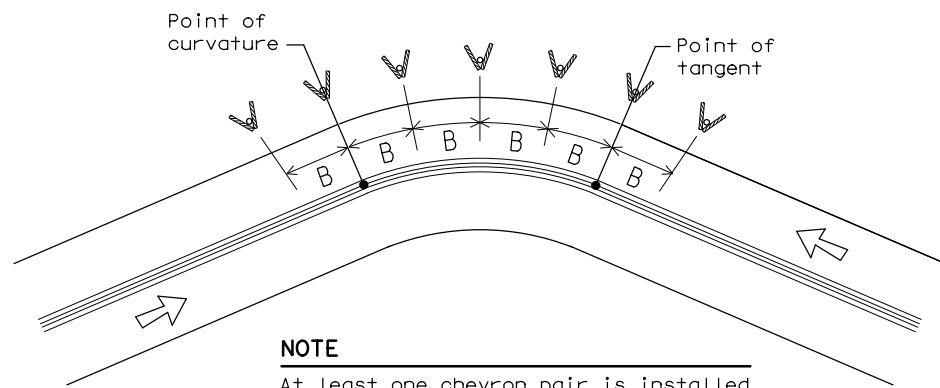
SUGGESTED SPACING FOR DELINEATORS ON HORIZONTAL CURVES



NOTE

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

SUGGESTED SPACING FOR CHEVRONS ON HORIZONTAL CURVES



NOTE

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

DELINEATOR AND CHEVRON SPACING

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

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

DELINEATOR AND CHEVRON SPACING

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

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

DELINEATOR AND OBJECT MARKER APPLICATION AND SPACING

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

NOTES

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

LEGEND	
	Bi-directional Delineator
	Delineator
	Sign



DELINEATOR & OBJECT MARKER PLACEMENT DETAILS

D & OM(3)-20

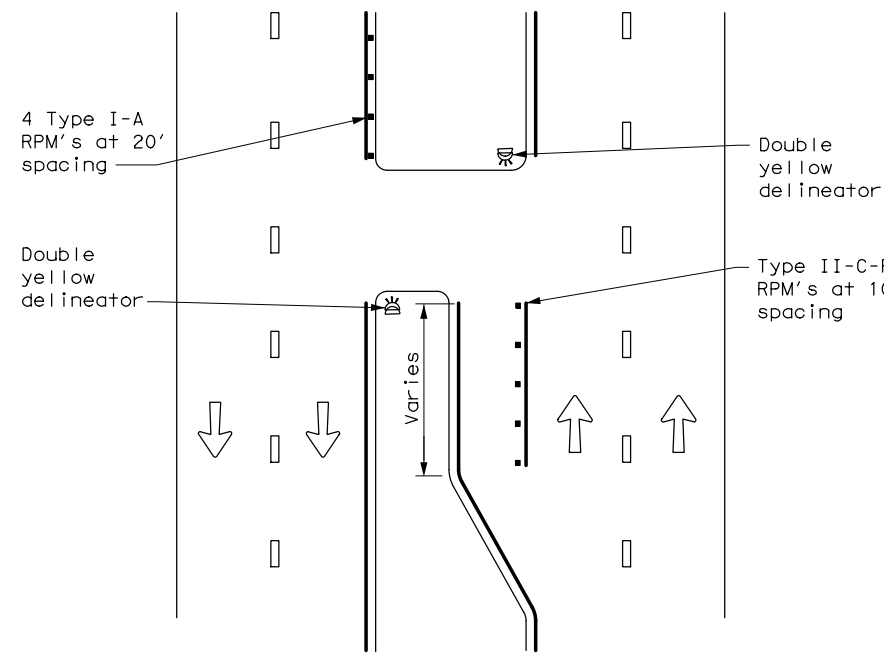
FILE: dom3-20.dgn	DN: TxDOT	CK: TxDOT	DW: TxDOT	CR: TxDOT
© TxDOT August 2004	CONT	SECT	JOB	HIGHWAY
REVISIONS	0913	28	083,ETC	CR
3-15 8-15	DIST	COUNTY	SHEET NO.	
8-15 7-20	YKM	FAYETTE	143	

DATE:
FILE:

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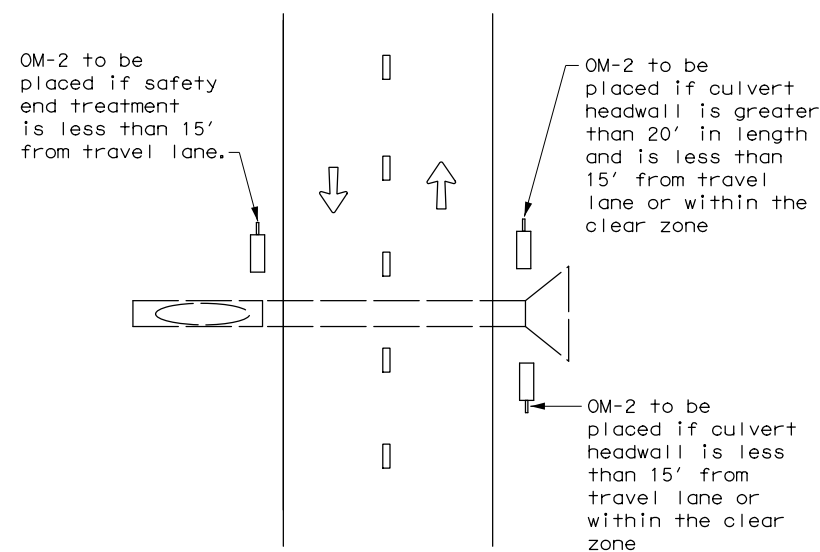
DATE:
FILE:

