INDEX OF SHEETS

SEE SHEET 2

STATE OF TEXAS
DEPARTMENT OF TRANSPORTATION

PLANS OF PROPOSED
STATE HIGHWAY IMPROVEMENT

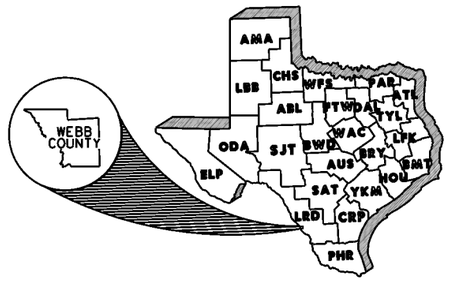
STATE AID PROJECT NO C18-5-90

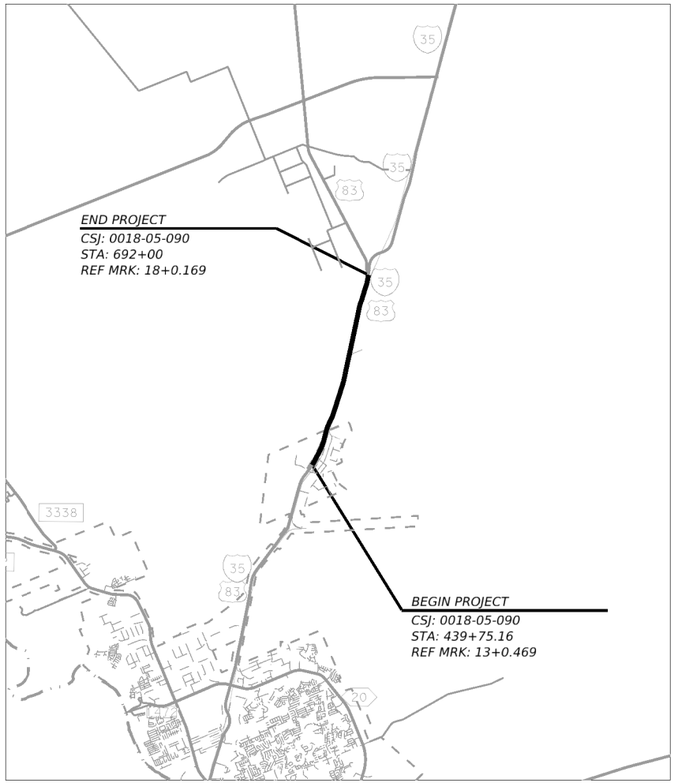
IH-35
WEBB COUNTY
CSJ: 0018-05-090

NET LENGTH OF ROADWAY = 25,170.56FT.= 4.766MI.
NET LENGTH OF BRIDGE = 52.00FT.= 0.01MI.
NET LENGTH OF PROJECT = 25,222.56FT.= 4.776MI.

LIMITS FROM: 0.09 MI N OF UNIROYAL DRIVE (WFR)
TO: 0.4 MI S OF HWY US 83

FOR THE CONSTRUCTION OF REHABILITATION
CONSISTING OF REHABILITATE OF EXISTING ROADWAY





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: SPECIAL LABOR PROVISIONS FOR STATE PROJECTS (000---008)

STATE AID PROJECT NO.			
C18-5-90			
CONT	SECT	JOB	HIGHWAY
0018	05	090	IH-35
DIST	COUNTY		SHEET NO.
22	WEBB		1

DESIGN CRITERIA: PREVENTIVE MAINTENANCE
A.D.T. (2024): 800
A.D.T. (2044): 1550
% TRUCK IN ADT: N/A
FUNCTIONAL CLASS: INTERSTATE
DESIGN SPEED: 55 MPH
TDLR REQUIRED: NO

FINAL PLANS

LETTING DATE: _____

DATE CONTRACTOR BEGAN WORK: _____

DATE WORK WAS COMPLETED & ACCEPTED: _____

FINAL CONTRACT COST: $ _____

CONTRACTOR : _____

FINAL AS BUILTS

THE CONSTRUCTION WAS PERFORMED UNDER MY SUPERVISION IN ACCORDANCE WITH THE PLANS AND CONTRACT

_____
AREA ENGINEER

_____
DATE

Texas Department of Transportation

SUBMITTED FOR LETTING: 11/27/2023
DocuSigned by:
98C72D65D494466...
TRANSPORTATION ENGINEER

RECOMMENDED FOR LETTING: 11/27/2023
DocuSigned by:
A54CD9F7312...
AREA ENGINEER

RECOMMENDED FOR LETTING: 11/27/2023
DocuSigned by:
Roberto Rodriguez III
DISTRICT DIRECTOR OF TRANSPORTATION
PLANNING AND DEVELOPMENT

APPROVED FOR LETTING: 11/27/2023
DocuSigned by:
A5A9883ECD1...
DISTRICT ENGINEER

DATE: 11/27/2023 2:44:33 PM
FILE: c:\txdot\pw_online\txdot5\krystal.hernandez\d0982946\IH35 WFR Title Sheet.dgn

STATE OF TEXAS
MISAEL AGUILAR
150329
LICENSED
PROFESSIONAL ENGINEER

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

DocuSigned by:
MISAEL AGUILAR P.E.
8EE5B149888F4E9...
11/30/2023
DATE

STATE OF TEXAS
LUIS G. URBINA
117019
LICENSED
PROFESSIONAL ENGINEER

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11/30/2023
DATE

Texas Department of Transportation

IH 35 WFR

INDEX OF SHEETS

CONT	SECT	JOB	HIGHWAY
0018	05	090	IH35 WFR
DIST	COUNTY		SHEET NO.
22	WEBB		2

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MISAEL AGUILAR
150329
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P.E.

11/30/2023

DATE

Texas Department of Transportation

IH 35 WFR

INDEX OF SHEETS

SHEET 2 OF 2

CONT	SECT	JOB	HIGHWAY
0018	05	090	IH35 WFR

DIST	COUNTY	SHEET NO.
22	WEBB	3

DATE: 11/29/2023 3:23:22 PM
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COUNTY	SEGMENT	PROJECT CSJ	HIGHWAY	LENGTH		TYPE OF WORK	PROJECT LIMITS		REFERENCE MARKER
				FEET	MILES				
WEBB	1	0018-05-090	IH 35	15,248.64	2.888	OVERLAY	FROM:	0.09 MI N OF UNIROYAL DRIVE (WFR)	13+0.469
							TO:	2.98 MILES NORTH OF UNIROYAL	15+1.310
	2	0018-05-090	IH 35	9,968.64	1.888	REHAB	FROM:	2.98 MILES NORTH OF UNIROYAL	15+1.310
							TO:	0.40 MI S OF HWY US 83 (WFR)	18+0.169
			TOTAL	25,217.28	4.776				

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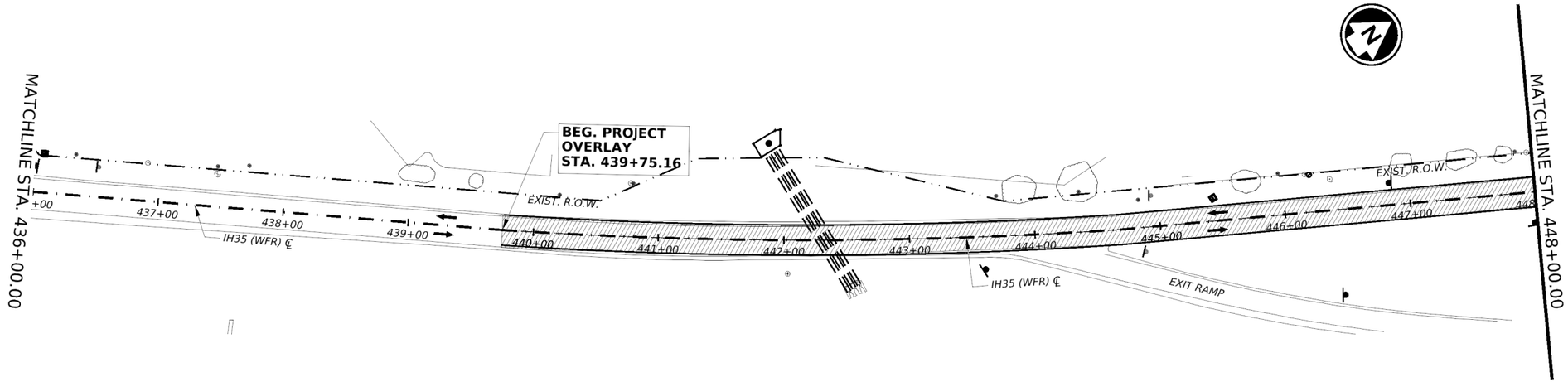
Texas Department of Transportation

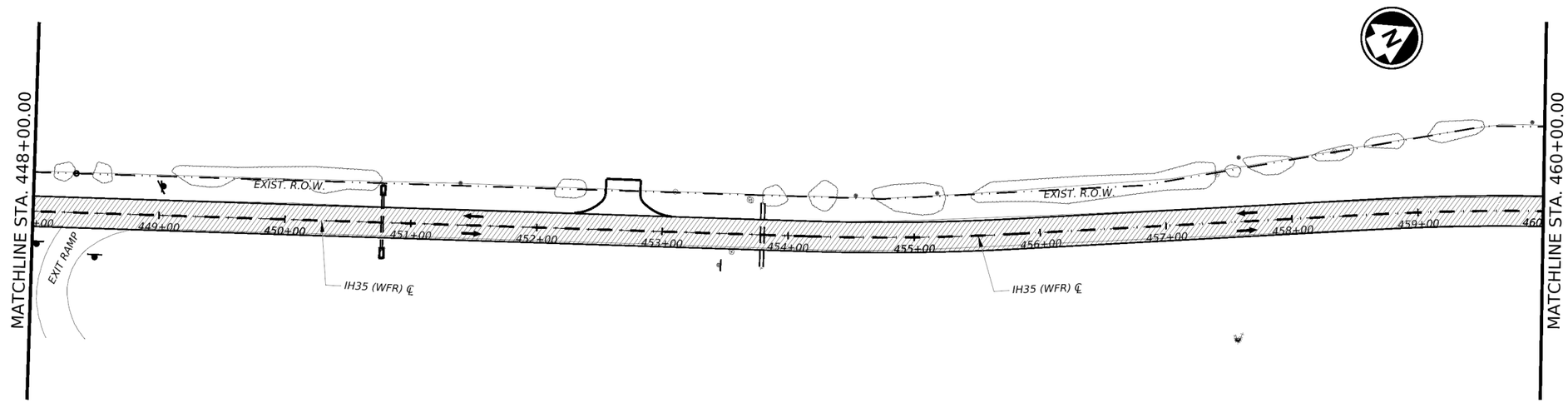
IH 35 WFR

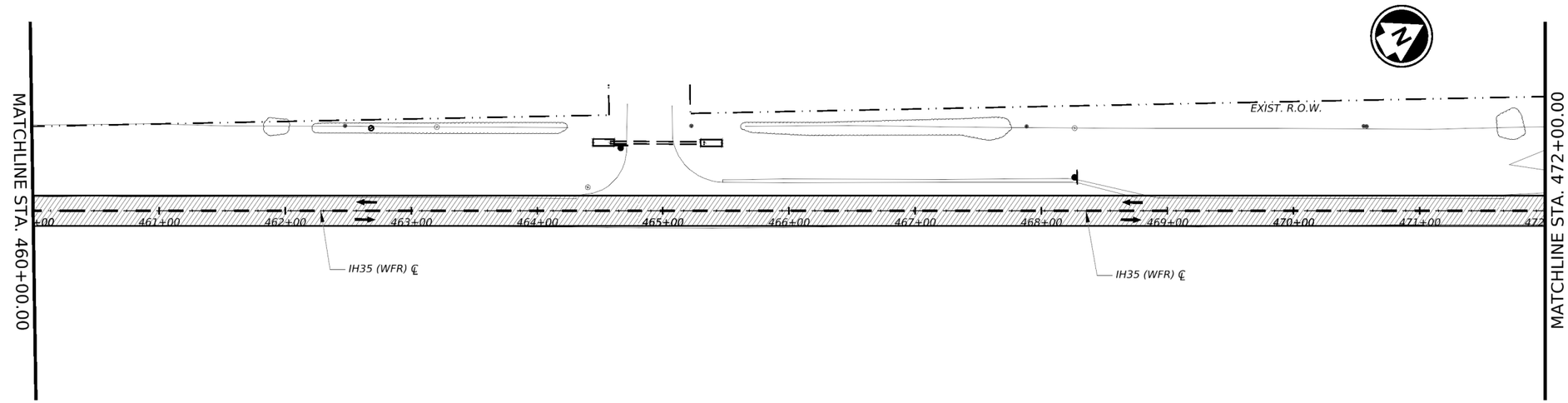
PROJECT LOCATION REFERENCE

CONT	SECT	JOB	HIGHWAY
0018	05	090	IH35 WFR

DIST	COUNTY	SHEET NO.
22	WEBB	4







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UNITS: U.S. SURVEY FEET.

LEGEND:

CONTROL POINT

OVERLAY AREA

STATE OF TEXAS
MISAEL AGUILAR
150329
LICENSED
PROFESSIONAL ENGINEER

DocuSigned by:
MISAEL AGUILAR
8EE5B149888F4E9...
11/27/2023

SCALE: 1" = 100'

Texas Department of Transportation

IH 35 WFR

PROJECT LAYOUT

SHEET 1 OF 8

CONT	SECT	JOB	HIGHWAY
0018	05	090	IH35 WFR
DIST	COUNTY		SHEET NO.
22	WEBB		5

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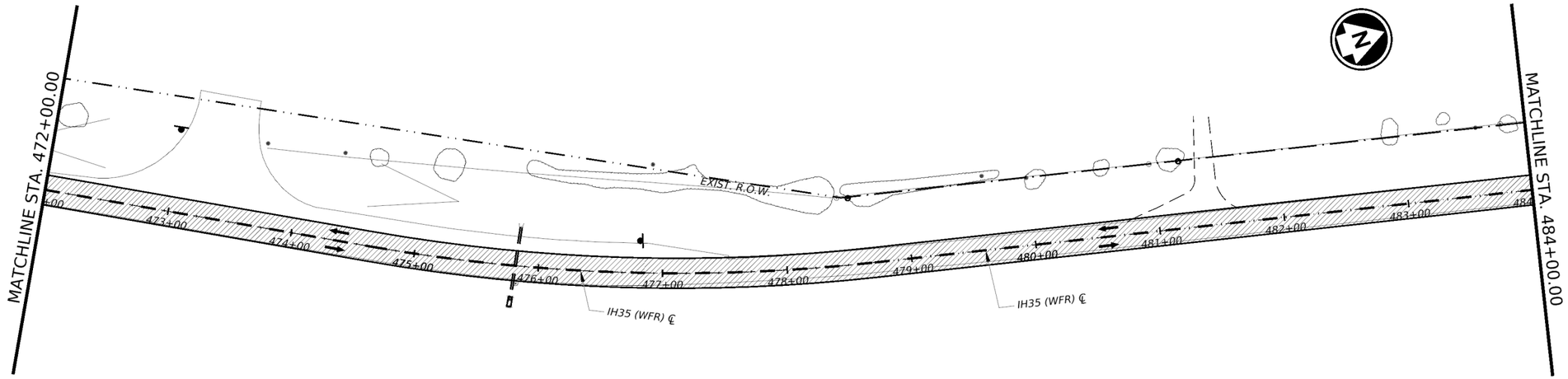

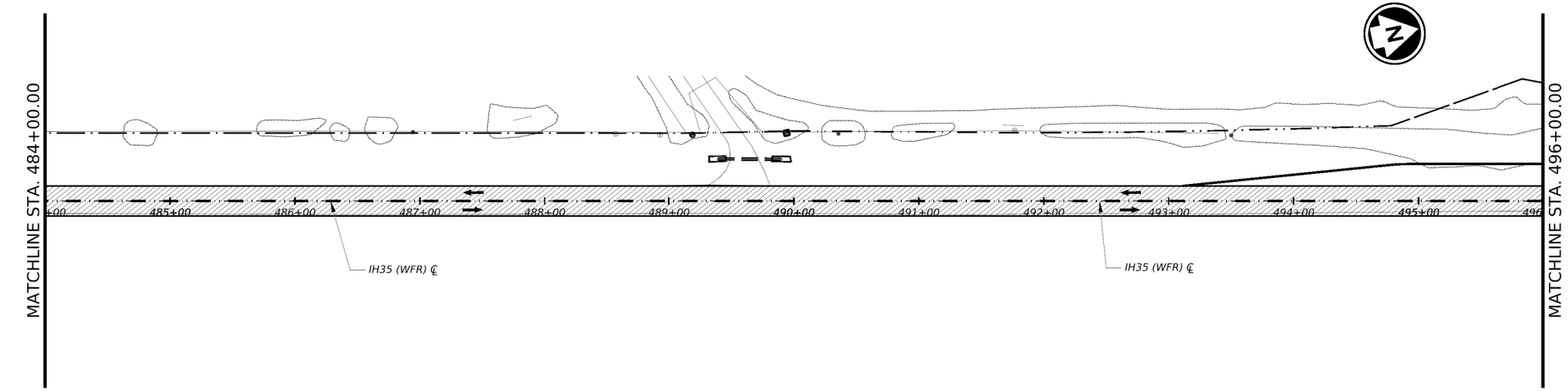

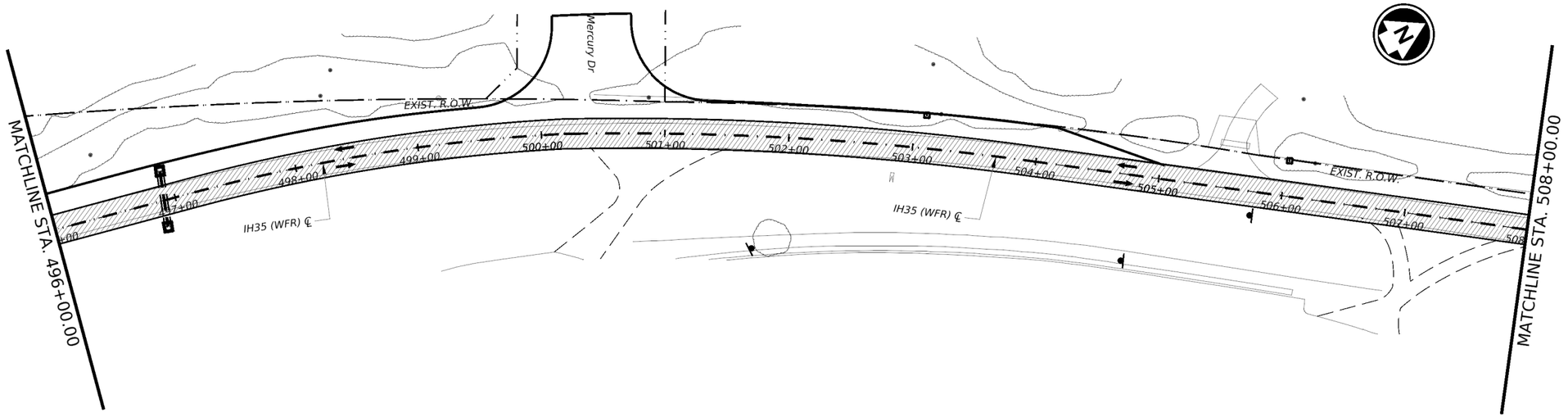

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UNITS: U.S. SURVEY FEET.

LEGEND:

CONTROL POINT

OVERLAY AREA

STATE OF TEXAS
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DocuSigned by: 11/27/2023
MISAEL AGUILAR
8EE5B149888F4E9...

SCALE: 1" = 100'

Texas Department of Transportation

IH 35 WFR

PROJECT LAYOUT

SHEET 2 OF 8

CONT	SECT	JOB	HIGHWAY
0018	05	090	IH35 WFR
DIST	COUNTY		SHEET NO.
22	WEBB		6

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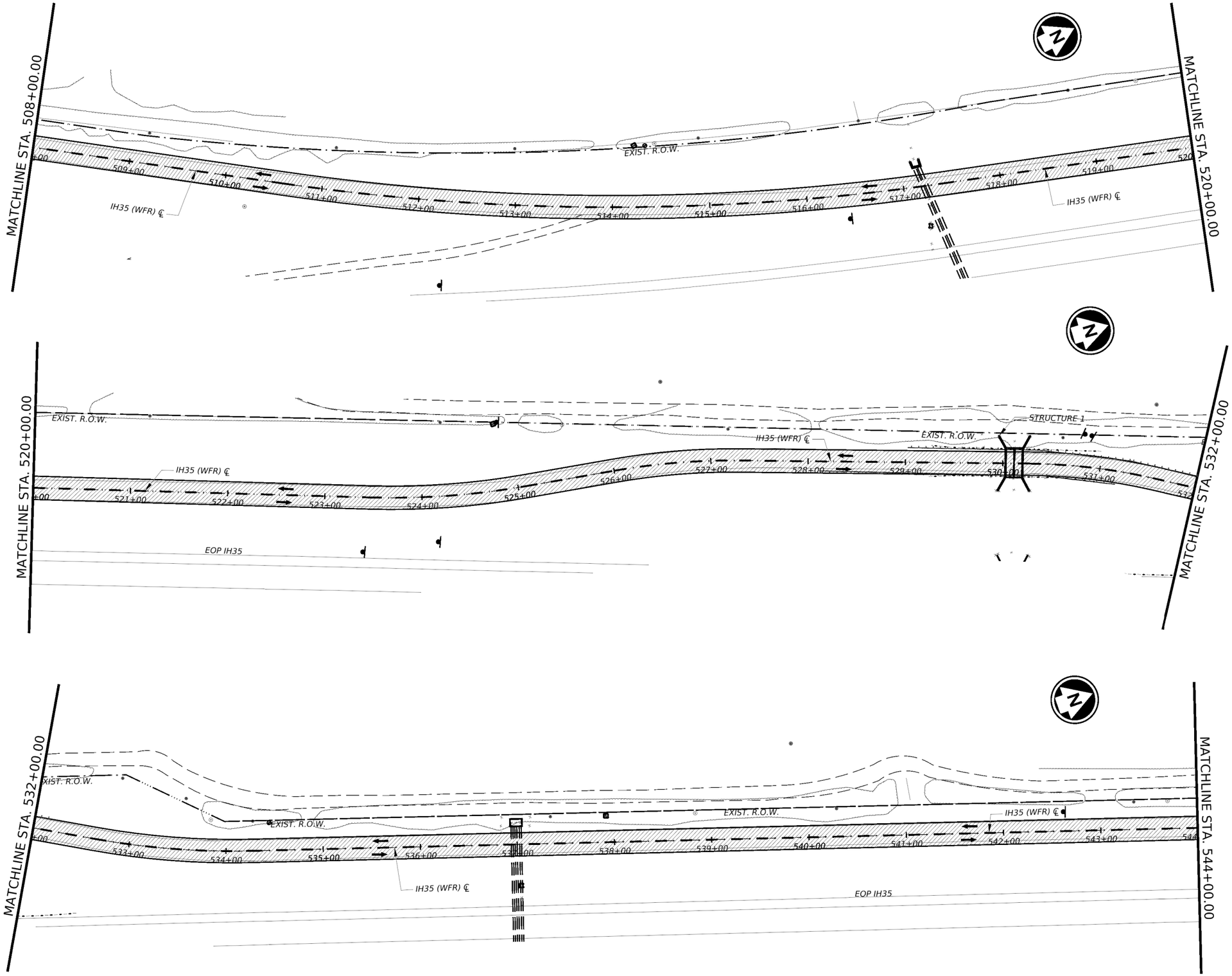

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UNITS: U.S. SURVEY FEET.

LEGEND:

CONTROL POINT

OVERLAY AREA

STATE OF TEXAS
MISAEL AGUILAR
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MISAEL AGUILAR
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SCALE: 1" = 100'

Texas Department of Transportation

IH 35 WFR

PROJECT LAYOUT

SHEET 3 OF 8

CONT	SECT	JOB	HIGHWAY
0018	05	090	IH35 WFR
DIST	COUNTY		SHEET NO.
22	WEBB		7

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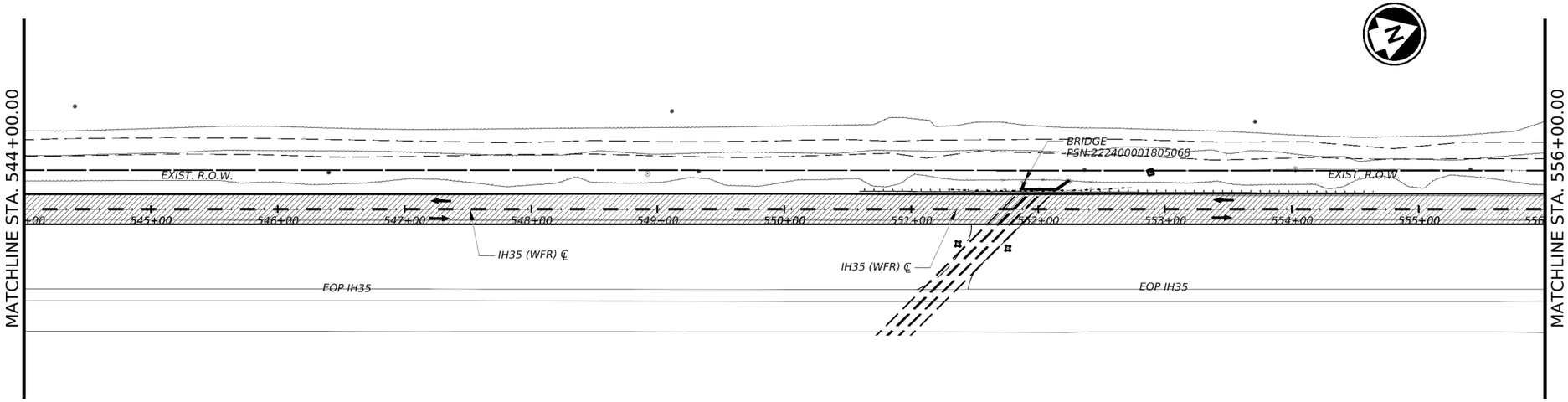

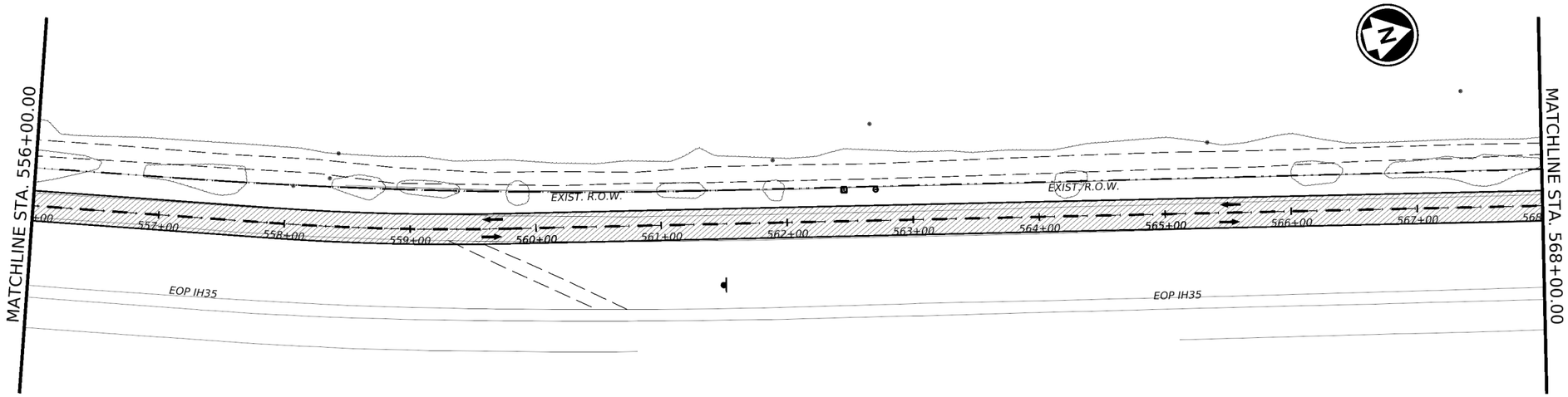

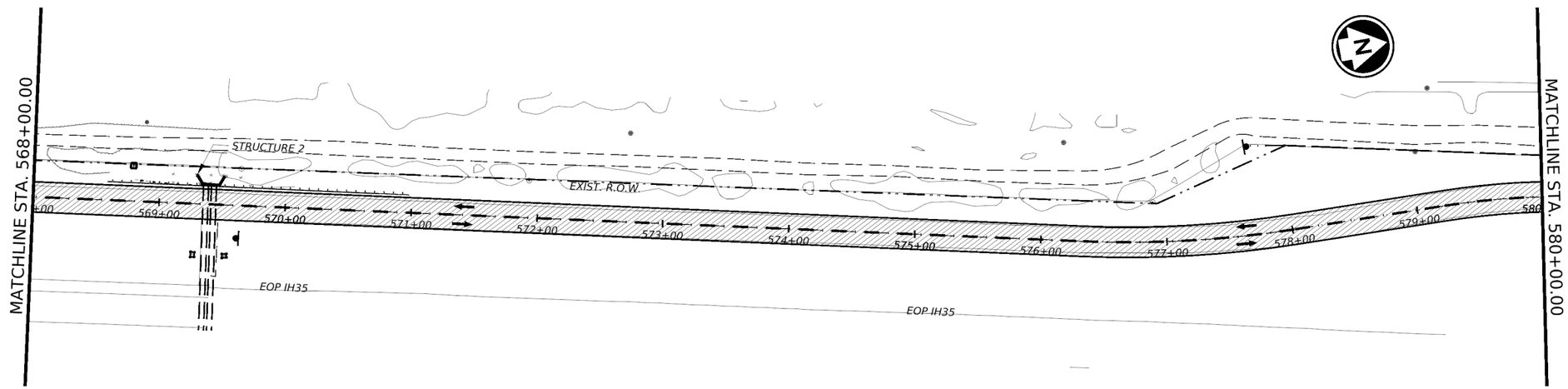

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UNITS: U.S. SURVEY FEET.

LEGEND:

CONTROL POINT

OVERLAY AREA

STATE OF TEXAS
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PROFESSIONAL ENGINEER

DocuSigned by: 11/27/2023
MISAEL AGUILAR
8EE5B149888F4E9...

SCALE: 1" = 100'

Texas Department of Transportation

IH 35 WFR

PROJECT LAYOUT

SHEET 4 OF 8

CONT	SECT	JOB	HIGHWAY
0018	05	090	IH35 WFR
DIST	COUNTY		SHEET NO.
22	WEBB		8

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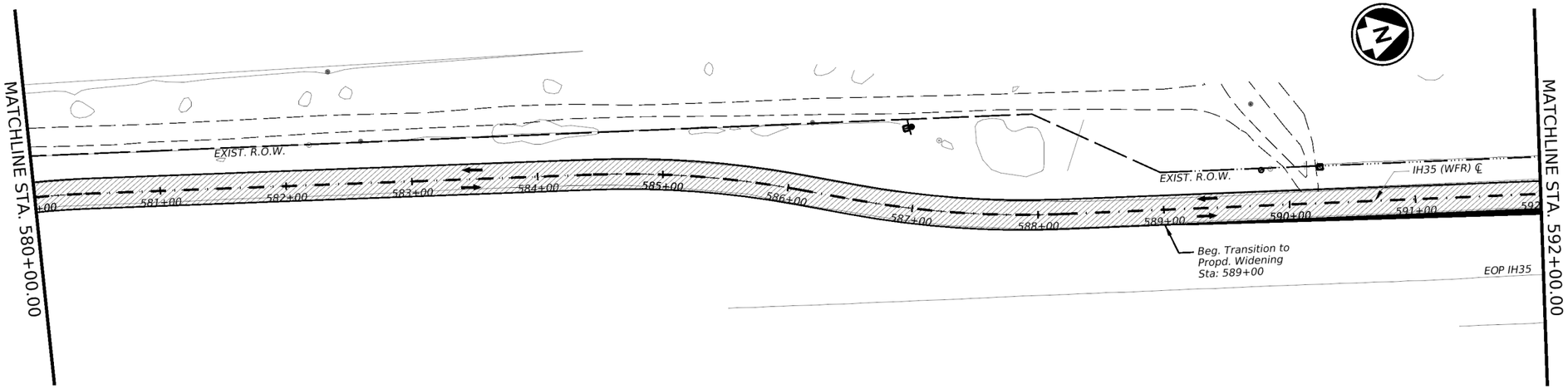

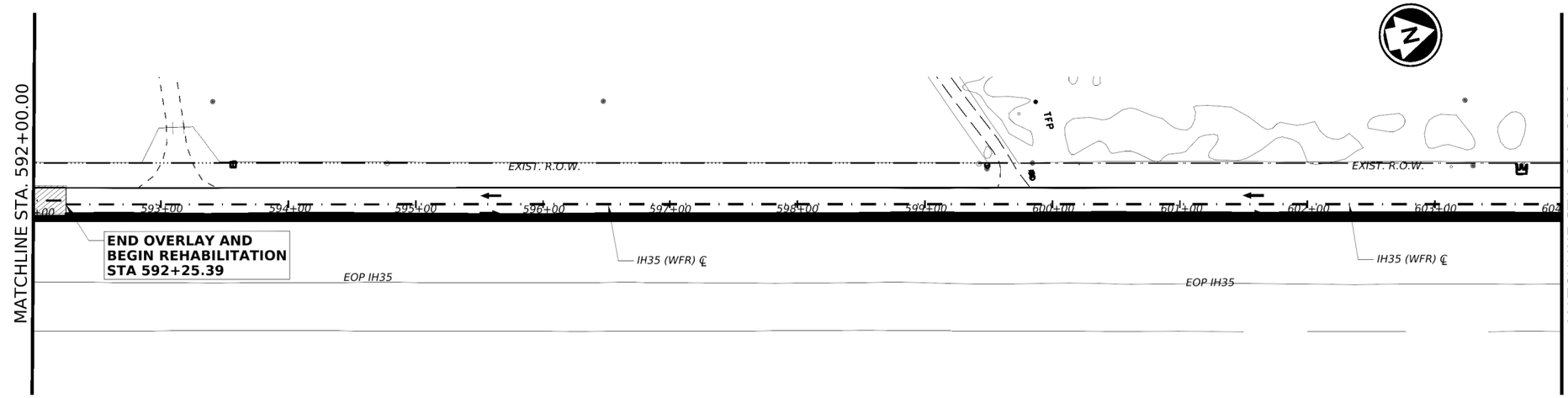

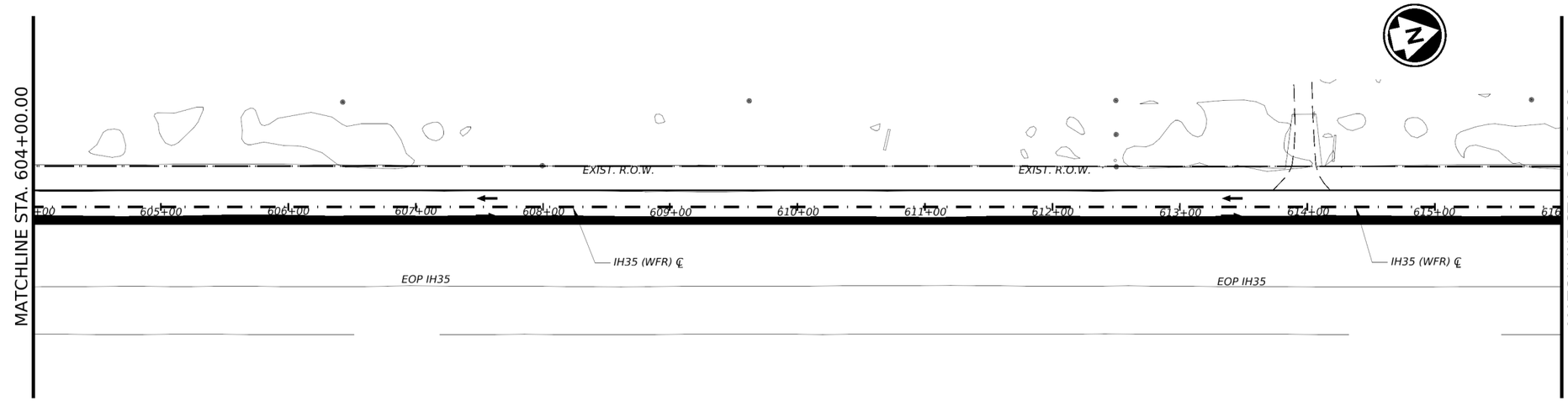

NOTES:

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UNITS: U.S. SURVEY FEET.

LEGEND:

- CONTROL POINT
- OVERLAY AREA
- WIDENING AREA

STATE OF TEXAS
MISAEL AGUILAR
150329
LICENSED
PROFESSIONAL ENGINEER

DocuSigned by: 11/27/2023
MISAEL AGUILAR
8EE5B149888F4E9...

SCALE: 1" = 100'

Texas Department of Transportation

IH 35 WFR

PROJECT LAYOUT

SHEET 5 OF 8

CONT	SECT	JOB	HIGHWAY
0018	05	090	IH35 WFR
DIST	COUNTY		SHEET NO.
22	WEBB		9

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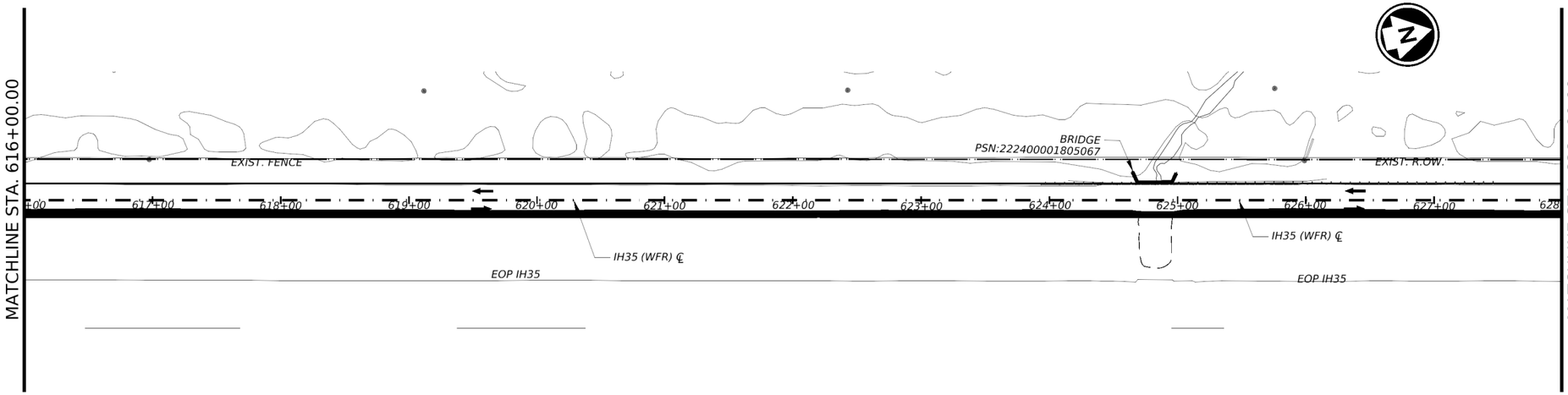

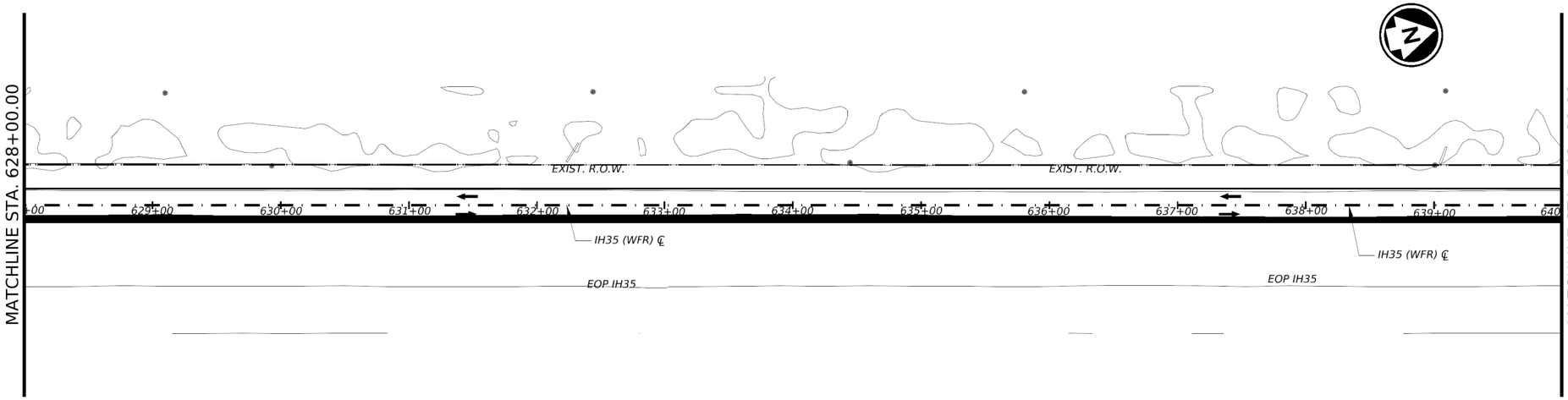

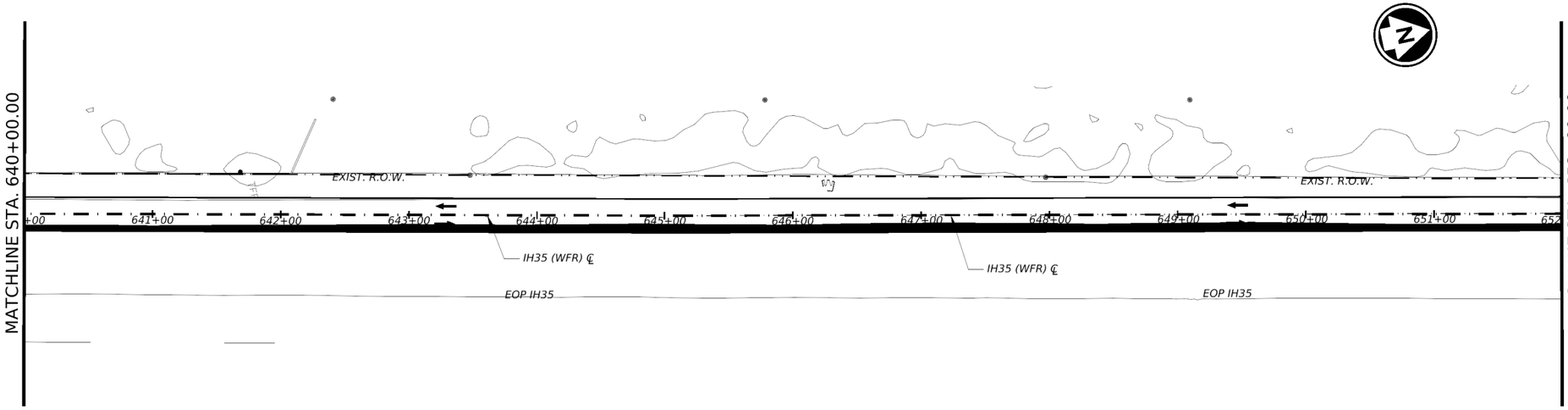

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LEGEND:

- CONTROL POINT
- OVERLAY AREA
- WIDENING AREA

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MISAEL AGUILAR
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Texas Department of Transportation

IH 35 WFR

PROJECT LAYOUT

SHEET 6 OF 8

CONT	SECT	JOB	HIGHWAY
0018	05	090	IH35 WFR
DIST	COUNTY		SHEET NO.
22	WEBB		10

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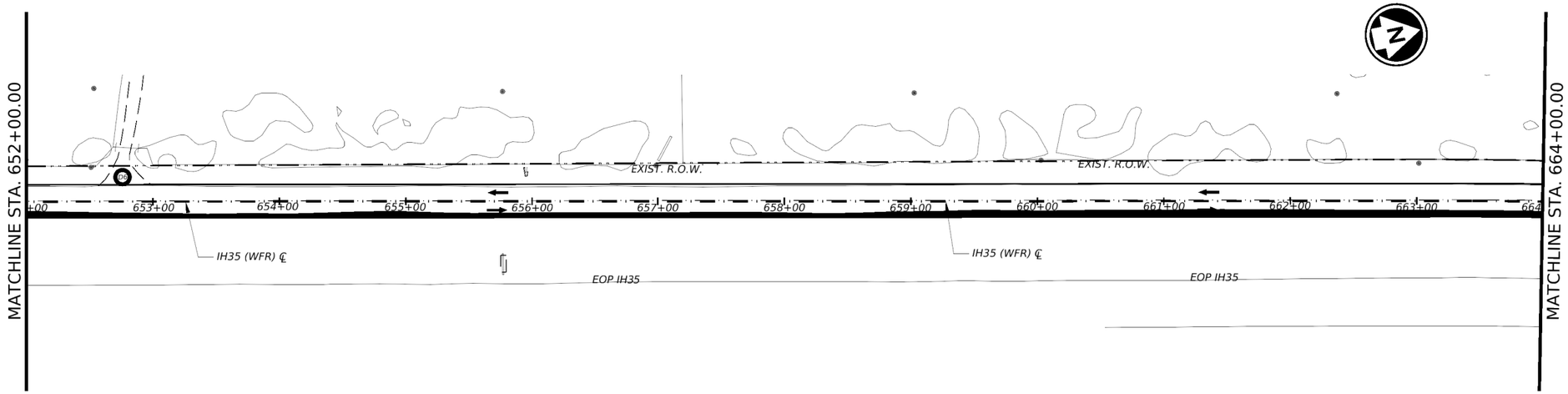

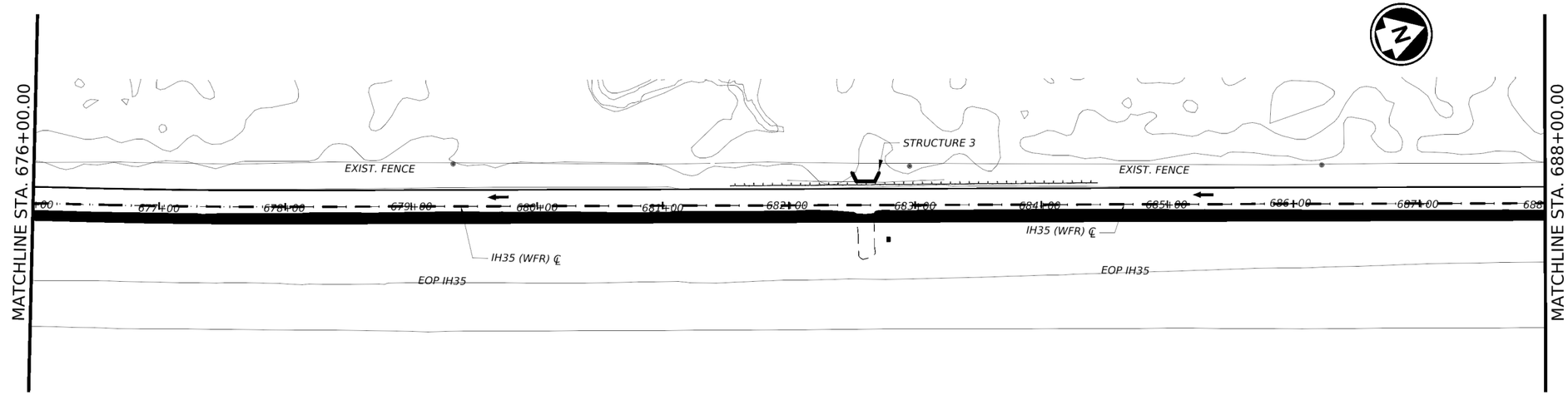

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UNITS: U.S. SURVEY FEET.

