INDEX OF SHEETS

SEE SHEET 2

STATE OF TEXAS
DEPARTMENT OF TRANSPORTATION

FEDERAL AID PROJECT NO.			
BR 2022(836), ETC.			
CONT	SECT	JOB	HIGHWAY
0920	03	082, ETC	CR 1065, ETC
DIST	COUNTY		SHEET NO.
20	HARDIN, ETC		1

PLANS OF PROPOSED
STATE HIGHWAY IMPROVEMENT

FEDERAL AID PROJECT NO. BR 2022(836), ETC.

CSJ: 0920-03-082, ETC.
HARDIN, ETC

CSJ	LOCATION	ROADWAY LENGTH FT	ROADWAY LENGTH MI	BRIDGE LENGTH FT	BRIDGE LENGTH MI	TOTAL LENGTH FT	TOTAL LENGTH MI
0920-03-082	CR 1065 (W PINESHADOWS DR) AT CLEMMONS GULLY	354.00	0.067	60.00	0.011	414.00	0.078
0920-39-031	BAILEY ROAD AT WHITES BAYOU	300.00	0.057	100.00	0.019	400.00	0.076
0920-13-041	CR 2380 AT VINCENT TRIBUTARY	393.00	0.074	50.00	0.009	443.00	0.084
1828-01-031	FM 1943 AT THEUVENINS CREEK (DRAIN)	570.00	0.108	27.00	0.005	597.00	0.113
1238-01-008	FM 1014 AT DRAW	321.00	0.061	27.00	0.005	348.00	0.066
0065-04-086	US 96 FROM NECHES RIVER RELIEF TO STR 20-122-0-0065-04-076	0.00	0.000	2080.22	0.394	2080.22	0.394
	TOTAL -->>	1,938.00	0.367	2344.22	0.444	4,282.22	0.811

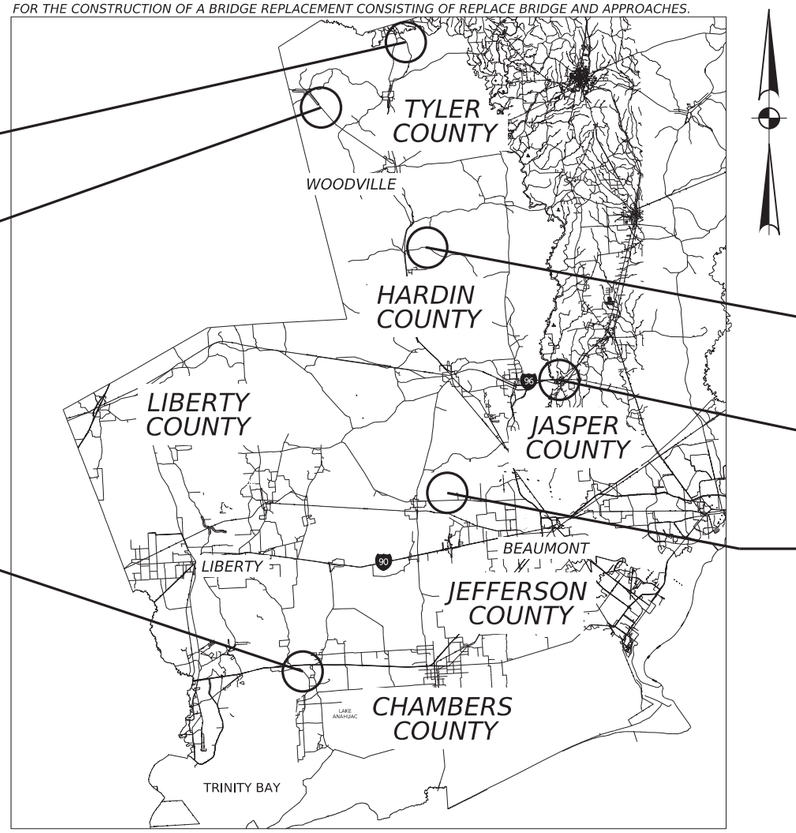
FROM AT CLEMMONS GULLY TO STR#20-101-0-AA10-65-001
FROM AT WHITES BAYOU TO STR#20-036-0-AA01-43-001
FROM AT VINCENT TRIBUTARY TO STR#20-229-0-AA23-80-002
FROM AT THEUVENINS CREEK (DRAIN) TO STR#20-229-0-1828-01-006
FROM AT DRAW TO STR#20-229-0-1238-01-001
US 96 FROM NECHES RIVER RELIEF TO STR 20-122-0-0065-04-076

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

BEGIN PROJECT
FM 1014 AT DRAW
CSJ: 1238-01-008
STA 10+92.00
END PROJECT
STA 14+46.00

BEGIN PROJECT
VINCENT TRIBUTARY
CSJ: 0920-13-041
STA 11+22.00
END PROJECT
STA 15+65.00

BEGIN PROJECT
BAILEY RD AT WHITES BAYOU
CSJ: 0920-39-031
STA 11+64.00
END PROJECT
STA 15+64.00



BEGIN PROJECT
FM 1943 AT DRAIN
CSJ: 0182-80-1031
STA 10+98.00
END PROJECT
STA 16+95.00

BEGIN PROJECT
US 96
CSJ: 0065-04-086
STA 502+22.00
END PROJECT
STA 499+48.33

BEGIN PROJECT
W PINE SHADOWS AT
CLEMMONS GULLY
CSJ: 0920-03-082
STA 10+67.00
END PROJECT
STA 14+81.00

NTS
EXCEPTIONS: NONE
EQUATIONS: NONE
RAILROAD CROSSINGS: NONE

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, OCTOBER 23, 2023)

DESIGN CRITERIA: OFF SYSTEM BRIDGE (4R)
DESIGN SPEED = MEETS OR IMPROVES EXISTING CONDITIONS

CR 1065 (W PINESHADOWS DR) AT CLEMMONS GULLY	ADT (2015)	50	ADT (2035)	100
BAILEY ROAD AT WHITES BAYOU	ADT (2016)	103	ADT (2042)	103
CR 2380 AT VINCENT TRIBUTARY	ADT (2016)	131	ADT (2037)	131

DESIGN CRITERIA: ON SYSTEM BRIDGE (3R)
DESIGN SPEED = 30 MPH

FM 1943 AT THEUVENINS CREEK (DRAIN)	ADT (2022)	789	ADT (2042)	1010
FM 1014 AT DRAW	ADT (2022)	110	ADT (2042)	154

DESIGN CRITERIA: PM

US 96	ADT (2022)	16,306	ADT (2042)	22,828

FINAL PLANS

LETTING DATE: _____

DATE CONTRACTOR BEGAN WORK: _____

DATE WORK WAS COMPLETED & ACCEPTED: _____

FINAL CONTRACT COST: $ _____

CONTRACTOR : _____

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

Texas Department of Transportation

SUBMITTED FOR LETTING: 2/28/2024
DocuSigned by:
50238C8D55F5470...
DESIGN ENGINEER

APPROVED FOR LETTING: 2/28/2024
DocuSigned by:
Lisa Collins
5C6C707937C24CE...
DIRECTOR OF TRANSPORTATION PLANNING AND DEVELOPMENT

APPROVED FOR LETTING: 3/1/2024
DocuSigned by:
Martin N. Goyal, P.E.
578CD749506D4F0...
DISTRICT ENGINEER

DATE: $DATE$ $TIME$
FILE: $FILE$

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

STATE OF TEXAS — JAMES D. HORNE — 141323 — REGISTERED PROFESSIONAL ENGINEER

DocuSigned by: 50238C8D55F5470...

2/29/2024

JAMES D. HORNE, P.E. DATE

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

STATE OF TEXAS — S. E. WRIGHT — 108969 — LICENSED PROFESSIONAL ENGINEER

S.E. Wright

02/28/2024

S.E. WRIGHT, P.E. DATE

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

STATE OF TEXAS — ARTHUR VIDALES — 127233 — LICENSED PROFESSIONAL ENGINEER

02/28/2024

ARTHUR VIDALES, P.E. DATE

LJA PROGRAM MANAGEMENT
FRN - F-14256

Texas Department of Transportation
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CLEMMONS GULLY PACKAGE

INDEX OF SHEETS

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CONT	SECT	JOB	HIGHWAY
0920	03	082, ETC	CR 1065, ETC
DIST	COUNTY		SHEET NO.
BMT	HARDIN, ETC		2

DATE: 2/28/2024 3:40:05 PM
FILE: pw://ja-pw.bentley.com:ja-pw-01/Documents/TxDOT/PM8016-2301 CEC WA4/Clemmons Gully Off-System Bridge/400 Production/4 - Design/Plan Set/1. General/CG GIX01.dgn

SHEET NO.		DESCRIPTION
		ENVIRONMENTAL ISSUES
189 - 190		STORM WATER POLLUTION PREVENTION PLAN W. PINE SHADOWS DR. (CR 1065) AT CLEMMONS GULLY
191 - 192		STORM WATER POLLUTION PREVENTION PLAN BAILEY RD AT WHITES BAYOU
193 - 194		STORM WATER POLLUTION PREVENTION PLAN CR 2380 AT VINCENT TRIBUTARY
195 - 196		STORM WATER POLLUTION PREVENTION PLAN FM 1943 AT DRAIN
197 - 198		STORM WATER POLLUTION PREVENTION PLAN FM 1014 AT DRAW
199 - 200		STORM WATER POLLUTION PREVENTION PLAN US 96 AT NECHES RELIEF
201		EPIC W. PINE SHADOWS DR. (CR 1065) AT CLEMMONS GULLY
202		EPIC BAILEY RD AT WHITES BAYOU
203		EPIC CR 2380 AT VINCENT TRIBUTARY
204		EPIC FM 1943 AT DRAIN AND FM 1014 AT DRAW
205		EPIC US 96 AT NECHES RELIEF
206		SW3P LAYOUT W. PINE SHADOWS DR. (CR 1065) AT CLEMMONS GULLY
207		SW3P LAYOUT BAILEY RD AT WHITES BAYOU
208		SW3P LAYOUT CR 2380 AT VINCENT TRIBUTARY
209		SW3P LAYOUT FM 1943 AT DRAIN
210		SW3P LAYOUT FM 1014 AT DRAW
		ENVIRONMENTAL ISSUES STANDARDS
211	*	EC(1)-16
212	*	EC(2)-16
213	*	EC(3)-16

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

STATE OF TEXAS
S. E. WRIGHT
108969
LICENSED
PROFESSIONAL ENGINEER

S E Wright 02/28/2024

S.E. WRIGHT, P.E. DATE

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

STATE OF TEXAS
ARTHUR VIDALES
127233
LICENSED
PROFESSIONAL ENGINEER

Arthur Vidales 02/28/2024

ARTHUR VIDALES, P.E. DATE

LJA PROGRAM MANAGEMENT
FRN - F-14256

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CLEMMONS GULLY PACKAGE

INDEX OF SHEETS

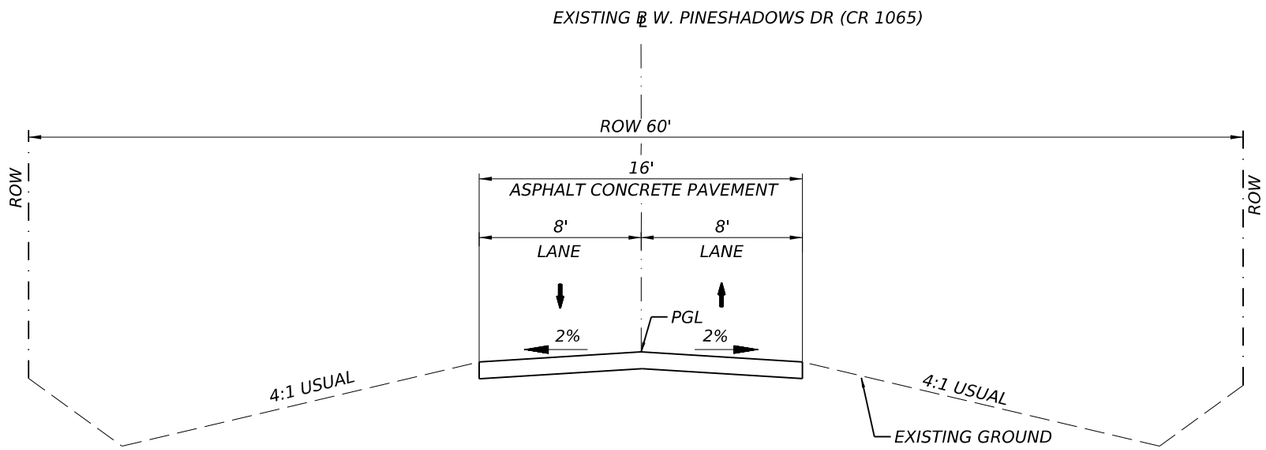
SHEET 2 OF 2

CONT	SECT	JOB	HIGHWAY
0920	03	082, ETC	CR 1065, ETC
DIST	COUNTY		SHEET NO.
BMT	HARDIN, ETC		3

DATE: 2/28/2024 6:16:27 AM
FILE: pw://lja-pw.bentley.com:lja-pw-01/Documents/TxDOT/PM8016-2301 CEC WA4/Clemmons Gully Off-System Bridge/400 Production/4 - Design/Plan Set/1. General/CG GIX02.dgn

NOTES:

COUNTY APPRAISL DISTRICT SHOWS 60' OF ROW.



CR 1065 AT CLEMMONS GULLY- EXISTING TYPICAL

STA 10+67.00 TO STA 13+43.00
EXISTING BRIDGE FROM STA 13+43.00 TO STA 13+88.00
STA 13+88.00 TO STA 14+87.00

NOT TO SCALE

STATE OF TEXAS
JAMES D. HORNE
141323
REGISTERED
PROFESSIONAL ENGINEER

DocuSigned by:
50238C8D55F5470...
2/29/2024

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CLEMMONS GULLY PACKAGE

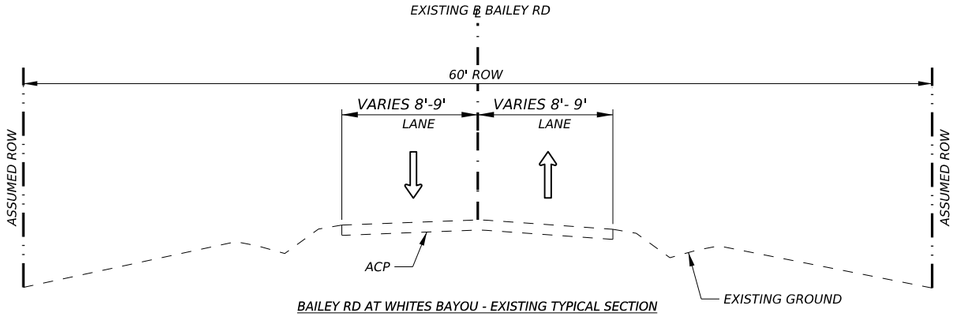
EXISTING TYPICAL SECTION
W. PINESHADOWS DR (CR 1065)
AT CLEMMONS GULLY

SHEET 1 OF 1

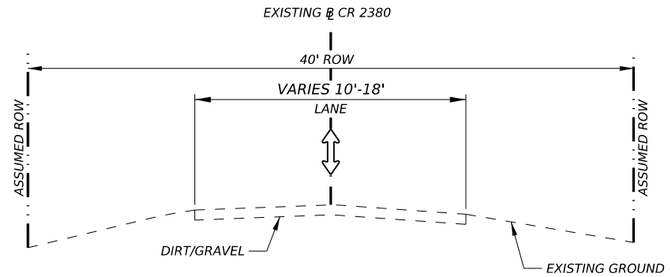
CONT	SECT	JOB	HIGHWAY
0920	03	082,ETC	CR 1065, ETC
DIST	COUNTY		SHEET NO.
20	HARDIN, ETC		4

FILE: pw://txdot.projectwiseonline.com:TXDOT5/Documents/20 - BMT/Design Projects/0920030382/4 - Design/Plan Set/1. General/TYPICAL SECTION.dgn

DW	CK	DW	CK

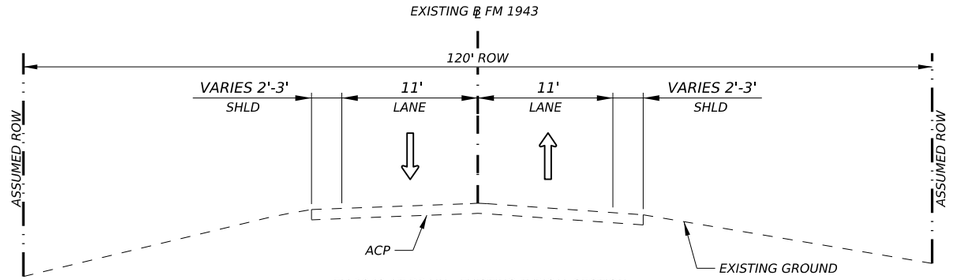


BAILEY RD AT WHITES BAYOU - EXISTING TYPICAL SECTION
STA 10+00.00 TO STA 13+19.18
EXISTING BRIDGE FROM STA 13+19.18 TO STA 14+10.15
STA 14+10.15 TO STA 17+28.06

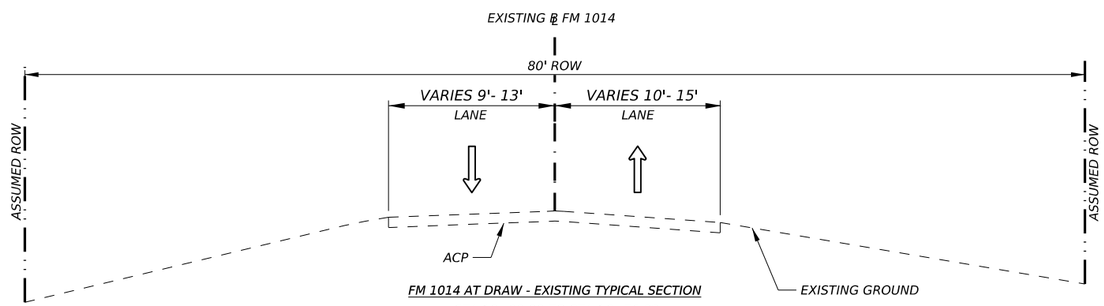


CR 2380 AT VINCENT TRIBUTARY - EXISTING TYPICAL SECTION
STA 10+00.00 TO STA 13+18.41
EXISTING BRIDGE FROM STA 13+18.41 TO STA 13+43.95
STA 13+43.95 TO STA 16+65.80

NOT TO SCALE



FM 1943 AT DRAIN - EXISTING TYPICAL SECTION
STA 10+00.00 TO STA 17+05.21



FM 1014 AT DRAW - EXISTING TYPICAL SECTION
STA 10+00.00 TO STA 16+76.33

02-27-2024

LJA PROGRAM MANAGEMENT
FRN - F-14256

Texas Department of Transportation

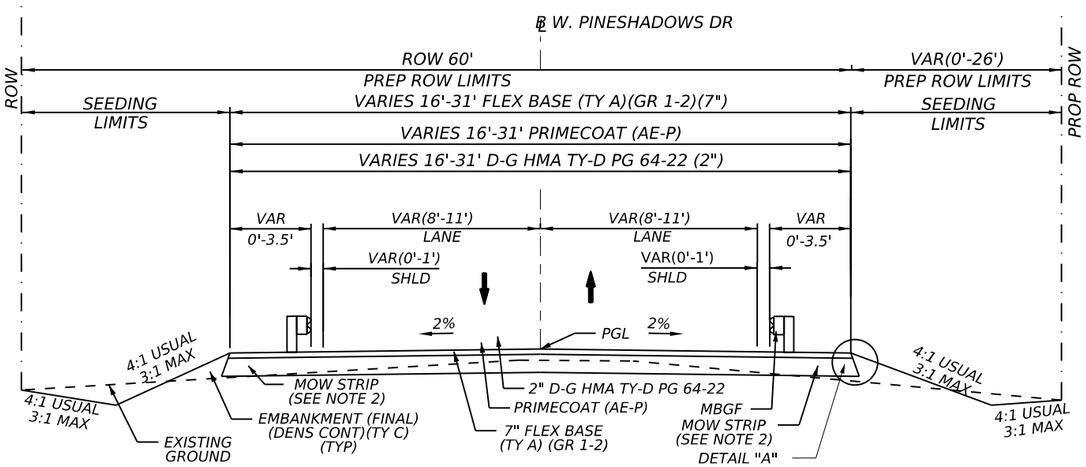
CLEMMONS GULLY PACKAGE

EXISTING TYPICAL SECTIONS

SHEET 1 OF 1

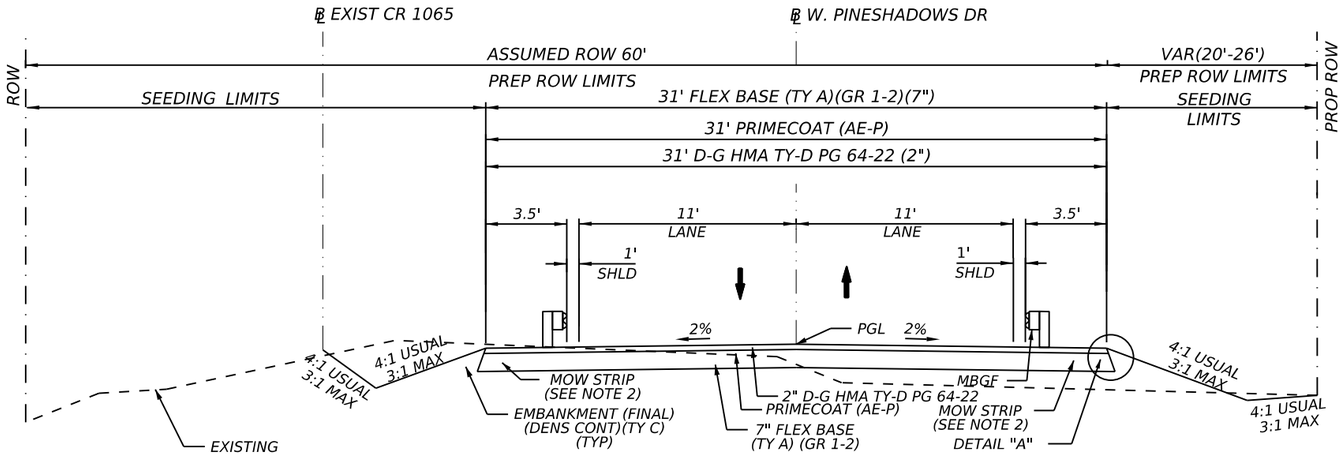
CONT	SECT	JOB	HIGHWAY
0920	03	082, ETC	CR 1065, ETC
DIST	COUNTY		SHEET NO.
BMT	HARDIN, ETC		5

DATE: 2/26/2024 2:12:56 PM
FILE: pw://lja-pw.bentley.com:lja-pw-01/Documents/TxDOT/PM8016-2301 CEC WA4/Clemmons Gully Off-System Bridge/400 Production/4 - Design/Plan Set/1. General/CG_GTX01.dgn



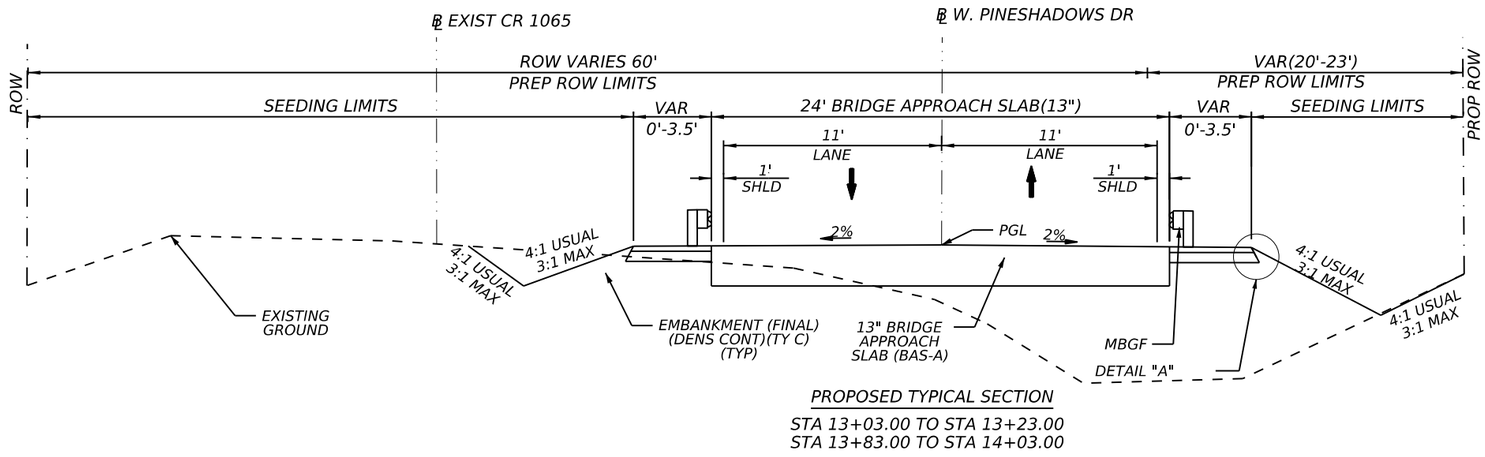
PROPOSED TYPICAL-TRANSITION SECTION

STA 10+67.00 TO STA 12+15.00
STA 14+14.00 TO STA 14+81.00



PROPOSED TYPICAL SECTION

STA 12+15.00 TO STA 13+03.00
STA 14+03.00 TO STA 14+14.00



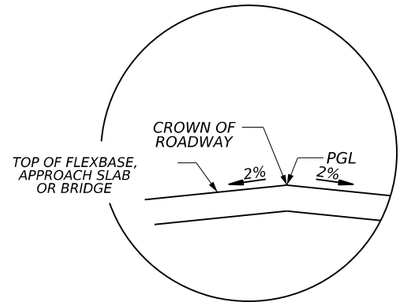
PROPOSED TYPICAL SECTION

STA 13+03.00 TO STA 13+23.00
STA 13+83.00 TO STA 14+03.00

NOTES:

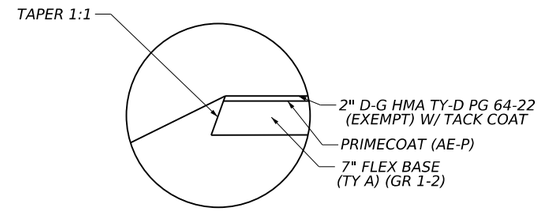
1. EMBANKMENT WILL BE ADDED TO COMPENSATE FOR ANY INCREASE IN ELEVATION OF PGL AS WELL AS ADDITIONAL ROAD CROWN.
2. MOW STRIP PAVEMENT WILL MATCH PROPOSED ROADWAY PAVEMENT:

   2" D-G HMA TY-D PG 64-22 (EXEMPT) W/ TACK COAT
   PRIMECOAT (AE-P)
   7" FLEXBASE (TY A)(GR 1-2)



ROADWAY CROWN DETAIL

N.T.S



DETAIL"A"

N.T.S

PROPOSED BRIDGE

STA 13+23.00 TO STA 13+83.00=60 FT

BRIDGE APPROACH SLAB

STA 13+03.00 TO STA 13+23.00=20 FT
STA 13+83.01 TO STA 14+03.00=20 FT

NOT TO SCALE

STATE OF TEXAS
JAMES D. HORNE
141323
REGISTERED PROFESSIONAL ENGINEER

DocuSigned by:
2/29/2024
50238C8D55F5470...

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CLEMMONS GULLY PACKAGE

PROPOSED TYPICAL SECTIONS
W. PINESHADOWS DR (CR 1065)
AT CLEMMONS GULLY

SHEET 1 OF 1

CONT	SECT	JOB	HIGHWAY
0920	03	082,ETC	CR 1065, ETC
DIST	COUNTY		SHEET NO.
20	HARDIN, ETC		6

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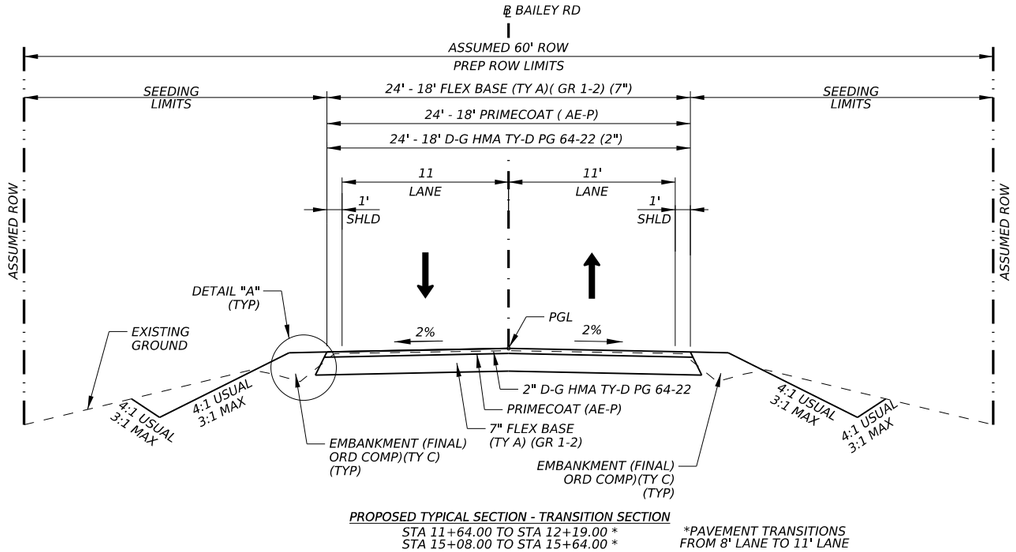
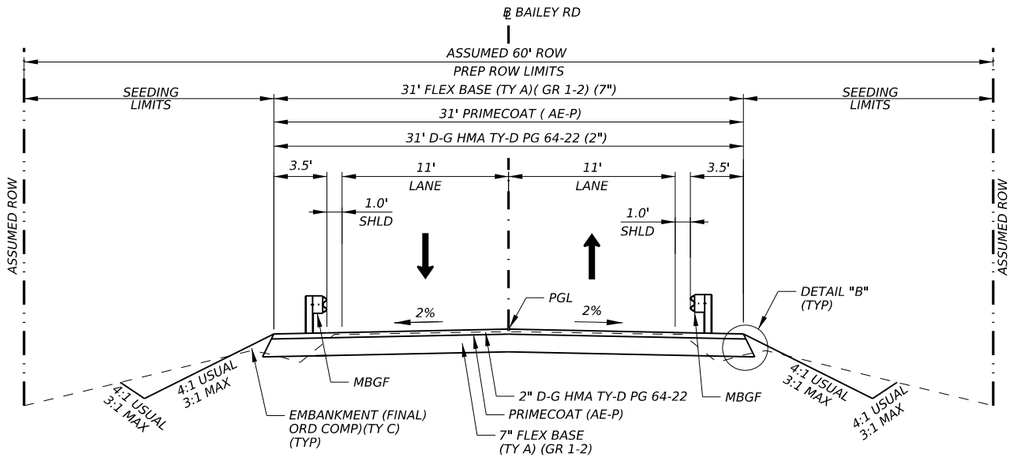


PROPOSED TYPICAL SECTION - TRANSITION SECTION
STA 11+64.00 TO STA 12+19.00 *
STA 15+08.00 TO STA 15+64.00 *

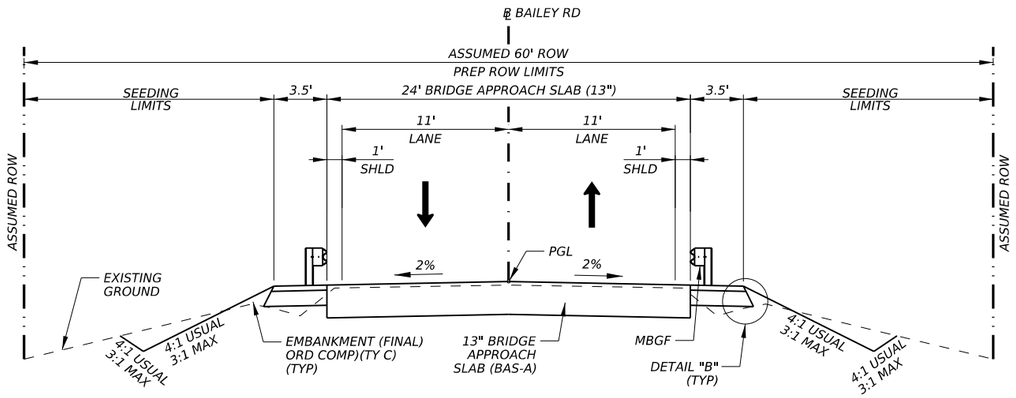
*PAVEMENT TRANSITIONS FROM 8' LANE TO 11' LANE



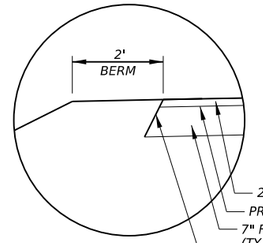
PROPOSED TYPICAL SECTION
STA 12+19.00 TO STA 12+94.00
STA 14+34.00 TO STA 15+08.00

PROPOSED BRIDGE
STA 13+14.00 TO STA 14+14.00 = 100 FT

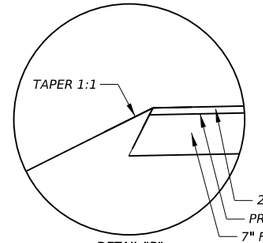
BRIDGE APPROACH SLAB
STA 12+94.00 TO STA 13+14.00 = 20 FT
STA 14+14.00 TO STA 14+34.00 = 20 FT



PROPOSED TYPICAL SECTION
STA 12+94.00 TO STA 13+14.00
STA 14+14.00 TO STA 14+34.00



DETAIL "A"
N.T.S.



DETAIL "B"
N.T.S.

NOTES:

1. *MOW STRIP PAVEMENT WILL MATCH PROPOSED ROADWAY PAVEMENT:*
   2" D-G HMA TY-D PG 64-22
   PRIMECOAT (AE-P)
   7" FLEXBASE (TY A)(GR 1-2)

NOT TO SCALE

STATE OF TEXAS
S. E. WRIGHT
108969
LICENSED
PROFESSIONAL ENGINEER

02-27-2024

LJA PROGRAM MANAGEMENT
FRN - F-14256

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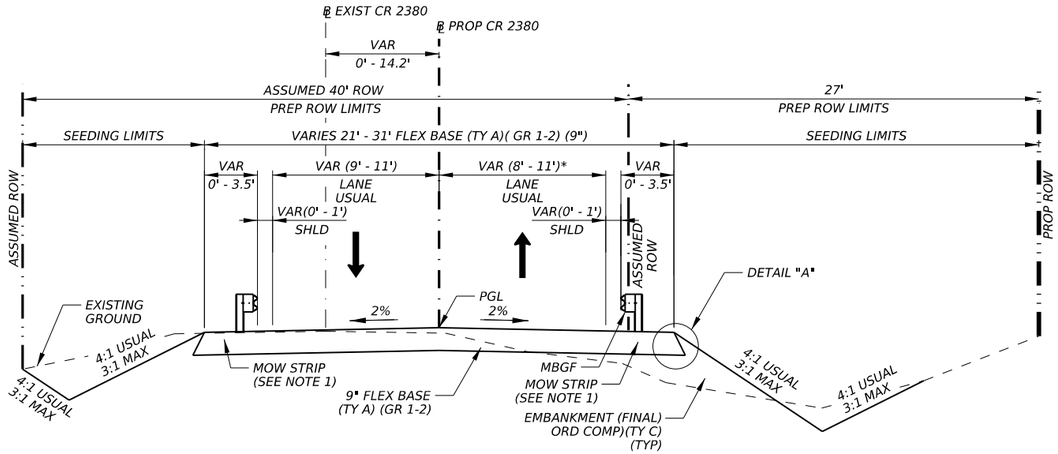
CLEMMONS GULLY PACKAGE

PROPOSED TYPICAL SECTIONS
BAILEY RD AT WHITES BAYOU

SHEET 1 OF 1

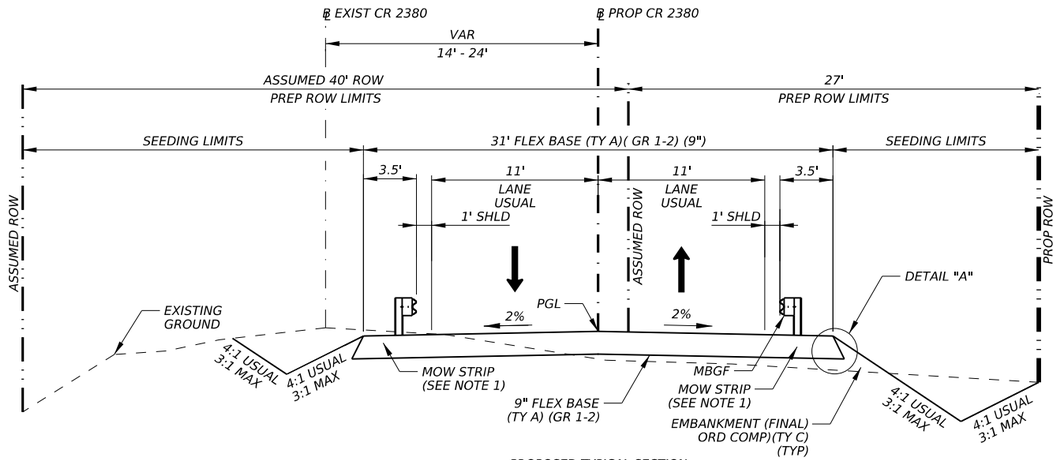
CONT	SECT	JOB	HIGHWAY
0920	03	082, ETC	CR 1065, ETC
DIST	COUNTY		SHEET NO.
BMT	HARDIN, ETC		7

DATE: 2/26/2024 2:13:02 PM
FILE: pw://la-pw.bentley.com:lja-pw-01/Documents/TxDOT/PM8016-2301 CEC WA4/Clemmons Gully Off-System Bridge/400 Production/4 - Design/Plan Set/1. General/031_BS_GTX01.dgn

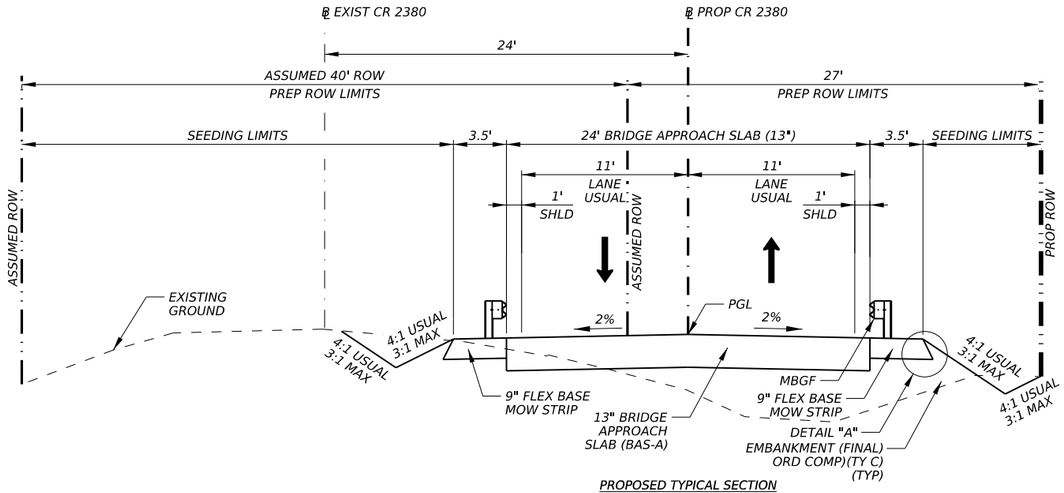


PROPOSED TYPICAL SECTION - TRANSITION SECTION

STA 11+22.47 TO STA 11+93.65
STA 14+64.39 TO STA 15+64.72
*PAVEMENT TRANSITIONS FROM 8' LANE TO 11' LANE



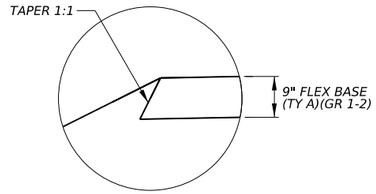
PROPOSED TYPICAL SECTION
STA 11+93.65 TO STA 12+96.00
STA 13+87.00 TO STA 14+64.39



PROPOSED TYPICAL SECTION
STA 12+96.00 TO STA 13+16.00
STA 13+66.00 TO STA 13+86.00

PROPOSED BRIDGE
STA 13+16.00 TO STA 13+66.00 = 100 FT

BRIDGE APPROACH SLAB
STA 12+96.00 TO STA 13+16.00 = 20 FT
STA 13+66.00 TO STA 13+86.00 = 20 FT



DETAIL "A"
N.T.S.

NOTES:

1. MOW STRIPS WILL BE CONSTRUCTED USING 9"FLEX BASE TO MATCH ROADWAY SECTION THICKNESS.

NOT TO SCALE

STATE OF TEXAS
S. E. WRIGHT
108969
LICENSED
PROFESSIONAL ENGINEER

02-27-2024

LJA PROGRAM MANAGEMENT
FRN - F-14256

Texas Department of Transportation

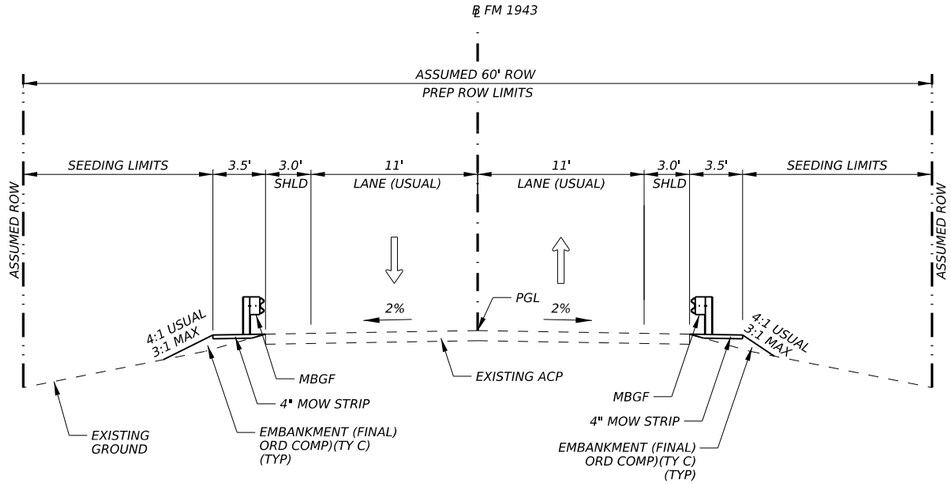
CLEMMONS GULLY PACKAGE

PROPOSED TYPICAL SECTIONS
CR 2380 AT VINCENT TRIBUTARY

SHEET 1 OF 1

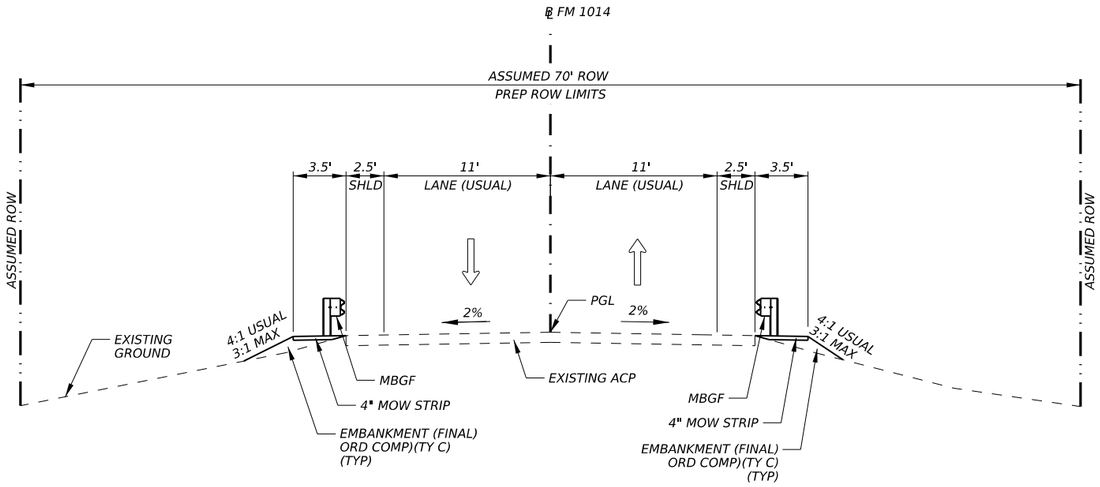
CONT	SECT	JOB	HIGHWAY
0920	03	082, ETC	CR 1065, ETC
DIST	COUNTY		SHEET NO.
BMT	HARDIN, ETC		8

DATE: 2/26/2024 2:13:08 PM
FILE: pw://lja-pw.bentley.com:lja-pw-01/Documents/TxDOT/PM8016-2301 CEC WA4/Clemmons Gully Off-System Bridge/400 Production/4 - Design/Plan Set/1. General/041_VT_TYP.dgn



PROPOSED TYPICAL SECTION
STA 11+04.00 TO STA 16+88.63

NOT TO SCALE



PROPOSED TYPICAL SECTION
STA 10+98.08 TO STA 14+46.44

02-27-2024

LJA PROGRAM MANAGEMENT
FRN - F-14256

Texas Department of Transportation

CLEMMONS GULLY PACKAGE

PROPOSED TYPICAL SECTIONS
FM 1943 AT DRAIN
FM 1014 AT DRAW

SHEET 1 OF 1

CONT	SECT	JOB	HIGHWAY
0920	03	082, ETC	CR 1065, ETC
DIST	COUNTY		SHEET NO.
BMT	HARDIN, ETC		9

DATE: 2/26/2024 2:13:13 PM
FILE: pw://lja-pw.bentley.com:lja-pw-01/Documents/TxDOT/PM8016-2301 CEC WA4/Clemmons Gully Off-System Bridge/400 Production/4 - Design/Plan Set/1. General/031_GTX01.dgn

GENERAL NOTES:

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

Name Dave Collins, PE

Email Dave.Collins@TxDOT.gov

Name Richard Bradley Jr, PE

Email Richard.Bradley@TxDOT.gov

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.

Item 5 Control of the Work

Station the project before commencing work. Mark the stations every 100 feet. Maintain stationing throughout the duration of the project. Remove the station markings at the completion of the project. Consider this work to be subsidiary to the various bid items of the contract.

Verify all horizontal and vertical control, approach grades to structures and driveways before beginning work. Notify the Engineer immediately if discrepancies are discovered.

Furnish, to the Engineer, a list of the final centerline elevations based on the alignment stationing shown on the plans.

When a precast or cast-in-place concrete element is included in the plans, a precast concrete alternate may be submitted in accordance with “Standard Operating Procedure for Alternate Precast Proposal Submission” found online at https://www.txdot.gov/inside-txdot/forms-publications/consultants-contractors/publications/bridge.html#design. Acceptance or denial of an alternate is at the sole discretion of the Engineer. Impact to the project schedule and any additional costs resulting from the use of alternates are the sole responsibility of the Contractor.

Item 6 Control of Materials

Flammable/combustible materials must be stored at a designated location as approved.

Do not store flammable/combustible materials under or adjacent to Bridge class structures. Daily removal of these materials will be considered incidental work.

To comply with the latest provisions of Build America, Buy America Act (BABA Act) of the Bipartisan Infrastructure Law, the contractor must submit a 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

Mixing of materials, storing of materials, storing of equipment, or repairing of equipment on top of concrete pavement or bridge decks will not be permitted unless specifically authorized.

Item 7 Legal Relations and Responsibilities

Furnish all materials, labor and incidentals required to provide for traffic across the highway and for temporary ingress and egress to private property in accordance with article 7.2.4 of the standard specifications at no additional cost to the state. Maintain ingress and egress to the adjacent property at all times. Consider this work to be subsidiary to the various bid items of the contract.

The Contractor will be completely responsible for the immediate removal of any material that gets upon any vehicle as a result of their operation.

No significant traffic generator events have been identified in the project limits.

Item 8 Prosecution and Progress

Compute and charge working days in accordance with Section 8.3.1.4 Standard Workweek.

Submit monthly progress schedules in accordance with 8.5.5.2.3. Failure to supply updated project schedule may result in the Engineer withholding progress (monthly) payments.

This project includes a 150 day work start delay as detailed in Special Provision 008-059. This delay is to allow for the fabrication of Bridge beams.

HURRICANE

In the event of the declaration of a hurricane watch, warning, other severe weather warning or national or state emergency that requires the roadways in the vicinity be used as evacuation routes, cease all work that requires the Contractor's, sub-contractors' or material suppliers' vehicles to enter the stream of traffic on these primary or secondary evacuation routes. This work includes material hauling and delivery, and mobilization or demobilization of equipment.

In addition to lane closures, cease work 3 days before hurricane landfall on or near the roadway that adversely impacts the flow of traffic and reduces the capacity of the highway during an evacuation. Prohibit the Contractor's, sub-Contractors' or material suppliers' vehicles from entering or exiting the stream of traffic including material hauling and delivery, and mobilization or demobilization of equipment. When directed, this prohibition will include a reasonable time period for the evacuees to return to their point of origin.

Item 100 Preparing Right of Way

When bridge demolition, tree trimming or tree/brush removal is required from February 15 to September 30, the contractor will provide a qualified biologist with a Bachelor's Degree in biology and demonstrated bird nest survey experience to conduct nesting surveys before work can begin and until vegetation work is completed to ensure compliance with the Migratory Bird Treaty Act (MBTA). See EPIC sheet for details.

Item 110 Excavation

Any earthwork cross-sections, computer printouts, data files and any other information provided is for non-construction purposes only and it is the responsibility of the prospective bidder to validate the data with the appropriate plans, specifications and estimates for the projects. Contact the Area Office for information on availability.

Do not windrow or stockpile material next to or along the roadway. Remove excess material from the project daily.

Transition the ditch grades and channel bottom widths at structure locations. Use only approved channel excavation in the embankment.

Item 112 Subgrade Widening

Remove excess material daily unless otherwise directed. Fill all excavated areas by the end of the work day.

Item 132 Embankment

Compaction method specified as ***ordinary*** compaction.

It is the Contractor's responsibility to advise the Engineer of the location of the material source enough in advance to avoid delay due to testing requirements.

Embankment Type C will conform to the following specification requirements:

1. Liquid Limit – 40
2. Plasticity Index – 25 maximum, 8 minimum
3. Bar Linear Shrinkage ≥ 2
4. A cohesionless sand will not be permitted

All slopes requiring embankment will be tracked immediately upon final grading to prevent erosion. Tracking consists of operating a tracked vehicle or equipment up and down the slopes leaving track marks perpendicular to the direction of the slope. See the EC(1) standard for tracking details. Tracking slopes to prevent erosion will not be measured or paid for directly, but will be subsidiary to pertinent Items.

Item 164 Seeding for Erosion Control

Final grading and stabilization (seeding) will be achieved as soon as possible and not scheduled only for the end of the project. Final grading and stabilization should be initiated as the overall work progresses.

Item 166 Fertilizer

Fertilize all the seeded areas of project.

Item 168 Vegetative Watering

Equip water trucks with sprinkler systems capable of covering the entire area to be seeded or sodded from the roadway.

Water all newly placed sod or seeded areas the same day of installation. Thereafter, maintain the sod or seeded areas in a well-watered condition and at no time allow the areas to dry to the condition that water stress is evident.

Mechanical watering may not be required during periods of adequate moisture as determined.

Comply with stabilization requirements for 70% grass coverage; uniform vegetative coverage is required. During this period, meter and operate water equipment under pumping pressure capable of delivering the required quantities of water necessary. For Permanent seeding each cycle will be executed weekly for 12 weeks, unless directed otherwise. For Temporary seeding each cycle will be executed weekly for 6 weeks, unless directed otherwise.

Provide a log book showing daily water usage and receipts of water applied, in addition to metering the water equipment.

Item 216 Proof Rolling

Perform proof rolling when the moisture content of the subgrade soil is near optimum or at the moisture content at which compaction was achieved. Operate the roller briefly to determine its effect on the subgrade. If consistent lateral displacement occurs, use a lower stress level. After an acceptable stress level is established, make two complete passes over the subgrade.

Do not proof roll over culverts, pipes or other conduits that may be damaged by the proof roller, and in areas where there is not enough maneuvering space.

Proof roll areas as directed.

Item 247 Flexible Base

Use Type A, Grade 1-2 flexible base.

The minimum plasticity index for this material will be 4.

Item 420 Concrete Substructures

Paint the Control Section (CSS) Number on a location approved by the Engineer using black exterior paint and stencils that result in two (2) inch high numbers. All numbers should be legible and free of smears or drips. The painting of these numbers will not be paid for directly but will be considered subsidiary to the various bid items.

Item 421 Hydraulic Cement Concrete

Entrained air is required in all slip formed concrete (bridge rail, concrete traffic barrier, pavement, etc.), but is not required for other structural concrete. Adjust the dosage of air entraining agent for low air content as directed or allowed.

Item 422 Concrete Superstructures

Mixing of materials, storing of materials, storing of equipment, or repairing of equipment on top of concrete pavement or bridge decks will not be permitted unless specifically authorized. Permission will be granted if, in the opinion of the Engineer, storage of the materials will not cause damage or discoloration. Any damage resulting from this work will be corrected at the Contractor's expense.

Item 496 Removing Structures

See EPIC sheet for hazardous materials locations. The Department will remove paint containing hazardous materials off the steel during the Contract in accordance with the following to allow for disassembly:

- A six inch wide strip around the perimeter of the beam cross-section for each beam for every 40 feet of beam length.
- A four inch wide strip around the perimeter of the diaphragm member or members at each attachment location to the beams.
- A four inch wide strip around bearing attachments and at the anchor bolts.
- As requested elsewhere and approved. Paint removal requested beyond that listed herein will be at the Contractor's expense.

The Contractor will provide a Deconstruction and Removal Plan to the Bridge Engineer of Record for review and approval that is signed and sealed by an Engineer licensed in the State of Texas. Submit the Deconstruction and Removal Plan to the Beaumont Area Office at least thirty (30) days prior to cutting any existing bridge members or elements. Under a separate contract, the paint has been removed from the existing steel members at predetermined locations. This paint is known to contain lead and will be treated as a Hazardous Material. Use the locations of the predetermined steel cut locations shown on the plans (supplemental sheets) to prepare the Deconstruction and Removal Plan. Steel members may only be cut at locations where the paint has been removed. Paint removal may be ongoing. The Contractor will coordinate with the paint removal contractor to facilitate work. The Contractor will be solely responsible for the safety and success in removing and disposing of the existing bridge structure. Stability calculations for each stage of removal must be included in the Deconstruction and Removal Plan.

Item 502 Barricades, Signs, and Traffic Handling

Construct all work zone signs, sign supports, and barricades from material other than wood unless approved otherwise. Metal posts, if used, are to be galvanized. Aluminum signs, if used, will meet the following minimum thickness requirements:

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

The Contractor Force Account "Safety Contingency" that has been established for this project is intended to be used for work zone enhancements, to improve the effectiveness of the Traffic Control Plan, that could not be foreseen in the project planning and design stage. These enhancements will be mutually agreed upon by the Engineer and the Contractor's Responsible Person based on weekly or more frequent traffic management reviews on the project. The Engineer may choose to use existing bid items if it does not slow the implementation of enhancement.

Item 506 Temporary Erosion, Sedimentation, and Environmental Controls

Construct all side slopes on rock filter dams with 6:1 slopes.

The Contractor will implement storm water pollution prevention plan measures using the Items listed below as specified in Item 506 and as directed:

Rock Filter Dams and Temporary Sediment Control Fence

The Contractor will designate a clean out area for concrete trucks. No other area will be allowed without approval of the Engineer.

Item 540 Metal Beam Guard Fence

Provide Type II galvanization metal beam rail elements.

Provide round timber posts.

County: Hardin, Etc.

Item 545 Crash Cushion Attenuators

See standards in the plan set for information describing the attenuator's details: direction of traffic, design speed, foundation, backup support, backup width, and/or transition options.

Payment for D&OM(VIA)-20, and all required object markers and barrier reflectors on the attenuators will be considered subsidiary to this Item.

Item 585 Ride Quality for Pavement Surfaces

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

Item 636 Signs and/or Item 644 Small Roadside Sign Assemblies and/or Item 647 Large Roadside Sign Supports and Assemblies

Remove and stockpile all existing signs and sign posts within the project that are not to remain, at a stockpile location designated by the Engineer. Remove the signs from the posts. Replace any signs or post damaged by the Contractor at his/her entire expense. Consider this work to be subsidiary to the various bid items of the contract.

Item 658 Delineator and Object Marker Assemblies

Use Type A reflector unit (sheeting) on delineator assemblies attached to concrete barrier.

Mount reflectors on a steel or concrete bridge rail, where the bridge is 200' or less in length, at the same height as the reflectors on the MBGF rail element.

Use bolt-on attachment for delineator assemblies attached to guard fence.

Type C delineators will be installed using Adhesive 795A manufactured by Davidson Traffic Control Products or an equivalent approved in writing.

Item 3076 Dense Graded Hot Mix Asphalt (Exempt)

Provide a separate Laboratory space, building or testing area, large enough to accommodate TxDOT equipment and testing on site at the Hot Mix Plant near or within the area of Contractor's testing equipment. The contractor will provide the SGC" Superpave Gyratory Compactor" and TGC "Texas Gyratory Compactor". All other equipment must be provided by TxDOT. TxDOT will be responsible for maintaining state provided equipment. The

Contractor will provide TxDOT with the Calibration paperwork on the shared equipment that they provide.

Provide an all-weather parking area for the sole use of at least 2 State-owned vehicles. Situate the parking area near the Laboratory area at an acceptable location. Maintain the parking area until the project is completed and restore the area to a condition acceptable to the Engineer upon project completion.

Laboratory area shall have a roof, floor, doors, and screened windows. Ensure the floor is strong enough to support testing equipment and has an impervious floor covering. Ensure that the Laboratory area is tied down, weatherproof, piped for water and fuel, and electrically wired by personnel meeting the requirements of Article 7.18., "Electrical Requirements."

Provide secured and controlled access to the Laboratory area through security measures such as bars, locks, alarms, or security fencing for the Laboratory area.

Furnish and install adequate equipment, outlets, lighting, air-conditioning, heating, and ventilation for the Laboratory area. Heating and Air Conditioning shall maintain the Laboratory working area temperature within a range of (68*o*F through 72*o*F).

Provide partitioned restroom furnished with restroom supplies, a lavatory, and a flush toilet connected to a sewer or septic tank within the Laboratory area.

Laboratory area will have the use of an internet service provider (ISP) that can provide more than one computer access to ISP account at one time. ISP provider must be able to supply a minimum 100 gigabyte download speed per account.

Required appurtenances within the Laboratory Area:

1. A 10lb ABC fire extinguisher with up-to-date inspection tag and a working smoke detector.
2. Additional workbench and tables at least 3 ft. wide, 6 ft. long, and 3 ft. high.
3. Minimum two chairs and one desk, filing cabinets, solar screen blinds or shades.
4. An operational telephone system.
5. Water fountain or bottled water fountain able to provide cold water and have cup dispenser and cups.
6. Water (for testing purposes) from an approved source
7. Adequately power ventilate the room for the ignition oven. Provide a NEMA 6-50R (208/240 volt, 50 amp) outlet within 2.25 ft. of the ignition oven location and an independent exhaust outlet to the outside located a maximum of 8 ft. from the oven. Provide a level, sturdy and

8. fireproof surface for the ignition oven with a minimum of 6 in. clearance between the furnace and other vertical surfaces. Vent the ignition oven to the outside.
9. A minimum of 20 ft. of total work counter length at least 3 ft. wide and 3 ft. above the floor and strong enough to support required testing equipment
10. A laboratory sink measuring 24 × 30 in. and 12 in. deep
11. Door openings for the Laboratory area must be 48-inches minimum width. If steps are required to gain access to the facility's then a landing dock will be provided with minimum dimensions of 60 inches wide by 60 inches deep. The strong floor and landing of the facility shall support the weight of all equipment and personnel providing a stable, essentially zero deflection during testing operations acceptable to the Engineer.

    - Provide multifunction color printer/fax/scanner/copier capable of reproducing 11 X 17

For the Laboratory area the work performed, materials furnished, utilities, and utility services (including phone and internet), appurtenances including office equipment testing

equipment, labor, tools, and incidentals will not be paid measured or paid for directly but will be subsidiary to pertinent items.

Use aggregate that meets the SAC requirement of class A for all surface mixes. RAP aggregate must meet the requirements of Table 1.

Aggregates used on shoulders and ramps are required to meet SAC requirements. Provide mix designs. Mix designs must be verified and approved.

Remove all vegetation from pavement edges, intersections, curbs and gutters and driveways before planning or ACP operations. This work will not be paid for directly but will be subsidiary to the various bid items.

Operate the spreading and finishing machine at a uniform forward speed consistent with the plant production rate, hauling capability, and roller train capacity to result in a continuous operation. The speed will be slow enough, so that stopping between trucks is not ordinarily required. If the Engineer determines sporadic delivery of material is adversely affecting the HMA placement, the Engineer may require paving operations to cease until acceptable methods are employed to minimize starting and stopping of the paver.

A material transfer device (MTD) will be required for all surface courses of HMA on this project. An MTD is defined as a self-propelled, wheel-mounted vehicle capable of receiving HMA from the haul trucks separate from the paver. The MTD will have a minimum storage capacity of approximately 25 tons and will be equipped with a pivoting discharge conveyor and a means of completely remixing the HMA before placement. The Engineer may approve

an alternative device on a trial basis for the surface course. This device will be capable of receiving HMA separate from

the paver and must have remixing capabilities. For all other courses of HMA, other than the surface, an alternative device may be used as long as it is capable of receiving HMA separate from the paver.

Item 6185 Traffic Mounted Attenuators

Shadow vehicles with TMA and high intensity rotating, flashing, oscillating or strobe lights are required. Use one TMA preceding every stationary work zone and two TMA's for mobile operations.

In addition to the shadow vehicles with truck mounted attenuator (TMA) that are specified as being required for this project, provide **2** additional shadow vehicle(s) with TMA for TCP of TCP **(2-2)-18** as detailed on General Note **6 & 7** this standard sheet.

Therefore, 4 total shadow vehicles with TMA will be required for this type of work. The contractor will be responsible for determining if one or more of these operations will be ongoing at the same time to determine the total number of TMA's needed for the project.

Estimate & Quantity Sheet

CONTROLLING PROJECT ID 0920-03-082 **DISTRICT** Beaumont **COUNTY** Chambers, Hardin, Jasper, Tyler
HIGHWAY CR 1065, CR 189, CR 2380, FM 1014, FM 1943, US 96

			CONTROL SECTION JOB	**0065-04-086**		**0920-03-082**		**0920-13-041**		**0920-39-031**		**1238-01-008**		**1828-01-031**	
			PROJECT ID	**A00064478**		**A00135481**		**A00190140**		**A00185144**		**A00064479**		**A00064480**	
			COUNTY	**Jasper**		**Hardin**		**Tyler**		**Chambers**		**Tyler**		**Tyler**	
			HIGHWAY	**US 96**		**CR 1065**		**CR 2380**		**CR 189**		**FM 1014**		**FM 1943**	
ALT	**BID CODE**	**DESCRIPTION**	**UNIT**	EST.	FINAL	EST.	FINAL	EST.	FINAL	EST.	FINAL	EST.	FINAL	EST.	FINAL
	100-6002	PREPARING ROW	STA			4.100		4.500		4.000		3.800		5.500	
	104-6030	REMOVING CONC (PILE ENCASEMENT)	CY	5.000											
	105-6046	REMOVING STAB BASE & ASPH PAV (0"-10")	SY			581.000				780.000					
	110-6001	EXCAVATION (ROADWAY)	CY			254.000		281.000		113.000		56.000		84.000	
	110-6002	EXCAVATION (CHANNEL)	CY			200.000		250.000		33.000					
	112-6001	SUBGRADE WIDENING (ORD COMP)	STA			3.500		4.000		3.000					
	132-6005	EMBANKMENT (FINAL)(ORD COMP)(TY C)	CY			621.000		142.000		229.000		37.000		387.000	
	164-6001	BROADCAST SEED (PERM) (RURAL) (SANDY)	SY											1,213.000	
	164-6009	BROADCAST SEED (TEMP) (WARM)	SY			939.000		709.500		430.500		525.500		606.500	
	164-6011	BROADCAST SEED (TEMP) (COOL)	SY			939.000		709.500		430.500		525.500		606.500	
	164-6021	CELL FBR MLCH SEED(PERM)(RURAL)(SANDY)	SY			1,878.000		1,419.000		861.000		1,051.000			
	168-6001	VEGETATIVE WATERING	MG			15.800		12.000		7.200		8.800		10.200	
	169-6004	SOIL RETENTION BLANKETS (CL 1) (TY D)	SY			250.000				850.000		433.000		1,665.000	
	216-6001	PROOF ROLLING	HR			10.000		10.000		10.000		10.000		10.000	
	247-6041	FL BS (CMP IN PLC)(TYA GR1-2)(FNAL POS)	CY			149.000		295.000		159.000					
	310-6005	PRIME COAT (AE-P)	GAL			169.000				163.000					
	400-6005	CEM STABIL BKFL	CY			115.000		58.000		61.000					
	416-6001	DRILL SHAFT (18 IN)	LF			220.000									
	416-6002	DRILL SHAFT (24 IN)	LF					300.000		795.000					
	416-6004	DRILL SHAFT (36 IN)	LF			330.000									
	420-6013	CL C CONC (ABUT)	CY			41.400		18.400		18.200					
	420-6029	CL C CONC (CAP)	CY							13.800					
	420-6037	CL C CONC (COLUMN)	CY							8.300					
	420-6066	CL C CONC (RAIL FOUNDATION)	CY			24.000									
	420-6158	CL C CONC(PILE ENCASEMENT)	LF	20.000											
	420-6222	CL C CONC(PILE ENCASEMENT)(UNDERWATER)	LF	40.000											
	422-6001	REINF CONC SLAB	SF			1,560.000									
	422-6007	REINF CONC SLAB (SLAB BEAM)	SF					1,300.000		2,600.000					
	422-6015	APPROACH SLAB	CY			51.800		38.500		44.700					
	425-6010	PRESTR CONC SLAB BEAM (5SB12)	LF							492.420					
	425-6012	PRESTR CONC SLAB BEAM (5SB15)	LF					247.500							
	425-6035	PRESTR CONC GIRDER (TX28)	LF			237.690									
	432-6031	RIPRAP (STONE PROTECTION)(12 IN)	CY					222.000		270.000					
	432-6033	RIPRAP (STONE PROTECTION)(18 IN)	CY			263.000									
	432-6046	RIPRAP (MOW STRIP)(5 IN)	CY									45.000		56.000	
	450-6006	RAIL (TY T223)	LF			176.000		124.000		224.000		74.000		53.000	
	454-6004	ARMOR JOINT (SEALED)	LF			58.000		51.000		53.000					

Estimate & Quantity Sheet

CONTROLLING PROJECT ID 0920-03-082 **DISTRICT** Beaumont **COUNTY** Chambers, Hardin, Jasper, Tyler
HIGHWAY CR 1065, CR 189, CR 2380, FM 1014, FM 1943, US 96

				0065-04-086		0920-03-082		0920-13-041		0920-39-031		1238-01-008		1828-01-031	
		CONTROL SECTION JOB													
		PROJECT ID		A00064478		A00135481		A00190140		A00185144		A00064479		A00064480	
		COUNTY		Jasper		Hardin		Tyler		Chambers		Tyler		Tyler	
		HIGHWAY		US 96		CR 1065		CR 2380		CR 189		FM 1014		FM 1943	
ALT	**BID CODE**	**DESCRIPTION**	**UNIT**	EST.	FINAL	EST.	FINAL	EST.	FINAL	EST.	FINAL	EST.	FINAL	EST.	FINAL
	460-6001	CMP (GAL STL 12 IN)	LF					4.000							
	464-6005	RC PIPE (CL III)(24 IN)	LF			32.000				140.000					
	467-6316	SET (TY II) (12 IN) (CMP) (4: 1) (C)	EA					2.000							
	467-6395	SET (TY II) (24 IN) (RCP) (6: 1) (P)	EA			2.000				6.000					
	467-6463	SET (TY II) (42 IN) (RCP) (4: 1) (C)	EA			8.000									
	496-6009	REMOV STR (BRIDGE 0 - 99 FT LENGTH)	EA			1.000		1.000		1.000					
	496-6016	REMOV STR (PIPE)	EA			5.000				4.000					
	500-6001	MOBILIZATION	LS			1.000									
	502-6001	BARRICADES, SIGNS AND TRAFFIC HANDLING	MO	3.000		3.000		3.000		3.000		2.000		2.000	
	506-6001	ROCK FILTER DAMS (INSTALL) (TY 1)	LF	150.000											
	506-6002	ROCK FILTER DAMS (INSTALL) (TY 2)	LF			100.000		113.000		74.000					
	506-6011	ROCK FILTER DAMS (REMOVE)	LF	150.000		100.000		113.000		74.000					
	506-6033	BULLDOZER WORK (EROSION & SEDMT CONT)	HR			8.000		8.000		8.000		8.000		8.000	
	506-6038	TEMP SEDMT CONT FENCE (INSTALL)	LF			750.000		799.000		540.000		556.000		933.000	
	506-6039	TEMP SEDMT CONT FENCE (REMOVE)	LF			750.000		799.000		540.000		556.000		933.000	
	530-6005	DRIVEWAYS (ACP)	SY			274.000				195.000					
	540-6001	MTL W-BEAM GD FEN (TIM POST)	LF			125.000		425.000		75.000		200.000		475.000	
	540-6006	MTL BEAM GD FEN TRANS (THRIE-BEAM)	EA			1.000						4.000		4.000	
	540-6007	MTL BEAM GD FEN TRANS (TL2)	EA			2.000		4.000		3.000					
	540-6016	DOWNSTREAM ANCHOR TERMINAL SECTION	EA									1.000			
	544-6001	GUARDRAIL END TREATMENT (INSTALL)	EA			2.000		4.000		3.000		3.000		4.000	
	545-6006	CRASH CUSH ATTEN (INSTL)(L)(N)(TL2)	EA			2.000				1.000					
	552-6005	GATE (TY 1)	EA			1.000									
	560-6011	MAILBOX INSTALL-S (TWW-POST) TY 4	EA			2.000				4.000					
	644-6001	IN SM RD SN SUP&AM TY10BWG(1)SA(P)	EA							3.000		2.000			
	644-6076	REMOVE SM RD SN SUP&AM	EA			3.000		3.000		6.000					
	658-6014	INSTL DEL ASSM (D-SW)SZ (BRF)CTB (BI)	EA			8.000		4.000		9.000		2.000		2.000	
	658-6062	INSTL DEL ASSM (D-SW)SZ 1(BRF)GF2(BI)	EA			9.000		25.000		8.000		13.000		25.000	
	666-6302	RE PM W/RET REQ TY I (W)4"(SLD)(090MIL)	LF			846.000				820.000					
	666-6314	RE PM W/RET REQ TY I (Y)4"(SLD)(090MIL)	LF			692.000				822.000					
	672-6009	REFL PAV MRKR TY II-A-A	EA			17.000				11.000					
	3076-6066	TACK COAT	GAL			50.000				48.000					
	3076-6071	D-GR HMA TY-D PG 64-22 (EXEMPT)	TON			92.000				89.000					
	4216-6005	THERMOPLASTIC PIPE (PP) (42")	LF			144.000									
	6185-6002	TMA (STATIONARY)	DAY	16.000		97.000		97.000		90.000				60.000	
	18	SAFETY CONTINGENCY: CONTRACTOR FORCE ACCOUNT WORK (PARTICIPATING)	LS	1.000		1.000									

Estimate & Quantity Sheet

CONTROLLING PROJECT ID 0920-03-082 **DISTRICT** Beaumont **COUNTY** Chambers, Hardin, Jasper, Tyler

HIGHWAY CR 1065, CR 189, CR 2380, FM 1014, FM 1943, US 96

CONTROL SECTION JOB				**0065-04-086**		**0920-03-082**		**0920-13-041**		**0920-39-031**		**1238-01-008**		**1828-01-031**	
PROJECT ID				**A00064478**		**A00135481**		**A00190140**		**A00185144**		**A00064479**		**A00064480**	
COUNTY				**Jasper**		**Hardin**		**Tyler**		**Chambers**		**Tyler**		**Tyler**	
HIGHWAY				**US 96**		**CR 1065**		**CR 2380**		**CR 189**		**FM 1014**		**FM 1943**	
ALT	**BID CODE**	**DESCRIPTION**	**UNIT**	EST.	FINAL	EST.	FINAL	EST.	FINAL	EST.	FINAL	EST.	FINAL	EST.	FINAL
	18	EROSION CONTROL MAINTENANCE: CONTRACTOR FORCE ACCOUNT WORK (PART)	LS	1.000		1.000									

Estimate & Quantity Sheet

CONTROLLING PROJECT ID 0920-03-082

DISTRICT Beaumont

COUNTY Chambers, Hardin, Jasper, Tyler

HIGHWAY CR 1065, CR 189, CR 2380, FM 1014, FM 1943, US 96

			CONTROL SECTION JOB		TOTAL EST.	TOTAL FINAL
			PROJECT ID			
			COUNTY			
			HIGHWAY			
ALT	**BID CODE**	**DESCRIPTION**		**UNIT**		
	100-6002	PREPARING ROW		STA	21.900	
	104-6030	REMOVING CONC (PILE ENCASEMENT)		CY	5.000	
	105-6046	REMOVING STAB BASE & ASPH PAV (0"-10")		SY	1,361.000	
	110-6001	EXCAVATION (ROADWAY)		CY	788.000	
	110-6002	EXCAVATION (CHANNEL)		CY	483.000	
	112-6001	SUBGRADE WIDENING (ORD COMP)		STA	10.500	
	132-6005	EMBANKMENT (FINAL)(ORD COMP)(TY C)		CY	1,416.000	
	164-6001	BROADCAST SEED (PERM) (RURAL) (SANDY)		SY	1,213.000	
	164-6009	BROADCAST SEED (TEMP) (WARM)		SY	3,211.000	
	164-6011	BROADCAST SEED (TEMP) (COOL)		SY	3,211.000	
	164-6021	CELL FBR MLCH SEED(PERM)(RURAL)(SANDY)		SY	5,209.000	
	168-6001	VEGETATIVE WATERING		MG	54.000	
	169-6004	SOIL RETENTION BLANKETS (CL 1) (TY D)		SY	3,198.000	
	216-6001	PROOF ROLLING		HR	50.000	
	247-6041	FL BS (CMP IN PLC)(TYA GR1-2)(FNAL POS)		CY	603.000	
	310-6005	PRIME COAT (AE-P)		GAL	332.000	
	400-6005	CEM STABIL BKFL		CY	234.000	
	416-6001	DRILL SHAFT (18 IN)		LF	220.000	
	416-6002	DRILL SHAFT (24 IN)		LF	1,095.000	
	416-6004	DRILL SHAFT (36 IN)		LF	330.000	
	420-6013	CL C CONC (ABUT)		CY	78.000	
	420-6029	CL C CONC (CAP)		CY	13.800	
	420-6037	CL C CONC (COLUMN)		CY	8.300	
	420-6066	CL C CONC (RAIL FOUNDATION)		CY	24.000	
	420-6158	CL C CONC(PILE ENCASEMENT)		LF	20.000	
	420-6222	CL C CONC(PILE ENCASEMENT)(UNDERWATER)		LF	40.000	
	422-6001	REINF CONC SLAB		SF	1,560.000	
	422-6007	REINF CONC SLAB (SLAB BEAM)		SF	3,900.000	
	422-6015	APPROACH SLAB		CY	135.000	
	425-6010	PRESTR CONC SLAB BEAM (5SB12)		LF	492.420	
	425-6012	PRESTR CONC SLAB BEAM (5SB15)		LF	247.500	
	425-6035	PRESTR CONC GIRDER (TX28)		LF	237.690	
	432-6031	RIPRAP (STONE PROTECTION)(12 IN)		CY	492.000	
	432-6033	RIPRAP (STONE PROTECTION)(18 IN)		CY	263.000	
	432-6046	RIPRAP (MOW STRIP)(5 IN)		CY	101.000	
	450-6006	RAIL (TY T223)		LF	651.000	
	454-6004	ARMOR JOINT (SEALED)		LF	162.000	

Estimate & Quantity Sheet

CONTROLLING PROJECT ID 0920-03-082

DISTRICT Beaumont

COUNTY Chambers, Hardin, Jasper, Tyler

HIGHWAY CR 1065, CR 189, CR 2380, FM 1014, FM 1943, US 96

		CONTROL SECTION JOB		TOTAL EST.	TOTAL FINAL
		PROJECT ID			
		COUNTY			
		HIGHWAY			
ALT	**BID CODE**	**DESCRIPTION**	**UNIT**		
	460-6001	CMP (GAL STL 12 IN)	LF	4.000	
	464-6005	RC PIPE (CL III)(24 IN)	LF	172.000	
	467-6316	SET (TY II) (12 IN) (CMP) (4: 1) (C)	EA	2.000	
	467-6395	SET (TY II) (24 IN) (RCP) (6: 1) (P)	EA	8.000	
	467-6463	SET (TY II) (42 IN) (RCP) (4: 1) (C)	EA	8.000	
	496-6009	REMOV STR (BRIDGE 0 - 99 FT LENGTH)	EA	3.000	
	496-6016	REMOV STR (PIPE)	EA	9.000	
	500-6001	MOBILIZATION	LS	1.000	
	502-6001	BARRICADES, SIGNS AND TRAFFIC HANDLING	MO	16.000	
	506-6001	ROCK FILTER DAMS (INSTALL) (TY 1)	LF	150.000	
	506-6002	ROCK FILTER DAMS (INSTALL) (TY 2)	LF	287.000	
	506-6011	ROCK FILTER DAMS (REMOVE)	LF	437.000	
	506-6033	BULLDOZER WORK (EROSION & SEDMT CONT)	HR	40.000	
	506-6038	TEMP SEDMT CONT FENCE (INSTALL)	LF	3,578.000	
	506-6039	TEMP SEDMT CONT FENCE (REMOVE)	LF	3,578.000	
	530-6005	DRIVEWAYS (ACP)	SY	469.000	
	540-6001	MTL W-BEAM GD FEN (TIM POST)	LF	1,300.000	
	540-6006	MTL BEAM GD FEN TRANS (THRIE-BEAM)	EA	9.000	
	540-6007	MTL BEAM GD FEN TRANS (TL2)	EA	9.000	
	540-6016	DOWNSTREAM ANCHOR TERMINAL SECTION	EA	1.000	
	544-6001	GUARDRAIL END TREATMENT (INSTALL)	EA	16.000	
	545-6006	CRASH CUSH ATTEN (INSTL)(L)(N)(TL2)	EA	3.000	
	552-6005	GATE (TY 1)	EA	1.000	
	560-6011	MAILBOX INSTALL-S (TWW-POST) TY 4	EA	6.000	
	644-6001	IN SM RD SN SUP&AM TY10BWG(1)SA(P)	EA	5.000	
	644-6076	REMOVE SM RD SN SUP&AM	EA	12.000	
	658-6014	INSTL DEL ASSM (D-SW)SZ (BRF)CTB (BI)	EA	25.000	
	658-6062	INSTL DEL ASSM (D-SW)SZ 1(BRF)GF2(BI)	EA	80.000	
	666-6302	RE PM W/RET REQ TY I (W)4"(SLD)(090MIL)	LF	1,666.000	
	666-6314	RE PM W/RET REQ TY I (Y)4"(SLD)(090MIL)	LF	1,514.000	
	672-6009	REFL PAV MRKR TY II-A-A	EA	28.000	
	3076-6066	TACK COAT	GAL	98.000	
	3076-6071	D-GR HMA TY-D PG 64-22 (EXEMPT)	TON	181.000	
	4216-6005	THERMOPLASTIC PIPE (PP) (42")	LF	144.000	
	6185-6002	TMA (STATIONARY)	DAY	360.000	
	18	SAFETY CONTINGENCY: CONTRACTOR FORCE ACCOUNT WORK (PARTICIPATING)	LS	2.000	

Estimate & Quantity Sheet

CONTROLLING PROJECT ID 0920-03-082

DISTRICT Beaumont

COUNTY Chambers, Hardin, Jasper, Tyler

HIGHWAY CR 1065, CR 189, CR 2380, FM 1014, FM 1943, US 96

		CONTROL SECTION JOB		TOTAL EST.	TOTAL FINAL
		PROJECT ID			
		COUNTY			
		HIGHWAY			
ALT	**BID CODE**	**DESCRIPTION**	**UNIT**		
	18	EROSION CONTROL MAINTENANCE: CONTRACTOR FORCE ACCOUNT WORK (PART)	LS	2.000	

SUMMARY OF ROADWAY ITEMS										
LOCATION	100 6002	110 6001	110 6002	112 6001	132 6005	216 6001	247 6041	310 6005	420 6066	432 6046
	PREPARING ROW (1)	EXCAVATION (ROADWAY)	EXCAVATION (CHANNEL)	SUBGRADE WIDENING (ORD COMP)	EMBANKMENT (FINAL)(ORD COMP)(TY C)	PROOF ROLLING	FL BS (CMP IN PLC)(TYA GR1-2)(FNAL POS)	PRIME COAT (AE-P)	CL C CONC (RAIL FOUNDATION)	RIPRAP (MOW STRIP)(5 IN)
	STA	CY	CY	STA	CY	HR	SY	SY	CY	CY
W. PINESHADOWS DR. (CR 1065) AT CLEMMONS GULLY	4.1	254	200	3.5	621	10	149	844	24	
CSJ: 0920-03-082										
BAILEY ROAD AT WHITES BAYOU	4.0	113	33	3.0	229	10	159	815		
CSJ: 0920-39-031										
CR 2380 AT VINCENT TRIBUTARY	4.5	281	250	4.0	142	10	295			
CSJ: 0920-13-041										
FM 1943 AT DRAIN	5.5	84			387	10				56
CSJ: 1828-01-031										
FM 1014 AT DRAW	3.8	56			37	10				45
CSJ: 1238-01-008										
PROJECT TOTALS	**22**	**788**	**483**	**11**	**1,416**	**50**	**603**	**1,659**	**24**	**101**

(1) *TREE REMOVAL IS INCLUDED WITH PREP ROW*

SUMMARY OF ROADWAY ITEMS								
LOCATION	450 6006	460 6001	464 6005	467 6316	467 6395	467 6463	530 6005	540 6001
	RAIL (TY T223)	CMP (GAL STL 12 IN)	RC PIPE (CL III)(24 IN)	SET (TY II) (12 IN) (CMP) (4: 1) (C)	SET (TY II) (24 IN) (RCP) (6: 1) (P)	SET (TY II) (42 IN) (RCP) (4: 1) (C)	DRIVEWAYS (ACP)	MTL W-BEAM GD FEN (TIM POST)
	LF	LF	LF	EA	EA	EA	SY	LF
W. PINESHADOWS DR. (CR 1065) AT CLEMMONS GULLY	37		32		2	8	274	125
CSJ: 0920-03-082								
BAILEY ROAD AT WHITES BAYOU			140		6		193	75
CSJ: 0920-39-031								
CR 2380 AT VINCENT TRIBUTARY		4		2				425
CSJ: 0920-13-041								
FM 1943 AT DRAIN	53							475
CSJ: 1828-01-031								
FM 1014 AT DRAW	74							200
CSJ: 1238-01-008								
PROJECT TOTALS	**164**	**4**	**172**	**2**	**8**	**8**	**467**	**1,300**

LJA PROGRAM MANAGEMENT
FRN - F-14256

Texas Department of Transportation

CLEMMONS GULLY PACKAGE

SUMMARY OF QUANTITIES

CONT	SECT	JOB	HIGHWAY
0920	03	082, ETC	CR 1065, ETC
DIST	COUNTY		SHEET NO.
BMT	HARDIN, ETC		12

SUMMARY OF ROADWAY ITEMS											
LOCATION	540 6006	540 6007	540 6016	544 6001	545 6006	552 6005	560 6011	3076 6066	3076 6071	4216 6005	6185 6002
	MTL BEAM GD FEN TRANS (THRIE-BEAM)	MTL BEAM GD FEN TRANS (TL2)	DOWNSTREAM ANCHOR TERMINAL SECTION	GUARDRAIL END TREATMENT (INSTALL)	CRASH CUSH ATTEN (INSTL)(L)(N) (TL2)	GATE (TY 1)	MAILBOX INSTALL-S (TWW-POST) TY 4	TACK COAT	D-GR HMA TY-D PG 64-22 (EXEMPT)	THERMOPLASTIC PIPE (PP)(42")	TMA (STATIONARY)
	EA	EA	EA	EA	EA	EA	EA	SY	SY	LF	DAY
W. PINESHADOWS DR. (CR 1065) AT CLEMMONS GULLY	1	2		2	2	1	2	832	832	144	97
CSJ: 0920-03-082											
BAILEY ROAD AT WHITES BAYOU		3		3	1		4	805	805		90
CSJ: 0920-39-031											
CR 2380 AT VINCENT TRIBUTARY		4		4							97
CSJ: 0920-13-041											
FM 1943 AT DRAIN	4			4							60
CSJ: 1828-01-031											
FM 1014 AT DRAW	4		1	3							60
CSJ: 1238-01-008											
PROJECT TOTALS	**9**	**9**	**1**	**16**	**3**	**1**	**6**	**1637**	**1637**	**144**	**404**

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LJA PROGRAM MANAGEMENT
FRN - F-14256

Texas Department of Transportation

CLEMMONS GULLY PACKAGE

SUMMARY OF QUANTITIES

CONT	SECT	JOB	HIGHWAY
0920	03	082, ETC	CR 1065, ETC
DIST	COUNTY		SHEET NO.
BMT	HARDIN, ETC		13

SUMMARY OF EROSION CONTROL ITEMS											
LOCATION	164 6009	164 6011	164 6021	166 6001	168 6001	169 6004	506 6002	506 6011	506 6033	506 6038	506 6039
	BROADCAST SEED (TEMP) (WARM)	BROADCAST SEED (TEMP) (COOL)	CELL FBR MLCH SEED(PERM)(RURAL) (SANDY)	* FERTILIZER	VEGETATIVE WATERING *(6.788 MG/AC X 6 CYCLES)*	SOIL RETENTION BLANKETS (CL 1) (TY D)	ROCK FILTER DAMS (INSTALL) (TY 2)	ROCK FILTER DAMS (REMOVE)	BULLDOZER WORK (EROSION & SEDMT CONT)	TEMP SEDMT CONT FENCE (INSTALL)	TEMP SEDMT CONT FENCE (REMOVE)
	SY	SY	SY	AC	SY	SY	LF	LF	HR	LF	LF
W. PINESHADOWS DR. (CR 1065) AT CLEMMONS GULLY	936.5	936.5	1873	0.387	1873	250	60	60	8	750	750
CSJ: 0920-03-082											
BAILEY ROAD AT WHITES BAYOU	430.5	430.5	861	0.178	861	850	74	74	8	540	540
CSJ: 0920-39-031											
CR 2380 AT VINCENT TRIBUTARY	709.5	709.5	1419	0.293	1419		113	113	8	799	799
CSJ: 0920-13-041											
FM 1943 AT DRAIN	606.5	606.5	1213	0.251	1213	1665			8	933	933
CSJ: 1828-01-031											
FM 1014 AT DRAW	525.5	525.5	1051	0.217	1051	433			8	556	556
CSJ: 1238-01-008											
PROJECT TOTALS	**3208.5**	**3208.5**	**6417.0**	**1.33**	**6417.00**	**3198**	**247**	**247**	**40**	**3578**	**3578**

* *FOR CONTRACTORS INFORMATION ONLY*

SUMMARY OF REMOVAL ITEMS				
LOCATION	105 6046	496 6009	496 6016	644 6076
	REMOVING STAB BASE & ASPH PAV (0"-10")	REMOV STR (BRIDGE 0 - 99 FT LENGTH)	REMOV STR (PIPE)	REMOVE SM RD SN SUP&AM
	SY	EA	EA	EA
W. PINESHADOWS DR. (CR 1065) AT CLEMMONS GULLY	581	1	5	3
CSJ: 0920-03-082				
BAILEY ROAD AT WHITES BAYOU	958	1	4	6
CSJ: 0920-39-031				
CR 2380 AT VINCENT TRIBUTARY		1		3
CSJ: 0920-13-041				
FM 1943 AT DRAIN				
CSJ: 1828-01-031				
FM 1014 AT DRAW				
CSJ: 1238-01-008				
PROJECT TOTALS	**1,539**	**3**	**9**	**12**

LJA PROGRAM MANAGEMENT
FRN - F-14256

Texas Department of Transportation

CLEMMONS GULLY PACKAGE

SUMMARY OF QUANTITIES

CONT	SECT	JOB	HIGHWAY
0920	03	082, ETC	CR 1065, ETC
DIST	COUNTY		SHEET NO.
BMT	HARDIN, ETC		14

DATE: 2/28/2024 1:39:04 PM
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SUMMARY OF PAVEMENT MARKING ITEMS					
LOCATION	658 6014	658 6062	666 6302	666 6314	672 6009
	INSTL DEL ASSM (D-SW)SZ (BRF)CTB (BI)	INSTL DEL ASSM (D-SW)SZ 1(BRF)GF2(BI)	RE PM W/RET REQ TY I (W)4"(SLD)(090MIL)	RE PM W/RET REQ TY I (Y)4"(SLD)(090MIL)	REFL PAV MRKR TY II-A-A
	EA	EA	LF	LF	EA
W. PINESHADOWS DR. (CR 1065) AT CLEMMONS GULLY	8	9	846	692	17
CSJ: 0920-03-082					
BAILEY ROAD AT WHITES BAYOU	9	8	820	822	11
CSJ: 0920-39-031					
CR 2380 AT VINCENT TRIBUTARY	4	25			
CSJ: 0920-39-031					
FM 1943 AT DRAIN	2	25			
CSJ: 1828-01-031					
FM 1014 AT DRAW	2	13			
CSJ: 1238-01-008					
PROJECT TOTALS	**25**	**80**	**1666**	**1514**	**28**

SUMMARY OF SIGNING ITEMS	
LOCATION	644 6001
	IN SM RD SN SUP&AM TY10BWG(1)SA(P)
	EA
W. PINESHADOWS DR. (CR 1065) AT CLEMMONS GULLY	
CSJ: 0920-03-082	
BAILEY ROAD AT WHITES BAYOU	3
CSJ: 0920-39-031	
CR 2380 AT VINCENT TRIBUTARY	
CSJ: 0920-13-041	
FM 1943 AT DRAIN	
CSJ: 1828-01-031	
FM 1014 AT DRAW	2
CSJ: 1238-01-008	
PROJECT TOTALS	**5**

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LJA PROGRAM MANAGEMENT
FRN - F-14256

Texas Department of Transportation

CLEMMONS GULLY PACKAGE

SUMMARY OF QUANTITIES

CONT	SECT	JOB	HIGHWAY
0920	03	082, ETC	CR 1065, ETC
DIST	COUNTY		SHEET NO.
BMT	HARDIN, ETC		15

SUMMARY OF ESTIMATED QUANTITIES

LOCATION	104 6030 REMOVING CONC (PILE ENCASEMENT) CY	420 6158 CL C CONC (PILE ENCASEMENT) LF	420 6222 CL C CONC (PILE ENCASEMENT) (UNDERWATER) LF	502 6001 BARRICADES, SIGNS AND TRAFFIC HANDLING MO	506 6001 ROCK FILTER DAMS (INSTALL) LF	506 6011 ROCK FILTER DAMS (REMOVE) LF	6185 6002 TMA (STATIONARY) DAY
0065-04-086	5	20	40	3.0	150.00	150.0	16.0
TOTAL	**5**	**20**	**40**	**3**	**150**	**150.00**	**16.0**

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DATE: $DATE$ $TIME$

QUANTITY SUMMARIES

Texas Department of Transportation

FHWA TEXAS DIVISION			SHEET NO.
			16
STATE	DISTRICT	COUNTY	
TEXAS	BMT	HARDIN, ETC	
CONTROL	SECTION	JOB	HIGHWAY NO.
0920	03	082, ETC	CR 1065, ETC

LOC NO.	TCP PHASE	PLAN SHEET NUMBER	LOCATION	STA	TEST LEVEL	DIRECTION OF TRAFFIC (UNI/BI)	FOUNDATION PAD		BACKUP SUPPORT			AVAILABLE SITE LENGTH	CRASH CUSHION									
															MOVE / RESET		L	L	R	R	S	S
							PROPOSED MATERIAL	PROPOSED THICKNESS	DESCRIPTION	WIDTH	HEIGHT		INSTALL	REMOVE	MOVE/ RESET	FROM LOC. #	N	W	N	W	N	W
1		64	W. PINESHADOWS AT CLEMMONS GULLY	14+00.00	TL-2	UNI	TY-D HMA FLEX BASE	9.0"	TY T223 RAIL	1'-3.5"	2'-8"	13'	1				1					
2		64	W. PINESHADOWS AT CLEMMONS GULLY	14+42.00	TL-2	UNI	TY-D HMA FLEX BASE	9.0"	TY T223 RAIL	1'-3.5"	2'-8"	13'	1				1					
1		66	BAILEY RD AT WHITES BAYOU	14+23.00	TL-2	UNI	TY-D HMA FLEX BASE	9.0"	TY T223 RAIL	1'-3.5"	2'-8"	13'	1				1					

LEGEND:
L=LOW MAINTENANCE
R=REUSABLE
S=SACRIFICIAL
N=NARROW
W=WIDE

FOR DEFINITIONS SEE THE "CRASH CUSHION CATEGORIZATION CHART.PDF" AT THE DESIGN DIVISION (ROADWAY STANDARDS) WEBSITE. USE QUICK LINKS TO ACCESS ATTENUATORS / CRASH CUSHIONS SECTION.
http://www.dot.state.tx.us/insdtdot/orgchart/cmd/cserve/standard/rdwyse.htm

CRASH CUSHION SUMMARY SHEET

FILE: ccss.dgn	DN: TxDOT	CK:	CK:
© TxDOT	CONT	SECT	JOB	HIGHWAY
REVISIONS	0920	03	082, ETC	CR 1065, ETC
	DIST	COUNTY	
	BMT	HARDIN, ETC	
	FEDERAL AID PROJECT		SHEET NO.
			17

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FILE: pw://ija-pw.bentley.com:ija-pw-01/Documents/TxDOT/PM8016-2301 CEC WA4/Clemmons Gully Off-System Bridge/400 Production/4 - Design/Plan Set/1. General/ccss.dgn

SUMMARY OF SMALL SIGNS

PLAN SHEET NO.	SIGN NO.	SIGN NOMENCLATURE	SIGN	DIMENSIONS	FLAT ALUMINUM (TYPE A)	EXAL ALUMINUM (TYPE G)	SM RD SGN ASSM TY XXXXX (X) XX (X-XXXX) POST TYPE: FRP = Fiberglass; TWT = Thin-Wall; 10BWG = 10 BWG; S80 = Sch 80	POSTS: 1 or 2	ANCHOR TYPE: UA=Universal Conc; UB=Universal Bolt; SA=Slipbase-Conc; SB=Slipbase-Bolt; WS=Wedge Steel; WP=Wedge Plastic	MOUNTING DESIGNATION: PREFABRICATED: P = "Plain"; T = "T"; U = "U"	MOUNTING DESIGNATION: 1EXT or 2EXT = # of Ext; BM = Extruded Wind Beam; WC = 1.12 #/ft Wing Channel; EXAL= Extruded Alum Sign Panels	BRIDGE MOUNT CLEARANCE SIGNS (See Note 2) TY = TYPE: TY N, TY S
2	1	W7-13aT	BRIDGE MAY ICE IN COLD WEATHER	36 X 36	X		10BWG	1	SA	P		
	2	R19-5T	NO DUMPING ALLOWED	24 X 30	X		10BWG	1	SA	P		
	3	W7-13aT	BRIDGE MAY ICE IN COLD WEATHER	36 X 36	X		10BWG	1	SA	P		
5	1	D20-1TR	CO RD 3380	24 X 24	X		10BWG	1	SA	P		
	2	W1-2R	HORIZONTAL ALIGNMENT	30 X 30	X		10BWG	1	SA	P		
		W13-1P	ADVISORY SPEED	18 X 18	X							

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

The Standard Highway Sign Designs for Texas (SHSD) can be found at the following website.

http://www.txdot.gov/

NOTE:

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

Texas Department of Transportation

Traffic Operations Division Standard

SUMMARY OF SMALL SIGNS

SOSS

FILE:	sums16.dgn	DN: TxDOT	CK: TxDOT	DW: TxDOT	CK: TxDOT
© TxDOT	May 1987	CONT	SECT	JOB	HIGHWAY
REVISIONS		0920	03	082, ETC	CR 1065, ETC
4-16		DIST	COUNTY		SHEET NO.
8-16		BMT	HARDIN, ETC		18

DATE: 2/26/2024 2:16:59 PM
FILE: pw://ija-pw.bentley.com:ija-pw-01/Documents/TxDOT/PM8016-2301 CEC WA4/Clemmons Gully Off-System Bridge/400 Production/4 - Design/Plan Set/1. General/031_SOSS.dgn

PROJECT CONSTRUCTION SEQUENCE

THE PROJECTS SHALL BE CONSTRUCTED IN THIS ORDER:

1. FM 1943 AT THEUVENINS CREEK (DRAIN)
2. FM 1014 AT DRAW
3. US 96 FROM NECHES RIVER RELIEF TO STR 20-122-0-0065-04-076
4. CR 1065 (W. PINE SHADOWS DR.) AT CLEMMONS GULLY
5. CR 2380 AT VINCENT TRIBUTARY
6. BAILEY ROAD AT WHITES BAYOU

STATE OF TEXAS
S. E. WRIGHT
108969
LICENSED
PROFESSIONAL ENGINEER
SE Wright
03-18-2024

LJA PROGRAM MANAGEMENT
FRN - F-14256

CLEMMONS GULLY PACKAGE

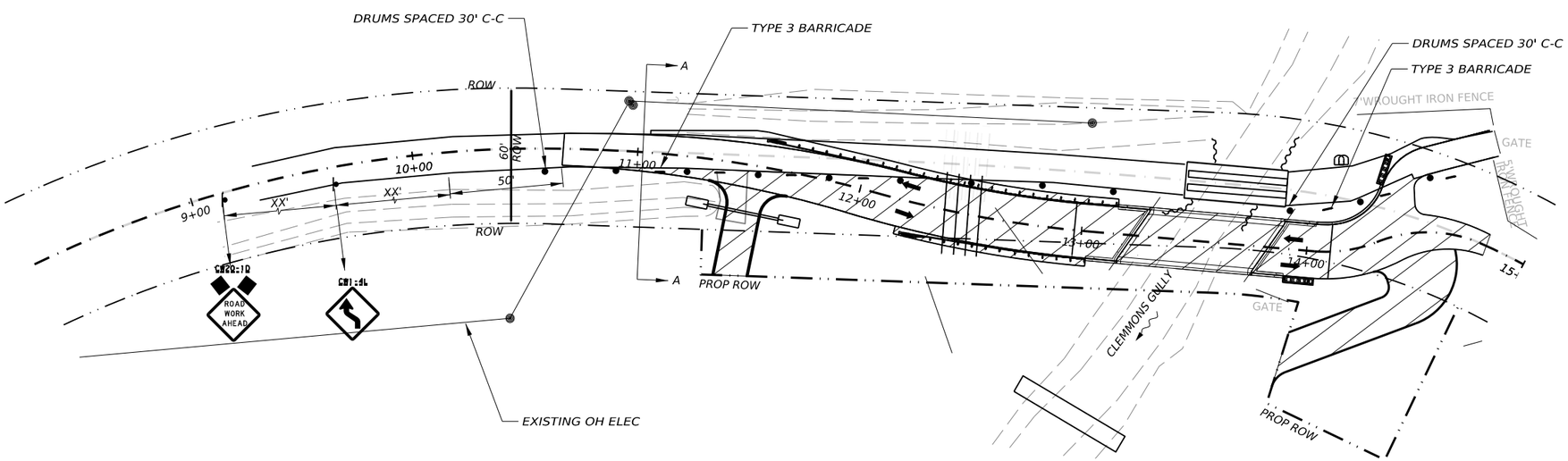
PROJECT CONSTRUCTION SEQUENCE

SHEET 1 OF 1

CONT	SECT	JOB	HIGHWAY
0920	03	082, ETC	CR 1065, ETC
DIST	COUNTY		SHEET NO.
BMT	HARDIN, ETC		18A

DATE: 3/18/2024 2:19:44 PM
FILE: pw://lja-pw.bentley.com:lja-pw-01/Documents/TxDOT/PM8016-2301 CEC WA 4/Clemmons Gully Off-System Bridge/400 Production/4 - Design/Plan Set/2. TCP/PRO) SEQ.dgn

CK:
DW:
CK:
DN:



LEGEND

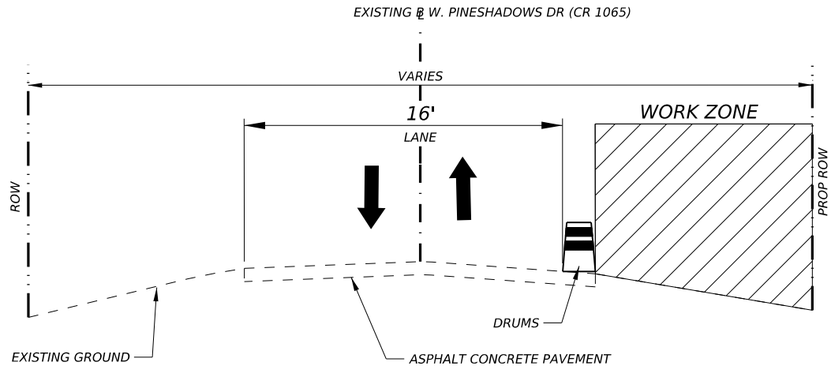
- CONSTRUCTION
- DRUM
- TYPE 3 BARRICADE

NOTES:

1. SEE "BC STANDARDS" FOR PROJECT LIMIT SIGNAGE.
2. SEE "BC STANDARDS" FOR SIGN SPACING (X).

SEQUENCE OF CONSTRUCTION:

1. SET UP BARRICADES AND ADVANCED WARNING SIGNS.
2. PREPARE ROW AND PLACE SW3P MEASURES.
3. CONSTRUCT PROPOSED BRIDGE.
4. CONSTRUCT APPROACH ROADWAY.
5. INSTALL MBGF, SGT, AND DELINEATORS TO EAST HALF OF ROADWAY.
6. PROCEED WITH CONSTRUCTION ON THE WEST SIDE.CONTRACTOR TO PLACE FLEX BASE AT TRANSITIONS FROM EXISTING PAVEMENT TO PROPOSE PAVEMENT AS NEEDED TO ACCOUNT FOR ELEVATION DIFFERENCES. INSTALLING AND REMOVING TEMPORARY FLEX BASE WILL BE CONSIDERED SUBSIDIARY TO ITEM 502.
7. INSTALL MBGF, SGT, AND DELINEATORS TO WEST HALF OF ROADWAY.



W. PINESHADOWS DR (CR 1065) AT CLEMMONS GULLY - TYPICAL SECTION A - A

NTS

NOT TO SCALE

STATE OF TEXAS
JAMES D. HORNE
141323
REGISTERED
PROFESSIONAL ENGINEER

DocuSigned by:
50238C8D55F5470...
2/29/2024

Texas Department of Transportation

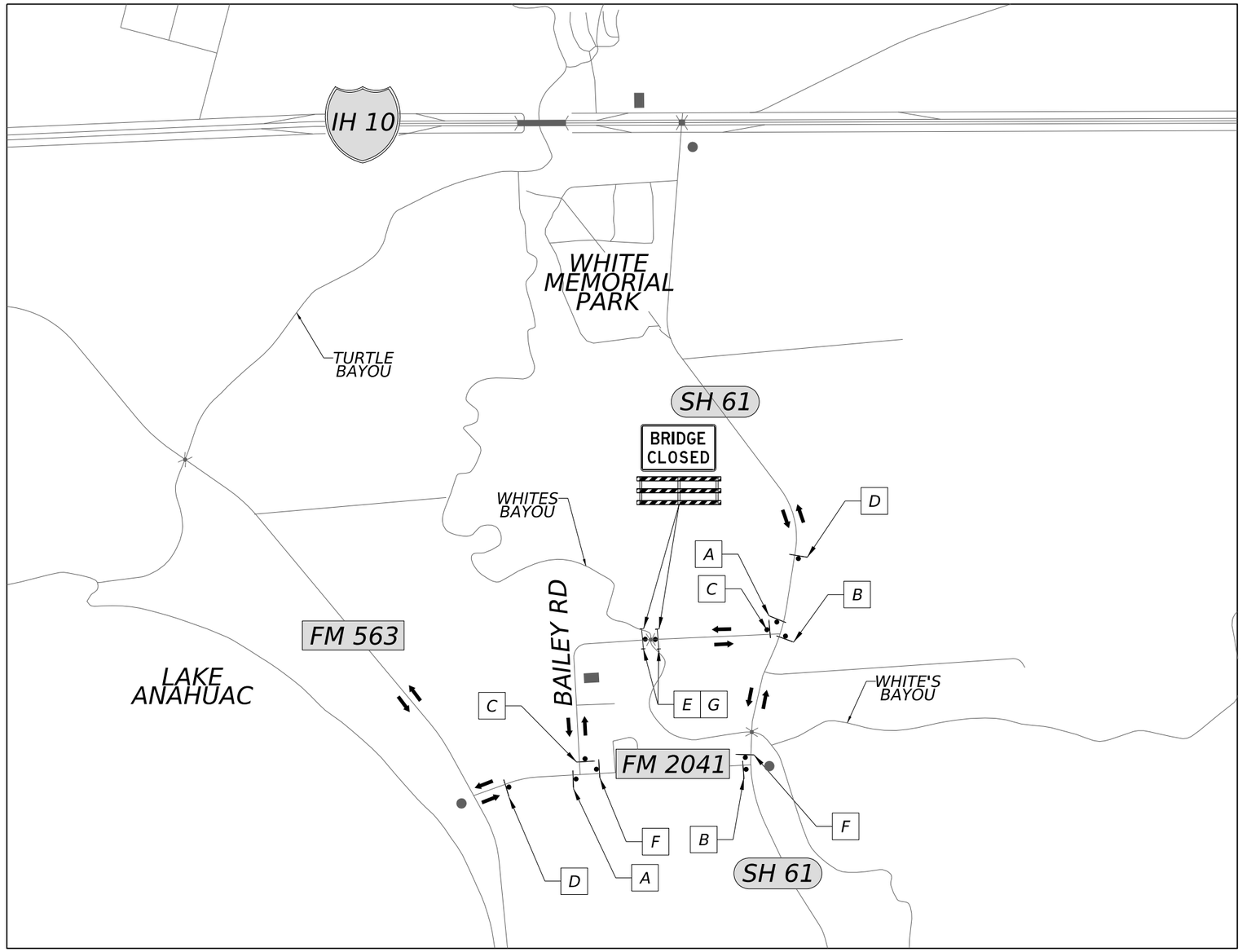
CLEMMONS GULLY PACKAGE

TRAFFIC CONTROL DETAILS
W. PINESHADOWS DR (CR 1065)
AT CLEMMONS GULLY

SHEET 1 OF 1

CONT	SECT	JOB	HIGHWAY
0920	03	082,ETC	CR 1065, ETC
DIST	COUNTY		SHEET NO.
20	HARDIN, ETC		19

DATE:
FILE:



LEGEND

- PROPOSED TRAFFIC DIRECTION ARROW
- SIGN
- TYPE III BARRICADE

NOTES:

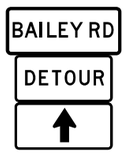
1. IT IS THE INTENT OF THIS PROJECT TO CLOSE BAILEY RD AT THE BRIDGE SITE FOR A MINIMUM LENGTH OF TIME. DO NOT CLOSE THE ROAD UNTIL THE CONTRACTOR IS MOBILIZED FOR BRIDGE CONSTRUCTION. SIGNS AND BARRICADES SHOWN HERE ARE TO BE IN PLACE PRIOR TO THE ROAD CLOSURE AND SHALL REMAIN IN PLACE FOR THE DURATION OF THE CONSTRUCTION. REFER TO BC STANDARDS FOR ADVANCED WARNING SIGNS.

SEQUENCE OF CONSTRUCTION

1. SET UP DETOUR
2. SET UP BARRICADES AND ADVANCED WARNING SIGNS FOR WHITES BAYOU CROSSING
3. CLOSE WHITES BAYOU BRIDGE CROSSING
4. PREPARE ROW AND PLACE SW3P MEASURES
5. REMOVE EXISTING BRIDGE
6. CONSTRUCT WHITES BAYOU BRIDGE
7. CONSTRUCT APPROACH ROADWAY TO LIMITS SHOWN
8. INSTALL MBGF, SGT, AND DELINEATORS TO EAST HALF OF ROADWAY
9. INSTALL PROPOSED SIGNS AND PAVEMENT MARKINGS
10. SEED AND FERTILIZE
11. PERFORM FINAL CLEAN UP
12. REMOVE WHITES BAYOU BARRICADES / SIGNS AND OPEN BRIDGE

NOT TO SCALE

A



M4-12T (21"x12")
M4-8 (24"x12")
M6-3 (21"x15")

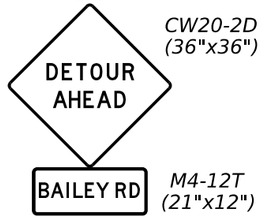
B

M4-12T (21"x12")
M4-8 (24"x12")
M6-1L (21"x15")

C

R11-3a (60"x30")

D



CW20-2D (36"x36")
M4-12T (21"x12")

E

R11-2aT (48"x30")

F

M4-12T (21"x12")
M4-8 (24"x12")
M6-1R (21"x15")

G

G20-6T (48"x30")

02-27-2024

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CLEMMONS GULLY PACKAGE

TRAFFIC CONTROL PLAN DETOUR
BAILEY RD AT WHITES BAYOU

SHEET 1 OF 1

CONT	SECT	JOB	HIGHWAY
0920	03	082, ETC	CR 1065, ETC
DIST	COUNTY		SHEET NO.
BMT	HARDIN, ETC		20

DATE: 2/26/2024 2:17:41 PM
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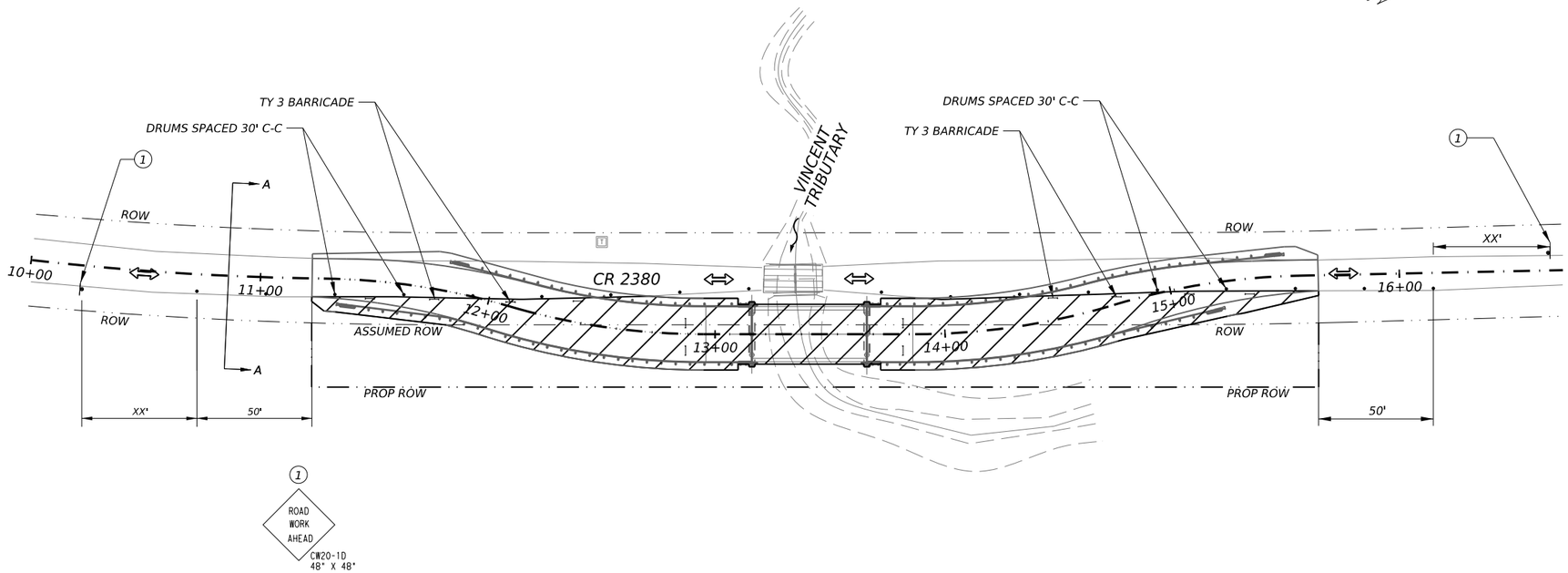

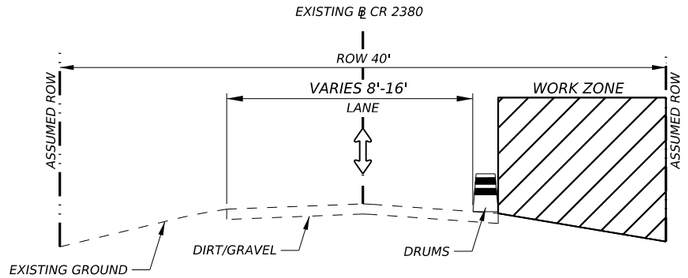

CR 2380 AT VINCENT TRIBUTARY - PHASE I TYPICAL SECTION A - A
NTS

LEGEND

- PERMANENT CONSTRUCTION
- PREVIOUSLY CONSTRUCTED PVMT
- DRUM
- TYPE 3 BARRICADE
- SIGN
- PROPOSED TRAFFIC DIRECTION ARROW
- EXISTING TRAFFIC DIRECTION ARROW

NOTES:

1. SEE "BC STANDARDS" FOR PROJECT LIMIT SIGNAGE.
2. SEE "BC STANDARDS" FOR SIGN SPACING (X).

SEQUENCE OF CONSTRUCTION:

1. SET UP BARRICADES AND ADVANCED WARNING SIGNS.
2. PREPARE ROW AND PLACE SW3P MEASURES.
3. CONSTRUCT PROPOSED BRIDGE.
4. CONSTRUCT APPROACH ROADWAY TO LIMITS SHOWN.
5. INSTALL MBGF, SGT, AND DELINEATORS TO EAST HALF OF ROADWAY.

0' 30' 60'
SCALE: 1"=60'

STATE OF TEXAS
S. E. WRIGHT
108969
LICENSED
PROFESSIONAL ENGINEER
02-27-2024

LJA PROGRAM MANAGEMENT
FRN - F-14256

Texas Department of Transportation

CLEMMONS GULLY PACKAGE

TRAFFIC CONTROL DETAILS
CR 2380 AT VINCENT TRIBUTARY
PHASE 1

SHEET 1 OF 4

CONT	SECT	JOB	HIGHWAY
0920	03	082, ETC	CR 1065, ETC
DIST	COUNTY		SHEET NO.
BMT	HARDIN, ETC		21

DATE: 2/26/2024 2:17:46 PM
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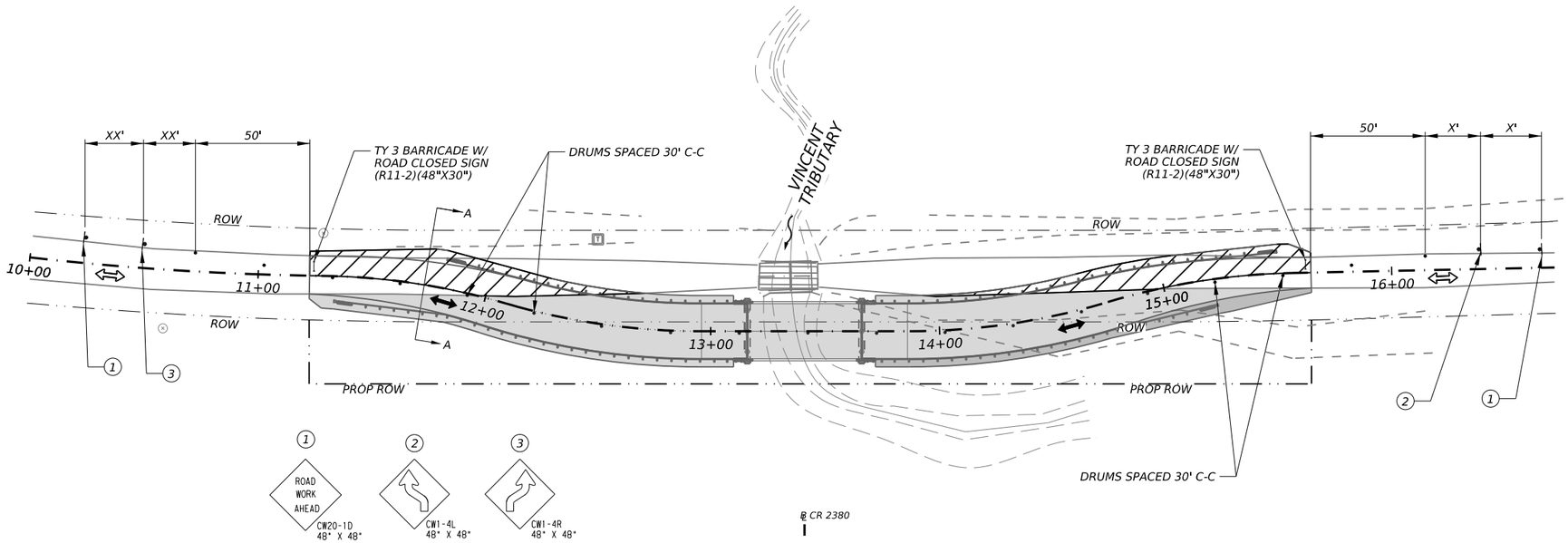

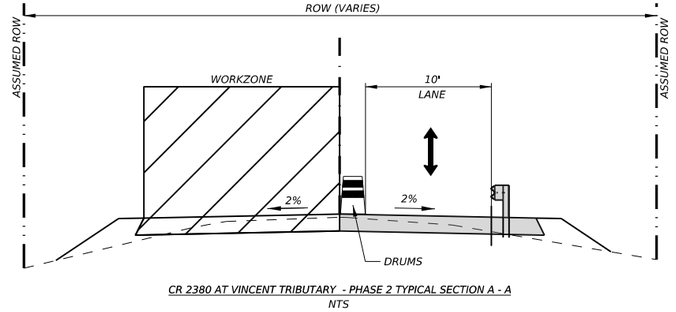

CR 2380 AT VINCENT TRIBUTARY - PHASE 2 TYPICAL SECTION A - A
NTS

LEGEND

- PERMANENT CONSTRUCTION
- PREVIOUSLY CONSTRUCTED PVMT
- DRUM
- TYPE 3 BARRICADE
- SIGN
- PROPOSED TRAFFIC DIRECTION ARROW
- EXISTING TRAFFIC DIRECTION ARROW

NOTES:

1. SEE "BC STANDARDS" FOR PROJECT LIMIT SIGNAGE.
2. SEE "BC STANDARDS" FOR SIGN SPACING (X).
3. CONTRACTOR TO PLACE FLEX BASE AT TRANSITIONS FROM EXISTING PAVEMENT TO PROPOSED PAVEMENT AS NEEDED TO ACCOUNT FOR ELEVATION DIFFERENCES. INSTALLING AND REMOVING TEMPORARY FLEX BASE WILL BE CONSIDERED SUBSIDIARY TO ITEM 502.

SEQUENCE OF CONSTRUCTION:

1. SET UP BARRICADES AND ADVANCED WARNING SIGNS.
2. PLACE SW3P MEASURES.
3. CONSTRUCT APPROACH ROADWAY TO LIMITS SHOWN.

0' 30' 60'
SCALE: 1"=60'

STATE OF TEXAS
S. E. WRIGHT
108969
LICENSED
PROFESSIONAL ENGINEER

02-27-2024

LJA PROGRAM MANAGEMENT
FRN - F-14256

Texas Department of Transportation

CLEMMONS GULLY PACKAGE

TRAFFIC CONTROL DETAILS
CR 2380 AT VINCENT TRIBUTARY
PHASE 2

SHEET 2 OF 4

CONT	SECT	JOB	HIGHWAY
0920	03	082, ETC	CR 1065, ETC
DIST	COUNTY		SHEET NO.
BMT	HARDIN, ETC		22

DATE: 2/26/2024 2:17:50 PM
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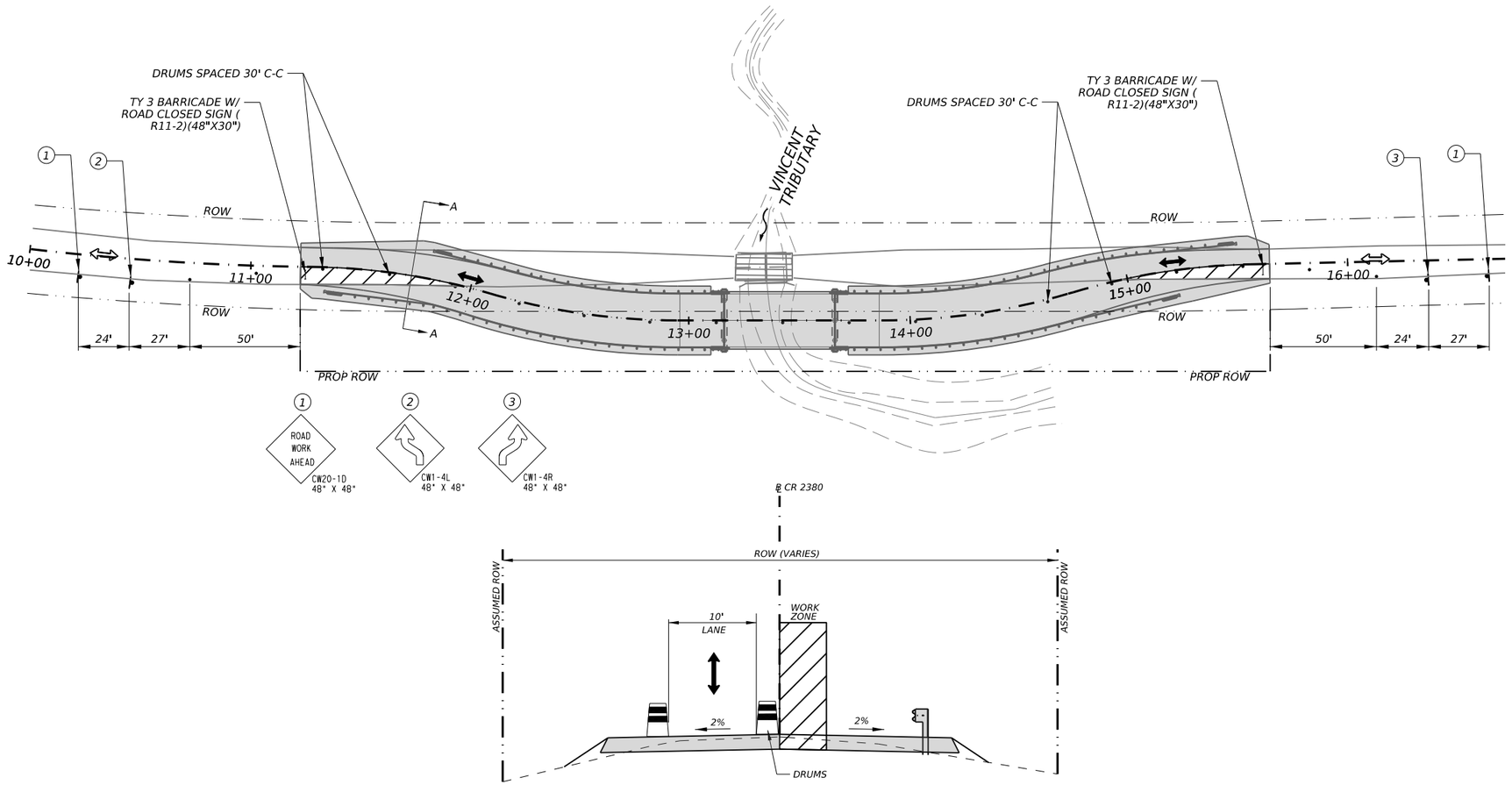

CR 2380 AT VINCENT TRIBUTARY - PHASE 3 TYPICAL SECTION A - A
NTS

LEGEND

- PERMANENT CONSTRUCTION
- PREVIOUSLY CONSTRUCTED PVMT
- DRUM
- TYPE 3 BARRICADE
- SIGN
- PROPOSED TRAFFIC DIRECTION ARROW
- EXISTING TRAFFIC DIRECTION ARROW

NOTES:

1. SEE "BC STANDARDS" FOR PROJECT LIMIT SIGNAGE.
2. SEE "BC STANDARDS" FOR SIGN SPACING (X).

SEQUENCE OF CONSTRUCTION:

1. SET UP BARRICADES AND ADVANCED WARNING SIGNS.
2. PLACE SW3P MEASURES.
3. CONSTRUCT APPROACH ROADWAY TO LIMITS SHOWN.

0' 30' 60'
SCALE: 1"=60'

STATE OF TEXAS
S. E. WRIGHT
108969
LICENSED
PROFESSIONAL ENGINEER
02-27-2024

LJA PROGRAM MANAGEMENT
FRN - F-14256

Texas Department of Transportation

CLEMMONS GULLY PACKAGE

TRAFFIC CONTROL DETAILS
CR 2380 AT VINCENT TRIBUTARY
PHASE 3

SHEET 3 OF 4

CONT	SECT	JOB	HIGHWAY
0920	03	082, ETC	CR 1065, ETC
DIST	COUNTY		SHEET NO.
BMT	HARDIN, ETC		23

DATE: 2/26/2024 2:17:55 PM
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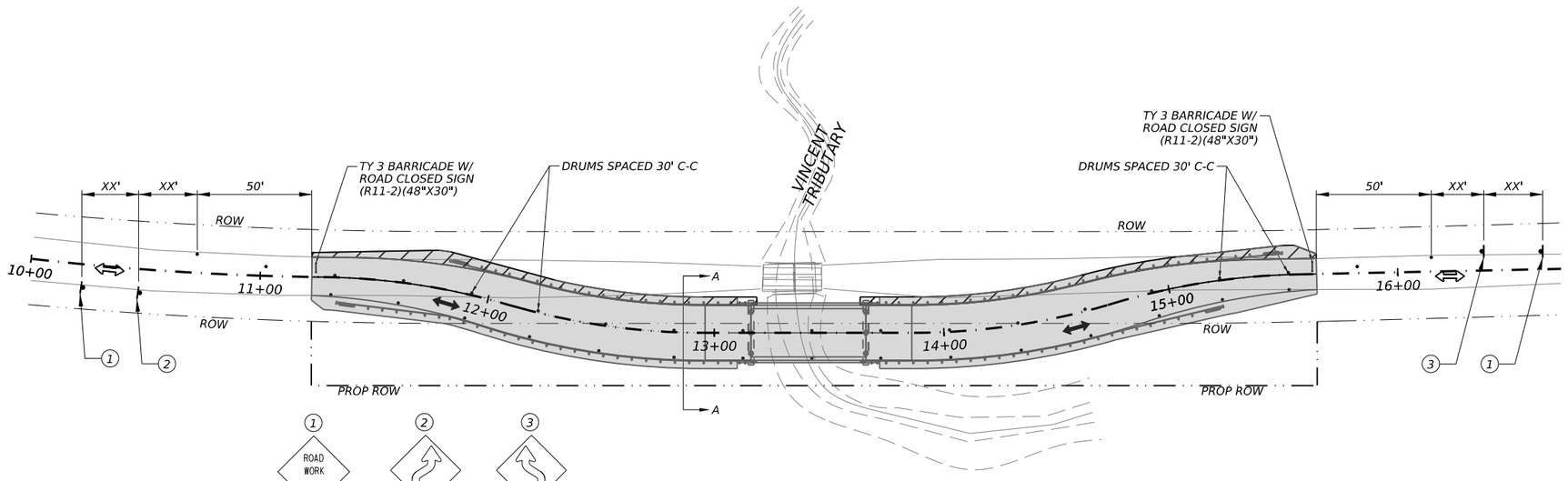
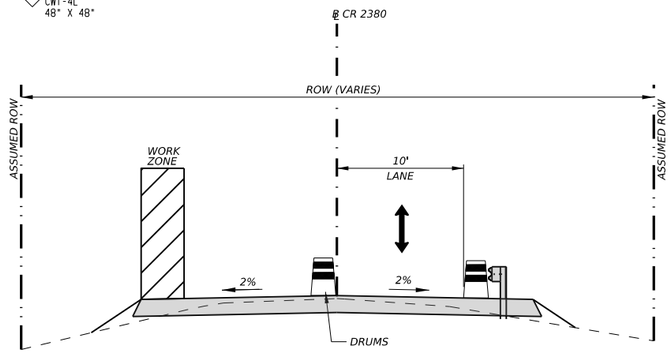




CR 2380 AT VINCENT TRIBUTARY - PHASE 4 STEP TYPICAL SECTION A - A
NTS

LEGEND

- PERMANENT CONSTRUCTION
- PREVIOUSLY CONSTRUCTED PVMT
- DRUM
- TYPE 3 BARRICADE
- SIGN
- PROPOSED TRAFFIC DIRECTION ARROW
- EXISTING TRAFFIC DIRECTION ARROW

NOTES:

1. SEE "BC STANDARDS" FOR PROJECT LIMIT SIGNAGE.
2. SEE "BC STANDARDS" FOR SIGN SPACING (X).

SEQUENCE OF CONSTRUCTION:

1. SET UP BARRICADES AND ADVANCED WARNING SIGNS.
2. PLACE SW3P MEASURES.
3. INSTALL MBGF, SGT, AND DELINEATORS TO WEST HALF OF ROADWAY.

0' 30' 60'
SCALE: 1"=60'

STATE OF TEXAS
S. E. WRIGHT
108969
LICENSED
PROFESSIONAL ENGINEER

02-27-2024

LJA PROGRAM MANAGEMENT
FRN - F-14256

Texas Department of Transportation

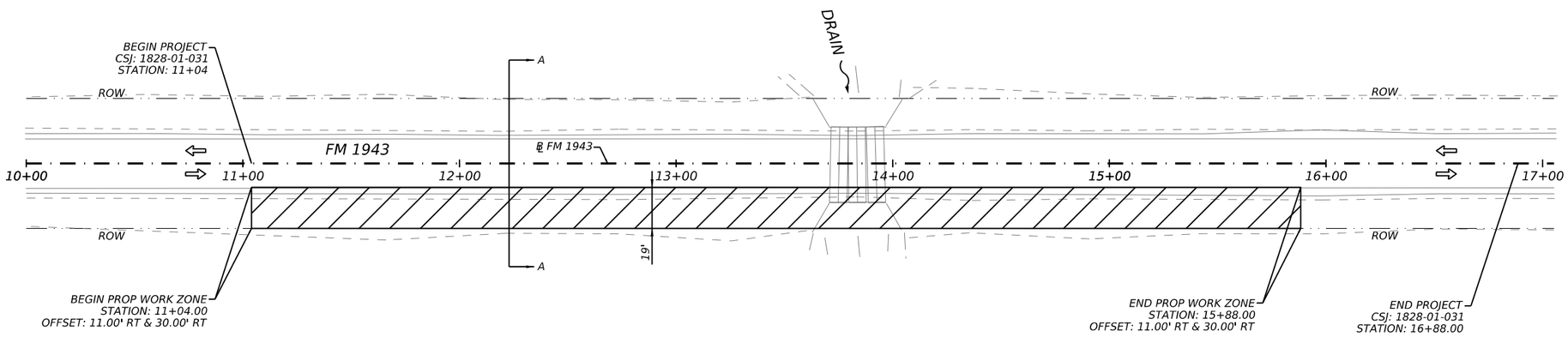
CLEMMONS GULLY PACKAGE

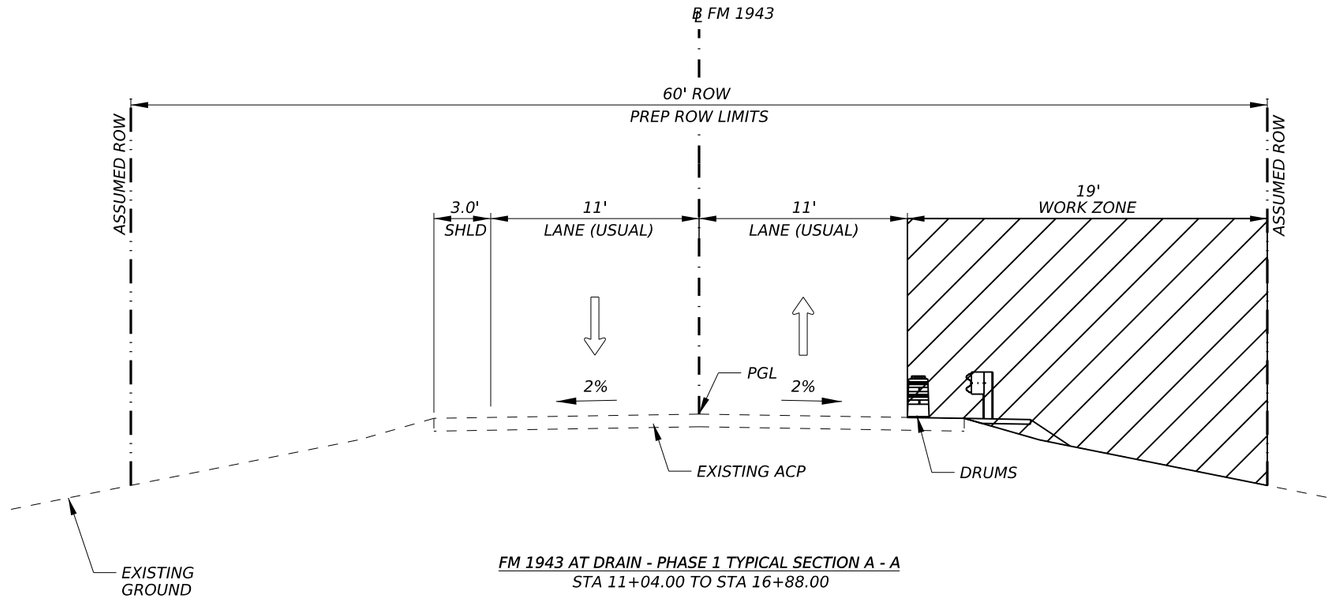
TRAFFIC CONTROL DETAILS
CR 2380 AT VINCENT TRIBUTARY
PHASE 4

SHEET 4 OF 4

CONT	SECT	JOB	HIGHWAY
0920	03	082, ETC	CR 1065, ETC
DIST	COUNTY		SHEET NO.
BMT	HARDIN, ETC		24

DATE: 2/26/2024 2:18:00 PM
FILE: pw://la-pw.bentley.com:la-pw-01/Documents/TxDOT/PM8016-2301 CEC WA4/Clemmons Gully Off-System Bridge/400 Production/4 - Design/Plan Set/2. TCP/VT_TCP PH4S1.dgn





FM 1943 AT DRAIN - PHASE 1 TYPICAL SECTION A - A
STA 11+04.00 TO STA 16+88.00

LEGEND

- PERMANENT CONSTRUCTION
- PREVIOUSLY CONSTRUCTED PVMT
- DRUM
- TYPE 3 BARRICADE
- SIGN
- PROPOSED TRAFFIC DIRECTION ARROW
- EXISTING TRAFFIC DIRECTION ARROW

N

NOTES:

1. SEE TCP STANDARD (2-1)-18 FOR PLACEMENT OF TRAFFIC CONTROL DEVICES.
2. SEE "BC STANDARDS" FOR PROJECT LIMIT SIGNAGE.
3. SEE "BC STANDARDS" FOR SIGN SPACING (X).

0' 30' 60'
SCALE: 1"=60'

STATE OF TEXAS
S. E. WRIGHT
108969
LICENSED
PROFESSIONAL ENGINEER

02-27-2024

LJA PROGRAM MANAGEMENT
FRN - F-14256

Texas Department of Transportation

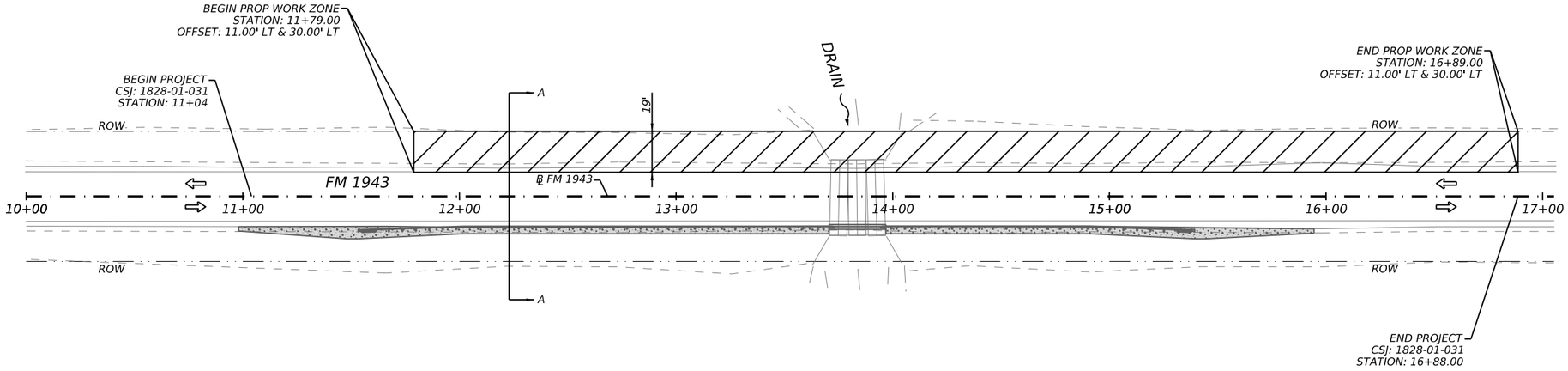
CLEMMONS GULLY PACKAGE

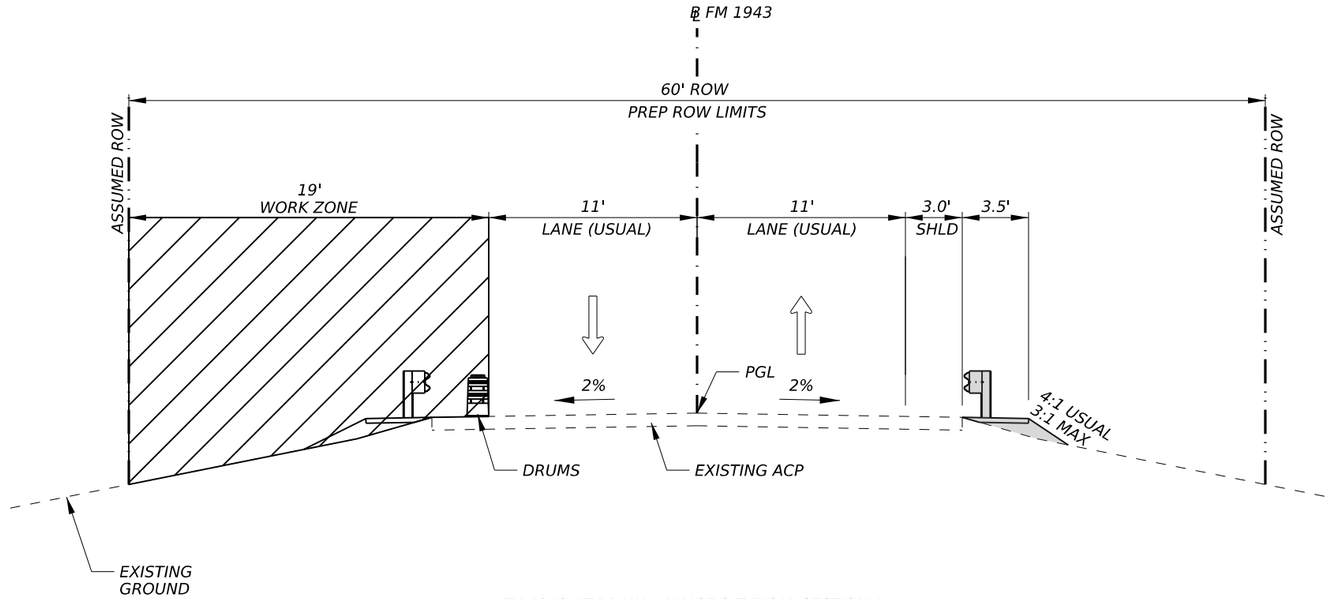
TRAFFIC CONTROL DETAILS
FM 1943 AT DRAIN
PHASE 1

SHEET 1 OF 2

CONT	SECT	JOB	HIGHWAY
0920	03	082, ETC	CR 1065, ETC
DIST	COUNTY		SHEET NO.
BMT	HARDIN, ETC		25

DATE: 2/26/2024 2:18:03 PM
FILE: pw://la-pw.bentley.com:la-pw-01/Documents/TxDOT/PM8016-2301 CEC WA4/Clemmons Gully Off-System Bridge/400 Production/4 - Design/Plan Set/2. TCP/Drain TCP PH1.dgn





FM 1943 AT DRAIN - PHASE 2 TYPICAL SECTION A - A

STA 11+04.00 TO STA 16+88.00

LEGEND

- PERMANENT CONSTRUCTION
- PREVIOUSLY CONSTRUCTED PVMT
- DRUM
- TYPE 3 BARRICADE
- SIGN
- PROPOSED TRAFFIC DIRECTION ARROW
- EXISTING TRAFFIC DIRECTION ARROW

N

NOTES:

1. SEE TCP STANDARD (2-1)-18 FOR PLACEMENT OF TRAFFIC CONTROL DEVICES.
2. SEE "BC STANDARDS" FOR PROJECT LIMIT SIGNAGE.
3. SEE "BC STANDARDS" FOR SIGN SPACING (X).

0' 30' 60'

SCALE: 1"=60'

STATE OF TEXAS
S. E. WRIGHT
108969
LICENSED
PROFESSIONAL ENGINEER

02-27-2024

LJA PROGRAM MANAGEMENT
FRN • F-14256

Texas Department of Transportation

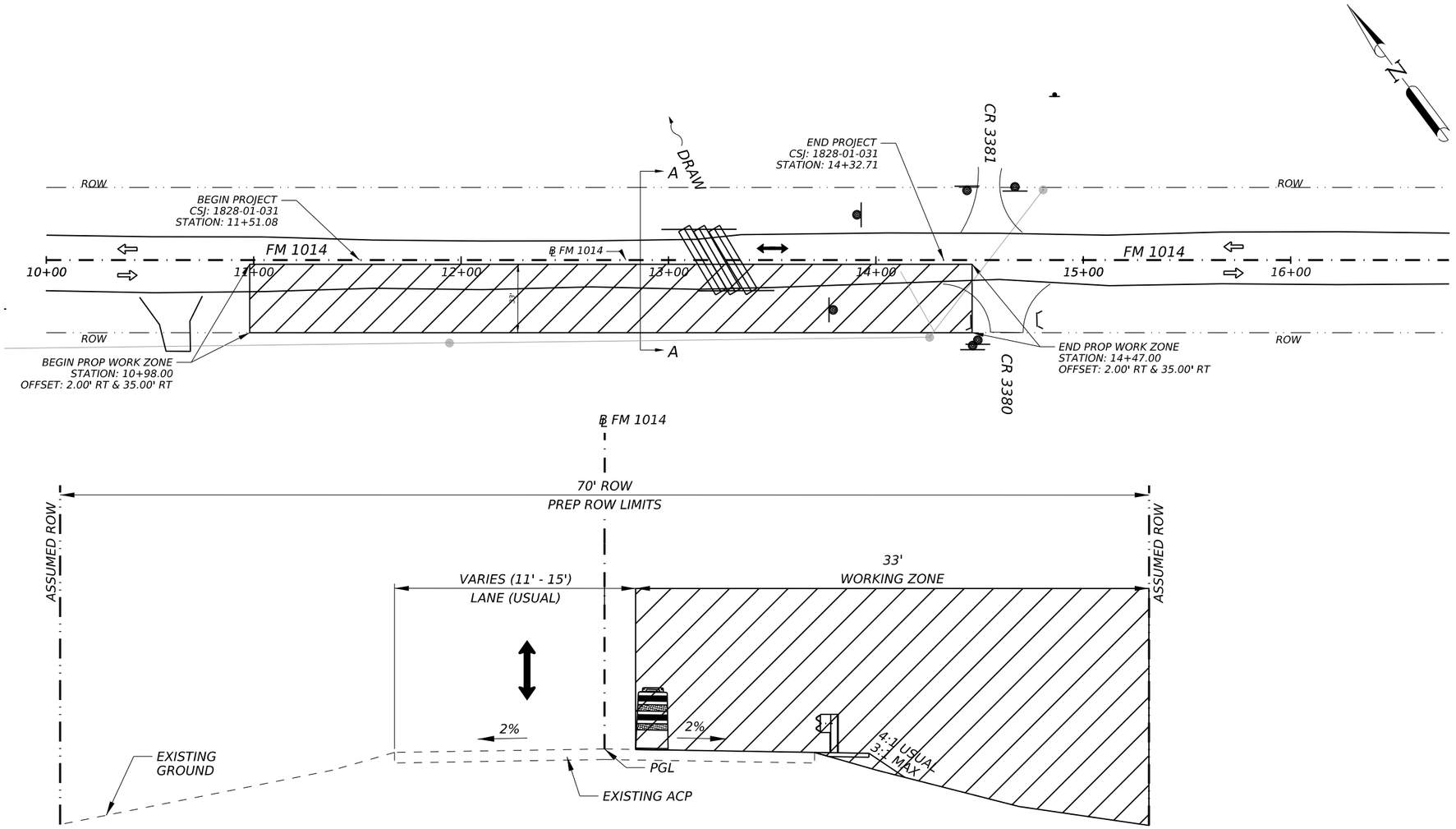
CLEMMONS GULLY PACKAGE

TRAFFIC CONTROL DETAILS
FM 1943 AT DRAIN
PHASE 2

SHEET 2 OF 2

CONT	SECT	JOB	HIGHWAY
0920	03	082, ETC	CR 1065, ETC
DIST	COUNTY		SHEET NO.
BMT	HARDIN, ETC		26

DATE: 2/26/2024 2:18:08 PM
FILE: pw://la-pw.bentley.com:la-pw-01/Documents/TxDOT/PM8016-2301 CEC WA4/Clemmons Gully Off-System Bridge/400 Production/4 - Design/Plan Set/2. TCP/Drain TCP PH2.dgn



FM 1014 AT DRAW - PHASE 1 TYPICAL SECTION A-A

STA 10+98.08 TO STA 14+46.44

LEGEND

- PERMANENT CONSTRUCTION
- PREVIOUSLY CONSTRUCTED PVMT
- DRUM
- TYPE 3 BARRICADE
- SIGN
- PROPOSED TRAFFIC DIRECTION ARROW
- EXISTING TRAFFIC DIRECTION ARROW

NOTES:

1. SEE TCP STANDARD (1-2)-18 FOR PLACEMENT OF TRAFFIC CONTROL DEVICES.
2. SEE "BC STANDARDS" FOR PROJECT LIMIT SIGNAGE.
2. SEE "BC STANDARDS" FOR SIGN SPACING (X).

0' 30' 60'

SCALE: 1"=60'

STATE OF TEXAS
S. E. WRIGHT
108969
LICENSED
PROFESSIONAL ENGINEER

02-27-2024

LJA PROGRAM MANAGEMENT
FRN - F-14256

Texas Department of Transportation
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CLEMMONS GULLY PACKAGE

TRAFFIC CONTROL DETAILS
FM 1014 AT DRAW
PHASE 1

SHEET 1 OF 2

CONT	SECT	JOB	HIGHWAY
0920	03	082, ETC	CR 1065, ETC
DIST	COUNTY		SHEET NO.
BMT	HARDIN, ETC		27

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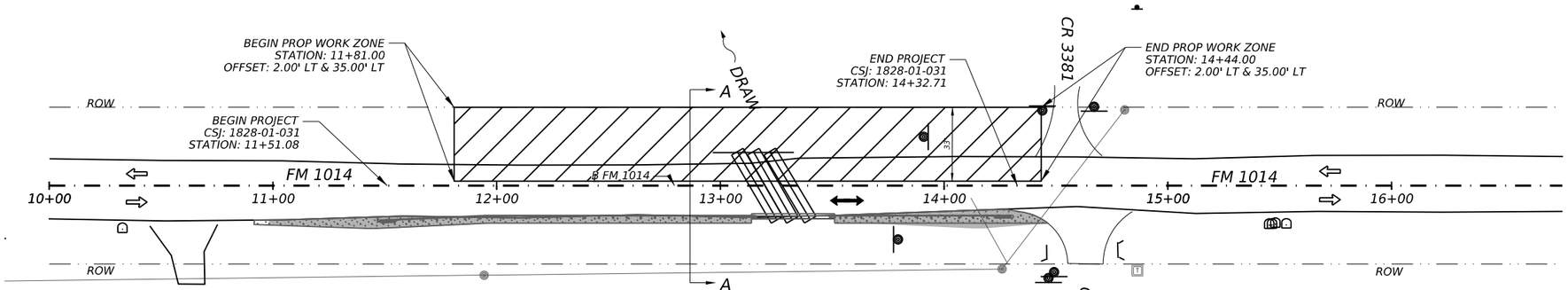

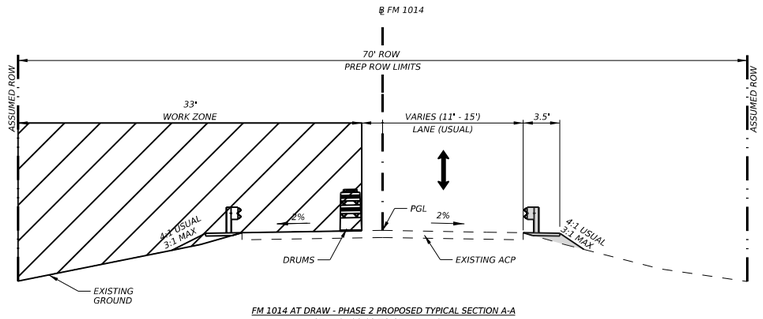

FM 1014 AT DRAW - PHASE 2 PROPOSED TYPICAL SECTION A-A
STA 10+98.08 TO STA 14+46.44

LEGEND

- PERMANENT CONSTRUCTION
- PREVIOUSLY CONSTRUCTED PVMT
- DRUM
- TYPE 3 BARRICADE
- SIGN
- PROPOSED TRAFFIC DIRECTION ARROW
- EXISTING TRAFFIC DIRECTION ARROW

NOTES:

1. SEE TCP STANDARD (1-2)-18 FOR PLACEMENT OF TRAFFIC CONTROL DEVICES.
2. SEE "BC STANDARDS" FOR PROJECT LIMIT SIGNAGE.
2. SEE "BC STANDARDS" FOR SIGN SPACING (X).

0' 30' 60'
SCALE: 1"=60'

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CLEMMONS GULLY PACKAGE

TRAFFIC CONTROL DETAILS
FM 1014 AT DRAW
PHASE 2

SHEET 2 OF 2

CONT	SECT	JOB	HIGHWAY
0920	03	082, ETC	CR 1065, ETC
DIST	COUNTY		SHEET NO.
BMT	HARDIN, ETC		28

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BARRICADE AND CONSTRUCTION (BC) STANDARD SHEETS GENERAL NOTES:

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

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

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

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

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

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

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

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

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

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

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

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

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

WORKER SAFETY NOTES:

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

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

COMPLIANT WORKZONE TRAFFIC CONTROL DEVICES

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

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

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

SHEET 1 OF 12

Texas Department of Transportation | Traffic Safety Division Standard

BARRICADE AND CONSTRUCTION GENERAL NOTES AND REQUIREMENTS

BC(1)-21

FILE: bc-21.dgn	DN: TxDOT	CK: TxDOT	DW: TxDOT	CK: TxDOT
©TxDOT November 2002	CONT	SECT	JOB	HIGHWAY
REVISIONS 4-03 7-13 9-07 8-14 5-10 5-21	0920	03	082, ETC	CR 1065, ETC
	DIST	COUNTY		SHEET NO.
	BMT	HARDIN, ETC		29

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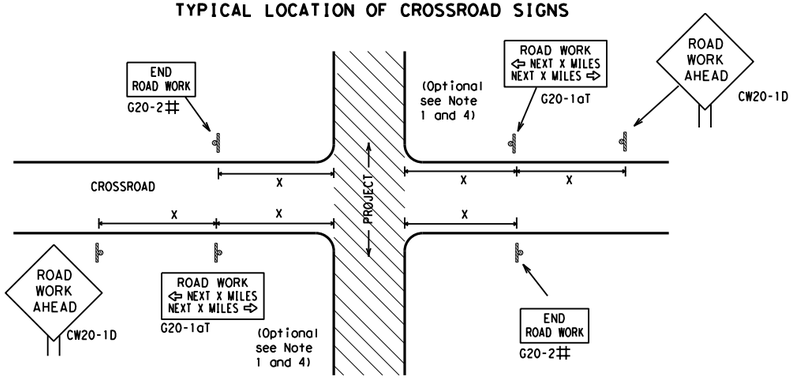
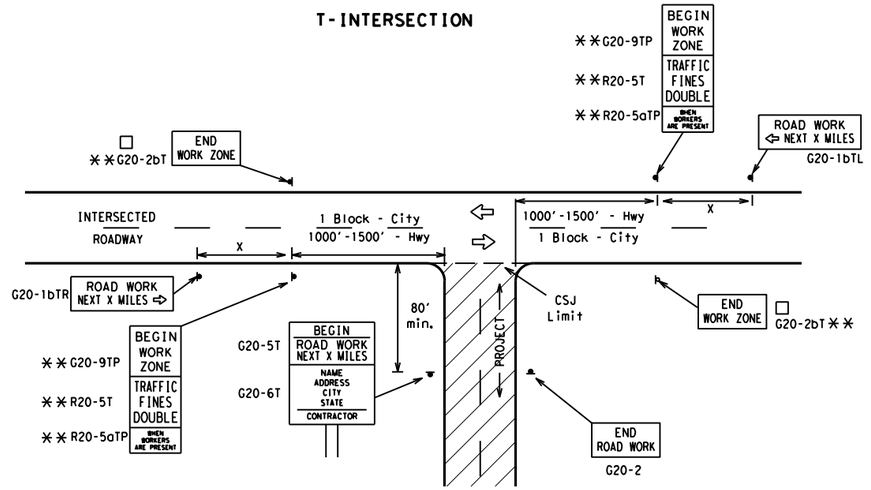
TYPICAL LOCATION OF CROSSROAD SIGNS



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

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

T-INTERSECTION



CSJ LIMITS AT T-INTERSECTION

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

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

SIZE

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

SPACING

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

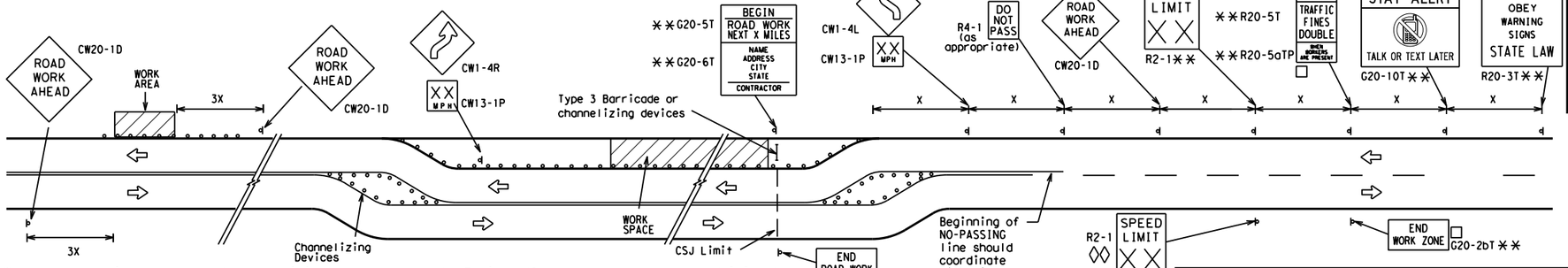
* For typical sign spacings on divided highways, expressways and freeways, see Part 6 of the "Texas Manual on Uniform Traffic Control Devices" (TMUTCD) typical application diagrams or TCP Standard Sheets.

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

GENERAL NOTES

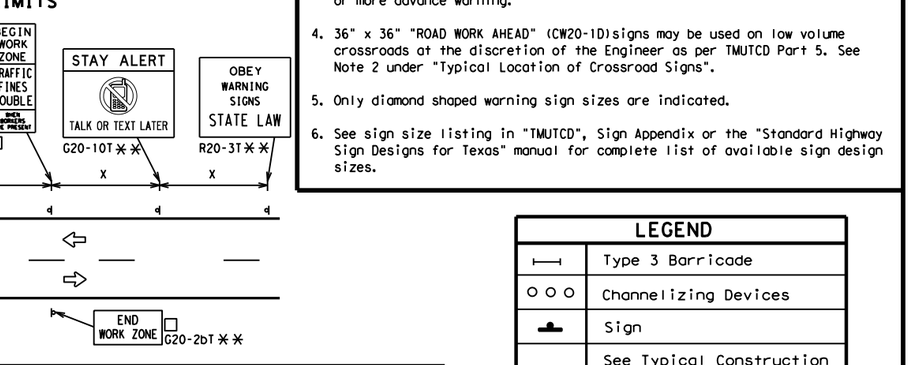
1. Special or larger size signs may be used as necessary.
2. Distance between signs should be increased as required to have 1500 feet advance warning.
3. Distance between signs should be increased as required to have 1/2 mile or more advance warning.
4. 36" x 36" "ROAD WORK AHEAD" (CW20-1D)signs may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

WORK AREAS IN MULTIPLE LOCATIONS WITHIN CSJ LIMITS

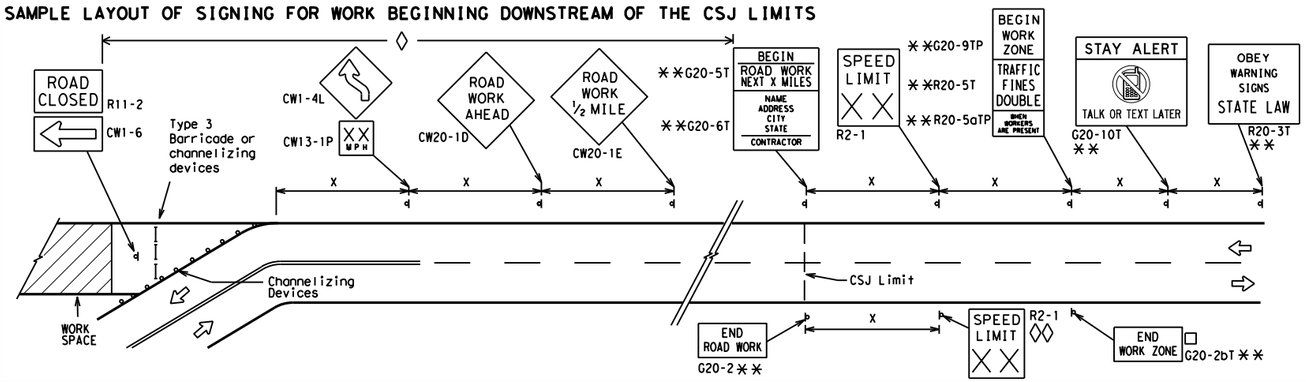


When extended distances occur between minimal work spaces, the Engineer/Inspector should ensure additional "ROAD WORK AHEAD"(CW20-1D)signs are placed in advance of these work areas to remind drivers they are still within the project limits. See the applicable TCP sheets for exact location and spacing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

SAMPLE LAYOUT OF SIGNING FOR WORK BEGINNING AT THE CSJ LIMITS



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



NOTES

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

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

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

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

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

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

Texas Department of Transportation

Traffic Safety Division Standard

BARRICADE AND CONSTRUCTION PROJECT LIMIT

BC(2)-21

FILE: bc-21.dgn	DN: TxDOT	CK: TxDOT	DW: TxDOT	CK: TxDOT
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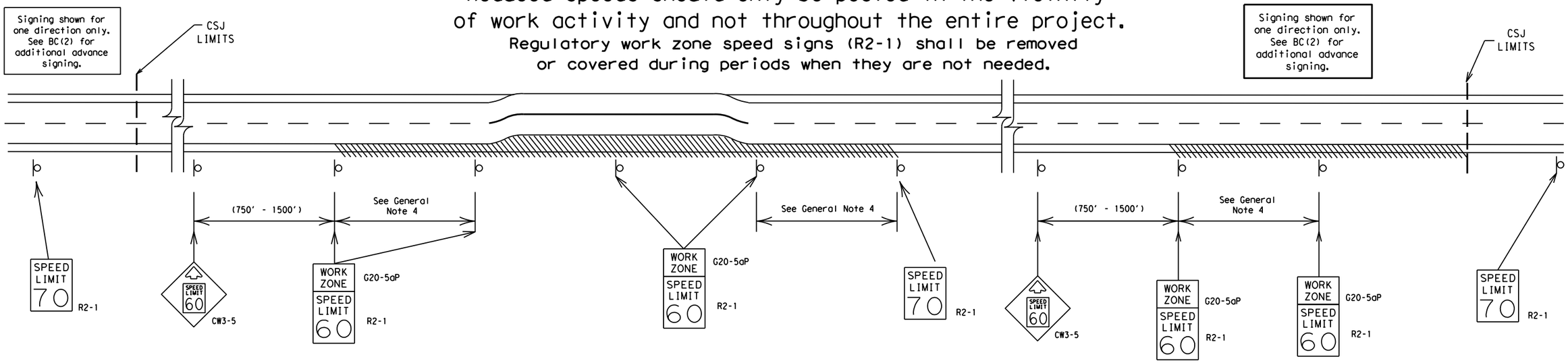
REVISIONS	0920	03	082, ETC	CR 1065, ETC
9-07 8-14	DIST	COUNTY		SHEET NO.
7-13 5-21	BMT	HARDIN, ETC		30

TYPICAL APPLICATION OF WORK ZONE SPEED LIMIT SIGNS

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

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

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



GUIDANCE FOR USE:

LONG/INTERMEDIATE TERM WORK ZONE SPEED LIMITS

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

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

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

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

SHORT TERM WORK ZONE SPEED LIMITS

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

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

GENERAL NOTES

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

Texas Department of Transportation

Traffic Safety Division Standard

BARRICADE AND CONSTRUCTION WORK ZONE SPEED LIMIT

BC(3)-21

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©TxDOT November 2002	CONT	SECT	JOB	HIGHWAY
REVISIONS 9-07 8-14 7-13 5-21	0920	03	082, ETC	CR 1065, ETC
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	BMT	HARDIN, ETC		31

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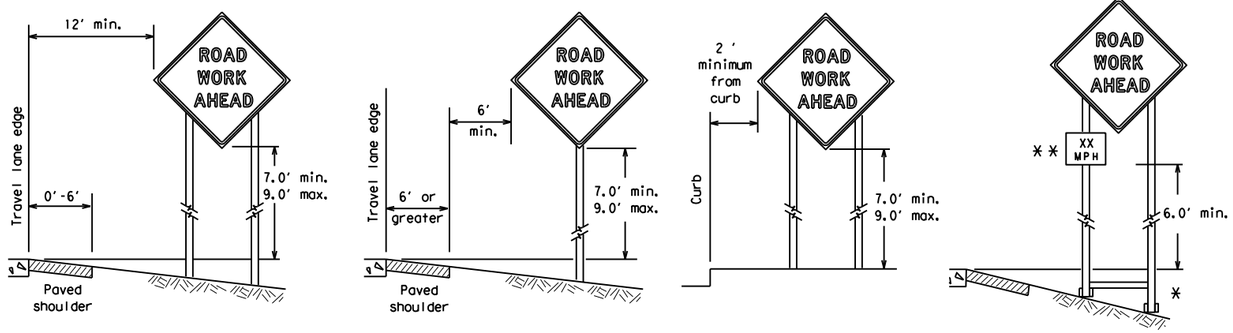
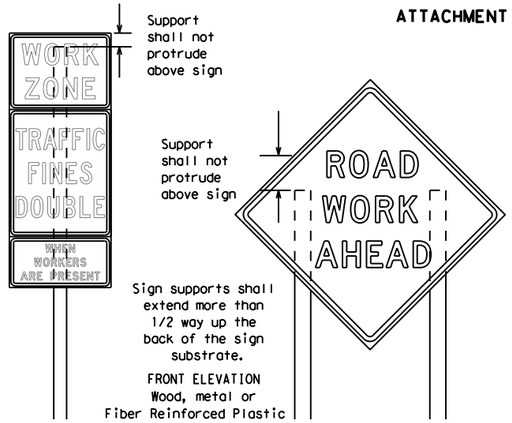
TYPICAL MINIMUM CLEARANCES FOR LONG TERM AND INTERMEDIATE TERM SIGNS

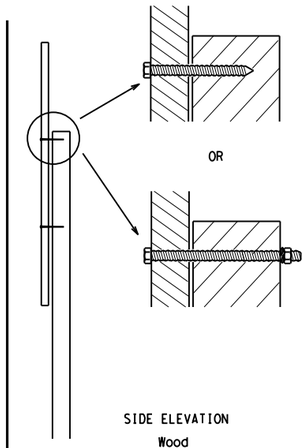


* When placing skid supports on unlevel ground, the leg post lengths must be adjusted so the sign appears straight and plumb. Objects shall NOT be placed under skids as a means of leveling.