CROSSOVERS



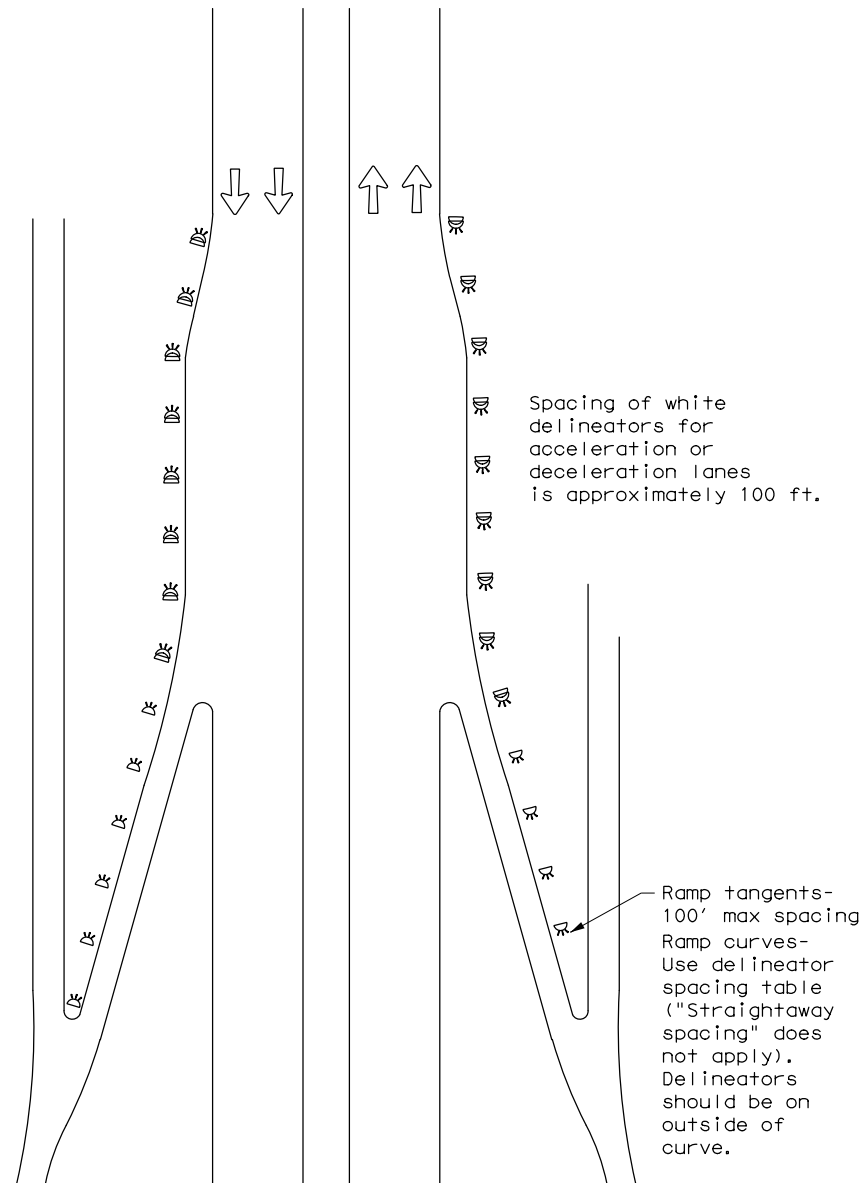
DETAIL 1

FOR CULVERTS WITHOUT MBGF



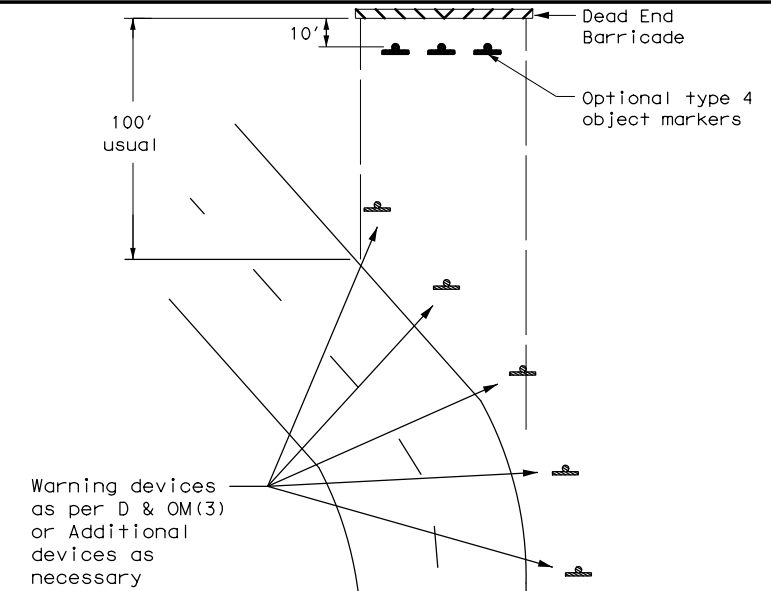
DETAIL 2

FREEWAY DELINEATION FOR RAMPS AND ACCELERATION/DECELERATION LANES



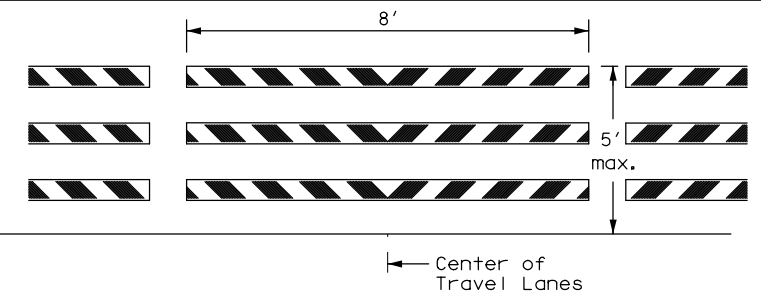
DETAIL 3

TYPICAL APPLICATION OF DEAD END BARRICADE



DETAIL 4

TYPICAL DEAD END BARRICADE INSTALLATION



NOTES

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

DETAIL 5

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

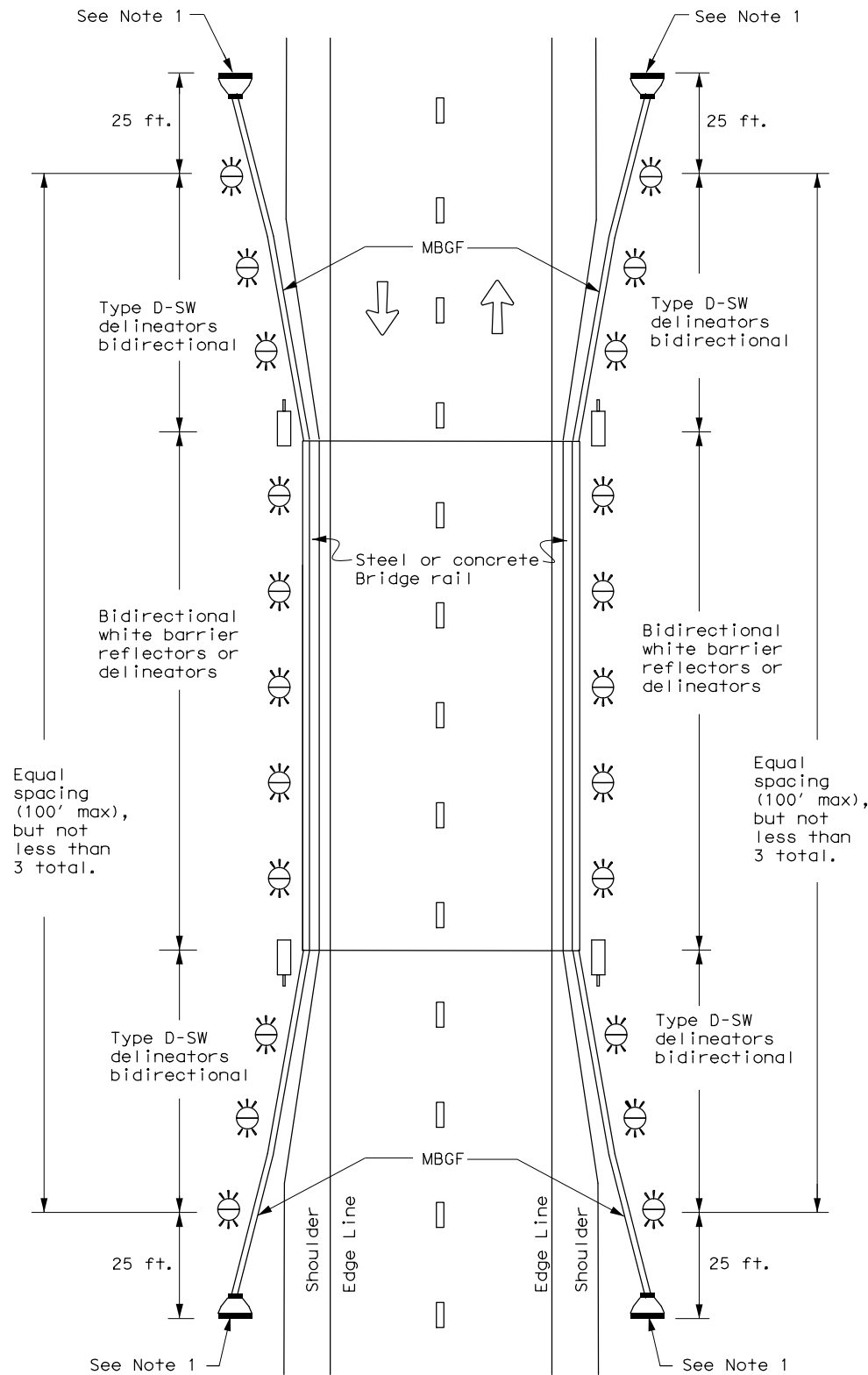


DELINEATOR & OBJECT MARKER PLACEMENT DETAILS

D & OM(4)-20

FILE: dom4-20.dgn	DN: TXDOT	CK: TXDOT	DW: TXDOT	CK: TXDOT
© TXDOT August 2004	CONT	SECT	JOB	HIGHWAY
REVISIONS	0913	28	083,ETC	CR
3-15	DIST	COUNTY	SHEET NO.	
7-20	YKM	FAYETTE	144	

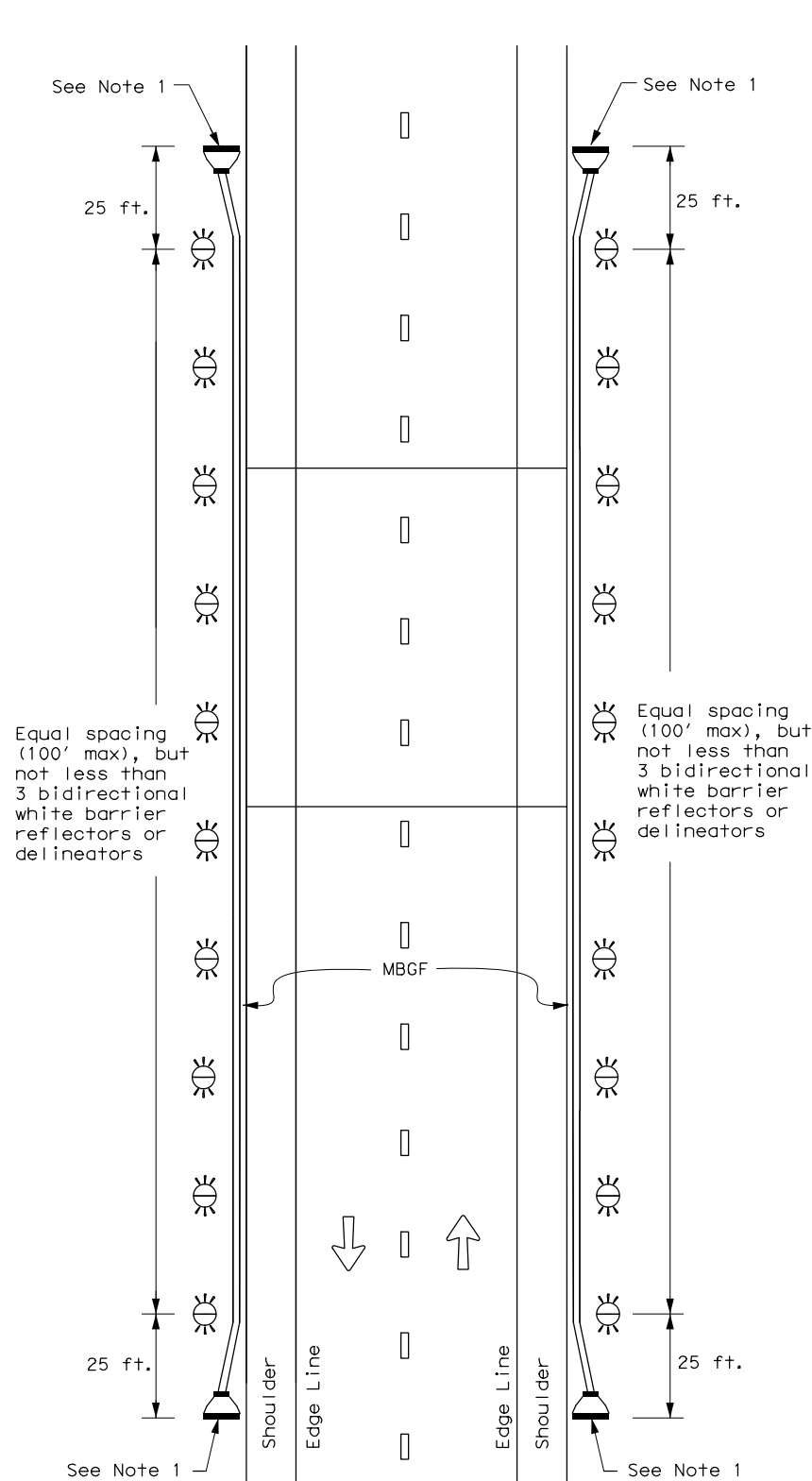
**TWO-WAY, TWO LANE ROADWAY
WITH REDUCED WIDTH APPROACH RAIL**



NOTE:

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

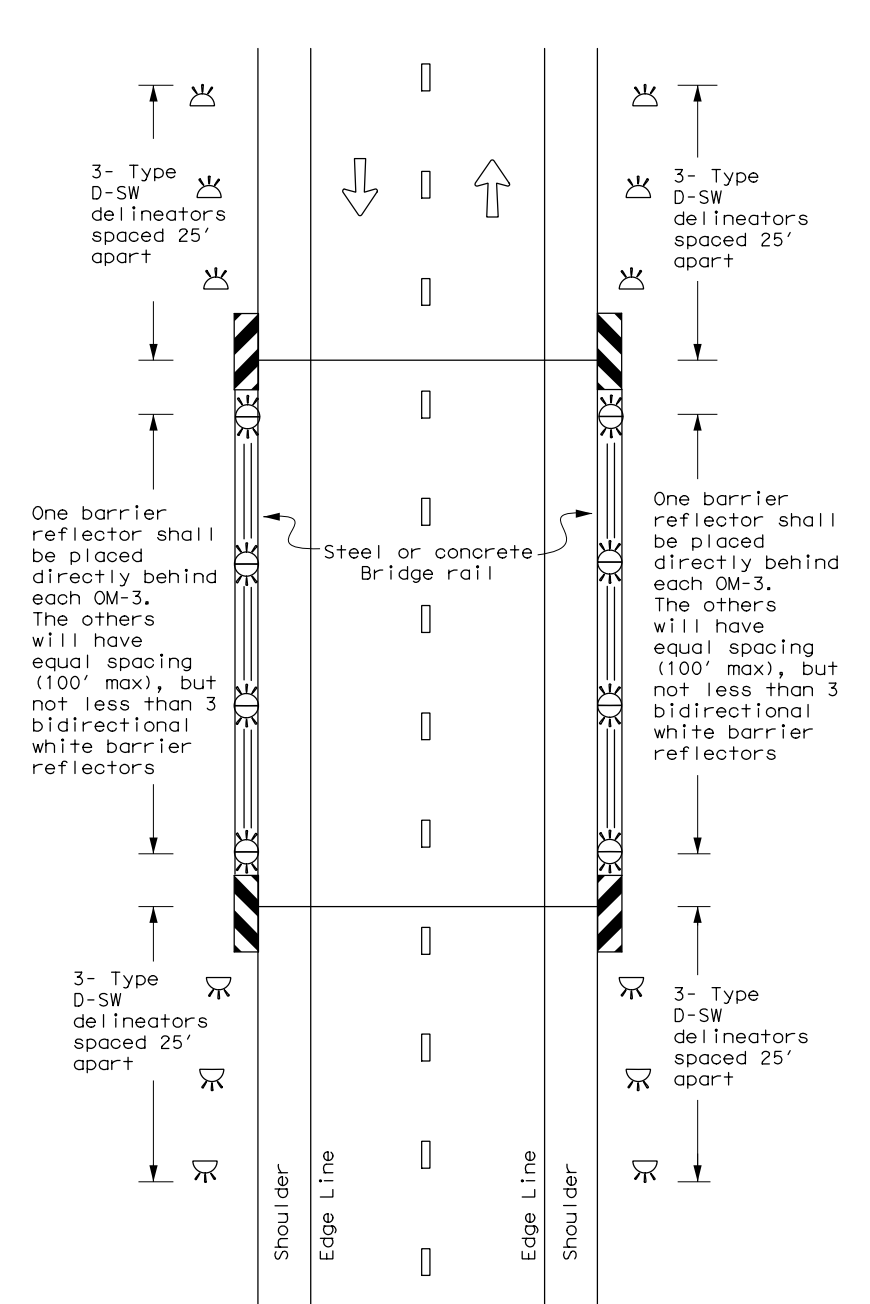
**TWO-WAY, TWO LANE ROADWAY
WITH METAL BEAM GUARD FENCE (MBGF)**



NOTE:

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

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



LEGEND

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



Traffic Safety Division Standard

**DELINEATOR &
OBJECT MARKER
PLACEMENT DETAILS**

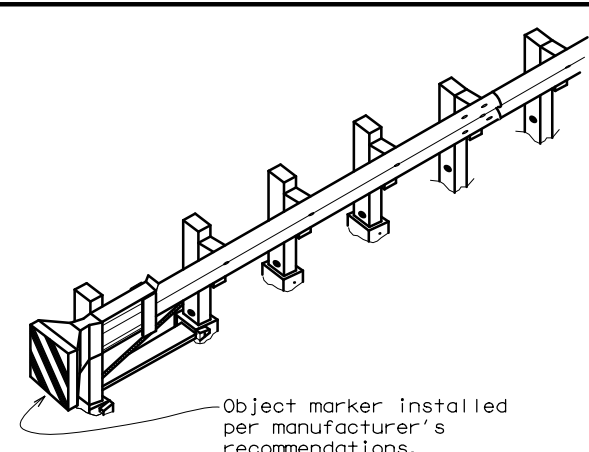
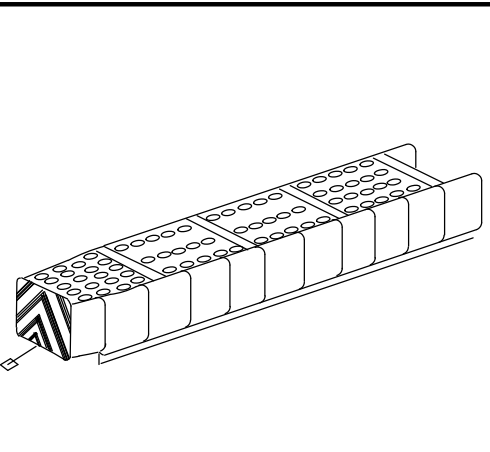
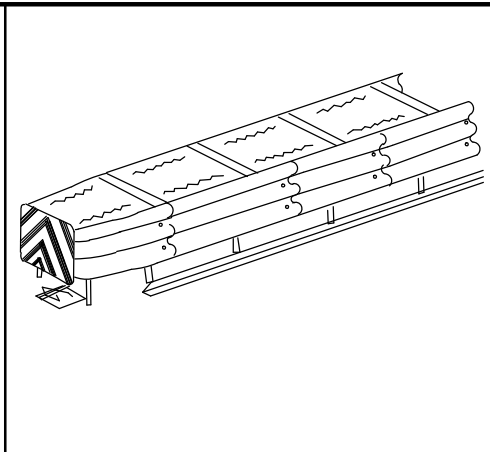
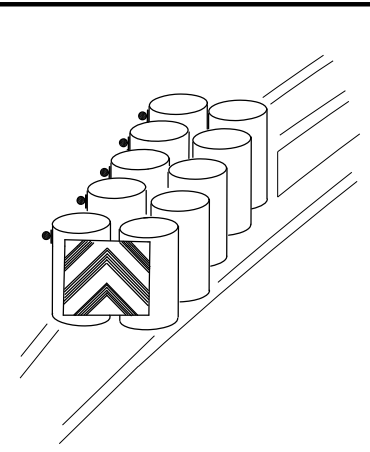
D & OM(5)-20

FILE: dom5-20.dgn	DN: TxDOT	CK: TxDOT	DW: TxDOT	CK: TxDOT
© TxDOT August 2015	CON: 0913	SECT: 28	JOB: 083,ETC	HIGHWAY: CR
7-20	DIST: YKM	COUNTY: FAYETTE	SHEET NO. 145	

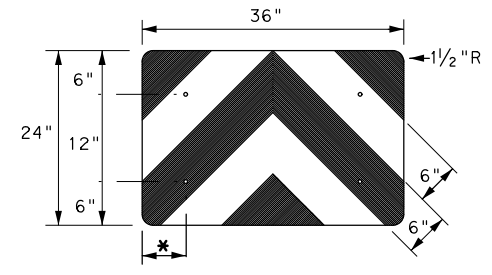
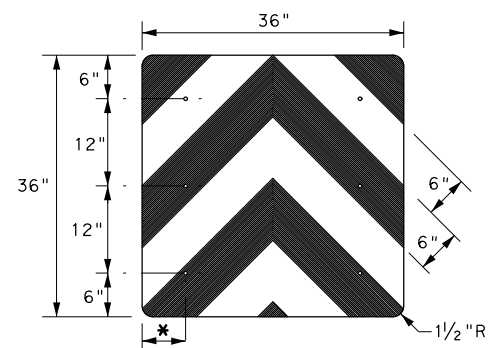
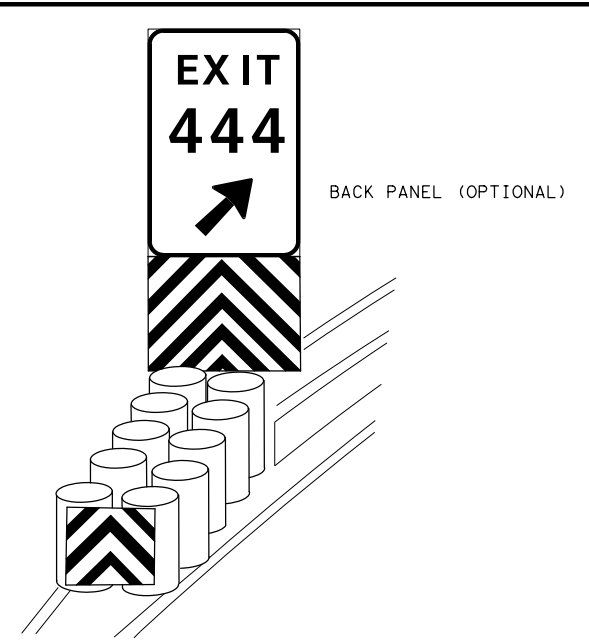
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DATE:
FILE:

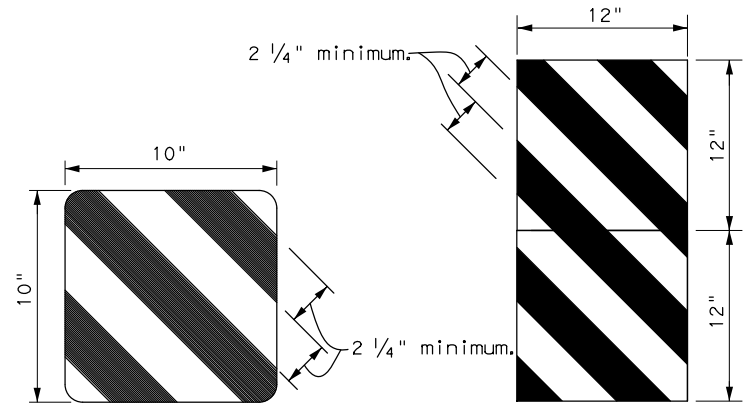
DISCLAIMER: The use of this standard is governed by the "Texas Engineering Practice Act". No warranty of any kind is made by TxDOT for any purpose whatsoever. TxDOT assumes no responsibility for the conversion of this standard to other formats or for incorrect results or damages resulting from its use.



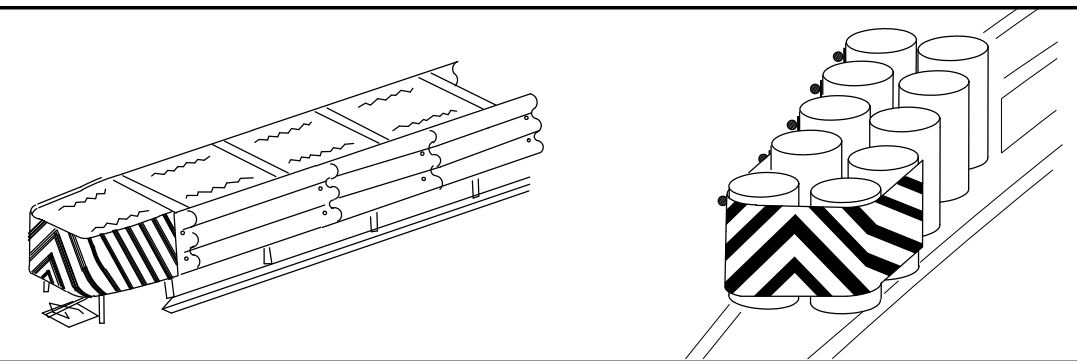
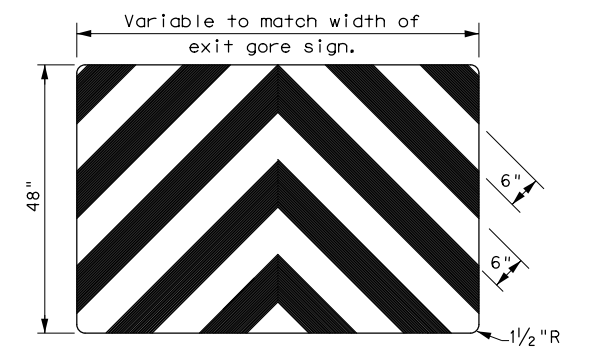
Object marker installed per manufacturer's recommendations.