LEGEND:

- CONTROL POINT
- OVERLAY AREA
- WIDENING AREA

STATE OF TEXAS
MISAEL AGUILAR
150329
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PROFESSIONAL ENGINEER

DocuSigned by: 11/27/2023
MISAEL AGUILAR
8EE5B149888F4E9...

SCALE: 1" = 100'

Texas Department of Transportation

IH 35 WFR

PROJECT LAYOUT

SHEET 7 OF 8

CONT	SECT	JOB	HIGHWAY
0018	05	090	IH35 WFR
DIST	COUNTY		SHEET NO.
22	WEBB		11

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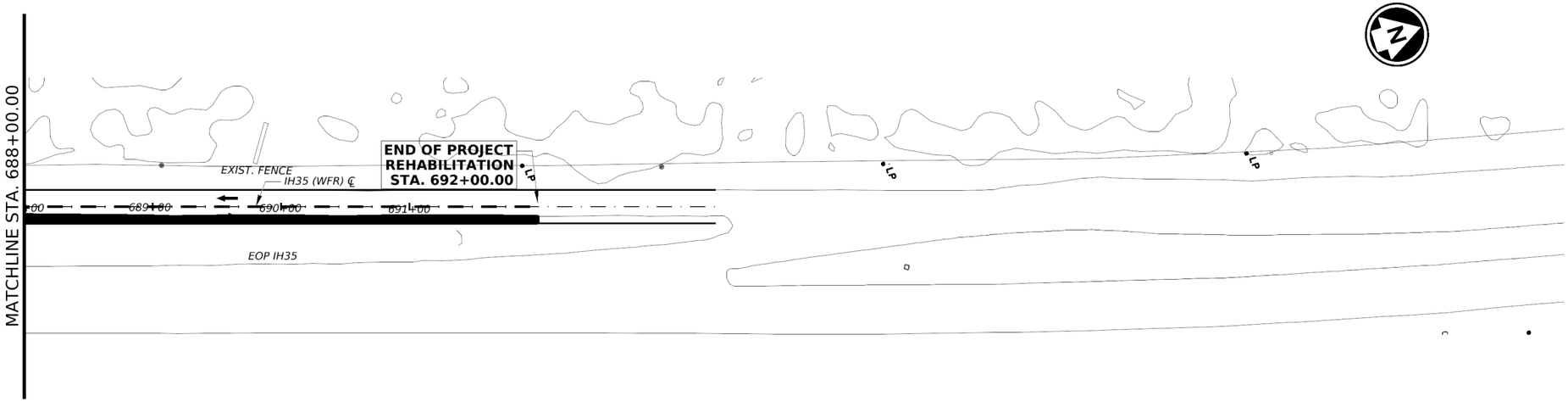

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LEGEND:

- CONTROL POINT
- OVERLAY AREA
- WIDENING AREA

STATE OF TEXAS
MISAEL AGUILAR
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PROFESSIONAL ENGINEER

DocuSigned by: 11/27/2023
MISAEL AGUILAR
8EE5B149888F4E9...

SCALE: 1" = 100'

Texas Department of Transportation

IH 35 WFR

PROJECT LAYOUT

SHEET 8 OF 8

CONT	SECT	JOB	HIGHWAY
0018	05	090	IH35 WFR

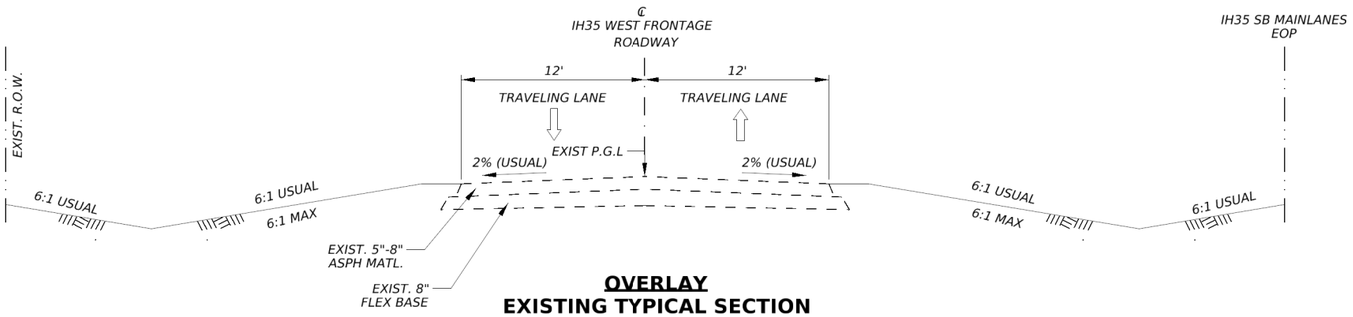
DIST	COUNTY	SHEET NO.
22	WEBB	12

DATE: 11/21/2023 4:50:20 PM
FILE: c:\txdot\pw_online\txdot5\krystal.hernandez\d1044153\Project layout-7.dgn

NOTES:

APPLICATION RATES NOTED IN THE PLANS ARE FOR BIDDING AND ESTIMATION PURPOSES ONLY. ACTUAL APPLICATION RATES WILL BE DETERMINED AND ADJUSTED AS NECESSARY.

* REFER TO GENERAL NOTES ITEM 3084 FOR MORE INFORMATION



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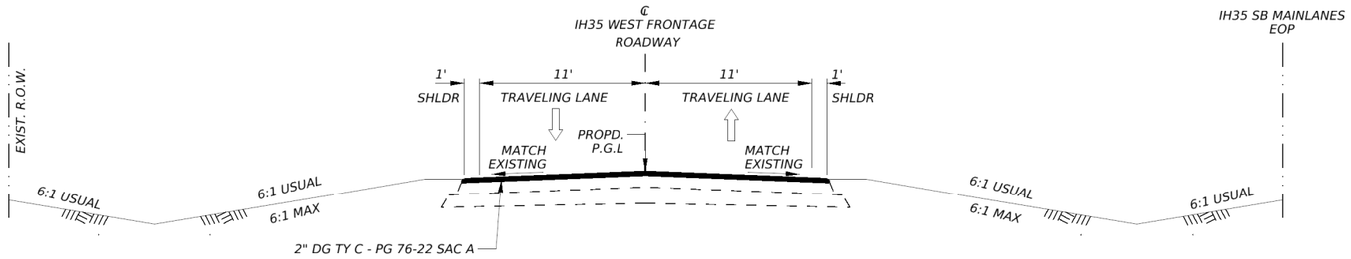
EXISTING TYPICAL SECTION
STA 439+75.16 TO 592+25.39



OVERLAY
PROPOSED TYPICAL SECTION
STA 439+75.16 TO 592+25.39

SEGMENT 1 - IH 35 (WEST FRONTAGE RD.)

PAVEMENT DESIGN	
OVERLAY :	
2" DG HMA TY-C (SAC-A) PG76-22	- 115 LBS/SY/IN
* BONDING COURSE:	

Texas Department of Transportation

IH 35 WFR

TYPICAL SECTIONS

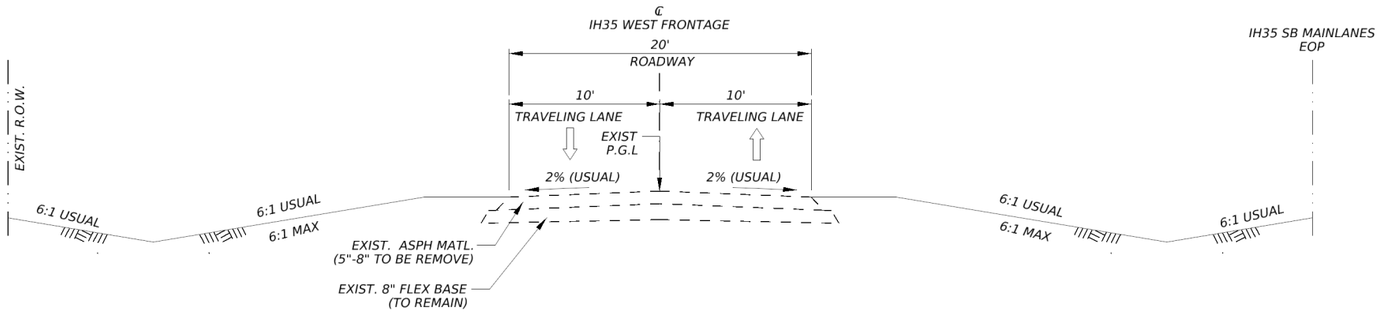
CONT	SECT	JOB	HIGHWAY
0018	05	090	IH35 WFR
DIST	COUNTY		SHEET NO.
22	WEBB		13

DATE: 12/19/2023 2:49:11 PM
FILE: c:\projects\projects\0018\05\090\Design\Plan Set_General_Typical Sections.dgn

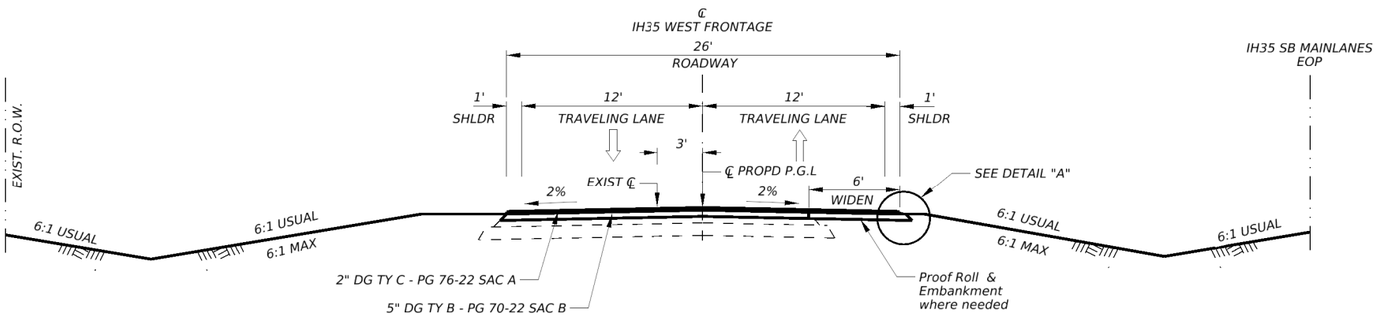
NOTES:

APPLICATION RATES NOTED IN THE PLANS ARE FOR BIDDING AND ESTIMATION PURPOSES ONLY. ACTUAL APPLICATION RATES WILL BE DETERMINED AND ADJUSTED AS NECESSARY.

* REFER TO GENERAL NOTES ITEM 3084 FOR MORE INFORMATION



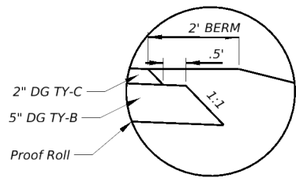
REHABILITATION
EXISTING TYPICAL SECTION
STA 592+25.39 TO 692+00.00



REHABILITATION
PROPOSED TYPICAL SECTION
STA 592+25.39 TO 692+00.00

SEGMENT 2 - IH 35 (WEST FRONTAGE RD.)

PAVEMENT DESIGN	
REHABILITAION:	
5" DG HMA TY-B - (SAC-B) PG70-22	- 120 LBS/SY/IN
* BONDING COURSE (TRACKLESS TACK-COAT)	
2" DG HMA TY-C (SAC-A) PG76-22	- 115 LBS/SY/IN
SUBGRADE: PROOF ROLL	



DETAIL "A"

Texas Department of Transportation

IH 35 WFR

TYPICAL SECTIONS

SHEET 2 OF 2

CONT	SECT	JOB	HIGHWAY
0018	05	090	IH35 WFR
DIST	COUNTY		SHEET NO.
22	WEBB		14

DATE: 11/27/2023 2:49:16 PM
FILE: c:\txdot\pw_online\txdot5\krystal.hernandez\d0982946\5090 Typical Sections.dgn

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

Luis G. Urbina – Luis.Urbina@txdot.gov

Angel Martinez – Angel.Martinez@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 webpage 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

The Contractor shall maintain and preserve the integrity of all “existing survey markers” by avoiding the disturbance of such markers, which include all control points (horizontal and/or vertical), stakes, marks, and right-of-way markers. The Department will repair all Contractor disturbed control points, stakes, marks, and right-of-way markers. The cost for any and all repairs to the “existing survey markers” will be deducted from money due or to become due to the Contractor.

Reference all existing striping and pavement markings in a manner which allow the markings to be re-established. Place extra reference (if needed) to ensure that the markings (lane lines, edge lines, ramp gores, etc.) are in-line with signs on OSB’s, TMS arrows, etc.

Contact the Laredo District Signal Section (956-712-7770) for coordination with TxDOT underground lines and/or facilities.

Prior to construction must call 811 to verify any utilities located within project limits. Contractor will also coordinate with utility owners listed below for any

adjustments needed to sanitary sewer manholes, water valves, gas valve, telecommunication, television manhole located within project limits. The utility company is responsible for any adjustment when necessary. The work should be performed in a manner as to not delay construction contractor work activity.

Item 7 - Legal Relations and Responsibilities

No significant traffic generator events identified.

Jurisdictional Waters of the United States and Project Specific Locations (PSL) Coordination - This project requires permit(s) with environmental resource agencies. There is a high probability that environmentally sensitive areas will be encountered on contractor designated project specific locations (PSLS) for the project (including but not limited to haul roads, equipment staging areas, parking areas, etc.).
Requirements for Work within Jurisdictional Waters of the United States:
The department has been authorized to perform work within designated areas of the project under U.S. Army Corps of Engineers (USACE) nationwide permit (NWP) #14 and/or #3a and/or #3b.

The contractor will not initiate activities in a project specific location (PSL) associated with a U.S. Army Corps of Engineers (USACE) permit area (i.e. an area where the USACE has jurisdiction) that has not been previously evaluated by the USACE as part of the permitting for this project. Such activities include, but are not limited to, haul roads, equipment staging areas, borrow and disposal sites. Associated defined here includes materials delivered to or from the PSL. The permit area includes all waters of the U.S. and their associated wetlands affected by activities associated with this project. Special restrictions may be required for such work in these USACE jurisdictional areas. The contractor will be responsible for any and all consultations with the USACE regarding activities, including PSLs, which have not been previously evaluated by the USACE. The Contractor will provide the department with a copy of all consultation(s) or approval(s) from the USACE prior to initiating activities.

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

permit area. The contractor will maintain copies of their determination(s) for review by the department and/or any regulatory agency.

The disturbed area for all project locations in the Contract, and the Contractor project specific locations (PSLs) within 1 mile of the project limits for the Contract, will further establish the authorization requirements for storm water discharges. The Department will obtain an authorization to discharge storm water from the Texas Commission on Environmental Quality (TCEQ) for the construction activities shown on the plans. The Contractor is to obtain required authorization from the TCEQ for Contractor PSLs for construction support activities on or off the ROW. When the total area disturbed in the Contract and PSLs within 1 mile of the project limits exceeds 5 acres, the Contractor shall provide a copy of the Contractor Notice of Intent (NOI) for the PSLs to the Engineer and to the local government operating a municipal separate storm sewer system (MS4) if applicable. If the total area of project disturbed areas and PSLs total between 1-acre but less than 5-acres, the Contractor shall post the appropriate Contractor Construction Site Notice for all Contractor PSLs to be in compliance with TCEQ storm water regulations.

In order to expedite the approval process for PSLs or to eliminate or minimize potential impacts to project progress, initiate coordination efforts with the U.S.A.C.E. within 30 days from the date of “authorization to begin work” for all PSLs that are in areas where the USACE has jurisdiction (i.e. USACE permit areas). If this is not done, the contractor waives the right to request any contract time considerations if project progress is impacted and PSL’S approval is still pending.

Requests submitted to the area engineer will be evaluated on this basis and will require documentation showing substantial early coordination efforts to expedite the approval process as herein stated. The request will include a detailed chronological summary status with dates of coordination activities with the resource agencies, including those occurring after the initial coordination, to be reviewed and confirmed by the district’s environmental section.

For PSLs that fall within USACE permit areas, the Contractor must document and coordinate with the USACE, if required, before any excavation hauled from or embankment hauled into a USACE permit area by either (1) or (2) below.

1. Restricted Use of Materials for Previously Evaluated Permit Areas. The Contractor will document both the project specific location (PSL) and their authorization, and the Contractor will maintain copies for review by the Department and/or any regulatory agency. When an area within the project

limits has been evaluated by the USACE as part of the permit process for this project, then:
   a. Suitable excavation of required material in the areas shown on the plans and cross sections as specified in Item 110 is used for permanent or
   b. temporary fill (Item 132, Embankment) within a USACE permit area may be restricted.
   c. Suitable embankment (Item 132) from within the USACE permit area is used as fill within a USACE evaluated area may be restricted; and,
   d. Unsuitable excavation or excess excavation [“Waste”] (Item 110) that is disposed of at an approved location within a USACE evaluated area may be restricted.

2. Contractor Materials from Areas Other than Previously Evaluated Areas. The Contractor will provide the Department with a copy of all USACE coordination or approvals before initiating any activities for an area within the project limits that has not been evaluated by the USACE or for any off-right-of-way locations used for the following, but not limited to, haul roads, equipment staging areas, borrow and disposal sites, including:
   a. Item 132, Embankment, used for temporary or permanent fill within a USACE permit area; and,
   b. Unsuitable excavation or excess excavation [“Waste”] (Item 110, Excavation) that is disposed of outside a USACE evaluated area.

Storm Water Regulations Requirements:
The Contractor shall be responsible for (off ROW) PSLs applicable to the TCEQ Construction General Permit (CGP) requirements and will notify the Engineer of the disturbed acreage within one (1) mile of the project limits. The Contractor shall obtain any required authorization form the TCEQ for any Contractor PSLs for construction support activities on or off ROW.

The total area disturbed for this project is 8 acres. The disturbed area in this project, all project locations in the Contract, and the Contractor project specific locations (PSLs), within 1 mile of the project limits, for the Contract will further establish the authorization requirements for storm water discharges. The Department will obtain an authorization to discharge storm water from the Texas Commission on Environmental Quality (TCEQ) for the construction activities shown on the plans. The Contractor is to obtain required authorization from the TCEQ for Contractor PSLs for construction support activities on or off the ROW. When the total area disturbed in the Contract and PSLs within 1 mile of the project limits exceeds 5 acres, the Contractor shall provide a copy of the Contractor NOI for PSLs on the ROW to the Engineer and to the local

government that operates a municipal separate storm sewer system (MS4), if applicable.

Item 8 - Prosecution and Progress

Before starting work, provide a sequence of work and estimated progress schedule meeting the requirements of Section 8.5.2, “Progress Schedule.”

No closures will be allowed on the weekends which include the following holidays: January 1, the last Monday in May, July 4, the first Monday in September, the fourth Thursday in November, December 25 and Easter weekend.

Nighttime work will be allowed to be performed, as approved and directed by the Engineer. Refer to the Sequence of Work, Traffic Control Plan, etc. shown in the plans, for other details.

Equipment and material may be pre-staged at approved locations.

Item 9 - Measurement and Payment

Coordinate and provide off-duty law enforcement officers with officially marked vehicles during the following operations: transitioning to a new sequence of construction, lane closures, *and/or* during a one-way traffic control situation. For payment through TxDOT state force account method, complete the weekly tracking forms provided by the department and submit invoices that agree with the tracking form for payment at the end of each month approved services were provided.

Submit Material on hand (MOH) payment requests at least Five (5) working days prior to the end of the month for payment on that month’s estimate. For out-of-town MOH submit requests at least 10 working days prior to the end of the month.

Item 100 - Preparing Right of Way

Burning of brush will not be permitted.

Do not begin any clearing operations until the trees and areas of vegetation that should not be removed or disturbed by construction activities have been

identified. To ensure that these areas are not disturbed, place protection fencing as shown in the plans or as directed/approved by the Engineer.

All right of way clearing operations will be coordinated with the project's SW3P and as directed/approved by the Engineer.

Trim and remove brush and trees in order to construct the project or to provide a horizontal clearance of approximately 2 feet inside the right of way line and a vertical clearance of at least 12 feet. For this operation, no vertical flailing equipment is allowed, and the Engineer will approve the method used. The limits are Sta 592+25.39 to Sta 692+00.

Item 132 - Embankment

The embankment material must be consistent and homogeneous, free from vegetation or other objectionable matter, reasonably free from lumps of earth and suitable for forming a stable embankment.

For fill sections from embankment finished grade line and below, to a depth of 4 feet:
Field compact density to ≥ 98% dry density.
Plasticity Index (PI) limit is: 5≤ PI ≤ 25.
Liquid limit ≤ 45

For all other fill sections, Plasticity Index (PI) limit is less than or equal to 30.

It is the Contractor’s responsibility to advise the Engineer of the location of the source sufficiently in advance to avoid delay.

Item 134 - Backfilling Pavement Edges

TY “A” material will meet the following testing requirements:

Property	Test Method	Specification Limit
Liquid limit	Tex-104-E	≤45
Plasticity index (PI)	Tex-106-E	≤15
Bar linear shrinkage	Tex-107-E	≥2

Or as directed by the Engineer.

Item 164 - Seeding for Erosion Control

Drill seeding will be used for this project. Refer to the Laredo District Standard Revegetation notes and specifications for additional information.

Item 166 - Fertilizer

Fertilize all areas of project to be seeded or sodded. The work performed will not be measured or paid for directly, but will be subsidiary to pertinent items.

Item 320 – Equipment for Hot Mix Asphalt Materials

For staged construction, all longitudinal ACP joints shall be constructed with a 3:1 to 6:1 taper. For placement of 2 inches or more, the device will provide a maximum ½ inch vertical edge. Outside edges (next to the grass/earth) will also have a taper or will be backfilled the same day.

Final Surface course: all longitudinal ACP joints for the final Hot Mix surface course shall be in widths equal to travel lane widths so that all final course ACP joints will match the proposed lane striping (pavement markings), unless otherwise directed by the engineer.

Item 354 - Planing and Texturing Pavement

Contractor to retain ownership of planed materials.

Pavement sections to be planed and overlaid are planed no more than one week prior to placing overlay.

The contractor will not be allowed to remove all existing asphalt from (edge of pavement to edge of pavement) when TCP requires to be done in phases.

The contractor will be responsible for verifying the existing asphalt depth at the bridge before beginning planing operations. The contractor will be responsible. for any needed repairs to the armor joint(s) and/or deck(s) as a result of the planing operations. The repairs will be conducted to the satisfaction of the Engineer. The Contractor will be responsible for all costs incurred for the repairs, including but not limited to materials, labor, equipment, and pertinent incidentals.

Item 421 - Hydraulic Cement Concrete

Sulfate resistant cement concrete shall be used in all situations for structural elements in contact with the natural ground. These includes, but is not limited to, all reinforced concrete pipe, concrete box culverts, drill shafts, bridge columns, bridge abutments, wingwalls, approach slabs, inlets, manholes, junction boxes, ground boxes and all concrete riprap.

Air entrainment is not required. If concrete is supplied with air entrainment, the concrete must adhere to the requirements of item 421.4.2.4.

Item 429 - Concrete Structure Repair

Use the following types of repair materials: *"*Concrete Repair Manual Chapter 3"

Item 432 - Riprap

Provide Class B Concrete for riprap.

Item 500 - Mobilization

"Materials-on-Hand" payments will not be considered in determining percentages used to compute mobilization payments.

Item 502 - Barricades, Signs, and Traffic Handling

Designate, as the Contractor Responsible Person (CRP), an English-speaking employee on-call nights and weekends (or any other time that work is not in progress) with a local address and telephone number for maintenance of signs and barricades. This employee will be located within one (1) hour of traveling time to the project site. Notify the Engineer in writing of the name, address, and telephone number of this employee. Furnish this information to local law enforcement officials.

When advanced warning flashing arrow panel(s) is/are specified, maintain one standby unit in good condition at the job site ready for immediate use is required.

Traffic control required for this project will not be paid for directly but will be considered subsidiary to the various bid items.

Provide two-way radios in areas where flagmen do not have visual contact with one another or cannot communicate with one another.

Limit lane closures to a maximum of 2 miles. If more than one lane closure location is desired, provide a minimum of a 2 mile passing zone between locations. Provide a separate sign set up for each location.

Ensure equipment not in use, stockpile aggregate, and other working materials are:
A minimum of 30 feet from the edge of the travel lane;
Do not obstruct traffic or sight distance;
Do not interfere with the access from abutting property; or
Do not interfere with roadway drainage.

Erect signs in locations not obstructing the traveling public's view of the normal roadway signing or necessary sight distance at intersections and curves.

During the holiday time frame of December 21st through January 1st, every effort should be taken to ensure that all travel lanes remain open where possible.

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

Item 504 - Field Office and Laboratory

Provide a Type D Structure and Asphalt Content by Ignition Method for TxDOT Quality Assurance Testing. Contractor's quality control testing shall be performed in a separate space or facility. If a separate space is utilized within a shared facility, partition the space with a floor to ceiling wall with a door access for indoor use that is lockable with a key. Each separate space shall have an exterior door access.

Ensure that the field lab has an office for TxDOT use along with lockable file cabinet, desk and chair.

The 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.

Contractor is responsible to transport to and from the field lab TxDOT owned testing equipment required for hot mix operations. Contractor will pick up, deliver, install and set up TxDOT owned equipment required in the field lab. TxDOT owned equipment required in the field lab will be picked up at LRD DST LAB or as determined by the LRD DST LAB Supervisor.

Pick up and deliver TxDOT owned equipment under the supervision of a TxDOT lab technician. A TxDOT lab technician will verify the installation and set-up of the equipment at least 48 hours prior to beginning of hot mix operations (trial batch included).

All equipment will be returned by the Contractor in the same manner and location as it was picked up. Contractor is responsible for any damages incurred to TxDOT equipment.

Item 506 - Temporary Erosion, Sedimentation, and Environmental Controls

The Department will take over responsibility for the establishment of 70% vegetative cover, based on adjacent undisturbed vegetation, upon the completion of all other work in accordance with the contract and final acceptance.

Concrete washout area(s) shall be installed prior to concrete placement on site. The concrete washout area(s) shall be entirely self-contained. Location must be approved by the Engineer. Concrete washout area(s) are subsidiary to pertinent items.

Item 510 - One-Way Traffic Control

Item 512 - Portable Traffic Barrier

Do not use different types of Portable Traffic Barriers in a single continuous installation.

Place PTB at ½" GAP over SPAN BRIDGE DECKS for Expansion to AVOID THERMAL SLAB vs. PTB Extreme THERMAL Movement.

Item 540 – Metal Beam Guard Fence

Install cast-in place concrete curb Type II in the metal beam guard fence transition (Thrie-Beam Transition). Pre-cast concrete curb will not be allowed.

Item 585 - Ride Quality for Pavement Surfaces

For reconstruction use pay adjustment schedule 2.

Measure ride quality of the base course after placement of the prime coat and before placement of the surface treatment, unless otherwise approved. Use a certified profiler operator from the Department's MPL. When requested, furnish the Engineer documentation for the person certified to operate the profiler.

Provide all profile measurements to the Engineer in electronic data files within 3 days after placement of the prime coat using the format specified in Tex-1001-S. The Engineer will use Department software to evaluate longitudinal profiles to determine areas requiring corrective action. Correct 0.1-mi. sections having an average international roughness index (IRI) value greater than 125.0 in. per mile to an IRI value of 125.0 in. per mile or less for each wheel path, unless otherwise shown on the plans.
Re-profile and correct sections that fail to maintain ride quality until placement of the next course, as directed. Correct re-profiled sections until specification requirements are met, as approved. Perform this work at no additional expense to the Department.

For overlay use pay adjustment schedule 3.

Item 636 - Signs

Salvage and deliver all aluminum sign faces to the local TxDOT maintenance office.

Item 644 - Small Roadside Sign Assemblies

Salvage and deliver all aluminum sign faces to the local TxDOT maintenance office.

Item 658 – Delineator and Object Marker Assemblies

Proposed delineators for this project will consist of oval shape tube flexible post with a quick release embedded anchor insert stub only, such as Flexstake Inc. – 650 series or Shur-Tite – SD series or equal flexible driveable delineators.

Provide and place delineator Type 1, 2, 3, 4, object markers/chevrons and large arrows signs project 4' or 7' above the pavement surface and not the ground line. (Provide adequate length for proper anchor and projection above ground line).

Item 666 – Reflectorized Pavement Markings

Reflectivity requirements for Type I will be as per Item 666.

Payment on Type I markings requiring retroreflective testing will be made at a 75% rate until passing test results are received.

Item 3076 - Dense-Graded Hot-Mix Asphalt

Use aggregate that meets the SAC-A, only for the final riding surface.

Apply the Bonding Course in accordance with Item 3084.

Substitute Binders (grade dumping) will not be allowed on the final riding surface.

Refer to item 585 for ride quality requirements.

The use of RAP or RAS will not be allowed on the final riding surface.

For Mill inlays sections:
Only mill what can be paved at the end of the workday.

RAP 20% is allowed for TY B mixes, but RAS will not be allowed. Substitute Binders in the intermediate layer (grade dumping) may be allowed when the surface HMA layer is placed not more than 6 months after the intermediate layer is complete or as approved by the engineer.

Item 3084 – Bonding Course

An average rate of 0.20 GAL/SY was used for estimation purposes. Contractor shall choose an option shown below and bid accordingly.

OPTIONS:

MATERIAL	MINIMUM TYPICAL APPLICATION RATE (GAL/SY)
TRAIL – Emulsified Asphalt	#
TRAIL – Hot Applied	#
Spray Applied Underseal Membrane	#

Typical Application Rate may vary from 0.07 to 0.20 GAL/SY depending on option.

Apply bonding course at every intermediate layer, unless otherwise directed. The type of tack coat must be approved by the Engineer.

The Engineer may adjust the application rates as per field conditions.

Shear Bond Strength Test will be performed for informational purposes, and will not be used for specification compliance. The target shear bond strength is a minimum of 40 psi and for final surface layer a minimum of 50 psi.

Item 6001 - Portable Changeable Message Sign

Provide two (2) electronic portable changeable message signs as required by the Engineer. Provide backups and keep operational and available on the jobsite at all times during traffic control operations. The electronic portable changeable message signs will be made available for utilization for the entire duration of the project, including all alternative locations.

Item 6158 – Trailer Mounted Solar Powered Radar Speed Control Monitor

Provide two (2) trailer mounted solar powered radar speed detection radar unit With light emitting diode (LED) display panel. Install as per plans or as directed by The Engineer.

Provide a display panel that consist of two characters, each a minimum of 18 in. Height. Display Panel shall be in amber color and visible from a minimum of 600 Ft. Provide a display panel that is equipped to alert motorist when they are traveling over the posted speed, either by flashing the traveling speed, changing the display color, or by blinking out the display.

Item 6185 – Truck Mounted Attenuator (TMA) and Trailer

Provide two Truck Mounted Attenuator as required by the Engineer. Provide backup and keep operational and available on the jobsite at all times during traffic control operations. The Truck Mounted Attenuator will be made available for utilization for the entire duration of the project, including all alternative locations.

Estimate & Quantity Sheet

CONTROLLING PROJECT ID 0018-05-090 **DISTRICT** Laredo **COUNTY** Webb
HIGHWAY IH 35

						TOTAL EST.	TOTAL FINAL
		CONTROL SECTION JOB		**0018-05-090**			
		PROJECT ID		**A00120338**			
		COUNTY		**Webb**			
		HIGHWAY		**IH 35**			
ALT	**BID CODE**	**DESCRIPTION**	**UNIT**	EST.	FINAL		
	100-6002	PREPARING ROW	STA	100.000		100.000	
	110-6001	EXCAVATION (ROADWAY)	CY	1,124.000		1,124.000	
	132-6001	EMBANKMENT (FINAL)(ORD COMP)(TY A)	CY	1,132.000		1,132.000	
	134-6002	BACKFILL (TY B)	STA	153.000		153.000	
	164-6035	DRILL SEEDING (PERM) (RURAL) (CLAY)	SY	26,970.300		26,970.300	
	164-6066	DRILL SEEDING (PERM)(WARM OR COOL)	SY	26,970.300		26,970.300	
	216-6001	PROOF ROLLING	HR	10.000		10.000	
	354-6030	PLANE ASPH CONC PAV(0" TO 8")	SY	8,536.000		8,536.000	
	354-6042	PLANE ASPH CONC PAV (8")	SY	3,294.000		3,294.000	
	354-6088	PLANE ASPH CONC PAV (0" TO 5")	SY	1,668.000		1,668.000	
	354-6100	PLANE ASPH CONC PAV (5")	SY	23,224.100		23,224.100	
	429-6007	CONC STR REPAIR (VERTICAL & OVERHEAD)	SF	122.000		122.000	
	432-6045	RIPRAP (MOW STRIP)(4 IN)	CY	68.000		68.000	
	451-6019	RETROFIT RAIL (TY T631)	LF	75.000		75.000	
	480-6001	CLEAN EXIST CULVERTS	EA	5.000		5.000	
	500-6001	MOBILIZATION	LS	1.000		1.000	
	502-6001	BARRICADES, SIGNS AND TRAFFIC HANDLING	MO	5.000		5.000	
	506-6020	CONSTRUCTION EXITS (INSTALL) (TY 1)	SY	100.000		100.000	
	506-6024	CONSTRUCTION EXITS (REMOVE)	SY	100.000		100.000	
	506-6038	TEMP SEDMT CONT FENCE (INSTALL)	LF	842.000		842.000	
	506-6039	TEMP SEDMT CONT FENCE (REMOVE)	LF	842.000		842.000	
	510-6002	ONE-WAY TRAF CONT (PILOT CAR)	HR	960.000		960.000	
	510-6003	ONE-WAY TRAF CONT (PORT TRAF SIG)	MO	4.000		4.000	
	512-6009	PORT CTB (FUR & INST)(LOW PROF)(TY 1)	LF	40.000		40.000	
	512-6010	PORT CTB (FUR & INST)(LOW PROF)(TY 2)	LF	40.000		40.000	
	512-6033	PORT CTB (MOVE)(LOW PROF)(TY 1)	LF	40.000		40.000	
	512-6034	PORT CTB (MOVE)(LOW PROF)(TY 2)	LF	40.000		40.000	
	512-6057	PORT CTB (REMOVE)(LOW PROF)(TY 1)	LF	40.000		40.000	
	512-6058	PORT CTB (REMOVE)(LOW PROF)(TY 2)	LF	40.000		40.000	
	540-6001	MTL W-BEAM GD FEN (TIM POST)	LF	1,125.000		1,125.000	
	540-6017	MTL BM GD FEN (LONG SPAN SYSTEM)	LF	100.000		100.000	
	542-6001	REMOVE METAL BEAM GUARD FENCE	LF	875.000		875.000	
	542-6002	REMOVE TERMINAL ANCHOR SECTION	EA	12.000		12.000	
	544-6001	GUARDRAIL END TREATMENT (INSTALL)	EA	12.000		12.000	
	644-6004	IN SM RD SN SUP&AM TY10BWG(1)SA(T)	EA	8.000		8.000	
	644-6076	REMOVE SM RD SN SUP&AM	EA	7.000		7.000	
	658-6062	INSTL DEL ASSM (D-SW)SZ 1(BRF)GF2(BI)	EA	38.000		38.000	

Estimate & Quantity Sheet

CONTROLLING PROJECT ID 0018-05-090 **DISTRICT** Laredo **COUNTY** Webb
HIGHWAY IH 35

						TOTAL EST.	TOTAL FINAL
		CONTROL SECTION JOB		**0018-05-090**			
		PROJECT ID		**A00120338**			
		COUNTY		**Webb**			
		HIGHWAY		**IH 35**			
ALT	**BID CODE**	**DESCRIPTION**	**UNIT**	EST.	FINAL		
	658-6100	INSTL OM ASSM (OM-2Z)(WFLX)GND(BI)	EA	10.000		10.000	
	662-6111	WK ZN PAV MRK SHT TERM (TAB)TY Y-2	EA	5,308.000		5,308.000	
	666-6309	RE PM W/RET REQ TY I (W)6"(SLD)(100MIL)	LF	51,626.000		51,626.000	
	666-6318	RE PM W/RET REQ TY I (Y)6"(BRK)(100MIL)	LF	5,367.000		5,367.000	
	666-6321	RE PM W/RET REQ TY I (Y)6"(SLD)(100MIL)	LF	20,697.000		20,697.000	
	672-6009	REFL PAV MRKR TY II-A-A	EA	539.000		539.000	
	3076-6006	D-GR HMA TY-B PG70-22	TON	8,701.000		8,701.000	
	3076-6032	D-GR HMA TY-C SAC-A PG76-22	TON	8,131.000		8,131.000	
	3084-6001	BONDING COURSE	GAL	14,142.000		14,142.000	
	6001-6002	PORTABLE CHANGEABLE MESSAGE SIGN	EA	2.000		2.000	
	6158-6001	TMSP RADAR SPEED CONTROL MONITOR	EA	2.000		2.000	
	6185-6002	TMA (STATIONARY)	DAY	86.000		86.000	
	6185-6003	TMA (MOBILE OPERATION)	HR	100.000		100.000	
	18	SAFETY CONTINGENCY: CONTRACTOR FORCE ACCOUNT WORK (PARTICIPATING)	LS	1.000		1.000	
		LAW ENFORCEMENT: CONTRACTOR FORCE ACCOUNT WORK (PARTICIPATING)	LS	1.000		1.000	
		EROSION CONTROL MAINTENANCE: CONTRACTOR FORCE ACCOUNT WORK (PART)	LS	1.000		1.000	

SUMMARY OF DRAINAGE ITEMS		
LOCATION - STRUCTURE	480 6001 CLEAN EXIST CULVERTS EA	429 6007 CONC STR REPAIR (VERTICAL & OVERHEAD) SF
SEGMENT 1 - CULVERT 1	1	18
SEGMENT 1 - PSN:222400001805068	1	0
SEGMENT 1 - CULVERT 2	1	24
SEGMENT 2 - PSN:222400001805067	1	80
SEGMENT 2 - CULVERT 3	1	0
PROJECT TOTALS	5	122

SUMMARY OF BRIDGE # 1 ITEMS	
SEGMENT - PSN	451 6019 RETROFIT RAIL (TY T631) LF
1 - 222400001805068	37.5
PROJECT TOTALS	37.5

SUMMAR OF BRIDGE # 2 ITEMS	
SEGMENT - PSN#	451 6019 RETROFIT RAIL (TY T631) LF
2 - 222400001805067	37.5
PROJECT TOTALS	37.5

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Texas Department of Transportation