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

ATTACHMENT FOR SIGN SUPPORTS





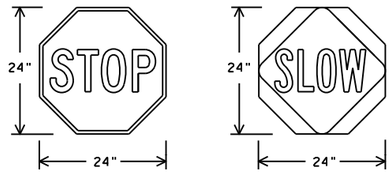
Attachment to wooden supports will be by bolts and nuts or screws. Use TxDOT's or manufacturer's recommended procedures for attaching sign substrates to other types of sign supports

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

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

STOP/SLOW PADDLES

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



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

CONTRACTOR REQUIREMENTS FOR MAINTAINING PERMANENT SIGNS WITHIN THE PROJECT LIMITS

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

GENERAL NOTES FOR WORK ZONE SIGNS

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

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

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

SIGN MOUNTING HEIGHT

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

SIZE OF SIGNS

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

SIGN SUBSTRATES

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

REFLECTIVE SHEETING

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

SIGN LETTERS

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

REMOVING OR COVERING

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

SIGN SUPPORT WEIGHTS

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

FLAGS ON SIGNS

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

Texas Department of Transportation | Traffic Safety Division Standard

BARRICADE AND CONSTRUCTION TEMPORARY SIGN NOTES

BC(4)-21

FILE: bc-21.dgn	DN: TxDOT	CK: TxDOT	DW: TxDOT	CK: TxDOT
©TxDOT November 2002	CONT	SECT	JOB	HIGHWAY
REVISIONS	0920	03	082, ETC	CR 1065, ETC
9-07 8-14	DIST	COUNTY		SHEET NO.
7-13 5-21	BMT	HARDIN, ETC		32

DATE: 2/26/2024 2:18:40 PM
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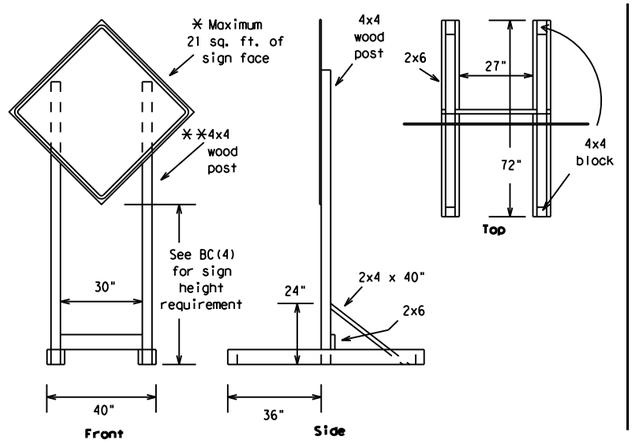
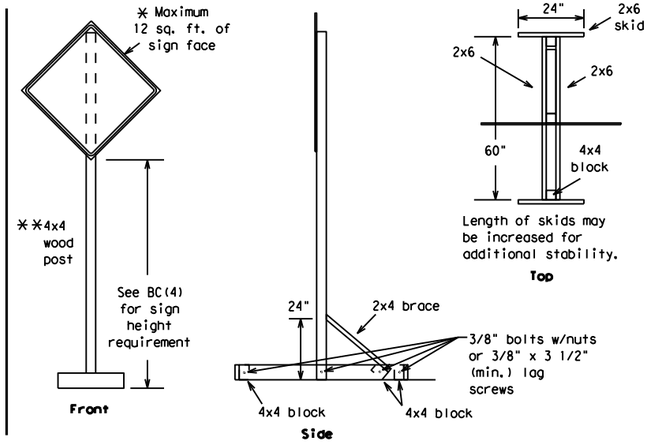
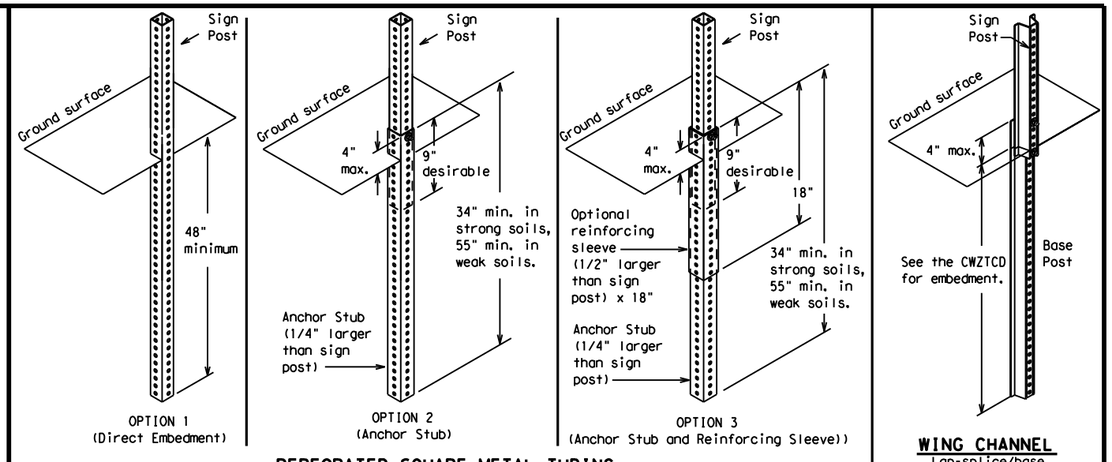




SKID MOUNTED WOOD SIGN SUPPORTS

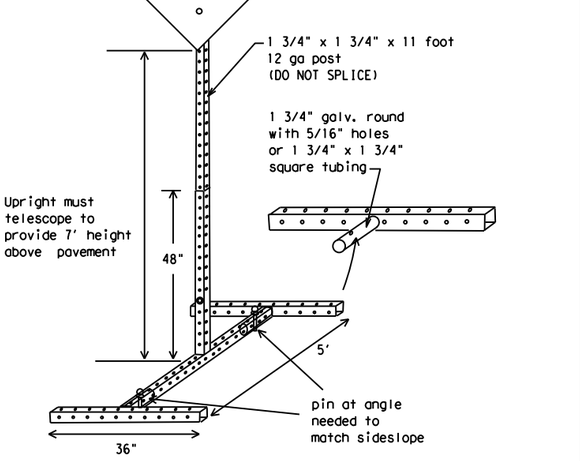
* LONG/INTERMEDIATE TERM STATIONARY - PORTABLE SKID MOUNTED SIGN SUPPORTS

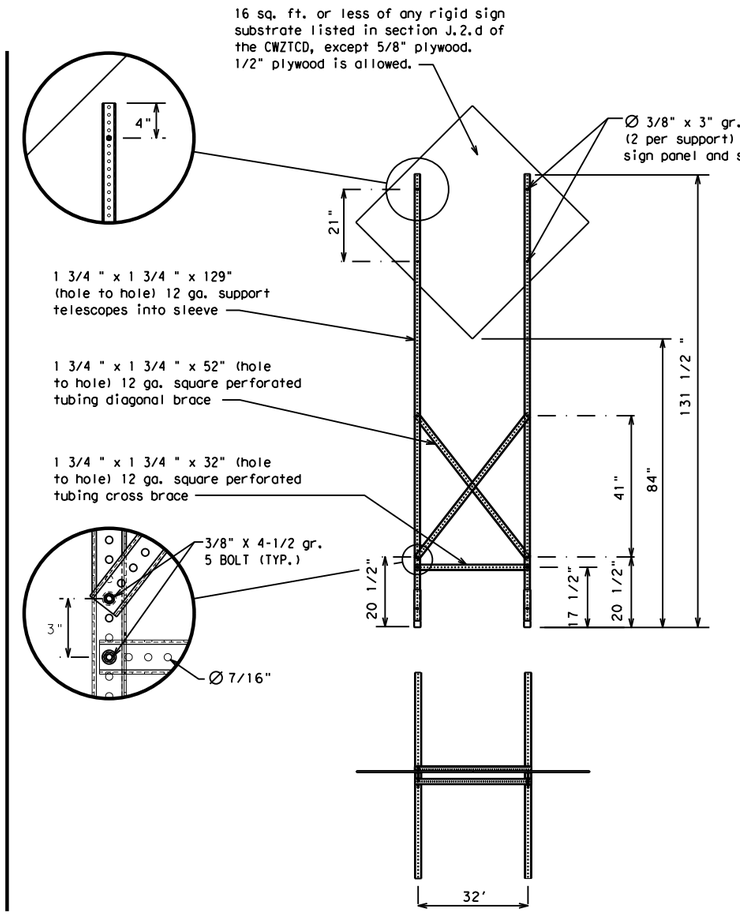


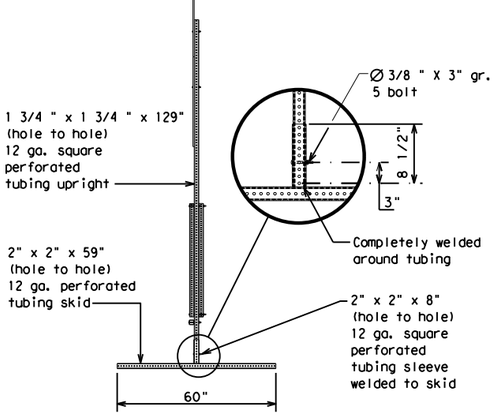
PERFORATED SQUARE METAL TUBING

GROUND MOUNTED SIGN SUPPORTS

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







SKID MOUNTED PERFORATED SQUARE STEEL TUBING SIGN SUPPORTS

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

WEDGE ANCHORS

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

OTHER DESIGNS

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

GENERAL NOTES

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

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

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

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

Texas Department of Transportation

Traffic Safety Division Standard

BARRICADE AND CONSTRUCTION TYPICAL SIGN SUPPORT

BC(5)-21

FILE: bc-21.dgn	DN: TxDOT	CK: TxDOT	DW: TxDOT	CK: TxDOT
©TxDOT November 2002	CONT	SECT	JOB	HIGHWAY
REVISIONS	0920	03	082, ETC	CR 1065, ETC
9-07 8-14	DIST	COUNTY		SHEET NO.
7-13 5-21	BMT	HARDIN, ETC		33

DATE: 2/26/2024 2:18:40 PM
FILE: pw://ja-pw.bentley.com:ja-pw-01/Documents/TxDOT/PM8016-2301 CEC WA4/Clemmons Gully Off-System Bridge/400 Production/4 - Design/Plan Set/2. TCP/Standards/bc-21.dgn

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

PORTABLE CHANGEABLE MESSAGE SIGNS

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

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

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

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

RECOMMENDED PHASES AND FORMATS FOR PCMS MESSAGES DURING ROADWORK ACTIVITIES

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

Phase 1: Condition Lists

Road/Lane/Ramp Closure List		Other Condition List	
FREEWAY CLOSED X MILE	FRONTAGE ROAD CLOSED	ROADWORK XXX FT	ROAD REPAIRS XXXX FT
ROAD CLOSED AT SH XXX	SHOULDER CLOSED XXX FT	FLAGGER XXXX FT	LANE NARROWS XXXX FT
ROAD CLSD AT FM XXXX	RIGHT LN CLOSED XXX FT	RIGHT LN NARROWS XXXX FT	TWO-WAY TRAFFIC XX MILE
RIGHT X LANES CLOSED	RIGHT X LANES OPEN	MERGING TRAFFIC XXXX FT	CONST TRAFFIC XXX FT
CENTER LANE CLOSED	DAYTIME LANE CLOSURES	LOOSE GRAVEL XXXX FT	UNEVEN LANES XXXX FT
NIGHT LANE CLOSURES	I-XX SOUTH EXIT CLOSED	DETOUR X MILE	ROUGH ROAD XXXX FT
VARIOUS LANES CLOSED	EXIT XXX CLOSED X MILE	ROADWORK PAST SH XXXX	ROADWORK NEXT FRI-SUN
EXIT CLOSED	RIGHT LN TO BE CLOSED	BUMP XXXX FT	US XXX EXIT X MILES
MALL DRIVEWAY CLOSED	X LANES CLOSED TUE - FRI	TRAFFIC SIGNAL XXXX FT	LANES SHIFT *
XXXXXXXX BLVD CLOSED			

* 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		Location List	Warning List	** Advance Notice List
MERGE RIGHT	FORM X LINES RIGHT	AT FM XXXX	SPEED LIMIT XX MPH	TUE-FRI XX AM- X PM
DETOUR NEXT X EXITS	USE XXXXX RD EXIT	BEFORE RAILROAD CROSSING	MAXIMUM SPEED XX MPH	APR XX-XX X PM-X AM
USE EXIT XXX	USE EXIT I-XX NORTH	NEXT X MILES	MINIMUM SPEED XX MPH	BEGINS MONDAY
STAY ON US XXX SOUTH	USE I-XX E TO I-XX N	PAST US XXX EXIT	ADVISORY SPEED XX MPH	BEGINS MAY XX
TRUCKS USE US XXX N	WATCH FOR TRUCKS	XXXXXXX TO XXXXXXX	RIGHT LANE EXIT	MAY X-X XX PM - XX AM
WATCH FOR TRUCKS	EXPECT DELAYS	US XXX TO FM XXXX	USE CAUTION	NEXT FRI-SUN
EXPECT DELAYS	PREPARE TO STOP		DRIVE SAFELY	XX AM TO XX PM
REDUCE SPEED XXX FT	END SHOULDER USE		DRIVE WITH CARE	NEXT TUE AUG XX
USE OTHER ROUTES	WATCH FOR WORKERS			TONIGHT XX PM- XX AM
STAY IN LANE *				

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

** See Application Guidelines Note 6.

APPLICATION GUIDELINES

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

WORDING ALTERNATIVES

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

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

FULL MATRIX PCMS SIGNS

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

Texas Department of Transportation — Traffic Safety Division Standard

BARRICADE AND CONSTRUCTION PORTABLE CHANGEABLE MESSAGE SIGN (PCMS)

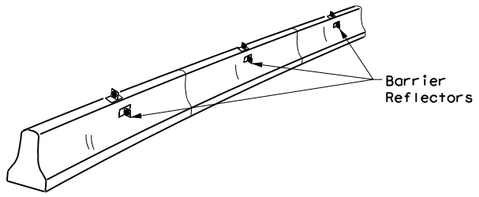
BC(6)-21

FILE: bc-21.dgn	DN: TxDOT	CK: TxDOT	DW: TxDOT	CK: TxDOT
©TxDOT November 2002	CONT	SECT	JOB	HIGHWAY
REVISIONS	0920	03	082, ETC	CR 1065, ETC
9-07 8-14	DIST	COUNTY		SHEET NO.
7-13 5-21	BMT	HARDIN, ETC		34

100

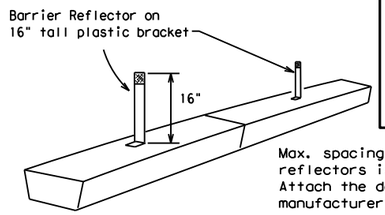
DATE: 2/26/2024 2:18:41 PM
FILE: pw://ija-pw.bentley.com:ija-pw-01/Documents/TxDOT/PM8016-2301 CEC WA4/Clemmons Gully Off-System Bridge/400 Production/4 - Design/Plan Set/2. TCP/Standards/bc-21.dgn

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



CONCRETE TRAFFIC BARRIER (CTB)

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

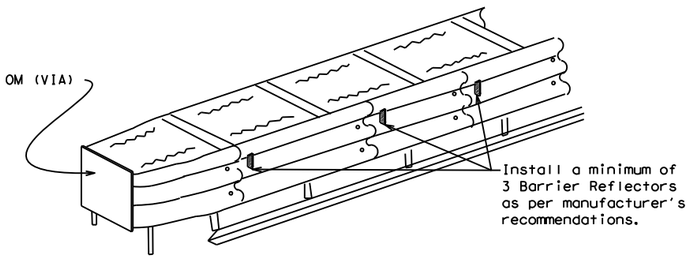


Max. spacing of barrier reflectors is 20 feet. Attach the delineators as per manufacturer's recommendations.

LOW PROFILE CONCRETE BARRIER (LPCB) USED IN WORK ZONES

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

LOW PROFILE CONCRETE BARRIER (LPCB)

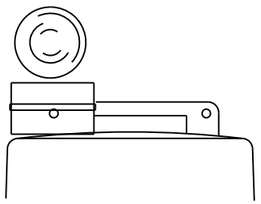


DELINEATION OF END TREATMENTS

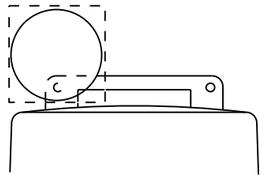
END TREATMENTS FOR CTB'S USED IN WORK ZONES

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

BARRIER REFLECTORS FOR CONCRETE TRAFFIC BARRIER AND ATTENUATORS



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



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

WARNING LIGHTS

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

WARNING LIGHTS MOUNTED ON PLASTIC DRUMS

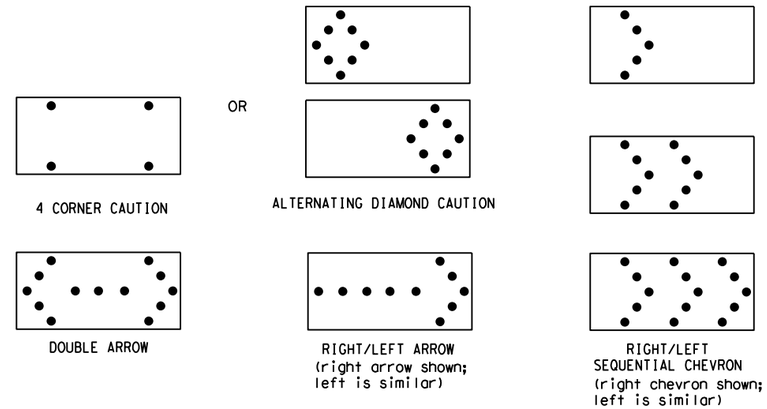
1. Type A flashing warning lights are intended to warn drivers that they are approaching or are in a potentially hazardous area.
2. Type A random flashing warning lights are not intended for delineation and shall not be used in a series.
3. A series of sequential flashing warning lights placed on channelizing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

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

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

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

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



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

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

ATTENTION

Flashing Arrow Boards shall be equipped with automatic dimming devices.

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

FLASHING ARROW BOARDS

TRUCK-MOUNTED ATTENUATORS

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

Texas Department of Transportation

Traffic Safety Division Standard

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

BC(7)-21

FILE: bc-21.dgn	DN: TxDOT	CK: TxDOT	DW: TxDOT	CK: TxDOT
©TxDOT November 2002	CONT	SECT	JOB	HIGHWAY
REVISIONS	0920	03	082, ETC	CR 1065, ETC
9-07 8-14	DIST	COUNTY		SHEET NO.
7-13 5-21	BMT	HARDIN, ETC		35

TOT

DATE: 2/26/2024 2:18:41 PM
FILE: pw://ija-pw.bentley.com:ija-pw-01/Documents/TxDOT/PM8016-2301 CEC WA4/Clemmons Gully Off-System Bridge/400 Production/4 - Design/Plan Set/2. TCP/Standards/bc-21.dgn

GENERAL NOTES

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

GENERAL DESIGN REQUIREMENTS

Pre-qualified plastic drums shall meet the following requirements:

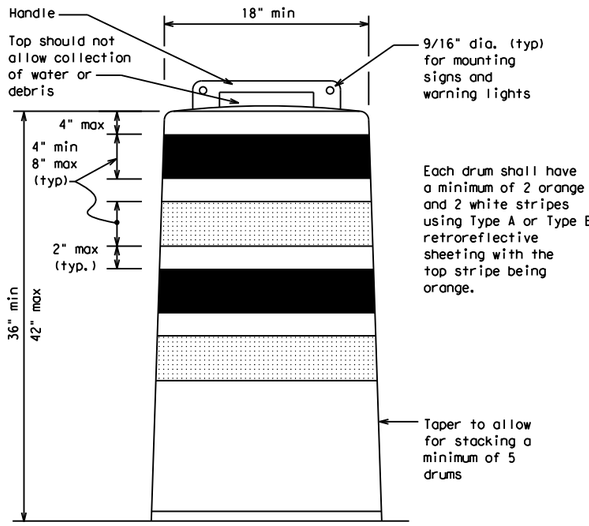
1. Plastic drums shall be a two-piece design; the "body" of the drum shall be the top portion and the "base" shall be the bottom.
2. The body and base shall lock together in such a manner that the body separates from the base when impacted by a vehicle traveling at a speed of 20 MPH or greater but prevents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

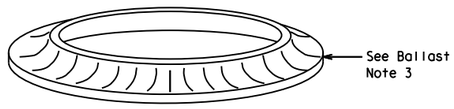
RETROREFLECTIVE SHEETING

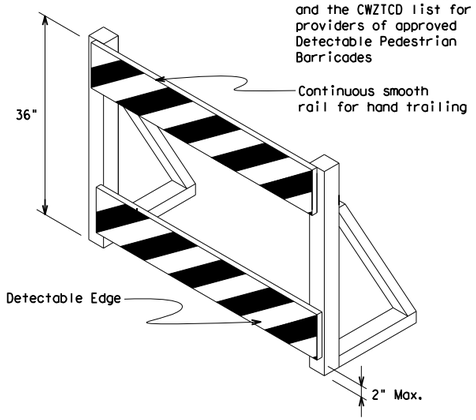
1. The stripes used on drums shall be constructed of sheeting meeting the color and retroreflectivity requirements of Departmental Materials Specification DMS-8300, "Sign Face Materials." Type A or Type B reflective sheeting shall be supplied unless otherwise specified in the plans.
2. The sheeting shall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

BALLAST

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

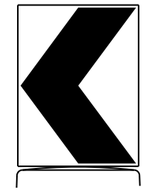




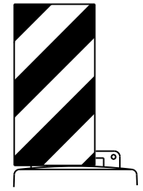


DETECTABLE PEDESTRIAN BARRICADES

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



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



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

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

SIGNS, CHEVRONS, AND VERTICAL PANELS MOUNTED ON PLASTIC DRUMS

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

Texas Department of Transportation | Traffic Safety Division Standard

BARRICADE AND CONSTRUCTION CHANNELIZING DEVICES

BC(8)-21

FILE: bc-21.dgn	DN: TxDOT	CK: TxDOT	DW: TxDOT	CK: TxDOT
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REVISIONS	0920	03	082, ETC	CR 1065, ETC
4-03 8-14	DIST	COUNTY		SHEET NO.
9-07 5-21	BMT	HARDIN, ETC		36
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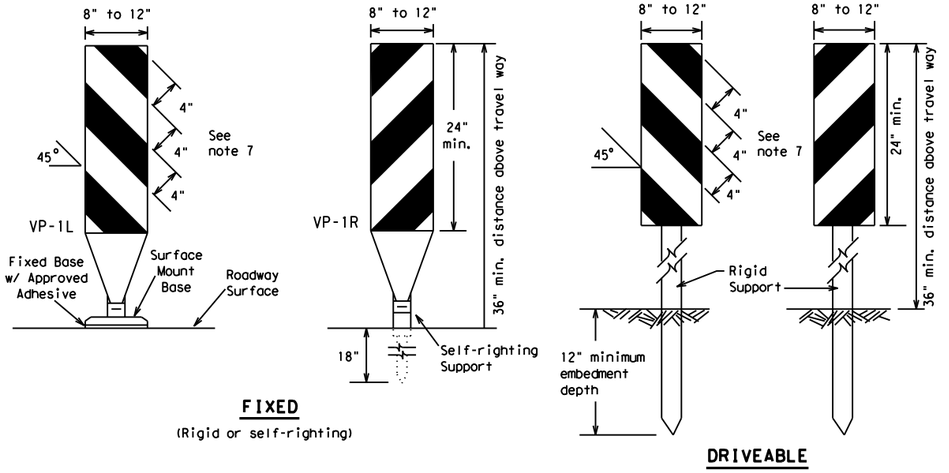
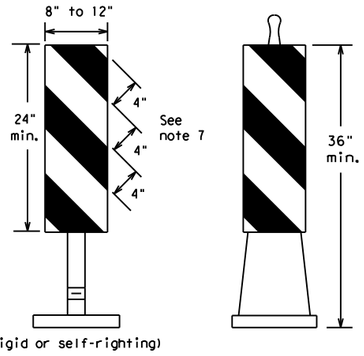
DATE: 2/26/2024 2:18:41 PM
FILE: pw://ljg-pw.bentley.com:ljg-pw-01/Documents/TxDOT/PM8016-2301 CEC WA4/Clemmons Gully Off-System Bridge/400 Production/4 - Design/Plan Set/2. TCP/Standards/bc-21.dgn



FIXED
(Rigid or self-righting)

DRIVEABLE

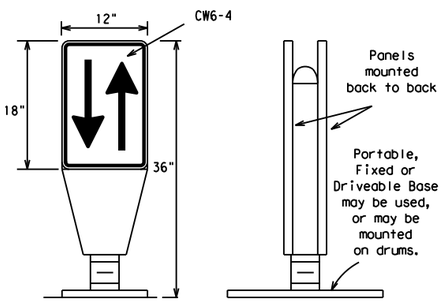


(Rigid or self-righting)

PORTABLE

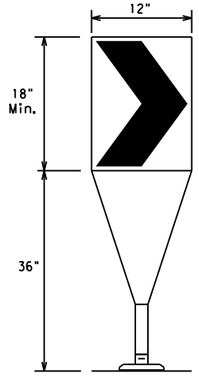
VERTICAL PANELS (VPs)

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



OPPOSING TRAFFIC LANE DIVIDERS (OTLD)

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



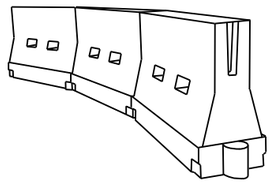
Fixed Base w/ Approved Adhesive (Driveable Base, or Flexible Support can be used)

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

CHEVRONS

GENERAL NOTES

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



LONGITUDINAL CHANNELIZING DEVICES (LCD)

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

WATER BALLASTED SYSTEMS USED AS BARRIERS

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

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

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

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

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

SUGGESTED MAXIMUM SPACING OF CHANNELIZING DEVICES AND MINIMUM DESIRABLE TAPER LENGTHS

SHEET 9 OF 12

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BARRICADE AND CONSTRUCTION CHANNELIZING DEVICES

BC(9)-21

FILE: bc-21.dgn	DN: TxDOT	CK: TxDOT	DW: TxDOT	CK: TxDOT
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REVISIONS	0920	03	082, ETC	CR 1065, ETC
9-07 8-14	DIST	COUNTY		SHEET NO.
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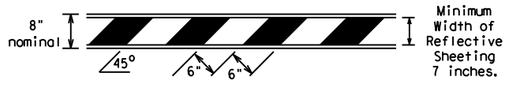
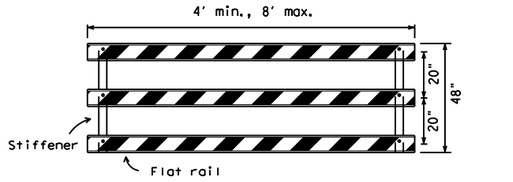
TYPE 3 BARRICADES

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

Barricades shall NOT be used as a sign support.



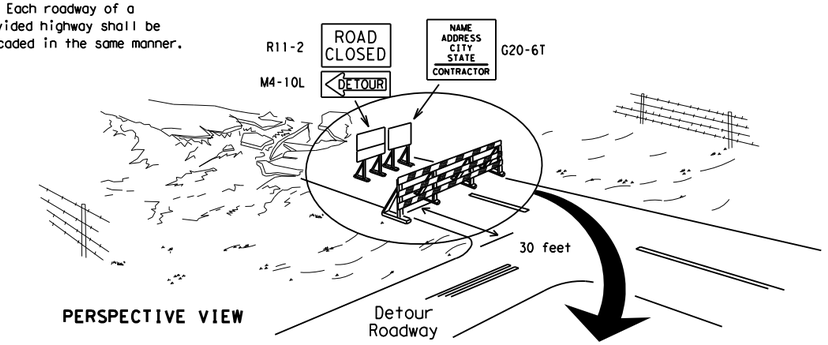
TYPICAL STRIPING DETAIL FOR BARRICADE RAIL



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

TYPICAL PANEL DETAIL FOR SKID OR POST TYPE BARRICADES

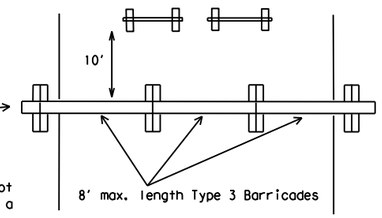
Each roadway of a divided highway shall be barricaded in the same manner.



PERSPECTIVE VIEW

The three rails on Type 3 barricades shall be reflectorized orange and reflective white stripes on one side facing one-way traffic and both sides for two-way traffic.

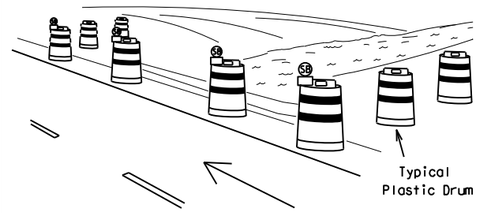
Barricade striping should slant downward in the direction of detour.



PLAN VIEW

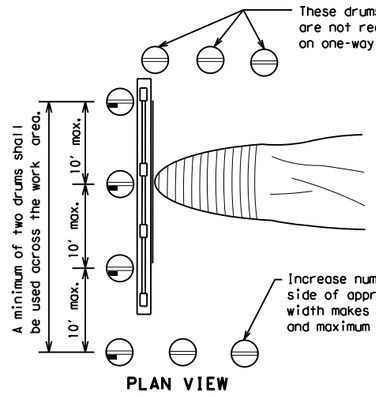
1. Signs should be mounted on independent supports at a 7 foot mounting height in center of roadway. The signs should be a minimum of 10 feet behind Type 3 Barricades.
2. Advance signing shall be as specified elsewhere in the plans.

TYPE 3 BARRICADE (POST AND SKID) TYPICAL APPLICATION



PERSPECTIVE VIEW

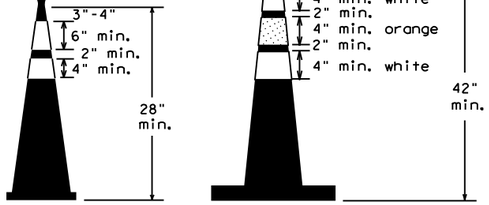
1. Where positive redirectional capability is provided, drums may be omitted.
2. Plastic construction fencing may be used with drums for safety as required in the plans.
3. Vertical Panels on flexible support may be substituted for drums when the shoulder width is less than 4 feet.
4. When the shoulder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



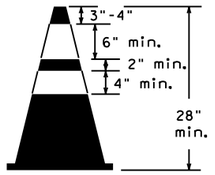
PLAN VIEW

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

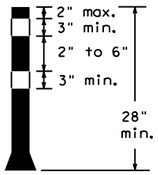
CULVERT WIDENING OR OTHER ISOLATED WORK WITHIN THE PROJECT LIMITS



Two-Piece cones



One-Piece cones

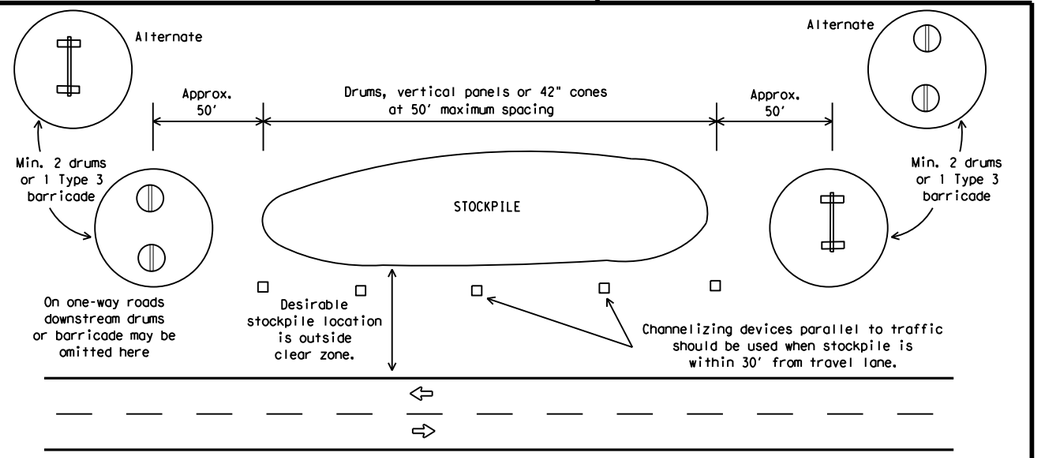


Tubular Marker

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

Texas Department of Transportation — Traffic Safety Division Standard

BARRICADE AND CONSTRUCTION CHANNELIZING DEVICES

BC(10)-21

FILE: bc-21.dgn	DN: TxDOT	CK: TxDOT	DW: TxDOT	CK: TxDOT
©TxDOT November 2002	CONT	SECT	JOB	HIGHWAY
REVISIONS	0920	03	082, ETC	CR 1065, ETC
9-07 8-14	DIST	COUNTY		SHEET NO.
7-13 5-21	BMT	HARDIN, ETC		38

WORK ZONE PAVEMENT MARKINGS

GENERAL

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

RAISED PAVEMENT MARKERS

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

PREFABRICATED PAVEMENT MARKINGS

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

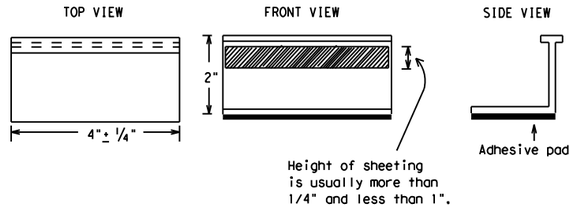
MAINTAINING WORK ZONE PAVEMENT MARKINGS

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

REMOVAL OF PAVEMENT MARKINGS

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

Temporary Flexible-Reflective Roadway Marker Tabs



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

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

RAISED PAVEMENT MARKERS USED AS GUIDEMARKS

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

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

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

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

Texas Department of Transportation

Traffic Safety Division Standard

BARRICADE AND CONSTRUCTION PAVEMENT MARKINGS

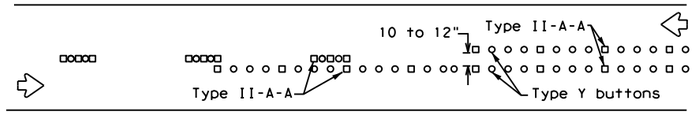
BC(11)-21

FILE: bc-21.dgn	DN: TxDOT	CK: TxDOT	DW: TxDOT	CK: TxDOT
© TxDOT February 1998	CONT	SECT	JOB	HIGHWAY
REVISIONS 2-98 9-07 5-21 1-02 7-13 11-02 8-14	0920	03	082, ETC	CR 1065, ETC
	DIST	COUNTY		SHEET NO.
	BMT	HARDIN, ETC		39

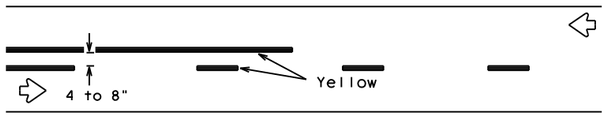
DATE: 2/26/2024 2:18:42 PM
FILE: pw://ljg-pw.bentley.com:ljg-pw-01/Documents/TxDOT/PM8016-2301 CEC WA4/Clemmons Gully Off-System Bridge/400 Production/4 - Design/Plan Set/2. TCP/Standards/bc-21.dgn

PAVEMENT MARKING PATTERNS

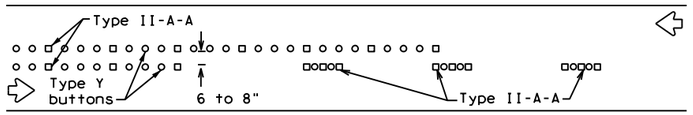
REFLECTORIZED PAVEMENT MARKINGS - PATTERN A



RAISED PAVEMENT MARKERS - PATTERN A



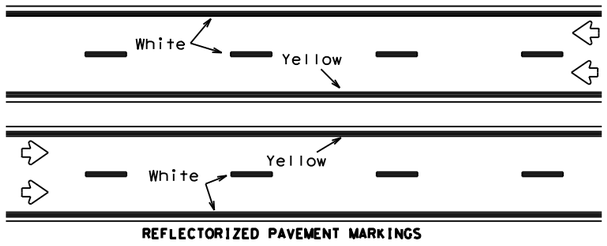
REFLECTORIZED PAVEMENT MARKINGS - PATTERN B



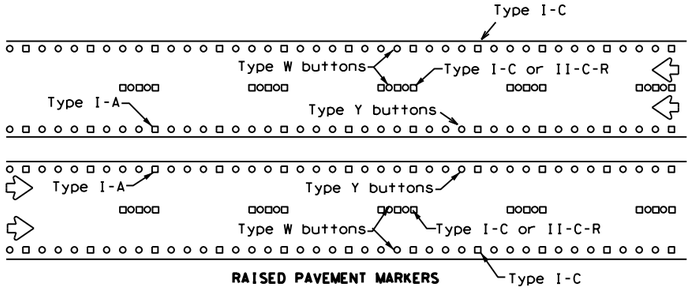
RAISED PAVEMENT MARKERS - PATTERN B

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

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



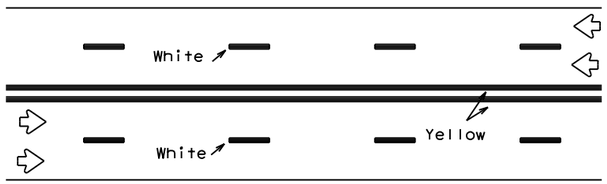
REFLECTORIZED PAVEMENT MARKINGS



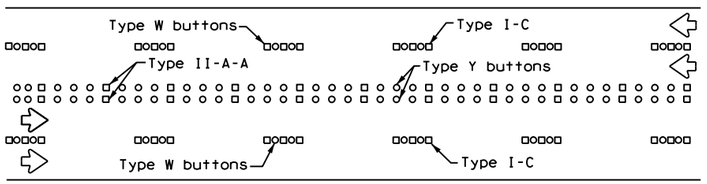
RAISED PAVEMENT MARKERS

Prefabricated markings may be substituted for reflectorized pavement markings.

EDGE & LANE LINES FOR DIVIDED HIGHWAY



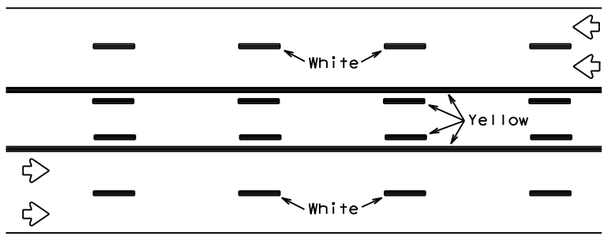
REFLECTORIZED PAVEMENT MARKINGS



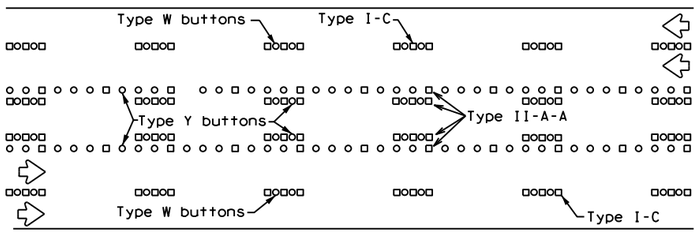
RAISED PAVEMENT MARKERS

Prefabricated markings may be substituted for reflectorized pavement markings.

LANE & CENTER LINES FOR MULTILANE UNDIVIDED HIGHWAYS



REFLECTORIZED PAVEMENT MARKINGS



RAISED PAVEMENT MARKERS

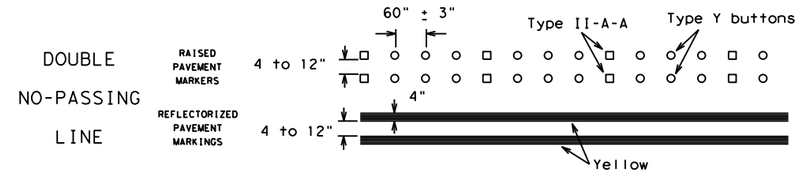
Prefabricated markings may be substituted for reflectorized pavement markings.

TWO-WAY LEFT TURN LANE

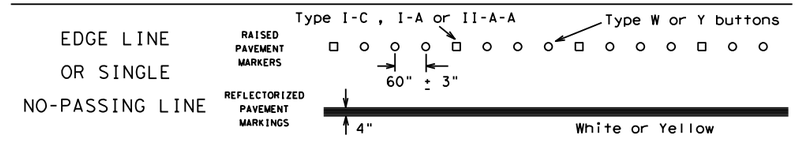
STANDARD WORK ZONE PAVEMENT MARKINGS DETAILS

SOLID LINES

DOUBLE NO-PASSING LINE

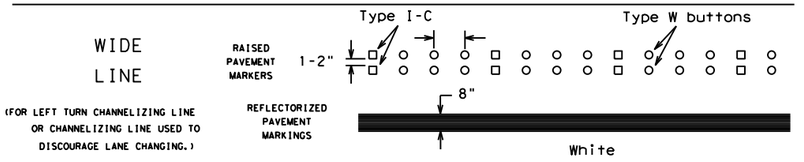


EDGE LINE OR SINGLE NO-PASSING LINE



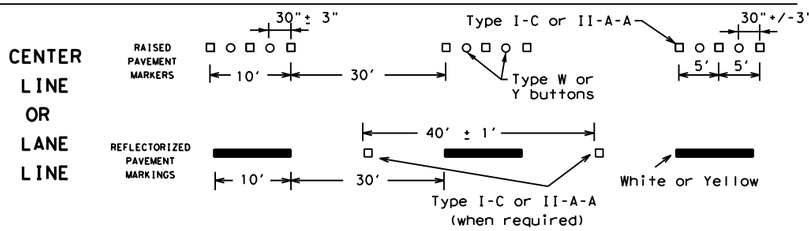
WIDE LINE

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

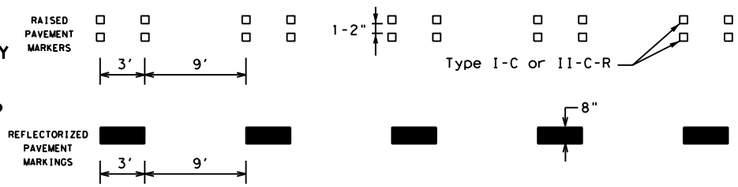


BROKEN LINES

CENTER LINE OR LANE LINE

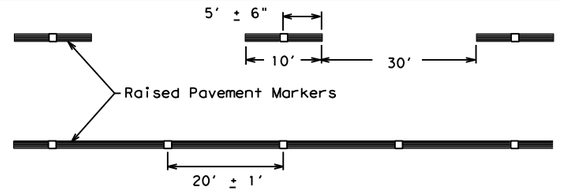


AUXILIARY OR LANEDROP LINE



REMOVABLE MARKINGS WITH RAISED PAVEMENT MARKERS

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



Centerline only - not to be used on edge lines

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

Texas Department of Transportation

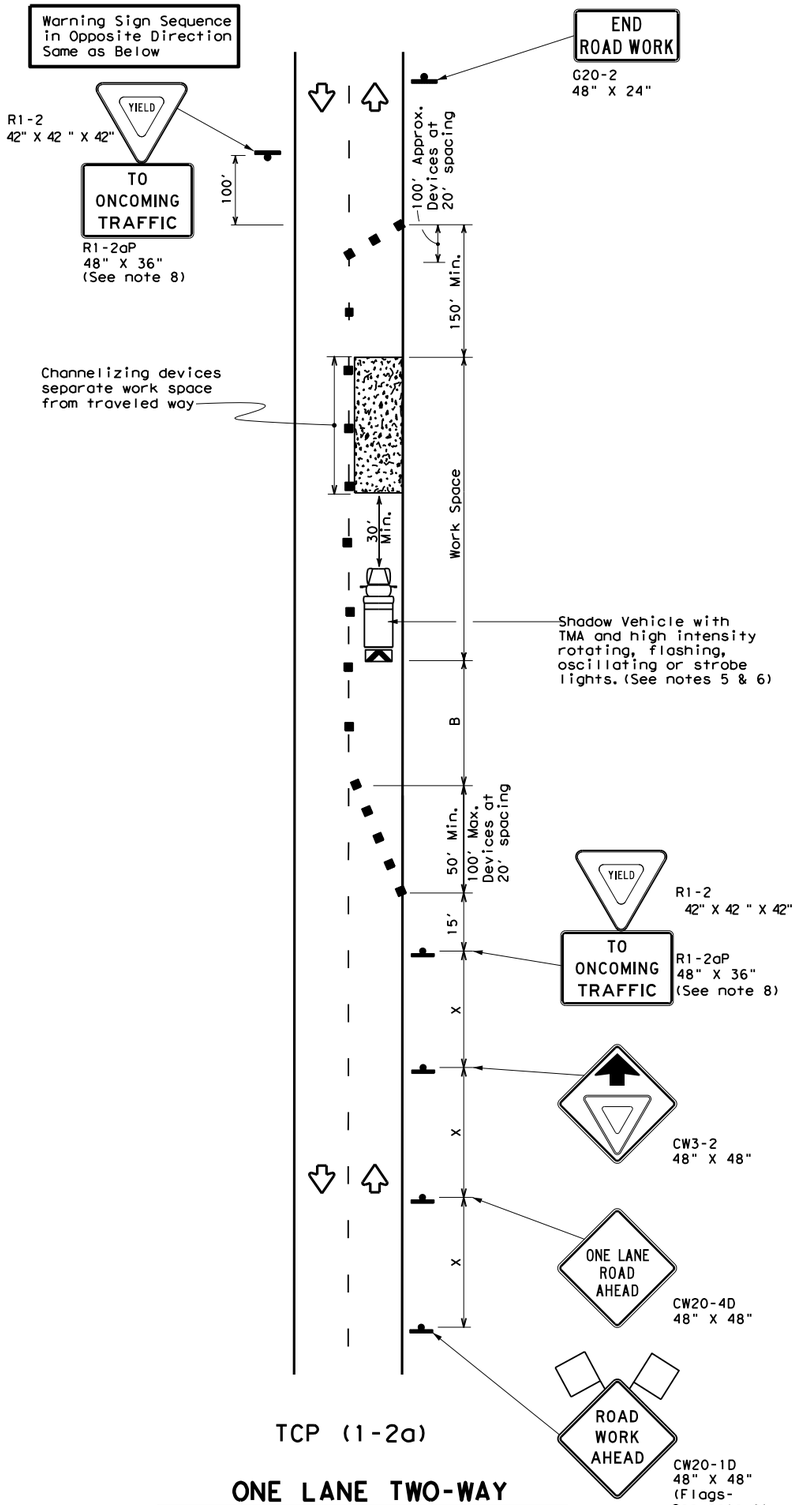
Traffic Safety Division Standard

BARRICADE AND CONSTRUCTION PAVEMENT MARKING PATTERNS

BC(12)-21

FILE: bc-21.dgn	DN: TxDOT	CK: TxDOT	DW: TxDOT	CK: TxDOT
©TxDOT February 1998	CONT	SECT	JOB	HIGHWAY
REVISIONS 1-97 9-07 5-21	0920	03	082, ETC	CR 1065, ETC
2-98 7-13	DIST	COUNTY		SHEET NO.
11-02 8-14	BMT	HARDIN, ETC		40

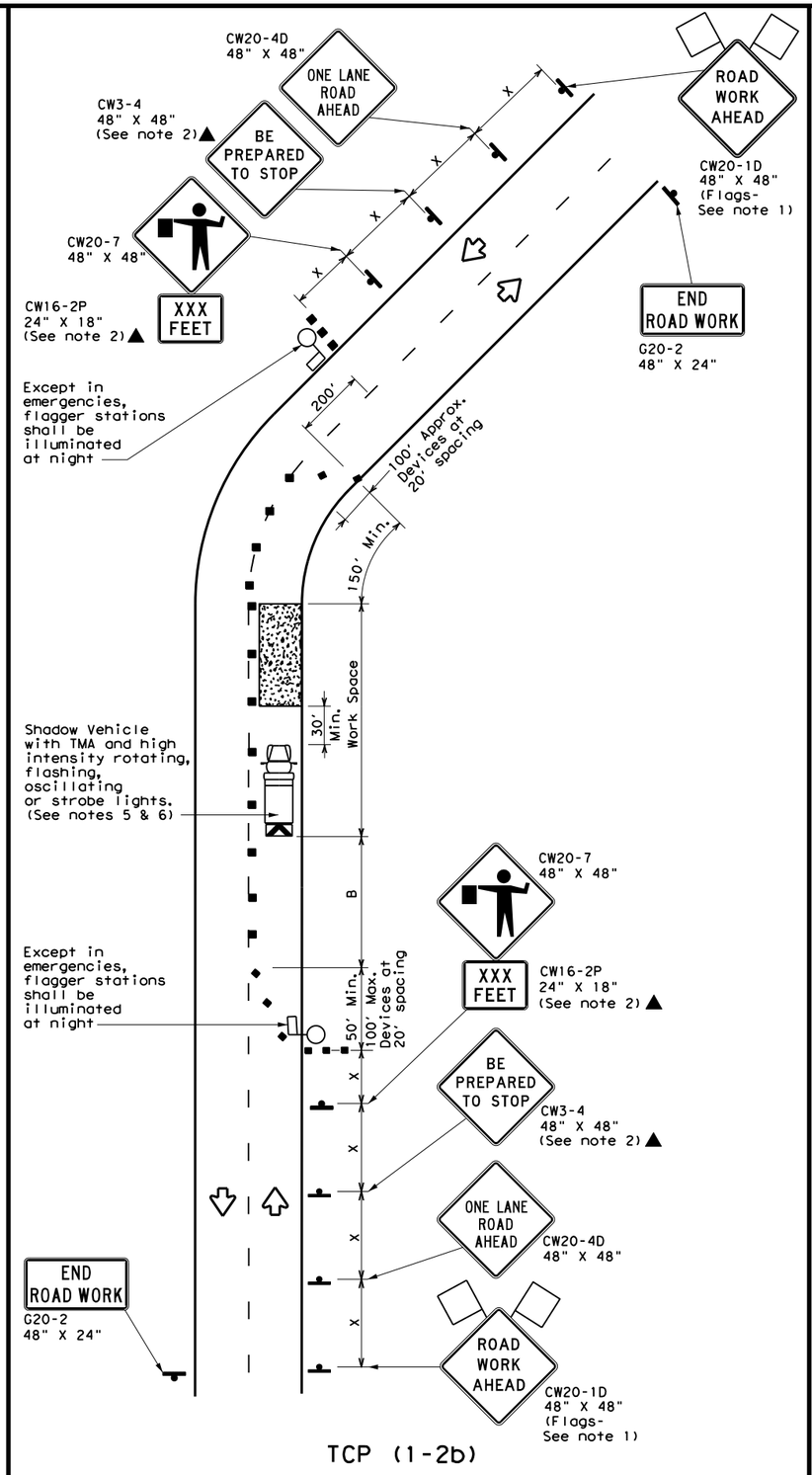
DATE: 2/26/2024 2:18:46 PM
FILE: pw://ija-pw.bentley.com:ija-pw-01/Documents/TxDOT/PM8016-2301 CEC WA4/Clemmons Gully Off-System Bridge/400 Production/4 - Design/Plan Set/2. TCP/Standards/tcp1-2-18.dgn



TCP (1-2a)

ONE LANE TWO-WAY CONTROL WITH YIELD SIGNS

(Less than 2000 ADT - See note 7)



TCP (1-2b)

ONE LANE TWO-WAY CONTROL WITH FLAGGERS

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

Posted Speed *	Formula	Minimum Desirable Taper Lengths ** 10' Offset	11' Offset	12' Offset	Suggested Maximum Spacing of Channelizing Devices: On a Taper	On a Tangent	Minimum Sign Spacing "X" Distance	Suggested Longitudinal Buffer Space "B"	Stopping Sight Distance
30	$L=\frac{WS^2}{60}$	150'	165'	180'	30'	60'	120'	90'	200'
35		205'	225'	245'	35'	70'	160'	120'	250'
40		265'	295'	320'	40'	80'	240'	155'	305'
45	L=WS	450'	495'	540'	45'	90'	320'	195'	360'
50		500'	550'	600'	50'	100'	400'	240'	425'
55		550'	605'	660'	55'	110'	500'	295'	495'
60		600'	660'	720'	60'	120'	600'	350'	570'
65		650'	715'	780'	65'	130'	700'	410'	645'
70		700'	770'	840'	70'	140'	800'	475'	730'
75		750'	825'	900'	75'	150'	900'	540'	820'

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

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

GENERAL NOTES

1. Flags attached to signs where shown are REQUIRED.
2. All traffic control devices illustrated are REQUIRED, except those denoted with the triangle symbol may be omitted when stated elsewhere in the plans, or for routine maintenance work, when approved by the Engineer.
3. The CW3-4 "BE PREPARED TO STOP" sign may be installed after the CW20-4D "ONE LANE ROAD AHEAD" sign, but proper sign spacing shall be maintained.
4. Sign spacing may be increased or an additional CW20-1D "ROAD WORK AHEAD" sign may be used if advance warning ahead of the flagger or R1-2 "YIELD" sign is less than 1500 feet.
5. A Shadow Vehicle with a TMA should be used anytime it can be positioned 30 to 100 feet in advance of the area of crew exposure without adversely affecting the performance or quality of the work. If workers are no longer present but road or work conditions require the traffic control to remain in place, Type 3 Barricades or other channelizing devices may be substituted for the Shadow Vehicle and TMA.
6. Additional Shadow Vehicles with TMAs may be positioned off the paved surface, next to those shown in order to protect wider work spaces.

TCP (1-2a)

7. R1-2 "YIELD" sign traffic control may be used on projects with approaches that have adequate sight distance. For projects in urban areas, work spaces should be no longer than one half city block. In rural areas on roadways with less than 2000 ADT, work spaces should be no longer than 400 feet.
8. R1-2 "YIELD" sign with R1-2aP "TO ONCOMING TRAFFIC" plaque shall be placed on a support at a 7 foot minimum mounting height.

TCP (1-2b)

9. Flaggers should use two-way radios or other methods of communication to control traffic.
10. Length of work space should be based on the ability of flaggers to communicate.
11. If the work space is located near a horizontal or vertical curve, the buffer distances should be increased in order to maintain adequate stopping sight distance to the flagger and a queue of stopped vehicles (see table above).
12. Channelizing devices on the center-line may be omitted when a pilot car is leading traffic and approved by the Engineer.
13. Flaggers should use 24" STOP/SLOW paddles to control traffic. Flags should be limited to emergency situations.

Texas Department of Transportation

Traffic Operations Division Standard

TRAFFIC CONTROL PLAN ONE-LANE TWO-WAY TRAFFIC CONTROL

TCP(1-2)-18

FILE: tcp1-2-18.dgn	DN:	CK:	DW:	CK:
©TxDOT December 1985	CONT	SECT	JOB	HIGHWAY
REVISIONS 4-90 4-98 2-94 2-12 1-97 2-18	0920	03	082, ETC	CR 1065, ETC
	DIST	COUNTY		SHEET NO.
	BMT	HARDIN, ETC		41

DATE: 2/20/2024 9:12:01 AM
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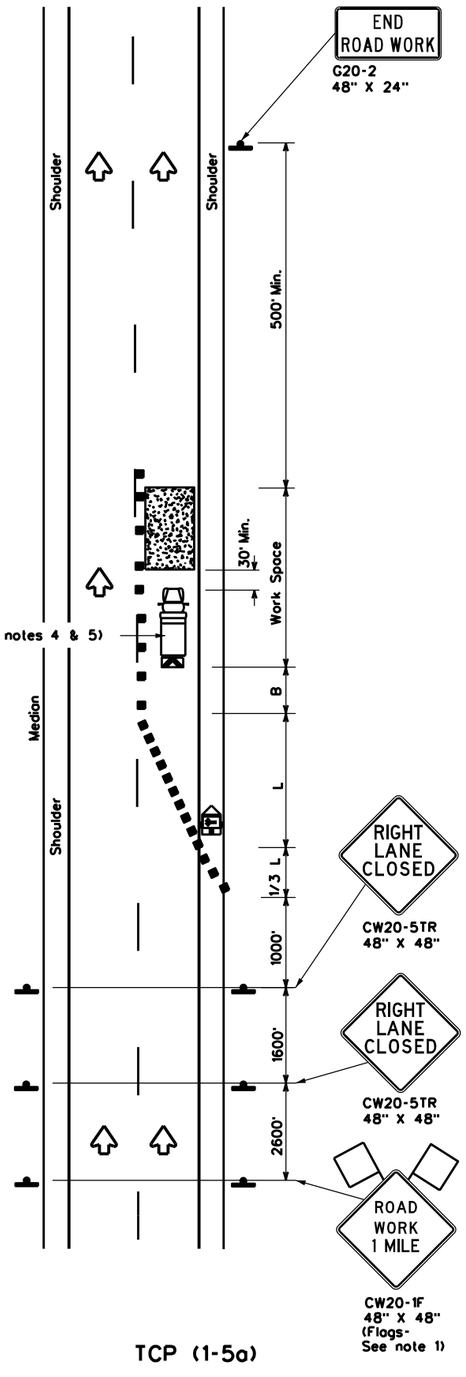
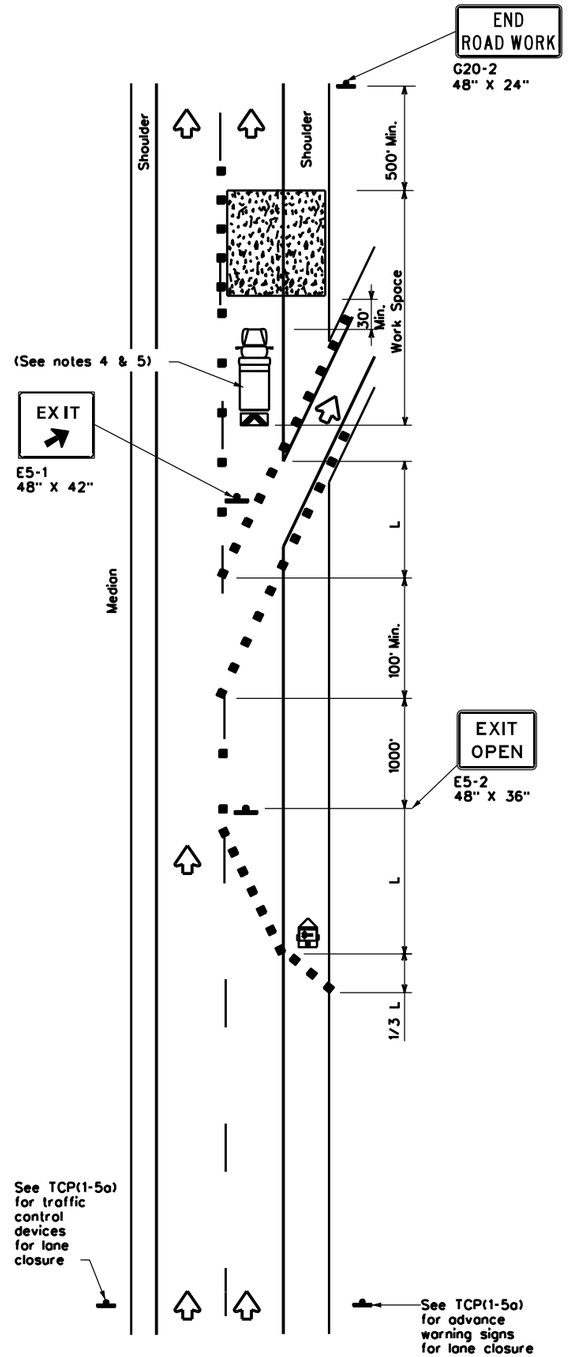


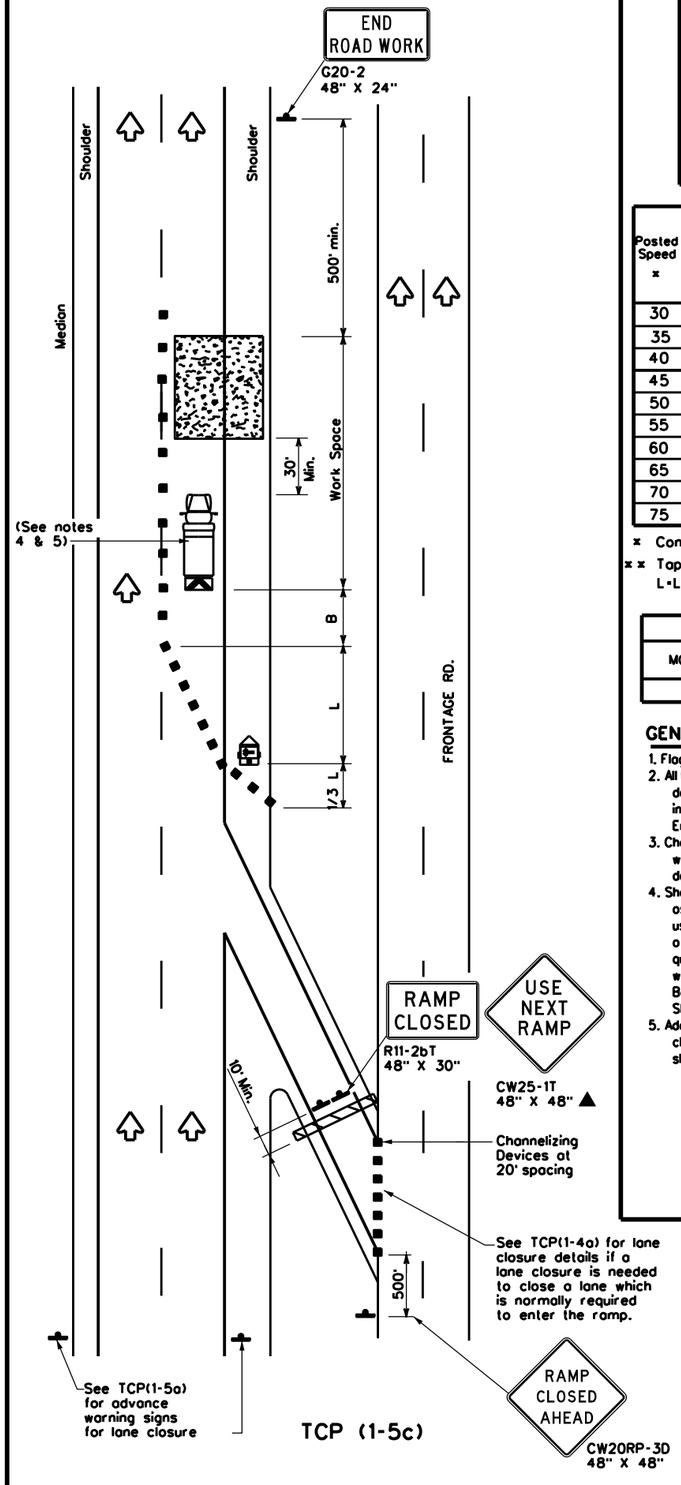
TCP (1-5a)

ONE LANE CLOSURE



TCP (1-5b)

LANE CLOSURE NEAR EXIT RAMPS



TCP (1-5c)

LANE CLOSURE NEAR ENTRANCE RAMPS

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

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

* Conventional Roads Only

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

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

GENERAL NOTES

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

Texas Department of Transportation

Traffic Operations Division Standard

TRAFFIC CONTROL PLAN LANE CLOSURES FOR DIVIDED HIGHWAYS

TCP(1-5)-18

FILE: tcp1-5-18.dgn	DN:	CK:	DW:	CK:
© TxDOT February 2012	CONT	SECT	JOB	HIGHWAY
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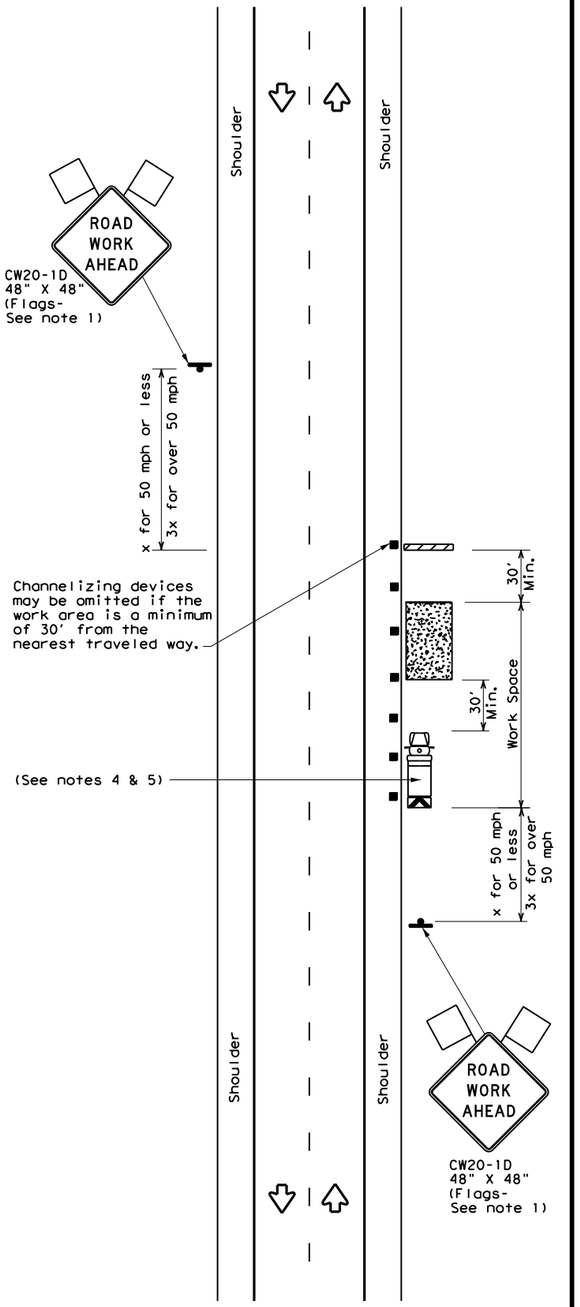
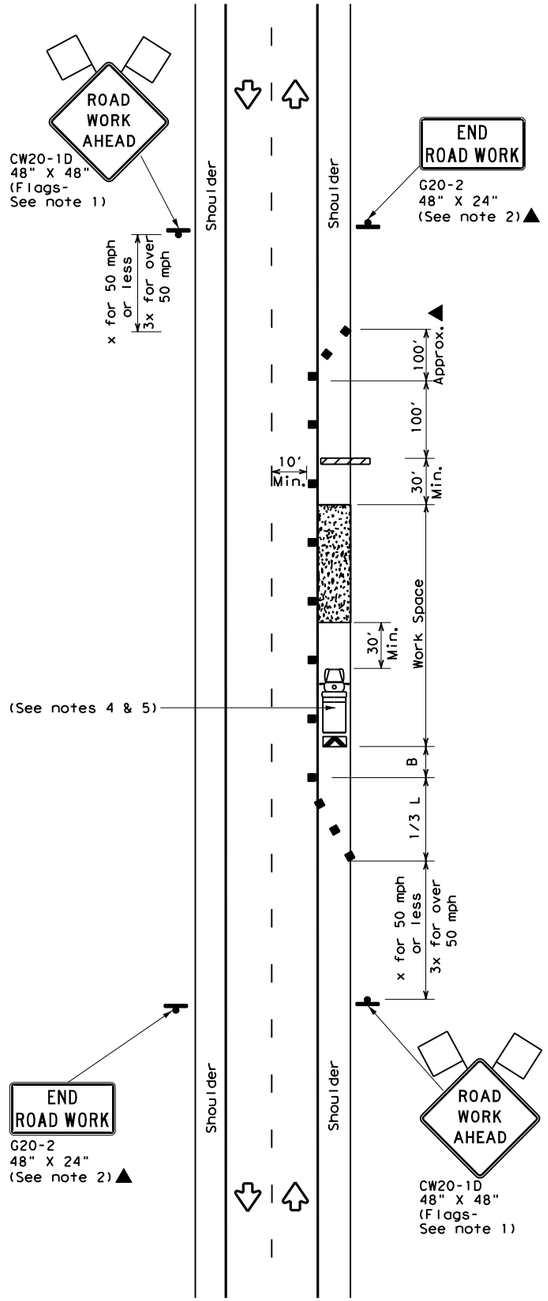
	BMT	HARDIN, ETC		42



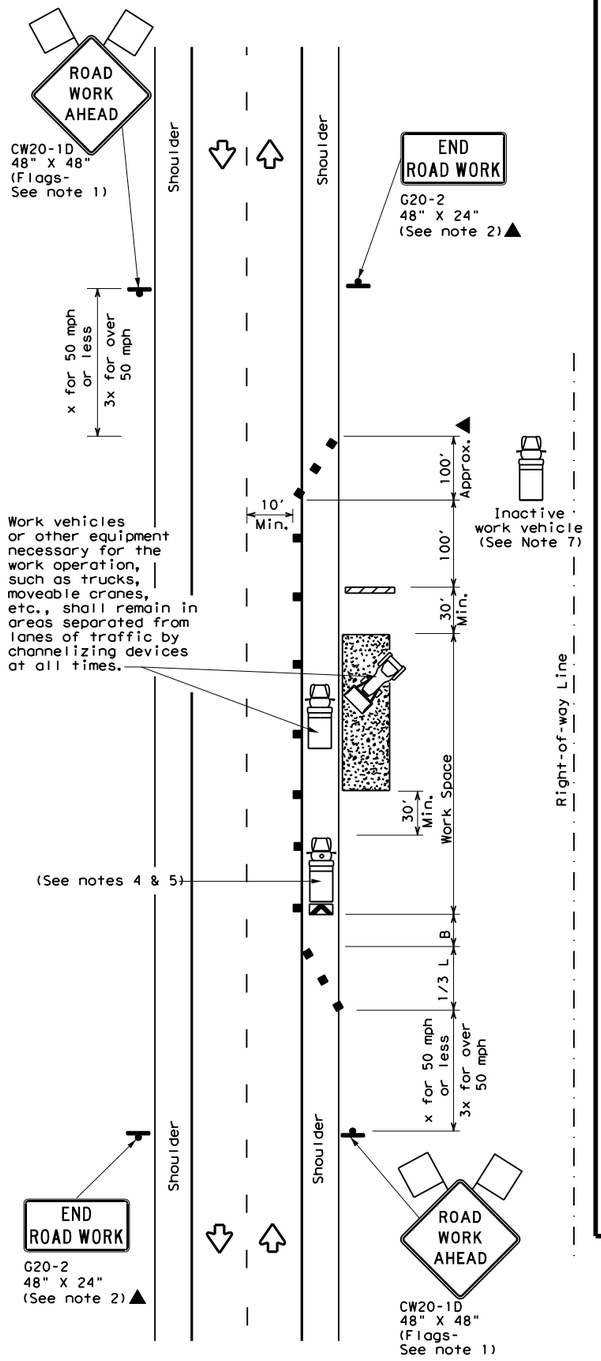
TCP (2-1a)

WORK SPACE NEAR SHOULDER
Conventional Roads



TCP (2-1b)

WORK SPACE ON SHOULDER
Conventional Roads



TCP (2-1c)

WORK VEHICLES ON SHOULDER
Conventional Roads

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

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

* Conventional Roads Only

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

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

GENERAL NOTES

1. Flags attached to signs where shown, are REQUIRED.
2. All traffic control devices illustrated are REQUIRED, except those denoted with the triangle symbol may be omitted when stated in the plans, or for routine maintenance work, when approved by the Engineer.
3. Stockpiled material should be placed a minimum of 30 feet from nearest traveled way.
4. Shadow Vehicle with TMA and high intensity rotating, flashing, oscillating or strobe lights. A Shadow Vehicle with a TMA should be used anytime it can be positioned 30 to 100 feet in advance of the area of crew exposure without adversely affecting the performance or quality of the work. If workers are no longer present but road or work conditions require the traffic control to remain in place, Type 3 Barricades or other channelizing devices may be substituted for the Shadow Vehicle and TMA.
5. Additional Shadow Vehicles with TMAs may be positioned off the paved surface, next to those shown in order to protect a wider work space.
6. See TCP(5-1) for shoulder work on divided highways, expressways and freeways.
7. Inactive work vehicles or other equipment should be parked near the right-of-way line and not parked on the paved shoulder.
8. CW21-5 "SHOULDER WORK" signs may be used in place of CW20-1D "ROAD WORK AHEAD" signs for shoulder work on conventional roadways.

Texas Department of Transportation

Traffic Operations Division Standard

TRAFFIC CONTROL PLAN CONVENTIONAL ROAD SHOULDER WORK

TCP(2-1)-18

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© TxDOT December 1985	CONT	SECT	JOB	HIGHWAY
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	DIST	COUNTY		SHEET NO.
	BMT	HARDIN, ETC		43

161

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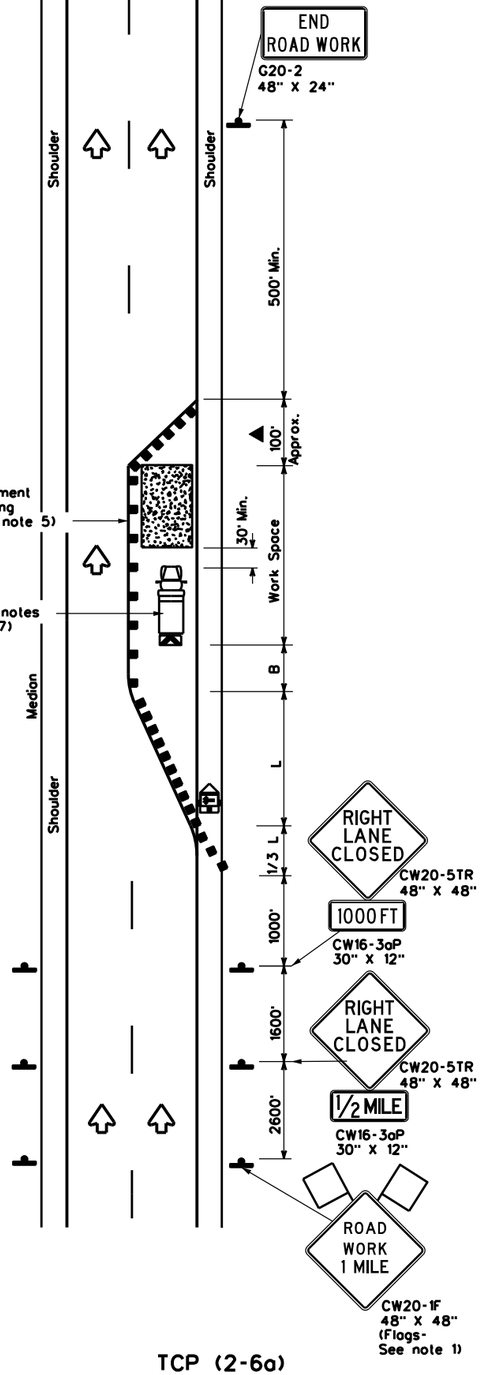
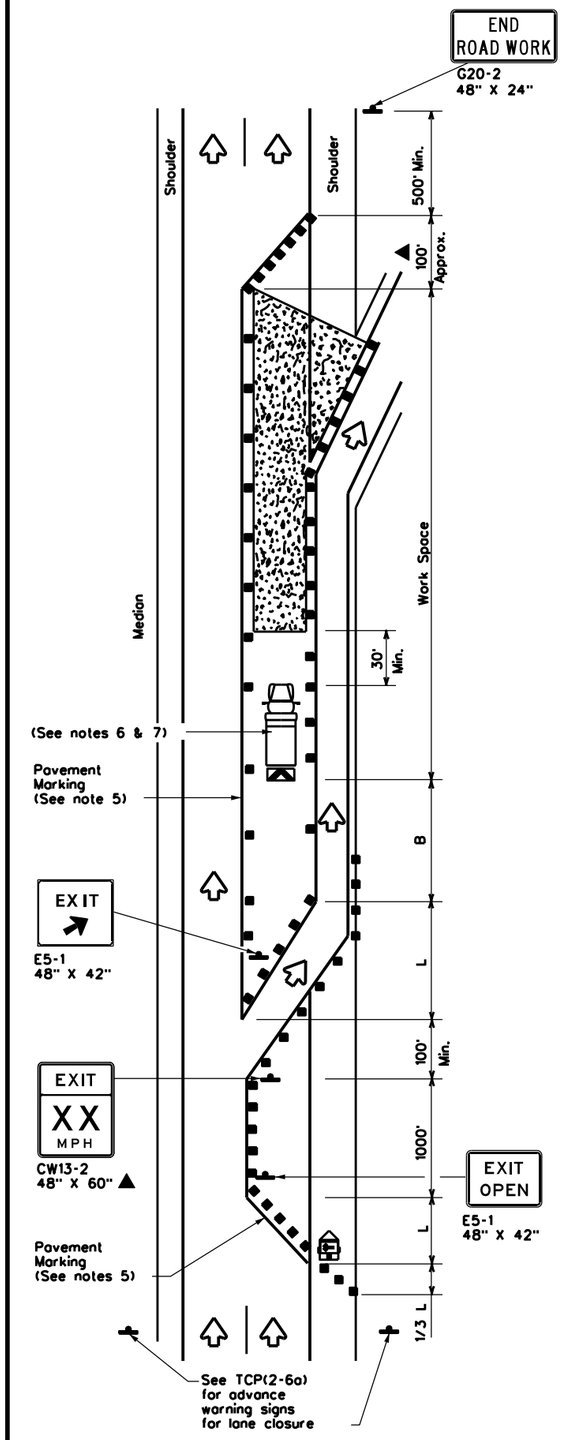


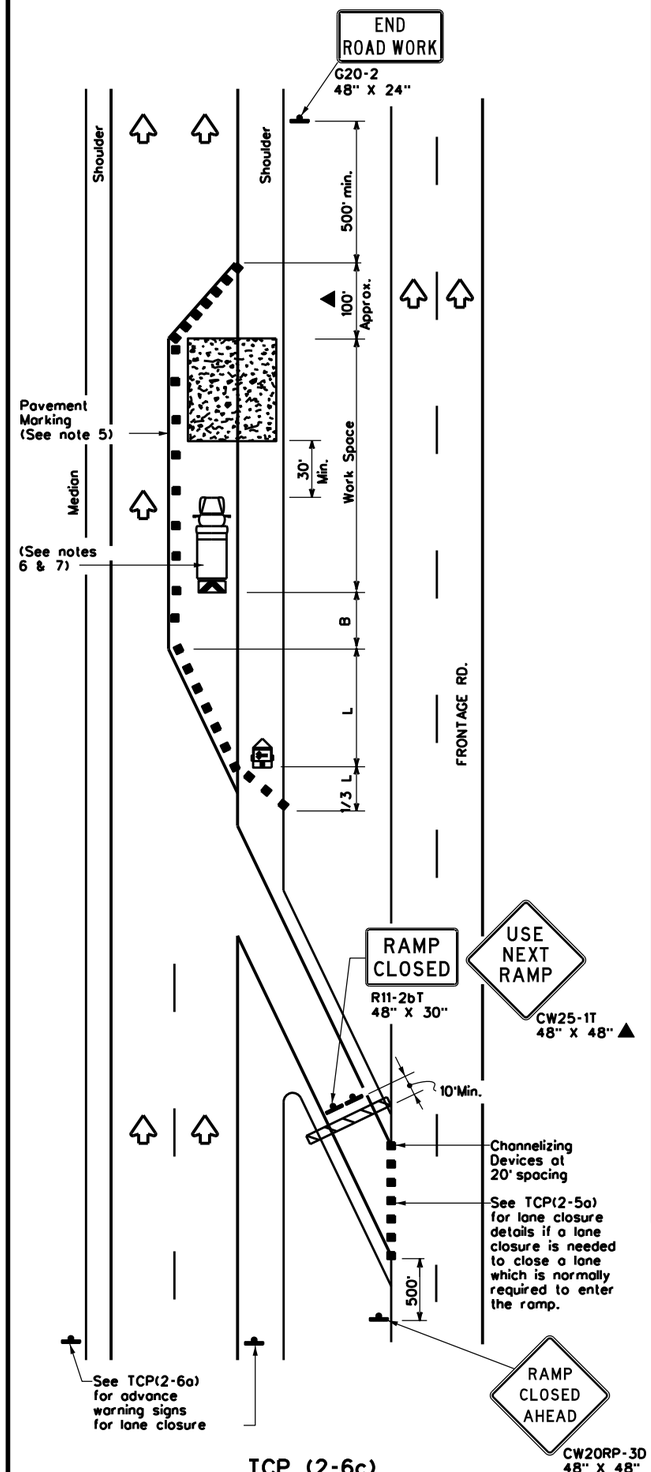
TCP (2-6a)

ONE LANE CLOSURE



TCP (2-6b)

LANE CLOSURE NEAR EXIT RAMPS



TCP (2-6c)

LANE CLOSURE NEAR ENTRANCE RAMPS

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

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

* Conventional Roads Only

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

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

GENERAL NOTES

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

Texas Department of Transportation

Traffic Operations Division Standard

TRAFFIC CONTROL PLAN LANE CLOSURES ON DIVIDED HIGHWAYS

TCP(2-6)-18

FILE: tcp2-6-18.dgn	DN:	CK:	DW:	CK:
© TxDOT December 1985	CONT	SECT	JOB	HIGHWAY
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2-94 4-98	DIST	COUNTY		SHEET NO.
8-95 2-12	BMT	HARDIN, ETC		44
1-97 2-18				

DATE: 2/26/2024 2:19:12 PM
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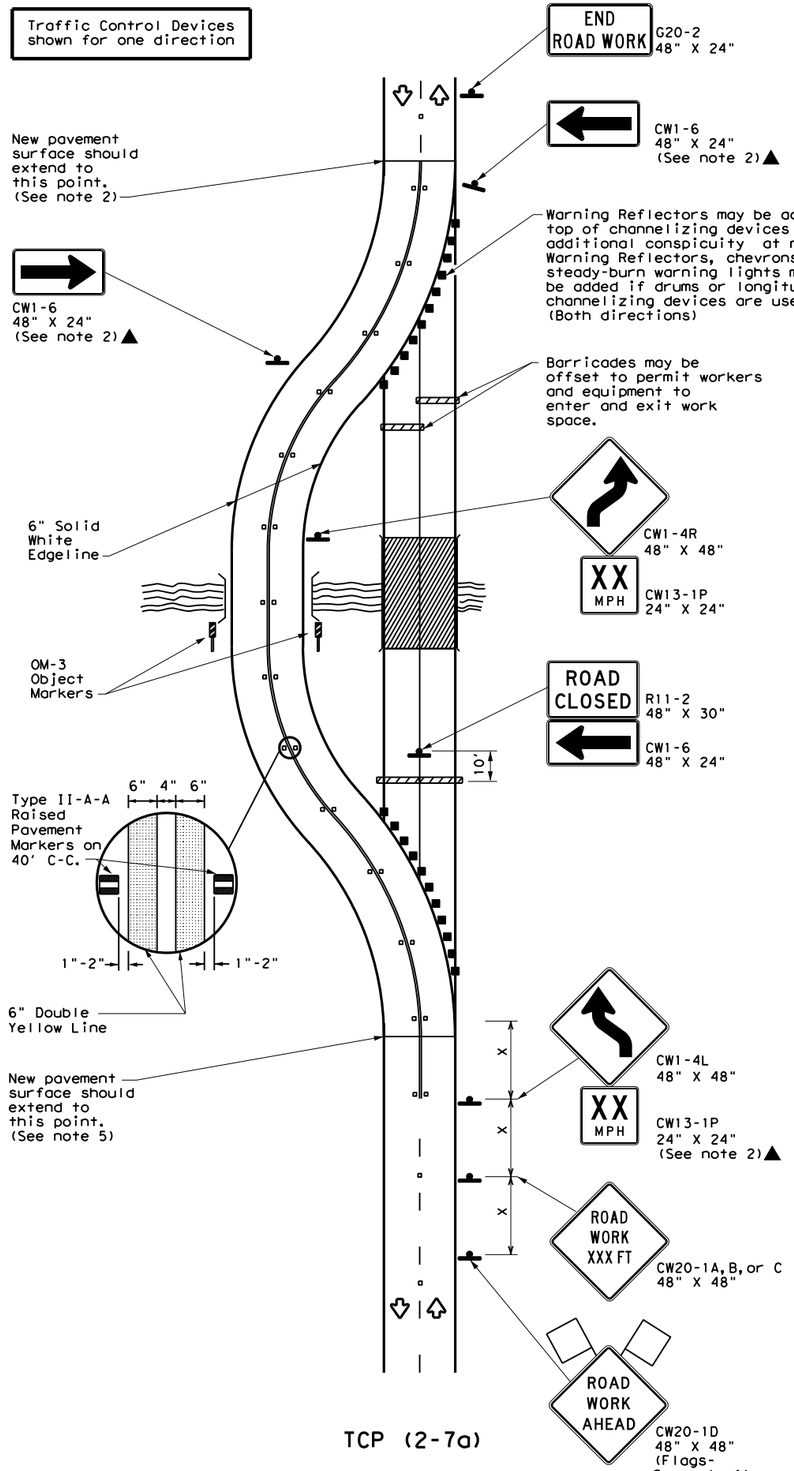
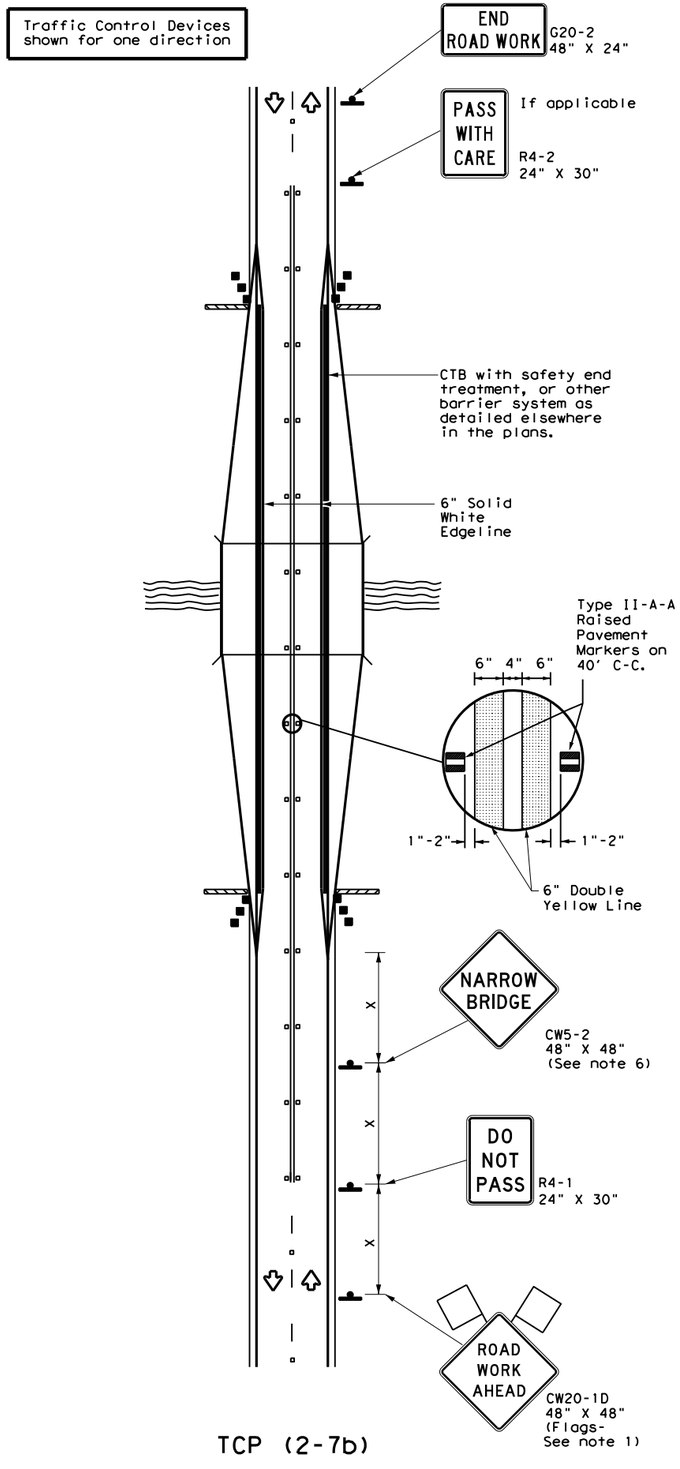


TCP (2-7a)

ROADWAY DIVERSION



TCP (2-7b)

BRIDGE WIDENING

LEGEND			
	Type 3 Barricade	▪▪	Channelizing Devices
	Heavy Work Vehicle		Truck Mounted Attenuator (TMA)
	Trailer Mounted Flashing Arrow Board	••••	Raised Pavement Markers Ty II-AA
	Sign		Traffic Flow
	Flag		Flagger

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

* Conventional Roads Only

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

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

GENERAL NOTES

1. Flags attached to signs where shown are REQUIRED.
2. All traffic control devices illustrated are REQUIRED, except those denoted with the triangle symbol may be omitted when stated elsewhere in the plans, or for routine maintenance work, when approved by the Engineer.

TCP (2-7a)

3. Raised pavement markers shall be placed 40 feet c-c on centerline throughout project.
4. Roadway diversion design requirements should be based on posted speed limit or prevailing speed.
5. New pavement surface should be extended across existing roadway edge to a point where existing pavement markings left in place during project do not conflict with construction area pavement marking.

TCP (2-7b)

6. The CW5-2 "Narrow Bridge" sign may be omitted if lane and shoulder widths are maintained.

Texas Department of Transportation

Traffic Safety Division Standard

TRAFFIC CONTROL PLAN DIVERSIONS AND NARROW BRIDGES

TCP(2-7)-23

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©TxDOT April 2023	CONT	SECT	JOB	HIGHWAY
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	BMT	HARDIN, ETC		45

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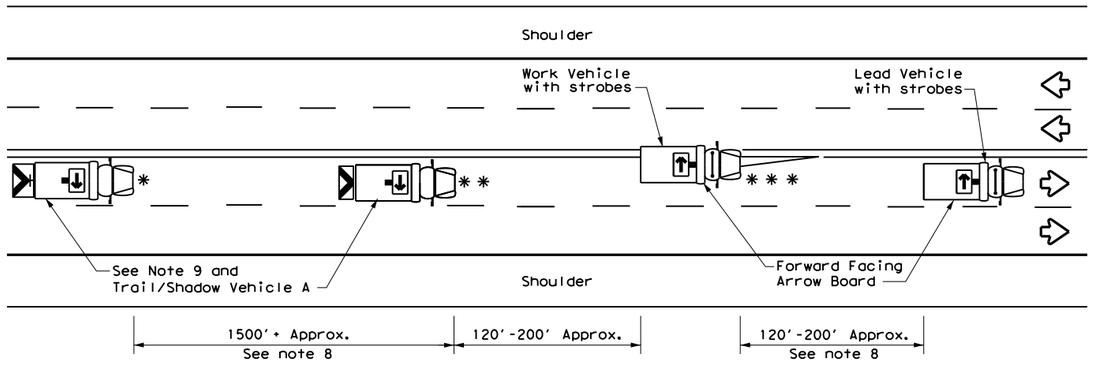
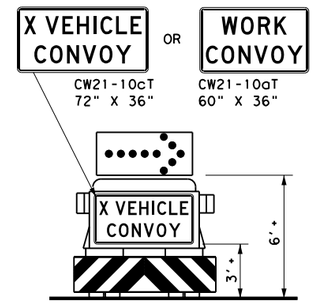


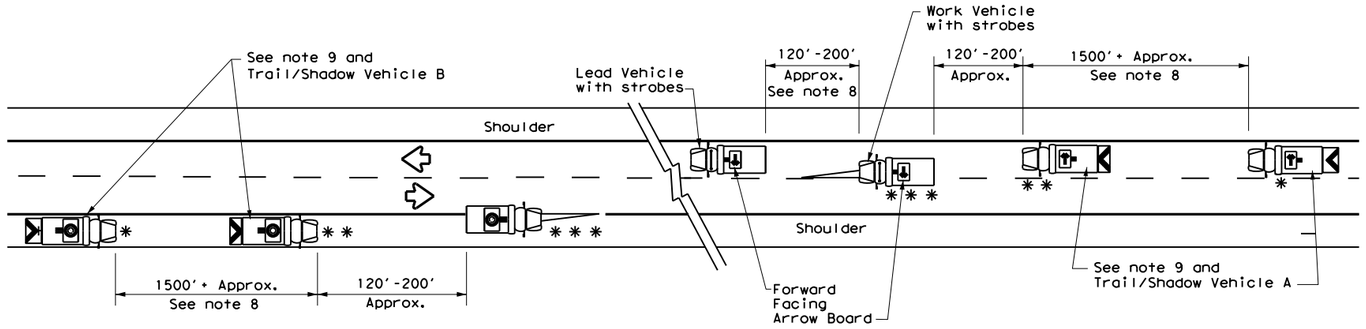
TCP (3-1a)

UNDIVIDED MULTILANE ROADWAY



TRAIL/SHADOW VEHICLE A

with RIGHT Directional display Flashing Arrow Board

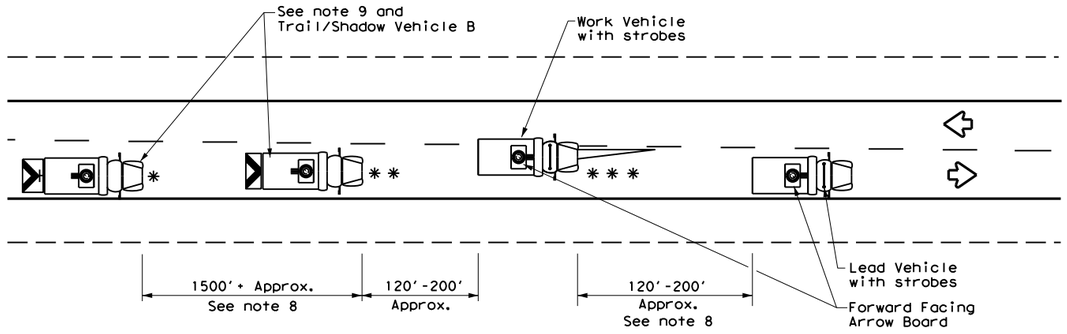


WORK ON SHOULDER

WORK ON TRAVEL LANE

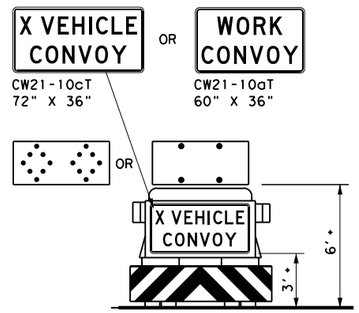
TCP (3-1b)

TWO-WAY ROADWAY WITH PAVED SHOULDERS



TCP (3-1c)

TWO-WAY ROADWAY WITHOUT PAVED SHOULDERS



TRAIL/SHADOW VEHICLE B

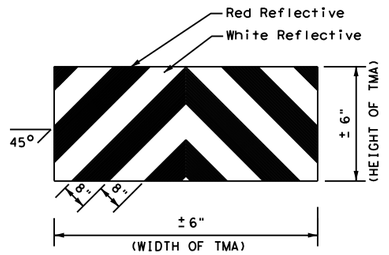
with Flashing Arrow Board in CAUTION display

LEGEND			
*	Trail Vehicle	ARROW BOARD DISPLAY	
**	Shadow Vehicle		
***	Work Vehicle		RIGHT Directional
	Heavy Work Vehicle		LEFT Directional
	Truck Mounted Attenuator (TMA)		Double Arrow
	Traffic Flow		CAUTION (Alternating Diamond or 4 Corner Flash)

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

GENERAL NOTES

1. TRAIL, SHADOW, and LEAD vehicles shall be equipped with arrow boards as illustrated. When a LEAD vehicle is not used the WORK vehicle must be equipped with an arrow board. The Engineer will determine if the LEAD VEHICLE and/or TRAIL VEHICLE are required based on prevailing roadway conditions, traffic volume, and sight distance restrictions.
2. The use of amber high intensity rotating, flashing, oscillating, or strobe lights on vehicles are required. Blue high intensity rotating, flashing, oscillating or strobe lights when mounted on the driver's side of the vehicle may be operated simultaneously with the amber beacons or strobe lights.
3. The use of truck mounted attenuators (TMA) on the SHADOW VEHICLE and TRAIL VEHICLE are required.
4. Reflective sheeting on the rear of the TMA shall meet or exceed the reflectivity and color requirements of DEPARTMENTAL MATERIAL SPECIFICATION DMS 8300, Type A.
5. Flashing arrow boards shall be Type B or Type C as per the Barricade and Construction (BC) standards. The board shall be controlled from inside the vehicle.
6. Each vehicle shall have two-way radio communication capability.
7. When work convoys must change lanes, the TRAIL VEHICLE should change lanes first to shadow the other convoy vehicles.
8. Vehicle spacing between the TRAIL VEHICLE and the SHADOW VEHICLE will vary depending on sight distance restrictions. Motorists approaching the work convoy should be able to see the TRAIL VEHICLE in time to slow down and/or change lanes as they approach the TRAIL VEHICLE. Vehicle spacing between the WORK VEHICLE and SHADOW VEHICLE and vehicle spacing between WORK VEHICLE and LEAD VEHICLE may vary according to terrain, work activity and other factors.
9. "X VEHICLE CONVOY" (CW21-10cT) or "WORK CONVOY" (CW21-10aT) signs shall be used on TRAIL VEHICLES and SHADOW VEHICLES as shown. As an option 48" X 48" diamond shaped "WORK CONVOY"(CW21-10T) or "X VEHICLE CONVOY" (CW21-10bT) signs may be used where adequate mounting space exists. When used, the X VEHICLE CONVOY sign shall have the number of the convoy vehicles displayed on the sign in the number designation "X" location. The "X VEHICLE CONVOY" sign shall not be used on the SHADOW VEHICLE if a TRAIL VEHICLE is used.
10. On two-lane two-way roadways, the work and protection vehicles should pull over periodically to allow motor vehicle traffic to pass. If motorists are not allowed to pass the work convoy, a "DO NOT PASS" (R4-1) sign should be placed on the back of the rearmost protection vehicle.



STRIPING FOR TMA

Texas Department of Transportation

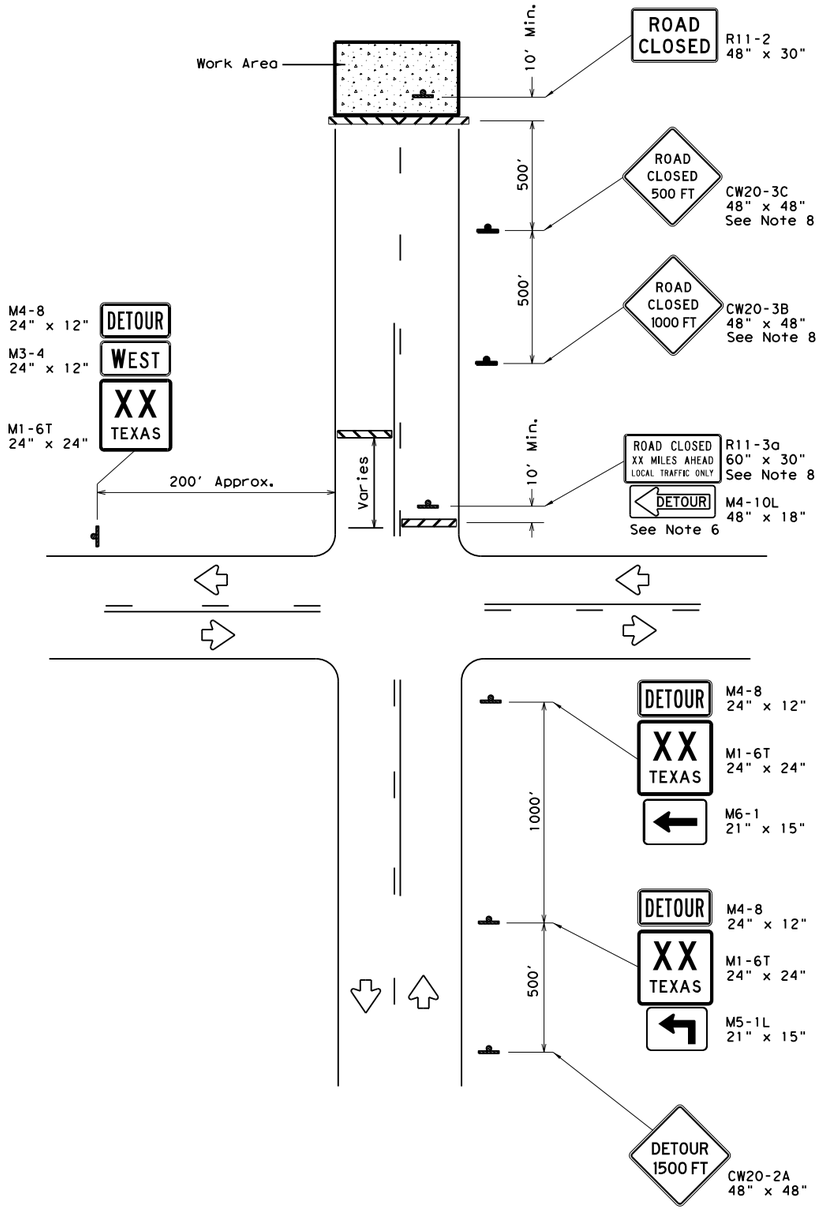
Traffic Operations Division Standard

TRAFFIC CONTROL PLAN MOBILE OPERATIONS UNDIVIDED HIGHWAYS

TCP(3-1)-13

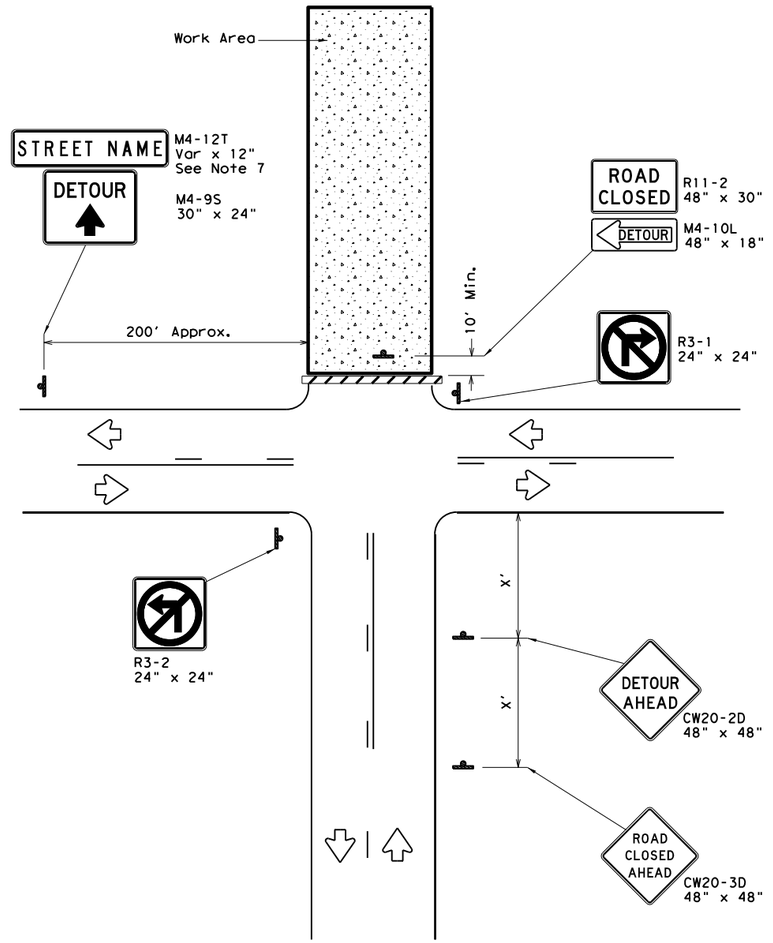
FILE: tcp3-1.dgn	DN: TxDOT	CK: TxDOT	DW: TxDOT	CK: TxDOT
©TxDOT December 1985	CONT	SECT	JOB	HIGHWAY
REVISIONS 2-94 4-98 8-95 7-13 1-97	0920	03	082, ETC	CR 1065, ETC
	DIST	COUNTY		SHEET NO.
	BMT	HARDIN, ETC		46

DATE: 2/26/2024 2:19:38 PM
FILE: pw://ija-pw.bentley.com:ija-pw-01/Documents/TxDOT/PM8016-2301 CEC WA4/Clemmons Gully Off-System Bridge/400 Production/4 - Design/Plan Set/2. TCP/Standards/wzrcd-13.dgn



ROAD CLOSURE BEYOND THE INTERSECTION

Signing for a Numbered Route with an Off-Site Detour



ROAD CLOSURE AT THE INTERSECTION

Signing for an Un-numbered Route with an Off-Site Detour

LEGEND	
	Type 3 Barricade
	Sign

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

* Conventional Roads Only

GENERAL NOTES

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

Texas Department of Transportation

Traffic Operations Division Standard

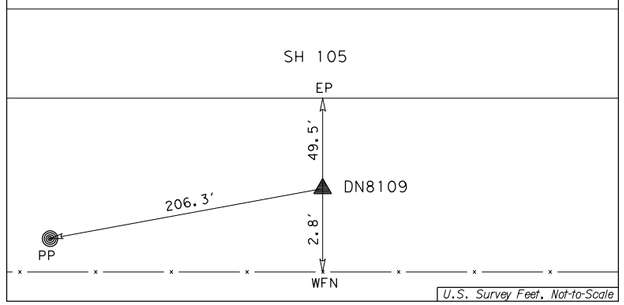
WORK ZONE ROAD CLOSURE DETAILS

WZ(RCD)-13

FILE: wzrcd-13.dgn	DN: TxDOT	CK: TxDOT	DW: TxDOT	CK: TxDOT
© TxDOT August 1995	CONT	SECT	JOB	HIGHWAY
REVISIONS	0920	03	082, ETC	CR 1065, ETC
1-97 4-98 7-13	DIST	COUNTY		SHEET NO.
2-98 3-03	BMT	HARDIN, ETC		47

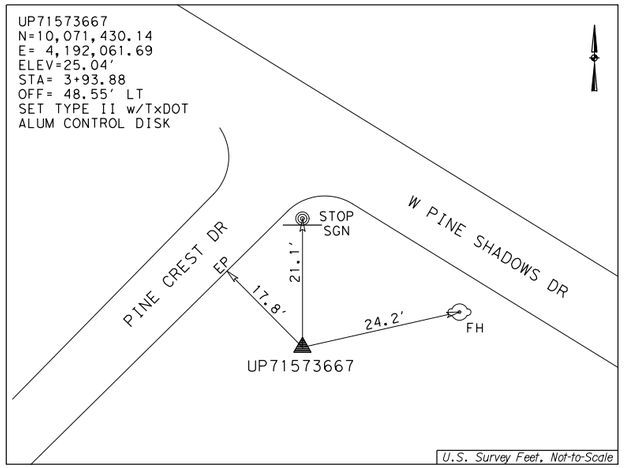
113

DN8109
N=10,064,920.63
E= 4,220,715.95
ELEV=29.2'
STA= OFF CHAIN
OFF= OFF CHAIN
FND DATUM ROD IN
SLV w/AC (THM 017)



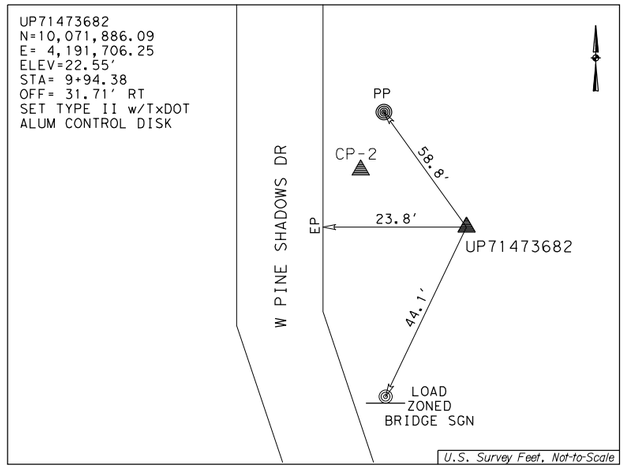
STATION IS LOCATED ON THE SOUTH SIDE OF SH 105 AND LYING 0.58 MILE EAST OF REINS RD.

UP71573667
N=10,071,430.14
E= 4,192,061.69
ELEV=25.04'
STA= 3+93.88
OFF= 48.55' LT
SET TYPE II w/TxDOT
ALUM CONTROL DISK



STATION IS LOCATED ON THE EAST SIDE OF PINE CREST DR AND LYING 46' SOUTH OF W PINE SHADOWS DR.

UP71473682
N=10,071,886.09
E= 4,191,706.25
ELEV=22.55'
STA= 9+94.38
OFF= 31.71' RT
SET TYPE II w/TxDOT
ALUM CONTROL DISK



STATION IS LOCATED ON THE EAST SIDE OF W PINE SHADOWS DR AND LYING 0.11 MILE NORTH OF PINE CREST DR.

NOTES:
1. ALL BEARINGS AND COORDINATES SHOWN HEREON ARE BASED ON THE TEXAS COORDINATE SYSTEM, CENTRAL ZONE (4203), NORTH AMERICAN DATUM OF 1983 (NAD83) (2011 ADJ.; EPOCH 2010.00).

2. ALL ELEVATIONS SHOWN HEREON ARE REFERENCED TO THE NORTH AMERICAN VERTICAL DATUM OF 1988 (NAVD88) (GEOID 18).

3. COORDINATES AND DISTANCES ARE U.S. SURVEY FEET, DISPLAYED IN SURFACE VALUES, AND MAY BE CONVERTED TO GRID VALUES BY DIVIDING BY THE SURFACE ADJUSTMENT FACTOR FOR HARDIN COUNTY OF 1.00003.

4. HORIZONTAL COORDINATES ARE BASED ON REDUNDANT GPS RTN OBSERVATIONS MEASURED FROM TxDOT RRP TXB1 DURING AUGUST 2023.

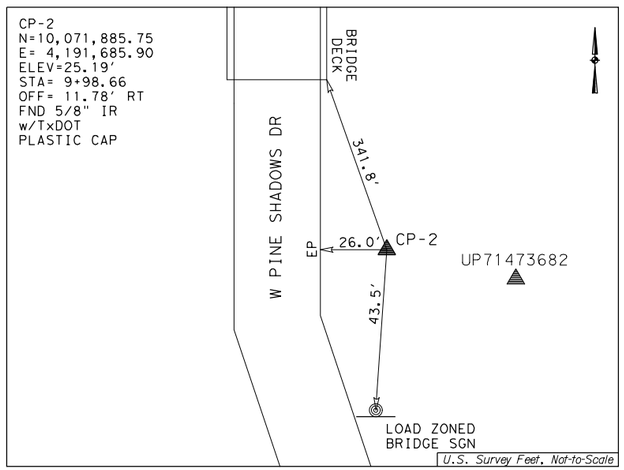
5. ELEVATIONS ARE BASED ON REDUNDANT GPS RTN OBSERVATIONS AND WERE ADJUSTED WITH DIGITAL LEVELING CONSTRAINED TO THE PROVIDED ELEVATIONS OF CP-1 (26.67') AND CP-2 (25.19'), AND THE ELEVATIONS OF PRIMARY MONUMENTS UP71473682 (22.55') AND UP71573667 (25.04').

THE CONTROL POINTS SHOWN HEREIN WERE DETERMINED BY A SURVEY MADE ON THE GROUND UNDER MY SUPERVISION.

STATE OF TEXAS
REGISTERED
JIMMY D. WALTON
5889
PROFESSIONAL
LAND SURVEYOR

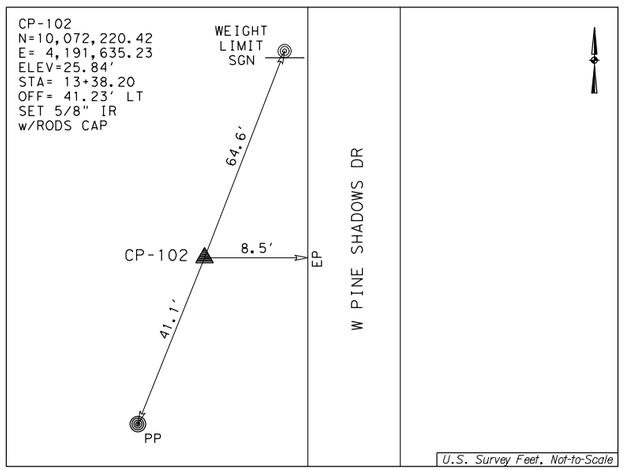
2-26-2024

CP-2
N=10,071,885.75
E= 4,191,685.90
ELEV=25.19'
STA= 9+98.66
OFF= 11.78' RT
FND 5/8" IR
w/TxDOT
PLASTIC CAP



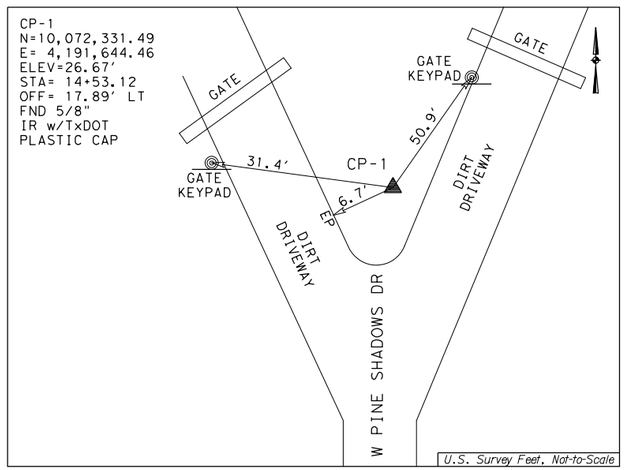
STATION IS LOCATED ON THE EAST SIDE OF W PINE SHADOWS DR AND LYING 0.11 MILE NORTH OF PINE CREST DR.

CP-102
N=10,072,220.42
E= 4,191,635.23
ELEV=25.84'
STA= 13+38.20
OFF= 41.23' LT
SET 5/8" IR
w/RODS CAP



STATION IS LOCATED ON THE WEST SIDE OF W PINE SHADOWS DR AND LYING 0.17 MILE NORTH OF PINE CREST DR.

CP-1
N=10,072,331.49
E= 4,191,644.46
ELEV=26.67'
STA= 14+53.12
OFF= 17.89' LT
FND 5/8"
IR w/TxDOT
PLASTIC CAP



STATION IS LOCATED ON THE NORTH SIDE OF CLEMMONS GULLY AND LYING ON THE WEST TERMINANCE OF W PINE SHADOWS DR.

THIS SURVEY CONTROL INFORMATION HAS BEEN ACCEPTED AND INCORPORATED INTO THIS PS&E

Sheet 1 of 1
Survey Date: AUGUST, 2023

RODS
Surveying, Inc.
6810 LEE ROAD, STE.100
SPRING, TEXAS 77379
TEL (281) 257-4020
FAX (281) 257-4021
TBPELS SURVEYING FIRM REG. No. 10030700
Central Infrastructure Transportation Land Development

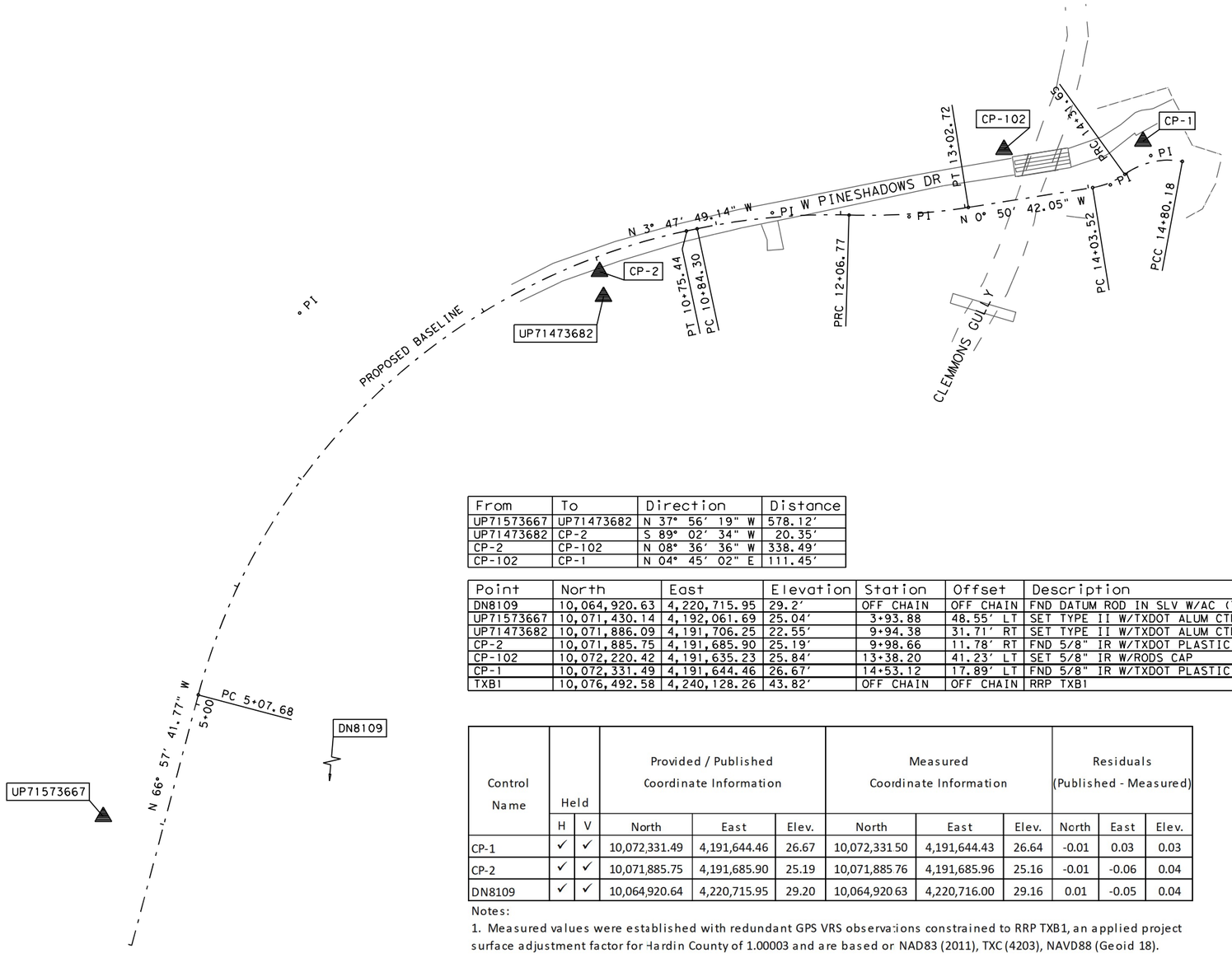
Texas Department of Transportation

W PINESHADOWS DRIVE AT CLEMMONS GULLY HORIZONTAL & VERTICAL CONTROL SHEET

FEDERAL AID PROJECT NO.				SHEET NO.
SEE COVER SHEET				48
FED. RD. DIV. NO.	STATE	DISTRICT		COUNTY
6	TEXAS	BMT		HARDIN, ETC
STATE DIST. NO.	CONTROL	SECTION	JOB	HIGHWAY
20	0920	03	082, ETC	CR 1065, ETC

N:\LJA Program Management 608\22046001\T05 - BMT 5 bridges\A - Clemmons Gully\CAD\H&V Control\H&V Sketches.dgn

PI STATION	= 8+24.30	PI STATION	= 11+45.83	PI STATION	= 12+54.88	PI STATION	= 14+17.85	PI STATION	= 14+57.33
DELTA	= 63° 09′ 52.63" (RT)	DELTA	= 13° 37′ 33.05" (RT)	DELTA	= 10° 40′ 25.96" (LT)	DELTA	= 26° 51′ 42.36" (LT)	DELTA	= 46° 20′ 39.13" (RT)
DEGREE OF CURVE	= 11° 07′ 31.42"	DEGREE OF CURVE	= 11° 07′ 31.42"	DEGREE OF CURVE	= 11° 07′ 31.42"	DEGREE OF CURVE	= 95° 29′ 34.68"	DEGREE OF CURVE	= 95° 29′ 34.68"
TANGENT	= 316.61	TANGENT	= 61.53	TANGENT	= 48.11	TANGENT	= 14.33	TANGENT	= 25.68
LENGTH	= 567.75	LENGTH	= 122.48	LENGTH	= 95.94	LENGTH	= 28.13	LENGTH	= 48.53
RADIUS	= 515.00	RADIUS	= 515.00	RADIUS	= 515.00	RADIUS	= 60.00	RADIUS	= 60.00
PC STATION	= 5+07.68	PC STATION	= 10+84.30	PC STATION	= 12+06.77	PC STATION	= 14+03.52	PC STATION	= 14+31.65
PT STATION	= 10+75.44	PT STATION	= 12+06.77	PT STATION	= 13+02.72	PT STATION	= 14+31.65	PT STATION	= 14+80.18



From	To	Direction	Distance
UP71573667	UP71473682	N 37° 56′ 19" W	578.12′
UP71473682	CP-2	S 89° 02′ 34" W	20.35′
CP-2	CP-102	N 08° 36′ 36" W	338.49′
CP-102	CP-1	N 04° 45′ 02" E	111.45′

Point	North	East	Elevation	Station	Offset	Description
DN8109	10,064,920.63	4,220,715.95	29.2′	OFF CHAIN	OFF CHAIN	FND DATUM ROD IN SLV W/AC (THM 017)
UP71573667	10,071,430.14	4,192,061.69	25.04′	3+93.88	48.55′ LT	SET TYPE II W/TXDOT ALUM CTRL DISK (UP71573667)
UP71473682	10,071,886.09	4,191,706.25	22.55′	9+94.38	31.71′ RT	SET TYPE II W/TXDOT ALUM CTRL DISK (UP71473682)
CP-2	10,071,885.75	4,191,685.90	25.19′	9+98.66	11.78′ RT	FND 5/8" IR W/TXDOT PLASTIC CAP
CP-102	10,072,220.42	4,191,635.23	25.84′	13+38.20	41.23′ LT	SET 5/8" IR W/RODS CAP
CP-1	10,072,331.49	4,191,644.46	26.67′	14+53.12	17.89′ LT	FND 5/8" IR W/TXDOT PLASTIC CAP
TXB1	10,076,492.58	4,240,128.26	43.82′	OFF CHAIN	OFF CHAIN	RRP TXB1

Control Name	Held		Provided / Published Coordinate Information			Measured Coordinate Information			Residuals (Published - Measured)		
	H	V	North	East	Elev.	North	East	Elev.	North	East	Elev.
CP-1	✓	✓	10,072,331.49	4,191,644.46	26.67	10,072,331 50	4,191,644.43	26.64	-0.01	0.03	0.03
CP-2	✓	✓	10,071,885.75	4,191,685.90	25.19	10,071,885 76	4,191,685.96	25.16	-0.01	-0.06	0.04
DN8109	✓	✓	10,064,920.64	4,220,715.95	29.20	10,064,920 63	4,220,716.00	29.16	0.01	-0.05	0.04

Notes:
1. Measured values were established with redundant GPS VRS observations constrained to RRP TXB1, an applied project surface adjustment factor for Hardin County of 1.00003 and are based or NAD83 (2011), TXC (4203), NAVD88 (Geoid 18).

2. Provided coordinate information for CP-1 and CP-2 are according to the ASCII.txt file provided by the District and appear to be based on NAD83 (2011 Adj), NAVD88 (Geoid 18). NGS monument DN819 is a Height Modernization Survey Station; published values are based cn NAD83(2011 Adj), NAVD88 (Geoid 18) anc were updated in November 2021.

Unit of Measure: U.S. Survey Feet

0 50′ 100′ 150′
SCALE 1"=100′

NOTES:
1. ALL BEARINGS AND COORDINATES SHOWN HEREON ARE BASED ON THE TEXAS COORDINATE SYSTEM, CENTRAL ZONE (4203), NORTH AMERICAN DATUM OF 1983 (NAD83) (2011 ADJ.; EPOCH 2010.00).

2. ALL ELEVATIONS SHOWN HEREON ARE REFERENCED TO THE NORTH AMERICAN VERTICAL DATUM OF 1988 (NAVD88) (GEOID 18).

3. COORDINATES AND DISTANCES ARE U.S. SURVEY FEET, DISPLAYED IN SURFACE VALUES, AND MAY BE CONVERTED TO GRID VALUES BY DIVIDING BY THE SURFACE ADJUSTMENT FACTOR FOR HARDIN COUNTY OF 1.00003.

4. HORIZONTAL COORDINATES ARE BASED ON REDUNDANT GPS RTN OBSERVATIONS MEASURED FROM TxDOT RRP TXB1 DURING AUGUST 2023.

5. ELEVATIONS ARE BASED ON REDUNDANT GPS RTN OBSERVATIONS AND WERE ADJUSTED WITH DIGITAL LEVELING CONSTRAINED TO THE PROVIDED ELEVATIONS OF CP-1 (26.67′) AND CP-2 (25.19′), AND THE ELEVATIONS OF PRIMARY MONUMENTS UP71473682 (22.55′) AND UP71573667 (25.04′).

THE CONTROL POINTS SHOWN HEREIN WERE DETERMINED BY A SURVEY MADE ON THE GROUND UNDER MY SUPERVISION.

STATE OF TEXAS
REGISTERED
JIMMY D. WALTON
5889
PROFESSIONAL
LAND SURVEYOR

2-26-2024

THIS SURVEY CONTROL INFORMATION HAS BEEN ACCEPTED AND INCORPORATED INTO THIS PS&E

Sheet 1 of 1
Survey Date: AUGUST, 2023

RODS Surveying, Inc.
6810 LEE ROAD, STE.100
SPRING, TEXAS 77379
TEL (281) 257-4020
FAX (281) 257-4021
TBPELS SURVEYING FIRM REG. No. 10030700

Central Infrastructure Transportation Land Development

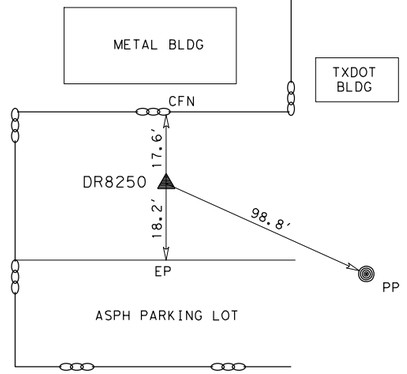
Texas Department of Transportation

W PINESHADOWS DR AT CLEMMONS GULLY SURVEY CONTROL INDEX SHEET

FEDERAL AID PROJECT NO.				SHEET NO.
SEE COVER SHEET				49
FED. RD. DIV. NO.	STATE	DISTRICT		COUNTY
6	TEXAS	BMT		HARDIN, ETC
STATE DIST. NO.	CONTROL	SECTION	JOB	HIGHWAY
20	0920	03	082, ETC	CR 1065, ETC

N:\LJA Program Management 608\2204600l\T05 - BMT 5 bridges\A - Clemmons Gully\CAD\H&V Control\H&V Index Sheet.dgn

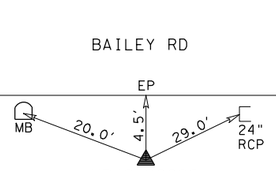
DR8250
N=13,857,541.72
E= 3,341,752.02
ELEV.=20.90'
STA= OFF CHAIN
OFF= OFF CHAIN
FND DATUM ROD
IN SLV w/AC
(TXAC RM1 2022)



U.S. Survey Feet. Not-to-Scale

STATION IS LOCATED ON THE WEST SIDE OF N ROSS STERLING AVE, AND LYING 0.19 MILE SOUTH OF SULLIVAN ST.

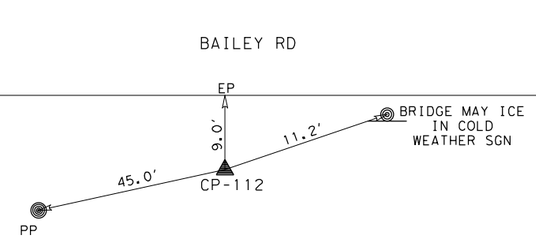
UP40390006
N=13,873,404.50
E= 3,347,399.73
ELEV.=20.18'
STA= OFF CHAIN
OFF= OFF CHAIN
SET TYPE II
w/TxDOT ALUM
CTRL DISK



U.S. Survey Feet. Not-to-Scale

STATION IS LOCATED ON THE SOUTH SIDE OF BAILEY RD AND LYING 0.44 MILE NORTHEAST OF FM 2041.

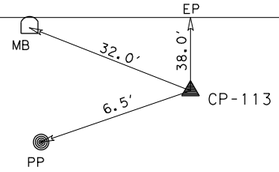
CP-112
N=13,873,430.83
E= 3,347,735.78
ELEV.=20.06'
STA= 12+78.15
OFF= 16.52' RT
SET 5/8" IR
w/RODS CAP



U.S. Survey Feet. Not-to-Scale

STATION IS LOCATED ON THE SOUTH SIDE OF BAILEY RD AND LYING 0.51 MILE NORTHEAST OF FM 2041.

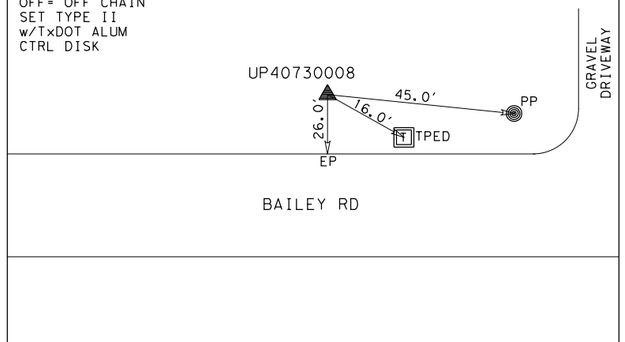
CP-113
N=13,873,449.61
E= 3,347,947.57
ELEV.=20.09'
STA= 14+90.76
OFF= 14.41' RT
SET 5/8" IR
w/RODS CAP



U.S. Survey Feet. Not-to-Scale

STATION IS LOCATED ON THE SOUTH SIDE OF BAILEY RD AND LYING 0.55 MILE NORTHEAST OF FM 2041.

UP40730008
N=13,873,526.87
E= 3,348,513.13
ELEV.=19.92'
STA= OFF CHAIN
OFF= OFF CHAIN
SET TYPE II
w/TxDOT ALUM
CTRL DISK



U.S. Survey Feet. Not-to-Scale

STATION IS LOCATED ON THE NORTH SIDE OF BAILEY RD AND LYING 0.21 MILE WEST OF SH 61.

NOTES:
1. ALL BEARINGS AND COORDINATES SHOWN HEREON ARE BASED ON THE TEXAS COORDINATE SYSTEM, SOUTH CENTRAL ZONE (4204), NORTH AMERICAN DATUM OF 1983 (NAD83) (2011 ADJ.; EPOCH 2010.00).

2. ALL ELEVATIONS SHOWN HEREON ARE REFERENCED TO THE NORTH AMERICAN VERTICAL DATUM OF 1988 (NAVD88) (GEOID 18).

3. COORDINATES AND DISTANCES ARE U.S. SURVEY FEET, DISPLAYED IN SURFACE VALUES, AND MAY BE CONVERTED TO GRID VALUES BY DIVIDING BY THE SURFACE ADJUSTMENT FACTOR FOR CHAMBERS COUNTY OF 1.00013.

4. HORIZONTAL COORDINATES ARE BASED ON REDUNDANT GPS RTN OBSERVATIONS MEASURED FROM TxDOT CORS TXAC DURING AUGUST 2023.

5. ELEVATIONS ARE BASED ON REDUNDANT GPS RTN OBSERVATIONS AND WERE ADJUSTED WITH DIGITAL LEVELING CONSTAINED TO THE ELEVATIONS OF PRIMARY MONUMENTS)UP40390006 (20.18') AND UP40730008 (19.92').

THE CONTROL POINTS SHOWN HEREIN WERE DETERMINED BY A SURVEY MADE ON THE GROUND UNDER MY SUPERVISION.

STATE OF TEXAS
REGISTERED
JIMMY D. WALTON
5889
PROFESSIONAL
LAND SURVEYOR

2-26-2024

THIS SURVEY CONTROL INFORMATION HAS BEEN ACCEPTED AND INCORPORATED INTO THIS PS&E

Sheet 1 of 1
Survey Date: AUGUST, 2023

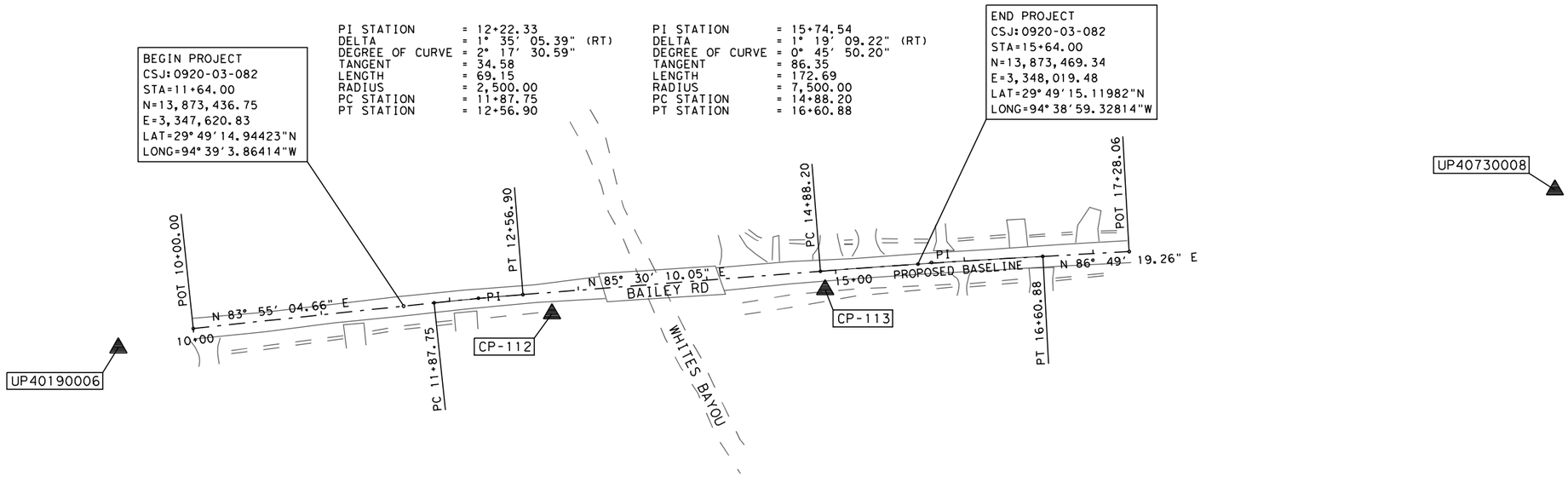
RODS
Surveying, Inc.
Control
Infrastructure
Transportation
Land Development
6810 LEE ROAD, STE. 100
SPRING, TEXAS 77379
TEL (281) 257-4020
FAX (281) 257-4021
TBPELS SURVEYING FIRM REG. No. 10030700

Texas Department of Transportation

BAILEY RD @ WHITES BAYOU HORIZONTAL & VERTICAL CONTROL SHEET

FEDERAL AID PROJECT NO.				SHEET NO.
SEE COVER SHEET				50
FED. RD. DIV. NO.	STATE	DISTRICT		COUNTY
6	TEXAS	BMT		HARDIN, ETC
STATE DIST. NO.	CONTROL	SECTION	JOB	HIGHWAY
20	0920	03	082, ETC	CR 1065, ETC

N:\LJA Program Management 608\22046001\T05 - BMT 5 bridges\C - Bailey Road\CAD\H&V Control\H&V Sketches.dgn



From	To	Direction	Distance
UP40390006	CP-112	N 85° 31′ 13" E	337.08′
CP-112	CP-113	N 84° 55′ 59" E	212.61′
CP-113	UP40730008	N 82° 13′ 17" E	570.81′

Point	North	East	Elevation	Station	Offset	Description
TXAC	13,857,560.67	3,341,741.18	33.75′	Off Chain	Off Chain	CORS TXAC
DR8250	13,857,541.72	3,341,752.02	20.90′	Off Chain	Off Chain	FND DATUM ROD IN SLV W/AC (TXAC RM1 2022)
UP40390006	13,873,404.50	3,347,399.73	20.18′	Off Chain	Off Chain	SET TYPE II W/ALUM CTRL DISK
CP-112	13,873,430.83	3,347,735.78	20.06′	12+78.15	16.52′ RT	SET 5/8" IR W/RODS CAP
CP-113	13,873,449.61	3,347,947.57	20.09′	14+90.76	14.41′ RT	SET 5/8" IR W/RODS CAP
UP40730008	13,873,526.87	3,348,513.13	19.92′	Off Chain	Off Chain	SET TYPE II W/ALUM CTRL DISK

Control Name	Held		Provided / Published Coordinate Information			Measured Coordinate Information			Residuals (Published - Measured)		
	H	V	North	East	Elev.	North	East	Elev.	North	East	Elev.
DR8250	✓	✓	13,857,541.72	3,341,752.02	20.90	13,857,541.70	3,341,752.04	20.85	0.02	-0.02	0.05
TXAC	✓	✓	13,857,560.67	3,341,741.18	33.75						

Notes:

1. Measured values were established with the TxDOT VRS network with observationed data constrained to CORS TXAC, an applied project surface adjustment factor for Chambers County of 1.00013 and are based on NAD83 (2011), TXSC (4204), NAVD88 (Geoid 18).

2. NGS monument DR8250 is a Height Modernization Survey Station; published values are based on NAD83(2011 Adj), TXSC (4204), NAVD88 (Geoid 18) and were established in August 2022.

NOTES:

1. ALL BEARINGS AND COORDINATES SHOWN HEREON ARE BASED ON THE TEXAS COORDINATE SYSTEM, SOUTH CENTRAL ZONE (4204), NORTH AMERICAN DATUM OF 1983 (NAD83) (2011 ADJ.; EPOCH 2010.00).

2. ALL ELEVATIONS SHOWN HEREON ARE REFERENCED TO THE NORTH AMERICAN VERTICAL DATUM OF 1988 (NAVD88) (GEOID 18).

3. COORDINATES AND DISTANCES ARE U.S. SURVEY FEET, DISPLAYED IN SURFACE VALUES, AND MAY BE CONVERTED TO GRID VALUES BY DIVIDING BY THE SURFACE ADJUSTMENT FACTOR FOR CHAMBERS COUNTY OF 1.00013.

4. HORIZONTAL COORDINATES ARE BASED ON REDUNDANT GPS RTN OBSERVATIONS MEASURED FROM TxDOT CORS TXAC DURING AUGUST 2023.

5. ELEVATIONS ARE BASED ON REDUNDANT GPS RTN OBSERVATIONS AND WERE ADJUSTED WITH DIGITAL LEVELING CONSTAINED TO THE ELEVATIONS OF PRIMARY MONUMENTS)UP40390006 (20.18′) AND UP40730008 (19.92′).

THE CONTROL POINTS SHOWN HEREIN WERE DETERMINED BY A SURVEY MADE ON THE GROUND UNDER MY SUPERVISION.

STATE OF TEXAS
REGISTERED
JIMMY D. WALTON
5889
PROFESSIONAL
LAND SURVEYOR

2-26-2024

THIS SURVEY CONTROL INFORMATION HAS BEEN ACCEPTED AND INCORPORATED INTO THIS PS&E

Sheet 1 of 1
Survey Date: AUGUST, 2023

RODS
Surveying, Inc.
6810 LEE ROAD, STE. 100
SPRING, TEXAS 77379
TEL (281) 257-4020
FAX (281) 257-4021
TBPELS SURVEYING FIRM REG. No. 10030700

Central Infrastructure Transportation Land Development

Texas Department of Transportation

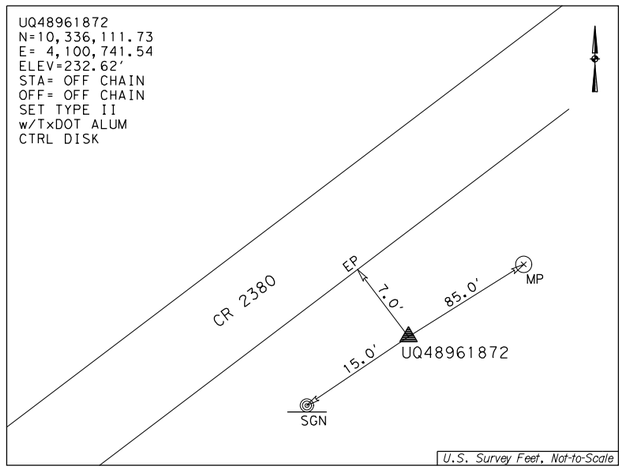
BAILEY RD @ WHITES BAYOU
SURVEY CONTROL
INDEX SHEET

FEDERAL AID PROJECT NO.				SHEET NO.
SEE COVER SHEET				51
FED. RD. DIV. NO.	STATE	DISTRICT		COUNTY
6	TEXAS	BMT		HARDIN, ETC
STATE DIST. NO.	CONTROL	SECTION	JOB	HIGHWAY
20	0920	03	082, ETC	CR 1065, ETC

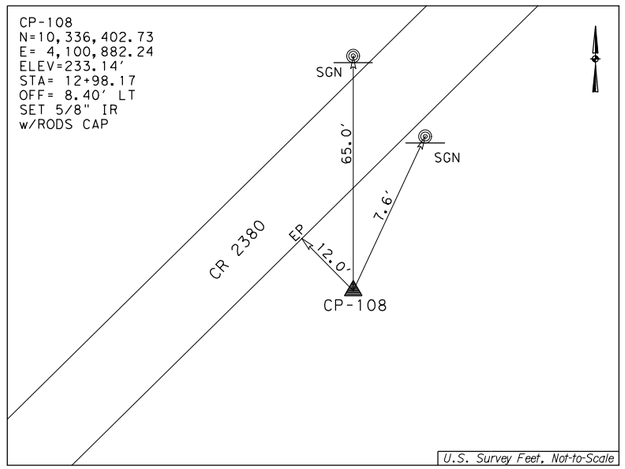
Unit of Measure: U.S. Survey Feet

0 50′ 100′ 150′
SCALE 1"=100′

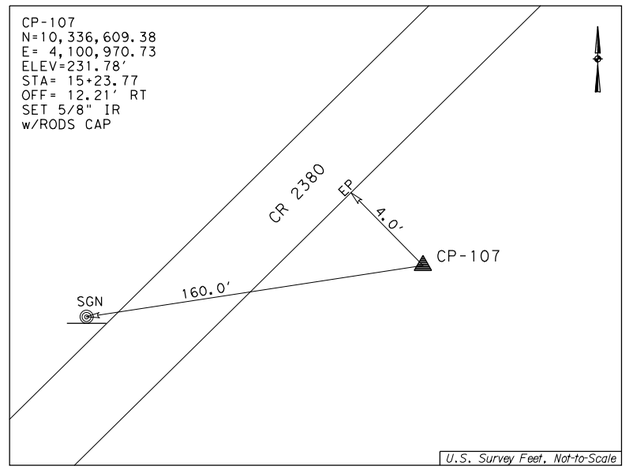
N:\LJA Program Management 608\22046001\T05 - BMT 5 bridges\C - Bailey Road\CAD\H&V Control\H&V Index Sheet.dgn



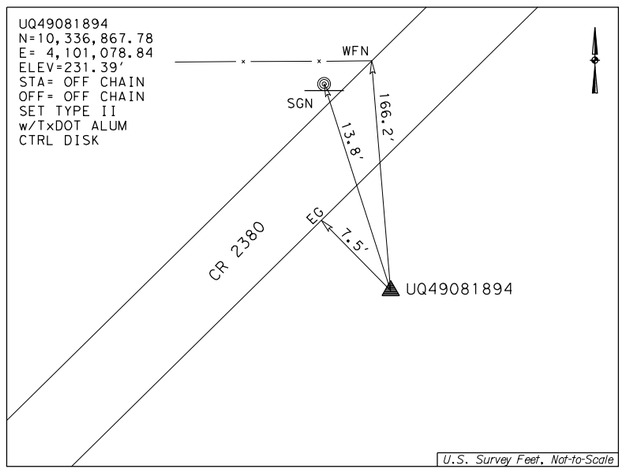
STATION IS LOCATED ON THE EAST SIDE OF CR 2380 AND LYING 0.18 MILE SOUTH OF CR 2375.



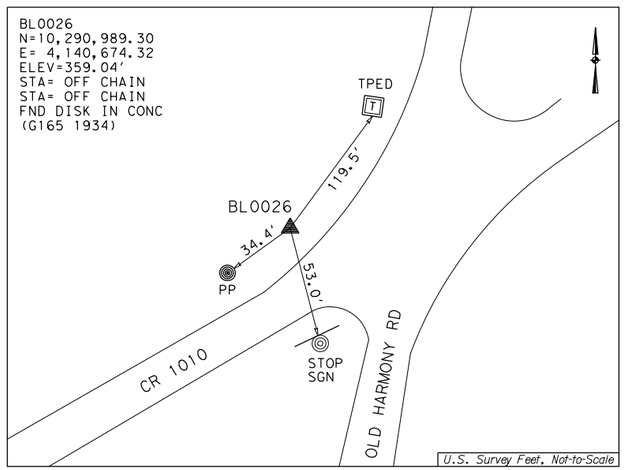
STATION IS LOCATED ON THE EAST SIDE OF CR 2380 AND LYING 0.12 MILE SOUTH OF CR 2375.



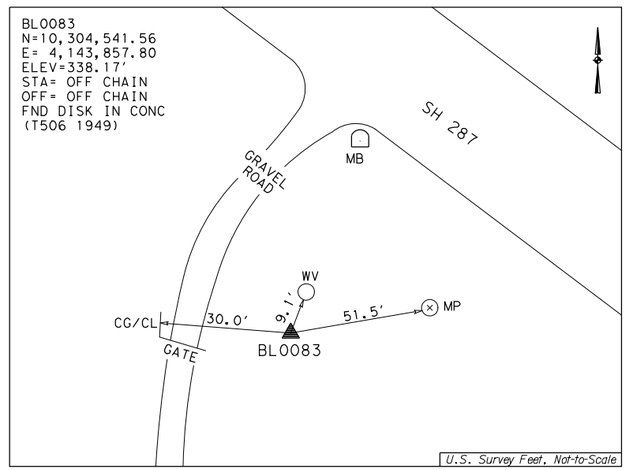
STATION IS LOCATED ON THE EAST SIDE OF CR 2380 AND LYING 489' SOUTH OF CR 2375.



STATION IS LOCATED ON THE EAST SIDE OF CR 2380 AND LYING 207' SOUTH OF CR 2375.



STATION IS LOCATED ON THE WEST CORNER OF CR 1010 AND OLD HARMONY RD.



STATION IS LOCATED ON THE SOUTH SIDE OF SH 287, AND LYING 0.16 MILE EAST OF CR 2512.

NOTES:
1. ALL BEARINGS AND COORDINATES SHOWN HEREON ARE BASED ON THE TEXAS COORDINATE SYSTEM, CENTRAL ZONE (4203), NORTH AMERICAN DATUM OF 1983 (NAD83) (2011 ADJ.; EPOCH 2010.00).

2. ALL ELEVATIONS SHOWN HEREON ARE REFERENCED TO THE NORTH AMERICAN VERTICAL DATUM OF 1988 (NAVD88) (GEOID 18).

3. COORDINATES AND DISTANCES ARE U.S. SURVEY FEET, DISPLAYED IN SURFACE VALUES, AND MAY BE CONVERTED TO GRID VALUES BY DIVIDING BY THE SURFACE ADJUSTMENT FACTOR FOR TYLER COUNTY OF 1.00012.

4. HORIZONTAL COORDINATES ARE BASED ON REDUNDANT GPS RTN OBSERVATIONS MEASURED FROM TxDOT CORS TXWO DURING AUGUST 2023.

5. ELEVATIONS ARE BASED ON REDUNDANT GPS RTN OBSERVATIONS AND WERE ADJUSTED WITH DIGITAL LEVELING CONSTRAINED TO THE STATIC GPS-DERIVED ELEVATIONS OF PRIMARY MONUMENTS UQ48961872 (232.62') and UQ49081894 (231.39').

THE CONTROL POINTS SHOWN HEREIN WERE DETERMINED BY A SURVEY MADE ON THE GROUND UNDER MY SUPERVISION.

STATE OF TEXAS
REGISTERED
JIMMY D. WALTON
5889
PROFESSIONAL
LAND SURVEYOR

2-26-2024

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Sheet 1 of 1
Survey Date: SEPTEMBER, 2023

RODS
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6810 LEE ROAD, STE.100
SPRING, TEXAS 77379
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TBPELS SURVEYING FIRM REG. No. 10030700
Central Infrastructure Transportation Land Development

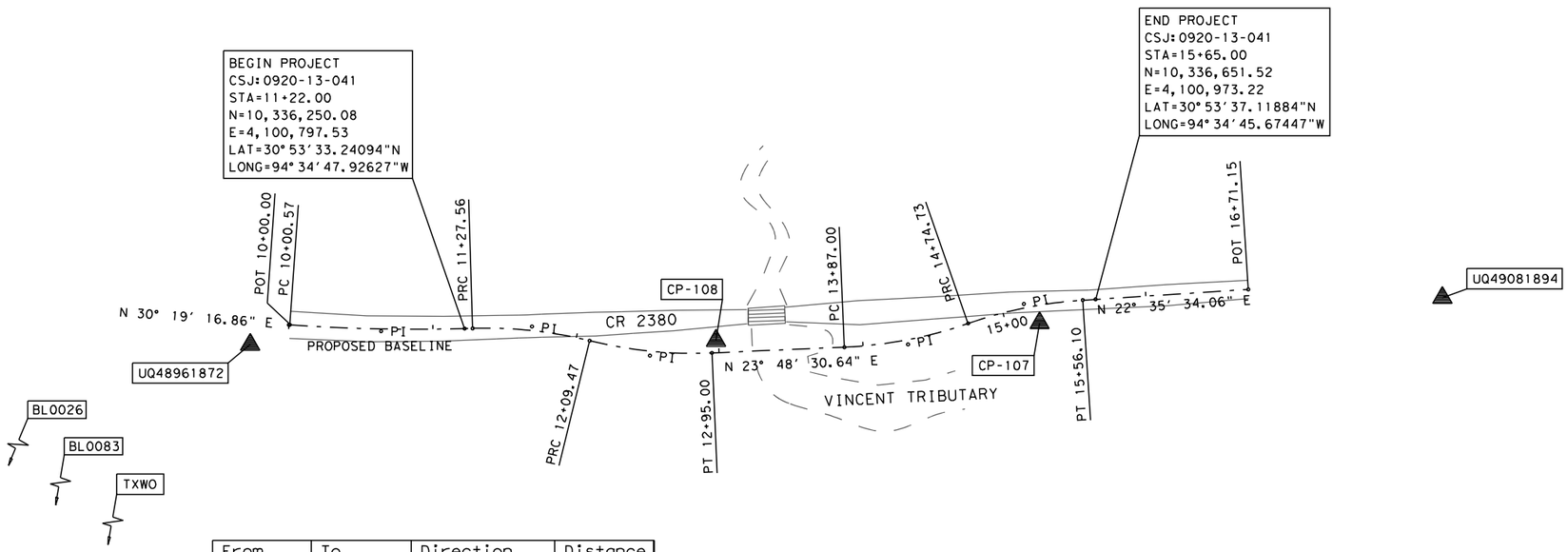
Texas Department of Transportation

CR 2380
AT
VINCENT TRIBUTARY
HORIZONTAL & VERTICAL
CONTROL SHEET

FEDERAL AID PROJECT NO.				SHEET NO.
SEE COVER SHEET				52
FED. RD. DIV. NO.	STATE	DISTRICT		COUNTY
6	TEXAS	BMT		HARDIN, ETC
STATE DIST. NO.	CONTROL	SECTION	JOB	HIGHWAY
20	0920	03	082, ETC	CR 1065, ETC

N:\LJA Program Management 608\22046001\T05 - BMT 5 bridges\B - CR 2380\CAD\H&V Control\H&V Sketches.dgn

PI STATION	= 10+64.12	PI STATION	= 11+68.77	PI STATION	= 12+52.53	PI STATION	= 14+31.18	PI STATION	= 15+15.67
DELTA	= 5° 49′ 14.96" (LT)	DELTA	= 15° 38′ 36.24" (RT)	DELTA	= 16° 20′ 07.50" (LT)	DELTA	= 16° 45′ 19.66" (LT)	DELTA	= 15° 32′ 23.08" (RT)
DEGREE OF CURVE	= 4° 35′ 01.18"	DEGREE OF CURVE	= 19° 05′ 54.94"	DEGREE OF CURVE	= 19° 05′ 54.94"	DEGREE OF CURVE	= 19° 05′ 54.94"	DEGREE OF CURVE	= 19° 05′ 54.94"
TANGENT	= 63.55	TANGENT	= 41.21	TANGENT	= 43.06	TANGENT	= 44.18	TANGENT	= 40.93
LENGTH	= 126.99	LENGTH	= 81.91	LENGTH	= 85.53	LENGTH	= 87.73	LENGTH	= 81.37
RADIUS	= 1,250.00	RADIUS	= 300.00	RADIUS	= 300.00	RADIUS	= 300.00	RADIUS	= 300.00
PC STATION	= 10+00.57	PC STATION	= 11+27.56	PC STATION	= 12+09.47	PC STATION	= 13+87.00	PC STATION	= 14+74.73
PT STATION	= 11+27.56	PT STATION	= 12+09.47	PT STATION	= 12+95.00	PT STATION	= 14+74.73	PT STATION	= 15+56.10



From	To	Direction	Distance
UQ48961872	CP-108	N 25° 48′ 15" E	323.22′
CP-108	CP-107	N 23° 10′ 50" E	224.80′
CP-107	UQ49081894	N 22° 42′ 21" E	280.10′
UQ48961872	UQ49081894	N 24° 02′ 38" E	827.87′

Point	North	East	Elevation	Station	Offset	Description
TXWO	10,298,653.79	4,151,909.77	329.16′	OFF CHAIN	OFF CHAIN	CORS TXWO
BL0026	10,290,989.30	4,140,674.32	359.04′	OFF CHAIN	OFF CHAIN	FND DISK IN CONC (G165 1934)
BL0083	10,304,541.56	4,143,857.80	338.17′	OFF CHAIN	OFF CHAIN	FND DISK IN CONC (T506 1949)
UQ48961872	10,336,111.73	4,100,741.54	232.62′	OFF CHAIN	OFF CHAIN	SET TYPE II W/TXDOT ALUM CTRL DISK (UQ48961872)
CP-108	10,336,402.73	4,100,882.24	233.14′	12+98.17	8.40′ LT	SET 5/8" IR W/RODS CAP
CP-107	10,336,609.38	4,100,970.73	231.78′	15+23.77	12.21′ RT	SET 5/8" IR W/RODS CAP
UQ49081894	10,336,867.78	4,101,078.84	231.39′	OFF CHAIN	OFF CHAIN	SET TYPE II W/TXDOT ALUM CTRL DISK (UQ49081894)

Control Name	Held		Published Coordinate Information			Measured Coordinate Information			Residuals (Published - Measured)		
	H	V	North	East	Elev.	North	East	Elev.	North	East	Elev.
BL0026			10,290,978	4,140,712	359.7	10,290,989.30	4,140,674.32	359.04	-11	38	0.7
BL0083			10,304,496	4,143,993	338.9	10,304,541.56	4,143,857.80	338.17	-46	135	0.7
TXWO	✓	✓	10,298,653.79	4,151,909.77	329.16						

Notes:

1. Measured values shown hereon were established with redundant GPS VRS observations constrained to CORS TXWO and are based on NAD83 (2011), TXC (4203), NAVD88 (Geoid 18) and an applied project surface adjustment factor for Tyler County of 1.00012.

2. NGS Monument names BL0026 & BL0083 are both second Vertical Order, Class zero benchmarks; published horizontal values are scaled and based on NAD83 (1986 Adj); Orthometric height (elevation) is based on NAVD88 (VERTCON);

NOTES:

1. ALL BEARINGS AND COORDINATES SHOWN HEREON ARE BASED ON THE TEXAS COORDINATE SYSTEM, CENTRAL ZONE (4203), NORTH AMERICAN DATUM OF 1983 (NAD83) (2011 ADJ.; EPOCH 2010.00).

2. ALL ELEVATIONS SHOWN HEREON ARE REFERENCED TO THE NORTH AMERICAN VERTICAL DATUM OF 1988 (NAVD88) (GEOID 18).

3. COORDINATES AND DISTANCES ARE U.S. SURVEY FEET, DISPLAYED IN SURFACE VALUES, AND MAY BE CONVERTED TO GRID VALUES BY DIVIDING BY THE SURFACE ADJUSTMENT FACTOR FOR TYLER COUNTY OF 1.00012.

4. HORIZONTAL COORDINATES ARE BASED ON REDUNDANT GPS RTN OBSERVATIONS MEASURED FROM TxDOT CORS TXWO DURING AUGUST 2023.

5. ELEVATIONS ARE BASED ON REDUNDANT GPS RTN OBSERVATIONS AND WERE ADJUSTED WITH DIGITAL LEVELING CONSTRAINED TO THE STATIC GPS-DERIVED ELEVATIONS OF PRIMARY MONUMENTS UQ48961872 (232.62′) and UQ49081894 (231.39′).

THE CONTROL POINTS SHOWN HEREIN WERE DETERMINED BY A SURVEY MADE ON THE GROUND UNDER MY SUPERVISION.

STATE OF TEXAS
REGISTERED
JIMMY D. WALTON
5889
PROFESSIONAL
LAND SURVEYOR

2-26-2024

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Sheet 1 of 1
Survey Date: SEPTEMBER, 2023

RODS
Surveying, Inc.
Control Infrastructure Transportation Land Development
6810 LEE ROAD, STE. 100
SPRING, TEXAS 77379
TEL (281) 257-4020
FAX (281) 257-4021
TBPELS SURVEYING FIRM REG. No. 10030700

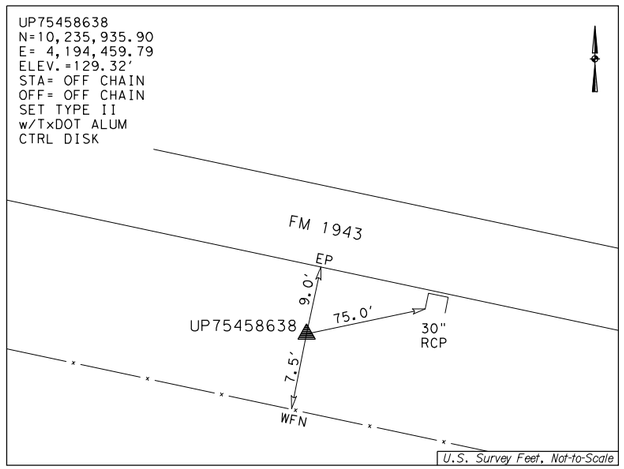
CR 2380
AT
VINCENT TRIBUTARY
SURVEY CONTROL
INDEX SHEET

FEDERAL AID PROJECT NO.				SHEET NO.
SEE COVER SHEET				53
FED. RD. DIV. NO.	STATE	DISTRICT		COUNTY
6	TEXAS	BMT		HARDIN, ETC
STATE DIST. NO.	CONTROL	SECTION	JOB	HIGHWAY
20	0920	03	082, ETC	CR 1065, ETC

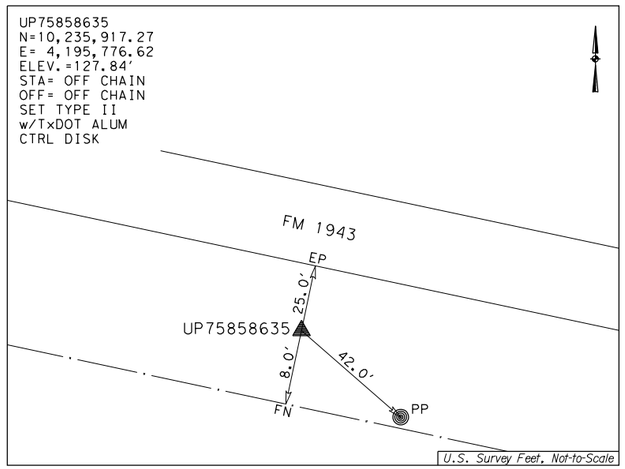
Unit of Measure: U.S. Survey Feet

0 50′ 100′ 150′
SCALE 1"=100′

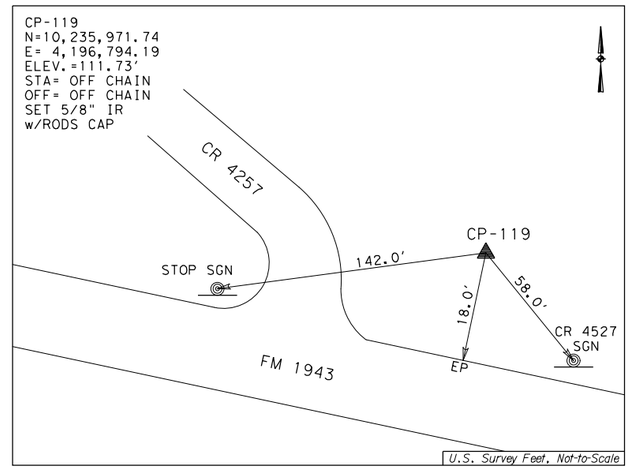
N:\LJA Program Management 608\22046001\T05 - BMT 5 bridges\B - CR 2380\CAD\H&V Control\H&V Index Sheet.dgn



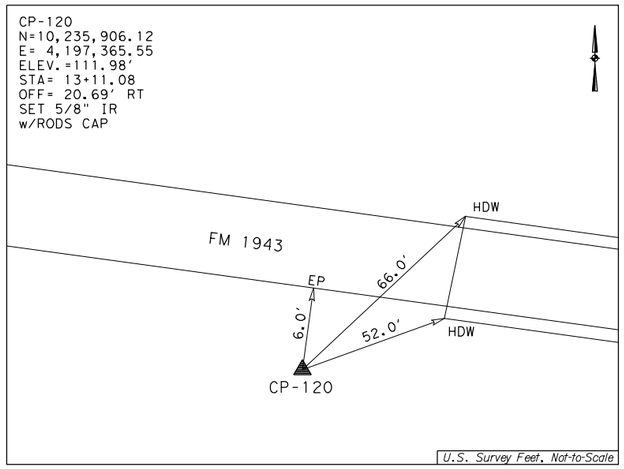
STATION IS LOCATED ON THE SOUTH SIDE OF FM 1943 AND LYING 484' EAST OF CR 4525.



STATION IS LOCATED ON THE SOUTH SIDE OF FM 1943 AND LYING 0.18 MILE EAST OF CR 4527.



STATION IS LOCATED AT THE NORTHEAST CORNER OF THE EAST INTERSECTION OF FM 1943 AND CR 4527.



STATION IS LOCATED ON THE SOUTH SIDE OF FM 1943 AND LYING 0.12 MILE EAST OF CR 4527.

NOTES:

1. ALL BEARINGS AND COORDINATES SHOWN HEREON ARE BASED ON THE TEXAS COORDINATE SYSTEM, CENTRAL ZONE (4203), NORTH AMERICAN DATUM OF 1983 (NAD83) (2011 ADJ.; EPOCH 2010.00).

2. ALL ELEVATIONS SHOWN HEREON ARE REFERENCED TO THE NORTH AMERICAN VERTICAL DATUM OF 1988 (NAVD88) (GEOID 18).

3. COORDINATES AND DISTANCES ARE U.S. SURVEY FEET, DISPLAYED IN SURFACE VALUES, AND MAY BE CONVERTED TO GRID VALUES BY DIVIDING BY THE SURFACE ADJUSTMENT FACTOR FOR TYLER COUNTY OF 1.00012.

4. HORIZONTAL COORDINATES ARE BASED ON REDUNDANT GPS RTN OBSERVATIONS MEASURED FROM TxDOT CORS TXKO DURING AUGUST 2023.

5. ELEVATIONS ARE BASED ON REDUNDANT GPS RTN OBSERVATIONS AND WERE ADJUSTED WITH DIGITAL LEVELING CONSTAINED TO THE ELEVATIONS OF PRIMARY MONUMENTS UP75458638 (129.32') and UP75858635 (127.84').

THE CONTROL POINTS SHOWN HEREIN WERE DETERMINED BY A SURVEY MADE ON THE GROUND UNDER MY SUPERVISION.

STATE OF TEXAS
REGISTERED
JIMMY D. WALTON
5889
PROFESSIONAL
LAND SURVEYOR

2-26-2024

THIS SURVEY CONTROL INFORMATION HAS BEEN ACCEPTED AND INCORPORATED INTO THIS PS&E

Sheet 1 of 1
Survey Date: AUGUST, 2023

RODS
Surveying, Inc.
6810 LEE ROAD, STE.100
SPRING, TEXAS 77379
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TBPELS SURVEYING FIRM REG. No. 10030700

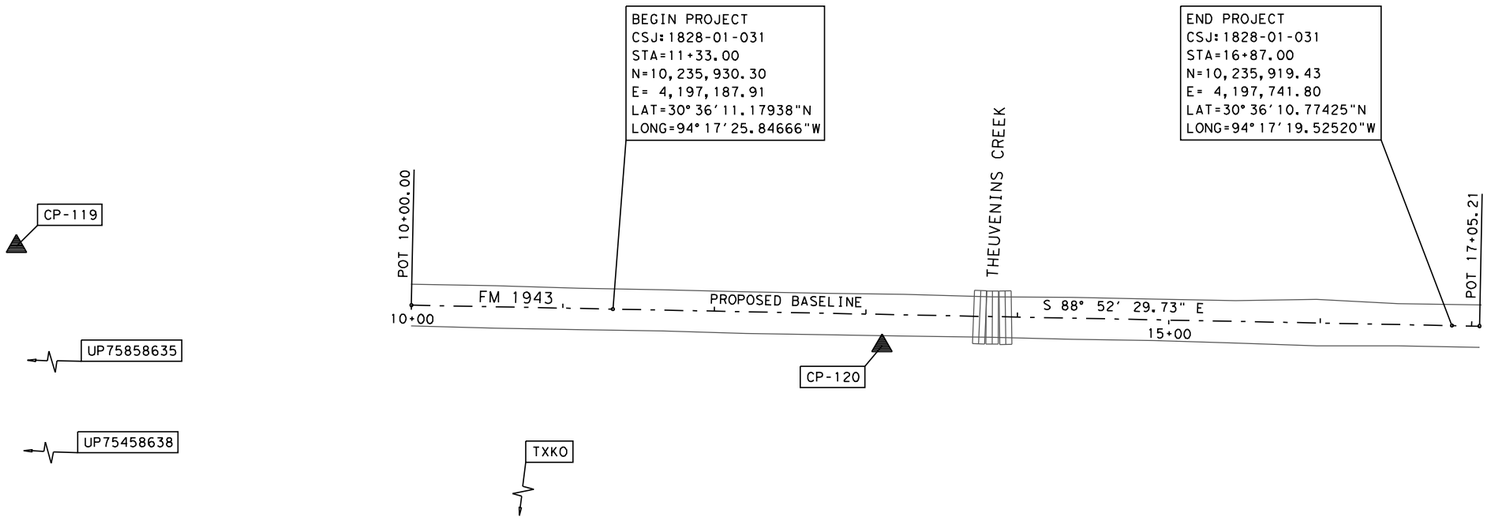
Control
Infrastructure
Transportation
Land Development

Texas Department of Transportation

FM 1943 @ THEUVENINS CREEK HORIZONTAL & VERTICAL CONTROL SHEET

FEDERAL AID PROJECT NO.				SHEET NO.
SEE COVER SHEET				54
FED. RD. DIV. NO.	STATE	DISTRICT		COUNTY
6	TEXAS	BMT		HARDIN, ETC
STATE DIST. NO.	CONTROL	SECTION	JOB	HIGHWAY
20	0920	03	082, ETC	CR 1065, ETC

N:\LJA Program Management 608\220460001\T05 - BMT 5 bridges\E - FM 1943 @ Theuvenins Crk\CAD\H&V Control\H&V Sketches.dgn



From	To	Direction	Distance
UP75458638	UP75858635	S 89° 11′ 22" E	1,316.96′
UP75858635	CP-119	N 86° 56′ 11" E	1,019.02′
CP-119	CP-120	S 83° 26′ 57" E	575.12′

Point	North	East	Elevation	Station	Offset	Description
UP75458638	10,235,935.90	4,194,459.79	129.32′	Off Chain	Off Chain	SET TYPE II W/TXDOT ALUM CTRL DISK (UP75458638)
UP75858635	10,235,917.27	4,195,776.62	127.84′	Off Chain	Off Chain	SET TYPE II W/TXDOT ALUM CTRL DISK (UP75858635)
CP-119	10,235,971.74	4,196,794.19	111.73′	Off Chain	Off Chain	SET 5/8" IR W/RODS CAP
CP-120	10,235,906.12	4,197,365.55	111.98′	13+11.08	20.69′ RT	SET 5/8" IR W/RODS CAP
TXKO	10,159,804.33	4,188,117.23	101.03′	Off Chain	Off Chain	CORS TXKO

Control Name	Static GPS Coordinate Information			TxDOT RTN4 VRS Coordinate Information			Residuals (Static - VRS)		
	North	East	Elev.	North	East	Elev.	North	East	Elev.
UP75458638	10,235,935.90	4,194,459.79	129.32	10,235,935.91	4,194,459.86	129.20	-0.01	-0.07	0.12
UP75858635	10,235,917.27	4,195,776.62	127.84	10,235,917.24	4,195,776.63	127.84	0.03	-0.01	0.00

Note: Static GPS values were established with two four-hour static sessions per point, rapid orbits, and a network adjustment constrained to the published coordinates and ellipsoid heights of CORS TXLF, TXHP and RRP TXWO. Values shown hereon are based NAD83 (2011 Adj), TXC (4203), NAVD88 (Geoid 18). Project (surface) values are based on the surface adjustment factor (SAF) for Tyler County, SAF = 1.00012. 2. RTN4 VRS values are based on redundant 180-epoch observations constrained to CORS TXKO.

NOTES:
1. ALL BEARINGS AND COORDINATES SHOWN HEREON ARE BASED ON THE TEXAS COORDINATE SYSTEM, CENTRAL ZONE (4203), NORTH AMERICAN DATUM OF 1983 (NAD83) (2011 ADJ.; EPOCH 2010.00).

2. ALL ELEVATIONS SHOWN HEREON ARE REFERENCED TO THE NORTH AMERICAN VERTICAL DATUM OF 1988 (NAVD88) (GEOID 18).

3. COORDINATES AND DISTANCES ARE U.S. SURVEY FEET, DISPLAYED IN SURFACE VALUES, AND MAY BE CONVERTED TO GRID VALUES BY DIVIDING BY THE SURFACE ADJUSTMENT FACTOR FOR TYLER COUNTY OF 1.00012.

4. HORIZONTAL COORDINATES ARE BASED ON REDUNDANT GPS RTN OBSERVATIONS MEASURED FROM TxDOT CORS TXKO DURING AUGUST 2023.

5. ELEVATIONS ARE BASED ON REDUNDANT GPS RTN OBSERVATIONS AND WERE ADJUSTED WITH DIGITAL LEVELING CONSTAINED TO THE ELEVATIONS OF PRIMARY MONUMENTS UP75458638 (129.32′) and UP75858635 (127.84′).