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



OBJECT MARKERS SMALLER THAN 3 FT²

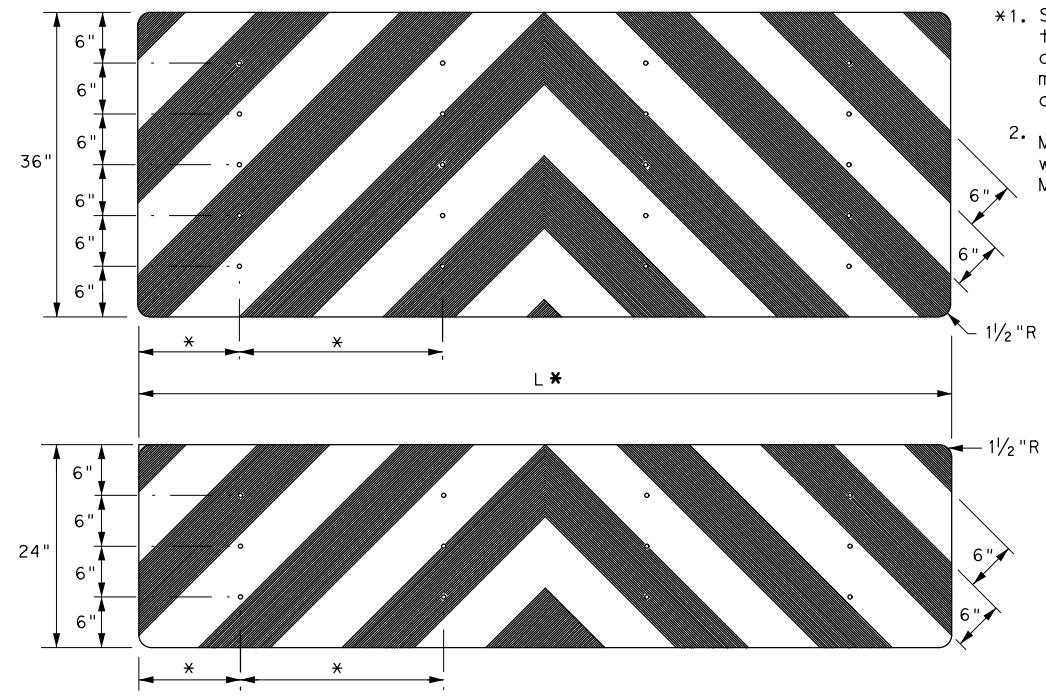


NOTES

- 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.
- 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.
- 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".
- 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.
- Object Marker at nose of attenuator is subsidiary to the attenuator.
- See D & OM (1-4) for required barrier reflectors.

NOTES

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



DATE:
FILE:

<p>DELINEATOR & OBJECT MARKER FOR VEHICLE IMPACT ATTENUATORS</p> <p>D & OM(VIA)-20</p>			
FILE: domvia20.dgn	DN: TxDOT	CK: TxDOT	DW: TxDOT
© TxDOT December 1989	CONT	SECT	JOB
REVISIONS		0913	28
4-92 8-04	DIST	COUNTY	SHEET NO.
8-95 3-15	YKM	FAYETTE	146
4-98 7-20			
20G			

STORMWATER POLLUTION PREVENTION PLAN (SWP3):

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

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

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

1.0 SITE/PROJECT DESCRIPTION

1.1 PROJECT CONTROL SECTION JOB (CSJ):
0913-28-083

1.2 PROJECT LIMITS:
From: AT BUSBY BRANCH

To: STR# AA01-14-001

1.3 PROJECT COORDINATES:

BEGIN: (Lat) 29.8611° (N) , (Long) 97.0942° (W)

END: (Lat) 29.8611° (N) , (Long) 97.0942° (W)

1.4 TOTAL PROJECT AREA (Acres): 0.41

1.5 TOTAL AREA TO BE DISTURBED (Acres): 0.36

1.6 NATURE OF CONSTRUCTION ACTIVITY:
FOR THE CONSTRUCTION OF BRIDGE REPLACEMENT
CONSISTING OF REPLACE BRIDGE AND APPROACHES

1.7 MAJOR SOIL TYPES:

Soil Type	Description
Uhland Clay Loam, Frequently flooded, 0 to 1% slopes	98% Clay, moderately well drained, low runoff class
Chazos loamy fine sand, 1 to 3% slopes	85% Sand, moderately well drained, high runoff class

1.8 PROJECT SPECIFIC LOCATIONS (PSLs):

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

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

Type	Sheet #s

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

1.9 CONSTRUCTION ACTIVITIES:

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

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

- Other: _____
- Other: _____
- Other: _____

1.10 POTENTIAL POLLUTANTS AND SOURCES:

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

1.11 RECEIVING WATERS:

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

Tributaries	Classified Waterbody
Busby Branch, Buckner Creek (1402C)	Colorado River Below La Grange (1402)

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

1.12 ROLES AND RESPONSIBILITIES: TxDOT

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

1.13 ROLES AND RESPONSIBILITIES: CONTRACTOR

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

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



FED. RD. DIV. NO.	PROJECT NO.			SHEET NO.
6				147
STATE	STATE DESG.	COUNTY		
TEXAS	YKM	FAYETTE		
CONT.	SECT.	JOB	HIGHWAY NO.	
0913	28	083,ETC	CR	

STORMWATER POLLUTION PREVENTION PLAN (SWP3):

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

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

2.1 EROSION CONTROL AND SOIL STABILIZATION BMPs:

T / P

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

2.2 SEDIMENT CONTROL BMPs:

T / P

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

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

2.3 PERMANENT CONTROLS:

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

BMPs To Be Left In Place Post Construction:

Type	Stationing	
	From	To
NO PERMANENT CONTROLS ARE PLANNED		

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

2.4 OFFSITE VEHICLE TRACKING CONTROLS:

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

2.5 POLLUTION PREVENTION MEASURES:

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

2.6 VEGETATED BUFFER ZONES:

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

Type	Stationing	
	From	To

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

2.7 ALLOWABLE NON-STORMWATER DISCHARGES:

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

2.8 INSPECTIONS:

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

2.9 MAINTENANCE:

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

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



FED. RD. DIV. NO.	PROJECT NO.			SHEET NO.
6				148
STATE	STATE DIST.	COUNTY		
TEXAS	YKM	FAYETTE		
CONT.	SECT.	JOB	HIGHWAY NO.	
0913	28	083,ETC	CR	

STORMWATER POLLUTION PREVENTION PLAN (SWP3):

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

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

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

1.0 SITE/PROJECT DESCRIPTION

1.1 PROJECT CONTROL SECTION JOB (CSJ):
0913-28-068

1.2 PROJECT LIMITS:

From: WALLACE RD AT BUCKNERS CREEK
To: _____

1.3 PROJECT COORDINATES:

BEGIN: (Lat) 29.8392 (N) _____, (Long) 97.0959 (W) _____
END: (Lat) 29.8381 (N) _____, (Long) 97.0960 (W) _____

1.4 TOTAL PROJECT AREA (Acres): 0.59

1.5 TOTAL AREA TO BE DISTURBED (Acres): 0.59

1.6 NATURE OF CONSTRUCTION ACTIVITY:
FOR THE CONSTRUCTION OF BRIDGE REPLACEMENT
CONSISTING OF REPLACE BRIDGE AND APPROACHES

1.7 MAJOR SOIL TYPES:

Soil Type	Description
EDGE GRAVELLY FINE SANDY LAOM, 5-12% SLOPES, ERODED	WELL DRAINED, VERY HIGH RUNOFF CLASS
UHLAND CLAY LOAM, FREQUENTLY FLOODED	MODERATELY WELL DRAINED, LOW RUNOFF CLASS

1.8 PROJECT SPECIFIC LOCATIONS (PSLs):

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

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

Type	Sheet #s

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

1.9 CONSTRUCTION ACTIVITIES:

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

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

Other: _____

 Other: _____

 Other: _____

1.10 POTENTIAL POLLUTANTS AND SOURCES:

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

 Other: _____

 Other: _____

1.11 RECEIVING WATERS:

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

Tributaries	Classified Waterbody
	BUCKNERS CREEK (1402C)
	COLORADO RIVER BELOW LAGRANGE (1402)
	COLORADO RIVER TIDAL (1401)

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

1.12 ROLES AND RESPONSIBILITIES: TxDOT

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

- Other: _____

1.13 ROLES AND RESPONSIBILITIES: CONTRACTOR

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

- Other: _____

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



Sheet 1 of 2

FED. RD. DIV. NO.	PROJECT NO.			SHEET NO.
6				149
STATE	STATE DESG.	COUNTY		
TEXAS	YKM	FAYETTE		
CONT.	SECT.	JOB	HIGHWAY NO.	
0913	28	078, ETC.	CR	

STORMWATER POLLUTION PREVENTION PLAN (SWP3):

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

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

2.1 EROSION CONTROL AND SOIL STABILIZATION BMPs:

T / P

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

2.2 SEDIMENT CONTROL BMPs:

T / P

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

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

2.3 PERMANENT CONTROLS:

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

BMPs To Be Left In Place Post Construction:

Type	Stationing	
	From	To
NO PERMANENT CONTROLS ARE PLANNED		

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

2.4 OFFSITE VEHICLE TRACKING CONTROLS:

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

2.5 POLLUTION PREVENTION MEASURES:

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

2.6 VEGETATED BUFFER ZONES:

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

Type	Stationing	
	From	To

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

2.7 ALLOWABLE NON-STORMWATER DISCHARGES:

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

2.8 INSPECTIONS:

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

2.9 MAINTENANCE:

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

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



FED. RD. DIV. NO.	PROJECT NO.		SHEET NO.
6			150
STATE	STATE DIST.	COUNTY	
TEXAS	YKM	FAYETTE	
CONT.	SECT.	JOB	HIGHWAY NO.
0913	28	078, ETC.	CR

STORMWATER POLLUTION PREVENTION PLAN (SWP3):

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

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

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

1.0 SITE/PROJECT DESCRIPTION

1.1 PROJECT CONTROL SECTION JOB (CSJ):

0913-28-085

1.2 PROJECT LIMITS: N. Old Smithville Road

From: Station 12+69.00

To: Station 16+36.00

1.3 PROJECT COORDINATES:

BEGIN: (Lat) 29° 51' 32.05" (Long) -97° 07' 53.01"

END: (Lat) 29° 51' 35.41" (Long) -97° 07' 51.49"

1.4 TOTAL PROJECT AREA (Acres): 0.48

1.5 TOTAL AREA TO BE DISTURBED (Acres): 0.48

1.6 NATURE OF CONSTRUCTION ACTIVITY:

Construction of the replacement of existing bridge.