IH 35 WFR

SUMMARY OF QUANTITIES

CONT	SECT	JOB	HIGHWAY
0018	05	090	IH35 WFR
DIST	COUNTY		SHEET NO.
22	WEBB		17

IH 35 WFR					
BASELINE STATION	STATION CUT	STATION FILL	ACCUM CUT	ACCUM FILL	MASS ORDINATE
STA	CY	CY	CY	CY	CY
592+25.390	0.0	0.0	0.0	0.0	0.0
593+00.000	10.2	1.5	10.2	1.5	8.7
594+00.000	11.6	3.1	21.8	4.5	17.3
595+00.000	13.5	4.4	35.2	8.9	26.3
596+00.000	15.5	4.0	50.8	12.9	37.8
597+00.000	13.3	4.7	64.1	17.7	46.4
598+00.000	6.8	4.8	70.9	22.5	48.4
599+00.000	6.9	3.1	77.8	25.6	52.2
600+00.000	6.9	4.3	84.7	29.8	54.9
601+00.000	8.7	11.7	93.4	41.5	51.9
602+00.000	0.5	11.8	93.9	53.3	40.6
603+00.000	0	10.3	93.9	63.7	30.2
604+00.000	6.2	9.8	100.1	73.5	26.7
605+00.000	2.4	16.9	102.5	90.3	12.2
606+00.000	7.1	16.9	109.6	107.2	2.4
607+00.000	13.4	5.5	123.0	112.7	10.3
608+00.000	15.0	3.1	138.0	115.9	22.1
609+00.000	6.9	9.6	145.0	125.5	19.5
610+00.000	0	14.3	145.0	139.8	5.2
611+00.000	0	6.7	145.0	146.5	-1.5
612+00.000	0	6.1	145.0	152.6	-7.6
613+00.000	0	19.0	145.0	171.6	-26.6
614+00.000	0	30.7	145.0	202.3	-57.3
615+00.000	0	23.3	145.0	225.6	-80.6
616+00.000	5.0	9.5	150.0	235.1	-85.1
617+00.000	14.0	3.6	164.0	238.7	-74.6
618+00.000	15.1	3.3	179.2	242.0	-62.9
619+00.000	11.8	3.7	191.0	245.8	-54.8
620+00.000	6.0	4.0	196.9	249.8	-52.9
621+00.000	0.9	8.8	197.8	258.6	-60.8
622+00.000	0	17.2	197.8	275.8	-78.0
623+00.000	1.5	19.2	199.3	295.0	-95.7
624+00.000	6.1	21.8	205.4	316.8	-111.4
625+00.000	0.8	43.7	206.2	360.5	-154.3
626+00.000	0.2	46.3	206.4	406.8	-200.4
627+00.000	4.8	24.0	211.2	430.9	-219.6
628+00.000	5.9	13.2	217.1	444.1	-226.9
629+00.000	11.6	8.5	228.7	452.6	-223.9
630+00.000	19.0	7.3	247.7	459.9	-212.2
631+00.000	22.1	7.5	269.8	467.4	-197.6
632+00.000	19.8	7.9	289.6	475.4	-185.7
633+00.000	12.9	7.7	302.5	483.1	-180.5
634+00.000	9.7	11.1	312.2	494.2	-181.9
635+00.000	12.7	17.7	324.9	511.9	-187.0
636+00.000	20.9	11.4	345.8	523.3	-177.5
637+00.000	34.0	1.6	379.9	525.0	-145.1
638+00.000	49.6	0.1	429.5	525.0	-95.5
639+00.000	51.2	0.0	480.7	525.0	-44.4
640+00.000	54.5	0.0	535.2	525.0	10.2

IH 35 WFR					
BASELINE STATION	STATION CUT	STATION FILL	ACCUM CUT	ACCUM FILL	MASS ORDINATE
STA	CY	CY	CY	CY	CY
641+00.000	65.2	0.0	600.4	525.022	75.4
642+00.000	53.0	0.0	653.4	525.027	128.3
643+00.000	33.3	1.3	686.7	526.309	160.4
644+00.000	25.7	7.1	712.4	533.383	179.0
645+00.000	17.2	9.0	729.6	542.341	187.2
646+00.000	5.5	9.2	735.1	551.53	183.6
647+00.000	0	16.6	735.1	568.144	167.0
648+00.000	0	19.9	735.1	588.04	147.1
649+00.000	0	13.8	735.1	601.852	133.3
650+00.000	4.6	11.6	739.7	613.426	126.3
651+00.000	4.7	15.4	744.5	628.78	115.7
652+00.000	4.3	19.2	748.8	648.0	100.8
653+00.000	10.1	13.9	758.9	661.9	97.0
654+00.000	11.5	10.4	770.4	672.3	98.1
655+00.000	9.5	19.4	780.0	691.7	88.3
656+00.000	11.0	17.0	790.9	708.7	82.2
657+00.000	11.2	6.8	802.2	715.5	86.7
658+00.000	10.4	4.1	812.6	719.6	93.1
659+00.000	13.5	6.0	826.1	725.6	100.6
660+00.000	8.0	6.5	834.2	732.0	102.1
661+00.000	13.3	3.2	847.5	735.3	112.2
662+00.000	23.8	0.5	871.3	735.8	135.5
663+00.000	22.1	0.2	893.4	736.0	157.4
664+00.000	16.3	3.3	909.7	739.3	170.4
665+00.000	6.2	5.9	915.8	745.2	170.6
666+00.000	0	5.6	915.8	750.8	165.0
667+00.000	0	9.2	915.8	760.0	155.8
668+00.000	0	19.1	915.8	779.1	136.7
669+00.000	0	38.6	915.8	817.7	98.2
670+00.000	0	43.2	915.8	860.8	55.0
671+00.000	2.3	33.5	918.1	894.4	23.8
672+00.000	12.1	22.1	930.3	916.4	13.8
673+00.000	26.0	6.1	956.3	922.6	33.7
674+00.000	20.5	4.0	976.8	926.6	50.2
675+00.000	10.0	6.7	986.7	933.3	53.5
676+00.000	17.4	3.8	1004.2	937.1	67.1
677+00.000	10.4	6.7	1014.6	943.8	70.8
678+00.000	2.0	12.9	1016.6	956.6	60.0
679+00.000	7.0	12.8	1023.6	969.4	54.2
680+00.000	7.9	13.4	1031.5	982.8	48.7
681+00.000	6.2	13.9	1037.7	996.7	41.0
682+00.000	8.6	19.4	1046.3	1016.1	30.2
683+00.000	15.1	16.2	1061.5	1032.3	29.2
684+00.000	15.2	7.1	1076.7	1039.4	37.3
685+00.000	15.2	8.8	1091.9	1048.2	43.7
686+00.000	14.0	7.9	1105.9	1056.1	49.8
687+00.000	17.2	4.8	1123.0	1060.9	62.2
688+00.000	19.2	2.7	1142.2	1063.6	78.6
689+00.000	9.4	6.3	1151.6	1070.0	81.6
690+00.000	10.6	13.8	1162.2	1083.8	78.4
691+00.000	13.2	25.1	1175.4	1108.9	66.5
692+00.000	11.2	18.1	1186.6	1127.0	59.7

SUMMARY EARTHWORK		
CSJ	110	132
	6001	6001
	EXCAVATION ON	EMABNKMENT (FINAL) (ORD
0018-05-090	1124	1132

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Texas Department of Transportation

IH 35 WFR

SUMMARY OF QUANTITITES

CONT	SECT	JOB	HIGHWAY
0018	05	090	IH35 WFR
DIST	COUNTY		SHEET NO.
22	WEBB		18

SUMMARY OF EROSION CONTROL ITEMS				
LOCATION (STATIONS)	506 6020	506 6024	506 6038	506 6039
	CONSTRUCTION EXITS (INSTALL) (TY 1)	CONSTRUCTION EXITS (REMOVE)	TEMP SEDMT CONT FENCE (INSTALL)	TEMP SEDMT CONT FENCE (REMOVE)
	SY	SY	LF	LF
592+25.39 to 604+25.39			80	80
604+25.39 to 616+25.39			80	80
616+25.39 to 628+25.39	50	50	167	167
628+25.39 to 640+25.39			80	80
640+25.39 to 652+25.39			80	80
652+25.39 to 664+25.39			80	80
664+25.39 to 676+25.39			80	80
676+25.39 to 688+25.39	50	50	155	155
688+25.39 to 692+25.39			40	40
PROJECT TOTALS	100	100	842	842

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Texas Department of Transportation

IH35 WFR

SUMMARY OF QUANTITIES

CONT	SECT	JOB	HIGHWAY
0018	05	090	IH35 WFR
DIST	COUNTY		SHEET NO.
22	WEBB		19

SUMMARY OF MBGF									
DESCRIPTION				432	540	540	542	542	544
				6045	6001	6017	6001	6002	6001
				RIPRAP (MOW STRIP)(4 IN)	MTL W-BEAM GD FEN (TIM POST)	MTL BM GD FEN (LONG SPAN SYSTEM)	REMOVE METAL BEAM GUARD FENCE	REMOVE TERMINAL ANCHOR SECTION	GUARDRAIL END TREATMENT (INSTALL)
				CY	LF	LF	LF	EA	EA
CSJ: 0018-05-090									
CROSSING	PSN	RMN	STA.						
SEGMENT 1									
CULVERT 1		15+.11	530+11	22.3	400	50	350	4	4
BRIDGE	222400001805068	15+.49	551+90	9.9	162.5		100	2	2
CULVERT 2		15+.83	569+40	9.4	125	25	125	2	2
SEGMENT 2									
BRIDGE	222400001805067	16+.59	624+82	14.2	262.5		175	2	2
CULVERT 3		17+.46	682+60	11.5	175	25	125	2	2
TOTAL				68	1,125	100	875	12	12

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Texas Department of Transportation

IH35 WFR

SUMMARY OF QUANTITIES

CONT	SECT	JOB	HIGHWAY
0018	05	090	IH35 WFR
DIST	COUNTY		SHEET NO.
22	WEBB		20

SUMMARY OF PAVEMENT MARKING & DELINEATOR ITEMS						
CSJ- SEGMENT	666 6309	666 6318	666 6321	672 6009	644 6004	644 6076
	RE PM W/RET REQ TY I (W)6"(SLD)(100MIL)	RE PM W/RET REQ TY I (Y)6"(BRK)(100MIL)	RE PM W/RET REQ TY I (Y)6"(SLD)(100MIL)	REFL PAV MRKR TY II-A-A	IN SM RD SN SUP&AM TY10BWG(1) SA(T)	REMOVE SM RD SN SUP&AM
	LF	LF	LF	EA	EA	EA
0018-05-090 - 1&2	51626	5367	20697	539	8	7
PROJECT TOTALS	**51626**	**5367**	**20697**	**539**	**8**	**7**

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Texas Department of Transportation

IH35 WFR

SUMMARY OF QUANTITIES

CONT	SECT	JOB	HIGHWAY
0018	05	090	IH35 WFR
DIST	COUNTY		SHEET NO.
22	WEBB		21

SUMMARY OF ROADWAY

LOCATION		LENGTH	100	354	354	354	354	164	164		ROLLING	BOTTOM HMA LAYER		MIDDLE LAYER		TOP HMA LAYER	
			6002	6100	6030	6042	6088	6035	6066	134	216		3076		3084		3076
										6002	6001		6006		6001		6032
BEGIN STATION	END STATION		PREPARING ROW	PLANE ASPH CONC PAV (5")	PLANE ASPH CONC PAV(0" TO 8")	PLANE ASPH CONC PAV (8")	PLANE ASPH CONC PAV (0" TO 5")	DRILL SEEDING (PERM) (RURAL) (CLAY)	DRILL SEEDING (PERM)(WARM OR COOL)	BACKFILL (TY B)	PROOF ROLLING	* AREA	D-GR HMA TY-B PG70-22	* AREA	BONDING COURSE	* AREA	D-GR HMA TY-C SAC-A PG76-22
		LF	STA	SY	SY	SY	SY	SY	SY	STA	HR	SY	TON	SY	GAL	SY	TON
CSJ: 0018-05-090																	
Name of Roadway																	
439+75.16	451+75.16	1200.00								12.0				3222.3	644.5	3222.3	370.6
451+75.16	463+75.16	1200.00								12.0				3222.3	644.5	3222.3	370.6
463+75.16	475+75.16	1200.00								12.0				3222.3	644.5	3222.3	370.6
475+75.16	487+75.16	1200.00								12.0				3222.3	644.5	3222.3	370.6
487+75.16	499+75.16	1200.00								12.0				3222.3	644.5	3222.3	370.6
499+75.16	511+75.16	1200.00								12.0				3222.3	644.5	3222.3	370.6
511+75.16	523+75.16	1200.00								12.0				3222.3	644.5	3222.3	370.6
523+75.16	535+75.16	1200.00		1058.0			1668.0			12.0				3222.3	644.5	3222.3	370.6
535+75.16	547+75.16	1200.00								12.0				3222.3	644.5	3222.3	370.6
547+75.16	559+75.16	1200.00			2134.0	809.0				12.0				3222.3	644.5	3222.3	370.6
559+75.16	571+75.16	1200.00			2134.0	638.0				12.0				3222.3	644.5	3222.3	370.6
571+75.16	583+75.16	1200.00								12.0				3222.3	644.5	3222.3	370.6
583+75.16	592+25.39	850.23								8.5				3222.3	644.5	3222.3	370.6
592+25.39	601+00.00	874.61	8.746	1943.6				2332.29	2332.29		0.8	2542.9	762.9	2526.7	505.3	2526.7	290.6
601+00.00	613+00.00	1200.00	12.000	2666.7				3200.00	3200.00		1.2	3488.9	1046.7	3466.7	693.3	3466.7	398.7
613+00.00	625+00.00	1200.00	12.000	2666.7	2134.0	1073.0		3200.00	3200.00		1.2	3488.9	1046.7	3466.7	693.3	3466.7	398.7
625+00.00	637+00.00	1200.00	12.000	2666.7				3200.00	3200.00		1.2	3488.9	1046.7	3466.7	693.3	3466.7	398.7
637+00.00	649+00.00	1200.00	12.000	2666.7				3200.00	3200.00		1.2	3488.9	1046.7	3466.7	693.3	3466.7	398.7
649+00.00	661+00.00	1200.00	12.000	2666.7				3200.00	3200.00		1.2	3488.9	1046.7	3466.7	693.3	3466.7	398.7
661+00.00	673+00.00	1200.00	12.000	2666.7				3200.00	3200.00		1.2	3488.9	1046.7	3466.7	693.3	3466.7	398.7
673+00.00	685+00.00	1200.00	12.000	2666.7	2134.0	774.0		3200.00	3200.00		1.2	3488.9	1046.7	3466.7	693.3	3466.7	398.7
685+00.00	692+00.00	700.00	7.000	1555.6				2237.95	2237.95		0.7	2035.2	610.6	2022.2	404.4	2022.2	232.6
TOTAL		25,224.84	100	23,224.1	8,536	3,294	1,668	26,970.3	26,970.3	153	10	29,001	8,701	70,705	14,142	70,705	8,131

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Texas Department of Transportation

IH35 WFR

SUMMARY OF QUANTITIES

CONT	SECT	JOB	HIGHWAY
0018	05	090	IH35 WFR
DIST	COUNTY		SHEET NO.
22	WEBB		22

SUMMARY OF MOBILIZATION ITEMS		
CSJ	500 6001	502 6001
	MOBILIZATION	BARRICADES, SIGNS AND TRAFFIC HANDLING
	LS	MO
0018-05-090	1.00	5.00
PROJECT TOTALS	1	5

SUMMARY OF WORKZONE TRAFFIC CONTROL ITEMS									
CSJ:0018-05-090	510 6002	510 6003	512 6009	512 6010	512 6033	512 6034	512 6057	512 6058	662 6111
	ONE-WAY TRAF CONT (PILOT CAR)	ONE-WAY TRAF CONT (PORT TRAF SIG)	PORT CTB (FUR & INST)(LOW PROF)(TY 1)	PORT CTB (FUR & INST)(LOW PROF)(TY 2)	PORT CTB (MOVE)(LOW PROF)(TY 1)	PORT CTB (MOVE)(LOW PROF)(TY 2)	PORT CTB (REMOVE)(LOW PROF)(TY 1)	PORT CTB (REMOVE)(LOW PROF)(TY 2)	WK ZN PAV MRK SHT TERM (TAB)TY Y-2
	HR	MO	LF	LF	LF	LF	LF	LF	EA
SEGMENT 1	160	2	40	40					3246
SEGMENT 2	800	2			40	40	40	40	2062
PROJECT TOTALS	960	4	40	40	40	40	40	40	5308

SUMMARY OF WORKZONE TRAFFIC CONTROL ITEMS					
6001 6002	6185 6002	6185 6003	6158 6001	658 6062	658 6100
PORTABLE CHANGEABLE MESSAGE SIGN	TMA (STATIONARY)	TMA (MOBILE OPERATION)	TMSP RADAR SPEED CONTROL MONITOR	INSTL DEL ASSM (D-SW)SZ 1(BRF)GF2(BI)	INSTL OM ASSM (OM-2Z)(WFLX)GND(BI)
EA	DAY	HR	EA	EA	EA
2	43	50	2	23	6
	43.00	50		15	4
2	86	100	2	38	10

Texas Department of Transportation

IH35 WFR

SUMMARY OF QUANTITIES

CONT	SECT	JOB	HIGHWAY
0018	05	090	IH35 WFR
DIST	COUNTY		SHEET NO.
22	WEBB		23

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TCP GENERAL NOTES

1. This is a suggested Traffic Control Plan (TCP). The Contractor may submit an alternate Traffic Control Plan, signed and sealed by a Licensed Professional Engineer in Texas, for approval by the Engineer. When mutually beneficial changes are proposed to the existing Traffic Control Plan and are agreed upon by the Contractor and the Department, the plan sheets shall be developed, signed and sealed by a Profesional Engineer.

2. Refer to Item 8 "Prosecution and Progress" and project general notes for additional information regarding the Traffic Control Plan.

3. Furnish and install all Traffic Control Plans devices, including but not limited to barricades, signs, and work zone markings, in compliance with the latest version of the Texas Manual on Uniform Traffic Control Devices (TMUTCD), the State Standard Traffic Control Plans (TCP) sheets, and the Barricades and Construction (BC) sheets. Refer to the project general notes for additional information regarding the Traffic Control Plan.

4. Moving an existing sign to a temporary location is subsidiary to Item 502. Installations with permanent supports at permanent locations will be paid for under the applicable bid item(s).

5. Additional signs, barricades and channelizing devices may be required to maintain traffic during construction, as shown on TCP standards. Additional signs, barricades, etc. (if any), will be subsidiary to Item 502 - "Barricades, Signs and Traffic Handling".

6. Refer to BC(6)-21 Portable Changeable Message Sign (PCMS) Standards for a listing of abbreviated words and two-word phrases that are acceptable for use on PCMS. Submit the suggested message for the board to the Engineer for approval.

7. Place the traffic control devices only while work is actually in progress or a definite need exists. Always have enough barricades, channelizing devices, and signs at all times to replace those damaged.

8. Cover all existing signs that conflict with the Traffic Control Plan and uncover during non-working hours or as directed by the Engineer. Partial coverage of the sign or coverage by material that will not cover the entire sign all the time is not permitted.

9. Vary the spacing of signs to meet traffic conditions or as directed by the Engineer and assure that all traffic control devices and work zone pavement markings are kept in a highly visible condition (clean, upright and at proper location).

10. Maintain the roadway surface and work zone striping within the project while the traffic control plan is in effect. Place and be responsible for all work zone pavement markings in accordance with standard sheets WZ(STPM)-23, BC (11), BC (12) and the TMUTCD.

11. Maintain all existing drainage conditions during all construction phases until the permanent drainage facilities are constructed and ready to use. Handle excavated and stockpiled material in such a way that it will not block drainage.

12. Regulate all construction traffic so as to cause a minimal inconvenience to the traveling public. At the times when it is necessary for trucks to stop, unload or cross roadways under traffic, provide warning signs and flaggers as needed to adequately protect the traveling public.

13. During non-working hours, all drop-offs are to be filled. Refer to standard WZ(UL)-13 for lateral drop-offs and to details shown in plans for longitudinal drop-offs or as directed by the Engineer.

14. Notify the Engineer in writing two weeks prior to shifting of traffic within each phase of the Traffic Control Plan.

15. Verify the location and spacing of signs, barricades, and channelizing devices prior to their placement along vertical curves, horizontal curves, and other geometric constraints to assure visibility to all motorists.

16. During the holiday time frame of December 21st through January 1st, every effort should be taken to ensure that all travel lanes remain open where possible.

18. Use of portable changeable message sign as advance notice of lane closures will be required, as directed by the engineer. For locations that are adjacent to each other, a single sign in advance of the entire work area is acceptable.

19. Place portable changeable message boards at locations requiring lane closures for 2 week(s) before the closures or as directed by the Engineer.

20. If the contractor chooses to work multiple locations simultaneously, with approval from the Engineer, contractor will be responsible for providing all applicable traffic control devices, including portable changeable message boards, and truck mounted attenuators at their own expense.

21. Use truck mounted attenuators as noted on plans,TxDOT traffic control plan standards, or as directed by the engineer. For locations that are adjacent to each other, a single truck mounted attenuator for the entire work area is acceptable.

22. Use plastic drums to channelize traffic when existing pavement markings have been obliterated.

23. Regulatory construction speed limit signs are erected only for the limits of the section of roadway where speed reduction is necessary for the safe operation of traffic and protection of construction personnel. If the regulatory construction speed limit signs are not necessary for the safe operation of traffic during certain construction operations or those days and hours when the contractor is not working, these signs should be made inoperative following guidance in BC(4)-21.

24. Contractor shall plan milling operations accordingly to where milled roadway surface is not exposed for more than 2 days, before placing the corresponding bonding course and surface mix unless otherwise approved by the Engineer.

25. Contractor is to construct longitudinal joint at approaches and departures prior to opening to traffic. Refer to "roadway miscellaneous details transition" sheet to be used when opening roadway(s) to traffic.

26. Limit the work to that area of operation that can be completed in one work day in order to allow for traffic at night. Refer to "TCP Sequence of Construction" for further information. Allow for all lanes open to traffic during non-working hours unless otherwise specified in the sequence of construction. Any additional overnight lane closures not specified in the sequence of construction will require approval by the Engineer.

27. The work has been identified by reference location numbers. Various reference locations can be worked on simultaneously when approved by the engineer. Once work has begun at a reference location, it must be worked on continuously through completion. Additional signing to safely guide traffic through the work area will be required as directed by the Engineer.

28. Conduct construction operations so as to provide the least possible interference to traffic and to permit the continuous movement of traffic in all allowable directions at all times or as permitted by the sequence of construction. Provide for safe and convenient access to abutting property, highways, public roads, and street crossings except as otherwise shown on the sequence of construction. The contractor will maintain at all times two-way traffic or a minimum of one lane using flaggers.

29. Place all stockpiled material, waste material, signs, barricades, channelizing devices and work vehicles not in use, at a minimum of 30 feet from the outer edge of the nearest travel lane.

30. Remove from the work area all loose materials and debris resulting from construction operations at the end of each work day.

STATE OF TEXAS
LUIS G. URBINA
117019
LICENSED
PROFESSIONAL ENGINEER

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11/27/2023

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IH 35 WFR

TCP
GENERAL NOTES

SHEET 1 OF 1

CONT	SECT	JOB	HIGHWAY
0018	05	090	IH35 WFR
DIST	COUNTY		SHEET NO.
22	WEBB		24

DATE: 11/27/2023 11:51:24 AM
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SEQUENCE OF CONSTRUCTION

GENERAL INSTRUCTIONS

THE FOLLOWING WORK WILL BE PERFORMED ON THE ROADWAY. PLEASE REFER TO TCP GENERAL NOTES AND CORRESPONDING PLAN SHEETS FOR MORE DETAILED INFORMATION.

INSTALL ALL APPLICABLE BARRICADES, SIGNS, AND WORK ZONE MARKINGS IN ACCORDANCE WITH TCP, BC, AND WZ TXDOT STANDARD SHEETS FOR TRAFFIC CONTROL SETUP.

ONCE WORK HAS BEGUN AT A REFERENCE LOCATION, THE ENTIRE SEGMENT MUST BE WORKED ON CONTINUOUSLY TO COMPLETION. CONTRACTOR SHALL MAINTAIN LANE CLOSURE UNTIL ALL WORK IN AREA HAS BEEN COMPLETED. ADJACENT LANES (SAME DIRECTION OF TRAVEL) MAY BE COMBINED WHEN APPLICABLE.

FOR ALL LOCATIONS, IN THE EVENT OF A SEGMENT NOT BEING COMPLETED AT THE END OF THE DAY NO DROPOFFS GREATER THAN 2" SHALL BE LEFT. CONTRACTOR SHALL IMPLEMENT "TCP CONSTRUCTION JOINT DETAIL" FOR LONGITUDINAL DROP OFFS AND CONDUCT ROADWAY SWEEPING. INSTALL ANY REQUIRED WORK ZONE SHORT TERM TABS TO GUIDE TRAFFIC PRIOR TO OPENING TRAVEL LANES. ROADWAY SURFACE SHALL NOT BE EXPOSED TO MORE THAN 2 DAYS, BEFORE PLACING THE CORRESPONDING BONDING COURSE UNLESS OTHERWISE APPROVED BY THE ENGINEER.

SPEED RADAR FEEDBACK SIGNS MUST BE USED IN ALL PHASES OF THE PROJECT AND IS INTENDED TO BE RELOCATED AS NEEDED OR AS DIRECTED BY THE ENGINEER.

SUMMARY OF WORK (REHAB AND OVERLAY)

A) INSTALL TRAFFIC CONTROL DEVICES.
B) INSTALL SW3P DEVICES.
C) PERFORM PROPOSED MBGF & BRIDGE WORK AT LOCATIONS SHOWN ON PLANS.
D) REMOVE 5'' OF EXISTING PAVEMENT MATERIAL.
E) EXCAVATE PROPOSED WIDEN AREA.
F) PROOF ROLL SUBGRADE.
G) APPLY PRIME COAT (RC-250).
H) LAY 5" HMA.
I) PERFORM SURFACE CLEAN UP.
J) LAY 2" HMA ON LOCATIONS WITH PRIOR ASSOCIATED BONDING COURSE.
K) PLACE FINAL PAVEMENT MARKINGS AND RAISED PAVEMENT MARKERS.
L) PERFORM BLADING & BACKFILL EDGES.

GENERAL SEQUENCE OF WORK

THIS IS A REHABILITATION AND RESURFACING PROJECT, WORK SHALL BE PERFORMED IN SIX (6) PHASES, AS APPLICABLE.

PHASE I - REMOVE/ INSTALL NEW MBGF/ BRIDGE RAIL AT LOCATIONS SPECIFIED IN THE PLANS.

PHASE II - ROADWAY CONSTRUCTION MM16 - MM18

PHASE III - PLACE SURFACE MIX (OVERLAY) MM13 - MM18

PHASE IV - PERFORM BLADING AND BACKFILL EDGES.

PHASE V- PLACE FINAL PAVEMENT MARKINGS/RAISED PAVEMENT MARKERS.

PHASE VI - PERFORM FINAL CLEAN UP.

PHASE I- REMOVE/INSTALL NEW MBGF/BRIDGE RAIL AT LOCATIONS SPECIFIED IN THE PLANS

FOR PROPOSED BRIDGE RAIL WORK SHOWN IN THE PLANS USE TCP PTB INSTALATTION LAYOUT AS REFERENCE. TEMPORARY TRAFFIC SIGNALS, DRUMS BARRICADES AND ALL TRAFFIC CONTROL DEVICES.

INSTALL TEMPORARY PORTABLE TRAFFIC BARRIER AND CRASH CUSHION ATTENUATOR SYSTEMS

REMOVE BRIDGE RAIL AND REPAIR BRIDGE DECK (PSN 0018-05-067) & AS SHOWN ON MBGF. RAIL AND TERMINAL INSTALLATION LAYOUT AND INSTALL PROPOSED RETROFIT RAIL T631 AS SHOWN ON PLANS.

ALL PTB(S) SET-UP'S ARE TO REMAIN IN PLACE OVERNIGHT UNTIL WORK IS COMPLETE AT EACH LOCATION.

ONCE WORK HAS BEEN COMPLETED, REMOVE CRASH CUSHION ATTENUATOR AND PTB

FOR PROPOSED MBGF WORK SHOWN IN THE PLANS USE TCP (2-1)-18 AS REFERENCE.

REMOVE MBGF FROM CULVERT STRUCTURES AND REPAIR DECK AS SHOWN ON CULVERT LAYOUT REPLACE THE EXISTING MBGF/ RAIL SECTIONS

REMOVAL OF EXISTING MBGF LENGTH WILL BE LIMITED TO THAT WHICH CAN BE CONSTRUCTED WITHIN THE SAME DAY. UPON COMPLETING THE PROPOSED MBGF SECTIONS. THE BLUNT EXPOSED END WILL BE TIED-DOWN AND/ OR TIED TO THE REMAINING EXISTING MBGF APPURTENANCES (IF THEY ARE STILL IN PLACE) AT THE END OF THE WORKING DAY.

PROCEED TO PLACEMENT OF MOW STRIP NEEDED AT LOCATIONS MENTIONED IN THE PLANS.

UPON APPROVAL FROM THE ENGINEER THIS STAGE CAN BE CONDUCTED IN CONJUNCTION WITH OTHER PHASES OF THE PROJECT.

PHASE II - ROADWAY CONSTRUCTION MM16 TO MM18

INSTALL REQUIRE SW3P WITHIN CONSTRUCTION LIMITS.

STAGE 1
1.-FOLLOW TCP(2-2)-18 ONE WAY TRAFFIC CONTROL WITH FLAGERS AND PILOT CAR PRIOR TO CONSTRUCT NORTHBOUND LANE.

2.-PLANE 5'' OF EXISTING PAVEMENT MATERIAL AND PROOF ROLL EXISTING SUBGRADE

3.-EXCAVATE THE SUBGRADE TO THE PROPOSED WIDENING LIMITS AND PROOF ROLL EXPOSED SUBGRADE

4.-APPLY RC-250 PRIME COAT AT A RATE OF 0.2 GAL/SY

5.-PLACE AND COMPACT 5'' OF DENSE GRADED TYPE B HOT MIX

STAGE 2

1.-SWITCH TRAFFIC TO THE NORTHBOUND LANE CONSTRUCTED AND MANTAIN TCP (2-2)-18

2.-PLANE 5'' OF EXISITING PAVEMENT MATERIAL AND PROOF ROLL EXISTING SUBGRADE

3.- FOLLOW STEPS 4 AND 5 FROM STAGE 1

PHASE III - PLACE SURFACE MIX OVERLAY

FOR SURFACE MIX OVERLAY LIMITS OF IH35 WEST FRONTAGE ROAD ONE WAY TRAFFIC CONTROL WITH FLAGERS AND PILOT CAR SHALL BE USED TCP(2-2)-18

PERFORM ROADWAY SWEEPING PRIOR TO RESURFACING AND PROCEED TO PLACE BONDING COURSE ON LOCATIONS AS SHOWN ON PLANS.

PLACE SURFACE MIX ON EXISTING PAVEMENT AT WIDTHS AND RATES OF APPLICATION SPECIFIED ON TYPICAL SECTIONS. MAINTAIN ONE LANE CLOSURE UNTIL ALL WORK IN AREA HAS BEEN COMPLETED.

INSTALL WORK ZONE SHORT TERM TABS/ MARKINGS.

PHASE IV - PERFORM BLADING AND BACKFILL EDGES

IDENTIFY AREAS IN NEED OF BLADING WORK IN COORDINATION WITH TXDOT PERSONNEL AND APPROVED BY THE ENGINEER. CONDUCT BLADING WORK PREVIOUSLY IDENTIFIED OR DIRECTED BY THE ENGINEER.

BACKFILL EDGES AT AREAS SPECIFIED IN THE PLANS.

PHASE V - PLACE FINAL PAVEMENT MARKINGS/RAISED PAVEMENT MARKERS.

FOR PAVEMENT MARKINGS AND RAISE PAVEMENT MARKER INSTALLATION USE TCP (3-1)-13, AS REFERENCE. REMOVE WORK ZONE SHORT TERM TABS/MARKINGS AND INSTALL FINAL PAVEMENT MARKING FOR THE LIMITS SHOWN. REFER TO PM STANDARD SHEETS AND SUPPLEMENTAL PAVEMENT MARKING SHEETS FOR MORE DETAILS.

PHASE VI - PERFORM FINAL CLEAN UP

PERFORM FINAL CLEAN UP AND REMOVE ALL BARRICADES AND WORK ZONE SIGNS AS DIRECTED BY THE ENGINEER.

STATE OF TEXAS
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IH 35 WFR

TCP SEQUENCE OF CONSTRUCTION

 SHEET 1 OF 1

CONT	SECT	JOB	HIGHWAY
0018	05	090	IH35 WFR
DIST	COUNTY		SHEET NO.
22	WEBB		25

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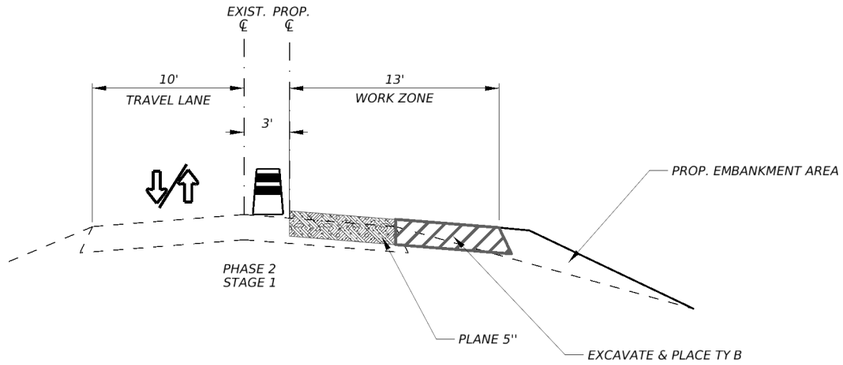
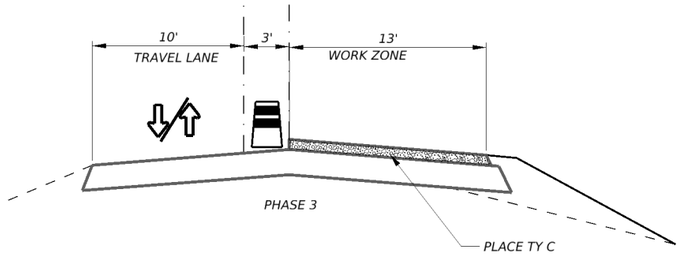




1.REFER TO "IH35 WFR TYPICAL SECTIONS" FOR MORE INFORMATION ON APPLICATION RATES AND THICKNESSES.

TRAFFIC ARROW

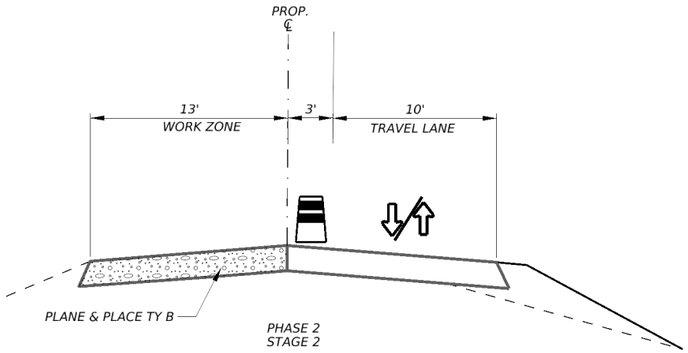
EXISTING MATERIAL

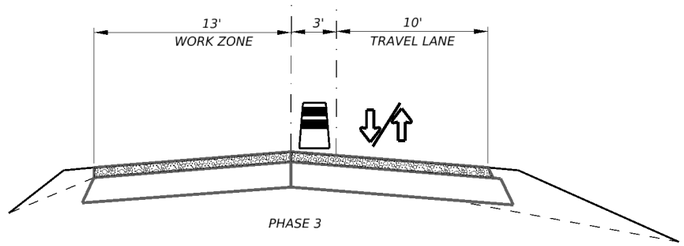
PROPOSED MILLED

PROPOSED EXCAVATION

PROPOSED HMA B

PROPOSED HMA C





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IH 35 WFR

TCP TYPICAL SECTIONS

SHEET 1 OF 1

CONT	SECT	JOB	HIGHWAY
0018	05	090	IH35 WFR
DIST	COUNTY		SHEET NO.
22	WEBB		26

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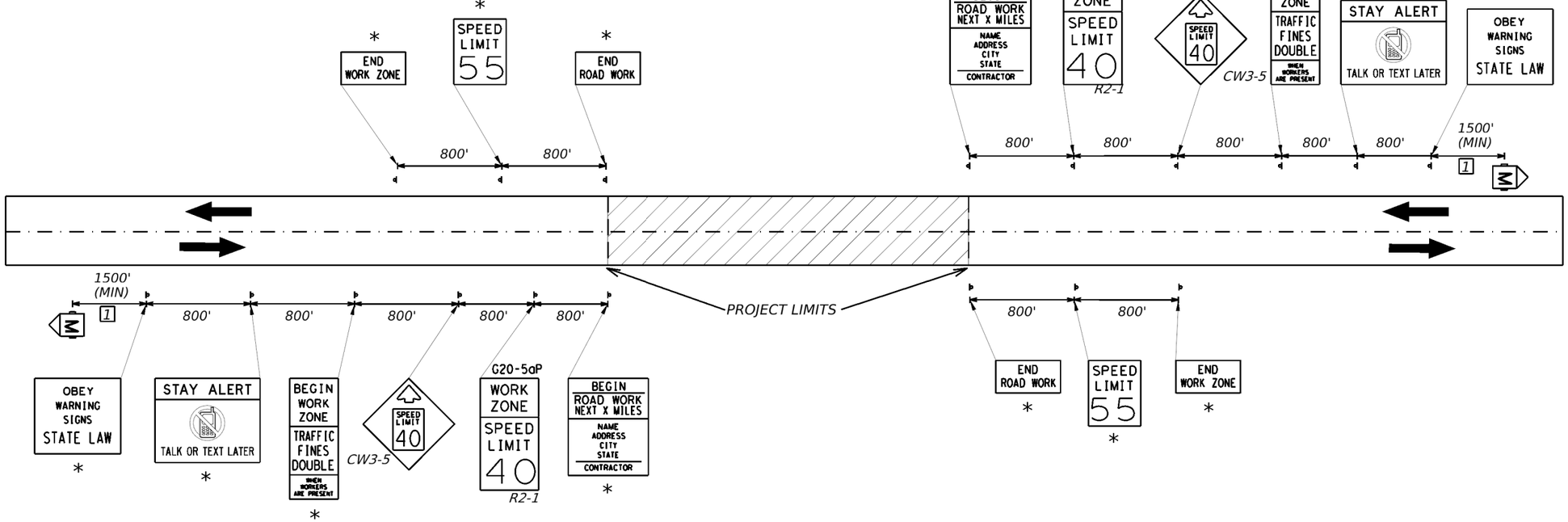


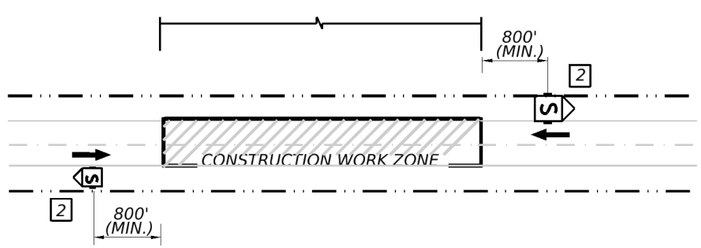
LEGEND	
	WORK AREA
M	PORTABLE CHANGEABLE MESSAGE SIGN (PCMS)
	TRAFFIC FLOW
S	TMSP RADAR SPEED CONTROL MONITOR

NOTES

1. DISTANCE BETWEEN SIGNS SHOULD BE INCREASED AS REQUIRED TO HAVE 1500 FT OR MORE ADVANCE WARNING
2. * REFER TO BC(2)-21 FOR MORE INFORMATION
3. [2] DRIVER FEEDBACK SPEED SIGN TO BE PLACED MIN. 800FT BEFORE FIRST SIGN OF APPLICABLE TCP STANDARD FOR THE CONSTRUCTION WORK ZONE OR AS DIRECTED BY THE ENGINEER.

IH35 WFR SPEED RADAR LOCATION LAYOUT

REFER TO TCP STANDARDS FOR CONSTRUCTION ZONE SIGN SETUP



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TCP MESSAGING SIGN LOCATION LAYOUT

SHEET 1 OF 1

CONT	SECT	JOB	HIGHWAY
0018	05	090	IH35 WFR
DIST	COUNTY		SHEET NO.
22	WEBB		27

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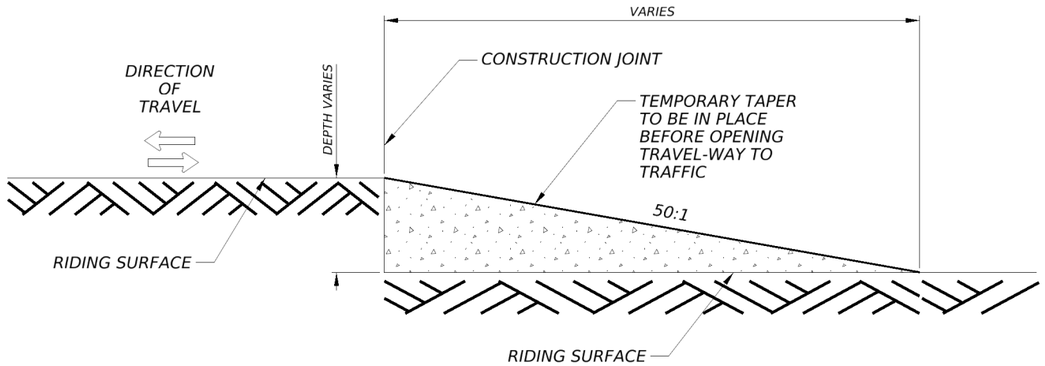
CK:
DW:
CK:
DW:

NOTES:

- DURING ANY PHASE OF CONSTRUCTION, A CONSTRUCTION JOINT TAPER IS TO BE IN PLACE AT THE END OF THE WORK DAY PRIOR TO OPENING ALL LANES TO TRAFFIC, IN ALL DIRECTIONS.
- USE FOR ALL LONGITUDINAL DROP-OFFS WHICH MAY RESULT FROM PLANING, OVERLAYS, OR ANY OTHER CONSTRUCTION OPERATIONS.
- PLACEMENT AND REMOVAL OF THIS CONSTRUCTION TAPER DURING CONSTRUCTION WILL NOT BE PAID FOR DIRECTLY BUT WILL BE SUBSIDIARY TO ITEM 502.