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STATE OF TEXAS
REGISTERED
JIMMY D. WALTON
5889
PROFESSIONAL
LAND SURVEYOR

2-26-2024

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Sheet 1 of 1
Survey Date: AUGUST, 2023

RODS
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6810 LEE ROAD, STE.100
SPRING, TEXAS 77379
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FAX (281) 257-4021
TBPELS SURVEYING FIRM REG. No. 10030700

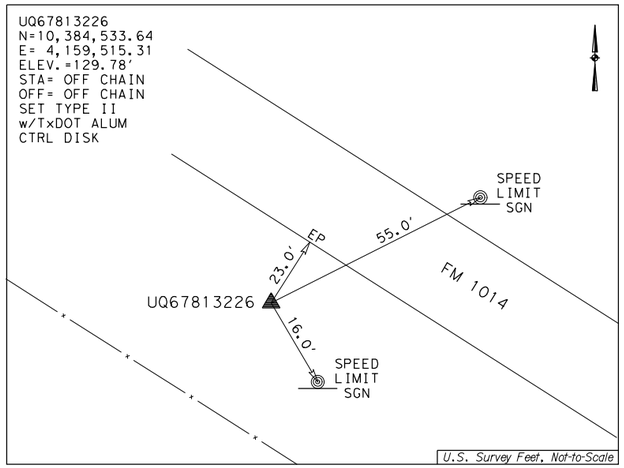
FM 1943 @ THEUVENINS CREEK SURVEY CONTROL INDEX SHEET

FEDERAL AID PROJECT NO.				SHEET NO.
SEE COVER SHEET				55
FED. RD. DIV. NO.	STATE	DISTRICT		COUNTY
6	TEXAS	BMT		HARDIN, ETC
STATE DIST. NO.	CONTROL	SECTION	JOB	HIGHWAY
20	0920	03	082, ETC	CR 1065, ETC

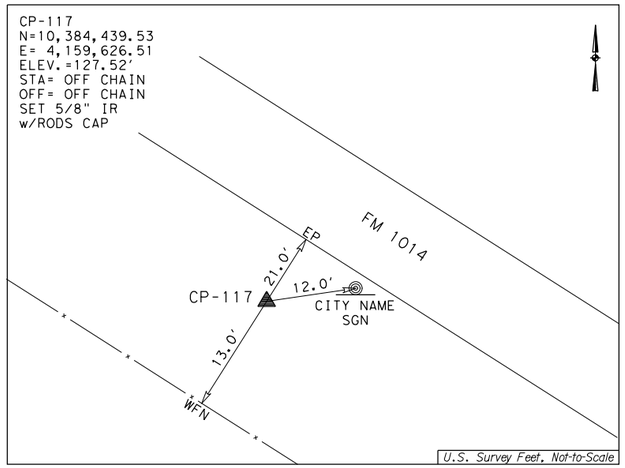
Unit of Measure: U.S. Survey Feet

0 50′ 100′ 150′
SCALE 1"=100′

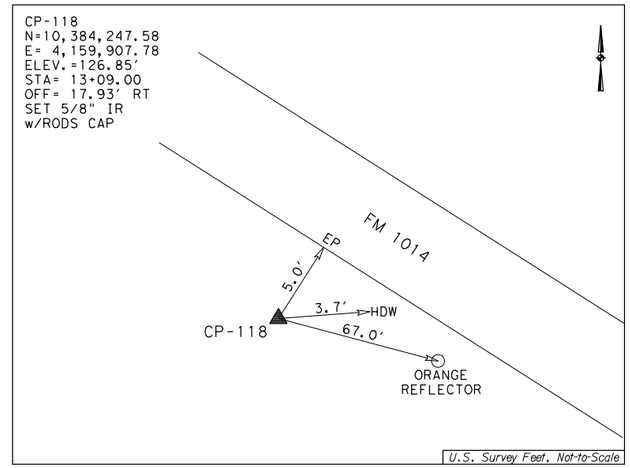
N:\LJA Program Management 608\22046001\T05 - BMT 5 bridges\E - FM 1943 @ Theuveins Crk\CAD\H&V Control\H&V Index Sheet.dgn



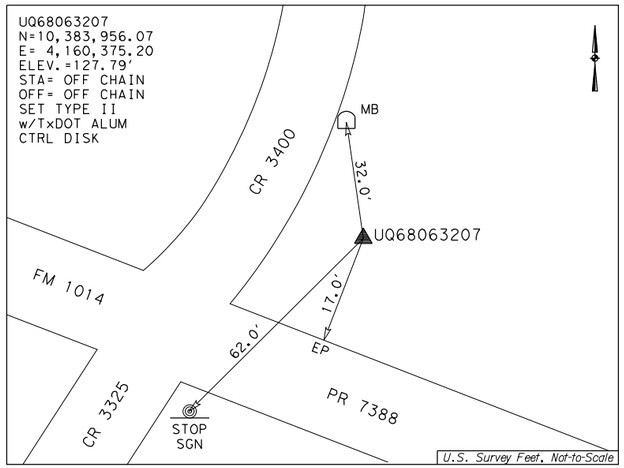
STATION IS LOCATED ON THE WEST SIDE OF FM 1014 AND LYING 0.84 MILE EAST OF US 69.



STATION IS LOCATED ON THE WEST SIDE OF FM 1014 AND LYING 0.87 MILE EAST OF US 69.



STATION IS LOCATED ON THE WEST SIDE OF FM 1014 AND LYING 0.93 MILE EAST OF US 69.



STATION IS LOCATED AT THE NORTHEAST CORNER OF THE INTERSECTION OF FM 1014 AND CR 3325.

NOTES:
1. ALL BEARINGS AND COORDINATES SHOWN HEREON ARE BASED ON THE TEXAS COORDINATE SYSTEM, CENTRAL ZONE (4203), NORTH AMERICAN DATUM OF 1983 (NAD83) (2011 ADJ.; EPOCH 2010.00).

2. ALL ELEVATIONS SHOWN HEREON ARE REFERENCED TO THE NORTH AMERICAN VERTICAL DATUM OF 1988 (NAVD88) (GEOID 18).

3. COORDINATES AND DISTANCES ARE U.S. SURVEY FEET, DISPLAYED IN SURFACE VALUES, AND MAY BE CONVERTED TO GRID VALUES BY DIVIDING BY THE SURFACE ADJUSTMENT FACTOR FOR TYLER COUNTY OF 1.00012.

4. HORIZONTAL COORDINATES ARE BASED ON REDUNDANT GPS RTN OBSERVATIONS MEASURED FROM TxDOT CORS TXKO DURING AUGUST 2023.

5. ELEVATIONS ARE BASED ON REDUNDANT GPS RTN OBSERVATIONS AND WERE ADJUSTED WITH DIGITAL LEVELING CONSTAINED TO THE ELEVATIONS OF PRIMARY MONUMENTS UQ67813226 (129.78') AND UQ68063207 (127.79').

THE CONTROL POINTS SHOWN HEREIN WERE DETERMINED BY A SURVEY MADE ON THE GROUND UNDER MY SUPERVISION.

STATE OF TEXAS
REGISTERED
JIMMY D. WALTON
5889
PROFESSIONAL
LAND SURVEYOR

2-26-2024

THIS SURVEY CONTROL INFORMATION HAS BEEN ACCEPTED AND INCORPORATED INTO THIS PS&E

Sheet 1 of 1
Survey Date: AUGUST, 2023

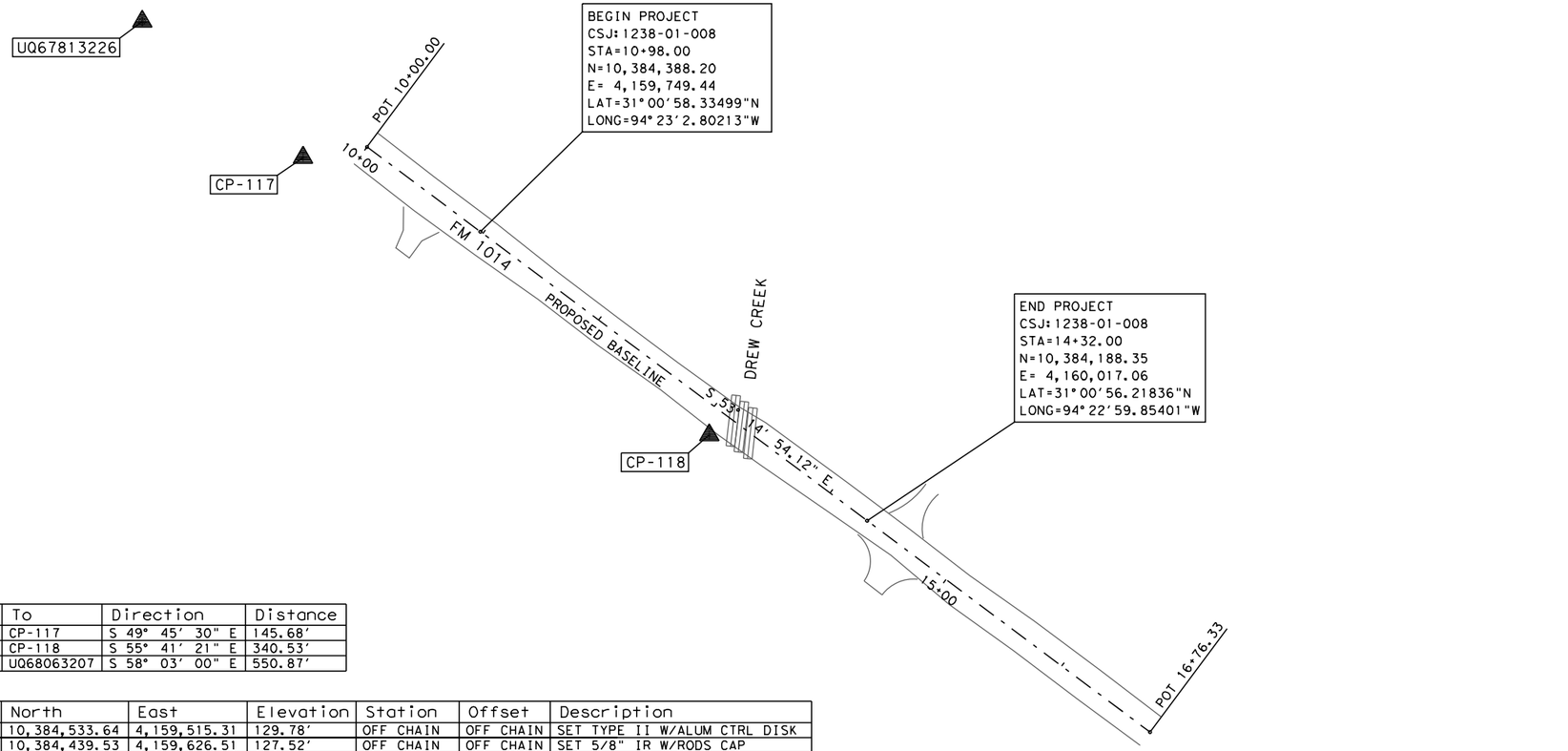
RODS
Surveying, Inc.
Control
Infrastructure
Transportation
Land Development
6810 LEE ROAD, STE.100
SPRING, TEXAS 77379
TEL (281) 257-4020
FAX (281) 257-4021
TBPELS SURVEYING FIRM REG. No. 10030700

Texas Department of Transportation

FM 1014 @ DRAW CREEK HORIZONTAL & VERTICAL CONTROL SHEET

FEDERAL AID PROJECT NO.				SHEET NO.
SEE COVER SHEET				56
FED. RD. DIV. NO.	STATE	DISTRICT		COUNTY
6	TEXAS	BMT		HARDIN, ETC
STATE DIST. NO.	CONTROL	SECTION	JOB	HIGHWAY
20	0920	03	082, ETC	CR 1065, ETC

N:\LJA Program Management 608\2204600l\T05 - BMT 5 bridges\D - FM 1014 @ draw\CAD\H&V Control\H&V Sketches.dgn



From	To	Direction	Distance
UQ67813226	CP-117	S 49° 45' 30" E	145.68'
CP-117	CP-118	S 55° 41' 21" E	340.53'
CP-118	UQ68063207	S 58° 03' 00" E	550.87'

Point	North	East	Elevation	Station	Offset	Description
UQ67813226	10,384,533.64	4,159,515.31	129.78'	OFF CHAIN	OFF CHAIN	SET TYPE II W/ALUM CTRL DISK
CP-117	10,384,439.53	4,159,626.51	127.52'	OFF CHAIN	OFF CHAIN	SET 5/8" IR W/RODS CAP
CP-118	10,384,247.58	4,159,907.78	126.85'	13+09.00	17.93' RT	SET 5/8" IR W/RODS CAP
UQ68063207	10,383,956.07	4,160,375.20	127.79'	OFF CHAIN	OFF CHAIN	SET TYPE II W/ALUM CTRL DISK
TXWO	10,298,653.79	4,151,909.77	329.16'	OFF CHAIN	OFF CHAIN	CORS TXWO

Control Name	Static GPS Coordinate Information			TxDOT RTN4 VRS Coordinate Information			Residuals (Static - VRS)		
	North	East	Elev.	North	East	Elev.	North	East	Elev.
UQ67813226	10,384,533.64	4,159,515.31	129.78	10,384,533.62	4,159,515.31	129.93	0.02	0.01	-0.15
UQ68063207	10,383,956.07	4,160,375.20	127.79	10,383,956.06	4,160,375.23	127.72	0.01	-0.02	0.08

Note: Static GPS values were established with two four-hour static sessions per point, rapid orbits, and a network adjustment constrained to the published coordinates and ellipsoid heights of CORS TXLF, TX-HP and RRP TXWO. Values shown hereon are based NAD83 (2011 Adj), TXC (4203), NAVD88 (Geoid 18). Project (surface) values are based on the surface adjustment factor (SAF) for Tyler County, SAF = 1.00012. 2. RTN4 VRS values are based on redundant 180-epoch observations constrained to CORS TXWO.

NOTES:
1. ALL BEARINGS AND COORDINATES SHOWN HEREON ARE BASED ON THE TEXAS COORDINATE SYSTEM, CENTRAL ZONE (4203), NORTH AMERICAN DATUM OF 1983 (NAD83) (2011 ADJ.; EPOCH 2010.00).

2. ALL ELEVATIONS SHOWN HEREON ARE REFERENCED TO THE NORTH AMERICAN VERTICAL DATUM OF 1988 (NAVD88) (GEOID 18).

3. COORDINATES AND DISTANCES ARE U.S. SURVEY FEET, DISPLAYED IN SURFACE VALUES, AND MAY BE CONVERTED TO GRID VALUES BY DIVIDING BY THE SURFACE ADJUSTMENT FACTOR FOR TYLER COUNTY OF 1.00012.

4. HORIZONTAL COORDINATES ARE BASED ON REDUNDANT GPS RTN OBSERVATIONS MEASURED FROM TxDOT CORS TXKO DURING AUGUST 2023.

5. ELEVATIONS ARE BASED ON REDUNDANT GPS RTN OBSERVATIONS AND WERE ADJUSTED WITH DIGITAL LEVELING CONSTAINED TO THE ELEVATIONS OF PRIMARY MONUMENTS UQ67813226 (129.78') AND UQ68063207 (127.79').

THE CONTROL POINTS SHOWN HEREIN WERE DETERMINED BY A SURVEY MADE ON THE GROUND UNDER MY SUPERVISION.

STATE OF TEXAS
REGISTERED
JIMMY D. WALTON
5889
PROFESSIONAL
LAND SURVEYOR

2-26-2024

THIS SURVEY CONTROL INFORMATION HAS BEEN ACCEPTED AND INCORPORATED INTO THIS PS&E

Sheet 1 of 1
Survey Date: AUGUST, 2023

RODS
Surveying, Inc.
Control Infrastructure Transportation Land Development
6810 LEE ROAD, STE. 100
SPRING, TEXAS 77379
TEL (281) 257-4020
FAX (281) 257-4021
TBPELS SURVEYING FIRM REG. No. 10030700

Texas Department of Transportation

FM 1014 @ DRAW CREEK SURVEY CONTROL INDEX SHEET

Unit of Measure: U.S. Survey Feet

0 50' 100' 150'
SCALE 1"=100'

FEDERAL AID PROJECT NO.				SHEET NO.
SEE COVER SHEET				57
FED. RD. DIV. NO.	STATE	DISTRICT		COUNTY
6	TEXAS	BMT		HARDIN, ETC
STATE DIST. NO.	CONTROL	SECTION	JOB	HIGHWAY
20	0920	03	082, ETC	CR 1065, ETC

N:\LJA Program Management 608\22046001\T05 - BMT 5 bridges\D - FM 1014 @ draw\CAD\H&V Control\H&V Index Sheet.dgn

W. PINESHADOWS DR (CR 1065) AT CLEMMONS GULLY

Horizontal Alignment Review Report

Alignment Name: CGBL
Alignment Description:
Alignment Style: Alignment\Baseline

Report Created: Thursday, June 15, 2023
Time: 4:26:09 PM

		Station	Northing	Easting
Element: Circular				
PC	( )	5+07.68 R1	10071217.2	4191850.18
PI	( )	8+24.30 R1	10071341.1	4191558.82
CC	( )		10071691.1	4192051.73
PT	( )	10+75.44 R1	10071657	4191537.86
Radius:		515		
Delta:		63°09'53" Right		
Degree of Curvature (Arc):		11°07'31"		
Length:		567.752		
Tangent:		316.611		
Chord:		539.435		
Middle Ordinate:		76.277		
External:		89.539		
Back Tangent Direction:		N66°57'42"W		
Back Radial Direction:		N23°02'18"E		
Chord Direction:		N35°22'45"W		
Ahead Radial Direction:		N86°12'11"E		
Ahead Tangent Direction:		N03°47'49"W		
Element: Linear				
PT	( )	10+75.44 R1	10071657	4191537.86
PC	( )	10+84.30 R1	10071665.9	4191537.27
Tangential Direction:		N03°47'49"W		
Tangential Length:		8.864		
Element: Circular				
PC	( )	10+84.30 R1	10071665.9	4191537.27
PI	( )	11+45.83 R1	10071727.2	4191533.2
CC	( )		10071700	4192051.14
PRC	( )	12+06.77 R1	10071787.9	4191543.7
Radius:		515		
Delta:		13°37'33" Right		
Degree of Curvature (Arc):		11°07'31"		
Length:		122.475		
Tangent:		61.528		
Chord:		122.187		
Middle Ordinate:		3.637		
External:		3.662		
Back Tangent Direction:		N03°47'49"W		
Back Radial Direction:		N86°12'11"E		
Chord Direction:		N03°00'57"E		
Ahead Radial Direction:		S80°10'16"E		
Ahead Tangent Direction:		N09°49'44"E		

		Station	Northing	Easting
Element: Circular				
PRC	( )	12+06.77 R1	10071787.87	4191543.699
PI	( )	12+54.88 R1	10071835.28	4191551.912
CC	( )		10071875.79	4191036.259
PT	( )	13+02.72 R1	10071883.38	4191551.203
Radius:		515		
Delta:		10°40'26" Left		
Degree of Curvature (Arc):		11°07'31"		
Length:		95.942		
Tangent:		48.11		
Chord:		95.803		
Middle Ordinate:		2.233		
External:		2.242		
Back Tangent Direction:		N09°49'44"E		
Back Radial Direction:		S80°10'16"E		
Chord Direction:		N04°29'31"E		
Ahead Radial Direction:		N89°09'18"E		
Ahead Tangent Direction:		N00°50'42"W		
Element: Linear				
PT	( )	13+02.72 R1	10071883.38	4191551.203
PC	( )	14+03.52 R1	10071984.17	4191549.716
Tangential Direction:		N00°50'42"W		
Tangential Length:		100.802		
Element: Circular				
PC	( )	14+03.52 R1	10071984.17	4191549.716
PI	( )	14+17.85 R1	10071998.5	4191549.505
CC	( )		10071983.29	4191489.722
PRC	( )	14+31.65 R1	10072011.18	4191542.843
Radius:		60		
Delta:		26°51'42" Left		
Degree of Curvature (Arc):		95°29'35"		
Length:		28.13		
Tangent:		14.328		
Chord:		27.873		
Middle Ordinate:		1.641		
External:		1.687		
Back Tangent Direction:		N00°50'42"W		
Back Radial Direction:		N89°09'18"E		
Chord Direction:		N14°16'33"W		
Ahead Radial Direction:		N62°17'36"E		
Ahead Tangent Direction:		N27°42'24"W		
Element: Circular				
PRC	( )	14+31.65 R1	10072011.18	4191542.843
PI	( )	14+57.33 R1	10072033.92	4191530.902
CC	( )		10072039.08	4191595.963
PCC	( )	14+80.18 R1	10072058.26	4191539.11
Radius:		60		
Delta:		46°20'39" Right		
Degree of Curvature (Arc):		95°29'35"		
Length:		48.532		
Tangent:		25.681		
Chord:		47.219		
Middle Ordinate:		4.84		
External:		5.265		
Back Tangent Direction:		N27°42'24"W		
Back Radial Direction:		N62°17'36"E		
Chord Direction:		N04°32'05"W		
Ahead Radial Direction:		S71°21'45"E		
Ahead Tangent Direction:		N18°38'15"E		

STATE OF TEXAS
JAMES D. HORNE
141323
REGISTERED
PROFESSIONAL ENGINEER

DocuSigned by:
2/29/2024
50238C8D55F5470...

Texas Department of Transportation
© 2024

CLEMMONS GULLY PACKAGE

HORIZONTAL ALIGNMENT DATA

SHEET 1 OF 5

CONT	SECT	JOB	HIGHWAY
0920	03	082,ETC	CR 1065, ETC
DIST	COUNTY		SHEET NO.
20	HARDIN, ETC		58

DATE: 2/28/2024
FILE: pw://txdot.projectwiseonline.com:TXDOT5/Documents/20 - BMT/Design Projects/092003082/4 - Design/Plan Set/3. Roadway/Horizontal Alignment Data.dgn

CC
DW
CC
DW

Horizontal Alignment Review Report

Report Created: Thursday, November 30, 2023
Time: 6:31:07 PM

Project: Default
Description:
File Name: c:\workingdir\lja-pw.bentley.com_lja-pw-01\guadalupe escobedo\dms82996\041_HALN_OS.dgn
Last Revised: 11/30/2023 18:30:39

Note: All units in this report are in feet unless specified otherwise.

Alignment Name: CL_VINCENT
Alignment Description:
Alignment Style: Alignment\Baseline

		Station	Northing	Easting
Element: Linear				
	POT ( )	10+00.00 R1	10336141.9542	4100741.1229
	PC ( )	10+00.57 R1	10336142.4451	4100741.4100
	Tangential Direction:	N30°19'16.86"E		
	Tangential Length:	0.5687		
Element: Circular				
	PC ( )	10+00.57 R1	10336142.4451	4100741.4100
	PI ( )	10+64.12 R1	10336197.3019	4100773.4932
	CC ( )		10336773.5067	4099662.4007
	PRC ( )	11+27.56 R1	10336255.1297	4100799.8475
	Radius:	1250.0000		
	Delta:	05°49'14.96" Left		
	Degree of Curvature (Arc):	04°35'01.18"		
	Length:	126.9907		
	Tangent:	63.5500		
	Chord:	126.9360		
	Middle Ordinate:	1.6123		
	External:	1.6144		
	Back Tangent Direction:	N30°19'16.86"E		
	Back Radial Direction:	S59°40'43.14"E		
	Chord Direction:	N27°24'39.38"E		
	Ahead Radial Direction:	S65°29'58.10"E		
	Ahead Tangent Direction:	N24°30'01.90"E		

CR 2380 AT VINCENT TRIBUTARY

Element: Circular				
	PRC ( )	11+27.56 R1	10336255.1297	4100799.8475
	PI ( )	11+68.77 R1	10336292.6297	4100816.9376
	CC ( )		10336130.7193	4101072.8347
	PRC ( )	12+09.47 R1	10336324.1322	4100843.5066
	Radius:	300.0000		
	Delta:	15°38'36.24" Right		
	Degree of Curvature (Arc):	19°05'54.94"		
	Length:	81.9086		
	Tangent:	41.2106		
	Chord:	81.6545		
	Middle Ordinate:	2.7911		
	External:	2.8173		
	Back Tangent Direction:	N24°30'01.90"E		
	Back Radial Direction:	S65°29'58.10"E		
	Chord Direction:	N32°19'20.02"E		
	Ahead Radial Direction:	S49°51'21.86"E		
	Ahead Tangent Direction:	N40°08'38.14"E		
Element: Circular				
	PRC ( )	12+09.47 R1	10336324.1322	4100843.5066
	PI ( )	12+52.53 R1	10336357.0470	4100871.2665
	CC ( )		10336517.5452	4100614.1784
	PT ( )	12+95.00 R1	10336396.4408	4100888.6483
	Radius:	300.0000		
	Delta:	16°20'07.50" Left		
	Degree of Curvature (Arc):	19°05'54.94"		
	Length:	85.5320		
	Tangent:	43.0581		
	Chord:	85.2426		
	Middle Ordinate:	3.0431		
	External:	3.0742		
	Back Tangent Direction:	N40°08'38.14"E		
	Back Radial Direction:	S49°51'21.86"E		
	Chord Direction:	N31°58'34.39"E		
	Ahead Radial Direction:	S66°11'29.36"E		
	Ahead Tangent Direction:	N23°48'30.64"E		
Element: Linear				
	PT ( )	12+95.00 R1	10336396.4408	4100888.6483
	PC ( )	13+87.00 R1	10336480.6116	4100925.7869

STATE OF TEXAS
S. E. WRIGHT
108969
LICENSED
PROFESSIONAL ENGINEER

02-27-2024

LJA PROGRAM MANAGEMENT
FRN - F-14256

CLEMMONS GULLY PACKAGE

HORIZONTAL ALIGNMENT DATA

SHEET 2 OF 5

CONT	SECT	JOB	HIGHWAY
0920	03	082, ETC	CR 1065, ETC
DIST	COUNTY		SHEET NO.
BMT	HARDIN, ETC		59

DATE: 2/26/2024 2:20:01 PM
FILE: pw://lja-pw.bentley.com:lja-pw-01/Documents/TxDOT/PM8016-2301 CEC WA4/Clemmons Gully Off-System Bridge/400 Production/4 - Design/Plan Set/3. Roadway/CG_HAD02.dgn

Tangential Direction:	N23°48'30.64"E		
Tangential Length:	92.0000		

Element: Circular

PC ( )	13+87.00 R1	10336480.6116	4100925.7869
PI ( )	14+31.18 R1	10336521.0328	4100943.6220
CC ( )		10336601.7160	4100651.3170
PRC ( )	14+74.73 R1	10336564.8795	4100949.0469
Radius:	300.0000		
Delta:	16°45'19.66" Left		
Degree of Curvature (Arc):	19°05'54.94"		
Length:	87.7314		
Tangent:	44.1810		
Chord:	87.4191		
Middle Ordinate:	3.2013		
External:	3.2358		
Back Tangent Direction:	N23°48'30.64"E		
Back Radial Direction:	S66°11'29.36"E		
Chord Direction:	N15°25'50.81"E		
Ahead Radial Direction:	S82°56'49.02"E		
Ahead Tangent Direction:	N07°03'10.98"E		

Element: Circular

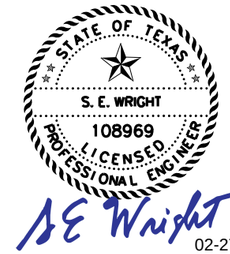
PRC ( )	14+74.73 R1	10336564.8795	4100949.0469
PI ( )	15+15.67 R1	10336605.5039	4100954.0731
CC ( )		10336528.0430	4101246.7768
PT ( )	15+56.10 R1	10336643.2968	4100969.7992
Radius:	300.0000		
Delta:	15°32'23.08" Right		
Degree of Curvature (Arc):	19°05'54.94"		
Length:	81.3659		
Tangent:	40.9342		
Chord:	81.1168		
Middle Ordinate:	2.7543		
External:	2.7798		
Back Tangent Direction:	N07°03'10.98"E		
Back Radial Direction:	S82°56'49.02"E		
Chord Direction:	N14°49'22.52"E		
Ahead Radial Direction:	S67°24'25.94"E		
Ahead Tangent Direction:	N22°35'34.06"E		

Element: Linear

PT ( )	15+56.10 R1	10336643.2968	4100969.7992

CR 2380 AT VINCENT TRIBUTARY

POT ( )	16+71.15 R1	10336749.5200	4101014.0000
Tangential Direction:	N22°35'34.06"E		
Tangential Length:	115.0525		



02-27-2024

LJA PROGRAM MANAGEMENT
FRN - F-14256

CLEMMONS GULLY PACKAGE

HORIZONTAL ALIGNMENT DATA

SHEET 3 OF 5

CONT	SECT	JOB	HIGHWAY
0920	03	082, ETC	CR 1065, ETC
DIST	COUNTY		SHEET NO.
BMT	HARDIN, ETC		60

DATE: 2/26/2024 2:20:07 PM
FILE: pw://lja-pw.bentley.com:lja-pw-01/Documents/TxDOT/PM8016-2301 CEC WA4/Clemmons Gully Off-System Bridge/400 Production/4 - Design/Plan Set/3. Roadway/CG_HAD03.dgn

Horizontal Alignment Review Report

Report Created: Thursday, November 30, 2023
Time: 6:20:06 PM

Project: Default
Description:
File Name: c:\workingdir\lja-pw.bentley.com_lja-pw-01\guadalupe escobedo\dms82997\031_HALN.dgn
Last Revised: 11/30/2023 18:19:39

Note: All units in this report are in feet unless specified otherwise.

Alignment Name: BL CL_BARROW
Alignment Description:
Alignment Style: Alignment\Baseline

		Station	Northing	Easting
Element: Linear				
POT	( )	10+00.00 R1	13873419.3700	3347457.7550
PC	( )	11+87.75 R1	13873439.2627	3347644.4491
Tangential Direction:		N83°55'04.66"E		
Tangential Length:		187.7509		
Element: Circular				
PC	( )	11+87.75 R1	13873439.2627	3347644.4491
PI	( )	12+22.33 R1	13873442.9263	3347678.8323
CC	( )		13870953.3346	3347909.3300
PT	( )	12+56.90 R1	13873445.6375	3347713.3037
Radius:		2500.0000		
Delta:		01°35'05.39" Right		
Degree of Curvature (Arc):		02°17'30.59"		
Length:		69.1513		
Tangent:		34.5779		
Chord:		69.1491		
Middle Ordinate:		0.2391		
External:		0.2391		
Back Tangent Direction:		N83°55'04.66"E		
Back Radial Direction:		S06°04'55.34"E		
Chord Direction:		N84°42'37.35"E		
Ahead Radial Direction:		S04°29'49.95"E		
Ahead Tangent Direction:		N85°30'10.05"E		

BAILEY RD AT WHITES BAYOU

Element: Linear				
PT	( )	12+56.90 R1	13873445.6375	3347713.3037
PC	( )	14+88.20 R1	13873463.7735	3347943.8865
Tangential Direction:		N85°30'10.05"E		
Tangential Length:		231.2949		
Element: Circular				
PC	( )	14+88.20 R1	13873463.7735	3347943.8865
PI	( )	15+74.54 R1	13873470.5440	3348029.9676
CC	( )		13865986.8648	3348531.9654
PT	( )	16+60.88 R1	13873475.3309	3348116.1818
Radius:		7500.0000		
Delta:		01°19'09.22" Right		
Degree of Curvature (Arc):		00°45'50.20"		
Length:		172.6863		
Tangent:		86.3470		
Chord:		172.6825		
Middle Ordinate:		0.4970		
External:		0.4970		
Back Tangent Direction:		N85°30'10.05"E		
Back Radial Direction:		S04°29'49.95"E		
Chord Direction:		N86°09'44.66"E		
Ahead Radial Direction:		S03°10'40.74"E		
Ahead Tangent Direction:		N86°49'19.26"E		
Element: Linear				
PT	( )	16+60.88 R1	13873475.3309	3348116.1818
POT	( )	17+28.06 R1	13873479.0550	3348183.2550
Tangential Direction:		N86°49'19.26"E		
Tangential Length:		67.1765		

STATE OF TEXAS
S. E. WRIGHT
108969
LICENSED
PROFESSIONAL ENGINEER

02-27-2024

LJA PROGRAM MANAGEMENT
FRN - F-14256

CLEMMONS GULLY PACKAGE

HORIZONTAL ALIGNMENT DATA

SHEET 4 OF 5

CONT	SECT	JOB	HIGHWAY
0920	03	082, ETC	CR 1065, ETC
DIST	COUNTY		SHEET NO.
BMT	HARDIN, ETC		61

DATE: 2/26/2024 2:20:13 PM
FILE: pw://lja-pw.bentley.com:lja-pw-01/Documents/TxDOT/PM80016-2301 CEC WA4/Clemmons Gully Off-System Bridge/400 Production/4 - Design/Plan Set/3. Roadway/CG_HAD04.dgn

FM 1943 AT DRAIN

Horizontal Alignment Review Report

Report Created: Thursday, November 30, 2023
Time: 6:00:08 PM

Project: Default
Description:
File Name: c:\workingdir\lja-pw.bentley.com_lja-pw-01\guadalupe escobedo\dms82999\031_HALN.dgn
Last Revised: 11/30/2023 17:59:41

Note: All units in this report are in feet unless specified otherwise.

Alignment Name: BL CL_Drain
Alignment Description:
Alignment Style: Alignment\Baseline

		Station	Northing	Easting
Element: Linear				
POT	( )	10+00.00 R1	10235932.9154	4197054.9314
POT	( )	17+05.21 R1	10235919.0687	4197760.0033
Tangential Direction:		S88°52'29.73"E		
Tangential Length:		705.2078		

FM 1014 AT DRAW

Horizontal Alignment Review Report

Report Created: Thursday, November 30, 2023
Time: 6:10:39 PM

Project: Default
Description:
File Name: c:\workingdir\lja-pw.bentley.com_lja-pw-01\guadalupe escobedo\dms82998\008_HALN.dgn
Last Revised: 11/30/2023 18:07:17

Note: All units in this report are in feet unless specified otherwise.

Alignment Name: BL CL_DRAW
Alignment Description:
Alignment Style: Alignment\Baseline

		Station	Northing	Easting
Element: Linear				
POT	( )	10+00.00 R1	10384446.8341	4159670.9228
POT	( )	16+76.33 R1	10384042.1541	4160212.8228
Tangential Direction:		S53°14'54.12"E		
Tangential Length:		676.3294		

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02-27-2024

LJA PROGRAM MANAGEMENT
FRN - F-14256

CLEMMONS GULLY PACKAGE

HORIZONTAL ALIGNMENT DATA

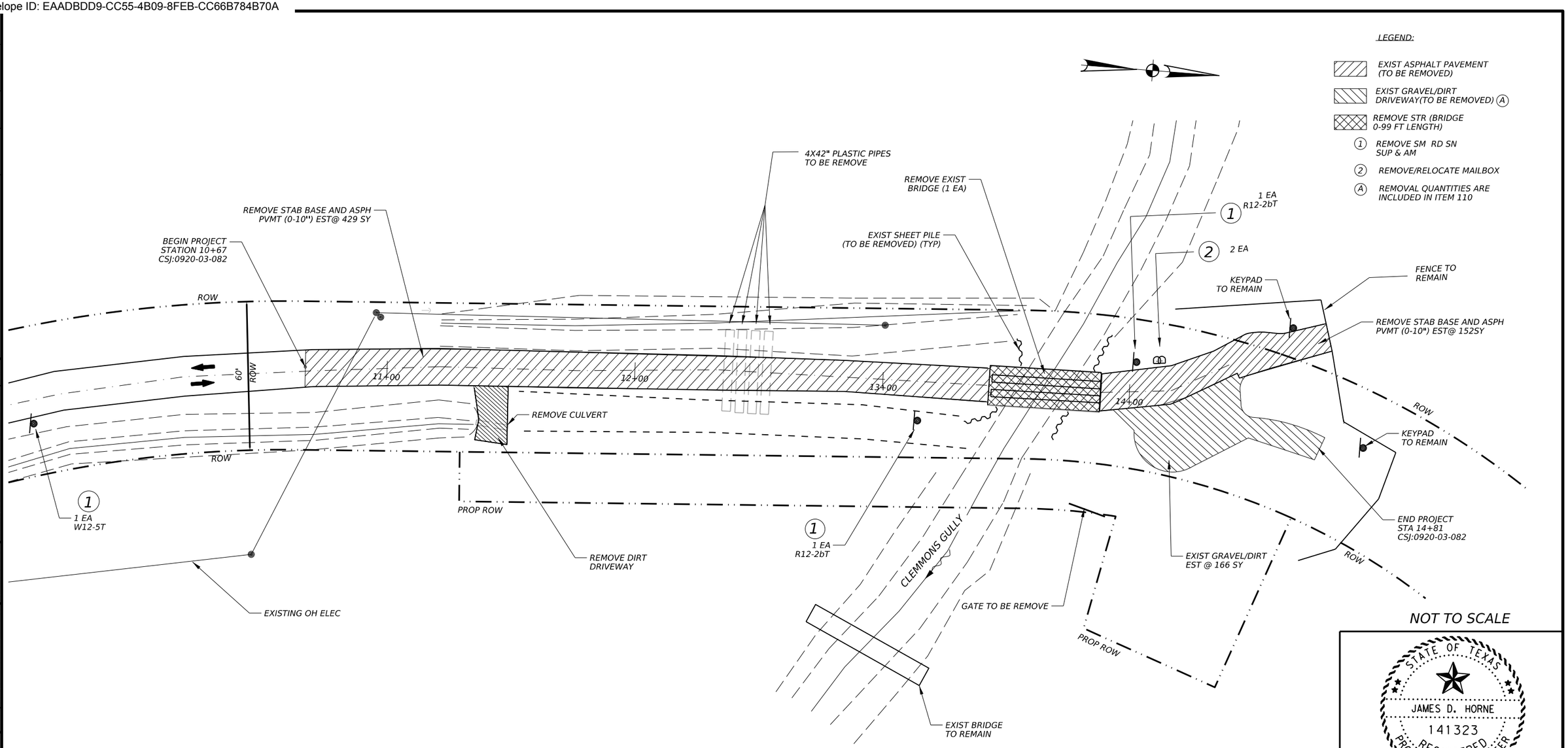
SHEET 5 OF 5

CONT	SECT	JOB	HIGHWAY
0920	03	082, ETC	CR 1065, ETC
DIST	COUNTY		SHEET NO.
BMT	HARDIN, ETC		62

DATE: 2/26/2024 2:20:18 PM
FILE: pw://lja-pw.bentley.com:lja-pw-01/Documents/TxDOT/PM8016-2301 CEC WA4/Clemmons Gully Off-System Bridge/400 Production/4 - Design/Plan Set/3. Roadway/CG_HAD05.dgn

DW: CK: DW: CK:

FILE: pw://txdot.projectwiseonline.com:TXDOT5/Documents/20 - BMT/Design Projects/0920030824 - Design/Master Design Files/CONTAINER FILES/Removal Layout.dgn



NOT TO SCALE

STATE OF TEXAS
JAMES D. HORNE
141323
REGISTERED PROFESSIONAL ENGINEER

DocuSigned by:
50238C8D55F5470...
2/29/2024

Texas Department of Transportation
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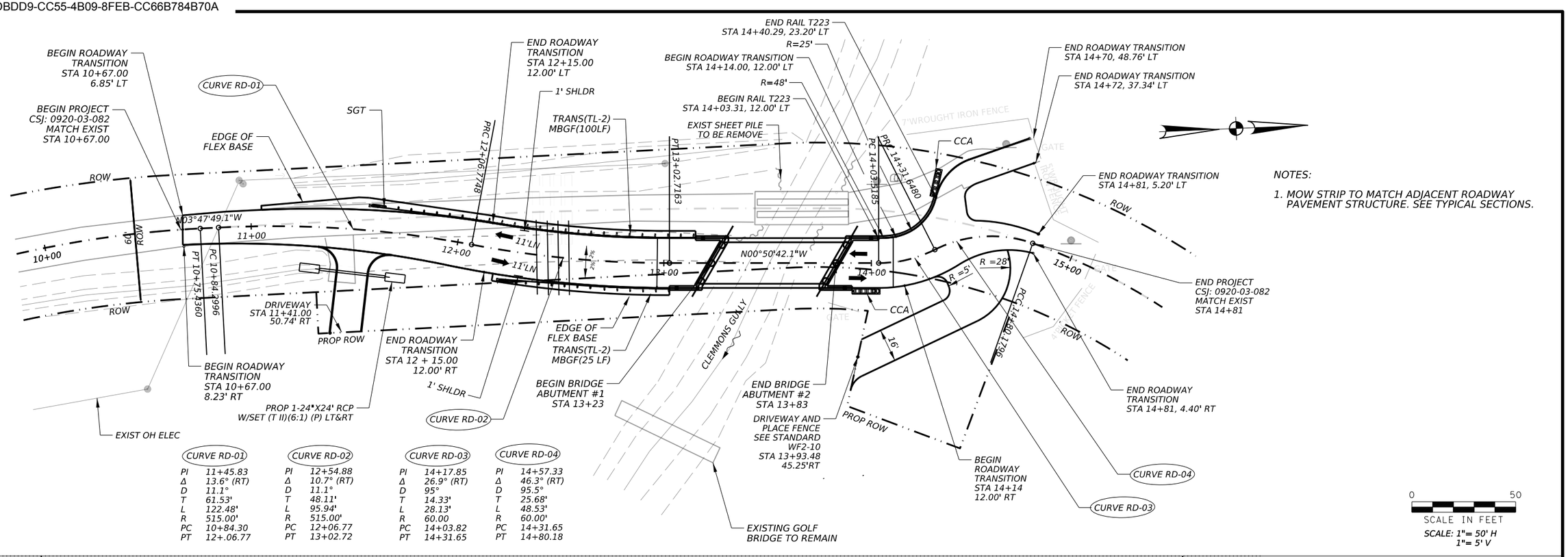
CLEMMONS GULLY PACKAGE

REMOVAL LAYOUT
W. PINESHADOWS DR (CR 1065) AT CLEMMONS GULLY

SHEET 1 OF 1

CONT	SECT	JOB	HIGHWAY
0920	03	082,ETC	CR 1065, ETC
DIST	COUNTY		SHEET NO.
20	HARDIN, ETC		63



NOTES:

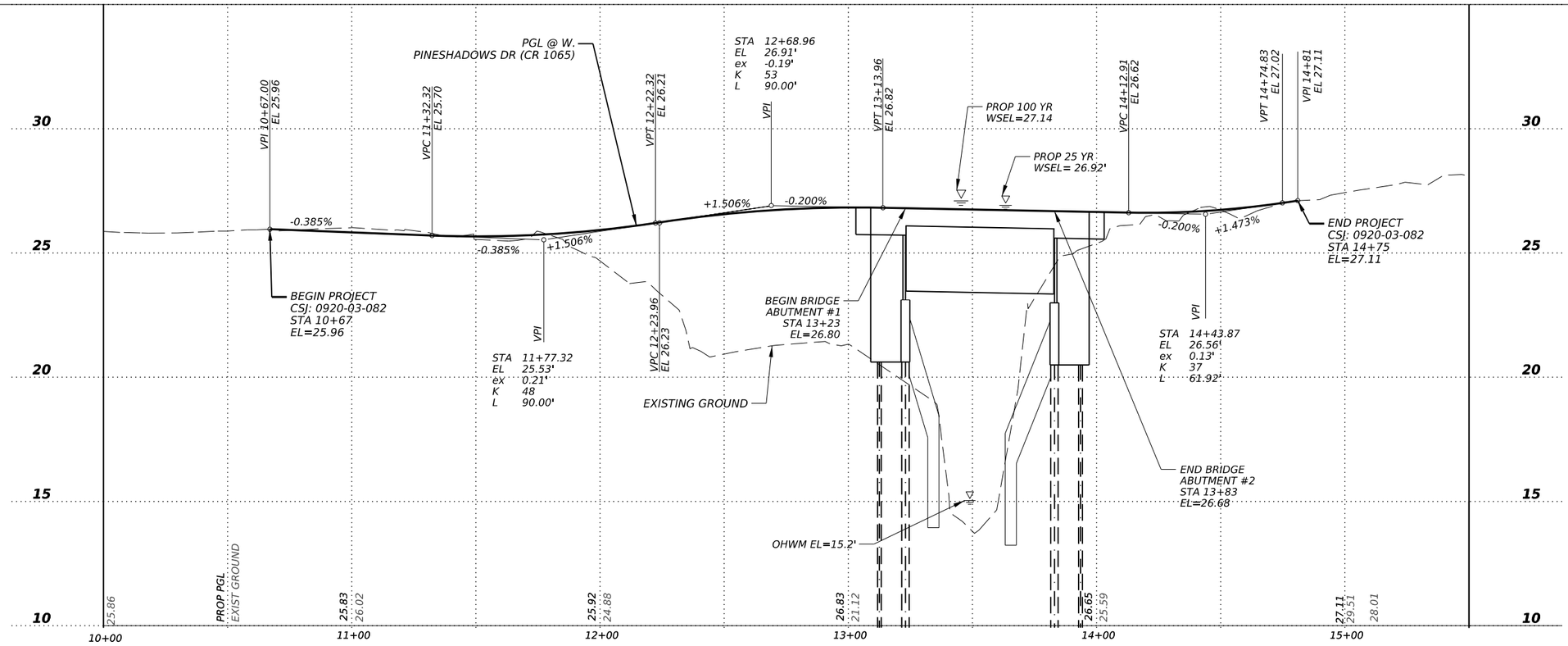
1. MOW STRIP TO MATCH ADJACENT ROADWAY PAVEMENT STRUCTURE. SEE TYPICAL SECTIONS.

CURVE RD-01	
PI	11+45.83
Δ	13.6° (RT)
D	11.1°
T	61.53'
L	122.48'
R	515.00'
PC	10+84.30
PT	12+.06.77

CURVE RD-02	
PI	12+54.88
Δ	10.7° (RT)
D	11.1°
T	48.11'
L	95.94'
R	515.00'
PC	12+06.77
PT	13+02.72

CURVE RD-03	
PI	14+17.85
Δ	26.9° (RT)
D	95°
T	14.33'
L	28.13'
R	60.00
PC	14+03.82
PT	14+31.65

CURVE RD-04	
PI	14+57.33
Δ	46.3° (RT)
D	95.5°
T	25.68'
L	48.53'
R	60.00'
PC	14+31.65
PT	14+80.18



STATE OF TEXAS
JAMES D. HORNE
141323
REGISTERED PROFESSIONAL ENGINEER

DocuSigned by:
50238C8D55F5470...
2/29/2024

Texas Department of Transportation

PLAN AND PROFILE

W. PINESHADOWS DR (CR 1065) AT CLEMMONS GULLY

SHEET 1 OF 1

CONT	SECT	JOB	HIGHWAY
0920	03	082, ETC	CR 1065, ETC
DIST	COUNTY		SHEET NO.
20	HARDIN, ETC		64

DATE: 2/29/2024 12:16:37 AM
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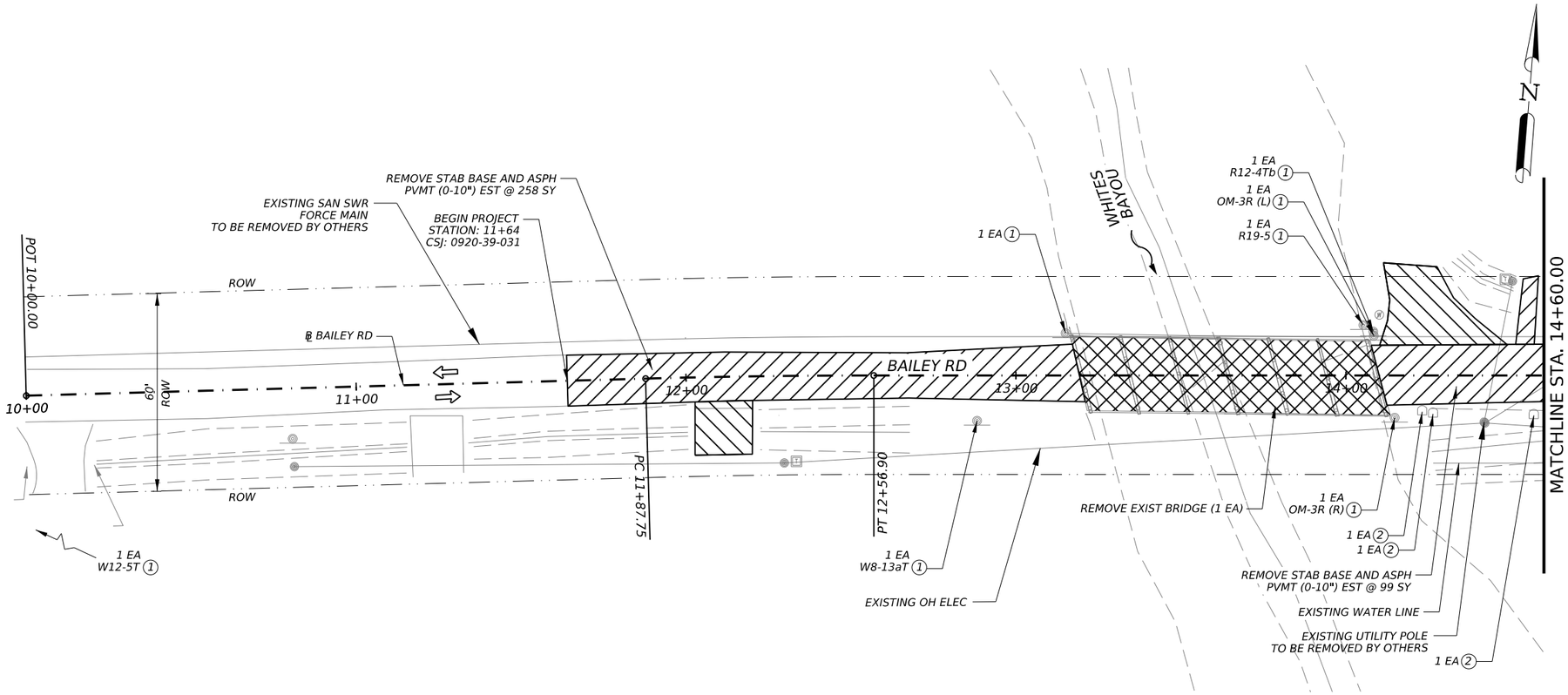

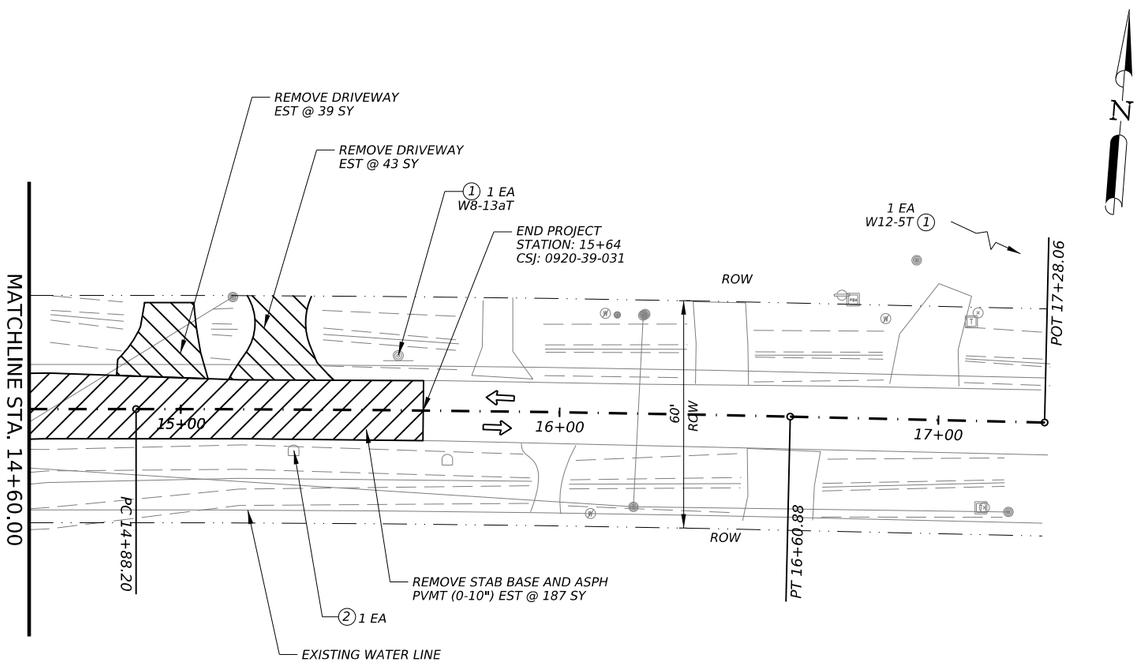

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02-27-2024

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FRN - F-14256

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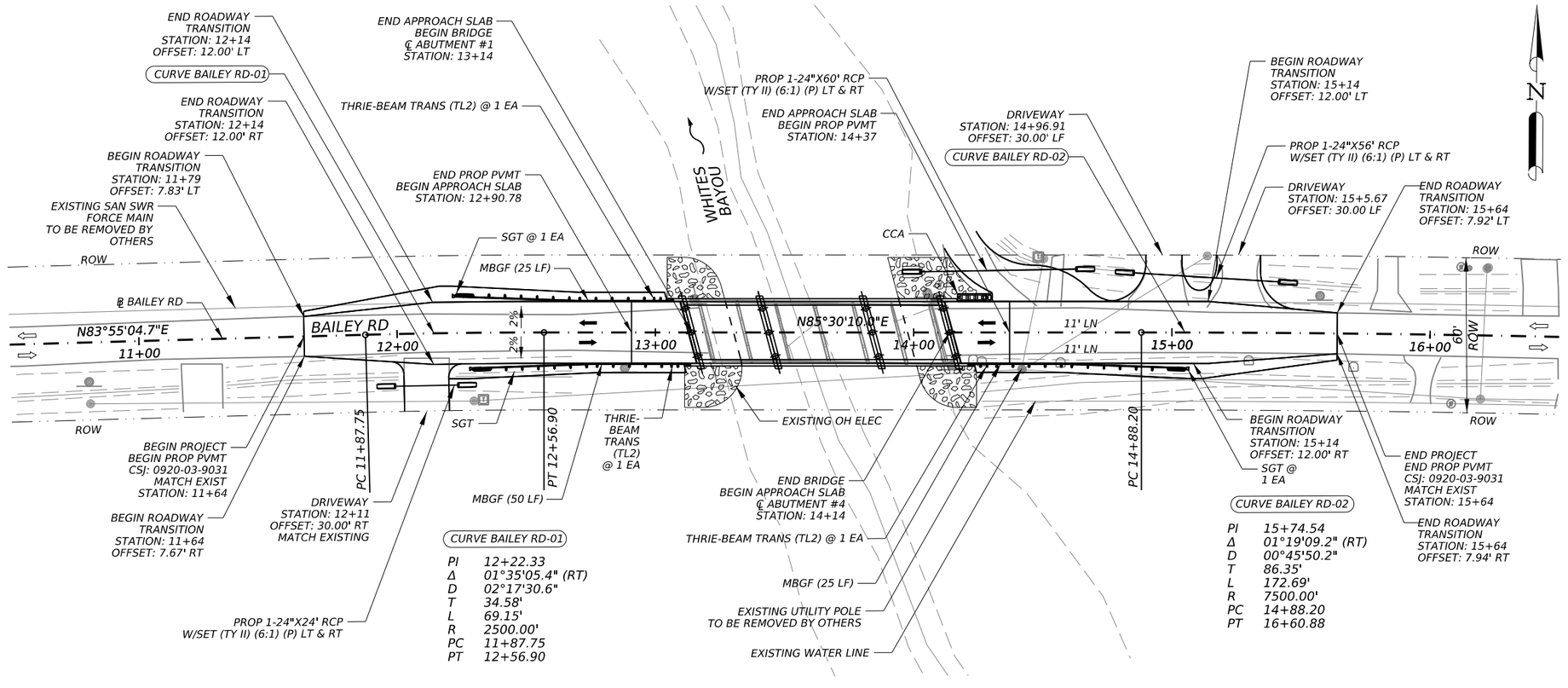
CLEMMONS GULLY PACKAGE

REMOVAL LAYOUT
BAILEY RD AT WHITES BAYOU

SHEET 1 OF 1

CONT	SECT	JOB	HIGHWAY
0920	03	082, ETC	CR 1065, ETC
DIST	COUNTY		SHEET NO.
BMT	HARDIN, ETC		65

DATE: 2/26/2024 2:20:24 PM
FILE: pw://la-pw.bentley.com:la-pw-01/Documents/TxDOT/PM8016-2301 CEC WA4/Clemmons Gully Off-System Bridge/400 Production/4 - Design/Plan Set/3. Roadway/031 BS_REM01.dgn



CURVE BAILEY RD-01

PI	12+22.33
Δ	01°35'05.4" (RT)
D	02°17'30.6"
T	34.58'
L	69.15'
R	2500.00'
PC	11+87.75
PT	12+56.90

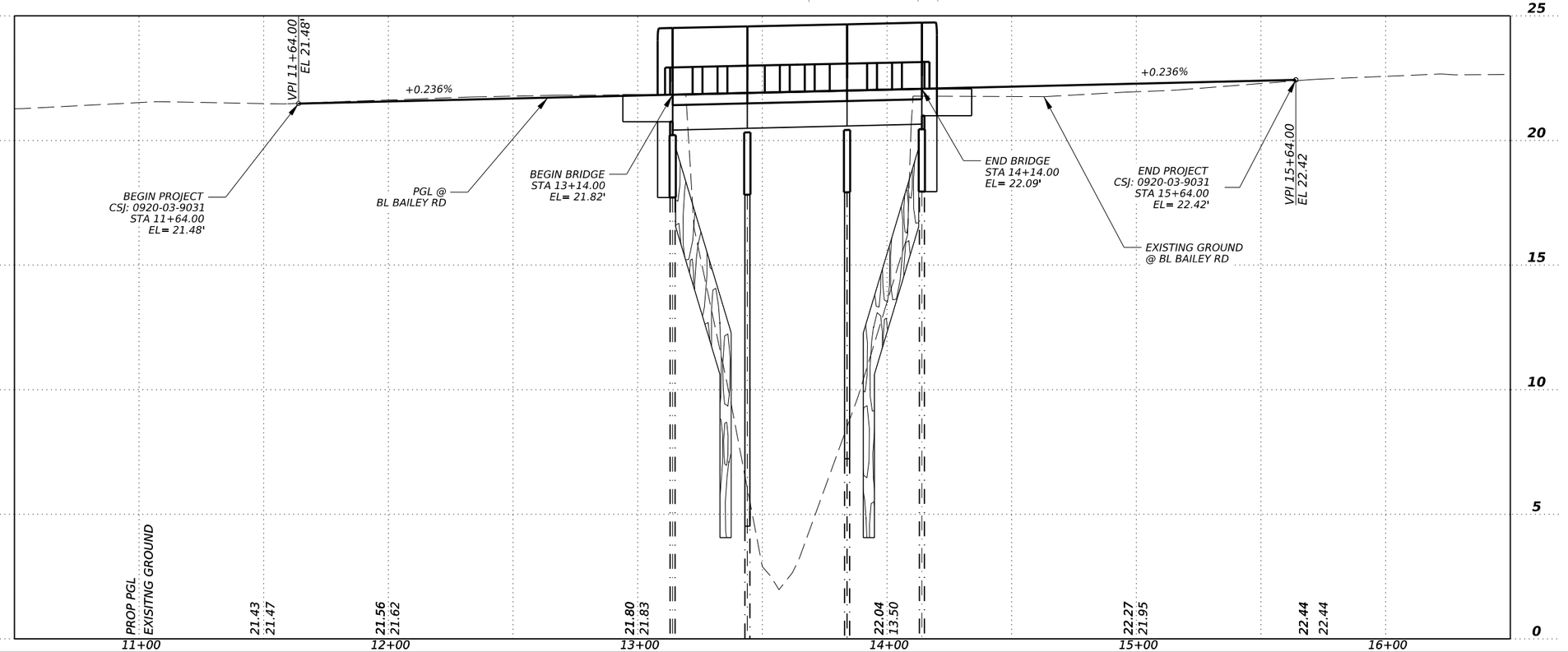
CURVE BAILEY RD-02

PI	15+74.54
Δ	01°19'09.2" (RT)
D	00°45'50.2"
T	86.35'
L	172.69'
R	7500.00'
PC	14+88.20
PT	16+60.88

NOTES:

1. MOW STRIP TO MATCH ADJACENT ROADWAY PAVEMENT STRUCTURE. SEE TYPICAL SECTION.

2.WHITES BAYOU WAS FORMERLY KNOWN AS BARROW SLOUGH.



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02-27-2024

LJA PROGRAM MANAGEMENT
FRN - F-14256

Texas Department of Transportation

CLEMMONS GULLY PACKAGE

PLAN & PROFILE
BAILEY RD AT WHITES BAYOU

SHEET 1 OF 1

CONT	SECT	JOB	HIGHWAY
0920	03	082, ETC	CR 1065, ETC
DIST	COUNTY		SHEET NO.
BMT	HARDIN, ETC		66

DATE: 2/26/2024 2:20:29 PM
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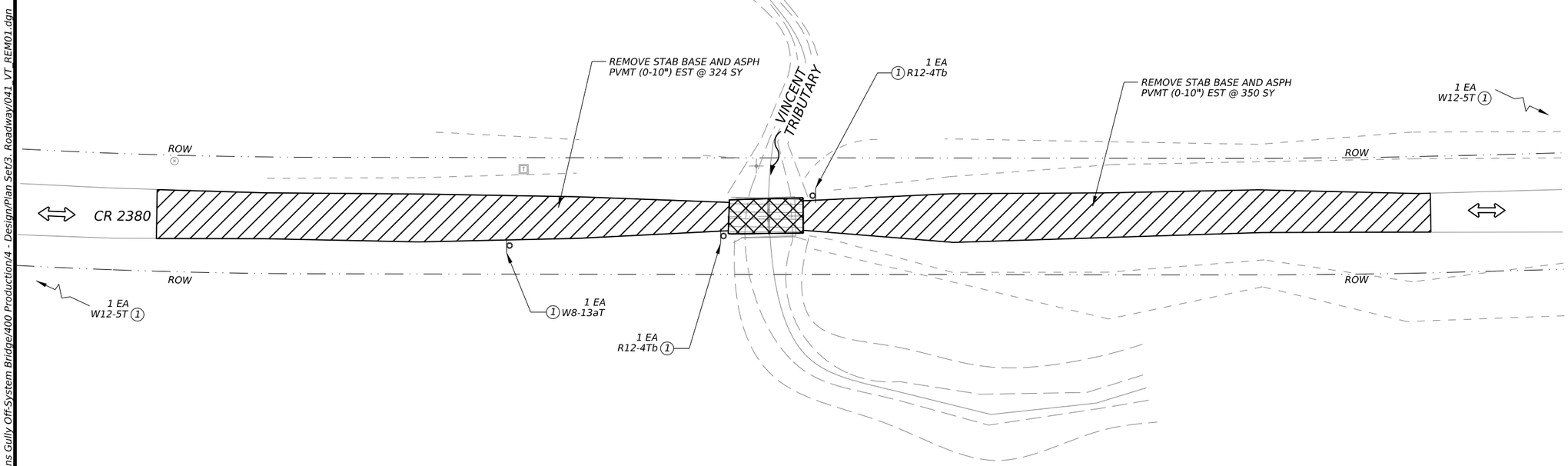
LEGEND

- EXIST ASPHALT PAVEMENT (TO BE REMOVED)
- EXIST GRAVEL / DIRT DRIVEWAY (TO BE REMOVED) (A)
- REMOV STR (BRIDGE 0-99 FT LENGTH)
- (1) REMOVE SM RD SN SUP & AM
- (2) REMOVE / RELOCATE MAILBOX
- (A) REMOVAL QUANTITIES ARE INCLUDED IN ITEM 110



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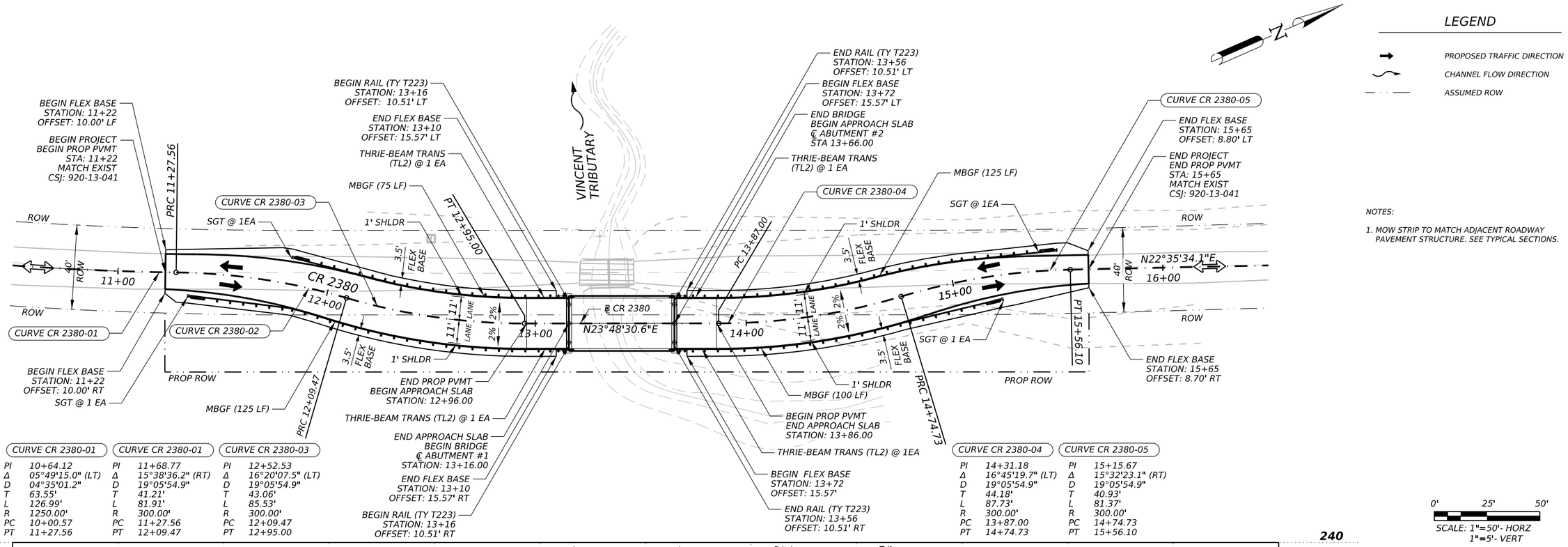
CLEMMONS GULLY PACKAGE

REMOVAL LAYOUT
CR 2380 AT VINCENT TRIBUTARY

SHEET 1 OF 1

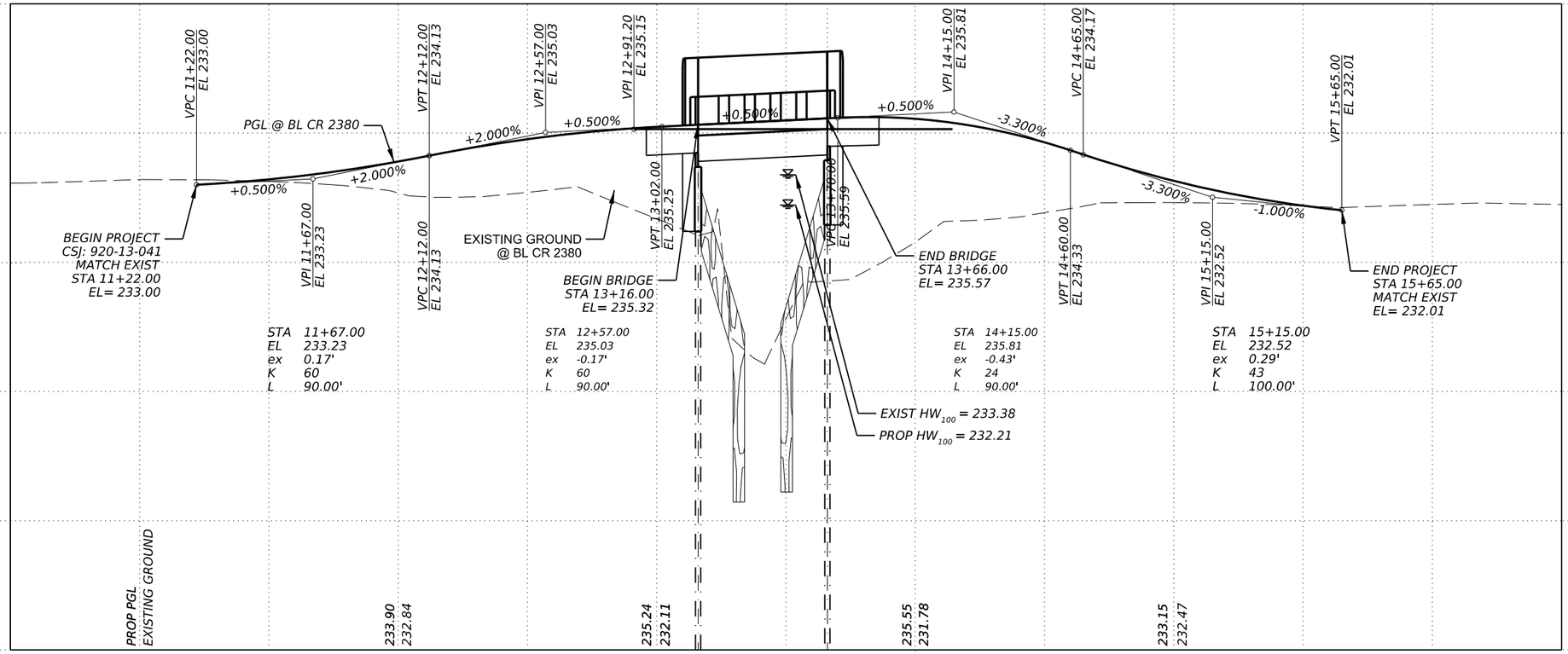
CONT	SECT	JOB	HIGHWAY
0920	03	082, ETC	CR 1065, ETC
DIST	COUNTY		SHEET NO.
BMT	HARDIN, ETC		67

DATE: 2/26/2024 2:20:34 PM
FILE: pw://la-pw.bentley.com:la-pw-01/Documents/TxDOT/PM8016-2301 CEC WA4/Clemmons Gully Off-System Bridge/400 Production/4 - Design/Plan Set/3. Roadway/041_VT_REM01.dgn



CURVE CR 2380-01		CURVE CR 2380-01		CURVE CR 2380-03	
PI	10+64.12	PI	11+68.77	PI	12+52.53
Δ	05°49'15.0" (LT)	Δ	15°38'36.2" (RT)	Δ	16°20'07.5" (LT)
D	04°35'01.2"	D	19°05'54.9"	D	19°05'54.9"
T	63.55'	T	41.21'	T	43.06'
L	126.99'	L	81.91'	L	85.53'
R	1250.00'	R	300.00'	R	300.00'
PC	10+00.57	PC	11+27.56	PC	12+09.47
PT	11+27.56	PT	12+09.47	PT	12+95.00

CURVE CR 2380-04		CURVE CR 2380-05	
PI	14+31.18	PI	15+15.67
Δ	16°45'19.7" (LT)	Δ	15°32'23.1" (RT)
D	19°05'54.9"	D	19°05'54.9"
T	44.18'	T	40.93'
L	87.73'	L	81.37'
R	300.00'	R	300.00'
PC	13+87.00	PC	14+74.73
PT	14+74.73	PT	15+56.10



STATE OF TEXAS
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02-27-2024

LJA PROGRAM MANAGEMENT
FRN - F-14256

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CLEMMONS GULLY PACKAGE

PLAN & PROFILE
CR 2380 AT VINCENT TRIBUTARY

SHEET 1 OF 1

CONT	SECT	JOB	HIGHWAY
0920	03	082, ETC	CR 1065, ETC
DIST	COUNTY		SHEET NO.
BMT	HARDIN, ETC		68

DATE: 2/26/2024 2:20:38 PM
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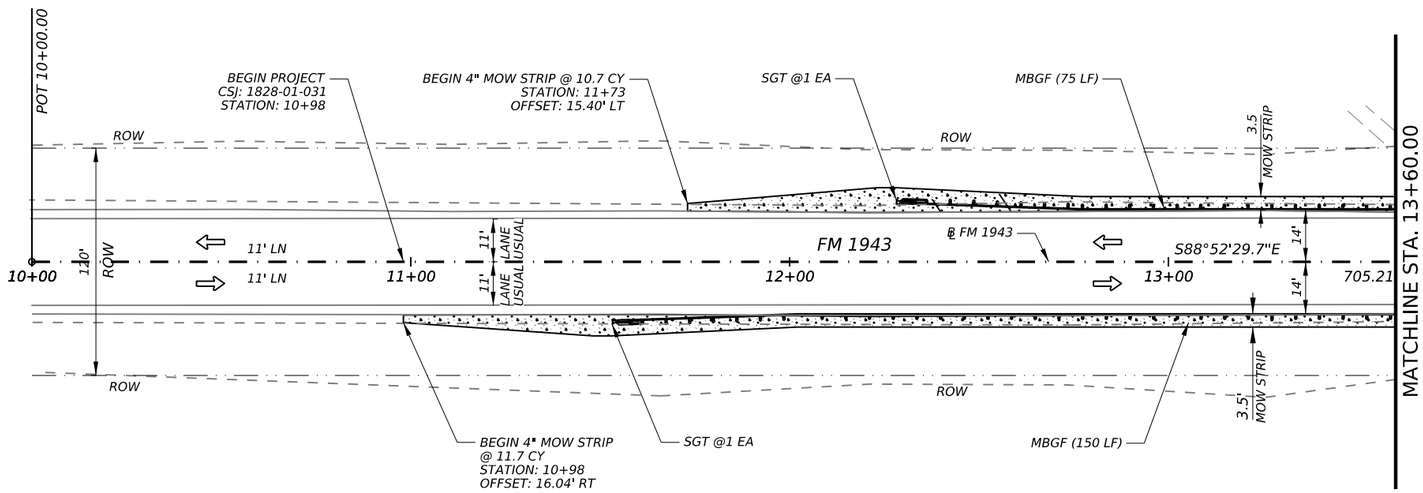
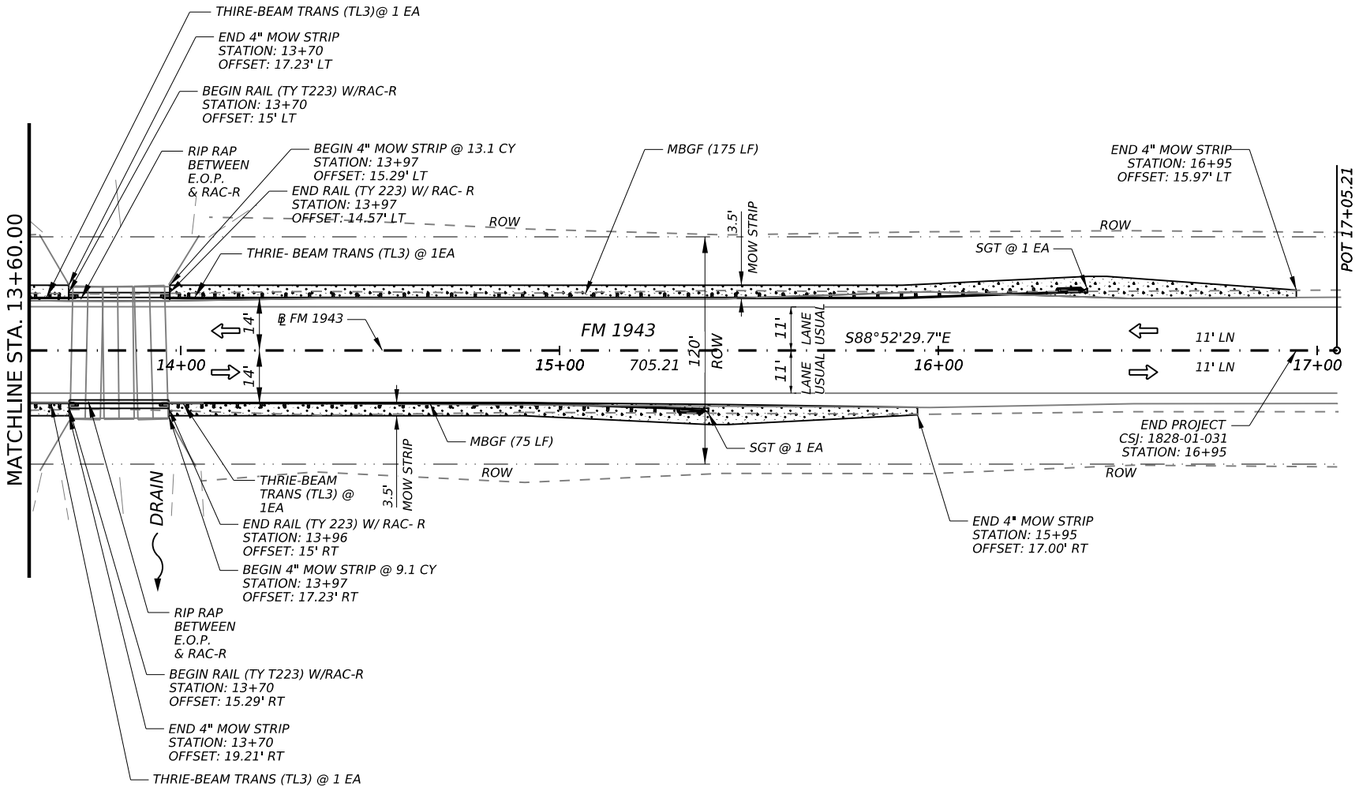


LEGEND

- PROPOSED TRAFFIC DIRECTION
- EXISTING TRAFFIC DIRECTION
- CHANNEL FLOW DIRECTION
- ASSUMED ROW



0' 20' 40'

SCALE: 1"=40'

STATE OF TEXAS
S. E. WRIGHT
108969
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PROFESSIONAL ENGINEER

02-27-2024

LJA PROGRAM MANAGEMENT
FRN - F-14256

Texas Department of Transportation

CLEMMONS GULLY PACKAGE

ROADWAY DETAILS
FM 1943 AT DRAIN

SHEET 1 OF 1

CONT	SECT	JOB	HIGHWAY
0920	03	082, ETC	CR 1065, ETC
DIST	COUNTY		SHEET NO.
BMT	HARDIN, ETC		69

DATE: 2/26/2024 2:20:43 PM
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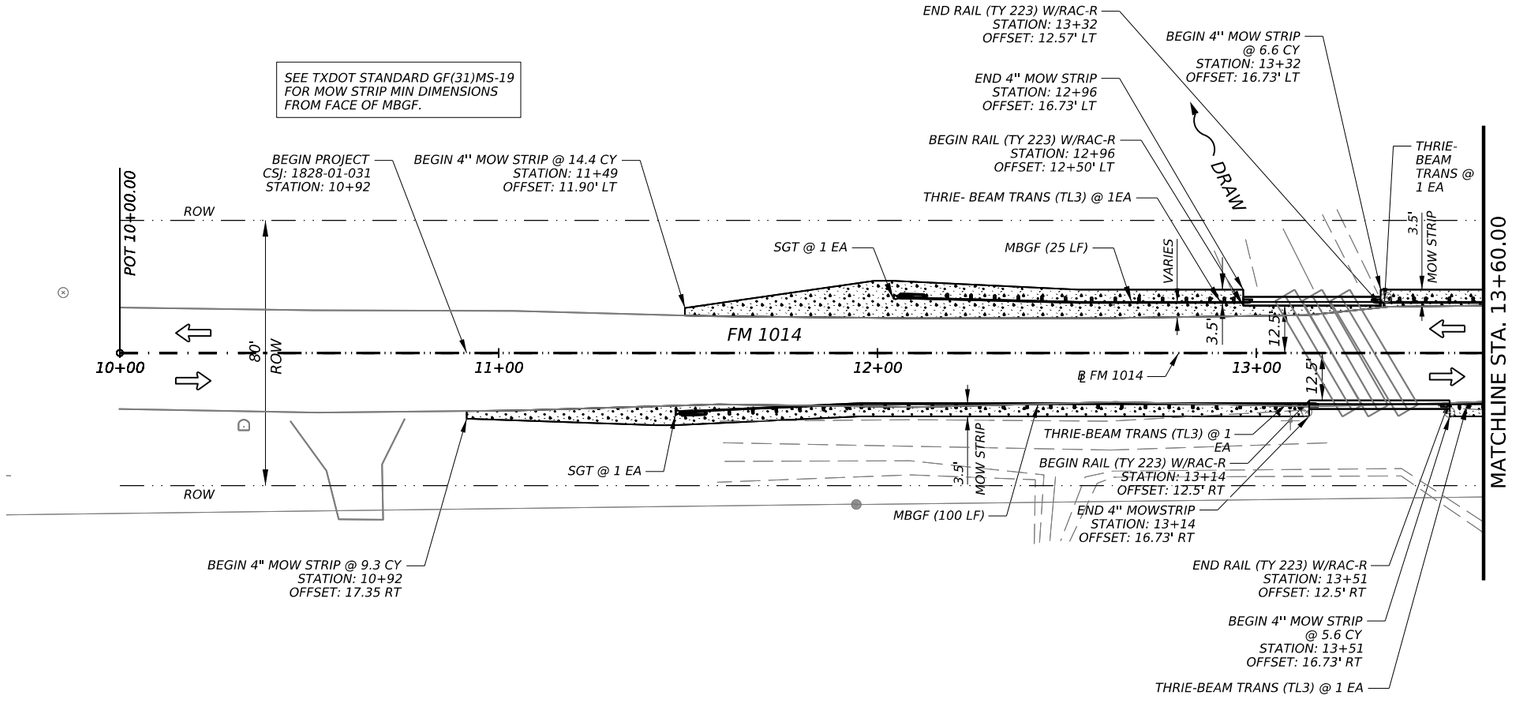

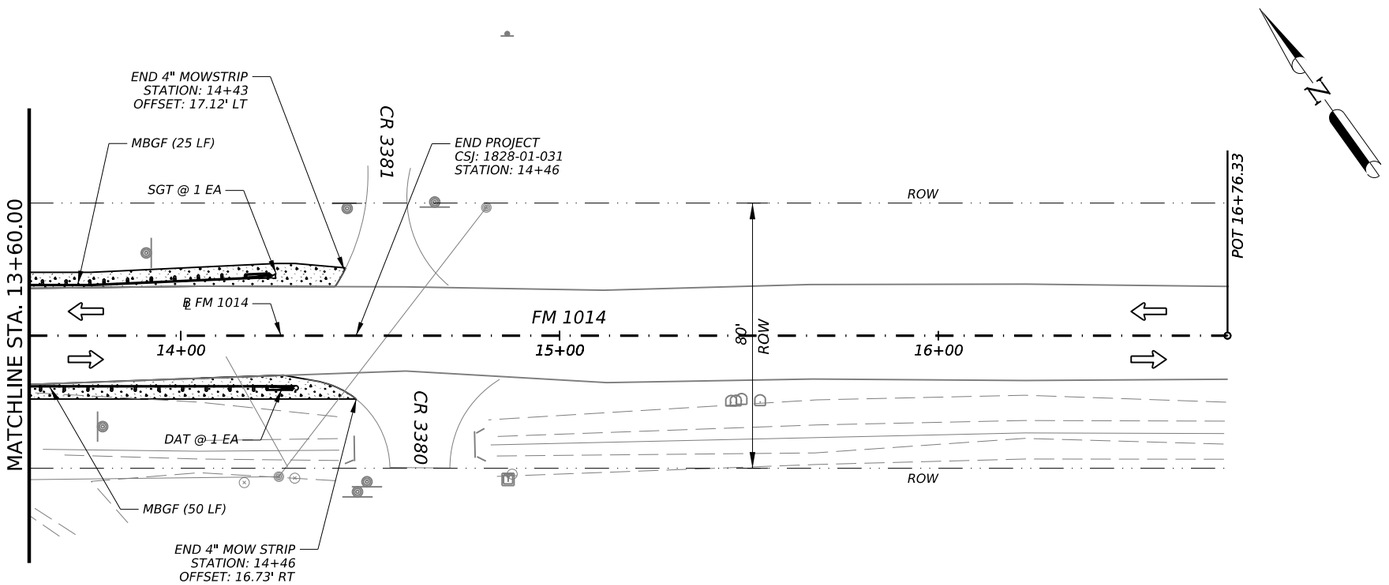

STATE OF TEXAS
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02-27-2024

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FRN - F-14256

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ROADWAY DETAILS
FM 1014 AT DRAW

SHEET 1 OF 1

CONT	SECT	JOB	HIGHWAY
0920	03	082, ETC	CR 1065, ETC
DIST	COUNTY		SHEET NO.
BMT	HARDIN, ETC		70

DATE: 2/26/2024 2:20:48 PM
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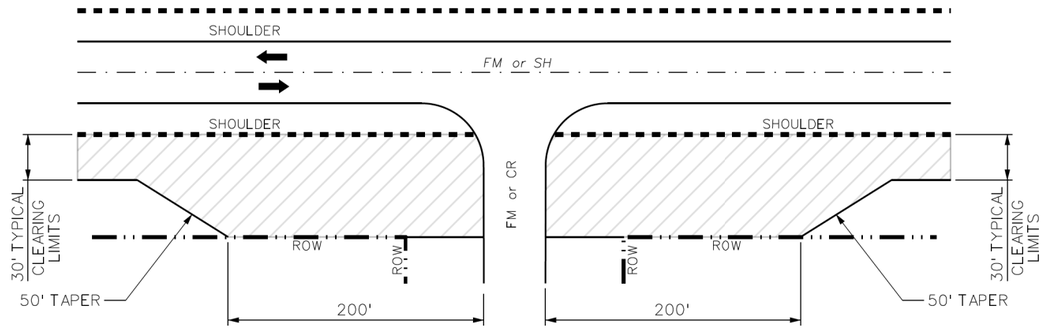
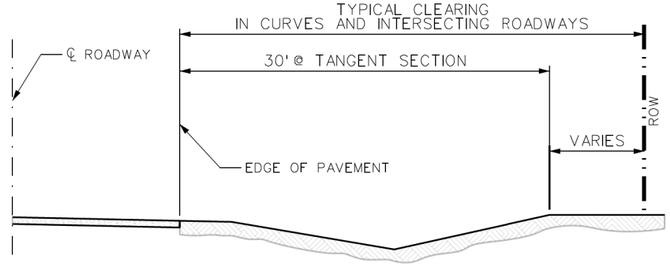
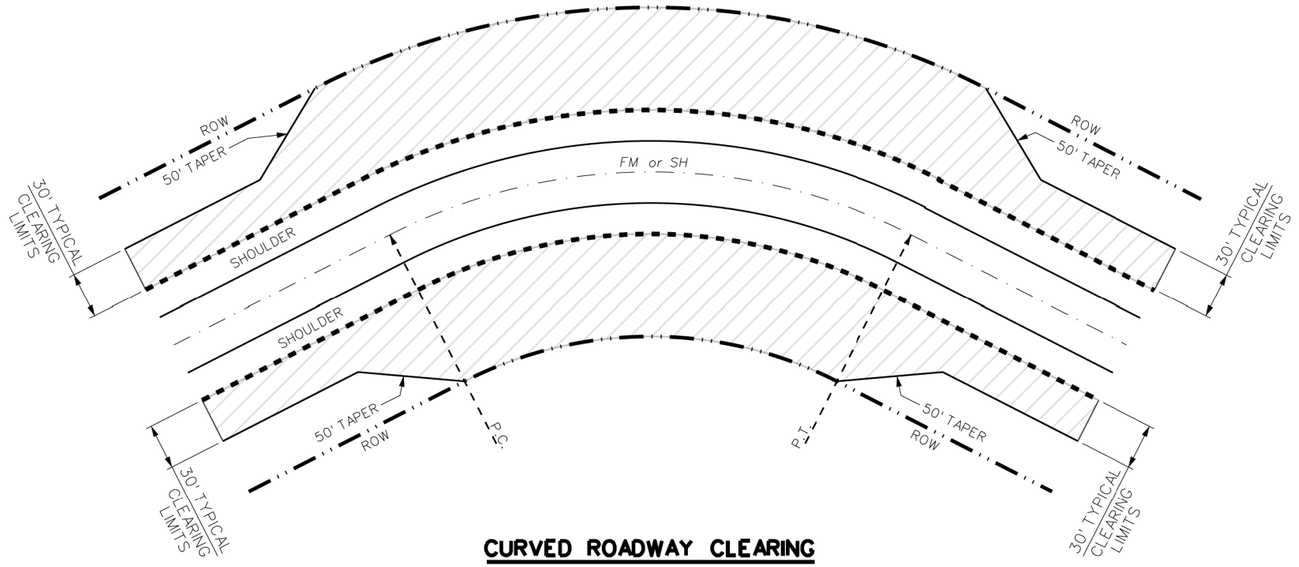
DATE: 2/27/2024
FILE: pw://ija-pw.bentley.com:ija-pw-01/Documents/TxDOT/PM8016-2301 CEC WA4/Clemmons Gully Off-System Bridge#400 Prjduction#4 - Design/Plan Set/3. Roadway/clearing detail.dgn



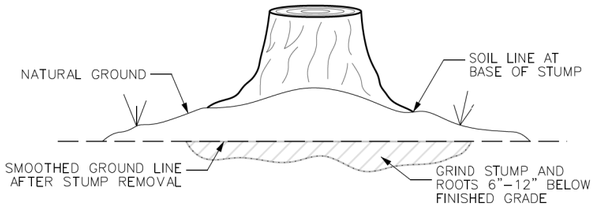
INTERSECTING ROADWAY CLEARING



TYPICAL CLEARING SECTION



CURVED ROADWAY CLEARING

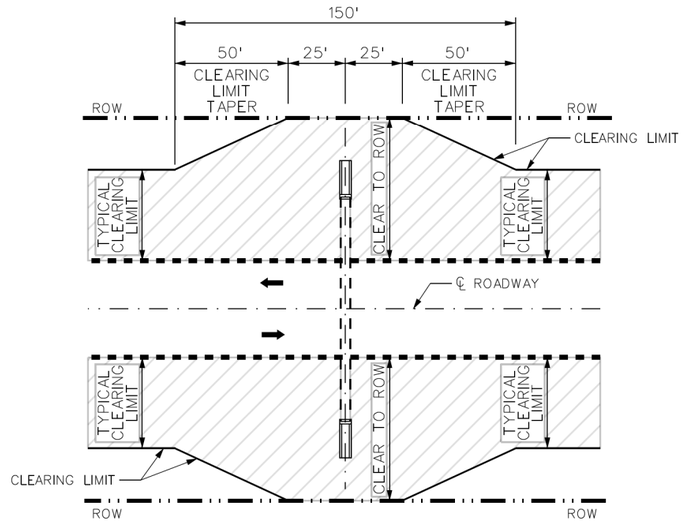


STUMP GRINDING DETAIL

LIMITS CLEARING LIMIT

NOTES:

1. ALL TREE LIMBS EXTENDING INTO THE CLEARING LIMITS WILL BE REMOVED TO A MINIMUM HEIGHT OF SIXTEEN FEET (16') ABOVE THE ADJACENT PAVEMENT EDGE ELEVATION.
2. CLEARING OPERATIONS SHALL BE PERFORMED IN ACCORDANCE WITH ITEM 100, "PREPARING THE RIGHT OF WAY", EXCEPT THOSE SHOWN BY THESE DETAILS.
3. ALL STUMPS WITHIN THE CLEARING LIMITS SHALL BE REMOVED BY GRUBBING, EXCEPT IN AREAS NEAR UNDERGROUND UTILITIES.
4. WHERE CLEARING IS REQUIRED NEAR EXISTING UNDERGROUND UTILITIES, TREES AND STUMPS ARE NOT TO BE GRUBBED. FOR THOSE CONDITIONS, THE RIGHT OF WAY SHALL BE PREPARED BY CUTTING AND GRINDING OF STUMPS AND ROOTS AS DIRECTED.
5. ON AREAS TO BE COVERED BY AT LEAST THREE (3) FEET OF EMBANKMENT, TREES AND STUMPS MAY BE CUT OFF AS CLOSE TO NATURAL GROUND AS PRACTICABLE.
6. WHERE STEEP SLOPES MAKE GRINDING OPERATIONS IMPRACTICAL, AND THE ENGINEER AGREES IN WRITING, THE CONTRACTOR MAY CUT STUMPS OFF EVEN WITH THE GROUND.
7. AT ALL INTERSECTING ROADWAYS, CLEARING SHALL EXTEND TO THE RIGHT OF WAY LINE FOR 200'.



TYPICAL CROSS-CULVERT DETAIL

STATE OF TEXAS
S. E. WRIGHT
108969
LICENSED
PROFESSIONAL ENGINEER

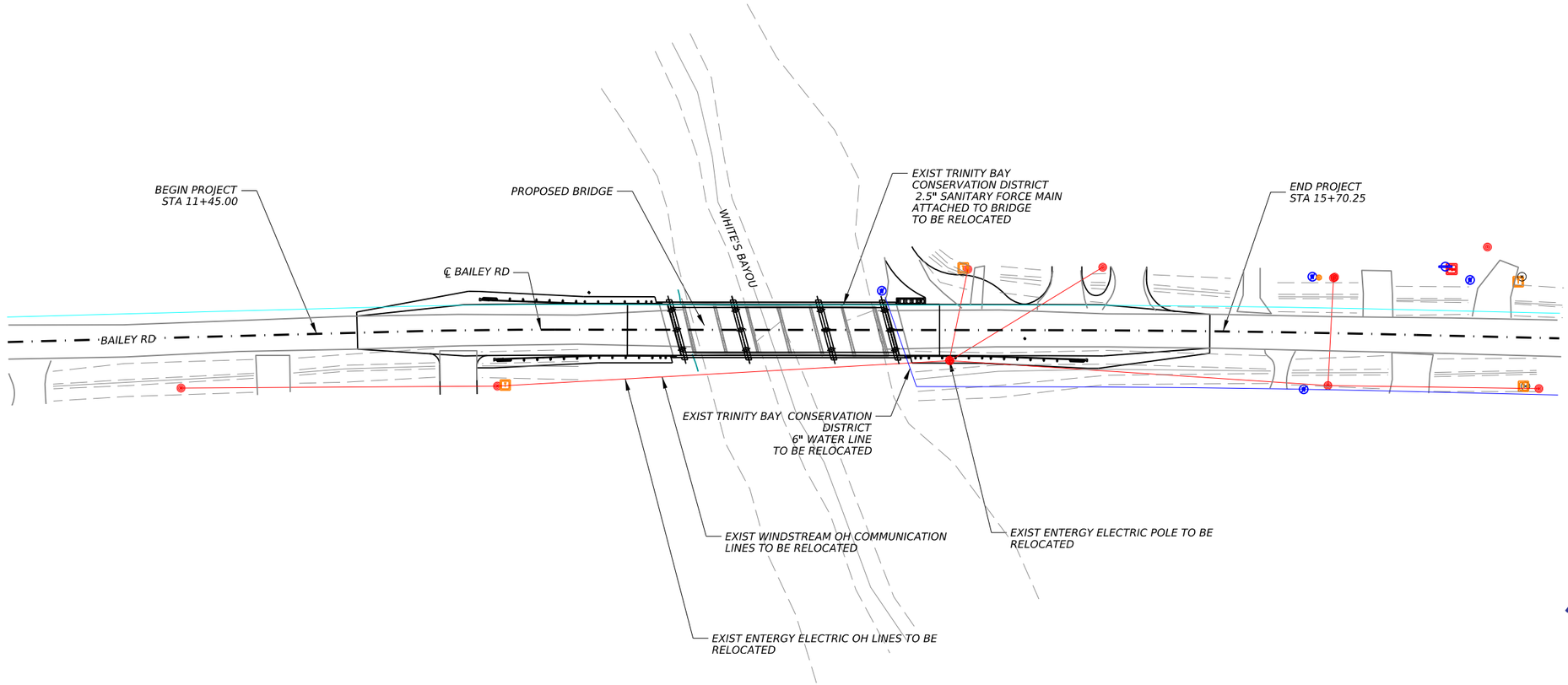
02-27-2024

CLEARING DETAIL

Texas Department of Transportation

FHWA TEXAS DIVISION			SHEET NO.
			71
STATE	DISTRICT	COUNTY	
	BMT	HARDIN, ETC	
CONTROL	SECTION	JOB	HIGHWAY NO.
0920	03	082,ETC	CR 1065, ETC

NTS



LEGEND

- ELECTRIC POLE
- WATER METER
- TELEPHONE PEDESTAL
- PULL BOX
- WATER WELL
- SMALL LIGHT POLE

N

0' 30' 60'
SCALE: 1"=60'

S. E. WRIGHT
108969
LICENSED PROFESSIONAL ENGINEER
STATE OF TEXAS

S E Wright
03-18-2024

0' 30' 60'
SCALE: 1"=60'

LJA PROGRAM MANAGEMENT
FRN - F-14256

Texas Department of Transportation

CLEMMONS GULLY PACKAGE

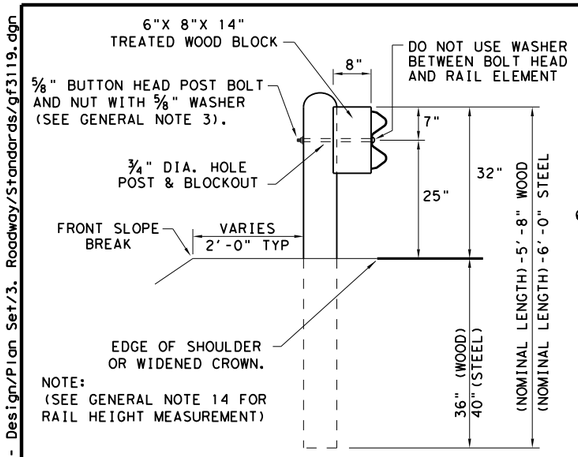
BAILEY RD
AT BARROW SLOUGH
EXISTING UTILITIES

SHEET 1 OF 1

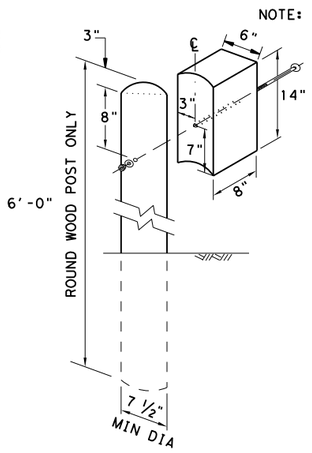
CONT	SECT	JOB	HIGHWAY
0920	03	082, ETC	CR 1065, ETC
DIST	COUNTY		SHEET NO.
BMT	HARDIN, ETC		72

DATE: 3/18/2024 4:13:39 PM
FILE: pw://la-pw.bentley.com:la-pw-01/Documents/TxDOT/PM8016-2301 CEC WA 4/Clemmons Gully Off-System Bridge/400 Production/4 - Design/EXHIBITS/031_BS_UTIL_EXHIBIT.dgn

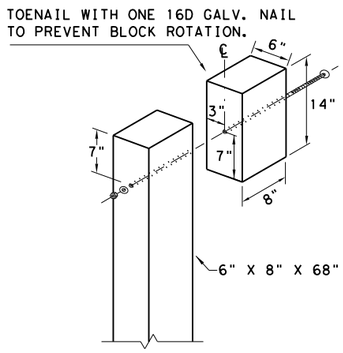
DATE: 2/26/2024
FILE: pw://ljg-pw.bentley.com:ljg-pw-01/Documents/TxDOT/PW8016-2301 CEC WA4/Clemmons Gully Off-System Bridge/400 Production/4 - Design/Plan Set/3. Roadway/Standards/gf3119.dgn



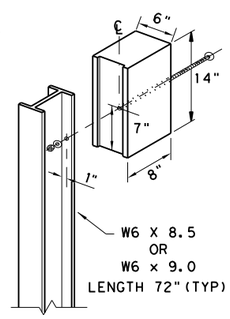
TYPICAL POST PLACEMENT



WOOD BLOCK TO ROUND WOOD POST

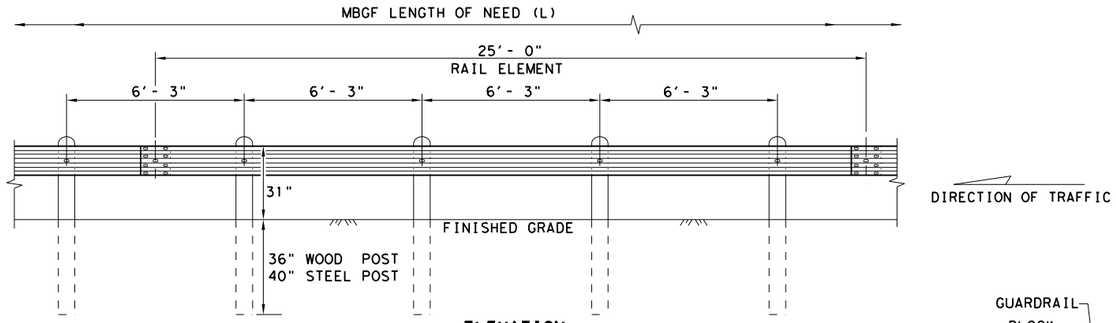


WOOD BLOCK TO RECTANGULAR WOOD POST



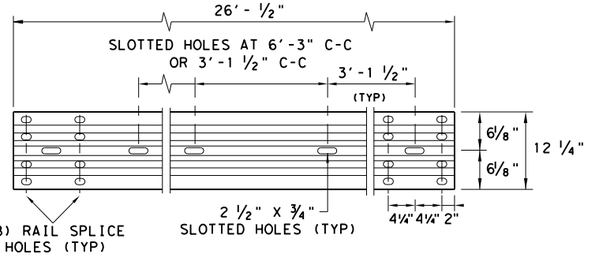
ROUTED WOOD BLOCK TO I-BEAM STEEL POST

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



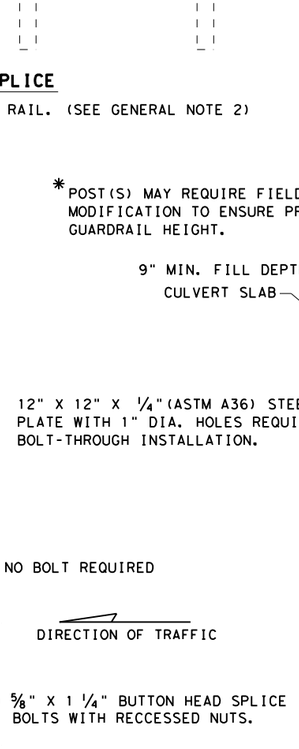
ELEVATION MID-SPAN RAIL SPLICE

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



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

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



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

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

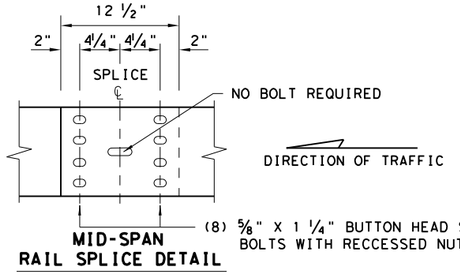
SPLICE BOLT LENGTH — VARIES

FBB01 = 1 1/4"
FBB02 = 2"
5/8"

POST & BLOCK LENGTH
FBB03 = 10"
FBB04 = 18"

BUTTON HEAD BOLT

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



MID-SPAN RAIL SPLICE DETAIL

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

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

Texas Department of Transportation — Design Division Standard

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

FILE: gf3119.dgn	DN: TxDOT	CK: KM	DW: VP	CK: CGL/AG
©TxDOT: NOVEMBER 2019	CONT	SECT	JOB	HIGHWAY
REVISIONS	0920	03	082, ETC	CR 1065, ETC
	DIST	COUNTY		SHEET NO.
	BMT	HARDIN, ETC		73

DATE: 2/26/2024 2:21:25 PM
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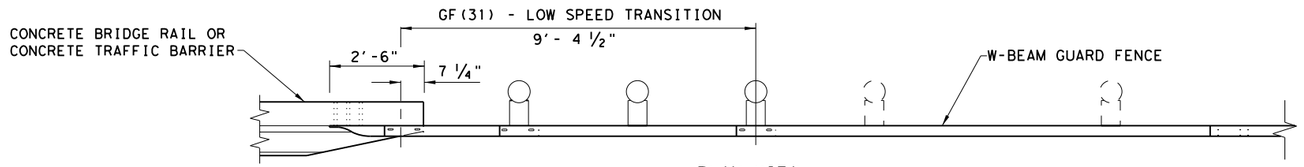
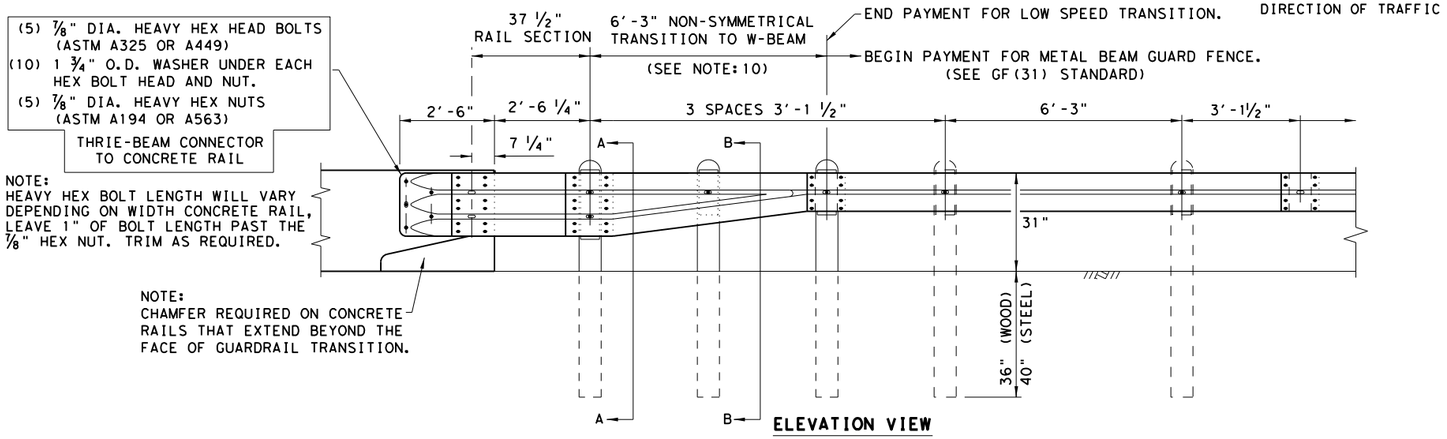


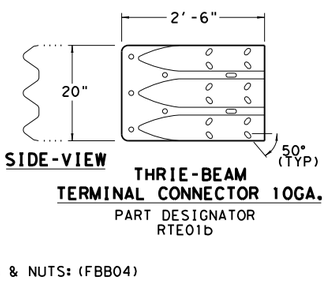
PLAN VIEW



ELEVATION VIEW

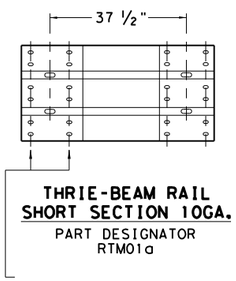
GENERAL NOTES

1. THE TYPE OF POST (ROUND WOOD POST, RECTANGULAR WOOD POST, OR STEEL POST) WILL BE AS SHOWN IN THE PLANS. THE EXACT POSITION OF TRANSITIONS SHALL BE AS SHOWN IN THE PLANS OR AS DIRECTED BY THE ENGINEER. REFER TO GF(31)STANDARD SHEET.
2. RAIL ELEMENT SHALL MEET THE REQUIREMENTS OF ITEM 540, "METAL BEAM GUARD FENCE" EXCEPT AS MODIFIED IN THE PLANS.
3. FITTINGS (BOLTS, NUTS, AND WASHERS) SHALL BE GALVANIZED IN ACCORDANCE WITH ITEM 445, "GALVANIZING." FITTINGS SHALL BE SUBSIDIARY TO THE BID ITEM REQUIRING CONSTRUCTION OF THE TRANSITION.
4. BUTTON HEAD "POST BOLTS & NUTS" SHALL MEET THE REQUIREMENTS OF (ASTM A307), AND SHALL BE OF SUFFICIENT LENGTH TO EXTEND THROUGH THE FULL THICKNESS OF THE NUT AND ⅝" WASHER (FWC16a) AND NOT MORE THAN 1" BEYOND IT. TRIM BOLT LENGTH TO MEET REQUIRED LENGTH.
5. POSTS SHALL NOT BE SET IN CONCRETE, OF ANY DEPTH.
6. CROWN SHALL BE WIDENED TO ACCOMMODATE TRANSITIONS.
7. WHERE SOLID ROCK IS ENCOUNTERED, CONTACT THE DESIGN DIVISION FOR ADDITIONAL GUIDANCE. (512) 416-2678
8. UNLESS OTHERWISE SHOWN IN THE PLANS, A COMPOSITE MATERIAL BLOCK THAT MEETS THE REQUIREMENTS OF DMS-7210, "COMPOSITE MATERIAL POSTS AND BLOCKS FOR METAL BEAM GUARD FENCE" MAY BE SUBSTITUTED FOR BLOCKS OF SIMILAR DIMENSIONS. THE CONSTRUCTION DIVISION, TXDOT, MAINTAINS A MATERIAL PRODUCER LIST (MPL) FOR PRODUCERS OF MATERIALS CONFORMING TO DMS-7210. ONLY PRODUCERS ON THE MPL CAN FURNISH COMPOSITE MATERIAL BLOCKS.
9. REFER TO GF(31)STANDARD SHEET & BRIDGE RAILING DETAILS FOR ADDITIONAL DETAILS.
10. FOR ROUND WOOD POSTS SYSTEMS, ALL ROUND WOOD POSTS SHALL BE 7 ½" DIA. MINIMUM THROUGHOUT THE TRANSITION.

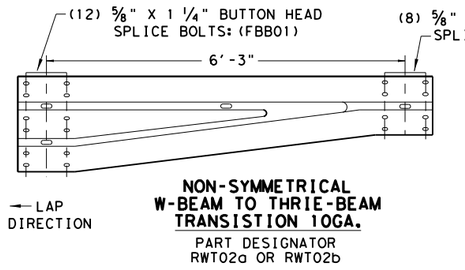


SIDE-VIEW

THRIE-BEAM TERMINAL CONNECTOR 10GA.
PART DESIGNATOR RTE01b



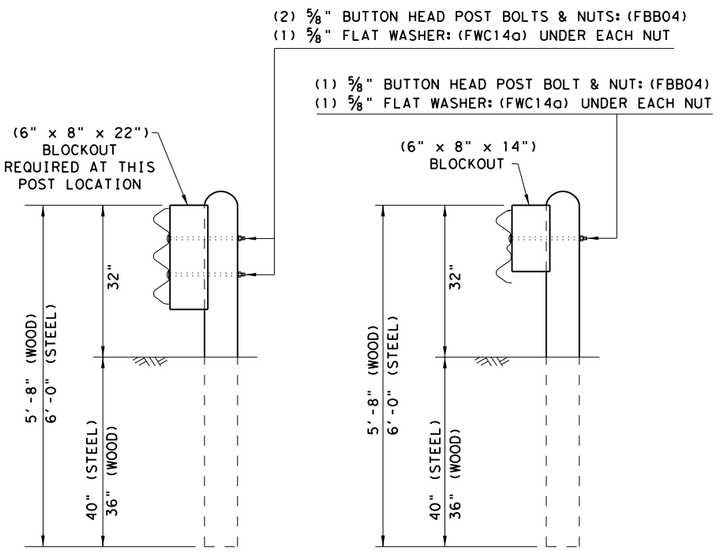
THRIE-BEAM RAIL SHORT SECTION 10GA.
PART DESIGNATOR RTM01a



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

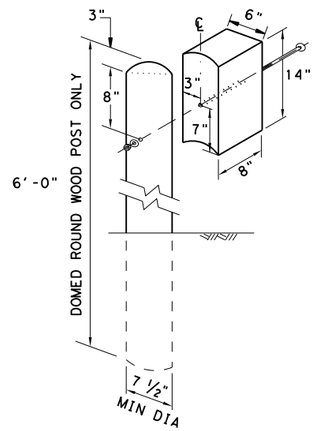
PLATE WASHER INSTRUCTIONS

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

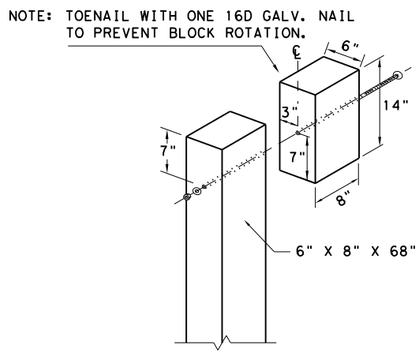


SECTION A-A

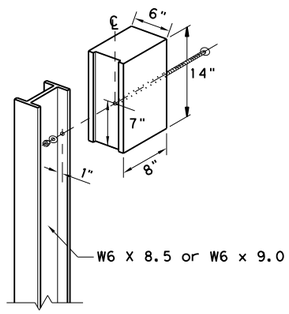
SECTION B-B



WOOD BLOCK TO ROUND WOOD POST



WOOD BLOCK TO RECTANGULAR WOOD POST



ROUTED WOOD BLOCK TO I-BEAM STEEL POST

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

LOW-SPEED TRANSITION

Texas Department of Transportation | Design Division Standard

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

GF(31)TR TL2-19

FILE: gf31trt1219.dgn	DN: TxDOT	CK: KM	DW: VP	CK: CGL/AG		
©TxDOT: NOVEMBER 2019	CONT	SECT	JOB		HIGHWAY	
REVISIONS	0920	03	082, ETC		CR 1065, ETC	
	DIST	COUNTY			SHEET NO.	
	BMT	HARDIN, ETC			74	

DATE: 2/26/2024
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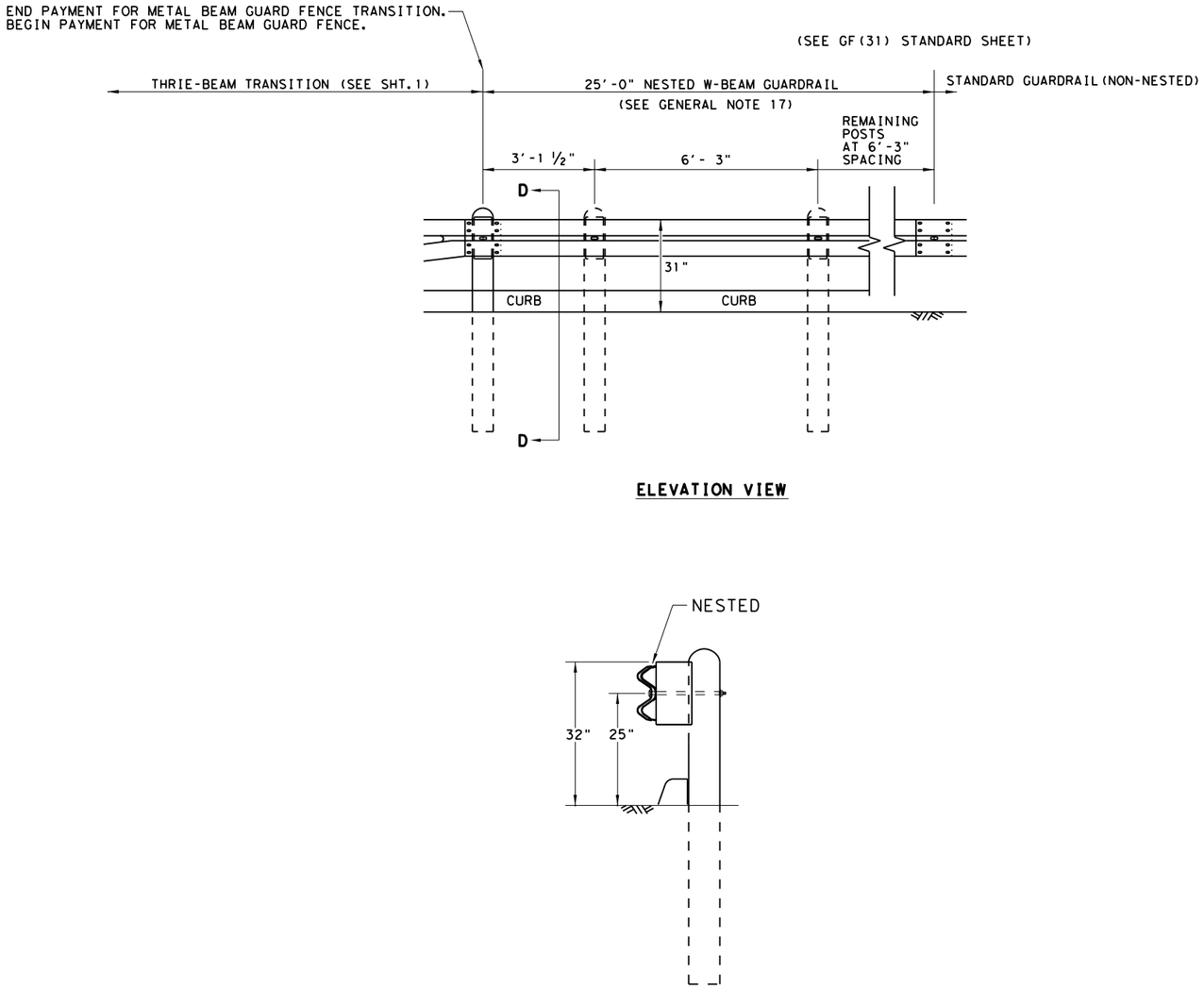
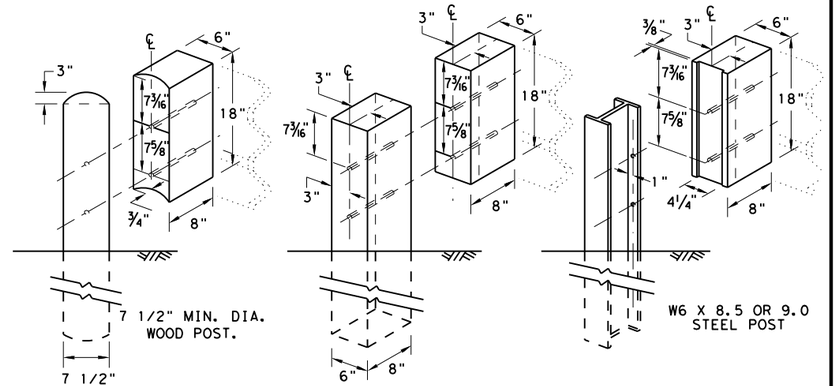
REQUIRED ALTERNATIVE FOR CONTINUOUS CURB EXTENDING PAST POST 7 (SEE SHT. 1 GENERAL NOTE 17)



ELEVATION VIEW

SECTION D-D



THRIE BEAM TRANSITION BLOCKOUT DETAILS

HIGH-SPEED TRANSITION

SHEET 2 OF 2

Texas Department of Transportation | Design Division Standard

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

GF(31)TR TL3-20

FILE: gf31trt1320.dgn	DN: TxDOT		CK: KM	DW: KM	CK: CGL/AG	
©TxDOT: NOVEMBER 2020	CONT	SECT	JOB		HIGHWAY	
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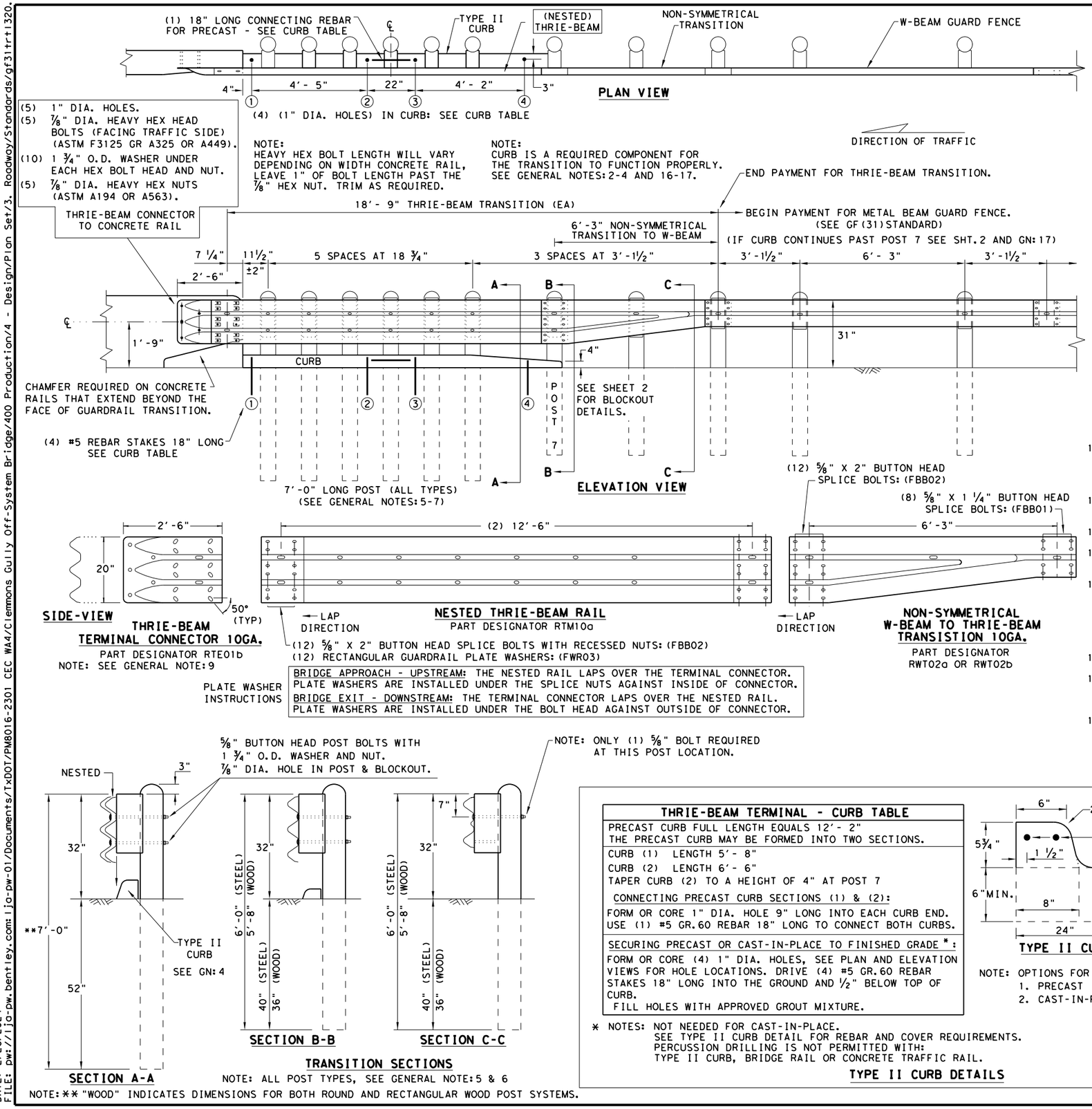


GENERAL NOTES

1. CONTACT THE DESIGN DIVISION FOR DRAINAGE CUT OUT OPTIONS NEEDED WITHIN THE CURB SECTION OF THE THRIE-BEAM TRANSITION. (512) 416-2678
2. CONCRETE CURB MAY BE CAST-IN-PLACE OR PRECAST AS SHOWN ON THIS SHEET. WHEN USED IN CONJUNCTION WITH THE THRIE-BEAM TRANSITIONS, CURB SHALL BE TYPE II (5- ¾" HEIGHT); SEE CURRENT CCCG STANDARD SHEET FOR FURTHER DETAILS. IF OTHER CURB HEIGHTS ARE SHOWN IN THE PLANS IN CONJUNCTION WITH THE TRANSITION, THE CURB HEIGHT MAY BE FROM 4" TO 8" WITH A RELATIVELY VERTICAL FACE. CONCRETE CURB SHALL BE CONTINUOUS TO THE SEVENTH POST UNLESS OTHERWISE SHOWN IN THE PLANS. SEE GENERAL NOTE: 17 FOR CIRCUMSTANCES WHERE CURB CONTINUES PAST POST 7.
3. CONCRETE CURB TYPE II SUBSIDIARY TO "METAL BEAM GUARD FENCE TRANSITION". IF NO ADDITIONAL CURB IS INDICATED BEYOND THE TRANSITION, THEN ANY CURB HEIGHT GREATER THAN 4" WILL BE TAPERED DOWN BEGINNING AT THE LAST 7 FT. POST TO A MAXIMUM HEIGHT OF 4" AT POST 7. IF SHOWN ELSEWHERE IN THE PLANS, ADDITIONAL CURB UNDERNEATH GUARDRAIL WILL BE PAID FOR BY THE LINEAR FOOT.
4. UNLESS OTHERWISE SHOWN IN THE PLANS, TRANSITIONS SHALL BE PLACED WITH THE BLOCKOUT FACE IN FRONT OF OR DIRECTLY ABOVE THE CURB FACE. SEE SECTION A-A.
5. FOR ROUND WOOD POST SYSTEMS, ALL ROUND WOOD POSTS SHALL BE 7 ½" DIA. MINIMUM THROUGHOUT THE THRIE-BEAM TRANSITION.
6. THE TYPE OF POST (ROUND WOOD POST, RECTANGULAR WOOD POST OR STEEL POST) WILL BE AS SHOWN IN THE PLANS. REFER TO GF(31) STANDARD SHEET.
7. THE POST LENGTH SHALL BE MARKED ON ALL 7'- 0" LONG POSTS BY THE MANUFACTURER. THE MARK SHALL BE LOCATED WITHIN THE TOP 1 FT. REGION OF THE POST, AT LEAST ⅝" IN HEIGHT, AND VISIBLE AFTER INSTALLATION. WOODEN POSTS SHALL BE MARKED WITH A BRAND, AND STEEL POSTS WITH A STENCIL BEFORE GALVANIZING.
8. POSTS SHALL NOT BE SET IN CONCRETE, OF ANY DEPTH.
9. RAIL ELEMENTS SHALL MEET THE REQUIREMENTS OF ITEM 540, "METAL BEAM GUARD FENCE" EXCEPT AS MODIFIED ON THE PLANS. THE THRIE-BEAM TERMINAL CONNECTOR AND THE THRIE-BEAM TRANSITION TO W-BEAM SHALL BE OF THE SAME MATERIAL, BUT SHALL NOT BE LESS THAN 10 GAUGE. CONTRACTOR SHALL VERIFY THAT THE LOCATIONS OF BOLT HOLES MATCH THOSE IN THE THRIE-BEAM TERMINAL CONNECTOR PRIOR TO ORDERING MATERIALS.
10. BUTTON HEAD "POST BOLTS & NUTS" SHALL MEET THE REQUIREMENTS OF (ASTM A307), AND SHALL BE OF SUFFICIENT LENGTH TO EXTEND THROUGH THE FULL THICKNESS OF THE NUT AND ⅝" WASHER (FWC16a) AND NOT MORE THAN 1" BEYOND IT. TRIM REMAINING BOLT LENGTH TO MEET REQUIRED LENGTH.
11. FITTINGS (BOLTS, NUTS, AND WASHERS) SHALL BE GALVANIZED IN ACCORDANCE WITH ITEM 445, "GALVANIZING". FITTINGS SHALL BE SUBSIDIARY TO THE BID ITEM.
12. CROWN SHALL BE WIDENED TO ACCOMMODATE TRANSITIONS.
13. WHERE SOLID ROCK IS ENCOUNTERED, CONTACT THE DESIGN DIVISION FOR ADDITIONAL GUIDANCE. (512) 416-2678
14. UNLESS OTHERWISE SHOWN IN THE PLANS, A COMPOSITE MATERIAL BLOCK THAT MEETS THE REQUIREMENTS OF DMS-7210, "COMPOSITE MATERIAL POSTS AND BLOCKS FOR METAL BEAM GUARD FENCE" MAY BE SUBSTITUTED FOR BLOCKS OF SIMILAR DIMENSIONS. TXDOT'S MATERIALS AND TESTS DIVISION MAINTAINS A MATERIAL PRODUCER LIST (MPL) FOR PRODUCERS OF MATERIALS CONFORMING TO DMS-7210. ONLY PRODUCERS ON THE MPL CAN FURNISH COMPOSITE MATERIAL BLOCKS.
15. REFER TO GF(31) STANDARD SHEET & BRIDGE RAILING DETAILS FOR ADDITIONAL DETAILS.
16. THE INSTALLATION OF THE TYPE II CURB IS CRITICAL FOR THE PERFORMANCE OF THE THRIE-BEAM TRANSITION SYSTEM. THE CURB PREVENTS (VEHICLE WHEEL SNAGGING) AT THE CONCRETE RAIL AND IS REQUIRED TO MEET MASH CRASH TEST CRITERIA.
17. IF CURB EXTENDS BEYOND POST 7, 25' OF NESTED W-BEAM GUARDRAIL SHALL BE INSTALLED BEYOND THE PAY LIMITS OF THRIE-BEAM TRANSITION SECTION, (SEE SHT.2). PAYMENT FOR THIS 25' SECTION WILL BE BY LINEAR FOOT, PAY ITEM "0540 6XXX MTL W-BEAM GD FEN (NESTED)(TIM POST)" OR "540 6XXX MTL W-BEAM GD FEN (NESTED)(STEEL POST)" AS APPLICABLE FOR POST TYPE. SEE SHT.2 FOR ADDITIONAL INFORMATION.

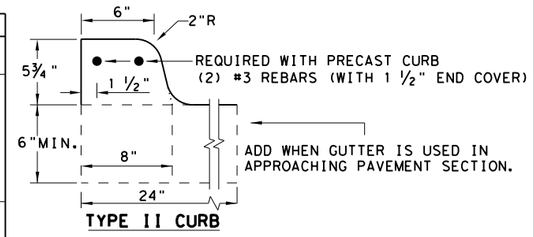
THRIE-BEAM TERMINAL - CURB TABLE

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

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

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

SECURING PRECAST OR CAST-IN-PLACE TO FINISHED GRADE *:
FORM OR CORE (4) 1" DIA. HOLES, SEE PLAN AND ELEVATION VIEWS FOR HOLE LOCATIONS. DRIVE (4) #5 GR.60 REBAR STAKES 18" LONG INTO THE GROUND AND ½" BELOW TOP OF CURB.
FILL HOLES WITH APPROVED GROUT MIXTURE.



TYPE II CURB

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

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

TYPE II CURB DETAILS

HIGH-SPEED TRANSITION

SHEET 1 OF 2

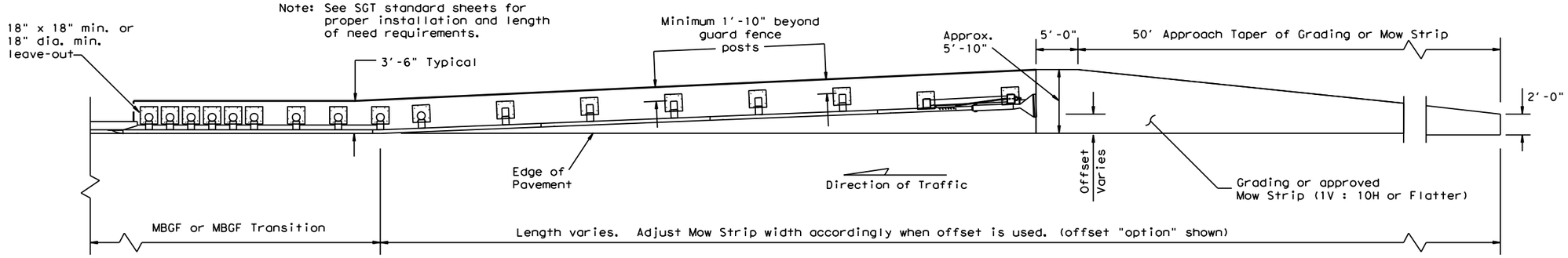
Texas Department of Transportation | Design Division Standard

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

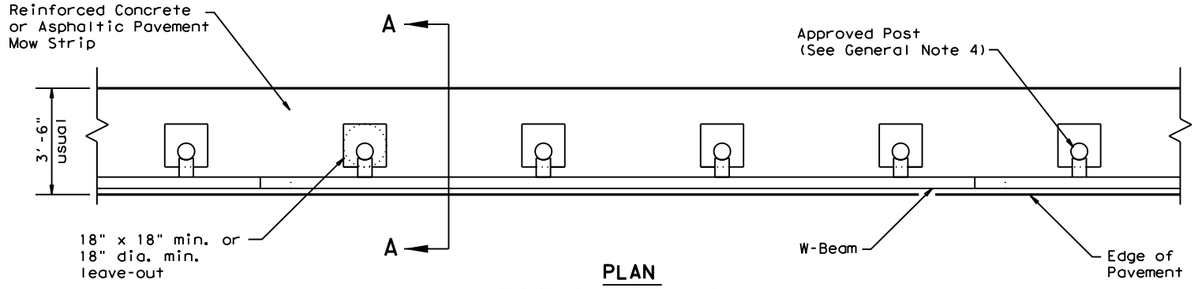
GF(31)TR TL3-20

FILE: gf31trt1320.dgn	DN: TxDOT	CK: KM	DW: VP	CK: CGL/AG
©TxDOT: NOVEMBER 2020	CONT	SECT	JOB	HIGHWAY
REVISIONS	0920	03	082, ETC	CR 1065, ETC
	DIST	COUNTY		SHEET NO.
	BMT	HARDIN, ETC		76

DATE: 2/26/2024
FILE: pw://ijo-pw.bentley.com:ijo-pw-01/Documents/TxDOT/PW8016-2301 CEC WA4/Clemmons Gully Off-System Bridge/400 Production/4 - Design/Plan Set/3. Roadway/Standards/gf31ms19 (1).dgn

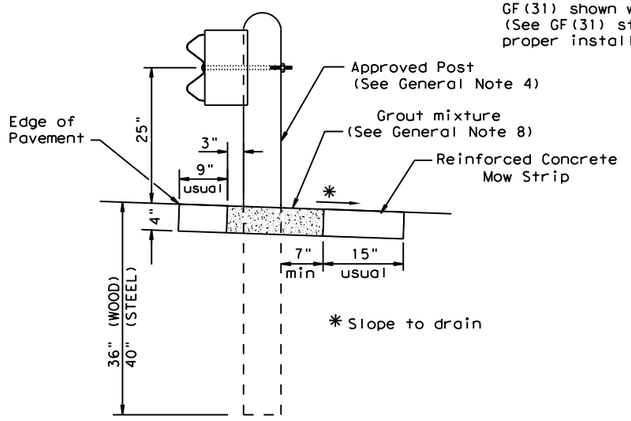


GRADING AND MOW STRIP AT GUARDRAIL END TREATMENTS



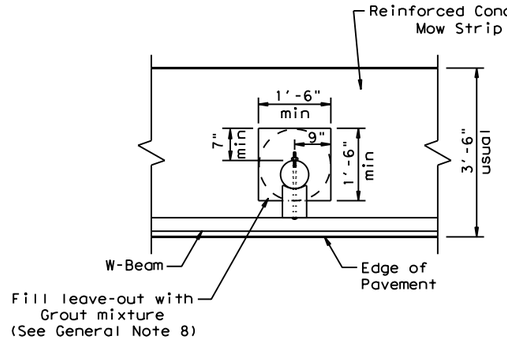
PLAN

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



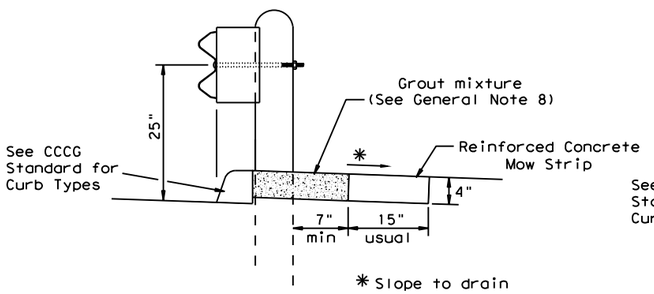
SECTION A-A

Typical



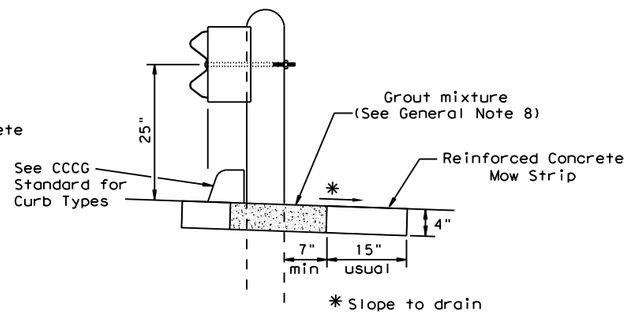
MOW STRIP DETAIL

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



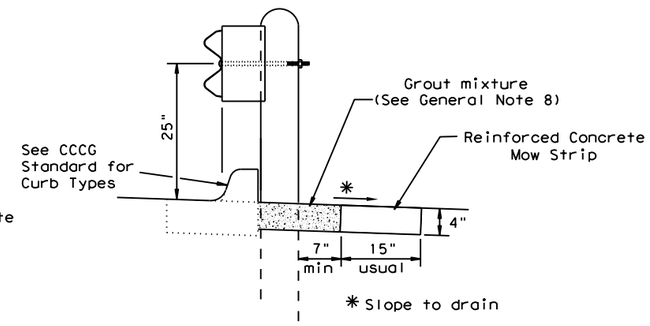
CURB OPTION (1)

This option will increase the post embedment throughout the system.



CURB OPTION (2)

Curb shown on top of mow strip



CURB OPTION (3)

Note: Site Condition(s)

Site conditions may exist where grading is required for the proper installation of metal guard fence and end treatments.

Approach grading or mow strip may be decreased or eliminated, as directed by the Engineer.

GENERAL NOTES

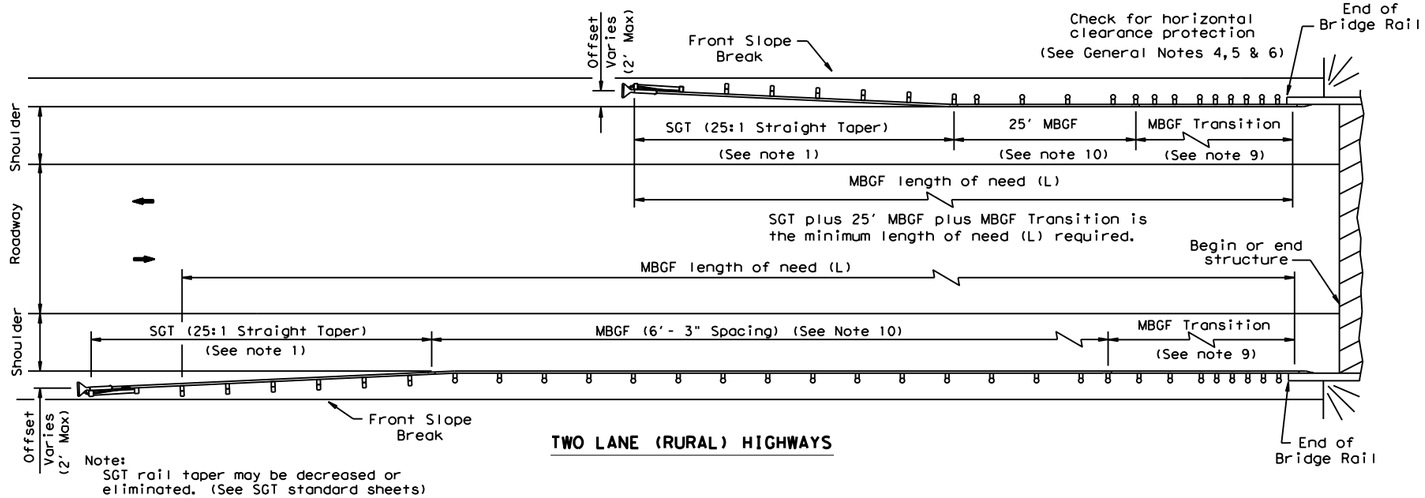
1. This mow strip design is for use with metal beam guard fence, guard fence transitions, and guard fence end treatments. See applicable GF(31) MBGF or GF(31) Transition Standard sheet for additional information.
2. Mow strips shall be reinforced concrete with (wire mesh or synthetic fiber), as shown on the plans and will be paid for under the pertinent bid item. Reinforced concrete shall be placed in accordance with Item 432, "Riprap." The use of the synthetic fiber in lieu of steel reinforcing is acceptable, provided the fiber producer is on the Department Material Producer List (MPL), maintained by TxDOT, Construction Division.
3. The leave-out behind the post shall be a minimum of 7".
4. Only steel (W6 x 8.5 or W6 x 9.0), or 7 ½" Dia. round wood posts are acceptable for use in the mow strip. See GF(31) Standard for additional details.
5. Other curb placement options may be used. Curbs are not considered part of the mow strip and will be paid for under other pertinent bid item.
6. Thickness of the mow strip will be 4".
7. The limits of payment for reinforced concrete will include leave-outs for the posts.
8. The leave-outs shall be filled with a Grout mixture consisting of: 2719 pounds sand, 188 pounds Type 1 or II cement, and 550 pounds of water per cubic yard, with a 28-day compressive strength of approximately 230 psi or less. Provide grout with a consistency that will flow into and completely fill all voids. Due to auger size, larger leave-out dimensions are acceptable from both an impact performance and maintenance repair standpoint (Suggested Maximum leave-out of 20"). Payment for furnishing and placing the grout mixture will be subsidiary to the pay item of riprap mow strip.

Texas Department of Transportation — Design Division Standard

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

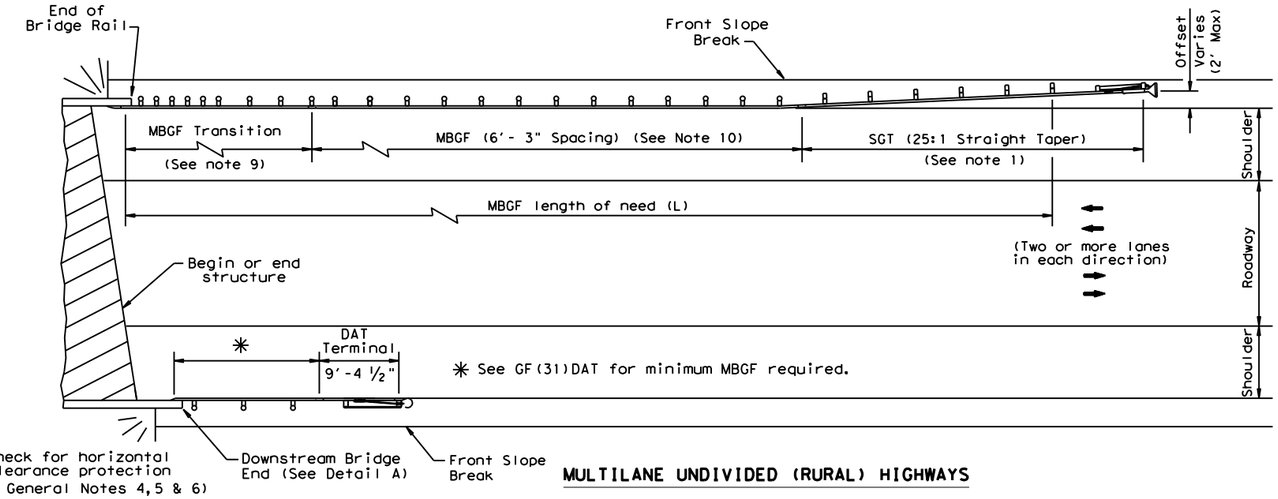
GF(31)MS-19

FILE: gf31ms19.dgn	DN: TxDOT	CK: KM	DW: VP	CK: CGL/AG		
©TxDOT: NOVEMBER 2019	CONT	SECT	JOB		HIGHWAY	
REVISIONS	0920	03	082, ETC		CR 1065, ETC	
	DIST	COUNTY			SHEET NO.	
	BMT	HARDIN, ETC			77	

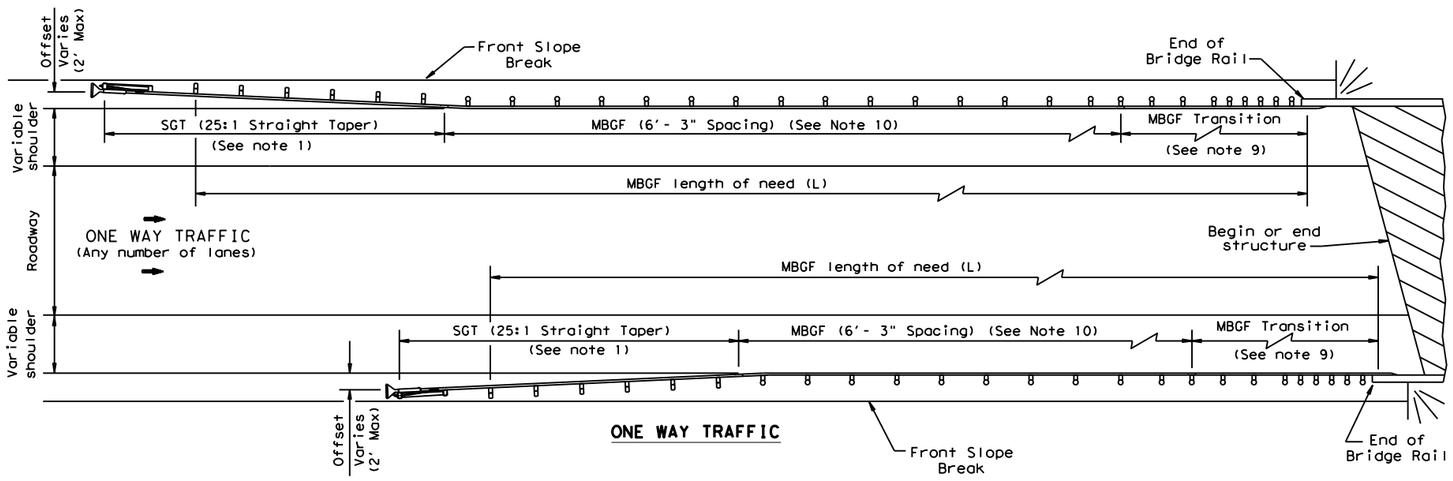


TWO LANE (RURAL) HIGHWAYS

Note:
SGT rail taper may be decreased or eliminated. (See SGT standard sheets)



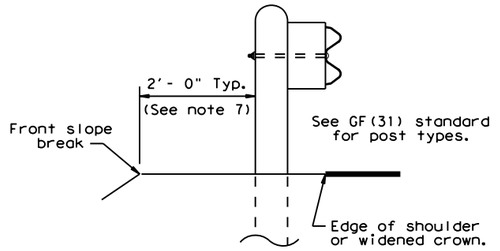
MULTILANE UNDIVIDED (RURAL) HIGHWAYS



ONE WAY TRAFFIC

GENERAL NOTES

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



TYPICAL CROSS SECTION AT MBGF

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

DETAIL A

Showing Downstream Rail Attachment

Texas Department of Transportation — Design Division Standard

BRIDGE END DETAILS

(METAL BEAM GUARD FENCE APPLICATIONS TO RIGID RAILS)

BED-14

FILE: bed14.dgn	DN: TxDOT	CK: AM	DW: BD/VP	CK: CGL
© TxDOT: December 2011	CONT	SECT	JOB	HIGHWAY
REVISIONS REVISED APRIL 2014 SEE (MEMO 0414)	0920	03	082, ETC	CR 1065, ETC
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	BMT	HARDIN, ETC		78

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DATE: 2/26/2024
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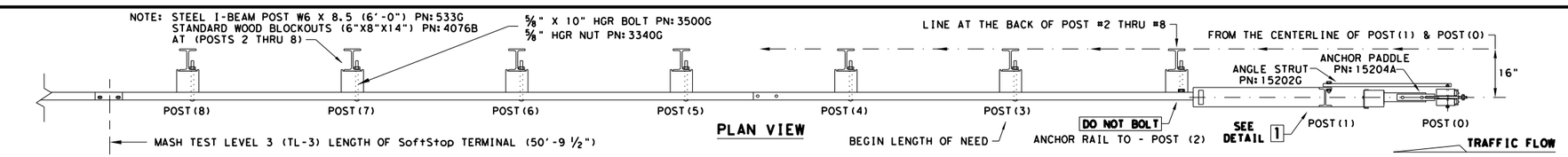
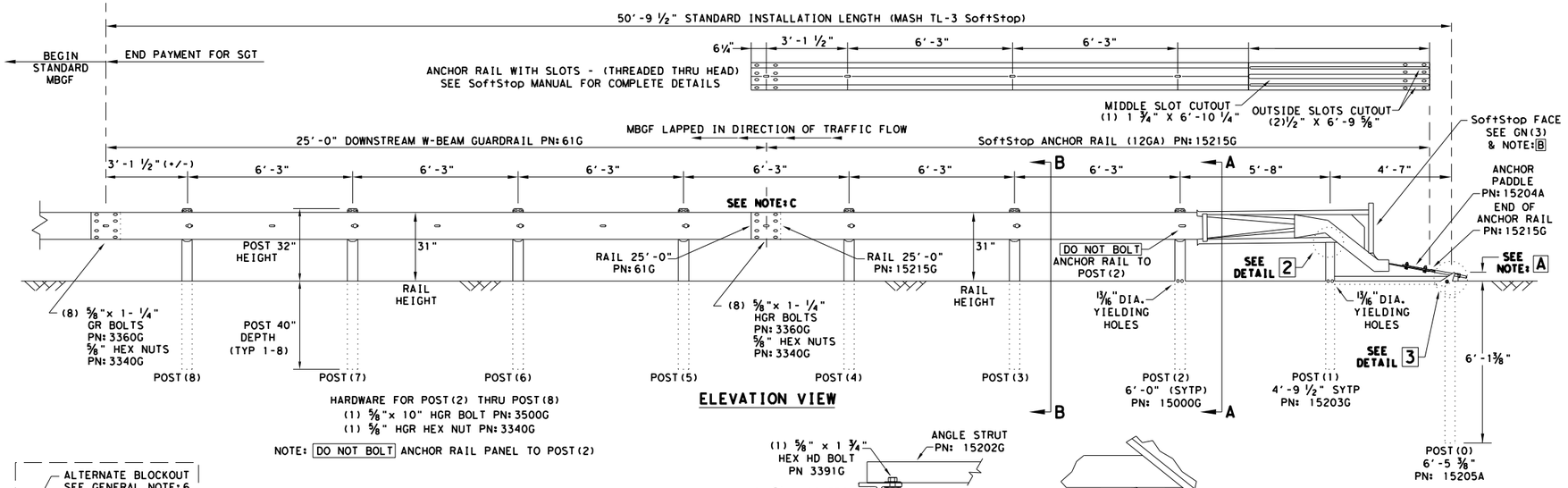
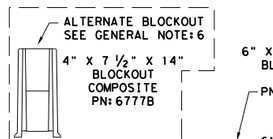


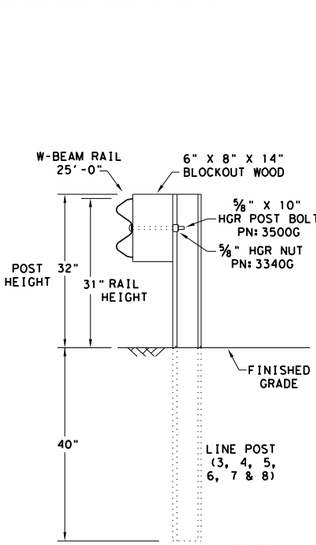




ISOMETRIC VIEW POST(1 & 2)

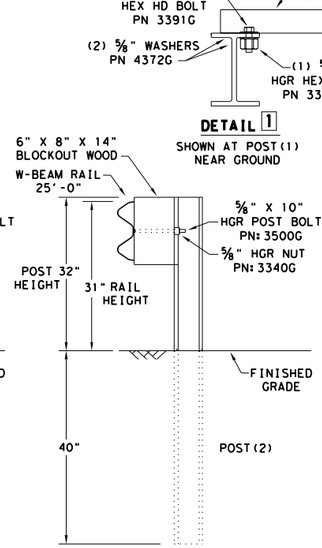
W6 X 8.5 I-BEAM POST SHOWING STANDARD WOOD BLOCKOUT

NOTE: NO BLOCKOUT INSTALLED AT POST(1)



SECTION VIEW B-B

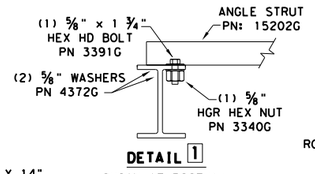
6'-0" (W6 X 8.5)
I-BEAM POST PN: 533G



SECTION VIEW A-A

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

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

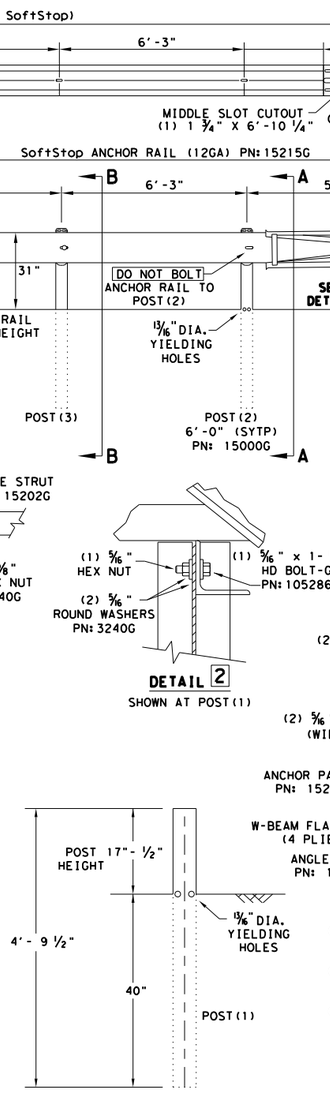


DETAIL 1

SHOWN AT POST(1) NEAR GROUND

DETAIL 2

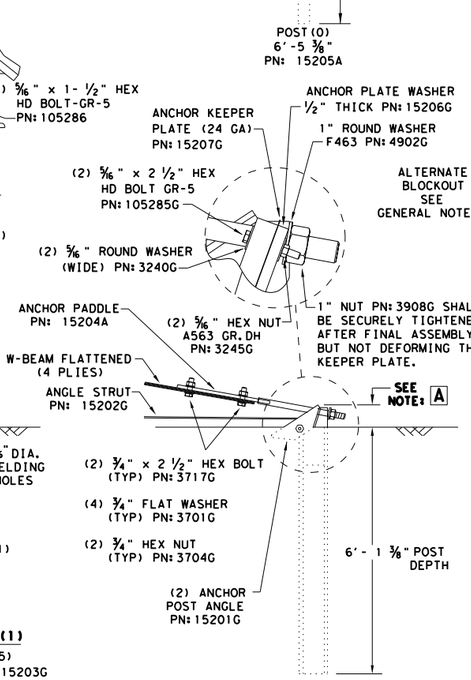
SHOWN AT POST(1)



FRONT VIEW POST(1)

4'-9 ½" (W6 X 8.5)
(SYTP) I-BEAM POST PN: 15203G

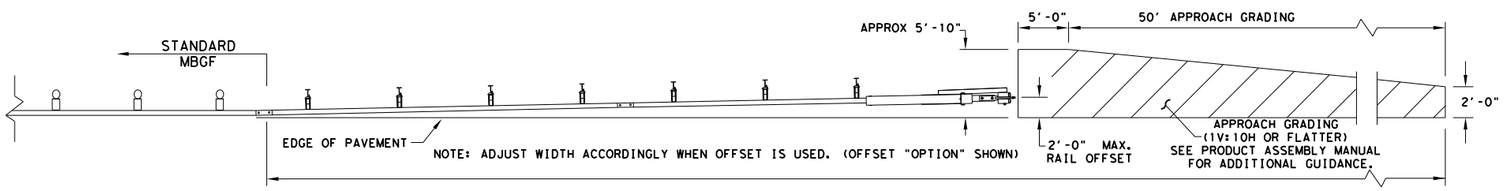
NOTE: NO BLOCKOUT INSTALLED AT POST(1)



DETAIL 3 AT POST(0)

6'-5 ⅜" (W6 X 15)
I-BEAM POST PN: 15205A

TRAFFIC FLOW



APPROACH GRADING AT GUARDRAIL END TREATMENTS

GENERAL NOTES

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

NOTE:A	THE INSTALLATION HEIGHT OF FULLY ASSEMBLED ANCHOR POST WILL VARY FROM 3-¾" MIN. TO 4" MAX. ABOVE FINISHED GRADE.
NOTE:B	PART PN: 5852B RIGHT-SIDE (HIGH INTENSITY REFLECTIVE SHEETING) PART PN: 5851B LEFT-SIDE (HIGH INTENSITY REFLECTIVE SHEETING)
NOTE:C	W-BEAM SPLICE LOCATED BETWEEN LINE POST(4) AND LINE POST(5) GUARDRAIL PANEL 25'-0" PN: 61G ANCHOR RAIL 25'-0" PN: 15215G LAP GUARDRAIL IN DIRECTION OF TRAFFIC FLOW.

PART	QTY	MAIN SYSTEM COMPONENTS
620237B	1	PRODUCT DESCRIPTION ASSEMBLY MANUAL (LATEST REV.)
15208A	1	SoftStop HEAD (SEE MANUAL FOR RIGHT-LEFT APPROACH)
15215G	1	SoftStop ANCHOR RAIL (12GA) WITH CUTOUT SLOTS
61G	1	SoftStop DOWNSTREAM W-BEAM RAIL (12GA) (25'- 0")
15205A	1	POST #0 - ANCHOR POST (6'- 5 ⅜")
15203G	1	POST #1 - (SYTP) (4'- 9 ½")
15000G	1	POST #2 - (SYTP) (6'- 0")
533G	6	POST #3 THRU #8 - I-BEAM (W6 x 8.5) (6'- 0")
4076B	7	BLOCKOUT - WOOD (ROUTED) (6" x 8" x 14")
6777B	7	BLOCKOUT - COMPOSITE (4" x 7 ½" x 14")
15204A	1	ANCHOR PADDLE
15207G	1	ANCHOR KEEPER PLATE (24 GA)
15206G	1	ANCHOR PLATE WASHER (½" THICK)
15201G	2	ANCHOR POST ANGLE (10" LONG)
15202G	1	ANGLE STRUT
		HARDWARE
4902G	1	1" ROUND WASHER F436
3908G	1	1" HEAVY HEX NUT A563 GR.DH
3717G	2	¾" x 2 ½" HEX BOLT A325
3701G	4	¾" ROUND WASHER F436
3704G	2	¾" HEAVY HEX NUT A563 GR.DH
3360G	16	⅝" x 1 ¼" W-BEAM RAIL SPLICE BOLTS HGR
3340G	25	⅝" W-BEAM RAIL SPLICE NUTS HGR
3500G	7	⅝" x 10" HGR POST BOLT A307
3391G	1	⅝" x 1 ¾" HEX HD BOLT A325
4489G	1	⅜" x 9" HEX HD BOLT A325
4372G	4	⅝" WASHER F436
105285G	2	⅝" x 2 ½" HEX HD BOLT GR-5
105286G	1	⅝" x 1 ½" HEX HD BOLT GR-5
3240G	6	⅝" ROUND WASHER (WIDE)
3245G	3	⅝" HEX NUT A563 GR.DH
5852B	1	HIGH INTENSITY REFLECTIVE SHEETING - SEE NOTE:B

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

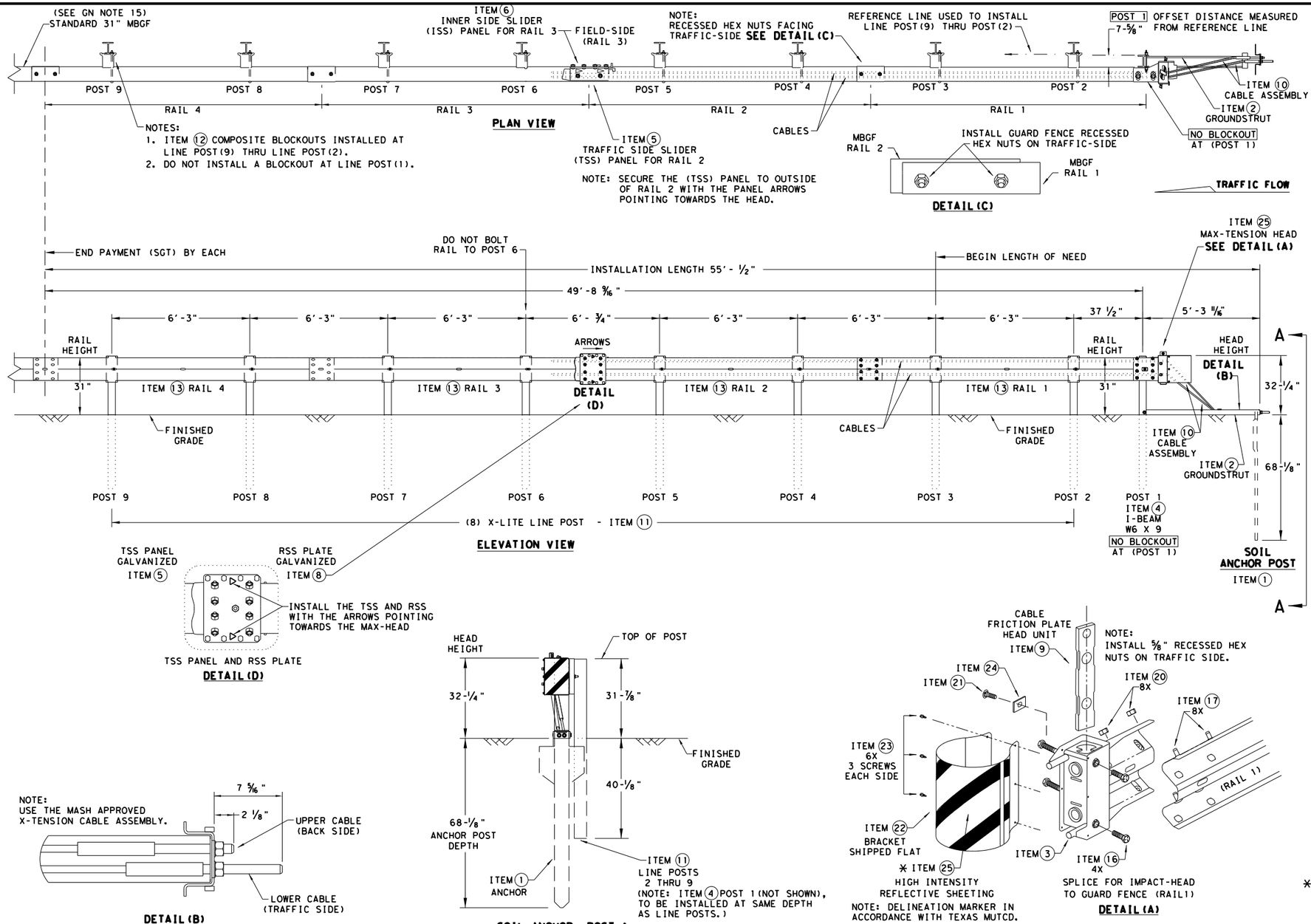
Texas Department of Transportation

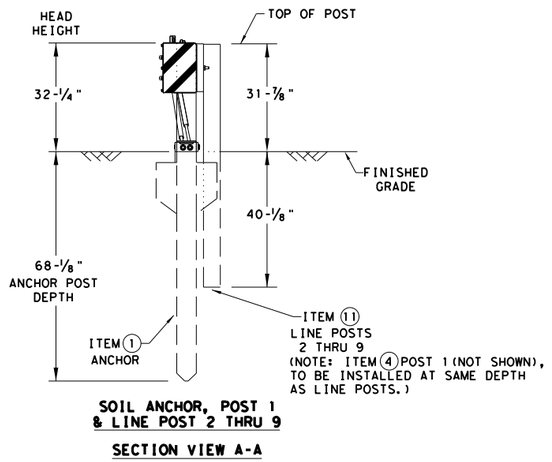
Design Division Standard

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

FILE: sgt10s3116	DN: TxDOT	CK: KM	DW: VP	CK: MB/VP
©TxDOT: JULY 2016	CONT	SECT	JOB	HIGHWAY
REVISIONS	0920	03	082, ETC	CR 1065, ETC
	DIST	COUNTY		SHEET NO.
	BMT	HARDIN, ETC		79

DATE: 2/26/2024
FILE: pw://ljg-pw.bentley.com:ljg-pw-01/Documents/TxDOT/PM8016-2301 CEC WA4/Clemmons Gully Off-System Bridge/400 Production/4 - Design/Plan Set/3. Roadway/Standards/sgt11s3118.dgn





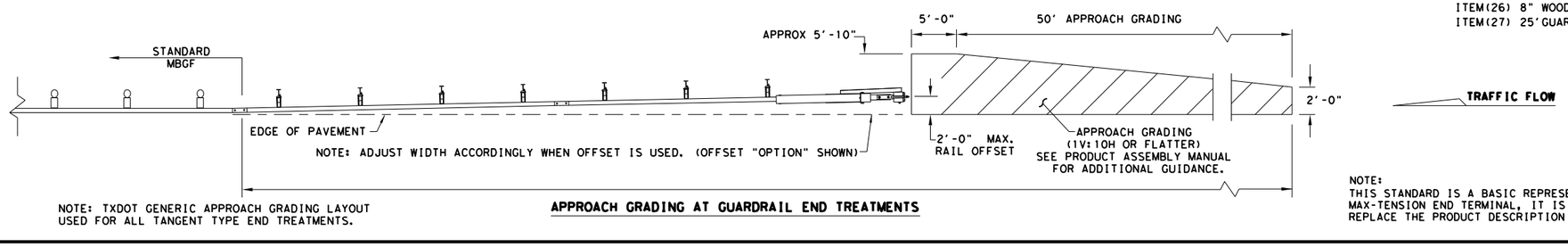
GENERAL NOTES

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

ITEM #	PART NUMBER	DESCRIPTION	QTY
1	BSI-1610060-00	SOIL ANCHOR - GALVANIZED	1
2	BSI-1610061-00	GROUND STRUT - GALVANIZED	1
3	BSI-1610062-00	MAX-TENSION IMPACT HEAD	1
4	BSI-1610063-00	W6x9 I-BEAM POST 6FT.-GALVANIZED	1
5	BSI-1610064-00	TSS PANEL - TRAFFIC SIDE SLIDER	1
6	BSI-1610065-00	ISS PANEL - INNER SIDE SLIDER	1
7	BSI-1610066-00	TOOTH - GEOMET	1
8	BSI-1610067-00	RSS PLATE - REAR SIDE SLIDER	1
9	B061058	CABLE FRICTION PLATE - HEAD UNIT	1
10	BSI-1610069-00	CABLE ASSEMBLY - MASH X-TENSION	2
11	BSI-1012078-00	X-LITE LINE POST-GALVANIZED	8
12	B090534	8" W-BEAM COMPOSITE-BLOCKOUT XT110	8
13	BSI-4004386	12'-6" W-BEAM GUARD FENCE PANELS 12GA.	4
14	BSI-1102027-00	X-LITE SQUARE WASHER	1
15	BSI-2001886	⅝" X 7" THREAD BOLT HH (GR.5)GEOMET	1
16	BSI-2001885	¾" X 3" ALL-THREAD BOLT HH (GR.5)GEOMET	4
17	4001115	⅝" X 1 ¼" GUARD FENCE BOLTS (GR.2)MGAL	48
18	2001840	⅝" X 10" GUARD FENCE BOLTS MGAL	8
19	2001636	⅝" WASHER F436 STRUCTURAL MGAL	2
20	4001116	⅝" RECESSED GUARD FENCE NUT (GR.2)MGAL	59
21	BSI-2001888	⅝" X 2" ALL THREAD BOLT (GR.5)GEOMET	1
22	BSI-1701063-00	DELINEATION MOUNTING (BRACKET)	1
23	BSI-2001887	¼" X ¾" SCREW SD HH 410SS	7
24	4002051	GUARDRAIL WASHER RECT AASHTO FWR03	1
25	SEE NOTE BELOW	HIGH INTENSITY REFLECTIVE SHEETING	1
26	4002337	8" W-BEAM TIMBER-BLOCKOUT, PDB01B	8
27	BSI-4004431	25' W-BEAM GUARDRAIL PANEL,8-SPACE,12GA.	2
28	MANMAX Rev-(D)	MAX-TENSION INSTALLATION INSTRUCTIONS	1

* TO BE PROVIDED BY DISTRIBUTOR OR CONTRACTOR.