1.7 MAJOR SOIL TYPES:

Soil Type	Description
Sandy Clay	The existing soils are moist sandy clay soils that frequently flood.

1.8 PROJECT SPECIFIC LOCATIONS (PSLs):

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

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

Type	Sheet #s

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

1.9 CONSTRUCTION ACTIVITIES:

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

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

- Other: _____
- Other: _____
- Other: _____

1.10 POTENTIAL POLLUTANTS AND SOURCES:

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

- Other: _____
- Other: _____
- Other: _____

1.11 RECEIVING WATERS:

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

Tributaries	Classified Waterbody
Buckners Creek	Colorado River, Below La Grange (Segment #1402) Colorado River Tidal (Segment #1401)

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

1.12 ROLES AND RESPONSIBILITIES: TxDOT

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

1.13 ROLES AND RESPONSIBILITIES: CONTRACTOR

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

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



FED. RD. DIV. NO.	PROJECT NO.			SHEET NO.
6				151
STATE	STATE DIST.	COUNTY		
TEXAS	YKM	FAYETTE		
CONT.	SECT.	JOB	HIGHWAY NO.	
0913	28	083, ETC.	CR	

STORMWATER POLLUTION PREVENTION PLAN (SWP3):

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

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

2.1 EROSION CONTROL AND SOIL STABILIZATION BMPs:

T / P

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

2.2 SEDIMENT CONTROL BMPs:

T / P

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

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

2.3 PERMANENT CONTROLS:

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

BMPs To Be Left In Place Post Construction:

Type	Stationing	
	From	To
Broadcast Seed	12+69.00	16+36.00

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

2.4 OFFSITE VEHICLE TRACKING CONTROLS:

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

2.5 POLLUTION PREVENTION MEASURES:

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

2.6 VEGETATED BUFFER ZONES:

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

Type	Stationing	
	From	To

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

2.7 ALLOWABLE NON-STORMWATER DISCHARGES:

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

2.8 INSPECTIONS:

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

2.9 MAINTENANCE:

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

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

FED. RD. DIV. NO.	PROJECT NO.			SHEET NO.
6				152
STATE	STATE DIST.	COUNTY		
TEXAS	YKM	FAYETTE		
CONT.	SECT.	JOB	HIGHWAY NO.	
0913	28	083, ETC.	CR	

STORMWATER POLLUTION PREVENTION PLAN (SWP3):

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

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

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

1.0 SITE/PROJECT DESCRIPTION

1.1 PROJECT CONTROL SECTION JOB (CSJ):

0913-28-086

1.2 PROJECT LIMITS: S. Old Smithville Road

From: Station 11+65.00

To: Station 15+30.00

1.3 PROJECT COORDINATES:

BEGIN: (Lat) 29° 49' 03.14" , (Long) -97° 08' 17.67"

END: (Lat) 29° 49' 06.74" , (Long) -97° 08' 17.37"

1.4 TOTAL PROJECT AREA (Acres): 0.51

1.5 TOTAL AREA TO BE DISTURBED (Acres): 0.51

1.6 NATURE OF CONSTRUCTION ACTIVITY:

Construction of the replacement of existing bridge.

1.7 MAJOR SOIL TYPES:

Soil Type	Description
Sandy Clay	The existing soils are moist sandy clays and sandy clay loams that frequently flood.
Sandy Clay Loam	The existing soils are moist sandy clays and sandy clay loams that frequently flood.

1.8 PROJECT SPECIFIC LOCATIONS (PSLs):

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

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

Type	Sheet #s

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

1.9 CONSTRUCTION ACTIVITIES:

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

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

Other: _____

Other: _____

Other: _____

1.10 POTENTIAL POLLUTANTS AND SOURCES:

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

Other: _____

Other: _____

Other: _____

1.11 RECEIVING WATERS:

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

Tributaries	Classified Waterbody
Live Oak Creek, Buckners Creek	Colorado River, Below La Grange (Segment #1402) Colorado River Tidal (Segment #1401)

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

1.12 ROLES AND RESPONSIBILITIES: TxDOT

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

1.13 ROLES AND RESPONSIBILITIES: CONTRACTOR

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

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



FED. RD. DIV. NO.	PROJECT NO.			SHEET NO.
6				153
STATE	STATE DIST.	COUNTY		
TEXAS	YKM	FAYETTE		
CONT.	SECT.	JOB	HIGHWAY NO.	
0913	28	083, ETC.	CR	

STORMWATER POLLUTION PREVENTION PLAN (SWP3):

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

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

2.1 EROSION CONTROL AND SOIL STABILIZATION BMPs:

T / P

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

2.2 SEDIMENT CONTROL BMPs:

T / P

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

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

2.3 PERMANENT CONTROLS:

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

BMPs To Be Left In Place Post Construction:

Type	Stationing	
	From	To
Broadcast Seed	11+65.00	15+30.00

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

2.4 OFFSITE VEHICLE TRACKING CONTROLS:

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

2.5 POLLUTION PREVENTION MEASURES:

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

2.6 VEGETATED BUFFER ZONES:

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

Type	Stationing	
	From	To

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

2.7 ALLOWABLE NON-STORMWATER DISCHARGES:

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

2.8 INSPECTIONS:

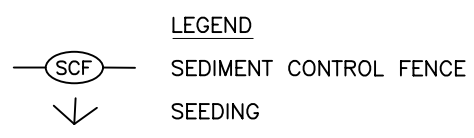
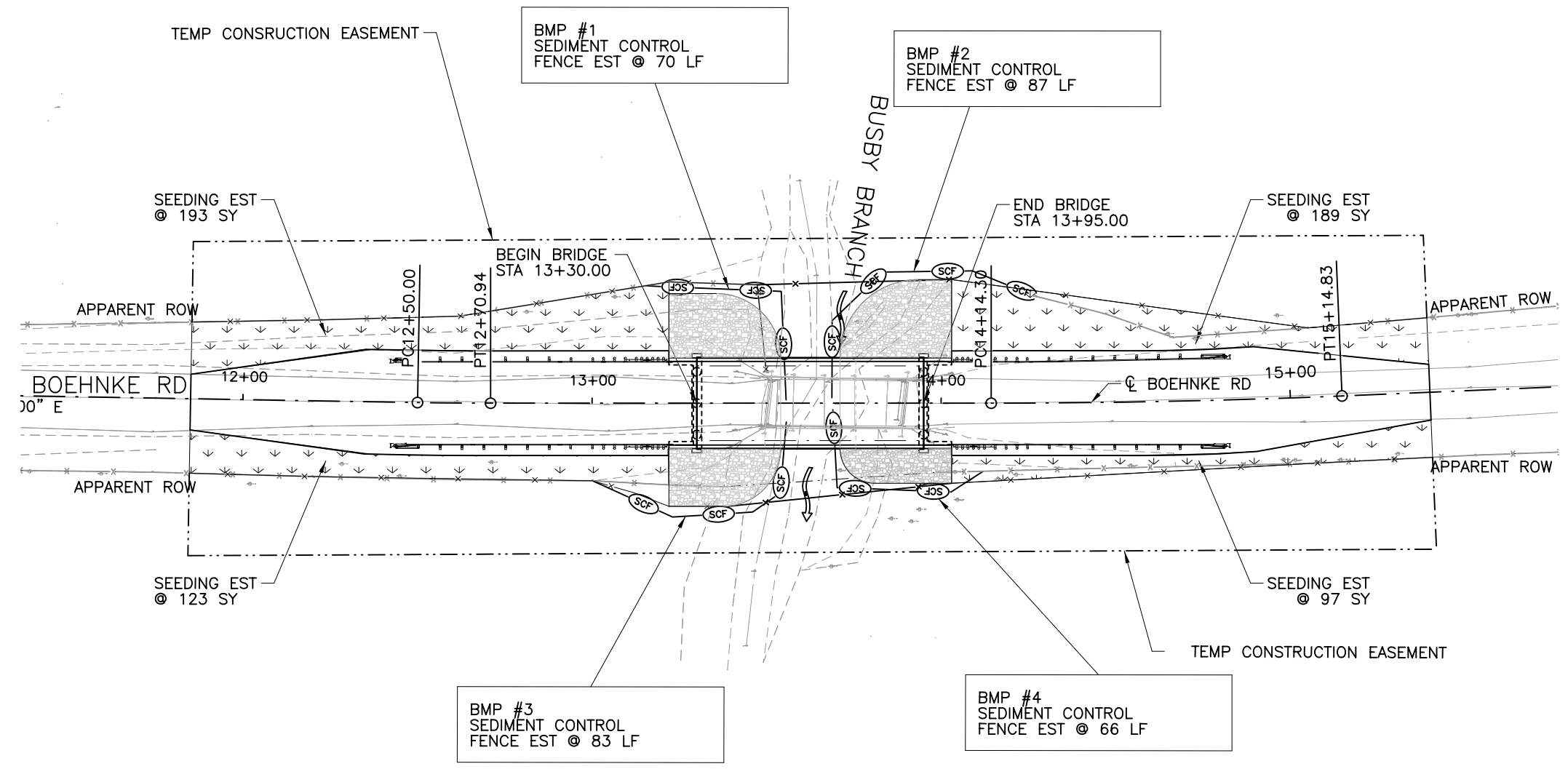
All disturbed areas and erosion and sediment control devices shall be inspected at least once every seven (7) days. Inspections shall be performed by TxDOT as indicated on the Field Inspection and Maintenance Report Form 2118 and retained in Attachment 2.3 of this SWP3 .

2.9 MAINTENANCE:

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

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

FED. RD. DIV. NO.	PROJECT NO.			SHEET NO.
6				154
STATE	STATE DIST.	COUNTY		
TEXAS	YKM	FAYETTE		
CONT.	SECT.	JOB	HIGHWAY NO.	
0913	28	083, ETC.	CR	



NOTES:

1. INSTALL BMP'S TO CORRESPOND WITH SEQUENCE OF CONSTRUCTION. ADDITIONAL BMP'S MAY BE ADDED TO CORRESPOND WITH CONSTRUCTION ACTIVITIES AS APPROVED OR AS DIRECTED BY THE ENGINEER.
2. ACTUAL BMP LOCATIONS AND LENGTHS MAY VARY TO MEET FIELD CONDITIONS, AS APPROVED OR AS DIRECTED BY THE ENGINEER.