CONSTRUCTION JOINT TAPER - END OF WORK DAY
(PROFILE)

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TCP
CONSTRUCTION JOINT
DETAIL

SHEET 1 OF 1

CONT	SECT	JOB	HIGHWAY
0018	05	090	IH35 WFR
DIST	COUNTY		SHEET NO.
22	WEBB		28

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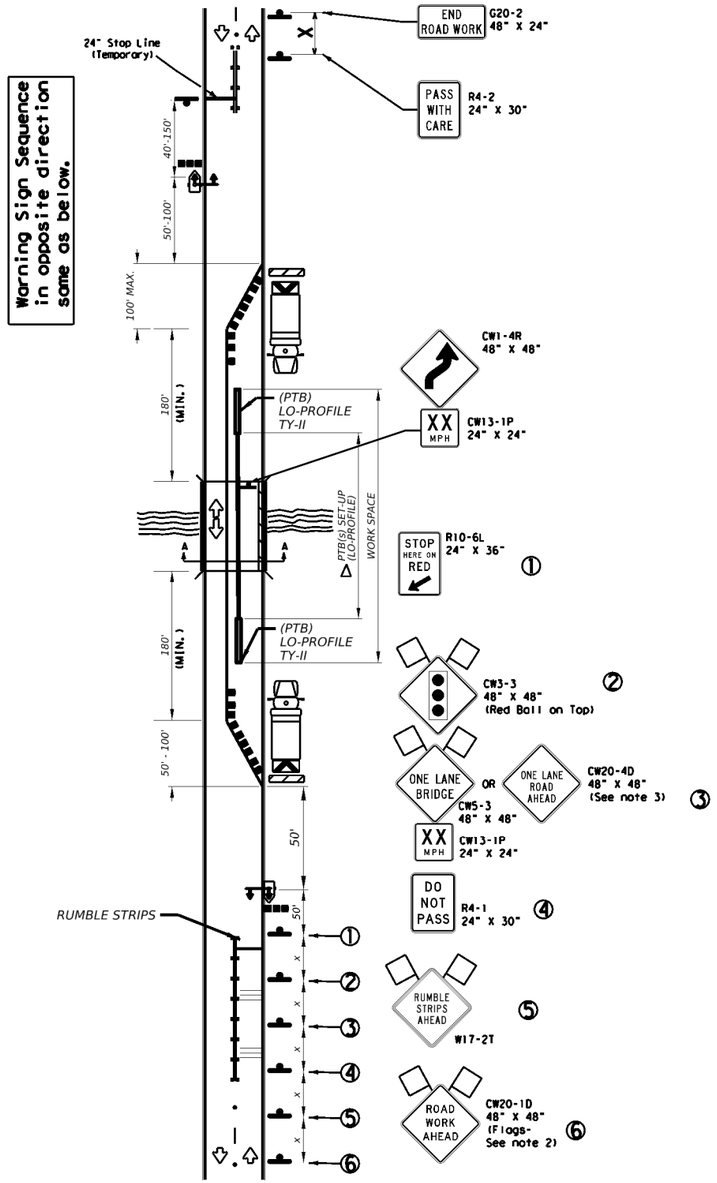

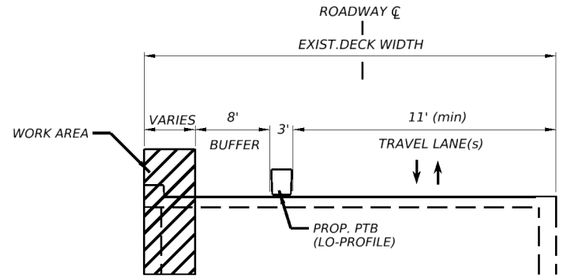

PHASE I
TYPICAL SECTION

SECTION A-A

LEGEND

- PORTABLE TRAFFIC BARRIER (LO-PROFILE)
- DIRECTIONAL TRAFFIC
- WORK ZONE
- TRUCK MOUNTED ATTENUATOR (TMA)
- TYPE III BARRICADE

NOTES:

1. REFER TO THE "SUMMARY OF QUANTITIES" PLAN SHEET FOR ADDITIONAL INFORMATION.
2. REMOVAL OF DRAINAGE STRUCTURE WILL BE LIMITED TO ONE SIDE OF THE ROADWAY AT A TIME, OR AS SPECIFIED BY THE ENGINEER.
3. REFER TO "BARRICADE AND CONSTRUCTJION GENERAL NOTES AND REQUIREMENTS" SHEETS FOR ADDITIONAL NOTES.
4. REFER TO STANDARD TCP (2-8)-23 FOR TRAFFIC CONTROL SET-UP, TAPER LENGTHS AND SPACING FOR SIGNS. THE WORK AREA WILL CONSIST OF THE REMOVAL OF BRIDGE RAIL AND GUARDRAIL OF THE ROADWAY.
5. SEE RUMBLE STRIP STANDARD WZ(RS)-22 FOR RUMBLE STRIPS ON ONE LANE TWO-WAY APPLICATIONS.

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.

PORTABLE TRAFFIC BARRIER QUANTITIES

LOCATION - PSN	SIDE	Δ 512 A FURNISH & INSTALL TY I LF	FURNISH & INSTALL TY II LF	MOVE TY I LF	MOVE TY II LF	REMOVE TY I LF	REMOVE TY II LF
SEGMENT 1 - 222400001805068	LT	40	40				
SEGMENT 2 - 222400001805067	LT			40	40	40	40
TOTAL		40	40	40	40	40	40

Δ FOR CONTRACTORS INFORMATION ONLY. PTB's SET-UP INSTALLATION TO BE PROPOSED. REFER TO "CRASH CUSHION SUMMARY SHEET" FOR ADDITIONAL INFORMATION NOT SHOWN.

STATE OF TEXAS
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LICENSED PROFESSIONAL ENGINEER

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IH 35 WFR

TCP-PTB
INSTALLATION LAYOUT

SHEET 1 OF 1

CONT	SECT	JOB	HIGHWAY
0018	05	090	IH35 WFR
DIST	COUNTY		SHEET NO.
22	WEBB		29

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BARRICADE AND CONSTRUCTION (BC) STANDARD SHEETS GENERAL NOTES:

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

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

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

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

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

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

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

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

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

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

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

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

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

WORKER SAFETY NOTES:

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

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

COMPLIANT WORKZONE TRAFFIC CONTROL DEVICES

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

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

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

Texas Department of Transportation

Traffic Safety Division Standard

BARRICADE AND CONSTRUCTION GENERAL NOTES AND REQUIREMENTS

BC(1)-21

FILE: bc-21.dgn	DN: TxDOT	CK: TxDOT	DW: TxDOT	CK: TxDOT
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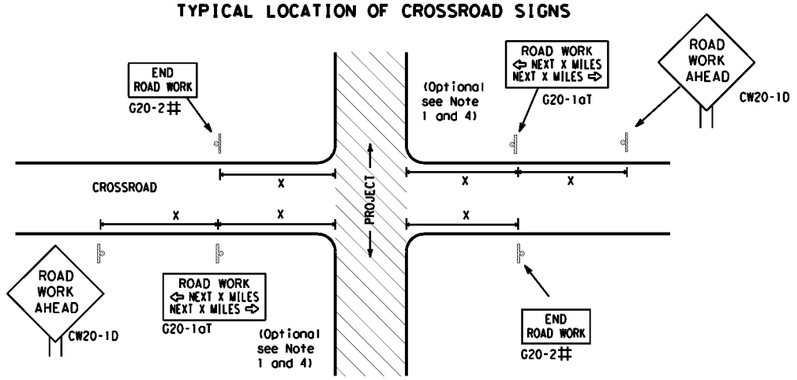
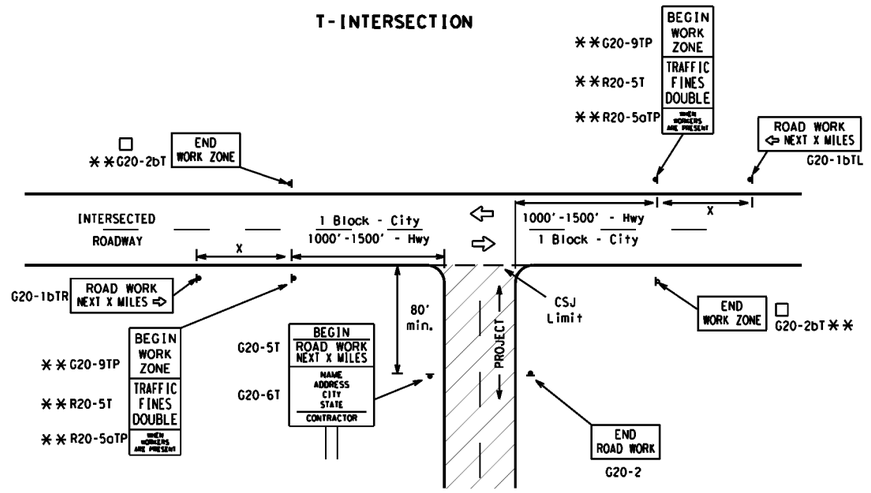
TYPICAL LOCATION OF CROSSROAD SIGNS



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]

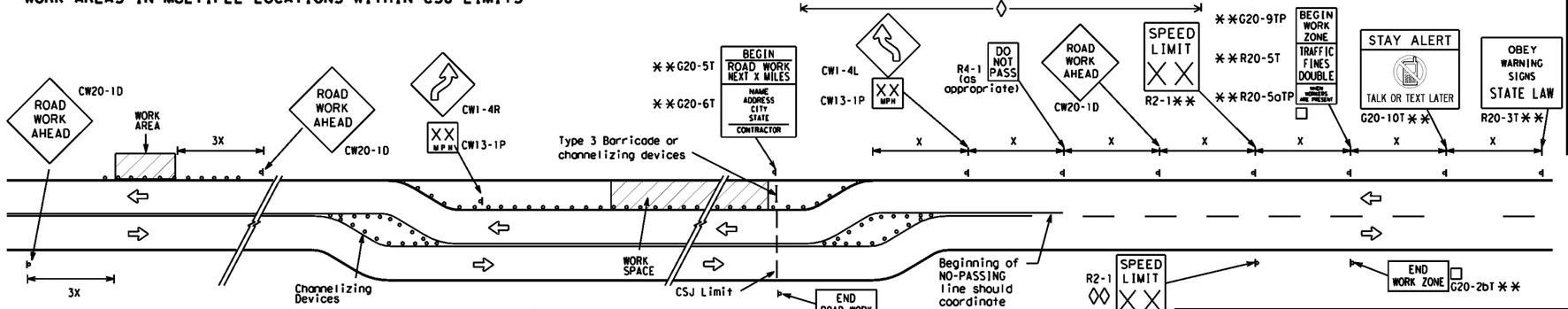
* For typical sign spacings on divided highways, expressways and freeways, see Part 6 of the "Texas Manual on Uniform Traffic Control Devices" (TMUTCD) typical application diagrams or TCP Standard Sheets.

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

GENERAL NOTES

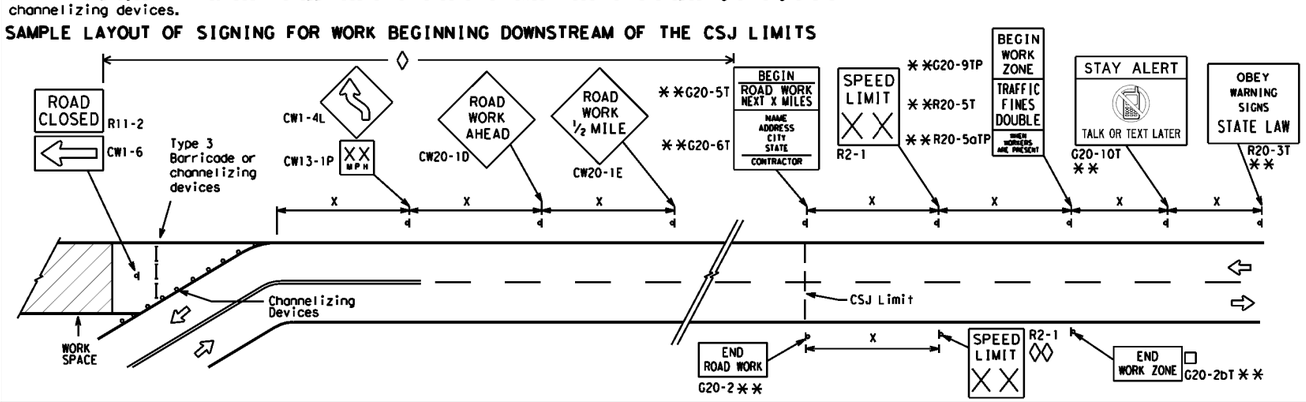
1. Special or larger size signs may be used as necessary.
2. Distance between signs should be increased as required to have 1500 feet advance warning.
3. Distance between signs should be increased as required to have 1/2 mile or more advance warning.
4. 36" x 36" "ROAD WORK AHEAD" (CW20-1D)signs may 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



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.

SHEET 2 OF 12

Texas Department of Transportation — Traffic Safety Division Standard

BARRICADE AND CONSTRUCTION PROJECT LIMIT

BC(2)-21

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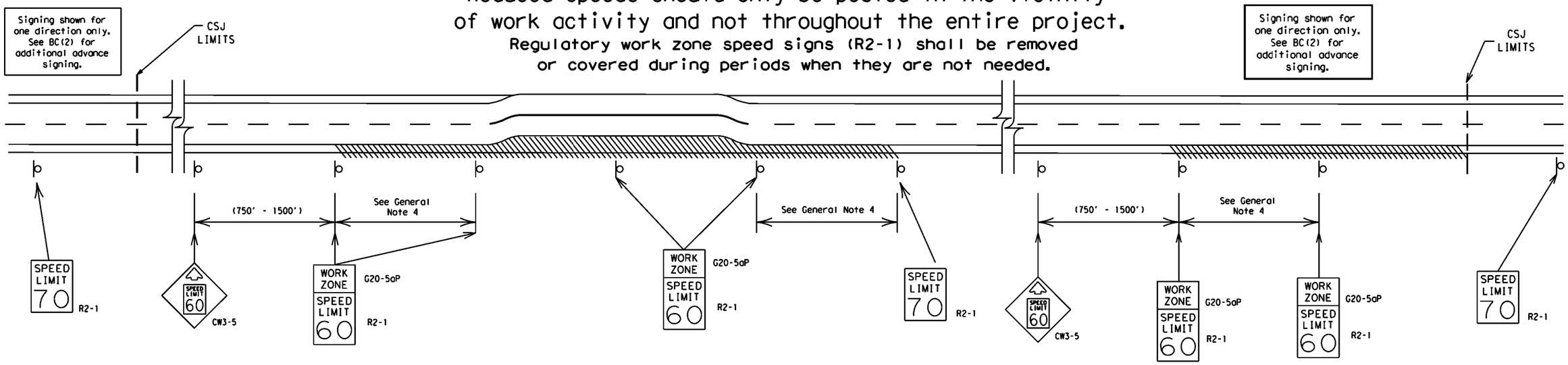
TYPICAL APPLICATION OF WORK ZONE SPEED LIMIT SIGNS

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

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

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



GUIDANCE FOR USE:

LONG/INTERMEDIATE TERM WORK ZONE SPEED LIMITS

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

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

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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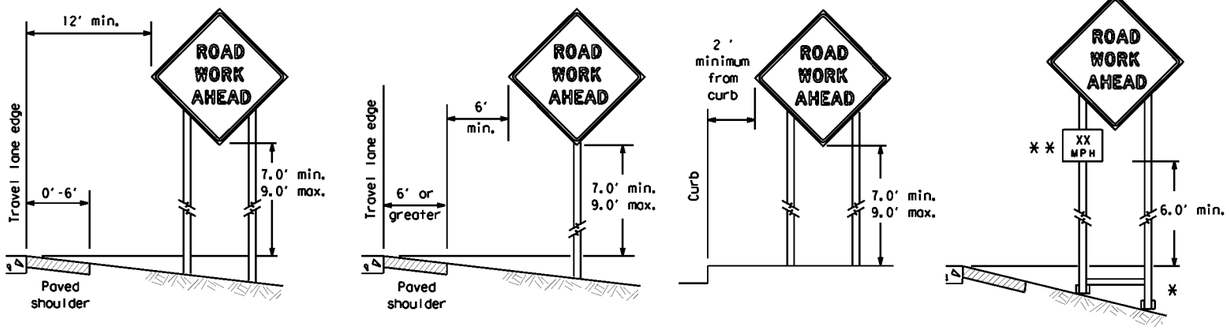
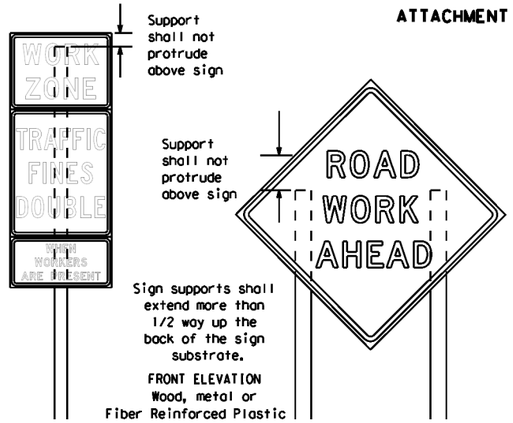
TYPICAL MINIMUM CLEARANCES FOR LONG TERM AND INTERMEDIATE TERM SIGNS

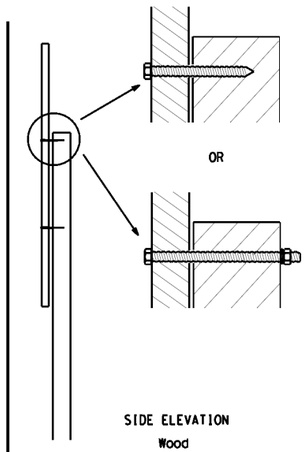


* When placing skid supports on unlevel ground, the leg post lengths must be adjusted so the sign appears straight and plumb. Objects shall NOT be placed under skids as a means of leveling.

** 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





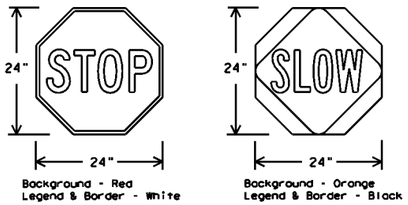
Attachment to wooden supports will be by bolts and nuts or screws. Use TxDOT's or manufacturer's recommended procedures for attaching sign substrates to other types of sign supports

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

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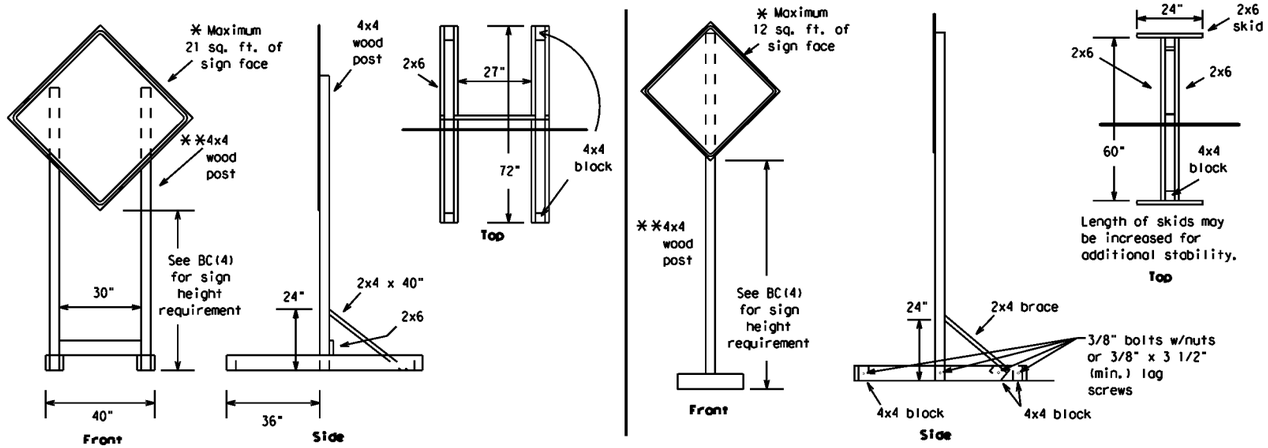
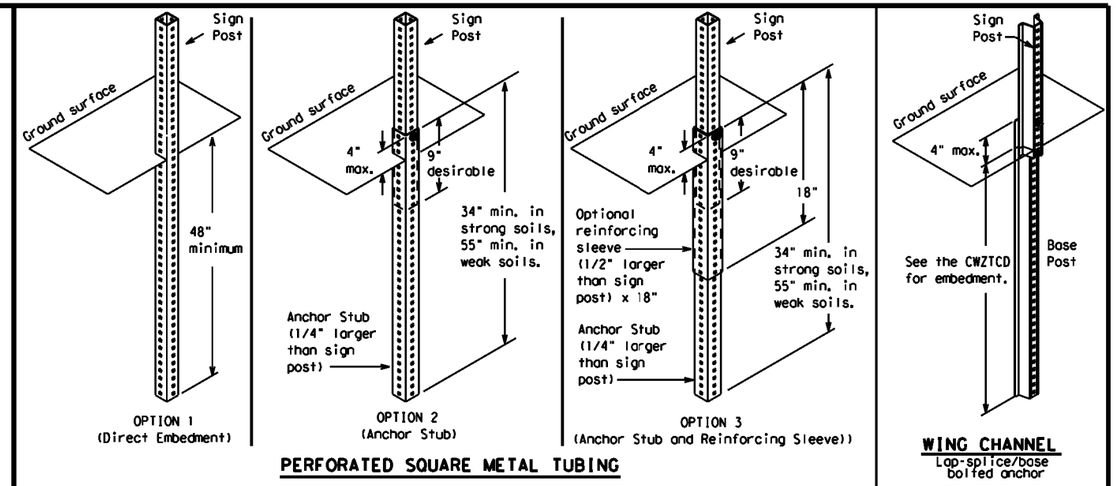


SKID MOUNTED WOOD SIGN SUPPORTS

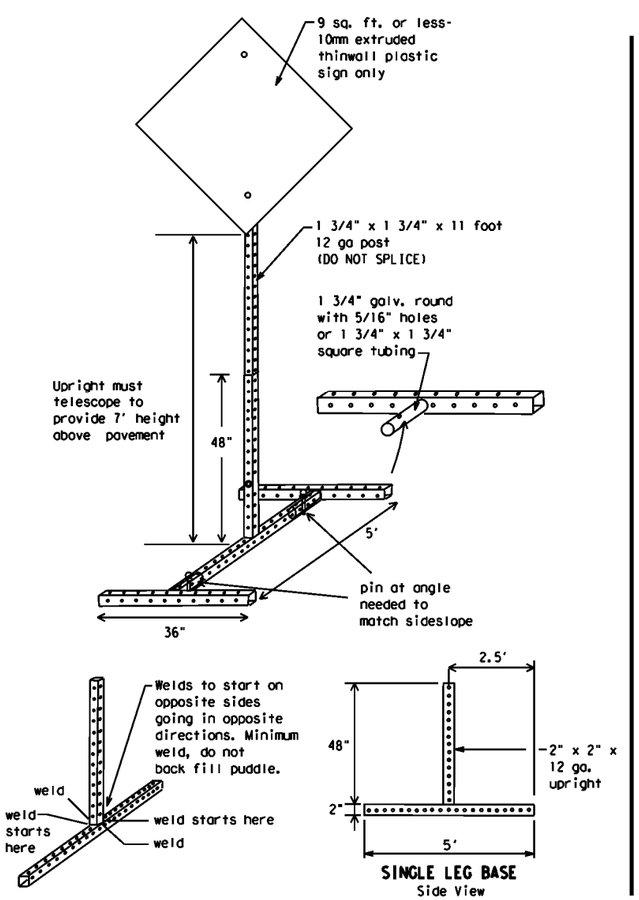
* LONG/INTERMEDIATE TERM STATIONARY - PORTABLE SKID MOUNTED SIGN SUPPORTS

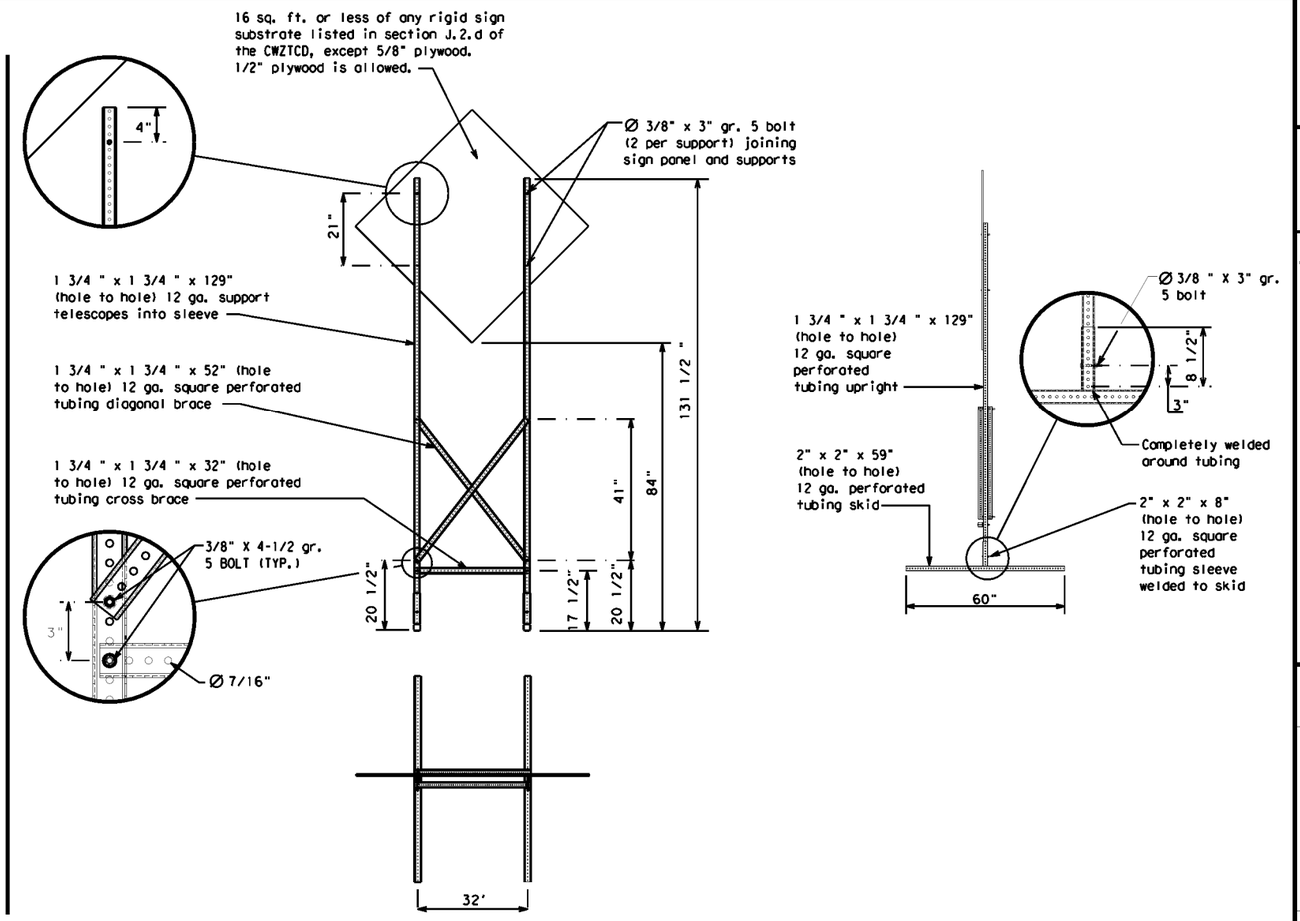


PERFORATED SQUARE METAL TUBING

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.

SHEET 5 OF 12

Texas Department of Transportation | Traffic Safety Division Standard

BARRICADE AND CONSTRUCTION TYPICAL SIGN SUPPORT

BC(5)-21

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©TxDOT November 2002	CONT	SECT	JOB	HIGHWAY
REVISIONS	0018	05	090	IH35 WFR
9-07 8-14	DIST	COUNTY		SHEET NO.
7-13 5-21	22	WEBB		34

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

PORTABLE CHANGEABLE MESSAGE SIGNS

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

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

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

RECOMMENDED PHASES AND FORMATS FOR PCMS MESSAGES DURING ROADWORK ACTIVITIES

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

Phase 1: Condition Lists

Road/Lane/Ramp Closure List

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

Other Condition List

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

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

Phase 2: Possible Component Lists

Action to Take/Effect on Travel List

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

Location List

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

Warning List

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

** Advance Notice List

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

** 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

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REVISIONS		0018	05	090	IH35 WFR
9-07 8-14		DIST	COUNTY		SHEET NO.
7-13 5-21		22	WEBB		35

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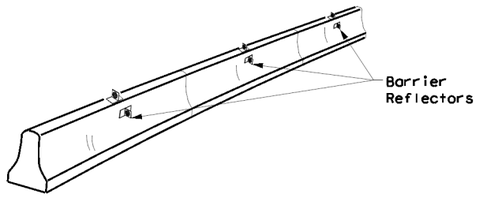
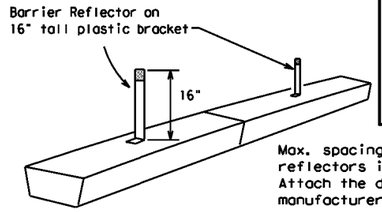
1. Barrier Reflectors shall be pre-qualified, and conform to the color and reflectivity requirements of DMS-8600. A list of prequalified Barrier Reflectors can be found at the Material Producer List web address shown on BC(1).
2. Color of Barrier Reflectors shall be as specified in the TMUTCD. The cost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



CONCRETE TRAFFIC BARRIER (CTB)

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

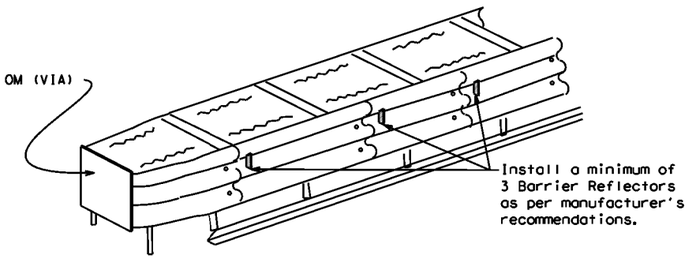


Max. spacing of barrier reflectors is 20 feet. Attach the delineators as per manufacturer's recommendations.

LOW PROFILE CONCRETE BARRIER (LPCB) 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)

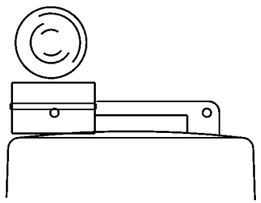


DELINEATION OF END TREATMENTS

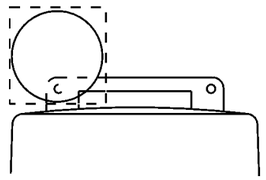
END TREATMENTS FOR CTB'S USED IN WORK ZONES

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

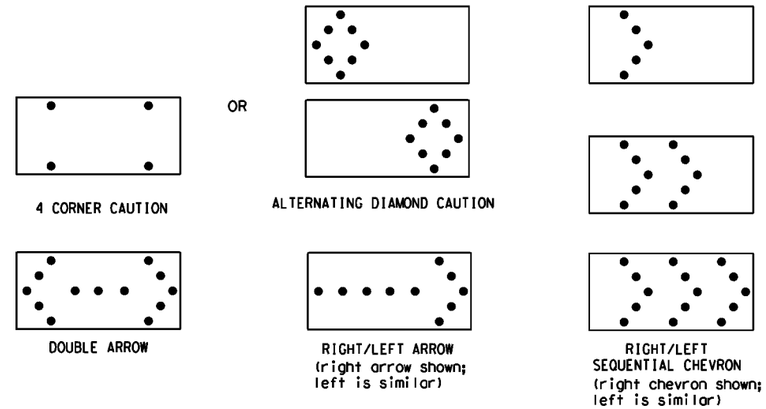
1. Type A flashing warning lights are intended to warn drivers that they are approaching or are in a potentially hazardous area.
2. Type A random flashing warning lights are not intended for delineation and shall not be used in a series.
3. A series of sequential flashing warning lights placed on channelizing 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 on 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
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9-07 8-14	DIST	COUNTY		SHEET NO.
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GENERAL NOTES

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

GENERAL DESIGN REQUIREMENTS

Pre-qualified plastic drums shall meet the following requirements:

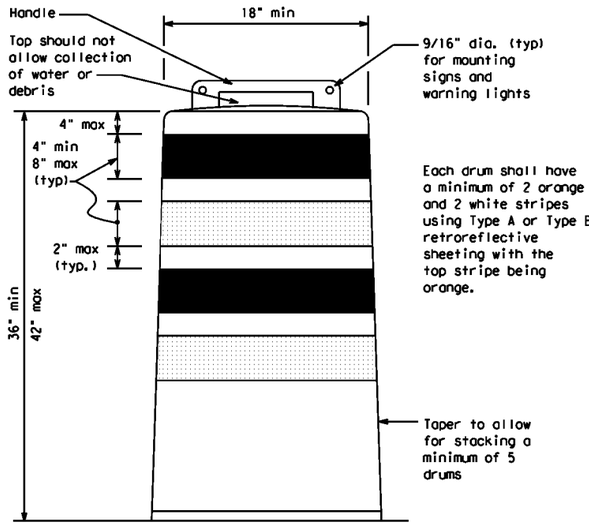
1. Plastic drums shall be a two-piece design; the "body" of the drum shall be the top portion and the "base" shall be the bottom.
2. The body and base shall lock together in such a manner that the body separates from the base when impacted by a vehicle traveling at a speed of 20 MPH or greater but prevents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

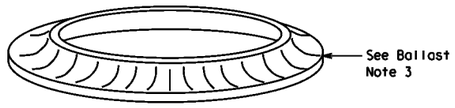
RETROREFLECTIVE SHEETING

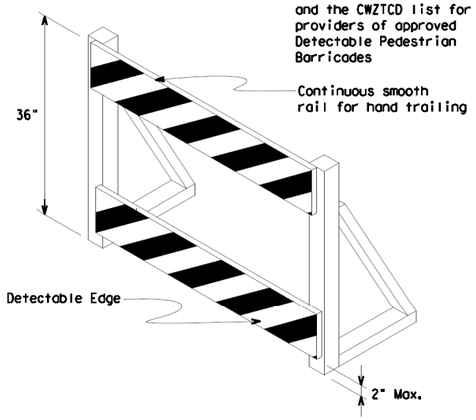
1. The stripes used on drums shall be constructed of sheeting meeting the color and retroreflectivity requirements of Departmental Materials Specification DMS-8300, "Sign Face Materials," Type A or Type B reflective sheeting shall be supplied unless otherwise specified in the plans.
2. The sheeting shall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

BALLAST

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

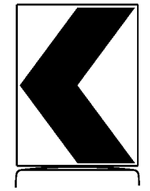




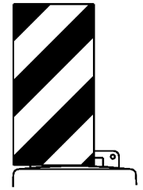


DETECTABLE PEDESTRIAN BARRICADES

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



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



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

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

SIGNS, CHEVRONS, AND VERTICAL PANELS MOUNTED ON PLASTIC DRUMS

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

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BARRICADE AND CONSTRUCTION CHANNELIZING DEVICES

BC(8)-21

FILE: bc-21.dgn	DN: TxDOT	CK: TxDOT	DW: TxDOT	CK: TxDOT
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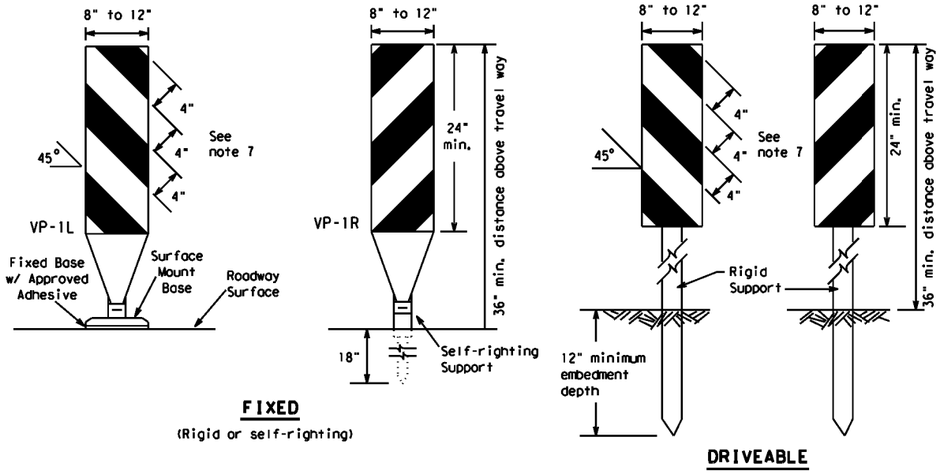
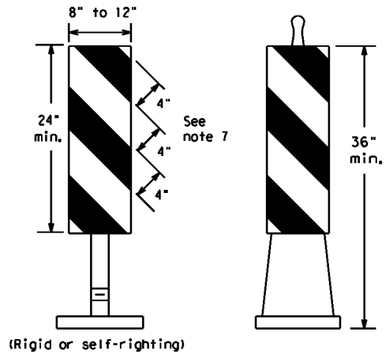
REVISIONS	0018	05	090	IH35 WFR
4-03 8-14	DIST	COUNTY		SHEET NO.
9-07 5-21	22	WEBB		37
7-13				



FIXED
(Rigid or self-righting)

DRIVEABLE

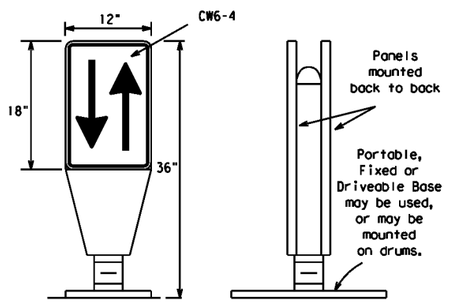


(Rigid or self-righting)

PORTABLE

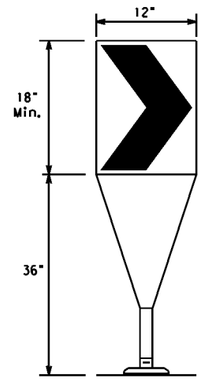
1. Vertical Panels (VP's) are normally used to channelize traffic or divide opposing lanes of traffic.
2. VP's may be used in daytime or nighttime situations. They may be used at the edge of shoulder drop-offs and other areas such as lane transitions where positive daytime and nighttime delineation is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

VERTICAL PANELS (VPs)



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

OPPOSING TRAFFIC LANE DIVIDERS (OTLD)



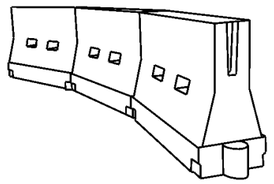
Fixed Base w/ Approved Adhesive (Driveable Base, or Flexible Support can be used)

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

CHEVRONS

GENERAL NOTES

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



LONGITUDINAL CHANNELIZING DEVICES (LCD)

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

WATER BALLASTED SYSTEMS USED AS BARRIERS

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

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

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

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

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

SUGGESTED MAXIMUM SPACING OF CHANNELIZING DEVICES AND MINIMUM DESIRABLE TAPER LENGTHS

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Texas Department of Transportation — Traffic Safety Division Standard

BARRICADE AND CONSTRUCTION CHANNELIZING DEVICES

BC(9)-21

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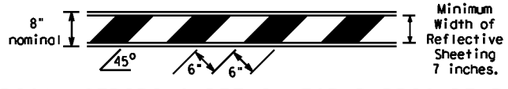
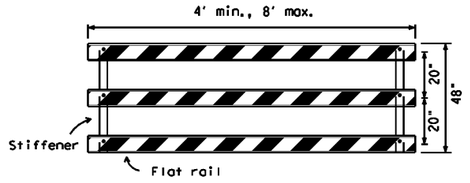
TYPE 3 BARRICADES

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

Barricades shall NOT be used as a sign support.



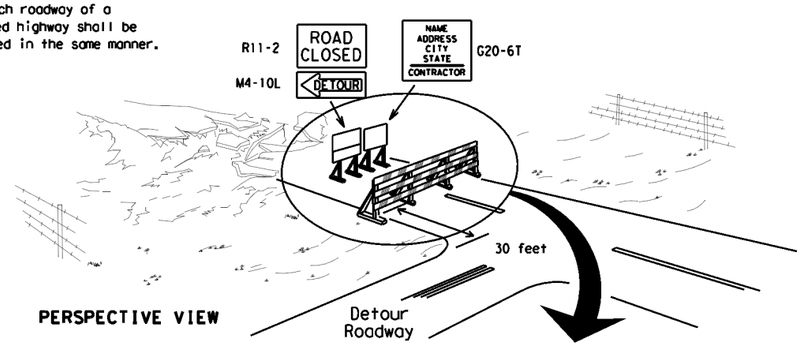
TYPICAL STRIPING DETAIL FOR BARRICADE RAIL



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

TYPICAL PANEL DETAIL FOR SKID OR POST TYPE BARRICADES

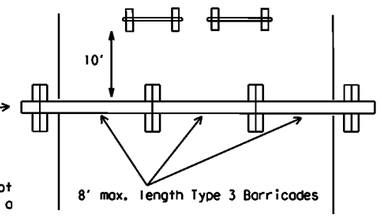
Each roadway of a divided highway shall be barricaded in the same manner.



PERSPECTIVE VIEW

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

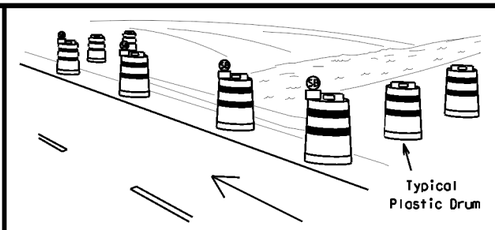
Barricade striping should slant downward in the direction of detour.



PLAN VIEW

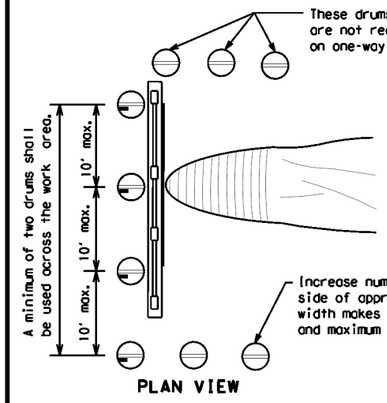
1. Signs should be mounted on independent supports at a 7 foot mounting height in center of roadway. The signs should be a minimum of 10 feet behind Type 3 Barricades.
2. Advance signing shall be as specified elsewhere in the plans.