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



TRAFFIC FLOW

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

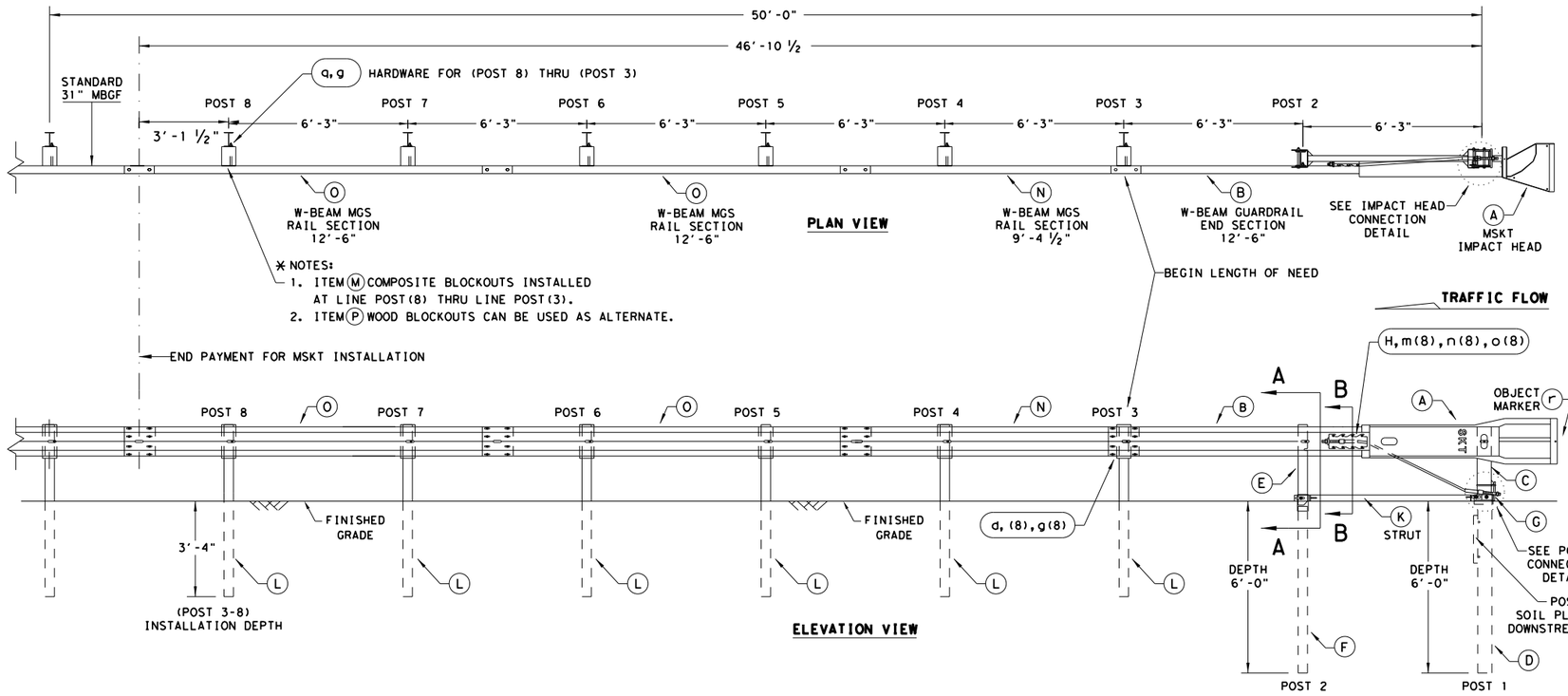
Texas Department of Transportation

Design Division Standard

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

FILE: sgt11s3118.dgn	DN: TxDOT	CK: KM	DW: TxDOT	CK: CL
© TxDOT: FEBRUARY 2018	CONT	SECT	JOB	HIGHWAY
REVISIONS	0920	03	082, ETC	CR 1065, ETC
	DIST	COUNTY		SHEET NO.
	BMT	HARDIN, ETC		80

DATE: 2/26/2024
FILE: pw://ija-pw.bentley.com:ija-pw-01/Documents/TxDOT/PM8016-2301 CEC WA4/Clemmons Gully Off-System Bridge/400 Production/4 - Design/Plan Set/3. Roadway/Standards/sgt12s3118.dgn



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

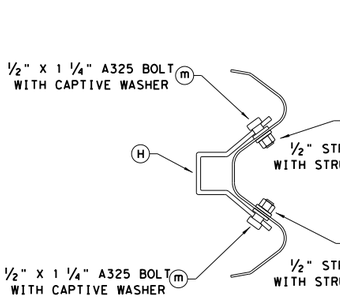
GENERAL NOTES

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

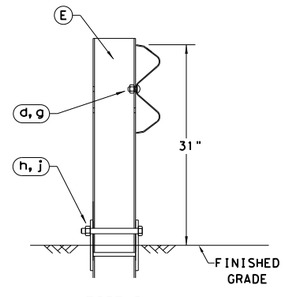
ITEM	QTY	MAIN SYSTEM COMPONENTS	ITEM NUMBERS
A	1	MSKT IMPACT HEAD	MS3000
B	1	W-BEAM GUARDRAIL END SECTION, 12 Ga.	SF1303
C	1	POST 1 - TOP (6" X 6" X 1/8" TUBE)	MTPHP1A
D	1	POST 1 - BOTTOM (6' W6X15)	MTPHP1B
E	1	POST 2 - ASSEMBLY TOP	UHP2A
F	1	POST 2 - ASSEMBLY BOTTOM (6' W6X9)	HP2B
G	1	BEARING PLATE	E750
H	1	CABLE ANCHOR BOX	S760
J	1	BCT CABLE ANCHOR ASSEMBLY	E770
K	1	GROUND STRUT	MS785
L	6	W6x9 OR W6x8.5 STEEL POST	P621
M	6	COMPOSITE BLOCKOUTS	CBSP-14
N	1	W-BEAM MGS RAIL SECTION (9'-4 1/2")	G12025
O	2	W-BEAM MGS RAIL SECTION (12'-6")	G1203A
P	6	WOOD BLOCKOUT 6" X 8" X 14"	P675
Q	1	W-BEAM MGS RAIL SECTION (25'-0")	G1209
		SMALL HARDWARE	
a	2	5/8" x 1" HEX BOLT (GRD 5)	B5160104A
b	4	5/8" WASHER	W0516
c	2	5/8" HEX NUT	N0516
d	25	5/8" Dia. x 1 1/4" SPLICE BOLT (POST 2)	B580122
e	2	5/8" Dia. x 9" HEX BOLT (GRD A449)	B580904A
f	3	5/8" WASHER	W050
g	33	5/8" Dia. H.G.R NUT	N050
h	1	3/4" Dia. x 8 1/2" HEX BOLT (GRD A449)	B340854A
j	1	3/4" Dia. HEX NUT	N030
k	2	1 ANCHOR CABLE HEX NUT	N100
l	2	1 ANCHOR CABLE WASHER	W100
m	8	1/2" x 1 1/4" A325 BOLT WITH CAPTIVE WASHER	SB12A
n	8	1/2" STRUCTURAL NUTS	N012A
o	8	1 1/16" O.D. x 9/16" I.D. STRUCTURAL WASHERS	W012A
p	1	BEARING PLATE RETAINER TIE	CT-100ST
q	6	5/8" x 10" H.G.R. BOLT	B581002
r	1	OBJECT MARKER 18" X 18"	E3151

SEE NOTES: *

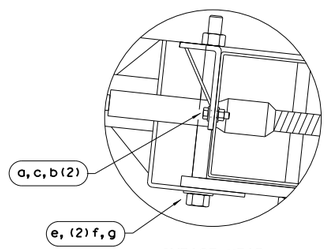
ALTERNATIVE ITEMS NOT SHOWN. * *
* ITEM(P) 8" WOOD-BLOCKOUT
* * ITEM(Q) 25'GUARD FENCE PANEL



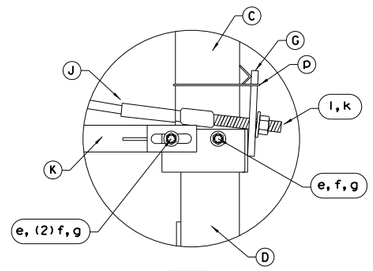
SECTION B-B
ANCHOR BRACKET



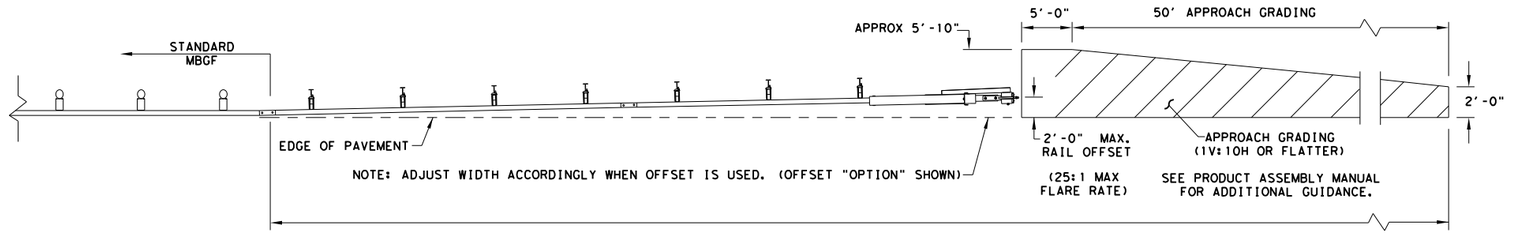
POST 2
SECTION A-A



IMPACT HEAD
CONNECTION DETAIL



POST 1
CONNECTION DETAIL



TRAFFIC FLOW

APPROACH GRADING AT GUARDRAIL END TREATMENTS

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

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

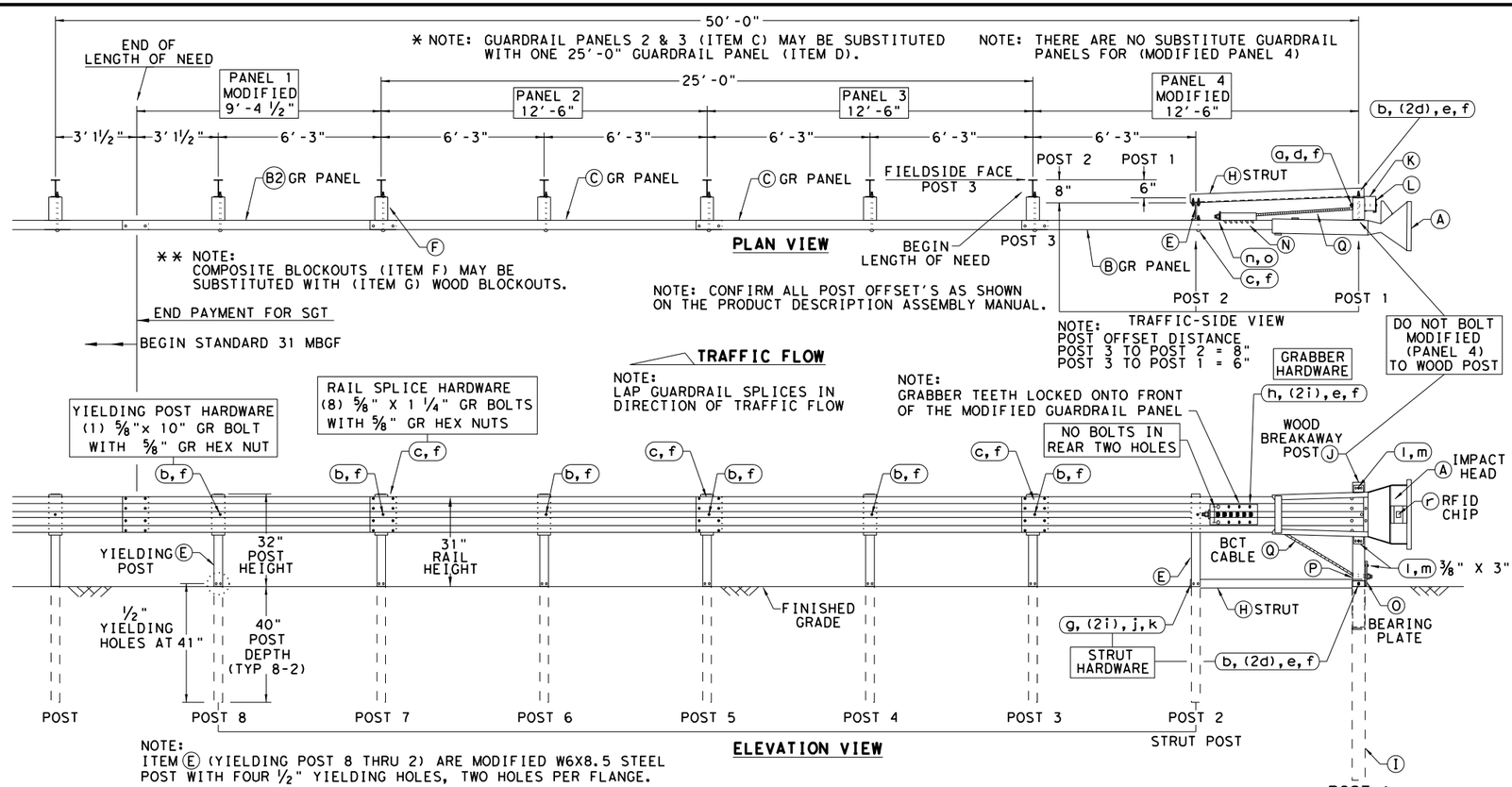
Texas Department of Transportation

Design Division Standard

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

FILE: sgt12s3118.dgn	DN: TxDOT	CK: KM	DW: VP	CK: CL		
© TxDOT: APRIL 2018	CONT	SECT	JOB	HIGHWAY		
REVISIONS	0920	03	082, ETC	CR 1065, ETC		
	DIST	COUNTY		SHEET NO.		
	BMT	HARDIN, ETC		81		

DATE: 2/26/2024
FILE: pw://ljo-pw.bentley.com:ljo-pw-01/Documents/TxDOT/PW8016-2301 CEC WA4/Clemmons Gully Off-System Bridge/400 Production/4 - Design/Plan Set/3. Roadway/Standards/sgt153120.dgn

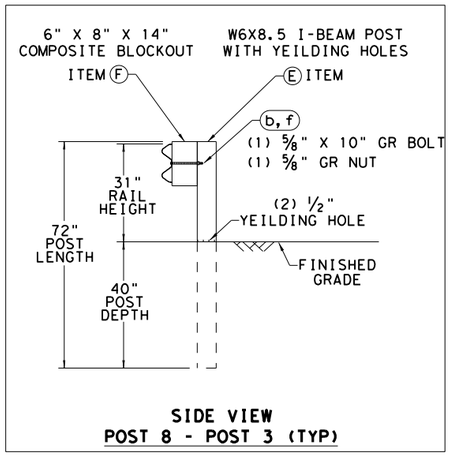


GENERAL NOTES

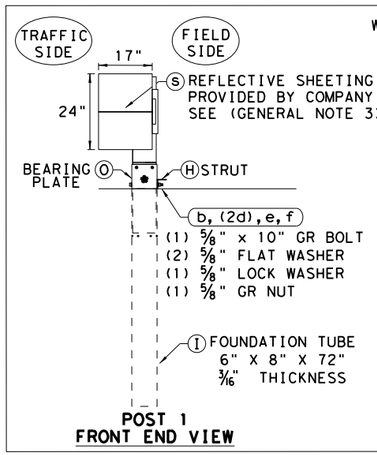
1. FOR SPECIFIC INFORMATION REGARDING INSTALLATION AND TECHNICAL GUIDANCE OF THE SYSTEM, CONTACT: SPIG INDUSTRY, INC. AT 1(267) 644-9510. 14675 INDUSTRIAL PARK RD; BRISTOL, VA 24202
2. FOR INSTALLATION, REPAIR AND MAINTENANCE REFER TO THE MANUFACTURER'S; SGET END TERMINAL, PRODUCT DESCRIPTION ASSEMBLY MANUAL.
3. 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.
4. THE NOMINAL HEIGHT OF THE GUARDRAIL BEAM IS 31 INCHES WITH A TOLERANCE OF +/- ONE INCH.
5. FOR POST (LEAVE-OUT) INSTALLATION AND GUIDANCE SEE TXDOT'S LATEST ROADWAY MOW STRIP STANDARD.
6. (POST 2 THROUGH POST 8) ARE MODIFIED STEEL-YIELDING POSTS WITH YIELDING HOLES AT GROUND LEVEL. THERE ARE NO SUBSTITUTE POSTS.
7. POSTS SHALL NOT BE SET IN CONCRETE.
8. IF SOLID ROCK IS ENCOUNTERED FOR ANY OF THE POSTS IN THE SYSTEM, CONTACT THE MANUFACTURER FOR SPECIFIC INSTALLATION GUIDANCE.
9. HARDWARE (BOLTS, NUTS, & WASHERS) SHALL BE GALVANIZED IN ACCORDANCE WITH ITEM 445, "GALVANIZING". FITTINGS SHALL BE SUBSIDIARY TO THE BID ITEM.
10. 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.
11. 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"	WBO8
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"	GGR17
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 A563DH 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

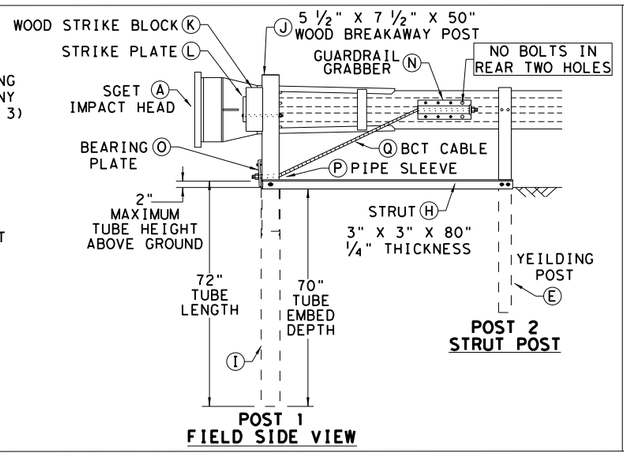
* ALTERNATIVE ITEMS
** NOTE: SEE PLAN VIEW



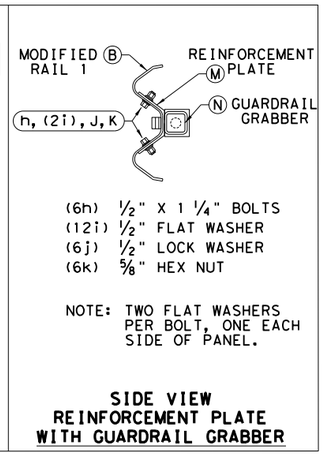
SIDE VIEW
POST 8 - POST 3 (TYP)



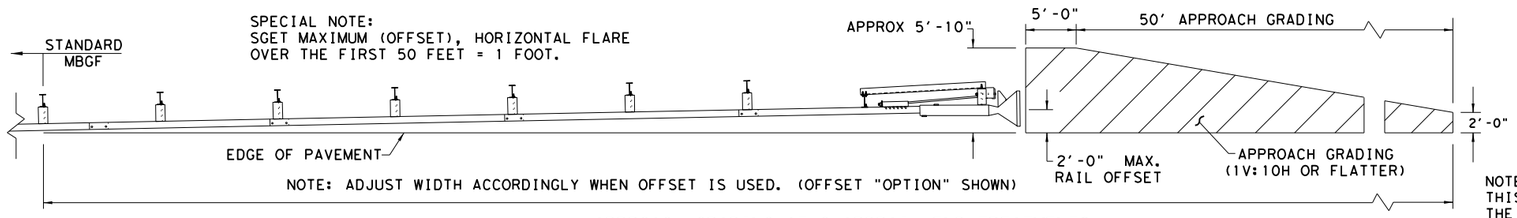
POST 1
FRONT END VIEW



POST 1
FIELD SIDE VIEW
POST 2
STRUT POST



SIDE VIEW
REINFORCEMENT PLATE
WITH GUARDRAIL GRABBER



APPROACH GRADING AT GUARDRAIL END TREATMENTS

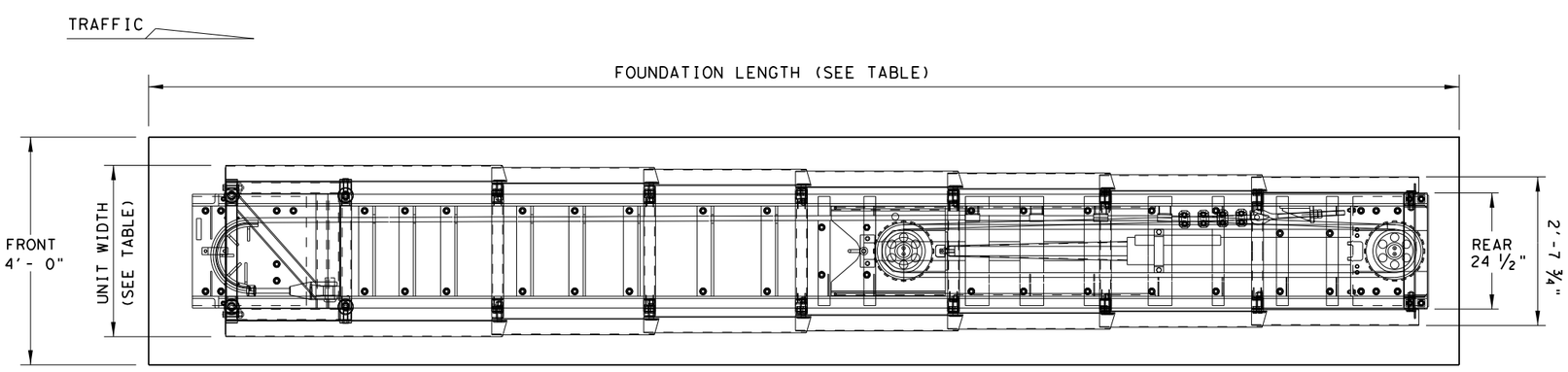
NOTE:
THIS STANDARD IS A BASIC REPRESENTATION OF THE SGET TERMINAL SYSTEM AND IS NOT INTENDED TO REPLACE THE MANUFACTURER'S ASSEMBLY MANUAL.

Texas Department of Transportation
Design Division Standard

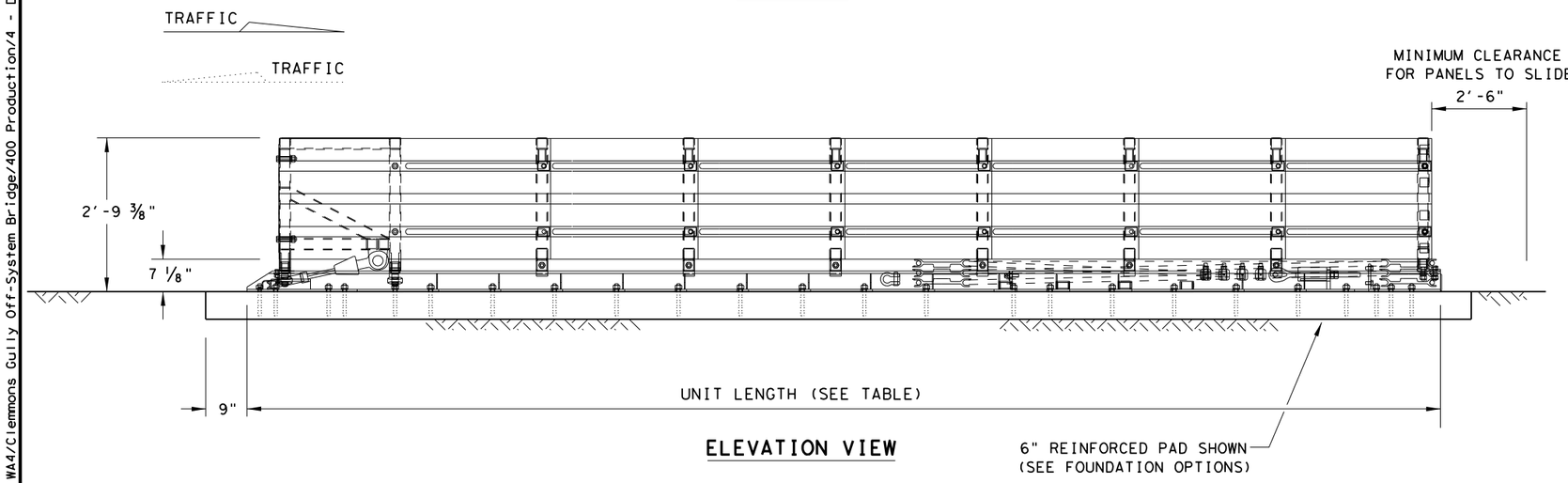
SPIG INDUSTRY, LLC
SINGLE GUARDRAIL TERMINAL
SGET - TL-3 - MASH
SGT(15)31-20

FILE: sgt153120.dgn	DN: TxDOT	CK: KM	DW: VP	CK: VP
© TxDOT: APRIL 2020	CONT	SECT	JOB	HIGHWAY
REVISIONS	0920	03	082, ETC	CR 1065, ETC
	DIST	COUNTY		SHEET NO.
	BMT	HARDIN, ETC		82

DATE: 2/26/2024
FILE: pw://ijo-pw.bentley.com:ijo-pw-01/Documents/TxDOT/PW8016-2301 CEC WA4/Clemmons Gully Off-System Bridge/400 Production/4 - Design/Plan Set/3. Roadway/Standards/smtcn16.dgn



PLAN VIEW



ELEVATION VIEW

GENERAL NOTES

1. FOR SPECIFIC INFORMATION REGARDING INSTALLATION AND TECHNICAL GUIDANCE OF THE SYSTEM, CONTACT: WORK AREA PROTECTION, CORP. AT (800) 327-4417, OR (630) 377-9100.
2. FOR BI-DIRECTIONAL TRAFFIC, APPROPRIATE TRANSITION PANELS WILL BE REQUIRED.
3. ADDITIONAL DETAILS FOR THE TRANSITION OPTION AND FOUNDATION OPTION WILL BE SHOWN ON THE MANUFACTURER'S SHOP DRAWINGS FURNISHED TO THE ENGINEER.
4. CONCRETE SHALL BE CLASS "S" WITH A MINIMUM COMPRESSIVE STRENGTH OF 4,000 PSI.
5. MAXIMUM PERMISSIBLE CROSS-SLOPE IS 8%.
6. THE INSTALLATION AREA SHOULD BE FREE FROM CURBS, ELEVATED OBJECTS, OR DEPRESSIONS.
7. THE SCI100GM & SCI70GM SYSTEMS SHOULD BE APPROXIMATELY PARALLEL WITH THE BARRIER OR CENTERLINE OF MERGING BARRIERS.

NOTE:
FOR ATTACHMENT AND TRANSITIONS TO OTHER SHAPES, BARRIERS, RAILINGS AND BI-DIRECTIONAL TRAFFIC FLOWS ARE AVAILABLE. (SEE MANUFACTURER'S PRODUCT MANUAL)

NOTE:
SIDE PANELS CAN TRAVEL 30" BEYOND THE LAST TERMINAL BRACE AT THE REAR OF THE CUSHION. ALL OBJECTS THAT MAY INTERFERE WITH THIS MOTION CAN AFFECT PERFORMANCE OF AND MAY CAUSE UNDUE DAMAGE TO THE CRASH CUSHION.

MODEL	TEST LEVEL	UNIT LENGTH (approx.)	UNIT WIDTH	FOUNDATION LENGTH	OBSTACLE WIDTH
SCI70GM	TL-2	13′-6"	2′-10 ⅝"	15′- 6 ¼"	24"to 36"
SCI100GM	TL-3	21′-6"	3′-1 ½"	23′- 0"	24"to 36"

SYSTEM AND PAD LENGTHS VARY DEPENDING ON BACKUP TYPE.

FOUNDATION OPTIONS
6" REINFORCED CONCRETE (5 ½" ANCHOR EMBEDMENT)
8" UNREINFORCED CONCRETE (5 ½" ANCHOR EMBEDMENT)
3" MIN. ASPHALT OVER 3" MIN. CONCRETE (16 ½" ANCHOR EMBED.)
6" ASPHALT OVER 6" COMPACT SUBBASE (16 ½" ANCHOR EMBED.)
8" MINIMUM ASPHALT (16 ½" ANCHOR EMBEDMENT)

FOR STEEL PLACEMENT IN CONCRETE FOUNDATIONS, SEE MANUFACTURER'S PRODUCT MANUAL.

TRANSITION OPTIONS
CONCRETE VERTICAL WALL
CONCRETE TRAFFIC BARRIERS
GUARDRAIL (W-BEAM)
GUARDRAIL (THRIE-BEAM)

TRANSITION TYPES ARE SHOWN ELSEWHERE ON THE PLANS (I.E. ATTENUATOR LOCATION DETAILS OR IN THE GENERAL NOTES).

FOR BI-DIRECTIONAL TRANSITION PANEL AND END SHOE DETAILS, SEE MANUFACTURER'S PRODUCT MANUAL.

LOW MAINTENANCE

Texas Department of Transportation

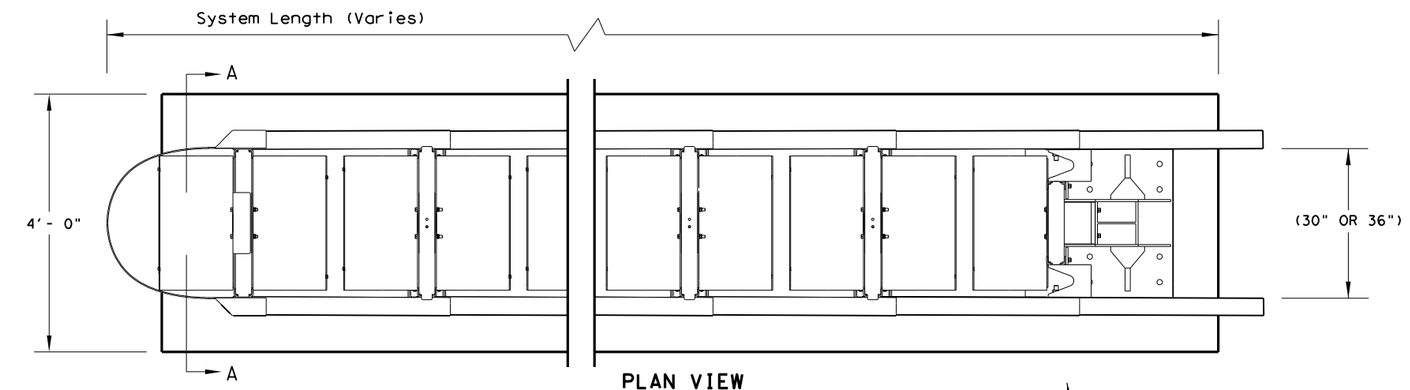
Design Division Standard

WORK AREA PROTECTION CORP (SMART-NARROW)

SMTC(N)-16

FILE: smtcn16.dgn	DN: TxDOT	CK: KM	DW: VP	CK: VP
©TxDOT: February 2006	CONT	SECT	JOB	HIGHWAY
REVISIONS REVISED 06, 2013 (VP) REVISED 03, 2016 (VP)	0920	03	082, ETC	CR 1065, ETC
	DIST	COUNTY		SHEET NO.
	BMT	HARDIN, ETC		83

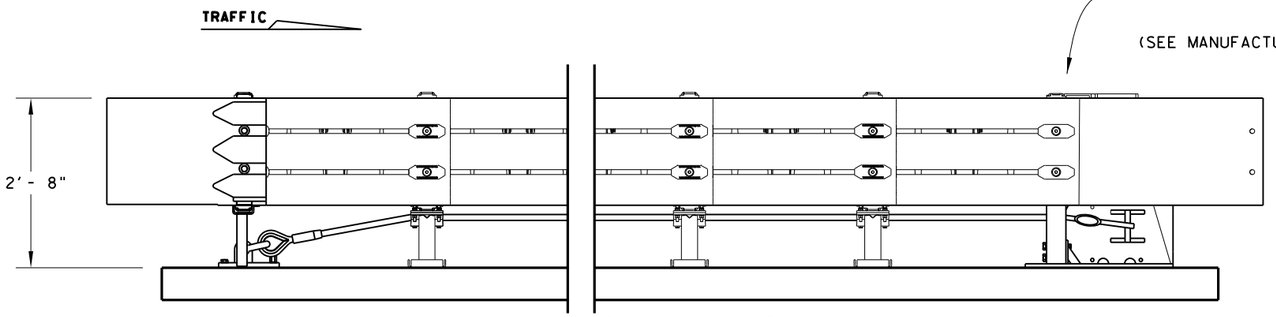
DATE: 2/26/2024
FILE: pw://ljg-pw.bentley.com:ljg-pw-01/Documents/TxDOT/PM8016-2301 CEC WA4/Clemmons Gully Off-System Bridge/400 Production/4 - Design/Plan Set/3. Roadway/Standards/tauiirn16.dgn



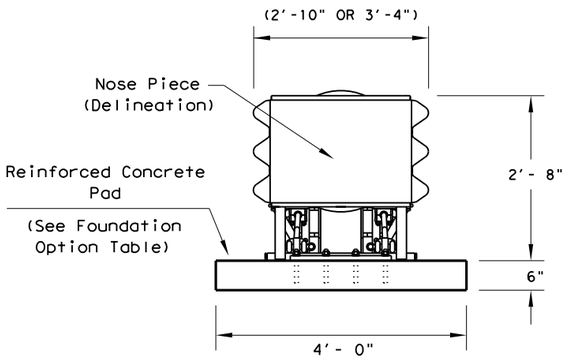
PLAN VIEW

Attachments and transitions to various barrier shapes, barrier railings and bi-directional traffic flows are available.

(SEE MANUFACTURER'S PRODUCT MANUAL)



ELEVATION VIEW



SECTION A-A

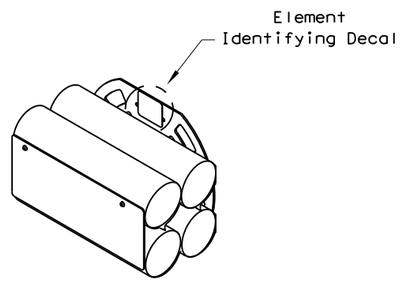
Nose Piece delineation orientation, is shown elsewhere on the plans.

TRANSITION OPTIONS
Vertical Wall
Concrete Traffic Barriers
W-Beam Guardrail
Thrie Beam Guardrail

For bi-directional transition panel and end shoe details. (See manufacturer's product manual.)

FOUNDATION OPTIONS
6" Reinforced Concrete
8" Unreinforced Concrete
Asphalt over Concrete with Minimum 6" Embedment in Concrete
6" Asphalt over 6" Compact Subbase
8" Minimum Asphalt

For steel placement in concrete foundations. (See manufacturer's product manual)



ENERGY ABSORBING ELEMENTS (EAE)

BACKUP SUPPORT OPTIONS
Compact (Stand Alone)
Flush Mount
PCB (Concrete Barrier)

TAU-II-R (NARROW) SYSTEM LENGTHS			
BACKSTOP	TL-2	TL-3	70 mph
PCB	13'-7"	27'-10"	30'-7"
Flush Mount	14'-0"	28'-3"	31'-0"
Compact	15'-3"	29'-6"	32'-3"

Backup and Transition types are shown elsewhere on the plans, (i.e. Attenuator location details or in the general notes).

Note: System lengths are ± 2"

GENERAL NOTES

1. For specific information regarding installation and technical guidance of the system, contact: Lindsay Transportation Solutions - Barrier Systems, Inc. at (707) 374-6800. 180 River Road, Rio Vista, CA 94571
2. For bi-directional traffic, appropriate transition panels will be required.
3. Additional details for the backup support option, transition options and foundation option will be shown on the manufacturer's shop drawings furnished to the Engineer.
4. Concrete shall be class "S" with a minimum compressive strength of 4,000 psi.
5. Maximum permissible cross-slope is 8%.
6. The installation area should be free from curbs, elevated objects, or depressions.
7. The TAU-II-R system should be approximately parallel with the barrier or center of merging barriers.
8. Refer to Universal TAU-II-R configuration chart for specific systems configuration number and location of each type of energy absorbing element.
9. 30-inch (30") model shown, also available in 36-inch (36") configuration.

BILL OF MATERIAL

PRODUCT CODE	QTY	DESCRIPTION
B030704	1	Front Support
B030703	TBD	Mid Support
TBD	1	Backstop Assembly (See Table)
TBD	1	Front Cable Anchor
TBD	1	Nose Assembly
B010202	TBD	Sliding Panel
B010659	2	End Panel
K001003	1	Slider Assembly Kit
BSI-1202006-KT	TBD	TAU-II-R Slider Kit
BSI-1107131-KT	TBD	TAU-II-R EAE Mounting Hw Kit
BSI-1012069-00	TBD	Energy Absorbing Element, Type 1
BSI-1012070-00	TBD	Energy Absorbing Element, Type 2
BSI-1012071-00	TBD	Energy Absorbing Element, Type 3
BSI-1110009-00	TBD	Energy Absorbing Element, Type 3N
TBD	TBD	Cable Assembly
K001004	TBD	Cable Guide Kit
K001005	2	Front Support Leg Kit
B010651	4	Pipe Panel Mount
TBD	1	Anchoring Package

(TBD) = To Be Determined, depending on Backup Type and System Length.

(See manufacturer's product manual for details)

Texas Department of Transportation

Design Division Standard

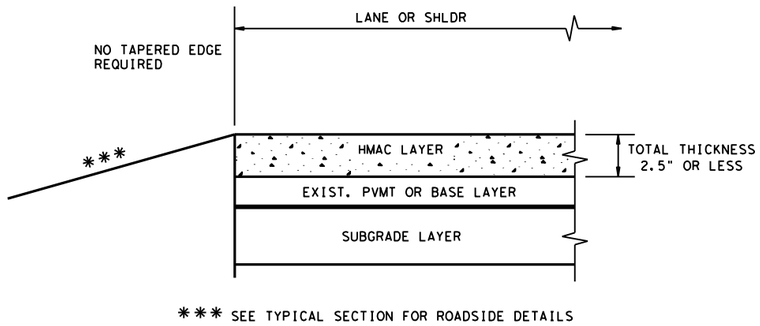
LTS-BARRIER SYSTEMS CRASH CUSHION (R-NARROW)

TAU-II-R(N)-16

FILE: tauiirn16.dgn	DN: TxDOT	CK: KM	DW: VP	CK: CGL
©TxDOT: January 2013	CONT	SECT	JOB	HIGHWAY
REVISIONS	0920	03	082, ETC	CR 1065, ETC
REVISED 06,2013 (VP)				
REVISED 03,2016 (VP)	DIST	COUNTY		SHEET NO.
	BMT	HARDIN, ETC		84

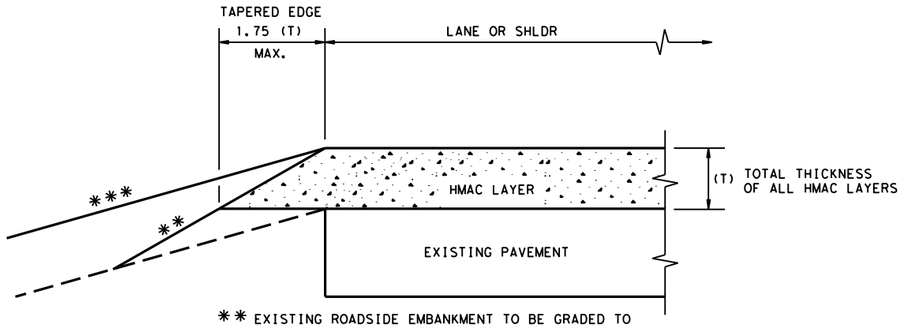
LOW MAINTENANCE

DATE: 2/26/2024
FILE: pw://ljo-pw.bentley.com:ljo-pw-01/Documents/TxDOT/PM8016-2301 CEC WA4/Clemmons Gully Off-System Bridge/400 Production/4 - Design/Plan Set/3. Roadway/Standards/tehmac11.dgn



*** SEE TYPICAL SECTION FOR ROADSIDE DETAILS

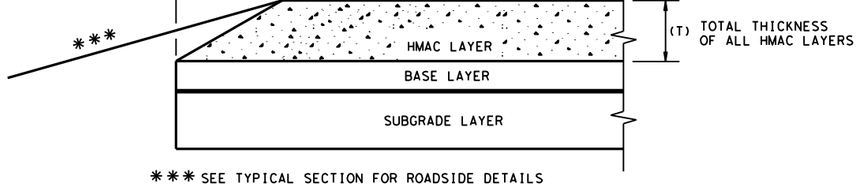
CONDITION - 1
THIN HMAC SURFACES OR HMAC OVERLAY WITH THICKNESS OF 2.5" OR LESS



** EXISTING ROADSIDE EMBANKMENT TO BE GRADED TO PRODUCE A SMOOTH LEVEL SURFACE FOR PLACEMENT OF TAPERED EDGE. THIS WORK IS SUBSIDIARY TO THE VARIOUS BID ITEMS.

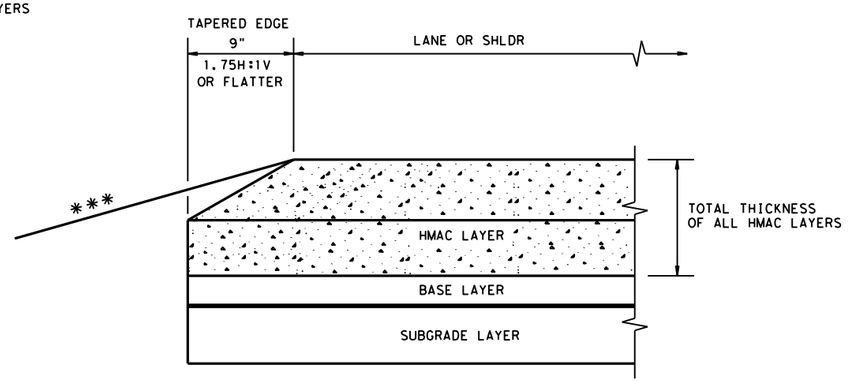
*** SEE TYPICAL SECTION FOR ROADSIDE DETAILS

CONDITION - 2
OVERLAY OF EXISTING PAVEMENT HMAC THICKNESS 2.5" TO 5"



*** SEE TYPICAL SECTION FOR ROADSIDE DETAILS

CONDITION - 3
NEW OR RECONSTRUCTED PAVEMENT HMAC THICKNESS 2.5" TO 5"



*** SEE TYPICAL SECTION FOR ROADSIDE DETAILS

CONDITION - 4
NEW OR RECONSTRUCTED PAVEMENT HMAC THICKNESS 5" OR GREATER

(NOT TO SCALE)

GENERAL NOTES

1. UNLESS OTHERWISE SHOWN IN THE PLANS, A VERTICAL EDGE IS PERMISSIBLE FOR HMAC PLACED GREATER THAN 5" BELOW THE EDGE OF PAVEMENT AND FOR THICKNESS OF HMAC LESS THAN 2.5".
2. FOR FURTHER INFORMATION REGARDING THE ROADSIDE AND PAVEMENT DETAILS, SEE TYPICAL SECTIONS.
3. PAYMENT FOR TAPERED EDGE WILL BE IN ACCORDANCE WITH APPLICABLE ITEMS IN THE CONTRACT.
4. THE SLOPE OF THE TAPERED EDGE SHALL BE 1.75H:1V OR FLATTER.
5. THE TAPERED EDGE SHALL BE PRODUCED BY USE OF A SCREED ATTACHMENT CAPABLE OF PRODUCING A SMOOTH COMPACTED SURFACE. ADDITIONAL COMPACTING EFFORT BEHIND THE SCREED IS NOT REQUIRED.

Texas Department of Transportation

Design Division Standard

TAPERED EDGE DETAILS HMAC PAVEMENT

TE(HMAC)-11

FILE: tehmac11.dgn	DN: TxDOT	CK: RL	DW: KB	CK:		
© TxDOT January 2011	CONT	SECT	JOB		HIGHWAY	
REVISIONS	0920	03	082, ETC		CR 1065, ETC	
	DIST	COUNTY			SHEET NO.	
	BMT	HARDIN, ETC			85	

DATE: 2/26/2024 2:22:26 PM
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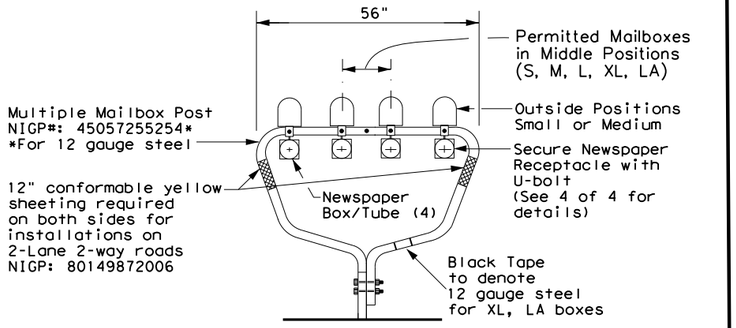
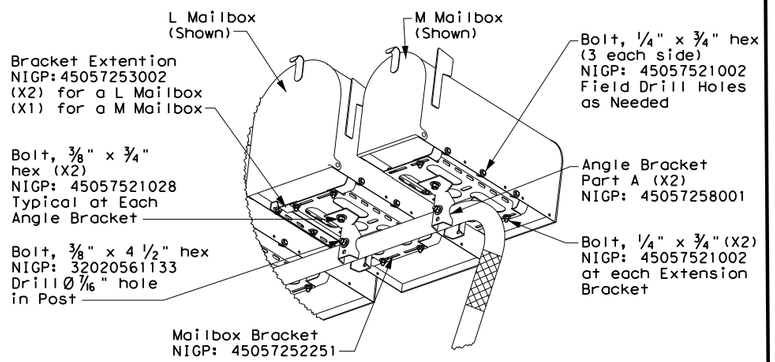
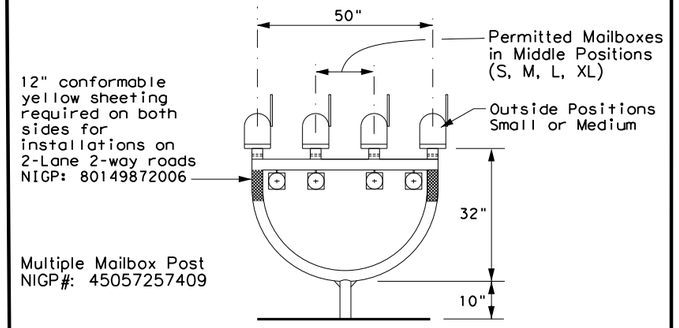
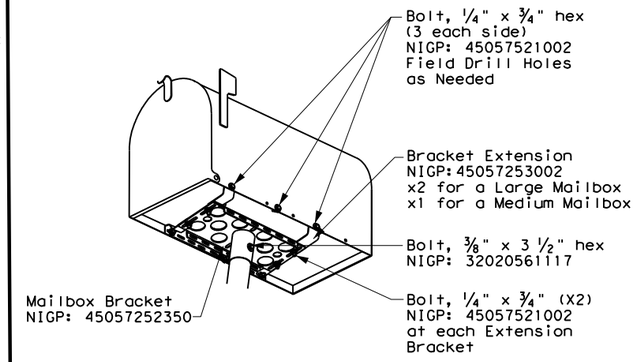
TYPE 1 - MULTIPLE





TYPE 4 - MULTIPLE





MAILBOX SIZES

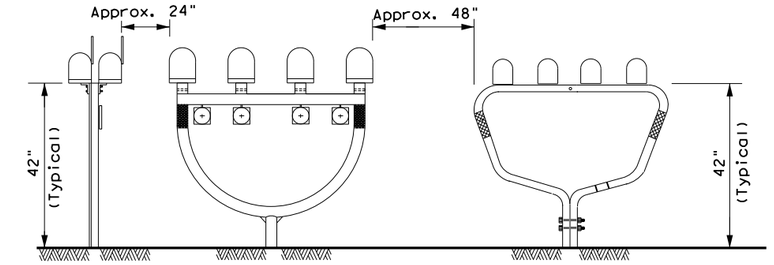
MAILBOX SIZE	TYPICAL DIMENSIONS			MAX **
	LENGTH	WIDTH	HEIGHT	WEIGHT
SMALL	19 1/2"	6"	7"	6 LBS
MEDIUM	22 1/2" *	8" *	11 1/2" *	8 LBS
LARGE	23 1/2"	11 1/2"	13 1/2"	11 LBS
EXTRA LARGE	18"	14"	12"	13 LBS
LOCKABLE	18"	11 1/2"	15"	23 LBS

* See Note 1.
** Excluding Molded Plastic on 4 X 4 Post

GENERAL NOTES:

1. Dimensions shown (length, width, and height) are typical, not maximums. However, anytime a medium size mailbox is mounted on a single/double mount or on the outside position on a multi mount, the dimensions shown are maximums.
2. Mailboxes shall be made of light weight sheet metal or light weight plastic. Heavy steel, cast iron or decorative mailboxes shall not be used on the state highway system.

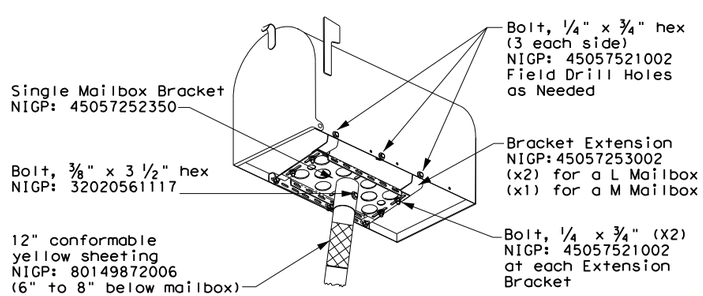
TYPICAL INSTALLATION MEASUREMENTS

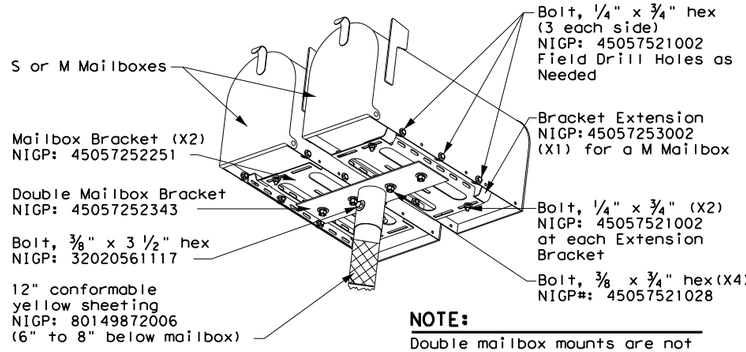


NOTE:

Mailbox installations in sidewalk areas shall be in accordance with the latest TxDOT Design Standard sheets PED-Pedestrian Facilities Curb Ramps.

TYPE 2 and 4 - SINGLE/DOUBLE

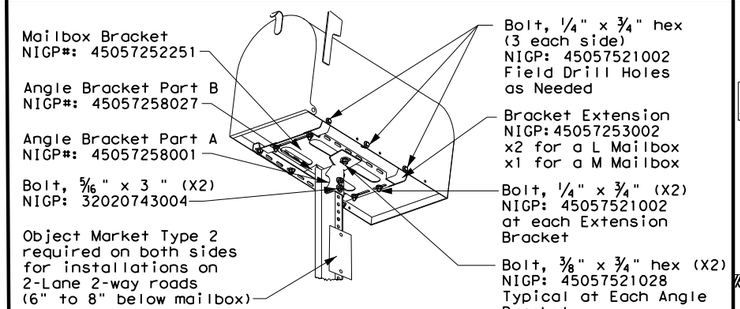


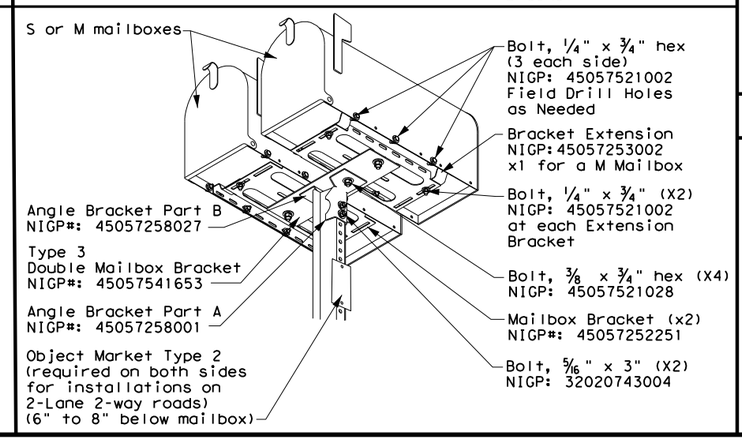


NOTE:

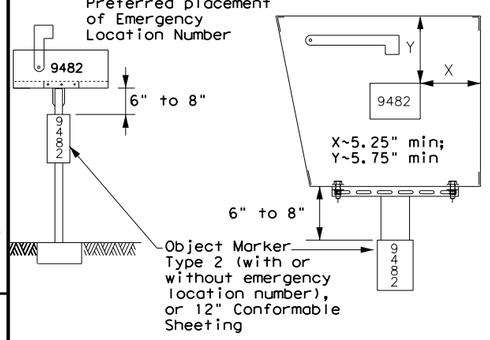
Double mailbox mounts are not allowed with a type 4 multiple mailbox installation

TYPE 3 - SINGLE/DOUBLE





PLACEMENT OF EMERGENCY LOCATION NUMBER

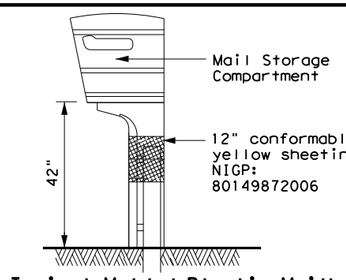


NOTES:

1. Location numbers are provided by homeowner. Minimum size 1" height.
2. Location number is typically placed on the mailbox in a contrasting color.
3. Black numbers may be placed on the Type 2 object marker if the numbers cannot be placed on the mailbox.
4. Alternatively, a green or blue plate with white numbers attached may be mounted below the object marker. Other contrasting color configuration, as approved, may be used.
5. See 3 of 4 for Foundation details.
6. See 4 of 4 for Hardware details.

SHEET 1 OF 4

TYPE 5



Typical Molded Plastic Mailbox

Texas Department of Transportation — Maintenance Division Standard

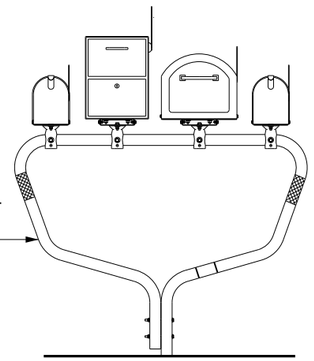
MAILBOX MOUNTING AND ASSEMBLY

MB(1)-21

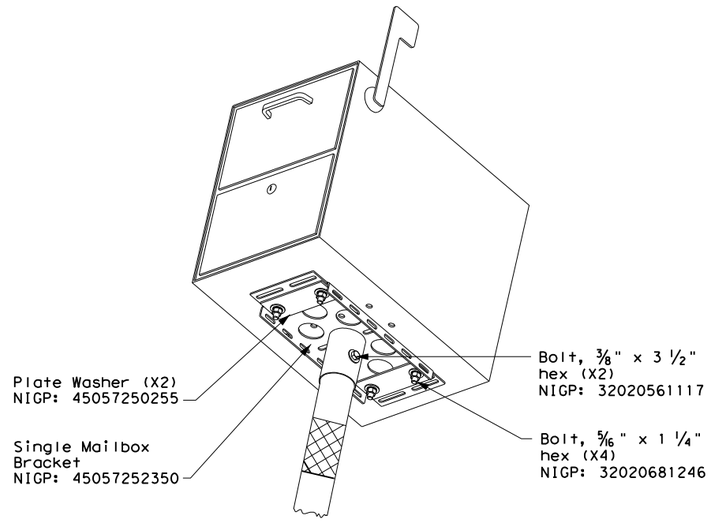
FILE: MB-21.dgn	DN: TxDOT	CK: TxDOT	DW: TxDOT	CK: TxDOT
©TxDOT March 2004	CONT	SECT	JOB	HIGHWAY
REVISIONS 2/2005 11/2009 4/2015 6/2005 1/2011 11/2006 7/2014	0920	03	082, ETC	CR 1065, ETC
	DIST	COUNTY		SHEET NO.
	BMT	HARDIN, ETC		86

DATE: 2/26/2024 2:22:26 PM
FILE: pw://ja-pw.bentley.com:ja-pw-01/Documents/TxDOT/PM8016-2301 CEC WA4/Clemmons Gully Off-System Bridge/400 Production/4 - Design/Plan Set/3. Roadway/Standards/mb-21(1).dgn

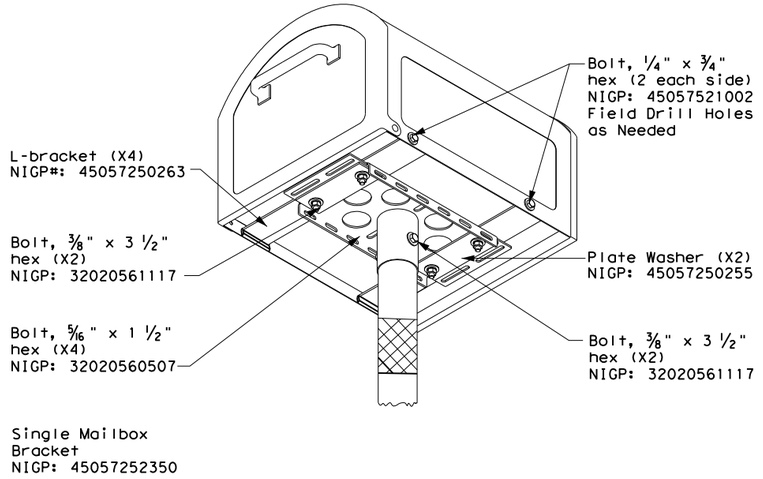
TYPE 1- MULTI LOCKABLE AND XL MAILBOX



TYPE 2/4 - SINGLE LOCKABLE MAILBOX

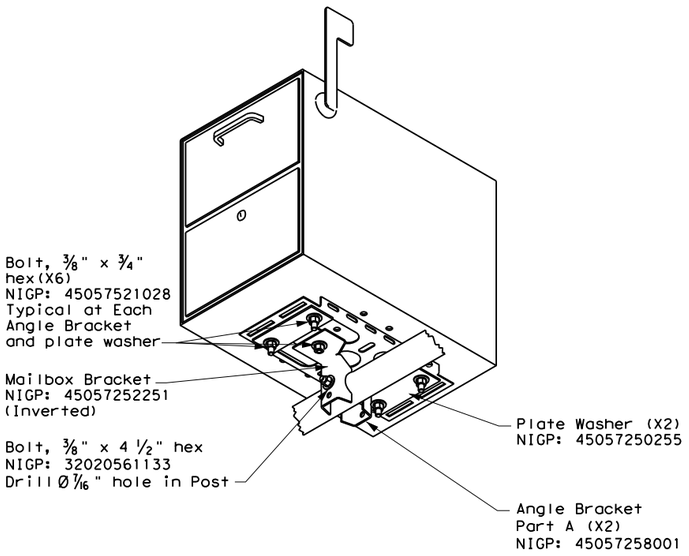


TYPE 2/4 - SINGLE XL MAILBOX

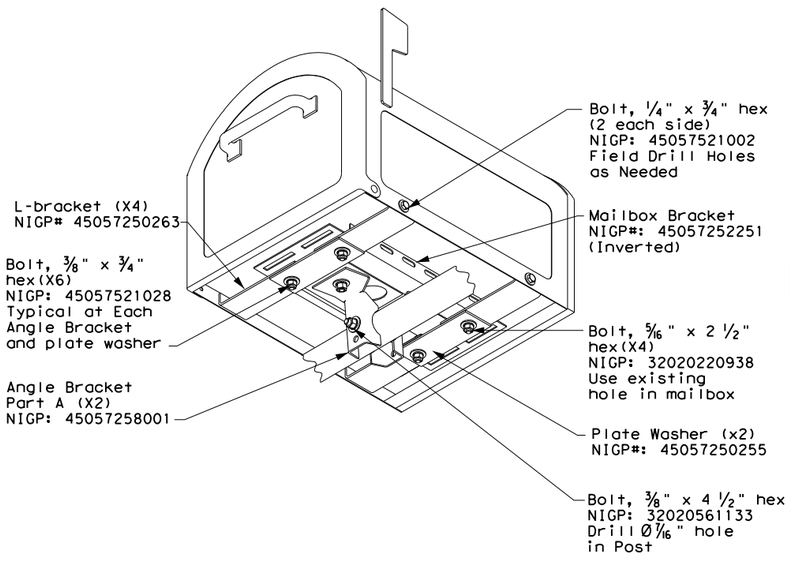


NOTE:
Follow same configuration when mounting an XL mailbox on a Type 4 multi post.

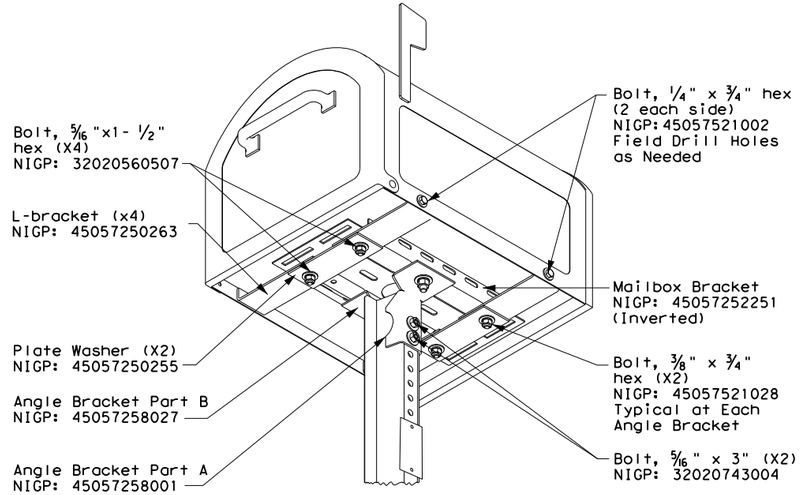
TYPE 1 MULTI – LOCKABLE ARCHITECTURAL (LA)



TYPE 1 MULTI – XL MAILBOX



TYPE 3 - XL MAILBOX MOUNTING



Texas Department of Transportation | Maintenance Division Standard

XL AND LOCKABLE ARCHITECTURAL MAILBOX ASSEMBLY

MB(2)-21

FILE: MB-21.dgn	DN: TxDOT	CK: TxDOT	DW: TxDOT	CK: TxDOT
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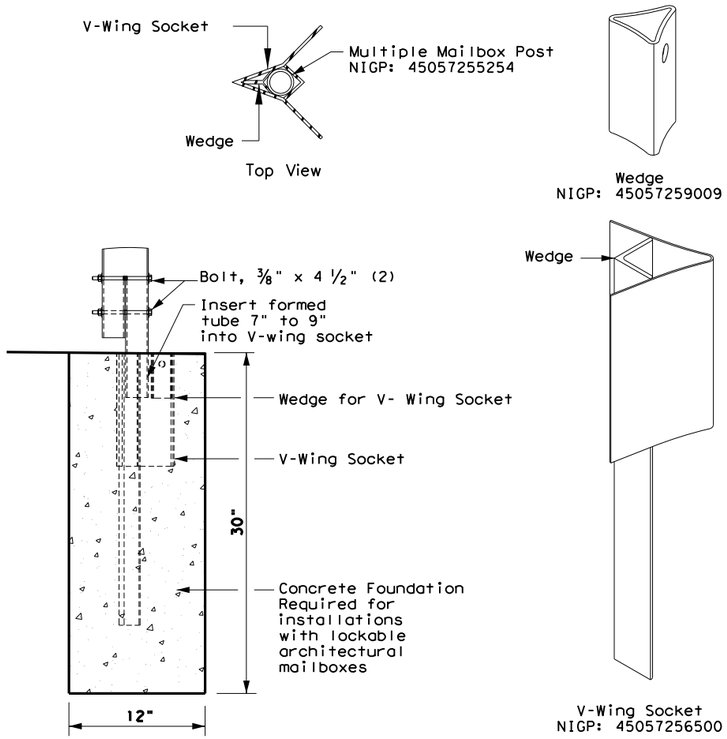
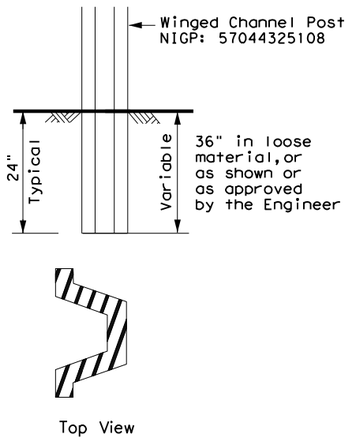
REVISIONS 2/2005 11/2009 4/2015 6/2005 1/2011 11/2006 7/2014	0920	03	082, ETC	CR 1065, ETC
	DIST	COUNTY		SHEET NO.
	BMT	HARDIN, ETC		87

TYPE 1 - SUPPORT/FOUNDATION

Thin Wall Tube w/ V-LOC Anchorage



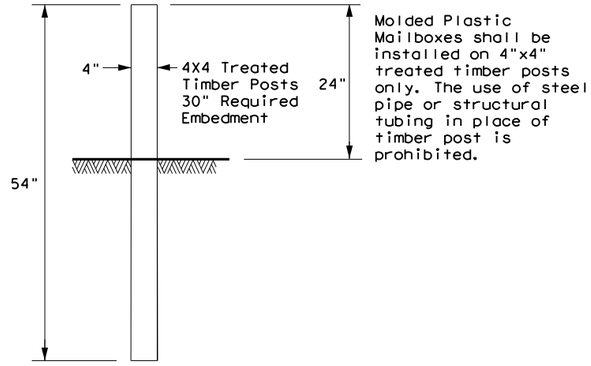
TYPE 3 - SUPPORT/FOUNDATION



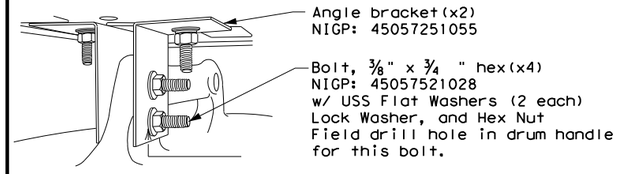
NOTES:

1. Attach Object Marker (OM) facing direction of traffic.
2. OM will also be required on opposite side if installed on a 2-Lane, 2-Way roadway.

TYPE 5 - SUPPORT/FOUNDATION



TYPE 6 - TEMPORARY MAILBOX SUPPORT



Plastic Drum NIGP: 55093383655
Rubber Collar NIGP: 55093387102

NOTES:

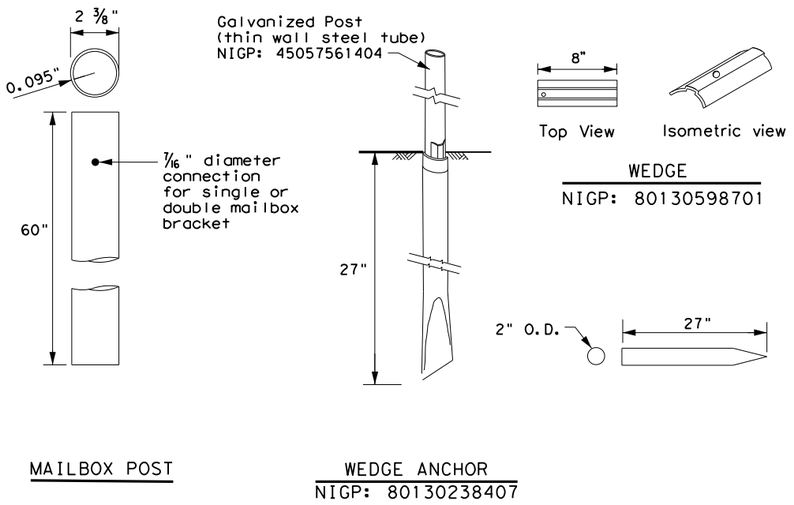
1. Place on approved plastic drum as shown in the Compliant Work Zone Traffic Control Devices (CWZTCD).
2. Existing attachment hardware shall be used unless damaged. Damaged hardware shall be replaced.

GENERAL NOTES:

1. Erect post plumb or vertical.
2. When galvanized part is required galvanize in accordance with Item 445.
3. Use a concrete footing as shown or when directed. Concrete footing will be required when soils do not hold the support/foundations in a stable condition, only on Type 1, Type 2, and Type 4

TYPE 2 - SUPPORT/FOUNDATION

Thin Wall Steel Tube w/Wedge Anchor System

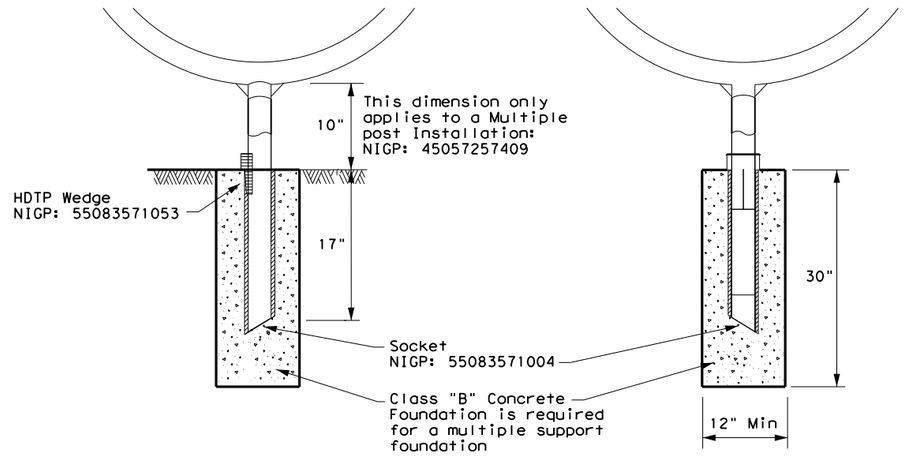


MAILBOX POST

WEDGE ANCHOR
NIGP: 80130238407

TYPE 4 - SUPPORT/FOUNDATION

Whitecoated steel post NIGP: 45057561107
Multiple post NIGP: 45057257409
Recycled Rubber post (RR) NIGP: 45057561057



SHEET 3 OF 4

Texas Department of Transportation | Maintenance Division Standard

MAILBOX SUPPORT AND FOUNDATION

MB(3)-21

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REVISIONS 2/2005 11/2009 4/2015 6/2005 1/2011 11/2006 7/2014	0920	03	082, ETC	CR 1065, ETC
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DATE: 2/26/2024 2:22:26 PM
FILE: pw://ljg-pw.bentley.com:ljg-pw-01/Documents/TxDOT/PM8016-2301 CEC WA4/Clemmons Gully Off-System Bridge/400 Production/4 - Design/Plan Set/3. Roadway/Standards/mb-21(1).dgn

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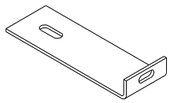
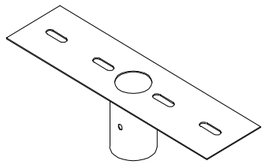
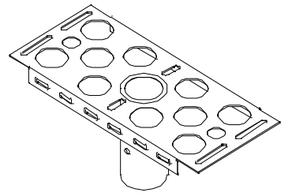
TYPE	TYPE 1	TYPE 2	TYPE 3	TYPE 4			TYPE 5	TYPE 6
Configuration	Multiple	Single or Double	Single or Double	Single	Double	Multiple	Single	Single
Mailbox Size NIGP #	Outside Position: S or M Inside Position: S, M, L, XL, or LA	Single: S, M, L, XL, or LA Double: SS, SM, MM	Single: S, M, L, or XL Double: SS, SM, MM	S, M, L, XL, or LA	SS, SM, or MM	Outside Position: S or M Inside Position: S, M, L, or XL	Molded Plastic	S, or M
Mailbox Post NIGP #	45057255254 (Galvanized Multiple)	45057561404 (Thin Walled Gavanize)	57044325108 (Wing Channel Post)	45057561107 (Thin walled white powder coated) 45057561057 (Recycled Rubber Post: S or M only)	45057561107 (Thin Walled White Powder Coated)	45057257409 (White Powder Coated Multiple)	4x4 Timber	Construction Barrel
Post and Mailbox Hardware NIGP #	45057259009 (Wedge) 45057256500 (V-Wing Socket) 45057253002 (Bracket Extension) 45057252251 (Mailbox Bracket) 45057258001 (Part A Angle Bracket x2) 45057250255 (Plate Washer for XL/LA x2) 45057250263 (L-Bracket for XL x4)	80130598701 (Wedge) 80130238407 (Wedge Anchor) 45057253002 (Bracket Extension) 45057252343 (Double MB Bracket) 45057252350 (S. Mailbox Bracket) 45057252251 (Mailbox Bracket) 45057250255 (Plate Washer for XL/LA x2) 45057250263 (L-Bracket forXL x4)	45057541653 (Type 3 Double Mailbox Bracket) 45057252251 (Mailbox Bracket) 45057253002 (Bracket Extension) 45057258001 (Part A Angle Bracket) 45057258027 (Part B Angle Bracket) 45057250255 (Plate Washer for XL x2) 45057250263 (L-Bracket for XL x4)	55083571053 (Wedge) 55083571004 (Socket) 45057252350 (Single Mailbox Bracket) 45057253002 (Bracket Extension) 45057250255 (Plate Washer for XL/LA x2) 45057250263 (L-Bracket for XL x4)	55083571053 (Wedge) 55083571004 (Socket) 45057253002 (Bracket Extension) 45057252343 (Double Mount Bracket) 45057252251 (Mailbox Bracket x2)	55083571053 (Wedge) 55083571004 (Socket) 45057253002 (Bracket Extension) 45057252350 (Single Mount Bracket) 45057250255 (Plate Washer for XL x2) 45057250263 (L-Bracket for XL x4)	None	45057251055 Angle Bracket (x2)
Foundation Used	Class B Concrete (Required for LA Mailboxes)	Class B Concrete (Required for LA Mailboxes)	None	Class B Concrete (not used with recycled rubber post, required for LA Mailboxes)	Class B Concrete (not required)	Class B Concrete	None	None



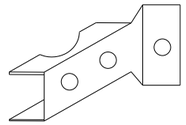
NIGP: 45057250263
L-Bracket x4 for
XL sized mailboxes



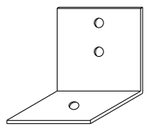
NIGP: 45057252343
Double Mailbox Bracket
For Type 2 and Type 4
double mount



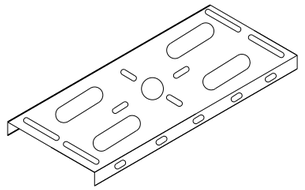
NIGP: 45057252350
Single Mailbox Bracket
For Type 2 single and for
Type 4 single and multi mount



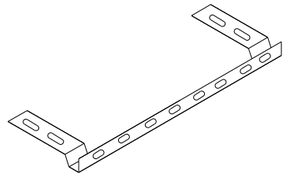
NIGP: 45057258001
Part "A" Angle Bracket
For Type 1 multi (2 per mailbox)
and Type 3 single and double



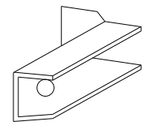
NIGP: 45057251055
Type 6 Angle Bracket
(2 per mailbox)



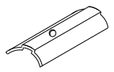
NIGP: 45057252251
Mailbox Bracket
For Type 1 multi and
any double mount (use 2)



NIGP: 45057253002
Bracket Extension
Use 1 for a medium Mailbox
Use 2 for a Large Mailbox



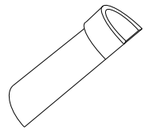
NIGP: 45057258027
Part "B" Angle Bracket
For Type 3 single
and double



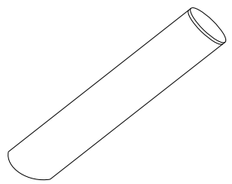
NIGP: 80130598701
Wedge for Type 2

NIGP: 45057250255
Plate Washer for Architecural
and XL Mailboxes

NIGP: 45057541653
Type 3 double mailbox bracket

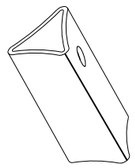


NIGP: 55083571053
Type 4 Mailbox Wedge

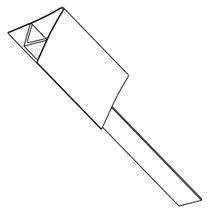


NIGP: 55083571004
Type 4 Mailbox Socket

NIGP: 80130238407
Type 2 Wedge Anchor



NIGP: 45057259009
Wedge for Type 1 V-wing Socket



NIGP: 45057256500
V-wing Socket for
Type 1 Foundation

NIGP #	OBJECT MARKERS AND CONFORMABLE SHEETING
55008311759	Type 2 OM 4"x4" (3 Needed) for Type 3 Wing Channel Post
55008312906	Type 2 OM 6"x12" (1 needed) for Type 3 Wing Channel Post
80149872006	12" Conformable Reflective Yellow Sheeting for Flexible Posts

NOTES:

1. Type 2 object marker in accordance with Traffic Engineering Standard Delineators & Object Markers.
2. A light weight receptacle for newspaper delivery can be attached to mailbox posts if the receptacle does not touch the mailbox, present a hazard to traffic or delivery of the mail, extend beyond the front of the mailbox, or display advertising, except the publication title.

BID CODES FOR CONTRACTS

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

Type of Mailbox
- S = Single
- D = Double
- M = Multiple
- MP = Molded Plastic

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

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

SHEET 4 OF 4

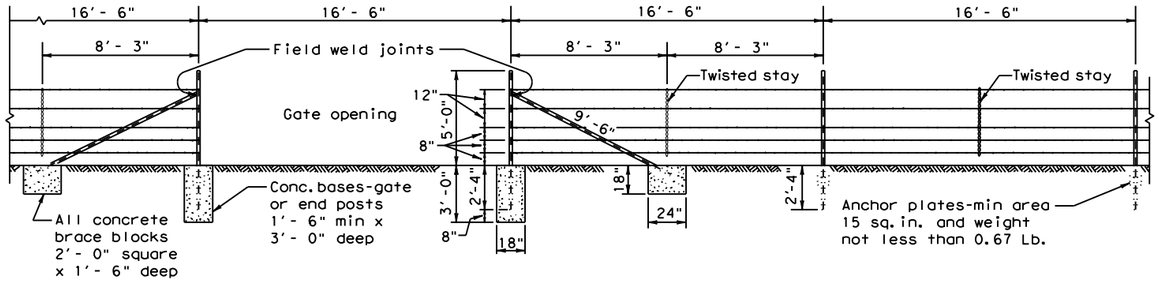
Texas Department of Transportation — Maintenance Division Standard

NIGP PARTS LIST AND COMPATIBILITY

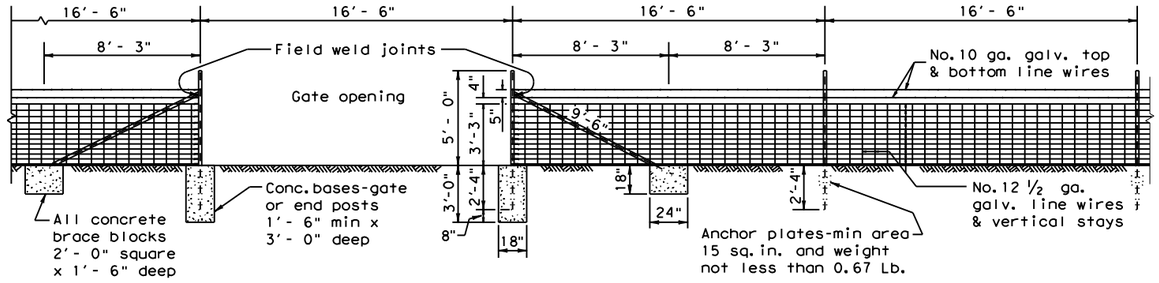
MB(4)-21

FILE: MB-21.dgn	DN: TxDOT	CK: TxDOT	DW: TxDOT	CK: TxDOT
© TxDOT March 2004	CONT	SECT	JOB	HIGHWAY
REVISIONS 2/2005 11/2009 4/2015 6/2005 1/2011 11/2006 7/2014	0920	03	082, ETC	CR 1065, ETC
	DIST	COUNTY		SHEET NO.
	BMT	HARDIN, ETC		89

DATE: 2/27/2024
FILE: pw://ljg-pw.bentley.com:ljg-pw-01/Documents/TxDOT/PW8016-2301 CEC WA4/Clemmons Gully/Standards/wf210.dgn

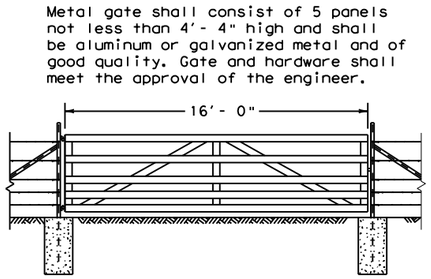


SECTION GALVANIZED BARBED WIRE FENCE WITH METAL POSTS
BRACING DETAIL USED AT ENDS AND GATES
TYPE "C" FENCE
(See General Note 8)

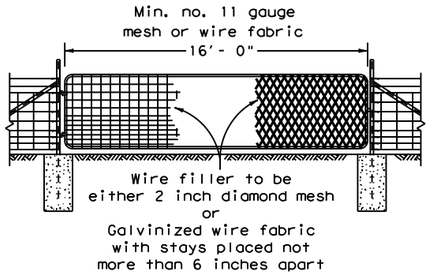


SECTION GALVANIZED WOVEN WIRE FENCE WITH METAL POSTS
BRACING DETAIL USED AT ENDS AND GATES
TYPE "D" FENCE
(See General Note 8)

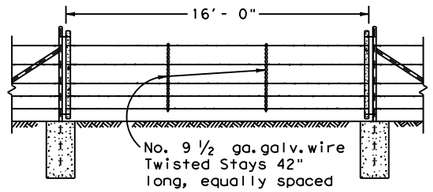
Note:
For Steel pipe and T-Post requirements.
(See General Notes 6 & 7)



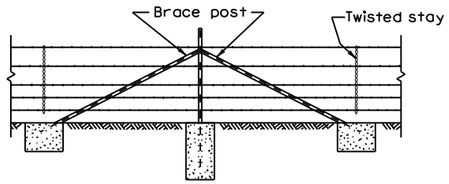
DETAIL TYPE 1 GATE



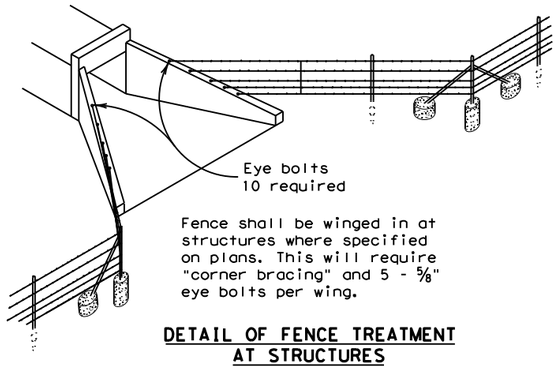
DETAIL TYPE 2 GATE



DETAIL TYPE 3 GATE

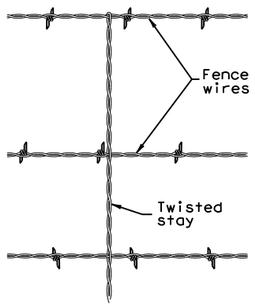


CORNER OR PULL POST ASSEMBLY

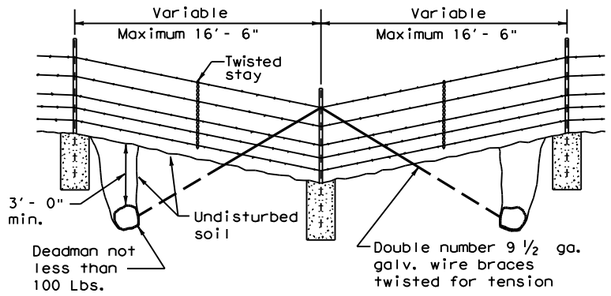


Fence shall be winged in at structures where specified on plans. This will require "corner bracing" and 5 - ⅝" eye bolts per wing.

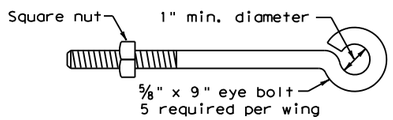
DETAIL OF FENCE TREATMENT AT STRUCTURES



DETAIL OF STAY
(Barbed Wire Fence)



DETAIL OF FENCE SAG



DETAIL OF EYE BOLT

GENERAL NOTES

1. Any high point which interferes with the placing of wire mesh shall be excavated to provide a 2 inch clearance.
2. 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.
3. Hinges for Type 2 gates shall be a commercial design approved by the Engineer suitable for post and gate.
4. 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.
5. Steel anchor plates shall be of a design and thickness sufficient to prevent turning of the post in firm soil.
6. 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 1¼" 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.
7. 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."
8. 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.

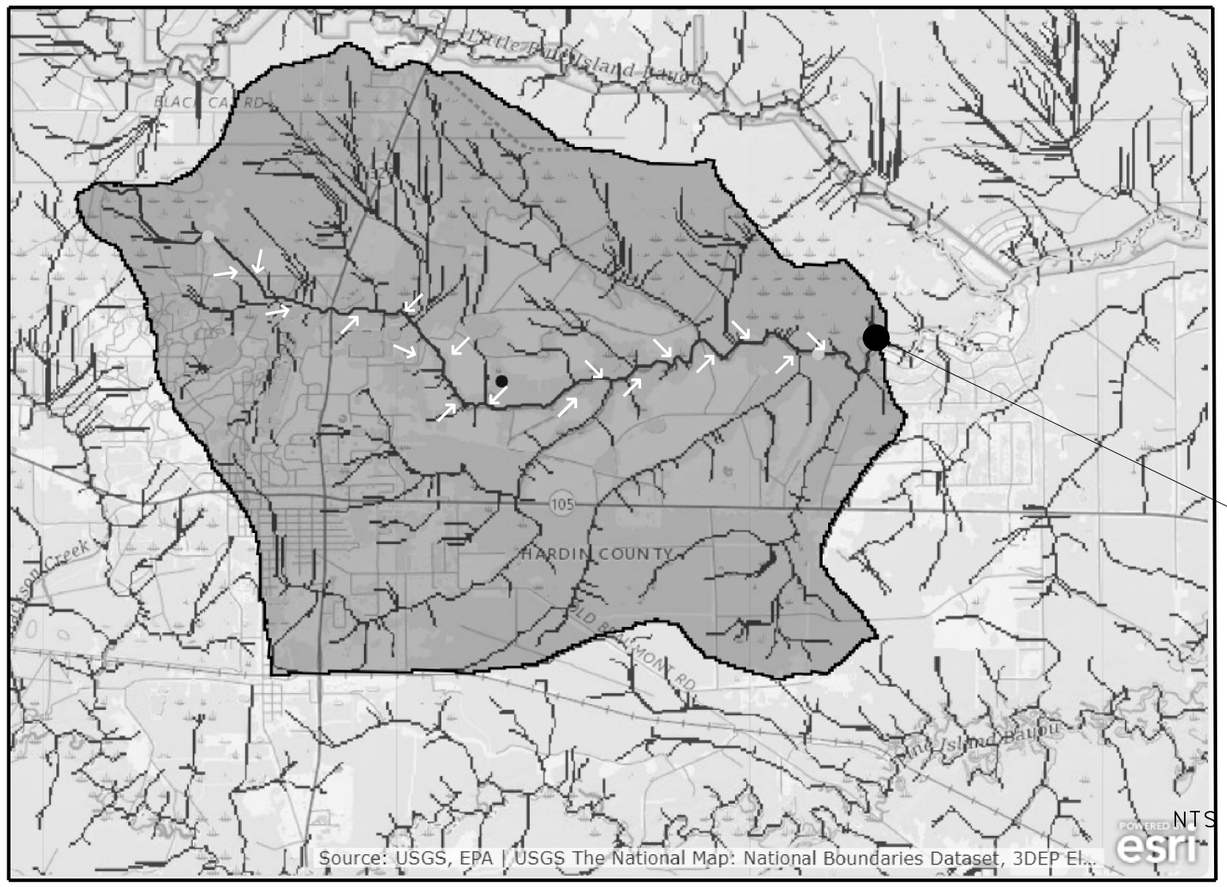
   Woven Wire Fence (Type D) shall be in accordance with ASTM A 116, Class 1 No. 12-1/2 Grade 60 (See Table 1 ASTM A 116) to the height and design shown on the plans, or as approved by the Engineer.
9. The location of gates and corner posts will be as indicated elsewhere in these plans.

Texas Department of Transportation

Design Division Standard

BARBED WIRE AND WOVEN WIRE FENCE
(STEEL POSTS)
WF(2)-10

FILE: wf210.dgn	DN: TxDOT	CK: AM	DW: VP	CK:
©TxDOT 1996	CONT	SECT	JOB	HIGHWAY
REVISIONS	0920	03	082, ETC	CR 1065, ETC
	DIST	COUNTY		SHEET NO.
	BMT	HARDIN, ETC		90



Watershed 1: Estimate Peak-Streamflow Frequency	
Control Section Job Number	092003082
Highway Name & Crossing	CLEMMONS GULLY
Designer	RG
County	Hardin
District	Beaumont
Drainage Area (sq. miles)	19.546
Annual Precipitation (inches)	57.7
Omega EM	-0.25299999
Channel Slope	0.000681
2-year Flow (cfs)	892
5-year Flow (cfs)	1412
10-year Flow (cfs)	1760
25-year Flow (cfs)	2292
50-year Flow (cfs)	2715
100-year Flow (cfs)	3179

EXIST AND PROP BRIDGE
AT CLEMMONS GULLY
DA1 - 19.546 SQ MI

At the Bridge	5-year	10-year	25-year	50-year	100-year
FEMA Model Flows	1412	1760	2292	2715	3179
OMEGA-EM Flows	1373	1712	2230	2642	3094
Difference Flow	-39	-48.3	-61.79	-72.75	-84.95
Percent Difference	3%	3%	3%	3%	3%

NOTES:

1) *OMEGA EM REGRESSION METHOD WAS FOUND TO BE COMPARABLE WITHIN FEMA FLOWS. THE SIMULATION FOR FLOWS STARTED NOVEMBER 6, 2023.*

2) *HEC-RAS 6.2.0 WAS USED TO MODEL AND ANALYZE EXISTING CONDITIONS AND PROPOSED STRUCTURE.*

3) *DESIGN FREQUENCY REQUIREMENT FOR OFF-SYSTEM BRIDGE IS SAME OR SLIGHTLY BETTER AS EXISTING.*

4) *PROJECT NOTIFICATION WAS PROVIDED TO HARDIN COUNTY FLOOD PLAIN ADMINISTRATORS (ALEX PARKER) ON 12/18/2023.*

5) *NORMAL DEPTH COMPUTATIONS WERE USED FOR DOWNSTREAM BOUNDARY CONDITIONS UTILIZING A SLOPE OF 0.000681 FOR BOTH EXISTING AND PROPOSED.*

6) *THE PROPOSED BRIDGE IS LOCATED WITHIN A FEMA DESIGNATED ZONE "AE" FLOOD PLAIN.*

7) *THE TXDOT'S FLOOD MAPPING TOOL WAS USED TO DELINEATE THE WATERSHED. ATLAS 14 DATA WAS USED.*

NOT TO SCALE

STATE OF TEXAS
JAMES D. HORNE
141323
REGISTERED PROFESSIONAL ENGINEER
DocuSigned by:
50238C8D55F5470...
2/29/2024

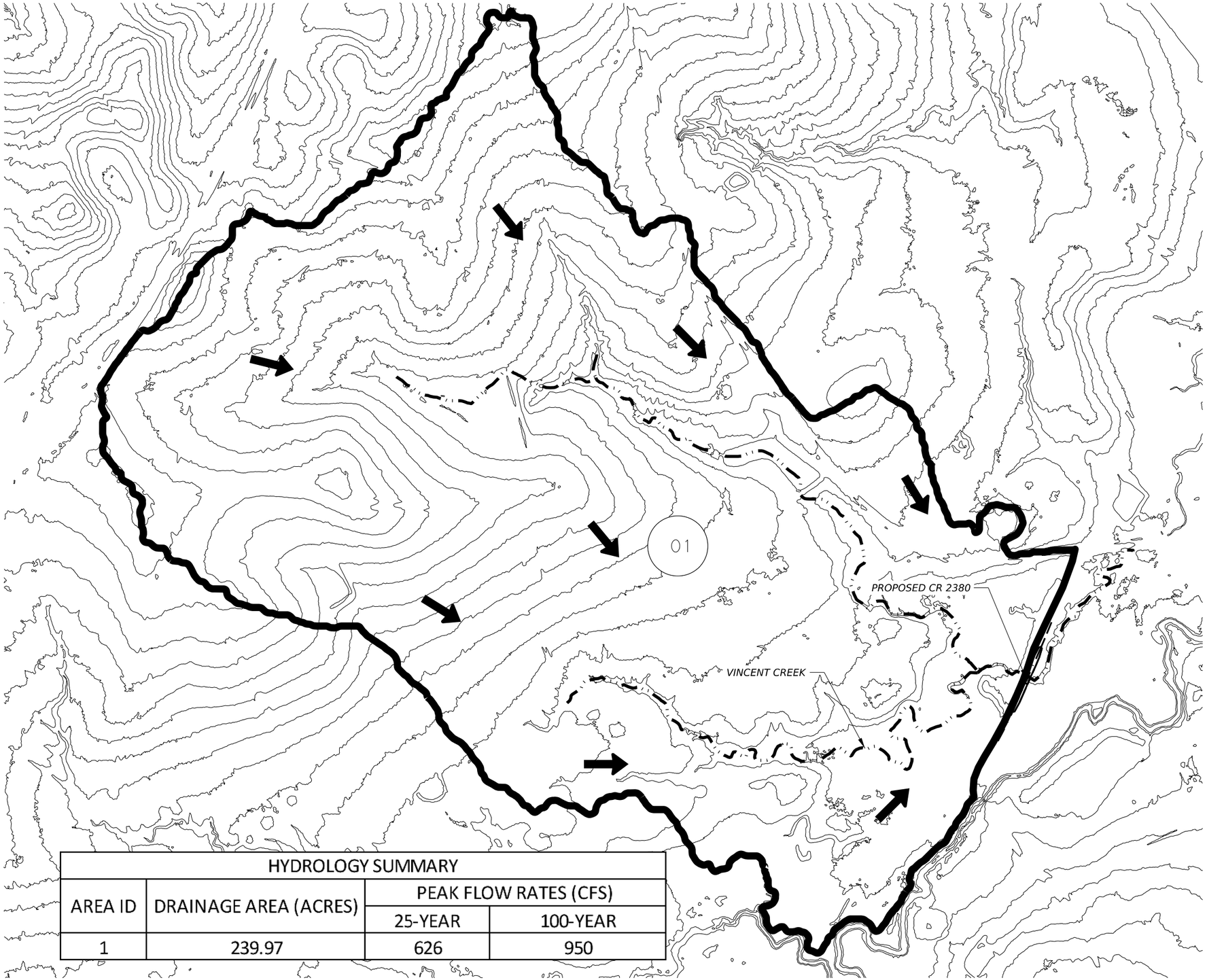
Texas Department of Transportation
© 2024

CLEMMONS GULLY PACKAGE

DRAINAGE AREA MAP
W. PINESHADOWS DR (CR 1065)
AT CLEMMONS GULLY

SHEET 1 OF 1

CONT	SECT	JOB	HIGHWAY
0920	03	082,ETC	CR 1065, ETC
DIST	COUNTY		SHEET NO.
20	HARDIN, ETC		91



N

LEGEND

XX — DRAINAGE AREA ID

DRAINAGE AREA BOUNDARY

RIVERS

FLOW ARROW

NOTES:

1. DRAINAGE AREA DELINEATED USING HEC-HMS 4.5
2. DRAINAGE AREA DELINEATED BASED ON LIDAR DATED BETWEEN 2016 & 2017. LIDAR HAS A RESOLUTION OF 70 CM
3. DISCHARGES WERE DETERMINED USING NRC HYDROGRAPH METHOD APPLYING LOSS METHOD AND ATLAS 14 24 HOUR RAINFALL DATA.
4. DOWNSTREAM BOUNDARY CONDITION IS SET TO A NORMAL DEPTH OF SLOPE OF 0.00249 FOR ALL STORM EVENTS.
5. CR 2380 DOES NOT CROSS A FEMA STREAM WITHIN PROJECT LIMITS
6. COUNTY FLOODPLAIN ADMINISTRATOR NOTIFIED 2/23/2024

HYDROLOGY SUMMARY			
AREA ID	DRAINAGE AREA (ACRES)	PEAK FLOW RATES (CFS)	
		25-YEAR	100-YEAR
1	239.97	626	950

STATE OF TEXAS
D'ANDRE R. JAMES
145862
LICENSED
PROFESSIONAL ENGINEER
2.26.23

LJA PROGRAM MANAGEMENT
FRN - F-14256

Texas Department of Transportation

CLEMMONS GULLY PACKAGE

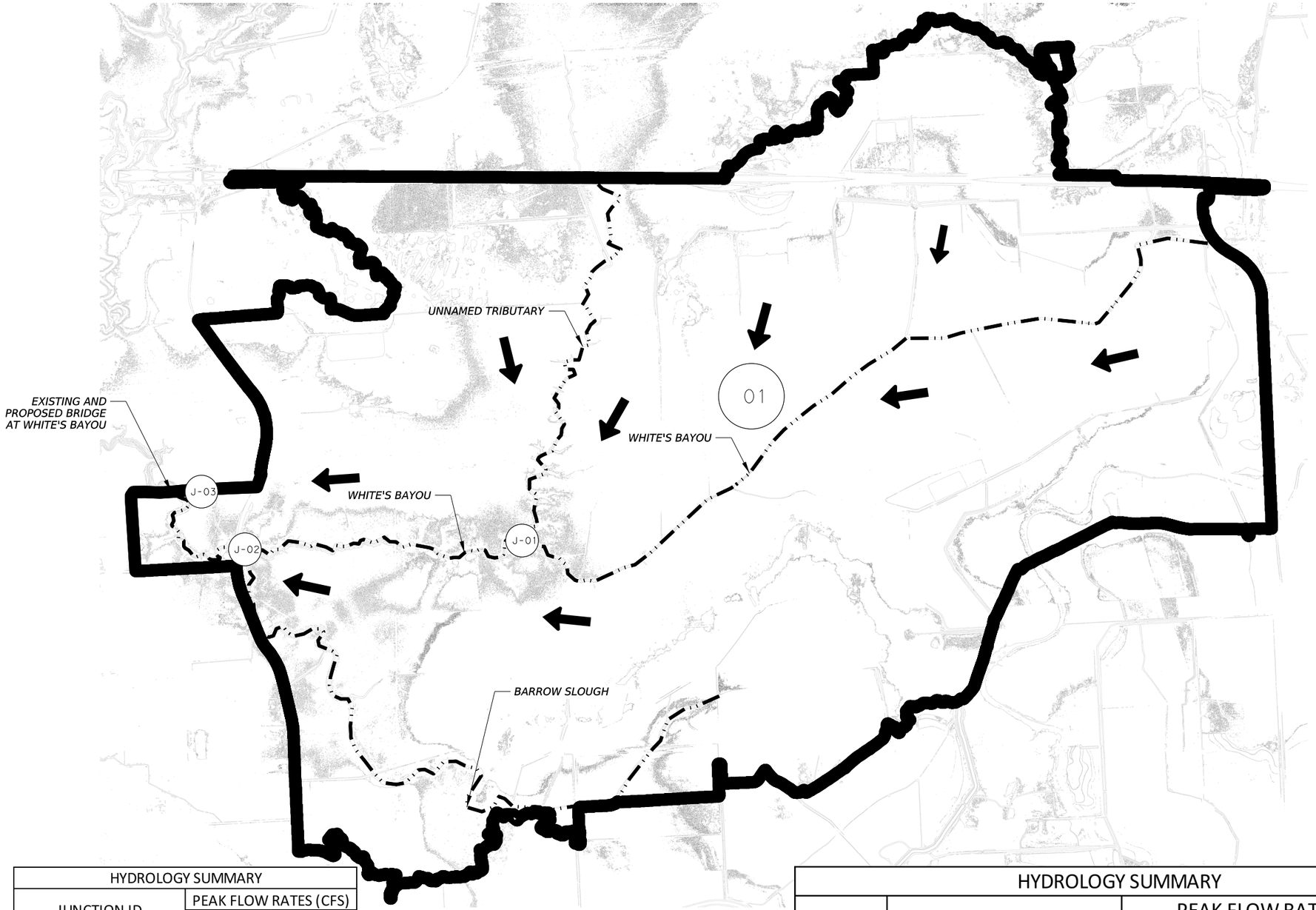
DRAINAGE AREA MAP
CR 2380 AT
VINCENT TRIBUTARY

SHEET 1 OF 1

CONT	SECT	JOB	HIGHWAY
0920	03	082, ETC	CR 1065, ETC
DIST	COUNTY		SHEET NO.
BMT	HARDIN, ETC		92

DATE: 2/23/2024
FILE: pw://lja-pw.bentley.com:lja-pw-01/Documents/TxDOT/PM8016-2301 CEC WA4/Clemmons Gully Off-System Bridge/400 Production/4 - Design/Master Design Files/2 Vincent Tributary/041_DRAIN

DN: | CK: | DW: | CK:



LEGEND

XX — DRAINAGE AREA ID

DRAINAGE AREA BOUNDARY

RIVERS

FLOW ARROW

NOTES:

1. DRAINAGE AREA DELINEATED USING HEC-HMS 4.5
2. DRAINAGE AREA DELINEATED BASED ON LIDAR DATED BETWEEN 2017 & 2018. THE 2017 LIDAR HAS A RESOLUTION OF 35 CM AND THE 2018 HAS A RESOLUTION OF 50 CM.
3. DISCHARGES WERE DETERMINED USING NRC HYDROGRAPH METHOD APPLYING LOSS METHOD AND ATLAS 14 24 HOUR RAINFALL DATA.
4. DOWNSTREAM BOUNDARY CONDITION IS SET TO THE NORMAL DEPTH OF SLOPE .000909 FOR ALL STORM EVENTS.
5. CROSSING IS A FEMA ZONE AE REGULATED STREAM.
6. COUNTY FLOODPLAIN ADMINISTRATOR NOTIFIED 2/23/2024

0' 3000' 6000'

SCALE: 1"=6000'

HYDROLOGY SUMMARY		
JUNCTION ID	PEAK FLOW RATES (CFS)	
	25-YEAR	100-YEAR
1	3109.21	4818.18
2	2948.57	4577.38
3	1807.75	2823.37

HYDROLOGY SUMMARY			
AREA ID	DRAINAGE AREA (ACRES)	PEAK FLOW RATES (CFS)	
		25-YEAR	100-YEAR
1	6648.63	3109.21	4818.18

STATE OF TEXAS
D'ANDRE R. JAMES
145862
LICENSED
PROFESSIONAL ENGINEER

2.26.23

LJA PROGRAM MANAGEMENT
FRN - F-14256

Texas Department of Transportation ©2024

CLEMMONS GULLY PACKAGE

DRAINAGE AREA MAP
BAILEY RD
AT WHITES BAYOU

SHEET 1 OF 1

CONT	SECT	JOB	HIGHWAY
0920	03	082, ETC	CR 1065, ETC
DIST	COUNTY		SHEET NO.
BMT	HARDIN, ETC		93

DATE: 2/23/2024
FILE: pw://lja-pw.bentley.com:lja-pw-01/Documents/TxDOT/PM80016-2301 CEC WA4/Clemmons Gully Off-System Bridge/400 Production/4 - Design/Master Design Files/3 Barrow Slough/031_DRAIN

HEC-RAS INFORMATION

Existing Conditions (25-Year)					
Reach	River Sta	Profile	Q Total	Vel Chnl	W.S. Elev
			(cfs)	(ft/s)	(ft)
Upstream	3669	25-year	2292	2.25	27.15
Upstream	3602	25-year	2292	2.13	27.11
Upstream	3555	25-year	2292	1.58	27.11
Upstream	3021	25-year	2292	0.95	27.04
Upstream	2848	25-year	2292	1.12	27.02
Upstream	2733	25-year	2292	0.98	27.01
Bridge	2696				
Downstream	2661	25-year	2292	4.35	24.61
Downstream	2593	25-year	2292	2.28	24.68
Pedestrain Bridge	2577				
Downstream	2564	25-year	2292	2.8	24.58
Downstream	2411	25-year	2292	2.51	24.47
Downstream	2346	25-year	2292	3.24	24.39

Proposed Conditions (25-Year)					
Reach	River Sta	Profile	Q Total	Vel Chnl	W.S. Elev
			(cfs)	(ft/s)	(ft)
Upstream	3669	25-year	2292	2.25	27.15
Upstream	3602	25-year	2292	2.13	27.11
Upstream	3555	25-year	2292	1.58	27.1
Upstream	3021	25-year	2292	0.95	27.03
Upstream	2848	25-year	2292	1.12	27.01
Upstream	2735	25-year	2292	2.11	26.92
Bridge	2664				
Downstream	2627	25-year	2292	3.57	24.62
Downstream	2593	25-year	2292	2.22	24.64
Pedestrain Bridge	2577				
Downstream	2564	25-year	2292	2.67	24.56
Downstream	2411	25-year	2292	2.31	24.48
Downstream	2346	25-year	2292	3.24	24.39

Existing Conditions (100-Year)					
Reach	River Sta	Profile	Q Total	Vel Chnl	W.S. Elev
			(cfs)	(ft/s)	(ft)
Upstream	3669	100-year	3179	2.94	27.39
Upstream	3602	100-year	3179	2.82	27.32
Upstream	3555	100-year	3179	2.09	27.31
Upstream	3021	100-year	3179	1.26	27.19
Upstream	2848	100-year	3179	1.49	27.16
Upstream	2733	100-year	3179	1.32	27.15
Bridge	2696				
Downstream	2661	100-year	3179	5.75	25.2
Downstream	2593	100-year	3179	2.55	25.36
Pedestrain Bridge	2577				
Downstream	2564	100-year	3179	3.13	25.26
Downstream	2411	100-year	3179	2.86	25.13
Downstream	2346	100-year	3179	3.49	25.05

Proposed Conditions (100-Year)					
Reach	River Sta	Profile	Q Total	Vel Chnl	W.S. Elev
			(cfs)	(ft/s)	(ft)
Upstream	3669	100-year	3179	2.95	27.38
Upstream	3602	100-year	3179	2.82	27.31
Upstream	3555	100-year	3179	2.09	27.31
Upstream	3021	100-year	3179	1.26	27.19
Upstream	2848	100-year	3179	1.5	27.16
Upstream	2735	100-year	3179	1.32	27.14
Bridge	2664				
Downstream	2627	100-year	3179	4.68	25.25
Downstream	2593	100-year	3179	2.51	25.33
Pedestrain Bridge	2577				
Downstream	2564	100-year	3179	3.02	25.23
Downstream	2411	100-year	3179	2.68	25.13
Downstream	2346	100-year	3179	3.49	25.05

NOTES:

1) OMEGA EM REGRESSION METHOD WAS FOUND TO BE COMPARABLE WITHIN FEMA FLOWS. THE SIMULATION FOR FLOWS STARTED NOVEMBER 6, 2023.

2) HEC-RAS 6.2.0 WAS USED TO MODEL AND ANALYZE EXISTING CONDITIONS AND PROPOSED STRUCTURE.

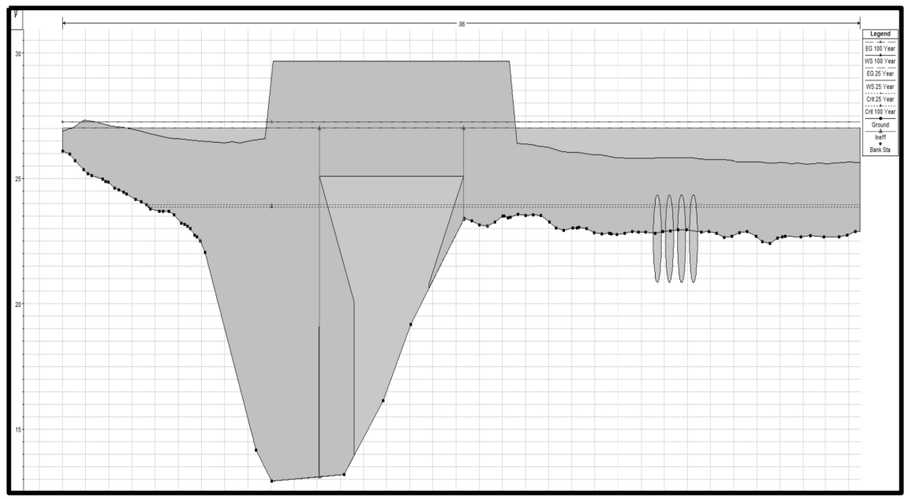
3) DESIGN FREQUENCY REQUIREMENT FOR OFF-SYSTEM BRIDGE IS SAME OR SLIGHTLY BETTER AS EXISTING.

4) PROJECT NOTIFICATION WAS PROVIDED TO NEWTON COUNTY FLOOD PLAIN ADMINISTRATORS (ALEX PARKER) ON DECEMBER 18,2023.

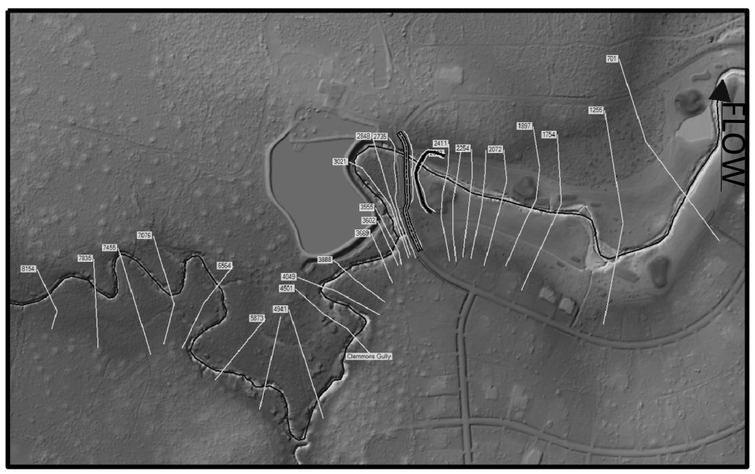
5) NORMAL DEPTH COMPUTATIONS WERE USED FOR DOWNSTREAM BOUNDARY CONDITIONS UTILIZING A SLOPE OF 0.000681 FOR BOTH EXISTING AND PROPOSED.

6) THE PROPOSED BRIDGE IS LOCATED WITHIN A FEMA DESIGNATED ZONE "AE" FLOOD PLAIN.

CROSS SECTION AT THE BRIDE UPSTREAM



CROSS SECTION AT CLEMMONS GULLY



NOT TO SCALE

STATE OF TEXAS
JAMES D. HORNE
141323
REGISTERED
PROFESSIONAL ENGINEER

DocuSigned by:
2/29/2024
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Texas Department of Transportation
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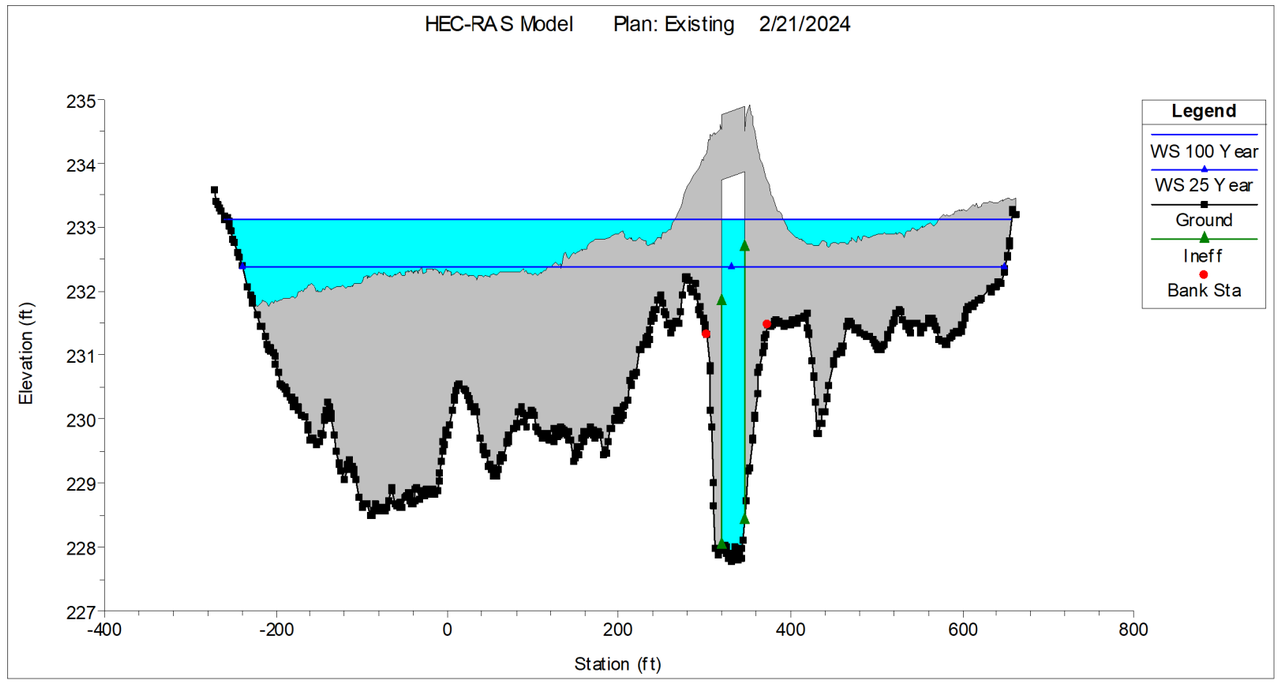
CLEMMONS GULLY PACKAGE

HYDRAULIC DATA
W. PINESHADOWS DR (CR 1065)
AT CLEMMONS GULLY

SHEET 1 *OF* 1

CONT	SECT	JOB	HIGHWAY
0920	03	082,ETC	CR 1065, ETC
DIST	COUNTY		SHEET NO.
20	HARDIN, ETC		94

DATE: 2/29/2024
FILE: pw://txdot.projectwiseonline.com:TXDOT5/Documents/20 - BMT/Design Projects/092003082/4 - Design/Plan Set/5. Drainage/Hydraulic Data for Clemmons Gully



Plan: Existing	Vincent Creek	Vincent Creek RS: 2021	Profile: 25 Year	
E.G. US. (ft)	232.84	Element	Inside BR US	Inside BR DS
W.S. US. (ft)	232.84	E.G. Elev (ft)	232.73	232.58
Q Total (cfs)	625.26	W.S. Elev (ft)	232.37	231.79
Q Bridge (cfs)	579.09	Crit W.S. (ft)	230.56	231.02
Q Weir (cfs)		Max Chl Dpth (ft)	4.61	4.21
Weir Sta Lft (ft)		Vel Total (ft/s)	3.34	7.13
Weir Sta Rgt (ft)		Flow Area (sq ft)	187.4	87.74
Weir Submerg		Froude # Chl	0.4	0.61
Weir Max Depth (ft)		Specif Force (cu ft)	358.84	290.54
Min El Weir Flow (ft)	232.26	Hydr Depth (ft)	0.49	3.4
Min El Prs (ft)	233.87	W.P. Total (ft)	389.09	29.14
Delta EG (ft)	0.47	Conv. Total (cfs)	12875	8496.3
Delta WS (ft)	1.47	Top Width (ft)	380.54	25.89
BR Open Area (sq ft)	140.05	Frctn Loss (ft)	0.03	0.15
BR Open Vel (ft/s)	6.6	C & E Loss (ft)	0.13	0.06
BR Sluice Coef		Shear Total (lb/sq ft)	0.07	1.02
BR Sel Method	Energy only	Power Total (lb/ft s)	0.24	7.26

Plan: Existing	Vincent Creek	Vincent Creek RS: 2021	Profile: 100 Year	
E.G. US. (ft)	233.31	Element	Inside BR US	Inside BR DS
W.S. US. (ft)	233.3	E.G. Elev (ft)	233.26	233.18
Q Total (cfs)	949.96	W.S. Elev (ft)	233.12	232.81
Q Bridge (cfs)	530.7	Crit W.S. (ft)	232.73	232.81
Q Weir (cfs)		Max Chl Dpth (ft)	5.36	5.23
Weir Sta Lft (ft)		Vel Total (ft/s)	1.62	2.68
Weir Sta Rgt (ft)		Flow Area (sq ft)	585.47	354.71
Weir Submerg		Froude # Chl	0.23	0.38
Weir Max Depth (ft)		Specif Force (cu ft)	616.47	454.52
Min El Weir Flow (ft)	232.26	Hydr Depth (ft)	0.8	0.66
Min El Prs (ft)	233.87	W.P. Total (ft)	738.47	544.05
Delta EG (ft)	0.45	Conv. Total (cfs)	26951.4	17128
Delta WS (ft)	0.82	Top Width (ft)	728.29	536.13
BR Open Area (sq ft)	140.05	Frctn Loss (ft)	0.02	0.08
BR Open Vel (ft/s)	4.65	C & E Loss (ft)	0.07	0
BR Sluice Coef		Shear Total (lb/sq ft)	0.06	0.13
BR Sel Method	Energy only	Power Total (lb/ft s)	0.1	0.34

NOTES:

1. HEC-RAS VERSION 6.3.1 WAS USED FOR THE HYDRAULIC ANALYSIS AND DESIGN OF THE BRIDGE.
2. DRAINAGE AREA DELINEATED BASED ON LIDAR DATED BETWEEN 2016 & 2017. LIDAR HAS A RESOLUTION OF 70 CM
3. DISCHARGES WERE DETERMINED USING NRC HYDROGRAPH METHOD APPLYING LOSS METHOD AND ATLAS 14 24 HOUR RAINFALL DATA.
4. DOWNSTREAM BOUNDARY CONDITION IS SET TO THE NORMAL DEPTH OF SLOPE OF .00198 FOR ALL STORM EVENTS.

STATE OF TEXAS
D'ANDRE R. JAMES
145862
LICENSED
PROFESSIONAL ENGINEER
2.26.23

LJA PROGRAM MANAGEMENT
FRN - F-14256

Texas Department of Transportation

CLEMMONS GULLY PACKAGE

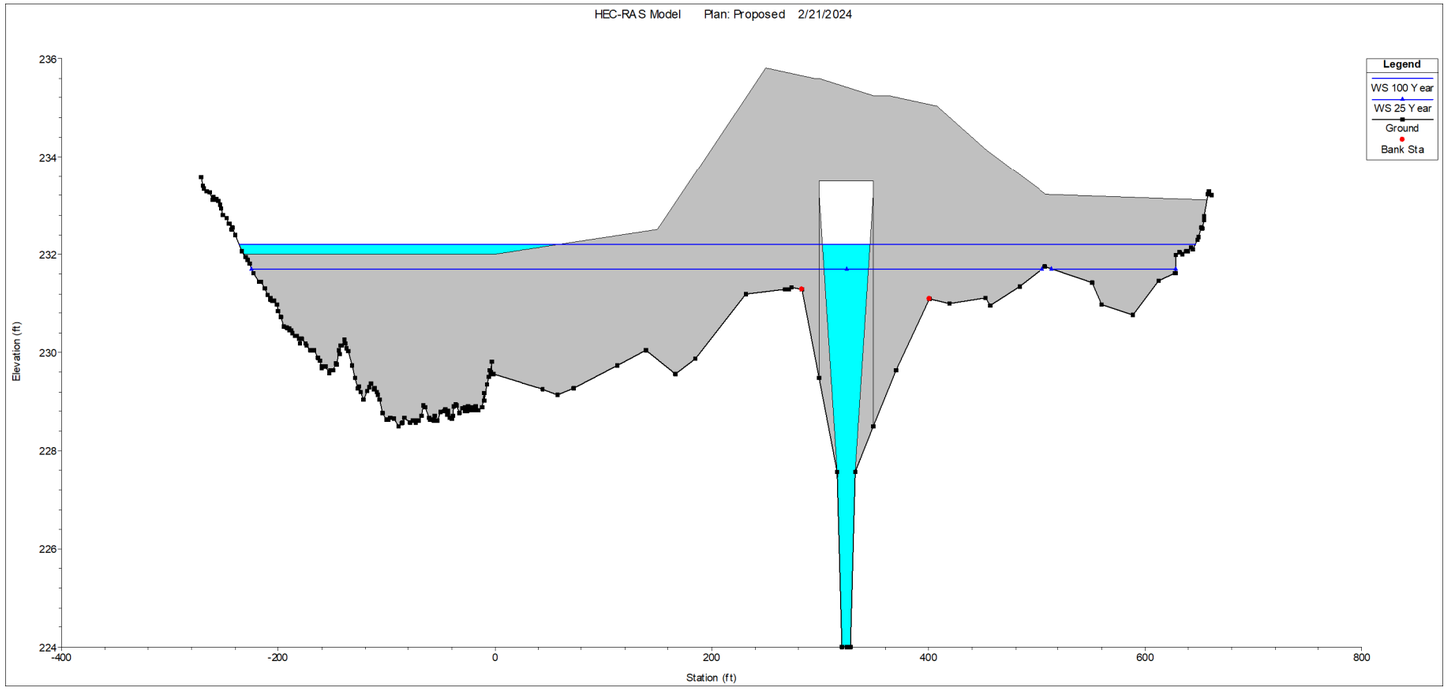
HYDRAULIC DATA
CR 2380
AT VINCENT TRIBUTARY

SHEET 1 OF 3

CONT	SECT	JOB	HIGHWAY
0920	03	082, ETC	CR 1065, ETC
DIST	COUNTY		SHEET NO.
BMT	HARDIN, ETC		95

DN: CK: DW: CK:

DATE: 2/23/2024 11:42:10 AM
FILE: pw://lja-pw.bentley.com:lja-pw-01/Documents/TxDOT/PM8016-2301 CEC WA4/Clemmons Gully Off-System Bridge/400 Production/4 - Design/Master Design Files/2 Vincent Tributary/041 HYDDATA



Plan: Proposed	Vincent Creek	Vincent Creek RS: 1993	Profile: 25 Year	
E.G. US. (ft)	232.01	Element	Inside BR US	Inside BR DS
W.S. US. (ft)	232	E.G. Elev (ft)	231.93	231.84
Q Total (cfs)	625.26	W.S. Elev (ft)	231.7	231.59
Q Bridge (cfs)	625.26	Crit W.S. (ft)	228.71	228.71
Q Weir (cfs)		Max Chl Dpth (ft)	7.7	7.59
Weir Sta Lft (ft)		Vel Total (ft/s)	3.85	3.95
Weir Sta Rgt (ft)		Flow Area (sq ft)	162.28	158.14
Weir Submerg		Froude # Chl	0.24	0.25
Weir Max Depth (ft)		Specif Force (cu ft)	531.96	517.41
Min El Weir Flow (ft)	232.02	Hydr Depth (ft)	3.95	3.91
Min El Prs (ft)	233.5	W.P. Total (ft)	56.02	57.96
Delta EG (ft)	0.29	Conv. Total (cfs)	10888.5	10196.1
Delta WS (ft)	0.35	Top Width (ft)	41.05	40.43
BR Open Area (sq ft)	245.32	Frctn Loss (ft)	0.09	0.03
BR Open Vel (ft/s)	3.95	C & E Loss (ft)	0	0.09
BR Sluice Coef		Shear Total (lb/sq ft)	0.6	0.64
BR Sel Method	Energy only	Power Total (lb/ft s)	2.3	2.53

Plan: Proposed	Vincent Creek	Vincent Creek RS: 1993	Profile: 100 Year	
E.G. US. (ft)	232.68	Element	Inside BR US	Inside BR DS
W.S. US. (ft)	232.68	E.G. Elev (ft)	232.57	232.38
Q Total (cfs)	949.96	W.S. Elev (ft)	232.2	231.9
Q Bridge (cfs)	914.37	Crit W.S. (ft)	229.78	229.77
Q Weir (cfs)		Max Chl Dpth (ft)	8.2	7.9
Weir Sta Lft (ft)		Vel Total (ft/s)	4.09	5.57
Weir Sta Rgt (ft)		Flow Area (sq ft)	232.09	170.68
Weir Submerg		Froude # Chl	0.3	0.35
Weir Max Depth (ft)		Specif Force (cu ft)	689.4	654.79
Min El Weir Flow (ft)	232.02	Hydr Depth (ft)	0.69	4.04
Min El Prs (ft)	233.5	W.P. Total (ft)	351.98	61.05
Delta EG (ft)	0.55	Conv. Total (cfs)	13085.6	11185.2
Delta WS (ft)	0.61	Top Width (ft)	334.87	42.2
BR Open Area (sq ft)	245.32	Frctn Loss (ft)	0.16	0.04
BR Open Vel (ft/s)	5.36	C & E Loss (ft)	0.03	0.21
BR Sluice Coef		Shear Total (lb/sq ft)	0.22	1.26
BR Sel Method	Energy only	Power Total (lb/ft s)	0.89	7.01

NOTES:

1. HEC-RAS VERSION 6.3.1 WAS USED FOR THE HYDRAULIC ANALYSIS AND DESIGN OF THE BRIDGE.
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STATE OF TEXAS
D'ANDRE R. JAMES
145862
LICENSED
PROFESSIONAL ENGINEER
2.26.23

LJA PROGRAM MANAGEMENT
FRN - F-14256

Texas Department of Transportation

CLEMMONS GULLY PACKAGE

HYDRAULIC DATA
CR 2380
AT VINCENT TRIBUTARY

SHEET 2 OF 3

CONT	SECT	JOB	HIGHWAY
0920	03	082, ETC	CR 1065, ETC
DIST	COUNTY		SHEET NO.
BMT	HARDIN, ETC		96

DN: CK: DW: CK:

DATE: 2/23/2024 11:41:45 AM
FILE: pw://la-pw.bentley.com:lja-pw-01/Documents/TxDOT/PM8016-2301 CEC WA4/Clemmons Gully Off-System Bridge/400 Production/4 - Design/Master Design Files/2 Vincent Tributary/041 HYDDATA

Reach	River Sta	Profile	Plan	Q Total	Min Ch El	W.S. Elev	Crit W.S.	E.G. Elev	E.G. Slope	Vel Chnl	Flow Area	Top Width	Froude # Chl
				(cfs)	(ft)	(ft)	(ft)	(ft)	(ft/ft)	(ft/s)	(sq ft)	(ft)	
Vincent Creek	3727	100 Year	Proposed	949.96	233.29	234.99		235.02	0.001366	1.95	738.42	709.11	0.29
Vincent Creek	3727	100 Year	Existing	949.96	233.29	234.99		235.02	0.001366	1.95	738.39	709.1	0.29
Vincent Creek	3727	25 Year	Proposed	625.26	233.29	234.73		234.75	0.001439	1.75	556.3	692.74	0.29
Vincent Creek	3727	25 Year	Existing	625.26	233.29	234.73		234.75	0.001439	1.75	556.33	692.75	0.29
Vincent Creek	3163	100 Year	Proposed	949.96	231.46	234.21		234.26	0.001355	2.62	627.84	508.3	0.31
Vincent Creek	3163	100 Year	Existing	949.96	231.46	234.22		234.26	0.001334	2.6	631.08	508.41	0.31
Vincent Creek	3163	25 Year	Proposed	625.26	231.46	233.88		233.92	0.001506	2.47	459.64	494.19	0.32
Vincent Creek	3163	25 Year	Existing	625.26	231.46	233.88		233.92	0.001507	2.47	459.51	494.18	0.32
Vincent Creek	2737	100 Year	Proposed	949.96	230.15	233.77		233.81	0.000847	2.3	735.21	565.41	0.25
Vincent Creek	2737	100 Year	Existing	949.96	230.15	233.79		233.83	0.000803	2.26	748.26	566.12	0.25
Vincent Creek	2737	25 Year	Proposed	625.26	230.15	233.43		233.47	0.000793	2.03	552.32	526.32	0.24
Vincent Creek	2737	25 Year	Existing	625.26	230.15	233.43		233.46	0.000797	2.03	551.44	526.25	0.24
Vincent Creek	2319	100 Year	Proposed	949.96	229.47	233.18		233.27	0.002139	3.29	529.72	599.09	0.39
Vincent Creek	2319	100 Year	Existing	949.96	229.47	233.3		233.37	0.001539	2.89	605.86	631.97	0.34
Vincent Creek	2319	25 Year	Proposed	625.26	229.47	232.84	232.41	232.93	0.002328	3.07	352.27	462.94	0.4
Vincent Creek	2319	25 Year	Existing	625.26	229.47	232.83		232.92	0.002455	3.13	343.82	452.8	0.41
Vincent Creek	2202	100 Year	Proposed	949.96	229.08	232.69		232.7	0.000383	1.69	1104.18	799.88	0.19
Vincent Creek	2202	100 Year	Existing	949.96	229.08	233.31		233.32	0.000124	1.01	1617.86	851.35	0.1
Vincent Creek	2202	25 Year	Proposed	625.26	229.08	232.01		232.03	0.000764	1.94	590.99	671.58	0.25
Vincent Creek	2202	25 Year	Existing	625.26	229.08	232.85		232.85	0.000123	0.91	1232.78	812.5	0.1
Vincent Creek	2035	100 Year	Proposed	949.96	226.46	232.68	229.75	232.68	0.000041	0.7	2193.67	900.8	0.06
Vincent Creek	2035	100 Year	Existing	949.96	227.76	233.3	231.37	233.31	0.000026	0.61	2609	928.09	0.05
Vincent Creek	2035	25 Year	Proposed	625.26	226.46	232	229.54	232.01	0.000045	0.64	1592.63	861.55	0.07
Vincent Creek	2035	25 Year	Existing	625.26	227.76	232.84	230.54	232.84	0.000019	0.49	2187.04	906.19	0.04
Vincent Creek	1993			Bridge									
Vincent Creek	1992	100 Year	Existing	949.96	227.58	232.48	232.48	232.85	0.003683	5.35	311.16	668.24	0.58
Vincent Creek	1992	25 Year	Existing	625.26	227.58	231.38	231	232.37	0.007073	8.01	78.11	61.68	0.82
Vincent Creek	1969	100 Year	Proposed	949.96	224.45	232.07		232.13	0.000543	2.73	725.09	670.02	0.23
Vincent Creek	1969	25 Year	Proposed	625.26	224.45	231.65		231.72	0.000502	2.45	506.12	473.91	0.22
Vincent Creek	1921	100 Year	Proposed	949.96	225.45	231.99		232.1	0.00112	3.63	574.86	742.1	0.31
Vincent Creek	1921	100 Year	Existing	949.96	227.57	232.01		232.12	0.001483	3.83	561.73	771.74	0.37
Vincent Creek	1921	25 Year	Proposed	625.26	225.45	231.58		231.68	0.000997	3.21	368.24	368.6	0.29
Vincent Creek	1921	25 Year	Existing	625.26	227.57	231.62		231.73	0.001477	3.51	351.13	387.82	0.36
Vincent Creek	1640	100 Year	Proposed	949.96	227.08	231.36		231.52	0.003194	4.66	430.86	533.7	0.49
Vincent Creek	1640	100 Year	Existing	949.96	227.08	231.36		231.52	0.003194	4.66	430.86	533.7	0.49
Vincent Creek	1640	25 Year	Proposed	625.26	227.08	231.06		231.19	0.002559	3.88	296.92	363.34	0.43
Vincent Creek	1640	25 Year	Existing	625.26	227.08	231.06		231.19	0.002559	3.88	296.9	363.32	0.43
Vincent Creek	1599	100 Year	Proposed	949.96	227.17	231.19	230.84	231.38	0.003809	4.9	392.96	492.21	0.53
Vincent Creek	1599	100 Year	Existing	949.96	227.17	231.19	230.84	231.38	0.003809	4.9	392.96	492.21	0.53
Vincent Creek	1599	25 Year	Proposed	625.26	227.17	230.89		231.07	0.003632	4.41	263.54	350.88	0.51
Vincent Creek	1599	25 Year	Existing	625.26	227.17	230.89	230.26	231.07	0.003633	4.41	263.51	350.85	0.51
Vincent Creek	1000	100 Year	Proposed	949.96	226.8	229.8	229.33	229.88	0.001981	3.1	525.52	531.57	0.37
Vincent Creek	1000	100 Year	Existing	949.96	226.8	229.8	229.33	229.88	0.001981	3.1	525.52	531.57	0.37
Vincent Creek	1000	25 Year	Proposed	625.26	226.8	229.52	229.05	229.6	0.00198	2.89	378.26	521.34	0.37
Vincent Creek	1000	25 Year	Existing	625.26	226.8	229.52	229.05	229.6	0.00198	2.89	378.26	521.34	0.37

NOTES:

1. HEC-RAS VERSION 6.3.1 WAS USED FOR THE HYDRAULIC ANALYSIS AND DESIGN OF THE BRIDGE.
2. DRAINAGE AREA DELINEATED BASED ON LIDAR DATED BETWEEN 2016 & 2017. LIDAR HAS A RESOLUTION OF 70 CM
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FRN - F-14256

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CLEMMONS GULLY PACKAGE

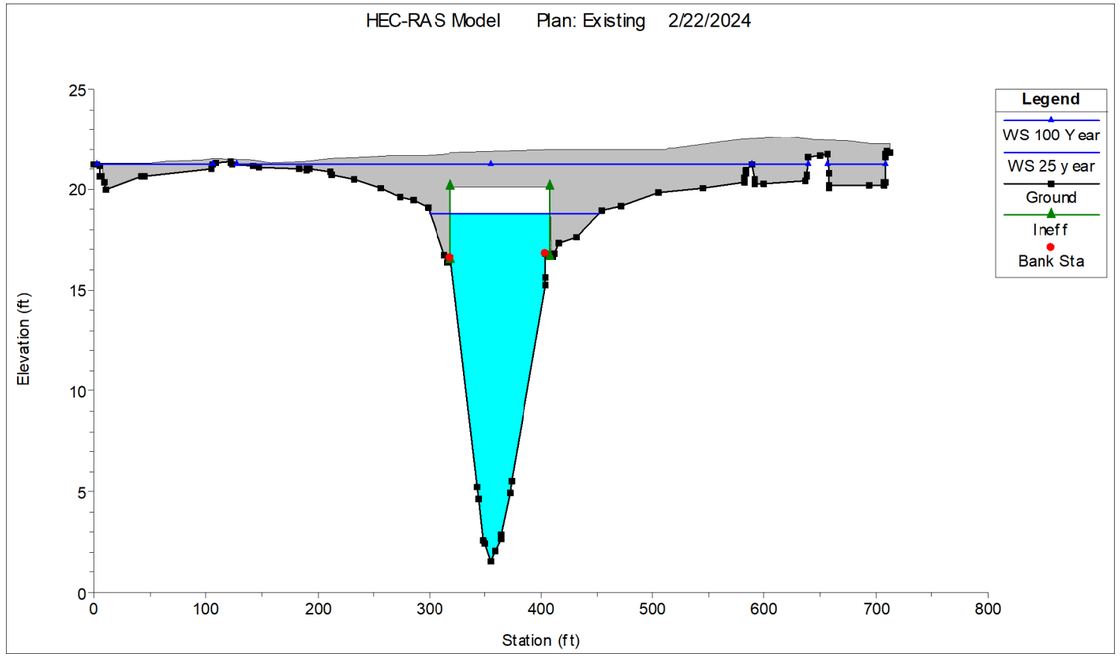
HYDRAULIC DATA
CR 2380
AT VINCENT TRIBUTARY

SHEET 3 OF 3

CONT	SECT	JOB	HIGHWAY
0920	03	082, ETC	CR 1065, ETC
DIST	COUNTY		SHEET NO.
BMT	HARDIN, ETC		97

DATE: 2/23/2024 11:41:24 AM
FILE: pw://lja-pw.bentley.com:lja-pw-01/Documents/TxDOT/PM8016-2301 CEC WA4/Clemmons Gully Off-System Bridge/400 Production/4 - Design/Master Design Files/2 Vincent Tributary/041_HYDDATA

DN: CK: DW: CK:



Plan: Existing Whites Bayou Whites Bayou RS: 2108 Profile: 25 year				
E.G. US. (ft)	18.96	Element	Inside BR US	Inside BR DS
W.S. US. (ft)	18.78	E.G. Elev (ft)	18.95	18.93
Q Total (cfs)	3109.21	W.S. Elev (ft)	18.78	18.72
Q Bridge (cfs)	3109.21	Crit W.S. (ft)	9.64	10.59
Q Weir (cfs)		Max Chl Dpth (ft)	17.24	16.5
Weir Sta Lft (ft)		Vel Total (ft/s)	3.32	3.63
Weir Sta Rgt (ft)		Flow Area (sq ft)	935.86	855.8
Weir Submerg		Froude # Chl	0.14	0.2
Weir Max Depth (ft)		Specif Force (cu ft)	6224.52	5427.56
Min El Weir Flow (ft)	21.34	Hydr Depth (ft)	10.43	9.79
Min El Prs (ft)	20.1	W.P. Total (ft)	98.5	95.26
Delta EG (ft)	0.03	Conv. Total (cfs)	161358.6	137392
Delta WS (ft)	0.06	Top Width (ft)	90.13	87.45
BR Open Area (sq ft)	978.64	Frctn Loss (ft)	0.01	0
BR Open Vel (ft/s)	3.63	C & E Loss (ft)	0.01	0
BR Sluice Coef		Shear Total (lb/sq ft)	0.22	0.29
BR Sel Method	Energy only	Power Total (lb/ft s)	0.73	1.04

Plan: Existing Whites Bayou Whites Bayou RS: 2108 Profile: 100 Year				
E.G. US. (ft)	21.6	Element	Inside BR US	Inside BR DS
W.S. US. (ft)	21.41	E.G. Elev (ft)	21.54	21.48
Q Total (cfs)	4818.18	W.S. Elev (ft)	21.21	21.1
Q Bridge (cfs)	4817.63	Crit W.S. (ft)	11.45	12.39
Q Weir (cfs)		Max Chl Dpth (ft)	19.67	18.88
Weir Sta Lft (ft)		Vel Total (ft/s)	4.56	4.92
Weir Sta Rgt (ft)		Flow Area (sq ft)	1057.28	978.66
Weir Submerg		Froude # Chl	0.18	0.2
Weir Max Depth (ft)		Specif Force (cu ft)	9083.76	8058.98
Min El Weir Flow (ft)	21.34	Hydr Depth (ft)		
Min El Prs (ft)	20.1	W.P. Total (ft)	199.51	190.72
Delta EG (ft)	0.18	Conv. Total (cfs)	126241.8	110020.2
Delta WS (ft)	0.26	Top Width (ft)	4.59	
BR Open Area (sq ft)	978.64	Frctn Loss (ft)	0.04	0
BR Open Vel (ft/s)	4.92	C & E Loss (ft)	0.01	0.06
BR Sluice Coef		Shear Total (lb/sq ft)	0.48	0.61
BR Sel Method	Energy only	Power Total (lb/ft s)	2.2	3.02

NOTES:

1. HEC-RAS VERSION 6.3.1 WAS USED FOR THE HYDRAULIC ANALYSIS AND DESIGN OF THE BRIDGE.
2. DRAINAGE AREA DELINEATED BASED ON LIDAR DATED BETWEEN 2017 & 2018. THE 2017 LIDAR HAS A RESOLUTOIN OF 35 CM ADN THE 2018 HAS A RESOLUTION OF 50 CM
3. DISCHARGES WERE DETERMINED USING NRC HYDROGRAPH METHOD APPLYING LOSS METHOD AND ATLAS 14 24 HOUR RAINFALL DATA,
4. DOWNSTREAM BOUNDARY CONDITION IS SET TO THE NORMAL DEPTH OF SLOPE OF .000909 FOR ALL STORM EVENTS.

STATE OF TEXAS
D'ANDRE R. JAMES
145862
LICENSED
PROFESSIONAL ENGINEER
2.26.23

LJA PROGRAM MANAGEMENT
FRN - F-14256

Texas Department of Transportation

CLEMMONS GULLY PACKAGE

HYDRAULIC DATA
BAILEY RD
AT WHITES BAYOU

SHEET 1 OF 3

CONT	SECT	JOB	HIGHWAY
0920	03	082, ETC	CR 1065, ETC
DIST	COUNTY		SHEET NO.
BMT	HARDIN, ETC		98

DN: CK: DW: CK:

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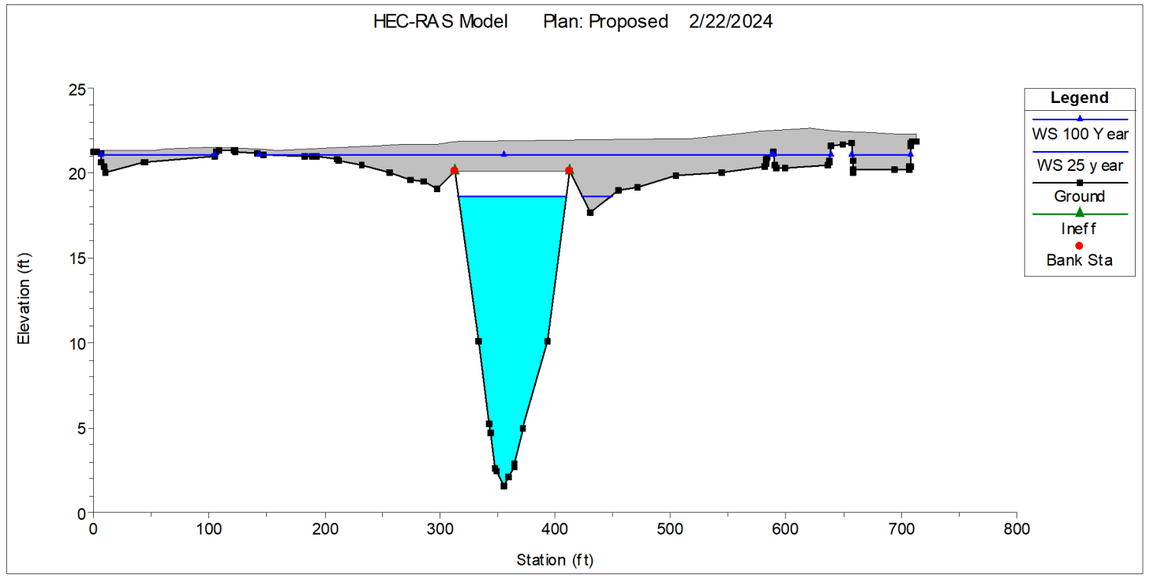

NOTES:

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2. DRAINAGE AREA DELINEATED BASED ON LIDAR DATED BETWEEN 2017 & 2018. THE 2017 LIDAR HAS A RESOLUTOIN OF 35 CM ADN THE 2018 HAS A RESOLUTION OF 50 CM
3. DISCHARGES WERE DETERMINED USING NRC HYDROGRAPH METHOD APPLYING LOSS METHOD AND ATLAS 14 24 HOUR RAINFALL DATA,
4. DOWNSTREAM BOUNDARY CONDITION IS SET TO THE NORMAL DEPTH OF SLOPE OF .000909 FOR ALL STORM EVENTS.

Plan: Proposed	Whites Bayou	Whites Bayou RS: 2108	Profile: 25 year	
E.G. US. (ft)	18.85	Element	Inside BR US	Inside BR DS
W.S. US. (ft)	18.69	E.G. Elev (ft)	18.85	18.84
Q Total (cfs)	3109.21	W.S. Elev (ft)	18.68	18.66
Q Bridge (cfs)	3109.21	Crit W.S. (ft)	9.57	10.2
Q Weir (cfs)		Max Chl Dpth (ft)	17.14	16.44
Weir Sta Lft (ft)		Vel Total (ft/s)	3.27	3.39
Weir Sta Rgt (ft)		Flow Area (sq ft)	950.73	917.29
Weir Submerg		Froude # Chl	0.18	0.19
Weir Max Depth (ft)		Specif Force (cu ft)	6327.51	5868.4
Min El Weir Flow (ft)	21.34	Hydr Depth (ft)	10.08	9.73
Min El Prs (ft)	20.1	W.P. Total (ft)	101.25	100.9
Delta EG (ft)	0.01	Conv. Total (cfs)	226464.3	213870.4
Delta WS (ft)	0.03	Top Width (ft)	94.34	94.25
BR Open Area (sq ft)	1056.89	Frctn Loss (ft)	0.01	0
BR Open Vel (ft/s)	3.39	C & E Loss (ft)	0	0
BR Sluice Coef		Shear Total (lb/sq ft)	0.11	0.12
BR Sel Method	Energy only	Power Total (lb/ft s)	0.36	0.41

Plan: Proposed	Whites Bayou	Whites Bayou RS: 2108	Profile: 100 Year	
E.G. US. (ft)	21.46	Element	Inside BR US	Inside BR DS
W.S. US. (ft)	21.25	E.G. Elev (ft)	21.43	21.4
Q Total (cfs)	4818.18	W.S. Elev (ft)	21.12	21.08
Q Bridge (cfs)	4817.88	Crit W.S. (ft)	11.25	11.79
Q Weir (cfs)		Max Chl Dpth (ft)	19.58	18.86
Weir Sta Lft (ft)		Vel Total (ft/s)	4.42	4.56
Weir Sta Rgt (ft)		Flow Area (sq ft)	1089.28	1056.89
Weir Submerg		Froude # Chl	0.18	0.19
Weir Max Depth (ft)		Specif Force (cu ft)	9229.16	8674.59
Min El Weir Flow (ft)	21.34	Hydr Depth (ft)		
Min El Prs (ft)	20.1	W.P. Total (ft)	210.55	207.33
Delta EG (ft)	0.1	Conv. Total (cfs)	178526.1	170213.7
Delta WS (ft)	0.13	Top Width (ft)	1.91	
BR Open Area (sq ft)	1056.89	Frctn Loss (ft)	0.02	0
BR Open Vel (ft/s)	4.56	C & E Loss (ft)	0.01	0.04
BR Sluice Coef		Shear Total (lb/sq ft)	0.24	0.25
BR Sel Method	Energy only	Power Total (lb/ft s)	1.04	1.16

STATE OF TEXAS
D'ANDRE R. JAMES
145862
LICENSED
PROFESSIONAL ENGINEER
2.26.23

LJA PROGRAM MANAGEMENT
FRN - F-14256

Texas Department of Transportation

CLEMMONS GULLY PACKAGE

HYDRAULIC DATA
BAILEY RD
AT WHITES BAYOU

SHEET 2 OF 3

CONT	SECT	JOB	HIGHWAY
0920	03	082, ETC	CR 1065, ETC
DIST	COUNTY		SHEET NO.
BMT	HARDIN, ETC		99

DATE: 2/23/2024 11:47:44 AM
FILE: pw://lja-pw.bentley.com/lja-pw-01/Documents/TxDOT/PM8016-2301 CEC WA4/Clemmons Gully Off-System Bridge/400 Production/4 - Design/Master Design Files/3 Barrow Slough/031 HYDDATA

DN: CK: DW: CK:

Reach	River Sta	Profile	Plan	Q Total	Min Ch El	W.S. Elev	Crit W.S.	E.G. Elev	E.G. Slope	Vel Chnl	Flow Area	Top Width	Froude # Chl
				(cfs)	(ft)	(ft)	(ft)	(ft)	(ft/ft)	(ft/s)	(sq ft)	(ft)	
Whites Bayou	3541	25 year	Existing	3109.21	4.76	19.58		19.67	0.000278	2.41	1367.97	290.52	0.15
Whites Bayou	3541	25 year	Proposed	3109.21	4.76	19.43		19.53	0.000295	2.47	1327.88	260.89	0.16
Whites Bayou	3541	100 Year	Existing	4818.18	4.76	22.16		22.24	0.000202	2.48	2676.24	649.34	0.14
Whites Bayou	3541	100 Year	Proposed	4818.18	4.76	22.01		22.1	0.000219	2.56	2579.78	649.34	0.14
Whites Bayou	3280	25 year	Existing	3109.21	4.38	19.47		19.59	0.000334	2.71	1162.37	157.73	0.17
Whites Bayou	3280	25 year	Proposed	3109.21	4.38	19.32		19.44	0.000354	2.76	1138.92	155.02	0.17
Whites Bayou	3280	100 Year	Existing	4818.18	4.38	22.04		22.17	0.000315	3.01	1894.19	403.9	0.17
Whites Bayou	3280	100 Year	Proposed	4818.18	4.38	21.88		22.02	0.000339	3.09	1832.28	403.9	0.17
Whites Bayou	2981	25 year	Existing	3109.21	4.37	19.2		19.41	0.000754	3.71	839.35	118.87	0.24
Whites Bayou	2981	25 year	Proposed	3109.21	4.37	19.05		19.28	0.000793	3.79	822.41	116.75	0.25
Whites Bayou	2981	100 Year	Existing	4818.18	4.37	21.76		22.02	0.000637	4.08	1338.11	273.76	0.23
Whites Bayou	2981	100 Year	Proposed	4818.18	4.37	21.61		21.87	0.000682	4.18	1295.32	273.76	0.24
Whites Bayou	2363	25 year	Existing	3109.21	4.03	18.93		19.05	0.000328	2.76	1127.18	130.81	0.17
Whites Bayou	2363	25 year	Proposed	3109.21	4.03	18.82		18.94	0.000338	2.79	1112.67	129.51	0.17
Whites Bayou	2363	100 Year	Existing	4818.18	4.03	21.53		21.69	0.000327	3.19	1650.96	287.86	0.17
Whites Bayou	2363	100 Year	Proposed	4818.18	4.03	21.39		21.55	0.000345	3.24	1609.36	287.86	0.18
Whites Bayou	2211	25 year	Existing	3109.21	1.92	18.85		18.99	0.000416	3.05	1019.96	125.3	0.18
Whites Bayou	2211	25 year	Proposed	3109.21	1.92	18.73		18.88	0.000432	3.09	1005.87	122.6	0.19
Whites Bayou	2211	100 Year	Existing	4818.18	1.92	21.44		21.63	0.000405	3.53	1487.46	302.09	0.19
Whites Bayou	2211	100 Year	Proposed	4818.18	1.92	21.29		21.49	0.000429	3.6	1445.18	262.93	0.19
Whites Bayou	2134	25 year	Existing	3109.21	1.54	18.78	9.65	18.96	0.00037	3.35	936.62	150.7	0.18
Whites Bayou	2134	25 year	Proposed	3109.21	1.54	18.69	9.57	18.85	0.00025	3.27	951.09	120.5	0.18
Whites Bayou	2134	100 Year	Existing	4818.18	1.54	21.41	11.45	21.6	0.000334	3.67	1971.31	689.58	0.18
Whites Bayou	2134	100 Year	Proposed	4818.18	1.54	21.25	11.25	21.46	0.000265	3.78	1808.97	672.7	0.19
Whites Bayou	2108			Bridge									
Whites Bayou	2089	25 year	Existing	3109.21	2.22	18.72	10.59	18.93	0.000512	3.63	855.7	87.67	0.2
Whites Bayou	2089	25 year	Proposed	3109.21	2.22	18.66	10.2	18.84	0.000281	3.39	917.24	94.25	0.19
Whites Bayou	2089	100 Year	Existing	4818.18	2.22	21.16	12.39	21.42	0.000546	4.23	1498.19	571.87	0.22
Whites Bayou	2089	100 Year	Proposed	4818.18	2.22	21.12	11.79	21.36	0.000323	4.01	1554.4	562.45	0.21
Whites Bayou	2023	25 year	Existing	3109.21	2.24	18.65		18.88	0.000698	3.88	810.87	113.38	0.24
Whites Bayou	2023	25 year	Proposed	3109.21	2.24	18.56		18.79	0.000722	3.93	800.58	112.5	0.24
Whites Bayou	2023	100 Year	Existing	4818.18	2.24	21.05		21.37	0.000705	4.54	1160.91	205.08	0.25
Whites Bayou	2023	100 Year	Proposed	4818.18	2.24	20.98		21.3	0.000726	4.59	1146.73	202.19	0.25
Whites Bayou	1644	25 year	Existing	3109.21	4.12	18.61		18.66	0.000169	1.92	1641.61	218.21	0.12
Whites Bayou	1644	25 year	Proposed	3109.21	4.12	18.56		18.62	0.000172	1.93	1632.65	217.93	0.12
Whites Bayou	1644	100 Year	Existing	4818.18	4.12	21.05		21.13	0.000165	2.26	2226.25	264.78	0.12
Whites Bayou	1644	100 Year	Proposed	4818.18	4.12	21.04		21.12	0.000167	2.27	2222.1	264.66	0.12
Whites Bayou	1242	25 year	Existing	3109.21	4.71	18.35		18.51	0.000555	3.21	968.59	133.29	0.21
Whites Bayou	1242	25 year	Proposed	3109.21	4.71	18.34		18.5	0.000557	3.21	967.32	133.21	0.21
Whites Bayou	1242	100 Year	Existing	4818.18	4.71	20.77		20.98	0.000539	3.65	1357.51	235.09	0.21
Whites Bayou	1242	100 Year	Proposed	4818.18	4.71	20.79		20.99	0.000537	3.65	1361.48	237.68	0.21
Whites Bayou	1000	25 year	Existing	3109.21	4.04	18.04	11.57	18.32	0.00091	4.25	734.53	102.69	0.27
Whites Bayou	1000	25 year	Proposed	3109.21	4.04	18.04	11.57	18.32	0.00091	4.25	734.34	102.62	0.27
Whites Bayou	1000	100 Year	Existing	4818.18	4.04	20.42	13.36	20.79	0.000911	4.9	1051.91	196.41	0.28
Whites Bayou	1000	100 Year	Proposed	4818.18	4.04	20.44	13.36	20.81	0.00091	4.91	1056.48	197.7	0.28

NOTES:

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4. DOWNSTREAM BOUNDARY CONDITION IS SET TO THE NORMAL DEPTH OF SLOPE OF .000909 FOR ALL STORM EVENTS.

STATE OF TEXAS
D'ANDRE R. JAMES
145862
LICENSED
PROFESSIONAL ENGINEER
2.26.23

LJA PROGRAM MANAGEMENT
FRN - F-14256

Texas Department of Transportation

CLEMMONS GULLY PACKAGE

HYDRAULIC DATA
BAILEY RD
AT WHITES BAYOU

SHEET 3 OF 3

CONT	SECT	JOB	HIGHWAY
0920	03	082, ETC	CR 1065, ETC
DIST	COUNTY		SHEET NO.
BMT	HARDIN, ETC		100

DATE: 2/23/2024 11:47:22 AM
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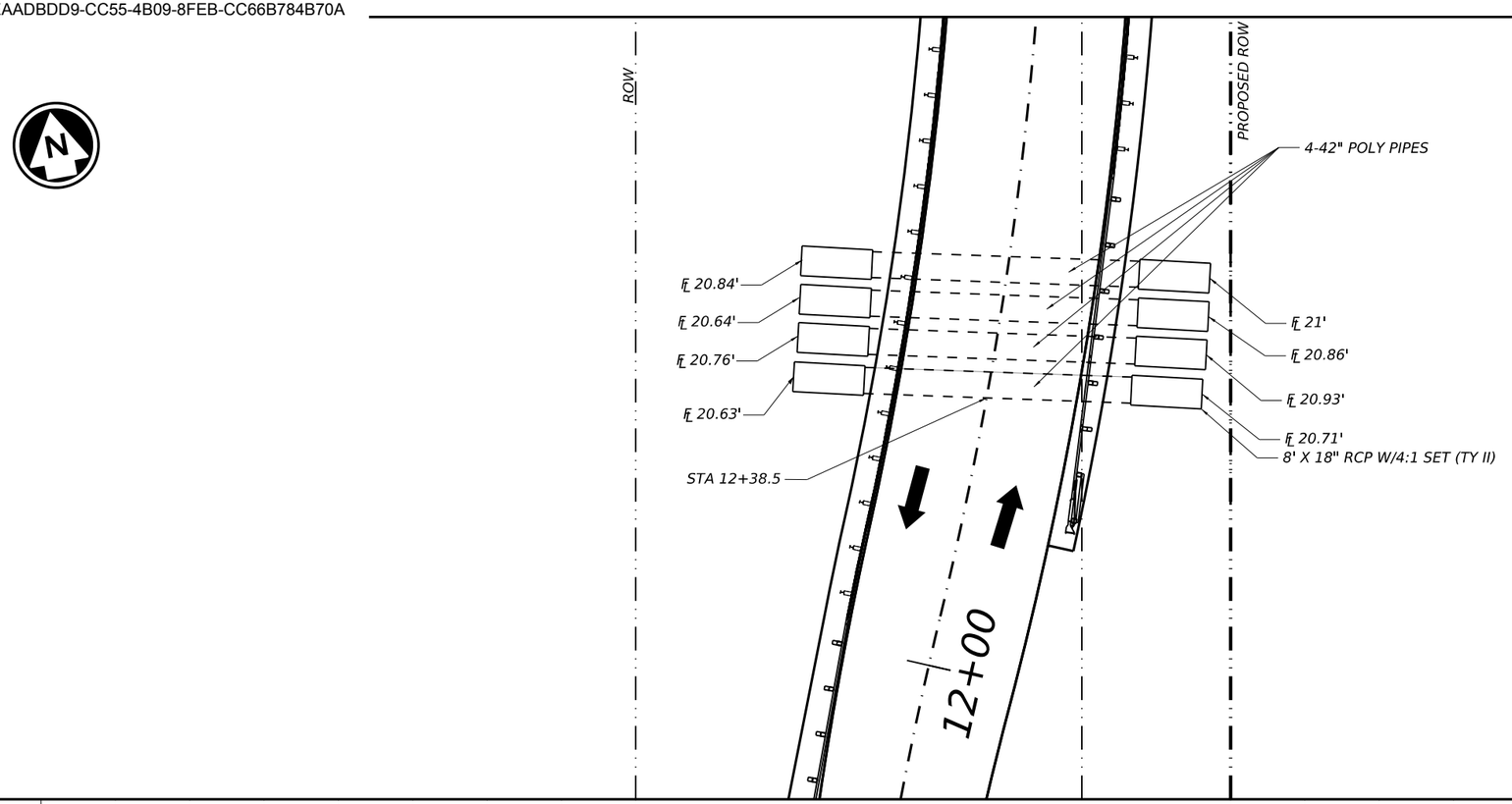

HORIZONTAL
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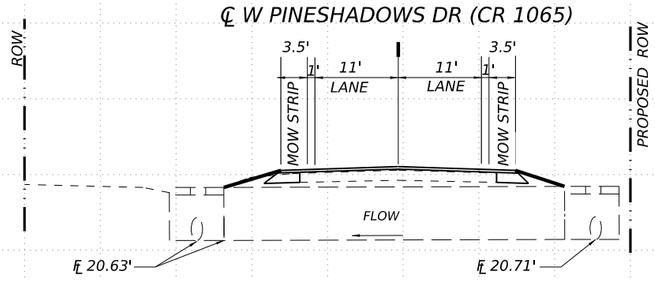

POLY PIES WORK AS EQUALIZER
STA. 12+38.5

EXISTING: 4-34' X 42" PLASTIC PIPES

PROPOSED: REMOVE EXISTING PIPES
PLACE 2 - 36' X 42" POLY PIPES,ADD 4:1 SETS (TYPE II), BACKFILL.

STATE OF TEXAS
JAMES D. HORNE
141323
REGISTERED
PROFESSIONAL ENGINEER
2/29/2024

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Texas Department of Transportation

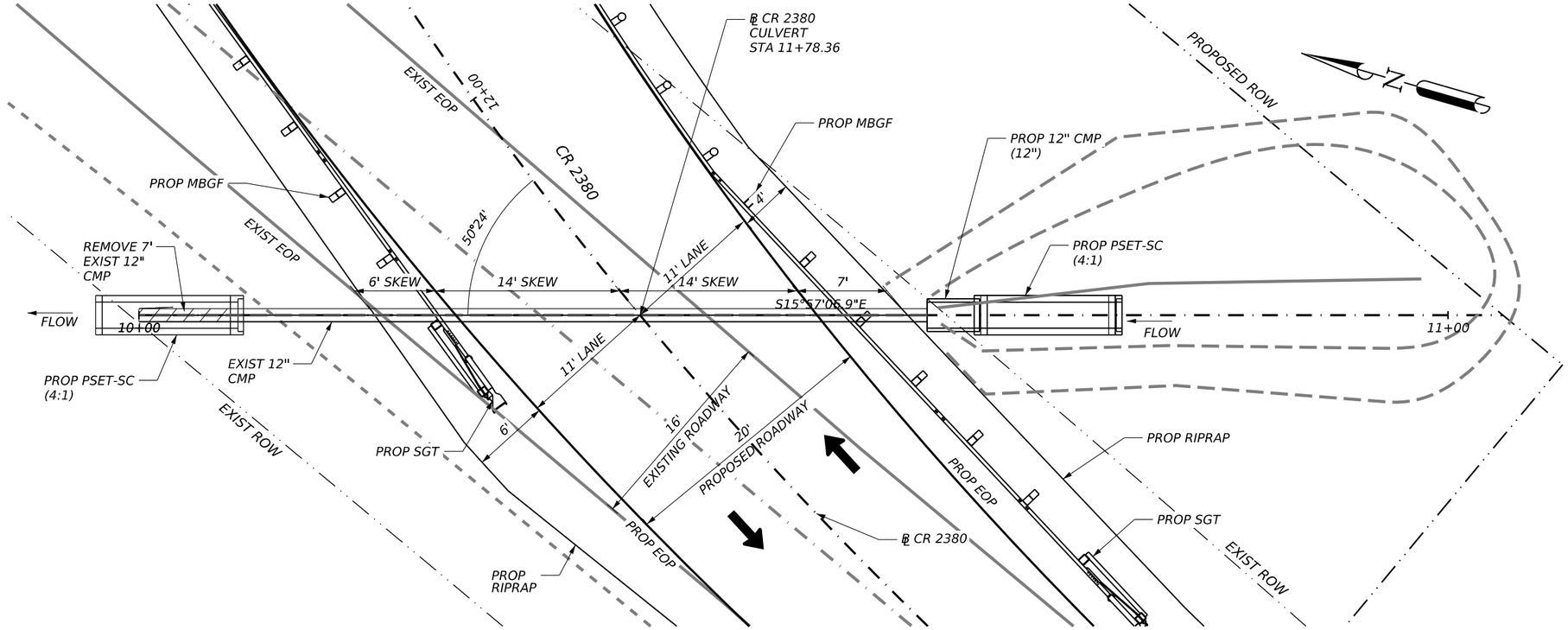
POLY PIPES

W. PINESHADOWS DR (CR 1065) AT CLEMMONS GULLY

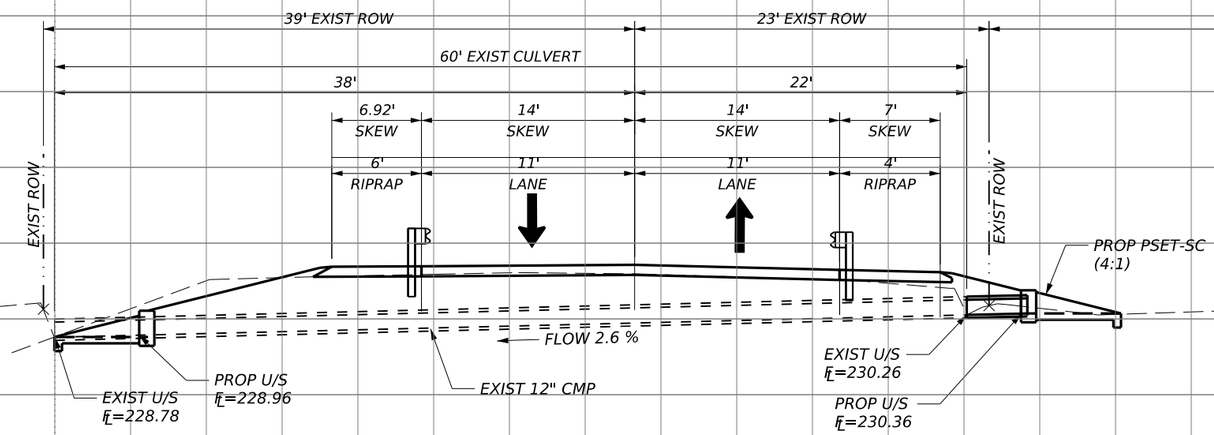
2024

CONT	SECT	JOB	HIGHWAY
0920	03	082, ETC	CR 1065, ETC
DIST	COUNTY		SHEET NO.
20	HARDIN, ETC		101

FILE: pw://txdot.projectwiseonline.com:TXDOT5/Documents/20 - BMT/Design Projects/092003082/4 - Design/Plan Set/5. Drainage/CROSS CULVERT DETAILS



SCALE: 1"= 10' H
1"= 5' V



STA 11+78.36
EXISTING 1-12"X60' CMP PIPE
REMOVE 7' LT 12" CMP PIPE
PROPOSED: EXTEND 4' RT W/1-12" CMP PIPE
AND PROP PSET-SC (TYPE II)(12 IN)(4:1) LT & RT

STATE OF TEXAS
S. E. WRIGHT
108969
LICENSED
PROFESSIONAL ENGINEER

02-28-2024

LJA PROGRAM MANAGEMENT
FRN - F-14256

Texas Department of Transportation

CLEMMONS GULLY PACKAGE

CR 2380
AT
VINCENT TRIBUTARY
CULVERT LAYOUT

SHEET 1 OF 1

CONT	SECT	JOB	HIGHWAY
0920	03	082, ETC	CR 1065, ETC
DIST	COUNTY		SHEET NO.
BMT	HARDIN, ETC		102

DATE: 2/28/2024 7:19:47 PM
FILE: pw://lja-pw.bentley.com:lja-pw-01/Documents/TxDOT/PM8016-2301 CEC WA4/Clemmons Gully Off-System Bridge/400 Production/4 - Design/Plan Set/5. Drainage/041 VT CC01.dgn

SUMMARY OF ESTIMATED QUANTITIES - CLEMMONS GULLY

BID ITEM	400 6005	416 6001	416 6004	420 6013	422 6001	422 6015	425 6035	432 6033	450 6006	454 6004	496 6009
BID ITEM DESCRIPTION	CEM STABIL BKFL	DRILL SHAFT (18 IN)	DRILL SHAFT (36 IN)	CL C CONC (ABUT)	REINF CONC SLAB	APPROACH SLAB	PRESTR CONC GIRDER (TX 28)	RIPRAP (STONE PROTECTION) (18 IN)	RAIL (TY T223)	ARMOR JOINT (SEALED)	REMOV STR (BRIDGE 0-99 FT LENGTH)
BRIDGE ELEMENT	*CY*	*LF*	*LF*	*CY*	*SF*	*CY*	*LF*	*CY*	*LF*	*LF*	*EA*
2 - ABUTMENTS	115	220	330	41.4		51.8		263	56	58	1
1 - 60.00' PRESTR CONCRETE GIRDER UNIT					1560		237.69		120		
TOTAL	115	220	330	41.4	1560	51.8	237.69	263	176	58	1

NOTES:

SIGNING AND SEALING ONLY FOR BEARING SEAT ELEVATIONS.

BEARING SEAT ELEVATIONS (FT)

	GIRDER 1	*GIRDER 2*	*GIRDER 3*	*GIRDER 4*
ABUT 1 (FWD)	*23.026*	*23.167*	*23.174*	*23.049*
ABUT 2 (BK)	*22.910*	*23.051*	*23.059*	*22.933*

STATE OF TEXAS
JAMES D. HORNE
141323
REGISTERED PROFESSIONAL ENGINEER
2/29/2024

DocuSigned by:
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HL-93 LOADING

REV. NO.	DATE	DESCRIPTION	BY

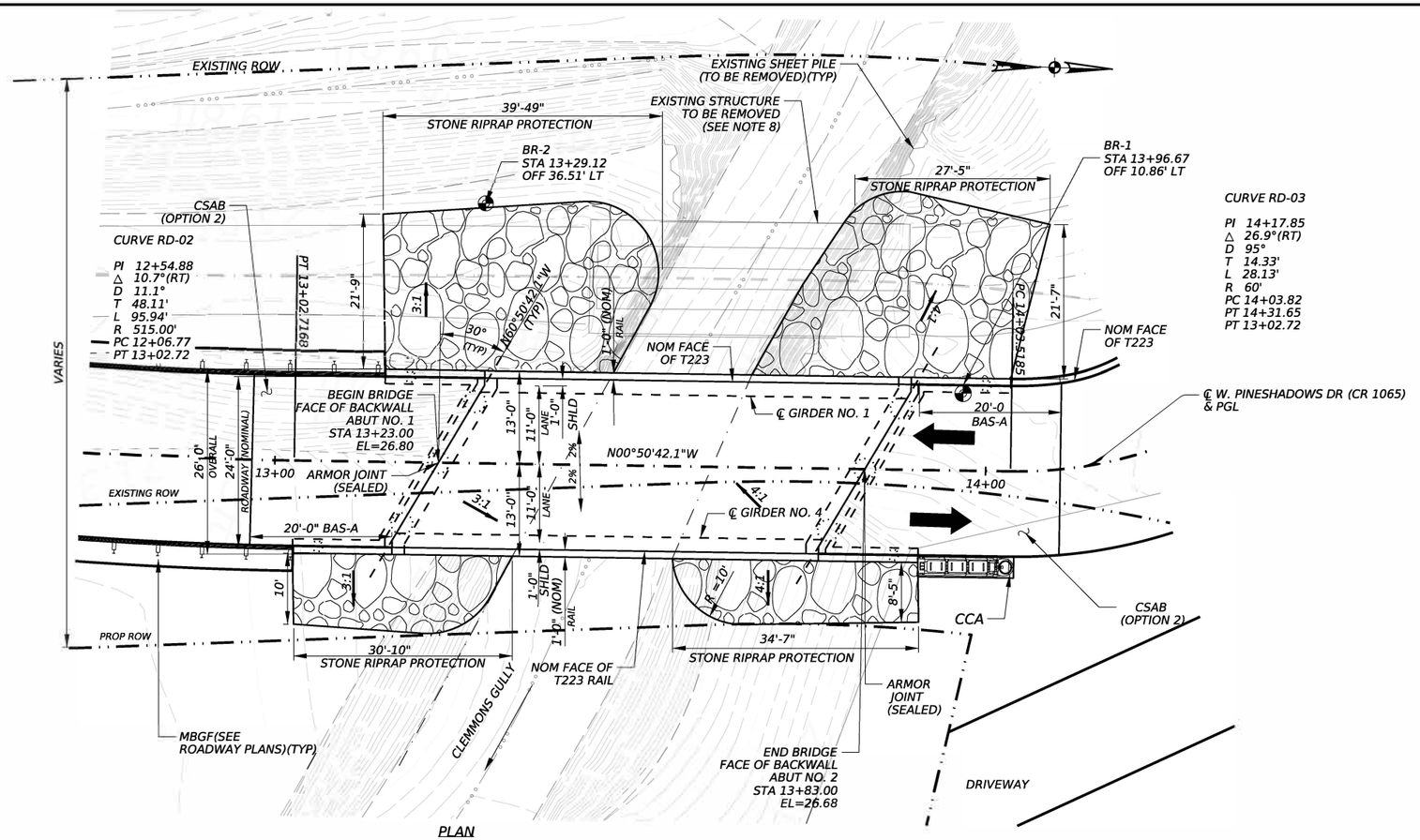
Texas Department of Transportation

W. PINESHADOWS DR (CR 1065) AT CLEMMONS GULLY

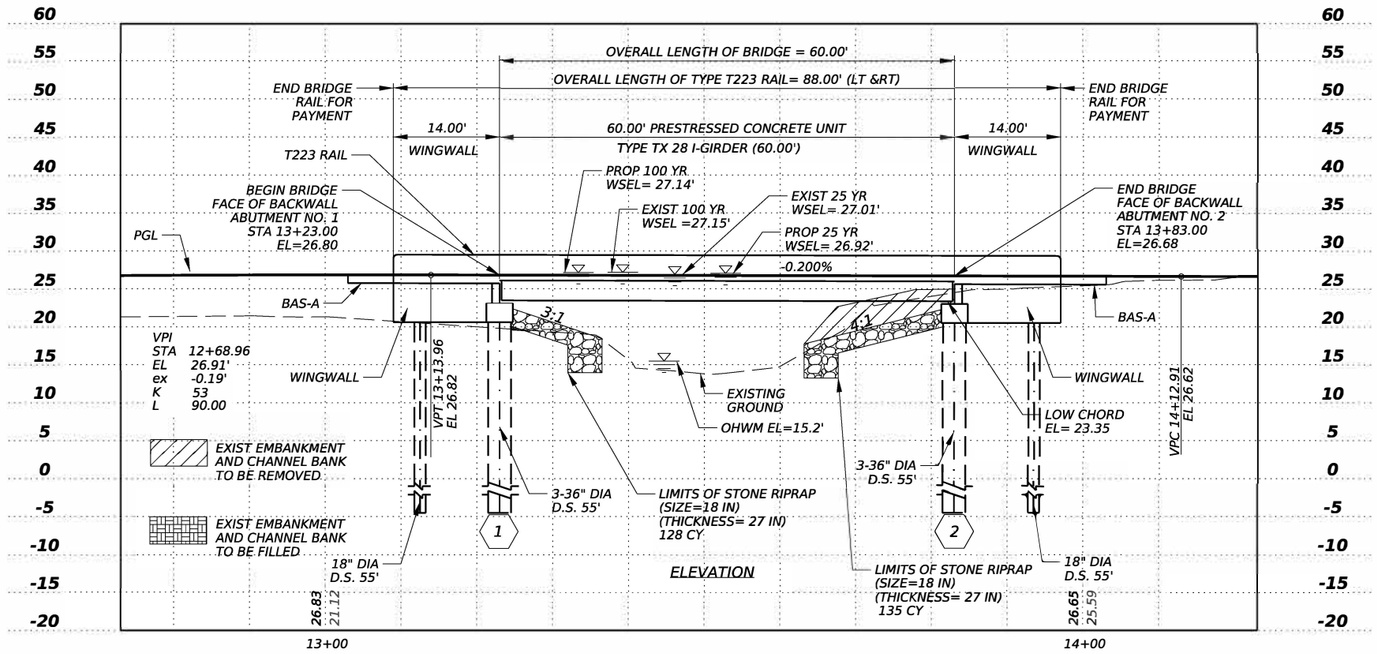
ESTIMATED QUANTITIES AND BEARING SEAT ELEVATIONS

FILE:	DN: RG	CK: AV	DW: RG	CK: AV
©TxDOT	CONT	SECT	JOB	HIGHWAY
REVISIONS	0920	03	082,ETC	CR 1065, ETC
	DIST	COUNTY		SHEET NO.
	20	HARDIN, ETC		103

FILE: pw://txdot.projectwiseonline.com:TXDOT5/Documents/20 - BMT/Design Projects/0920030824 - Design/Plan Set/7. Bridge/ESTIMATED QUANTITIES



PLAN



ELEVATION

NOTES:

1. DESIGNED ACCORDING TO AASHTO LRFD BRIDGE SPECIFICATIONS 2020, 9TH EDITION AND CURRENT INTERIM REVISIONS AS MODIFIED BY TXDOT BRIDGE DESIGN MANUAL.
2. HORIZONTAL AND VERTICAL DIMENSIONS ARE SHOWN. LENGTHS MUST BE CORRECTED FOR GRADE OR CROSS SLOPE WHERE APPROPRIATE.
3. CONTRACTOR TO VERIFY LOCATION OF ALL UTILITIES PRIOR TO CONSTRUCTION.
4. REFER TO THE TXDOT STONE RIPRAP (SRR) STANDARD FOR RIPRAP DETAILS.
5. SEE CSAB STANDARD FOR CEMENT STABILIZED BACKFILL DETAILS AND LIMITS.
6. SEE BRIDGE BORING LOG SHEET FOR GEOTECHNICAL INFORMATION. BORING LOCATIONS ARE APROXIMATE.
7. FOR TYPICAL SECTION SEE SHEET BRIDGE TYPICAL SECTION.
8. THE EXISTING SIMPLE SPAN BRIDGE TO BE REMOVED BY THE CONTRACTOR. THE BRIDGE IS APPROXIMATELY 45' LONG WITH A STEEL STRINGER SUPERSTRUCTURE AND SUBSTRUCTURE (SPAN EXTEND PAST SUPPORTS CONSIDERED TO BE ABUTMENTS AND REST ON GROUND.)THE BRIDGE IS TO BE REMOVED AND DISPOSED OF IN ACCORDANCE WITH STANDARD SPECIFICATION ITEM 496.
9. SHEAR KEYS REQUIRED AT ABUTMENTS. SEE "IGSK" STANDARD AND DETAILS.
10. BRIDGE NOT DESIGNED FOR FUTURE OVERLAY.
11. WATER BEARING COHESIONLESS SOILS ARE EXPECTED DURING DRILLED SHAFT CONSTRUCTION. CASING OR SLURRY DISPLACEMENT METHOD MAY BE REQUIRED TO PREVENT THE CAVE-IN OF SURROUNDING MATERIAL. STABILITY OF THE DRILLED SHAFT HOLE IS THE RESPONSIBILITY OF THE DRILLED SHAFT CONTRACTOR.