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Sandra Gail Morris

113680
PROFESSIONAL ENGINEER

10/14/2022

NO.	REVISION	BY	DATE

TEXAS REGISTERED ENGINEERING FIRM F-1741

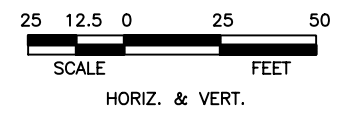
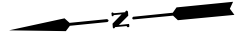
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BOEHNKE RD AT BUSBY BRANCH

SW3P LAYOUT

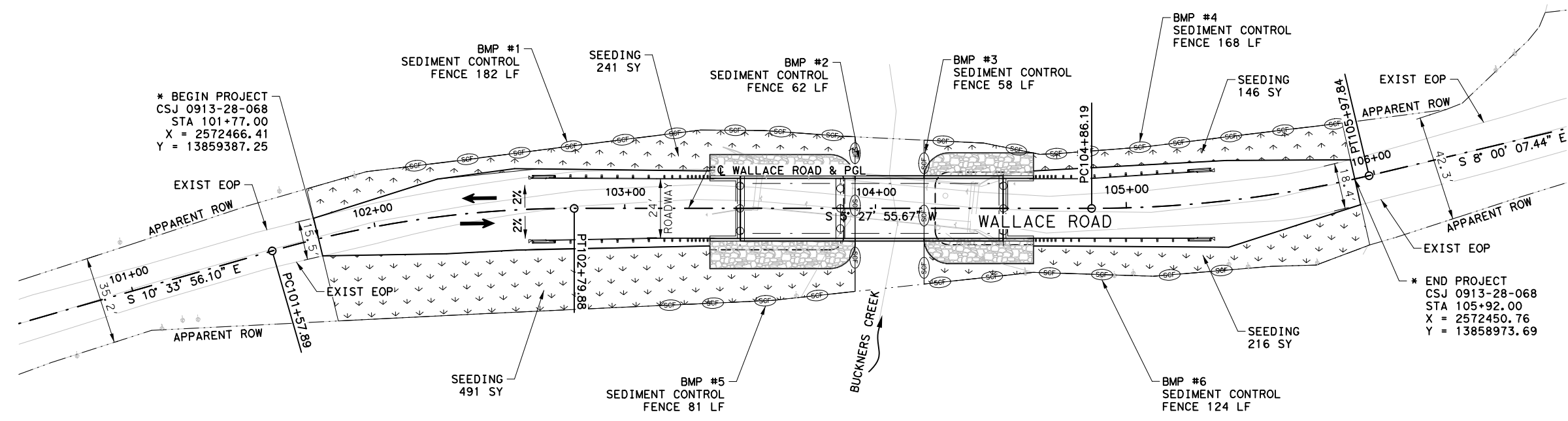
CSJ 0913-28-083 SHEET 1 OF 1

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Checked:	SM	6	TEXAS		CR
Drawn:	GH	DIST.	COUNTY	CONTROL NO.	SECTION NO.
Checked:	SM	YKM	FAYETTE	0913	28
				083,ETC	155



* BEGIN PROJECT
CSJ 0913-28-068
STA 101+77.00
X = 2572466.41
Y = 13859387.25

* END PROJECT
CSJ 0913-28-068
STA 105+92.00
X = 2572450.76
Y = 13858973.69



- LEGEND**
- SEDIMENT CONTROL FENCE
 - WATER FLOW DIRECTION
 - SEEDING

- NOTES:**
1. INSTALL BMP'S TO CORRESPOND WITH SEQUENCE OF CONSTRUCTION. ADDITIONAL BMP'S MAY BE ADDED TO CORRESPOND WITH CONSTRUCTION ACTIVITIES AS APPROVED OR AS DIRECTED BY THE ENGINEER.
 2. ACTUAL BMP LOCATIONS AND LENGTHS MAY VARY TO MEET FIELD CONDITIONS, AS APPROVED OR AS DIRECTED BY THE ENGINEER.

Emily Petrosky
 10/13/2022

NO.	REVISION	BY	DATE

BGE, Inc.
 1701 Directors Blvd., Suite 1000, Austin, TX 78744
 Tel: 512-879-0400 • www.bgeinc.com
 TBPE Registration No. F-1046

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WALLACE ROAD AT BUCKNERS CREEK

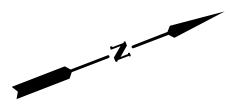
SW3P LAYOUT

CSJ 0913-28-068 SHEET 1 OF 1



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Drawn:	BGE	DIST.	COUNTY	CONTROL NO.	SECTION NO.	JOB NO.	SHEET NO.
Checked:	BGE	YKM	FAYETTE	0913	28	083,ETC.	156

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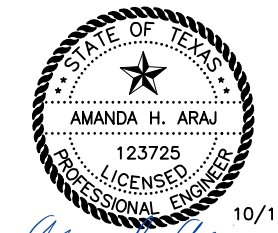
LEGEND

-  SEDIMENT CONTROL FENCE
-  BROADCAST SEEDING (PERM)



NOTES:

1. INSTALL BMPs TO CORRESPOND WITH SEQUENCE OF CONSTRUCTION. ADDITIONAL BMPs MAY BE ADDED TO CORRESPOND WITH CONSTRUCTION ACTIVITIES AS APPROVED OR AS DIRECTED BY THE ENGINEER.
2. BMP QUANTITIES AND LOCATIONS SHOWN ARE ESTIMATES. ACTUAL BMP LOCATIONS AND LENGTHS MAY VARY TO MEET FIELD CONDITIONS, AS APPROVED OR AS DIRECTED BY THE ENGINEER.



Amanda Araj 10/13/2022

NO.	REVISION	BY	DATE

WSP WSP USA Inc.
16200 Park Row, Suite 200
Houston, TX 77084
TBPE # F-2263

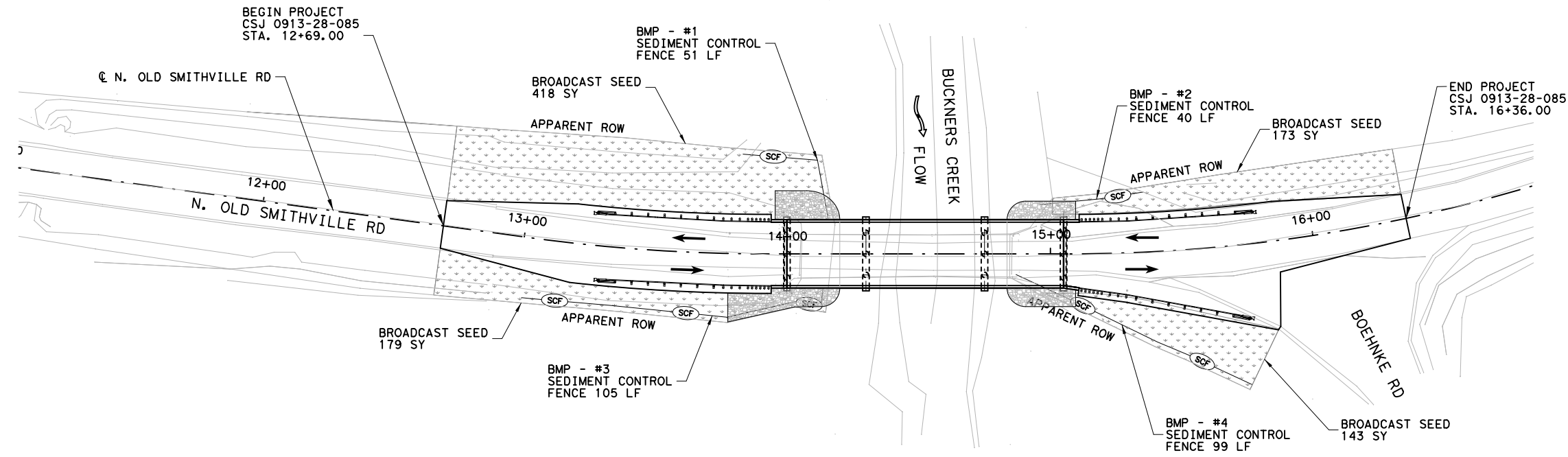
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NORTH OLD SMITHVILLE RD (CR 483) AT BUCKNERS CREEK

SW3P LAYOUT

CSJ 0913-28-085 SHEET 1 OF 1

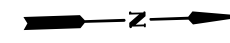
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				083, ETC.	157





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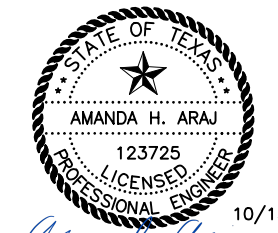


LEGEND

-  SEDIMENT CONTROL FENCE
-  BROADCAST SEEDING (PERM)



- NOTES:**
1. INSTALL BMPs TO CORRESPOND WITH SEQUENCE OF CONSTRUCTION. ADDITIONAL BMPs MAY BE ADDED TO CORRESPOND WITH CONSTRUCTION ACTIVITIES AS APPROVED OR AS DIRECTED BY THE ENGINEER.
 2. BMP QUANTITIES AND LOCATIONS SHOWN ARE ESTIMATES. ACTUAL BMP LOCATIONS AND LENGTHS MAY VARY TO MEET FIELD CONDITIONS, AS APPROVED OR AS DIRECTED BY THE ENGINEER.



Amanda H. Araj
10/13/2022

NO.	REVISION	BY	DATE

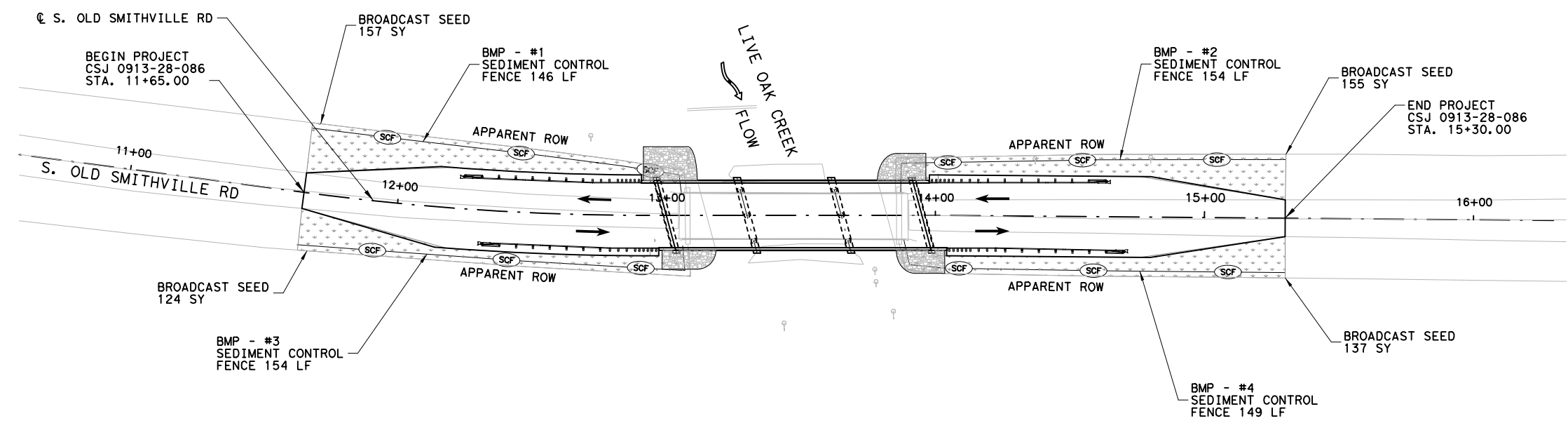
wsp WSP USA Inc.
16200 Park Row, Suite 200
Houston, TX 77084
TBPE # F-2263

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SOUTH OLD SMITHVILLE RD (CR 477) AT LIVE OAK CREEK

SW3P LAYOUT

CSJ 0913-28-086 SHEET 1 OF 1

Designed:	GD	FED. RD. DIV. NO.	STATE	FEDERAL AID PROJECT NO.	HIGHWAY NO.
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Drawn:	GD	DIST.	COUNTY	CONTROL NO.	SECTION NO.
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				083, ETC.	158



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I. STORMWATER POLLUTION PREVENTION

Texas Pollutant Discharge Elimination System (TPDES) TXR 150000: Stormwater Discharge Permit or Construction General Permit is 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. If applicable list MS4 operator that may receive discharges from this project. MS4 operator should be notified prior to construction activities.