TYPE 3 BARRICADE (POST AND SKID) TYPICAL APPLICATION



PERSPECTIVE VIEW

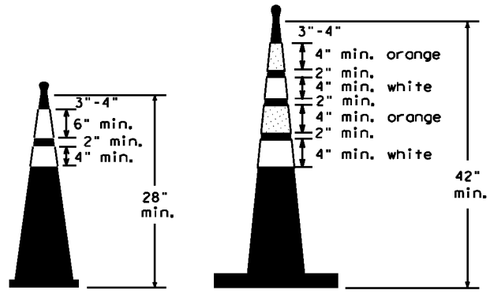
1. Where positive redirectional capability is provided, drums may be omitted.
2. Plastic construction fencing may be used with drums for safety as required in the plans.
3. Vertical Panels on flexible support may be substituted for drums when the shoulder width is less than 4 feet.
4. When the shoulder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



PLAN VIEW

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

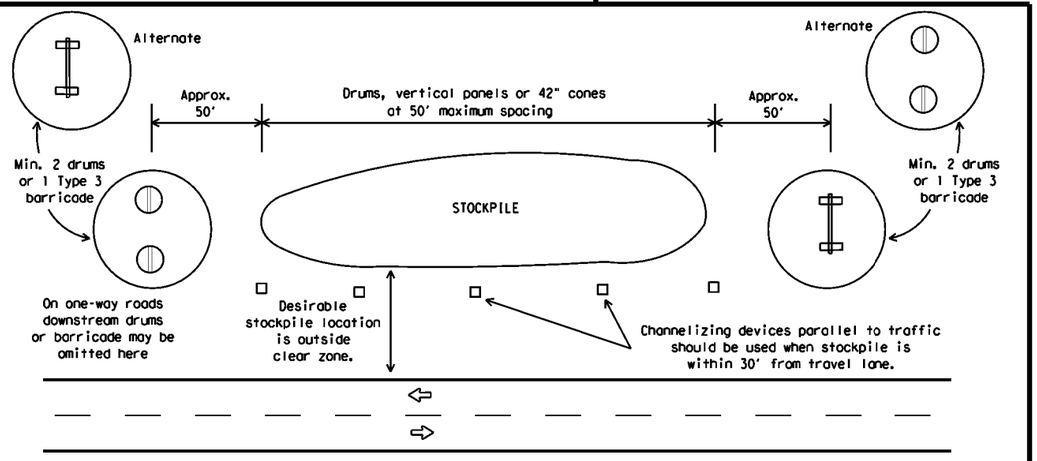
CULVERT WIDENING OR OTHER ISOLATED WORK WITHIN THE PROJECT LIMITS



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

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

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



TRAFFIC CONTROL FOR MATERIAL STOCKPILES

SHEET 10 OF 12

Texas Department of Transportation

Traffic Safety Division Standard

BARRICADE AND CONSTRUCTION CHANNELIZING DEVICES

BC(10)-21

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	22	WEBB		39

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WORK ZONE PAVEMENT MARKINGS

GENERAL

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

RAISED PAVEMENT MARKERS

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

PREFABRICATED PAVEMENT MARKINGS

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

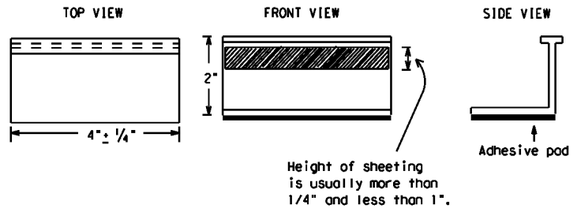
MAINTAINING WORK ZONE PAVEMENT MARKINGS

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

REMOVAL OF PAVEMENT MARKINGS

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

Temporary Flexible-Reflective Roadway Marker Tabs



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

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

RAISED PAVEMENT MARKERS USED AS GUIDEMARKS

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

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

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

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

Texas Department of Transportation

Traffic Safety Division Standard

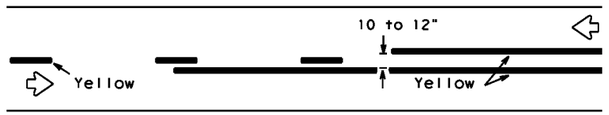
BARRICADE AND CONSTRUCTION PAVEMENT MARKINGS

BC(11)-21

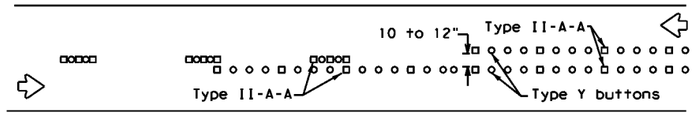
FILE: bc-21.dgn	DN: TxDOT	CK: TxDOT	DW: TxDOT	CK: TxDOT
©TxDOT February 1998	CONT	SECT	JOB	HIGHWAY
REVISIONS 2-98 9-07 5-21 1-02 7-13 11-02 8-14	0018	05	090	IH35 WFR
	DIST	COUNTY		SHEET NO.
	22	WEBB		40

DATE: 11/27/2023 2:53:13 PM
FILE: c:\txdot\pw_online\txdot5\krystal.hernandez\d1042305\bc-21.dgn

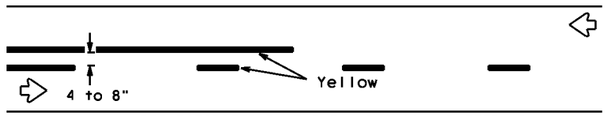
PAVEMENT MARKING PATTERNS



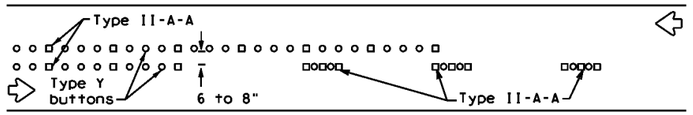
REFLECTORIZED PAVEMENT MARKINGS - PATTERN A



RAISED PAVEMENT MARKERS - PATTERN A



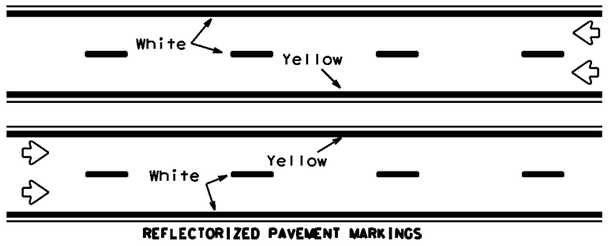
REFLECTORIZED PAVEMENT MARKINGS - PATTERN B



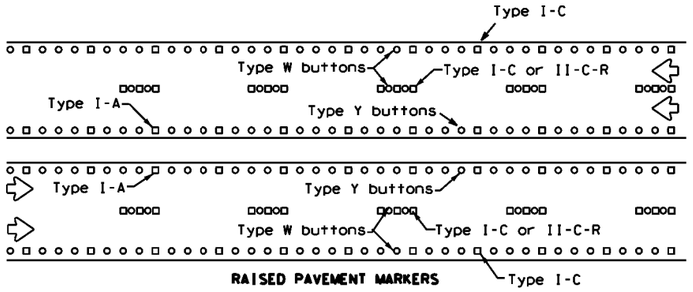
RAISED PAVEMENT MARKERS - PATTERN B

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



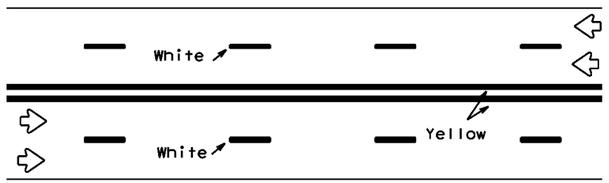
REFLECTORIZED PAVEMENT MARKINGS



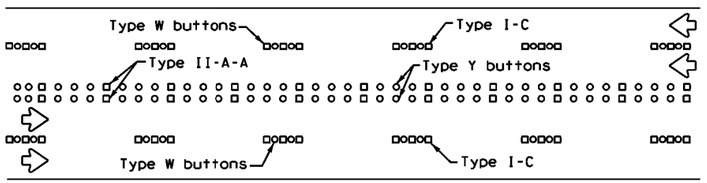
RAISED PAVEMENT MARKERS

Prefabricated markings may be substituted for reflectorized pavement markings.

EDGE & LANE LINES FOR DIVIDED HIGHWAY



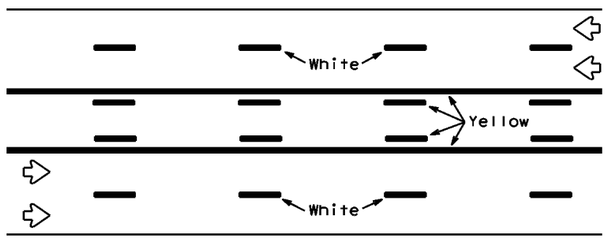
REFLECTORIZED PAVEMENT MARKINGS



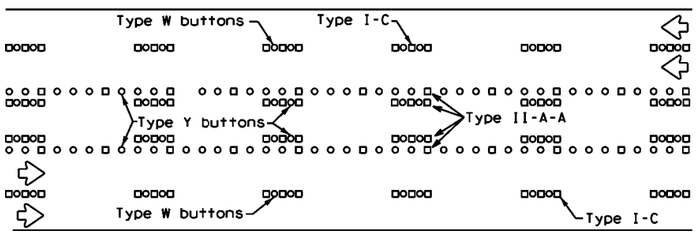
RAISED PAVEMENT MARKERS

Prefabricated markings may be substituted for reflectorized pavement markings.

LANE & CENTER LINES FOR MULTILANE UNDIVIDED HIGHWAYS



REFLECTORIZED PAVEMENT MARKINGS



RAISED PAVEMENT MARKERS

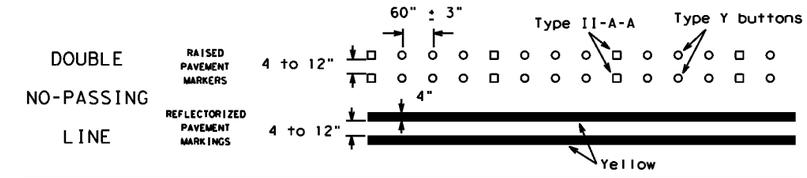
Prefabricated markings may be substituted for reflectorized pavement markings.

TWO-WAY LEFT TURN LANE

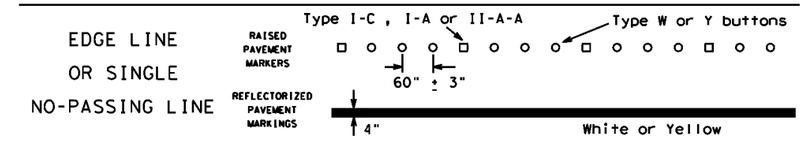
STANDARD WORK ZONE PAVEMENT MARKINGS DETAILS

SOLID LINES

DOUBLE NO-PASSING LINE

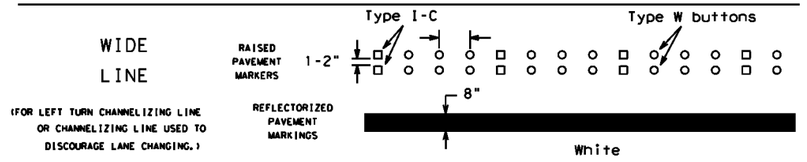


EDGE LINE OR SINGLE NO-PASSING LINE



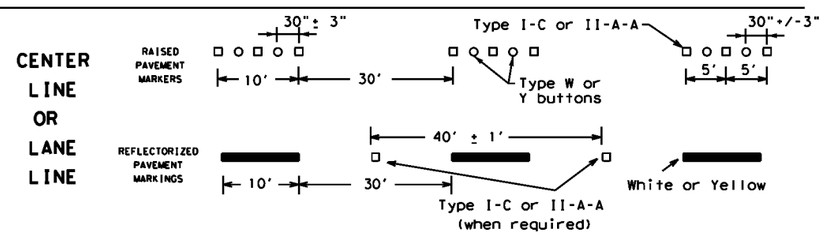
WIDE LINE

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

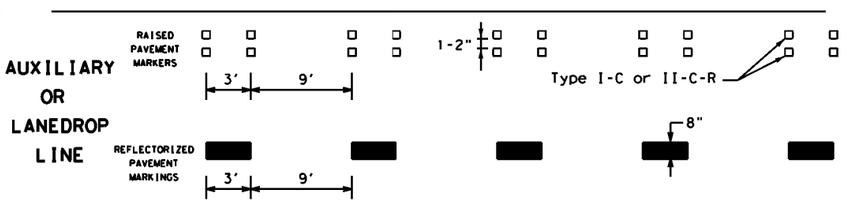


BROKEN LINES

CENTER LINE OR LANE LINE

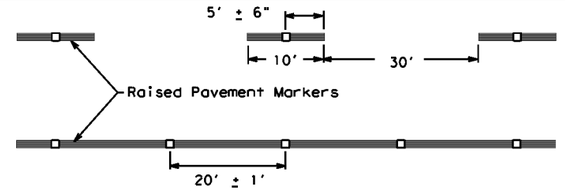


AUXILIARY OR LANEDROP LINE



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	0018	05	090	IH35 WFR
1-97 9-07 5-21	DIST	COUNTY		SHEET NO.
2-98 7-13	22	WEBB		41
11-02 8-14				

DATE: 11/27/2023 2:53:30 PM
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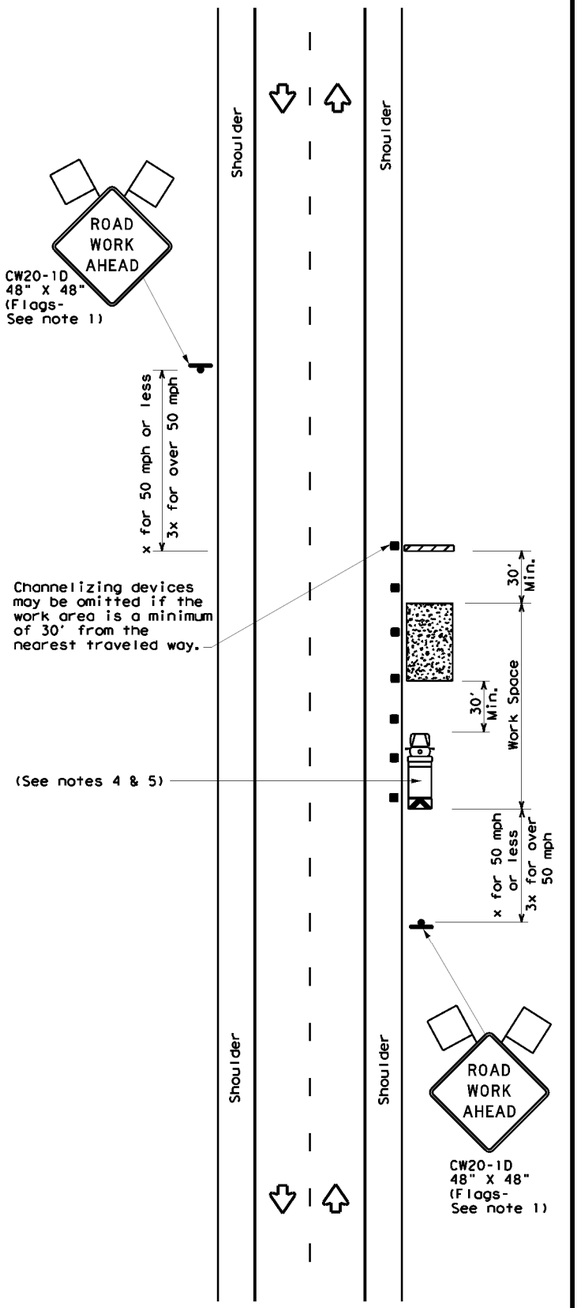
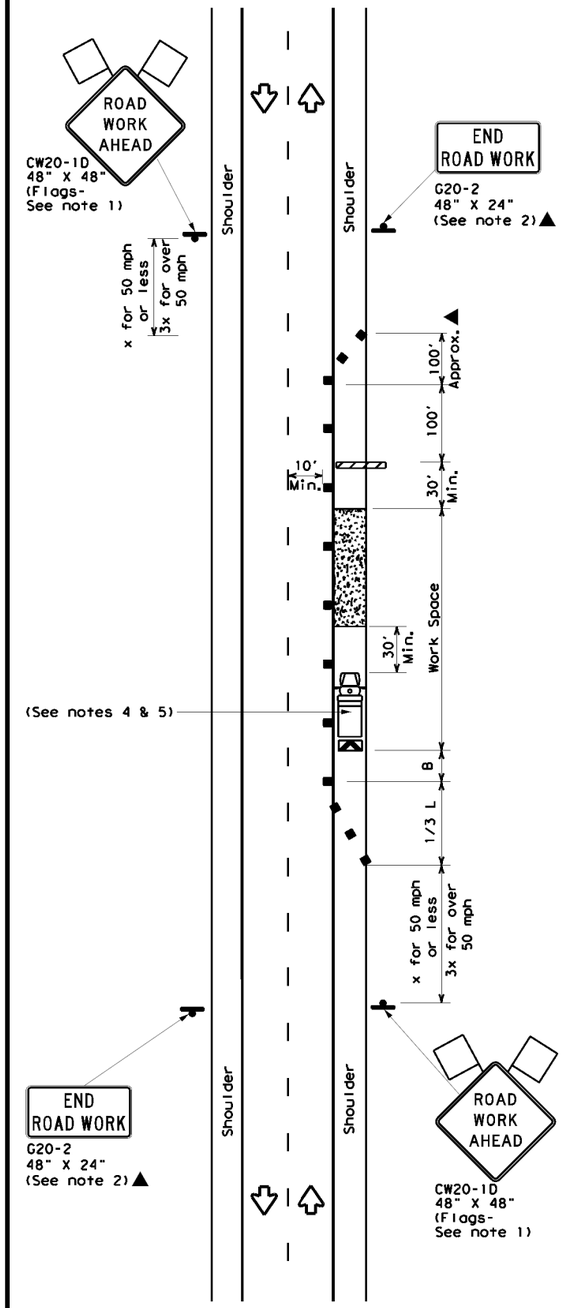


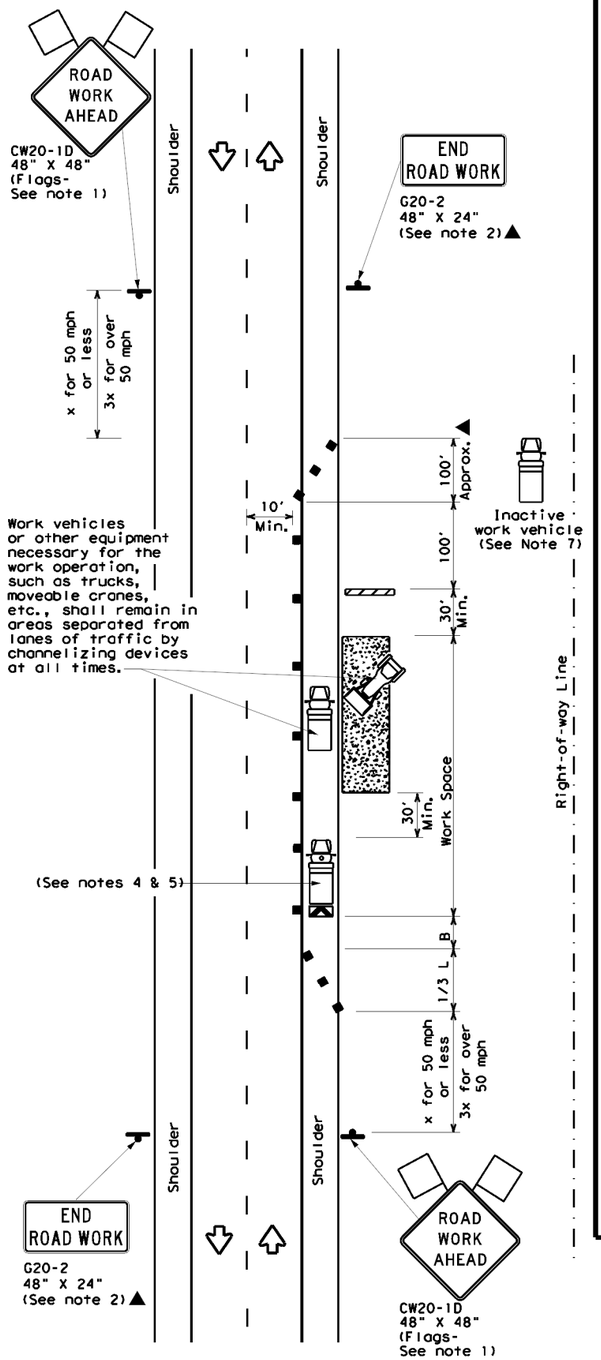
TCP (2-1a)

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.

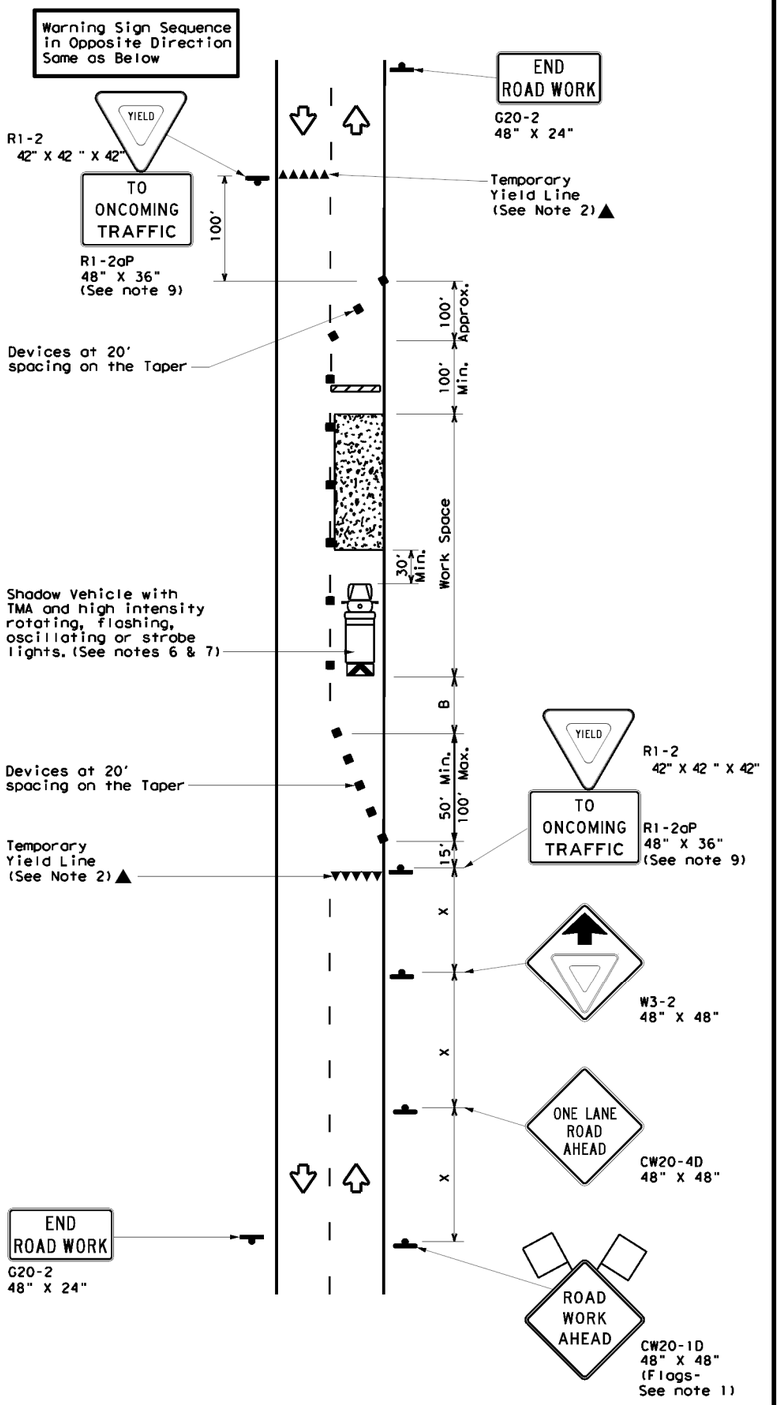
Texas Department of Transportation

Traffic Operations Division Standard

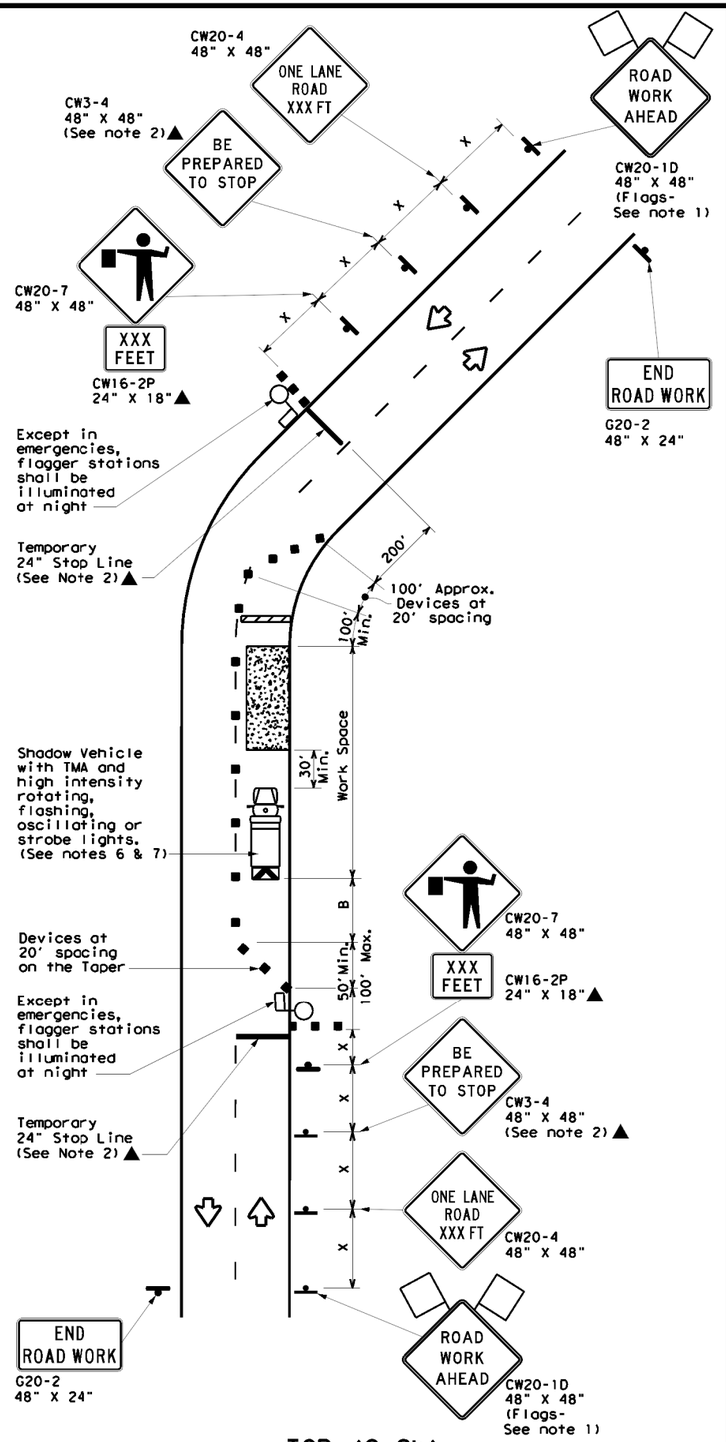
TRAFFIC CONTROL PLAN CONVENTIONAL ROAD SHOULDER WORK

TCP(2-1)-18

FILE: tcp2-1-18.dgn	DN: TxDOT	CK: TxDOT	DW: TxDOT	CK: TxDOT
© TxDOT December 1985	CONT	SECT	JOB	HIGHWAY
REVISIONS	0018	05	090	IH35 WFR
2-94 4-98	DIST	COUNTY		SHEET NO.
8-95 2-12	22	WEBB		42
1-97 2-18				



TCP (2-2a)
2-LANE ROADWAY WITHOUT PAVED SHOULDERS
ONE LANE TWO-WAY
CONTROL WITH YIELD SIGNS
(Less than 2000 ADT - See Note 9)



TCP (2-2b)
2-LANE ROADWAY WITHOUT PAVED SHOULDERS
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 CW20-4 "ONE LANE ROAD XXX FT" sign, but proper sign spacing shall be maintained.
4. Flaggers should use two-way radios or other methods of communication to control traffic.
5. Length of work space should be based on the ability of flaggers to communicate.
6. 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 off the paved surface, next to those shown in order to protect a wider work space.

TCP (2-2a)

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

TCP (2-2b)

10. Channelizing devices on the center line may be omitted when a pilot car is leading traffic and approved by the Engineer.
11. If the work space is located near a horizontal or vertical curve, the buffer distances should be increased in order to maintain stopping sight distance to the flagger and a queue of stopped vehicles. (See table above).
12. Flaggers should use 24" STOP/SLOW paddles to control traffic. Flags should be limited to emergency situtations.

Texas Department of Transportation
Traffic Operations Division Standard

TRAFFIC CONTROL PLAN ONE-LANE TWO-WAY TRAFFIC CONTROL

TCP(2-2)-18

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1-97 2-12	22	WEBB		43
4-98 2-18				

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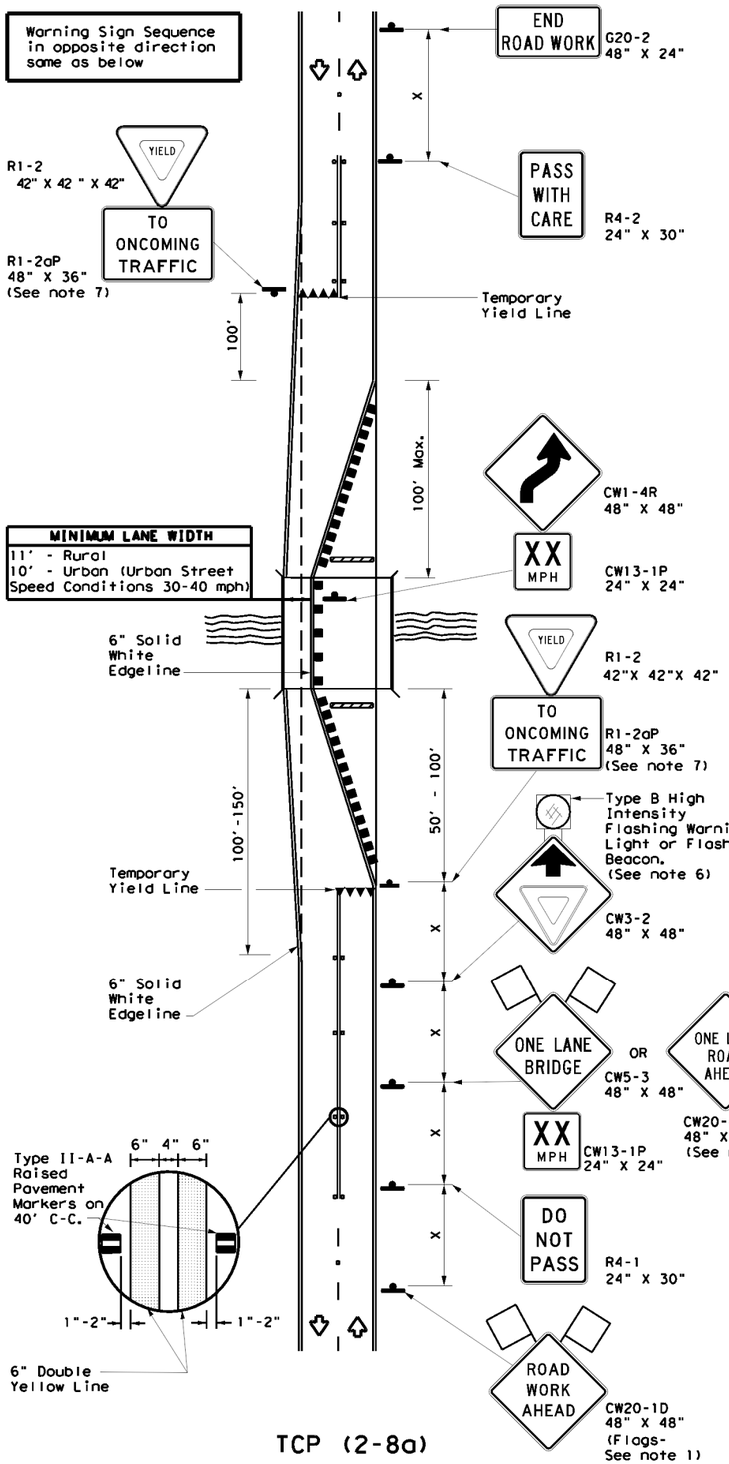
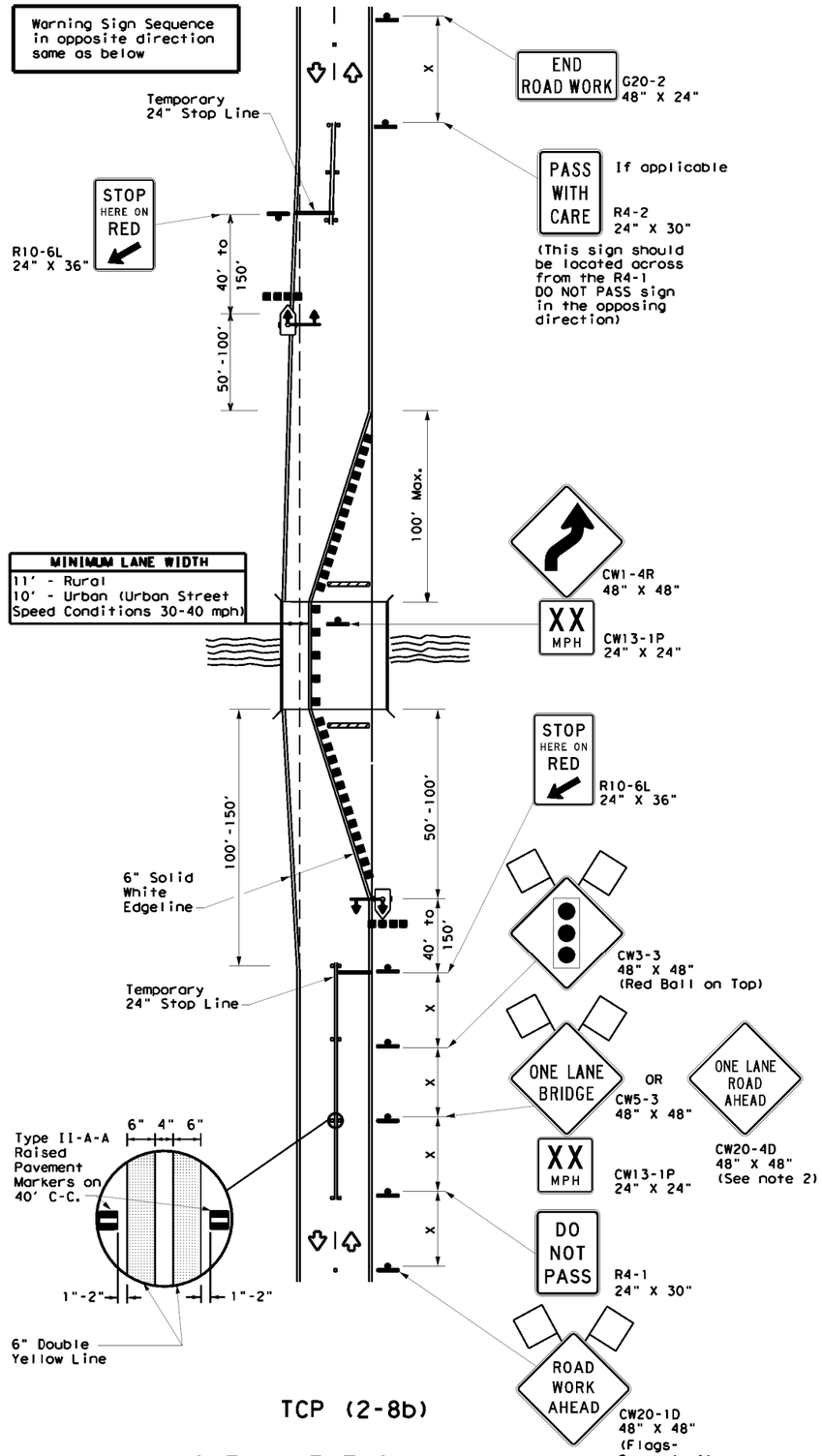


TCP (2-8a)

ONE LANE TWO-WAY
TRAFFIC CONTROL WITH YIELD SIGNS
(Less Than 2000 ADT-See Note 5)



TCP (2-8b)

ONE LANE TWO-WAY
TRAFFIC CONTROL WITH TRAFFIC SIGNAL

LEGEND			
	Type 3 Barricade		Channelizing Devices
	Sign		Traffic Flow
	Flag		Flagger
	Raised Pavement Markers Ty II-AA		Temporary or Portable Traffic Signal

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. When this TCP is used at a location which does not involve a bridge, a 48" x 48" CW20-4D "ONE LANE ROAD AHEAD" signs should be used in lieu of the CW5-3 "ONE LANE BRIDGE" signs. The CW13-1P Advisory Speed Plaque is required with either warning sign.
3. Raised pavement markers shall be placed 40 feet c-c on centerline between DO NOT PASS signs and stop or yield lines.
4. For intermediate term situations, when it is not feasible to remove and restore pavement markings, the channelization must be made dominant by using a very close spacing. This is especially important in locations of conflicting information, such as where traffic is directed over a double yellow centerline. In such locations a maximum channelizing device spacing of 20 feet is recommended. The 20 foot channelizing device spacing recommendation is intended for the area of conflicting information and not the entire work zone.

TCP (2-8a)

5. Traffic control by CW3-2 "YIELD AHEAD" symbol signs for one lane two-way traffic control operations should be limited to work spaces less than 400 feet long and roadways with less than 2000 ADT. Otherwise, portable traffic signals should be used.
6. If power is available, a flashing beacon should be attached to the CW3-2 "YIELD AHEAD" symbol sign for emphasis.
7. The R1-2 "YIELD" and R1-2aP "TO ONCOMING TRAFFIC" signs and other regulatory signs shall be installed at 7 foot minimum mounting height.

TCP (2-8b)

8. A list of approved Portable Traffic Signals can be found in the "Compliant Work Zone Traffic Control Devices" list.
9. Portable traffic signals should be located to provide adequate stopping sight distance for approaching motorist (See table above).