DESIGN SPEED: MEETS OR EXCEED EXISTING
ADT(2015): 50
ADT(2035):100
FUNCTION CLASS: RURAL LOCAL ROAD
EXISTING NBI:20-101-0-AA10-65-001
PROPOSED NBI: 20-101-0-AA10-65-002

LOAD RATING	INV	OP
STRENGTH I	1.43	1.86
SERVICE III	1.14	

HYDRAULIC DATA:

EXISTING DATA			
PROFILE	Q(CFS)	V(fps)	HW Elev(ft)
25 YR	2292.00	2.28	27.01
100 YR	3179.00	2.55	27.15
PROPOSED DATA			
PROFILE	Q(CFS)	V(fps)	HW Elev(ft)
25 YR	2292.00	2.11	26.92
100 YR	3179.00	1.32	27.14

STATE OF TEXAS
JAMES D. HORNE
141323
REGISTERED PROFESSIONAL ENGINEER

DocuSigned by:
50238C8D55F5470...

LAYOUT 2/29/2024

STATE OF TEXAS
ARTHUR VIDALES
127233
LICENSED PROFESSIONAL ENGINEER

ARTHUR VIDALES, P.E.

2/29/2024
DATE

FOUNDATION

0 10 20
SCALE IN FEET

HL93 LOADING

REV. NO.	DATE	DESCRIPTION	BY

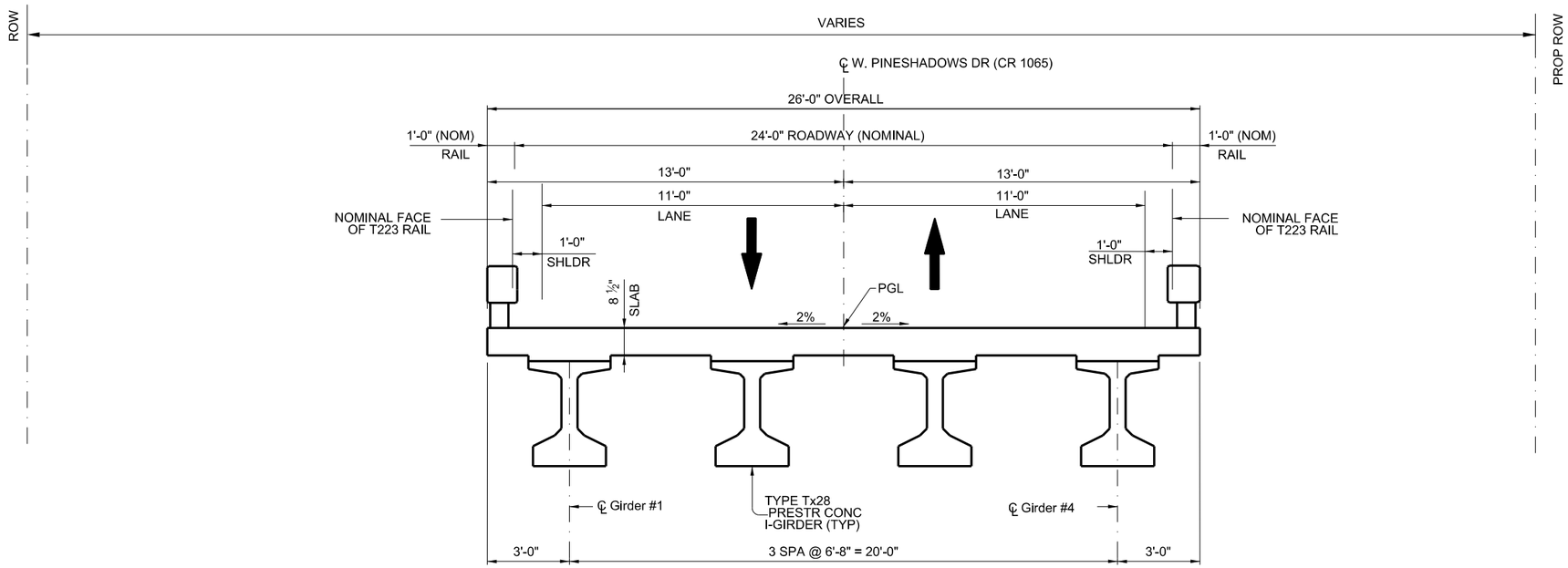
Texas Department of Transportation

W. PINESHADOWS DR (CR 1065) AT CLEMMONS GULLY

BRIDGE LAYOUT

FILE:	DN: RG	CK: AV	DW: RG	CK: AV
©TxDOT	CONT	SECT	JOB	HIGHWAY
REVISIONS	0920	03	082,ETC	CR 1065, ETC
	DIST	COUNTY		SHEET NO.
	20	HARDIN, ETC		104

FILE: pw://txdot.projectwiseonline.com:TXDOT5/Documents/20 - BMT/Design Projects/09200308Z/4 - Design/Master Design Files/CONTAINER FILES/BRG_Container.dgn



TYPICAL SECTION

N.T.S

STA 13+23 TO STA 13+83

HL-93 LOADING

REV. NO.	DATE	DESCRIPTION	BY

Texas Department of Transportation
© 2024

W. PINESHADOWS DR (CR 1065) AT CLEMMONS GULLY

BRIDGE TYPICAL SECTION

FILE:	DN: RG	CK: AV	DW: RG	CK: AV
©TxDOT	CONT	SECT	JOB	HIGHWAY
REVISIONS	0920	03	082,ETC	CR 1065, ETC
	DIST	COUNTY		SHEET NO.
	20	HARDIN, ETC		105

FILE: pw://txdot.projectwiseonline.com:TXDOT5/Documents/20 - BMT/Design Projects/092003082/4 - Design/Plan Set/7. Bridge/BRIDGE TYPLICAL SECTION

DRILLING LOG

WinCore Version 3.1

County	Hardin	Hole	BR-1 (Clemmons)	District	Beaumont
Highway	W. Pineshadows Dr.	Structure	Bridge	Date	09/5/23
CSJ	0920-03-082	Station	13+96.67	Grnd. Elev.	26.18 ft
		Offset	10.86' LT	GW Elev.	12.88 ft

Elev. (ft)	LOG	Texas Cone Penetrometer	Strata Description	Triaxial Test: Lateral Press. (psi)	Triaxial Test: Deviator Stress (psi)	Properties: MC	LL	PI	Wet Den. (pcf)	Additional Remarks
19.2		10 (6) 5 (6)	CLAY, Fat w/ Sand, soft to hard, moist, gray and brown, w/ gravel at 0'-2' and 5'-7' (CH)		185.2	11	50	31	134	% Passing #200 Sieve: 73.3
10.7		7 (6) 8 (6)	CLAY, Fat, soft, moist, brown and gray, w/ ferrous stains at 10'-12' (CH)			30	61	36		% Passing #200 Sieve: 95.6
		8 (6) 8 (6)	CLAY, Lean w/ Sand, soft, moist, gray, w/ sand seams at 17'-19' and 28'-35' (CL)			23	31	14		% Passing #200 Sieve: 75.9
		10 (6) 10 (6)		21	10	26			128	
		7 (6) 5 (6)				31	39	20		% Passing #200 Sieve: 81.3
-9.3		4 (6) 6 (6)	SAND, w/ Silt, very loose to dense, moist, gray (SP-SM)			21	NP	NP		% Passing #200 Sieve: 7.5
		6 (6) 8 (6)								
		3 (6) 3 (6)								
		30 (6) 45 (6)								
		50 (6) 35 (6)								

Remarks: Survey data not available. Water level was encountered at 21' below the existing grade during drilling operations; at 14.8', 13.7' and 13.3' after 5 minutes, 10 minutes and 15 minutes, respectively. Modified split spoons were conducted in non-cohesive and cohesive soil within the soil strata. TCP requirement caused the split spoons to be performed with a deviation from ASTM D1586. A 170-pound hammer falling 24 inches was used instead of a 140-pound hammer falling 30 inches. (Northing, Easting)=(10072279.325, 4191664.708). NP: Non-Plastic.

Driller: Atlas Logger: Jobin Organization: HVJ Associates, Inc.

g:\houston\hou ps\geo\lab info\gint logs\hg2010295.2.1.gpj

DRILLING LOG

WinCore Version 3.1

County	Hardin	Hole	BR-1 (Clemmons)	District	Beaumont
Highway	W. Pineshadows Dr.	Structure	Bridge	Date	09/5/23
CSJ	0920-03-082	Station	13+96.67	Grnd. Elev.	26.18 ft
		Offset	10.86' LT	GW Elev.	12.88 ft

Elev. (ft)	LOG	Texas Cone Penetrometer	Strata Description	Triaxial Test: Lateral Press. (psi)	Triaxial Test: Deviator Stress (psi)	Properties: MC	LL	PI	Wet Den. (pcf)	Additional Remarks
		35 (6) 50 (6)	SAND, w/ Silt, very loose to dense, moist, gray (SP-SM)			16	NP	NP		% Passing #200 Sieve: 9.6
		50 (6) 50 (4)								
		50 (4) 50 (3)				21				
-39.3		50 (2) 50 (2)	SAND, Silty, very dense, moist, gray (SM)			17	NP	NP		% Passing #200 Sieve: 14.6
-44.3		20 (6) 28 (6)	SAND, w/ Silt, slightly compact to compact, moist, gray, w/ clay seams at 82'-84' (SP-SM)			17	NP	NP		% Passing #200 Sieve: 6.6
		12 (6) 18 (6)								
-58.3		9 (6) 11 (6)	CLAY, Fat, stiff, moist, gray (CH)			33	67	38		% Passing #200 Sieve: 89.4
-63.3		13 (6) 16 (6)	CLAY, Sandy Lean, stiff, moist, reddish brown and gray (CL)			25				
		15 (6) 21 (6)		56	19.5	25	34	13	125	% Passing #200 Sieve: 68.7
-73.8		14 (6) 17 (6)								

Remarks: Survey data not available. Water level was encountered at 21' below the existing grade during drilling operations; at 14.8', 13.7' and 13.3' after 5 minutes, 10 minutes and 15 minutes, respectively. Modified split spoons were conducted in non-cohesive and cohesive soil within the soil strata. TCP requirement caused the split spoons to be performed with a deviation from ASTM D1586. A 170-pound hammer falling 24 inches was used instead of a 140-pound hammer falling 30 inches. (Northing, Easting)=(10072279.325, 4191664.708). NP: Non-Plastic.

Driller: Atlas Logger: Jobin Organization: HVJ Associates, Inc.

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STATE OF TEXAS
PRAKASH DAHAL
150264
LICENSED
PROFESSIONAL ENGINEER

P. Dahal

02/26/2024

Texas Department of Transportation
© 2024

CLEMMONS GULLY PACKAGE

BORING LOG
W. PINESHADOWS DR (CR 1065)
AT CLEMMONS GULLY

SHEET 1 OF 2

CONT	SECT	JOB	HIGHWAY
0920	03	082,ETC	CR 1065, ETC
DIST	COUNTY		SHEET NO.
20	HARDIN, ETC		106

FILE: pw://txdot.projectwiseonline.com:TXDOT5/Documents/20 - BMT/Design Projects/092003082/4 - Design/Plan Set/7. Bridge/BORING LOG

DRILLING LOG

WinCore Version 3.1	County	Hardin	Hole	BR-2 (Clemmons)	District	Beaumont
	Highway	W. Pineshadows Dr.	Structure	Bridge	Date	09/7/23
	CSJ	0920-03-082	Station	13+29.12	Grnd. Elev.	26.52 ft
			Offset	36.51' LT	GW Elev.	3.72 ft

Elev. (ft)	LOG	Texas Cone Penetrometer	Strata Description	Triaxial Test: Lateral Press. (psi)	Triaxial Test: Deviator Stress (psi)	Properties: MC	LL	PI	Wet Den. (pcf)	Additional Remarks
26.2			PAVEMENT, 4" Asphalt							
			SAND, Clayey, loose, moist, gray and reddish brown, w/ gravel (SC)							
		4 (6) 6 (6)				10	25	14		% Passing #200 Sieve: 44.2
21.0	5									
			CLAY, Lean, very soft to stiff, moist, gray and brown (CL)		20.6	14			128	% Passing #200 Sieve: 85.0
		3 (6) 4 (6)								
16.0	10					21	38	26		% Passing #200 Sieve: 68.4
			CLAY, Sandy Lean, very soft, moist, gray and brown (CL)			21				
		3 (6) 4 (6)								
11.0	15					27				
			CLAY, Fat, soft, moist, gray, brown, gray and reddish brown (CH)							
	20	5 (6) 5 (6)								
						27	58	47		% Passing #200 Sieve: 98.1
		4 (6) 7 (6)								
1.0	25		CLAY, Sandy Lean, soft, moist, gray (CL)							
		4 (6) 4 (6)								
	30			25	7.1	26	40	24	127	% Passing #200 Sieve: 58.7
		8 (6) 9 (6)								
-9.0	35		SAND, Silty, loose to compact, moist, gray (SM)							
		4 (6) 6 (6)								
	40					23	NP	NP		% Passing #200 Sieve: 20.6
		18 (6) 16 (6)								
	45									
		26 (6) 25 (6)								
	50									

Remarks: Survey data not available. Water level was encountered at 31' below the existing grade during drilling operations; at 26', 24.9' and 22.8' after 5 minutes, 10 minutes and 15 minutes, respectively. Modified split spoons were conducted in non-cohesive and cohesive soil within the soil strata. TCP requirement caused the split spoons to be performed with a deviation from ASTM D1586. A 170-pound hammer falling 24 inches was used instead of a 140-pound hammer falling 30 inches. (Northing, Easting)=(10072211.401, 4191640.055). NP: Non-Plastic.

Driller: Atlas Logger: Jobin Organization: HVJ Associates, Inc.

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DRILLING LOG

WinCore Version 3.1	County	Hardin	Hole	BR-2 (Clemmons)	District	Beaumont
	Highway	W. Pineshadows Dr.	Structure	Bridge	Date	09/7/23
	CSJ	0920-03-082	Station	13+29.12	Grnd. Elev.	26.52 ft
			Offset	36.51' LT	GW Elev.	3.72 ft

Elev. (ft)	LOG	Texas Cone Penetrometer	Strata Description	Triaxial Test: Lateral Press. (psi)	Triaxial Test: Deviator Stress (psi)	Properties: MC	LL	PI	Wet Den. (pcf)	Additional Remarks
			SAND, Silty, loose to compact, moist, gray (SM)							
		22 (6) 18 (6)								
	55					21	NP	NP		% Passing #200 Sieve: 12.9
-33.0	60	50 (4) 50 (3)	SAND, w/ Silt, dense, moist, gray (SP-SM)							
		50 (6) 46 (6)								
	65					16	NP	NP		% Passing #200 Sieve: 6.9
-44.0	70	50 (4.5) 43 (6)								
			SAND, Silty, dense, moist, gray (SM)							
	75	50 (4) 50 (2.5)				19	NP	NP		% Passing #200 Sieve: 12.9
-53.0	80	12 (6) 13 (6)	CLAY, Fat, soft to stiff, moist, gray (CH)							
		8 (6) 7 (6)								
	85			49	20.2	36	74	44	115	% Passing #200 Sieve: 97.6
-64.0	90	4 (6) 5 (6)	CLAY, Lean w/ sand, stiff to hard, moist, gray and brown (CL)							
		16 (6) 20 (6)								
	95			53	76.3	19	39	20	133	% Passing #200 Sieve: 82.5
-73.5	100	21 (6) 23 (6)								

Remarks: Survey data not available. Water level was encountered at 31' below the existing grade during drilling operations; at 26', 24.9' and 22.8' after 5 minutes, 10 minutes and 15 minutes, respectively. Modified split spoons were conducted in non-cohesive and cohesive soil within the soil strata. TCP requirement caused the split spoons to be performed with a deviation from ASTM D1586. A 170-pound hammer falling 24 inches was used instead of a 140-pound hammer falling 30 inches. (Northing, Easting)=(10072211.401, 4191640.055). NP: Non-Plastic.

Driller: Atlas Logger: Jobin Organization: HVJ Associates, Inc.

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STATE OF TEXAS
PRAKASH DAHAL
150264
LICENSED
PROFESSIONAL ENGINEER

P. Dahal

02/26/2024

Texas Department of Transportation
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CLEMMONS GULLY PACKAGE

BORING LOG
W. PINESHADOWS DR (CR 1065)
AT CLEMMONS GULLY

SHEET 2 OF 2

CONT	SECT	JOB	HIGHWAY
0920	03	082,ETC	CR 1065, ETC
DIST	COUNTY		SHEET NO.
20	HARDIN, ETC		107

FILE: pw://txdot.projectwiseonline.com:TXDOT5/Documents/20 - BMT/Design Projects/0920030824 - Design/Plan Set/7. Bridge/BORING LOG

SCOUR ANALYSIS - 25-YR (DESIGN)

SCOUR ANALYSIS DETERMINED BY UTILIZING EQUATIONS FROM HEC-18 MANUAL. COMPUTED USING HYDRAULIC TOOLBOX VERSION 5.2

LIVE-BED CONTRACTION SCOUR EQUATIONS (EQNS. 6.1 & 6.2)

PRESSURE SCOUR EQUATIONS (EQNS. 6.15 & 6.16)

D50 = 0.200 mm
K1 = 0.69

SCOUR DEPTH Y (CHANNEL) = 3.18 FT

SCOUR ANALYSIS - 50-YR (DESIGN)

SCOUR ANALYSIS DETERMINED BY UTILIZING EQUATIONS FROM HEC-18 MANUAL. COMPUTED USING HYDRAULIC TOOLBOX VERSION 5.2

LIVE-BED CONTRACTION SCOUR EQUATIONS (EQNS. 6.1 & 6.2)

PRESSURE SCOUR EQUATIONS (EQNS. 6.15 & 6.16)

D50 = 0.200 mm
K1 = 0.69

SCOUR DEPTH Y (CHANNEL) = 6.04 FT

NOTES:

1) SCOUR ANALYSIS IS PERFORMED IN ACCORDANCE WITH TxDOT SCOUR ANALYSIS GUIDE AND HEC-18.

2) ABUTMENTS TO BE PROTECTED WITH RIPRAP (STONE PROTECTION). ABUTMENT SCOUR IS NOT REQUIRE PER TXDOT GEOTECHNICAL MANUAL.

3) SCOUR ANALYSIS WAS ALSO COMPLETED FOR THE 5-YR, 10-YR, 25-YR, AND 50-YR DISCHARGES. REFER TO HYDRAULIC REPORT FOR ADDITIONAL INFORMATION.

4) THE PROPOSED BRIDGE IS A SINGLE SPAN STRUCTURE. THE MINIMUM 18" STONE PROTECTION SIZE IS RECOMMENDED WITH AN 27" THICKNESS.

STATE OF TEXAS
JAMES D. HORNE
141323
REGISTERED PROFESSIONAL ENGINEER
2/29/2024

DocuSigned by:
50238C8D55F5470...

Texas Department of Transportation

CLEMMONS GULLY PACKAGE

SCOUR DATA
W. PINESHADOWS DR (CR 1065)
AT CLEMMONS GULLY

SHEET 1 OF 1

CONT	SECT	JOB	HIGHWAY
0920	03	082,ETC	CR 1065, ETC
DIST	COUNTY		SHEET NO.
20	HARDIN, ETC		108

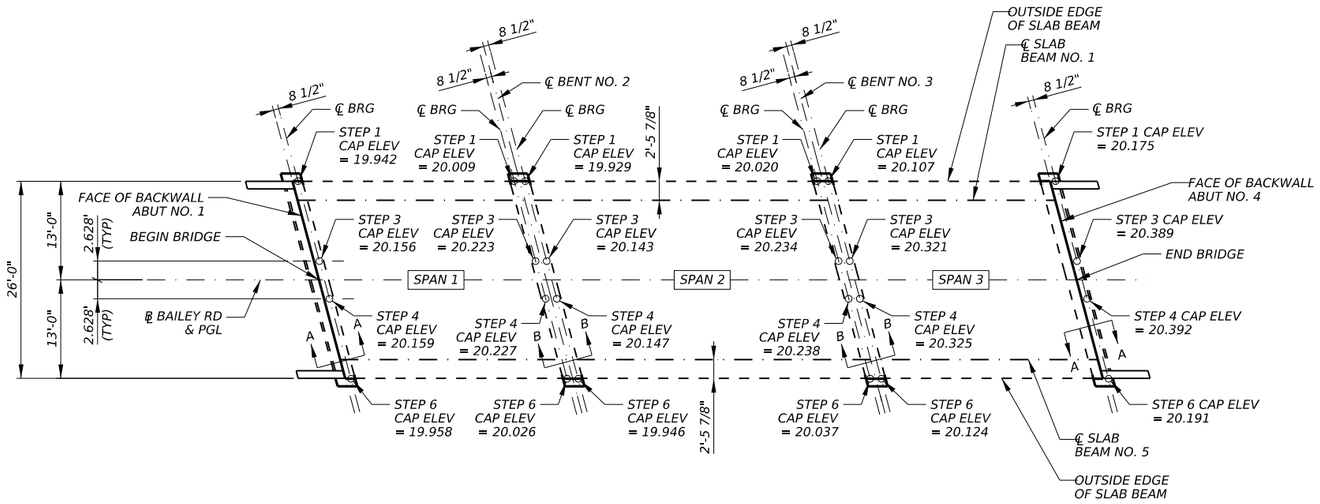
DW: DW: CK: CK:

NOTE:

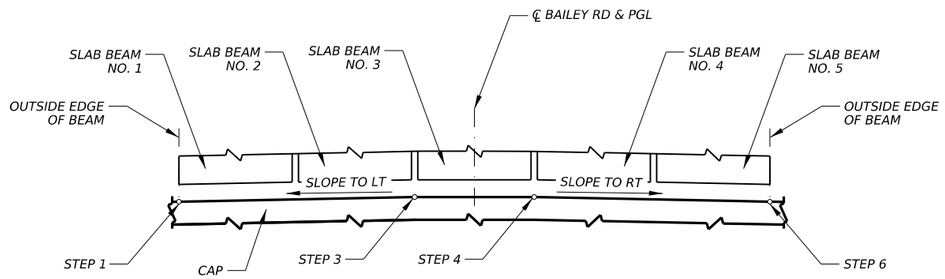
1. SIGNING AND SEALING FOR CAP ELEVATIONS ONLY.

SUMMARY OF ESTIMATED QUANTITIES - BAILEY RD AT WHITES BAYOU

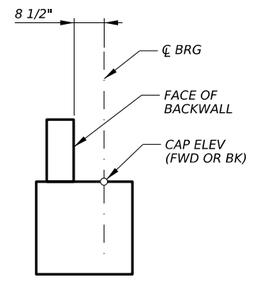
BID ITEM	400 6005	416 6002	420 6013	420 6029	420 6037	422 6007	422 6015	425 6010	432 6031	450 6006	454 6004	496 6009
BID ITEM DESCRIPTION / BRIDGE ELEMENT	CEM STABIL BKFL	DRILL SHAFT (24 IN)	CL C CONC (ABUT)	CL C CONC (CAP)	CL C CONC (COLUMN)	REINF CONC SLAB (SLAB BEAM)	APPROACH SLAB	PRESTR CONC SLAB BEAM (5SB12)	RIPRAP (STONE PROTECTION) (12 IN)	RAIL (TY T223)	ARMOR JOINT (SEALED)	REMOV STR (BRIDGE 0-99 FT LENGTH)
	CY	LF	CY	CY	CY	SF	CY	LF	CY	LF	LF	EA
2 - ABUTMENTS	61	345	18.2				44.7		270	24	53	1
2 - INTERIOR BENTS		450		13.8	8.3							
1 - 100.00' PRESTR CONCRETE SLAB BEAM UNIT						2600		492.42		200		
TOTAL	61	795	18.2	13.8	8.3	2600	44.7	492.42	270	224	53	1



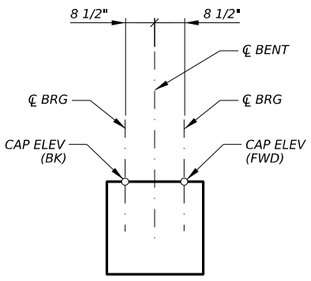
PLAN OF STEP LOCATIONS



COMMON TRANSVERSE SECTIONS AT STEP LOCATIONS



SECTION A-A



SECTION B-B

STATE OF TEXAS
ARTHUR V DALES
127233
LICENSED
PROFESSIONAL ENGINEER

2/23/2024
DATE

NOT TO SCALE

HL-93 LOADING

REV. NO.	DATE	DESCRIPTION	BY

PAPE-DAWSON ENGINEERS

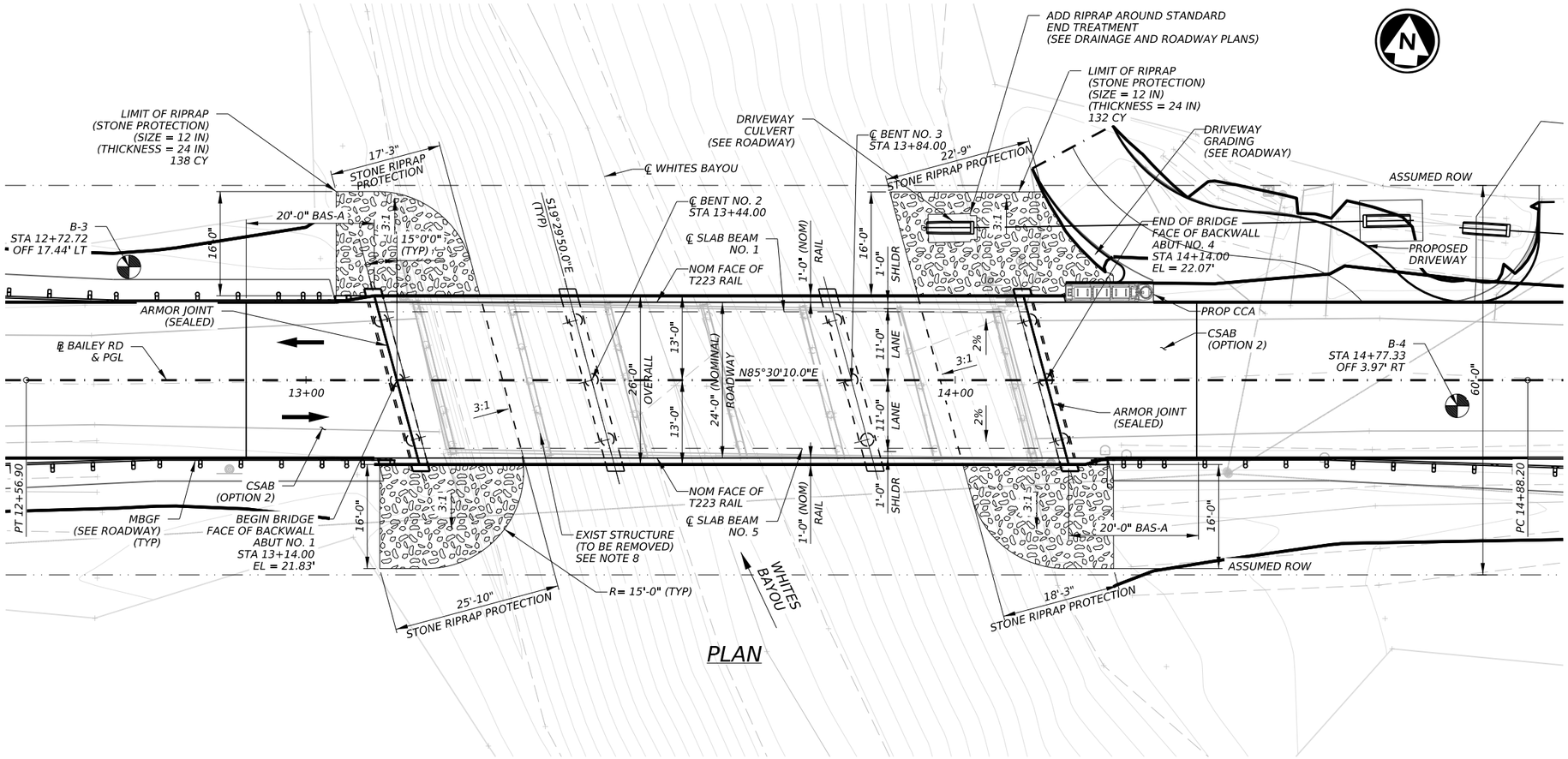
DALLAS I SAN ANTONIO I AUSTIN I HOUSTON I FORT WORTH
6105 TENNYSON PKWY, STE 210 I PLANO, TX 75024 I 214.420.8494
TEXAS ENGINEERING FIRM #470 I TEXAS SURVEYING FIRM #10194390

Texas Department of Transportation

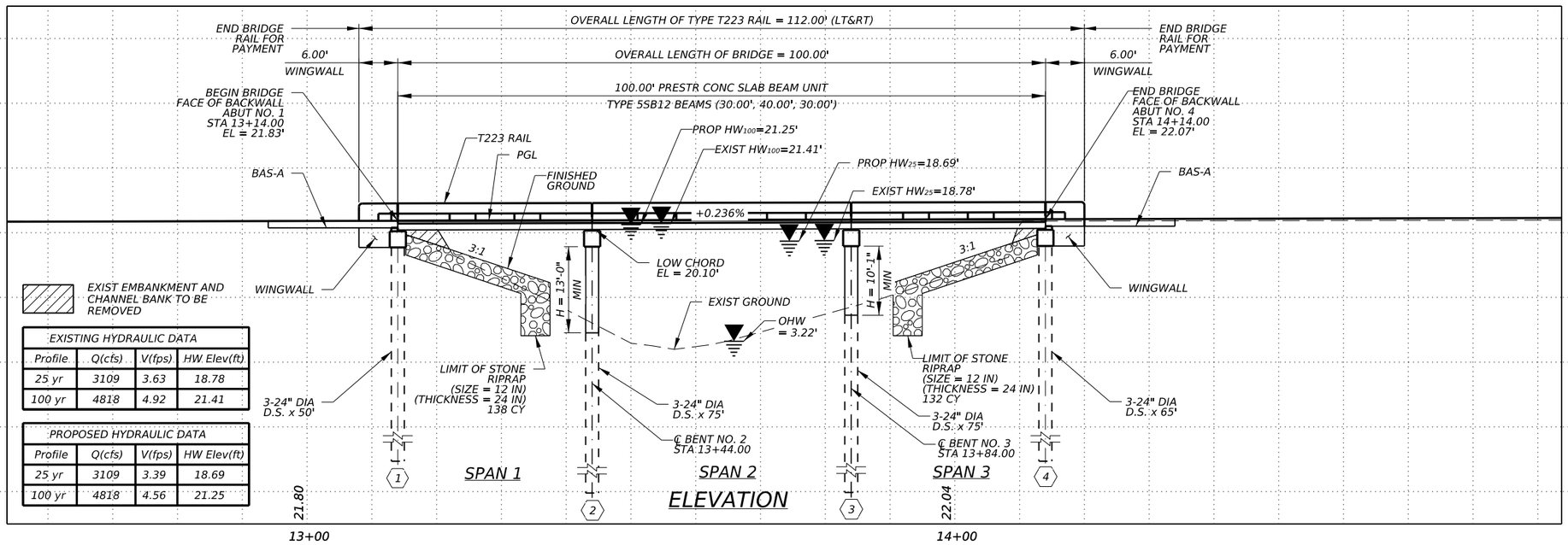
BAILEY RD AT WHITES BAYOU
ESTIMATED QUANTITIES AND CAP ELEVATIONS

DESIGNED:	JHG	CONT	SECT	JOB	HIGHWAY
CHECKED:	AV	0920	03	082, ETC	CR 1065, ETC
DRAWN:	AMS	DIST	COUNTY		SHEET NO.
CHECKED:	AV	BMT	HARDIN, ETC		109

DATE: 2/23/2024 2:04:19 PM
FILE: pw://fja-pw.bentley.com:fja-pw-01/Documents/TxDOT/PM8016-2301 CEC WA4/Clemmons Gully Off-System Bridge/400 Production/4 - Design/Plan Set/7. Bridge/WBayou/037_BSlough_BR_EQ01.dgn



PLAN



ELEVATION

EXISTING HYDRAULIC DATA			
Profile	Q(cfs)	V(fps)	HW Elev(ft)
25 yr	3109	3.63	18.78
100 yr	4818	4.92	21.41

PROPOSED HYDRAULIC DATA			
Profile	Q(cfs)	V(fps)	HW Elev(ft)
25 yr	3109	3.39	18.69
100 yr	4818	4.56	21.25

NOTES:

1. DESIGNED ACCORDING TO AASHTO LRFD BRIDGE SPECIFICATIONS 2020, 9TH EDITION AND CURRENT INTERIM REVISIONS AS MODIFIED BY THE TXDOT BRIDGE DESIGN MANUAL.
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3. CONTRACTOR TO VERIFY LOCATION OF ALL UTILITIES PRIOR TO CONSTRUCTION.
4. REFER TO THE TXDOT STONE RIPRAP (SRR) STANDARD FOR RIPRAP DETAILS.
5. SEE CSAB STANDARD FOR CEMENT STABILIZED BACKFILL DETAILS AND LIMITS.
6. SEE BRIDGE BORING LOG SHEET FOR GEOTECHNICAL INFORMATION. BORING LOCATIONS ARE APPROXIMATE.
7. FOR TYPICAL SECTION SEE BRIDGE TYPICAL SECTION.
8. THE EXISTING SIX SPAN BRIDGE TO BE REMOVED BY THE CONTRACTOR. THE BRIDGE IS APPROXIMATELY 24' WIDE BY 90' LONG WITH A TIMBER SUPERSTRUCTURE AND CONCRETE SUBSTRUCTURE. THE BRIDGE IS TO BE REMOVED AND DISPOSED OF IN ACCORDANCE WITH STANDARD SPECIFICATION ITEM 496.
9. THE "H" VALUES SHOWN ARE ESTIMATED COLUMN HEIGHTS. CONTRACTOR IS RESPONSIBLE FOR CALCULATING ACTUAL COLUMN HEIGHT BASED ON FIELD CONDITIONS.
10. BRIDGE NOT DESIGNED FOR FUTURE OVERLAY.
11. WHITES BAYOU WAS FORMERLY KNOWN AS BARROW SLOUGH.
12. SEE ROADWAY AND DRAINAGE PLANS FOR CULVERT INFORMATION.
13. CONTRACTOR'S ATTENTION IS DRAWN TO THE WATER BEARING SAND SHOWN IN THE BORING LOGS. HOLE STABILITY IS THE RESPONSIBILITY OF THE CONTRACTOR. CASING OR SLURRY DISPLACEMENT MAY BE REQUIRED TO PREVENT MATERIAL CAVE IN.

DESIGN SPEED:MEETS OR EXCEEDS EXISTING
ADT(2016): 103
ADT(2042): 103
FUNCTION CLASS: RURAL
EXISTING NBI: 20-036-0-AA01-43-001
PROPOSED NBI: 20-036-0-AA01-43-002

LOAD RATING	INV	OP
STRENGTH I	1.25	1.62
SERVICE III	1.12	

HL-93 LOADING

STATE OF TEXAS · ARTHUR VIDALES · 127233 · LICENSED PROFESSIONAL ENGINEER

2/23/2024
DATE

0' 10' 20'
SCALE: 1"=20'

REV. NO.	DATE	DESCRIPTION	BY

PAPE-DAWSON ENGINEERS
DALLAS I SAN ANTONIO I AUSTIN I HOUSTON I FORT WORTH
6105 TENNYSON PKWY, STE 210 I PLANO, TX 75024 I 214.420.8494
TEXAS ENGINEERING FIRM #470 I TEXAS SURVEYING FIRM #10194390

Texas Department of Transportation
© 2023

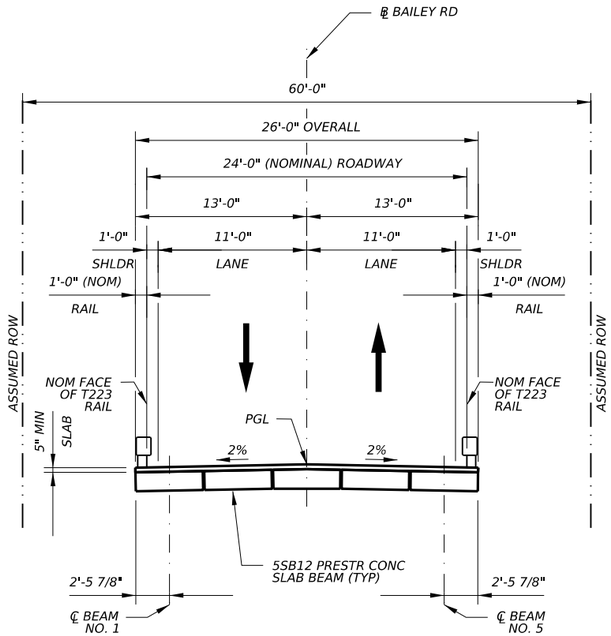
BAILEY RD AT WHITES BAYOU

BRIDGE LAYOUT

DESIGNED:	JHG	CONT	SECT	JOB	HIGHWAY
CHECKED:	AV	0920	03	082, ETC	CR 1065, ETC
DRAWN:	AMS	DIST	COUNTY		SHEET NO.
CHECKED:	AV	BMT	HARDIN, ETC		110

DATE: 2/23/2024 4:01:19 PM
FILE: pw://ja-pw.bentley.com:ja-pw-01/Documents/TxDOT/PM8016-2301 CEC WA4/Clemmons Gully Off-System Bridge/400 Production/4 - Design/Plan Set/7. Bridge/WBayou/037_BSlough_BR_BL01.dgn

CK: DW: CK: DW:



TYPICAL SECTION

N.T.S.

STA 13+14.00 TO STA 14+14.00

STATE OF TEXAS
ARTHUR VIDALES
127233
LICENSED
PROFESSIONAL ENGINEER

2/23/2024
DATE

NOT TO SCALE

HL-93 LOADING

REV. NO.	DATE	DESCRIPTION	BY

PAPE-DAWSON ENGINEERS

DALLAS I SAN ANTONIO I AUSTIN I HOUSTON I FORT WORTH

6105 TENNYSON PKWY, STE 210 I PLANO, TX 75024 I 214.420.8494

TEXAS ENGINEERING FIRM #470 I TEXAS SURVEYING FIRM #10194390

BAILEY RD AT WHITES BAYOU

BRIDGE TYPICAL SECTION

DESIGNED:	JHG	CONT	SECT	JOB	HIGHWAY
CHECKED:	AV	0920	03	082, ETC	CR 1065, ETC
DRAWN:	AMS	DIST	COUNTY		SHEET NO.
CHECKED:	AV	BMT	HARDIN, ETC		111

DW: | CK: | DW: | CK:

DATE: 2/23/2024 2:04:52 PM
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DW: CK: DW: CK:

NOTES:

1. BORE HOLES REPLICATED FROM HVJ ASSOCIATES, INC. BORINGS TAKEN ON OCTOBER 19 AND 20 OF 2023.

2. WATER BEARING COHESIONLESS SOILS ARE EXPECTED DURING DRILLED SHAFT CONSTRUCTION. CASING OR SLURRY DISPLACEMENT METHOD MAY BE REQUIRED TO PREVENT THE CAVE-IN OF SURROUNDING MATERIAL. STABILITY OF DRILLED SHAFT HOLE IS THE RESPONSIBILITY OF THE DRILLED SHAFT CONTRACTOR.

3. DRILLED SHAFT EXCAVATIONS SHOULD BE INSPECTED FOR VERTICALITY AND SIDE SLOUGHING. VERTICALITY IS SPECIFIED AT ONE INCH IN TEN FEET OF THE SHAFT LENGTH AND SHOULD BE CHECKED OVER THE FULL DEPTH OF DRY AUGERING PRIOR TO INTRODUCING DRILLING MUD.

4. BEFORE PLACING CONCRETE, THE SHAFT BOTTOM SHOULD BE CLEANED OUT WITH A DRILLING BUCKET IN ORDER TO REMOVE ANY SEDIMENTS THAT MAY NOT BE DISPLACED BY THE CONCRETE. THE SHAFT BOTTOMS SHOULD BE CLEANED WITH A "CLEAN-OUT" BUCKET UNTIL ROTATION ON THE BOTTOM WITHOUT CROWD (I.E. PENETRATION UNDER FORCE) PRODUCES LITTLE SPOIL. PROBING AFTER CLEAN OUT IS ESSENTIAL TO VERIFY THE CONDITION OF THE BASE OF THE SHAFT.

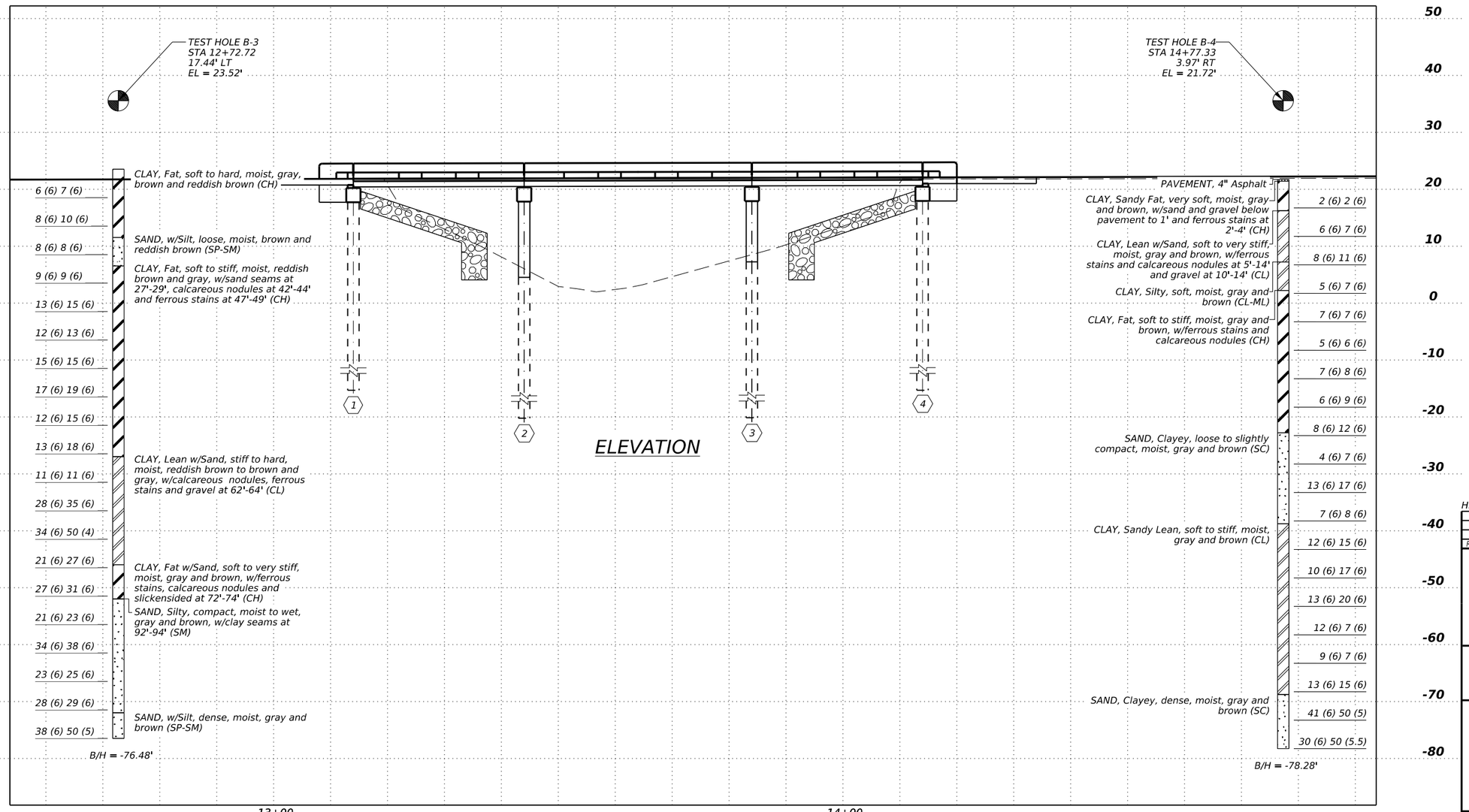
5. CONCRETE PLACEMENT SHOULD BE ACCOMPLISHED AS DIRECTED IN TXDOT STANDARD SPECIFICATION ITEM 416.3.6. THE TREMIE PIPE DIAMETER SHOULD BE AT LEAST SIX TIMES THE MAXIMUM SIZE OF AGGREGATE IN THE CONCRETE MIX.

6. A COMPUTATION OF THE FINAL CONCRETE VOLUME FOR EACH SHAFT SHOULD BE MADE. SHAFTS TAKING AN UNREASONABLY HIGH OR LOW VOLUME OF CONCRETE SHOULD BE CORED TO CHECK THEIR INTEGRITY.

NOTES CONT:

7. CASING WHICH CAN BE USED TO OVERCOME CAVING BECAUSE OF THE SANDS SHOULD BE EXTRACTED SLOWLY AND SMOOTHLY WITH A VIBRATORY HAMMER. THE CASING SHOULD ALWAYS REMAIN AT LEAST FIVE FEET BELOW THE LEVEL OF THE CONCRETE DURING PLACEMENT. THE GEOTECHNICAL ENGINEER'S ANALYSES ASSUMES NO CASING WILL BE LEFT IN PLACE. THE GEOTECHNICAL ENGINEER SHOULD BE INFORMED IF CASING WILL BE LEFT IN PLACE SO THEY MAY PROVIDE REVISED SHAFT CAPACITY CALCULATIONS.

8. SHAFT EXCAVATIONS SHOULD NOT BE MADE WITHIN TWO SHAFT DIAMETERS (EDGE TO EDGE) OF SHAFTS THAT HAVE BEEN CONCRETED WITHIN THE LAST 24 HOURS OR FROM OPEN SHAFT EXCAVATION.



ELEVATION

HL-93 LOADING

0' 10' 20'

SCALE: 1"=20'

STATE OF TEXAS
ARTHUR VIDALES
127233
LICENSED
PROFESSIONAL ENGINEER

2/23/2024
DATE

REV. NO.	DATE	DESCRIPTION	BY

PAPE-DAWSON ENGINEERS
DALLAS I SAN ANTONIO I AUSTIN I HOUSTON I FORT WORTH
6105 TENNYSON PKWY, STE 210 I PLANO, TX 75024 I 214.420.8494
TEXAS ENGINEERING FIRM #470 I TEXAS SURVEYING FIRM #10194390

Texas Department of Transportation

BAILEY RD AT WHITES BAYOU

BORING LOGS

DESIGNED:	JHG	CONT	SECT	JOB	HIGHWAY
CHECKED:	AV	0920	03	082, ETC	CR 1065, ETC
DRAWN:	AMS	DIST	COUNTY		SHEET NO.
CHECKED:	AV	BMT	HARDIN, ETC		112

DATE: 2/23/2024 2:05:08 PM
FILE: pw://la-pw.bentley.com:la-pw-01/Documents/TxDOT/PM8016-2301 CEC WA4/Clemmons Gully Off-System Bridge/400 Production/4 - Design/Plan Set/7. Bridge/WBayou/037_BSlough_BR_BORE01.dgn

DN: CK: DW: CK:

SCOUR ANALYSIS - 100-YR (DESIGN)
SCOUR ANALYSIS DETERMINED BY UTILIZING EQUATIONS FROM HEC-18 MANUAL.
COMPUTED USING HYDRAULIC TOOLBOX VERSION 5.2

LIVE-BED CONTRACTION SCOUR EQUATIONS (EQNS. 6.1 & 6.2)

D50 = 0.200 MM
K1 = 0.69
SCOUR DEPTH Y (CHANNEL) = 2.65 FT

NOTES:

1. SCOUR ANALYSIS IS PERFORMED IN ACCORDANCE WITH TXDOT GEOTECHNICAL MANUAL AND HEC-18
2. ABUTMENTS TO BE PROTECTED WITH RIPRAP (STONE PROTECTION). ABUTMENT SCOUR IS NOT REQUIRED PER TXDOT GEOTECHNICAL MANUAL.
3. 12" STONE PROTECTION SIZE IS RECOMMENDED WITH A 24" THICKNESS

STATE OF TEXAS
D'ANDRE R. JAMES
145862
LICENSED
PROFESSIONAL ENGINEER
2.26.23

LJA PROGRAM MANAGEMENT
FRN - F-14256

Texas Department of Transportation

CLEMMONS GULLY PACKAGE

SCOUR DATA
BAILEY RD
AT WHITES BAYOU

SHEET 1 OF 1

CONT	SECT	JOB	HIGHWAY
0920	03	082, ETC	CR 1065, ETC
DIST	COUNTY		SHEET NO.
BMT	HARDIN, ETC		113

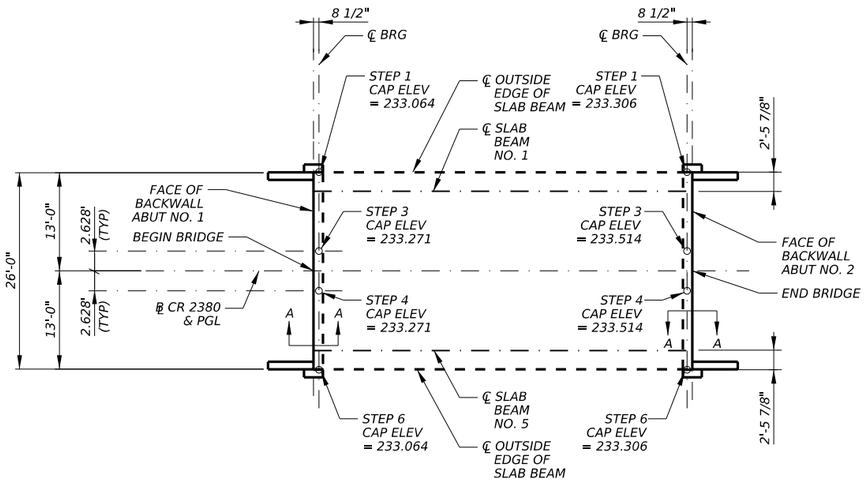
DATE: 2/25/2024 11:40:43 PM
FILE: pw://lja-pw.bentley.com/lja-pw-01/Documents/TxDOT/PM8016-2301 CEC WA4/Clemmons Gully Off-System Bridge/400 Production/4 - Design/Master Design Files/3 Barrow Slough/031_Bridge Scour Data

NOTE:

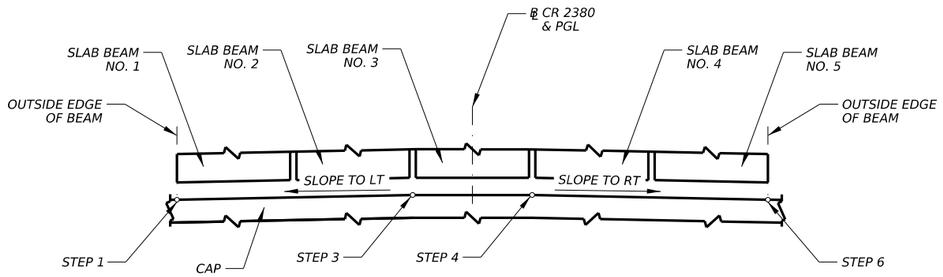
1. SIGNING AND SEALING FOR CAP ELEVATIONS ONLY.

SUMMARY OF ESTIMATED QUANTITIES - CR 2380 AT VINCENT TRIBUTARY

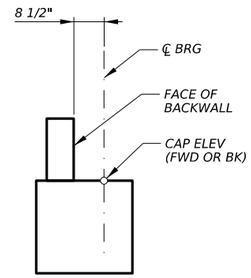
BID ITEM	400 6005	416 6002	420 6013	422 6007	422 6015	425 6012	432 6031	450 6006	454 6004	496 6009
BID ITEM DESCRIPTION	CEM STABIL BKFL	DRILL SHAFT (24 IN)	CL C CONC (ABUT)	REINF CONC SLAB (SLAB BEAM)	APPROACH SLAB	PRESTR CONC SLAB BEAM (5SB15)	RIPRAP (STONE PROTECTION) (12 IN)	RAIL (TY T223)	ARMOR JOINT (SEALED)	REMOV STR (BRIDGE 0-99 FT LENGTH)
BRIDGE ELEMENT	CY	LF	CY	SF	CY	LF	CY	LF	LF	EA
2 - ABUTMENTS	58	300	18.4		38.5		222	24	51	1
1 - 50.00' PRESTR CONCRETE SLAB BEAM UNIT				1300		247.50		100		
TOTAL	58	300	18.4	1300	38.5	247.50	222	124	51	1



PLAN OF STEP LOCATIONS



COMMON TRANSVERSE SECTIONS AT STEP LOCATIONS



SECTION A-A

NOT TO SCALE

HL-93 LOADING

REV. NO.	DATE	DESCRIPTION	BY

STATE OF TEXAS
ARTHUR VIDALES
127233
LICENSED
PROFESSIONAL ENGINEER

2/23/2024
DATE

PAPE-DAWSON ENGINEERS

DALLAS I SAN ANTONIO I AUSTIN I HOUSTON I FORT WORTH
6105 TENNYSON PKWY, STE 210 I PLANO, TX 75024 I 214.420.8494
TEXAS ENGINEERING FIRM #470 I TEXAS SURVEYING FIRM #10194390

Texas Department of Transportation

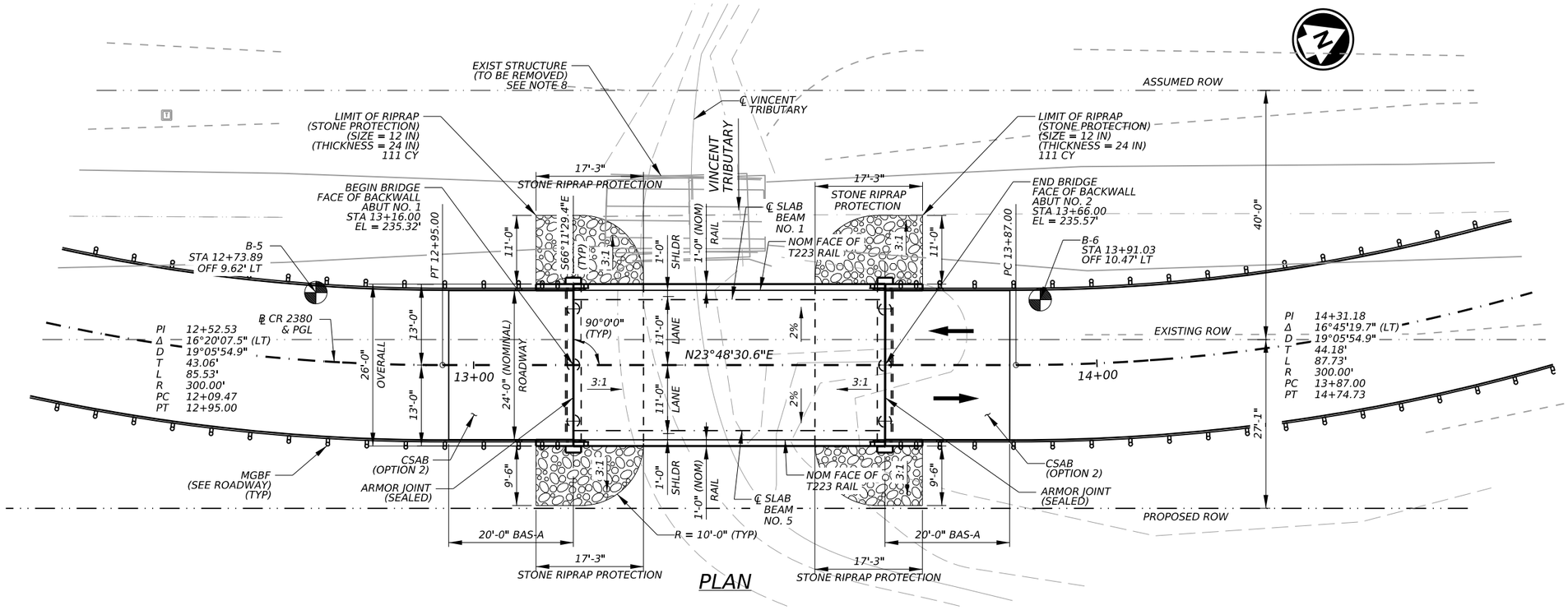
CR 2380 AT VINCENT TRIBUTARY

ESTIMATED QUANTITIES AND CAP ELEVATIONS

DESIGNED:	AJG	CONT	SECT	JOB	HIGHWAY
CHECKED:	JHG	0920	03	082, ETC	CR 1065, ETC
DRAWN:	AMS	DIST	COUNTY		SHEET NO.
CHECKED:	JHG	BMT	HARDIN, ETC		114

DATE: 2/23/2024 2:05:24 PM
FILE: pw://ljs-pw.bentley.com:ljs-pw-01/Documents/TxDOT/PM8016-2301 CEC WA4/Clemmons Gully Off-System Bridge/400 Production/4 - Design/Plan Set/7. Bridge/Vincent/041_Vincent_BR_EQ01.dgn

CK: DW: CK: DW:

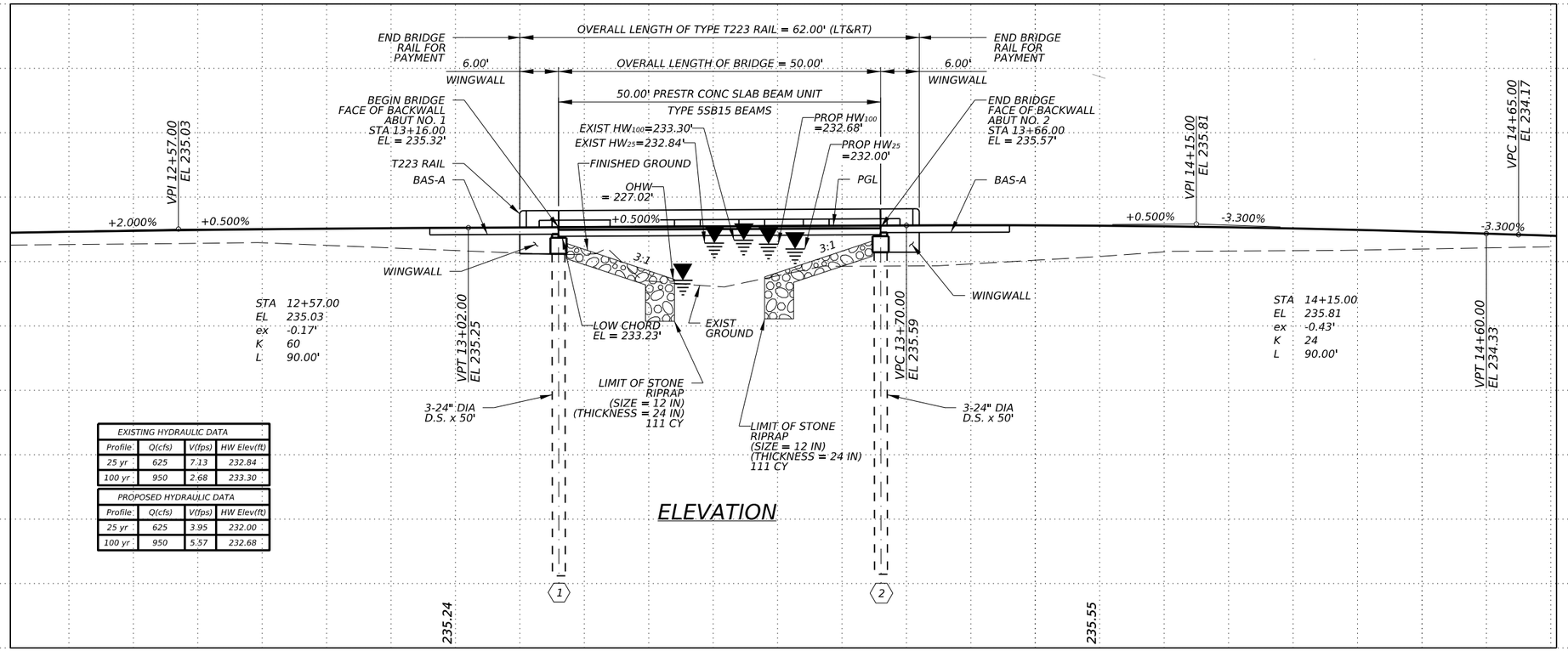


NOTES:

1. DESIGNED ACCORDING TO AASHTO LRFD BRIDGE SPECIFICATIONS 2020, 9TH EDITION AND CURRENT INTERIM REVISIONS AS MODIFIED BY THE TXDOT BRIDGE DESIGN MANUAL.
2. HORIZONTAL AND VERTICAL DIMENSIONS ARE SHOWN. LENGTHS MUST BE CORRECTED FOR GRADE OR CROSS SLOPE WHERE APPROPRIATE.
3. CONTRACTOR TO VERIFY LOCATION OF ALL UTILITIES PRIOR TO CONSTRUCTION.
4. REFER TO THE TXDOT STONE RIPRAP (SRR) STANDARD FOR RIPRAP DETAILS.
5. SEE CSAB STANDARD FOR CEMENT STABILIZED BACKFILL DETAILS AND LIMITS.
6. SEE BRIDGE BORING LOG SHEET FOR GEOTECHNICAL INFORMATION. BORING LOCATIONS ARE APPROXIMATE.
7. FOR TYPICAL SECTION SEE BRIDGE TYPICAL SECTION.
8. THE EXISTING SINGLE SPAN BRIDGE TO BE REMOVED BY THE CONTRACTOR. THE BRIDGE IS 12'-5" WIDE BY APPROXIMATELY 24' LONG WITH A TIMBER DECK ON STEEL SUPERSTRUCTURE AND SUBSTRUCTURE. THE BRIDGE IS TO BE REMOVED AND DISPOSED OF IN ACCORDANCE WITH STANDARD SPECIFICATION ITEM 496.
9. BRIDGE NOT DESIGNED FOR FUTURE OVERLAY.
10. CONTRACTOR'S ATTENTION IS DRAWN TO THE WATER BEARING SAND SHOWN IN THE BORING LOGS. HOLE STABILITY IS THE RESPONSIBILITY OF THE CONTACTOR. CASING OR SLURRY DISPLACEMENT MAY BE REQUIRED TO PREVENT MATERIAL CAVE IN.

DESIGN SPEED: MEETS OR EXCEEDS EXISTING
ADT(2016): 131
ADT(2042): 131
FUNCTION CLASS: RURAL
EXISTING NBI: 20-229-0-AA23-80-002
PROPOSED NBI: 20-229-0-AA23-80-003

LOAD RATING	INV	OP
STRENGTH	1.33	1.72
SERVICE III	1.11	



EXISTING HYDRAULIC DATA			
Profile	Q(cfs)	V(fps)	HW Elev(ft)
25 yr	625	7.13	232.84
100 yr	950	2.68	233.30

PROPOSED HYDRAULIC DATA			
Profile	Q(cfs)	V(fps)	HW Elev(ft)
25 yr	625	3.95	232.00
100 yr	950	5.57	232.68

HL-93 LOADING

STATE OF TEXAS
ARTHUR VIDALES
127233
LICENSED
PROFESSIONAL ENGINEER

2/23/2024
DATE

0' 10' 20'
SCALE: 1"=20'

REV. NO.	DATE	DESCRIPTION	BY

PAPE-DAWSON ENGINEERS
DALLAS I SAN ANTONIO I AUSTIN I HOUSTON I FORT WORTH
6105 TENNYSON PKWY, STE 210 I PLANO, TX 75024 I 214.420.8494
TEXAS ENGINEERING FIRM #470 I TEXAS SURVEYING FIRM #10194390

Texas Department of Transportation
© 2023

CR 2380 AT VINCENT TRIBUTARY

BRIDGE LAYOUT

DESIGNED:	AJG	CONT	SECT	JOB	HIGHWAY
CHECKED:	JHG	0920	03	082, ETC	CR 1065, ETC
DRAWN:	AMS	DIST	COUNTY		SHEET NO.
CHECKED:	JHG	BMT	HARDIN, ETC		115

DATE: 2/23/2024 4:01:41 PM
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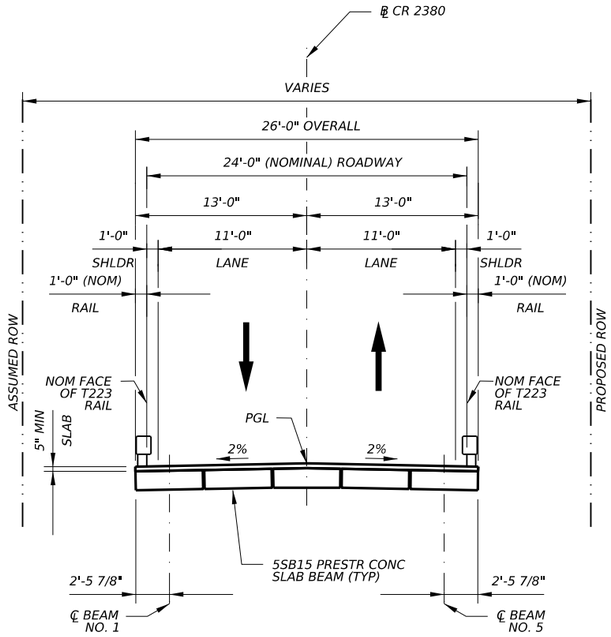
270



TYPICAL SECTION

N.T.S.

STA 13+16.00 TO STA 13+66.00

STATE OF TEXAS
ARTHUR VIDALES
127233
LICENSED PROFESSIONAL ENGINEER

2/23/2024
DATE

NOT TO SCALE

HL-93 LOADING

REV. NO.	DATE	DESCRIPTION	BY

PAPE-DAWSON ENGINEERS

DALLAS I SAN ANTONIO I AUSTIN I HOUSTON I FORT WORTH

6105 TENNYSON PKWY, STE 210 I PLANO, TX 75024 I 214.420.8494

TEXAS ENGINEERING FIRM #470 I TEXAS SURVEYING FIRM #10194390

CR 2380 AT VINCENT TRIBUTARY

BRIDGE TYPICAL SECTION

DESIGNED:	JHG	CONT	SECT	JOB	HIGHWAY
CHECKED:	AV	0920	03	082, ETC	CR 1065, ETC
DRAWN:	AMS	DIST	COUNTY		SHEET NO.
CHECKED:	AV	BMT	HARDIN, ETC		116

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DW: CK: DW: CK:

CK:
DW:
CK:
DW:

NOTES:

1. BORE HOLES REPLICATED FROM HVJ ASSOCIATES, INC. BORINGS TAKEN ON OCTOBER 13 AND 17 OF 2023.

2. WATER BEARING COHESIONLESS SOILS ARE EXPECTED DURING DRILLED SHAFT CONSTRUCTION. CASING OR SLURRY DISPLACEMENT METHOD MAY BE REQUIRED TO PREVENT THE CAVE-IN OF SURROUNDING MATERIAL. STABILITY OF DRILLED SHAFT HOLE IS THE RESPONSIBILITY OF THE DRILLED SHAFT CONTRACTOR.

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5. CONCRETE PLACEMENT SHOULD BE ACCOMPLISHED AS DIRECTED IN TXDOT STANDARD SPECIFICATION ITEM 416.3.6. THE TREMIE PIPE DIAMETER SHOULD BE AT LEAST SIX TIMES THE MAXIMUM SIZE OF AGGREGATE IN THE CONCRETE MIX.

6. A COMPUTATION OF THE FINAL CONCRETE VOLUME FOR EACH SHAFT SHOULD BE MADE. SHAFTS TAKING AN UNREASONABLY HIGH OR LOW VOLUME OF CONCRETE SHOULD BE CORED TO CHECK THEIR INTEGRITY.

NOTES CONT:

7. CASING WHICH CAN BE USED TO OVERCOME CAVING BECAUSE OF THE SANDS SHOULD BE EXTRACTED SLOWLY AND SMOOTHLY WITH A VIBRATORY HAMMER. THE CASING SHOULD ALWAYS REMAIN AT LEAST FIVE FEET BELOW THE LEVEL OF THE CONCRETE DURING PLACEMENT. THE GEOTECHNICAL ENGINEER'S ANALYSES ASSUMES NO CASING WILL BE LEFT IN PLACE. THE GEOTECHNICAL ENGINEER SHOULD BE INFORMED IF CASING WILL BE LEFT IN PLACE SO THEY MAY PROVIDE REVISED SHAFT CAPACITY CALCULATIONS.

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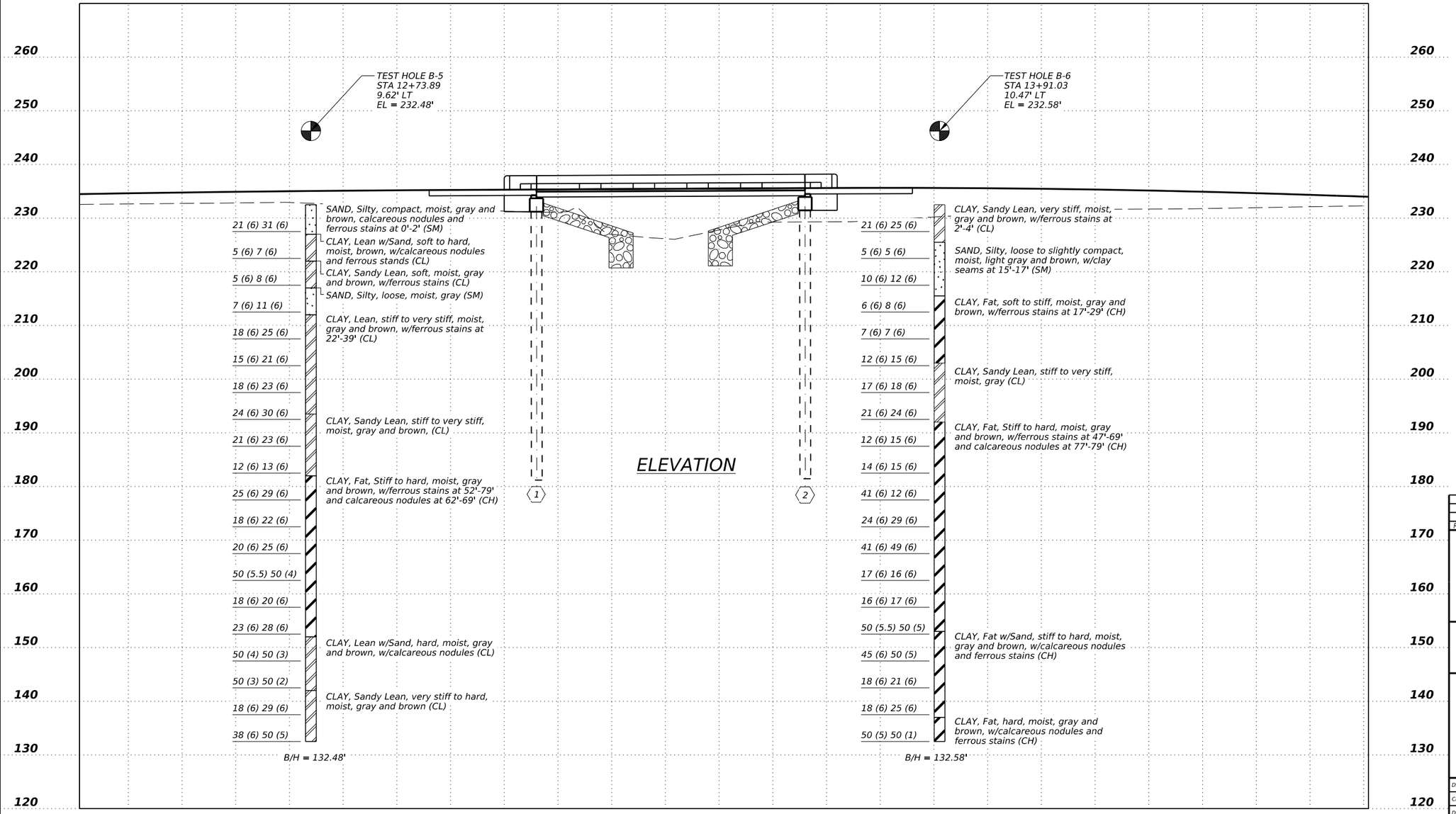

STATE OF TEXAS
ARTHUR VIDALES
127233
LICENSED
PROFESSIONAL ENGINEER

2/23/2024
DATE

0' 10' 20'

SCALE: 1"=20'

REV. NO.	DATE	DESCRIPTION	BY

PAPE-DAWSON ENGINEERS
DALLAS I SAN ANTONIO I AUSTIN I HOUSTON I FORT WORTH
6105 TENNYSON PKWY, STE 210 I PLANO, TX 75024 I 214.420.8494
TEXAS ENGINEERING FIRM #470 I TEXAS SURVEYING FIRM #10194390

Texas Department of Transportation

CR 2380 AT VINCENT TRIBUTARY

BORING LOGS

DESIGNED:	AJG	CONT	SECT	JOB	HIGHWAY
CHECKED:	JHG	0920	03	082, ETC	CR 1065, ETC
DRAWN:	AMS	DIST	COUNTY		SHEET NO.
CHECKED:	JHG	BMT	HARDIN, ETC		117

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SCOUR ANALYSIS - 100-YR (DESIGN)
SCOUR ANALYSIS DETERMINED BY UTILIZING EQUATIONS FROM HEC-18 MANUAL.
COMPUTED USING HYDRAULIC TOOLBOX VERSION 5.2

CLEAR WATER CONTRACTION SCOUR EQUATIONS (EQNS. 6.4 & 6.5)

D50 = 0.200 MM
K1 = 0.69
SCOUR DEPTH Y (CHANNEL) = 6.47 FT

NOTES:

1. SCOUR ANALYSIS IS PERFORMED IN ACCORDANCE WITH TXDOT GEOTECHNICAL MANUAL AND HEC-18
2. ABUTMENTS TO BE PROTECTED WITH RIPRAP (STONE PROTECTION). ABUTMENT SCOUR IS NOT REQUIRED PER TXDOT GEOTECHNICAL MANUAL.
3. 12" STONE PROTECTION SIZE IS RECOMMENDED WITH A 24" THICKNESS

STATE OF TEXAS
D'ANDRE R. JAMES
145862
LICENSED
PROFESSIONAL ENGINEER
2.26.23

LJA PROGRAM MANAGEMENT
FRN - F-14256

Texas Department of Transportation

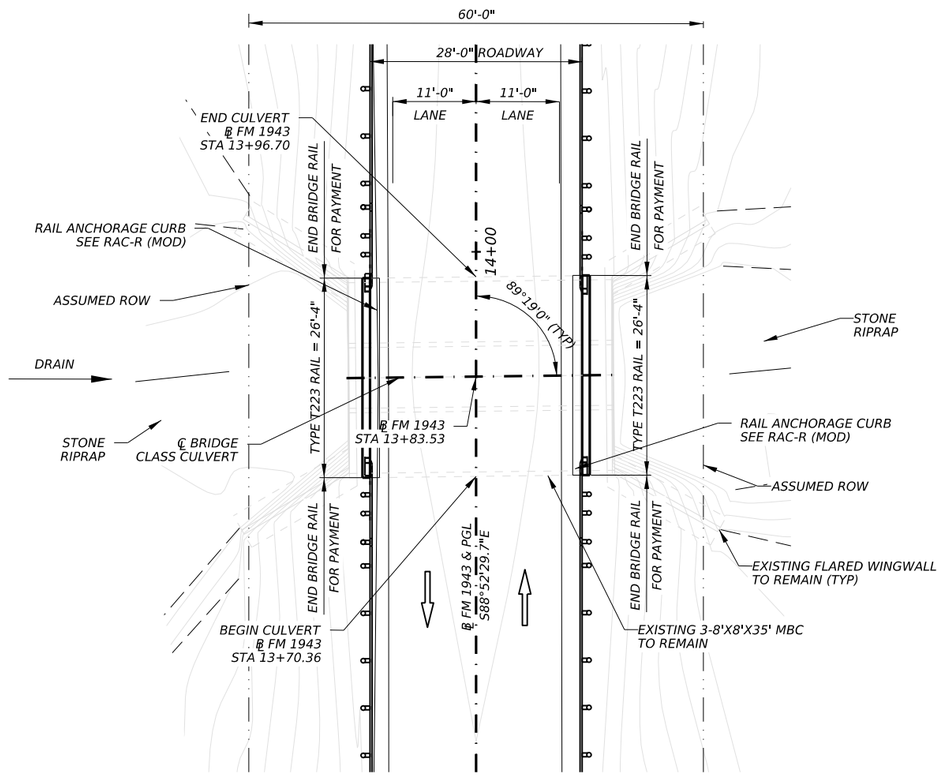
CLEMMONS GULLY PACKAGE

SCOUR DATA
CR 2380
AT VINCENT TRIBUTARY

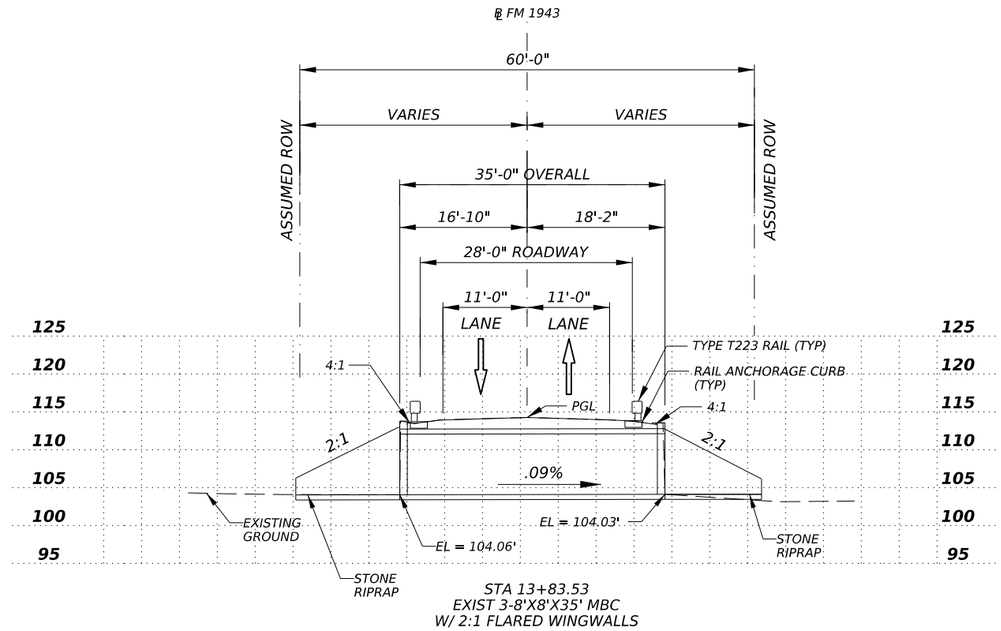
SHEET 1 OF 1

CONT	SECT	JOB	HIGHWAY
0920	03	082, ETC	CR 1065, ETC
DIST	COUNTY		SHEET NO.
BMT	HARDIN, ETC		118

DATE: 2/27/2024 10:19:27 AM
FILE: pw://lja-pw.bentley.com:lja-pw-01/Documents/TxDOT/PM8016-2301 CEC WA4/Clemmons Gully Off-System Bridge/400 Production/4 - Design/Master Design Files/2 Vincent Tributary/041_Bridge Scour Data



PLAN



STA 13+83.53
EXIST 3-8'X8'X35' MBC
W/ 2:1 FLARED WINGWALLS

PROP: INSTALL TY T223 RAIL USING RAIL ANCHORAGE CURB TYPE (RAC-R MOD)

ELEVATION

NOTES:

1. THE EXISTING MULTIPLE BOX CULVERT IS TO REMAIN.
   THE CULVERT IS 3 - 8'X8'X35' CONCRETE BOXES.
   ORIGINAL DESIGN DRAWINGS NOT AVAILABLE.
   CONTRACTOR TO VERIFY EXISTING STRUCTURE DIMENSIONS IN FIELD.
2. FOR NEW RAIL INSTALLATION, SEE RAC-R(MOD) SHEET.
   CONTRACTOR SHALL FIELD VERIFY THE FILL CONDITIONS.

DESIGN SPEED: MEETS OR EXCEEDS EXISTING
ADT(2017): 789
ADT(2042): 1010
FUNCTION CLASS: MAJOR COLLECTOR
EXISTING NBI: 20-229-0-1828-01-006

SUMMARY OF ESTIMATED QUANTITIES - FM 1943 AT DRAIN

BID ITEM	420 6136	450 6006
BID ITEM DESCRIPTION	CL C CONC (RAC-R)	RAIL (TY T223)
BRIDGE ELEMENT	CY	LF
EXISTING BOX CULVERT	3.5	53
TOTAL	3.5	53

ARTHUR Y DALES 127233 LICENSED PROFESSIONAL ENGINEER STATE OF TEXAS

2/23/2024
DATE

0' 10' 20'
SCALE: 1"=20'

HL-93 LOADING

REV. NO.	DATE	DESCRIPTION	BY

PAPE-DAWSON ENGINEERS
DALLAS I SAN ANTONIO I AUSTIN I HOUSTON I FORT WORTH
6105 TENNYSON PKWY, STE 210 I PLANO, TX 75024 I 214.420.8494
TEXAS ENGINEERING FIRM #470 I TEXAS SURVEYING FIRM #10194390

FM 1943 AT DRAIN

BRIDGE CLASS CULVERT LAYOUT

DESIGNED:	CT	CONT	SECT	JOB	HIGHWAY
CHECKED:	JHG	0920	03	082, ETC	CR 1065, ETC
DRAWN:	CT	DIST	COUNTY		SHEET NO.
CHECKED:	JHG	BMT	HARDIN, ETC		119

DATE: 2/23/2024 4:01:58 PM
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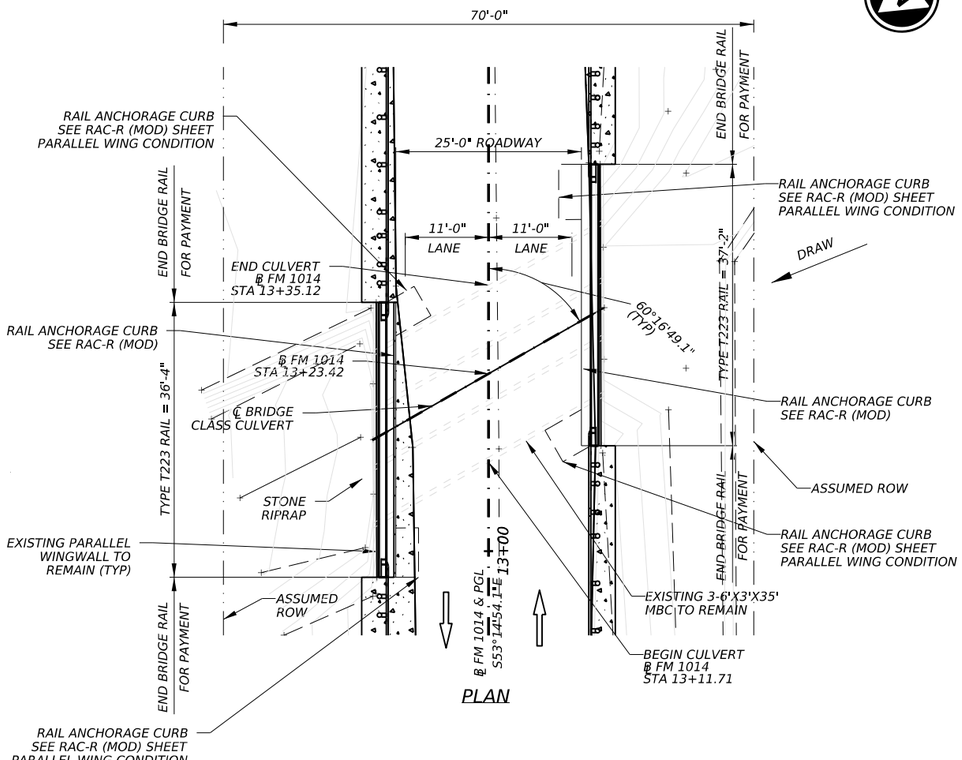
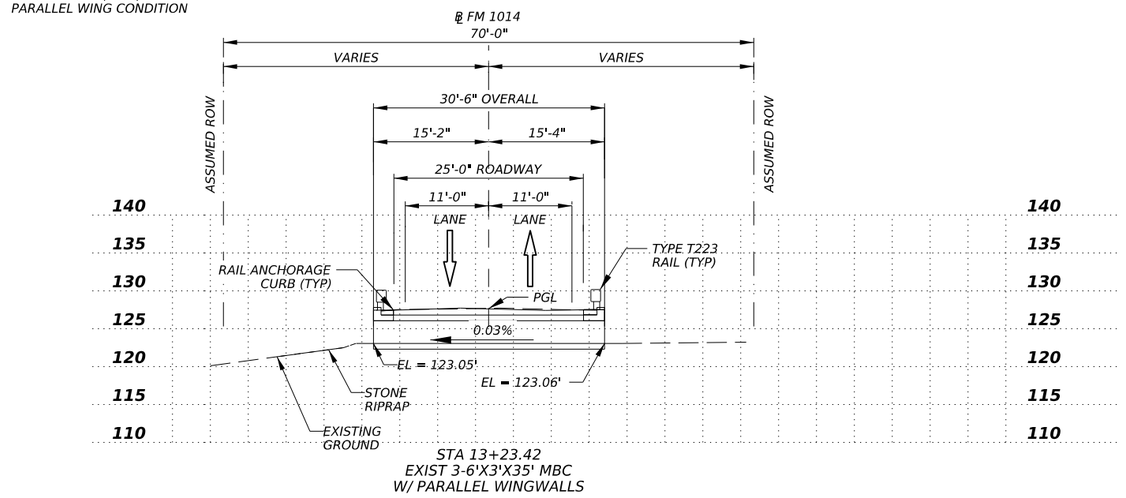


PLAN



STA 13+23.42
EXIST 3-6'X3'X35' MBC
W/ PARALLEL WINGWALLS

ELEVATION

NOTES:

1. *THE EXISTING MULTIPLE BOX CULVERT IS TO REMAIN.*
   THE CULVERT IS 3 - 6'X3'x35' CONCRETE BOXES.
   ORIGINAL DESIGN DRAWINGS NOT AVAILABLE.
   CONTRACTOR TO VERIFY EXISTING STRUCTURE DIMENSIONS IN FIELD.
2. *FOR NEW RAIL INSTALLATION, SEE RAC-R (MOD) SHEET.*
   CONTRACTOR SHALL FIELD VERIFY THE FILL CONDITIONS.

DESIGN SPEED:MEETS OR EXCEEDS EXISTING
ADT(2017): 110
ADT(2042): 154
FUNCTION CLASS: MINOR COLLECTOR
EXISTING NBI: 20-229-0-1238-01-001

SUMMARY OF ESTIMATED QUANTITIES - FM 1014 AT DRAW

BID ITEM	420 6136	450 6006
BID ITEM DESCRIPTION	CL C CONC (RAC-R)	RAIL (TY T223)
BRIDGE ELEMENT	*CY*	*LF*
EXISTING BOX CULVERT	22.5	74
TOTAL	22.5	74

STATE OF TEXAS
ARTHUR VIDALES
127233
LICENSED
PROFESSIONAL ENGINEER

Arthur Vidales

2/23/2024
DATE

0' 10' 20'

SCALE: 1"=20'

HL-93 LOADING

REV. NO.	DATE	DESCRIPTION	BY

PAPE-DAWSON ENGINEERS

DALLAS I SAN ANTONIO I AUSTIN I HOUSTON I FORT WORTH
6105 TENNYSON PKWY, STE 210 I PLANO, TX 75024 I 214.420.8494
TEXAS ENGINEERING FIRM #470 I TEXAS SURVEYING FIRM #10194390

Texas Department of Transportation

FM 1014 AT DRAW

BRIDGE CLASS CULVERT LAYOUT

DESIGNED:	CT	CONT	SECT	JOB	HIGHWAY
CHECKED:	JHG	0920	03	082, ETC	CR 1065, ETC
DRAWN:	CT	DIST	COUNTY		SHEET NO.
CHECKED:	JHG	BMT	HARDIN, ETC		120

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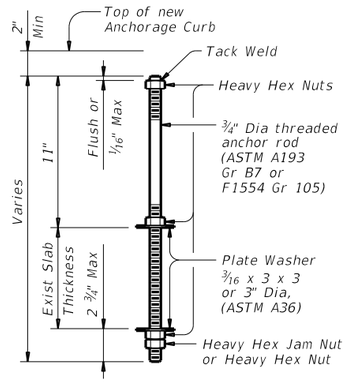
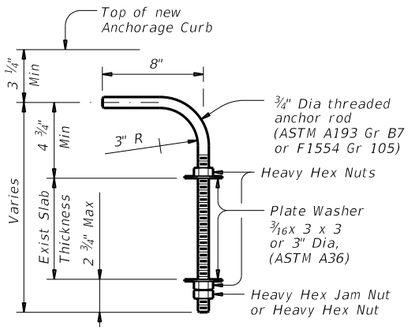
DATE:
FILE:

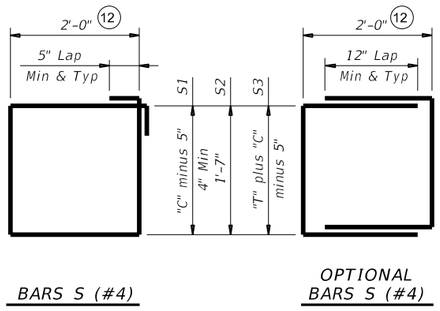


STRAIGHT ANCHOR (9)



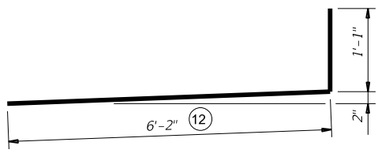
HOOKED ANCHOR (9)

ANCHOR DETAILS

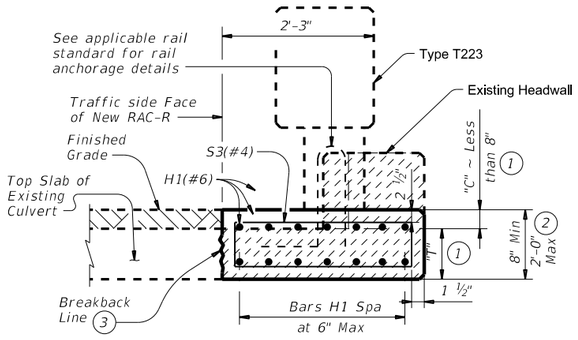


BARS S (#4)

OPTIONAL BARS S (#4)

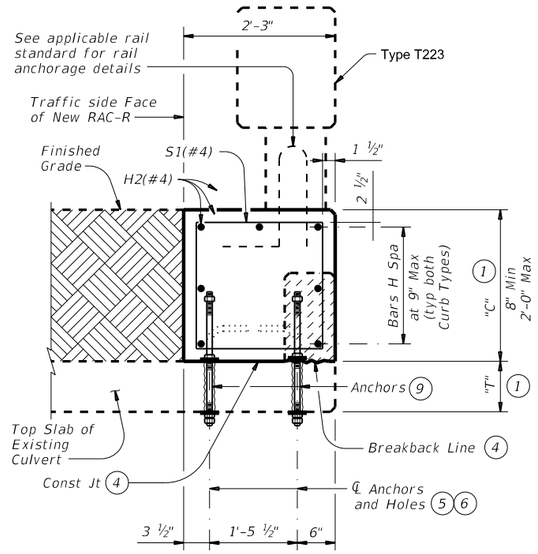


BARS L (#5)



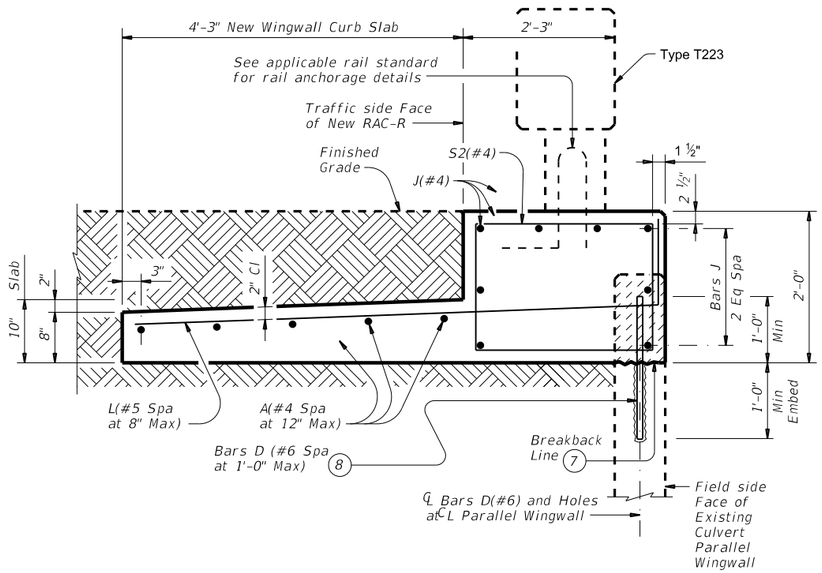
TYPICAL SECTION ~ TYPE 1

Used when the top of the Retrofit Curb is less than 8" above existing slab. (Bars L(#5) on T223 Rails are not used for this structure).



TYPICAL SECTION ~ TYPE 2

Used when the Retrofit Curb is 8" in height or greater.
(Bars L(#5) on T223 Rails are not used for this structure).



TYPICAL SECTION ~ PARALLEL WINGWALL

Wingwall Anchorage Curb is required on Parallel Wingwalls only. Omit Wingwall Anchorage Curb on Flared and Straight Wingwalls. Showing T223 Rail, other rails similar. (Bars L(#5) on T223 are not used for this structure).

(1) "T" is equal to the existing culvert top slab thickness. If "T" is less than 6", a special design will be required. "C" is equal to the Retrofit Rail Anchorage Curb thickness. "T" is equal to 9" for FM 1014 and equal to 8" for FM 1943.

(2) The total thickness ("T" plus "C") must be 8" minimum in order to properly install the railing anchorage reinforcing.

(3) Remove shaded portion of existing concrete to Breakback Line shown. Care must be taken so as to not damage existing reinforcing. Replace damaged reinforcing with new, like reinforcing. Clean existing reinforcing and incorporate into new concrete construction.

(4) Saw cut (score) 1" deep flush with top of existing culvert slab, on the field side face of existing curb, if present. After scoring, remove shaded portion of existing concrete to Breakback Line shown. Do not damage existing reinforcing. Clean, bend and incorporate existing reinforcing into new concrete construction. Note that new anchors, as shown in the detail, are required even when existing reinforcing remains in use. Remove existing overlay and/or base material to flush with top of culvert in areas of new construction. Care must be taken to not damage the existing slab. In order to prevent existing asphalt remnants from acting as a bond breaker between the exposed, existing concrete and the retrofitted concrete curb, clean the newly exposed concrete with abrasive blasting or shot blasting. Remove all loose debris prior to placing new anchorage curb.

(5) Core drill 1" diameter holes through existing slab. Percussion drilling is not permitted. Patch spalls, when directed by the Engineer, in accordance with Item 429, "Concrete Structure Repair", at the Contractor's expense. Tighten nuts snug tight.

(6) Space field side anchors at 36" maximum. Space traffic side anchors at 11" maximum. Do not align field side and traffic side anchors transversely.

(7) Retrofit Wingwall Anchorage Curb must always be 2'-0" in height. Breakback existing wingwall as needed in order to properly align the wingwall Anchorage Curb with that placed on the existing culvert. Saw cut (score) 1" deep on field side face of the existing wingwall prior to breakback. Care must be taken so as to not damage existing reinforcing. Clean and extend existing reinforcing into new construction. Note that new Bars D(#6), as shown in the detail, are required even when existing reinforcing remains in use.

(8) Embed bars D(#6) into existing wingwall with a Type III, Class C, D, E, or F anchor adhesive. Minimum adhesive anchor embedment depth is 12". Anchor adhesive chosen must be able to achieve a basic bond strength in tension, Nba, of 26 kips. 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." If existing parallel wingwall thickness is less than 8", a special design will be required.

(9) Use straight anchors if retrofit anchorage curb is 1'-2" or greater in thickness. Use hooked anchors for retrofit anchorage curb less than 1'-2" thick.

(12) If anchorage curb width is greater than 2'-3", increase bar width accordingly.

CONSTRUCTION NOTES:

Contractor to field verify dimensions before commencing work and ordering materials.

MATERIAL NOTES:

Provide Class "C" concrete (f'c=3,600 psi). Provide Class "C" (HPC) concrete if shown elsewhere in the plans.

Chamfer all exposed corners ¾" unless shown otherwise.

Provide Grade 60 reinforcing steel.

Galvanize all reinforcing steel if required elsewhere.

Provide bar laps, where required, as follows: Uncoated or galvanized ~ #4 = 1'-11"

Galvanize ¾" Dia threaded rods, heavy hex nuts and plate washers, unless otherwise shown on plans.

GENERAL NOTES:

Designed according to AASHTO LRFD Bridge Design Specifications.

The rail anchorage curb details have sufficient strength for use with all standard rail types.

See appropriate rail standard for approved speed restrictions, notes and details not shown.

For vehicle safety, the top of the new curb must be flush with the finished grade.

These details are for use with curbs with a maximum height of 2'-0" only. Curb heights greater than 2'-0" will require special design.

Removal and replacement of backfill, subgrade, and asphalt or concrete pavement necessary for this installation is considered subsidiary to the rail anchorage curb.

Payment for rail anchorage curb (including wingwall curb slab) will be by CY of Class "C" or Class "C" (HPC) concrete, CL C Conc (RAC-R) bid item 420 6136.

Not all possible combinations of existing box culverts, curbs, wingwalls etc. have been shown on this sheet. Other combinations and reinforcement arrangements are permissible if they meet the same strength requirements as indicated on this sheet.

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

STATE OF TEXAS
ARTHUR VIDALES
127233
LICENSED
PROFESSIONAL ENGINEER

2/23/2024
DATE

Texas Department of Transportation

Bridge Division Standard

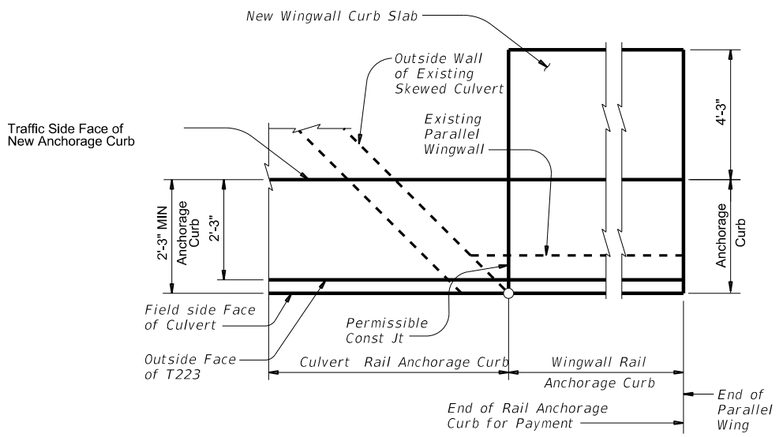
RAIL ANCHORAGE CURB RETROFIT GUIDE

BOX CULVERT RAIL MOUNTING DETAILS (CURBS 2'-0" TALL AND LESS ONLY)

RAC-R (MOD)

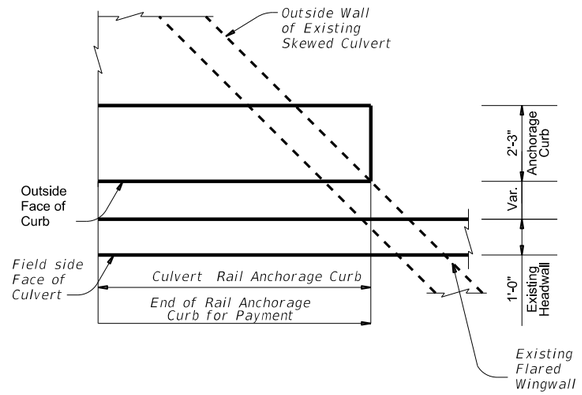
FILE: CD-RAC-R-20.dgn	DN: TxDOT	CK: TxDOT	DW: TxDOT	CK: TxDOT
©TxDOT February 2020	CONT	SECT	JOB	HIGHWAY
REVISIONS	0920	03	082, ETC.	CR 1065, ETC
	DIST	COUNTY		SHEET NO.
	BMT	HARDIN, ETC.		121

DATE:
FILE:



PARALLEL WINGWALL AT SKEWED CULVERT

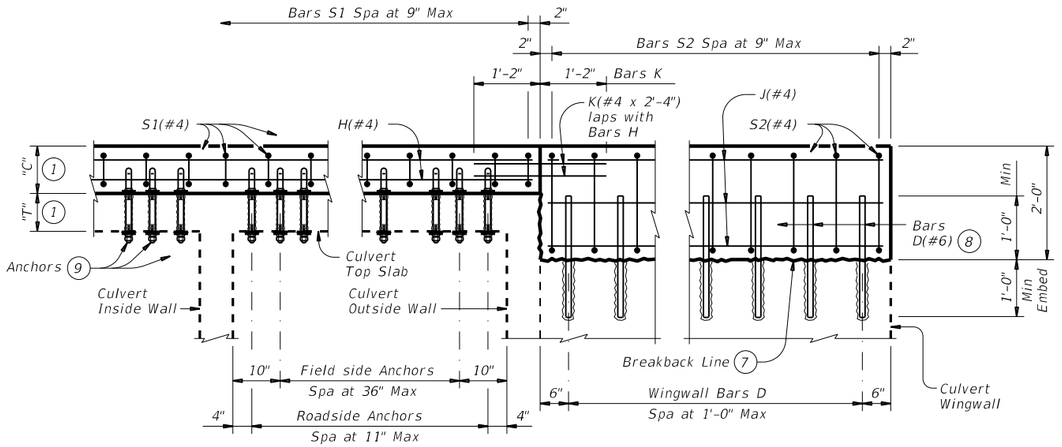
Note that Wingwall Rail Anchorage Curb is used only at culverts with parallel wingwalls.



OPTION A ~
FLARED WINGWALL
AT SKEWED CULVERT (10)

TYPICAL CURB PLANS

Showing Geometry only. Reinforcing, Curb Anchors, and Railing not shown for clarity.



SHOWING CULVERT ANCHORAGE CURB

Showing Anchorage Curb Type 2. Anchor and Bars S spacing are the same for Anchorage Type 1.

SHOWING WINGWALL ANCHORAGE CURB

Curb Slab and Slab reinforcing not shown for clarity.

TYPICAL ELEVATIONS OF INSTALLATION

(1) "T" is equal to the existing culvert top slab thickness. If "T" is less than 6", a special design will be required. "C" is equal to the Retrofit Rail Anchorage Curb thickness.

(7) Retrofit Wingwall Anchorage Curb must always be 2'-0" in height. Breakback existing wingwall as needed in order to properly align the wingwall Anchorage Curb with that placed on the existing culvert. Saw cut (score) 1" deep on field side face of the existing wingwall prior to breakback. Care must be taken so as to not damage existing reinforcing. Clean and extend existing reinforcing into new construction. Note that new Bars D(#6), as shown in the detail, are required even when existing reinforcing remains in use.

(8) Embed bars D(#6) into existing wingwall with a Type III, Class C, D, E, or F anchor adhesive. Minimum adhesive anchor embedment depth is 12". Anchor adhesive chosen must be able to achieve a basic bond strength in tension, Nba, of 26 kips. 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." If existing parallel wingwall thickness is less than 8", a special design will be required.

(9) Use straight anchors if retrofit anchorage curb is 1'-2" or greater in thickness. Use hooked anchors for retrofit anchorage curb less than 1'-2" thick.

(10) Use Option A if finished grade at face of rail anchorage curb remains unchanged, or if both wingwalls and rail anchorage curb will be vertically raised. Existing wingwalls must be checked for suitability of vertically raising.

Texas Department of Transportation

Bridge Division Standard

RAIL ANCHORAGE CURB RETROFIT GUIDE

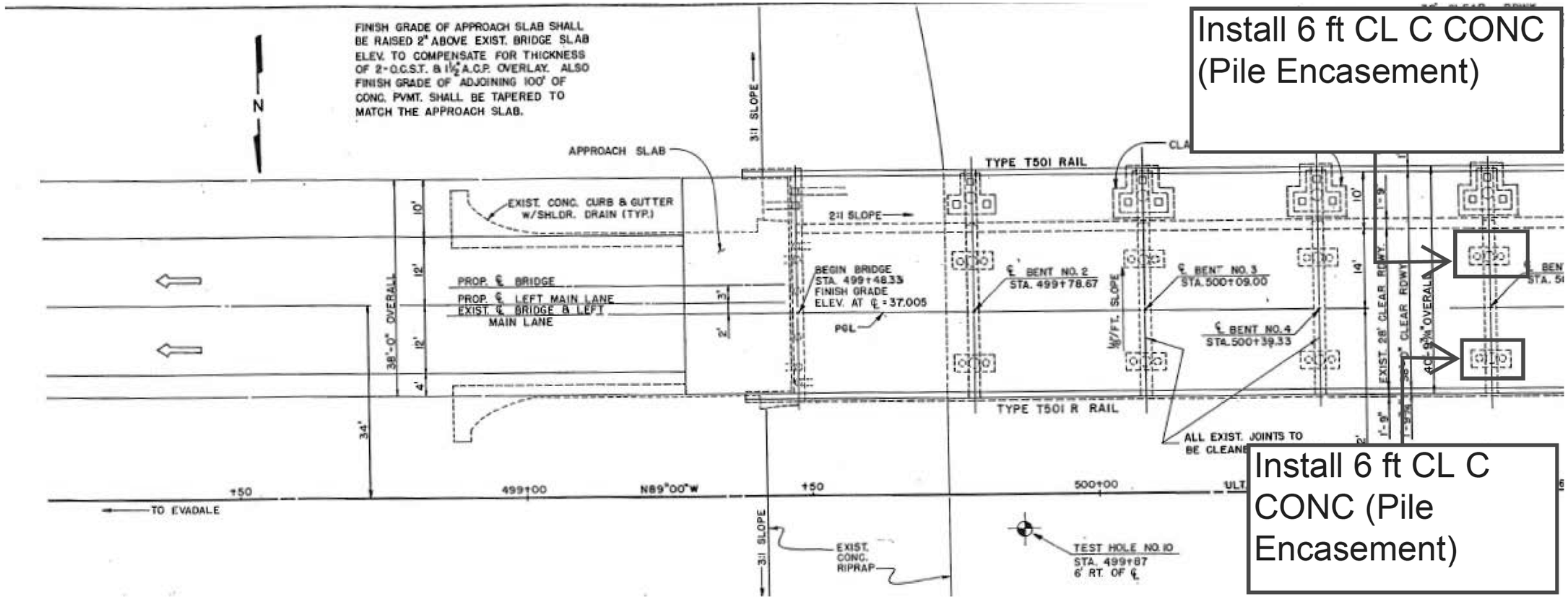
BOX CULVERT RAIL MOUNTING DETAILS (CURBS 2'-0" TALL AND LESS ONLY)

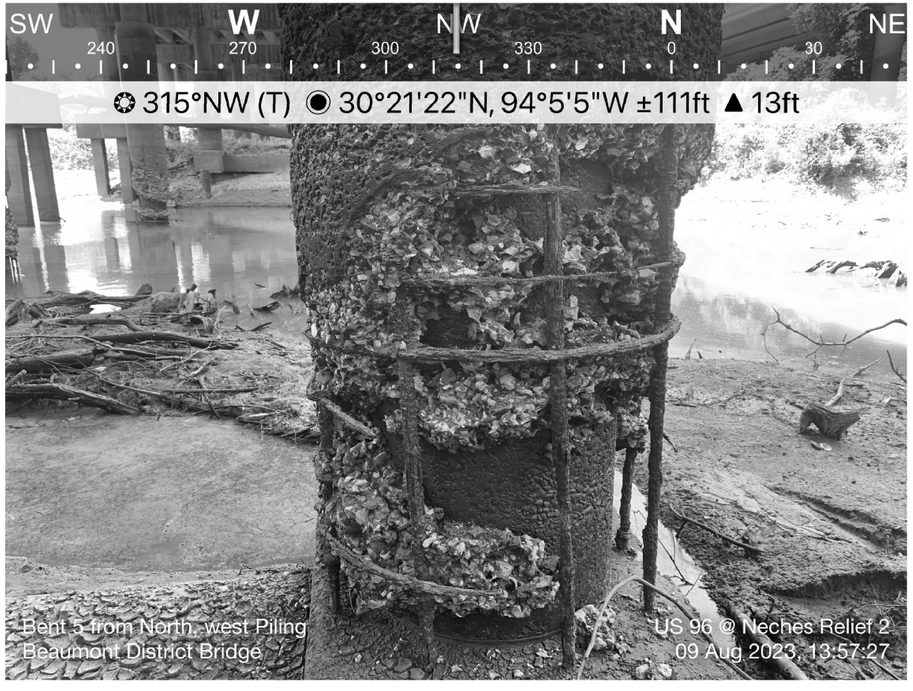
RAC-R (MOD)

STATE OF TEXAS
ARTHUR VIDALES
127233
LICENSED
PROFESSIONAL ENGINEER

2/23/2024
DATE

FILE: CD-RAC-R-20.dgn	DN: TxDOT	CK: TxDOT	DW: TxDOT	CK: TxDOT
©TxDOT February 2020	CONT	SECT	JOB	HIGHWAY
REVISIONS	0920	03	082, ETC.	CR 1065, ETC
	DIST	COUNTY		SHEET NO.
	BMT	HARDIN, ETC.		122





STATE OF TEXAS
JAMES D. HORNE
141323
REGISTERED PROFESSIONAL ENGINEER

DocuSigned by: 2/29/2024
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US 69 @ NECHES RELIEF 2

BRIDGE LAYOUTS

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FHWA TEXAS DIVISION			SHEET NO.
			123
STATE	DISTRICT	COUNTY	
TEXAS	BMT	HARDIN, ETC	
CONTROL	SECTION	JOB	HIGHWAY NO.
0920	03	082, ETC	CR 1065, ETC

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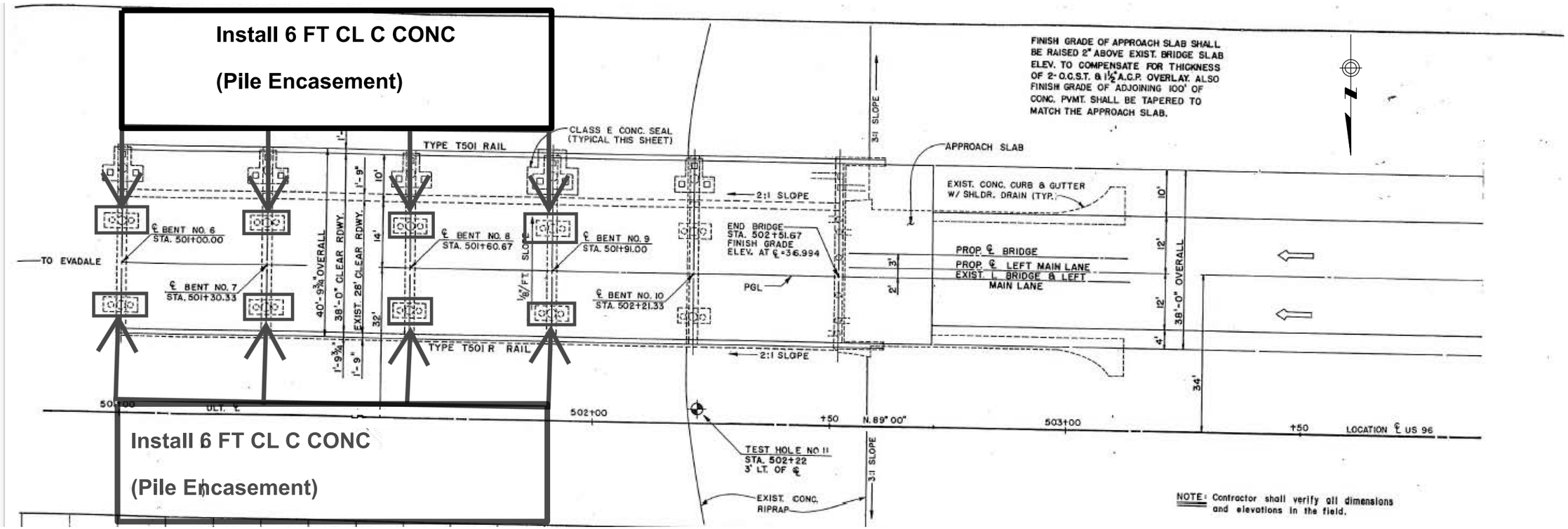

STATE OF TEXAS
JAMES D. HORNE
141323
REGISTERED PROFESSIONAL ENGINEER
2/29/2024

DocuSigned by:
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US 96 @ NECHES RELIEF 2

BRIDGE LAYOUTS

Texas Department of Transportation

FHWA TEXAS DIVISION			SHEET NO.
			124
STATE	DISTRICT	COUNTY	
TEXAS	BMT	HARDIN, ETC	
CONTROL	SECTION	JOB	HIGHWAY NO.
0920	03	082, ETC	CR 1065, ETC

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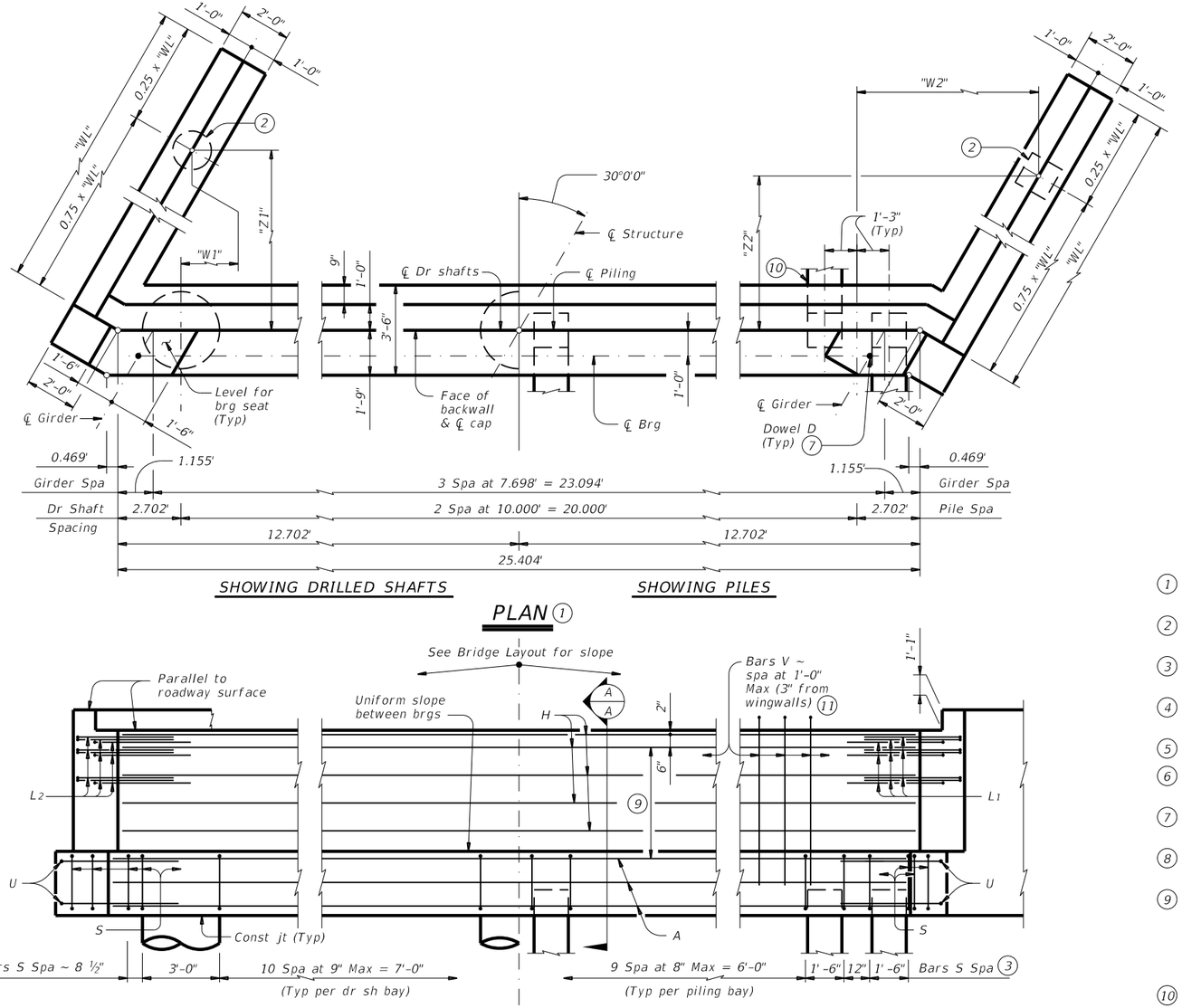
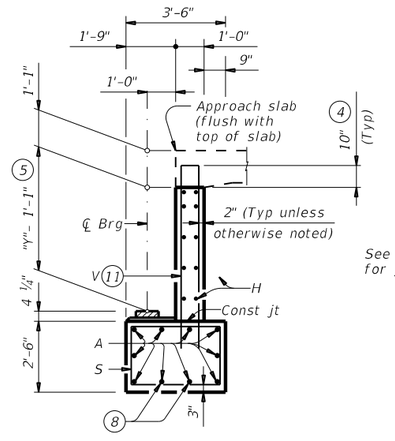


SHOWING DRILLED SHAFTS — SHOWING PILES

PLAN (1)

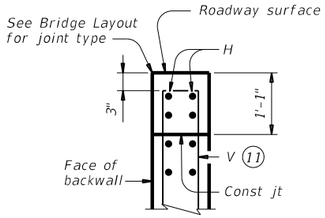
SHOWING DRILLED SHAFTS — SHOWING PILES

ELEVATION



SECTION A-A

(With approach slab) (6)



BACKWALL DETAIL

(Without approach slab) (6)

TABLE OF FOUNDATION LOADS

Span Length	All Girder Types	
Ft	Tons/Shaft	Tons/Pile
40	65	57
45	70	59
50	74	62
55	78	64
60	82	66
65	86	68
70	90	70
75	94	72
80	97	74
85	101	76
90	105	78
95	109	80
100	113	82
105	116	83
110	120	85
115	124	87
120	127	89
125	131	91

(1) See Table A for variable dimensions based on header slope and girder type.

(2) See Table A to determine if wingwall foundations are required.

(3) For piling larger than 16" adjust Bars S spacing as required to avoid piling.

(4) Increase as required to maintain 3" from finished grade.

(5) See Span details for "Y" value.

(6) See Bridge Layout to determine if approach slab is present.

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

(8) With pile foundations, move Bars A shown to clear piles.

(9) Spacing based on girder type:
Tx28 ~ 3 spaces at 1'-0" Max
Tx34 ~ 3 spaces at 1'-0" Max
Tx40 ~ 4 spaces at 1'-0" Max
Tx46 ~ 4 spaces at 1'-0" Max
Tx54 ~ 5 spaces at 1'-0" Max

(10) See Detail A on FD standard.

(11) Field bend as needed to clear piles.

GENERAL NOTES:

Designed according to AASHTO LRFD Bridge Design Specifications.

See Bridge Layout for header slope and foundation type, size and length.

See Common Foundation Details (FD) standard sheet for all foundation details and notes.

See Concrete Riprap (CRR) standard sheet or Stone Riprap (SRR) standard sheet for riprap attachment details, if applicable.

See applicable rail details for rail anchorage in wingwalls.

Details are drawn showing right forward skew. See Bridge Layout for actual skew direction.

These abutment details may be used with standard SIG-24-30 only.

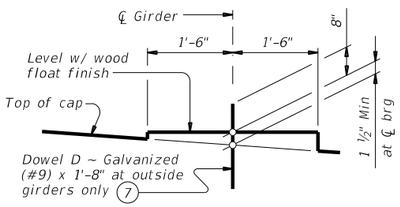
Cover dimensions are clear dimensions, unless noted otherwise.
Reinforcing bar dimensions shown are out-to-out of bar.

MATERIAL NOTES:

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

TABLE A

Header Slope	Girder Type	Wingwall Type	Wingwall Lgth "WL"	"W1"	"Z1"	"W2"	"Z2"
2:1	Tx28	Cantilevered	10.000'	Not Applicable			
	Tx34	Cantilevered	11.000'				
	Tx40	Cantilevered	12.000'				
	Tx46	Founded	14.000'	1.682'	9.593'	8.818'	8.593'
	Tx54	Founded	15.000'	2.057'	10.243'	9.193'	9.243'
3:1	Tx28	Founded	14.000'	1.682'	9.593'	8.818'	8.593'
	Tx34	Founded	16.000'	2.432'	10.892'	9.568'	9.892'
	Tx40	Founded	18.000'	3.182'	12.191'	10.318'	11.191'
	Tx46	Founded	20.000'	3.932'	13.490'	11.068'	12.490'
	Tx54	Founded	22.000'	4.682'	14.789'	11.818'	13.789'



BEARING SEAT DETAIL

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

HL93 LOADING — SHEET 1 OF 3

Texas Department of Transportation — Bridge Division Standard

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

AIG-24-30

FILE: IG-AIG2430-17.dgn	DN: TAR	CK: KCM	DW: JTR	CK: TAR
©TxDOT August 2017	CONT	SECT	JOB	HIGHWAY
REVISIONS	0920	03	082, ETC	W PINESHADOWS DR, ETC
10-2023 ~ Stirrup Spa	DIST	COUNTY		SHEET NO.
	BMT	HARDIN, ETC		125

DATE: 2/26/2024 2:24:47 PM
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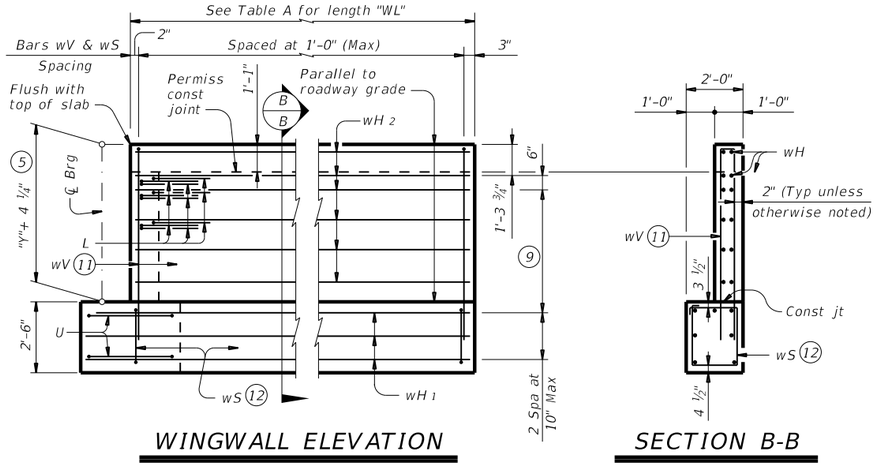
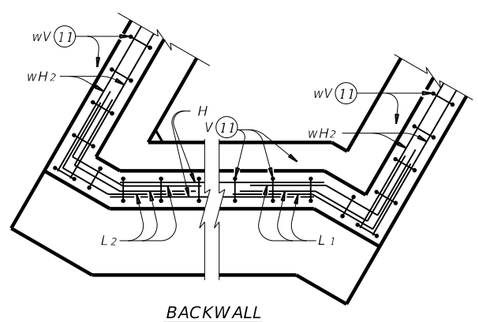
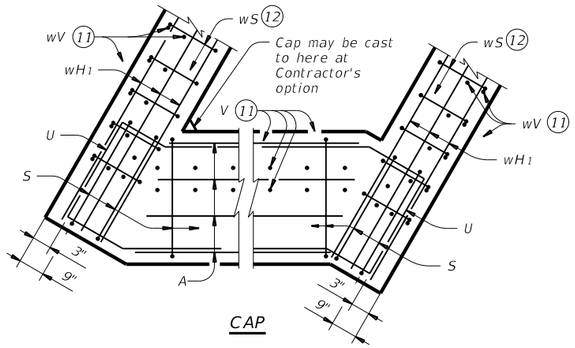


WINGWALL ELEVATION

SECTION B-B

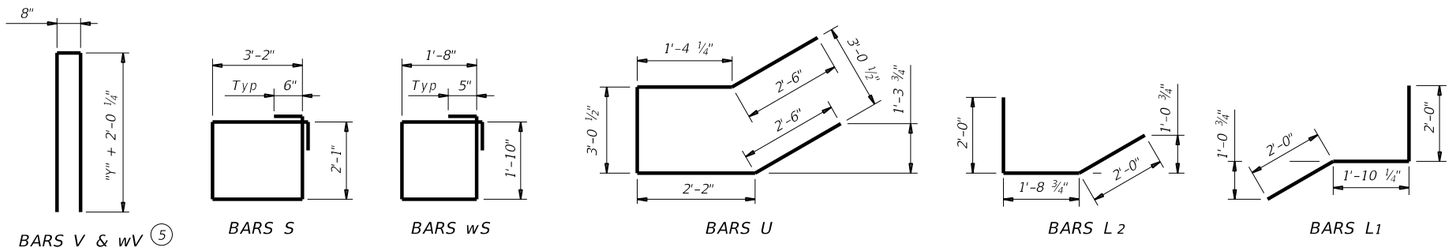


BACKWALL



CAP

CORNER DETAILS



(5) See Span details for "Y" value.

(9) Spacing based on girder type:
Tx28 ~ 3 spaces at 1'-0" Max
Tx34 ~ 3 spaces at 1'-0" Max
Tx40 ~ 4 spaces at 1'-0" Max
Tx46 ~ 4 spaces at 1'-0" Max
Tx54 ~ 5 spaces at 1'-0" Max

(11) Field bend as needed to clear piles.

(12) Adjust as required to avoid piling.

HL93 LOADING

Texas Department of Transportation

Bridge Division Standard

ABUTMENTS

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

AIG-24-30

FILE: IG-AIG2430-17.dgn	DN: TAR	CK: KCM	DW: JTR	CK: TAR			
©TxDOT August 2017	CONT	SECT	JOB		HIGHWAY		
REVISIONS	0920	03	082, ETC		W PINESHADOWS DR, ETC		
10-2023 ~ Stirrup Spa	DIST	COUNTY			SHEET NO.		
	BMT	HARDIN, ETC			126		

DATE: 2/26/2024 2:24:47 PM
FILE: pw://ig-pw.bentley.com:ij-pw-01/Documents/TxDOT/PM8016-2301 CEC WA4/Clemmons Gully Off-System Bridge/400 Production/4 - Design/Bridge/STANDARDS/IG-AIG2430-23.dgn

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

TYPE Tx28 Girders

Bar	No.	Size	Length	Weight
A	10	#11	25'-5"	1,350
D (7)	2	#9	1'-8"	11
H	8	#6	25'-5"	305
L1	9	#6	5'-11"	80
L2	9	#6	5'-9"	78
S	30	#5	11'-6"	360
U	4	#6	11'-7"	70
V	28	#5	11'-4"	331
wH1	14	#6	11'-5"	240
wH2	20	#6	9'-8"	290
wS	22	#4	7'-10"	115
wV	22	#5	11'-4"	260

Reinforcing Steel	Lb	3,490
Class "C" Concrete	CY	17.9

TYPE Tx34 Girders

Bar	No.	Size	Length	Weight
A	10	#11	25'-5"	1,350
D (7)	2	#9	1'-8"	11
H	8	#6	25'-5"	305
L1	9	#6	5'-11"	80
L2	9	#6	5'-9"	78
S	30	#5	11'-6"	360
U	4	#6	11'-7"	70
V	28	#5	12'-4"	360
wH1	14	#6	12'-5"	261
wH2	20	#6	10'-8"	320
wS	24	#4	7'-10"	126
wV	24	#5	12'-4"	309

Reinforcing Steel	Lb	3,630
Class "C" Concrete	CY	19.5

TYPE Tx40 Girders

Bar	No.	Size	Length	Weight
A	10	#11	25'-5"	1,350
D (7)	2	#9	1'-8"	11
H	10	#6	25'-5"	382
L1	9	#6	5'-11"	80
L2	9	#6	5'-9"	78
S	30	#5	11'-6"	360
U	4	#6	11'-7"	70
V	28	#5	13'-4"	389
wH1	14	#6	13'-5"	282
wH2	24	#6	11'-8"	421
wS	26	#4	7'-10"	136
wV	26	#5	13'-4"	362

Reinforcing Steel	Lb	3,921
Class "C" Concrete	CY	21.1

TYPE Tx46 Girders

Bar	No.	Size	Length	Weight
A	10	#11	25'-5"	1,350
D (7)	2	#9	1'-8"	11
H	10	#6	25'-5"	382
L1	9	#6	5'-11"	80
L2	9	#6	5'-9"	78
S	30	#5	11'-6"	360
U	4	#6	11'-7"	70
V	28	#5	14'-4"	419
wH1	14	#6	15'-5"	324
wH2	24	#6	13'-8"	493
wS	30	#4	7'-10"	157
wV	30	#5	14'-4"	448

Reinforcing Steel	Lb	4,172
Class "C" Concrete	CY	23.6

TYPE Tx54 Girders

Bar	No.	Size	Length	Weight
A	10	#11	25'-5"	1,350
D (7)	2	#9	1'-8"	11
H	12	#6	25'-5"	458
L1	9	#6	5'-11"	80
L2	9	#6	5'-9"	78
S	30	#5	11'-6"	360
U	4	#6	11'-7"	70
V	28	#5	15'-8"	458
wH1	14	#6	16'-5"	345
wH2	28	#6	14'-8"	617
wS	32	#4	7'-10"	167
wV	32	#5	15'-8"	523

Reinforcing Steel	Lb	4,517
Class "C" Concrete	CY	25.7

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

TYPE Tx28 Girders

Bar	No.	Size	Length	Weight
A	10	#11	25'-5"	1,350
D (7)	2	#9	1'-8"	11
H	8	#6	25'-5"	305
L1	9	#6	5'-11"	80
L2	9	#6	5'-9"	78
S	30	#5	11'-6"	360
U	4	#6	11'-7"	70
V	28	#5	11'-4"	331
wH1	14	#6	15'-5"	324
wH2	20	#6	13'-8"	411
wS	30	#4	7'-10"	157
wV	30	#5	11'-4"	355

Reinforcing Steel	Lb	3,832
Class "C" Concrete	CY	20.5

TYPE Tx34 Girders

Bar	No.	Size	Length	Weight
A	10	#11	25'-5"	1,350
D (7)	2	#9	1'-8"	11
H	8	#6	25'-5"	305
L1	9	#6	5'-11"	80
L2	9	#6	5'-9"	78
S	30	#5	11'-6"	360
U	4	#6	11'-7"	70
V	28	#5	12'-4"	360
wH1	14	#6	17'-5"	366
wH2	20	#6	15'-8"	471
wS	34	#4	7'-10"	178
wV	34	#5	12'-4"	437

Reinforcing Steel	Lb	4,066
Class "C" Concrete	CY	22.9

TYPE Tx40 Girders

Bar	No.	Size	Length	Weight
A	10	#11	25'-5"	1,350
D (7)	2	#9	1'-8"	11
H	10	#6	25'-5"	382
L1	9	#6	5'-11"	80
L2	9	#6	5'-9"	78
S	30	#5	11'-6"	360
U	4	#6	11'-7"	70
V	28	#5	13'-4"	389
wH1	14	#6	19'-5"	408
wH2	24	#6	17'-8"	637
wS	38	#4	7'-10"	199
wV	38	#5	13'-4"	528

Reinforcing Steel	Lb	4,492
Class "C" Concrete	CY	25.4

TYPE Tx46 Girders

Bar	No.	Size	Length	Weight
A	10	#11	25'-5"	1,350
D (7)	2	#9	1'-8"	11
H	10	#6	25'-5"	382
L1	9	#6	5'-11"	80
L2	9	#6	5'-9"	78
S	30	#5	11'-6"	360
U	4	#6	11'-7"	70
V	28	#5	14'-4"	419
wH1	14	#6	21'-5"	450
wH2	24	#6	19'-8"	709
wS	42	#4	7'-10"	220
wV	42	#5	14'-4"	628

Reinforcing Steel	Lb	4,757
Class "C" Concrete	CY	28.1

TYPE Tx54 Girders

Bar	No.	Size	Length	Weight
A	10	#11	25'-5"	1,350
D (7)	2	#9	1'-8"	11
H	12	#6	25'-5"	458
L1	9	#6	5'-11"	80
L2	9	#6	5'-9"	78
S	30	#5	11'-6"	360
U	4	#6	11'-7"	70
V	28	#5	15'-8"	458
wH1	14	#6	23'-5"	492
wH2	28	#6	21'-8"	911
wS	46	#4	7'-10"	241
wV	46	#5	15'-8"	752

Reinforcing Steel	Lb	5,261
Class "C" Concrete	CY	31.3

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

(13) Quantities shown are for one abutment only (with approach slab). With no approach slab, add 1.1 CY Class "C" concrete and 153 lbs reinforcing steel for 4 additional Bars H.

HL93 LOADING SHEET 3 OF 3

Texas Department of Transportation — Bridge Division Standard

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

AIG-24-30

FILE: IG-AIG2430-17.dgn	DN: TAR	CK: KCM	DW: JTR	CK: TAR
©TxDOT August 2017	CONT	SECT	JOB	HIGHWAY
REVISIONS	0920	03	082, ETC	W PINESHADOWS DR, ETC
10-2023 ~ Stirrup Spa	DIST	COUNTY		SHEET NO.
	BMT	HARDIN, ETC		127

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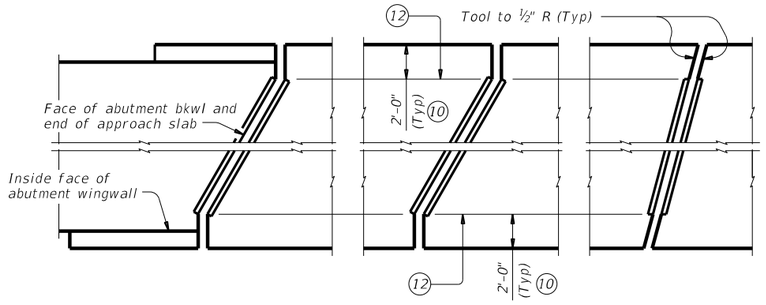
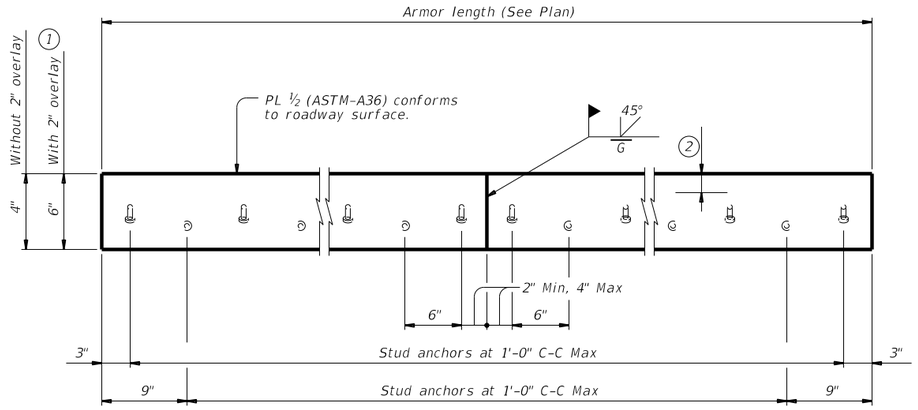


JOINTS AT ABUTMENTS | SKEWS OVER 15° | SKEWS THRU 15°

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 ½" variation in thickness.

(2) Do not paint top 1 ½" 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.

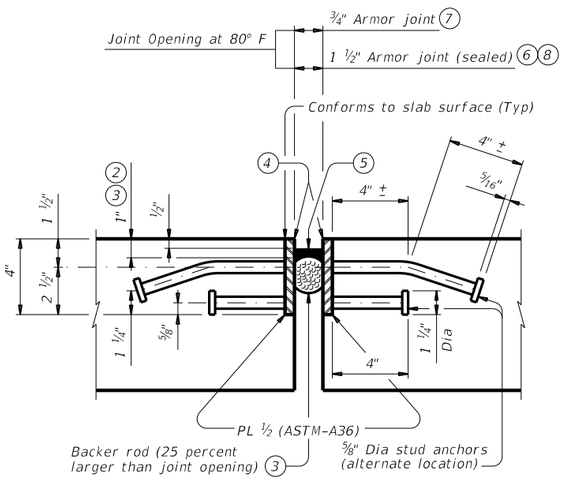
(9) Form vertical leg of seal as per the Manufacturer's recommendations. Use Class 4 joint sealant if Class 7 cannot be installed correctly. Install according to Manufacturer's recommendations.

(10) Unless shown otherwise, terminate armor plate at slab break point if break is more than 2'-0" from slab edge.

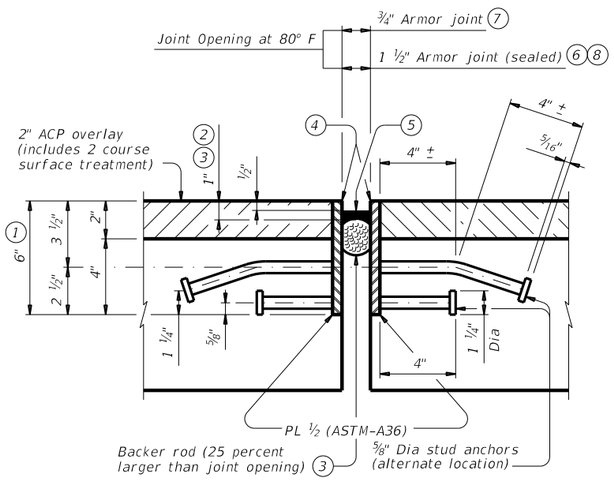
(11) See "Plans of Armor Plates".

(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 (1)

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.

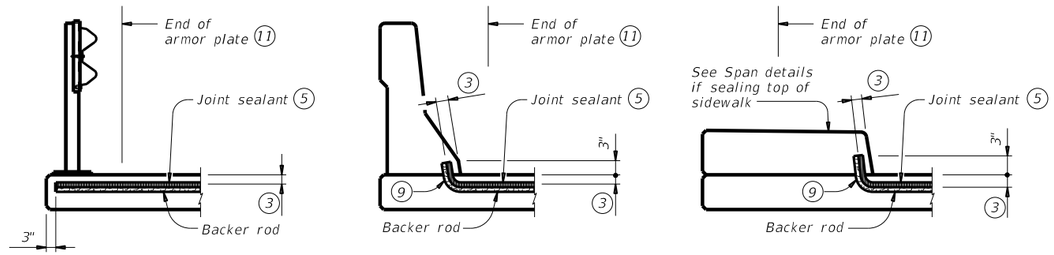
Remove shipping angle immediately after each joint half is secured in place. Grind smooth, and touch up with organic zinc-rich paint.

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 ⅜" (¾" opening movement and ⅜" closure movement).

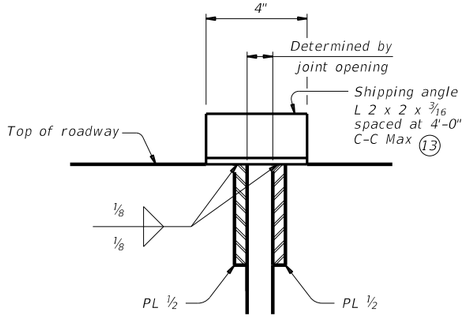
Payment for armor joint, with or without seal, is based on length of armor plate.



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.



SHOWN WITHOUT 2" OVERLAY AT JOINT LOCATION

With overlay similar

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: MS-AJ-19 (1).dgn	DN: TxDOT	CK: TxDOT	DW: TxDOT	CK: TxDOT
©TxDOT April 2019	CONT	SECT	JOB	HIGHWAY
REVISIONS	0920	03	082, ETC	CR 1065, ETC
	DIST	COUNTY		SHEET NO.
	BMT	HARDIN, ETC		128

DATE: 2/26/2024 2:25:13 PM
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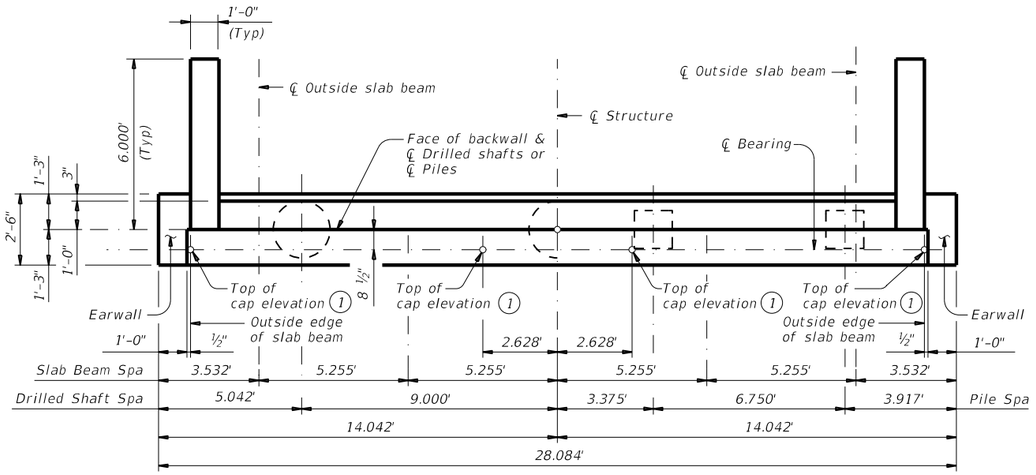
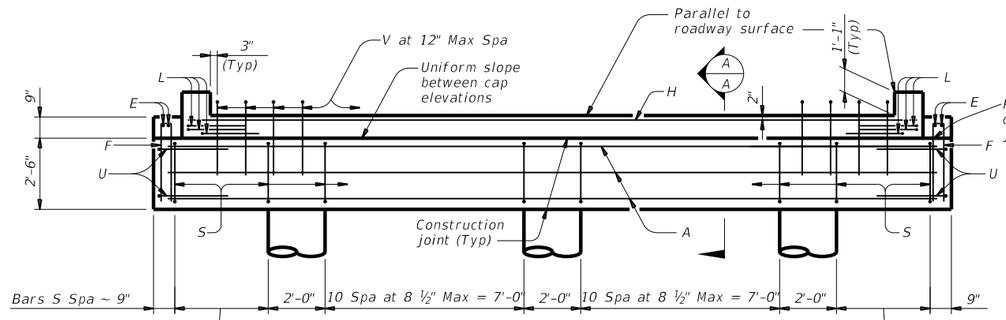


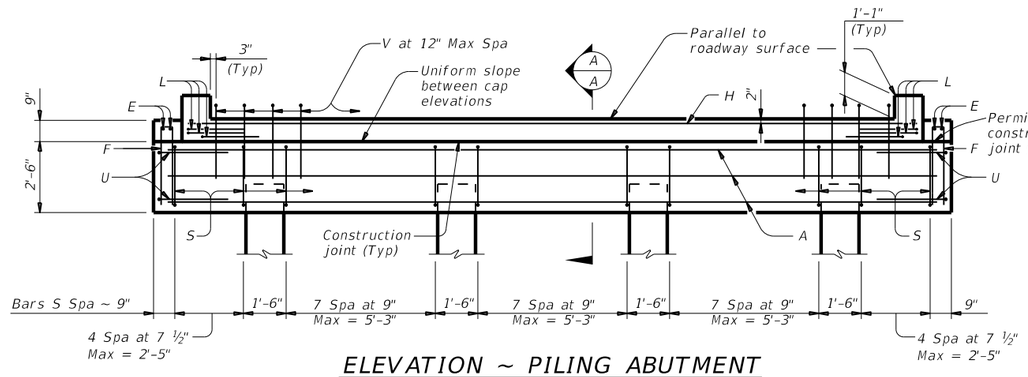
SHOWING DRILLED SHAFTS

PLAN

SHOWING PILES

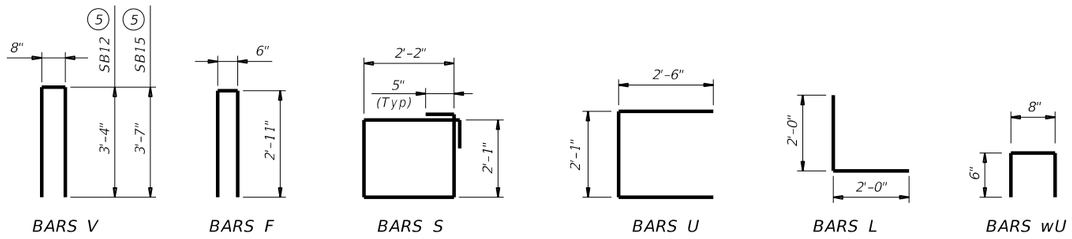


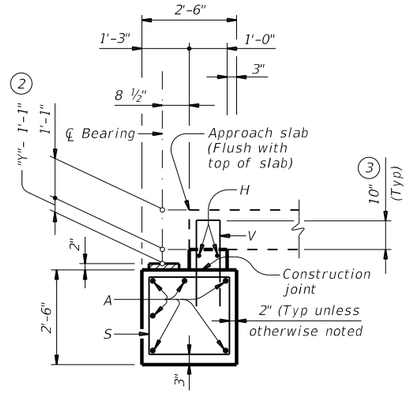
ELEVATION ~ DRILLED SHAFT ABUTMENT



ELEVATION ~ PILING ABUTMENT

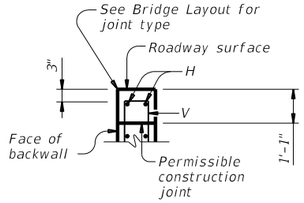
Note: For piles larger than 16", adjust Bars S spacing as required to avoid piles.





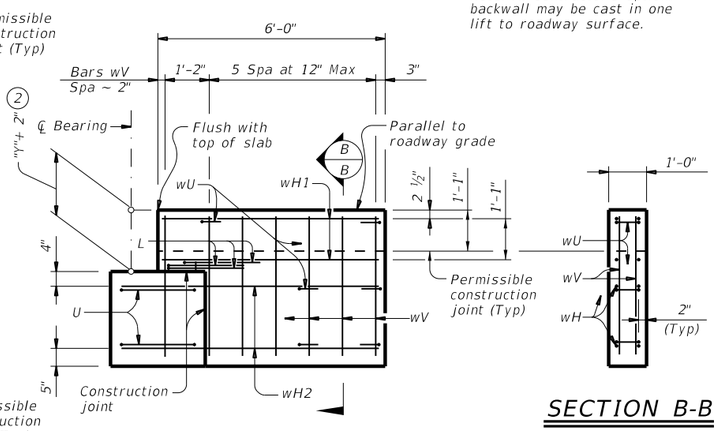
SECTION A-A (4)

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



BACKWALL DETAIL (4)

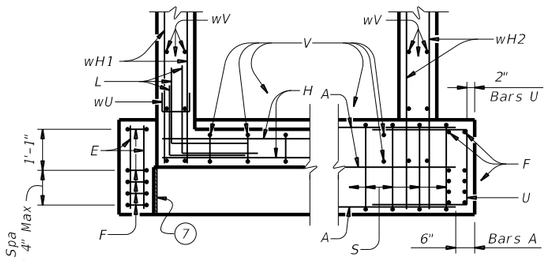
(Without approach slab)
Note: At Contractor's option, backwall may be cast in one lift to roadway surface.



WINGWALL ELEVATION

(Earwall not shown for clarity.)

SECTION B-B



BACKWALL CAP

CORNER DETAILS

FOUNDATION LOADS

Span Length	Drilled Shaft Loads		Vertical Pile Loads	
Ft	Tons/DS		Tons/Pile	
	5SB12	5SB15	5SB12	5SB15
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 (6)

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
Cl "C" Conc (Abut)				CY	8.8	9.2

(1) *Top of cap elevations are based on section depths shown on Span Details.*

(2) *See Span Details for "Y".*

(3) *Increase as required to maintain 3" from finished grade.*

(4) *See Bridge Layout to determine if approach slab is present.*

(5) *See Bridge Layout for beam type used in the superstructure.*

(6) *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.*

(7) *½" 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.

HL93 LOADING

Texas Department of Transportation

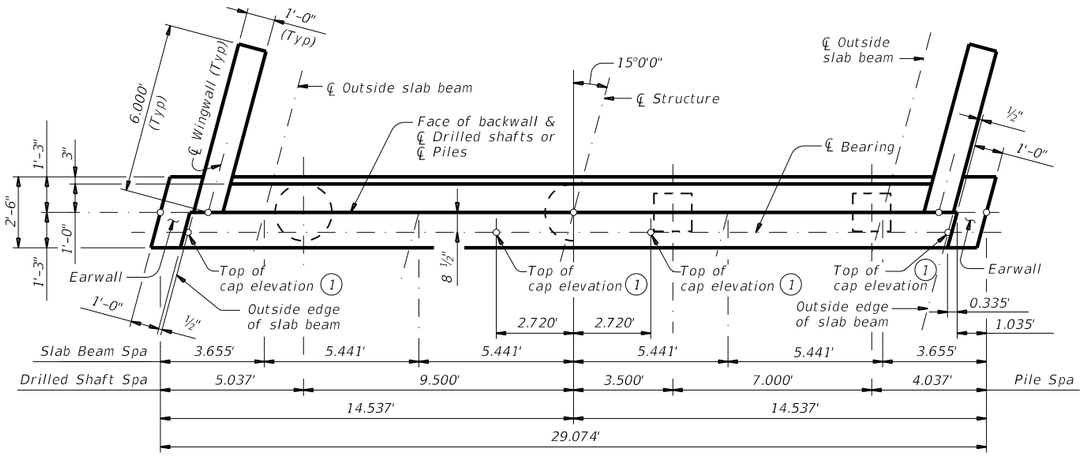
Bridge Division Standard

ABUTMENTS PRESTR CONC SLAB BEAM 24' ROADWAY

APSB-24

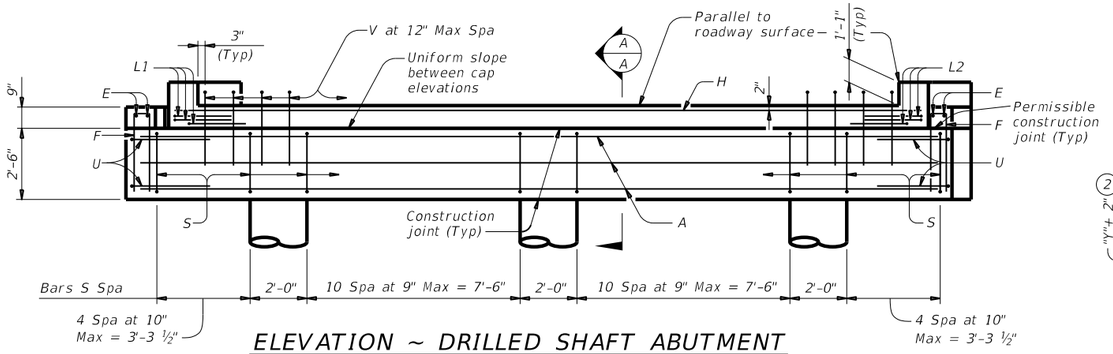
FILE:	DN: TxDOT	CK: TxDOT	DW: TxDOT	CK: TxDOT
©TxDOT January 2017	CONT	SECT	JOB	HIGHWAY
REVISIONS	0920	03	082, ETC	CR 1065, ETC
	DIST	COUNTY		SHEET NO.
	BMT	HARDIN, ETC		129

DATE: 2/26/2024 2:25:17 PM
FILE: pw://ija-pw.bentley.com:ija-pw-01/Documents/TxDOT/PM8016-2301 CEC WA4/Clemmons Gully Off-System Bridge/400 Production/4 - Design/Plan Set/7. Bridge/Bridge Standards/PSB-APSB2

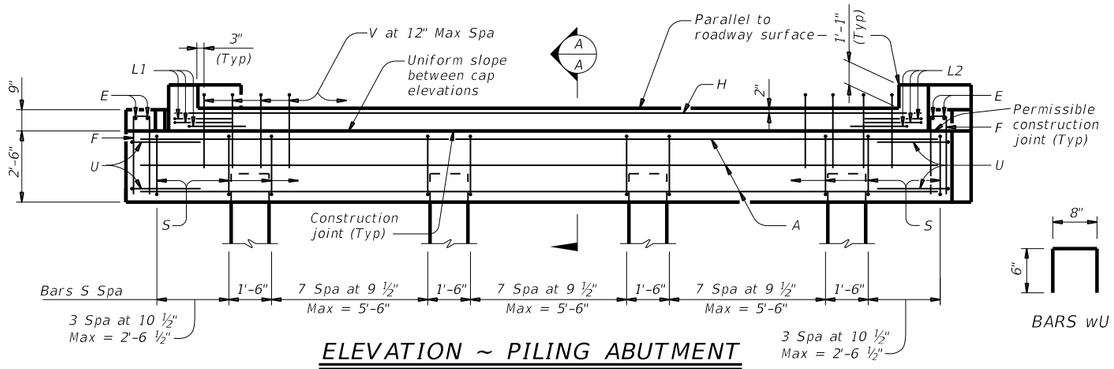


SHOWING DRILLED SHAFTS SHOWING PILES

PLAN

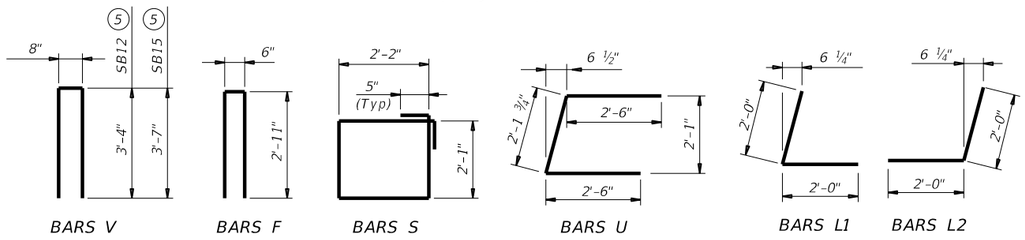


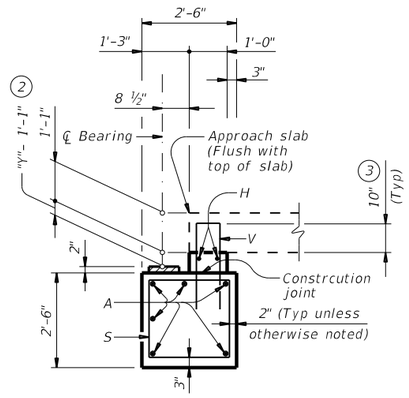
ELEVATION ~ DRILLED SHAFT ABUTMENT



ELEVATION ~ PILING ABUTMENT

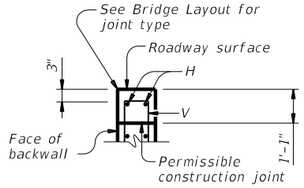
Note: For piles larger than 16", adjust Bars S spacing as required to avoid piles.





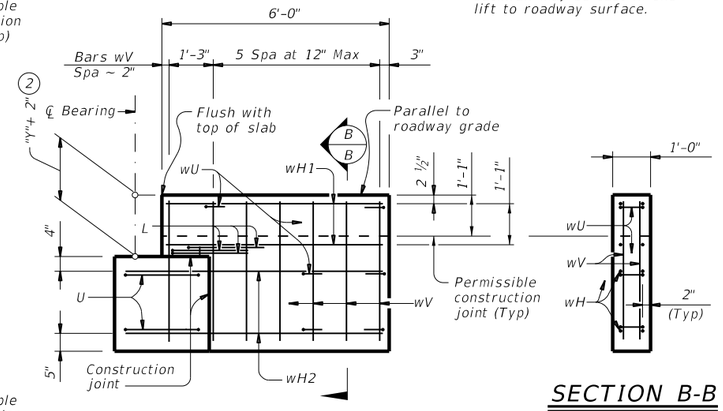
SECTION A-A (4)

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



BACKWALL DETAIL (4)

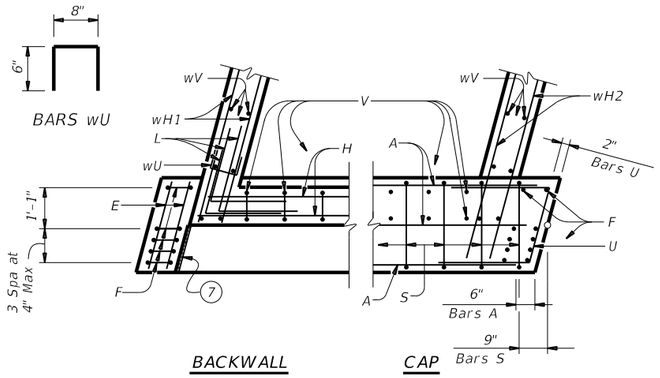
(Without approach slab)
Note: At Contractor's option, backwall may be cast in one lift to roadway surface.



WINGWALL ELEVATION

(Earwall not shown for clarity.)

SECTION B-B



CORNER DETAILS

FOUNDATION LOADS

Span Length	Drilled Shaft Loads		Vertical Pile Loads	
Ft	Tons/DS		Tons/Pile	
	5SB12	5SB15	5SB12	5SB15
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 (6)

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

(1) *Top of cap elevations are based on section depths shown on Span Details.*

(2) *See Span Details for "Y".*

(3) *Increase as required to maintain 3" from finished grade.*

(4) *See Bridge Layout to determine if approach slab is present.*

(5) *See Bridge Layout for beam type used in the superstructure.*

(6) *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.*

(7) *½" 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

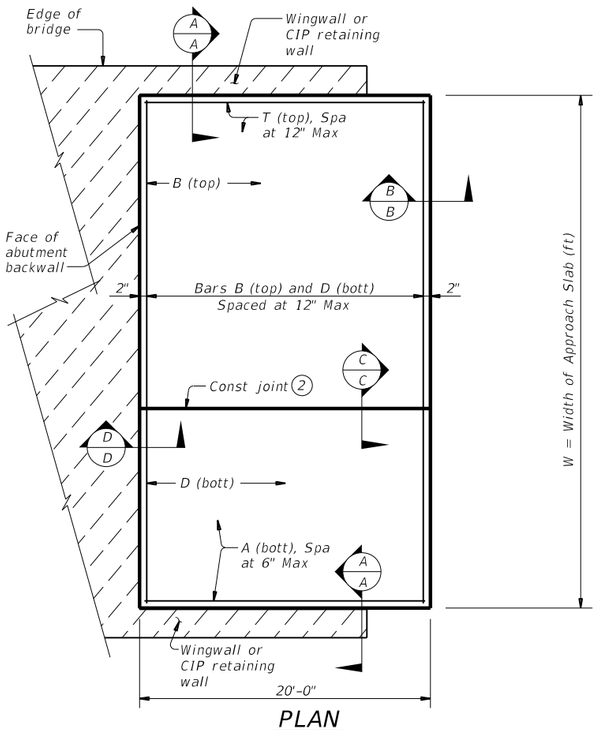
Bridge Division Standard

ABUTMENTS PRESTR CONC SLAB BEAM 24' ROADWAY 15° SKEW

APSB-24-15

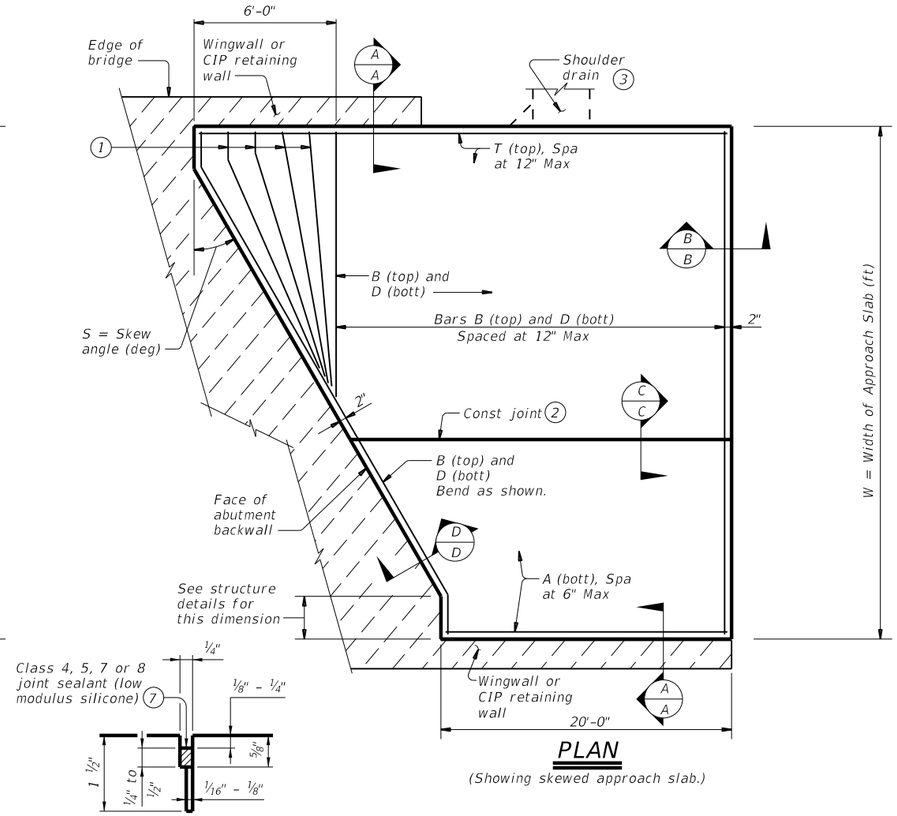
FILE: PSB-APSB2415-17.dgn	DN: TxDOT	CK: TxDOT	DW: TxDOT	CK: TxDOT
©TxDOT January 2017	CONT	SECT	JOB	HIGHWAY
REVISIONS	0920	03	082, ETC	CR 1065, ETC
	DIST	COUNTY		SHEET NO.
	BMT	HARDIN, ETC		130

DATE: 2/26/2024 2:25:21 PM
FILE: pw://ljg-pw.bentley.com:ljg-pw-01/Documents/TxDOT/PM8016-2301 CEC WA4/Clemmons Gully Off-System Bridge/400 Production/4 - Design/Plan Set/7. Bridge/Bridge Standards/MS-BAS-A-



PLAN

(Showing non-skewed approach slab.)



PLAN

(Showing skewed approach slab.)

LONGITUDINAL SAW CUT JOINT DETAIL

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

APPROXIMATE QUANTITIES (4)

Reinf steel weight = 8.5 Lbs/SF of Approach Slab

Volume of Appr Slab Conc (CY) = $0.802W + 0.02W^2 \tan S$

W = Width of Approach Slab (ft)

S = Skew Angle (deg)

(1) Flare Bars B and D in this region (1'-6" Max Spa, 3" Min Spa). Minimum flared bar length = 2'-6". Bend bars as necessary.

(2) Provide longitudinal construction joints that align with longitudinal construction joints in the bridge slab with bridges built in stages. Other longitudinal construction joints must receive approval of the Engineer.

(3) See details elsewhere in plans for shoulder drain location and details.

(4) For Contractor's information only. Quantities shown are for one approach slab.

(5) Multiple piece tie bars are acceptable at longitudinal construction joints provided minimum laps shown are achieved.

(6) See details elsewhere in plans for required cross-slope.

(7) Place in accordance with Item 438.

(8) Provide backer rod that is 25% larger than joint opening and compatible with the sealant.

(9) If bridge rail is present at the wingwall or CIP retaining wall, place ½" rebonded recycled tire rubber between concrete railing and top of approach slab as shown when concrete railing projects over the approach slab.

GENERAL NOTES:

Construct approach slab in accordance with Item 422.

Provide Class "S" concrete with a minimum compressive strength of 4,000 psi.

Provide Grade 60 reinforcing steel.

Provide longitudinal joints as shown on the Longitudinal Saw Cut Joint Detail at lane lines and shoulders when width between longitudinal construction joints or edges of approach slab exceeds 16 feet. Saw cut joints within 24 hours of concrete placement to a depth of 1 ½" and seal in accordance with Item 438. Alternately, provide a controlled joint consisting of 1 ½" vinyl or plastic joint former (Stress Cap, Zip Strip, Stress Lock, or equal as approved by the Engineer.)

Provide rebonded recycled tire rubber joint filler that meets the requirements of DMS-6310. "Joint Sealants and Fillers."

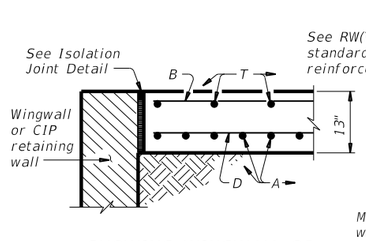
Construct the subgrade or subbase away from the bridge for a minimum distance of 100 feet prior to the approach slab, unless otherwise indicated on the plans.

Compact and finish the subgrade or foundation for the approach slab to the typical cross-section and to the lines and grades shown on the plans.

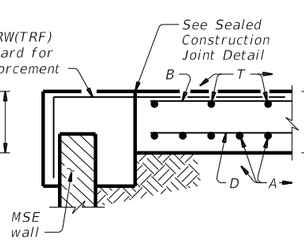
Cure for 4 days using water or membrane curing per Item 422.

All details shown herein are subsidiary to bridge approach slab.

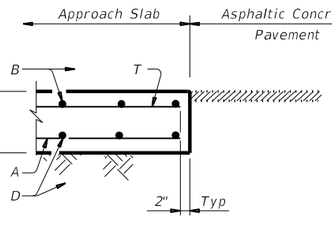
Cover dimensions are clear dimensions, unless noted otherwise.