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

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

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

When Contractor project specific locations (PSL) increase disturbed soil area to 5 acres or more, submit Notice of Intent (NOI) to TCEQ and Engineer.

MS4 Operator(s):

No Additional Comments

II. WORK IN OR NEAR STREAMS, WATERBODIES AND WETLANDS

United States Army Corps of Engineers (USACE) Permit is required for filling, dredging, excavating or other work in water bodies, rivers, creeks, streams, wetlands or wet areas. The Contractor must adhere to all of the terms and general conditions associated with the following permit(s). If additional work not represented in the plans is required, contact the Engineer immediately.

No USACE Permit Required

Work is authorized by the USACE under a Nationwide Permit #14 without a Pre-Construction Notification (PCN). Project specific permit was not issued by USACE, therefore is not in the plan set.

Work is authorized by the USACE under a Nationwide Permit _____ with a Pre-Construction Notification (PCN). The project specific permit issued by the USACE is included in the plan set.

Work is authorized by the USACE under a Individual Permit (IP). The project specific permit issued by the USACE is included in the plan set.

Work would be authorized by the USACE. The project specific permit issued by the USACE or Nationwide Permit will be provided to the contractor.

United States Coast Guard (USCG) Permit is required for projects that involve the construction or modification (including changes to lighting) of a bridge or causeway across a water body determined to be navigable by the United States Coast Guard (USCG) under Section 9 of the Rivers and Harbors Act. If additional work not represented in the plans is required, contact the Engineer immediately.

No United States Coast Guard (USCG) Coordination Required

United States Coast Guard (USCG) Permit

United States Coast Guard (USCG) Exemption

Best Management Practices

Erosion	Sedimentation	Post Construction TSS
<input checked="" type="checkbox"/> Temporary Vegetation	<input checked="" type="checkbox"/> Silt Fence	<input checked="" type="checkbox"/> Vegetative Filter Strips
<input type="checkbox"/> Vegetation Lined Ditches	<input type="checkbox"/> Rock Filter Dam	<input type="checkbox"/> Vegetation Lined Ditches
<input type="checkbox"/> Sodding	<input type="checkbox"/> Sand Bag Berm	<input type="checkbox"/> Grassy Swales

No Additional Comments

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 area and contact the Engineer immediately.

No Additional Comments

IV. VEGETATION RESOURCES

Preserve native vegetation to the extent practical. Refer to TxDOT Standard Specifications 162, 164, 192, 193, 506, 730, 751, and 752 in order to comply with requirements for invasive species, beneficial landscaping and tree/brush removal.

No Additional Comments

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

If any of the listed species below are observed, cease work in the area, do not disturb species or habitat and contact the Engineer immediately.

The work may not remove active nests (from bridges, structures, or vegetation adjacent to the roadway, etc.) during nesting season (February 15 to October 1). If removal of structures or vegetation is necessary during the nesting season, the Contractor shall conduct a bird survey no more than 3 days in advance of the clearing/demolish start date. All bird surveys shall be conducted by a Field Biologist and adhere to the guidance document "Avoiding Migratory Birds and Handling Potential Violations" found in the TxDOT Environmental Compliance Toolkits at the time of the survey. (See below for Field Biologist and Ornithologist qualifications)

Additional Comments

Field Biologist, Ornithologist – a field biologist is defined as an individual qualified to perform field investigations, presence/absence surveys and habitat surveys for protected avian species or species of concern. A mandatory bachelor's degree in biology or a related science is required. At a minimum, the Field Biologist, Ornithologist, shall have completed and reported a minimum of three presence/absence and habitat surveys for protected avian species in the past five years. A minimum of three projects must have been conducted in Texas. Surveys shall have been performed for documentation of species in accordance with a protocol approved by USFWS or TPWD, or following generally accepted methodologies.

Field Biologist, Ornithologist – a field biologist is defined as an individual qualified to perform field investigations, presence/absence surveys and habitat surveys for protected avian species or species of concern. A mandatory bachelor's degree in biology or a related science is required. At a minimum, the Field Biologist, Ornithologist, shall have completed and reported a minimum of three presence/absence and habitat surveys for protected avian species in the past five years. A minimum of three projects must have been conducted in Texas. Surveys shall have been performed for documentation of species in accordance with a protocol approved by USFWS or TPWD, or following generally accepted methodologies.

VI. HAZARDOUS MATERIALS OR CONTAMINATION ISSUES

Refer to TxDOT Standard Specifications in the event potentially contaminated materials are observed, such as dead or distressed vegetation, trash disposal areas, drums, canisters, barrels, leaching or seepage of substances, unusual smells or odors, or stained soil, cease work in the area and contact the Engineer immediately.

Does the project involve any bridge class structure rehabilitation or replacements (bridge class structures not including box culverts)? Yes No

Are results of the asbestos inspection positive (is asbestos present)? Yes No

TxDOT is still required to notify DSHS 14 working days prior to any scheduled demolition.

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.


Additional Comments


VII. GENERAL NOTES

The contractor's attention is directed to the fact that discharges of permanent or temporary fill material into the waters of the United States, including jurisdictional wetlands, as necessary for construction, will require specific approval of the USACE under Section 404 of the Clean Water Act.

TxDOT will obtain the appropriate permit(s), Nationwide or Individual, when necessary as dictated by the proposed actions for the project and it's potential to affect USACE jurisdictional areas. The contractor may review the permitted plans at the office of the Area Engineer in charge of construction. TxDOT will hold the contractor responsible for following all conditions of the approved permit. If the contractor cannot work within the limits of the permit(s), then it becomes the contractor's entire responsibility to consult with the USACE pertaining to the need for changes or amendments to the conditions of the exiting permit(s) as originally obtained by the department.

Particular importance is stressed on the fact that any impacts to USACE jurisdictional waters of the United States, including jurisdictional wetlands, be the minimum necessary to complete the proposed work. The contractor shall maintain near normal flow of any jurisdictional waters of the United States at all times during construction. If the contractor needs further explanation of the conditions of the permit, including means of compliance, they may contact the Yoakum District Environmental Coordinator.

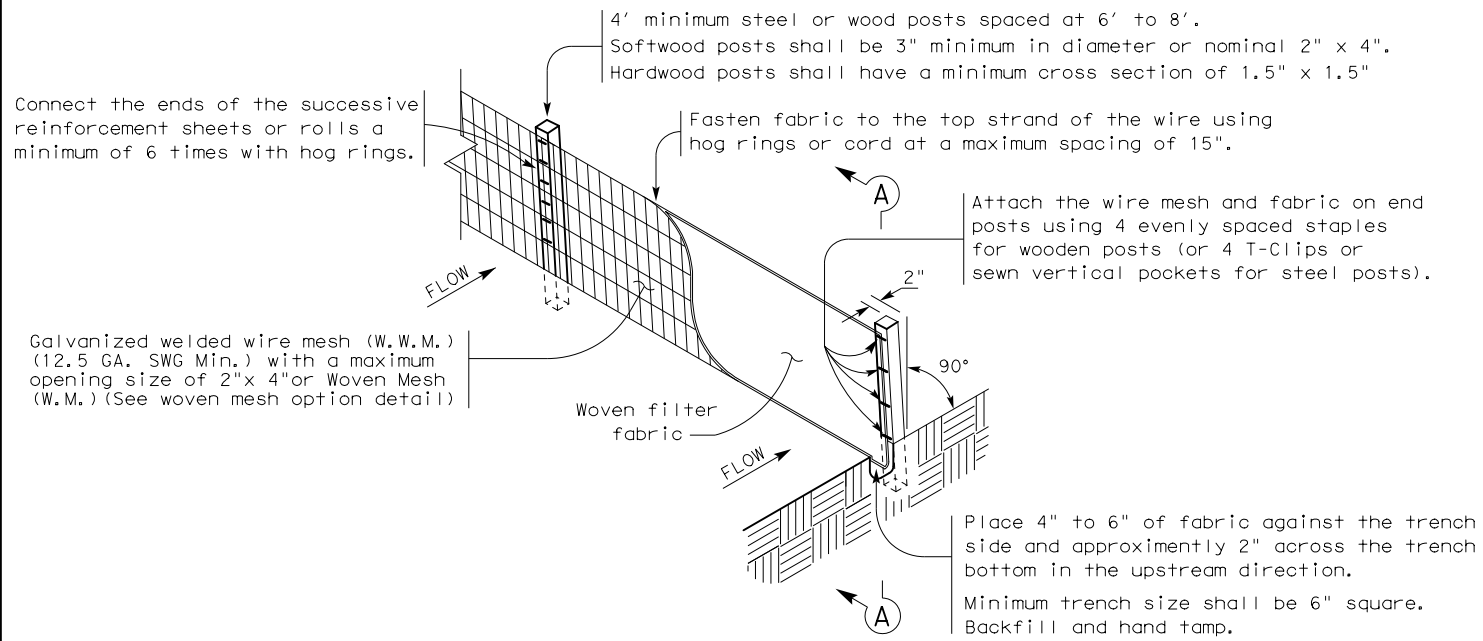
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ENVIRONMENTAL PERMITS, ISSUES AND COMMITMENTS					
EPIC					
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© TxDOT: March 2017	CONT	SECT	JOB	HIGHWAY	
REVISIONS		0913	28	083, ETC.	CR
	DIST	COUNTY		SHEET NO.	
	YKM	FAYETTE		159	