Texas Department of Transportation

Traffic Safety Division Standard

TRAFFIC CONTROL PLAN LONG TERM ONE-LANE TWO-WAY CONTROL

TCP(2-8)-23

FILE: tcp2-8-23.dgn	DN:TxDOT	CK:TxDOT	DW:TxDOT	CK:TxDOT
©TxDOT April 2023	CONT	SECT	JOB	HIGHWAY
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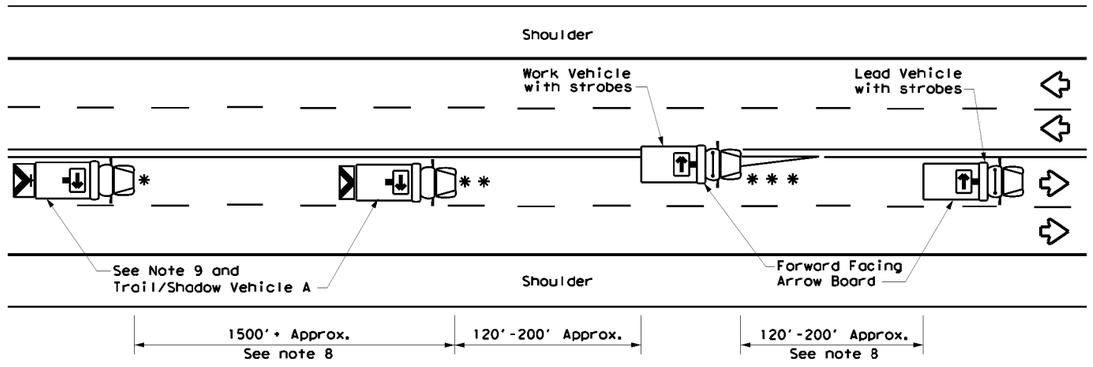
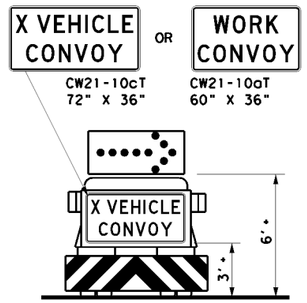


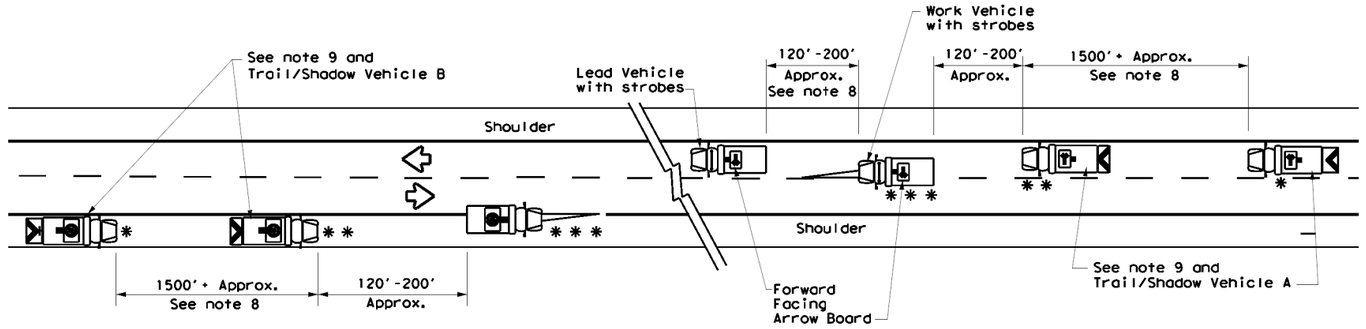
TCP (3-1a)

UNDIVIDED MULTILANE ROADWAY



TRAIL/SHADOW VEHICLE A

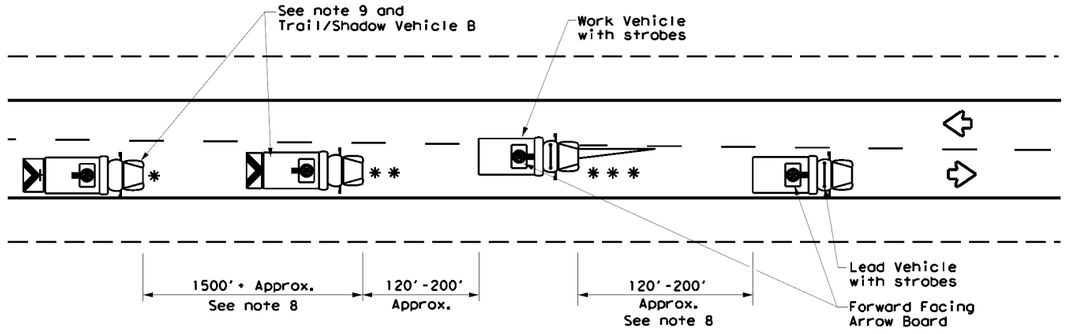
with RIGHT Directional display Flashing Arrow Board



WORK ON SHOULDER — WORK ON TRAVEL LANE

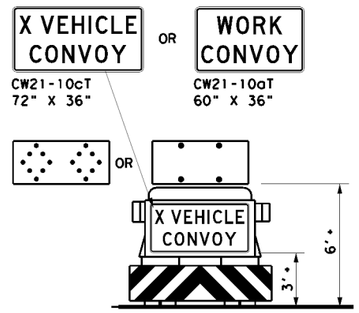
TCP (3-1b)

TWO-WAY ROADWAY WITH PAVED SHOULDERS



TCP (3-1c)

TWO-WAY ROADWAY WITHOUT PAVED SHOULDERS



TRAIL/SHADOW VEHICLE B

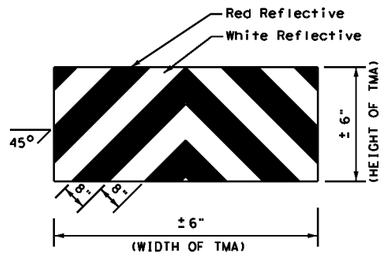
with Flashing Arrow Board in CAUTION display

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

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©TxDOT December 1985	CONT	SECT	JOB	HIGHWAY
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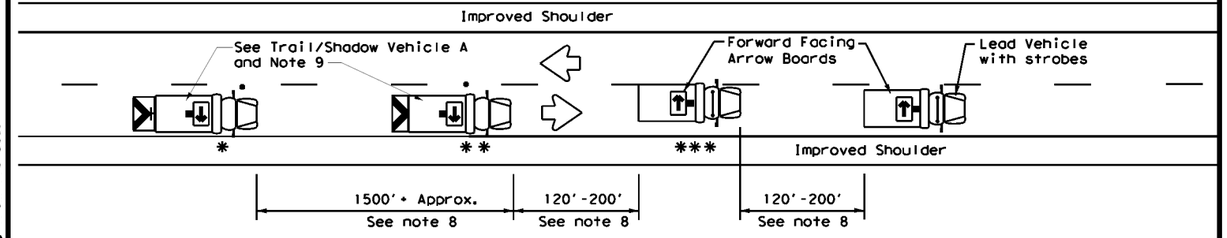
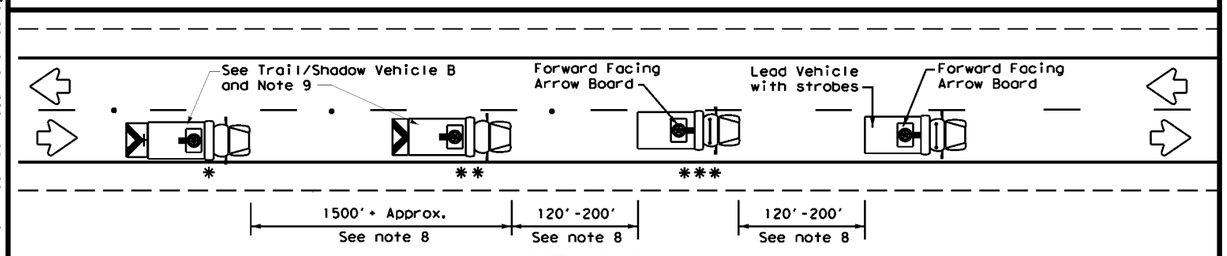


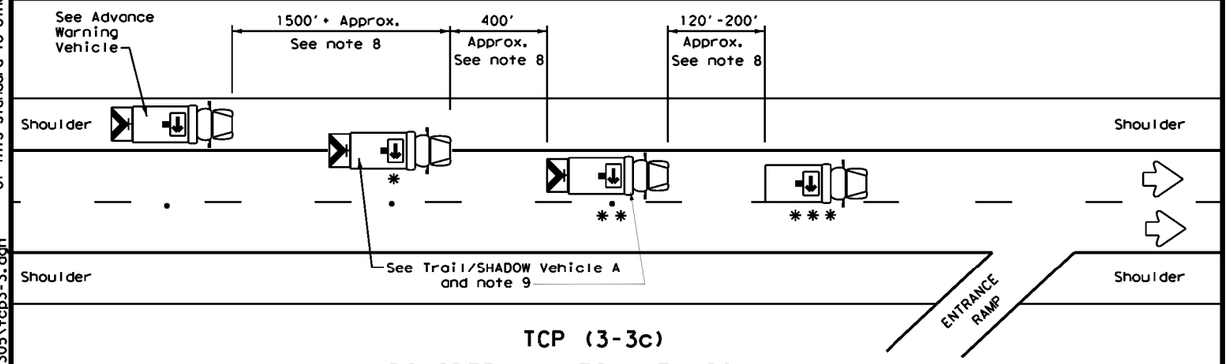
TCP (3-3a)

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



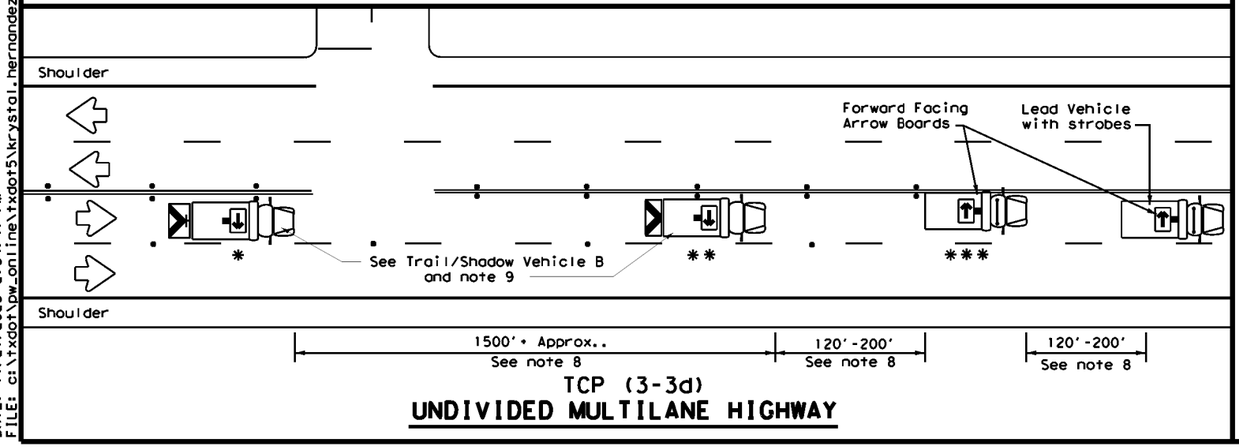
TCP (3-3b)

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



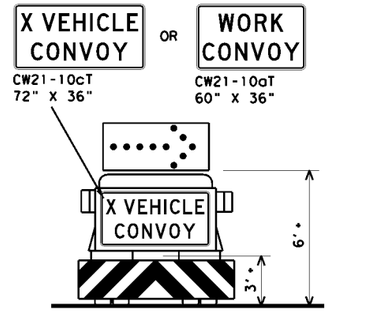
TCP (3-3c)

DIVIDED MULTILANE HIGHWAY



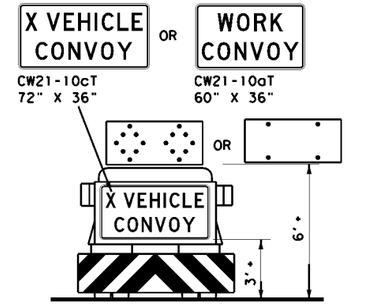
TCP (3-3d)

UNDIVIDED MULTILANE HIGHWAY



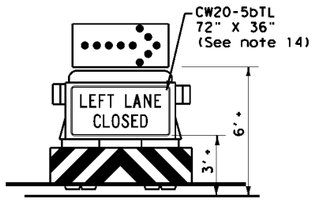
TRAIL/SHADOW VEHICLE A

with RIGHT Directional display
Flashing Arrow Board

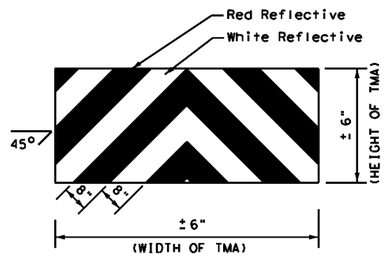


TRAIL/SHADOW VEHICLE B

with Flashing Arrow Board
in Caution Mode



ADVANCE WARNING VEHICLE



STRIPING FOR TMA

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

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

GENERAL NOTES

1. TRAIL, SHADOW, and LEAD vehicles shall be equipped with arrow boards as illustrated. When a LEAD vehicle is not used on two way roads the WORK vehicle must have an arrow board. For divided roadways, the arrow board on the WORK vehicle is optional based on the type of work being performed. The Engineer will determine if the LEAD vehicle and/or TRAIL vehicle are required based on prevailing roadway conditions, traffic volume, and sight distance restrictions.
2. The use of amber high intensity rotating, flashing, oscillating, or strobe lights on vehicles are required. Blue high intensity rotating, flashing, oscillating, or strobe lights when mounted on the driver's side of the vehicle may be operated simultaneously with the amber beacons or strobe lights.
3. The use of truck mounted attenuators (TMA) on the SHADOW VEHICLE, ADVANCE WARNING and TRAIL VEHICLE are required.
4. Reflective sheeting on the rear of the TMA shall meet or exceed the reflectivity and color requirements of DEPARTMENTAL MATERIAL SPECIFICATION DMS 8300, Type A.
5. Flashing arrow boards shall be Type B or Type C as per the Barricade and Construction (BC) standards. The board shall be controlled from inside the vehicle.
6. Each vehicle shall have two-way radio communication capability.
7. When work convoys must change lanes, the TRAIL VEHICLE should change lanes first to shadow the other convoy vehicles.
8. Vehicle spacing between the TRAIL VEHICLE and the SHADOW VEHICLE will vary depending on sight distance restrictions. Motorists approaching the convoy should be able to see the TRAIL VEHICLE in time to slow down and/or change lanes as they approach the TRAIL VEHICLE. Vehicle spacing between the WORK VEHICLE and SHADOW VEHICLE and vehicle spacing between WORK VEHICLE and LEAD VEHICLE may vary according to terrain, work activity and other factors.
9. X VEHICLE CONVOY (CW21-10cT) or WORK CONVOY (CW21-10aT) signs shall be used on TRAIL VEHICLES and SHADOW VEHICLES as shown. As an option 48" x 48" diamond shaped WORK CONVOY (CW21-10T) or X VEHICLE CONVOY (CW21-10bT) signs may be used where adequate mounting space exists. When used, the X VEHICLE CONVOY sign shall have the number of the convoy vehicles displayed on the sign in the number designation "X" location. The X VEHICLE CONVOY sign shall not be used on the SHADOW VEHICLE if a TRAIL VEHICLE is used.
10. For divided highways with two or three lanes in one direction, the appropriate LEFT LANE CLOSED (CW20-5bTL), RIGHT LANE CLOSED (CW20-5bTR), or CENTER LANE CLOSED (CW20-5dT) sign should be used on the Advance Warning Vehicle. As an option, a portable changeable message sign (PCMS) or truck mounted changeable message sign (TMCMS) with a minimum character height of 12", and displaying the same legend may be substituted for these signs. An appropriate directional arrow display, simulating the size and legibility of the flashing arrow board may be used in the second phase of the PCMS/TMCMS message. When this is done, the arrow board will not be required on the Advance Warning Vehicle.
11. A double arrow shall not be displayed on the arrow board on the Advance Warning Vehicle.
12. For divided highways with three or four lanes in each direction, use TCP(3-2).
13. Standard diamond shape versions of the CW20-5 series signs may be used as an option if the rectangular signs shown are not available.
14. The Advance Warning Vehicle may straddle the edgeline when Shoulder width makes it necessary.
15. On two-lane two-way roadways, the work and protection vehicles should pull over periodically to allow motor vehicle traffic to pass. If motorists are not allowed to pass the work convoy, a DO NOT PASS (R4-1) sign should be placed on the back of the rearmost protection vehicle.

Texas Department of Transportation

Traffic Operations Division Standard

TRAFFIC CONTROL PLAN
MOBILE OPERATIONS
RAISED PAVEMENT MARKER INSTALLATION/ REMOVAL
TCP(3-3)-14

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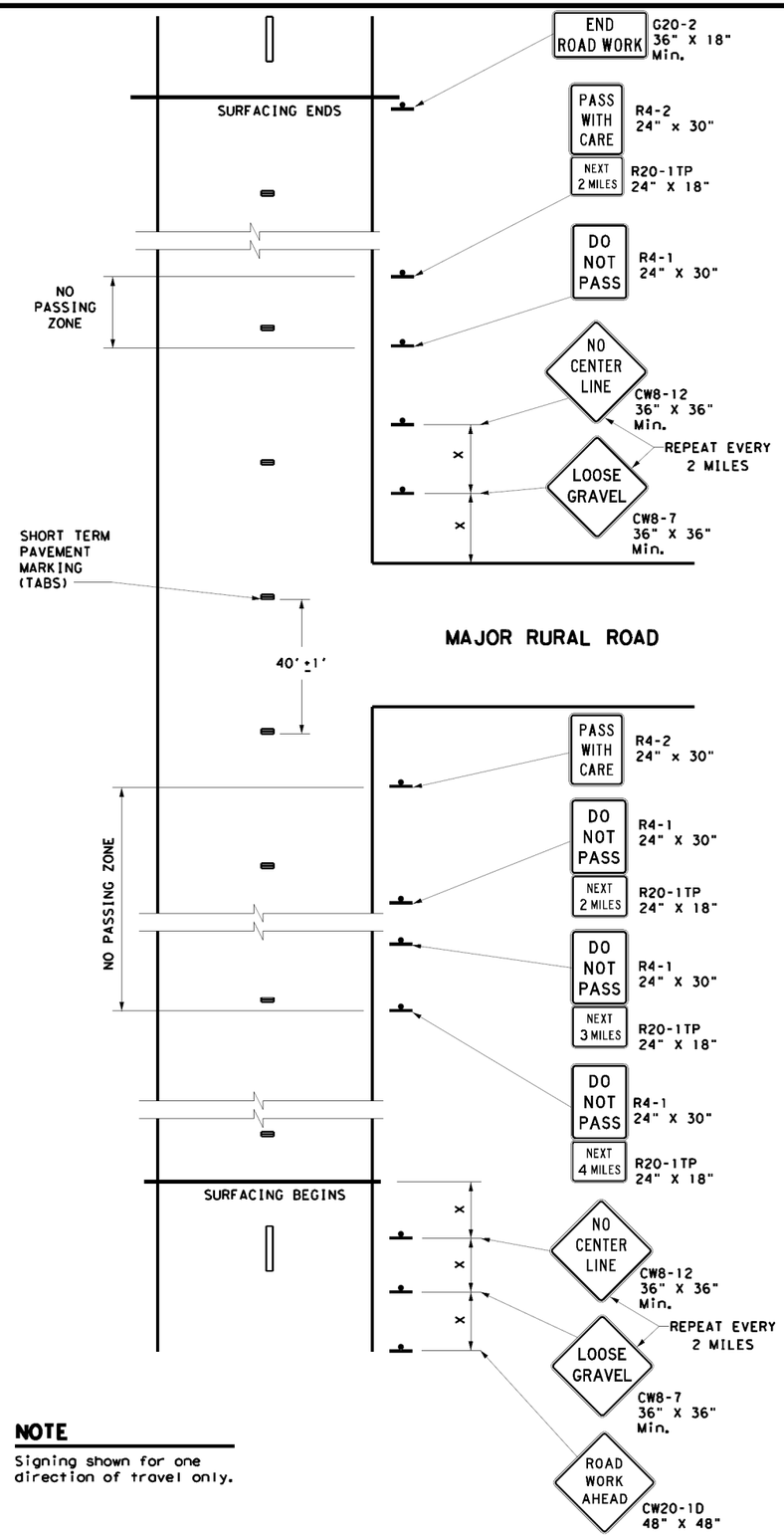
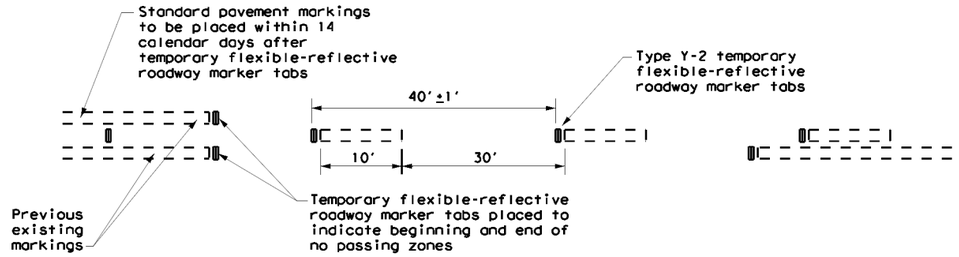


NOTE

Signing shown for one direction of travel only.

NO PASSING ZONES ON TWO-LANE TWO-WAY ROADS



TABS ON CENTERLINES OF TWO-LANE TWO-WAY ROADS

For seal coat, micro-surface or similar operations

"DO NOT PASS" SIGN (R4-1) and NO-PASSING ZONES

A. Prior to the beginning of construction, all currently striped no-passing zones shall be signed with the DO NOT PASS (R4-1) signs and PASS WITH CARE (R4-2) signs placed at the beginning and end of each zone for each direction of travel except as otherwise provided herein. Signs marking these individual no-passing zones need not be covered prior to construction if the signs supplement the existing pavement markings.

B. At the discretion of the Engineer, in areas of numerous no-passing zones, several zones may be combined as a single zone. If passing is to be prohibited over one or more lengthy sections, a DO NOT PASS sign and a NEXT XX MILES (R20-1TP) plaque may be used at the beginning of such zones. The DO NOT PASS sign and the NEXT XX MILES plaque should be repeated every mile to the end of the no-passing zone. In areas where there is considerable distance between no-passing zones, the end of the no-passing zone may be signed with a PASS WITH CARE sign and a NEXT XX MILES plaque.

C. Depending on traffic volumes and length of sections, it may be desirable to prohibit passing throughout the project to prevent damage to windshield and lights. The DO NOT PASS sign and NEXT XX MILES plaque should be used and repeated as often as necessary for this purpose. Where several existing zones are to be combined into one individual no-passing zone, the sign at the beginning of the zone should be covered until the surfacing operation has passed this location so as not to have the DO NOT PASS sign conflict with the existing pavement markings. Also, unless one days operation completes the entire length of such combined zones, appropriate DO NOT PASS and PASS WITH CARE signs should be placed at the beginning and end of the no-passing zones where the surfacing operation has stopped for the day.

D. R4-1 and R4-2 are to remain in place until standard pavement markings are installed.

"NO CENTER LINE" SIGN (CW8-12)

A. Center line markings are yellow pavement markings that delineate the separation of travel lanes that have opposite directions of travel on a roadway. Divided highways do not typically have center line markings.

B. At the time construction activity obliterates the existing center line markings(low volume roads may not have an existing centerline), a NO CENTER LINE (CW8-12) sign should be erected at the beginning of the work area, at approximately 2 mile intervals within the work area, beyond major intersections and other locations deemed necessary by the Engineer.

C. The NO CENTER LINE signs are to remain in place until standard pavement markings are installed.

"LOOSE GRAVEL" SIGN (CW8-7)

A. When construction begins, a LOOSE GRAVEL (CW8-7) sign should be erected at each end of the work area and repeated at intervals of approximately 2 miles in rural areas and closer in urban areas.

B. The LOOSE GRAVEL signs are to remain in place until the condition no longer exists.

PAVEMENT MARKINGS

A. Temporary markings for surfacing projects shall be Temporary Flexible-reflective Roadway Marker Tabs unless otherwise approved by the Engineer. Tabs are to be installed to provide true alignment for striping crews or as directed by the Engineer. Tabs will be placed at the spacing indicated. Tabs should be applied to the pavement
no more than two (2) days before the surfacing is applied. After the surfacing is rolled and swept, the cover over the reflective strip shall be removed.

B. Tabs shall not be used to simulate edge lines.

C. Tab placement for overlay/inlay operations shall be as shown on the WZ(STPM) standard sheet.

COORDINATION OF SIGN LOCATIONS

A. The location of warning signs at the beginning and end of a work area are to be coordinated with other signing typically shown on the Barricade and Construction Standards for project limits to ensure adequate sign spacing.

B. Where possible the ROAD WORK AHEAD (CW20-1D), LOOSE GRAVEL (CW8-7), and NO CENTER LINE (CW8-12) signs should be placed in the sequence shown following the OBEY WARNING SIGNS STATE LAW (R20-3T) and the TRAFFIC FINES DOUBLE (R20-5T) sign, and one "X" sign spacing prior to the CONTRACTOR (G20-6T)sign typically located at or near the limits of surfacing. LOOSE GRAVEL and NO CENTER LINE signs will then be repeated as described above.

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

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

GENERAL NOTES

1. The traffic control devices detailed on this sheet will be furnished and erected as directed by the Engineer on sections of roadway where tabs must be placed prior to the surfacing operation which will cover or obliterate the existing pavement markings.
2. The devices shown on this sheet are to be used to supplement those required by the BC Standards or others required elsewhere in the plans.
3. Signs shall be erected as detailed on the BC Standards or the Compliant Work Zone Traffic Control Devices List (CWZTCD) on supports approved for Long-Term / Intermediate-Term Work Zone Sign Supports.
4. When surfacing operations take place on divided highways, freeways or expressways, the size of diamond shaped construction warning signs shall be 48" x 48".
5. Signs on divided highways, freeways and expressways will be placed on both right and left sides of the roadway based on roadway conditions as directed by the Engineer.

Texas Department of Transportation

Traffic Operations Division Standard

TRAFFIC CONTROL DETAILS FOR SURFACING OPERATIONS

TCP(7-1)-13

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© TxDOT March 1991	CONT	SECT	JOB	HIGHWAY
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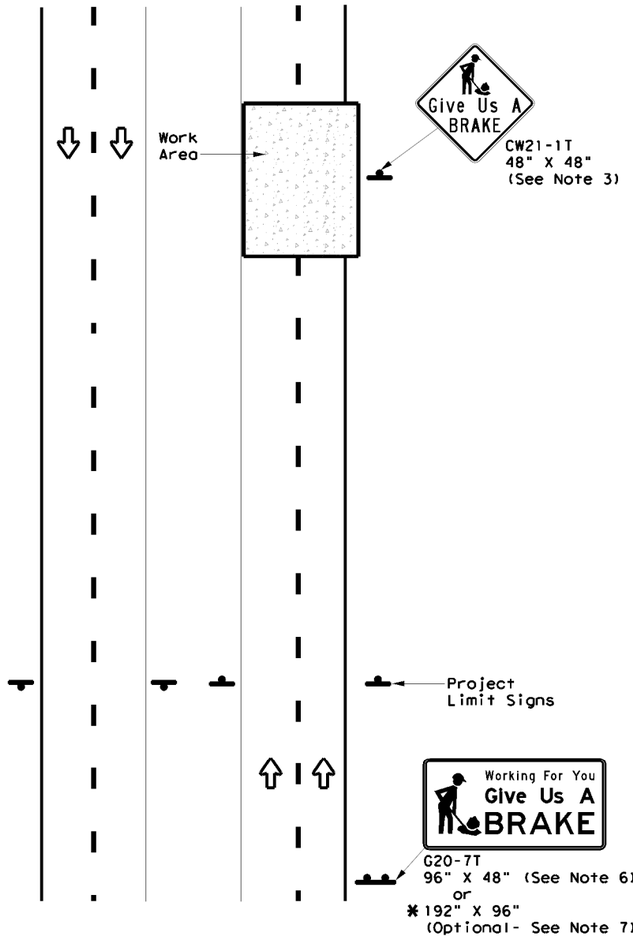
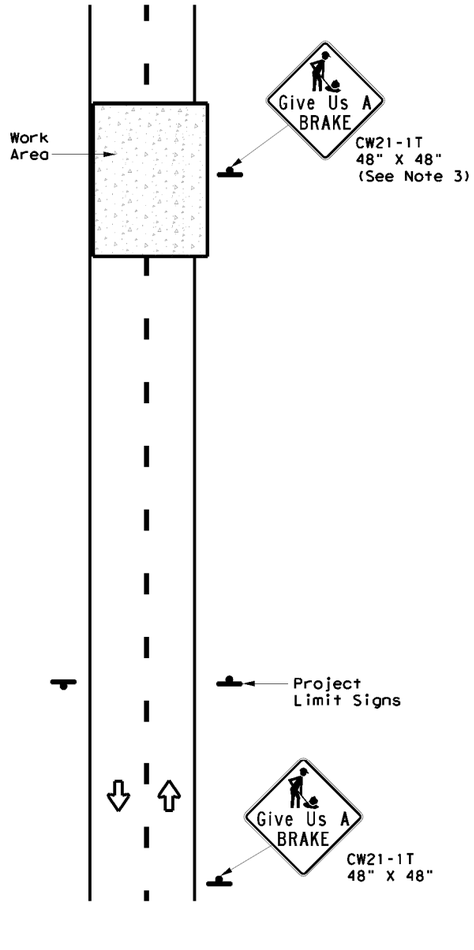


DIVIDED HIGHWAY



UNDIVIDED HIGHWAY

SIGNS ARE SHOWN FOR ONE DIRECTION OF TRAVEL

* When the optional larger WORKING FOR YOU GIVE US A BRAKE (G20-7T) 192" x 96" sign is required, the locations shall be noted elsewhere in the plans.

SUMMARY OF LARGE SIGNS

BACKGROUND COLOR	SIGN DESIGNATION	SIGN	SIGN DIMENSIONS	REFLECTIVE SHEETING	SQ FT	GALVANIZED STRUCTURAL STEEL			DRILLED SHAFT 24" DIA. (LF)
						Size	(LF) ①	(LF) ②	
Orange	G20-7T	Working For You Give Us A BRAKE	96" X 48"	Type B_{FL} or C_{FL}	32	▲	▲	▲	▲
Orange	G20-7T	Working For You Give Us A BRAKE	192" X 96"	Type B_{FL} or C_{FL}	128	W8x18	16	17	12

▲ See Note 6 Below

LEGEND	
	Sign
	Large Sign
	Traffic Flow

DEPARTMENTAL MATERIAL SPECIFICATIONS	
PLYWOOD SIGN BLANKS	DMS-7100
ALUMINUM SIGN BLANKS	DMS-7110
SIGN FACE MATERIALS	DMS-8300

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

GENERAL NOTES

1. See BC and SMD sheets for additional sign support details.
2. Sign locations shall be approved by the Engineer.
3. For projects more than two miles in length, Give Us a BRAKE signs should be repeated halfway through the project. The Give Us a Brake (CW21-1T) may be used for this purpose.
4. Work zone speed limits are sometimes used in conjunction with GIVE US A BRAKE signing. See BC(3) for location and spacing of construction speed zone signing when required.
5. Give Us a Brake (CW21-1T) signs and supports shall be considered subsidiary to Item 502, "Barricades, Signs and Traffic Handling."
6. The 96" X 48" Working For You Give Us A BRAKE (G20-7T) may use a 1/2" or 5/8" plywood substrate or 0.125" aluminum sheeting substrate and may be supported by two 4" x 6" wood posts with drilled holes for breakaway as per BC(5) and will be subsidiary to Item 502.
7. The Working For You Give Us A BRAKE (G20-7T) 192" X 96" sign shall be paid for under the following specification items:
   Item 636 - Aluminum Signs
   Item 647 - Large Roadside Sign Supports and Assemblies.
   Item 416 - Drilled Shaft Foundations
8. All signs shall be constructed in accordance with the details found in the "Standard Highway Sign Designs for Texas," latest edition. Sign details not shown in this manual shall be shown in the plans or the Engineer shall provide a detail to the Contractor before the sign is manufactured.

Texas Department of Transportation

Traffic Operations Division Standard

WORK ZONE "GIVE US A BRAKE" SIGNS

WZ(BRK)-13

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116

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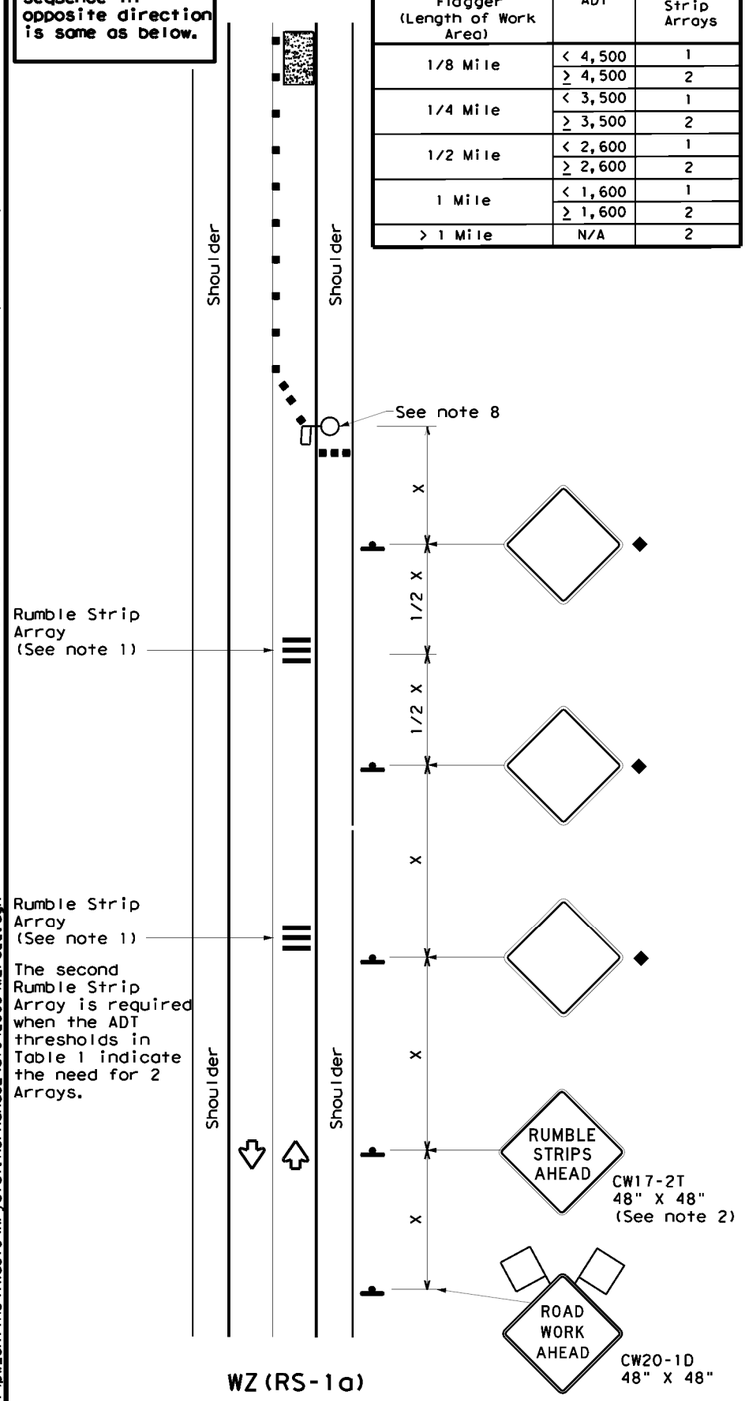
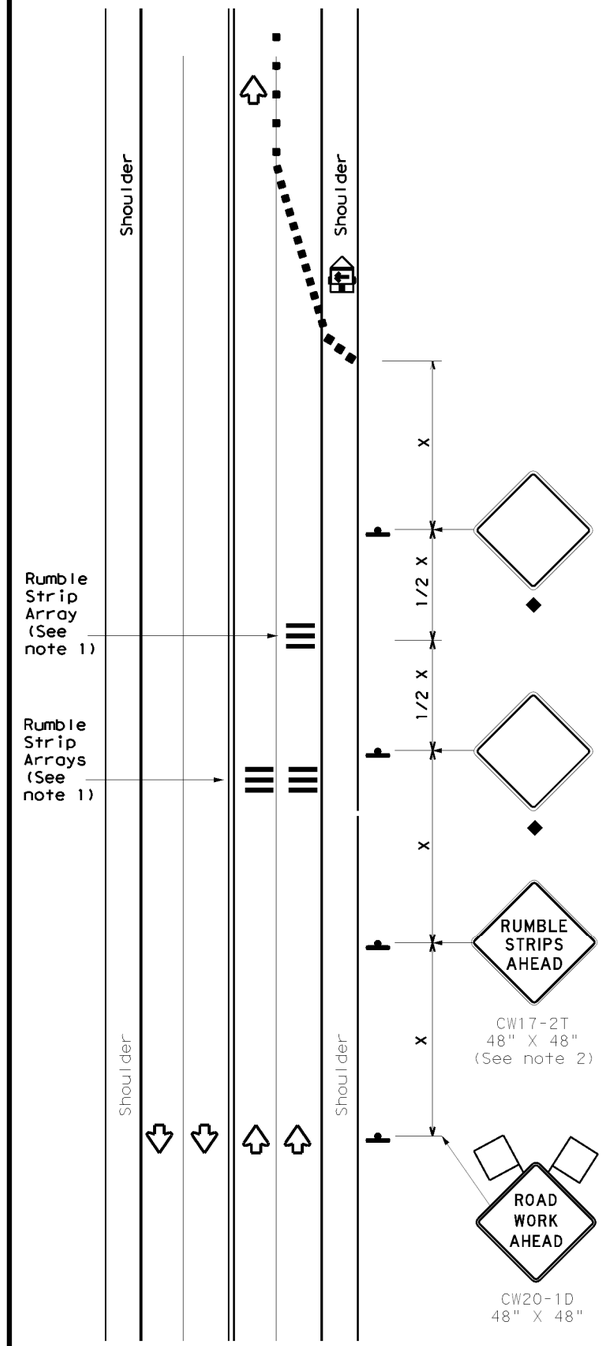
Warning sign and rumble strip sequence in opposite direction is same as below.

TABLE 1		
Flagger to Flagger (Length of Work Area)	ADT	# of Rumble Strip Arrays
1/8 Mile	< 4,500	1
	≥ 4,500	2
1/4 Mile	< 3,500	1
	≥ 3,500	2
1/2 Mile	< 2,600	1
	≥ 2,600	2
1 Mile	< 1,600	1
	≥ 1,600	2
> 1 Mile	N/A	2



WZ(RS-1a)

RUMBLE STRIPS ON ONE-LANE TWO-WAY APPLICATION



WZ(RS-1b)

RUMBLE STRIPS FOR LANE CLOSURE ON CONVENTIONAL ROADWAY

GENERAL NOTES

1. Each Rumble Strip Array should consist of three rumble strips spaced center to center at the spacing shown in Table 2, placed transverse across the lane at locations shown.
2. The CW17-2T "RUMBLE STRIPS AHEAD" sign should be located after the CW20-1D "ROAD WORK AHEAD sign and spaced as shown. If traffic is observed to be queuing, or is expected to queue beyond the Rumble Strips, the CW17-2T sign and the first Rumble Strip Array may be located upstream of the CW20-1D sign as necessary to provide needed warning.
3. Temporary Rumble Strips will be considered subsidiary to Item 502, and shall be a product listed on the Compliant Work Zone Traffic Control Devices.
4. Remove Temporary Rumble Strips before removing the advanced warning signs.
5. Temporary Rumble Strips should not be used on horizontal curves, loose gravel, soft or bleeding asphalt, heavily rutted pavements or unpaved surfaces.
6. Temporary Rumble Strips shall be installed and maintained as per manufacturer's recommendations.
7. This standard sheet shall be used in conjunction with other appropriate TCP standard, TMUTCD typical application or project specific detail for the project.
8. The one-lane two-way application may utilize a flagger, an Automated Flagger Assistance Device (AFAD) or a Portable Traffic Signal (PTS).
9. Replace defective Temporary Rumble Strips as directed by the Engineer.
10. Temporary Rumble Strips may be used on freeways or expressways based on engineering judgment and written direction from the Engineer.

LEGEND			
	Type 3 Barricade		Channelizing Devices
	Heavy Work Vehicle		Truck Mounted Attenuator (TMA)
	Trailer Mounted Flashing Arrow Panel	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
	✓	✓		

◆ Signs are for illustrative purposes only. Signs required may vary depending on the TCP, TMUTCD Typical Application, or project specific details for the project.

* For posted speeds in excess of 65 MPH, it is recommended that spacing is increased as speed limits increase. Increasing space between rumble strips will improve effectiveness.

TABLE 2	
Speed	Approximate distance between strips in an array
≤ 40 MPH	10'
> 40 MPH & ≤ 55 MPH	15'
= 60 MPH	20'
≥ 65 MPH	* 35' +

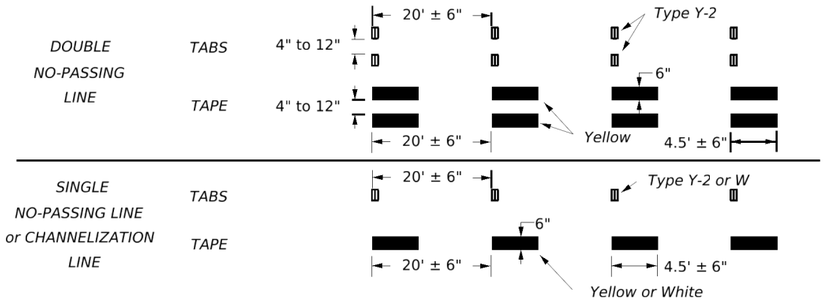
Texas Department of Transportation — Traffic Safety Division Standard

TEMPORARY RUMBLE STRIPS

WZ(RS)-22

FILE: wzrs22.dgn	DN: TxDOT	CK: TxDOT	DW: TxDOT	CK: TxDOT
©TxDOT November 2012	CONT	SECT	JOB	HIGHWAY
REVISIONS 2-14 1-22 4-16	0018	05	090	IH35 WFR
	DIST	COUNTY		SHEET NO.
	22	WEBB		49

WORK ZONE SHORT TERM PAVEMENT MARKINGS DETAILS



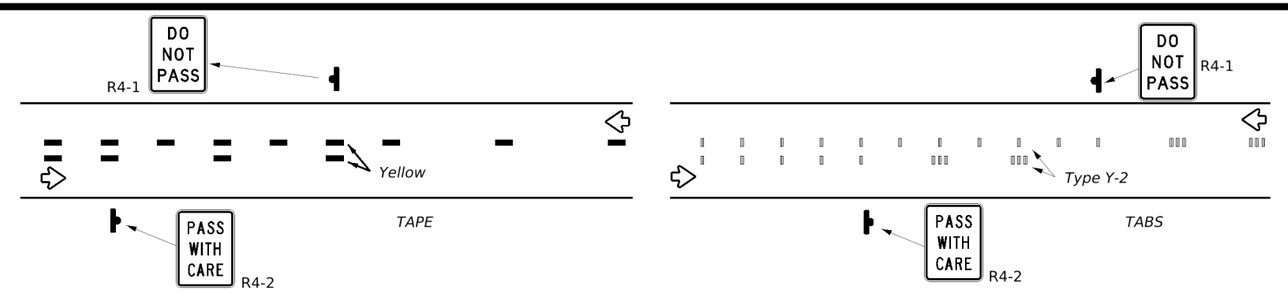
NOTES:

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

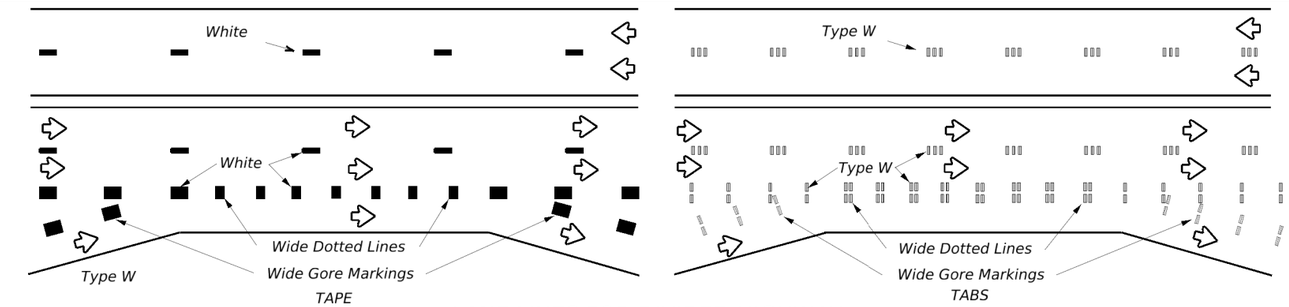
TEMPORARY FLEXIBLE, REFLECTIVE ROADWAY MARKER TABS (TABS)

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

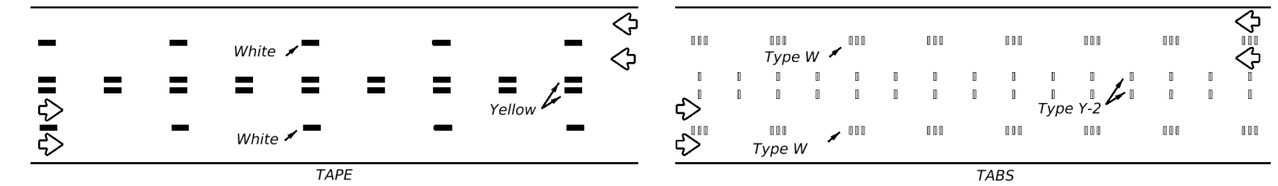
WORK ZONE SHORT TERM PAVEMENT MARKINGS PATTERNS



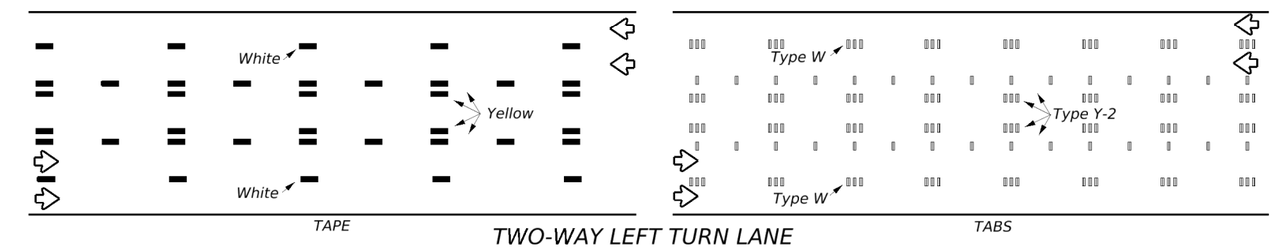
CENTER LINE & NO-PASSING ZONE BARRIER LINES FOR TWO LANE TWO-WAY HIGHWAYS



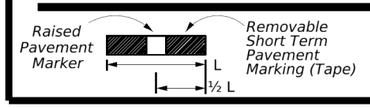
LANE LINES FOR DIVIDED HIGHWAY



LANE & CENTER LINES FOR MULTILANE UNDIVIDED HIGHWAYS



TWO-WAY LEFT TURN LANE



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

PREFABRICATED PAVEMENT MARKINGS

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

RAISED PAVEMENT MARKERS

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

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

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

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

Texas Department of Transportation

Traffic Safety Division Standard

WORK ZONE SHORT TERM PAVEMENT MARKINGS

WZ(STPM)-23

FILE: wzstpm-23.dgn	DN: TxDOT	CK: TxDOT	DW: TxDOT	CK: TxDOT
© TxDOT February 2023	CONT	SECT	JOB	HIGHWAY
REVISIONS	0018	05	090	IH35 WFR
4-92 7-13	DIST	COUNTY		SHEET NO.
1-97 2-23	22	WEBB		50
3-03				