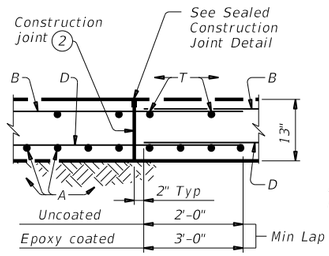


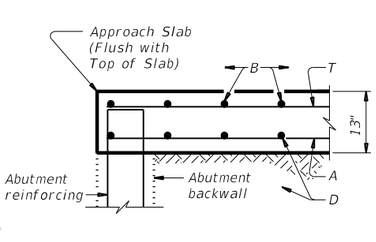
SHOWING WINGWALL OR CIP RETAINING WALL



SHOWING MSE WALL





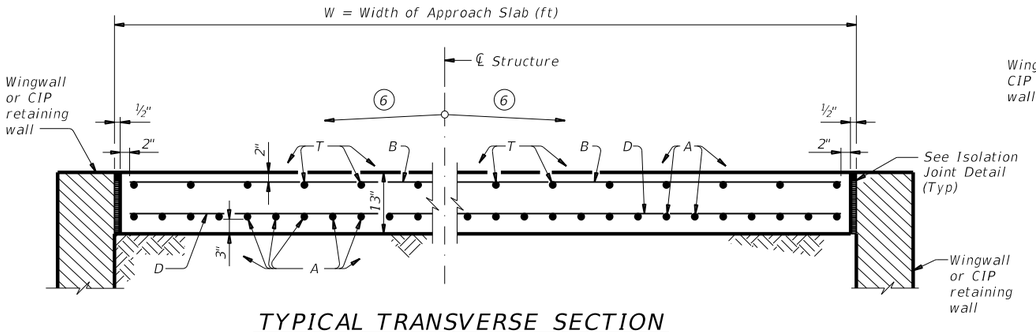


SECTION A-A

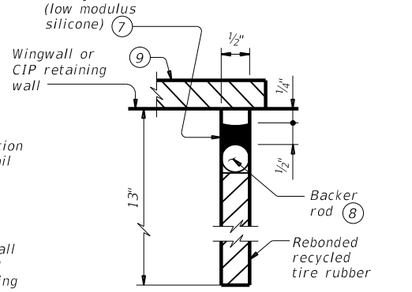
SECTION B-B

SECTION C-C (5)

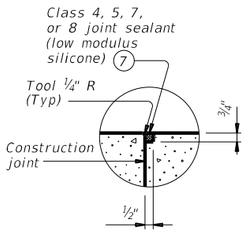
SECTION D-D



TYPICAL TRANSVERSE SECTION



ISOLATION JOINT DETAIL



SEALED CONSTRUCTION JOINT DETAIL

Texas Department of Transportation

Bridge Division Standard

BRIDGE APPROACH SLAB
ASPHALTIC CONCRETE PAVEMENT

BAS-A

FILE: MS-BAS-A-20 (1).dgn	DN: TxDOT	CK: TxDOT	DW: TxDOT	CK: TxDOT
©TxDOT April 2019	CONT	SECT	JOB	HIGHWAY
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02-20: Removed stress relieving pad.	DIST	COUNTY		SHEET NO.
	BMT	HARDIN, ETC		131

DATE: 2/26/2024 2:25:25 PM
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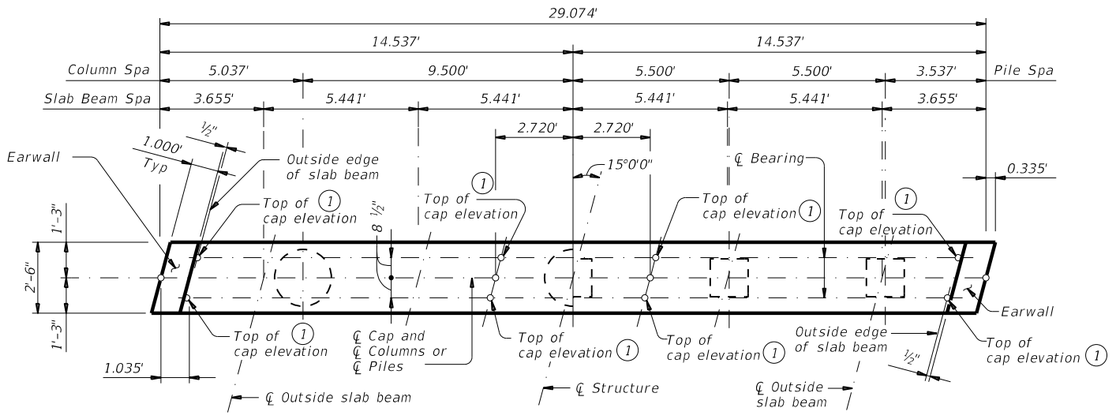
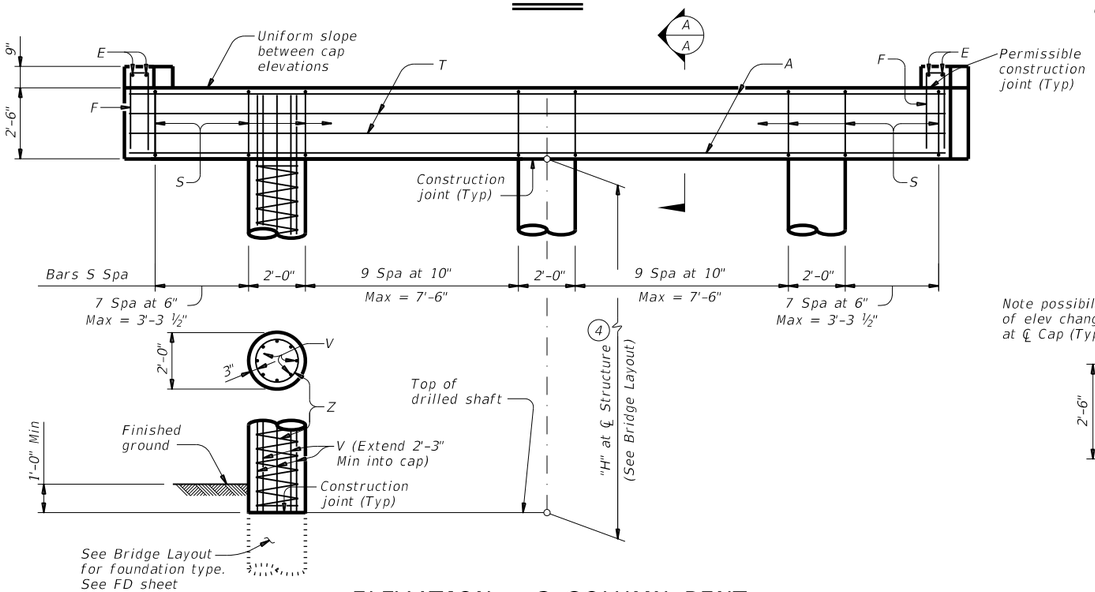


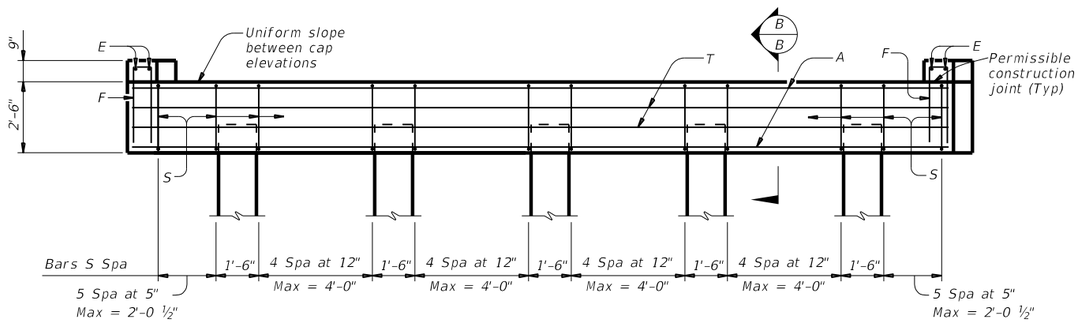
SHOWING COLUMNS

SHOWING PILES

PLAN

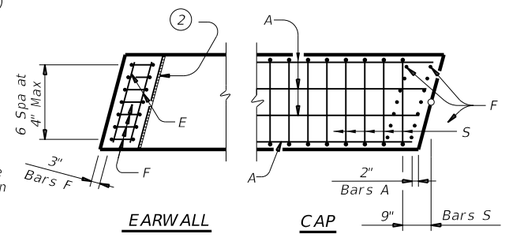


ELEVATION ~ 3 COLUMN BENT



ELEVATION ~ 5 PILE BENT

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



EARWALL CAP

CAP END DETAIL

FOUNDATION LOADS

Average Span Length	Drilled Shaft Loads (5)		Vertical Pile Loads	
Ft	Tons/DS		Tons/Pile	
	5SB12	5SB15	5SB12	5SB15
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
Cl "C" Conc (Cap)			CY	6.9
Cl "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
Cl "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

(1) Top of cap elevations are based on section depths shown on Span Details.

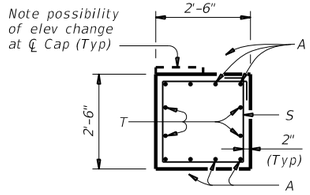
(2) ½" preformed bituminous fiber material between slab beam and earwall. Bond to earwall with an approved adhesive. Cast inside face of earwall perpendicular to cap. (Typ)

(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

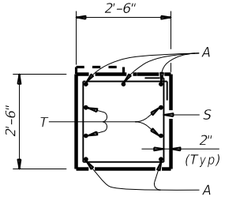
(4) This standard may not be used for "H" heights exceeding 24 feet or exposed pile heights exceeding the values shown in the table. In areas of very soft soil or where scour is anticipated, allowable "H" heights or exposed pile heights must be evaluated by the Engineer prior to the use of this standard.

(5) Foundation Loads based on "H" = 24 feet.

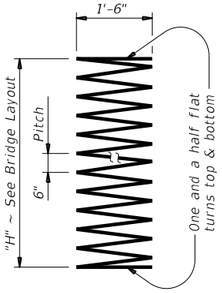
(6) When HP14x117 steel piling is specified in the plans, the Contractor has the option of furnishing either HP14x117 or HP16x101 steel piling.



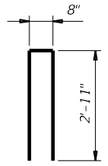
SECTION A-A



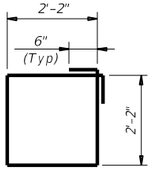
SECTION B-B



BARS Z



BARS F



BARS S

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

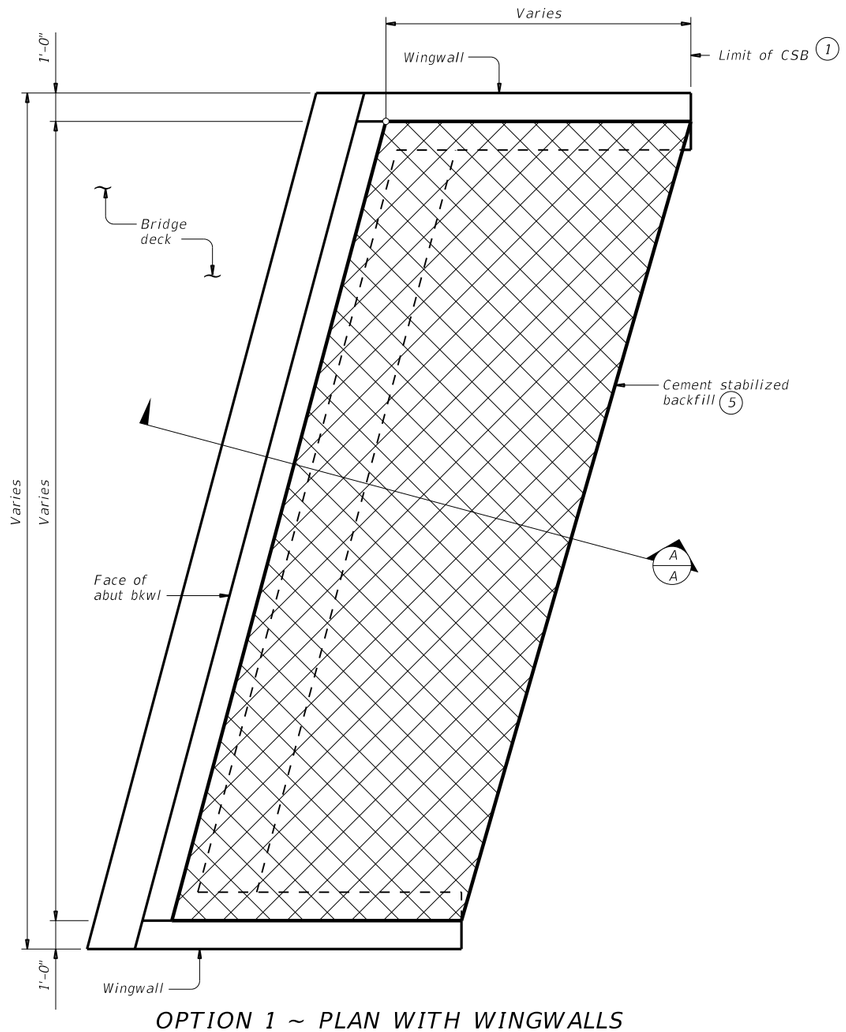
INTERIOR BENTS PRESTR CONC SLAB BEAM

24' ROADWAY 15° SKEW

BPSB-24-15

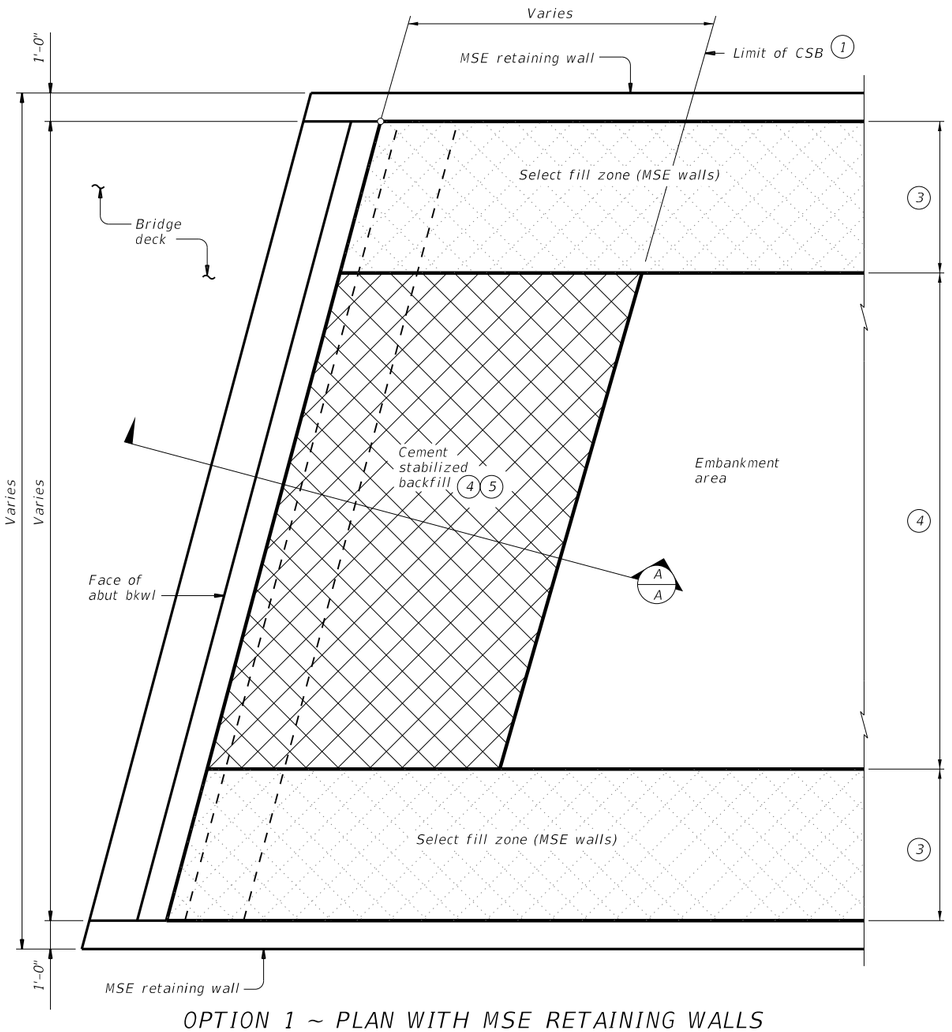
FILE: PSB-BPSB2415-17.dgn	DN: TxDOT	CK: TxDOT	DW: TxDOT	CK: TxDOT
©TxDOT January 2017	CONT	SECT	JOB	HIGHWAY
REVISIONS	0920	03	082, ETC	CR 1065, ETC
	DIST	COUNTY		SHEET NO.
	BMT	HARDIN, ETC		132

DATE: 2/26/2024 2:26:09 PM
FILE: pw://ljg-pw.bentley.com:ljg-pw-01/Documents/TxDOT/PW8016-2301 CEC WA4/Clemmons Gully Off-System Bridge/400 Production/4 - Design/Plan Set/7. Bridge/Bridge Standards/MS-CSAB-2

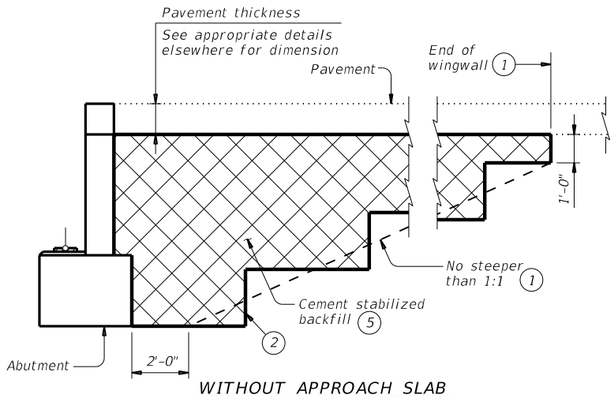


OPTION 1 ~ PLAN WITH WINGWALLS

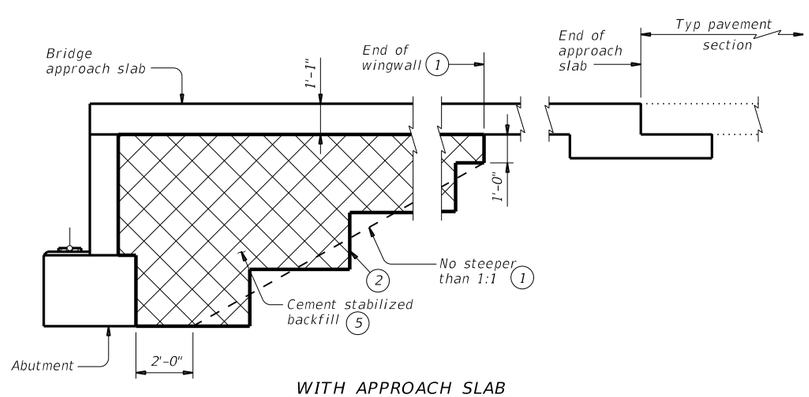
Cast-in-place retaining walls similar.



OPTION 1 ~ PLAN WITH MSE RETAINING WALLS



WITHOUT APPROACH SLAB



WITH APPROACH SLAB

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

SECTION A-A

(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).

GENERAL NOTES:

See the Bridge Layout for selected Option. Option 1 is intended for construction only requiring plasticity index (PI) controlled embankment fill or excavation in competent soils/rocks in order to construct the abutment. Option 2 is intended for new construction requiring high plasticity embankment fill with a PI greater than 30 or pavement built in poor native soil. Poor soils are defined as high plasticity clays or expansive clays.

Construct abutment backfill in accordance with Item 400, "Excavation and Backfill for Structures".

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.

Texas Department of Transportation

Bridge Division Standard

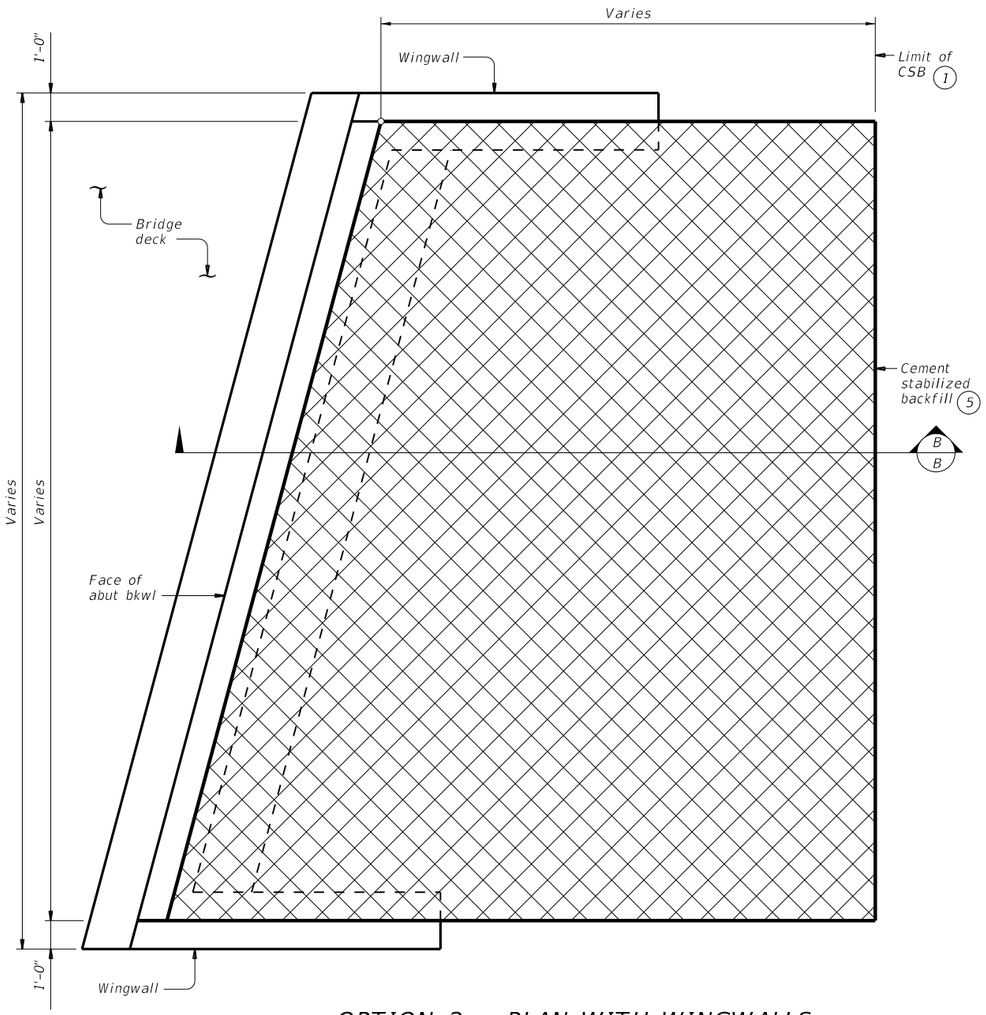
CEMENT STABILIZED ABUTMENT BACKFILL

BRIDGE ABUTMENT

CSAB

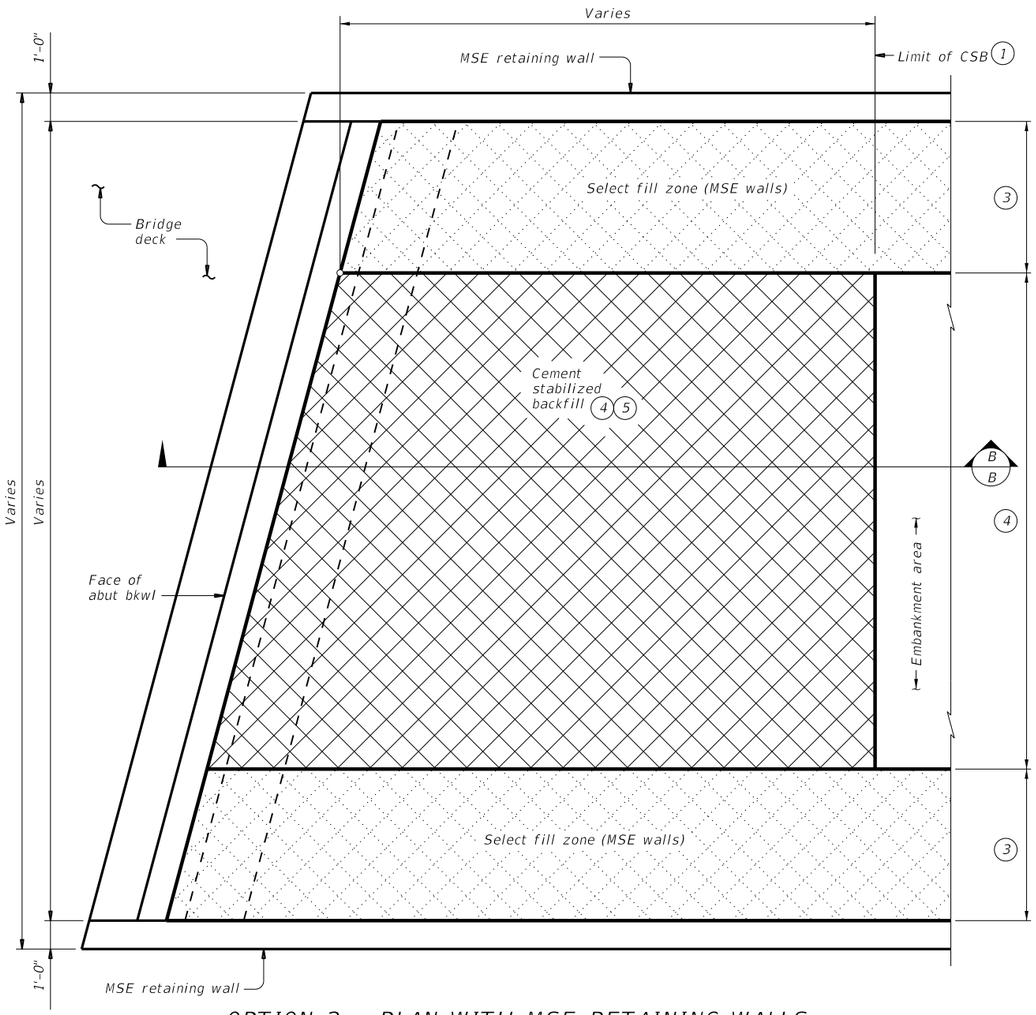
FILE: MS-CSAB-23 (1).dgn	DN: TxDOT	CK: TxDOT	DW: TxDOT	CK: TxDOT
©TxDOT April 2019	CONT	SECT	JOB	HIGHWAY
REVISIONS	0920	03	082, ETC	CR 1065, ETC
02-20: Added Option 2. 03-23: Updated General Notes.	DIST	COUNTY		SHEET NO.
	BMT	HARDIN, ETC		133

DATE: 2/26/2024 2:26:10 PM
FILE: pw://ljo-pw.bentley.com:ljo-pw-01/Documents/TxDOT/PM8016-2301 CEC WA4/Clemmons Gully Off-System Bridge/400 Production/4 - Design/Plan Set/7. Bridge/Bridge Standards/MS-CSAB-2



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.

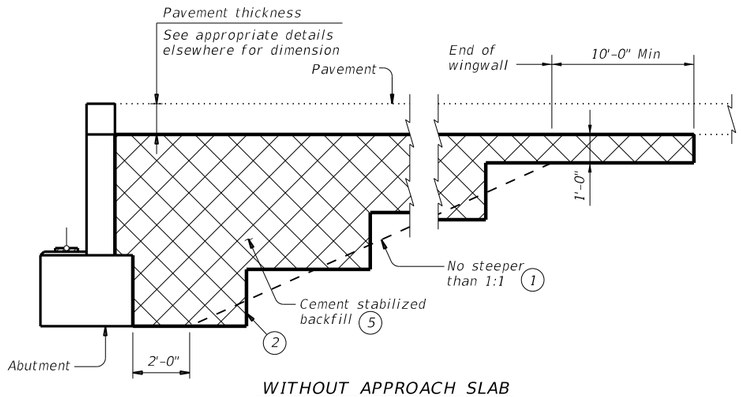
(2) Bench backfill as shown with 12" (approximate) bench depths.

(3) Where MSE retaining walls are present, adjust CSB limits to accommodate the select fill zone. See retaining wall details for additional information.

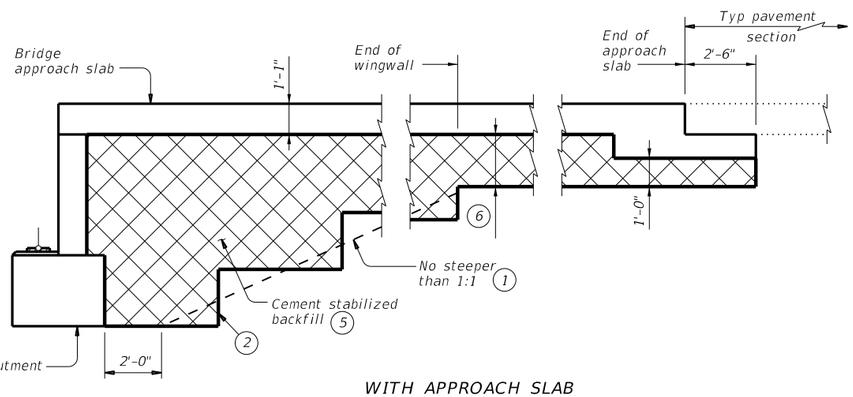
(4) When distance between select fill zones is less than 5'-0", MSE select fill may be substituted for cement stabilized backfill with approval from the Engineer.

(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).

(6) 1'-0" for BAS-A
1'-10" for BAS-C



WITHOUT APPROACH SLAB



WITH APPROACH SLAB

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

SECTION B-B

SHEET 2 OF 2

Texas Department of Transportation

Bridge Division Standard

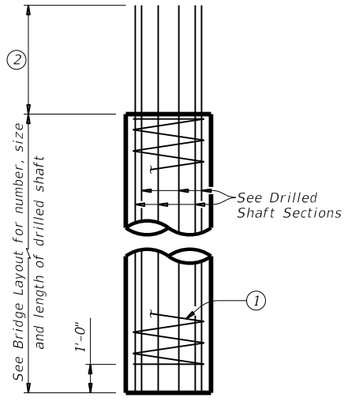
CEMENT STABILIZED ABUTMENT BACKFILL

BRIDGE ABUTMENT

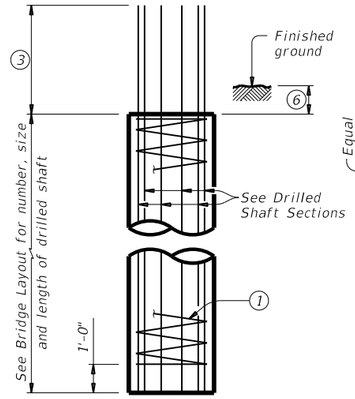
CSAB

FILE: MS-CSAB-23 (1).dgn	DN: TxDOT	CK: TxDOT	DW: TxDOT	CK: TxDOT
©TxDOT April 2019	CONT	SECT	JOB	HIGHWAY
REVISIONS	0920	03	082, ETC	CR 1065, ETC
02-20: Added Option 2. 03-23: Updated General Notes.	DIST	COUNTY		SHEET NO.
	BMT	HARDIN, ETC		134

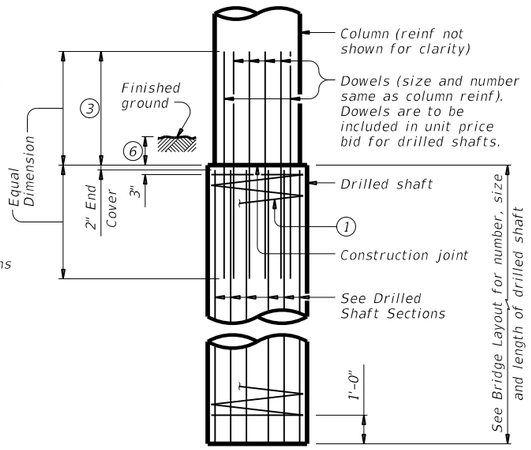
DATE: 2/26/2024 2:26:13 PM
FILE: pw://ljg-pw.bentley.com:ljg-pw-01/Documents/TxDOT/PM8016-2301 CEC WA4/Clemmons Gully Off-System Bridge/400 Production/4 - Design/Plan Set/7. Bridge/Bridge Standards/MS-FD-20



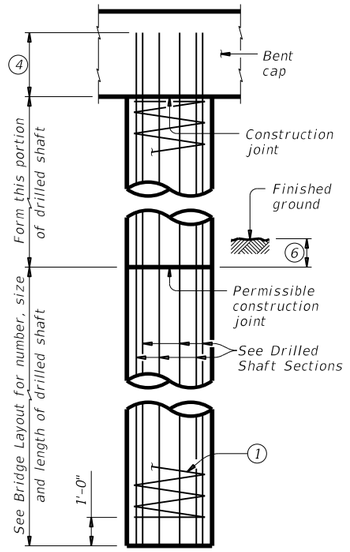
ABUTMENTS, WINGWALLS AND MULTI-DRILLED SHAFT FOOTINGS



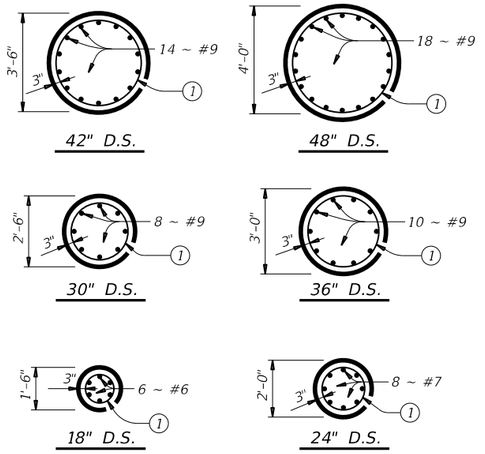
INTERIOR BENTS DRILLED SHAFT DIA EQUAL TO COLUMN DIA



INTERIOR BENTS DRILLED SHAFT DIA GREATER THAN COLUMN DIA



OPTIONAL INTERIOR BENT DRILLED SHAFT DETAIL (5)

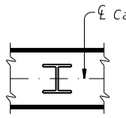


DRILLED SHAFT SECTIONS

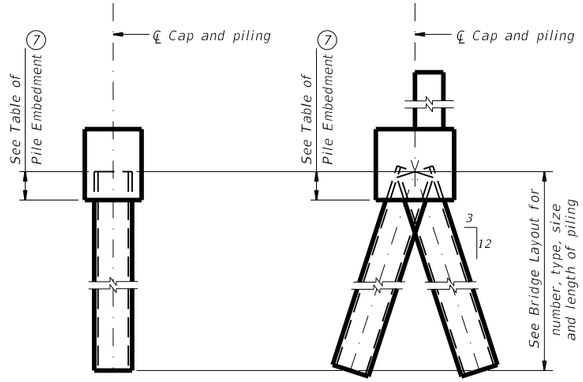
DRILLED SHAFT DETAILS

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"

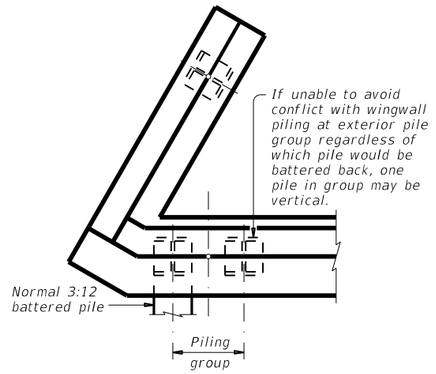
See Prestressed Concrete Piling (CP) standard for additional details on concrete pile embedment.



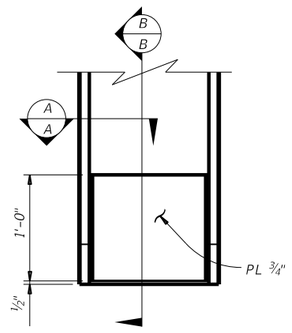
ORIENTATION OF STEEL H-PILING



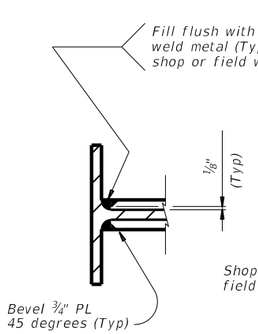
PILING DETAILS
(Concrete or steel H)



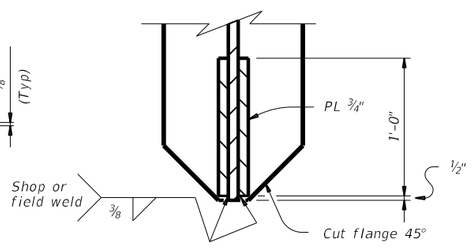
DETAIL "A"
(Showing plan view of a 30° skewed abutment)



ELEVATION

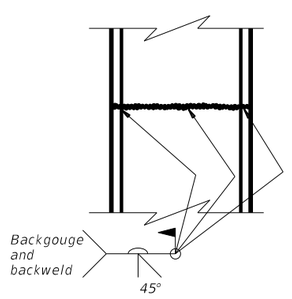


SECTION A-A

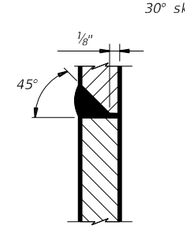


SECTION B-B

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.



SECTION THRU FLANGE OR WEB

(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.

Texas Department of Transportation

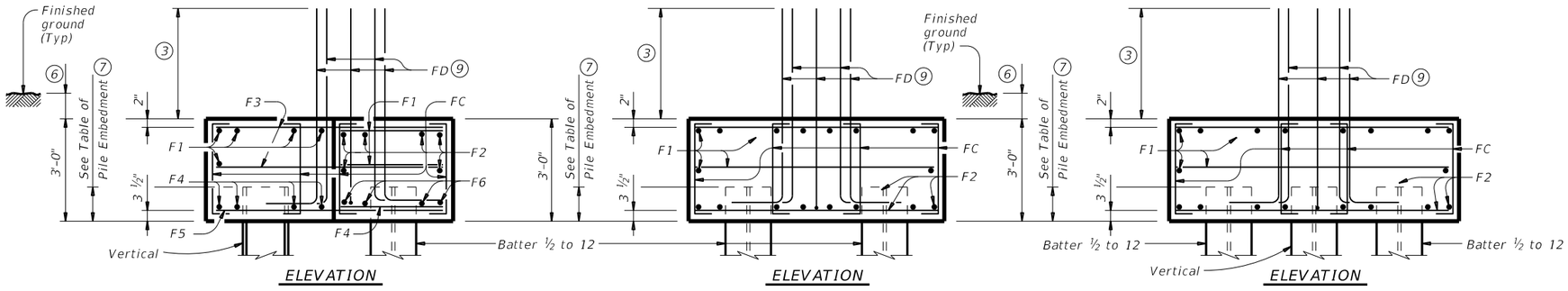
Bridge Division Standard

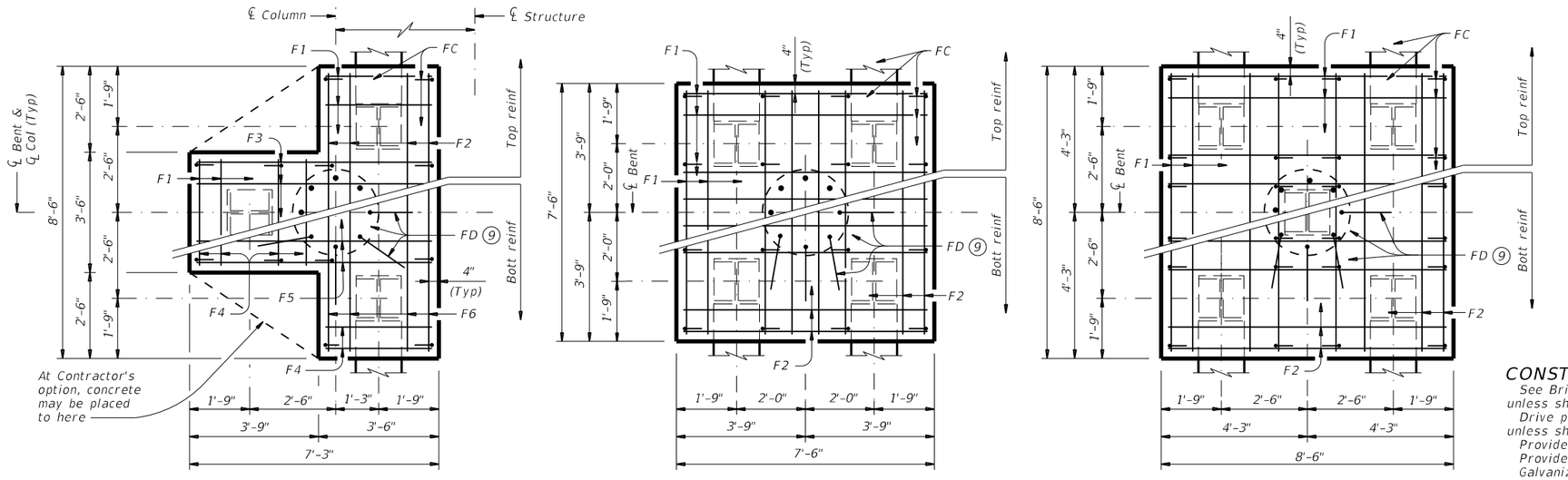
COMMON FOUNDATION DETAILS

FD

FILE: MS-FD-20.dgn	DN: TxDOT	CK: TxDOT	DW: TxDOT	CK: TxDOT
©TxDOT April 2019	CONT	SECT	JOB	HIGHWAY
REVISIONS	0920	03	082, ETC	CR 1065, ETC
01-20: Added #11 bars to the FD bars.	DIST	COUNTY		SHEET NO.
	BMT	HARDIN, ETC		135

DATE: 2/26/2024 2:26:14 PM
FILE: pw://ljg-pw.bentley.com:ljg-pw-01/Documents/TxDOT/PM8016-2301 CEC WA4/Clemmons Gully Off-System Bridge/400 Production/4 - Design/Plan Set/7. Bridge/Bridge Standards/MS-FD-20





THREE PILE FOOTING (8)

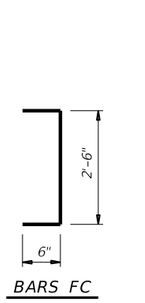
For 36" Dia and smaller columns.

FOUR PILE FOOTING (8)

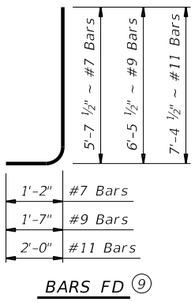
For 42" Dia and smaller columns.

FIVE PILE FOOTING (8)

For 42" Dia and smaller columns.



BARS FC



BARS FD (9)

(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

Texas Department of Transportation

Bridge Division Standard

COMMON FOUNDATION DETAILS

FD

FILE: MS-FD-20 (1).dgn	DN: TxDOT	CK: TxDOT	DW: TxDOT	CK: TxDOT
©TxDOT April 2019	CONT	SECT	JOB	HIGHWAY
REVISIONS	0920	03	082, ETC	CR 1065, ETC
01-20: Added #11 bars to the FD bars.	DIST	COUNTY		SHEET NO.
	BMT	HARDIN, ETC		136

DATE: 2/26/2024 2:26:36 PM
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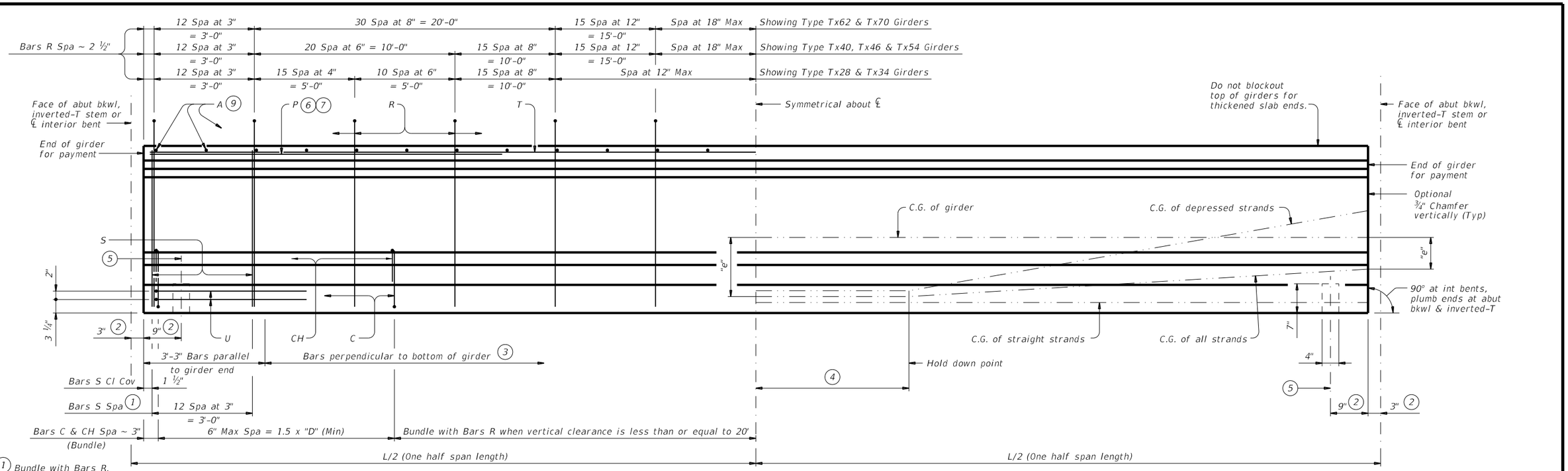


GIRDER ELEVATION

(1) Bundle with Bars R.

(2) Measured along ℄ 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').

(5) ℄ 4" x 1 ½" Vertical Slotted Hole at doweled girder end [labeled (D) on Bridge Layout]. Required for outside girder only or as shown on substructure details. Anchorage holes may be tapered (4 ¾" x 1 ⅝") at base. If holes are formed with sheet metal, forms may be left in place.

(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.

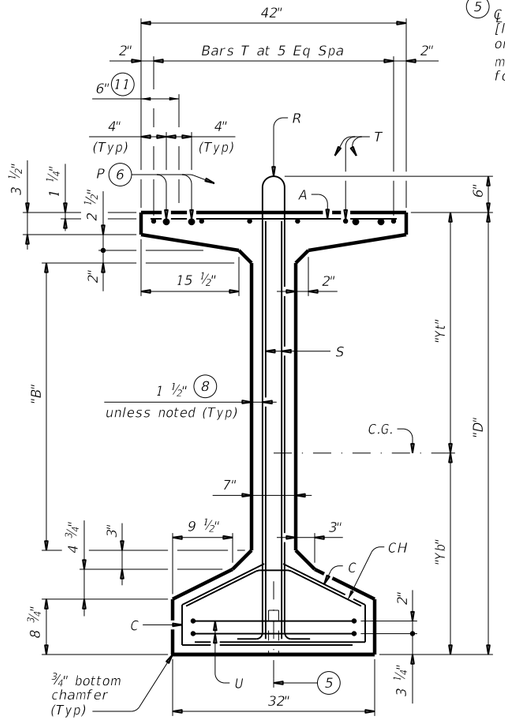
(7) Bars P (#6 x 15'-0") are only required in Tx28, Tx34, Tx40, Tx46, and Tx54 girders when "e" at girder ends exceeds 0.25 x "D". At the fabricator's option bars larger than #6 may be used. When L is less than 50 ft, Bars P are to be the same length as Bars T.

(8) 1 ⅜" Clear Cover to Bars S.

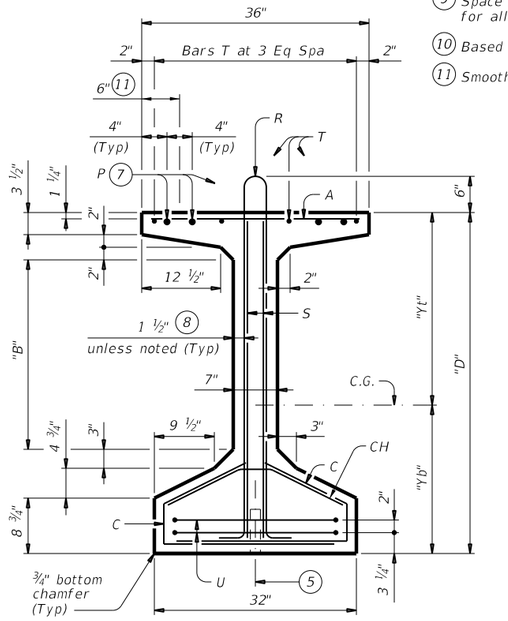
(9) Space Bars A at 6" Max for girders requiring overhang bracket hangers. Space at 12" Max for all other girders. Tie to Bars R as necessary. See standard IGMS for "Deck Forming Notes".

(10) Based on 155 pcf total weight of concrete and reinforcing steel.

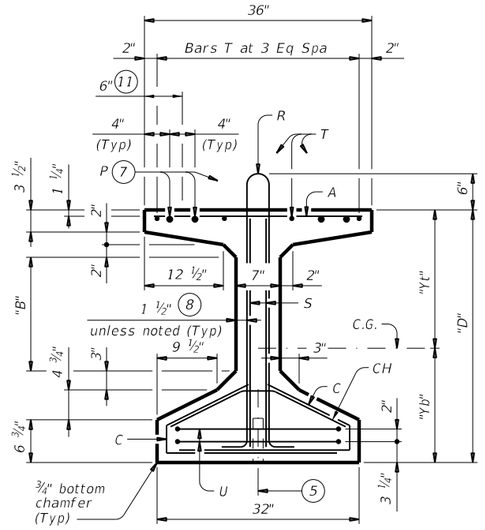
(11) Smooth trowel finish on the slab overhang side of exterior girder.



TYPE Tx62 & Tx70



TYPE Tx46 & Tx54



TYPE Tx28, Tx34 & Tx40

GIRDER DIMENSIONS AND SECTION PROPERTIES

Girder Type	"D" (in.)	"B" (in.)	"Yt" (in.)	"Yb" (in.)	Area (in.²)	"Ix" (in.⁴)	"Iy" (in.⁴)	Weight (10) (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 ½"	33.72	28.28	910	463,072	57,351	980
Tx70	70	45 ½"	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.
When vertical clearance of the span is less than or equal to 20', provide additional Bars C and CH in every girder of that span.

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

HL93 LOADING

Texas Department of Transportation

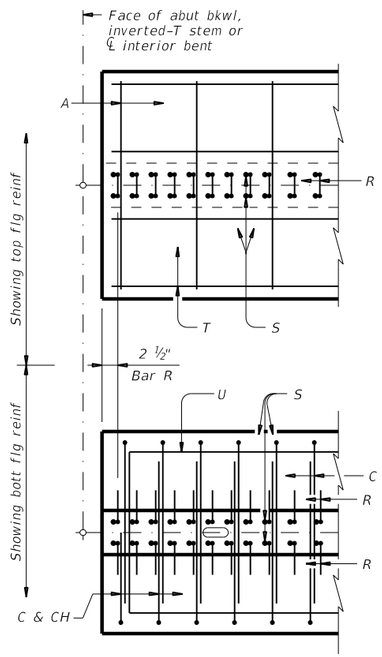
Bridge Division Standard

PRESTRESSED CONCRETE I-GIRDER DETAILS

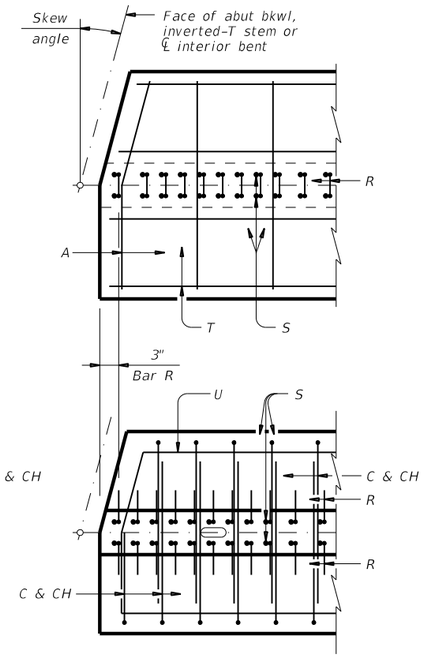
IGD

FILE: IG-IGD-23.dgn	DN: TxDOT	CK: JMH	DW: JTR	CK: TAR
©TxDOT August 2017	CONT	SECT	JOB	HIGHWAY
REVISIONS 10-19: Added Bars C and CH full length for VC<= 20' 3-23: Clarified C and CH requirement	0920	03	082, ETC	W PINESHADOWS DR, ETC
	DIST	COUNTY		SHEET NO.
	BMT	HARDIN, ETC		137

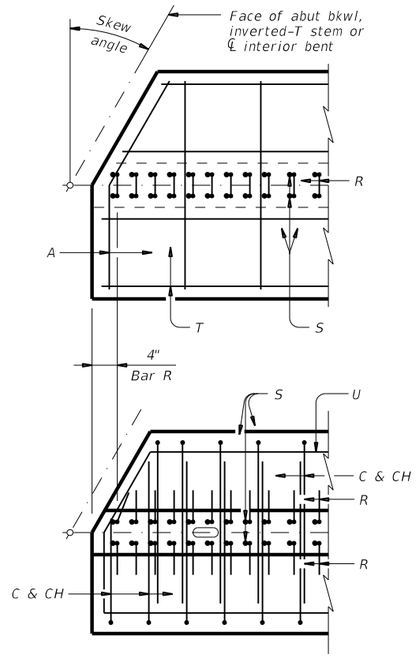
DATE: 2/26/2024 2:26:37 PM
FILE: pw://ljg-pw.bentley.com:ljg-pw-01/Documents/TxDOT/PM8016-2301 CEC WA4/Clemmons Gully Off-System Bridge/400 Production/4 - Design/Bridge/STANDARDS/IG-IGD-23.dgn



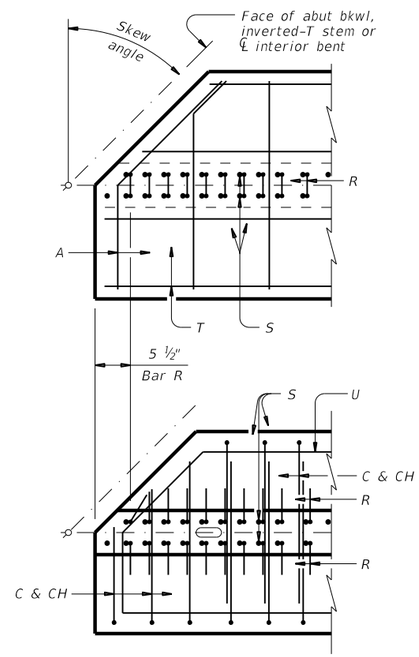
0° SKEW



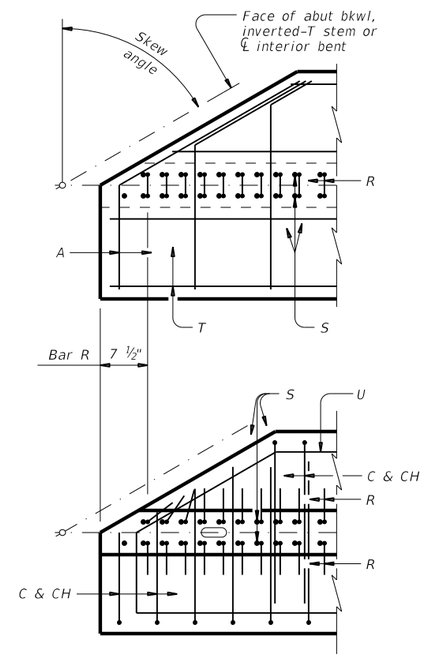
15° SKEW



30° SKEW



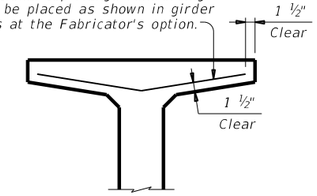
45° SKEW



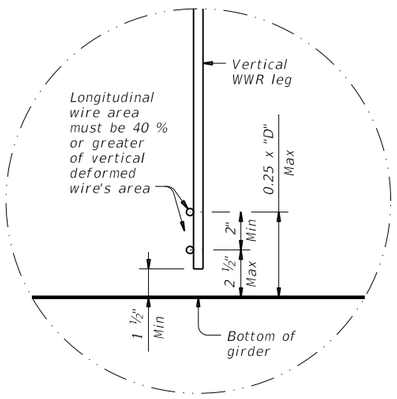
60° SKEW

PLAN OF GIRDER ENDS (12)

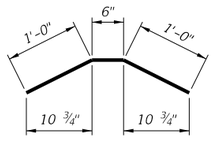
To control top flange cracking that may occur during form removal, additional top flange reinforcing may be placed as shown in girder ends at the Fabricator's option.



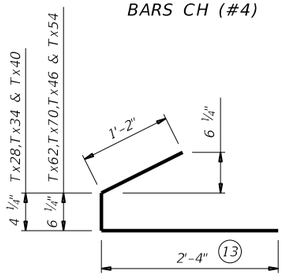
OPTIONAL TOP FLANGE REINFORCING DETAIL



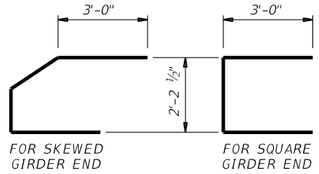
OPTIONAL WELDED WIRE REINFORCEMENT (WWR) DETAIL



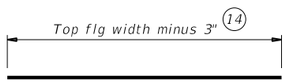
BARS CH (#4)



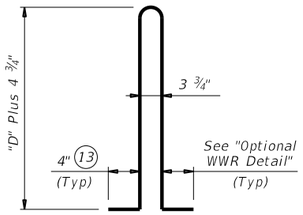
BARS C (#4)



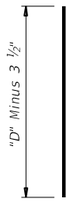
BARS U (#5)



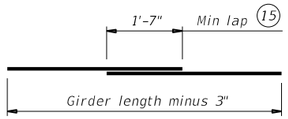
BARS A (#3)



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.

HL93 LOADING SHEET 2 OF 2

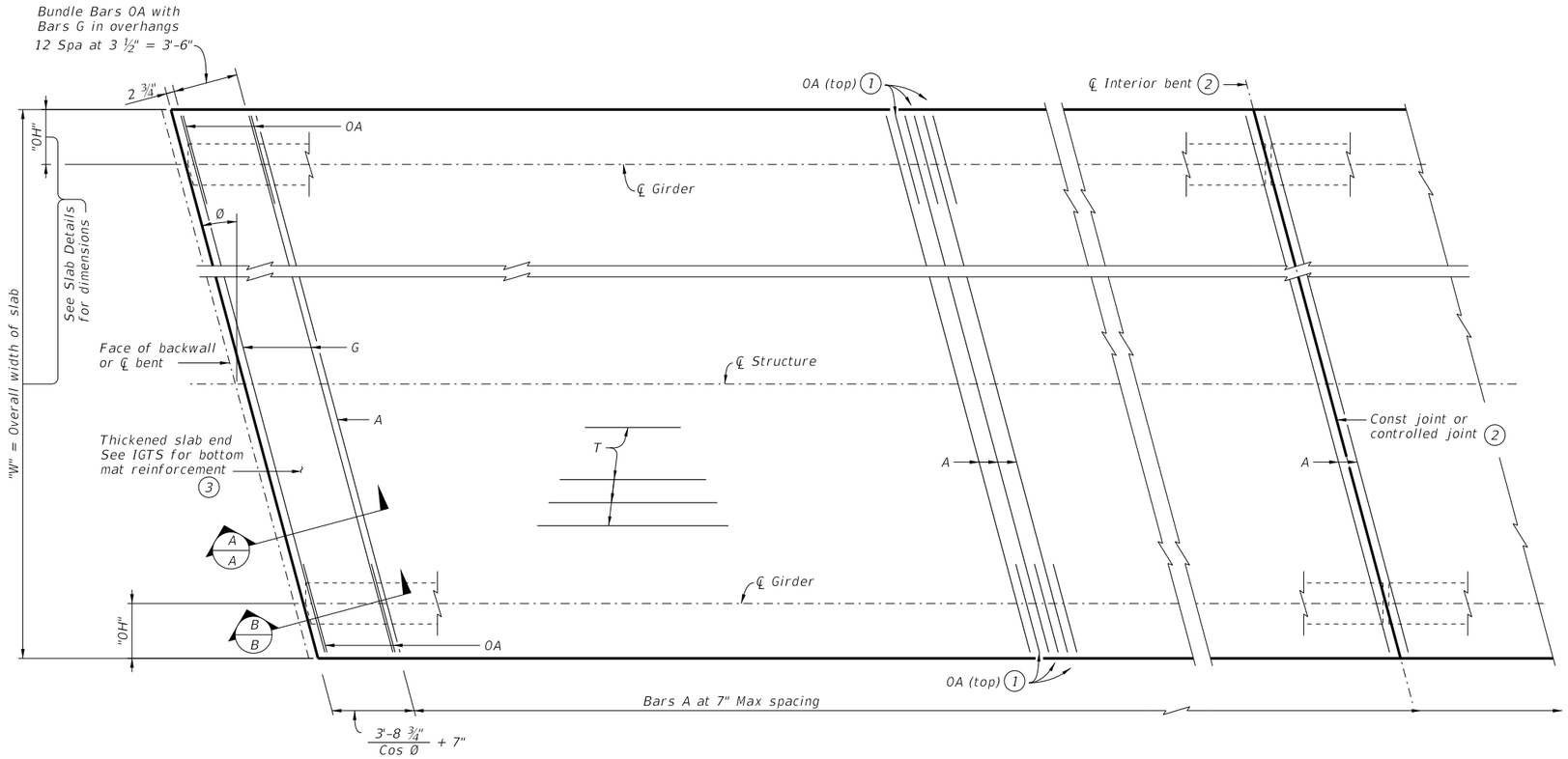
Texas Department of Transportation — Bridge Division Standard

PRESTRESSED CONCRETE I-GIRDER DETAILS

IGD

FILE: IG-IGD-23.dgn	DN: TxDOT	CK: JMH	DW: JTR	CK: TAR
©TxDOT August 2017	CONT	SECT	JOB	HIGHWAY
REVISIONS 10-19: Added Bars C and CH full length for VC<= 20' 3-23: Clarifed C and CH requirement	0920	03	082, ETC	W PINESHADOWS DR, ETC
	DIST	COUNTY		SHEET NO.
	BMT	HARDIN, ETC		138

DATE:
FILE:

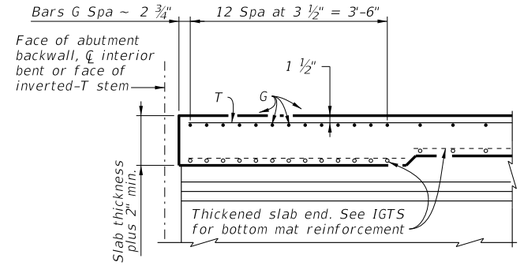


AT THICKENED SLAB END

AT SLAB CONTINUOUS OVER INTERIOR BENTS

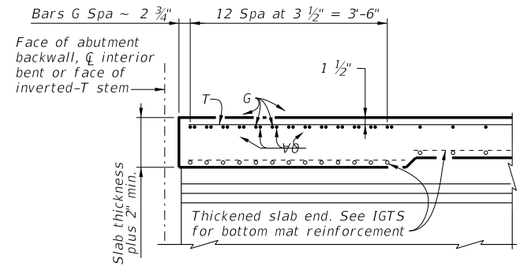
PLAN FOR SLABS WITHOUT BREAKBACKS

Showing top mat reinforcement only.



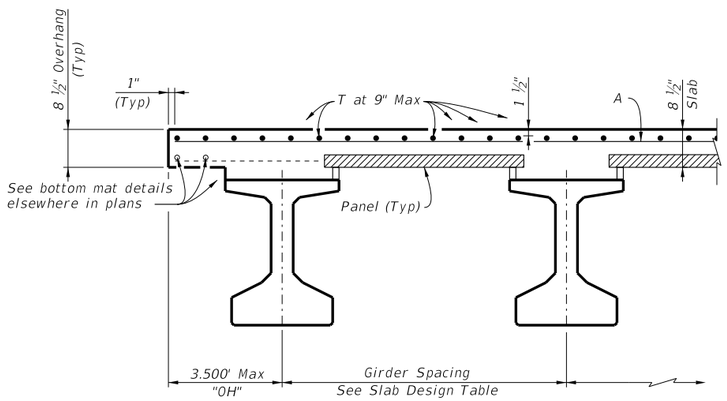
SECTION A-A

Showing Thickened Slab End with PCP Option 1. Option 2 similar.

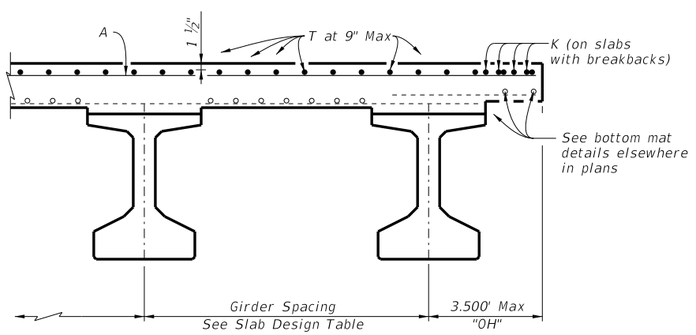


SECTION B-B

Showing Thickened Slab End with PCP Option 1. Option 2 similar.



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

Texas Department of Transportation

Bridge Division Standard

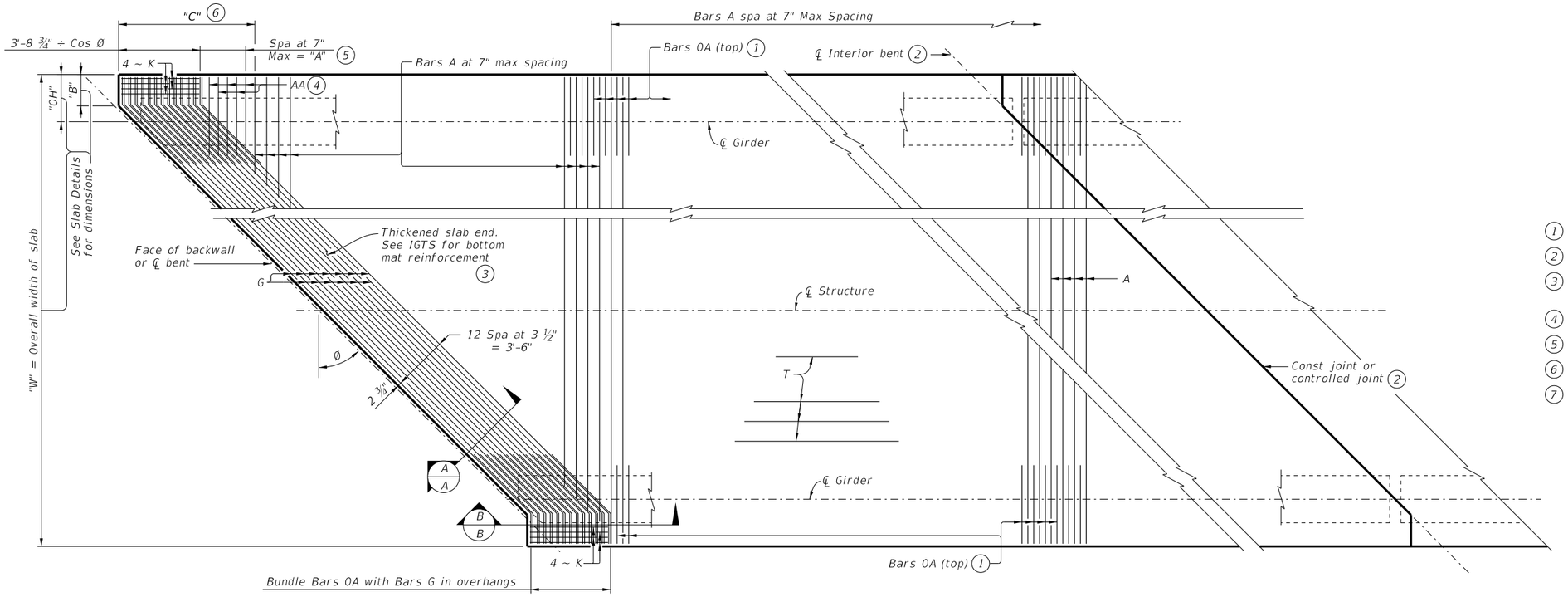
GFRP SLAB TOP MAT REINFORCEMENT

PRESTRESSED CONC I-GIRDER SPANS

IGFRP

FILE: IG-IGFRP-19.dgn	DN: TxDOT	CK: TxDOT	DW: TxDOT	CK: TxDOT
©TxDOT August 2017	CONT	SECT	JOB	HIGHWAY
REVISIONS	0920	03	082, ETC	CR 1065, ETC
10-19: Updated to latest design specification.	DIST	COUNTY		SHEET NO.
	BMT	HARDIN, ETC		139

DATE:
FILE:

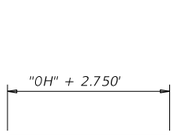


AT THICKENED SLAB END

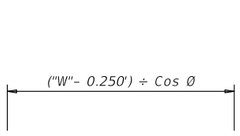
AT SLAB CONTINUOUS OVER INTERIOR BENTS

PLAN FOR SLABS WITH BREAKBACKS

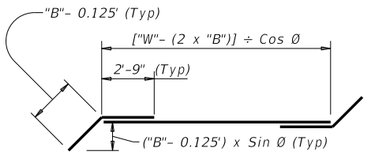
Showing top mat reinforcement only.



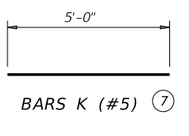
BARS AA (#5) (7)



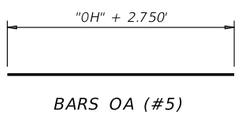
BARS G (#5)
(For slabs without breakbacks)



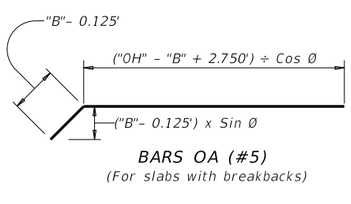
BARS G (#5)
(For slabs with breakbacks)



BARS K (#5) (7)



BARS OA (#5)



BARS OA (#5)
(For slabs with breakbacks)

BAR TABLE

BAR	SIZE
A	#5
AA	#5
G	#5
K	#5
0A	#5
T	#5

(1) Place Bars 0A 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 = ("0H" + 2.333' - "B") x Tan Ø

(6) $C = \frac{3.729'}{\cos Ø} + \text{"A"} + \text{Bar A spacing}$

(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 ½" 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"

HL93 LOADING

Texas Department of Transportation

Bridge Division Standard

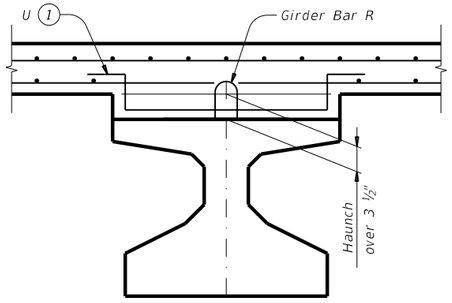
GFRP SLAB TOP MAT REINFORCEMENT

PRESTRESSED CONC I-GIRDER SPANS

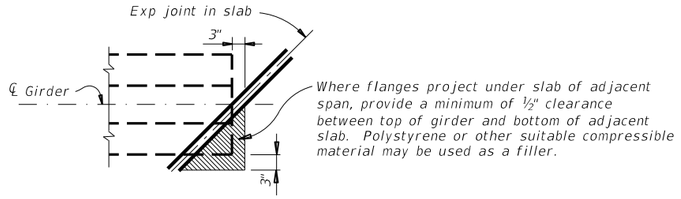
IGFRP

FILE: IG-IGFRP-19.dgn	DN: TxDOT	CK: TxDOT	DW: TxDOT	CK: TxDOT
©TxDOT August 2017	CONT	SECT	JOB	HIGHWAY
REVISIONS	0920	03	082, ETC	CR 1065, ETC
10-19: Updated to latest design specification.	DIST	COUNTY		SHEET NO.
	BMT	HARDIN, ETC		140

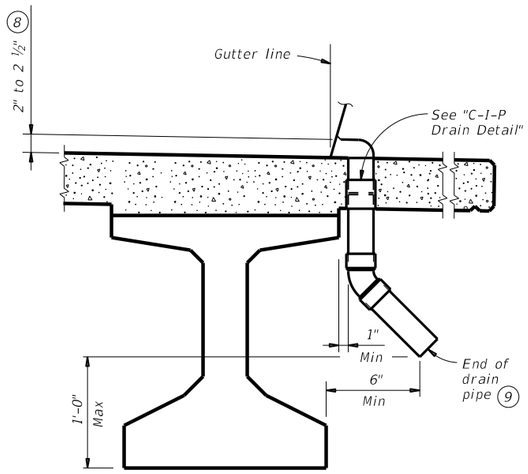
DATE: 2/26/2024 2:26:40 PM
FILE: pw://ig-pw.bentley.com:ig-pw-01/Documents/TxDOT/PM8016-2301 CEC WA4/Clemmons Gully Off-System Bridge/400 Production/4 - Design/Bridge/STANDARDS/IG-IGMS-19.dgn



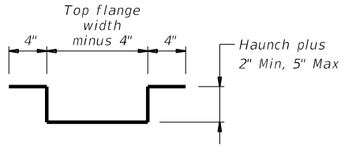
HAUNCH REINFORCING DETAIL



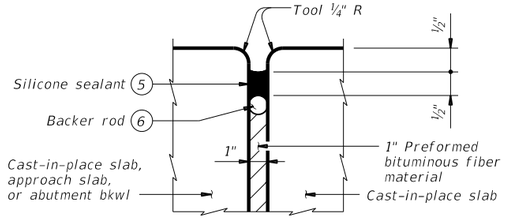
TREATMENT AT GIRDER END FOR SKEWED SPANS



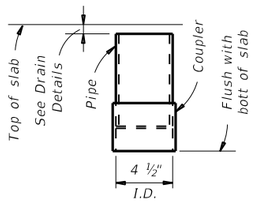
DRAIN DETAIL (10)



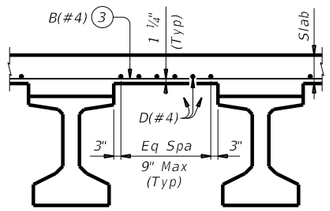
BARS U (#4)



TYPE A JOINT DETAIL (7)



C-I-P DRAIN DETAIL (2)



TYPICAL PART TRANSVERSE SLAB SECTION WITHOUT PCP (4)

Top reinforcing steel not shown for clarity.

(1) Space Bars U with girder Bars R in all areas where measured haunch exceeds 3 ½".

(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 ¼" 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 railways, 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.

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.

Texas Department of Transportation

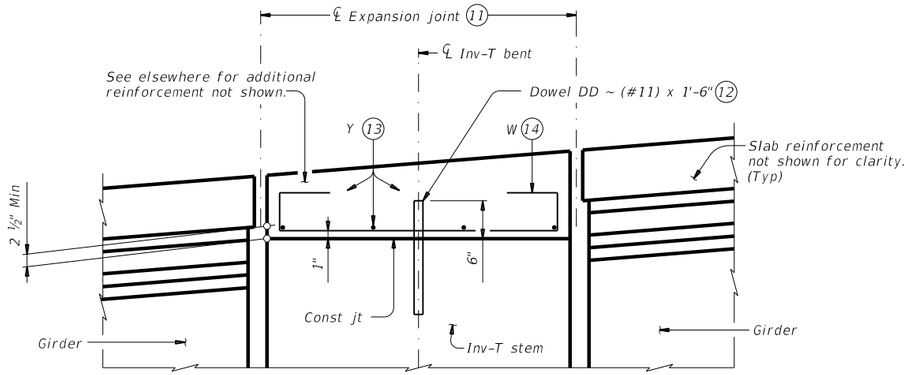
Bridge Division Standard

MISCELLANEOUS SLAB DETAILS

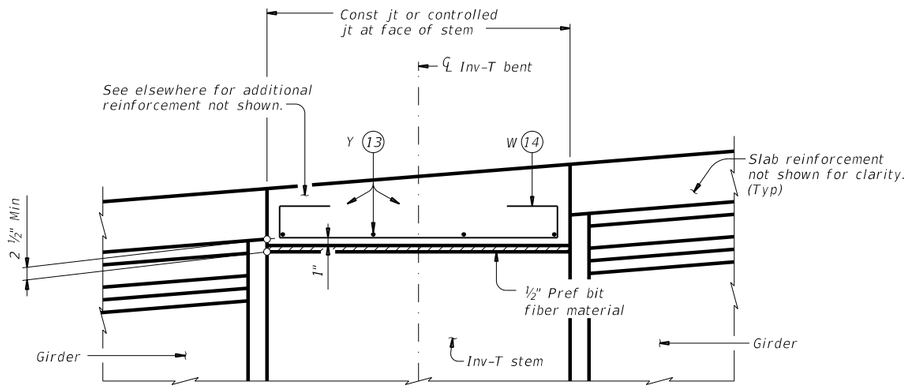
PRESTR CONCRETE I-GIRDERS

IGMS

FILE: IG-IGMS-19.dgn	DN: TxDOT	CK: TxDOT	DW: JTR	CK: TxDOT		
©TxDOT August 2017	CONT	SECT	JOB		HIGHWAY	
REVISIONS	0920	03	082, ETC		W PINESHADOWS DR, ETC	
10-19: Modified Note 7. Type A now a pay item.	DIST	COUNTY			SHEET NO.	
	BMT	HARDIN, ETC			141	

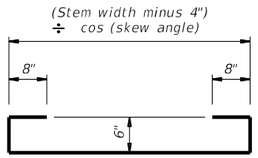


SHOWING EXPANSION JOINTS

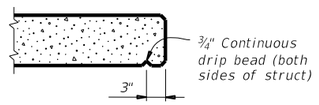


SHOWING CONST JTS OR CONTROLLED JTS

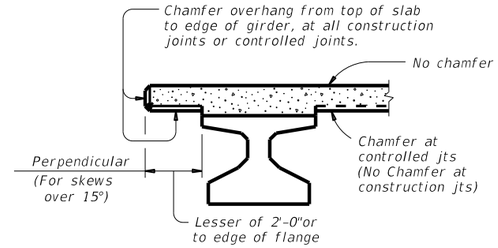
REINFORCEMENT OVER INV-T BENTS



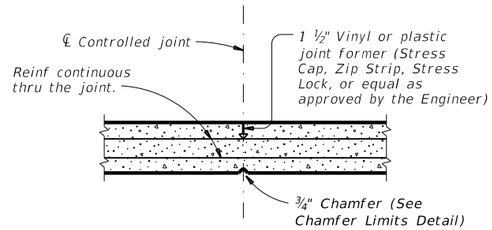
BARS W (#4)



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.

Texas Department of Transportation

Bridge Division Standard

MISCELLANEOUS SLAB DETAILS

PRESTR CONCRETE I-GIRDERS

IGMS

FILE: IG-IGMS-19.dgn	DN: TxDOT	CK: TxDOT	DW: JTR	CK: TxDOT			
©TxDOT August 2017	CONT	SECT	JOB		HIGHWAY		
REVISIONS	0920	03	082, ETC		W PINESHADOWS DR, ETC		
10-19: Modified Note 7. Type A now a pay item.	DIST	COUNTY			SHEET NO.		
	BMT	HARDIN, ETC			142		

DATE: 2/26/2024 2:26:41 PM
FILE: pw://ijg-pw.bentley.com:ijg-pw-01/Documents/TxDOT/PM8016-2301 CEC WA4/Clemmons Gully Off-System Bridge/400 Production/4 - Design/Bridge/STANDARDS/IG-IGMS-19.dgn

DATE: 2/26/2024 2:26:45 PM
FILE: pw://ljg-pw.bentley.com:ljg-pw-01/Documents/TxDOT/PM8016-2301 CEC WA4/Clemmons Gully Off-System Bridge/400 Production/4 - Design/Bridge/STANDARDS/IG-IGSD24-21.dgn

STRUCTURE	DESIGNED GIRDERS								DEPRESSED STRAND PATTERN		CONCRETE		OPTIONAL DESIGN					LOAD RATING FACTORS			
				PRESTRESSING STRANDS														STRENGTH I		SERVICE III	
	SPAN NO.	GIRDER NO.	GIRDER TYPE	NON-STD STRAND PATTERN	TOTAL NO.	SIZE (in)	STRGTH fpu (ksi)	"e" ℄ (in)	"e" END (in)	NO.	TO END (in)	RELEASE STRGTH (1) f'ci (ksi)	MINIMUM 28 DAY COMP STRGTH f'c (ksi)	DESIGN LOAD COMP STRESS (TOP ℄) (SERVICE I) fct(ksi)	DESIGN LOAD TENSILE STRESS (BOTT ℄) (SERVICE III) fcb(ksi)	REQUIRED MINIMUM ULTIMATE MOMENT CAPACITY (STRENGTH I) (kip-ft)	LIVE LOAD DISTRIBUTION FACTOR (2) Moment	LIVE LOAD DISTRIBUTION FACTOR (2) Shear	Inv	Opr	Inv
Type Tx28 Girders 24' Roadway 8.5" Slab	40	ALL	Tx28		10	0.6	270	10.48	10.48			4.000	5.000	1.055	-1.423	1382	0.670	0.850	1.56	2.02	1.98
	45	ALL	Tx28		12	0.6	270	10.48	10.48			4.500	5.000	1.332	-1.744	1525	0.650	0.850	1.58	2.05	1.79
	50	ALL	Tx28		12	0.6	270	10.48	10.48			4.200	5.000	1.645	-2.113	1657	0.630	0.860	1.25	1.62	1.25
	55	ALL	Tx28		14	0.6	270	10.48	9.62	2	8.5	4.000	5.000	1.969	-2.490	1919	0.610	0.860	1.27	1.64	1.11
	60	ALL	Tx28		18	0.6	270	10.04	7.81	4	14.5	4.000	5.600	2.320	-2.901	2206	0.600	0.870	1.43	1.86	1.14
	65	ALL	Tx28		22	0.6	270	9.75	6.12	4	24.5	4.300	5.900	2.716	-3.337	2486	0.580	0.870	1.55	2.00	1.14
	70	ALL	Tx28		26	0.6	270	9.56	6.48	4	24.5	5.200	6.300	3.131	-3.802	2793	0.570	0.870	1.26	1.89	1.01
	75	ALL	Tx28		28	0.6	270	9.48	6.62	4	24.5	5.600	7.800	3.572	-4.291	3110	0.560	0.880	1.38	1.81	1.08
Type Tx34 Girders 24' Roadway 8.5" Slab	40	ALL	Tx34		10	0.6	270	13.01	13.01			4.000	5.000	0.835	-1.089	1605	0.690	0.830	1.85	2.40	2.60
	45	ALL	Tx34		10	0.6	270	13.01	13.01			4.500	5.500	1.050	-1.332	1750	0.670	0.840	1.90	2.46	2.42
	50	ALL	Tx34		12	0.6	270	13.01	13.01			4.000	5.000	1.294	-1.612	1868	0.650	0.840	1.53	1.98	1.81
	55	ALL	Tx34		12	0.6	270	13.01	13.01			4.000	5.000	1.553	-1.904	1981	0.630	0.840	1.24	1.61	1.33
	60	ALL	Tx34		14	0.6	270	13.01	12.44	2	6.5	4.000	5.000	1.845	-2.231	2287	0.620	0.850	1.27	1.64	1.22
	65	ALL	Tx34		16	0.6	270	12.76	11.76	4	8.5	4.000	5.000	2.161	-2.579	2605	0.610	0.850	1.25	1.62	1.06
	70	ALL	Tx34		20	0.6	270	12.41	9.61	4	18.5	4.000	5.100	2.461	-2.902	2888	0.590	0.850	1.46	1.89	1.13
	75	ALL	Tx34		24	0.6	270	12.18	7.84	4	30.5	4.300	5.400	2.818	-3.283	3223	0.580	0.860	1.57	2.04	1.15
	80	ALL	Tx34		26	0.6	270	12.09	8.09	4	30.5	4.700	5.700	3.168	-3.660	3554	0.570	0.860	1.39	1.96	1.04
	85	ALL	Tx34		30	0.6	270	11.81	7.81	6	26.5	5.400	6.100	3.567	-4.078	3909	0.560	0.860	1.46	2.00	1.04
Type Tx40 Girders 24' Roadway 8.5" Slab	40	ALL	Tx40		10	0.6	270	15.60	15.60			4.000	5.000	0.697	-0.889	1671	0.720	0.820	2.10	2.73	3.15
	45	ALL	Tx40		10	0.6	270	15.60	15.60			4.000	5.000	0.873	-1.080	1972	0.690	0.820	1.74	2.26	2.50
	50	ALL	Tx40		12	0.6	270	15.60	15.60			4.000	5.000	1.065	-1.299	2276	0.670	0.830	1.78	2.31	2.33
	55	ALL	Tx40		12	0.6	270	15.60	15.60			4.000	5.000	1.283	-1.538	2237	0.650	0.830	1.46	1.90	1.80
	60	ALL	Tx40		14	0.6	270	15.60	15.60			4.200	5.000	1.522	-1.801	2434	0.640	0.830	1.49	1.93	1.66
	65	ALL	Tx40		14	0.6	270	15.60	15.60			4.000	5.000	1.780	-2.081	2688	0.630	0.840	1.24	1.60	1.25
	70	ALL	Tx40		16	0.6	270	15.35	14.85	4	6.5	4.000	5.000	2.035	-2.349	2989	0.610	0.840	1.28	1.65	1.17
	75	ALL	Tx40		18	0.6	270	15.16	14.27	4	8.5	4.000	5.000	2.328	-2.657	3337	0.600	0.840	1.28	1.66	1.05
	80	ALL	Tx40		22	0.6	270	14.87	11.24	4	24.5	4.000	5.000	2.616	-2.961	3681	0.590	0.850	1.47	1.90	1.11
	85	ALL	Tx40		26	0.6	270	14.68	9.76	4	36.5	4.400	5.100	2.930	-3.287	4041	0.580	0.850	1.60	2.08	1.22
	90	ALL	Tx40		28	0.6	270	14.60	10.03	4	36.5	4.800	5.500	3.259	-3.626	4410	0.570	0.850	1.55	2.01	1.07
	95	ALL	Tx40		32	0.6	270	14.23	8.60	6	36.5	5.100	5.800	3.620	-3.991	4799	0.560	0.850	1.62	2.10	1.06
	100	ALL	Tx40		36	0.6	270	13.93	8.93	6	36.5	5.800	6.600	4.006	-4.393	5245	0.560	0.850	1.47	1.94	1.06
Type Tx46 Girders 24' Roadway 8.5" Slab	40	ALL	Tx46		10	0.6	270	17.60	17.60			4.000	5.000	0.613	-0.708	1732	0.740	0.810	2.35	3.05	3.78
	45	ALL	Tx46		10	0.6	270	17.60	17.60			4.000	5.000	0.768	-0.865	2066	0.720	0.810	1.93	2.50	3.01
	50	ALL	Tx46		12	0.6	270	17.60	17.60			4.000	5.000	0.937	-1.042	2452	0.700	0.820	1.97	2.55	2.81
	55	ALL	Tx46		12	0.6	270	17.60	17.60			4.000	5.000	1.127	-1.235	2726	0.680	0.820	1.63	2.11	2.22
	60	ALL	Tx46		14	0.6	270	17.60	17.60			4.000	5.000	1.332	-1.438	2951	0.660	0.820	1.68	2.18	2.10
	65	ALL	Tx46		14	0.6	270	17.60	17.60			4.000	5.000	1.557	-1.662	2905	0.650	0.820	1.41	1.82	1.64
	70	ALL	Tx46		14	0.6	270	17.60	17.60			4.000	5.000	1.798	-1.898	3157	0.640	0.830	1.18	1.52	1.25
	75	ALL	Tx46		16	0.6	270	17.35	16.85	4	6.5	4.000	5.000	2.050	-2.137	3495	0.620	0.830	1.23	1.59	1.17
	80	ALL	Tx46		18	0.6	270	17.16	16.27	4	8.5	4.000	5.000	2.304	-2.384	3859	0.610	0.830	1.25	1.63	1.09
	85	ALL	Tx46		22	0.6	270	16.88	15.06	4	14.5	4.000	5.000	2.591	-2.656	4249	0.600	0.830	1.46	1.89	1.30
	90	ALL	Tx46		24	0.6	270	16.77	14.10	4	20.5	4.000	5.000	2.870	-2.923	4631	0.590	0.840	1.45	1.88	1.06
	95	ALL	Tx46		28	0.6	270	16.60	11.46	4	40.5	4.200	5.000	3.192	-3.234	5087	0.590	0.840	1.57	2.03	1.08
	100	ALL	Tx46		32	0.6	270	16.23	9.48	6	42.5	4.400	5.000	3.524	-3.542	5513	0.580	0.840	1.65	2.14	1.07
	105	ALL	Tx46		36	0.6	270	15.94	9.94	6	42.5	5.000	5.800	3.856	-3.851	5937	0.570	0.840	1.72	2.23	1.17
	110	ALL	Tx46		38	0.6	270	15.81	10.45	6	40.5	5.400	6.300	4.200	-4.169	6370	0.560	0.840	1.67	2.16	1.04
	115	ALL	Tx46		42	0.6	270	15.60	10.75	6	40.5	6.000	7.000	4.584	-4.532	6886	0.560	0.840	1.46	1.96	1.05

NON-STANDARD STRAND PATTERNS

PATTERN	STRAND ARRANGEMENT AT ℄ 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.

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.

Optional designs for girders 120 feet or longer must have a calculated residual camber equal to or greater than that of the designed girder.

Prestress losses for the designed girders have been calculated for a relative humidity of 60 percent. Optional designs must likewise conform.

FABRICATION NOTES:

Provide Class H concrete.

Provide Grade 60 reinforcing steel bars.

Use low relaxation strands, each pretensioned to 75 percent of fpu.

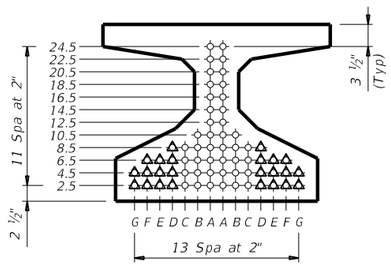
Strand debonding must comply with Item 424.4.2.2.2.4. Full-length debonded strands are only permitted in positions marked Δ. Double wrap full-length debonded strands in outer most position of each row.

When shown on this sheet, the Fabricator has the option of furnishing either the designed girder or an approved optional design. All optional design submittals must be signed, sealed and dated by a Professional Engineer registered in the State of Texas.

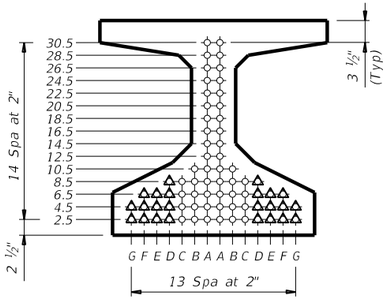
Seal cracks in girder ends exceeding 0.005" in width as directed by the Engineer. The fabricator is permitted to decrease the spacing of Bars R and S by providing additional bars to help limit crack width provided the decreased spacing results in no less than 1" clear between bars. The fabricator must take an approved corrective action if cracks greater than 0.005" form on a repetitive basis.

DEPRESSED STRAND DESIGNS:

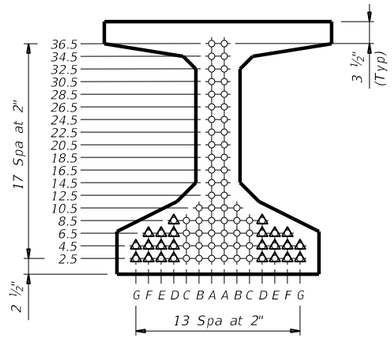
Locate strands for the designed girder as low as possible on the 2" grid system unless a non-standard strand pattern is indicated. Fill row "2.5", then row "4.5", then row "6.5", etc., beginning each row in the "A" position and working outward until the required number of strands is reached. All strands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



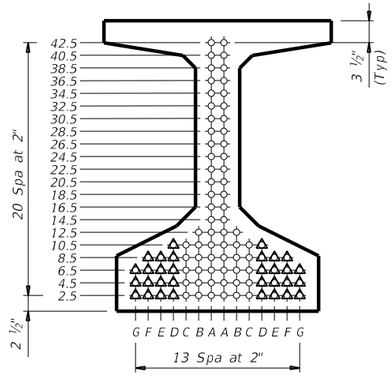
TYPE Tx28



TYPE Tx34



TYPE Tx40



TYPE Tx46

HL93 LOADING SHEET 1 OF 2

Texas Department of Transportation — Bridge Division Standard

PRESTRESSED CONCRETE I-GIRDER STANDARD DESIGNS

24' ROADWAY

IGSD-24

FILE: IG-IGSD24-21.dgn	DN: EFC	CK: AJF	DW: EFC	CK: TAR
©TxDOT August 2017	CONT	SECT	JOB	HIGHWAY
REVISIONS 10-19: Redesigned girders. 1-21: Added load rating.	0920	03	082, ETC	W PINESHADOWS DR, ETC
	DIST	COUNTY		SHEET NO.
	BMT	HARDIN, ETC		143

DATE: 2/26/2024 2:26:46 PM
FILE: pw://ljg-pw.bentley.com:ljg-pw-01/Documents/TxDOT/PM8016-2301 CEC WA4/Clemmons Gully Off-System Bridge/400 Production/4 - Design/Bridge/STANDARDS/IG-IGSD24-21.dgn

DESIGNED GIRDERS

STRUCTURE	SPAN NO.	GIRDER NO.	GIRDER TYPE	PRESTRESSING STRANDS: NON-STD STRAND PATTERN	PRESTRESSING STRANDS: TOTAL NO.	PRESTRESSING STRANDS: SIZE (in)	PRESTRESSING STRANDS: STRGTH fpu (ksi)	PRESTRESSING STRANDS: "e" ℄ (in)	PRESTRESSING STRANDS: "e" END (in)
Type Tx54 Girders 24' Roadway 8.5" Slab	40	ALL	Tx54		8	0.6	270	21.01	21.01
	45	ALL	Tx54		10	0.6	270	21.01	21.01
	50	ALL	Tx54		12	0.6	270	21.01	21.01
	55	ALL	Tx54		12	0.6	270	21.01	21.01
	60	ALL	Tx54		12	0.6	270	21.01	21.01
	65	ALL	Tx54		14	0.6	270	21.01	21.01
	70	ALL	Tx54		14	0.6	270	21.01	21.01
	75	ALL	Tx54		16	0.6	270	20.76	20.26
	80	ALL	Tx54		16	0.6	270	20.76	20.76
	85	ALL	Tx54		18	0.6	270	20.56	19.67
	90	ALL	Tx54		20	0.6	270	20.41	19.21
	95	ALL	Tx54		22	0.6	270	20.28	18.46
	100	ALL	Tx54		26	0.6	270	20.08	16.39
	105	ALL	Tx54		30	0.6	270	19.81	12.21
	110	ALL	Tx54		32	0.6	270	19.63	11.38
	115	ALL	Tx54		36	0.6	270	19.34	12.01
	120	ALL	Tx54		38	0.6	270	19.22	13.22
	125	ALL	Tx54		42	0.6	270	19.01	12.72
Type Tx62 Girders 24' Roadway 8.5" Slab	60	ALL	Tx62		12	0.6	270	25.78	25.78
	65	ALL	Tx62		12	0.6	270	25.78	25.78
	70	ALL	Tx62		14	0.6	270	25.78	25.78
	75	ALL	Tx62		14	0.6	270	25.78	25.78
	80	ALL	Tx62		16	0.6	270	25.53	25.53
	85	ALL	Tx62		16	0.6	270	25.53	25.53
	90	ALL	Tx62		16	0.6	270	25.53	25.53
	95	ALL	Tx62		20	0.6	270	25.18	24.78
	100	ALL	Tx62		22	0.6	270	25.05	23.96
	105	ALL	Tx62		24	0.6	270	24.94	23.28
	110	ALL	Tx62		26	0.6	270	24.85	22.70
	115	ALL	Tx62		30	0.6	270	24.58	17.78
	120	ALL	Tx62		34	0.6	270	24.25	15.07
	125	ALL	Tx62		36	0.6	270	24.11	17.11
	130	ALL	Tx62		40	0.6	270	23.88	16.68
	135	ALL	Tx62		42	0.6	270	23.78	16.35

STRUCTURE	DEPRESSED STRAND PATTERN: NO.	DEPRESSED STRAND PATTERN: TO END (in)	CONCRETE: RELEASE STRGTH (1) f'ci (ksi)	CONCRETE: MINIMUM 28 DAY COMP STRGTH f'c (ksi)	OPTIONAL DESIGN: DESIGN LOAD COMP STRESS (TOP ℄) (SERVICE I) fct(ksi)	OPTIONAL DESIGN: DESIGN LOAD TENSILE STRESS (BOTT ℄) (SERVICE III) fcb(ksi)	OPTIONAL DESIGN: REQUIRED MINIMUM ULTIMATE MOMENT CAPACITY (STRENGTH I) (kip-ft)	OPTIONAL DESIGN: LIVE LOAD DISTRIBUTION FACTOR (2) Moment	OPTIONAL DESIGN: LIVE LOAD DISTRIBUTION FACTOR (2) Shear	LOAD RATING FACTORS: STRENGTH I Inv	LOAD RATING FACTORS: STRENGTH I Opr	LOAD RATING FACTORS: SERVICE III Inv
Type Tx54 Girders 24' Roadway 8.5" Slab			4.000	5.000	0.511	-0.578	1798	0.770	0.800	2.05	2.66	3.76
			4.000	5.000	0.636	-0.703	2126	0.740	0.800	2.24	2.90	3.69
			4.000	5.000	0.781	-0.850	2533	0.720	0.810	1.81	2.35	2.91
			4.000	5.000	0.938	-1.007	2951	0.700	0.810	1.90	2.46	2.79
			4.000	5.000	1.108	-1.173	3271	0.680	0.810	1.60	2.07	2.25
			4.000	5.000	1.285	-1.348	3547	0.670	0.810	1.66	2.16	2.16
			4.000	5.000	1.482	-1.540	3502	0.660	0.820	1.41	1.82	1.73
	4	6.5	4.000	5.000	1.689	-1.733	3745	0.640	0.820	1.47	1.91	1.66
			4.000	5.000	1.912	-1.944	4001	0.630	0.820	1.26	1.63	1.30
	4	8.5	4.000	5.000	2.148	-2.166	4406	0.620	0.820	1.07	1.39	1.00
	4	10.5	4.000	5.000	2.379	-2.384	4806	0.610	0.820	1.33	1.73	1.16
	4	14.5	4.000	5.000	2.639	-2.624	5234	0.600	0.820	1.35	1.75	1.07
	4	28.5	4.000	5.000	2.896	-2.871	5699	0.600	0.830	1.52	1.97	1.14
	6	44.5	4.000	5.000	3.180	-3.130	6153	0.590	0.830	1.51	1.96	1.02
	6	50.5	4.100	5.000	3.477	-3.400	6619	0.580	0.830	1.63	2.12	1.03
	6	50.5	4.700	5.500	3.786	-3.679	7096	0.570	0.830	1.60	2.07	1.00
	6	44.5	5.200	6.100	4.116	-3.985	7646	0.570	0.830	1.65	2.14	1.01
	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			4.000	5.000	0.878	-0.986	3525	0.700	0.800	1.81	2.35	2.73
			4.000	5.000	1.016	-1.133	3847	0.690	0.800	1.89	2.45	2.64
			4.000	5.000	1.171	-1.293	4173	0.680	0.810	1.61	2.08	2.16
			4.000	5.000	1.332	-1.455	4132	0.660	0.810	1.68	2.18	2.10
			4.000	5.000	1.506	-1.633	4429	0.650	0.810	1.45	1.88	1.72
			4.000	5.000	1.691	-1.819	4610	0.640	0.810	1.24	1.61	1.37
			4.000	5.000	1.885	-2.013	5051	0.630	0.810	1.29	1.68	1.31
	4	6.5	4.000	5.000	2.081	-2.209	5493	0.620	0.820	1.11	1.44	1.02
	4	10.5	4.000	5.000	2.295	-2.420	5959	0.610	0.820	1.16	1.50	1.01
	4	14.5	4.000	5.000	2.514	-2.642	6475	0.610	0.820	1.37	1.78	1.10
	4	18.5	4.000	5.000	2.723	-2.850	6936	0.600	0.820	1.39	1.80	1.03
	6	40.5	4.000	5.000	2.963	-3.083	7440	0.590	0.820	1.56	2.02	1.09
	6	58.5	4.200	5.000	3.213	-3.325	7957	0.580	0.820	1.55	2.01	1.00
	6	48.5	4.700	5.600	3.480	-3.591	8551	0.580	0.820	1.64	2.13	1.04
	6	54.5	5.100	6.100	3.733	-3.836	9072	0.570	0.820	1.52	2.09	1.02
	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 ℄ OF GIRDER

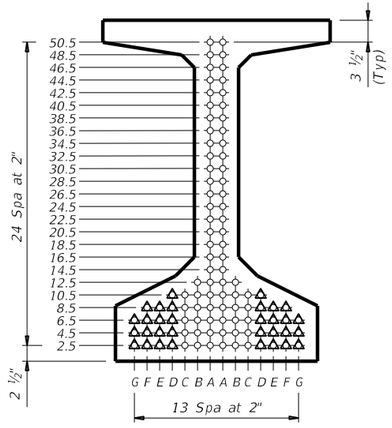
(1) Based on the following allowable stresses (ksi):

Compression = 0.65 f'ci

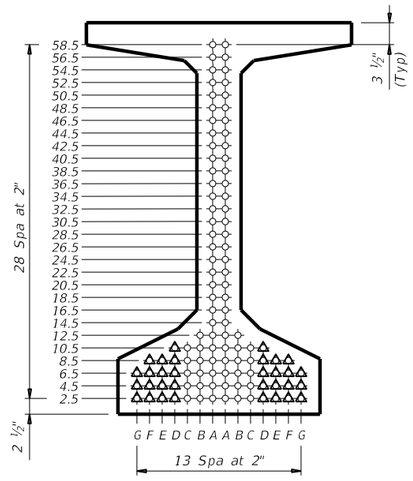
Tension = $0.24\sqrt{f'ci}$

Optional designs must likewise conform.

(2) Portion of full HL93.



TYPE Tx54



TYPE Tx62

HL93 LOADING

SHEET 2 OF 2

Texas Department of Transportation

Bridge Division Standard

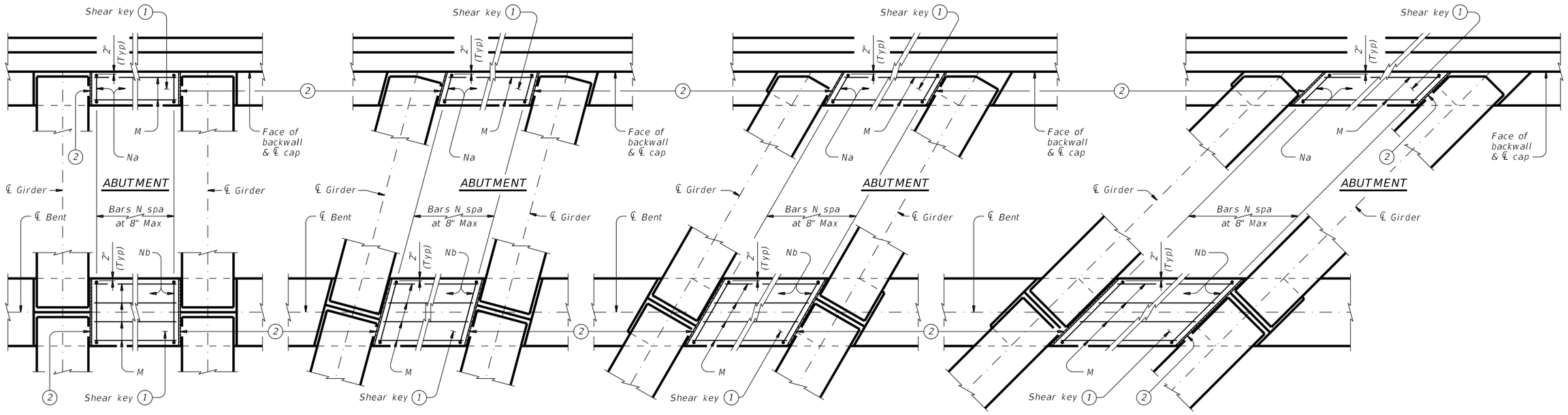
PRESTRESSED CONCRETE I-GIRDER STANDARD DESIGNS

24' ROADWAY

IGSD-24

FILE: IG-IGSD24-21.dgn	DN: EFC	CK: AJF	DW: EFC	CK: TAR
©TxDOT August 2017	CONT	SECT	JOB	HIGHWAY
REVISIONS 10-19: Redesigned girders. 1-21: Added load rating.	0920	03	082, ETC	W PINESHADOWS DR, ETC
	DIST	COUNTY		SHEET NO.
	BMT	HARDIN, ETC		144

DATE: 2/26/2024 2:26:50 PM
FILE: pw://ljg-pw.bentley.com:ljg-pw-01/Documents/TxDOT/PM8016-230I CEC MA4/Clemmons Gully Off-System Bridge/400 Production/4 - Design/Bridge/STANDARDS/IG-IGSK-17.dgn



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 ¼" 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.

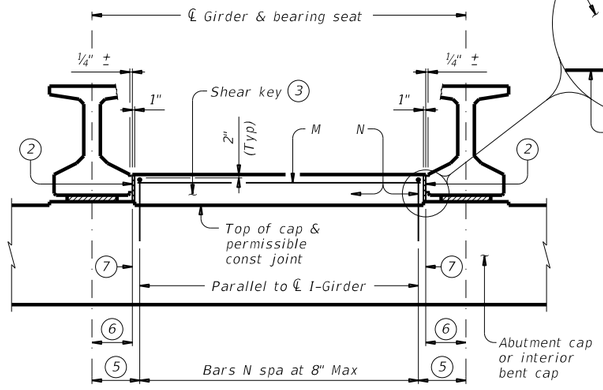
(5) With No Skew = 1'-8 ¼", measured along ℄ cap.
With Skew = 1'-8 ¼" ✱ Cos Skew, measured along ℄ cap.

(6) With No Skew = 1'-4 ¼", measured along ℄ cap.
With Skew = 1'-4 ¼" ✱ Cos Skew, measured along ℄ cap.

(7) Face of UHMW polyethylene wear pad. Smooth side of pad facing girder.

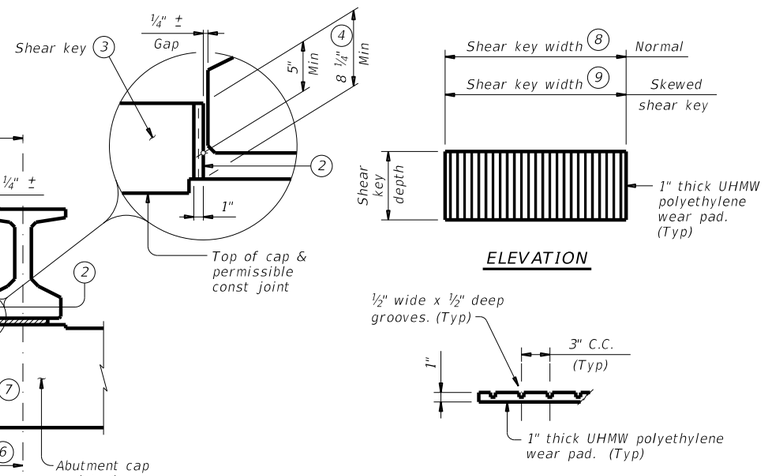
(8) Abutments = ½ Cap width.
Interior bents = Cap width.

(9) Abutments = ½ Cap width ✱ Cos Skew.
Interior bents = Cap width ✱ Cos Skew.

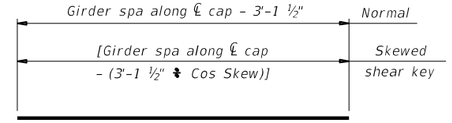


PARTIAL ELEVATION OF ABUTMENT OR INTERIOR BENT CAP (1)

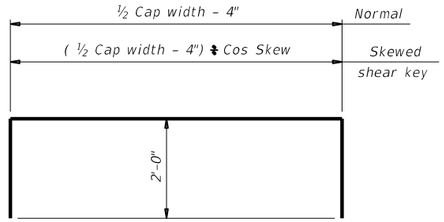
Showing shear key with girder Type Tx46. Other I-Girder types similar.



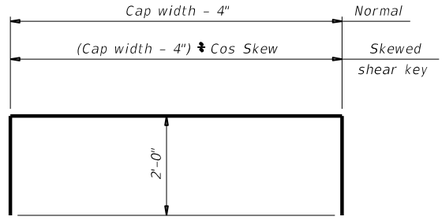
ULTRA HIGH MOLECULAR WEIGHT (UHMW) POLYETHYLENE WEAR PAD DETAILS



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.

Texas Department of Transportation

Bridge Division Standard

SHEAR KEY DETAILS
PRESTR CONCRETE I-GIRDERS

IGSK

FILE: IG-IGSK-17.dgn	DN: TxDOT	CK: TxDOT	DW: JTR	CK: AES
©TxDOT August 2017	CONT	SECT	JOB	HIGHWAY
REVISIONS	0920	03	082, ETC	W PINESHADOWS DR, ETC
	DIST	COUNTY		SHEET NO.
	BMT	HARDIN, ETC		145

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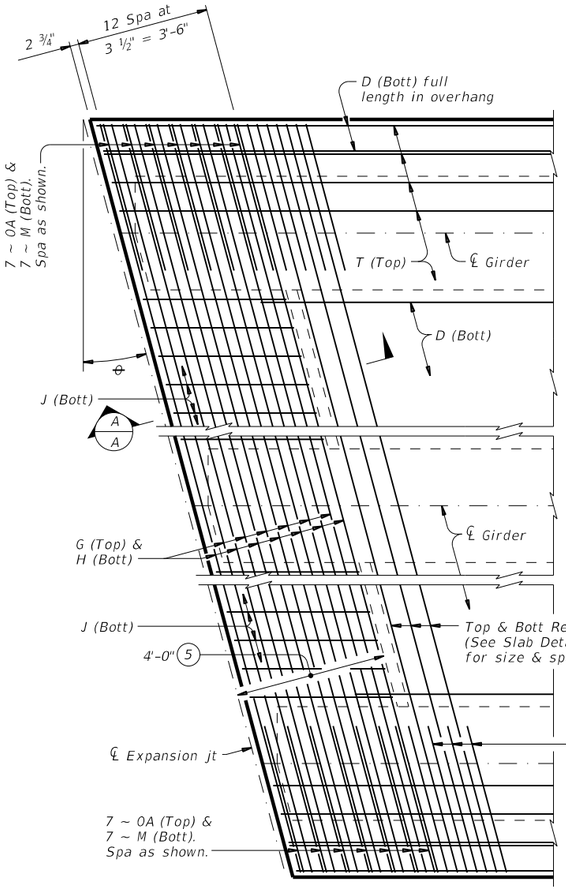
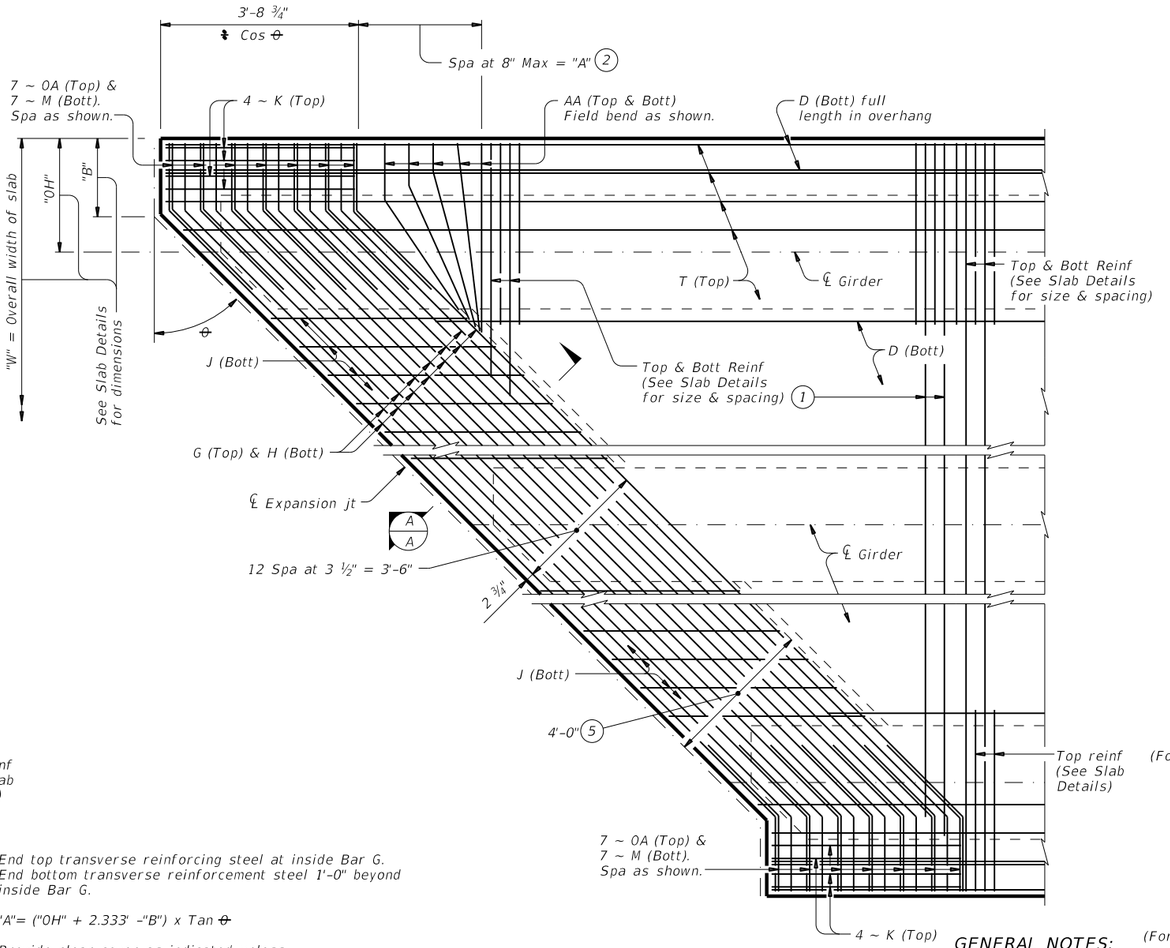


PARTIAL PLAN FOR SLABS WITHOUT BREAKBACK



PARTIAL PLAN FOR SLABS WITH BREAKBACK

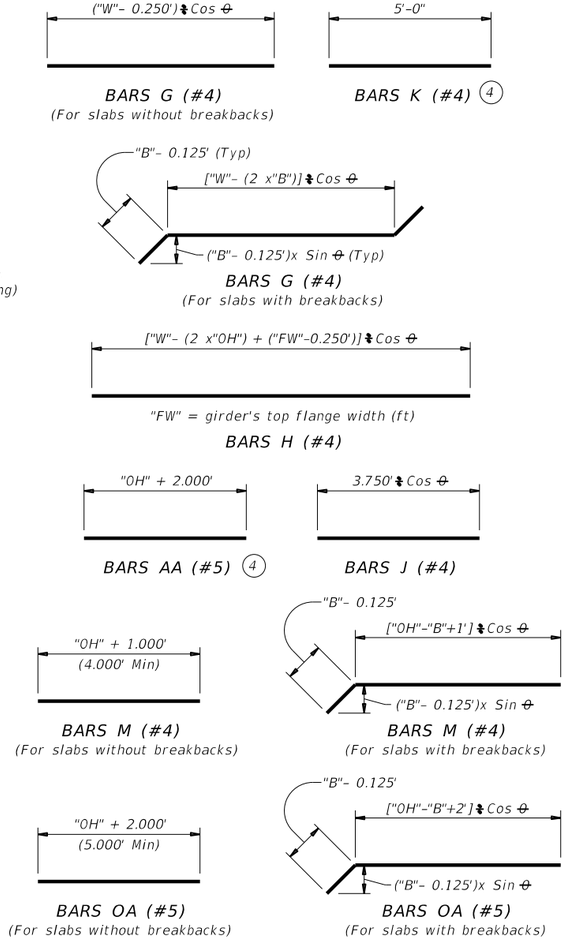
(1) End top transverse reinforcing steel at inside Bar G. End bottom transverse reinforcement steel 1'-0" beyond inside Bar G.

(2) "A"= ("0H" + 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.



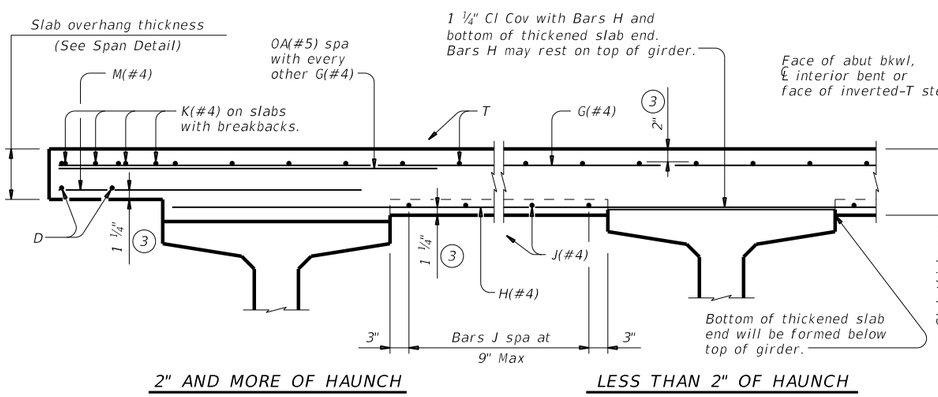
GENERAL NOTES:

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"

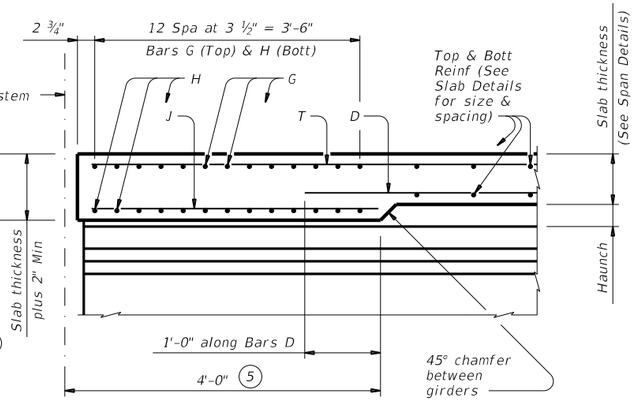
Cover dimensions are clear dimensions, unless noted otherwise.
Reinforcing bar dimensions shown are out-to-out of bar.



2" AND MORE OF HAUNCH — LESS THAN 2" OF HAUNCH

TYPICAL TRANSVERSE SECTION

(Showing Prestressed Conc I-Girders at ℄ Brg)



SECTION A-A

(Showing with 2" and more of haunch)

HL93 LOADING

Texas Department of Transportation — Bridge Division Standard

THICKENED SLAB END DETAILS
PRESTRESSED CONCRETE I-GIRDER SPANS

IGTS

FILE: IG-IGTS-17.dgn	DN: TxDOT	CK: TxDOT	DW: JTR	CK: TxDOT
©TxDOT August 2017	CONT	SECT	JOB	HIGHWAY
REVISIONS	0920	03	082, ETC	W PINESHADOWS DR, ETC
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	BMT	HARDIN, ETC		146

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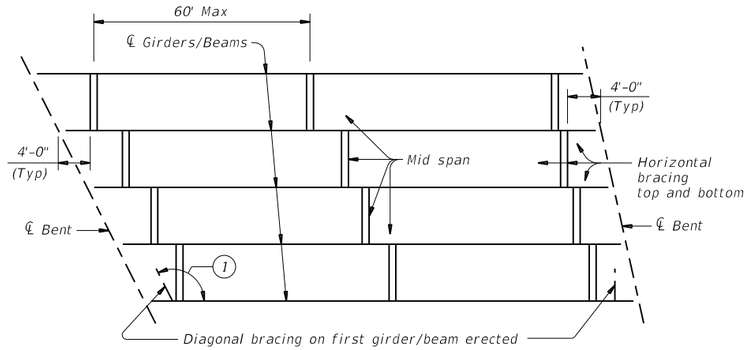
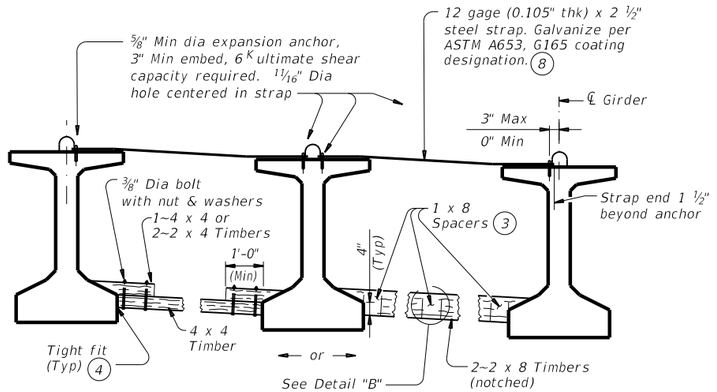
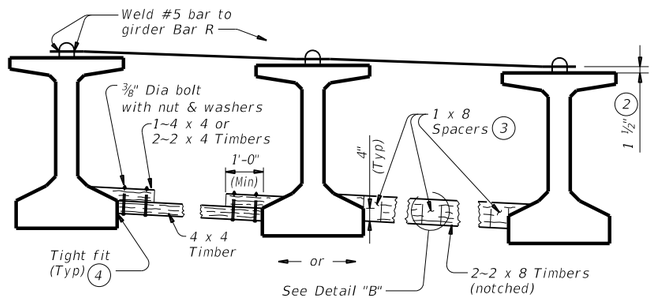


ERECTION BRACING



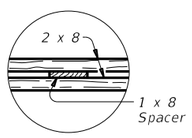
FOR ERECTION BRACING, OPTION 1

(This option is not allowed when slab is formed with PMDF or plywood.)



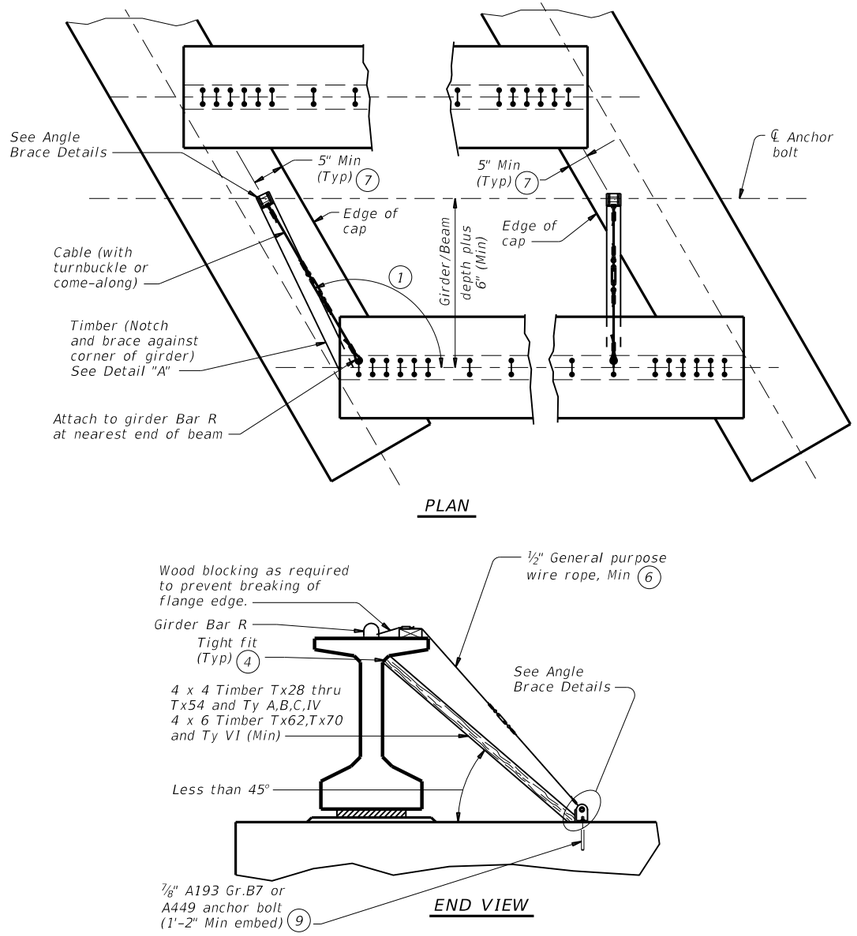
FOR ERECTION BRACING, OPTION 2

HORIZONTAL BRACING DETAILS 5



PLAN

DETAIL "B"

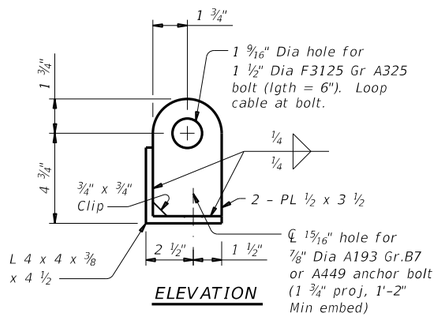


PLAN

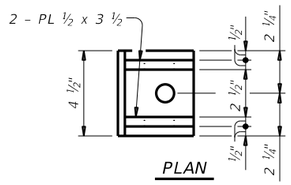
END VIEW

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.

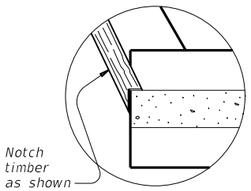
ERECTION BRACING:

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 aginst 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.

Texas Department of Transportation

Bridge Division Standard

MINIMUM ERECTION AND BRACING REQUIREMENTS

PRESTRESSED CONCRETE I-GIRDERS AND I-BEAMS

MEBR(C)

FILE: IG-MEBR(C)-17.dgn	DN: TxDOT	CK: TxDOT	DW: TxDOT	CK: TxDOT
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	DIST	COUNTY		SHEET NO.
	BMT	HARDIN, ETC		147

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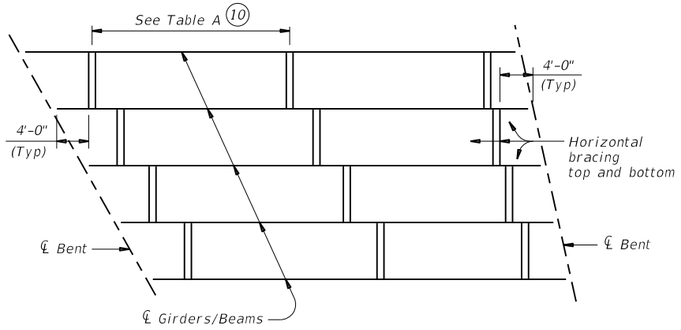


SLAB PLACEMENT BRACING

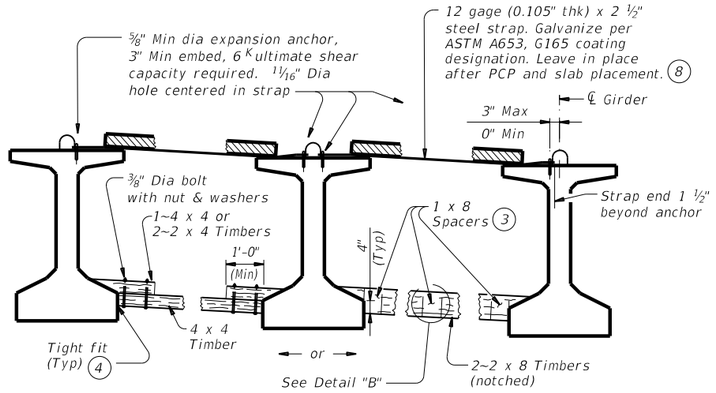
TABLE A

OPTION 1-RIGID BRACING (STEEL STRAP)

Girder or Beam Type	Maximum Bracing Spacing	
	Slab Overhang less than 4'-0" (11)	Slab Overhang 4'-0" and greater (11)
Tx28	¼ points	¼ points
Tx34	¼ points	¼ points
Tx40	¼ points	⅛ points
Tx46	¼ points	⅛ points
Tx54	¼ points	⅛ points
Tx62	¼ points	⅛ points
Tx70	¼ points	⅛ points
A	⅛ points	⅛ points
B	⅛ points	⅛ points
C	⅛ points	⅛ points
IV	¼ points	⅛ points
VI	¼ points	⅛ points

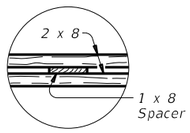
OPTION 2-FLEXIBLE BRACING (NO. 5 OVER PCP)

Girder or Beam Type	Maximum Bracing Spacing	
	Slab Overhang less than 4'-0" (11)	Slab Overhang 4'-0" and greater (11)
Tx28	¼ points	⅛ points
Tx34	¼ points	⅛ points
Tx40	¼ points	⅛ points
Tx46	¼ points	⅛ points
Tx54	¼ points	⅛ points
Tx62	¼ points	⅛ points
Tx70	¼ points	⅛ points
A	2.0 ft	1.5 ft
B	3.0 ft	2.0 ft
C	4.5 ft	2.0 ft
IV	¼ points	4.0 ft
VI	¼ points	4.0 ft



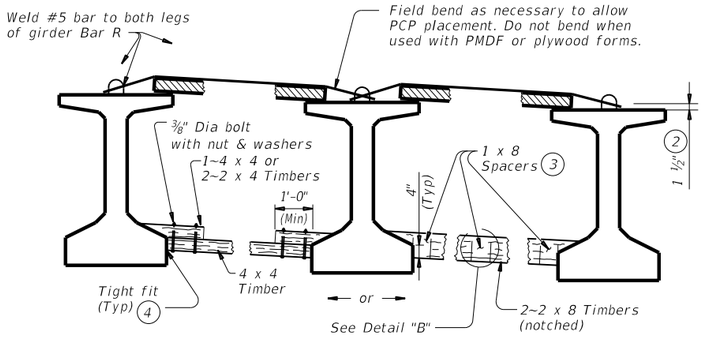
FOR SLAB PLACEMENT BRACING, OPTION 1 - RIGID

(Showing slab formed with PCP. This option is not allowed when slab is formed with PMDF or plywood.)



PLAN

DETAIL "B"



FOR SLAB PLACEMENT BRACING, OPTION 2 - FLEXIBLE

(Showing slab formed with PCP.)

HORIZONTAL BRACING DETAILS (5)

(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 (¼ and ⅛ 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".

Texas Department of Transportation

Bridge Division Standard

MINIMUM ERECTION AND BRACING REQUIREMENTS

PRESTRESSED CONCRETE I-GIRDERS AND I-BEAMS

MEBR(C)

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©TxDOT August 2017	CONT	SECT	JOB	HIGHWAY
REVISIONS	0920	03	082, ETC	W PINESHADOWS DR, ETC
	DIST	COUNTY		SHEET NO.
	BMT	HARDIN, ETC		148

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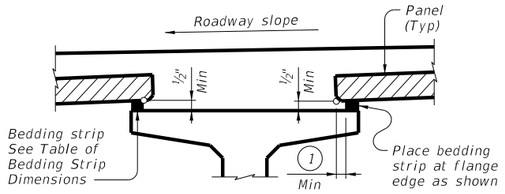
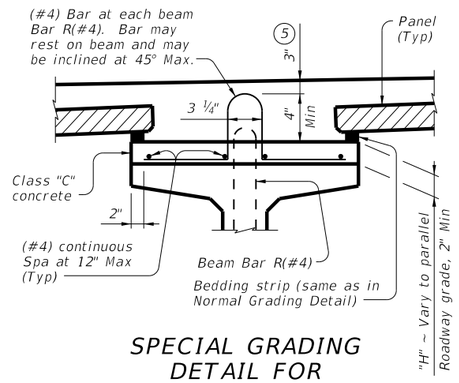


NORMAL GRADING DETAIL (3)

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



SPECIAL GRADING DETAIL FOR CONCRETE BEAMS

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

TABLE OF BEDDING STRIP DIMENSIONS		
WIDTH	HEIGHT (4)	
	Min	Max
1" (Min)	½"	2"
1 ¼"	½"	2 ½"
1 ½"	½"	3"
1 ¾"	½"	3 ½"
2"	½"	4"
2 ¼"	½"	4 ½" (2)
2 ½"	½"	5" (2)
2 ¾"	½"	5 ½" (2)
3" (Max)	½"	6" (2)

(1) 2" Min for I-girders, 1 ½" Min for all other beam types.

(2) Allowed for prestressed concrete 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 ¼" 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 ¼". 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 ½" 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 ¼" deep, in the top of the bedding strips at 8' o.c..

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 ½" 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 ½". 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.

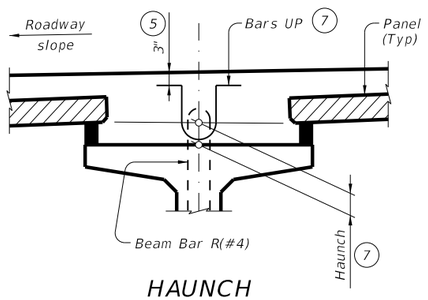
These details are to be used in conjunction with the Span Details, PCP-FAB and other applicable standard drawings.

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".

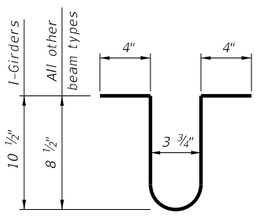
Cover dimensions are clear dimensions, unless noted otherwise.

Reinforcing bar dimensions shown are out-to-out of bar.

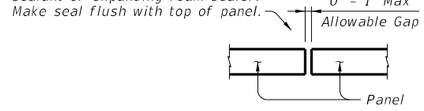


HAUNCH REINFORCING DETAIL

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

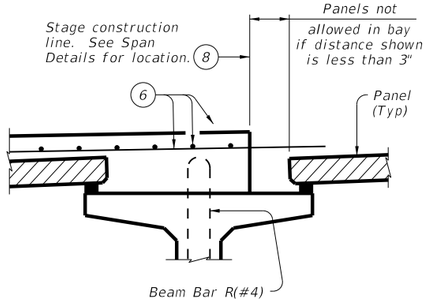


BARS UP (#4) (7)

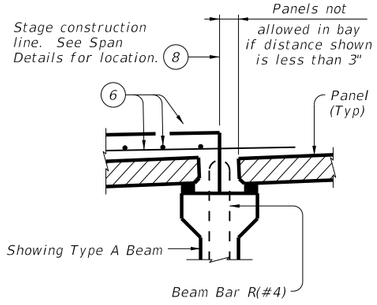


PANEL JOINTS

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



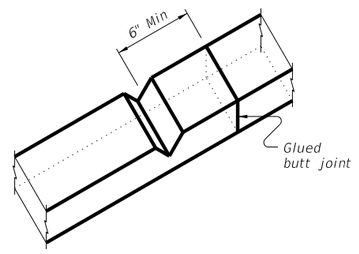
PRESTR CONC I-GIRDERS



PRESTR CONC I-BEAMS

STAGE CONSTRUCTION LIMITATIONS

(Other beam types similar)



BEDDING STRIP DETAIL (9)

HL93 LOADING SHEET 1 OF 4

Texas Department of Transportation — Bridge Division Standard

PRESTRESSED CONCRETE PANELS
DECK DETAILS

PCP

FILE: MS-PCP-23.dgn	DN: TxDOT	CK: TxDOT	DW: JTR	CK: JMH
©TxDOT April 2019	CONT	SECT	JOB	HIGHWAY
REVISIONS	0920	03	082, ETC	W PINESHADOWS DR, ETC
3/2023: Removed top flange tension limit.	DIST	COUNTY		SHEET NO.
	BMT	HARDIN, ETC		149

DATE: 2/26/2024 2:27:03 PM
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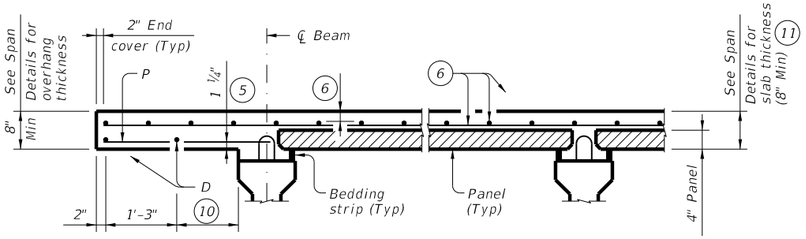
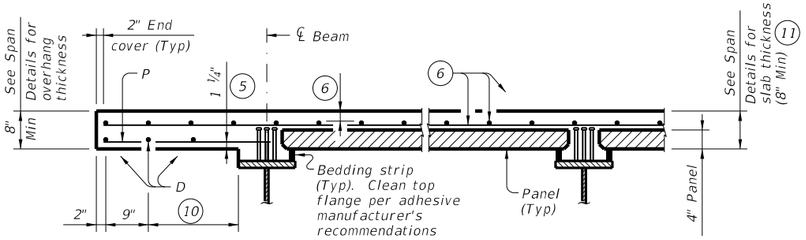
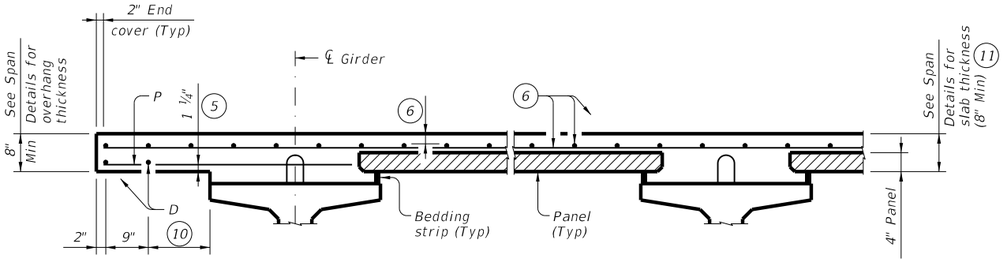


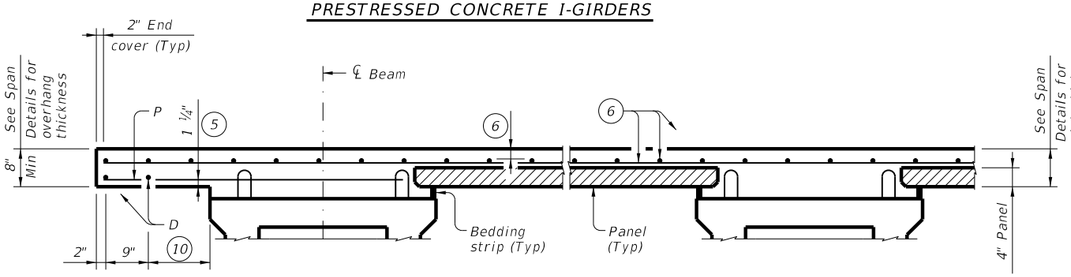
PRESTRESSED CONCRETE I-BEAMS



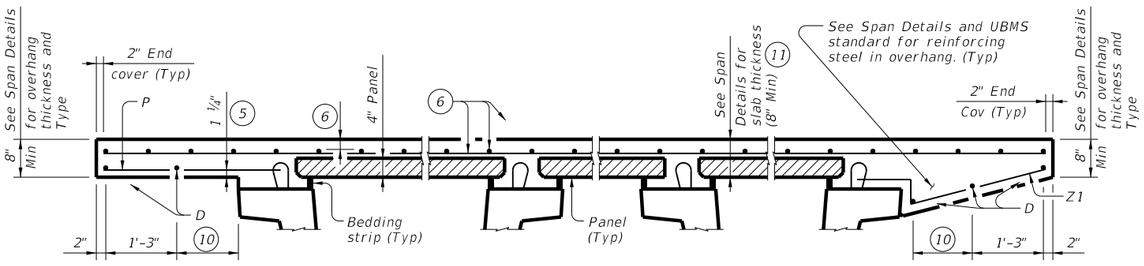
STEEL BEAMS (13)



PRESTRESSED CONCRETE I-GIRDERS



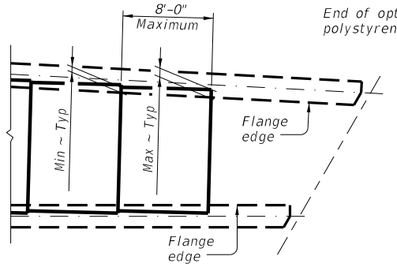
PRESTRESSED CONCRETE X-BEAMS



NORMAL OVERHANG WITH PRESTR CONC U-BEAMS

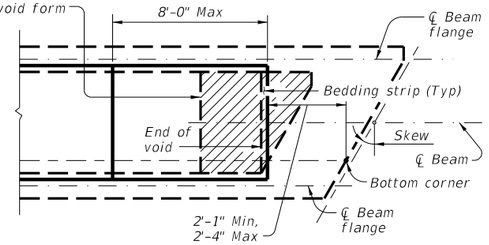
SLOPED OVERHANG WITH PRESTR CONC U-BEAMS

TYPICAL PART TRANSVERSE SECTIONS



AT FLARED BEAMS OR GIRDERS

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



OVER CONC U-BEAMS

PART PLANS OF PANEL PLACEMENT

(5) Provide clear cover as indicated unless otherwise shown on Span Details.

(6) See Span Details and Thickened Slab End Details for top slab reinforcement and clear cover. Transverse top slab reinforcement may rest on top of prestressed concrete panels if necessary to maintain clear cover.

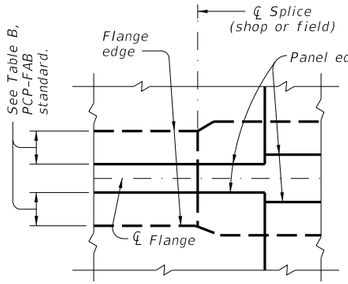
(9) Butt adjacent bedding strips together with adhesive. Cut v-notches, approx ¼" deep, in the top of the bedding strips at 8' o.c..

(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.

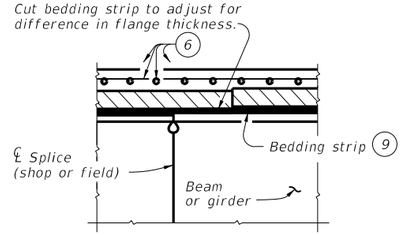
(12) Field adjust Bars Z1(#4) to match actual slope of slab overhangs. Width of slab overhang will vary along span with curved slab edges. Adjust Bar Z1(#4) dimensions to maintain proper cover. Bars Z2(#4) are located at Inverted-Tee stems only.

(13) Panels are allowed over top tension flanges, as approved by the Engineer. See Span Details for additional top mat reinforcement required in tension zones. Location of concrete placement sequence boundaries and bolted field splices should be considered by the contractor in determining panel limits.



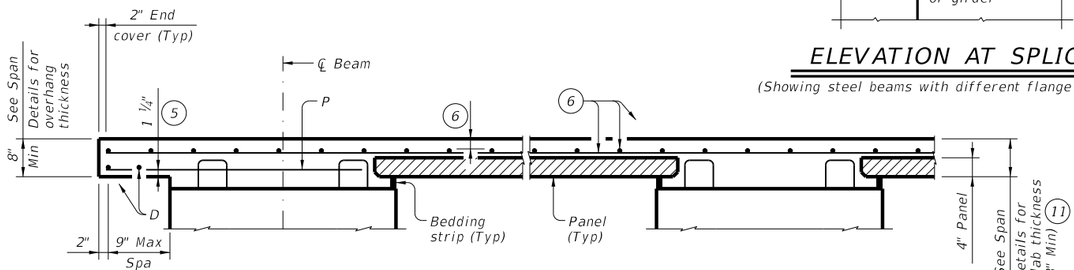
PLAN AT SPLICE

(Showing steel beams with flange width transition)



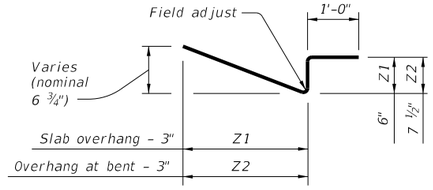
ELEVATION AT SPLICE

(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)

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Texas Department of Transportation

Bridge Division Standard

PRESTRESSED CONCRETE PANELS
DECK DETAILS

PCP

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©TxDOT April 2019	CONT	SECT	JOB	HIGHWAY
REVISIONS	0920	03	082, ETC	W PINESHADOWS DR, ETC
3/2023: Removed top flange tension limit.	DIST	COUNTY		SHEET NO.
	BMT	HARDIN, ETC		150

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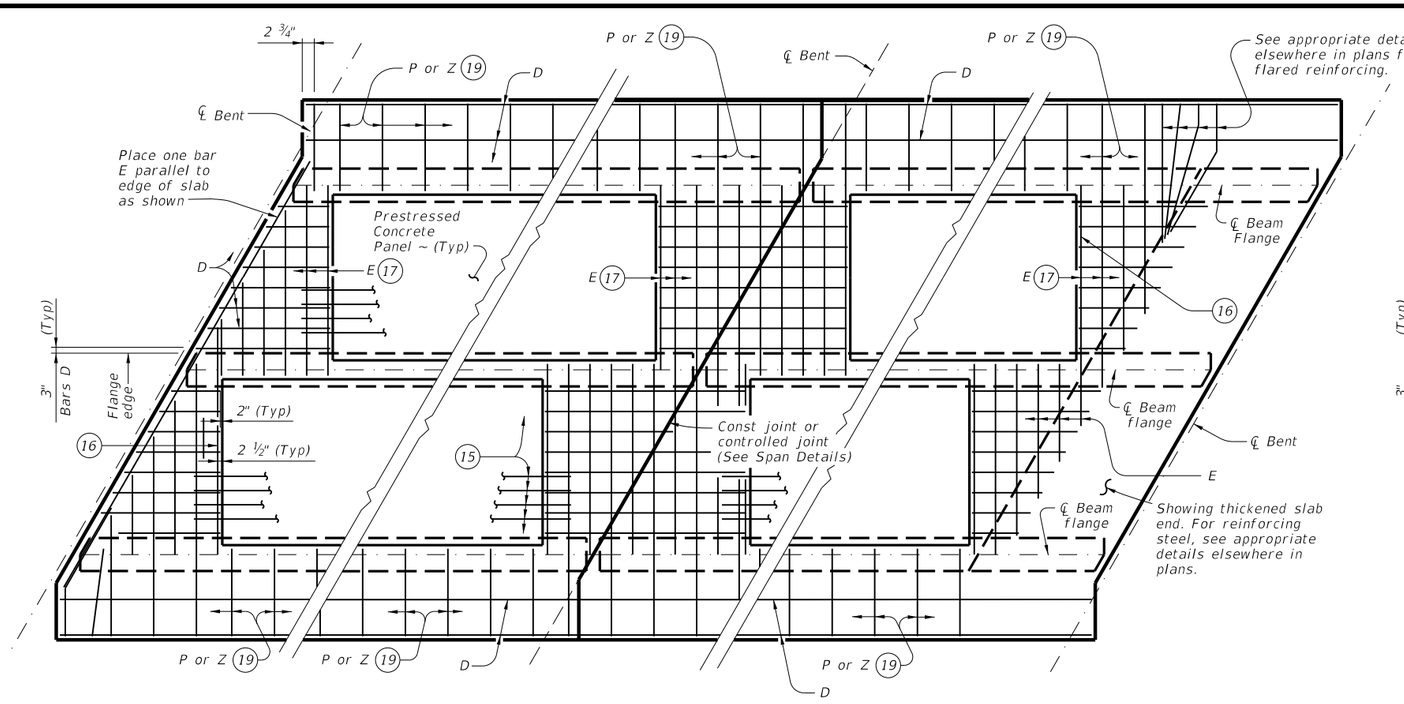
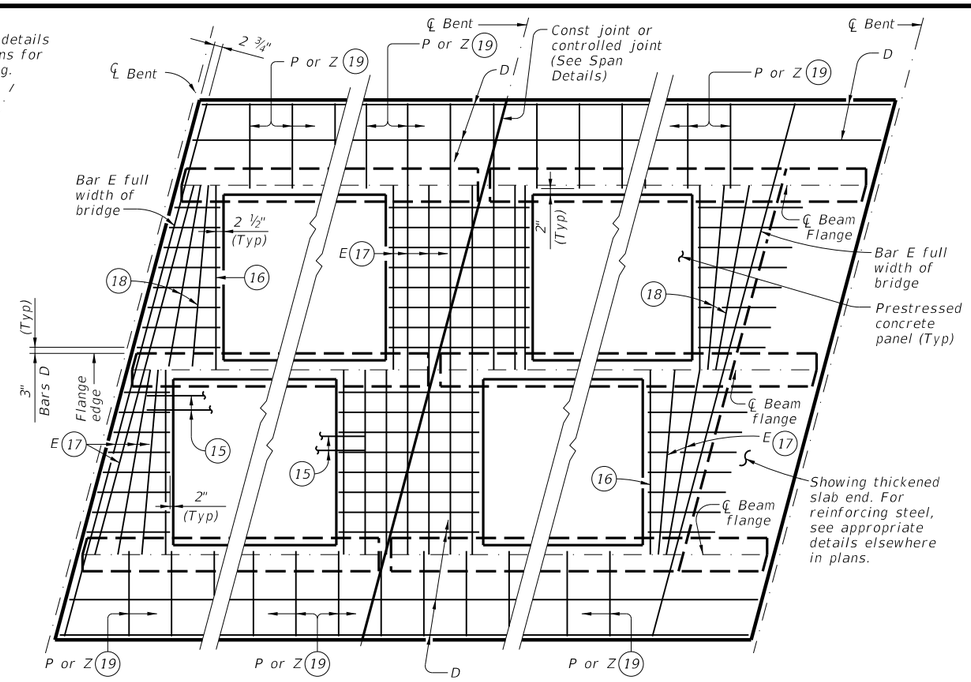


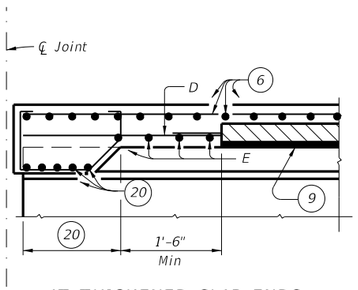
AT ALL SPAN ENDS UNLESS NOTED OTHERWISE | AT INTERIOR BENTS | AT THICKENED END SLABS

OPTION 1 ~ PLAN OF SLABS WITH NORMAL REINFORCEMENT

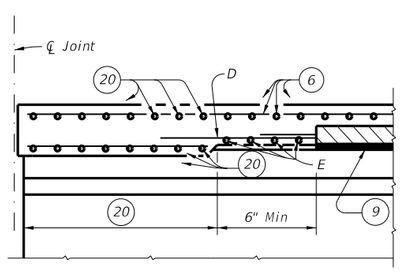


AT ALL SPAN ENDS UNLESS NOTED OTHERWISE | AT INTERIOR BENTS | AT THICKENED END SLABS

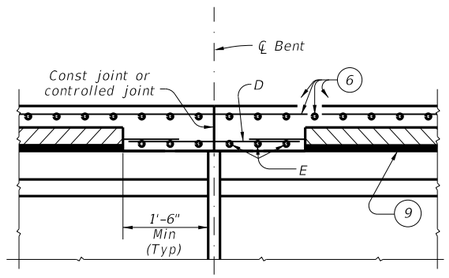
OPTION 1 ~ PLAN OF SLABS WITH SKEWED REINFORCEMENT



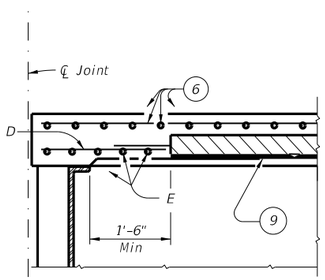
AT THICKENED SLAB ENDS FOR PRESTR CONCRETE U-BEAMS



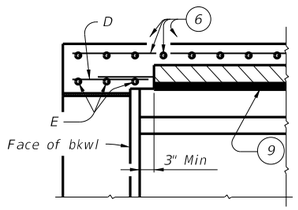
AT THICKENED SLAB ENDS FOR PRESTR CONCRETE I-BEAMS AND STEL BEAMS



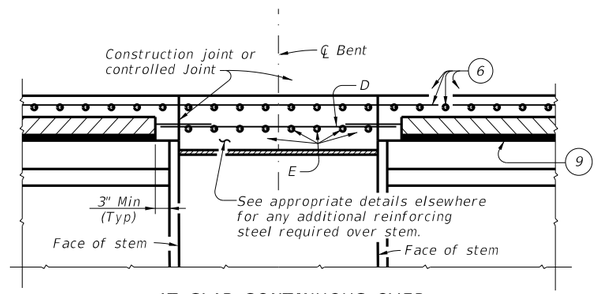
AT SLAB CONTINUOUS OVER CONVENTIONAL INTERIOR BENTS FOR ALL SIMPLE SPAN BEAMS



AT CONVENTIONAL END DIAPHRAGMS FOR STEEL BEAMS



AT SLAB OVER ABUTMENT BACKWALL FOR ALL BEAMS



AT SLAB CONTINUOUS OVER INVERTED-T BENTS FOR ALL BEAMS

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 ¼" 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

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Texas Department of Transportation | Bridge Division Standard

PRESTRESSED CONCRETE PANELS
DECK DETAILS

PCP

FILE: MS-PCP-23.dgn	DN: TxDOT	CK: TxDOT	DW: JTR	CK: JMH
©TxDOT April 2019	CONT	SECT	JOB	HIGHWAY
REVISIONS	0920	03	082, ETC	W PINESHADOWS DR, ETC
3/2023: Removed top flange tension limit.	DIST	COUNTY		SHEET NO.
	BMT	HARDIN, ETC		151

DATE: 2/26/2024 2:27:04 PM
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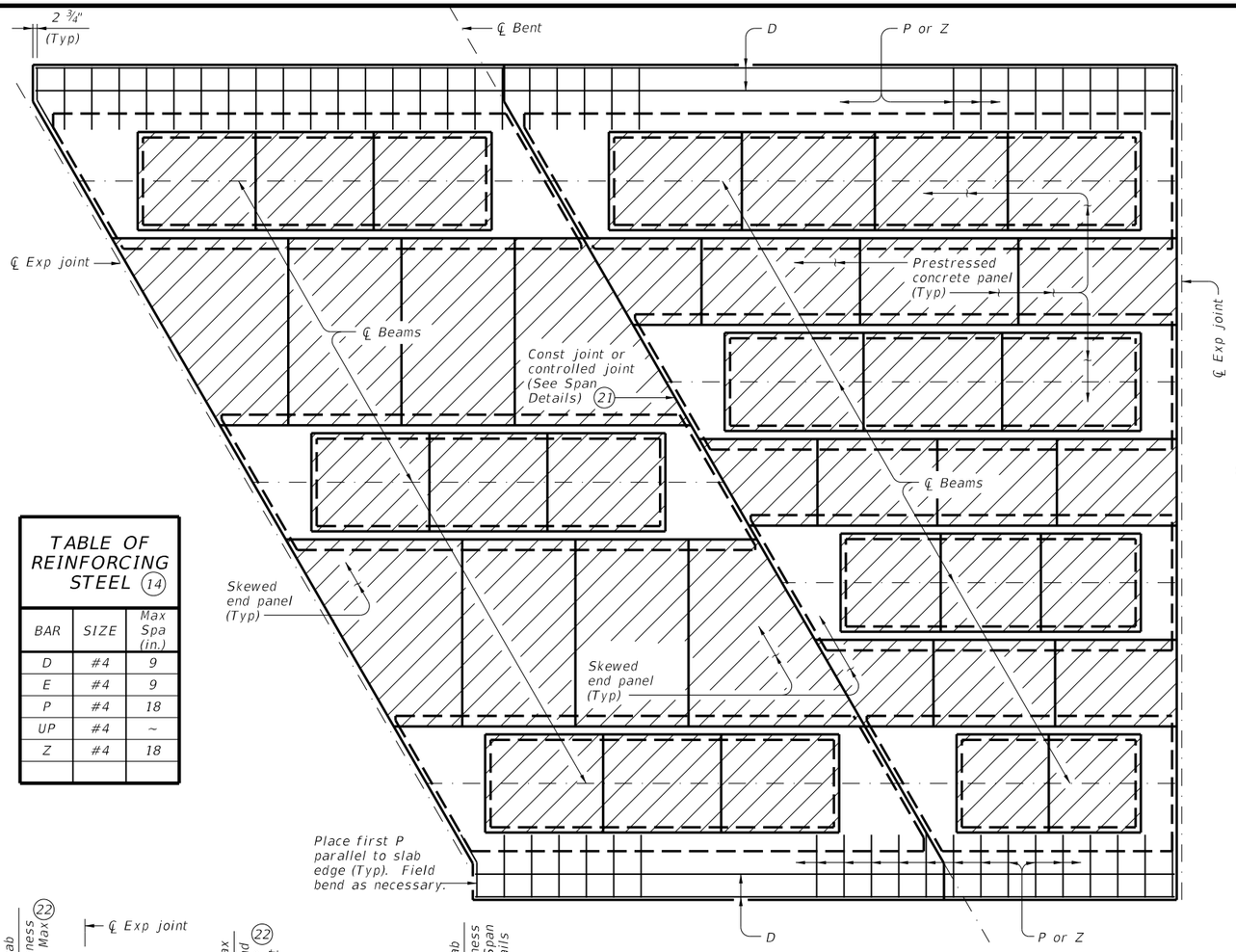
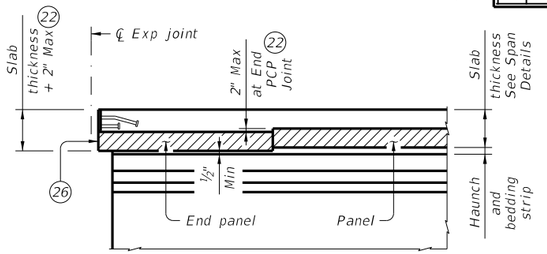


OPTION 2 ~ PLAN OF SLAB

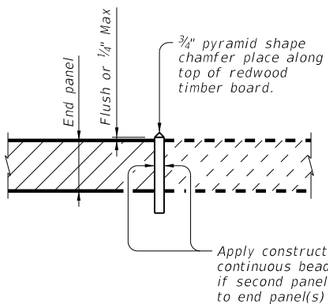
(Showing U-Beams; other beams similar)

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



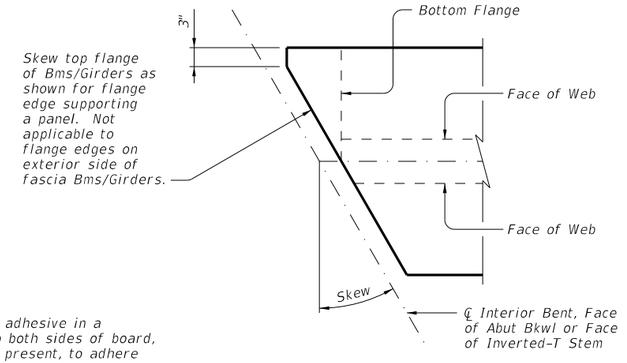
JOINTS (BETWEEN BEAMS/GIRDERS OR AT INV-T STEM)

For SEJ-B, SEJ-M, SEJ-S(0), AJ, and Type A expansion joints only.



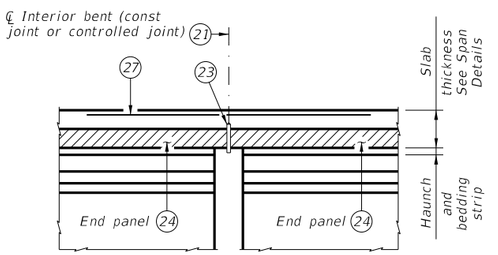
ELEVATION EXAMPLE OF END PANEL AND TIMBER BOARD (23)

See "Option 2 ~ Elevation At Beam Ends".



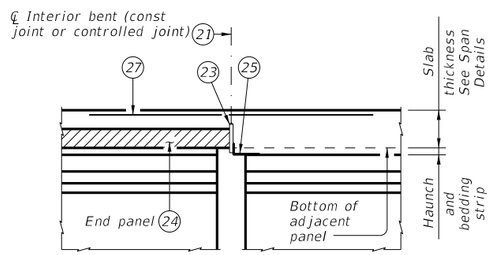
OPTION 2 ~ SHOWING MODIFICATION TO BEAM/GIRDER TOP FLANGE FOR SKEWS OVER 5°

Showing I-Beam/I-Girder, U-Beams and Steel Beams similar.



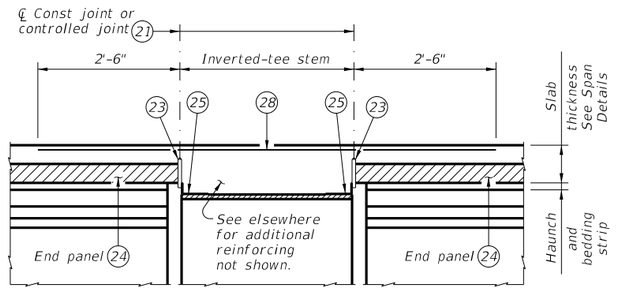
CONVENTIONAL INTERIOR BENT

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)

(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 ½" 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 ½" thick.

(23) ¾" thick redwood timber board, leave in place. Redwood timber board placed flush with top of panel or within ¼" Max above panel. Place ¾" pyramid shape chamfer along top of timber board. See "Elevation Example of End Panel and Timber Board". Place straight, within ¼" 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 ½" of ¾" thick board.

(25) Permanent galvanized steel sheet form. Removable formwork is acceptable.

(26) Place end panel within ½" 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.

SPECIAL OPTION 2 CONSTRUCTION NOTES:

When Option 2 is chosen bottom mat of thickened end slab reinforcing is not required. Use the same top mat as shown on the Thickened Slab End Details sheet.

Placing panels adjacent to expansion joints and bent centerlines prior to completing interior panel placement is recommended. Saw cutting panels to fit is acceptable when approved by the Engineer. Minimum distance from a saw cut edge to a panel strand is 1 ½".

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.

HL93 LOADING SHEET 4 OF 4

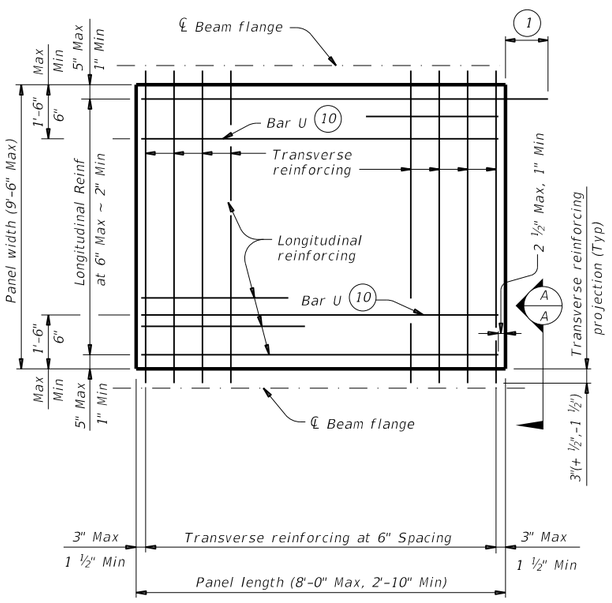
Texas Department of Transportation | Bridge Division Standard

PRESTRESSED CONCRETE PANELS
DECK DETAILS

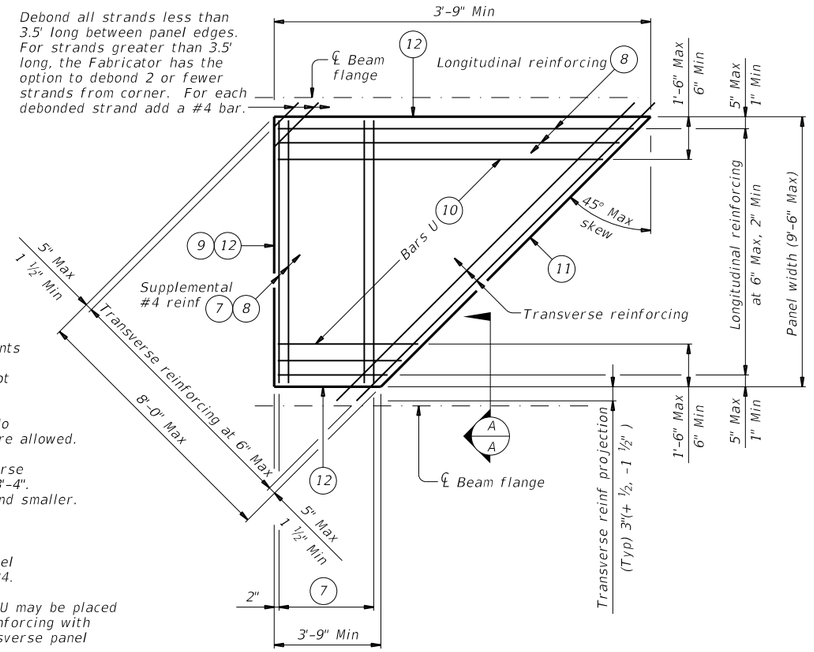
PCP

FILE: MS-PCP-23.dgn	DN: TxDOT	CK: TxDOT	DW: JTR	CK: JMH
©TxDOT April 2019	CONT	SECT	JOB	HIGHWAY
REVISIONS	0920	03	082, ETC	W PINESHADOWS DR, ETC
3/2023: Removed top flange tension limit.	DIST	COUNTY		SHEET NO.
	BMT	HARDIN, ETC		152

DATE: 2/26/2024 2:27:09 PM
FILE: pw://ljg-pw.bentley.com:ljg-pw-01/Documents/TxDOT/PM8016-2301 CEC WA4/Clemmons Gully Off-System Bridge/400 Production/4 - Design/Bridge/STANDARDS/MS-PCP-FAB-19.dgn



TYPICAL NON-SKEWED PANEL PLAN



TYPICAL SKEWED END PANEL PLAN

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

1. At connection with cast-in-place slab, extend longitudinal panel reinforcement 1'-0" (+2",-0") past panel end. Alternatively, provide (#3) x 2'-0" dowels at 6" Max Spacing and extend dowels 1'-0" past panel end.
2. Four loops required per panel.
3. Four loops required per panel. ⅜" or ½" 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 ½" Max, 1" Min.
9. Recess strands on indicated panel edge in accordance with Item 424.
10. At the fabricator's option, Bars U may be placed parallel to transverse panel reinforcing with horizontal legs in plane of transverse panel reinforcing.
11. Use length of indicated panel edge as panel width for purpose of determining type of transverse reinforcing.
12. Timber form work permissible this edge.

TABLE A (4) (5)			
Beam Type	Normal (In.)	Min (In.)	Max (In.)
A	3	2 ½	3 ½
B	3	2 ½	3 ½
C	4	3	4 ½
IV	6	4	7 ½
VI	6 ½	4 ½"	8 ½
U40 – 54	5 ½	5 ½	7
Tx28-70	6	5	7 ½
XB20 – 40	4	3	4 ½
XSB12 – 15	4	3	4 ½

TABLE B (4) (5)			
Top Flange Width	Normal (In.)	Min (In.)	Max (In.)
11" to 12"	2 ¾	2 ½	2 ¾
Over 12" to 15"	3 ¼	3	3 ¼
Over 15" to 18"	4	3	4 ¾
Over 18"	5	3 ½	6 ¼

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 ¾" 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 ⅜" or ½" 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 ⅜" or ½" 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.

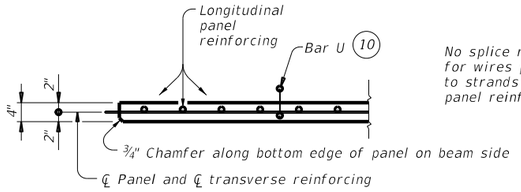
LONGITUDINAL PANEL REINFORCEMENT:

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. ⅜" Dia prestressing strands at 4 ½" Max Spacing (unstressed). No splices allowed.
3. ½" Dia prestressing strands at 6" Max Spacing (unstressed). No splices allowed.
4. Deformed Welded Wire Reinforcement (WWR) (ASTM A1064) providing 0.22 sq in per foot of panel width. Wires larger than D11 not permitted. Provide transverse wires to ensure proper handling of reinforcing. One splice per panel is allowed. See WWR Splice Detail.

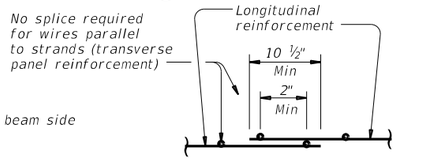
No combination of longitudinal reinforcement options in a panel is allowed.

Place longitudinal panel reinforcement above or below transverse panel reinforcement. Must be placed above transverse panel reinforcement for skewed end panels with supplemental (#4) reinforcement.