VIII. OTHER ENVIRONMENTAL ISSUES	VIII. OTHER ENVIRONMENTAL ISSUES	VIII. OTHER ENVIRONMENTAL ISSUES																									
<p>FEDERAL LISTED, PROPOSED THREATENED, ENDANGERED SPECIES, CRITICAL HABITAT, STATE LISTED SPECIES, CANIDATE SPECIES, AND MIGRATORY BIRDS CONTINUED:</p> <p>THE FOLLOWING BMPs REQUIRED AT ALL BRIDGE REPLACEMENT LOCATIONS:</p> <p>Eastern Spotted Skunk BMPs</p> <ul style="list-style-type: none"> • The Eastern Spotted Skunk (<i>Spilogale putorius</i>) has the potential to occur within the project area. The contractor shall not harm the species if encountered and shall avoid unnecessary impacts to dens. <p>Eastern Box Turtle BMPs Western Box Turtle BMPs</p> <ul style="list-style-type: none"> • 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 • Avoid or minimize disturbing or removing cover objects, such as downed trees, rotting stumps, brush piles, and leaf litter. If avoidance or minimization is not practicable, consider removing cover objects prior to the start of the project and replace them at project completion. • Examine heavy equipment stored on site before use, particularly after rain events when reptile and amphibian movements occur more often, to ensure use will not harm individuals that might be seeking temporary refuge. • Due to increased activity (mating) of reptiles and amphibian during the spring, construction activities like clearing or grading should attempt to be scheduled outside of the spring (March-May) season. Also, timing ground disturbing activities before October when reptiles and amphibians become less active and may be using burrows in the project area is also encouraged. • When designing roads with curbs, consider using Type I or Type III curbs to provide a gentle slope to enable turtles and small animals to get out of roadways. • If Texas tortoises (<i>Gopherus berlandieri</i>) or box turtles (<i>Terrepene</i> spp.) are present in a project area, they should be removed from the area and relocated between 100 and 200 meters from the project area. After removal of the individuals, the area that will be disturbed during active construction and project specific locations should be fenced off to exclude reentry by turtles, tortoises, and other reptiles. The exclusion fence should be constructed and maintained as follows: <ul style="list-style-type: none"> o The exclusion fence should be constructed with metal flashing or drift fence material. o Rolled erosion control mesh material should not be used. o The exclusion fence should be buried at least 6 inches deep and be at least 24 inches high. o The exclusion fence should be maintained for the life of the project and only removed after the construction is completed and the disturbed site has been revegetated. <p>Water Quality BMPs</p> <ol style="list-style-type: none"> 1. Minimize the use of equipment in streams and riparian areas during construction. When possible, equipment access should be from banks, bridge decks, or barges. 2. When temporary stream crossings are unavoidable, remove stream crossings once they are no longer needed and stabilize banks and soils around crossing. 3. Once construction is completed and disturbed areas have been revegetated, remove silt fence and accumulated sediment to reduce wildlife barriers and hazards. 	<p>HAZARDOUS MATERIALS OR CONTANIMATION ISSUES CONTINUED:</p> <p>Boehnke Rd at Busby Branch 0913-28-083: Lead based paint was identified in the yellow & red paint on the steel columns of the bridge.</p> <p>North Old Smithville Rd at Buckners Creek 0913-28-086: Lead based paint was identified in the yellow paint on the rail car frame and bridge rails.</p>	<div data-bbox="2501 1572 3039 1951" style="border: 1px solid black; padding: 5px;">  <p style="text-align: right;">TxDOT Yoakum District</p> <p style="text-align: center;">ENVIRONMENTAL PERMITS, ISSUES AND COMMITMENTS</p> <p style="text-align: center;">EPIC</p> <table border="1" style="width: 100%; border-collapse: collapse;"> <tr> <td>FILE: EPIC Sheet.dgn</td> <td>DN:</td> <td>CK:</td> <td>DW:</td> <td>CK:</td> </tr> <tr> <td>© TxDOT: March 2017</td> <td>CONT</td> <td>SECT</td> <td>JOB</td> <td>HIGHWAY</td> </tr> <tr> <td>REVISIONS</td> <td>0913</td> <td>28</td> <td>083, ETC.</td> <td>CR</td> </tr> <tr> <td></td> <td>DIST</td> <td colspan="2">COUNTY</td> <td>SHEET NO.</td> </tr> <tr> <td></td> <td>YKM</td> <td colspan="2">FAYETTE</td> <td>159A</td> </tr> </table> </div>	FILE: EPIC Sheet.dgn	DN:	CK:	DW:	CK:	© TxDOT: March 2017	CONT	SECT	JOB	HIGHWAY	REVISIONS	0913	28	083, ETC.	CR		DIST	COUNTY		SHEET NO.		YKM	FAYETTE		159A
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	YKM	FAYETTE		159A																							

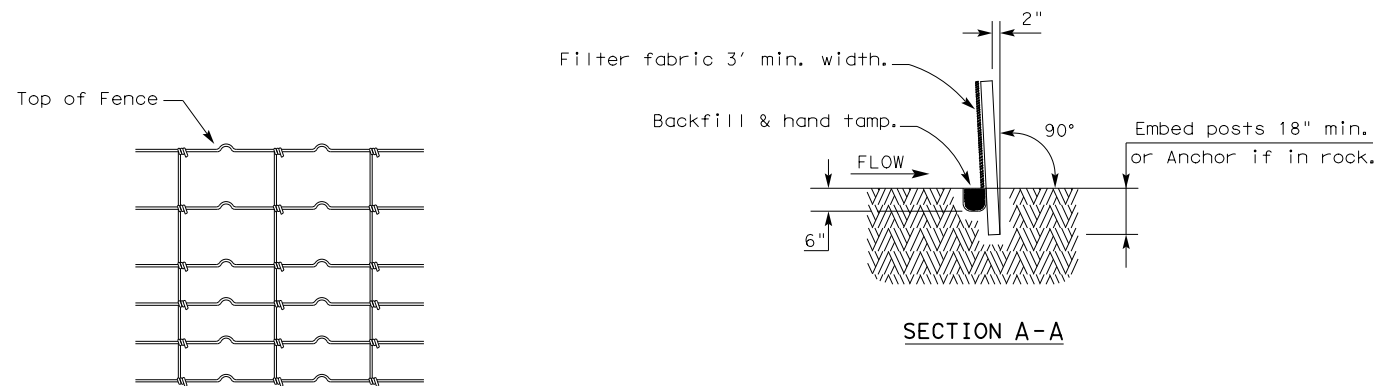
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TEMPORARY SEDIMENT CONTROL FENCE



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.

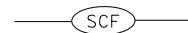
SEDIMENT CONTROL FENCE USAGE GUIDELINES

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.

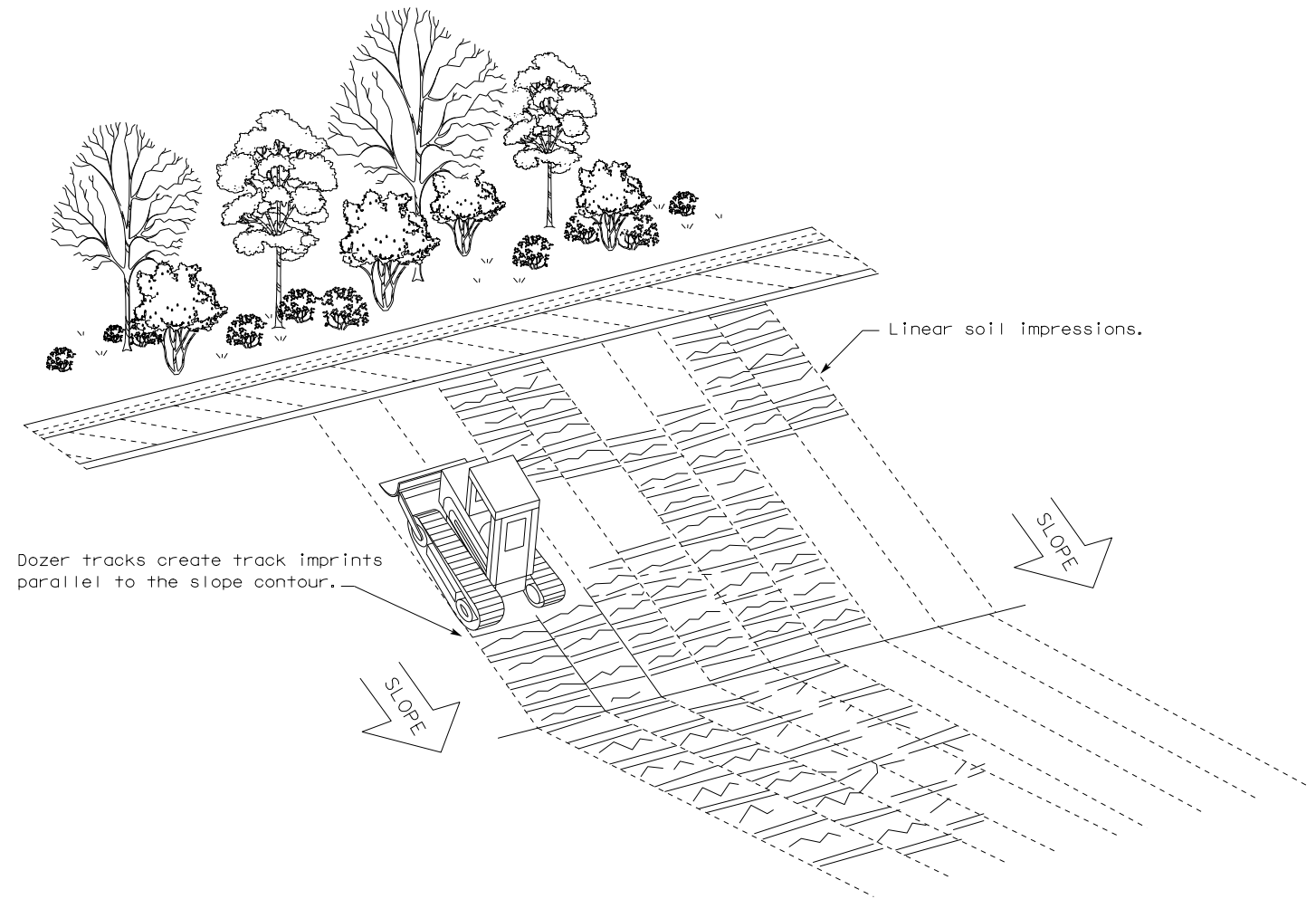
LEGEND

Sediment Control Fence



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.



				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	
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REVISIONS		0913	28	083,ETC	CR
	DIST	COUNTY		SHEET NO.	
	YKM	FAYETTE		160	