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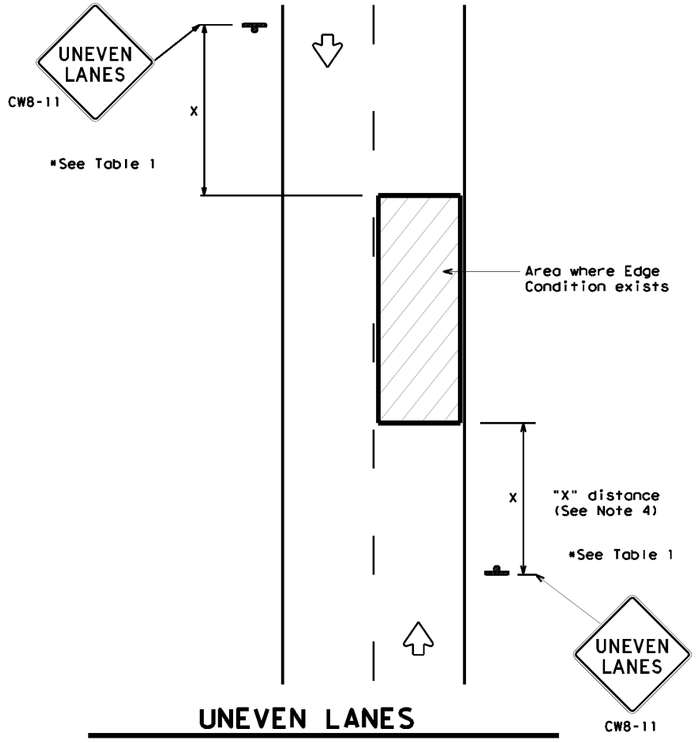
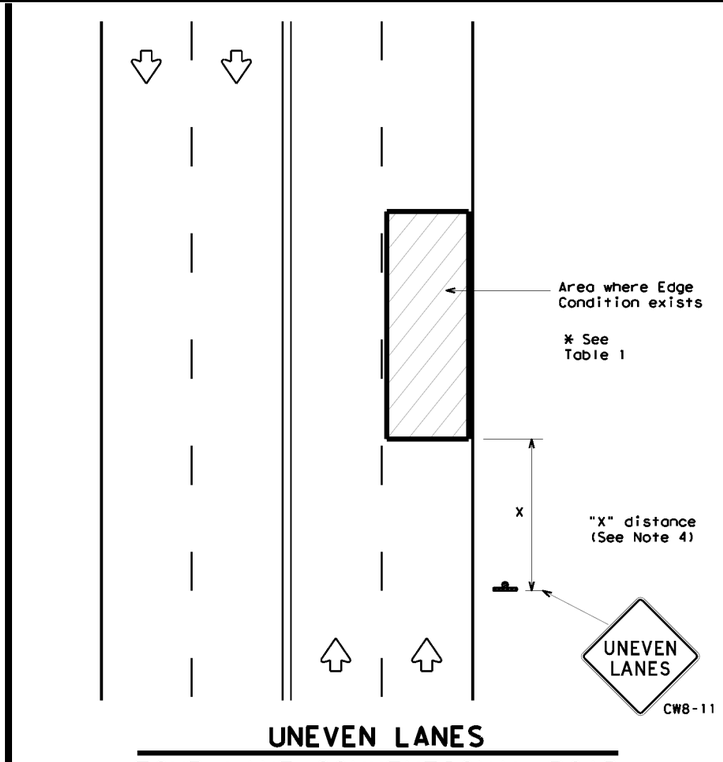
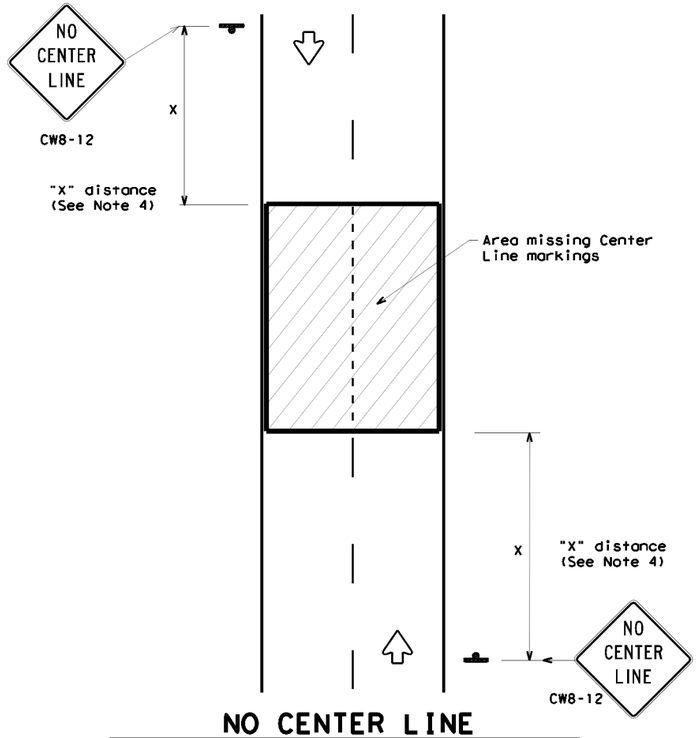


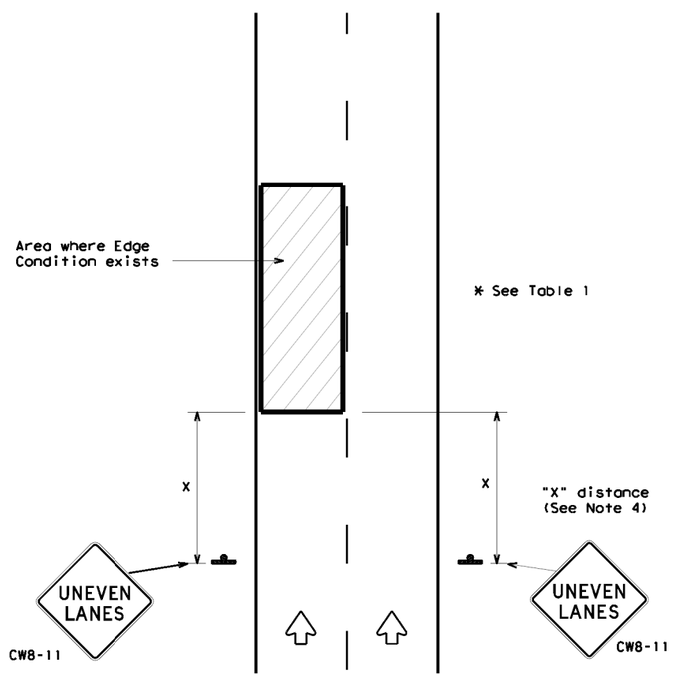
UNEVEN LANES
TWO LANE CONVENTIONAL ROAD



UNEVEN LANES
FOUR LANE CONVENTIONAL ROAD



NO CENTER LINE
TWO LANE CONVENTIONAL ROAD



UNEVEN LANES
DIVIDED ROADWAY

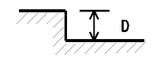
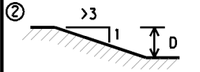
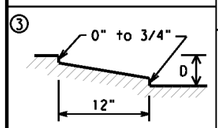
DEPARTMENTAL MATERIAL SPECIFICATIONS	
PERMANENT PREFABRICATED PAVEMENT MARKINGS	DMS-8240
TEMPORARY (REMOVABLE) PREFABRICATED PAVEMENT MARKINGS	DMS-8241
SIGN FACE MATERIALS	DMS-8300

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

GENERAL NOTES

1. If spalling or holes occur, ROUGH ROAD (CW8-8) signs should be placed in advance of the condition and be repeated every two miles where the condition persists.
2. UNEVEN LANES (CW8-11) signs shall be installed in advance of the condition and repeated every mile. Signs installed along the uneven lane condition may be supplemented with the NEXT XX MILES (CW7-3aP) plaque or Advisory Speed (CW13-1P) plaque.
3. NO CENTER LINE (CW8-12) signs and temporary pavement markings as per the WZ(STPM) standard shall be installed if yellow centerlines separating two way traffic are obscured or obliterated. Repeat NO CENTER LINE signs every two miles where the center line markings are not in place. The signs and markings shall remain in place until permanent pavement markings are installed.
4. Signs shall be spaced at the distances recommended as per BC standards.
5. Additional signs may be required as directed by the Engineer. Signs shall remain in place until final surface is applied. Signs shall be considered subsidiary to Item 502 "BARRICADES, SIGNS AND TRAFFIC HANDLING."
6. Signs shall be fabricated and mounted on supports as shown on the BC standards and/or listed on the "Compliant Work Zone Traffic Control Devices" list.
7. Short term markings shall not be used to simulate edge lines.
8. All signs shall be constructed in accordance with the details found in the "Standard Highway Sign Designs for Texas," latest edition.

TABLE 1

Edge Condition	Edge Height (D)	* Warning Devices
① 	Less than or equal to: 1¼" (maximum-planing) 1½" (typical-overlay)	Sign: CW8-11
	Distance "D" may be a maximum of 1 1/4 " for planing operations and 2" for overlay operations if uneven lanes with edge condition 1 are open to traffic after work operations cease.	
② 	Less than or equal to 3"	Sign: CW8-11
③  Notched Wedge Joint	Distance "D" may be a maximum of 3" if uneven lanes with edge condition 2 or 3 are open to traffic after work operations cease. Uneven lanes should not be open to traffic when "D" is greater than 3".	

TRAFFIC CONTROL DURING PLANING, OVERLAY AND LEVELING OPERATIONS ARE SHOWN ELSEWHERE IN THE PLANS.

MINIMUM WARNING SIGN SIZE	
Conventional roads	36" x 36"
Freeways/expressways, divided roadways	48" x 48"

Texas Department of Transportation

Traffic Operations Division Standard

SIGNING FOR UNEVEN LANES

WZ(UL)-13

FILE: wzul-13.dgn	DN: TxDOT	CK: TxDOT	DW: TxDOT	CK: TxDOT
©TxDOT April 1992	CONT	SECT	JOB	HIGHWAY
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8-95 2-98 7-13	DIST	COUNTY		SHEET NO.
1-97 3-03	22	WEBB		51

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CK
DW
CK
DW

IH 35 WFR HORIZONTAL ALIGNMENT REPORT

STATION	X	Y
POT 592+25.390 R1	677836.837	17154391.298
PI 645+10.396 R1	678961.272	17159555.302

Tangential Direction: N12°17'02.800"E
Tangential Length: 5285.006

PI 645+10.396 R1	678961.272	17159555.302
PC 663+43.988 R1	679342.024	17161348.926

Tangential Direction: N11°59'05.577"E
Tangential Length: 1833.592

CURVE DATA

PC 663+43.988 R1	679342.024	17161348.926
PI 665+29.918 R1	679380.633	17161530.803
CC	682421.405	17160695.232
PT 667+15.417 R1	679440.384	17161706.871

Radius: 3148.000
Delta: 06°45'36.957" Right
Degree of Curvature(Arc): 01°49'12.249"
Length: 371.429
Tangent: 185.930
Chord: 371.214
Middle Ordinate: 5.476
External: 5.486
Tangent Back Direction: N11°59'05.577"E
Radial Direction: S78°00'54.423"E
Chord Direction: N15°21'54.056"E
Radial Direction: S71°15'17.465"E
Tangent Ahead Direction: N18°44'42.535"E

PT 667+15.417 R1	679440.384	17161706.871
PC 676+58.836 R1	679743.560	17162600.249

Tangential Direction: N18°44'42.535"E
Tangential Length: 943.419

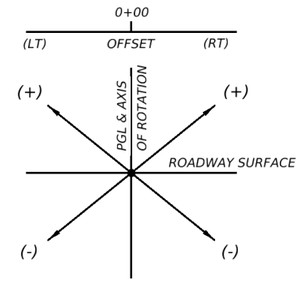
CURVE DATA

PC 676+58.836 R1	679743.560	17162600.249
PI 677+31.079 R1	679766.776	17162668.660
CC	674606.316	17164343.623
PT 678+03.313 R1	679788.162	17162737.665

Radius: 5425.000
Delta: 01°31'33.204" Left
Degree of Curvature(Arc): 01°03'22.116"
Length: 144.478
Tangent: 72.243
Chord: 144.473
Middle Ordinate: 0.481
External: 0.481
Tangent Back Direction: N18°44'42.535"E
Radial Direction: S71°15'17.465"E
Chord Direction: N17°58'55.933"E
Radial Direction: S72°46'50.669"E
Tangent Ahead Direction: N17°13'09.331"E

PT 678+03.313 R1	679788.162	17162737.665
POT 693+39.234 R1	680201.622	17164071.751

Tangential Direction: N17°13'09.331"E
Tangential Length: 1396.687



SIGN CONVENTION

IH 35 WFR CROSS SLOPE & SUPERELEVATION RATES

LEFT			STA.	TO	STA.	RIGHT		
-2.00%	TO	-2.00%	592+25.39	TO	662+71.90	-2.00%	TO	-2.00%
-2.00%	TO	2.30%	662+71.90	TO	663+62.19	-2.00%	TO	-2.30%
2.30%	TO	2.30%	663+62.19	TO	666+97.22	-2.30%	TO	-2.30%
2.30%	TO	-2.00%	666+97.22	TO	667+88.22	-2.30%	TO	-2.00%
-2.00%	TO	-2.00%	667+88.22	TO	693+39.23	-2.00%	TO	-2.00%

STATE OF TEXAS
LUIS G. URBINA
117019
LICENSED
PROFESSIONAL ENGINEER

DocuSigned by:
98C72D65D494466...
11/27/2023

Texas Department of Transportation

IH 35 WFR

GEOMETRIC DATA SHEETS

SHEET 1 OF 3

CONT	SECT	JOB	HIGHWAY
0018	05	090	IH35 WFR
DIST	COUNTY		SHEET NO.
22	WEBB		52

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CC
DW
CC
DW

IH 35 WFR VERTICAL ALIGNMENT REPORT

STATION	ELEVATION
POT 592+25.390 R1	686.270
VPI 593+41.080 R1	685.925
Tangent Grade:	-0.00
Tangent Length:	115.690
VPI 593+41.080 R1	685.925
VPC 594+92.500 R1	685.844
Tangent Grade:	-0.00
Tangent Length:	151.420
VPC 594+92.500 R1	685.844
VPI 595+75.000 R1	685.800
VPT 596+57.500 R1	685.351
Length:	165.000
Entrance Grade:	-0.00
Exit Grade:	-0.01
K Value =:	336.334
Middle Ordinate (E):	-0.101
VPT 596+57.500 R1	685.351
VPI 596+84.383 R1	685.205
Tangent Grade:	-0.01
Tangent Length:	26.883
VPI 596+84.383 R1	685.205
VPI 597+92.516 R1	684.279
Tangent Grade:	-0.01
Tangent Length:	108.133
VPI 597+92.516 R1	684.279
VPI 599+54.065 R1	683.508
Tangent Grade:	-0.00
Tangent Length:	161.550
VPI 599+54.065 R1	683.508
VPC 599+58.785 R1	683.487
Tangent Grade:	-0.00
Tangent Length:	4.720
VPC 599+58.785 R1	683.487
VPI 600+41.285 R1	683.125
VPT 601+23.785 R1	683.375
VLP 600+56.359 R1	683.273
Length:	165.000
Entrance Grade:	-0.00
Exit Grade:	0.00
K Value =:	222.194
Middle Ordinate (E):	0.153
VPT 601+23.785 R1	683.375
VPI 601+58.295 R1	683.480
Tangent Grade:	0.00
Tangent Length:	34.510
VPI 601+58.295 R1	683.480
VPI 604+58.000 R1	683.200
Tangent Grade:	-0.00
Tangent Length:	299.705
VPI 604+58.000 R1	683.200
VPI 606+00.000 R1	682.400
Tangent Grade:	-0.01
Tangent Length:	142.000
VPI 606+00.000 R1	682.400
VPI 606+55.306 R1	682.324
Tangent Grade:	-0.00
Tangent Length:	55.306
VPI 606+55.306 R1	682.324
VPI 607+46.889 R1	681.774
Tangent Grade:	-0.01
Tangent Length:	91.583
VPI 607+46.889 R1	681.774
VPI 609+32.750 R1	680.707
Tangent Grade:	-0.01
Tangent Length:	185.860
VPI 609+32.750 R1	680.707
VPI 613+44.020 R1	677.386
Tangent Grade:	-0.01
Tangent Length:	411.270
VPI 613+44.020 R1	677.386
VPI 615+50.000 R1	675.700
Tangent Grade:	-0.01
Tangent Length:	205.980
VPI 615+50.000 R1	675.700
VPC 615+60.500 R1	675.598
Tangent Grade:	-0.01
Tangent Length:	10.500
VPC 615+60.500 R1	675.598
VPI 616+43.000 R1	674.800
VPT 617+25.500 R1	674.462
Length:	165.000
Entrance Grade:	-0.01
Exit Grade:	-0.00
K Value =:	295.972
Middle Ordinate (E):	0.115
VPT 617+25.500 R1	674.462
VPI 618+38.000 R1	674.000
Tangent Grade:	-0.00
Tangent Length:	112.500
VPI 618+38.000 R1	674.000
VPI 619+27.000 R1	673.500
Tangent Grade:	-0.01
Tangent Length:	89.000
VPI 619+27.000 R1	673.500
VPI 621+90.000 R1	673.100
Tangent Grade:	-0.00
Tangent Length:	263.000
VPI 621+90.000 R1	673.100
VPI 623+75.000 R1	673.700
Tangent Grade:	0.00
Tangent Length:	185.000
VPI 623+75.000 R1	673.700
VPI 626+00.025 R1	673.884
Tangent Grade:	0.00
Tangent Length:	225.025
VPI 626+00.025 R1	673.884
VPI 628+24.016 R1	674.742
Tangent Grade:	0.00
Tangent Length:	223.991
VPI 628+24.016 R1	674.742
VPI 628+63.854 R1	675.070
Tangent Grade:	0.01
Tangent Length:	39.838
VPI 628+63.854 R1	675.070
VPI 629+44.954 R1	676.141
Tangent Grade:	0.01
Tangent Length:	81.100
VPI 629+44.954 R1	676.141
VPI 629+83.921 R1	676.815
Tangent Grade:	0.02
Tangent Length:	38.967
VPI 629+83.921 R1	676.815
VPC 630+49.066 R1	678.098
Tangent Grade:	0.02
Tangent Length:	65.144
VPC 630+49.066 R1	678.098
VPI 631+49.066 R1	680.068
VPT 632+49.066 R1	680.567
Length:	200.000
Entrance Grade:	0.02
Exit Grade:	0.00
K Value =:	135.976
Middle Ordinate (E):	-0.368
VPT 632+49.066 R1	680.567
VPI 634+36.000 R1	681.500
Tangent Grade:	0.00
Tangent Length:	186.934
VPI 634+36.000 R1	681.500
VPI 634+80.989 R1	681.514
Tangent Grade:	0.00
Tangent Length:	44.989
VPI 634+80.989 R1	681.514
VPI 635+41.115 R1	681.780
Tangent Grade:	0.00
Tangent Length:	60.126
VPI 635+41.115 R1	681.780
VPI 636+02.483 R1	682.332
Tangent Grade:	0.01
Tangent Length:	61.368
VPI 636+02.483 R1	682.332
VPC 637+04.013 R1	683.724
Tangent Grade:	0.01
Tangent Length:	101.530
VPC 637+04.013 R1	683.724
VPI 637+86.513 R1	684.855
VPT 638+69.013 R1	686.505
Length:	165.000
Entrance Grade:	0.01
Exit Grade:	0.02
K Value =:	262.324
Middle Ordinate (E):	0.130
VPT 638+69.013 R1	686.505
VPC 639+59.664 R1	688.318
Tangent Grade:	0.02
Tangent Length:	90.651
VPC 639+59.664 R1	688.318
VPI 640+42.164 R1	689.968
VPT 641+24.664 R1	690.807
Length:	165.000
Entrance Grade:	0.02
Exit Grade:	0.01
K Value =:	167.877
Middle Ordinate (E):	-0.203
VPT 641+24.664 R1	690.807
VPC 641+34.652 R1	690.909
Tangent Grade:	0.01
Tangent Length:	9.987
VPC 641+34.652 R1	690.909
VPI 642+17.152 R1	691.748
VPT 642+99.652 R1	691.504
VHP 642+62.539 R1	691.559
Length:	165.000
Entrance Grade:	0.01
Exit Grade:	-0.00
K Value =:	125.732
Middle Ordinate (E):	-0.271
VPT 642+99.652 R1	691.504
VPI 645+64.802 R1	690.722
Tangent Grade:	-0.00
Tangent Length:	265.150
VPI 645+64.802 R1	690.722
VPI 647+25.192 R1	690.832
Tangent Grade:	0.00
Tangent Length:	160.389
VPI 647+25.192 R1	690.832
VPI 650+07.398 R1	692.297
Tangent Grade:	0.01
Tangent Length:	282.207
VPI 650+07.398 R1	692.297
VPI 650+97.176 R1	692.353
Tangent Grade:	0.00
Tangent Length:	89.777
VPI 650+97.176 R1	692.353
VPI 651+79.000 R1	692.800
Tangent Grade:	0.01
Tangent Length:	81.824
VPI 651+79.000 R1	692.800
VPI 652+87.000 R1	693.200
Tangent Grade:	0.00
Tangent Length:	108.000
VPI 652+87.000 R1	693.200
VPI 655+43.000 R1	694.100
Tangent Grade:	0.00
Tangent Length:	256.000
VPI 655+43.000 R1	694.100
VPI 655+63.000 R1	694.200
Tangent Grade:	0.00
Tangent Length:	20.000
VPI 655+63.000 R1	694.200
VPC 656+12.500 R1	694.275
Tangent Grade:	0.00
Tangent Length:	49.500
VPC 656+12.500 R1	694.275
VPI 656+95.000 R1	694.400
VPT 657+77.500 R1	695.207
Length:	165.000
Entrance Grade:	0.00
Exit Grade:	0.01
K Value =:	199.466
Middle Ordinate (E):	0.171
VPT 657+77.500 R1	695.207
VPI 659+30.000 R1	696.700
Tangent Grade:	0.01
Tangent Length:	152.500
VPI 659+30.000 R1	696.700
VPI 659+74.000 R1	697.200
Tangent Grade:	0.01
Tangent Length:	44.000
VPI 659+74.000 R1	697.200
VPI 660+58.377 R1	698.020
Tangent Grade:	0.01
Tangent Length:	84.377
VPI 660+58.377 R1	698.020
VPI 661+45.000 R1	698.900
Tangent Grade:	0.01
Tangent Length:	86.623
VPI 661+45.000 R1	698.900
VPC 663+40.500 R1	700.588
Tangent Grade:	0.01
Tangent Length:	195.500
VPC 663+40.500 R1	700.588
VPI 664+23.000 R1	701.300
VPT 665+05.500 R1	701.331
Length:	165.000
Entrance Grade:	0.01
Exit Grade:	0.00
K Value =:	199.768
Middle Ordinate (E):	-0.170
VPT 665+05.500 R1	701.331
VPI 665+90.934 R1	701.363
Tangent Grade:	0.00
Tangent Length:	85.434
VPI 665+90.934 R1	701.363
VPI 668+50.951 R1	700.223
Tangent Grade:	-0.00
Tangent Length:	260.017
VPI 668+50.951 R1	700.223
VPI 670+36.961 R1	698.508
Tangent Grade:	-0.01
Tangent Length:	186.010
VPI 670+36.961 R1	698.508
VPI 671+76.000 R1	696.600
Tangent Grade:	-0.01
Tangent Length:	139.039
VPI 671+76.000 R1	696.600
VPC 673+37.500 R1	694.085
Tangent Grade:	-0.02
Tangent Length:	161.500

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IH 35 WFR

GEOMETRIC DATA SHEETS

SHEET 2 OF 3

CONT	SECT	JOB	HIGHWAY
0018	05	090	IH35 WFR
DIST	COUNTY		SHEET NO.
22	WEBB		53

DATE: 11/27/2023 11:53:53 AM
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CK: DW: CK: DW:

IH 35 WFR VERTICAL ALIGNMENT REPORT

	STATION	ELEVATION
VPC	673+37.500 R1	694.085
VPI	674+20.000 R1	692.800
VPT	675+02.500 R1	692.044
Length:	165.000	
Entrance Grade:	-0.02	
Exit Grade:	-0.01	
K Value =:	257.271	
Middle Ordinate (E):	0.132	
VPT	675+02.500 R1	692.044
VPI	675+51.000 R1	691.600
Tangent Grade:	-0.01	
Tangent Length:	48.500	
VPI	675+51.000 R1	691.600
VPI	675+98.000 R1	691.400
Tangent Grade:	-0.00	
Tangent Length:	47.000	
VPI	675+98.000 R1	691.400
VPI	677+87.298 R1	690.602
Tangent Grade:	-0.00	
Tangent Length:	189.298	
VPI	677+87.298 R1	690.602
VPI	680+36.000 R1	690.200
Tangent Grade:	-0.00	
Tangent Length:	248.702	
VPI	680+36.000 R1	690.200
VPI	682+31.000 R1	690.500
Tangent Grade:	0.00	
Tangent Length:	195.000	
VPI	682+31.000 R1	690.500
VPI	682+64.475 R1	690.388
Tangent Grade:	-0.00	
Tangent Length:	33.475	
VPI	682+64.475 R1	690.388
VPI	682+96.986 R1	690.424
Tangent Grade:	0.00	
Tangent Length:	32.511	
VPI	682+96.986 R1	690.424
VPI	683+87.000 R1	690.300
Tangent Grade:	-0.00	
Tangent Length:	90.014	
VPI	683+87.000 R1	690.300
VPI	684+87.000 R1	690.600
Tangent Grade:	0.00	
Tangent Length:	100.000	
VPI	684+87.000 R1	690.600
VPI	686+88.000 R1	692.100
Tangent Grade:	0.01	
Tangent Length:	201.000	
VPI	686+88.000 R1	692.100
VPI	688+42.000 R1	693.700
Tangent Grade:	0.01	
Tangent Length:	154.000	
VPI	688+42.000 R1	693.700
VPI	690+00.000 R1	696.000
Tangent Grade:	0.01	
Tangent Length:	158.000	
VPI	690+00.000 R1	696.000
VPI	690+84.000 R1	697.000
Tangent Grade:	0.01	
Tangent Length:	84.000	
VPI	690+84.000 R1	697.000
VPI	691+60.841 R1	698.145
Tangent Grade:	0.01	
Tangent Length:	76.841	
VPI	691+60.841 R1	698.145
VPI	692+00.000 R1	699.175
Tangent Grade:	0.03	
Tangent Length:	39.159	

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IH 35 WFR

GEOMETRIC DATA SHEETS

SHEET 3 OF 3

CONT	SECT	JOB	HIGHWAY
0018	05	090	IH35 WFR
DIST	COUNTY		SHEET NO.
22	WEBB		54

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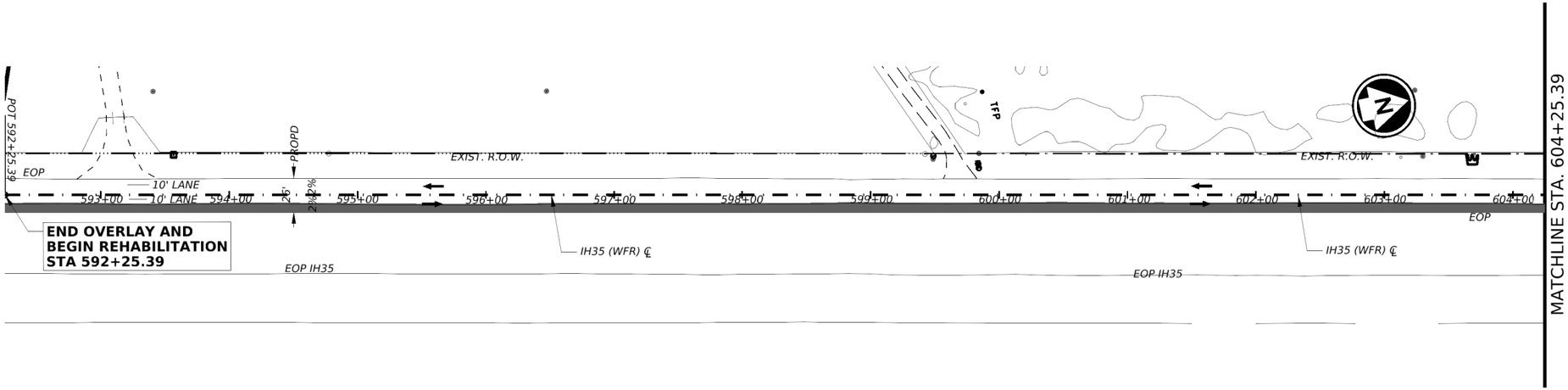


LEGEND:

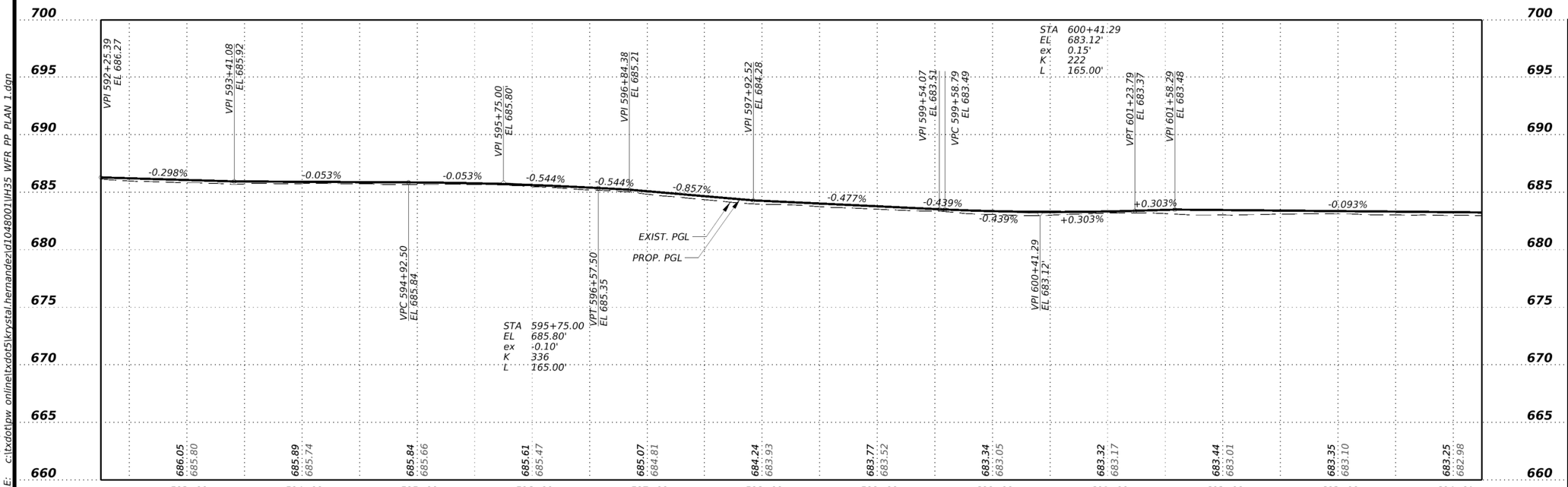
WIDENING AREA

NOTES:

1. SEE "GEOMETRIC DATA SHEETS FOR ALIGNMENT, CROSS SLOPES & SUPER ELEVATION DATA.

2.SEE CULVERT CROSS SECTIONS SHEETS FOR DRAINAGE STRUCTURE INFORMATION.

3. SEE PROJECT LAYOUT SHEETS FOR SURVEY CONTROL POINTS.



SCALE: HORIZ 1"= 50'
VERT 1"= 5'

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IH 35 WFR

PLAN AND PROFILE SHEETS STA 592+25.39 TO STA 604+25.39

SHEET 1 OF 9

CONT	SECT	JOB	HIGHWAY
0018	05	090	IH35 WFR
DIST	COUNTY		SHEET NO.
22	WEBB		55

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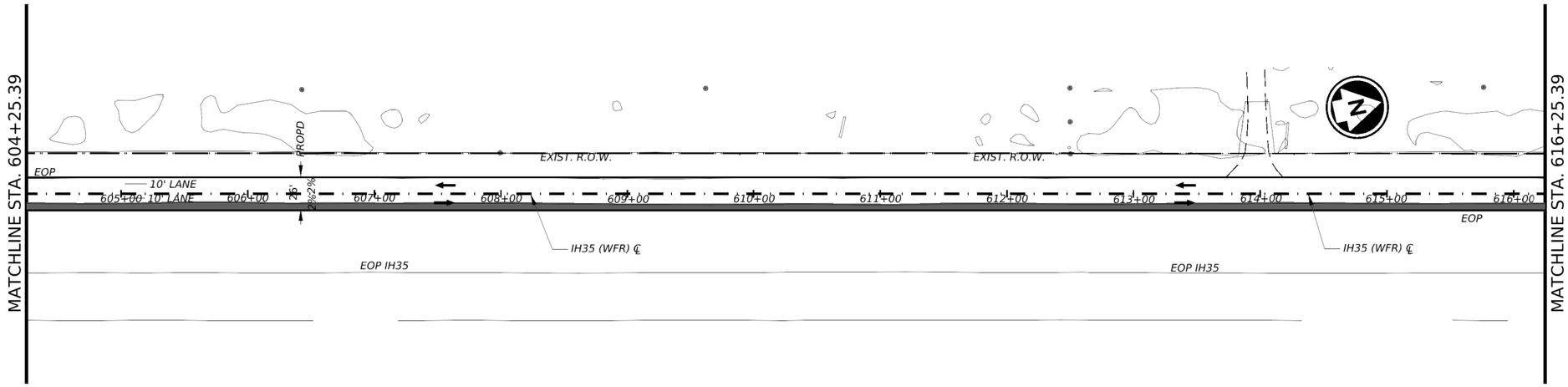

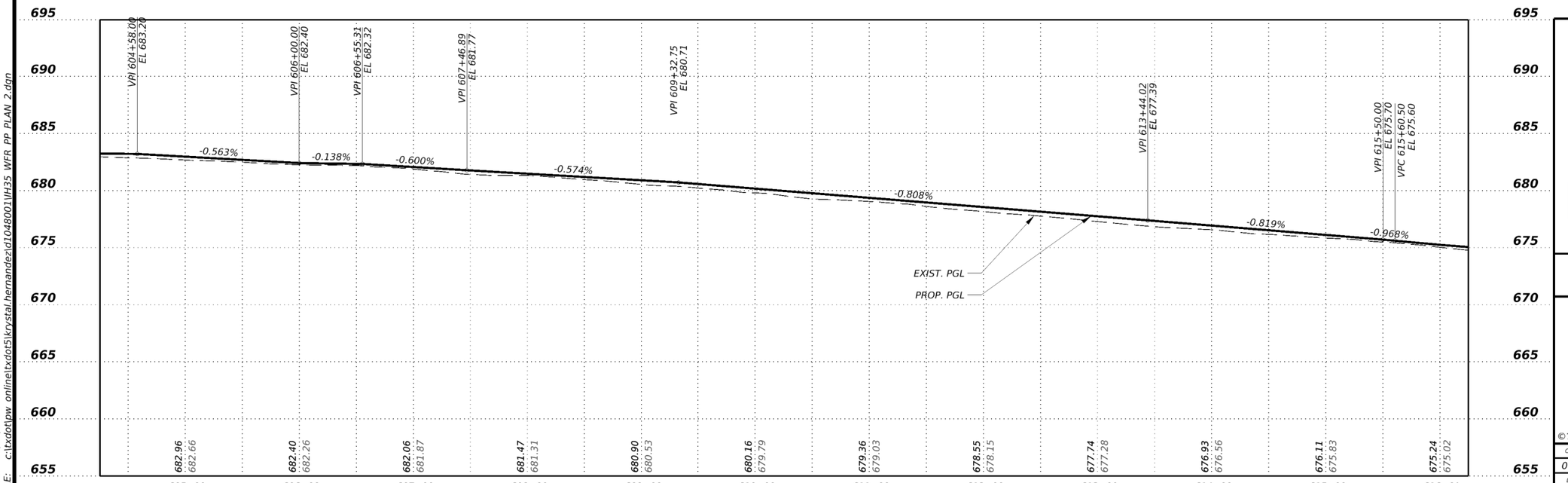

LEGEND:

WIDENING AREA

NOTES:

1. SEE "GEOMETRIC DATA SHEETS FOR ALIGNMENT, CROSS SLOPES & SUPER ELEVATION DATA.

2. SEE CULVERT CROSS SECTIONS SHEETS FOR DRAINAGE STRUCTURE INFORMATION.

3. SEE PROJECT LAYOUT SHEETS FOR SURVEY CONTROL POINTS.

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IH 35 WFR

PLAN AND PROFILE SHEETS STA 604+25.39 TO STA 616+25.39

CONT	SECT	JOB	HIGHWAY
0018	05	090	IH35 WFR
DIST	COUNTY		SHEET NO.
22	WEBB		56

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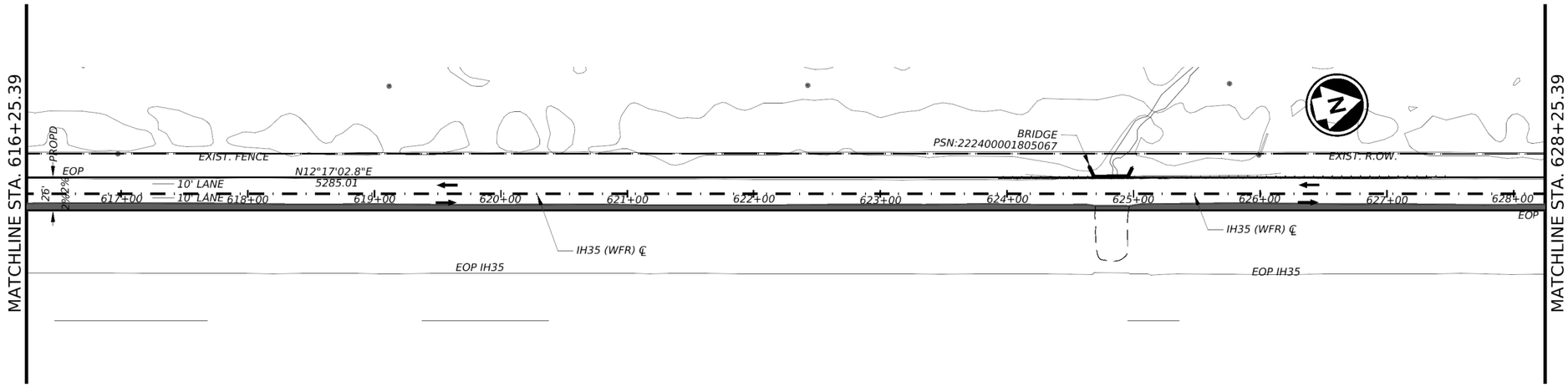
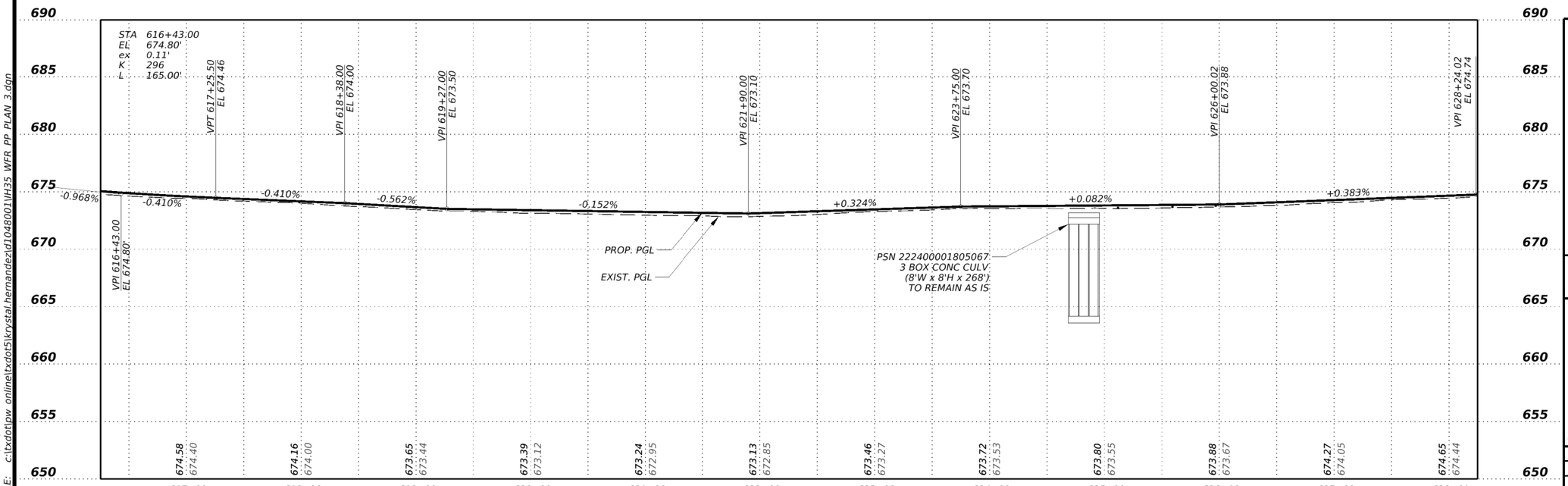


LEGEND:

WIDENING AREA

NOTES:

1. SEE "GEOMETRIC DATA SHEETS FOR ALIGNMENT, CROSS SLOPES & SUPER ELEVATION DATA.
2. SEE CULVERT CROSS SECTIONS SHEETS FOR DRAINAGE STRUCTURE INFORMATION.
3. SEE PROJECT LAYOUT SHEETS FOR SURVEY CONTROL POINTS.