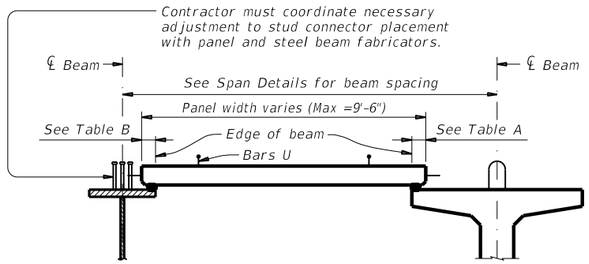


SECTION A-A

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



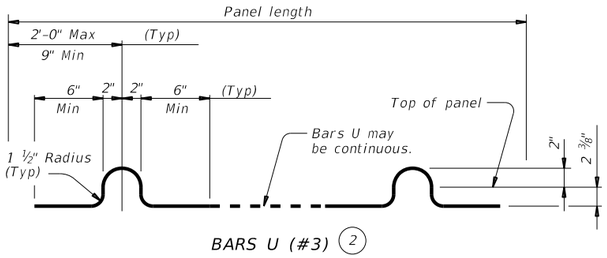
WELDED WIRE REINFORCEMENT (WWR) SPLICE DETAIL (6)



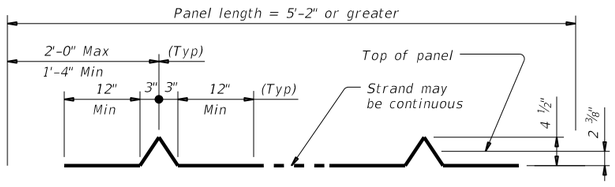
STEEL BEAMS

PRESTRESSED CONCRETE BEAMS OR GIRDERS

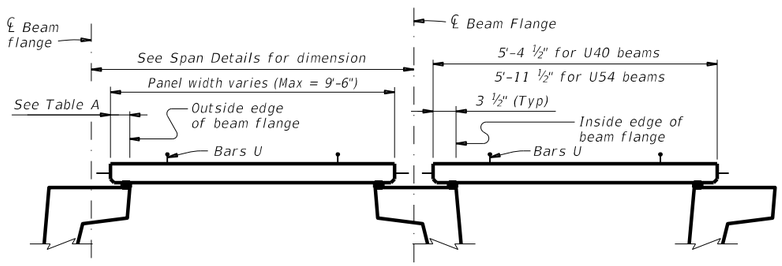
Typ unless noted otherwise



BARS U (#3) (2)



OPTIONAL STRAND FOR BARS U (3)



PRESTRESSED CONCRETE U-BEAMS

TYPICAL SECTIONS FOR DETERMINING PANEL WIDTH

HL93 LOADING

Texas Department of Transportation

Bridge Division Standard

PRESTRESSED CONCRETE PANEL FABRICATION DETAILS

PCP-FAB

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©TxDOT April 2019	CONT	SECT	JOB	HIGHWAY
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	DIST	COUNTY		SHEET NO.
	BMT	HARDIN, ETC		153

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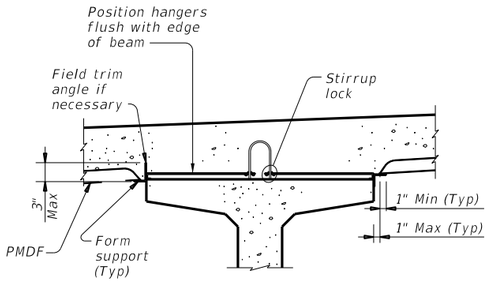
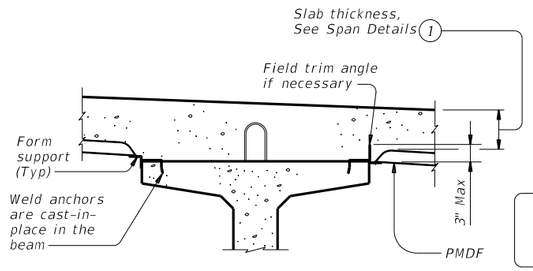
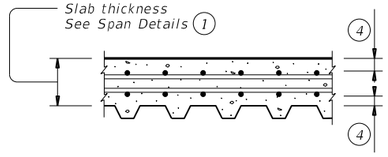


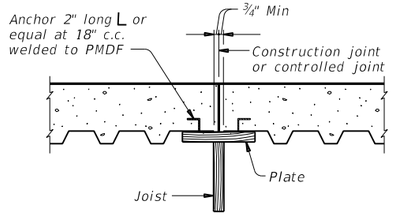
PRESTR CONC I-BEAMS AND I-GIRDERS WITH STIRRUP LOCKS



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

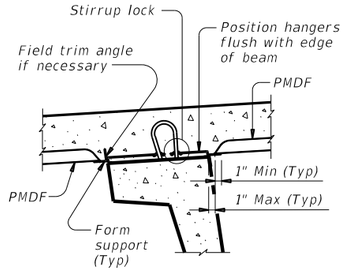


TYP LONGITUDINAL SLAB SECTION

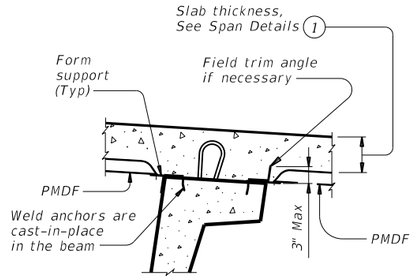


Note: In spans where PMD forms are used, timber forms must be used at construction joints. Adequate provision must be made to support edge of metal form and to provide anchorage of metal form to slab concrete where joined to wood forms.

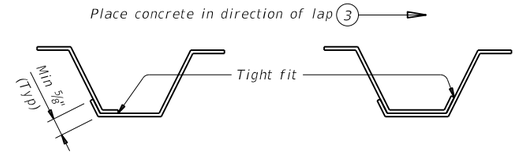
SECTION THRU CONSTRUCTION JOINT



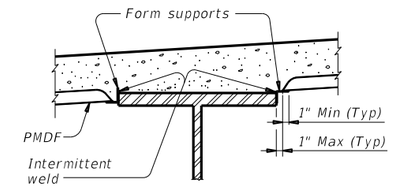
U-BEAMS WITH STIRRUP LOCKS



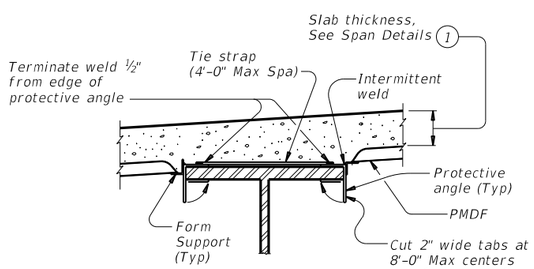
U-BEAMS WITH WELD ANCHORS



SIDE LAP DETAILS

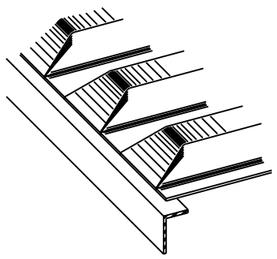


STEEL BEAMS AT COMPRESSION FLANGES



STEEL BEAMS AT TENSION FLANGES (2)

TYPICAL TRANSVERSE SECTIONS



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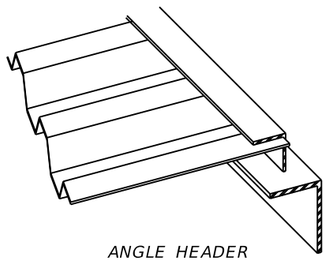

ANGLE HEADER

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

TYPES OF END CLOSURES

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

GENERAL NOTES:

Steel for Permanent Metal Deck Forms (PMDF) and support angles shall conform to ASTM A653, structural steel (SS), with coating designation G165. Steel must have a minimum yield strength of 33 ksi. Minimum thickness of PMDF is 20 gage and that of support angles and protective angles is 12 gage.

Submit two copies of forming plans for PMDF to the Engineer. These plans must show all essential details of proposed form sheets, closures, fasteners, supports, connectors, special conditions and size and location of welds. These plans must clearly show areas of tension flanges for steel beams and provisions for protecting the tension flanges from welding notch effects by inclusion of separating sheet metal or other positive method. These plans must be designed, signed, and sealed by a licensed professional engineer. Department approval of these plans is not required, but the Department reserves the right to require modifications to the plans. The Contractor is responsible for the adequacy of these plans.

The details and notes shown on this standard are to be used as a guide in preparation of the forming plans.

All material, labor, tools and incidentals necessary to form a bridge deck with Permanent Metal Deck Forms is considered subsidiary to Item 422, "Concrete Superstructures".

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.

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 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.

Texas Department of Transportation

Bridge Division Standard

PERMANENT METAL DECK FORMS

PMDF

FILE: MS-PMDF-21.dgn	DN: TxDOT	CK: TxDOT	DW: TxDOT	CK: TxDOT
©TxDOT April 2019	CONT	SECT	JOB	HIGHWAY
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02-20: Modified box note by adding steel beams/girders and subsidiary.	DIST	COUNTY		SHEET NO.
12-21: Updated max deflection for RR.	BMT	HARDIN, ETC		154

DATE: 2/26/2024 2:27:13 PM
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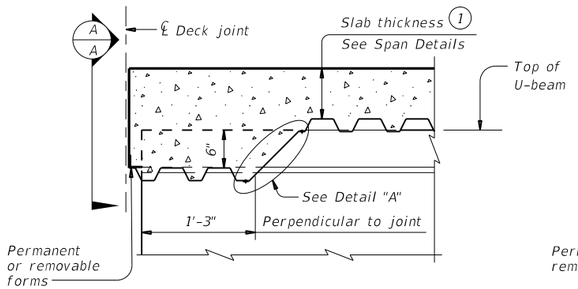
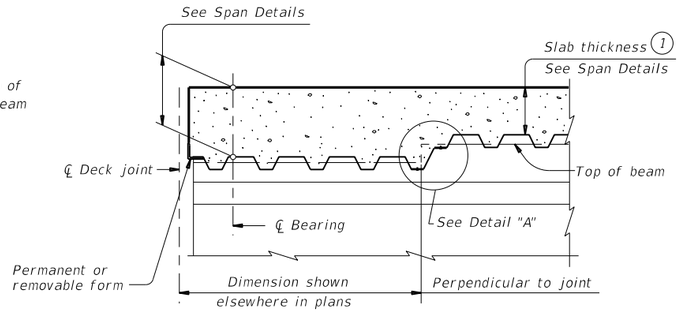
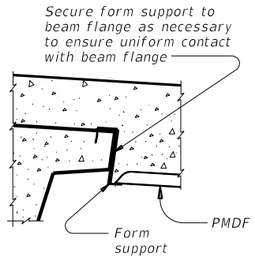


AT THICKENED SLAB END FOR U-BEAMS

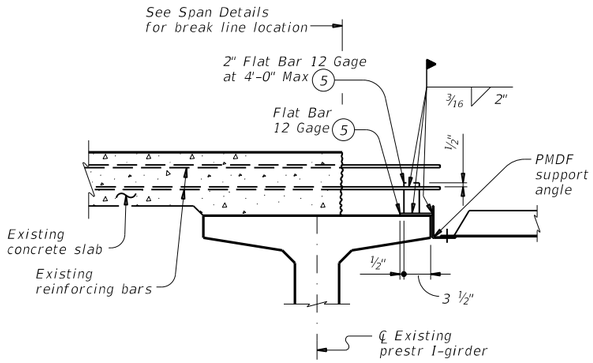


AT THICKENED SLAB END FOR PRESTRESSED I-BEAMS, I-GIRDERS AND STEEL BEAMS

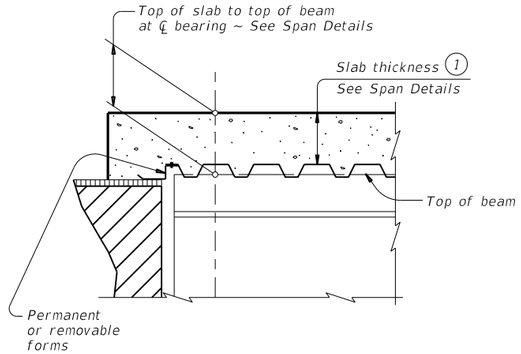
Showing I-beam block-out. No block-out for I-girders or steel beams.



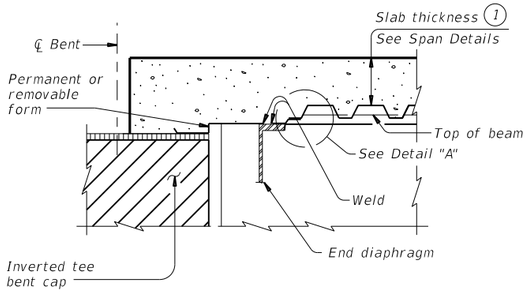
SECTION A-A



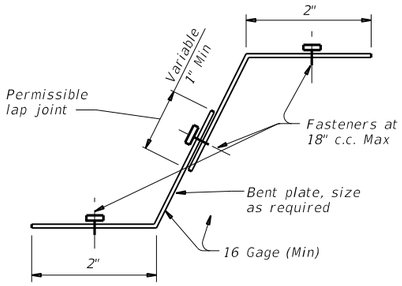
SHOWING PRESTRESSED CONCRETE I-BEAMS, I-GIRDERS AND U-BEAMS



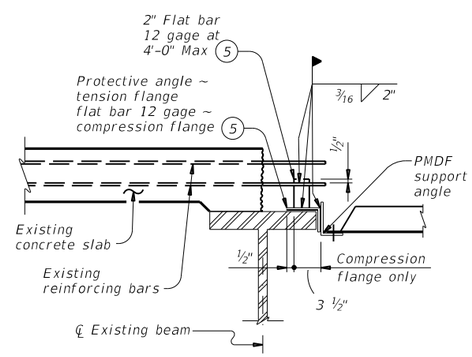
AT SLAB OVER ABUTMENT BACKWALL OR INVERTED-T STEM FOR CONCRETE BEAMS WITHOUT THICKENED SLAB END



AT SLAB OVER INVERTED-T STEM FOR STEEL BEAMS WITHOUT THICKENED SLAB END

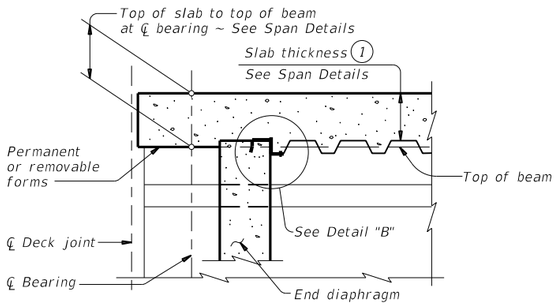


DETAIL "A"

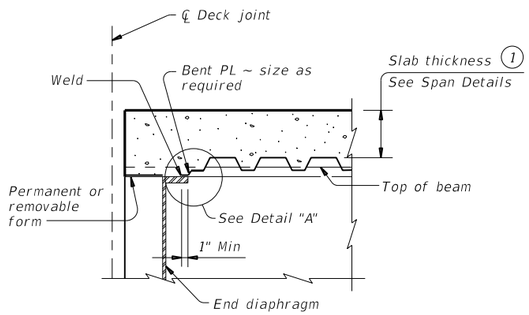


SHOWING STEEL BEAMS

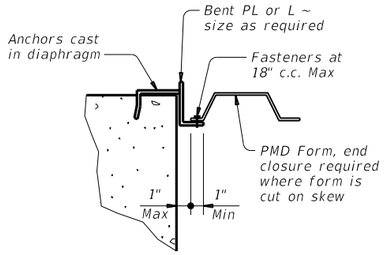
WIDENING DETAILS



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



AT END DIAPHRAGM FOR STEEL BEAMS WITHOUT THICKENED SLAB END



DETAIL "B"

(1) Slab thickness minus 5/8" if corrugations match reinforcing bars

(5) Minimum yield stress of 12 gage bars shall be 40 ksi

DETAILS AT ENDS OF BEAMS

SHEET 2 OF 2

Texas Department of Transportation | Bridge Division Standard

PERMANENT METAL DECK FORMS

PMDF

FILE: MS-PMDF-21.dgn	DN: TxDOT	CK: TxDOT	DW: TxDOT	CK: TxDOT
©TxDOT April 2019	CONT	SECT	JOB	HIGHWAY
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02-20: Modified box note by adding steel beams/girders and subsidiary; 12-21: Updated max deflection for RR.	DIST	COUNTY		SHEET NO.
	BMT	HARDIN, ETC		155

DATE: 2/26/2024 2:27:38 PM
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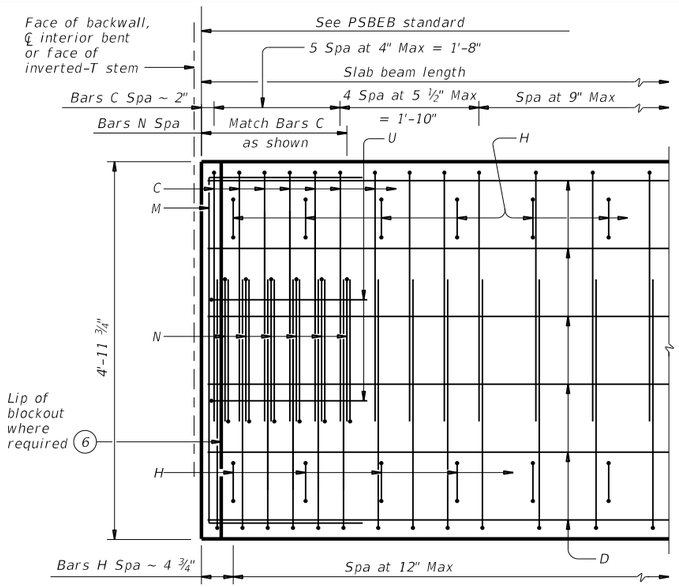
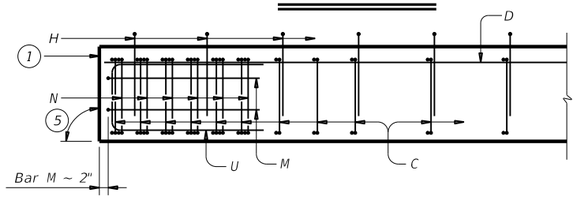
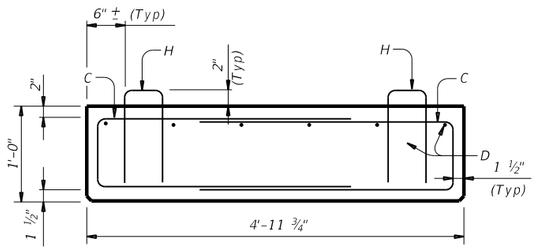


PART PLAN



ELEVATION



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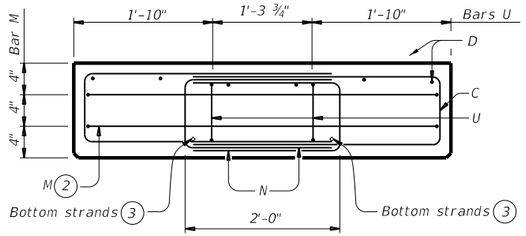
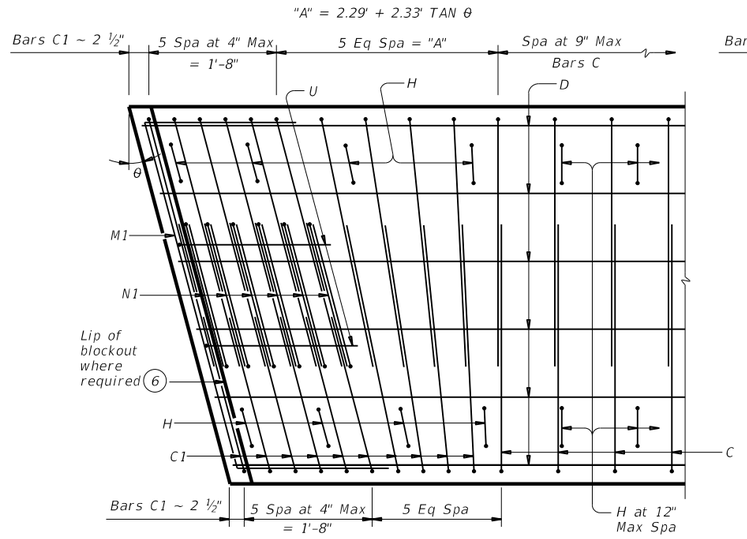


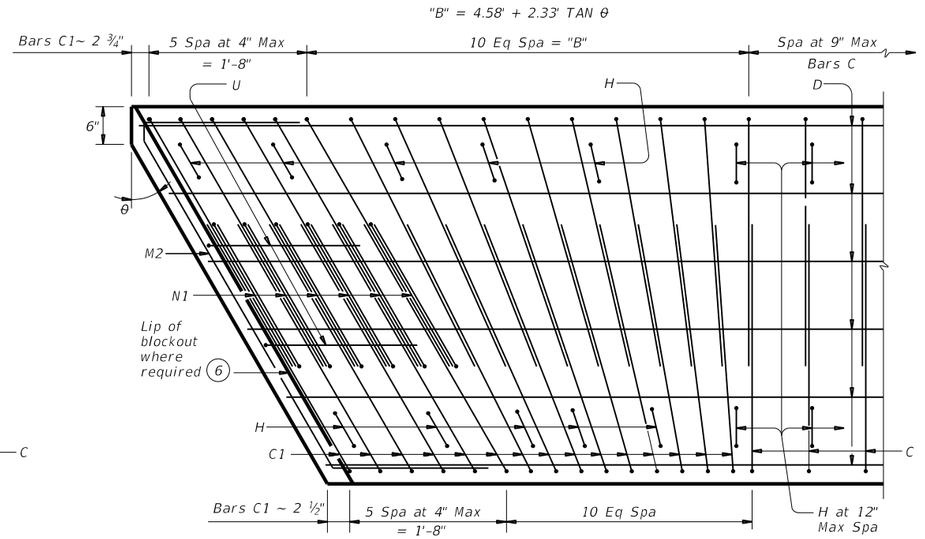
END MAT REINFORCING

Bars H not shown for clarity.



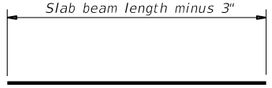
PART SKEW PLAN

(Showing θ over 0° to 15° Skew)



PART SKEW PLAN

(Showing θ over 15° to 30° Skew)



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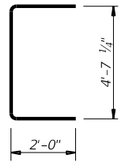

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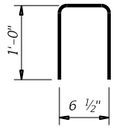

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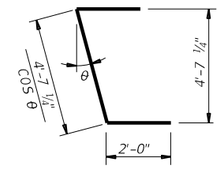

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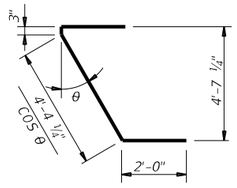

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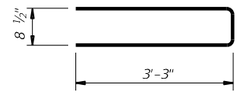
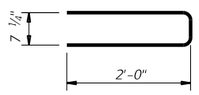
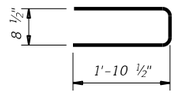


BARS C(#4)



BARS U(#5)



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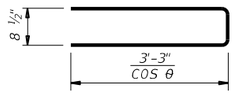
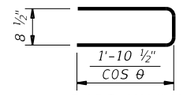


BARS C1(#4)



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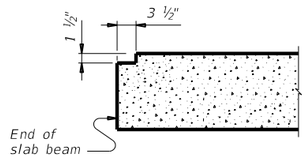


ELEVATION OF BLOCKOUT (6)

BEAM PROPERTIES		
Area	in^2	717.0
Y top	in	6.00
Y bott	in	6.00
I	in^4	8,604
Weight (4)	lb/ft	747

(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.

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 ¾" or round to a ¾" 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.

HL93 LOADING

Texas Department of Transportation

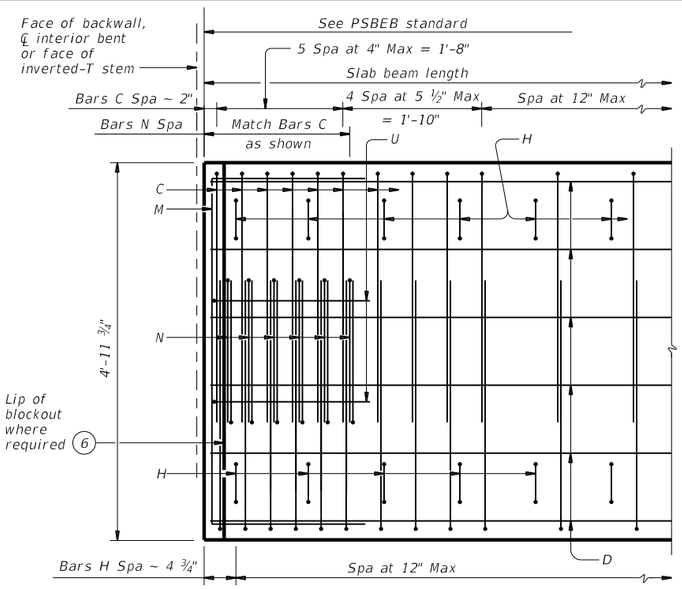
Bridge Division Standard

PRESTRESSED CONCRETE SLAB BEAM DETAILS (TYPE 5SB12)

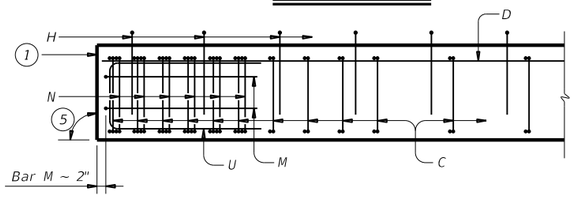
PSB-5SB12

FILE: PSB-5SB12-17.dgn	DN: TxDOT	CK: TxDOT	DW: TxDOT	CK: TxDOT
©TxDOT January 2017 REVISIONS	CONT	SECT	JOB	HIGHWAY
	0920	03	082, ETC	CR 1065, ETC
	DIST	COUNTY		SHEET NO.
	BMT	HARDIN, ETC		156

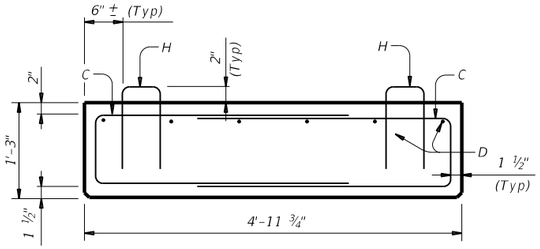
DATE: 2/26/2024 2:28:01 PM
FILE: pw://ljg-pw.bentley.com:ljg-pw-01/Documents/TxDOT/PM8016-2301 CEC WA4/Clemmons Gully Off-System Bridge/400 Production/4 - Design/Plan Set/7. Bridge/Vincent Standards/PSB-5SB15



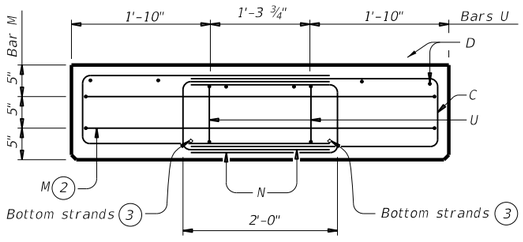
PART PLAN



ELEVATION

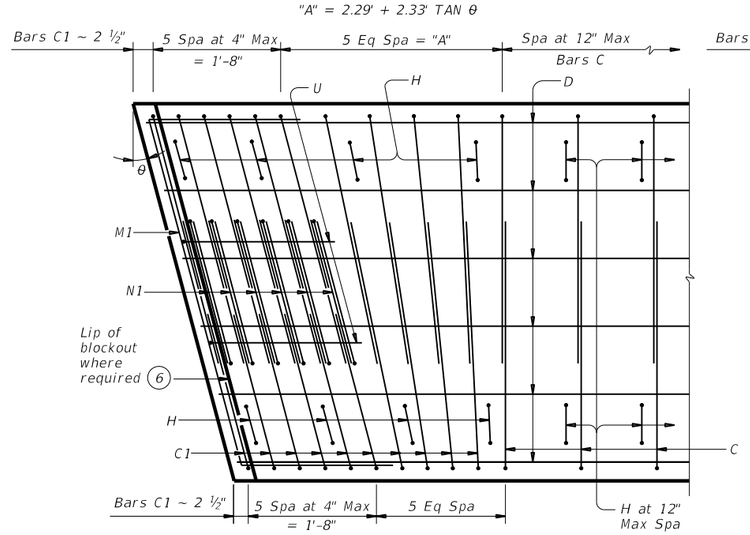


SECTION



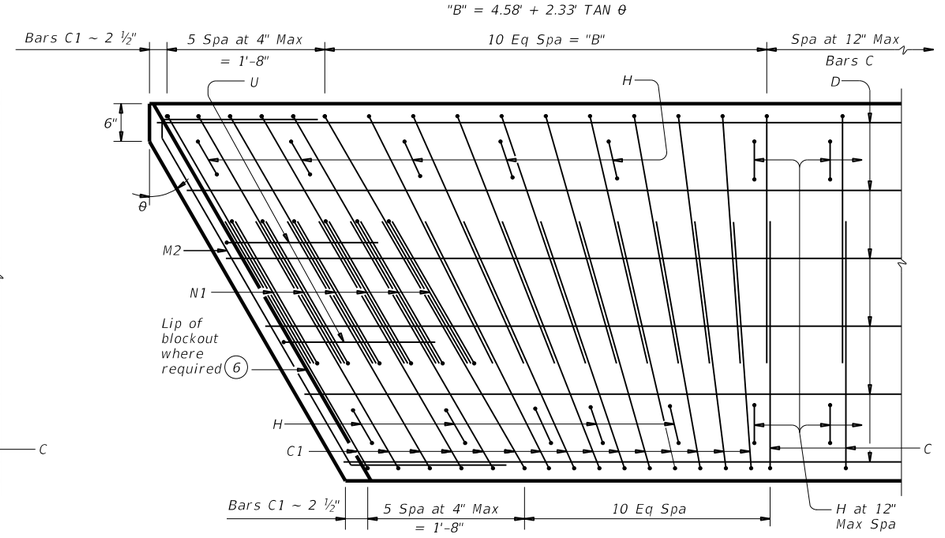
END MAT REINFORCING

Bars H not shown for clarity.



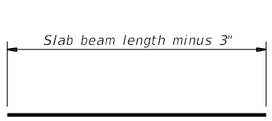
PART SKEW PLAN

(Showing θ over 0° to 15° skew)



PART SKEW PLAN

(Showing θ over 15° to 30° skew)



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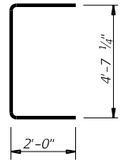

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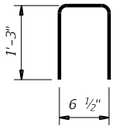

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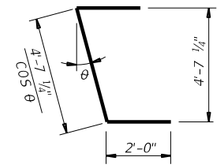

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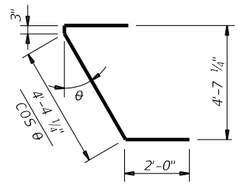

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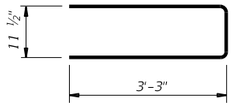

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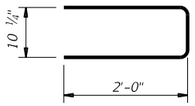

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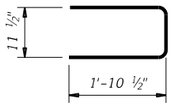

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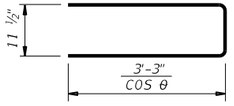
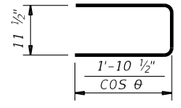


BARS C1(#4)



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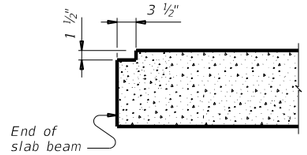


ELEVATION OF BLOCKOUT 6

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 ¾" or round to a ¾" 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.

BEAM PROPERTIES		
Area	in^2	896.2
Y top	in	7.50
Y bott	in	7.50
I	in^4	16,805
Weight (4)	lb/ft	934

(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

Texas Department of Transportation

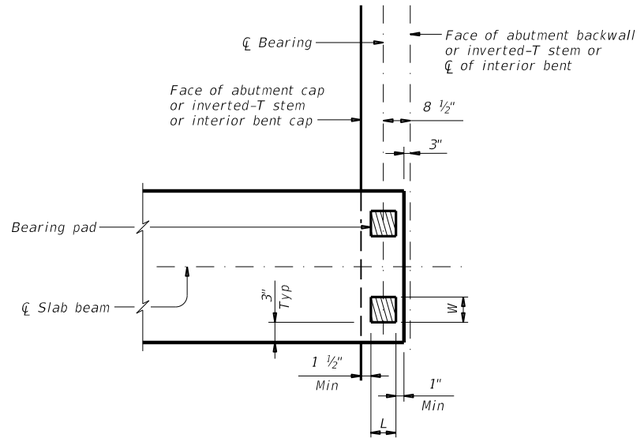
Bridge Division Standard

PRESTRESSED CONCRETE SLAB BEAM DETAILS
(TYPE 5SB15)

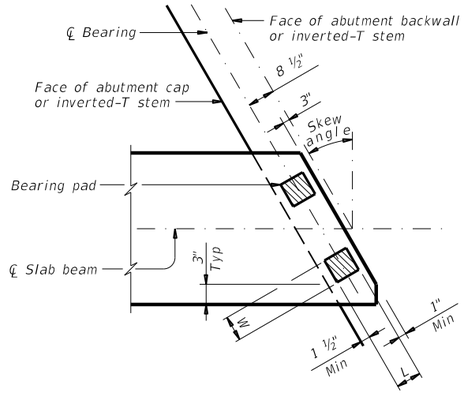
PSB-5SB15

FILE: PSB-5SB15-17 (1).dgn	DN: TxDOT	CK: TxDOT	DW: TxDOT	CK: TxDOT
©TxDOT January 2017	CONT	SECT	JOB	HIGHWAY
REVISIONS	0920	03	082, ETC	CR 1065, ETC
	DIST	COUNTY		SHEET NO.
	BMT	HARDIN, ETC		157

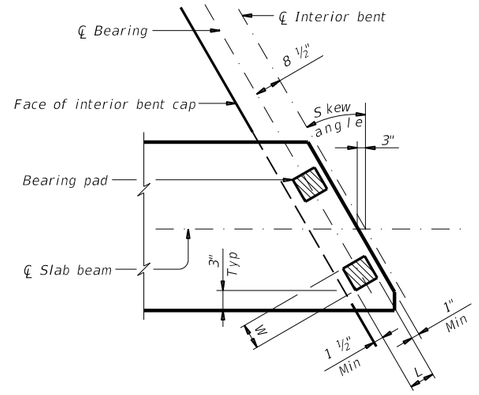
DATE: 2/26/2024 2:28:27 PM
FILE: pw://ijo-pw.bentley.com:ijo-pw-01/Documents/TxDOT/PM8016-2301 CEC WA4/Clemmons Gully Off-System Bridge/400 Production/4 - Design/Plan Set/7. Bridge/Bridge Standards/PSB-PSBEB



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)

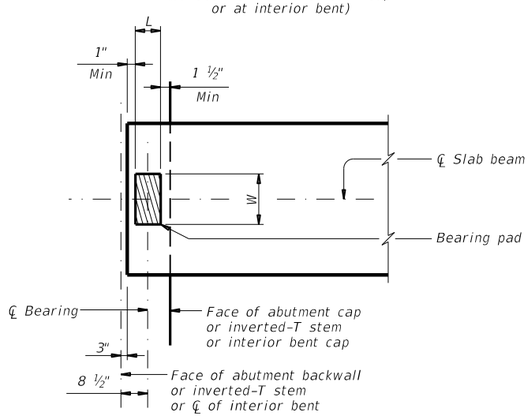


TWO-PAD DETAIL SKEW PLAN
(At interior bent)

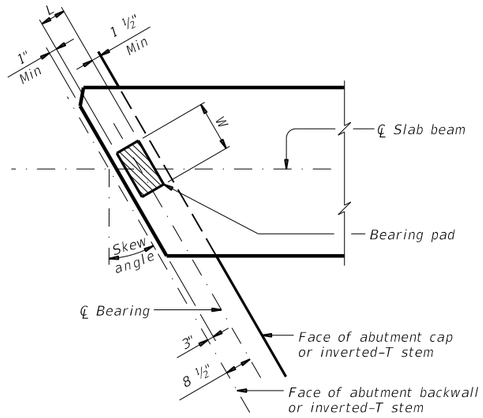
TABLE OF BEARING PAD DIMENSIONS (ALL PRESTR CONC SLAB BM TYPES)					
One-Pad (Ty SB1-"N") (2)			Two-Pad (Ty SB2-"N") (2)		
W	L	T	W	L	T
14"	7"	2"	7"	7"	2"

Pad sizes shown are applicable for the following conditions:

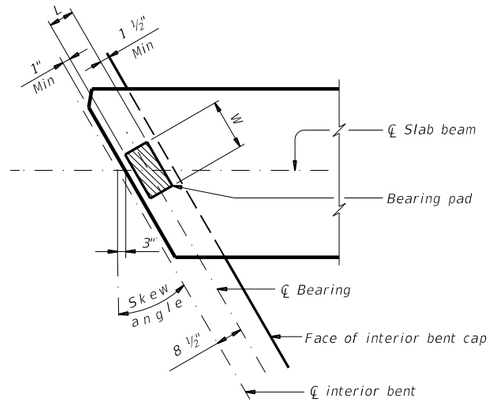
(1) All one, two and three span units where the minimum span length is not less than 25' and the maximum span is not more than 50'.
(2) Skews less than or equal to 30°.



ONE-PAD DETAIL PLAN
(At abutment or inverted-T cap or at interior bent)

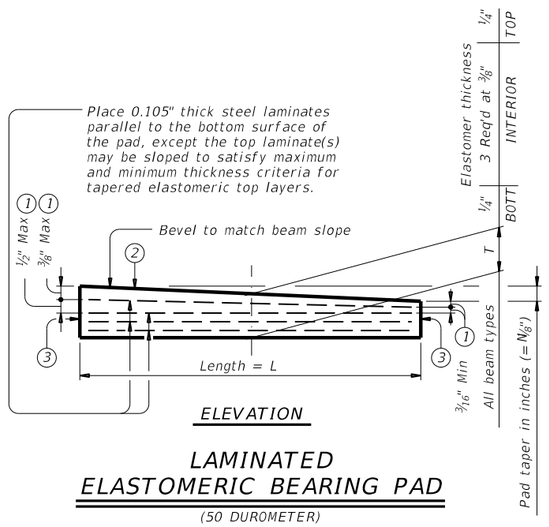


ONE-PAD DETAIL SKEW PLAN
(At abutment or inverted-T cap)



ONE-PAD DETAIL SKEW PLAN
(At interior bent)

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".



ELEVATION

LAMINATED ELASTOMERIC BEARING PAD
(50 DUROMETER)

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.

(1) Maximum and minimum layer thicknesses shown are for elastomer only, on tapered layers.

(2) 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 $\left(\frac{0.0625"}{\text{Length}}\right)$ IN/IN.

(3) Locate permanent mark here.

HL93 LOADING

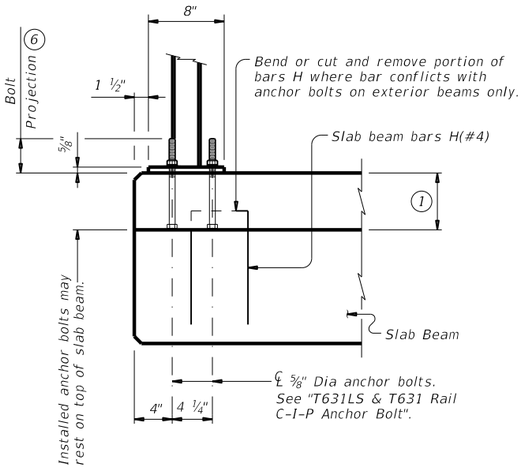
Texas Department of Transportation | Bridge Division Standard

ELASTOMERIC BEARING AND BEAM END DETAILS
PRESTR CONCRETE SLAB BEAM

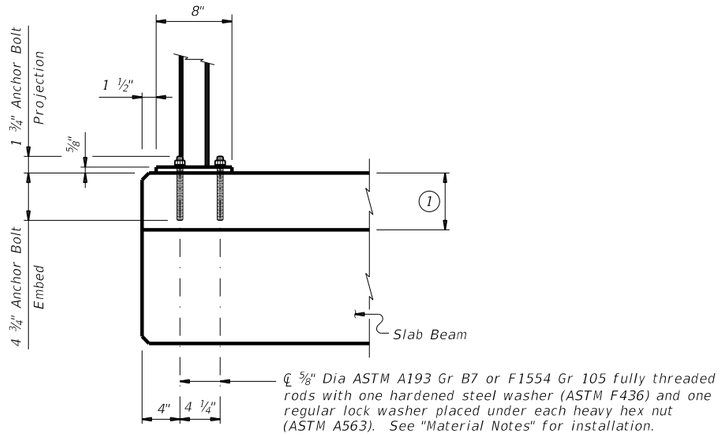
PSBEB

FILE: PSB-PSBEB-17 (1).dgn	DN: TxDOT	CK: TxDOT	DW: TxDOT	CK: TxDOT
©TxDOT January 2017	CONT	SECT	JOB	HIGHWAY
REVISIONS	0920	03	082, ETC	CR 1065, ETC
	DIST	COUNTY		SHEET NO.
	BMT	HARDIN, ETC		158

DATE: 2/26/2024 2:28:31 PM
FILE: pw://ljg-pw.bentley.com:ljg-pw-01/Documents/TxDOT/PW8016-2301 CEC WA4/Clemmons Gully Off-System Bridge/400 Production/4 - Design/Plan Set/7. Bridge/Bridge Standards/PSB-PSBRA

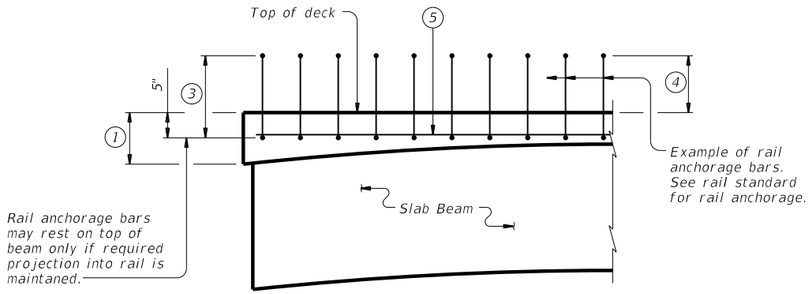


CAST-IN-PLACE ANCHORAGE OPTION

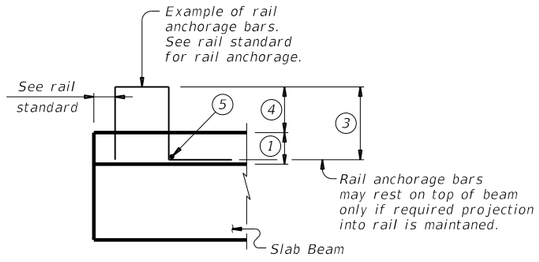


ADHESIVE ANCHORAGE OPTION

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



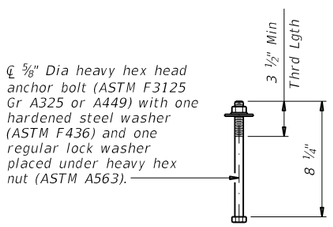
PART SPAN ELEVATION



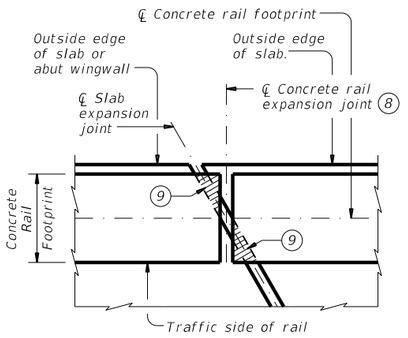
SECTION

TYPICAL CONCRETE RAIL ANCHORAGE

(Showing typical concrete rail anchorage)



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 ¼". 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 ½" 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 ℄ slab expansion joint, ℄ rail footprint and perpendicular to slab outside edge.

(9) Cross-hatched area must have ½" preformed bitumuminous 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 ½" 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 ¾". 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.

Texas Department of Transportation

Bridge Division Standard

RAIL ANCHORAGE DETAILS

PRESTR CONCRETE SLAB BEAMS

PSBRA

FILE: PSB-PSBRA-18 (1).dgn	DN: TxDOT	CK: TxDOT	DW: JTR	CK: JMH
©TxDOT January 2017	CONT	SECT	JOB	HIGHWAY
REVISIONS	0920	03	082, ETC	CR 1065, ETC
03-18: Updated adhesive anchor notes.	DIST	COUNTY		SHEET NO.
	BMT	HARDIN, ETC		159

DATE: 2/26/2024 2:28:35 PM
FILE: pw://ljg-pw.bentley.com:ljg-pw-01/Documents/TxDOT/PM8016-2301 CEC WA4/Clemmons Gully Off-System Bridge/400 Production/4 - Design/Plan Set/7. Bridge/Bridge Standards/PSB-PSBSD

DESIGNED BEAMS (STRAIGHT STRANDS)

STRUCTURE	SPAN LENGTH (ft)	BEAM NO.	BEAM TYPE	PRESTRESSING STRANDS: NON-STD STRAND PATTERN	TOTAL NO.	SIZE (in)	STRGTH fpu (ksi)	"e" ℄ (in)	"e" END (in)	TOT NO. DEB	DEBONDED STRANDS PER ROW: DIST FROM BOTTOM (in)	NO. OF STRANDS: TOTAL	DE-BONDED	NUMBER OF STRANDS DEBONDED TO (ft from end): 3	6	9	12	15	CONCRETE: RELEASE STRGTH ① f'ci (ksi)	MINIMUM 28 DAY COMP STRGTH f'c (ksi)
24' ROADWAY SB12 BEAM	25	ALL	5SB12		8	0.6	270	3.50	3.50	0	2.5	8	0	0	0	0	0	0	4.000	5.000
	30	ALL	5SB12		10	0.6	270	3.50	3.50	0	2.5	10	0	0	0	0	0	0	4.000	5.000
	35	ALL	5SB12		14	0.6	270	3.50	3.50	0	2.5	14	0	0	0	0	0	0	4.000	5.000
	40	ALL	5SB12		18	0.6	270	3.50	3.50	0	2.5	18	0	0	0	0	0	0	4.000	5.000
24' ROADWAY SB15 BEAM	25	ALL	5SB15		8	0.6	270	5.00	5.00	0	2.5	8	0	0	0	0	0	0	4.000	5.000
	30	ALL	5SB15		8	0.6	270	5.00	5.00	0	2.5	8	0	0	0	0	0	0	4.000	5.000
	35	ALL	5SB15		10	0.6	270	5.00	5.00	0	2.5	10	0	0	0	0	0	0	4.000	5.000
	40	ALL	5SB15		14	0.6	270	5.00	5.00	0	2.5	14	0	0	0	0	0	0	4.000	5.000
	45	ALL	5SB15		18	0.6	270	5.00	5.00	2	2.5	18	2	2	0	0	0	0	4.000	5.000
	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
28' ROADWAY SB12 BEAM	25	ALL	5SB12		8	0.6	270	3.50	3.50	0	2.5	8	0	0	0	0	0	0	4.000	5.000
	30	ALL	5SB12		10	0.6	270	3.50	3.50	0	2.5	10	0	0	0	0	0	0	4.000	5.000
	35	ALL	5SB12		12	0.6	270	3.50	3.50	0	2.5	12	0	0	0	0	0	0	4.000	5.000
	40	ALL	5SB12		18	0.6	270	3.50	3.50	0	2.5	18	0	0	0	0	0	0	4.000	5.000
28' ROADWAY SB15 BEAM	25	ALL	5SB15		8	0.6	270	5.00	5.00	0	2.5	8	0	0	0	0	0	0	4.000	5.000
	30	ALL	5SB15		8	0.6	270	5.00	5.00	0	2.5	8	0	0	0	0	0	0	4.000	5.000
	35	ALL	5SB15		10	0.6	270	5.00	5.00	0	2.5	10	0	0	0	0	0	0	4.000	5.000
	40	ALL	5SB15		14	0.6	270	5.00	5.00	0	2.5	14	0	0	0	0	0	0	4.000	5.000
	45	ALL	5SB15		18	0.6	270	5.00	5.00	2	2.5	18	2	2	0	0	0	0	4.000	5.000
	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
30' ROADWAY SB12 BEAM	25	ALL	4SB12		6	0.6	270	3.50	3.50	0	2.5	6	0	0	0	0	0	0	4.000	5.000
	30	ALL	4SB12		8	0.6	270	3.50	3.50	0	2.5	8	0	0	0	0	0	0	4.000	5.000
	35	ALL	4SB12		10	0.6	270	3.50	3.50	0	2.5	10	0	0	0	0	0	0	4.000	5.000
	40	ALL	4SB12		14	0.6	270	3.50	3.50	0	2.5	14	0	0	0	0	0	0	4.000	5.000
30' ROADWAY SB15 BEAM	25	ALL	4SB15		6	0.6	270	5.00	5.00	0	2.5	6	0	0	0	0	0	0	4.000	5.000
	30	ALL	4SB15		6	0.6	270	5.00	5.00	0	2.5	6	0	0	0	0	0	0	4.000	5.000
	35	ALL	4SB15		8	0.6	270	5.00	5.00	0	2.5	8	0	0	0	0	0	0	4.000	5.000
	40	ALL	4SB15		12	0.6	270	5.00	5.00	0	2.5	12	0	0	0	0	0	0	4.000	5.000
	45	ALL	4SB15		14	0.6	270	5.00	5.00	2	2.5	14	2	2	0	0	0	0	4.000	5.000
	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

OPTIONAL DESIGN

STRUCTURE	SPAN LENGTH (ft)	BEAM NO.	BEAM TYPE	DESIGN LOAD COMP STRESS (TOP ℄) (SERVICE I) fct (ksi)	DESIGN LOAD TENSILE STRESS (BOTT ℄) (SERVICE III) fcb (ksi)	REQUIRED MINIMUM ULTIMATE MOMENT CAPACITY (STRENGTH I) (kip-ft)	LIVE LOAD DISTRIBUTION FACTOR ②: Moment	Shear
24' ROADWAY SB12 BEAM	25	ALL	5SB12	0.914	-1.217	448	0.450	0.450
	30	ALL	5SB12	1.292	-1.685	530	0.450	0.450
	35	ALL	5SB12	1.730	-2.219	675	0.450	0.450
	40	ALL	5SB12	2.218	-2.796	820	0.440	0.440
24' ROADWAY SB15 BEAM	25	ALL	5SB15	0.725	-0.897	551	0.450	0.450
	30	ALL	5SB15	1.020	-1.244	574	0.450	0.450
	35	ALL	5SB15	1.361	-1.640	708	0.450	0.450
	40	ALL	5SB15	1.739	-2.068	864	0.440	0.440
	45	ALL	5SB15	2.179	-2.574	1054	0.440	0.440
	50	ALL	5SB15	2.680	-3.153	1276	0.440	0.440
28' ROADWAY SB12 BEAM	25	ALL	5SB12	0.903	-1.184	444	0.430	0.430
	30	ALL	5SB12	1.276	-1.639	508	0.430	0.430
	35	ALL	5SB12	1.708	-2.159	647	0.430	0.430
	40	ALL	5SB12	2.200	-2.744	799	0.430	0.430
28' ROADWAY SB15 BEAM	25	ALL	5SB15	0.716	-0.874	529	0.430	0.430
	30	ALL	5SB15	1.007	-1.212	570	0.430	0.430
	35	ALL	5SB15	1.343	-1.598	680	0.430	0.430
	40	ALL	5SB15	1.725	-2.032	842	0.430	0.430
	45	ALL	5SB15	2.149	-2.508	1013	0.420	0.420
	50	ALL	5SB15	2.643	-3.073	1227	0.420	0.420
30' ROADWAY SB12 BEAM	25	ALL	4SB12	0.904	-1.187	341	0.340	0.340
	30	ALL	4SB12	1.277	-1.646	407	0.340	0.340
	35	ALL	4SB12	1.711	-2.169	518	0.340	0.340
	40	ALL	4SB12	2.205	-2.758	640	0.340	0.340
30' ROADWAY SB15 BEAM	25	ALL	4SB15	0.723	-0.888	431	0.350	0.350
	30	ALL	4SB15	1.017	-1.231	438	0.350	0.350
	35	ALL	4SB15	1.346	-1.605	545	0.340	0.340
	40	ALL	4SB15	1.729	-2.043	675	0.340	0.340
	45	ALL	4SB15	2.166	-2.542	823	0.340	0.340
	50	ALL	4SB15	2.665	-3.115	998	0.340	0.340

LOAD RATING FACTORS

STRUCTURE	STRENGTH I: Inv	Opr	SERVICE III: Inv
24' ROADWAY SB12 BEAM	1.40	1.82	1.71
	1.25	1.62	1.29
	1.33	1.73	1.23
	1.34	1.74	1.12
24' ROADWAY SB15 BEAM	1.77	2.29	2.41
	1.23	1.59	1.45
	1.15	1.49	1.14
	1.32	1.71	1.19
	1.34	1.73	1.08
	1.33	1.72	1.11
28' ROADWAY SB12 BEAM	1.47	1.91	1.80
	1.32	1.71	1.37
	1.18	1.53	1.02
	1.37	1.78	1.17
28' ROADWAY SB15 BEAM	1.85	2.40	2.53
	1.29	1.67	1.53
	1.21	1.57	1.22
	1.36	1.76	1.24
	1.41	1.82	1.16
	1.33	1.72	1.01
30' ROADWAY SB12 BEAM	1.38	1.79	1.67
	1.32	1.71	1.37
	1.24	1.60	1.08
	1.34	1.73	1.11
30' ROADWAY SB15 BEAM	1.69	2.19	2.32
	1.16	1.50	1.37
	1.21	1.57	1.21
	1.47	1.91	1.38
	1.33	1.73	1.06
	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.

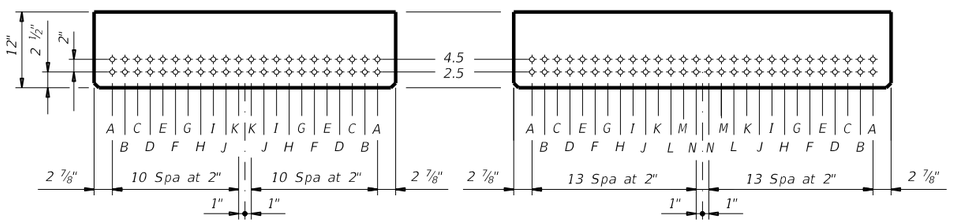
② Portion of full HL93.

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.

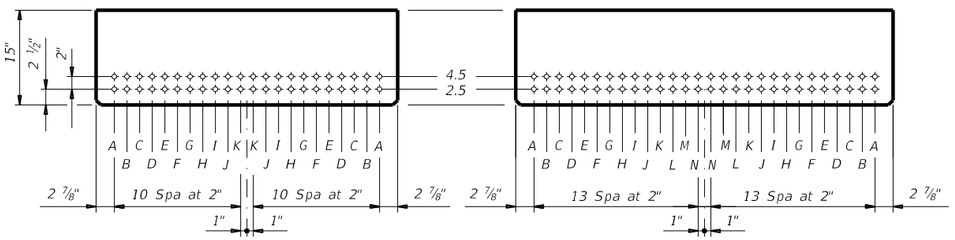
FABRICATION NOTES:

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 424.4.2.2.2.4.
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.



TxDOT 4SB12 SLAB BEAM

TxDOT 5SB12 SLAB BEAM



TxDOT 4SB15 SLAB BEAM

TxDOT 5SB15 SLAB BEAM

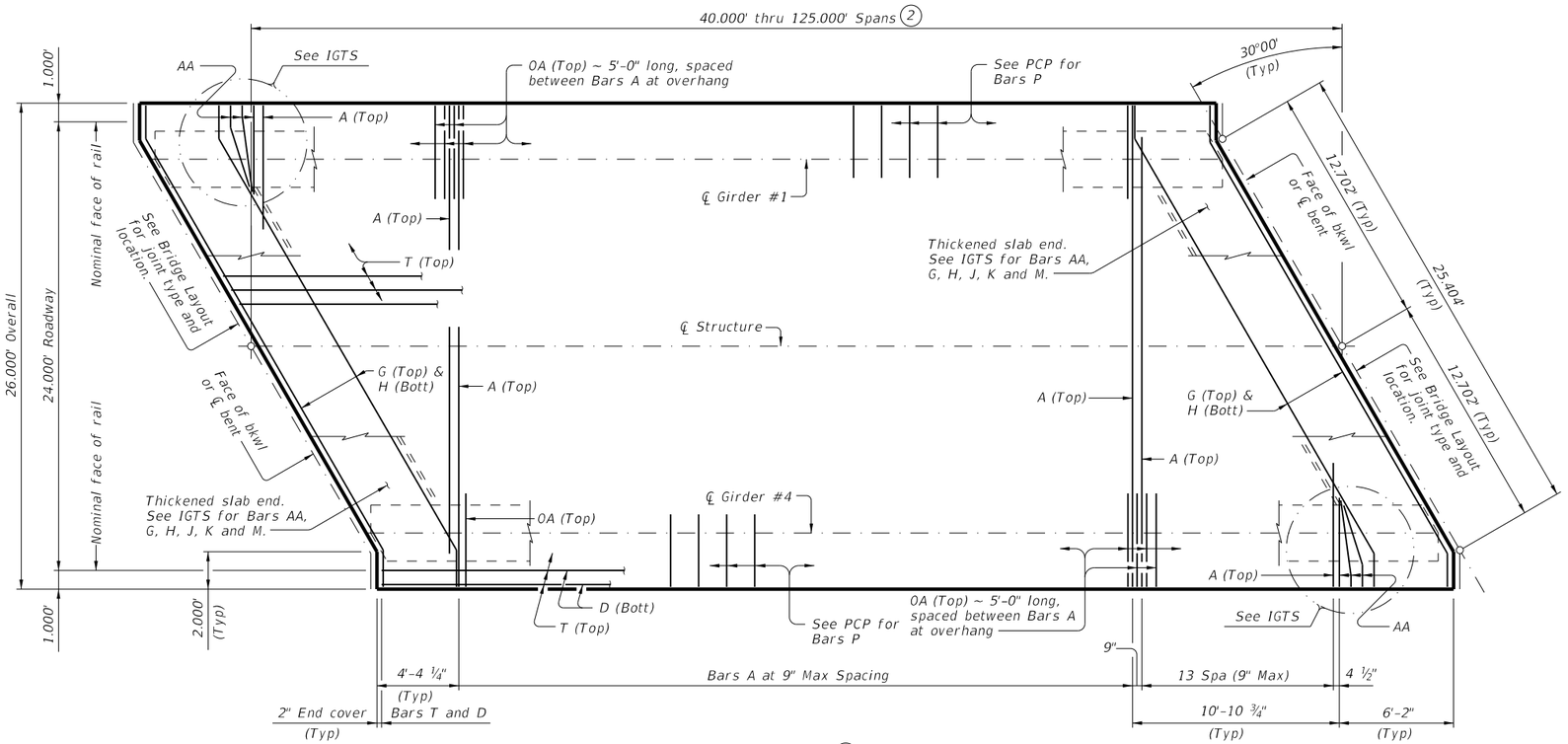
HL93 LOADING

Texas Department of Transportation — Bridge Division Standard

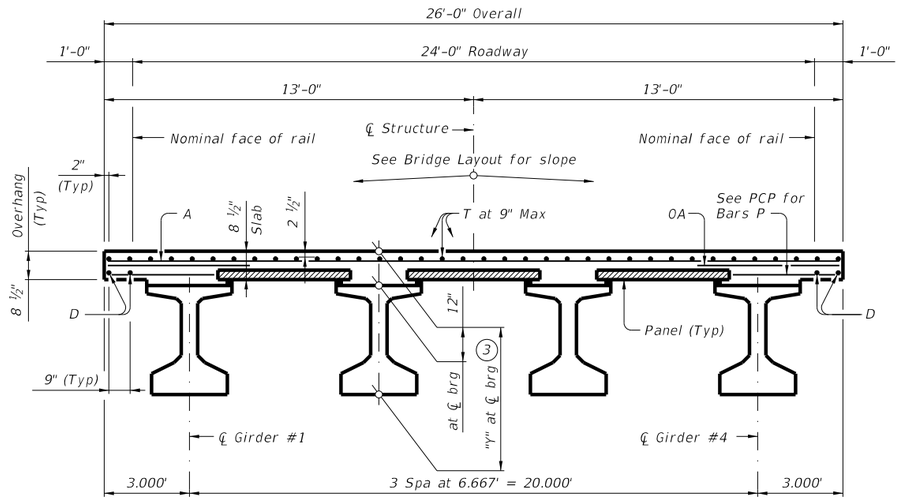
PRESTRESSED CONCRETE SLAB BEAM STD DESIGNS
(TYPE SB12 OR SB15)
24', 28' & 30' ROADWAY
PSBSD

FILE: PSB-PSBSD-21 (1).dgn	DN: SRW	CK: BMP	DW: SFS	CK: SDB
©TxDOT January 2017	CONT	SECT	JOB	HIGHWAY
REVISIONS 1-21: Added load rating.	0920	03	082, ETC	CR 1065, ETC
	DIST	COUNTY		SHEET NO.
	BMT	HARDIN, ETC		160

DATE: 2/26/2024 2:28:58 PM
FILE: pw://ig-pw.bentley.com:ig-pw-01/Documents/TxDOT/PM8016-2301 CEC WA4/Clemmons Gully Off-System Bridge/400 Production/4 - Design/Bridge/STANDARDS/IG-SIG2430-23.dgn



PLAN (1)



TYPICAL TRANSVERSE SECTION

(Showing girder type Tx46)

BAR TABLE	
BAR	SIZE
A	#4
AA	#5
D	#4
G	#4
H	#4
J	#4
K	#4
M	#4
0A	#5
P	#4
T	#4

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

(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 ½" concrete slab, a constant roadway grade, and using precast panels (PCP). The Contractor will adjust this value as necessary for any roadway vertical curve.

HL93 LOADING SHEET 1 OF 2

Texas Department of Transportation — Bridge Division Standard

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

24' ROADWAY 30° SKEW

SIG-24-30

FILE: IG-SIG2430-23.dgn	DN: JMH	CK: NRN	DW: JTR	CK: TAR
©TxDOT August 2017	CONT	SECT	JOB	HIGHWAY
REVISIONS	0920	03	082, ETC	W PINESHADOWS DR, ETC
10-19: Increased "X" and "Y" Values. 01-23: Removed PCP(0) reference.	DIST	COUNTY		SHEET NO.
	BMT	HARDIN, ETC		161

DATE: 2/26/2024 2:28:58 PM
FILE: pw://IJG-pw.bentley.com:IJG-pw-01/Documents/TxDOT/PM8016-2301 CEC WA4/Clemmons Gully Off-System Bridge/400 Production/4 - Design/Bridge/STANDARDS/IG-SIG2430-23.dgn

TABLE OF DEAD LOAD DEFLECTIONS

TYPE Tx28 GIRDERS

SPAN LENGTH	"A"	"B"
Ft	Ft	Ft
40	0.007	0.010
45	0.012	0.017
50	0.019	0.027
55	0.028	0.040
60	0.041	0.057
65	0.056	0.079
70	0.077	0.108
75	0.102	0.143

TYPE Tx34 GIRDERS

SPAN LENGTH	"A"	"B"
Ft	Ft	Ft
40	0.004	0.006
45	0.007	0.010
50	0.011	0.016
55	0.017	0.024
60	0.024	0.034
65	0.033	0.047
70	0.046	0.064
75	0.061	0.085
80	0.079	0.111
85	0.102	0.143

TYPE Tx40 GIRDERS

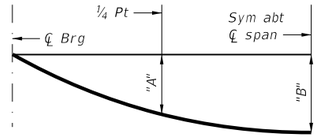
SPAN LENGTH	"A"	"B"
Ft	Ft	Ft
40	0.003	0.004
45	0.005	0.007
50	0.007	0.010
55	0.011	0.016
60	0.016	0.022
65	0.022	0.031
70	0.030	0.042
75	0.040	0.056
80	0.052	0.073
85	0.066	0.093
90	0.084	0.118
95	0.105	0.147
100	0.130	0.182

TYPE Tx46 GIRDERS

SPAN LENGTH	"A"	"B"
Ft	Ft	Ft
40	0.002	0.003
45	0.004	0.005
50	0.005	0.007
55	0.008	0.011
60	0.011	0.015
65	0.015	0.021
70	0.021	0.029
75	0.027	0.038
80	0.036	0.050
85	0.046	0.064
90	0.057	0.080
95	0.071	0.100
100	0.088	0.124
105	0.108	0.151
110	0.130	0.182
115	0.156	0.219

TYPE Tx54 GIRDERS

SPAN LENGTH	"A"	"B"
Ft	Ft	Ft
40	0.001	0.002
45	0.002	0.003
50	0.004	0.005
55	0.005	0.007
60	0.007	0.010
65	0.010	0.014
70	0.014	0.019
75	0.018	0.025
80	0.024	0.033
85	0.030	0.042
90	0.038	0.053
95	0.047	0.066
100	0.058	0.082
105	0.071	0.100
110	0.086	0.121
115	0.103	0.144
120	0.123	0.172
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 (5) REINF STEEL
		ABUT TO (4) INT BT	INT BT TO (4) INT BT	ABUT TO (4) ABUT	
Ft	SF	LF	LF	LF	Lb
40	1,040	157.85	158.00	157.69	2,392
45	1,170	177.85	178.00	177.69	2,691
50	1,300	197.85	198.00	197.69	2,990
55	1,430	217.85	218.00	217.69	3,289
60	1,560	237.85	238.00	237.69	3,588
65	1,690	257.85	258.00	257.69	3,887
70	1,820	277.85	278.00	277.69	4,186
75	1,950	297.85	298.00	297.69	4,485
80	2,080	317.85	318.00	317.69	4,784
85	2,210	337.85	338.00	337.69	5,083
90	2,340	357.85	358.00	357.69	5,382
95	2,470	377.85	378.00	377.69	5,681
100	2,600	397.85	398.00	397.69	5,980
105	2,730	417.85	418.00	417.69	6,279
110	2,860	437.85	438.00	437.69	6,578
115	2,990	457.85	458.00	457.69	6,877
120	3,120	477.85	478.00	477.69	7,176
125	3,250	497.85	498.00	497.69	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.

MATERIAL NOTES:

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

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 the I-Girder Continuous Slab Detail (IGCS) standard.
See I-Girder Thickened Slab End Details (IGTS) standard for details and quantity adjustments.
See Prestressed Concrete Panels (PCP) standard and Prestressed Concrete Panel Fabrication Details (PCP-FAB) standard for panel details not shown.
See I-Girder Miscellaneous Slab Details (IGMS) standard for miscellaneous details.
See applicable rail details for rail anchorage in slab.
See Permanent Metal Deck Forms (PMDF) standard for details and quantity adjustments if this option is used.
This standard is drawn showing right forward skew.
See Bridge Layout for actual skew direction.
This standard does not support the use of transition bents.

Cover dimensions are clear dimensions, unless noted otherwise.

HL93 LOADING

Texas Department of Transportation

Bridge Division Standard

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

24' ROADWAY 30° SKEW

SIG-24-30

FILE: IG-SIG2430-23.dgn	DN: JMH	CK: NRN	DW: JTR	CK: TAR
©TxDOT August 2017	CONT	SECT	JOB	HIGHWAY
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10-19: Increased "X" and "Y" Values. 01-23: Removed PCP(0) reference.	DIST	COUNTY		SHEET NO.
	BMT	HARDIN, ETC		162

DATE: 2/26/2024 2:29:02 PM
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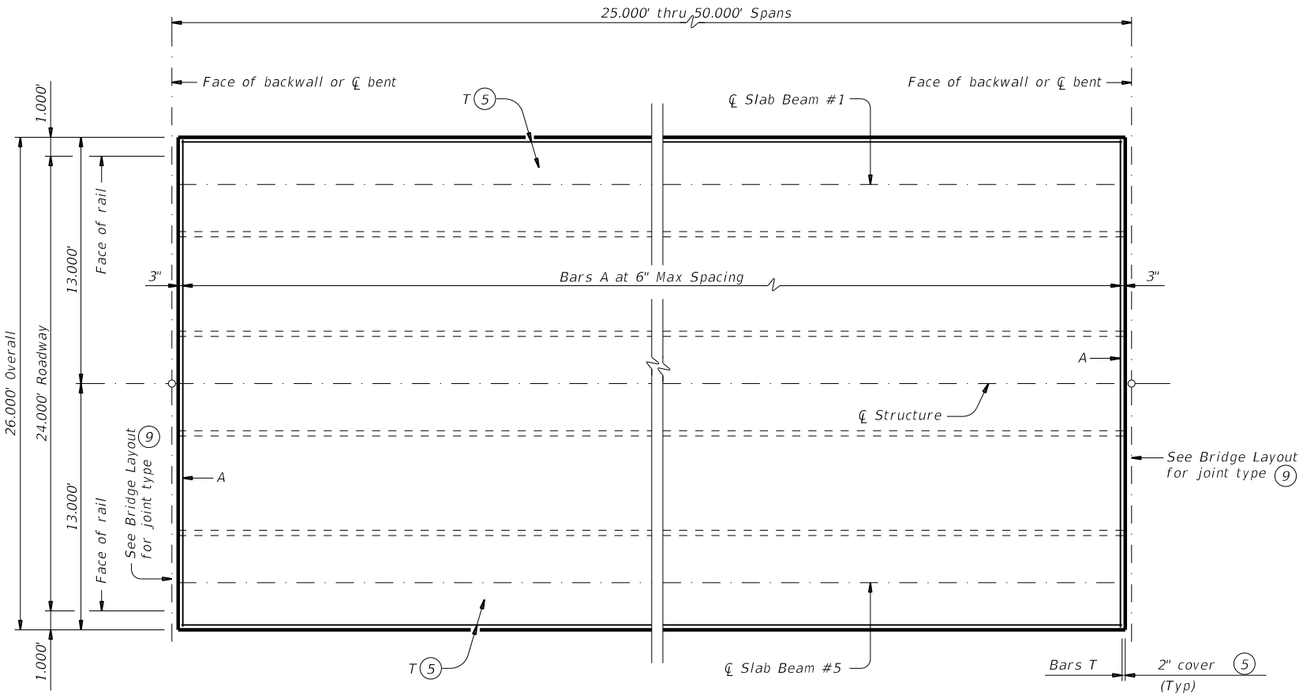
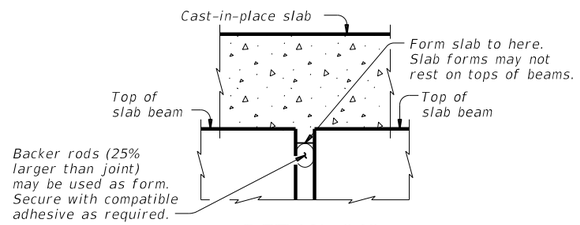
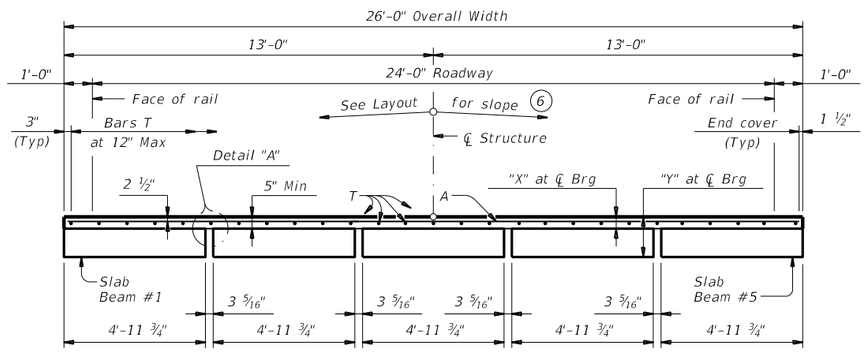


PLAN



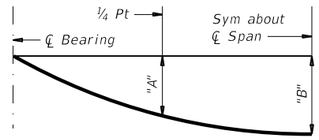
DETAIL "A"



TYPICAL TRANSVERSE SECTION

TABLE OF VARIABLE VALUES

Span Length	Beam Type	Dead Load Deflection		Section (3) Depths	
		"A"	"B"	"X"	"Y"
Ft	(1)	Ft	Ft	In	Ft/In
25	5SB12	0.004	0.005	5 ¼"	1'-5 ¼"
30	5SB12	0.008	0.011	5 ½"	1'-5 ½"
35	5SB12	0.015	0.021	6"	1'-6"
40	5SB12	0.026	0.036	6 ½"	1'-6 ½"
25	5SB15	0.002	0.003	5 ¼"	1'-8 ¼"
30	5SB15	0.004	0.006	5 ½"	1'-8 ½"
35	5SB15	0.008	0.011	5 ½"	1'-8 ½"
40	5SB15	0.013	0.019	5 ¾"	1'-8 ¾"
45	5SB15	0.022	0.030	6 ½"	1'-9 ½"
50	5SB15	0.034	0.047	7"	1'-10"

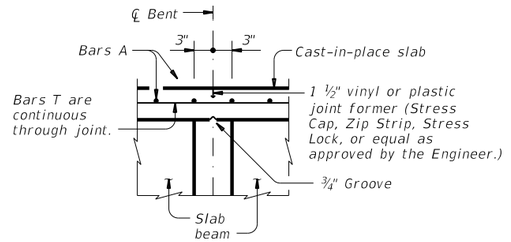


DEAD LOAD DEFLECTION DIAGRAM

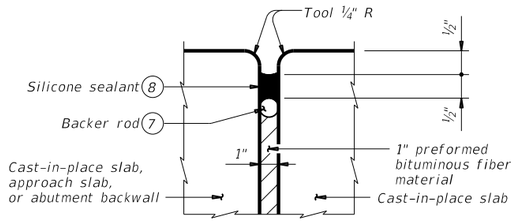
NOTE: Deflections shown are due to concrete slab only (E_C = 5,000 ksi). Calculated deflections shown are theoretical and actual dimensions may vary. Adjust based on field verification.

BAR TABLE

BAR	SIZE
A	#5
T	#4



CONTINUOUS SLAB DETAIL



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 (2) REINF STEEL
		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

(1) 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.

(2) Reinforcing steel weight is calculated using an approximate factor of 2.8 Lbs/SF.

(3) 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.

(4) Fabricator will adjust beam lengths for beam slopes as required.

(5) Where slab is continuous over Interior Bents, Bars T are continuous through Joint. See "Continuous Slab Detail".

(6) This standard does not provide for changes in roadway cross-slopes within the structure.

(7) 1 ¼" 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.

(8) 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.

(9) 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

Texas Department of Transportation

Bridge Division Standard

PRESTRESSED CONCRETE SLAB BEAM SPANS
(TYPE SB12 OR SB15)
24' ROADWAY
SPSB-24

FILE: PSB-SPSB2400-17.dgn	DN: TxDOT	CK: TxDOT	DW: TxDOT	CK: TxDOT
©TxDOT January 2017	CONT	SECT	JOB	HIGHWAY
REVISIONS	0920	03	082, ETC	CR 1065, ETC
	DIST	COUNTY		SHEET NO.
	BMT	HARDIN, ETC		163

DATE: 2/26/2024 2:29:24 PM
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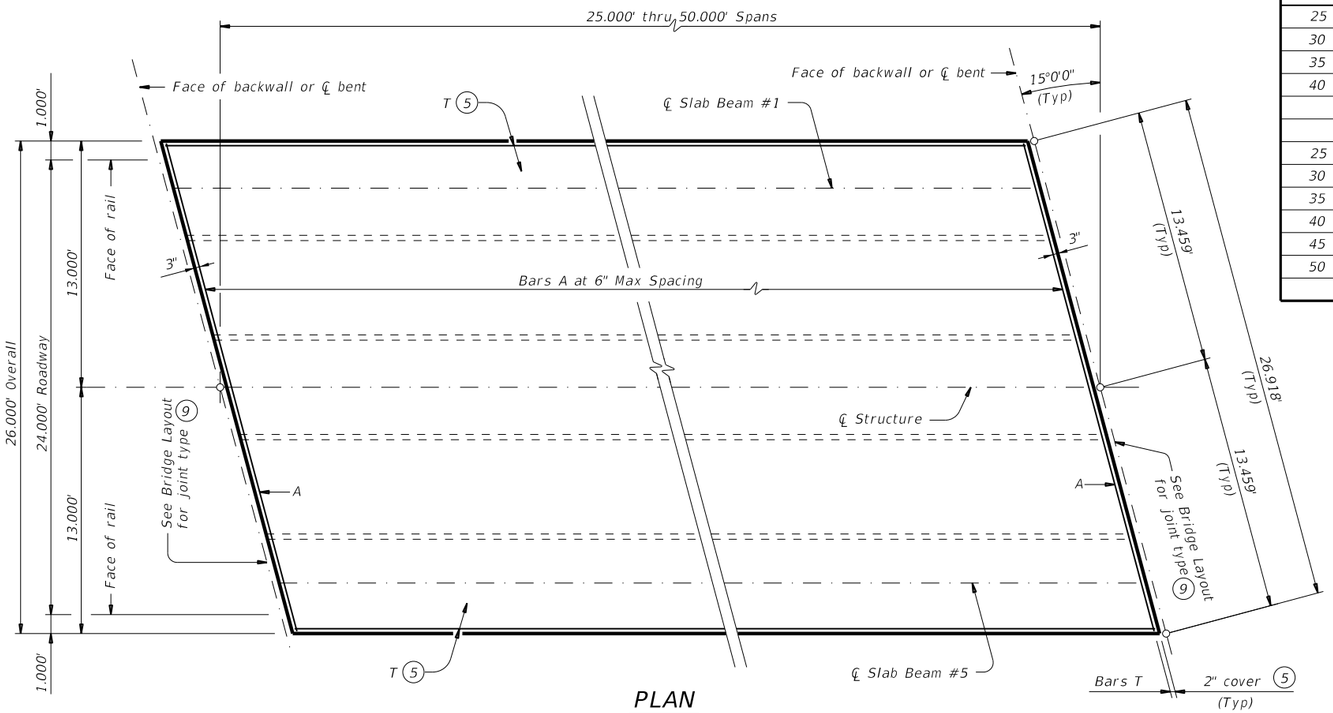
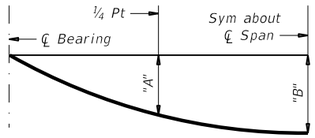


PLAN

TABLE OF VARIABLE VALUES

Span Length	Beam Type	Dead Load Deflection "A"	Dead Load Deflection "B"	Section Depths (3) "X"	Section Depths (3) "Y"
Ft	(1)	Ft	Ft	In	Ft/In
25	5SB12	0.004	0.005	5 ¼"	1'-5 ¼"
30	5SB12	0.008	0.011	5 ½"	1'-5 ½"
35	5SB12	0.015	0.021	6"	1'-6"
40	5SB12	0.026	0.036	6 ½"	1'-6 ½"
25	5SB15	0.002	0.003	5 ¼"	1'-8 ¼"
30	5SB15	0.004	0.006	5 ½"	1'-8 ½"
35	5SB15	0.008	0.011	5 ½"	1'-8 ½"
40	5SB15	0.013	0.019	5 ¾"	1'-8 ¾"
45	5SB15	0.022	0.030	6 ½"	1'-9 ½"
50	5SB15	0.034	0.047	7"	1'-10"



DEAD LOAD DEFLECTION DIAGRAM

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.

TABLE OF ESTIMATED QUANTITIES

SPAN LENGTH	REINF CONCRETE SLAB (SLAB BEAM)	PRESTR CONC SLAB BEAM (5SB12 OR 5SB15) (1) ABUT TO INT BT	PRESTR CONC SLAB BEAM (5SB12 OR 5SB15) (1) INT BT TO INT BT	PRESTR CONC SLAB BEAM (5SB12 OR 5SB15) (1) ABUT TO ABUT	TOTAL (2) REINF STEEL
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

(1) 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.

(2) Reinforcing steel weight is calculated using an approximate factor of 2.8 Lbs/SF.

(3) Based on theoretical beam camber, dead load deflections of 5" cast-in-place concrete slab and a constant grade.

(4) Fabricator will adjust beam lengths for beam slopes as required.

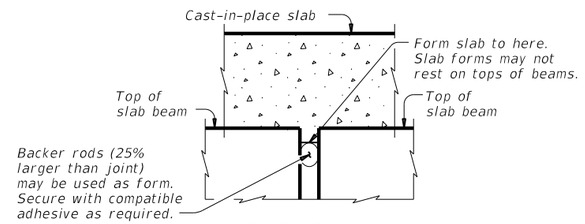
(5) Where slab is continuous over Interior Bents, Bars T are continuous through Joint. See "Continuous Slab Detail".

(6) This standard does not provide for changes in roadway cross-slopes within the structure.

(7) 1 ¼" 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.

(8) 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.

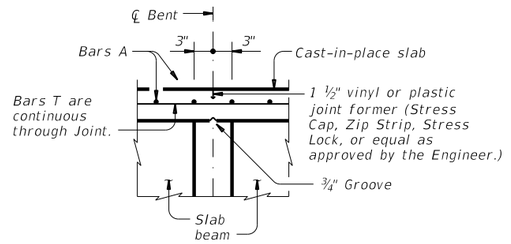
(9) See Bridge Layout for expansion joint locations. If using Type A expansion joints, the maximum distance between joints is 100 feet. Type A joints are subsidiary to Item 422, "Concrete Superstructures".



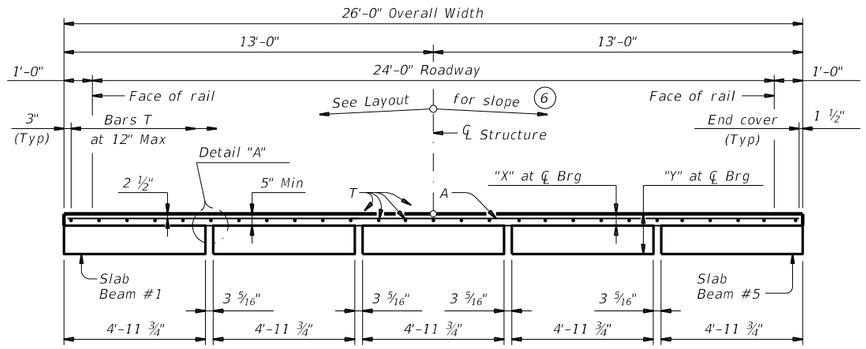
DETAIL "A"

BAR	SIZE
A	#5
T	#4

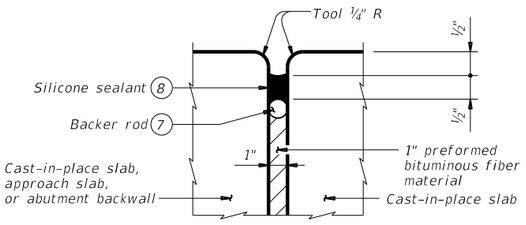
BAR TABLE



CONTINUOUS SLAB DETAIL



TYPICAL TRANSVERSE SECTION



TYPE A JOINT DETAIL (9)

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 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

Texas Department of Transportation

Bridge Division Standard

PRESTRESSED CONCRETE SLAB BEAM SPANS
(TYPE SB12 OR SB15)
24' ROADWAY 15° SKEW
SPSB-24-15

FILE: PSB-SPSB2415-17.dgn	DN: TxDOT	CK: TxDOT	DW: TxDOT	CK: TxDOT
©TxDOT January 2017	CONT	SECT	JOB	HIGHWAY
REVISIONS	0920	03	082, ETC	CR 1065, ETC
	DIST	COUNTY		SHEET NO.
	BMT	HARDIN, ETC		164

DATE: 2/26/2024 2:29:28 PM
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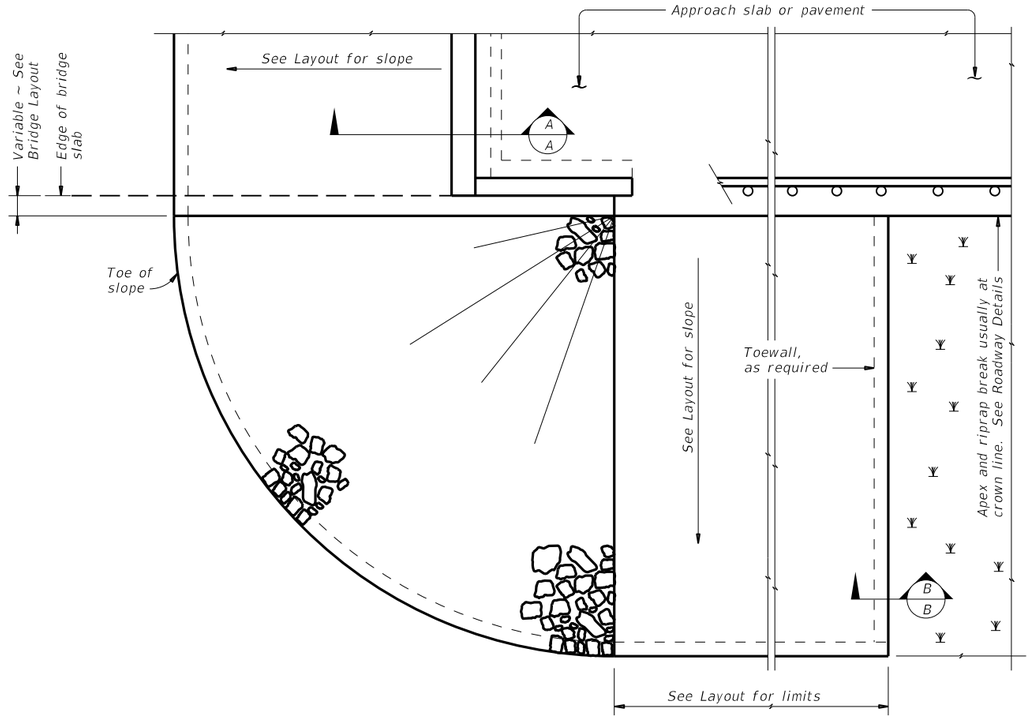
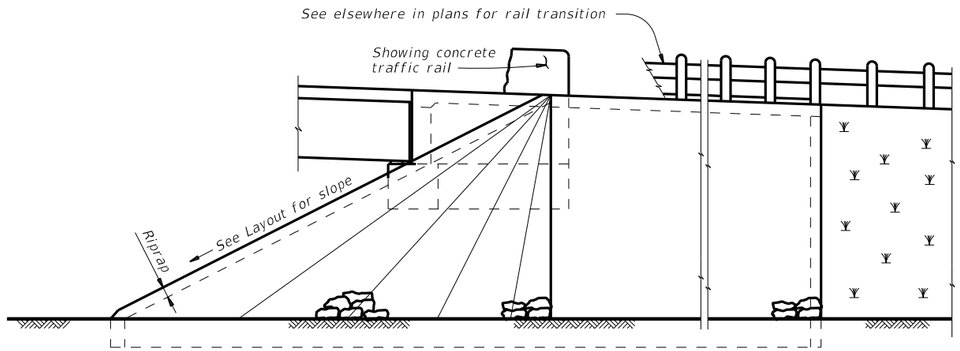
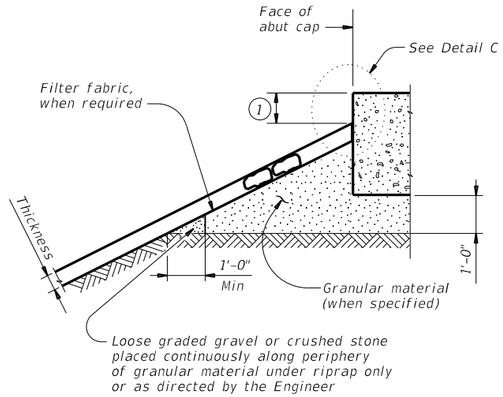


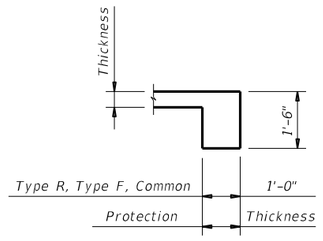
PLAN



ELEVATION

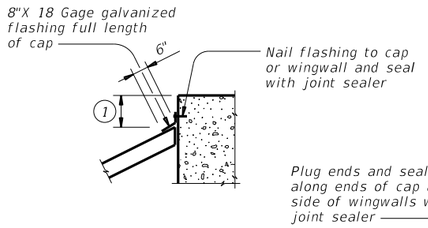


SECTION A-A AT CAP

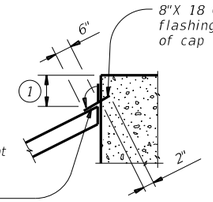


SECTION B-B

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.

Texas Department of Transportation

Bridge Division Standard

STONE RIPRAP

SRR

FILE: MS-SRR-19.dgn	DN: AES	CK: JGD	DW: BWH	CK: AES
©TxDOT April 2019	CONT	SECT	JOB	HIGHWAY
REVISIONS	0920	03	082, ETC	CR 1065, ETC
	DIST	COUNTY		SHEET NO.
	BMT	HARDIN, ETC		165

DATE: 2/26/2024 2:29:28 PM
FILE: pw://ija-pw.bentley.com:ija-pw-01/Documents/TxDOT/PW8016-2301 CEC WA4/Clemmons Gully Off-System Bridge/400 Production/4 - Design/Plan Set/7. Bridge/Bridge Standards/MS-SRR-19

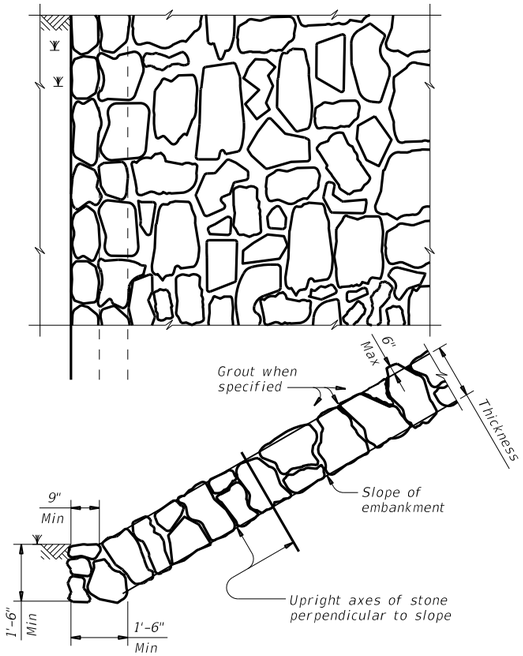


FIGURE 1 ~ TYPE R STONE RIPRAP
dry or grouted

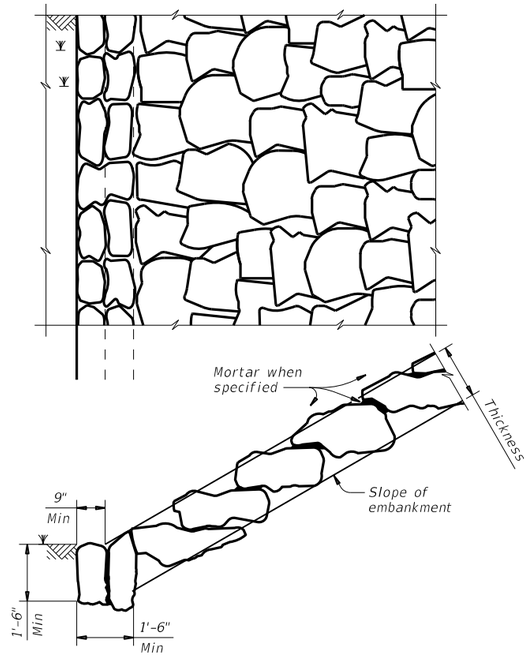


FIGURE 2 ~ TYPE F STONE RIPRAP
dry or mortared

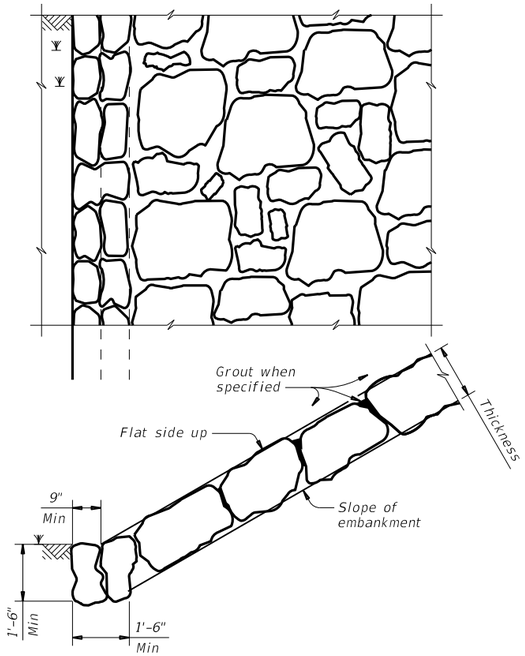


FIGURE 3 ~ TYPE F STONE RIPRAP
grouted

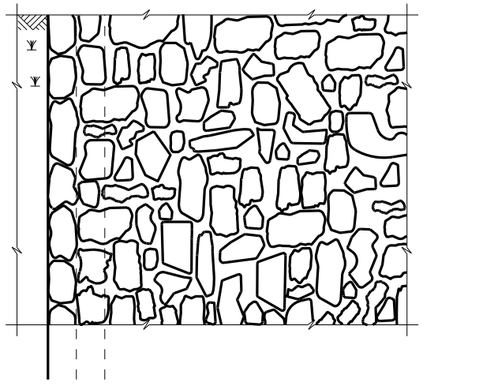


FIGURE 4 ~ COMMON STONE RIPRAP
dry or grouted

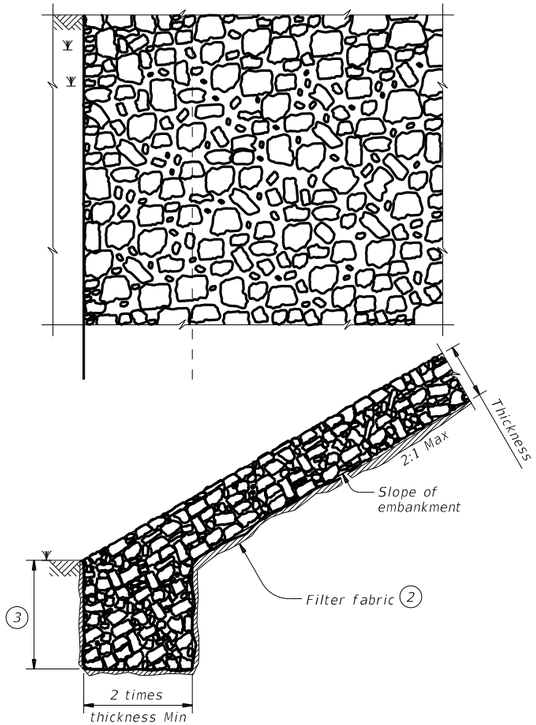


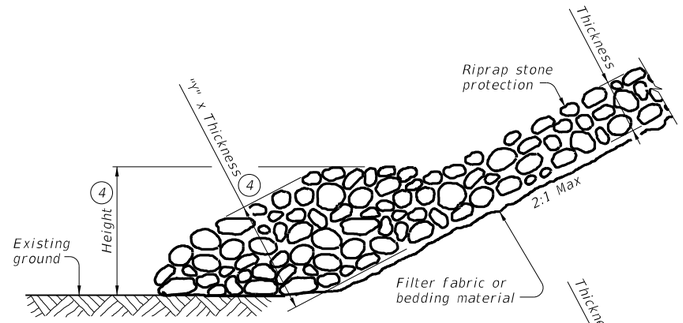
FIGURE 5 ~ PROTECTION STONE RIPRAP (5)

(2) Provide bedding material instead of filter fabric if shown elsewhere in plans. See Layout for thickness of bedding material.

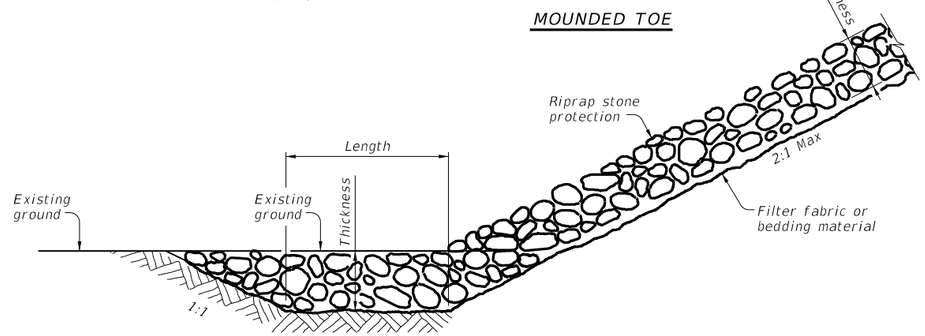
(3) Minimum toe depth is the larger of the maximum scour depth or 2 times the riprap thickness.

(4) "Y" and Height need to be defined. See layout or detail sheet for values if this option is used.

(5) List Stone Protection as size (XX inch) and thickness (YY inch) on the layout.
Example: Riprap (Stone Protection) XX inch, Thickness = YY inch.



MOUNDED TOE



EXTENDED ROCK FILLED TRENCH

PROTECTION STONE RIPRAP TOE OPTIONS (5)

SHEET 2 OF 2

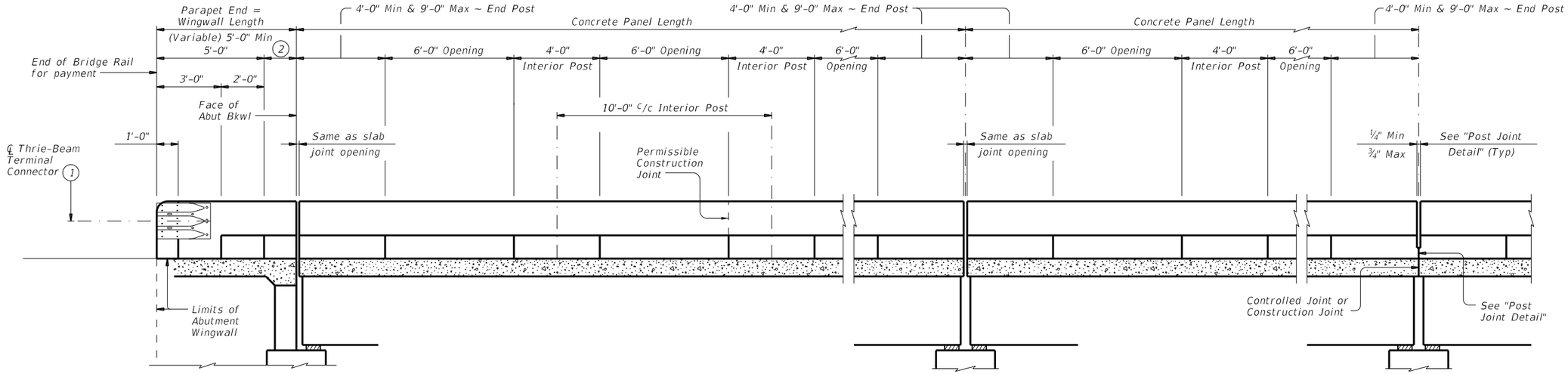
Texas Department of Transportation | Bridge Division Standard

STONE RIPRAP

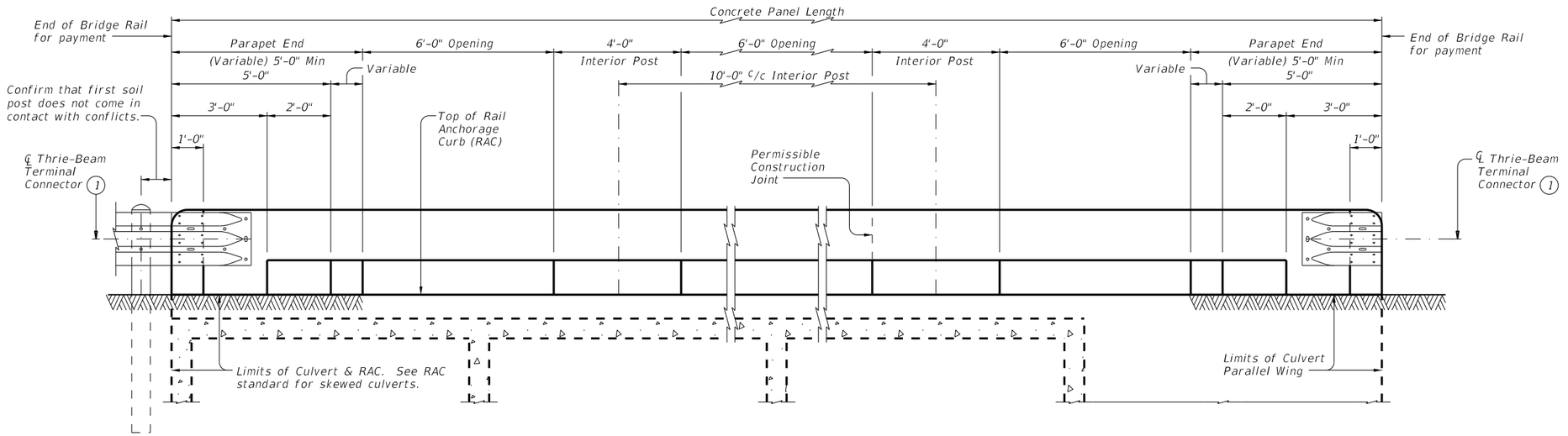
SRR

FILE: MS-SRR-19 (1).dgn	DN: AES	CK: JGD	DW: BWH	CK: AES
©TxDOT April 2019	CONT	SECT	JOB	HIGHWAY
REVISIONS	0920	03	082, ETC	CR 1055, ETC
	DIST	COUNTY		SHEET NO.
	BMT	HARDIN, ETC		166

DATE: 2/26/2024 2:29:32 PM
FILE: pw://ljg-pw.bentley.com:ljg-pw-01/Documents/TxDOT/PM8016-2301 CEC WA4/Clemmons Gully Off-System Bridge/400 Production/4 - Design/Plan Set/7. Bridge/Bridge Standards/RL-T223-19 (1).dgn



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)*

Texas Department of Transportation

Bridge Division Standard

TRAFFIC RAIL

TYPE T223

FILE: RL-T223-19 (1).dgn	DN: TxDOT	CK: TxDOT	DW: JTR	CK: AES
©TxDOT September 2019	CONT	SECT	JOB	HIGHWAY
REVISIONS	0920	03	082, ETC	CR 1065, ETC
	DIST	COUNTY		SHEET NO.
	BMT	HARDIN, ETC		167

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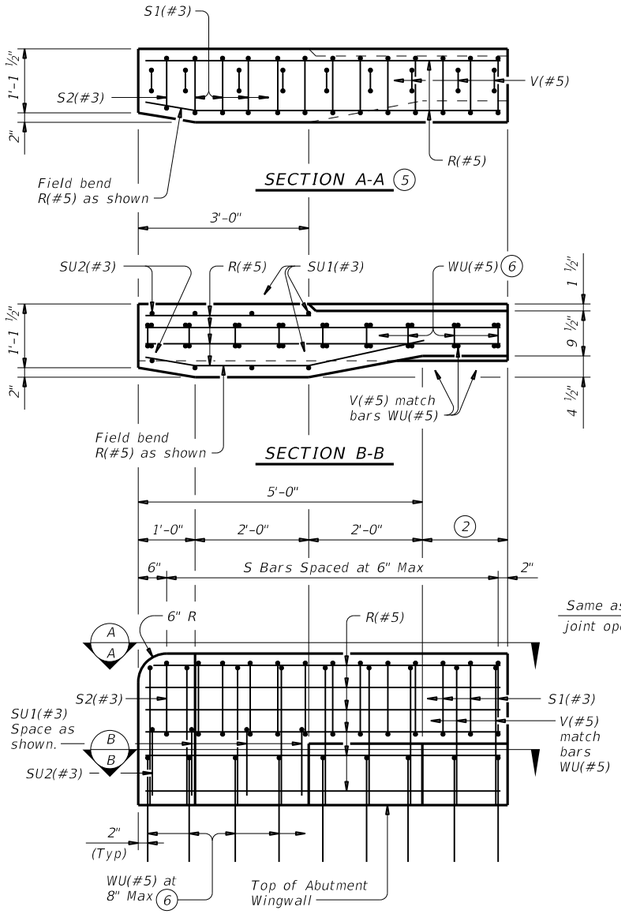
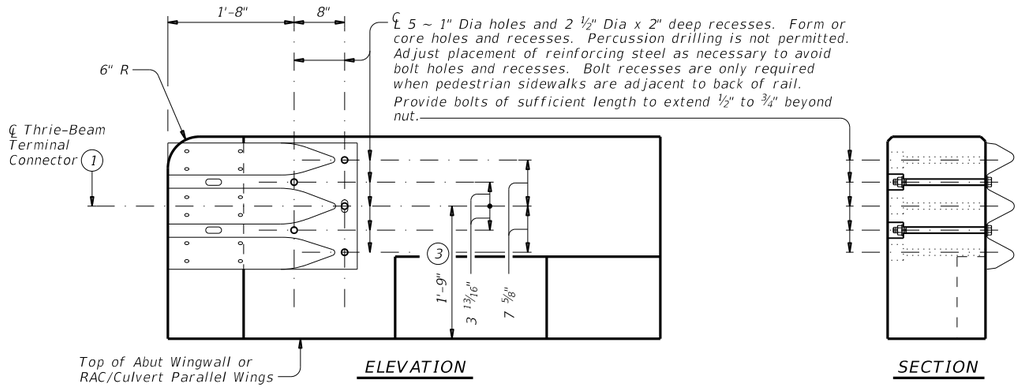
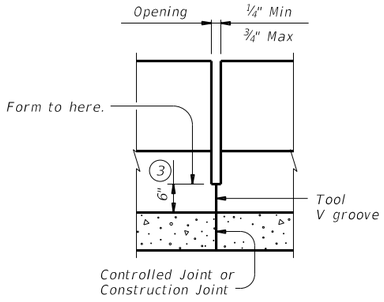
FILE: pw://ljg-pw.bentley.com:ljg-pw-01/Documents/TxDOT/PM8016-2301 CEC WA4/Clemmons Gully Off-System Bridge/400 Production/4 - Design/Plan Set/7. Bridge/Bridge Standards/RL-T223-19 (1).dgn



PARAPET END AT ABUT WINGVALL (6)

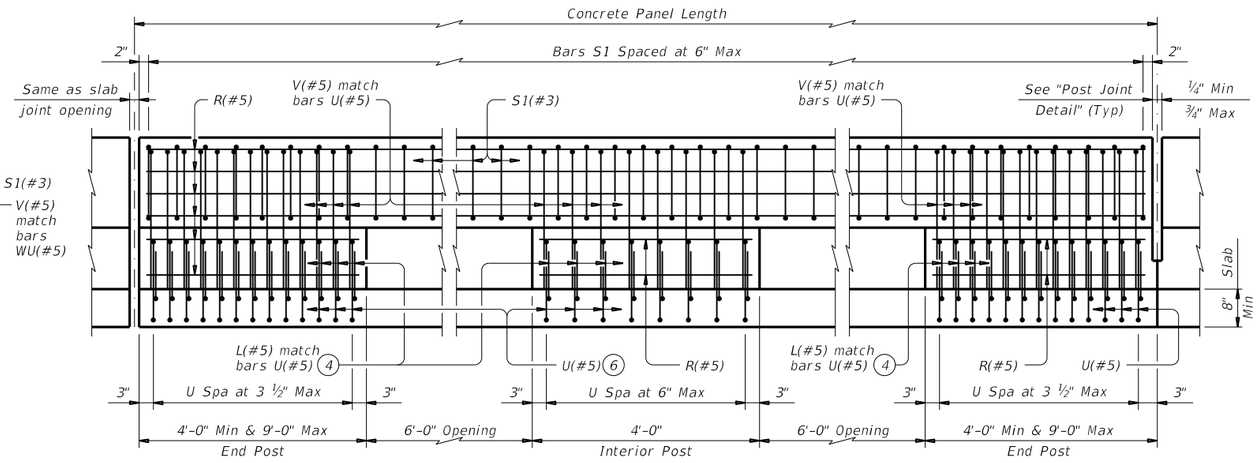


TERMINAL CONNECTION DETAILS



POST JOINT DETAIL

Provide at all interior bents without slab expansion joints.



AT SLAB EXPANSION JOINTS | AT 4' INTERIOR POST | AT BENTS WITHOUT SLAB EXPANSION JOINTS

ELEVATION SHOWING TYPICAL REINFORCING PLACEMENT

Showing rail on slab. Rail on box culvert similar.

(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.

Texas Department of Transportation | Bridge Division Standard

TRAFFIC RAIL

TYPE T223

FILE: RL-T223-19 (1).dgn	DN: TxDOT	CK: TxDOT	DW: JTR	CK: AES
©TxDOT September 2019	CONT	SECT	JOB	HIGHWAY
REVISIONS	0920	03	082, ETC	CR 1065, ETC
	DIST	COUNTY		SHEET NO.
	BMT	HARDIN, ETC		168

DATE: 2/26/2024 2:29:33 PM
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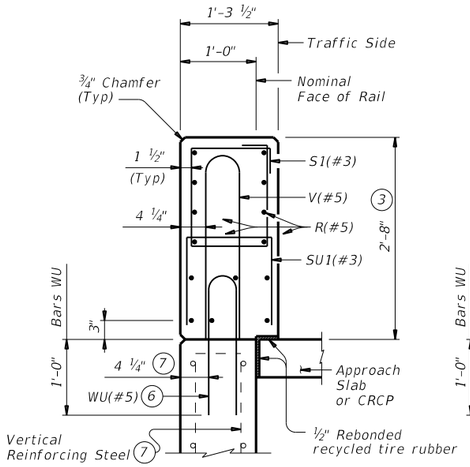
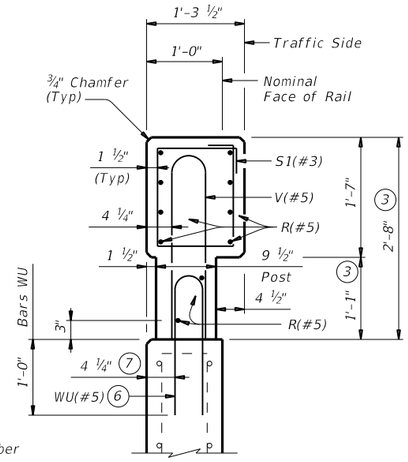
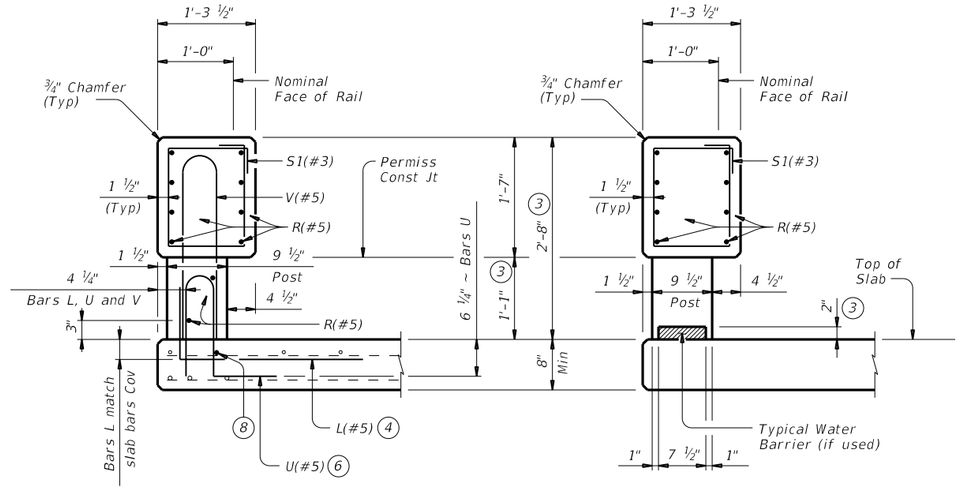


SECTION C-C
ON ABUTMENT WINGWALLS
OR CIP RETAINING WALLS



SECTION D-D
ON ABUTMENT WINGWALLS
OR CIP RETAINING WALLS

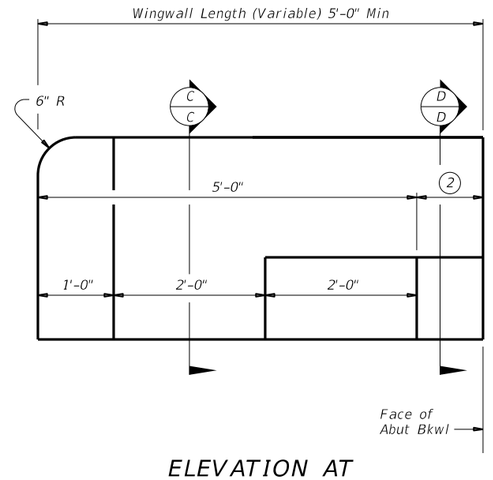


AT POST
ON BRIDGE SLAB

AT OPENING
ON BRIDGE SLAB

SECTIONS THRU RAIL

Sections on box culverts similar.



ELEVATION AT ABUTMENT WINGWALL

Box culvert parallel wings or rail anchorage curb similar.

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

(3) Increase 2" for structures with overlay.

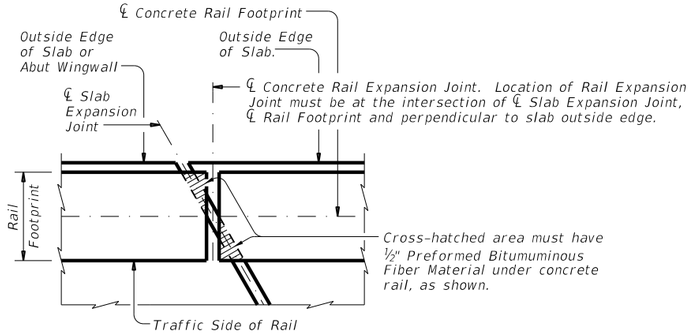
(4) Bars L(#5) are part of rail reinforcing and are included in unit price bid for railing. Space with Bars U. Bars L match slab bar cover. Bars L may be bundled with top slab reinforcing if spacing is equivalent.

(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 ¼" 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.

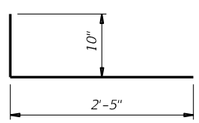
Do not use this railing on bridges with expansion joints providing more than 5" movement.

Rail anchorage details shown on this standard may require modification for select structure types. See appropriate details elsewhere in plans for these modifications.

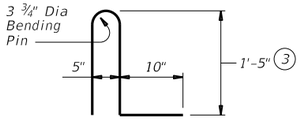
Shop drawings are not required for this rail.

Average weight of railing with no overlay is 358 plf.

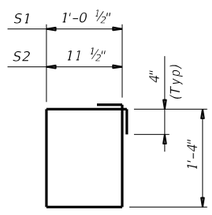
Cover dimensions are clear dimensions, unless noted otherwise. Reinforcing bar dimensions shown are out-to-out of bar.



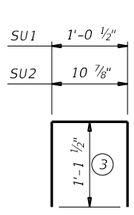
BARS L (#5)



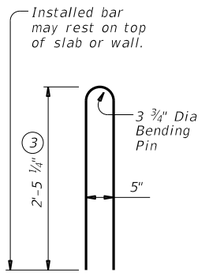
BARS U (#5) (9)



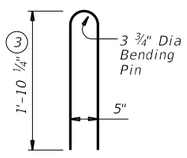
BARS S (#3)



BARS SU (#3)



BARS V (#5) (9)



BARS WU (#5)

SHEET 3 OF 3

Texas Department of Transportation

Bridge Division Standard

TRAFFIC RAIL

TYPE T223

FILE: RL-T223-19 (1).dgn	DN: TxDOT	CK: TxDOT	DW: JTR	CK: AES
©TxDOT September 2019	CONT	SECT	JOB	HIGHWAY
REVISIONS	0920	03	082, ETC	CR 1065, ETC
	DIST	COUNTY		SHEET NO.
	BMT	HARDIN, ETC		169

DATE: 2/26/2024 2:29:55 PM
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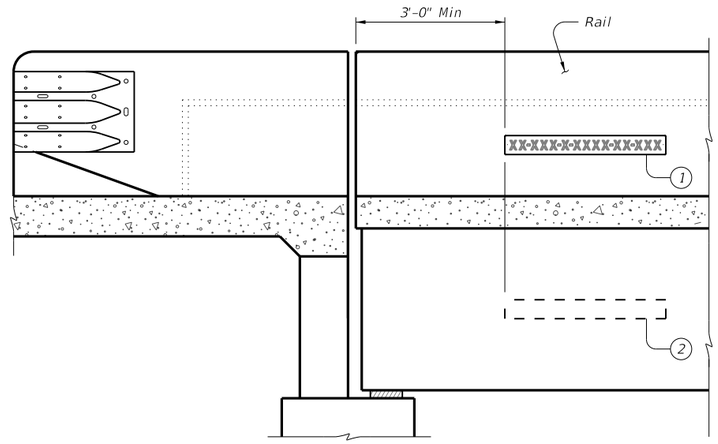
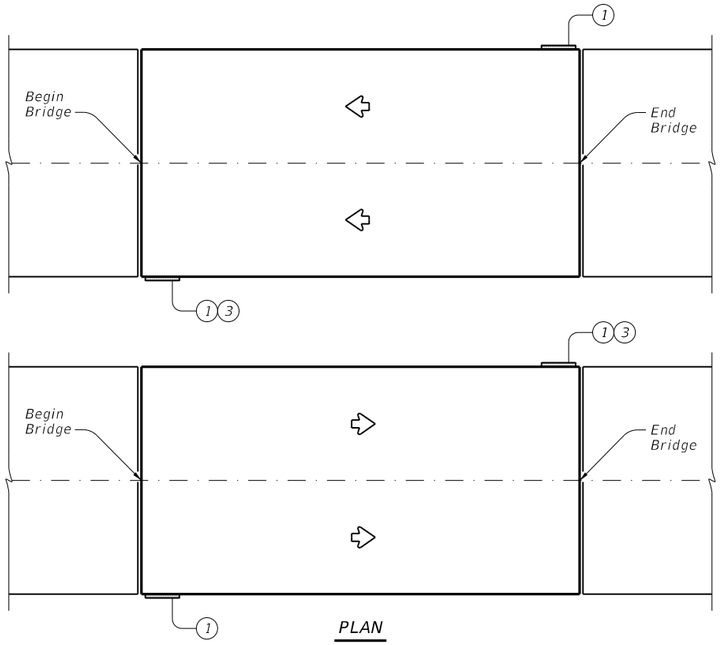
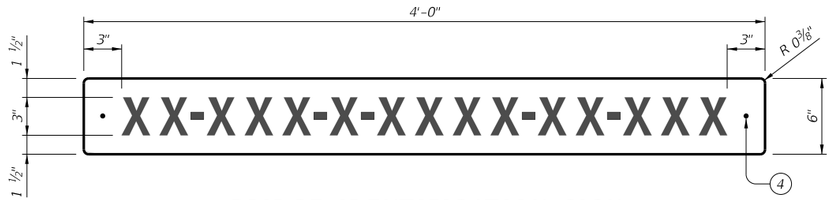


ELEVATION

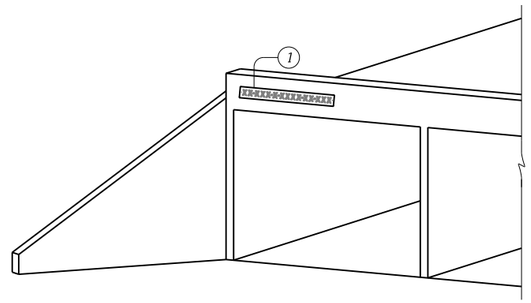


PLAN

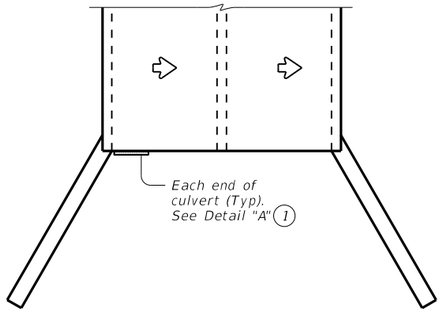
BRIDGE SIGN LOCATIONS



BRIDGE IDENTIFICATION SIGN

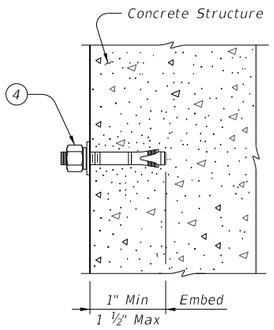


DETAIL "A"



PLAN

BRIDGE CLASS CULVERT SIGN PLACEMENT



ANCHOR DETAIL

SHEETING REQUIREMENTS

Usage	Color	Sign Face Material
Background	White	Type B or C Sheeting
Letters and Symbols	Black	Type B or C Sheeting

(1) Bridge identification sign location

(2) Alternate sign placement location for exterior concrete beams.

(3) If adjacent bridges are less than 2 feet apart, these signs may be omitted.

(4) ¼" Diameter stainless steel expansion anchor with hex nut, washer, and spring-lock washer.

SIGN NOTES:

Standard sign designs can be found in the Standard Highway Sign Designs for Texas (SHSD).

Use the Clearview Alphabet CV-2W for the letters and symbols.

MATERIAL NOTES:

Provide lateral spacing between letters and numerals conforming with the SHSD, and any approved changes thereto. Provide a balanced appearance when spacing is not shown.

Provide aluminum sign blanks with a minimum thickness of 0.080" that meet the requirements of DMS-7110.

Provide sign face materials that meet the requirements of DMS-8300 and the sheeting requirements shown in the table.

Provide ¼" diameter stainless steel expansion anchors with one hex head nut, one flat washer, and one helical spring-lock washer each.

Use torque controlled mechanical expansion anchors that are approved for use in cracked concrete by the International Code Council, Evaluation Service (ICC-ES). Provide anchor products that have a designated ICC-ES Evaluation Report number. The approval status must be maintained on the ICC-ES website under Division 031600 for Concrete Anchors.

Unless otherwise approved by the Engineer: do not use adhesive anchors; do not use expansion anchors that are not included in the ICC-ES approval list; and do not use expansion anchors that are only approved for use in uncracked concrete.

Use anchors manufactured with stainless steel expansion wedges. Anchors manufactured with carbon steel expansion wedges are not allowed. Anchor bodies can be either zinc-plated carbon steel or stainless steel. For application in marine environments, provide both stainless steel anchor bodies and expansion wedges.

GENERAL NOTES:

Prior to hole drilling, locate rebar to ensure clearing of existing reinforcement and/or strands.

Prior to installation, obtain approval of sign locations from the Engineer. Avoid placement of sign over travel lanes and pedestrian walkways. Submit proposed installation method to Engineer prior to beginning work. Install anchors as shown on plans and in accordance with the anchor manufacturer's published installation instructions.

Do not install anchors sections of members under tension.

For new construction, the signs and anchors are subsidiary to the bridge. For installations on existing structures, the signs and anchors are paid under Item 442, "Metal for Structures." Each sign weighs 28 lbs.

Texas Department of Transportation

Bridge Division Standard

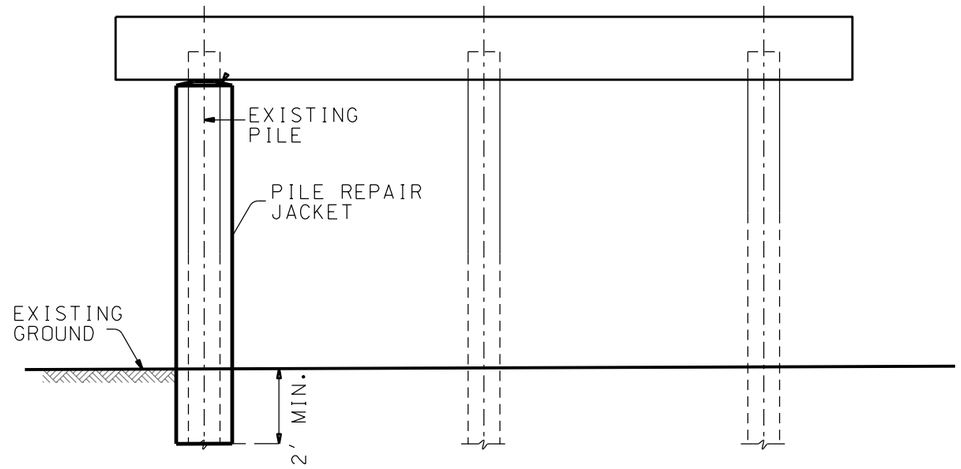
NBIS BRIDGE IDENTIFICATION SIGN STANDARD

NBIS

FILE: MS-NBIS-23.dgn	DN: TAR	CK: TxDOT	DW: JER	CK: TAR
©TxDOT March 2023 REVISIONS	CONT	SECT	JOB	HIGHWAY
	0920	03	082, ETC	CR 1065, ETC
	DIST	COUNTY		SHEET NO.
	BMT	HARDIN, ETC		170

The following steps will be required:

1. Scrape the surface of the pile clean, removing deteriorated concrete.
2. Sandblasting may be used to clean the exposed reinforcement in concrete piles above the waterline. Splice with new reinforcement if required. Install steel reinforcement as shown. Use spacers to keep the forming in proper position.
3. Place the forming jacket around pile and seal the bottom of form against pile surface
4. Pump concrete into form through opening at the top.
5. Finish top portion of repaired area.
6. Leave forms in-place for at least 48 hours and until the concrete reaches a compressive strength of 3000 psi.



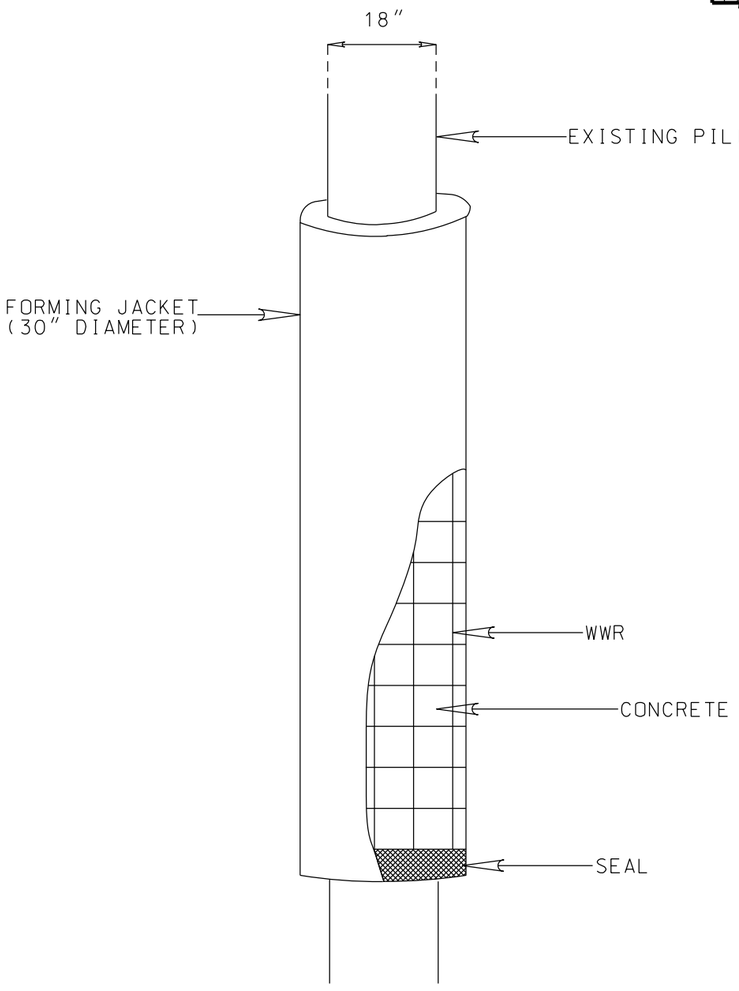
Notes:

Provide concrete for the pile encasement with a strength of 3000 psi in 24 hours and coarse aggregate grades not greater than no. 5 (3/4"). Provide a concrete mix with 2 gallons of corrosion inhibitor per CY.

If underwater placement is approved, concrete mix should be designed for underwater placement and may require the use of anti-washout admixtures.

Place the concrete in the encasement/jacket per approved steps and in accordance with Items 420 and 421.

Provide a minimum of 2" clear cover of the WWR in all directions.



* Use 6 x 6 - W10 x W10 WWR, unless otherwise directed by the engineer. Use Class C concrete

STATE OF TEXAS
JAMES D. HORNE
141323
REGISTERED PROFESSIONAL ENGINEER

02/29/2024

Texas Department of Transportation

Bridge Division

PILING REPAIR JACKET DETAIL

FILE: 14Jacket (1).dgn	DN:	CK:	DW:	CK:
©TxDOT August 2022	CONT	SECT	JOB	HIGHWAY
REVISIONS	0920	03	082, ETC	CR 1065, ETC
	DIST	COUNTY		SHEET NO.
	BMT	HARDIN, ETC		171

DW: CK: DW: CK:

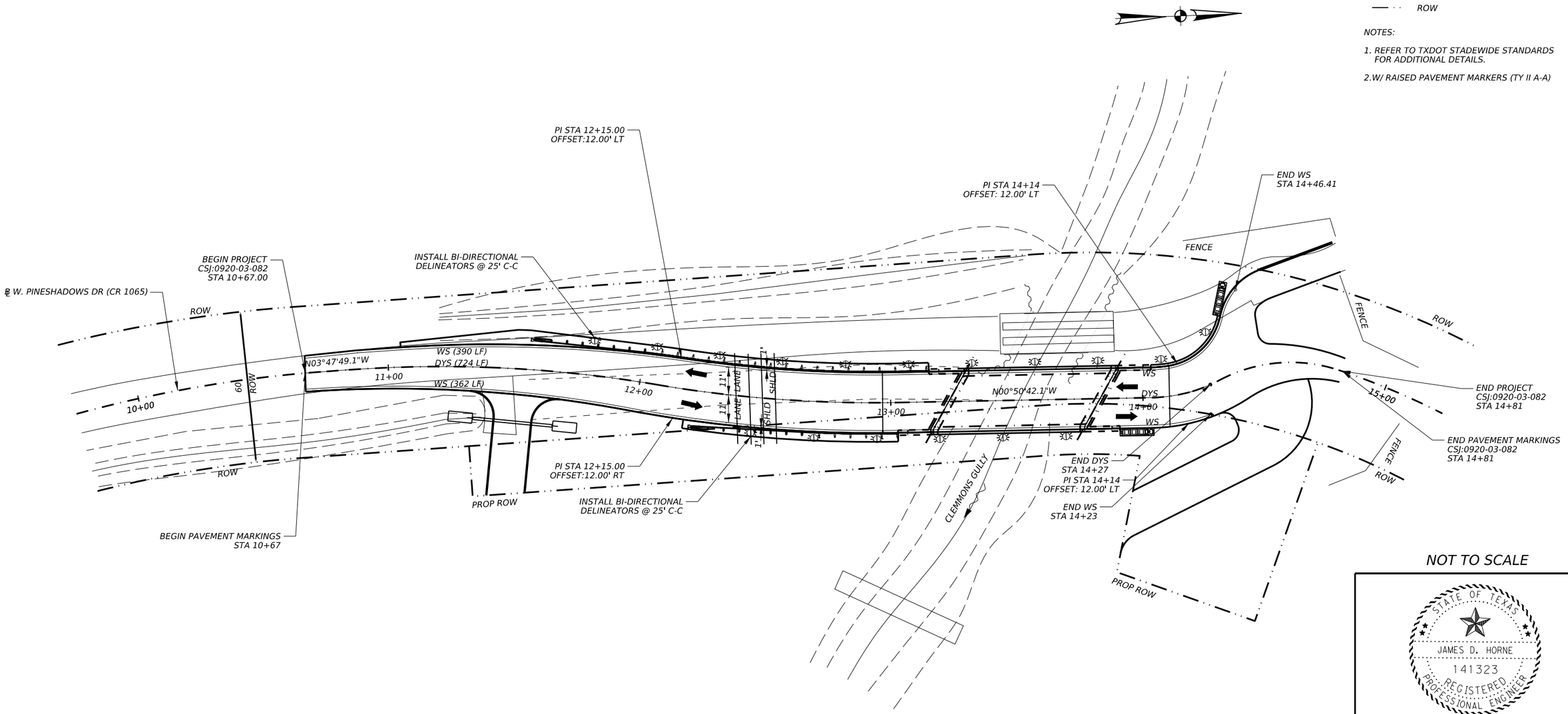
LEGEND

BIDIRECTIONAL DELINEATOR

ROW

NOTES:

1. REFER TO TXDOT STADEWIDE STANDARDS FOR ADDITIONAL DETAILS.
2. W/ RAISED PAVEMENT MARKERS (TY II A-A)



NOT TO SCALE

STATE OF TEXAS
JAMES D. HORNE
141323
REGISTERED
PROFESSIONAL ENGINEER

DocuSigned by:
50238C8D55F5470...
2/29/2024

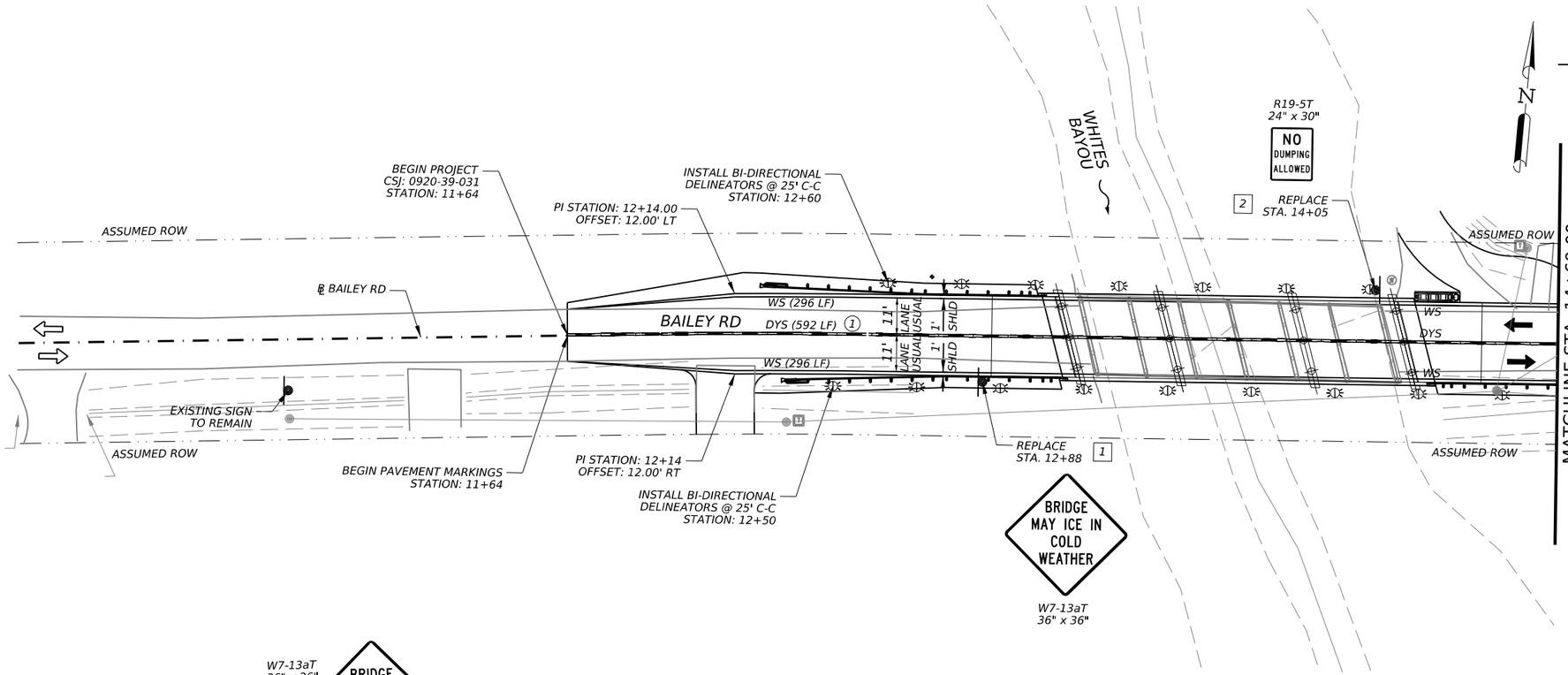
Texas Department of Transportation

CLEMMONS GULLY PACKAGE

PAVEMENT MARKING & DELINEATION PLAN SHEET W. PINESHADOWS DR (CR 1065) AT CLEMMONS GULLY

SHEET 1 OF 1

CONT	SECT	JOB	HIGHWAY
0920	03	082,ETC	CR 1065, ETC
DIST	COUNTY		SHEET NO.
20	HARDIN, ETC		172



LEGEND

- EXISTING TRAFFIC ARROW
- PROPOSED TRAFFIC DIRECTION
- BIDIRECTIONAL DELINEATOR
- ASSUMED ROW
- # PROPOSED SIGN NUMBER
- PROPOSED SIGN

1 W/ RAISED PAVEMENT MARKERS (TY II A-A)

STATE OF TEXAS
S. E. WRIGHT
108969
LICENSED
PROFESSIONAL ENGINEER

02-27-2024

LJA PROGRAM MANAGEMENT
FRN - F-14256

Texas Department of Transportation

CLEMMONS GULLY PACKAGE

PAVEMENT MARKINGS &
DELINEATION PLAN SHEET
BAILEY RD AT WHITES BAYOU

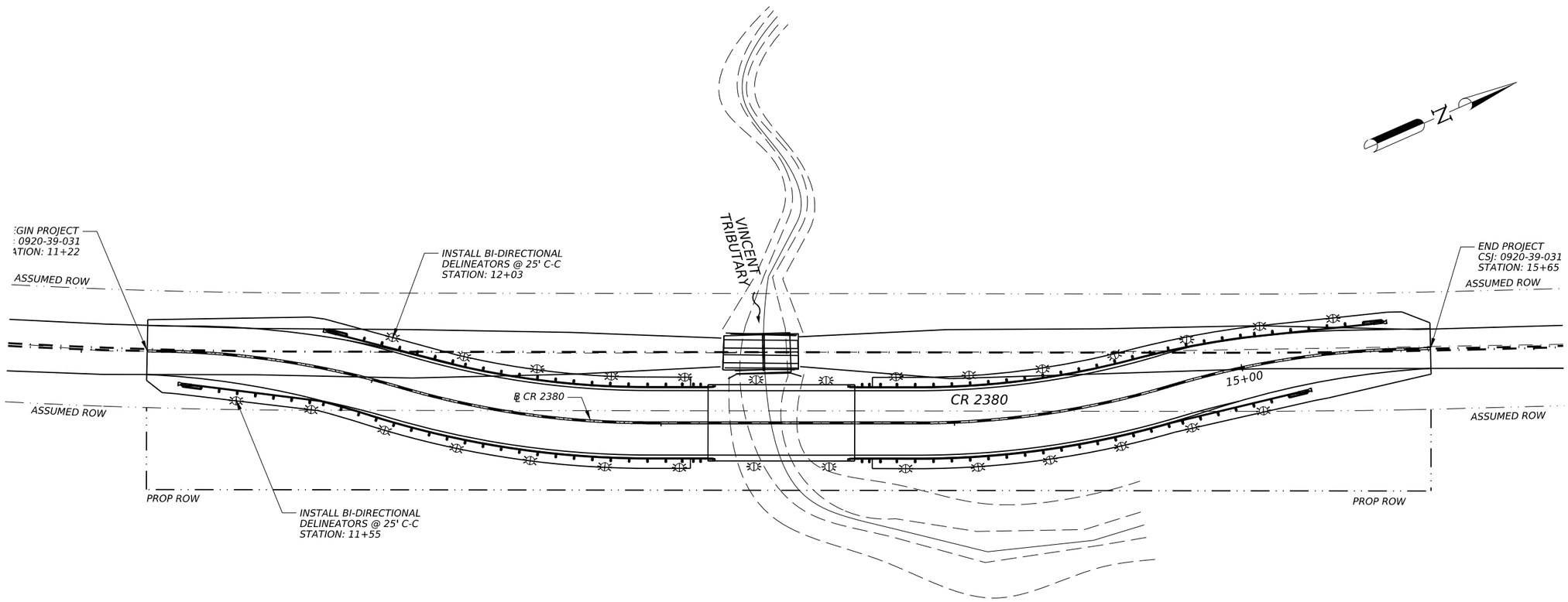
SHEET 1 OF 1

CONT	SECT	JOB	HIGHWAY
0920	03	082, ETC	CR 1065, ETC
DIST	COUNTY		SHEET NO.
BMT	HARDIN, ETC		173

DATE: 2/26/2024 2:30:18 PM
FILE: pw://lja-pw.bentley.com:lja-pw-01/Documents/TxDOT/PM80016-2301 CEC WA4/Clemmons Gully Off-System Bridge/400 Production/4 - Design/Plan Set/8. Traffic/SPM/031_BS_SPM01.dgn

LEGEND

- EXISTING TRAFFIC ARROW
- PROPOSED TRAFFIC DIRECTION
- BIDIRECTIONAL DELINEATOR
- ASSUMED ROW
- PROPOSED SIGN NUMBER
- PROPOSED SIGN



0' 20' 40'

SCALE: 1"=40'

STATE OF TEXAS
S. E. WRIGHT
108969
LICENSED
PROFESSIONAL ENGINEER

02-27-2024

LJA PROGRAM MANAGEMENT
FRN - F-14256

Texas Department of Transportation

CLEMMONS GULLY PACKAGE

PAVEMENT MARKINGS &
DELINEATION PLAN SHEET
CR 2380 AT VINCENT TRIBUTARY

SHEET 1 OF 1

CONT	SECT	JOB	HIGHWAY
0920	03	082, ETC	CR 1065, ETC
DIST	COUNTY		SHEET NO.
BMT	HARDIN, ETC		174

DATE: 2/26/2024 2:30:22 PM
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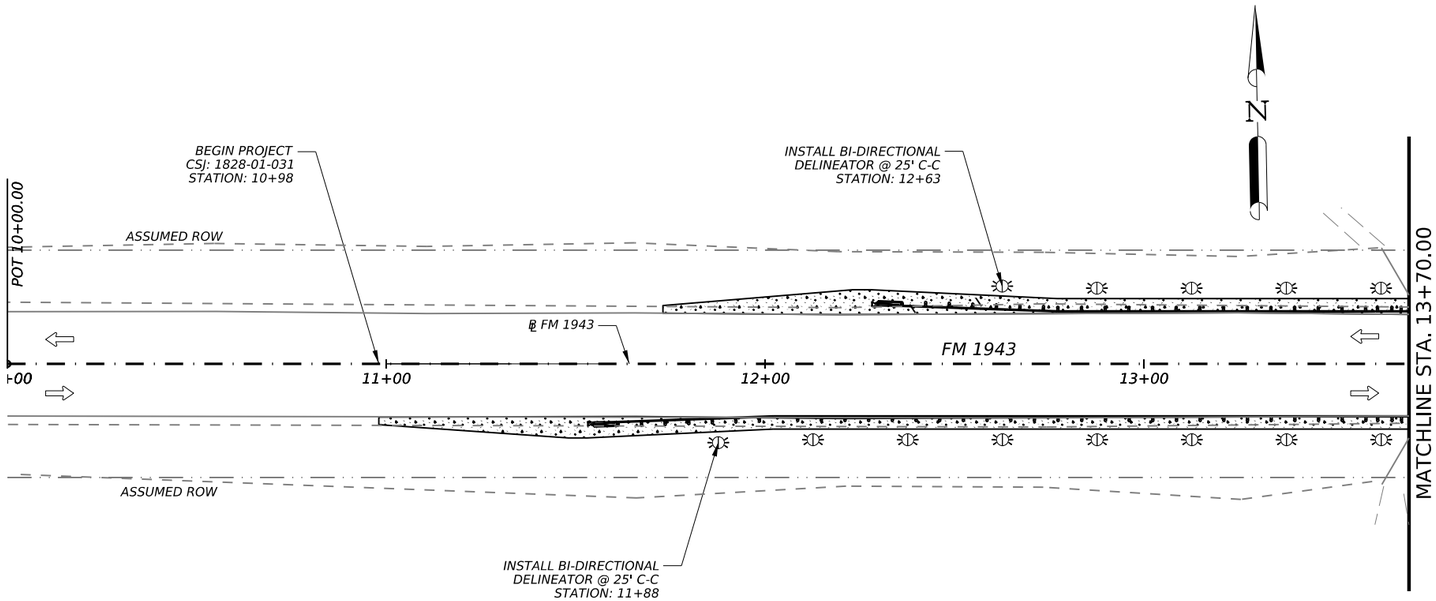
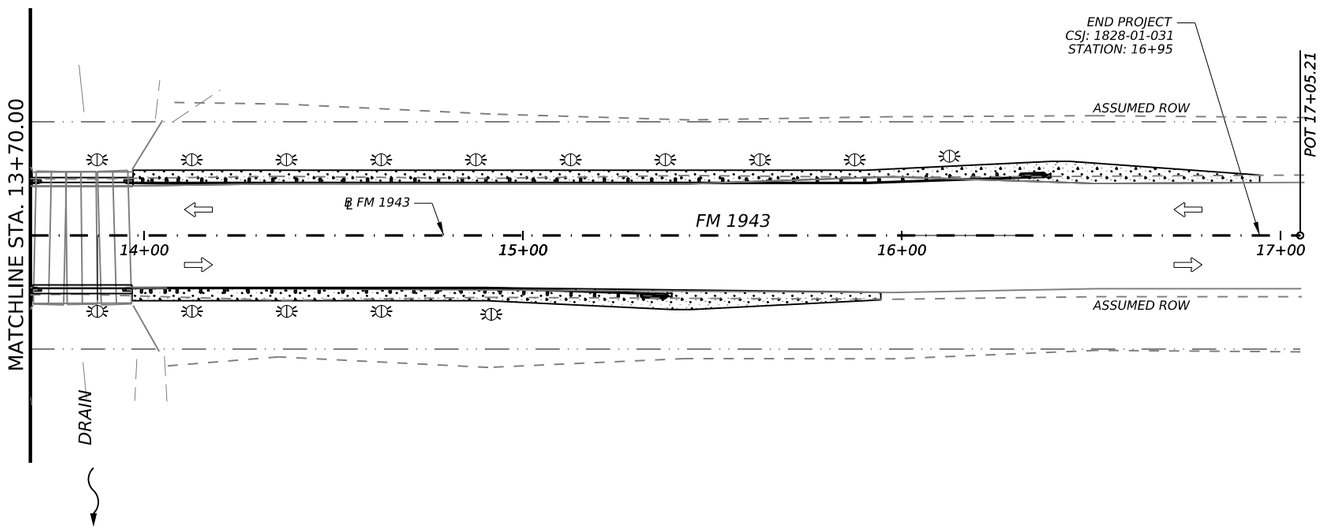


LEGEND

- EXISTING TRAFFIC ARROW
- PROPOSED TRAFFIC DIRECTION
- BIDIRECTIONAL DELINEATOR
- ASSUMED ROW
- PROPOSED SIGN NUMBER
- PROPOSED SIGN

0' 20' 40'

SCALE: 1"=40'



02-27-2024

LJA PROGRAM MANAGEMENT
FRN - F-14256

Texas Department of Transportation

CLEMMONS GULLY PACKAGE

PAVEMENT MARKINGS &
DELINEATION PLAN SHEET
FM 1943 AT DRAIN

SHEET 1 OF 1

CONT	SECT	JOB	HIGHWAY
0920	03	082, ETC	CR 1065, ETC
DIST	COUNTY		SHEET NO.
BMT	HARDIN, ETC		175

DATE: 2/26/2024 2:30:26 PM
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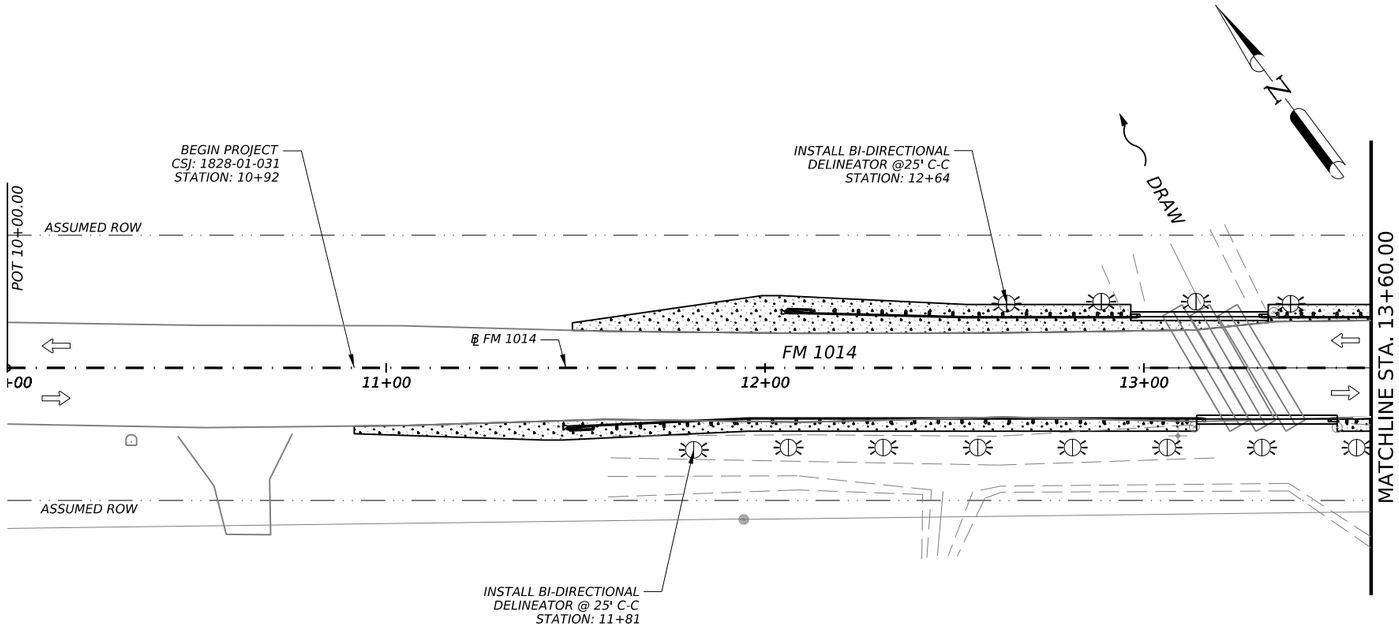

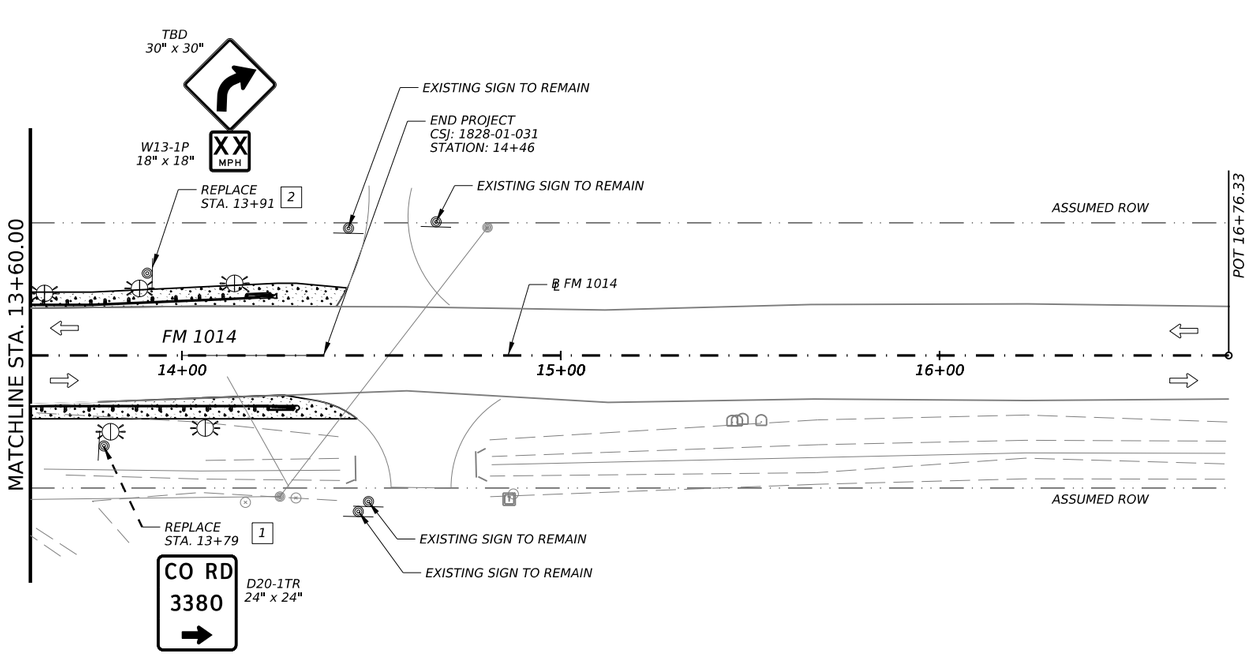

LEGEND

- EXISTING TRAFFIC ARROW
- PROPOSED TRAFFIC DIRECTION
- BIDIRECTIONAL DELINEATOR
- ASSUMED ROW
- PROPOSED SIGN NUMBER
- PROPOSED SIGN

0' 20' 40'

SCALE: 1"=40'

STATE OF TEXAS
S. E. WRIGHT
108969
LICENSED
PROFESSIONAL ENGINEER

02-27-2024

LJA PROGRAM MANAGEMENT
FRN - F-14256

Texas Department of Transportation

CLEMMONS GULLY PACKAGE

PAVEMENT MARKINGS &
DELINEATION PLAN SHEET
FM 1014 AT DRAW

SHEET 1 OF 1

CONT	SECT	JOB	HIGHWAY
0920	03	082, ETC	CR 1065, ETC
DIST	COUNTY		SHEET NO.
BMT	HARDIN, ETC		176

DATE: 2/26/2024 2:30:31 PM
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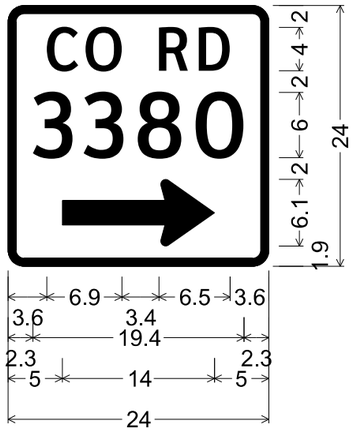

D20-1TR_24x24;
1.5" Radius, 0.8" Border, White on Green;
"CO RD", ClearviewHwy-3-W;
"3380", ClearviewHwy-3-W;
Standard Arrow Custom 14.0" X 6.1" 0°;

STATE OF TEXAS
S. E. WRIGHT
108969
LICENSED
PROFESSIONAL ENGINEER

02-29-2024

LJA PROGRAM MANAGEMENT
FRN - F-14256

CLEMMONS GULLY PACKAGE

SIGN DETAILS

SHEET 1 OF 1

CONT	SECT	JOB	HIGHWAY
0920	03	082, ETC	CR 1065, ETC
DIST	COUNTY		SHEET NO.
BMT	HARDIN, ETC		177

DATE: 2/29/2024 6:58:15 PM
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DATE: 2/26/2024 2:30:57 PM
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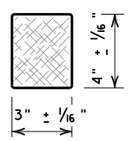
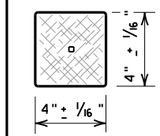
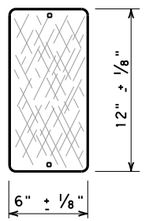
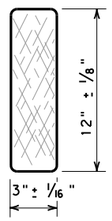
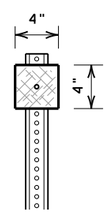
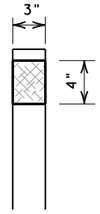
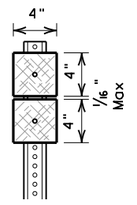
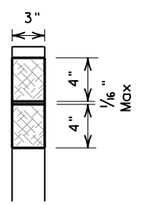
REFLECTOR UNIT SIZES FOR DELINEATORS AND OBJECT MARKERS

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

DELINEATORS

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

D & OM DESCRIPTIVE CODES

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

NUMBER OF REFLECTORS
S = Single
D = Double

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

REFLECTOR UNIT SIZE
1 or 2

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

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

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

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

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

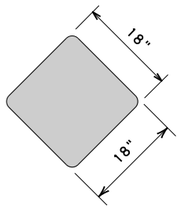
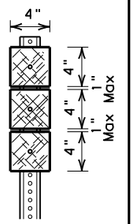
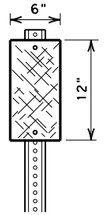
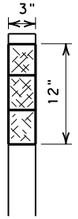
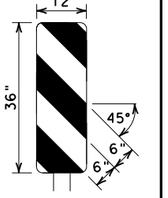
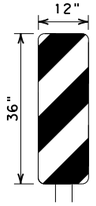
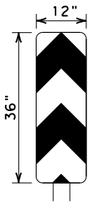
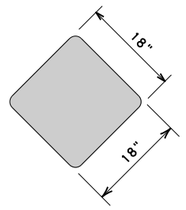
NUMBER OF REFLECTORS OR DIRECTION
X = 3-Size 2 reflector units (Type 2 only)
Y = 1-Size 3 reflector unit (Type 2 only)
Z = 3-Size 1 or 1-Size 4 reflector unit(s) (Type 2 only)
L = Left Side (Type 3 Object Marker only)
R = Right Side (Type 3 Object Marker only)
C = Center (Type 3 Object Marker only)

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

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

DIRECTION
If Required
BI = Bi-Directional

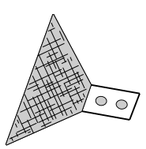
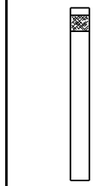
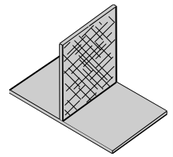
OBJECT MARKERS

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

DEPARTMENTAL MATERIAL SPECIFICATIONS

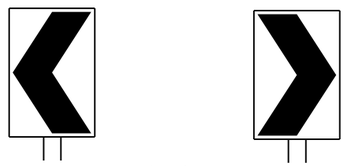
FLEXIBLE DELINEATOR & OBJECT MARKER POSTS (EMBEDDED & SURFACE MOUNT TYPES)	DMS-4400
SIGN FACE MATERIALS	DMS-8300
DELINEATORS, OBJECT MARKERS AND BARRIER REFLECTORS	DMS-8600

BARRIER REFLECTORS (BRF)

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

CHEVRONS

DEVICE

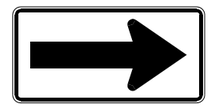


SIZE (W x L)	18"x 24" (Conventional)	24"x 30" (Conventional Oversize)	30"x 36" (Expressway)	36" x 48" (Freeway)
MOUNTING HEIGHT	4'-0" or 7'-0"		7'-0" Only	

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

ONE DIRECTION LARGE ARROW

DEVICE



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

NOTE:

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

Texas Department of Transportation

Traffic Safety Division Standard

DELINEATOR & OBJECT MARKER MATERIAL DESCRIPTION

D & OM(1)-20

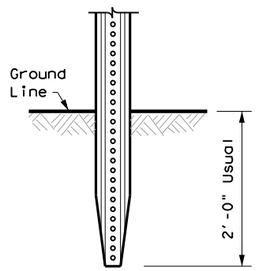
FILE: dom1-20.dgn	DN: TXDOT	CK: TXDOT	DW: TXDOT	CK: TXDOT
©TxDOT August 2004	CONT	SECT	JOB	HIGHWAY
REVISIONS	0920	03	082, ETC	CR 1065, ETC
10-09 3-15	DIST	COUNTY		SHEET NO.
4-10 7-20	BMT	HARDIN, ETC		178

20A

POST TYPE AND SUPPORT FOUNDATION DETAILS

WING CHANNEL (WC)

GND

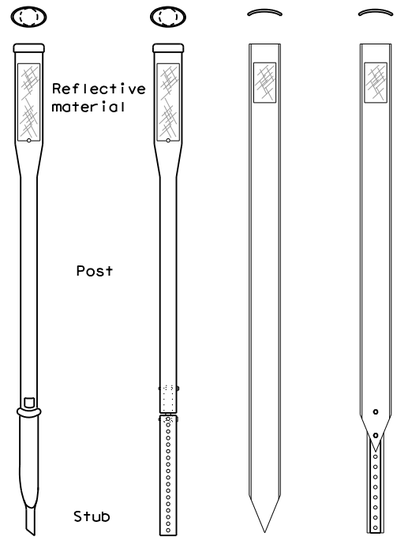


NOTES

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

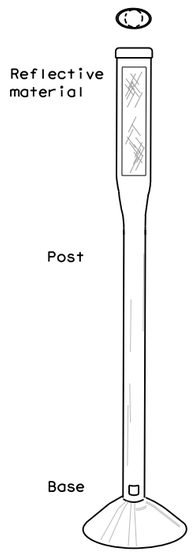
FLEXIBLE POSTS (YFLX, WFLX)

GND



EMBEDDED

SRF



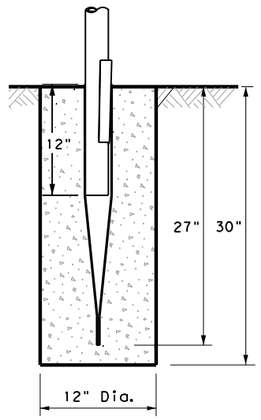
SURFACE MOUNT

NOTES

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

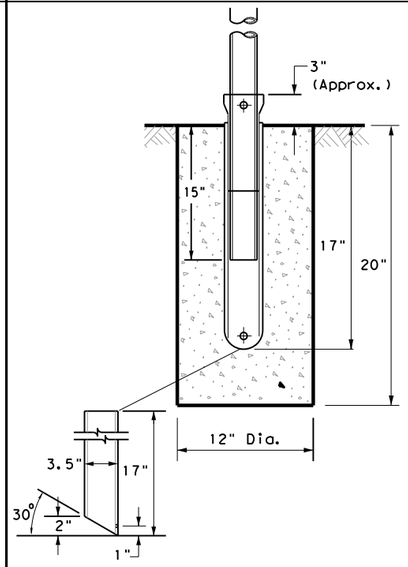
WEDGE ANCHOR SYSTEMS

WAS



STEEL

WAP



PLASTIC

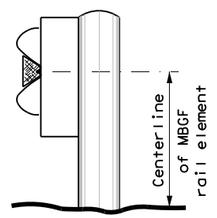
NOTE

1. Install per manufacturer's recommendations.

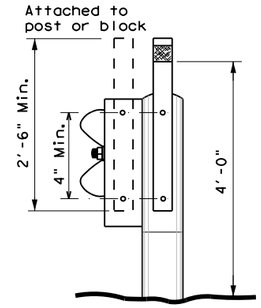
TYPE OF BARRIER MOUNTS

GUARD FENCE ATTACHMENT

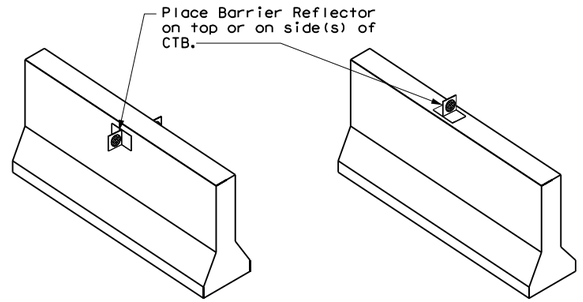
GF1



GF2



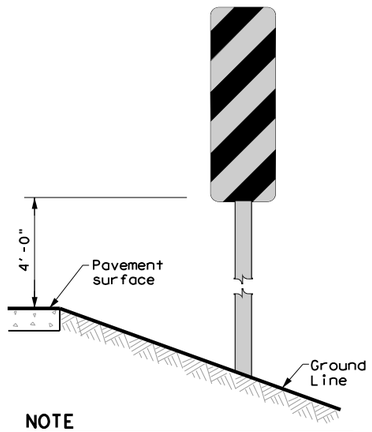
CONCRETE TRAFFIC BARRIER (CTB)



GENERAL NOTES

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

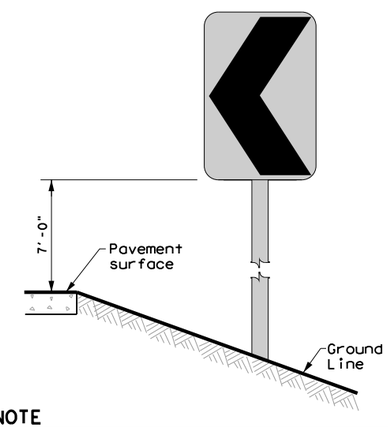
TYPES 1, 3, AND 4 OBJECT MARKERS AND CHEVRONS



NOTE

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

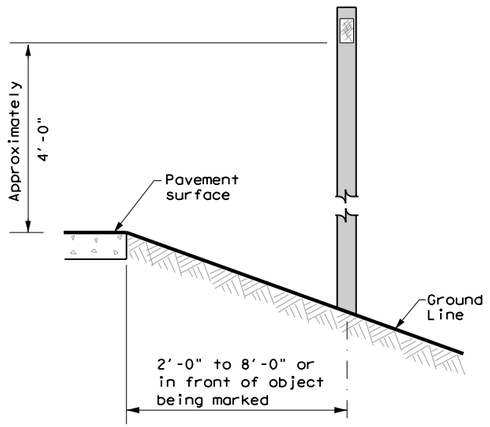
CHEVRONS AND ONE DIRECTION LARGE ARROW SIGN



NOTE

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

DELINEATORS AND TYPE 2 OBJECT MARKERS



See general notes 1, 2 and 3.

Texas Department of Transportation — Traffic Safety Division Standard

DELINEATOR & OBJECT MARKER INSTALLATION

D & OM(2)-20

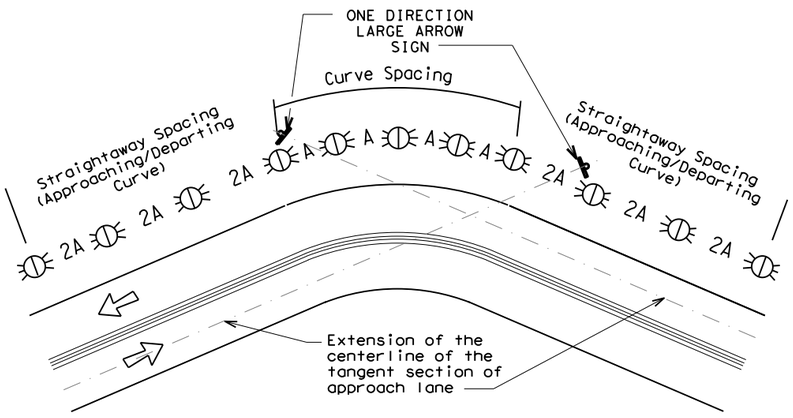
FILE: dom2-20.dgn	DN: TXDOT	CK: TXDOT	DW: TXDOT	CK: TXDOT
© TxDOT August 2004	CONT	SECT	JOB	HIGHWAY
REVISIONS	0920	03	082, ETC	CR 1065, ETC
10-09 3-15	DIST	COUNTY		SHEET NO.
4-10 7-20	BMT	HARDIN, ETC		179

20B

MINIMUM WARNING DEVICES AT CURVES WITH ADVISORY SPEEDS

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

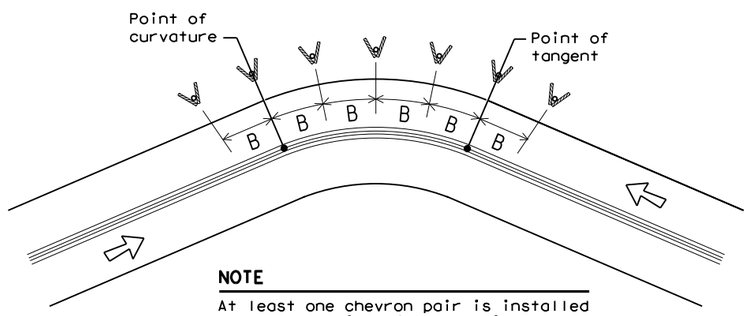
SUGGESTED SPACING FOR DELINEATORS ON HORIZONTAL CURVES



NOTE

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

SUGGESTED SPACING FOR CHEVRONS ON HORIZONTAL CURVES



NOTE

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

DELINEATOR AND CHEVRON SPACING

WHEN DEGREE OF CURVE OR RADIUS IS KNOWN

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

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

DELINEATOR AND CHEVRON SPACING

WHEN DEGREE OF CURVE OR RADIUS IS NOT KNOWN

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

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

DELINEATOR AND OBJECT MARKER APPLICATION AND SPACING

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

NOTES

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

LEGEND

	Bi-directional Delineator
	Delineator
	Sign

Texas Department of Transportation

Traffic Safety Division Standard

DELINEATOR & OBJECT MARKER PLACEMENT DETAILS

D & OM(3)-20

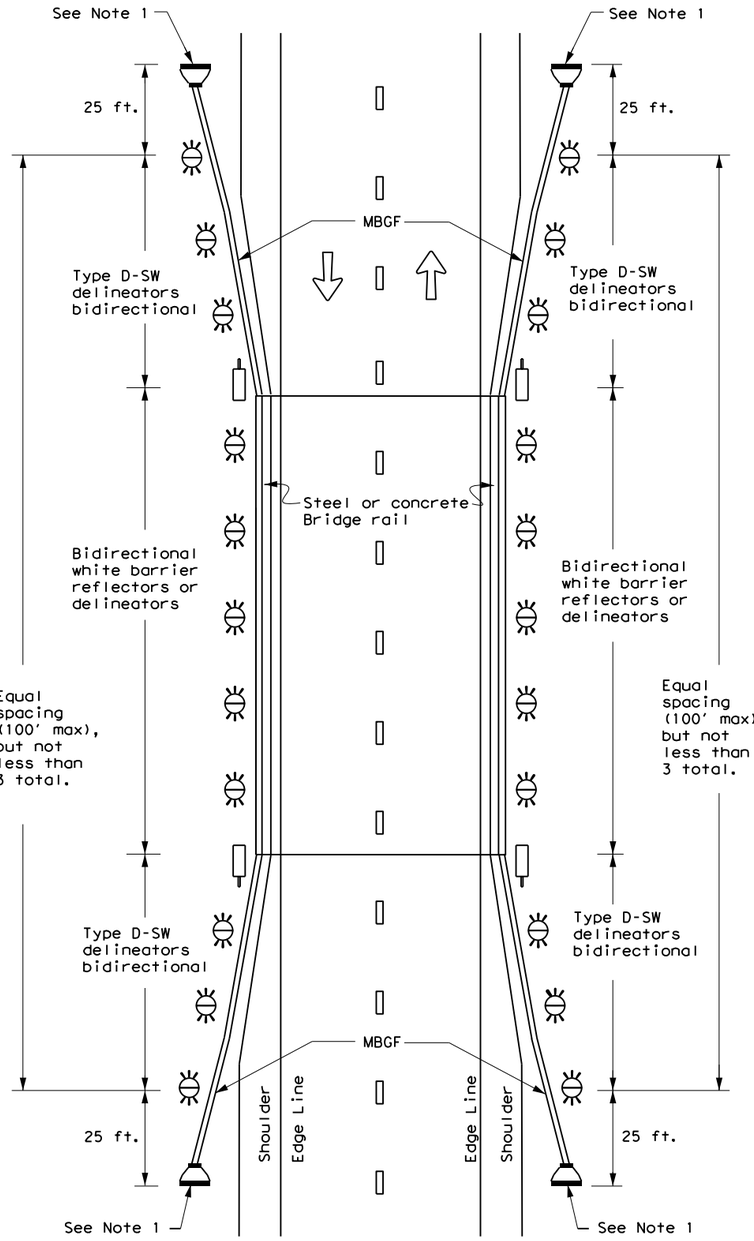
FILE: dom3-20.dgn	DN: TXDOT	CK: TXDOT	DW: TXDOT	CK: TXDOT
©TxDOT August 2004	CONT	SECT	JOB	HIGHWAY
REVISIONS	0920	03	082, ETC	CR 1065, ETC
3-15 8-15	DIST	COUNTY		SHEET NO.
8-15 7-20	BMT	HARDIN, ETC		180

20C

DATE: 2/26/2024 2:31:16 PM
FILE: pw://ija-pw.bentley.com:ija-pw-01/Documents/TxDOT/PM8016-2301 CEC WA4/Clemmons Gully Off-System Bridge/400 Production/4 - Design/Plan Set/8. Traffic/SPM/Standards/dom3-20 (1)

DATE: 2/26/2024 2:31:19 PM
FILE: pw://ja-pw.bentley.com:ja-pw-01/Documents/TxDOT/PM8016-2301 CEC WA4/Clemmons Gully Off-System Bridge/400 Production/4 - Design/Plan Set/8. Traffic/SPM/Standards/dom5-20 (1)

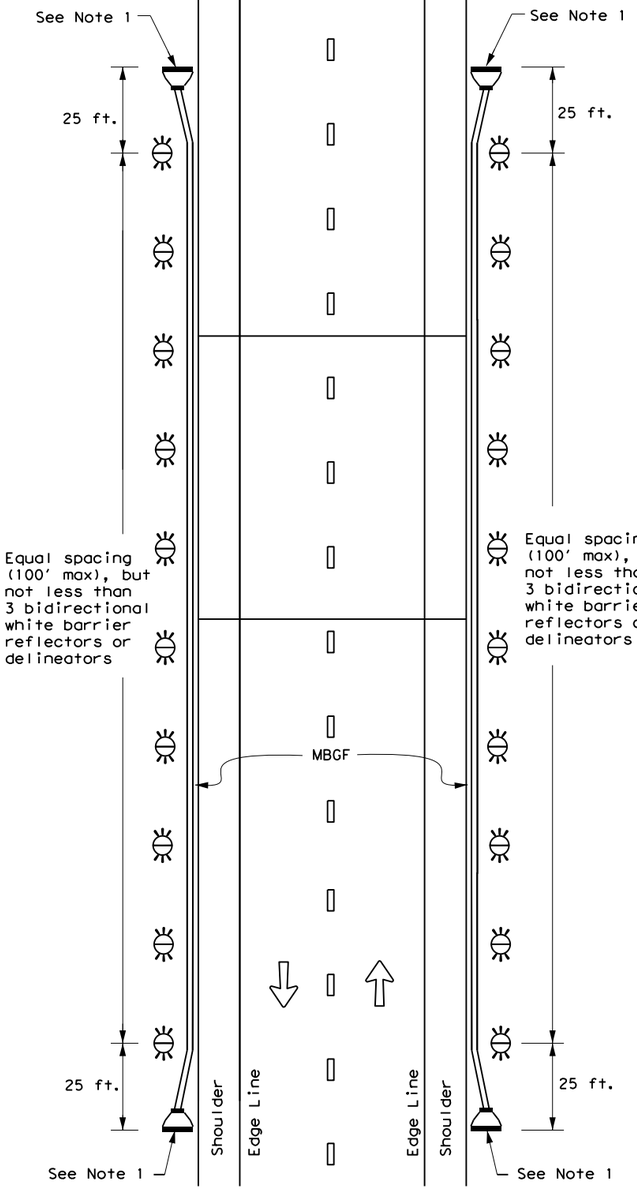
TWO-WAY, TWO LANE ROADWAY WITH REDUCED WIDTH APPROACH RAIL



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.

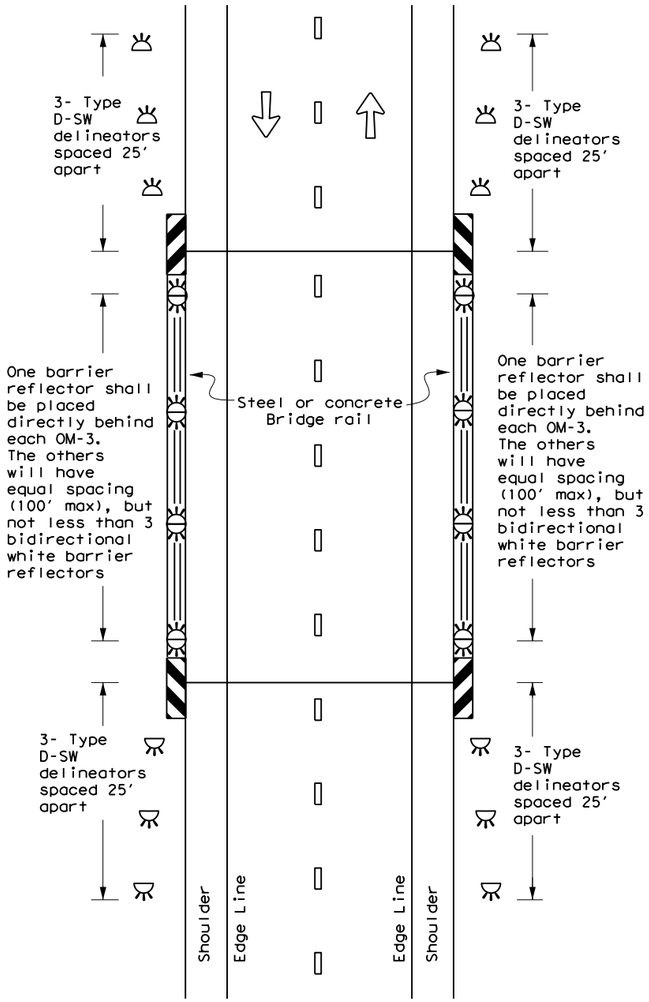
TWO-WAY, TWO LANE ROADWAY WITH METAL BEAM GUARD FENCE (MBGF)



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

Texas Department of Transportation

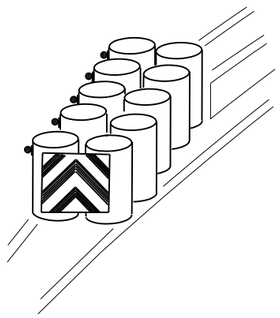
Traffic Safety Division Standard

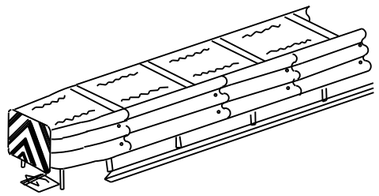
DELINEATOR & OBJECT MARKER PLACEMENT DETAILS

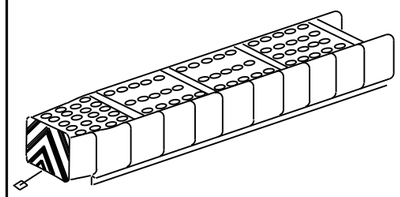
D & OM(5)-20

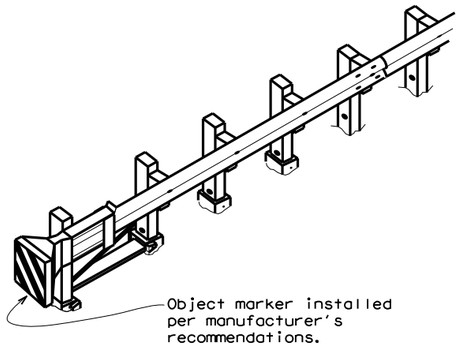
FILE: dom5-20.dgn	DN: TxDOT	CK: TxDOT	DW: TxDOT	CK: TxDOT
© TxDOT August 2015	CONT	SECT	JOB	HIGHWAY
REVISIONS	0920	03	082, ETC	CR 1065, ETC
7-20	DIST	COUNTY		SHEET NO.
	BMT	HARDIN, ETC		181

20E

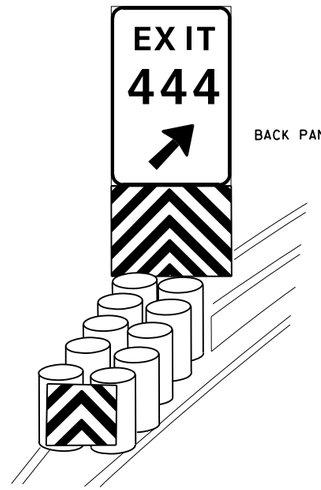




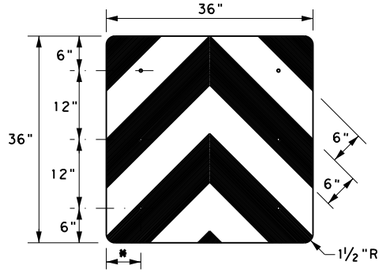


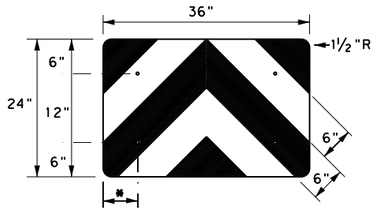


Object marker installed per manufacturer's recommendations.

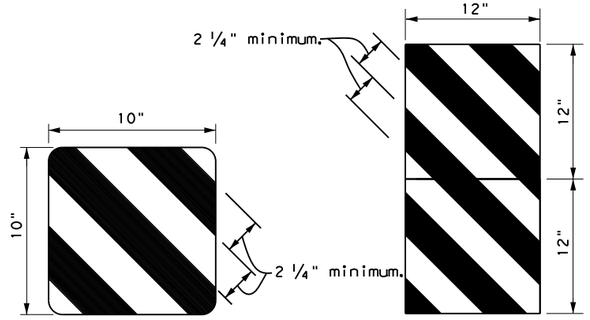


BACK PANEL (OPTIONAL)

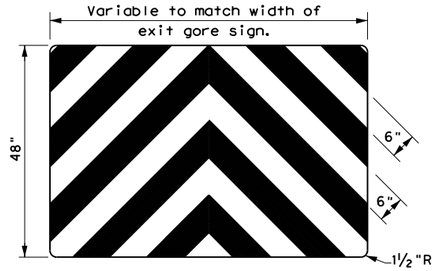


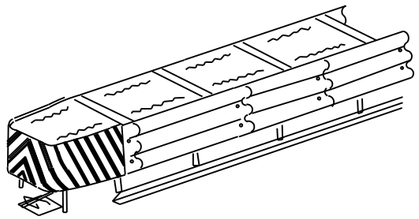


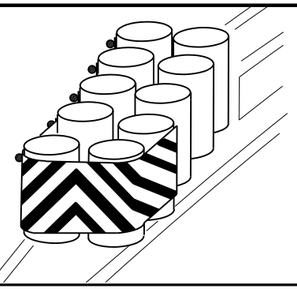
* Adjust to fit attenuator per manufacturer's recommendation, or as directed by the Engineer

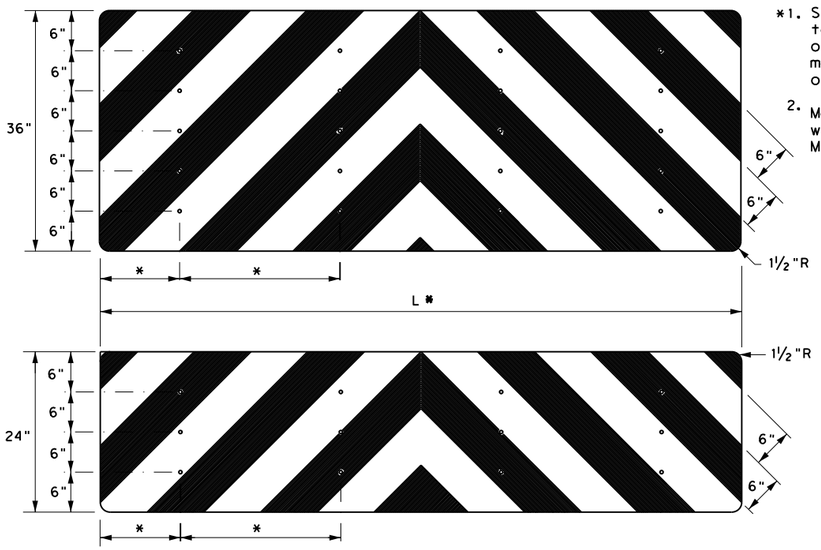


OBJECT MARKERS SMALLER THAN 3 FT^2









NOTES

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

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

NOTES

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

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

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

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

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

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

Texas Department of Transportation

Traffic Safety Division Standard

DELINEATOR & OBJECT MARKER FOR VEHICLE IMPACT ATTENUATORS

D & OM(VIA)-20

FILE: __domvig20.dgn__	DN: TXDOT	CK: TXDOT	DW: TXDOT	CK: TXDOT
©TxDOT December 1989	CONT	SECT	JOB	HIGHWAY
REVISIONS	0920	03	082, ETC	CR 1065, ETC
4-92 8-04	DIST	COUNTY		SHEET NO.
8-95 3-15	BMT	HARDIN, ETC		182
4-98 7-20				

20G

DATE: 2/26/2024 2:31:23 PM
FILE: pw://ljg-pw.bentley.com:ljg-pw-01/Documents/TxDOT/PW8016-2301 CEC WA4/Clemmons Gully Off-System Bridge/400 Production/4 - Design/Plan Set/8. Traffic/SPM/Standards/domvig-20

DATE: 2/26/2024 2:31:27 PM
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SIGN SUPPORT DESCRIPTIVE CODES

(Descriptive Codes correspond to project estimate and quantities sheets)

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

Post Type

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

Number of Posts (1 or 2)

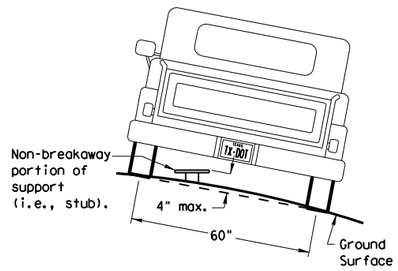
Anchor Type

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

Sign Mounting Designation

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

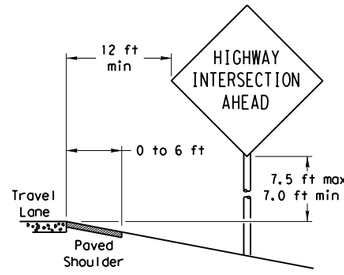
REQUIRED CLEARANCE FOR BREAKAWAY SUPPORT



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

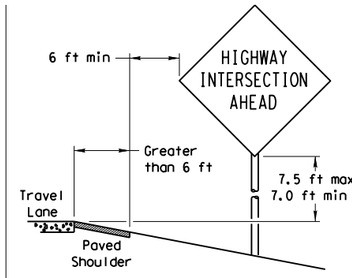
SIGN LOCATION

PAVED SHOULDERS



LESS THAN 6 FT. WIDE

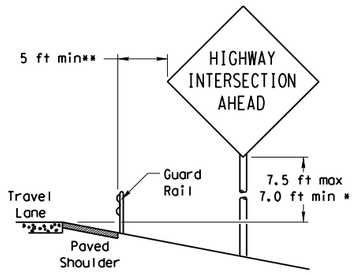
When the shoulder is 6 ft. or less in width, the sign must be placed at least 12 ft. from the edge of the travel lane.



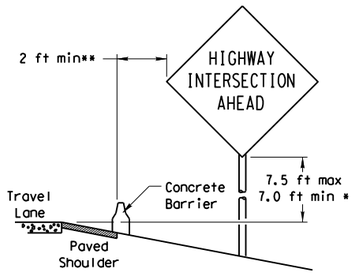
GREATER THAN 6 FT. WIDE

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

BEHIND BARRIER



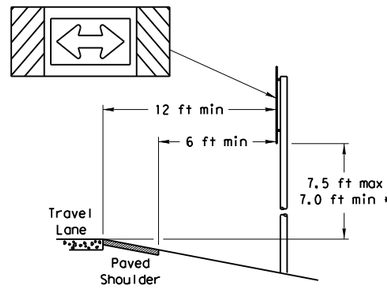
BEHIND GUARDRAIL



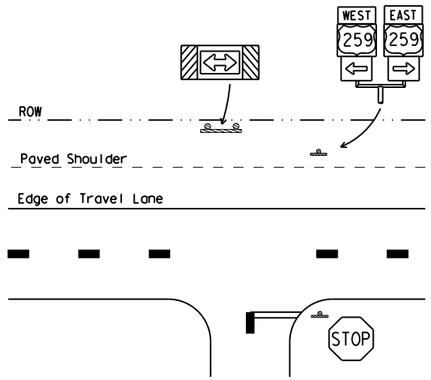
BEHIND CONCRETE BARRIER

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

T-INTERSECTION



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



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

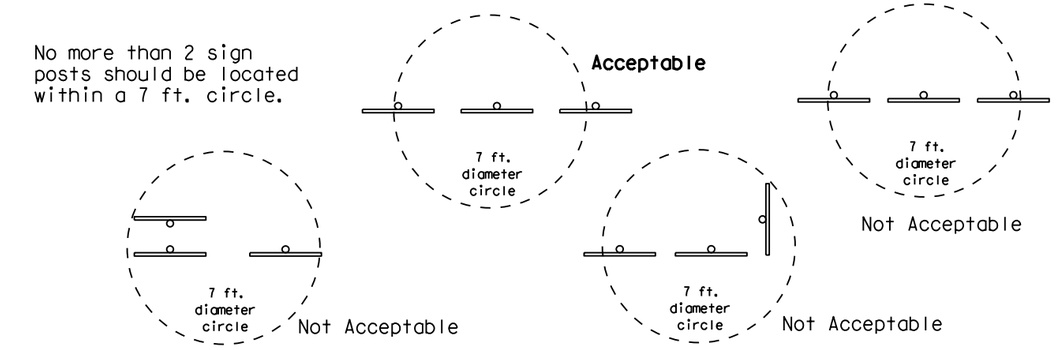
(1) a minimum of 7 to a maximum of 7.5 feet above the edge of the travel lane or

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

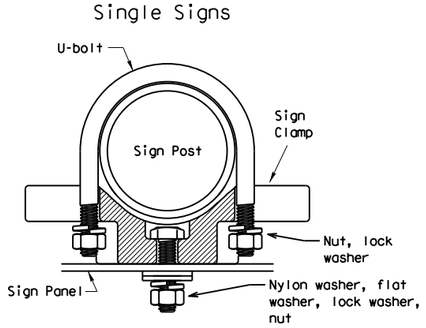
The maximum values may be increased when directed by the Engineer.

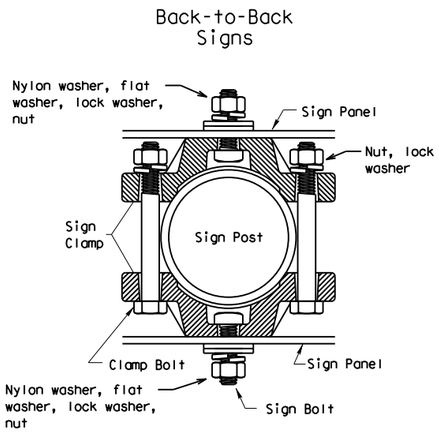
See the Traffic Operations Division website for detailed drawings of sign clamps, Triangular Slipbase System components and Wedge Anchor System components.

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



TYPICAL SIGN ATTACHMENT DETAIL





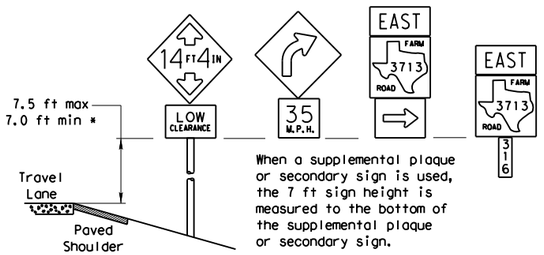
Bolts used to mount sign panels to the clamp are 5/16-18 UNC galvanized square head with nut, nylon washer, flat washer and lock washer. The bolt length is 1 inch for aluminum.

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

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

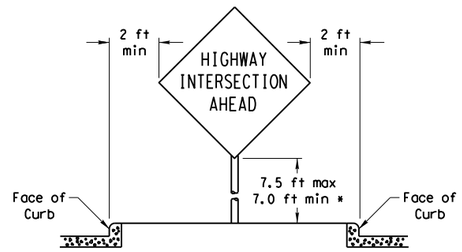
Pipe Diameter	Approximate Bolt Length	
	Specific Clamp	Universal Clamp
2" nominal	3"	3 or 3 1/2"
2 1/2" nominal	3 or 3 1/2"	3 1/2 or 4"
3" nominal	3 1/2 or 4"	4 1/2"

SIGNS WITH PLAQUES



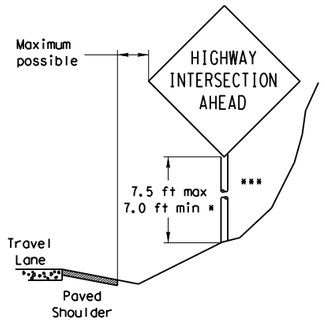
When a supplemental plaque or secondary sign is used, the 7 ft sign height is measured to the bottom of the supplemental plaque or secondary sign.

CURB & GUTTER OR RAISED ISLAND



RESTRICTED RIGHT-OF-WAY

(When 6 ft min. is not possible.)



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

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

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

Texas Department of Transportation
Traffic Operations Division

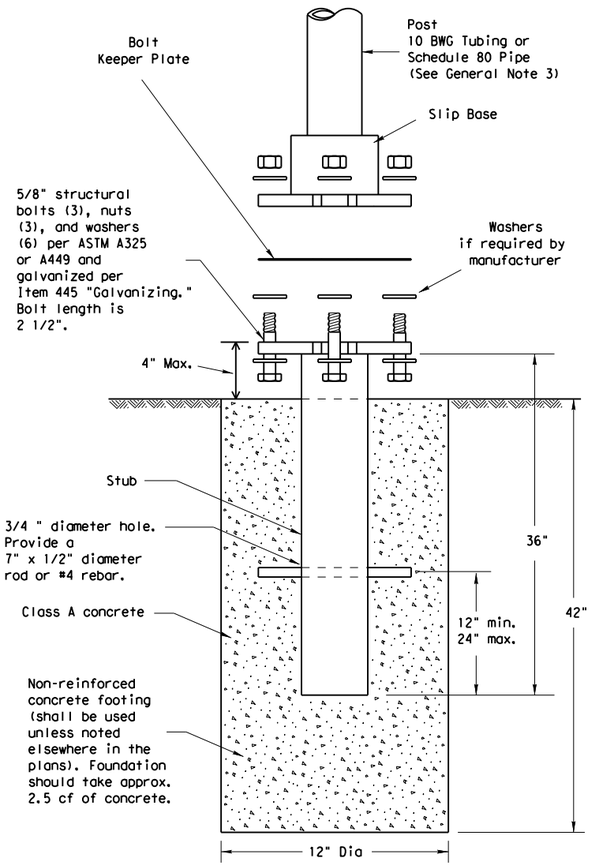
SIGN MOUNTING DETAILS SMALL ROADSIDE SIGNS GENERAL NOTES & DETAILS

SMD(GEN)-08

REVISIONS	DN: TXDOT	CK: TXDOT	DW: TXDOT	CK: TXDOT
9-08	CONT	SECT	JOB	HIGHWAY
	0920	03	082, ETC	CR 1065, ETC
	DIST	COUNTY		SHEET NO.
	BMT	HARDIN, ETC		183

DATE: 2/26/2024 2:31:31 PM
FILE: pw://ijo-pw.bentley.com:ijo-pw-01/Documents/TxDOT/PM8016-2301 CEC WA4/Clemmons Gully Off-System Bridge/400 Production/4 - Design/Plan Set/8. Traffic/SPM/Standards/smdsl.dgn

TRIANGULAR SLIPBASE INSTALLATION GENERAL REQUIREMENTS



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

NOTE

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

GENERAL NOTES:

1. Slip base shall be permanently marked to indicate manufacturer. Method, design, and location of marking are subject to approval of the TxDOT Traffic Standards Engineer.
2. Material used as post with this system shall conform to the following specifications:
   10 BWG Tubing (2.875" outside diameter)
   - 0.134" nominal wall thickness
   - Seamless or electric-resistance welded steel tubing or pipe
   - Steel shall be HSLAS Gr 55 per ASTM A1011 or ASTM A1008
   - Other steels may be used if they meet the following:
     - 55,000 PSI minimum yield strength
     - 70,000 PSI minimum tensile strength
     - 20% minimum elongation in 2"
   - Wall thickness (uncoated) shall be within the range of 0.122" to 0.138"
   - Outside diameter (uncoated) shall be within the range of 2.867" to 2.883"
   - Galvanization per ASTM A123 or ASTM A653 G210. For precoated steel tubing (ASTM A653), recoat tube outside diameter weld seam by metallizing with zinc wire per ASTM B833.

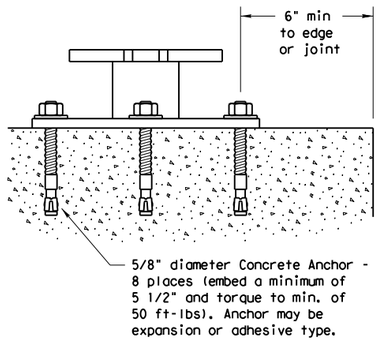
   Schedule 80 Pipe (2.875" outside diameter)
   - 0.276" nominal wall thickness
   - Steel tubing per ASTM A500 Gr C
   - Other seamless or electric-resistance welded steel tubing or pipe with equivalent outside diameter and wall thickness may be used if they meet the following:
     - 46,000 PSI minimum yield strength
     - 62,000 PSI minimum tensile strength
     - 21% minimum elongation in 2"
   - Wall thickness (uncoated) shall be within the range of 0.248" to 0.304"
   - Outside diameter (uncoated) shall be within the range of 2.855" to 2.895"
   - Galvanization per ASTM A123
3. See the Traffic Operations Division website for detailed drawings of sign clamps and Texas Universal Triangular Slipbase System components. The website address is: http://www.txdot.gov/publications/traffic.htm
4. Sign supports shall not be spliced except where shown. Sign support posts shall not be spliced.

ASSEMBLY PROCEDURE

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

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

CONCRETE ANCHOR



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

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

Texas Department of Transportation
Traffic Operations Division

SIGN MOUNTING DETAILS SMALL ROADSIDE SIGNS TRIANGULAR SLIPBASE SYSTEM

SMD(SLIP-1)-08

DN: TXDOT	CK: TXDOT	DW: TXDOT	CK: TXDOT
REVISIONS 9-08			

CONT	SECT	JOB	HIGHWAY
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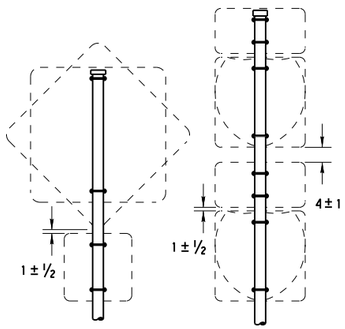
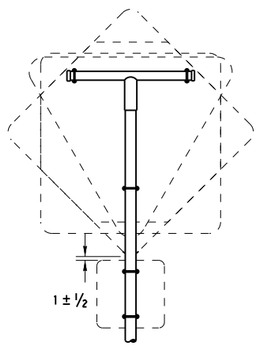
DIST	COUNTY		SHEET NO.
BMT	HARDIN, ETC		184

DATE: 2/26/2024 2:31:36 PM
FILE: pw://ljg-pw.bentley.com:ljg-pw-01/Documents/TxDOT/PW8016-2301 CEC WA4/Clemmons Gully Off-System Bridge/400 Production/4 - Design/Plan Set/8. Traffic/SPM/Standards/smds2.dgn



SM RD SGN ASSM TY XXXXX(1)XX(P)



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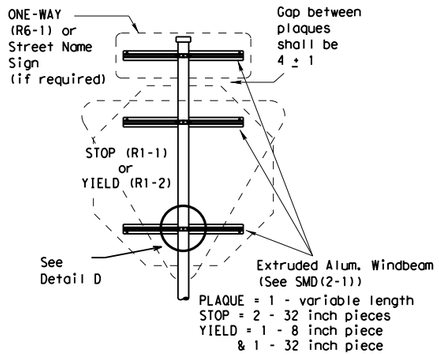

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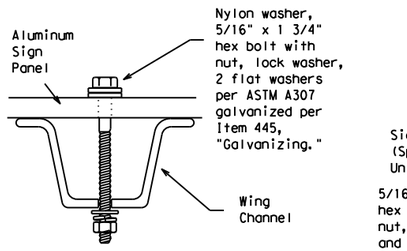
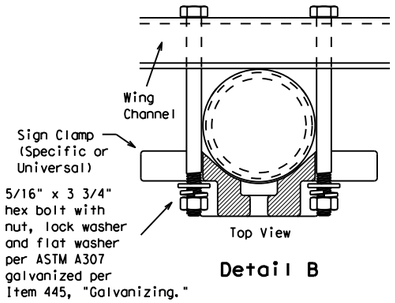
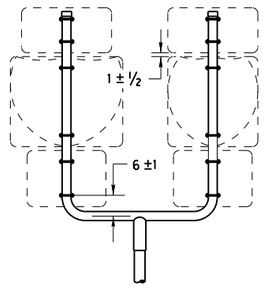


Detail A



Detail B



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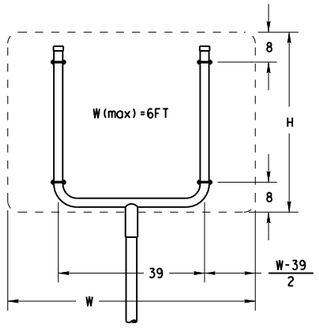

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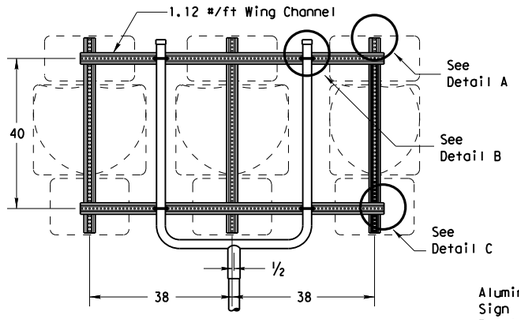
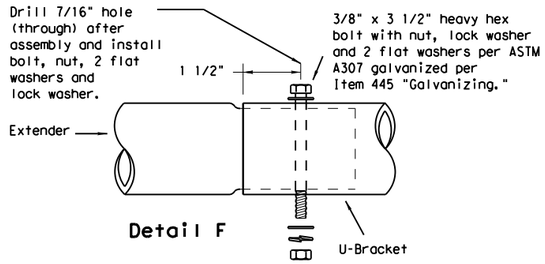
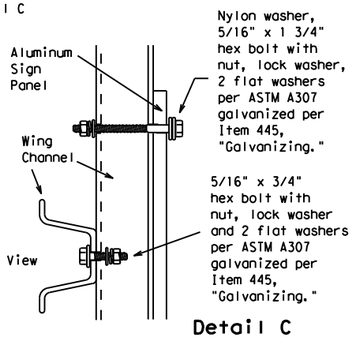


SM RD SGN ASSM TY XXXXX(1)XX(U-WC)
(See Note 11)

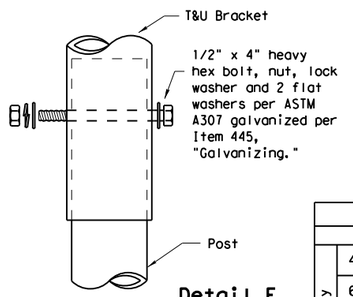


Detail F

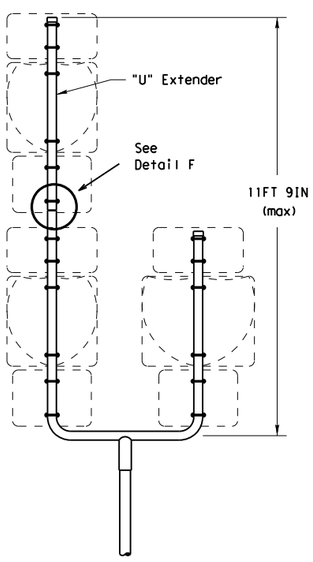
Splices shall only be allowed behind the sign substrate.



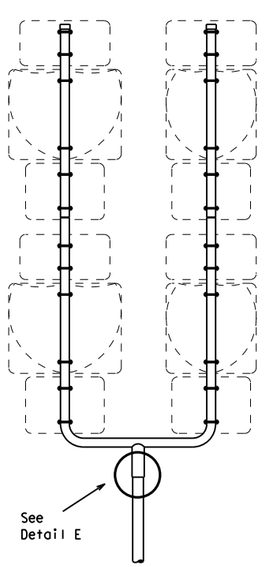
Detail C



Detail E



SM RD SGN ASSM TY S80(1)XX(U-1EXT)



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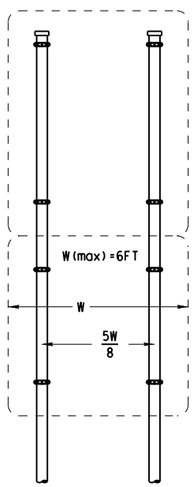
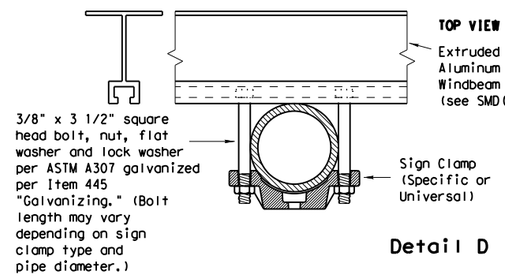
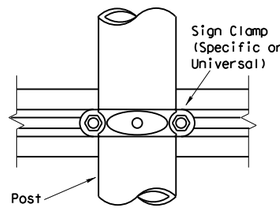


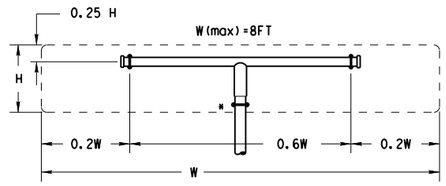
SM RD SGN ASSYM TY XXXXX(2)XX(P)

SIDE VIEW



Detail D

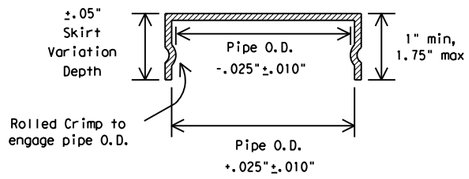




SM RD SGN ASSM TY XXXXX(1)XX(T)
(* - See Note 12)

All dimensions are in english unless detailed otherwise.

FRICTION CAP DETAIL



Friction caps may be manufactured from hot rolled or cold rolled steel sheets. The minimum sheet metal thickness shall be 24 gauge for all cap sizes.

The rim edges shall be reasonably straight and smooth. Caps shall be sized and formed in such a manner as to produce a drive-on friction fit and have no tendency to rock when seated on the pipe. The depth shall be sufficient to give positive protection against entrance of rainwater. They shall be free of sharp creases or indentations and show no evidence of metal fracture.

Caps shall have an electrodeposited coating of zinc in accordance with the requirements of ASTM B633 Class FE/ZN 8.

GENERAL NOTES:

1.

SIGN SUPPORT	# OF POSTS	MAX. SIGN AREA
10 BWG	1	16 SF
10 BWG	2	32 SF
Sch 80	1	32 SF
Sch 80	2	64 SF

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

REQUIRED SUPPORT

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

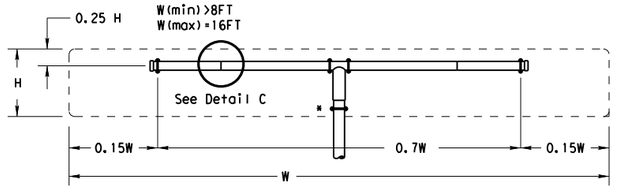
Texas Department of Transportation
Traffic Operations Division

SIGN MOUNTING DETAILS SMALL ROADSIDE SIGNS TRIANGULAR SLIPBASE SYSTEM

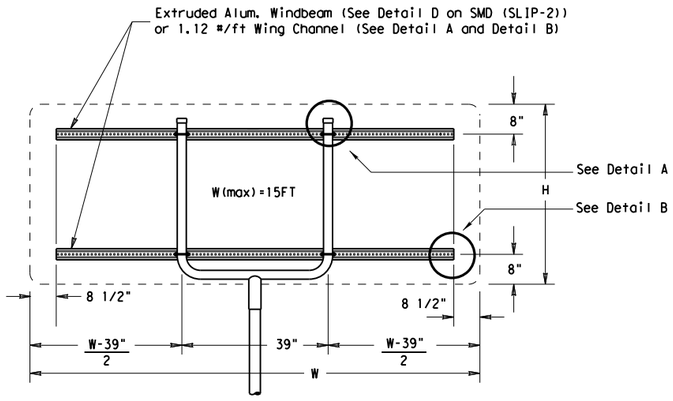
SMD(SLIP-2)-08

REVISIONS	DN: TXDOT	CK: TXDOT	DW: TXDOT	CK: TXDOT
9-08	CONT	SECT	JOB	HIGHWAY
	0920	03	082, ETC	CR 1065, ETC
	DIST	COUNTY		SHEET NO.
	BMT	HARDIN, ETC		185

DATE: 2/26/2024 2:31:40 PM
FILE: pw://ija-pw.bentley.com:ija-pw-01/Documents/TxDOT/PM8016-2301 CEC WA4/Clemmons Gully Off-System Bridge/400 Production/4 - Design/Plan Set/8. Traffic/SPM/Standards/smds3.dgn



SM RD SGN ASSM TY XXXXX(1)XX(T-2EXT)
(* - See Note 12)



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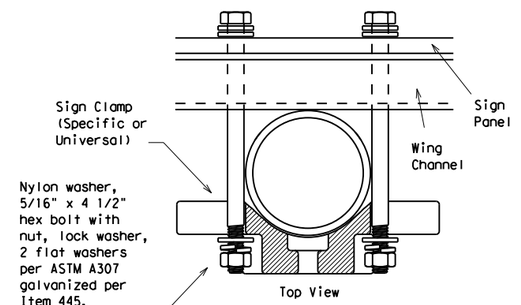
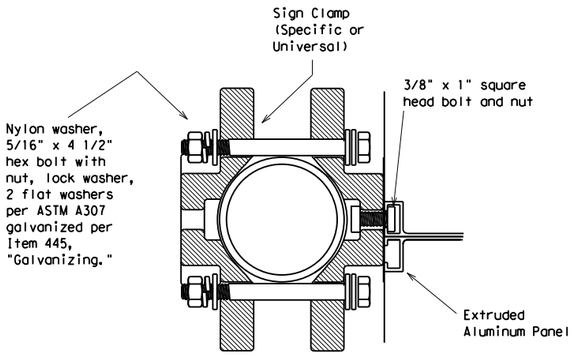
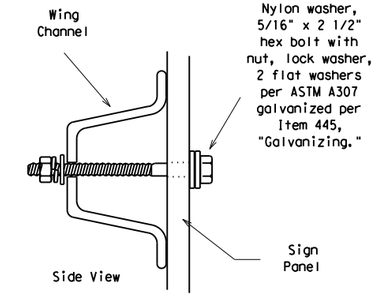


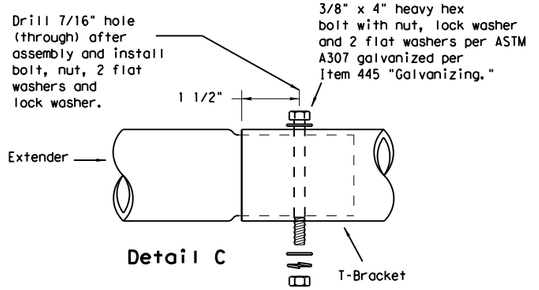
Detail A



Detail D
EXTRUDED ALUMINUM SIGN WITH T BRACKET

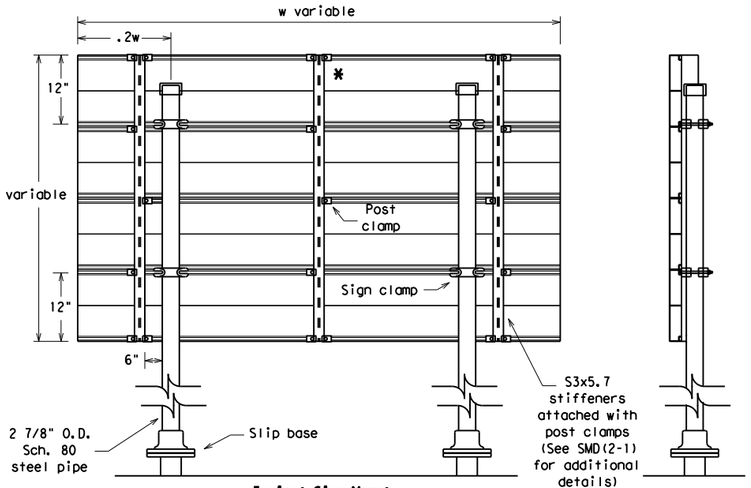


Detail B



Detail C

Splices shall only be allowed behind the sign substrate.

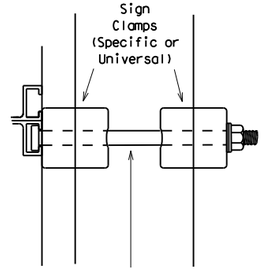


Typical Sign Mount

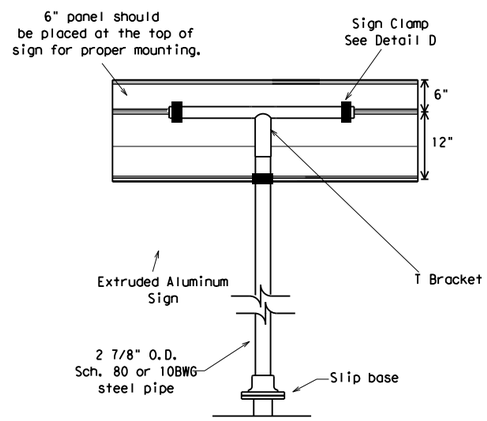
SM RD SGN ASSM TY S80(2)XX(P-EXAL)

* Additional stiffener placed at approximate center of signs when sign width is greater than 10'.

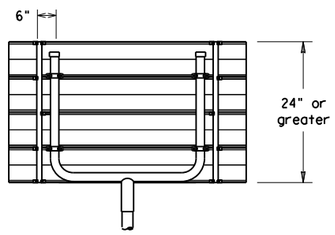
See Detail E
for clamp installation



Detail E



Extruded Aluminum Sign
With T Bracket



Use Extruded Alum. Windbeam as stiffeners
See SMD (2-1) for additional details

See Detail E
for clamp installation

GENERAL NOTES:

1.

SIGN SUPPORT	# OF POSTS	MAX. SIGN AREA
10 BWG	1	16 SF
10 BWG	2	32 SF
Sch 80	1	32 SF
Sch 80	2	64 SF

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

REQUIRED SUPPORT

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

Texas Department of Transportation
Traffic Operations Division

SIGN MOUNTING DETAILS
SMALL ROADSIDE SIGNS
TRIANGULAR SLIPBASE SYSTEM

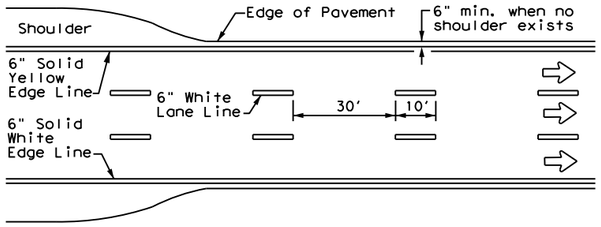
SMD(SLIP-3)-08

REVISIONS
9-08

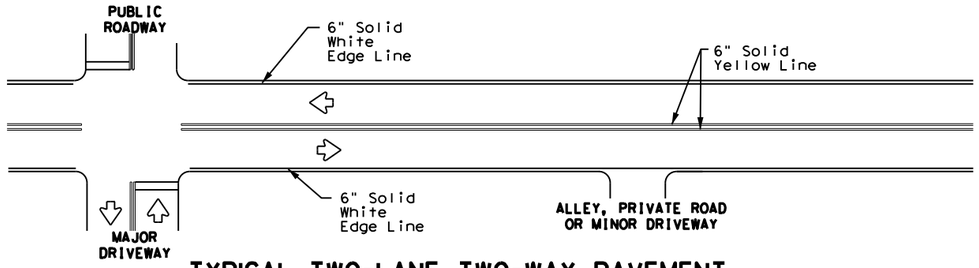
DN: TXDOT	CK: TXDOT	DW: TXDOT	CK: TXDOT

CONT	SECT	JOB	HIGHWAY
0920	03	082, ETC	CR 1065, ETC

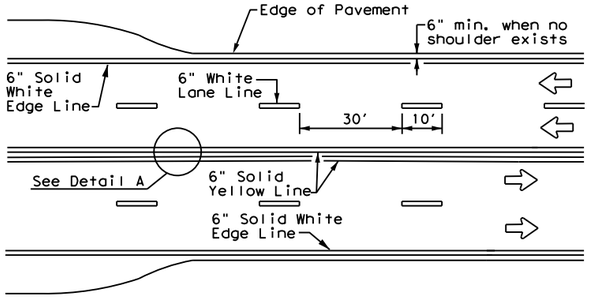
DIST	COUNTY	SHEET NO.
BMT	HARDIN, ETC	186

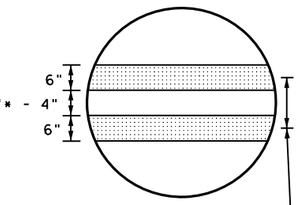


EDGE LINE AND LANE LINES ONE-WAY ROADWAY WITH OR WITHOUT SHOULDERS



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





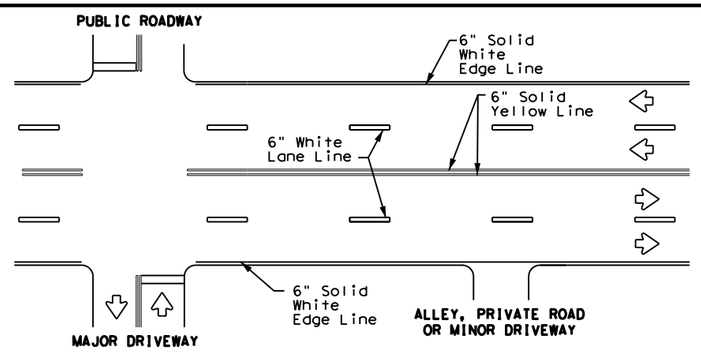
DETAIL "A"

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

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

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

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



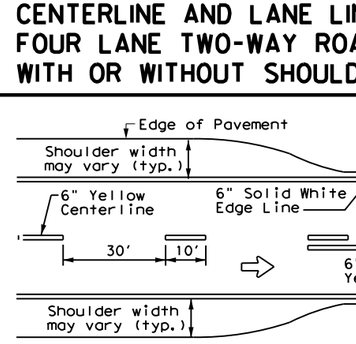
TYPICAL MULTI-LANE, TWO-WAY PAVEMENT MARKINGS THROUGH INTERSECTIONS

GENERAL NOTES

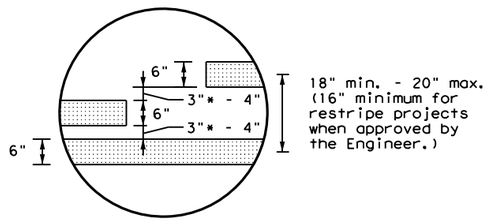
1. Edge line striping shall be as shown in the plans or as directed by the Engineer. The edge line should not be placed less than 6 inches from the edge of pavement. This distance may vary due to pavement raveling or other conditions. Edge lines are not required in curb and gutter sections of roadways.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

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

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

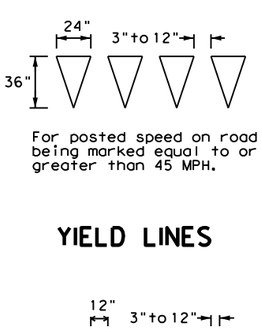


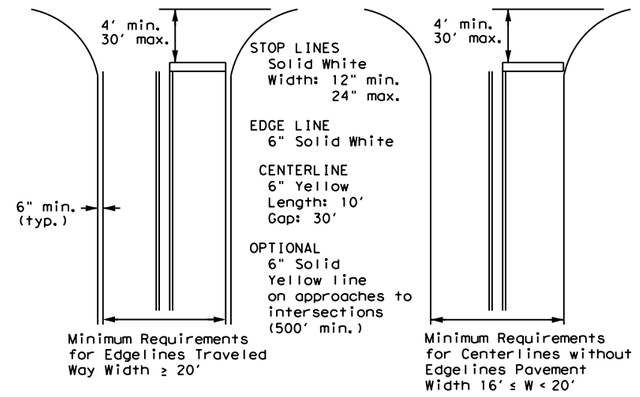
TWO LANE TWO-WAY ROADWAY WITH OR WITHOUT SHOULDERS



DETAIL "B"

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

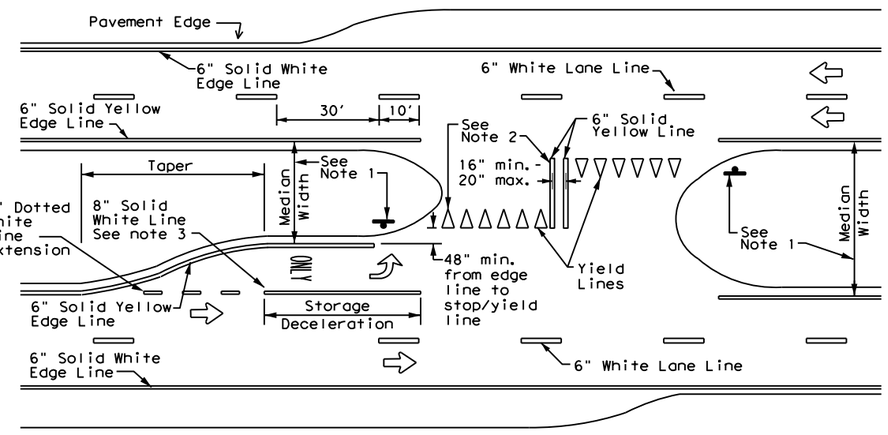




NOTE: Traveled way is exclusive of shoulder widths. Refer to General Note 2 for additional details.

GUIDE FOR PLACEMENT OF STOP LINES, EDGE LINE & CENTERLINE

Based on Traveled Way and Pavement Widths for Undivided Roadways



FOUR LANE DIVIDED ROADWAY CROSSOVERS

NOTES

1. Where divided highways are separated by median widths at the median opening itself of 30 feet or more, median openings shall be signed as two separate intersections. Each median opening has two width measurements, with one measurement for each approach. The narrow median width will be the controlling width to determine if signs are required. Yield signs are the typical intersection control. Stop signs and stop bars are optional as determined by the Engineer.
2. Install median striping (double yellow centerlines and stop lines/yield lines) when a 50' or greater median centerline can be placed. Stop lines shall only be used with stop signs. Yield lines shall only be used with yield signs.
3. Length of turn bays, including taper, deceleration, and storage lengths shall be as shown on the plans or as directed by the Engineer.

Texas Department of Transportation

Traffic Safety Division Standard

TYPICAL STANDARD PAVEMENT MARKINGS

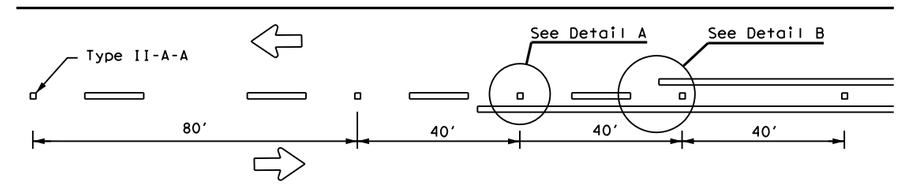
PM(1)-22

FILE: pm1-22.dgn	DN:	CK:	DW:	CK:
© TxDOT December 2022	CONT	SECT	JOB	HIGHWAY
REVISIONS 11-78 8-00 6-20 8-95 3-03 12-22 5-00 2-12	0920	03	082, ETC	CR 1065, ETC
	DIST	COUNTY		SHEET NO.
	BMT	HARDIN, ETC		187

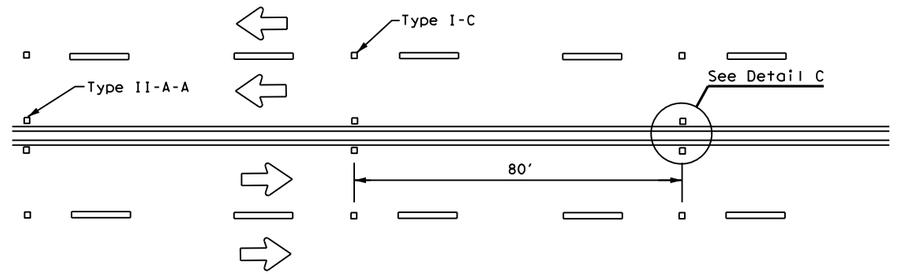
22A

DATE: 2/26/2024 2:31:44 PM
FILE: pw://ija-pw.bentley.com:ija-pw-01/Documents/TxDOT/PM8016-2301 CEC WA4/Clemmons Gully Off-System Bridge/400 Production/4 - Design/Plan Set/8. Traffic/SPM/Standards/pm1-22 (1).

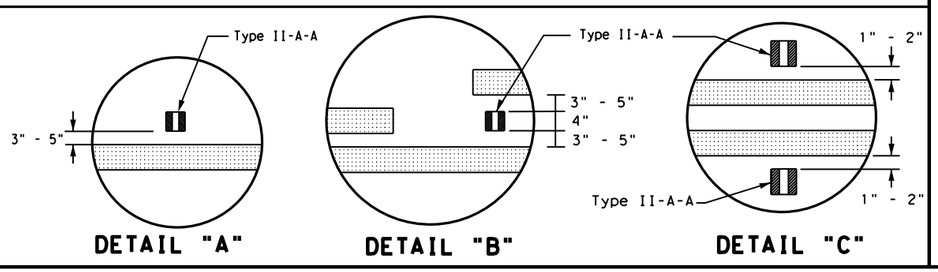
REFLECTIVE RAISED PAVEMENT MARKERS FOR VEHICLE POSITIONING GUIDANCE

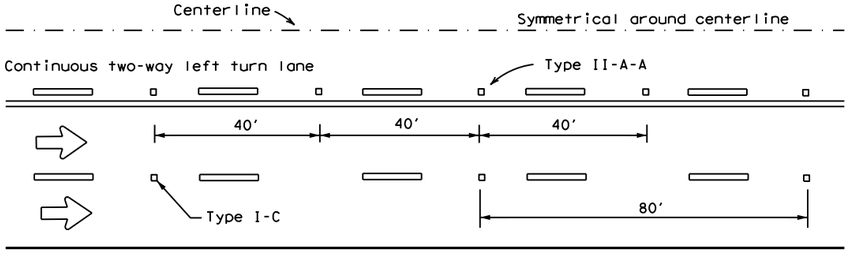


CENTERLINE FOR ALL TWO LANE TWO-WAY ROADWAYS

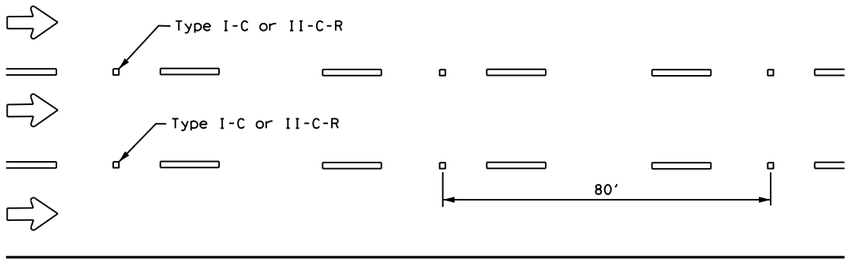


CENTERLINE & LANE LINES FOR FOUR LANE TWO-WAY ROADWAYS





CENTERLINE AND LANE LINES FOR TWO-WAY LEFT TURN LANE



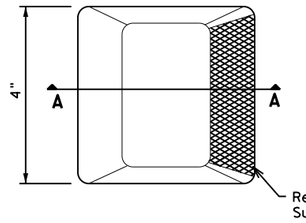
LANE LINES FOR ONE-WAY ROADWAY (NON-FREEWAY FACILITIES)

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

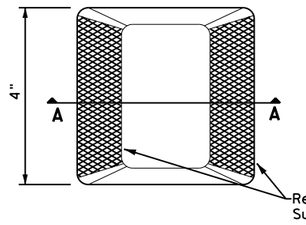
See Note 3.

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

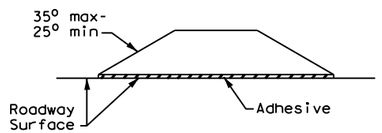
All pavement marking materials shall meet the required Departmental Material Specifications as specified by the plans.



Type I (Top View)

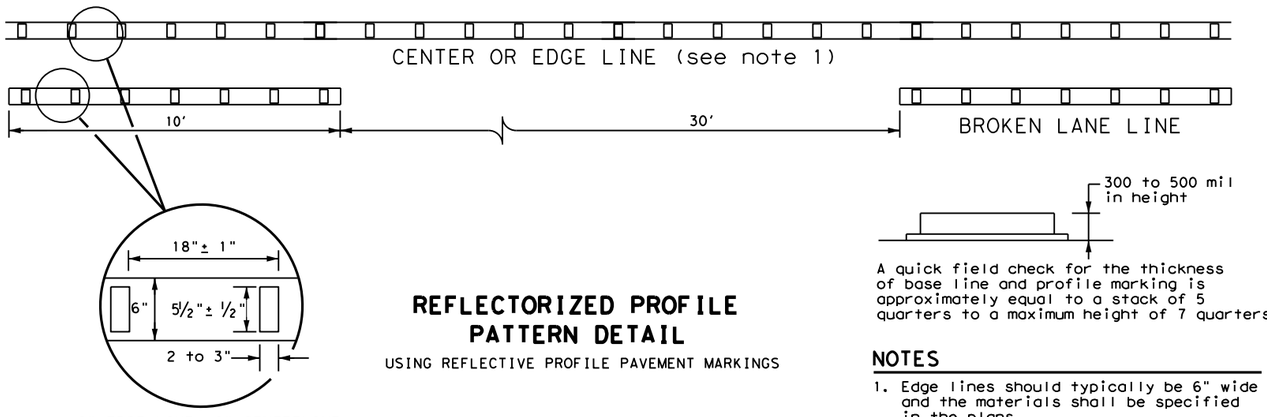


Type II (Top View)



SECTION A

RAISED PAVEMENT MARKERS



REFLECTORIZED PROFILE PATTERN DETAIL

USING REFLECTIVE PROFILE PAVEMENT MARKINGS

NOTES

1. Edge lines should typically be 6" wide and the materials shall be specified in the plans.
2. Profile markings shall not be placed on roadways with a posted speed limit of 45 MPH or less.

GENERAL NOTES

1. All raised pavement markers placed along broken lines shall be placed in line with and midway between the stripes.
2. On concrete pavements the raised pavement markers should be placed to one side of the longitudinal joints.
3. Use raised pavement marker Type I-C with undivided roadways, flush medians and two way left turn lanes. Use raised pavement marker Type II-C-R with divided highways and raised medians.

Texas Department of Transportation

Traffic Safety Division Standard

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

FILE: pm2-22.dgn	DN:	CK:	DW:	CK:
©TxDOT December 2022	CONT	SECT	JOB	HIGHWAY
REVISIONS 4-77 8-00 6-20 4-92 2-10 12-22 5-00 2-12	0920	03	082, ETC	CR 1065, ETC
	DIST	COUNTY		SHEET NO.
	BMT	HARDIN, ETC		188

22B

DATE: 2/26/2024 2:31:48 PM
FILE: pw://ljg-pw.bentley.com:ljg-pw-01/Documents/TxDOT/PM8016-2301 CEC WA4/Clemmons Gully Off-System Bridge/400 Production/4 - Design/Plan Set/8. Traffic/SPM/Standards/pm2-22.dgn

STORMWATER POLLUTION PRVENTION PLAN (SWP3):

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

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

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

1.0 SITE/PROJECT DESCRIPTION

1.1 PROJECT CONTROL SECTION JOB (CSJ): 0920-03-082

1.2 PROJECT LIMITS:

From: W. PINESHADOWS DR (CR 1065)

To: STR # 201010AA1065001

1.3 PROJECT COORDINATES:

BEGIN: (Lat) 30°09' 22.2948", (Long) -94° 20' 5.2116"

END: (Lat) 30° 09' 26.352, (Long) -94° 20' 4.9524"

1.4 TOTAL PROJECT AREA (Acres): 0.82

1.5 TOTAL AREA TO BE DISTURBED (Acres): 0.60

1.6 NATURE OF CONSTRUCTION ACTIVITY:

1.7 MAJOR SOIL TYPES:

Soil Type	Description
Evadale-Gist 0% to 1% Slopes	65% Evadale and simiar soils, 30% Gist and similar soils, 5% Minor Components
Simelake Clay	85% Simelake and similar soils, 15% Minor components

1.8 PROJECT SPECIFIC LOCATIONS (PSLs):

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

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

Type	Sheet #s

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

1.9 CONSTRUCTION ACTIVITIES:

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

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

1.10 POTENTIAL POLLUTANTS AND SOURCES:

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

1.11 RECEIVING WATERS:

Receiving waters must be depicted on the Environmental Layout Sheets in Attachment 1.2 of this SWP3. Include Segment # for receiving waters.

Tributaries	Classified Waterbody
Little Pine Island Bayou	Pine Island Bayou 0607

* 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: _____

STATE OF TEXAS
JAMES D. HORNE
141323
REGISTERED PROFESSIONAL ENGINEER

2/29/2024

DocuSigned by:
50238C8D55F5470...

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

July 2023 Sheet 1 of 2

Texas Department of Transportation

FED. RD. DIV. NO.	PROJECT NO.		SHEET NO.
			189
STATE	STATE DIST.	COUNTY	
TEXAS	20	HARDIN, ETC	
CONT.	SECT.	JOB	HIGHWAY NO.
0920	03	082, ETC	CR 1065, ETC

STORMWATER POLLUTION PRVENTION PLAN (SWP3):

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

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

2.1 EROSION CONTROL AND SOIL STABILIZATION BMPs:

T / P

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

2.2 SEDIMENT CONTROL BMPs:

T / P

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

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

2.3 PERMANENT CONTROLS:

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

BMPs To Be Left In Place Post Construction:

Type	Stationing	
	From	To

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

2.4 OFFSITE VEHICLE TRACKING CONTROLS:

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

2.5 POLLUTION PREVENTION MEASURES:

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

2.6 VEGETATED BUFFER ZONES:

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

Type	Stationing	
	From	To

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

2.7 ALLOWABLE NON-STORMWATER DISCHARGES:

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

2.8 DEWATERING:

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

2.9 INSPECTIONS:

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

2.10 MAINTENANCE:

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

STATE OF TEXAS
JAMES D. HORNE
141323
REGISTERED PROFESSIONAL ENGINEER

DocuSigned by:
50238C8D55F5470...

2/29/2024

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

July 2023 Sheet 2 of 2

Texas Department of Transportation

FED. RD. DIV. NO.	PROJECT NO.		SHEET NO.
			190
STATE	STATE DIST.	COUNTY	
TEXAS	20	HARDIN, ETC	
CONT.	SECT.	JOB	HIGHWAY NO.
0920	03	082, ETC	CR 1065, ETC

STORMWATER POLLUTION PRVENTION PLAN (SWP3):

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

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

1.0 SITE/PROJECT DESCRIPTION

1.1 PROJECT CONTROL SECTION JOB (CSJ):

0920-39-031

1.2 PROJECT LIMITS:

From: BAILEY RD @ WHITES BAYOU

To: STR# 20-036-0-AA01-43-002

1.3 PROJECT COORDINATES:

BEGIN: (Lat) 29.8208730 ,(Long) -94.6503554

END: (Lat) 29.8208730 ,(Long) -94.6503554

1.4 TOTAL PROJECT AREA (Acres): 0.55

1.5 TOTAL AREA TO BE DISTURBED (Acres): 0.28

1.6 NATURE OF CONSTRUCTION ACTIVITY:

REPLACEMENT OF EXISTING BRIDGE

1.7 MAJOR SOIL TYPES:

Soil Type	Description
VAMONT - WOODVILLE 1% TO 5% SLOPES	40% VAMONT SOILS, 35% WOODVILLE SOILS, 25% OTHER SOILS. CLAYEY AND LOAMY, SOMEWHAT POORLY DRAINED

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.)

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

1.10 POTENTIAL POLLUTANTS AND SOURCES:

X Sediment laden stormwater from stormwater conveyance over disturbed area
X Fuels, oils, and lubricants from construction vehicles, equipment, and storage
☐ Solvents, paints, adhesives, etc. from various construction activities
X 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
X 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
WHITES BAYOU	NOT LISTED

* Add (*) for impaired waterbodies with pollutant in ().

1.12 ROLES AND RESPONSIBILITIES: TxDOT

X Development of plans and specifications
X Perform SWP3 inspections
X Maintain SWP3 records and update to reflect daily operations
☐ Other: _____
☐ Other: _____

1.13 ROLES AND RESPONSIBILITIES: CONTRACTOR

X Day To Day Operational Control
X Maintain schedule of major construction activities
X Install, maintain and modify BMPs
☐ Other: _____
☐ Other: _____
☐ Other: _____

S. E. WRIGHT 108969 LICENSED PROFESSIONAL ENGINEER
STATE OF TEXAS
02-27-2024

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

July 2023 Sheet 1 of 2

Texas Department of Transportation

FED. RD. DIV. NO.	PROJECT NO.		SHEET NO.
			191
STATE	STATE DIST.	COUNTY	
TEXAS	BMT	HARDIN, ETC	
CONT.	SECT.	JOB	HIGHWAY NO.
0920	03	082, ETC	CR 1065, ETC

STORMWATER POLLUTION PRVENTION PLAN (SWP3):

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

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

2.1 EROSION CONTROL AND SOIL STABILIZATION BMPs:

T	P	
X	☐	Protection of Existing Vegetation
☐	☐	Vegetated Buffer Zones
X	X	Soil Retention Blankets
☐	☐	Geotextiles
☐	☐	Mulching/ Hydromulching
☐	☐	Soil Surface Treatments
X	X	Temporary Seeding
☐	X	Permanent Planting, Sodding or Seeding
☐	☐	Biodegradable Erosion Control Logs
X	☐	Rock Filter Dams/ Rock Check Dams
☐	☐	Vertical Tracking
☐	☐	Interceptor Swale
☐	X	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
X	☐	Rock Filter Dams/ Rock Check Dams
☐	☐	Sandbag Berms
X	☐	Sediment Control Fence
☐	☐	Stabilized Construction Exit
☐	☐	Floating Turbidity Barrier
☐	☐	Vegetated Buffer Zones
☐	☐	Vegetated Filter Strips
☐	☐	Other: _____
☐	☐	Other: _____
☐	☐	Other: _____
☐	☐	Other: _____

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

2.3 PERMANENT CONTROLS:

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

BMPs To Be Left In Place Post Construction:

Type	Stationing	
	From	To

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

2.4 OFFSITE VEHICLE TRACKING CONTROLS:

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

2.5 POLLUTION PREVENTION MEASURES:

- X Chemical Management
- X Concrete and Materials Waste Management
- X Debris and Trash Management
- X 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:

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

2.8 DEWATERING:

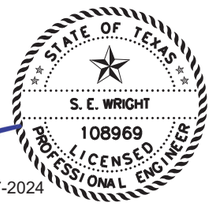
Dewatering discharges of accumulated stormwater, groundwater, and surface water including discharges from dewatering of trenches, excavations, foundations, vaults, and other points of accumulation are prohibited unless managed by appropriate controls to prevent and minimize the offsite discharge of sediment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

2.9 INSPECTIONS:

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

2.10 MAINTENANCE:

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



SE Wright
02-27-2024

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

July 2023 Sheet 2 of 2

Texas Department of Transportation

FED. RD. DIV. NO.	PROJECT NO.		SHEET NO.
			192
STATE	STATE DIST.	COUNTY	
TEXAS	BMT	HARDIN, ETC	
CONT.	SECT.	JOB	HIGHWAY NO.
0920	03	082, ETC	CR 1065, ETC

STORMWATER POLLUTION PRVENTION PLAN (SWP3):

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

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

1.0 SITE/PROJECT DESCRIPTION

1.1 PROJECT CONTROL SECTION JOB (CSJ):

0920-13-041

1.2 PROJECT LIMITS:

From: CR 2380 @ VINCENT TRIBUTARY

To: STR#20-229-0-AA23-80-003

1.3 PROJECT COORDINATES:

BEGIN: (Lat)_____,(Long)_____

END: (Lat)_____,(Long)_____

1.4 TOTAL PROJECT AREA (Acres): 0.67

1.5 TOTAL AREA TO BE DISTURBED (Acres): 0.29

1.6 NATURE OF CONSTRUCTION ACTIVITY:

1.7 MAJOR SOIL TYPES:

Soil Type	Description
SHANKLER-HILLISTER-DOUCETTE 1% TO 20% SLOPES	30% SHANKLER SOILS, 20% HILLISTER SOILS, 15% DOUCETTE SOILS, 35% MINERAL SOILS. LOAMY, WELL DRAINED, MODERATELY PERMEABLE SOILS.

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.)

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

1.10 POTENTIAL POLLUTANTS AND SOURCES:

X Sediment laden stormwater from stormwater conveyance over disturbed area
X Fuels, oils, and lubricants from construction vehicles, equipment, and storage
☐ Solvents, paints, adhesives, etc. from various construction activities
X 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
X 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
VINCENT CREEK	NOT LISTED

* Add (*) for impaired waterbodies with pollutant in ().

1.12 ROLES AND RESPONSIBILITIES: TxDOT

X Development of plans and specifications
X Perform SWP3 inspections
X Maintain SWP3 records and update to reflect daily operations
☐ Other: _____
☐ Other: _____

1.13 ROLES AND RESPONSIBILITIES: CONTRACTOR

X Day To Day Operational Control
X Maintain schedule of major construction activities
X Install, maintain and modify BMPs
☐ Other: _____
☐ Other: _____
☐ Other: _____

STATE OF TEXAS
S. E. WRIGHT
108969
LICENSED
PROFESSIONAL ENGINEER

SE Wright
02-27-2024

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

July 2023 Sheet 1 of 2

Texas Department of Transportation

FED. RD. DIV. NO.	PROJECT NO.		SHEET NO.
			193
STATE	STATE DIST.	COUNTY	
TEXAS	BMT	HARDIN, ETC	
CONT.	SECT.	JOB	HIGHWAY NO.
0920	03	082, ETC	CR 1065, ETC

STORMWATER POLLUTION PRVENTION PLAN (SWP3):

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

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

2.1 EROSION CONTROL AND SOIL STABILIZATION BMPs:

T	P	
X	☐	Protection of Existing Vegetation
☐	☐	Vegetated Buffer Zones
X	X	Soil Retention Blankets
☐	☐	Geotextiles
☐	☐	Mulching/ Hydromulching
☐	☐	Soil Surface Treatments
X	X	Temporary Seeding
☐	X	Permanent Planting, Sodding or Seeding
☐	☐	Biodegradable Erosion Control Logs
X	☐	Rock Filter Dams/ Rock Check Dams
X	☐	Vertical Tracking
☐	☐	Interceptor Swale
☐	X	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
X	☐	Rock Filter Dams/ Rock Check Dams
☐	☐	Sandbag Berms
X	☐	Sediment Control Fence
☐	☐	Stabilized Construction Exit
☐	☐	Floating Turbidity Barrier
☐	☐	Vegetated Buffer Zones
☐	☐	Vegetated Filter Strips
☐	☐	Other: _____
☐	☐	Other: _____
☐	☐	Other: _____
☐	☐	Other: _____

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

2.3 PERMANENT CONTROLS:

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

BMPs To Be Left In Place Post Construction:

Type	Stationing	
	From	To

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

2.4 OFFSITE VEHICLE TRACKING CONTROLS:

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

2.5 POLLUTION PREVENTION MEASURES:

X Chemical Management
X Concrete and Materials Waste Management
X Debris and Trash Management
X 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:

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

2.8 DEWATERING:

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

2.9 INSPECTIONS:

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

2.10 MAINTENANCE:

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

STATE OF TEXAS
S. E. WRIGHT
108969
LICENSED
PROFESSIONAL ENGINEER

SE Wright
02-27-2024

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

July 2023 Sheet 2 of 2

Texas Department of Transportation

FED. RD. DIV. NO.	PROJECT NO.		SHEET NO.
			194
STATE	STATE DIST.	COUNTY	
TEXAS	BMT	HARDIN, ETC	
CONT.	SECT.	JOB	HIGHWAY NO.
0920	03	082, ETC	CR 1065, ETC

STORMWATER POLLUTION PRVENTION PLAN (SWP3):

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

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

1.0 SITE/PROJECT DESCRIPTION

1.1 PROJECT CONTROL SECTION JOB (CSJ):

1828-01-031

1.2 PROJECT LIMITS:

From: FM 1943 @ DRAIN

To: STR#20-229-0-1828-01-006

1.3 PROJECT COORDINATES:

BEGIN: (Lat) 30.6030847 ,(Long) -94.2901586

END: (Lat) 30.6030847 ,(Long) -94.2901586

1.4 TOTAL PROJECT AREA (Acres): 0.82

1.5 TOTAL AREA TO BE DISTURBED (Acres): 0.08

1.6 NATURE OF CONSTRUCTION ACTIVITY:

RAIL RETROFIT AND END TREATMENT INSTALLATION.

1.7 MAJOR SOIL TYPES:

Soil Type	Description
SHANKLER- HILLISTER-DOUCETTE 1% TO 20% SLOPES	30% SHANKLER SOILS, 20% HILLISTER SOILS, 15% DOUCETTE SOILS, 35% MINERAL SOILS. LOAMY, WELL DRAINED, MODERATELY PERMEABLE SOILS.

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.)

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

1.10 POTENTIAL POLLUTANTS AND SOURCES:

- X Sediment laden stormwater from stormwater conveyance over disturbed area
- X Fuels, oils, and lubricants from construction vehicles, equipment, and storage
- ☐ Solvents, paints, adhesives, etc. from various construction activities
- X 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
- X 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
THEUVENINS CREEK	NOT LISTED

* Add (*) for impaired waterbodies with pollutant in ().

1.12 ROLES AND RESPONSIBILITIES: TxDOT

- X Development of plans and specifications
- X Perform SWP3 inspections
- X Maintain SWP3 records and update to reflect daily operations
- ☐ Other: _____
- ☐ Other: _____

1.13 ROLES AND RESPONSIBILITIES: CONTRACTOR

- X Day To Day Operational Control
- X Maintain schedule of major construction activities
- X Install, maintain and modify BMPs
- ☐ Other: _____
- ☐ Other: _____
- ☐ Other: _____

S E Wright

02-27-2024

STATE OF TEXAS
S. E. WRIGHT
108969
LICENSED
PROFESSIONAL ENGINEER

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

July 2023 Sheet 1 of 2

Texas Department of Transportation

FED. RD. DIV. NO.	PROJECT NO.		SHEET NO.
			195
STATE	STATE DIST.	COUNTY	
TEXAS	BMT	HARDIN, ETC	
CONT.	SECT.	JOB	HIGHWAY NO.
0920	03	082, ETC	CR 1065, ETC

STORMWATER POLLUTION PRVENTION PLAN (SWP3):

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

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

2.1 EROSION CONTROL AND SOIL STABILIZATION BMPs:

T	P	
X	☐	Protection of Existing Vegetation
☐	☐	Vegetated Buffer Zones
X	X	Soil Retention Blankets
☐	☐	Geotextiles
☐	☐	Mulching/ Hydromulching
☐	☐	Soil Surface Treatments
X	X	Temporary Seeding
☐	X	Permanent Planting, Sodding or Seeding
☐	☐	Biodegradable Erosion Control Logs
X	☐	Rock Filter Dams/ Rock Check Dams
X	☐	Vertical Tracking
☐	☐	Interceptor Swale
☐	X	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
X	☐	Rock Filter Dams/ Rock Check Dams
☐	☐	Sandbag Berms
X	☐	Sediment Control Fence
☐	☐	Stabilized Construction Exit
☐	☐	Floating Turbidity Barrier
☐	☐	Vegetated Buffer Zones
☐	☐	Vegetated Filter Strips
☐	☐	Other: _____
☐	☐	Other: _____
☐	☐	Other: _____
☐	☐	Other: _____

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

2.3 PERMANENT CONTROLS:

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

BMPs To Be Left In Place Post Construction:

Type	Stationing	
	From	To

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

2.4 OFFSITE VEHICLE TRACKING CONTROLS:

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

2.5 POLLUTION PREVENTION MEASURES:

X Chemical Management
X Concrete and Materials Waste Management
X Debris and Trash Management
X 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:

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

2.8 DEWATERING:

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

2.9 INSPECTIONS:

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

2.10 MAINTENANCE:

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

STATE OF TEXAS
S. E. WRIGHT
108969
LICENSED
PROFESSIONAL ENGINEER

SE Wright
02-27-2024

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

July 2023 Sheet 2 of 2

Texas Department of Transportation

FED. RD. DIV. NO.	PROJECT NO.		SHEET NO.
			196
STATE	STATE DIST.	COUNTY	
TEXAS	BMT	HARDIN, ETC	
CONT.	SECT.	JOB	HIGHWAY NO.
0920	03	082, ETC	CR 1065, ETC

STORMWATER POLLUTION PRVENTION PLAN (SWP3):

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

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

1.0 SITE/PROJECT DESCRIPTION

1.1 PROJECT CONTROL SECTION JOB (CSJ):

1238-01-008

1.2 PROJECT LIMITS:

From: FM 1014 @ DRAW

To: STR#20-229-0-1238-01-001

1.3 PROJECT COORDINATES:

BEGIN: (Lat) 31.0161613 ,(Long) -94.3840544

END: (Lat) 31.0159406 ,(Long) -94.3837540

1.4 TOTAL PROJECT AREA (Acres): 0.57

1.5 TOTAL AREA TO BE DISTURBED (Acres): 0.06

1.6 NATURE OF CONSTRUCTION ACTIVITY:

1.7 MAJOR SOIL TYPES:

Soil Type	Description
SHANKLER- HILLISTER-DOUCETTE 1% TO 20% SLOPES	30% SHANKLER SOILS, 20% HILLISTER SOILS, 15% DOUCETTE SOILS, 35% MINERAL SOILS. LOAMY, WELL DRAINED, MODERATELY PERMEABLE SOILS.

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.)

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

1.10 POTENTIAL POLLUTANTS AND SOURCES:

- X Sediment laden stormwater from stormwater conveyance over disturbed area
- X Fuels, oils, and lubricants from construction vehicles, equipment, and storage
- ☐ Solvents, paints, adhesives, etc. from various construction activities
- X 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
- X 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

* Add (*) for impaired waterbodies with pollutant in ().

1.12 ROLES AND RESPONSIBILITIES: TxDOT

- X Development of plans and specifications
- X Perform SWP3 inspections
- X Maintain SWP3 records and update to reflect daily operations
- ☐ Other: _____
- ☐ Other: _____

1.13 ROLES AND RESPONSIBILITIES: CONTRACTOR

- X Day To Day Operational Control
- X Maintain schedule of major construction activities
- X Install, maintain and modify BMPs
- ☐ Other: _____
- ☐ Other: _____
- ☐ Other: _____

S. E. WRIGHT 108969 LICENSED PROFESSIONAL ENGINEER
STATE OF TEXAS

SE Wright
02-27-2024

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

July 2023 Sheet 1 of 2

Texas Department of Transportation

FED. RD. DIV. NO.	PROJECT NO.		SHEET NO.
			197
STATE	STATE DIST.	COUNTY	
TEXAS	BMT	HARDIN, ETC	
CONT.	SECT.	JOB	HIGHWAY NO.
0920	03	082, ETC	CR 1065, ETC

STORMWATER POLLUTION PRVENTION PLAN (SWP3):

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

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

2.1 EROSION CONTROL AND SOIL STABILIZATION BMPs:

T	P	
X	☐	Protection of Existing Vegetation
☐	☐	Vegetated Buffer Zones
X	X	Soil Retention Blankets
☐	☐	Geotextiles
☐	☐	Mulching/ Hydromulching
☐	☐	Soil Surface Treatments
X	X	Temporary Seeding
☐	X	Permanent Planting, Sodding or Seeding
☐	☐	Biodegradable Erosion Control Logs
X	☐	Rock Filter Dams/ Rock Check Dams
X	☐	Vertical Tracking
☐	☐	Interceptor Swale
☐	X	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
X	☐	Rock Filter Dams/ Rock Check Dams
☐	☐	Sandbag Berms
X	☐	Sediment Control Fence
☐	☐	Stabilized Construction Exit
☐	☐	Floating Turbidity Barrier
☐	☐	Vegetated Buffer Zones
☐	☐	Vegetated Filter Strips
☐	☐	Other: _____
☐	☐	Other: _____
☐	☐	Other: _____
☐	☐	Other: _____

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

2.3 PERMANENT CONTROLS:

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

BMPs To Be Left In Place Post Construction:

Type	Stationing	
	From	To

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

2.4 OFFSITE VEHICLE TRACKING CONTROLS:

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

2.5 POLLUTION PREVENTION MEASURES:

X Chemical Management
X Concrete and Materials Waste Management
X Debris and Trash Management
X 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:

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

2.8 DEWATERING:

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

2.9 INSPECTIONS:

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

2.10 MAINTENANCE:

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

STATE OF TEXAS
S. E. WRIGHT
108969
LICENSED
PROFESSIONAL ENGINEER

S E Wright
02-27-2024

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

July 2023 Sheet 2 of 2

Texas Department of Transportation

FED. RD. DIV. NO.	PROJECT NO.		SHEET NO.
			198
STATE	STATE DIST.	COUNTY	
TEXAS	BMT	HARDIN, ETC	
CONT.	SECT.	JOB	HIGHWAY NO.
0920	03	082, ETC	CR 1065, ETC

STORMWATER POLLUTION PRVENTION PLAN (SWP3):

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

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

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

1.0 SITE/PROJECT DESCRIPTION

1.1 PROJECT CONTROL SECTION JOB (CSJ):
0065-04-086

1.2 PROJECT LIMITS:
From: At Neches River Relief #2

To: STR 201220006504076

1.3 PROJECT COORDINATES:
BEGIN: (Lat) 30.3562458 ,(Long) -94.0822594

END: (Lat) 30.3563569 ,(Long) -94.0888683

1.4 TOTAL PROJECT AREA (Acres): < 0.1

1.5 TOTAL AREA TO BE DISTURBED (Acres): < 0.1

1.6 NATURE OF CONSTRUCTION ACTIVITY:
removal of concrete pile encasement and installation of concrete pile encasements under water.

1.7 MAJOR SOIL TYPES:

Soil Type	Description
BunD	Buna very fine sandy loam, 3 to 8 percent slopes
SipA	Simelake-Pluck complex, 0 to 1 percent slopes frequently flooded

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: removal of existing concrete pile encasements and installation of new concrete pile encasements.
- ☐ Other: _____
- ☐ Other: _____

1.10 POTENTIAL POLLUTANTS AND SOURCES:

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

1.11 RECEIVING WATERS:

Receiving waters must be depicted on the Environmental Layout Sheets in Attachment 1.2 of this SWP3. Include Segment # for receiving waters.

Tributaries	Classified Waterbody
Segment ID0602	Neches River Below B.A Steinhagen Lake

* Add (*) for impaired waterbodies with pollutant in ().

1.12 ROLES AND RESPONSIBILITIES: TxDOT

- ☒ Development of plans and specifications
- ☒ Perform SWP3 inspections
- ☒ Maintain SWP3 records and update to reflect daily operations
- ☐ Other: _____
- ☐ Other: _____

1.13 ROLES AND RESPONSIBILITIES: CONTRACTOR

- ☒ Day To Day Operational Control
- ☒ Maintain schedule of major construction activities
- ☒ Install, maintain and modify BMPs
- ☐ Other: _____
- ☐ Other: _____
- ☐ Other: _____

STATE OF TEXAS
JAMES D. HORNE
141323
REGISTERED PROFESSIONAL ENGINEER

2/29/2024

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

July 2023 Sheet 1 of 2

Texas Department of Transportation

FED. RD. DIV. NO.	PROJECT NO.		SHEET NO.
			199
STATE	STATE DIST.	COUNTY	
TEXAS	BMT	HARDIN, ETC	
CONT.	SECT.	JOB	HIGHWAY NO.
0920	03	082, ETC	CR 1065, ETC

STORMWATER POLLUTION PRVENTION PLAN (SWP3):

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

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

2.1 EROSION CONTROL AND SOIL STABILIZATION BMPs:

T / P

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

2.2 SEDIMENT CONTROL BMPs:

T / P

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

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

2.3 PERMANENT CONTROLS:

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

BMPs To Be Left In Place Post Construction:

Type	Stationing	
	From	To

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

2.4 OFFSITE VEHICLE TRACKING CONTROLS:

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

2.5 POLLUTION PREVENTION MEASURES:

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

2.6 VEGETATED BUFFER ZONES:

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

Type	Stationing	
	From	To

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

2.7 ALLOWABLE NON-STORMWATER DISCHARGES:

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

2.8 DEWATERING:

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

2.9 INSPECTIONS:

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

2.10 MAINTENANCE:

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

STATE OF TEXAS
JAMES D. HORNE
141323
REGISTERED PROFESSIONAL ENGINEER

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2/29/2024

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

July 2023 Sheet 2 of 2

Texas Department of Transportation

FED. RD. DIV. NO.	PROJECT NO.	SHEET NO.
		200

STATE	STATE DIST.	COUNTY	
TEXAS	BMT	HARDIN, ETC	
CONT.	SECT.	JOB	HIGHWAY NO.
0920	03	082, ETC	CR 1065, ETC

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:

I. STORMWATER POLLUTION PREVENTION-CLEAN WATER ACT SECTION 402

TPDES TXR 150000: Stormwater Discharge Permit or Construction General Permit required for projects with 1 or more acres disturbed soil. Projects with any disturbed soil must protect for erosion and sedimentation in accordance with Item 506.

List MS4 Operator(s) that may receive discharges from this project. They may need to be notified prior to construction activities.

1. TxDOT - Beaumont District

☐ No Action Required ☒ Required Action

Action No.

1. Prevent stormwater pollution by controlling erosion and sedimentation in accordance with TPDES Permit TXR 150000
2. Comply with the SW3P and revise when necessary to control pollution or as required by the Engineer.
3. The project is estimated to involve less than one acre of soil disturbance. In the event the project disturbance acreage becomes equal to or greater than one acre, the CGP is applicable. Contact TxDOT project inspector for coordination with DEQC for necessary action.
4. Take measures to prevent construction materials and debris including, but not limited to wastewater (i.e., cooling liquid, etc.) associated with concrete removal from entering any inlets, ditches, or waterways.

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

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

The Contractor must adhere to all of the terms and conditions, including Regional conditions for the State of Texas, associated with the following permit(s):

☒ No Permit Required

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

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

☐ Individual 404 Permit Required: Permit # _____

☐ Other Nationwide Permit Required: NWP# _____

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

1. Maintain a neat and clean worksite next to the water and do not allow any debris to fall into the water.
2. Comply with "Work In or Near Waters/Wetlands Regulatory Requirements and Best Management Practices" section found in the Beaumont District Environmental Field Guide.

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

Best Management Practices:

Erosion
- ☐ Temporary Vegetation
- ☐ Blankets/Matting
- ☐ Mulch
- ☐ Sodding
- ☐ Interceptor Swale
- ☐ Diversion Dike
- ☐ Erosion Control Compost
- ☐ Mulch Filter Berm and Socks
- ☐ Compost Filter Berm and Socks

Sedimentation
- ☐ Silt Fence
- ☐ Rock Berm
- ☐ Triangular Filter Dike
- ☐ Sand Bag Berm
- ☐ Straw Bale Dike
- ☐ Brush Berms
- ☐ Erosion Control Compost
- ☐ Mulch Filter Berm and Socks
- ☐ Compost Filter Berm and Socks
- ☐ Stone Outlet Sediment Traps
- ☐ Sediment Basins

Post-Construction TSS
- ☐ Vegetative Filter Strips
- ☐ Retention/Irrigation Systems
- ☐ Extended Detention Basin
- ☐ Constructed Wetlands
- ☐ Wet Basin
- ☐ Erosion Control Compost
- ☐ Mulch Filter Berm and Socks
- ☐ Compost Filter Berm and Socks
- ☐ Vegetation Lined Ditches
- ☐ Sand Filter Systems

III. CULTURAL RESOURCES

☐ No Action Required ☒ Required Action

Action No.

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

IV. VEGETATION RESOURCES

☐ No Action Required ☒ Required Action

Action No.

1. Preserve native vegetation to the extent practical. Contractor must adhere to Construction Specification Requirements Specs 162, 164, 192, 193, 506, 730, 751, 752 in order to comply with requirements for invasive species, beneficial landscaping, and tree/brush removal commitments.
2. Any equipment that comes into contact with water is required to follow TPWD Clean, Drain, and Dry procedures to protect against the spreading of invasive aquatic species. See https://tpwd.texas.gov/fishboat/boat/protect_water or contact District environmental staff for guidance.

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

☐ No Action Required ☒ Required Action

Action No.

1. The project contains potential habitat for the southern crawfish frog, Wood Stork, alligator gar, American eel, Mississippi silvery minnow, Rafinesque's Big Eared Bat, big brown bat, eastern spotted skunk, long-tailed weasel, muskrat, southeastern Myotis bat, swamp rabbit, corkwood, smooth indigobush, eastern box turtle, and the slender glass lizard. If any animal enters the work area, do not harm, harass, or attempt to handle: let the animal leave on its own. Avoid unnecessary impacts to dens.
2. If caves or sinkholes are discovered on site, cease work in the area and contact the TxDOT Inspector or DEQC for guidance.
3. Comply with "Wildlife: Regulatory Requirements and Best Management Practices" section found in the Beaumont District Environmental Field Guide.
4. Contractor shall maintain compliance with the Migratory Bird Treaty Act (MBTA) and (TPW) Code Section 64.002. For compliance with MBTA and TPW Code, bridge demolition, clearing of vegetation, and tree trimming activities are to be scheduled from October 1 to February 14 (outside of migratory bird nesting season). Contractor is responsible for securing a qualified biologist to conduct a nest survey for any bridge demolition, tree trimming, or vegetation clearing that occurs during migratory bird nesting season. The qualified biologist must submit a survey protocol for approval by District environmental staff prior to construction. A nesting survey will remain valid up to five days. Any activity not completed within 5 days of a nesting survey will require another survey. Migratory bird nesting season is from February 15 to September 30. No removal of active nests is allowed during migratory bird nesting season; therefore, any structure or vegetation containing an active nest may not be disturbed, cleared, or trimmed. No removal of inactive nests is allowed during migratory bird nesting season except by an approved, qualified biologist. Contractor is responsible for ensuring all nests on bridge structures are removed prior to the start of nesting season. The full TxDOT MBTA guidance may be found here: https://ftp.txdot.gov/pub/txdot-info/env/toolkit/350-01-gui.pdf
5. Contractor shall comply with TPWD MOU BMPs for General Design and Construction, Vegetation, Invasive Species, Water Quality, Stream Crossings, Bird, Fish, Small Mammal, Bat, Aquatic Amphibian and Reptile, Terrestrial Amphibian and Reptile. https://ftp.txdot.gov/pub/txdot-info/env/toolkit/300-01-bmp.pd

LIST OF ABBREVIATIONS

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

VI. HAZARDOUS MATERIALS OR CONTAMINATION ISSUES

☐ No Action Required ☒ Required Action

General (applies to all projects):

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

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

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

Contact the Engineer if any of the following are detected:
- Dead or distressed vegetation (not identified as normal)
- Trash piles, drums, canister, barrels, etc.
- Undesirable smells or odors
- Evidence of leaching or seepage of substances
- Any other evidence indicating possible hazardous materials or contamination discovered on site.

List below any bridge class structure(s), not including box culverts, being replaced, rehabilitated, removed, extended or modified as part of this project, or state "None", if applicable.
If "None", then no further action is required. Otherwise TxDOT is responsible for completing asbestos assessment/inspection and evaluation for presence of lead.

Provide results below:

Structure Location	PSN	Element	Lead	Asbestos
CLEMMONS GULLY	201010AA1065001	Varies	N/A	N/A

If Asbestos is present, then TxDOT must retain a DSHS licensed asbestos consultant to assist with the notification, develop abatement/mitigation procedures, and perform management activities as necessary.

If Asbestos is not present, then TxDOT is still required to notify DSHS prior to any scheduled demolition.

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

Hazardous Materials or Contamination Issues Specific to this Project:

Action No.

1. Comply with TxDOT Standard Specification 7.12 and Special Provision 006-012 if evidence of hazardous materials or contamination is noted during construction.
2. Notify TxDOT Inspector or DEQC of any hazardous materials spills including fuel, hydraulic fluid, etc.

VII. OTHER ENVIRONMENTAL ISSUES

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

☐ No Action Required ☒ Required Action

Action No.

1. Comply with "General Construction" section found in the Beaumont District Environmental Field Guide.

Johnny J Darcey Jr
APPROVED BY

2/26/2024
DATE

DISTRICT ENVIRONMENTAL DEPARTMENT

Texas Department of Transportation

Beaumont District Standard

ENVIRONMENTAL PERMITS, ISSUES AND COMMITMENTS

EPIC

FILE: epic.dgn	DN: TxDOT	CK: AM	DW: VP	CK: AR
©TxDOT February 2019	CONT	SECT	JOB	HIGHWAY
	0920	03	082, ETC	CR 1065, ETC
	DIST	COUNTY		SHEET NO.
	20	HARDIN, ETC		201

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DATE:
FILE:

I. STORMWATER POLLUTION PREVENTION-CLEAN WATER ACT SECTION 402

TPDES TXR 150000: Stormwater Discharge Permit or Construction General Permit required for projects with 1 or more acres disturbed soil. Projects with any disturbed soil must protect for erosion and sedimentation in accordance with Item 506.

List MS4 Operator(s) that may receive discharges from this project. They may need to be notified prior to construction activities.

1. TxDOT - Beaumont District

☐ No Action Required ☒ Required Action

Action No.

1. Prevent stormwater pollution by controlling erosion and sedimentation in accordance with TPDES Permit TXR 150000
2. Comply with the SW3P and revise when necessary to control pollution or as required by the Engineer.
3. The project is estimated to involve less than one acre of soil disturbance. In the event the project disturbance acreage becomes equal to or greater than one acre, the CGP is applicable. Contact TxDOT project inspector for coordination with DEQC for necessary action.
4. Take measures to prevent construction materials and debris including, but not limited to wastewater (i.e., cooling liquid, etc.) associated with concrete removal from entering any inlets, ditches, or waterways.

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

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

The Contractor must adhere to all of the terms and conditions, including Regional conditions for the State of Texas, associated with the following permit(s):

☒ No Permit Required

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

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

☐ Individual 404 Permit Required: Permit # _____

☐ Other Nationwide Permit Required: NWP# _____

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

1. Maintain a neat and clean worksite next to the water and do not allow any debris to fall into the water.
2. Comply with "Work In or Near Waters/Wetlands Regulatory Requirements and Best Management Practices" section found in the Beaumont District Environmental Field Guide.

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

Best Management Practices:

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

III. CULTURAL RESOURCES

☐ No Action Required ☒ Required Action

Action No.

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

IV. VEGETATION RESOURCES

☐ No Action Required ☒ Required Action

Action No.

1. Preserve native vegetation to the extent practical. Contractor must adhere to Construction Specification Requirements Specs 162, 164, 192, 193, 506, 730, 751, 752 in order to comply with requirements No vegetation removal or trimming of any kind is allowed. Exceptions are allowed for mowed and maintained grass.

2. Any equipment that comes into contact with water is required to follow TPWD Clean, Drain, and Dry procedures to protect against the spreading of invasive aquatic species. See https://tpwd.texas.gov/fishboat/boat/protect_water

or contact District environmental staff for guidance.

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

☐ No Action Required ☒ Required Action

Action No.

1. The project contains potential habitat for the southern crawfish frog, Wood stork, alligator gar, American eel, Mississippi silvery minnow, Rafinesque's Big Eared Bat, big brown bat, eastern spotted skunk, long-tailed weasel, muskrat, southeastern Myotis bat, swamp rabbit, corkwood, smooth indigobush, eastern box turtle, slender glass lizard. If any animal enters the work area, do not harm, harass, or attempt to handle: let the animal leave on its own. Avoid unnecessary impacts to dens.
2. If caves or sinkholes are discovered on site, cease work in the area and contact the TxDOT Inspector or DEQC for guidance.
3. Comply with "Wildlife: Regulatory Requirements and Best Management Practices" section found in the Beaumont District Environmental Field Guide.
4. Contractor shall maintain compliance with the Migratory Bird Treaty Act (MBTA), and (TPW) Code Section 64.002. For compliance with MBTA and TPW Code, bridge demolition, clearing of vegetation, and tree trimming activities are to be scheduled from October 1 to February 14 (outside of migratory bird nesting season). Contractor is responsible for securing a qualified biologist to conduct a nest survey for any bridge demolition, tree trimming, or vegetation clearing that occurs during migratory bird nesting season. The qualified biologist must submit a survey protocol for approval by District environmental staff prior to construction. A nesting survey will remain valid up to five days. Any activity not completed within 5 days of a nesting surve will require another survey. Migratory bird nesting season is from February 15 to September 30. No removal of active nests is allowed during migratory bird nesting season: therefore, any structure or vegetation containing an active nest may not be disturbed, cleared, or trimmed. No removal of inactive nests is allowed during migratory bird nesting season except by an approved, qualified biologist. Contractor is responsible for ensuring all nests on bridge structures are removed prior to the start of nesting season. The full TxDOT MBTA guidance may be found here: https://ftp.txdot.gov/pub/txdot-info/env/toolkit/350-01-gui.pdf
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LIST OF ABBREVIATIONS

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DSHS:	Texas Department of State Health Services	PCN:	Pre-Construction Notification
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NWP:	Nationwide Permit	USACE:	U.S. Army Corps of Engineers
NOI:	Notice of Intent	USFWS:	U.S. Fish and Wildlife Service

VI. HAZARDOUS MATERIALS OR CONTAMINATION ISSUES

☐ No Action Required ☒ Required Action

General (applies to all projects):

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

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

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

Contact the Engineer if any of the following are detected:

- Dead or distressed vegetation (not identified as normal)
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- Undesirable smells or odors
- Evidence of leaching or seepage of substances
- Any other evidence indicating possible hazardous materials or contamination discovered on site.

List below any bridge class structure(s), not including box culverts, being replaced, rehabilitated, removed, extended or modified as part of this project, or state "None", if applicable.
If "None", then no further action is required. Otherwise TxDOT is responsible for completing asbestos assessment/inspection and evaluation for presence of lead.

Provide results below:

Structure Location	PSN	Element	Lead	Asbestos
BARROW SLOUGH	200360AA0143001	VARIOUS	NONE	NONE

If Asbestos is present, then TxDOT must retain a DSHS licensed asbestos consultant to assist with the notification, develop abatement/mitigation procedures, and perform management activities as necessary.

If Asbestos is not present, then TxDOT is still required to notify DSHS prior to any scheduled demolition.

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

Hazardous Materials or Contamination Issues Specific to this Project:

Action No.

1. Comply with TxDOT Standard Specification 7.12 and Special Provision 006-012 if evidence of hazardous materials or contamination is noted during construction.
2. Notify TxDOT Inspector or DEQC of any hazardous materials spills including fuel, hydraulic fluid, etc.

VII. OTHER ENVIRONMENTAL ISSUES

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

☐ No Action Required ☒ Required Action

Action No.

1. Comply with "General Construction" section found in the Beaumont District Environmental Field Guide.

Johnny J Darcy Jr
APPROVED BY

2/22/2024
DATE

DISTRICT ENVIRONMENTAL DEPARTMENT

Texas Department of Transportation

Beaumont District Standard

ENVIRONMENTAL PERMITS, ISSUES AND COMMITMENTS

EPIC

FILE: epic.dgn	DN: TxDOT	CK: AM	DW: VP	CK: AR
© TxDOT February 2019	CONT	SECT	JOB	HIGHWAY
	0920	03	082, ETC	CR 1065, ETC
	DIST	COUNTY		SHEET NO.
	20	HARDIN, ETC		202

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DATE:
FILE:

I. STORMWATER POLLUTION PREVENTION-CLEAN WATER ACT SECTION 402

TPDES TXR 150000: Stormwater Discharge Permit or Construction General Permit required for projects with 1 or more acres disturbed soil. Projects with any disturbed soil must protect for erosion and sedimentation in accordance with Item 506.

List MS4 Operator(s) that may receive discharges from this project. They may need to be notified prior to construction activities.

1. TxDOT - Beaumont District

☐ No Action Required ☒ Required Action

Action No.

1. Prevent stormwater pollution by controlling erosion and sedimentation in accordance with TPDES Permit TXR 150000
2. Comply with the SW3P and revise when necessary to control pollution or as required by the Engineer.
3. The project is estimated to involve less than one acre of soil disturbance. In the event the project disturbance acreage becomes equal to or greater than one acre, the CGP is applicable. Contact TxDOT project inspector for coordination with DEQC for necessary action.
4. Take measures to prevent construction materials and debris including, but not limited to wastewater (i.e., cooling liquid, etc.) associated with concrete removal from entering any inlets, ditches, or waterways.

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

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

The Contractor must adhere to all of the terms and conditions, including Regional conditions for the State of Texas, associated with the following permit(s):

☒ No Permit Required

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

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☐ Individual 404 Permit Required: Permit # _____

☐ Other Nationwide Permit Required: NWP# _____

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

1. Maintain a neat and clean worksite next to the water and do not allow any debris to fall into the water.
2. Comply with "Work In or Near Waters/Wetlands Regulatory Requirements and Best Management Practices" section found in the Beaumont District Environmental Field Guide.

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

Best Management Practices:

Erosion	Sedimentation	Post-Construction TSS
☐ Temporary Vegetation	☐ Silt Fence	☐ Vegetative Filter Strips
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III. CULTURAL RESOURCES

☐ No Action Required ☒ Required Action

Action No.

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

IV. VEGETATION RESOURCES

☐ No Action Required ☒ Required Action

Action No.

1. Preserve native vegetation to the extent practical. Contractor must adhere to Construction Specification Requirements Specs 162, 164, 192, 193, 506, 730, 751, 752 in order to comply with requirements for invasive species, beneficial landscaping, and tree/brush removal commitments.
2. Comply with "Vegetation and Habitat Impacts: Regulatory Requirements and Best Management Practices" section found in the Beaumont District Environmental Field Guide.

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

☐ No Action Required ☒ Required Action

Action No.

1. This project area contains habitat for White-faced Ibis, westerns creek Chubsucker, Rafinesque's Big-eared Bat, Northern Scarlet Snake and Monarch Butterfly.
2. If any animal enters the work area, do not harm, harass, or attempt to handle: let the animal leave on its own.
3. If caves or sinkholes are discovered on siter, cease work in the area and contact the TxDOT inspector or DEQC for guidance.
4. Comply with "Wildlife: Regulatory Requirements and Best Management Practices" section found in the Beaumont District Environmental Field Guide.
5. Contractor shall maintain compliance with the Migratory Bird Treaty Act (MBTA) and (TPW) Code Section 64.002. For compliance with MBTA and TPW Code, bridge demolition, clearing of vegetation, and tree trimmining activities are to be scheduled from October 1 to Febubary 14 (outside of migratory bird nesting season). Contractor is responsible for securing a qualified biologist to conduct a nest survey for any bridge migratorybird nesting season. The qualified biologist must submit a survey protocol for approval by District environmental staff prior to construction. A nesting survey will remian valid up to five days. Any activity not complied within 5 days of nesting survey will require another survey. Migratory bird nesting season is from February 15 to September 30. No removal of activitie nest is allowed during migratory bird nesting season except by an approved, qualified biologist. Contractor is responsible for ensuring all nests on bridge structures are removed prior to the start of nesting season. the full TxDot MBTA guidance may be found here: http://ftp.txdot.gov/pub/txdot-info/env/toolkit/350-01-gui.pdf
6. Resource specific BMPs (Section I) and Equipment Maintenance BMPs Section II, A) from the "Updated Best Management Practices (BMPs) for TxDOT Maintenance Activities' guidance under the TxDot Maintenance Program EA shall be reviewed and implemented where appropriate. The maintenance EA BMPs may be found here: http://ftp.txdot.gov/pub/txdot-info/env/080-01-bmp.pdf

LIST OF ABBREVIATIONS

BMP:	Best Management Practice	SPCC:	Spill Prevention Control and Countermeasure
CGP:	Construction General Permit	SW3P:	Storm Water Pollution Prevention Plan
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General (applies to all projects):

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

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

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

Contact the Engineer if any of the following are detected:

- Dead or distressed vegetation (not identified as normal)
- Trash piles, drums, canister, barrels, etc.
- Undesirable smells or odors
- Evidence of leaching or seepage of substances
- Any other evidence indicating possible hazardous materials or contamination discovered on site.

List below any bridge class structure(s), not including box culverts, being replaced, rehabilitated, removed, extended or modified as part of this project, or state "None", if applicable.
If "None", then no further action is required. Otherwise TxDOT is responsible for completing asbestos assessment/inspection and evaluation for presence of lead.

Provide results below:

Structure Location	PSN	Element	Lead	Asbestos
Vincent Tributary	202290AA2380002	Various	None	None

If Asbestos is present, then TxDOT must retain a DSHS licensed asbestos consultant to assist with the notification, develop abatement/mitigation procedures, and perform management activities as necessary.

If Asbestos is not present, then TxDOT is still required to notify DSHS prior to any scheduled demolition.

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

Hazardous Materials or Contamination Issues Specific to this Project:

Action No.

1. Comply with TxDOT Standard Specification 7.12 and Special Provision 006-012 if evidence of hazardous materials or contamination is noted during construction.
2. Notify TxDOT Inspector or DEQC of any hazardous materials spills including fuel, hydraulic fluid, etc.

VII. OTHER ENVIRONMENTAL ISSUES

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

☐ No Action Required ☒ Required Action

Action No.

1. Comply with "General Construction" section found in the Beaumont District Environmental Field Guide.

Jerrod Justice — APPROVED BY
02/22/2024 — DATE

DISTRICT ENVIRONMENTAL DEPARTMENT

Texas Department of Transportation

Beaumont District Standard

ENVIRONMENTAL PERMITS, ISSUES AND COMMITMENTS

EPIC

FILE: epic.dgn	DN: TxDOT	CK: AM	DW: VP	CK: AR
©TxDOT February 2019	CONT	SECT	JOB	HIGHWAY
	0920	03	082, ETC	CR 1065, ETC
	DIST	COUNTY		SHEET NO.
	20	HARDIN, ETC		203

DATE:
FILE:

I. STORMWATER POLLUTION PREVENTION-CLEAN WATER ACT SECTION 402

TPDES TXR 150000: Stormwater Discharge Permit or Construction General Permit required for projects with 1 or more acres disturbed soil. Projects with any disturbed soil must protect for erosion and sedimentation in accordance with Item 506.

List MS4 Operator(s) that may receive discharges from this project. They may need to be notified prior to construction activities.

1. TxDOT - Beaumont District

☐ No Action Required ☒ Required Action

Action No.

1. Prevent stormwater pollution by controlling erosion and sedimentation in accordance with TPDES Permit TXR 150000
2. Comply with the SW3P and revise when necessary to control pollution or as required by the Engineer.
3. The project is estimated to involve less than one acre of soil disturbance. In the event the project disturbance acreage becomes equal to or greater than one acre, the CGP is applicable. Contact TxDOT project inspector for coordination with DEQC for necessary action.
4. Take measures to prevent construction materials and debris including, but not limited to wastewater (i.e., cooling liquid, etc.) associated with concrete removal from entering any inlets, ditches, or waterways.

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

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

The Contractor must adhere to all of the terms and conditions, including Regional conditions for the State of Texas, associated with the following permit(s):

☒ No Permit Required

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

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

☐ Individual 404 Permit Required: Permit # _____

☐ Other Nationwide Permit Required: NWP# _____

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

1. Maintain a neat and clean worksite next to the water and do not allow any debris to fall into the water.
2. Comply with "Work In or Near Waters/Wetlands Regulatory Requirements and Best Management Practices" section found in the Beaumont District Environmental Field Guide.

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

Best Management Practices:

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

III. CULTURAL RESOURCES

☐ No Action Required ☒ Required Action

Action No.

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

IV. VEGETATION RESOURCES

☐ No Action Required ☒ Required Action

Action No.

1. No vegetation removal or trimming of any kind is allowed. Exceptions are allowed for mowed and maintained grass.

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

☐ No Action Required ☒ Required Action

Action No.

1. If any animal enters the work area, do not harm, harasss, or attempt to handle: let the animal leave on its own. Do not harm any encountered species.
2. If caves or sinkholes are discovered on site, cease work in the area and contact the TxDOT Inspector or DEQC for guidance.
3. Comply with "Wildlife: Regulatory Requirements and Best Management Practices" section found in the Beaumont District Environmental Field Guide.
4. Contractor shall maintain compliance with the Migratory Bird Treaty Act (MBTA) and Texas Parks and Wildlife (TPW) code section 64.002. The full MBTA guidance may be found here http://ftp.dotstate.tx.us/pub/txdot-info/env/toolkit/350-01-gui.pdf
5. Resource specific BMPs (Section I) and Bridge BMPs (Section II, B) from the 'Updated Best Mangment Procctices (BMPs) for TxDOT Maintenance Activities' guidance under the TxDOT Maintenance Program EA shall be reviewed and implemented where appropriate. The maintenance EA BMPs may be found here: http://ftp.txdot.gov/pub/txdot-info/env/080-01-bmp.pdf

LIST OF ABBREVIATIONS

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

VI. HAZARDOUS MATERIALS OR CONTAMINATION ISSUES

☐ No Action Required ☒ Required Action

General (applies to all projects):

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

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

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- Evidence of leaching or seepage of substances
- Any other evidence indicating possible hazardous materials or contamination discovered on site.

List below any bridge class structure(s), not including box culverts, being replaced, rehabilitated, removed, extended or modified as part of this project, or state "None", if applicable.
If "None", then no further action is required. Otherwise TxDOT is responsible for completing asbestos assessment/inspection and evaluation for presence of lead.

Provide results below:

Structure Location	PSN	Element	Lead	Asbestos
FM 1014 @ Draw	202290123801001	N/A	N/A	N/A
FM 1943 @ Drain	202290182801006	N/A	N/A	N/A

If Asbestos is present, then TxDOT must retain a DSHS licensed asbestos consultant to assist with the notification, develop abatement/mitigation procedures, and perform management activities as necessary.

If Asbestos is not present, then TxDOT is still required to notify DSHS prior to any scheduled demolition.

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

Hazardous Materials or Contamination Issues Specific to this Project:

Action No.

1. Comply with TxDOT Standard Specification 7.12 and Special Provision 006-012 if evidence of hazardous materials or contamination is noted during construction.
2. Notify TxDOT Inspector or DEQC of any hazardous materials spills including fuel, hydraulic fluid, etc.

VII. OTHER ENVIRONMENTAL ISSUES

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

☐ No Action Required ☒ Required Action

Action No.

1. Comply with "General Construction" section found in the Beaumont District Environmental Field Guide.

Johnny J Darcey Jr
APPROVED BY

2/23/2024
DATE

DISTRICT ENVIRONMENTAL DEPARTMENT

Texas Department of Transportation

Beaumont District Standard

ENVIRONMENTAL PERMITS, ISSUES AND COMMITMENTS

EPIC

FILE: epic.dgn	DN: TxDOT	CK: AM	DW: VP	CK: AR
©TxDOT February 2019	CONT	SECT	JOB	HIGHWAY
	0920	03	082, ETC	CR 1065, ETC
	DIST	COUNTY		SHEET NO.
	20	HARDIN, ETC		204

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:

I. STORMWATER POLLUTION PREVENTION-CLEAN WATER ACT SECTION 402

TPDES TXR 150000: Stormwater Discharge Permit or Construction General Permit required for projects with 1 or more acres disturbed soil. Projects with any disturbed soil must protect for erosion and sedimentation in accordance with Item 506.

List MS4 Operator(s) that may receive discharges from this project. They may need to be notified prior to construction activities.

1. TxDOT - Beaumont District

☐ No Action Required ☒ Required Action

Action No.

1. Prevent stormwater pollution by controlling erosion and sedimentation in accordance with TPDES Permit TXR 150000
2. Comply with the SW3P and revise when necessary to control pollution or as required by the Engineer.
3. The project is estimated to involve less than one acre of soil disturbance. In the event the project disturbance acreage becomes equal to or greater than one acre, the CGP is applicable. Contact TxDOT project inspector for coordination with DEQC for necessary action.
4. Take measures to prevent construction materials and debris including, but not limited to wastewater (i.e., cooling liquid, etc.) associated with concrete removal from entering any inlets, ditches, or waterways.

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

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

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☐ No Permit Required

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

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

☐ Individual 404 Permit Required: Permit # _____

☒ Other Nationwide Permit Required: NWP# 3

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

1. Maintain a neat and clean worksite next to the water and do not allow any debris to fall into the water.
2. Comply with "Work In or Near Waters/Wetlands Regulatory Requirements and Best Management Practices" section found in the Beaumont District Environmental Field Guide.

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

Best Management Practices:

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

II. CULTURAL RESOURCES

☐ No Action Required ☒ Required Action

Action No.

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

IV. VEGETATION RESOURCES

☐ No Action Required ☒ Required Action

Action No.

1. No vegitation removal or trimming of any king is allowed. Exceptions are allowed for wored and mainted grass.
2. Any equipment that comes into contact with water is required to follow TPWD Clean, Drain, and Dry procedures to protect against the spreading of invasive aquatic species. See https://tpwd.texas.gov/fishboat/boat/protect water or contact District Environmental staff for guidance.

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

☐ No Action Required ☒ Required Action

Action No.

1. If any animal enters the work area, do not harm, harass, or attempt to handle: let the animal leave on its own.
2. If caves or sinkholes are discovered on site, cease work in the area and contact the TxDOT Inspector or DEQC for guidance.
3. Comply with "Wildlife: Regulatory Requirements and Best Management Practices" section found in the Beaumont District Environmental Field Guide.
4. Contractor shall maintain compliance with the Migratory Bird Treaty Act (MBTA) and Texas Parks and Wildlife (TPW) Code Section 64.002. The full MBTA guidance may be found here: demolition of a bridge or bridge class structure is to occur https://ftp.dot.state.tx.us/pub/txdot-info/env/tookit/350-01-gui.pdf
5. Resources specific BMPs (Section 1) and bridges BMP (Section 11, B) from the "updated Best Management Practices (BMPs) for TxDOT Maintence Program, EA shall be reviewed and implemented where appropiate. The Maintence EA BMPs may be found here: https://ftp.txdot.gov/pub/txdot-env/080-01-bmp.pdf

LIST OF ABBREVIATIONS

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

VI. HAZARDOUS MATERIALS OR CONTAMINATION ISSUES

☐ No Action Required ☒ Required Action

General (applies to all projects):

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

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

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- Dead or distressed vegetation (not identified as normal)
- Trash piles, drums, canister, barrels, etc.
- Undesirable smells or odors
- Evidence of leaching or seepage of substances
- Any other evidence indicating possible hazardous materials or contamination discovered on site.

List below any bridge class structure(s), not including box culverts, being replaced, rehabilitated, removed, extended or modified as part of this project, or state "None", if applicable.
If "None", then no further action is required. Otherwise TxDOT is responsible for completing asbestos assessment/inspection and evaluation for presence of lead.

Provide results below:

Structure Location	PSN	Element	Lead	Asbestos
Neches River Relief #2	201220006504076	Various	N/A	N/A

If Asbestos is present, then TxDOT must retain a DSHS licensed asbestos consultant to assist with the notification, develop abatement/mitigation procedures, and perform management activities as necessary.

If Asbestos is not present, then TxDOT is still required to notify DSHS prior to any scheduled demolition.

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

Hazardous Materials or Contamination Issues Specific to this Project:

Action No.

1. Comply with TxDOT Standard Specification 7.12 and Special Provision 006-012 if evidence of hazardous materials or contamination is noted during construction.
2. Notify TxDOT Inspector or DEQC of any hazardous materials spills including fuel, hydraulic fluid, etc.

VII. OTHER ENVIRONMENTAL ISSUES

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

☐ No Action Required ☒ Required Action

Action No.

1. Comply with "General Construction" section found in the Beaumont District Environmental Field Guide.

Johnny J Darcey Jr
APPROVED BY

2/16/2024
DATE

DISTRICT ENVIRONMENTAL DEPARTMENT

Texas Department of Transportation

Beaumont District Standard

ENVIRONMENTAL PERMITS, ISSUES AND COMMITMENTS

EPIC

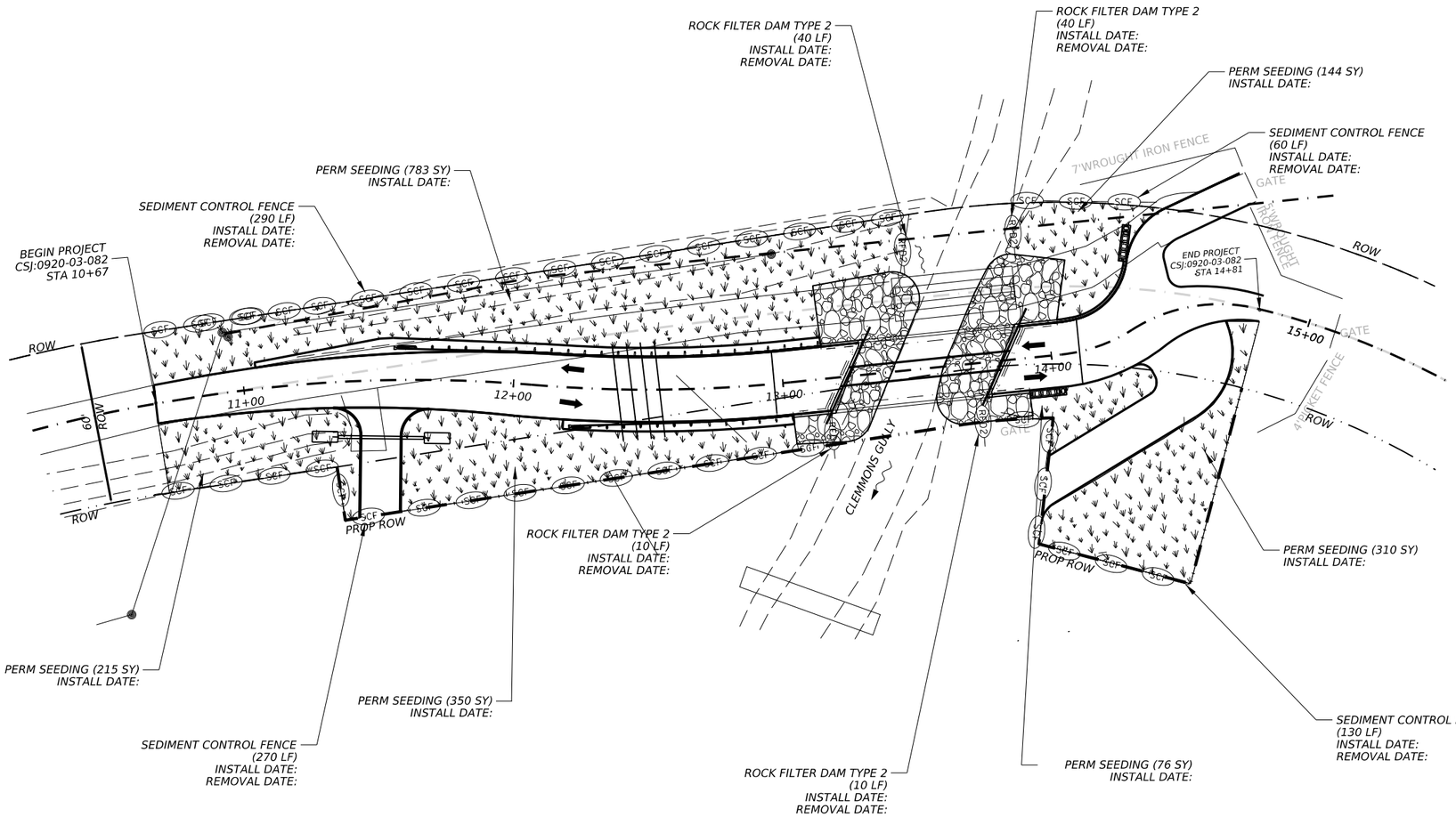
FILE: epic.dgn	DN: TxDOT	CK: AM	DW: VP	CK: AR
© TxDOT February 2019	CONT	SECT	JOB	HIGHWAY
	0920	03	082, ETC	CR 1065, ETC
	DIST	COUNTY		SHEET NO.
	BMT	HARDIN, ETC		205

DW: CK: DW: CK:

DATE:
FILE: pw://txdot.projectwiseonline.com:TXDOT5/Documents/20 - BMT/Design Projects/0920030824 - Design/Plan Set/9. Environmental/SW3P

LEGEND:

- PROPOSED TRAFFIC DIRECTION
- PERMANENT SEEDING
- RFD2 — ROCK FILTER DAM (TY 2)
- SCF — SEDIMENT CONTROL FENCE
- ROW



ROCK FILTER DAM TYPE 2 (40 LF) INSTALL DATE: REMOVAL DATE:

ROCK FILTER DAM TYPE 2 (40 LF) INSTALL DATE: REMOVAL DATE:

PERM SEEDING (144 SY) INSTALL DATE:

SEDIMENT CONTROL FENCE (60 LF) INSTALL DATE: REMOVAL DATE:

PERM SEEDING (783 SY) INSTALL DATE:

SEDIMENT CONTROL FENCE (290 LF) INSTALL DATE: REMOVAL DATE:

PERM SEEDING (215 SY) INSTALL DATE:

SEDIMENT CONTROL FENCE (270 LF) INSTALL DATE: REMOVAL DATE:

PERM SEEDING (350 SY) INSTALL DATE:

ROCK FILTER DAM TYPE 2 (10 LF) INSTALL DATE: REMOVAL DATE:

ROCK FILTER DAM TYPE 2 (10 LF) INSTALL DATE: REMOVAL DATE:

PERM SEEDING (76 SY) INSTALL DATE:

PERM SEEDING (310 SY) INSTALL DATE:

SEDIMENT CONTROL FENCE (130 LF) INSTALL DATE: REMOVAL DATE:

NOTES:

1. SEDIMENT CONTROLS SHALL BE IN PLACE PRIOR TO COMMENCING ANY SOIL DISTURBING ACTIVITIES.
2. ALL CONTROLS TO BE PLACED AS SHOWN ON STANDARDS EC(1)-16 AND EC(2)-16.
3. ALL PERIMETER SEDIMENT CONTROLS TO IN PLACE UNTIL END OF WORK.
4. LOCATIONS OF EROSION CONTROL MEASURES MAY BE ADJUSTED IN THE FIELD AS DIRECTED BY ENGINEER.

NOT TO SCALE

STATE OF TEXAS
JAMES D. HORNE
141323
REGISTERED
PROFESSIONAL ENGINEER

DocuSigned by:
50238C8D55F5470...
2/29/2024

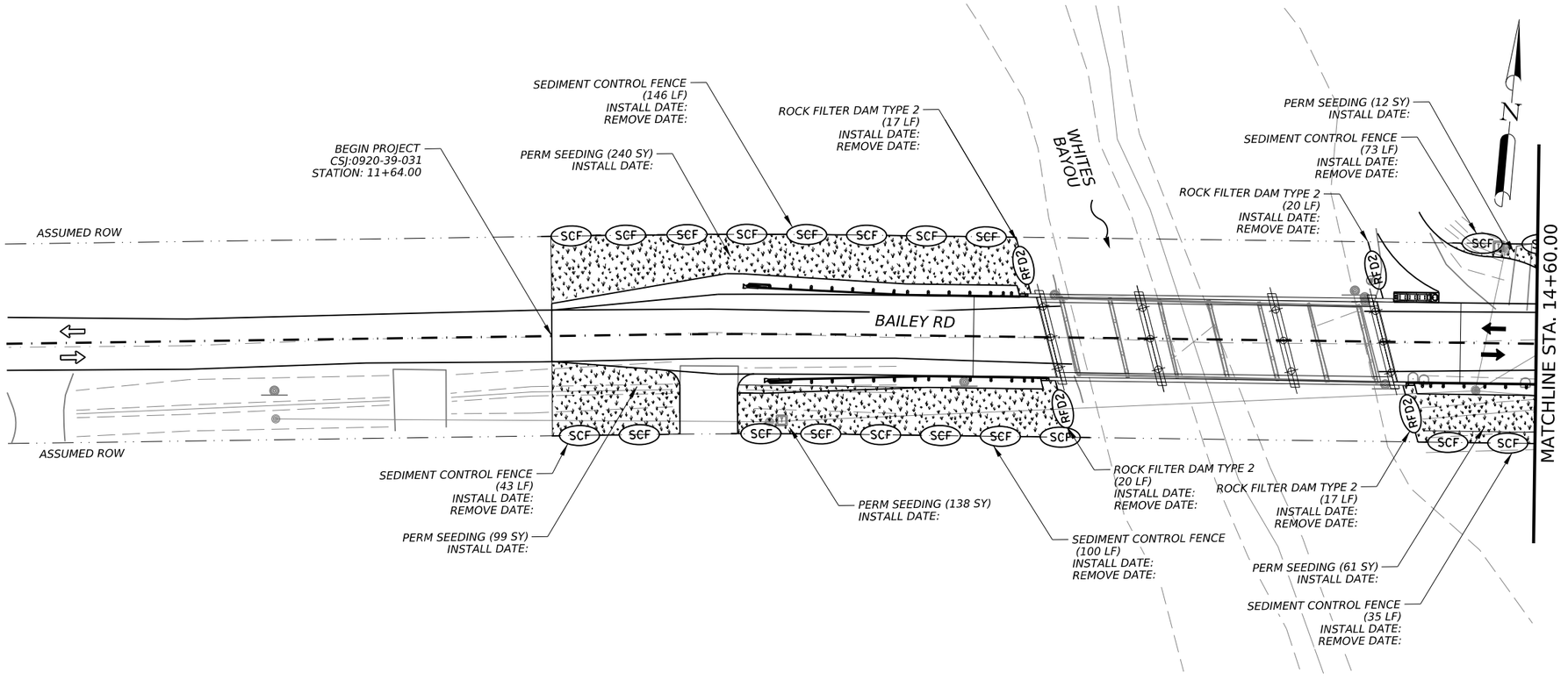
Texas Department of Transportation

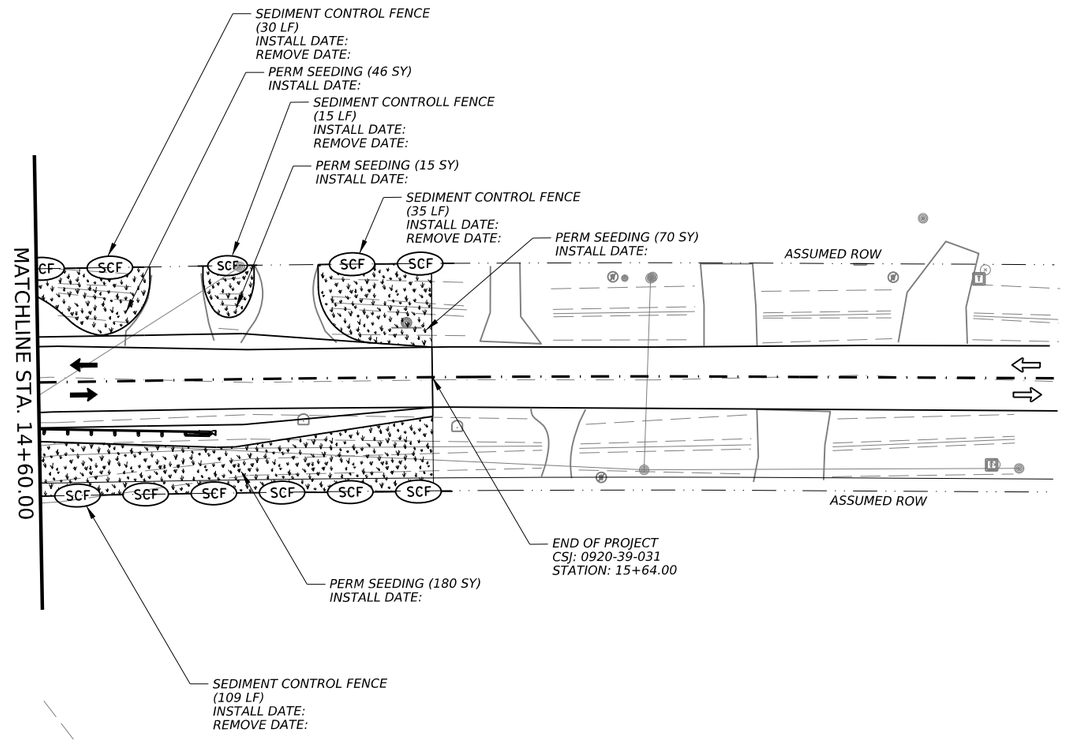
CLEMMONS GULLY PACKAGE

SW3P LAYOUT
W. PINESHADOWS DR (CR 1065)
AT CLEMMONS GULLY

SHEET 1 OF 1

CONT	SECT	JOB	HIGHWAY
0920	03	082,ETC	CR 1065, ETC
DIST	COUNTY		SHEET NO.
20	HARDIN, ETC		206





LEGEND

- DIRECTION OF TRAFFIC
- PERM AND TEMP SEEDING
- SOIL RETENTION BLANKET
- SCF — SEDIMENT CONTROL FENCE
- RFD2 — ROCK FILTER DAM TYPE 2
- APPARENT ROW

NOTES:

1. SEDIMENT CONTROLS SHALL BE IN PLACE PRIOR TO COMMENCING ANY SOIL DISTURBING ACTIVITIES.
2. ALL CONTROLS TO BE PLACED AS SHOWN ON STANDARDS EC(1)-16 AND EC(2)-16.
3. ALL PERIMETER SEDIMENT CONTROLS TO BE IN PLACE UNTIL END OF WORK.
4. LOCATIONS OF EROSION CONTROL MEASURES MAY BE ADJUSTED IN THE FIELD AS DIRECTED BY THE ENGINEER.

STATE OF TEXAS
S. E. WRIGHT
108969
LICENSED
PROFESSIONAL ENGINEER

02-27-2024

LJA PROGRAM MANAGEMENT
FRN - F-14256

Texas Department of Transportation

CLEMMONS GULLY PACKAGE

SW3P LAYOUT
BAILEY RD AT WHITES BAYOU

SHEET 1 OF 1

CONT	SECT	JOB	HIGHWAY
0920	03	082, ETC	CR 1065, ETC
DIST	COUNTY		SHEET NO.
BMT	HARDIN, ETC		207

DATE: 2/26/2024 2:32:30 PM
FILE: pw://lja-pw.bentley.com:lja-pw-01/Documents/TxDOT/PM8016-2301 CEC WA4/Clemmons Gully Off-System Bridge/400 Production/4 - Design/Plan Set/9. Environmental/031_BS_SW3P01.dgn

LEGEND

- DIRECTION OF TRAFFIC
- PERM AND TEMP SEEDING
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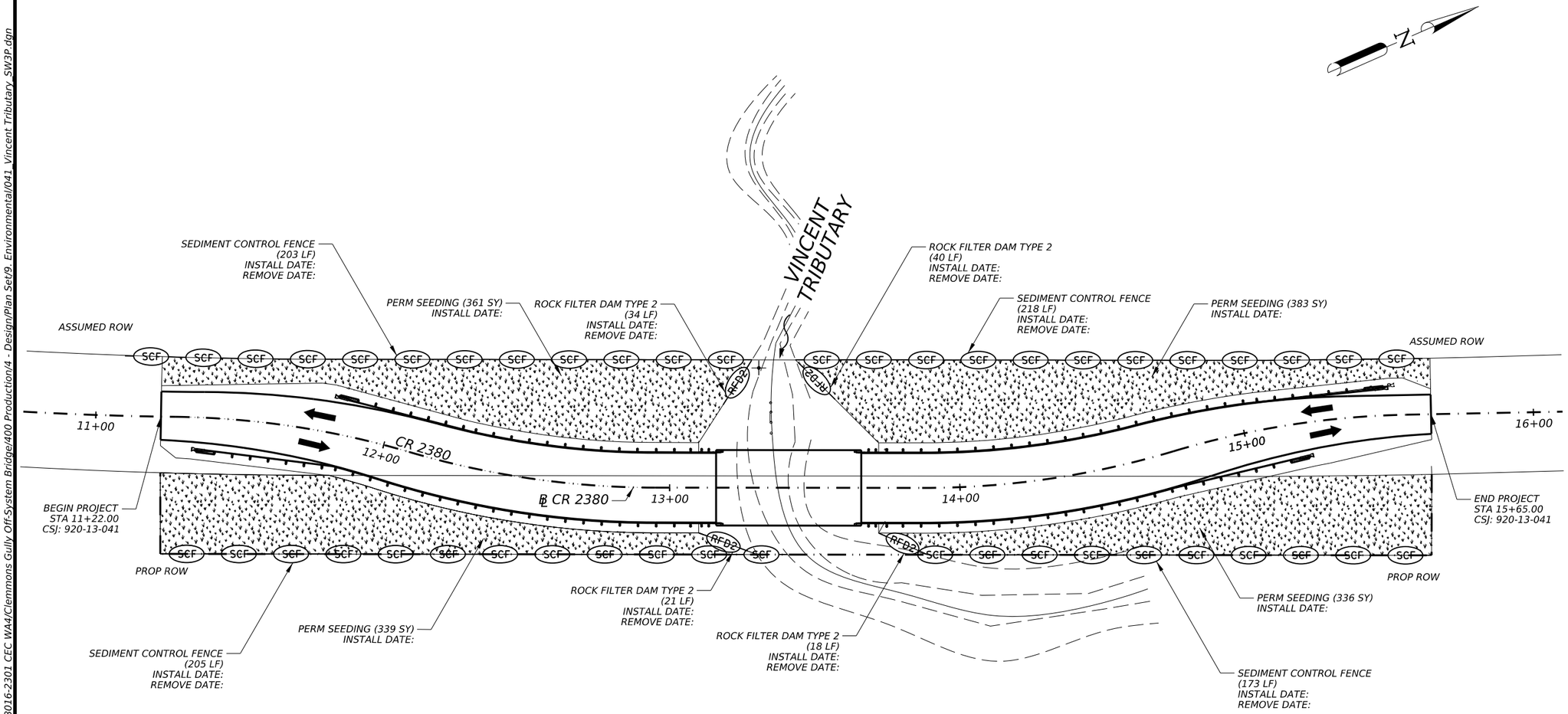

0' 20' 40'

SCALE: 1"=40'

STATE OF TEXAS
S. E. WRIGHT
108969
LICENSED
PROFESSIONAL ENGINEER

02-27-2024

LJA PROGRAM MANAGEMENT
FRN - F-14256

Texas Department of Transportation

CLEMMONS GULLY PACKAGE

SW3P LAYOUT
CR 2380 AT VINCENT TRIBUTARY

SHEET 1 OF 1

CONT	SECT	JOB	HIGHWAY
0920	03	082, ETC	CR 1065, ETC
DIST	COUNTY		SHEET NO.
BMT	HARDIN, ETC		208

DATE: 2/26/2024 2:32:34 PM
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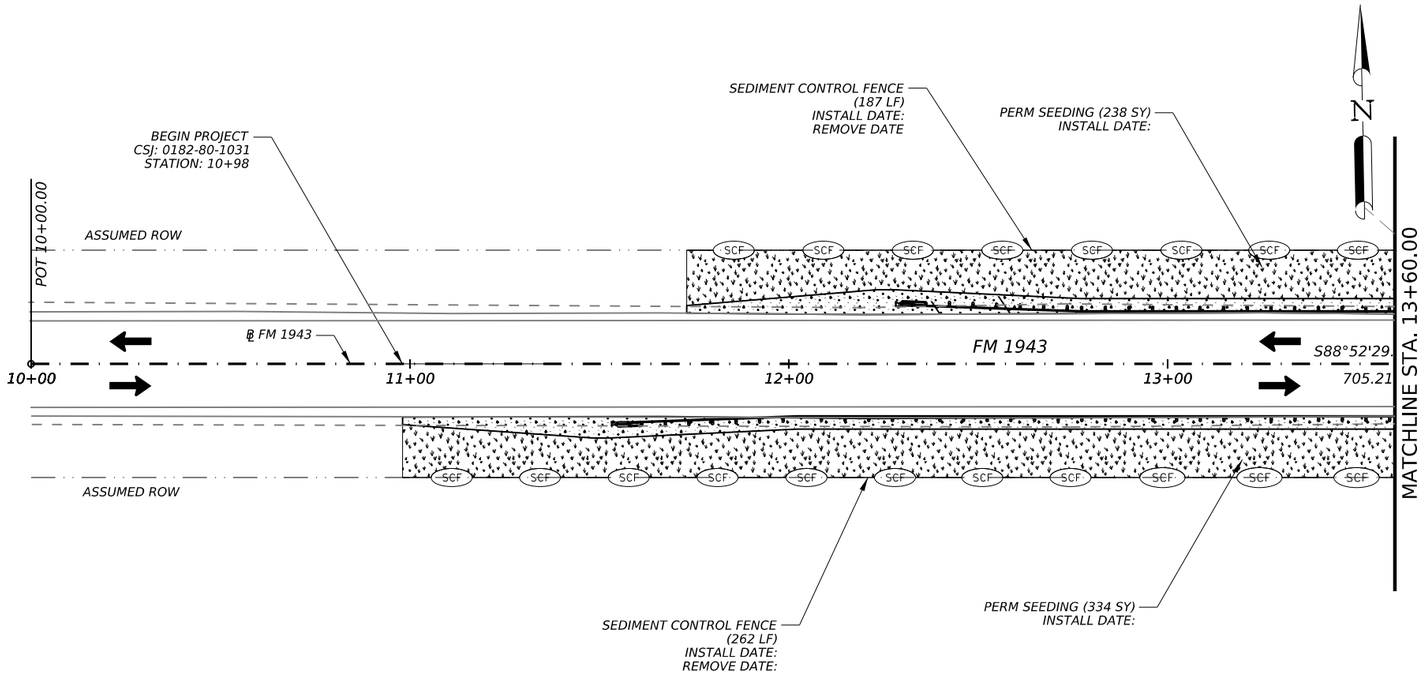

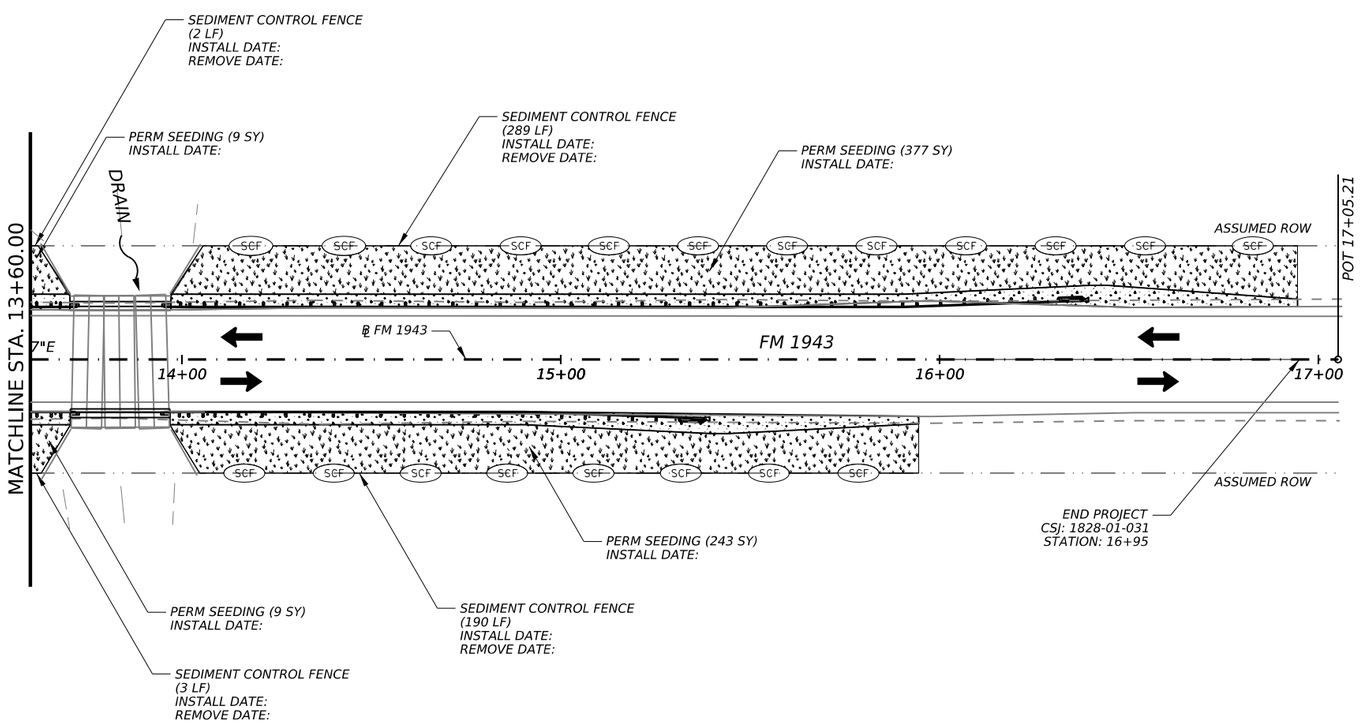

LEGEND

- DIRECTION OF TRAFFIC
- PERM AND TEMP SEEDING
- SOIL RETENTION BLANKET
- SCF — SEDIMENT CONTROL FENCE
- RFD2 — ROCK FILTER DAM TYPE 2
- APPARENT ROW

NOTES:

1. SEDIMENT CONTROLS SHALL BE IN PLACE PRIOR TO COMMENCING ANY SOIL DISTURBING ACTIVITIES.
2. ALL CONTROLS TO BE PLACED AS SHOWN ON STANDARDS EC(1)-16 AND EC(2)-16.
3. ALL PERIMETER SEDIMENT CONTROLS TO BE IN PLACE UNTIL END OF WORK.
4. LOCATIONS OF EROSION CONTROL MEASURES MAY BE ADJUSTED IN THE FIELD AS DIRECTED BY THE ENGINEER.

0' 20' 40'

SCALE: 1"=40'

STATE OF TEXAS
S. E. WRIGHT
108969
LICENSED
PROFESSIONAL ENGINEER

02-27-2024

LJA PROGRAM MANAGEMENT
FRN - F-14256

Texas Department of Transportation
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CLEMMONS GULLY PACKAGE

SW3P LAYOUT
FM 1943 AT DRAIN

SHEET 1 OF 1

CONT	SECT	JOB	HIGHWAY
0920	03	082, ETC	CR 1065, ETC
DIST	COUNTY		SHEET NO.
BMT	HARDIN, ETC		209

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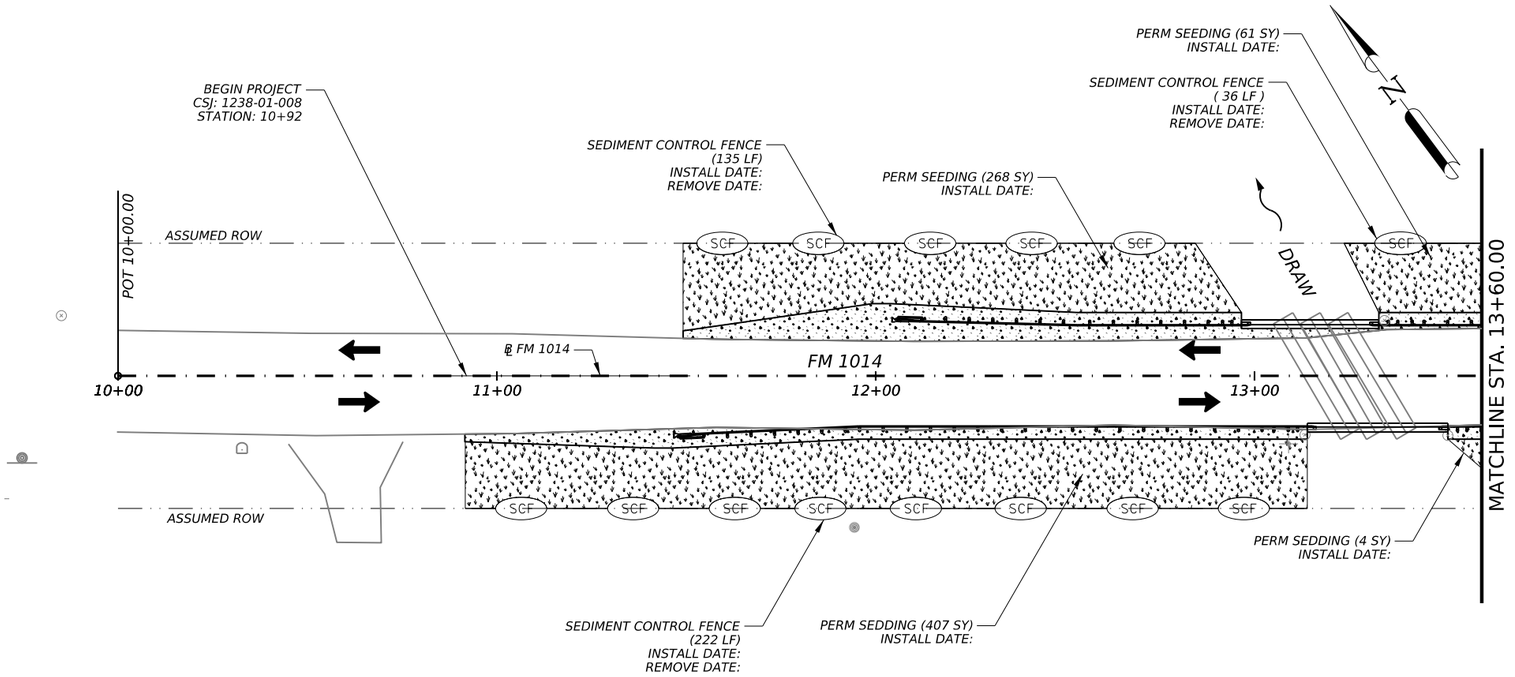

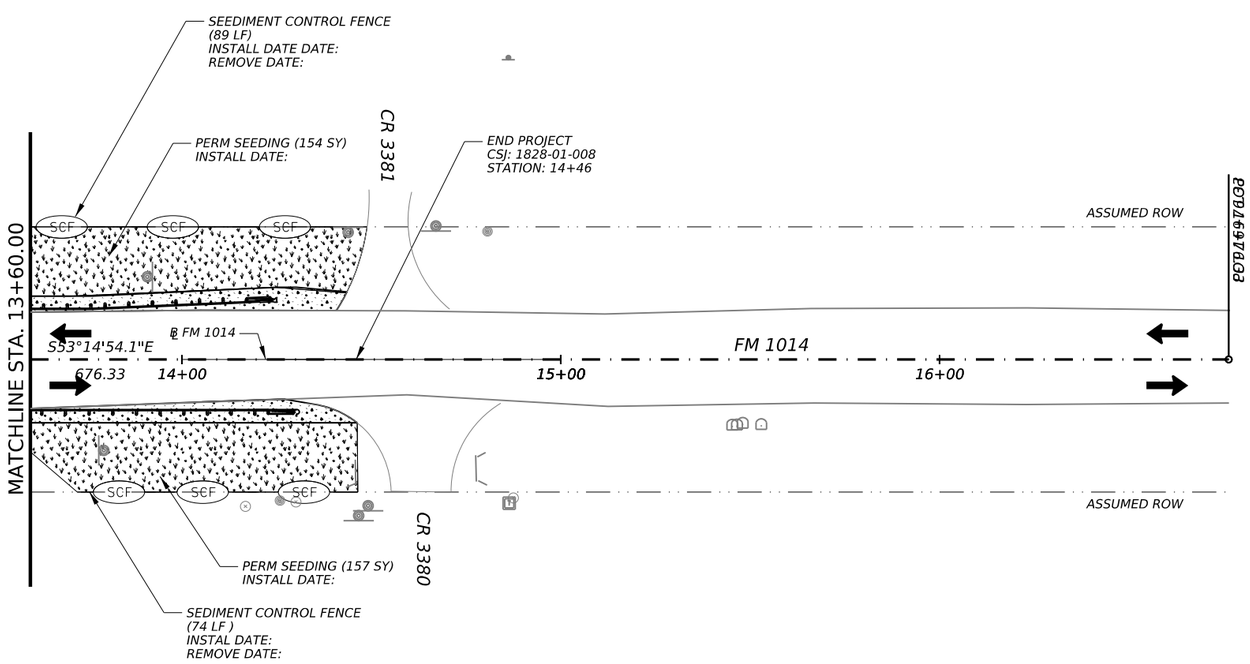

LEGEND

- DIRECTION OF TRAFFIC
- PERM AND TEMP SEEDING
- SOIL RETENTION BLANKET
- SCF — SEDIMENT CONTROL FENCE
- RFD2 — ROCK FILTER DAM TYPE 2
- APPARENT ROW

NOTES:

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3. ALL PERIMETER SEDIMENT CONTROLS TO BE IN PLACE UNTIL END OF WORK.
4. LOCATIONS OF EROSION CONTROL MEASURES MAY BE ADJUSTED IN THE FIELD AS DIRECTED BY THE ENGINEER.

0' 20' 40'

SCALE: 1"=40'

STATE OF TEXAS
S. E. WRIGHT
108969
LICENSED
PROFESSIONAL ENGINEER

02-27-2024

LJA PROGRAM MANAGEMENT
FRN - F-14256

Texas Department of Transportation

CLEMMONS GULLY PACKAGE

SW3P LAYOUT
FM 1014 AT DRAW

SHEET 1 OF 1

CONT	SECT	JOB	HIGHWAY
0920	03	082, ETC	CR 1065, ETC
DIST	COUNTY		SHEET NO.
BMT	HARDIN, ETC		210

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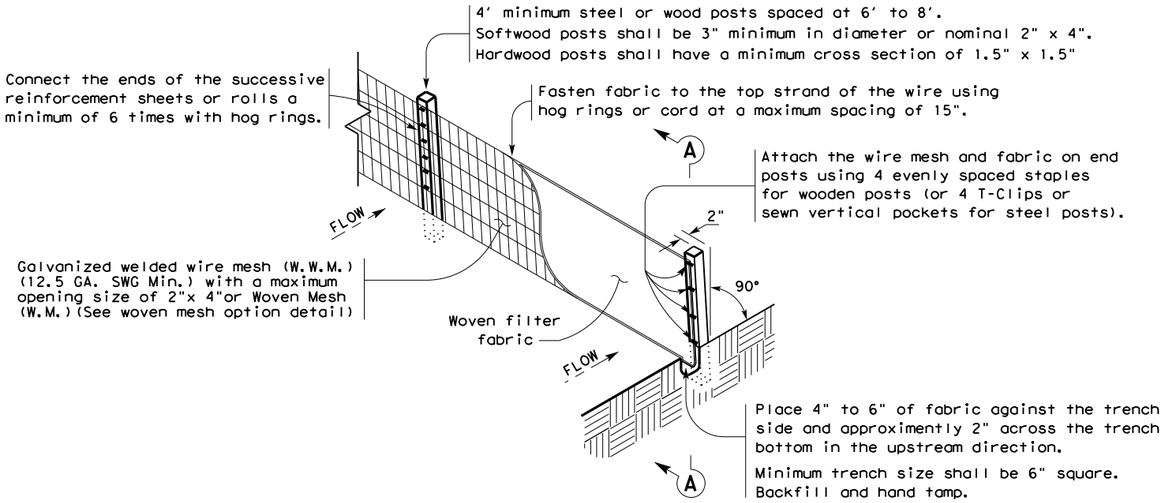
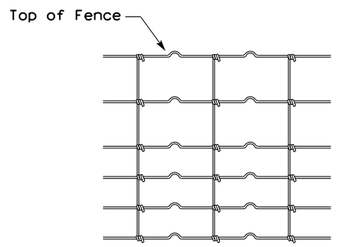
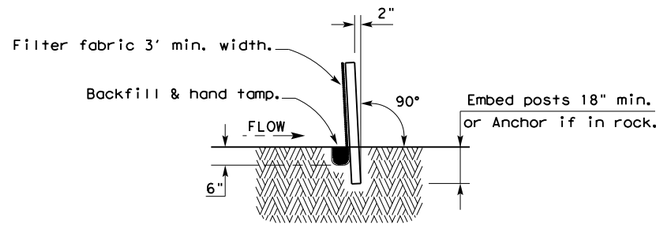


TEMPORARY SEDIMENT CONTROL FENCE

SCF





SECTION A-A

HINGE JOINT KNOT WOVEN MESH (OPTION) DETAIL

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

SEDIMENT CONTROL FENCE USAGE GUIDELINES

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

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

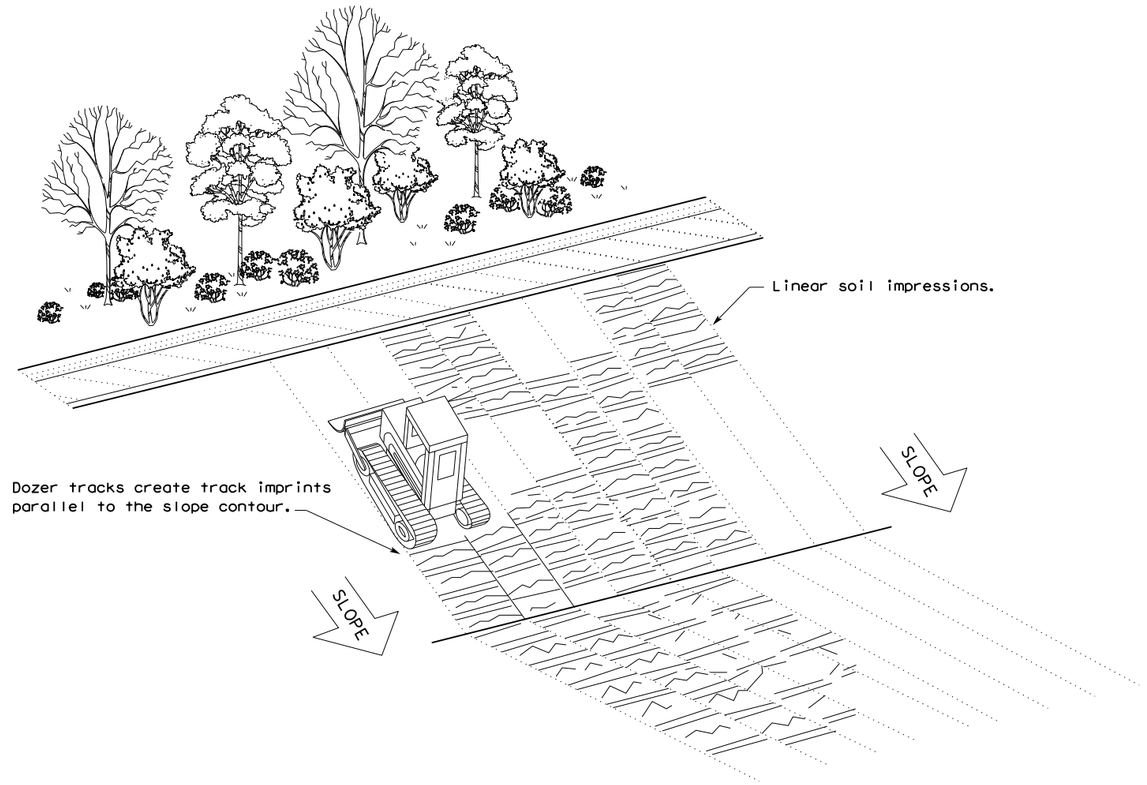
LEGEND

Sediment Control Fence

SCF

GENERAL NOTES

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



VERTICAL TRACKING

Texas Department of Transportation

Design Division Standard

TEMPORARY EROSION, SEDIMENT AND WATER POLLUTION CONTROL MEASURES

FENCE & VERTICAL TRACKING

EC(1)-16

FILE: ec116	DN: TxDOT	CK: KM	DW: VP	DN/CK: LS
© TxDOT: JULY 2016	CONT	SECT	JOB	HIGHWAY
REVISIONS	0920	03	082, ETC	CR 1065, ETC
	DIST	COUNTY		SHEET NO.
	BMT	HARDIN, ETC		211

DATE: 2/26/2024 2:33:08 PM
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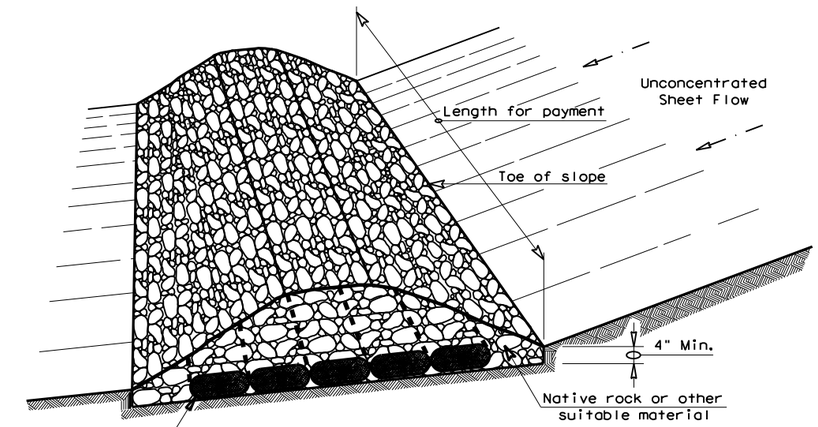
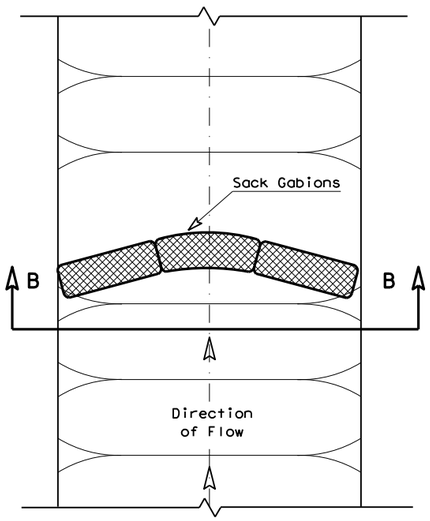
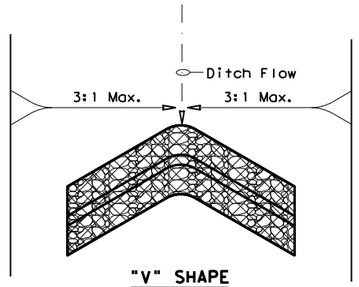


FILTER DAM AT TOE OF SLOPE

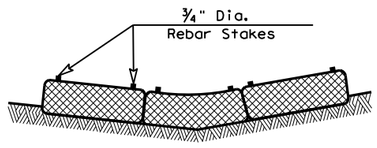
RFD1



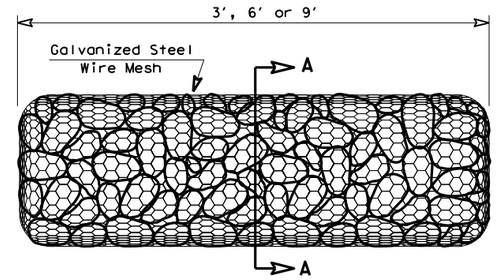
PLAN VIEW



"V" SHAPE PLAN VIEW

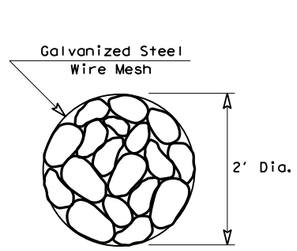


SECTION B-B

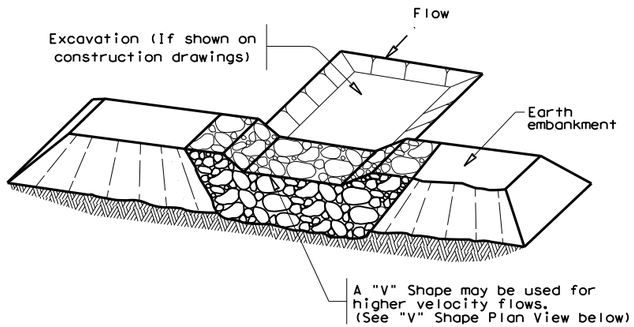


TYPE 4 (SACK GABIONS)

RFD4

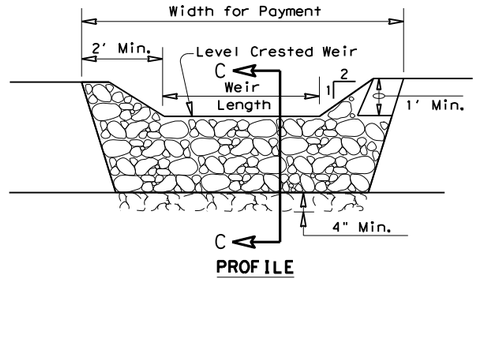


SECTION A-A

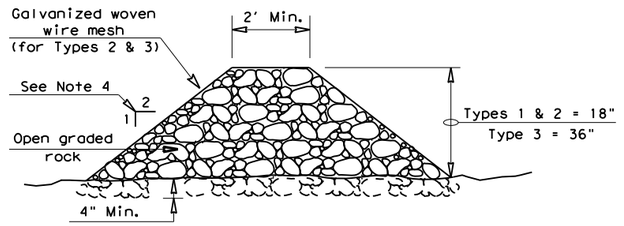


FILTER DAM AT SEDIMENT TRAP

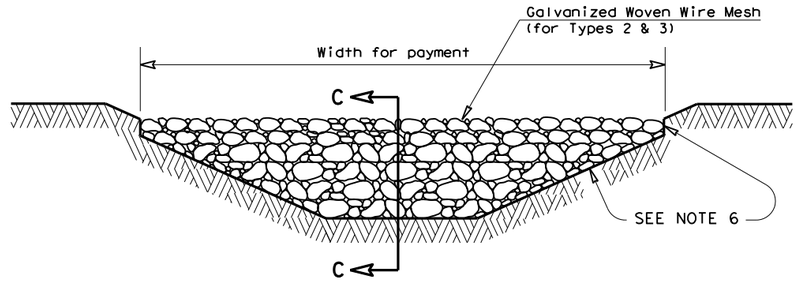
RFD1 — OR — RFD2



PROFILE



SECTION C-C



FILTER DAM AT CHANNEL SECTIONS

RFD1 — OR — RFD2 — OR — RFD3

ROCK FILTER DAM USAGE GUIDELINES

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

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

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

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

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

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

GENERAL NOTES

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

PLAN SHEET LEGEND

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

Texas Department of Transportation — Design Division Standard

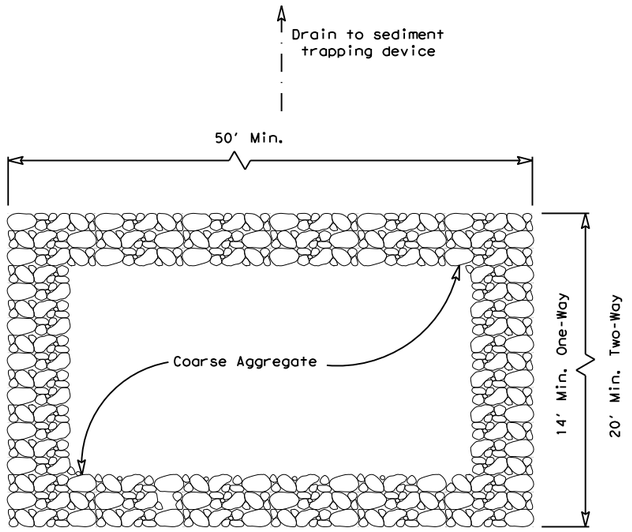
TEMPORARY EROSION, SEDIMENT AND WATER POLLUTION CONTROL MEASURES

ROCK FILTER DAMS

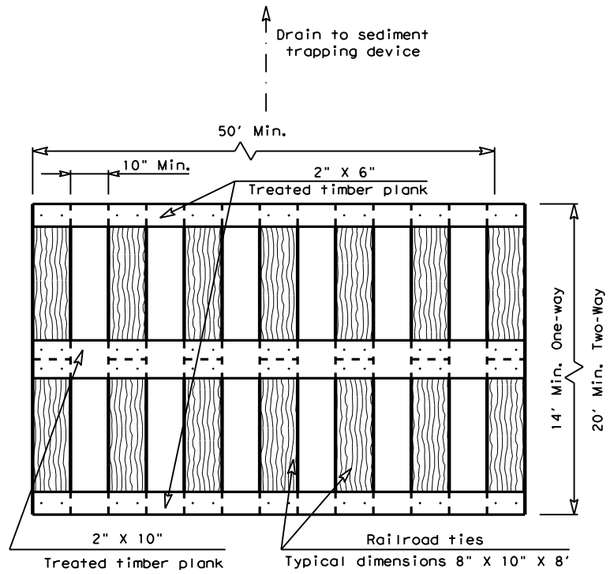
EC(2)-16

FILE: ec216	DN: TxDOT	CK: KM	DW: VP	DN/CK: LS	
© TxDOT: JULY 2016	CONT	SECT	JOB	HIGHWAY	
REVISIONS	0920	03	082, ETC	CR 1065, ETC	
	DIST	COUNTY		SHEET NO.	
	BMT	HARDIN, ETC		212	

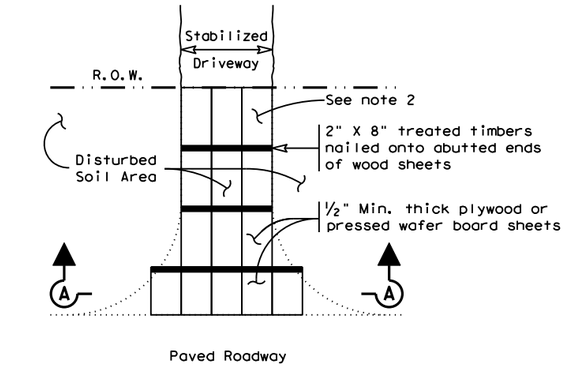
DATE: 2/26/2024 2:33:13 PM
FILE: pw://ljg-pw.bentley.com:ljg-pw-01/Documents/TxDOT/PM8016-2301 CEC WA4/Clemmons Gully Off-System Bridge/400 Production/4 - Design/Plan Set/9. Environmental/Standards/ec316.dgn



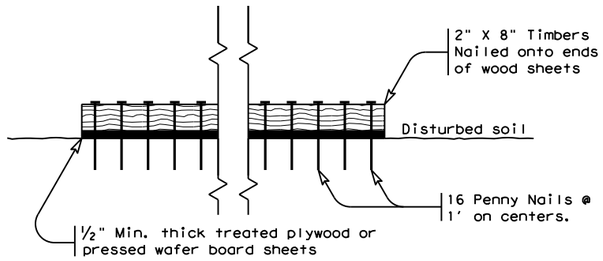
PLAN VIEW



PLAN VIEW



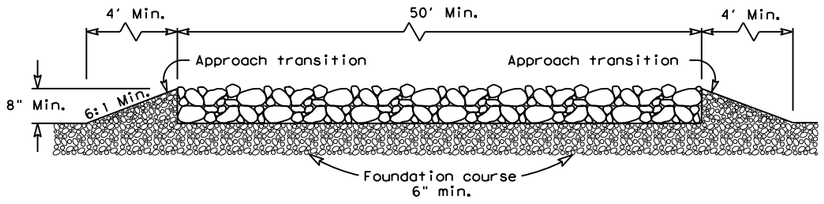
PLAN VIEW



SECTION A-A

CONSTRUCTION EXIT (TYPE 3)

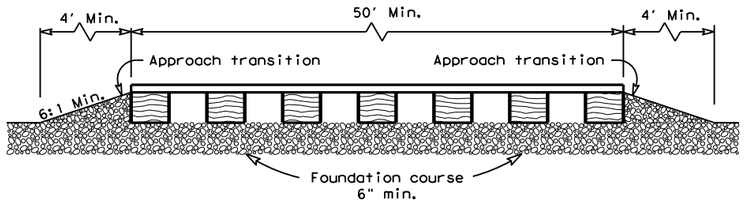
SHORT TERM



ELEVATION VIEW

CONSTRUCTION EXIT (TYPE 1)

ROCK CONSTRUCTION (LONG TERM)



ELEVATION VIEW

CONSTRUCTION EXIT (TYPE 2)

TIMBER CONSTRUCTION (LONG TERM)

GENERAL NOTES (TYPE 1)

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

GENERAL NOTES (TYPE 2)

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

GENERAL NOTES (TYPE 3)

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

Texas Department of Transportation | Design Division Standard

TEMPORARY EROSION, SEDIMENT AND WATER POLLUTION CONTROL MEASURES

CONSTRUCTION EXITS

EC(3)-16

FILE: ec316	DN: TxDOT		CK: KM		DW: VP	DN/CK: LS
	CONT	SECT	JOB		HIGHWAY	
REVISIONS	0920	03	082, ETC		CR 1065, ETC	
	DIST	COUNTY			SHEET NO.	
	BMT	HARDIN, ETC			213	