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IH 35 WFR

PLAN AND PROFILE SHEETS STA 616+25.39 TO STA 628+25.39

SHEET 3 OF 9

CONT	SECT	JOB	HIGHWAY
0018	05	090	IH35 WFR
DIST	COUNTY		SHEET NO.
22	WEBB		57

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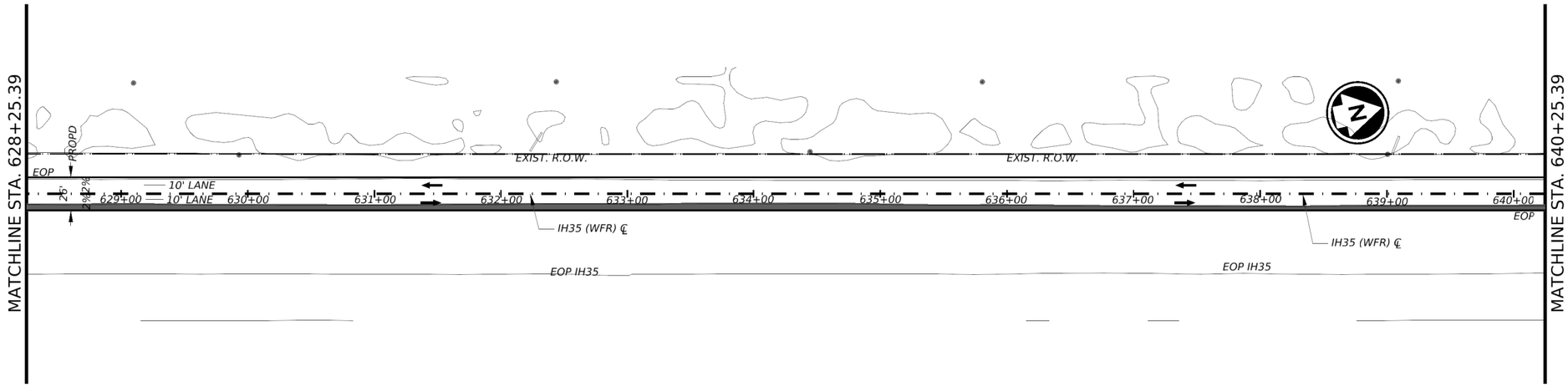
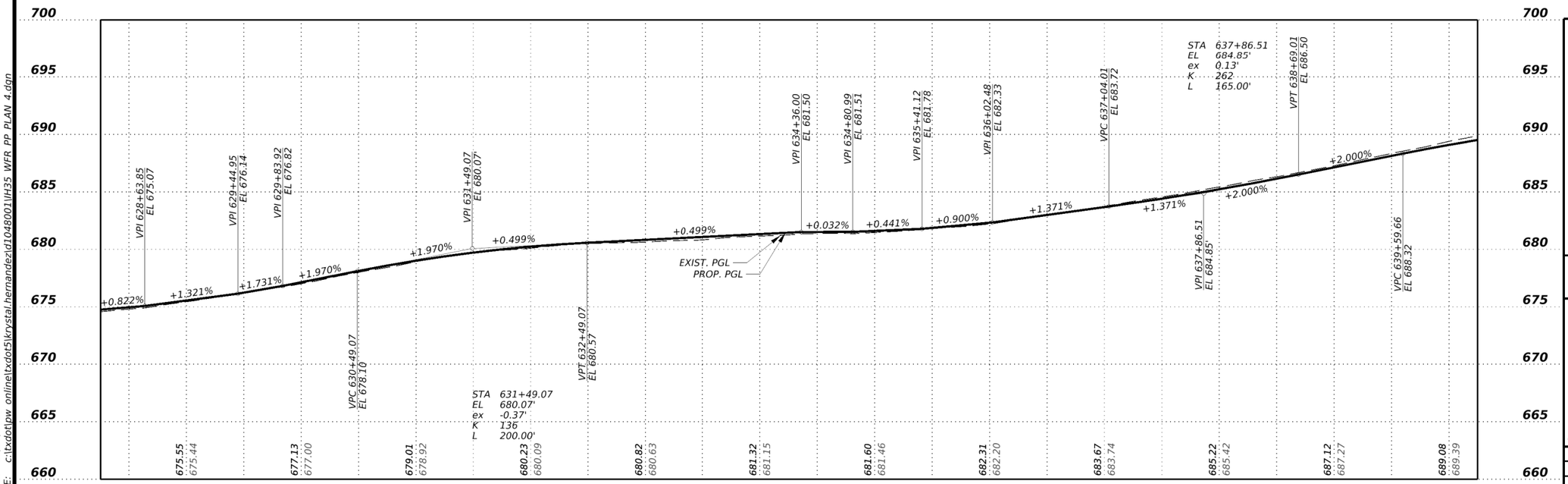


LEGEND:

WIDENING AREA

NOTES:

1. SEE "GEOMETRIC DATA SHEETS FOR ALIGNMENT, CROSS SLOPES & SUPER ELEVATION DATA.
2. SEE CULVERT CROSS SECTIONS SHEETS FOR DRAINAGE STRUCTURE INFORMATION.
3. SEE PROJECT LAYOUT SHEETS FOR SURVEY CONTROL POINTS.



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VERT 1"= 5'

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IH 35 WFR

PLAN AND PROFILE SHEETS STA 628+25.39 TO STA 640+25.39

SHEET 4 OF 9

CONT	SECT	JOB	HIGHWAY
0018	05	090	IH35 WFR
DIST	COUNTY		SHEET NO.
22	WEBB		58

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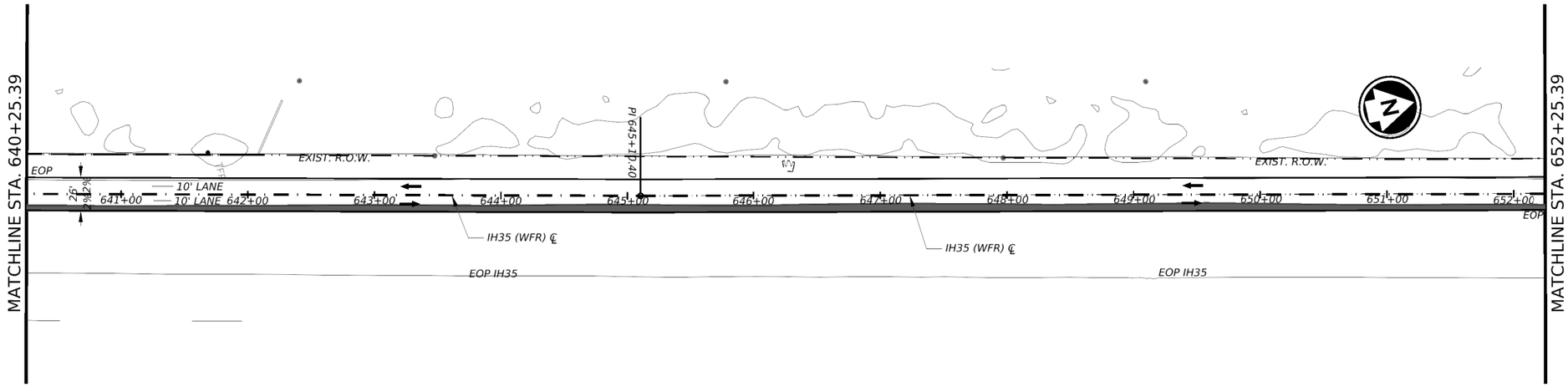


LEGEND:

WIDENING AREA

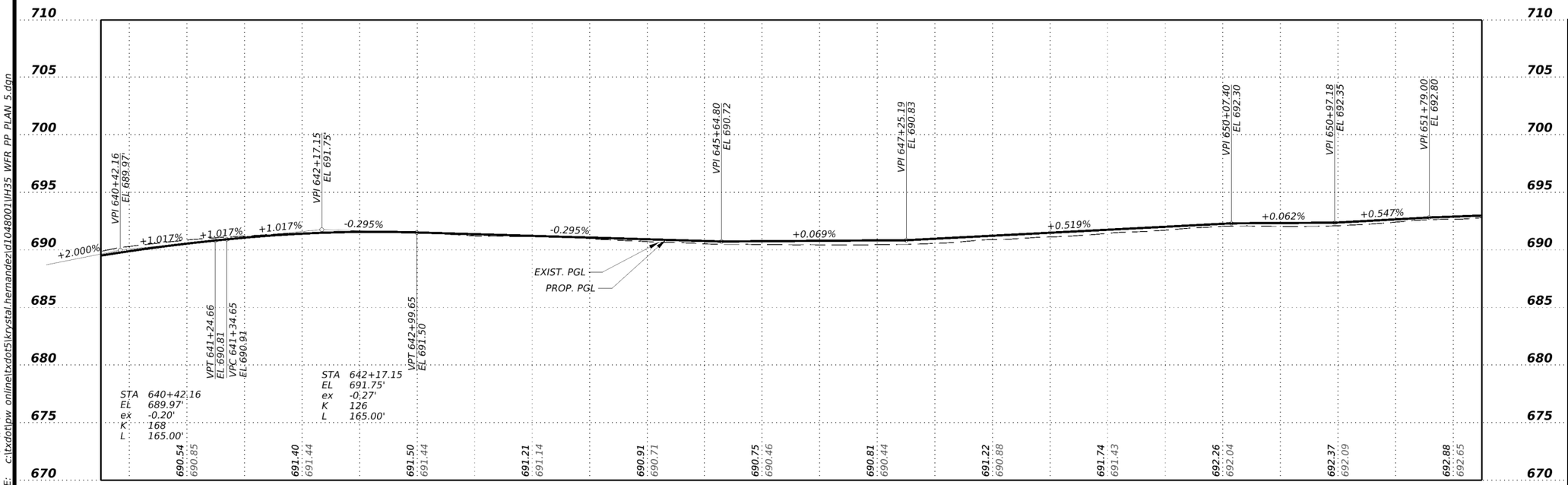
NOTES:

1. SEE "GEOMETRIC DATA SHEETS FOR ALIGNMENT, CROSS SLOPES & SUPER ELEVATION DATA.

2.SEE CULVERT CROSS SECTIONS SHEETS FOR DRAINAGE STRUCTURE INFORMATION.

3. SEE PROJECT LAYOUT SHEETS FOR SURVEY CONTROL POINTS.

SCALE: HORIZ 1"= 50'
VERT 1"= 5'



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IH 35 WFR

PLAN AND PROFILE SHEETS STA 640+25.39 TO STA 652+25.39

SHEET 5 OF 9

CONT	SECT	JOB	HIGHWAY
0018	05	090	IH35 WFR
DIST	COUNTY		SHEET NO.
22	WEBB		59

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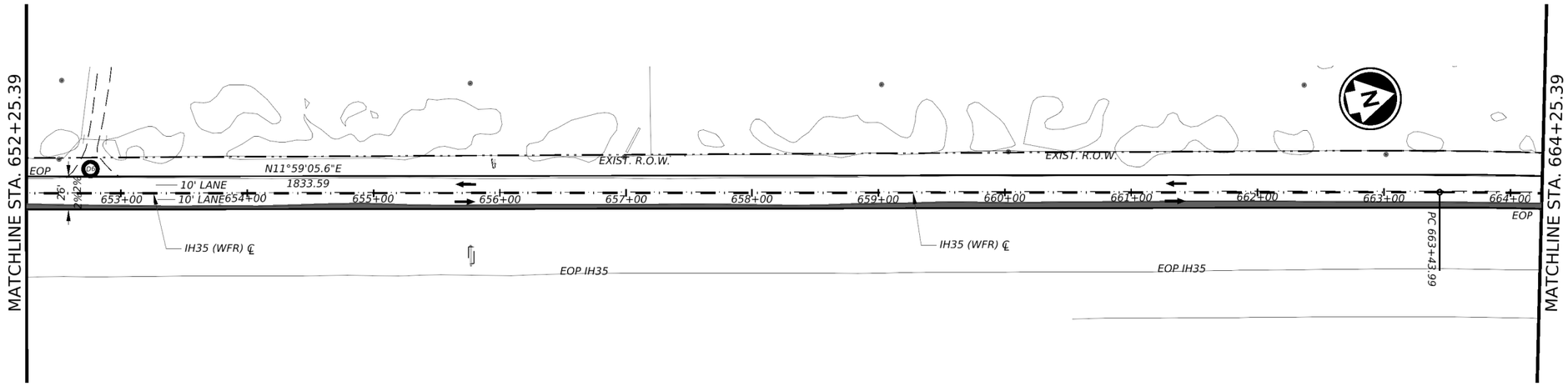
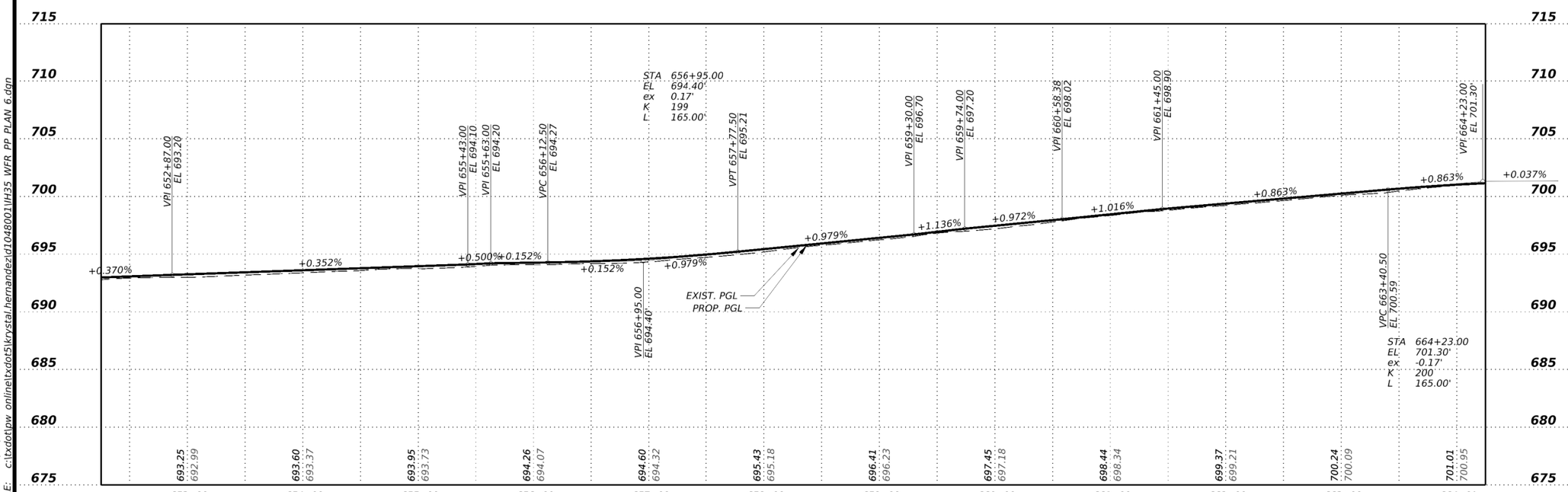


LEGEND:

WIDENING AREA

NOTES:

1. SEE "GEOMETRIC DATA SHEETS FOR ALIGNMENT, CROSS SLOPES & SUPER ELEVATION DATA.
2. SEE CULVERT CROSS SECTIONS SHEETS FOR DRAINAGE STRUCTURE INFORMATION.
3. SEE PROJECT LAYOUT SHEETS FOR SURVEY CONTROL POINTS.



SCALE: HORIZ 1"= 50'
VERT 1"= 5'

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IH 35 WFR

PLAN AND PROFILE SHEETS STA 652+25.39 TO STA 664+25.39

SHEET 6 OF 9

CONT	SECT	JOB	HIGHWAY
0018	05	090	IH35 WFR
DIST	COUNTY		SHEET NO.
22	WEBB		60

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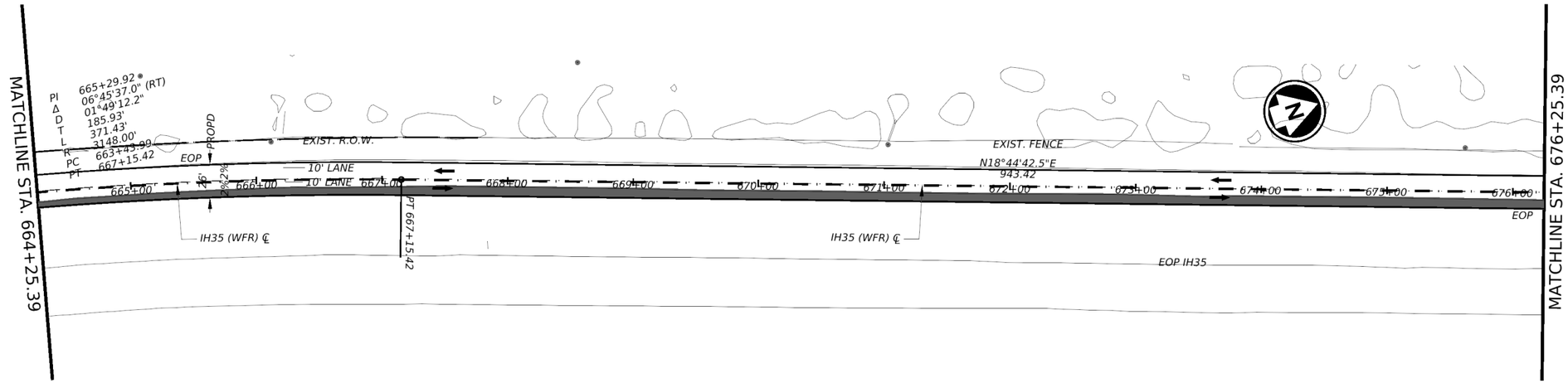


LEGEND:

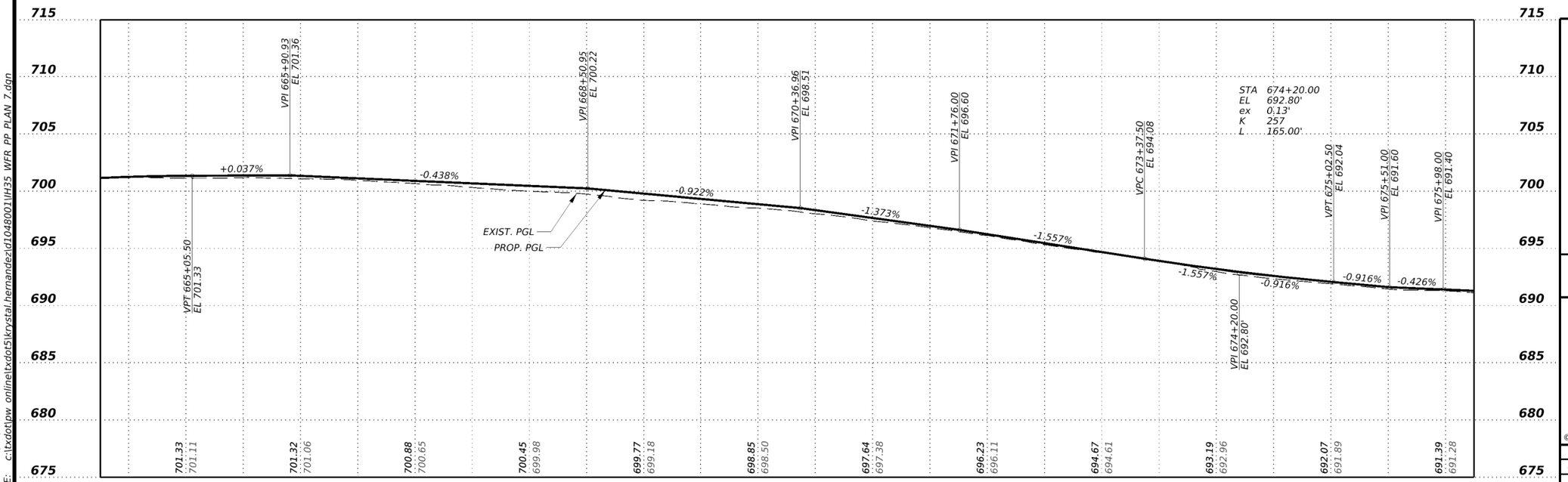
WIDENING AREA

NOTES:

1. SEE "GEOMETRIC DATA SHEETS FOR ALIGNMENT, CROSS SLOPES & SUPER ELEVATION DATA.

2.SEE CULVERT CROSS SECTIONS SHEETS FOR DRAINAGE STRUCTURE INFORMATION.

3. SEE PROJECT LAYOUT SHEETS FOR SURVEY CONTROL POINTS.



SCALE: HORIZ 1"= 50'
VERT 1"= 5'

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IH 35 WFR

PLAN AND PROFILE SHEETS STA 664+25.39 TO STA 676+25.39

SHEET 7 OF 9

CONT	SECT	JOB	HIGHWAY
0018	05	090	IH35 WFR
DIST	COUNTY		SHEET NO.
22	WEBB		61

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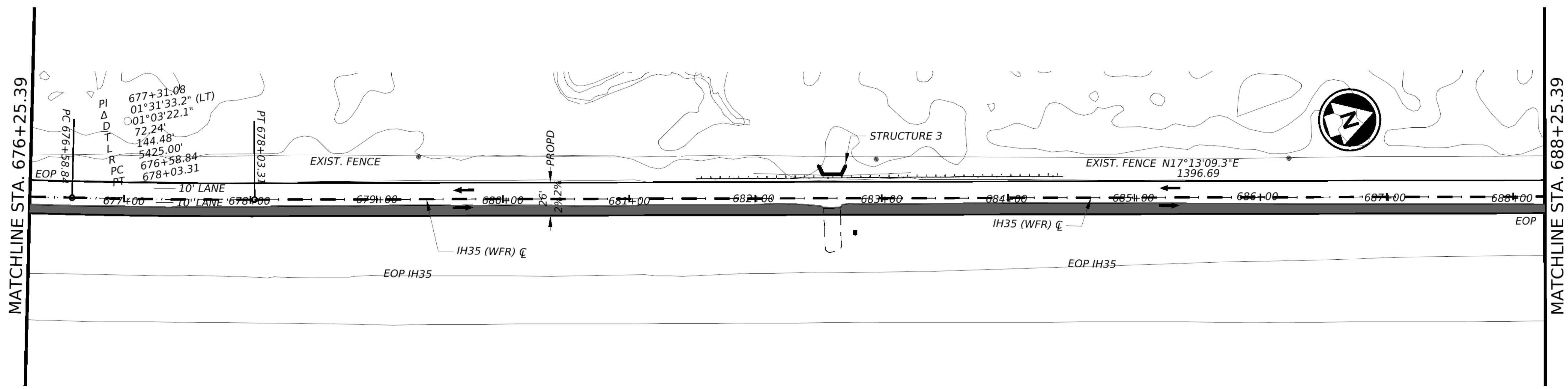
LEGEND:

WIDENING AREA



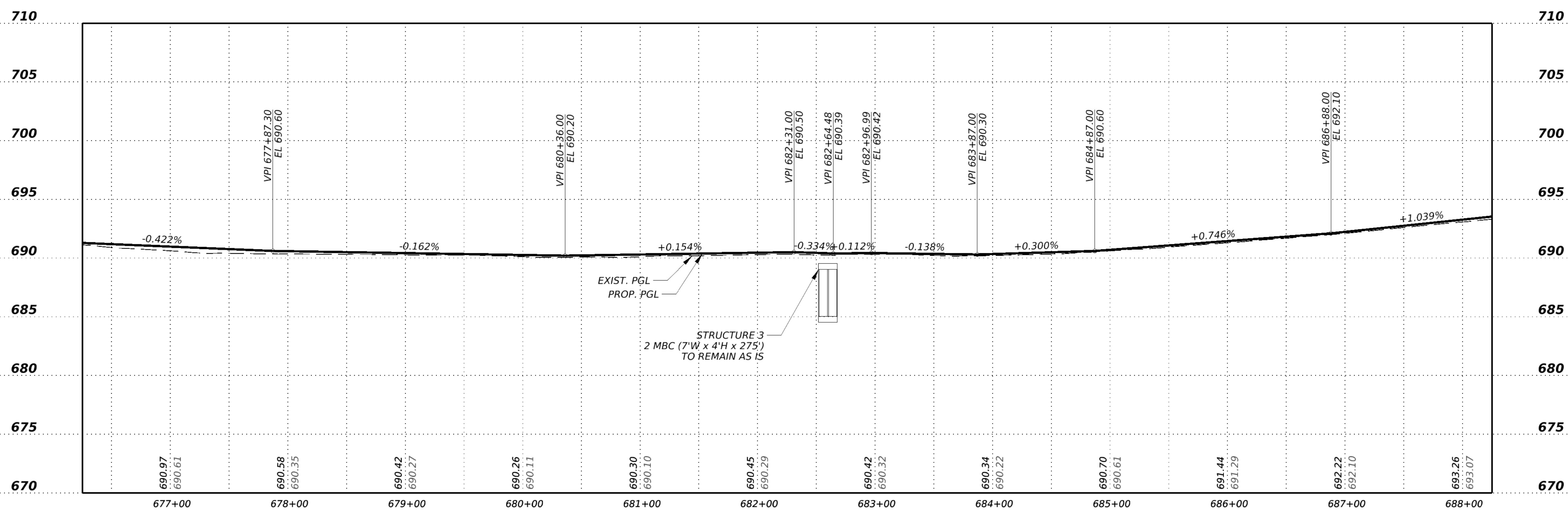
NOTES:

1. SEE "GEOMETRIC DATA SHEETS FOR ALIGNMENT, CROSS SLOPES & SUPER ELEVATION DATA.

2.SEE CULVERT CROSS SECTIONS SHEETS FOR DRAINAGE STRUCTURE INFORMATION.

3. SEE PROJECT LAYOUT SHEETS FOR SURVEY CONTROL POINTS.

SCALE: HORIZ 1"= 50'
VERT 1"= 5'



STATE OF TEXAS
LUIS G. URBINA
117019
LICENSED PROFESSIONAL ENGINEER

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11/27/2023

Texas Department of Transportation

IH 35 WFR

PLAN AND PROFILE
SHEETS STA 676+25.39
TO STA 688+25.39

SHEET 8 OF 9

CONT	SECT	JOB	HIGHWAY
0018	05	090	IH35 WFR
DIST		COUNTY	SHEET NO.
22		WEBB	62

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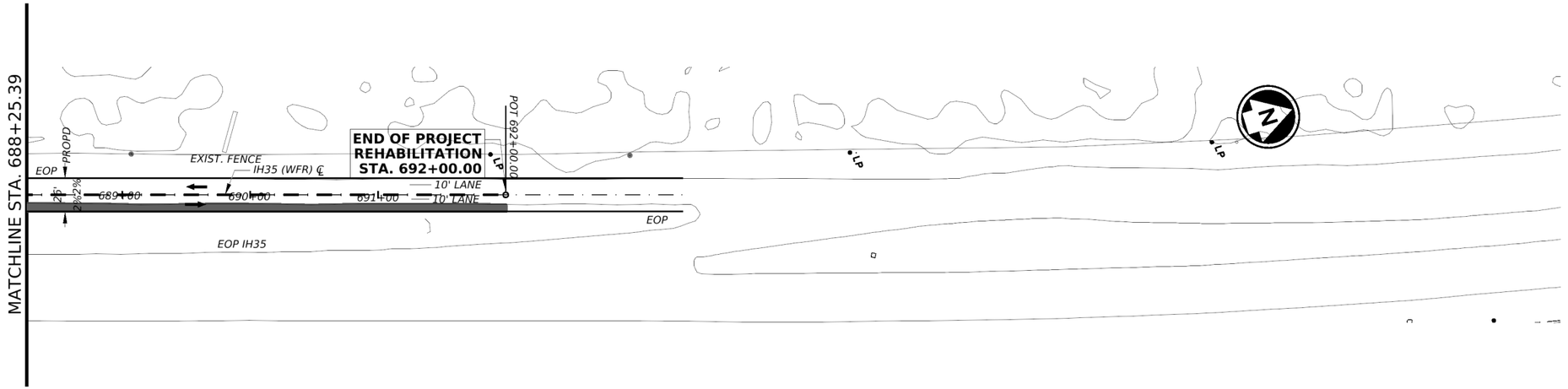


LEGEND:

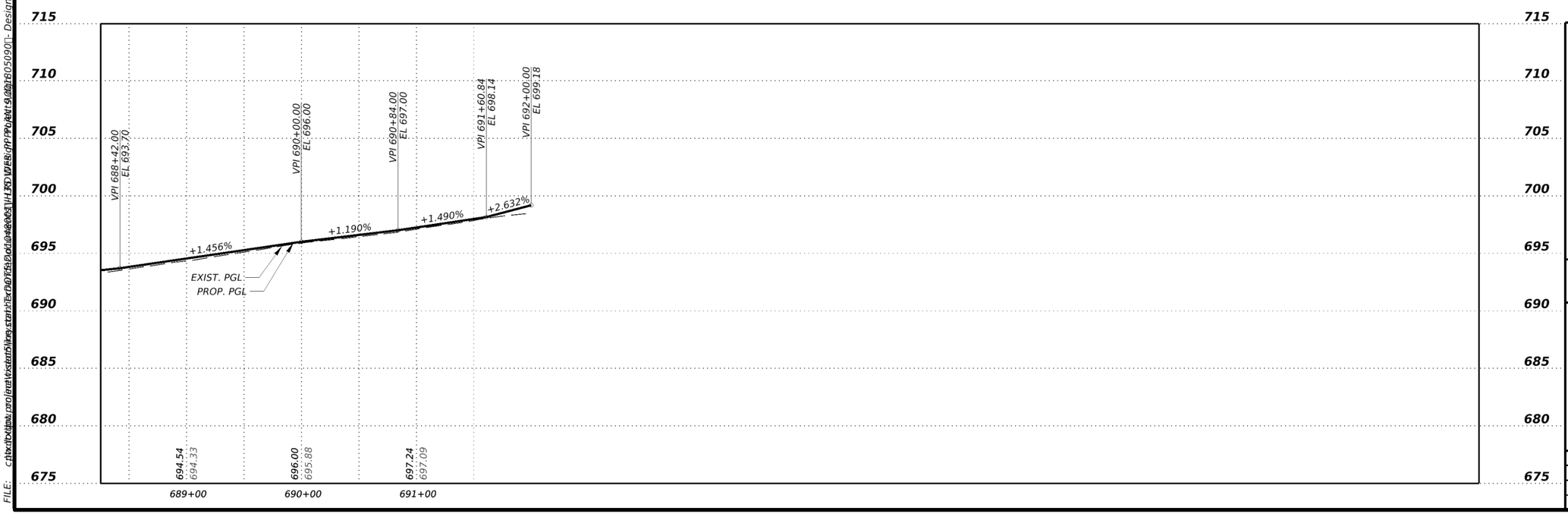
WIDENING AREA

NOTES:

1. SEE "GEOMETRIC DATA SHEETS FOR ALIGNMENT, CROSS SLOPES & SUPER ELEVATION DATA.

2.SEE CULVERT CROSS SECTIONS SHEETS FOR DRAINAGE STRUCTURE INFORMATION.

3. SEE PROJECT LAYOUT SHEETS FOR SURVEY CONTROL POINTS.



SCALE: HORIZ 1"= 50'
VERT 1"= 5'

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117019
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PROFESSIONAL ENGINEER

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11/27/2023

Texas Department of Transportation

IH 35 WFR

PLAN AND PROFILE
SHEETS STA 688+25.39
TO STA 692+00

SHEET 9 OF 9

CONT	SECT	JOB	HIGHWAY
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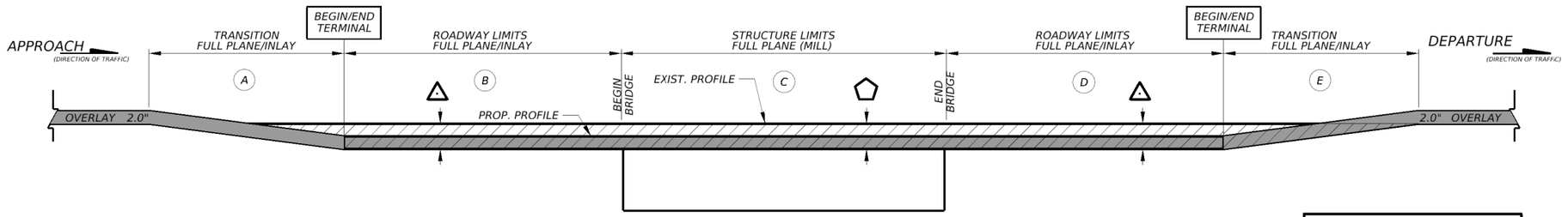

(DETAIL TYPE 1)
ROADWAY PROFILE VIEW
(OVERLAY)

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		DETAIL	FULL PLANE	FULL INLAY	FULL PLANE	FULL INLAY																
		TYPE	IN	IN	IN	IN	LENG	WIDTH	SY	LENG	WIDTH	SY	LENG	WIDTH	SY	LENG	WIDTH	SY	LENG	WIDTH	SY	SY
530+11	CULVERT 1	1	5	2	5	2	250	30	834	100	30	334	17	30	57	200	30	667	250	30	834	2726
551+90	22-240-0-0018-05-068	1	8	2	8	2	400	24	1067	100	24	267	28	24	75	175	24	467	400	24	1067	2943
569+40	CULVERT 2	1	8	2	8	2	400	24	1067	75	24	200	14	24	38	150	24	400	400	24	1067	2772
																						8441

NOTES:

1. REFER TO "MBGF.RAIL & TERMINAL INSTALLATION LAYOUT" SHEET(S) FOR ADDITIONAL STRUCTURAL INFORMATION.
2. ALL PLANING WORK DONE OVER STRUCTURE LIMITS SHOWN ON THIS SHEET TO BE DONE AT 1" INCREMENTS UNTIL FULL PLANING DEPTH IS ACHIEVED UNLESS OTHERWISE APPROVED BY THE ENGINEER.
3. ANY ADDITIONAL WORK NEEDED TO ACHIEVE FULL PLANE DEPTH WILL NOT BE PAID DIRECTLY BUT WILL BE SUBSIDIARY TO ITEM "354".
4. CONTRACTOR TO VERIFY DEPTH OVER STRUCTURE BEFORE PLANING OPERATIONS.
5. ITEMS 354-6030 and 354-6088 WILL BE USED ONLY FOR TRANSITIONS

STATE OF TEXAS
LUIS G. URBINA
117019
LICENSED
PROFESSIONAL ENGINEER

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11/30/2023

Texas Department of Transportation

IH 35 WFR

ROADWAY
MISCELLENEOUS DETAILS

SHEET 1 OF 3

CONT	SECT	JOB	HIGHWAY
0018	05	090	IH35 WFR
DIST	COUNTY		SHEET NO.
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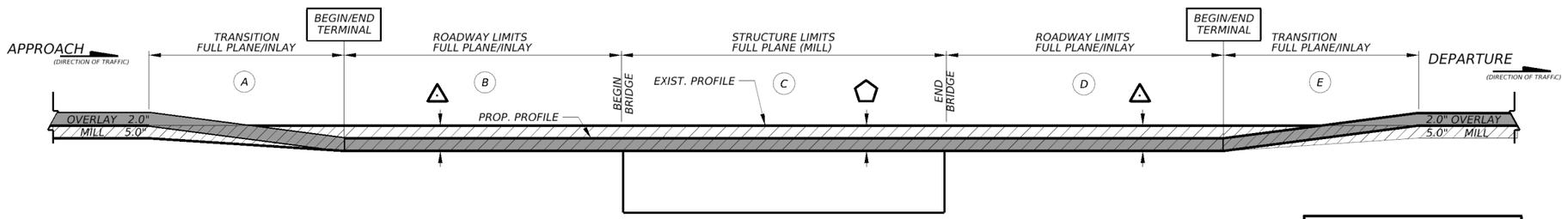

(DETAIL TYPE 2)
ROADWAY PROFILE VIEW
(REHABILITATION)

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		TYPE	IN	IN	IN	IN																
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682+60	CULVERT 3	2	8	2	8	2	400	24	1067	75	24	200	15	24	40	200	24	534	400	24	1067	2908
																						6115

NOTES:

1. *REFER TO "MBGF.RAIL & TERMINAL INSTALLATION LAYOUT" SHEET(S) FOR ADDITIONAL STRUCTURAL INFORMATION.*
2. *ALL PLANING WORK DONE OVER STRUCTURE LIMITS SHOWN ON THIS SHEET TO BE DONE AT 1" INCREMENTS UNTIL FULL PLANING DEPTH IS ACHIEVED UNLESS OTHERWISE APPROVED BY THE ENGINEER.*
3. *ANY ADDITIONAL WORK NEEDED TO ACHIEVE FULL PLANE DEPTH WILL NOT BE PAID DIRECTLY BUT WILL BE SUBSIDIARY TO ITEM "354".*
4. *CONTRACTOR TO VERIFY DEPTH OVER STRUCTURE BEFORE PLANING OPERATIONS.*
5. *ITEMS 354-6030 and 354-6088 WILL BE USED ONLY FOR TRANSITIONS*

STATE OF TEXAS
LUIS G. URBINA
117019
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PROFESSIONAL ENGINEER

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11/30/2023

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IH 35 WFR

ROADWAY
MISCELLENEOUS DETAILS

CONT	SECT	JOB	HIGHWAY
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DIST	COUNTY		SHEET NO.
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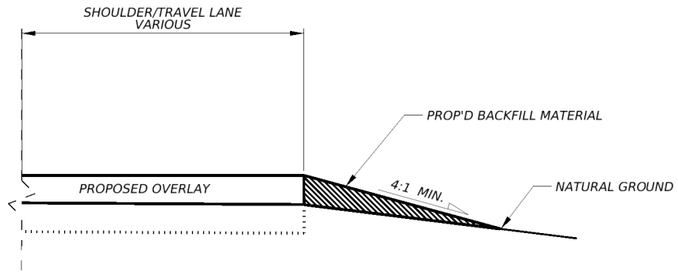

BACKFILL

OVERLAY/BACKFILL
(CROSS SECTION)

NOTES OVERLAY- BACKFILL

1. BACKFILL WILL VARY DUE TO EXISTING NATURAL GROUND CONDITIONS.
2. REFER TO "SUMMARY OF QUANTITIES" SHEET(S) FOR BACKFILL MATERIAL TYPE TO BE PLACED.
3. DURING ALL NON-WORK HOURS ALL PAVEMENT EDGE DROP-OFFS ARE TO BE FILLED TO A 3:1 MAXIMUM SLOPE, UNTIL FINAL BACKFILL MATERIAL CAN BE PLACED.

Texas Department of Transportation

IH 35 WFR

ROADWAY
MISCELLANEOUS DETAILS

SHEET 3 OF 3

CONT	SECT	JOB	HIGHWAY
0018	05	090	IH35 WFR
DIST	COUNTY		SHEET NO.
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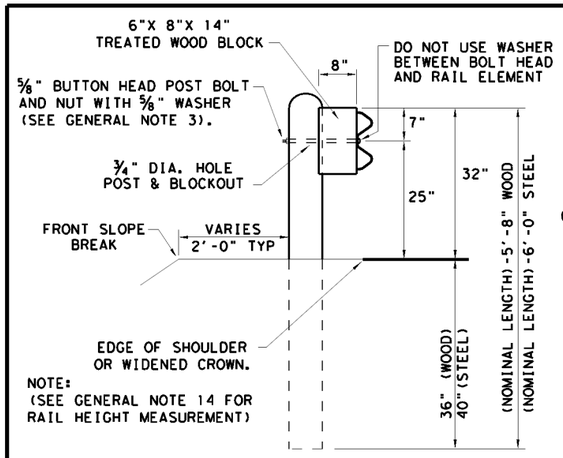
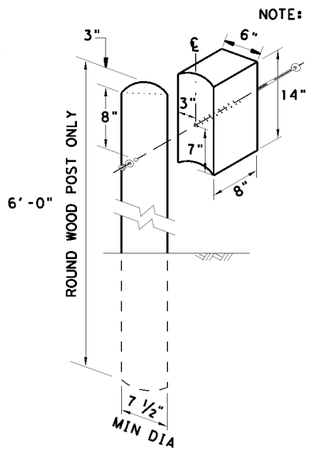
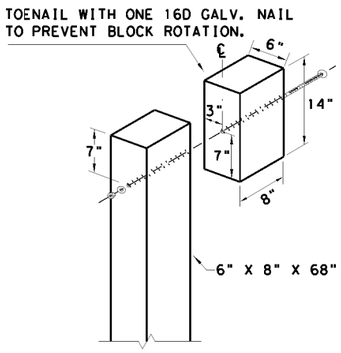


TYPICAL POST PLACEMENT

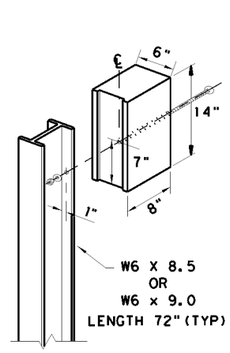


WOOD BLOCK TO ROUND WOOD POST

NOTE: TOENAIL WITH ONE 16D GALV. NAIL TO PREVENT BLOCK ROTATION.

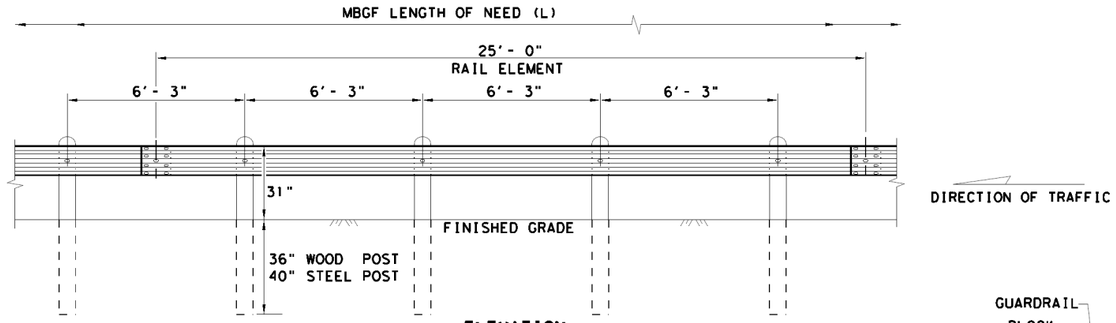


WOOD BLOCK TO RECTANGULAR WOOD POST



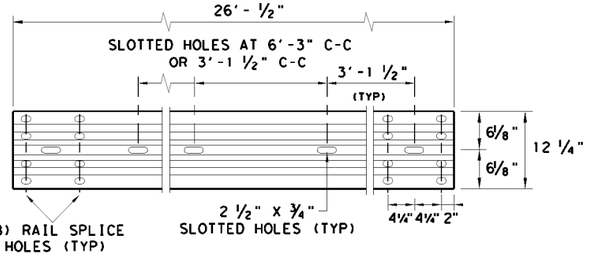
ROUTED WOOD BLOCK TO I-BEAM STEEL POST

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



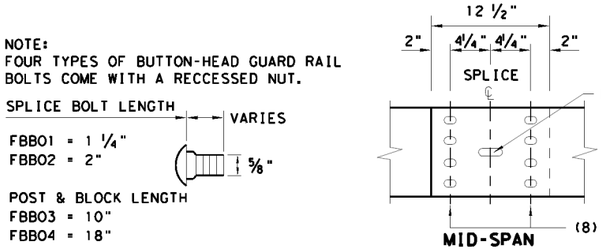
ELEVATION MID-SPAN RAIL SPLICE

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



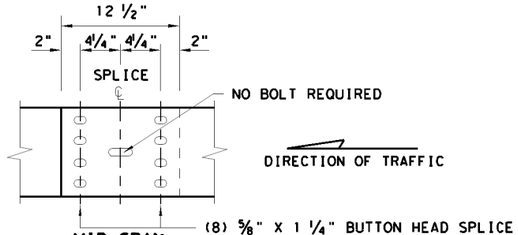
ELEVATION 25'- 0" (NOM.) W-BEAM SECTION

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



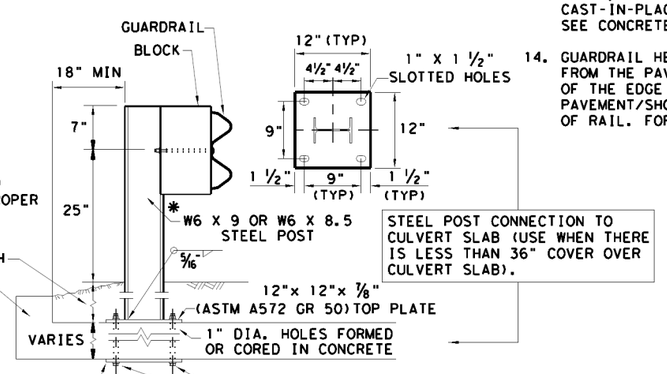
BUTTON HEAD BOLT

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.



LOW FILL CULVERT POST

NOTE: TWO INSTALLATION OPTIONS.

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

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

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

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

GENERAL NOTES

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

Texas Department of Transportation — Design Division Standard

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

FILE: gf3119.dgn	DN: TxDOT	CK: KM	DW: VP	CK: CGL/AG
©TxDOT: NOVEMBER 2019	CONT	SECT	JOB	HIGHWAY
REVISIONS	0018	05	090	IH35 WFR
	DIST	COUNTY		SHEET NO.
	22	WEBB		67

DATE: 11/27/2023
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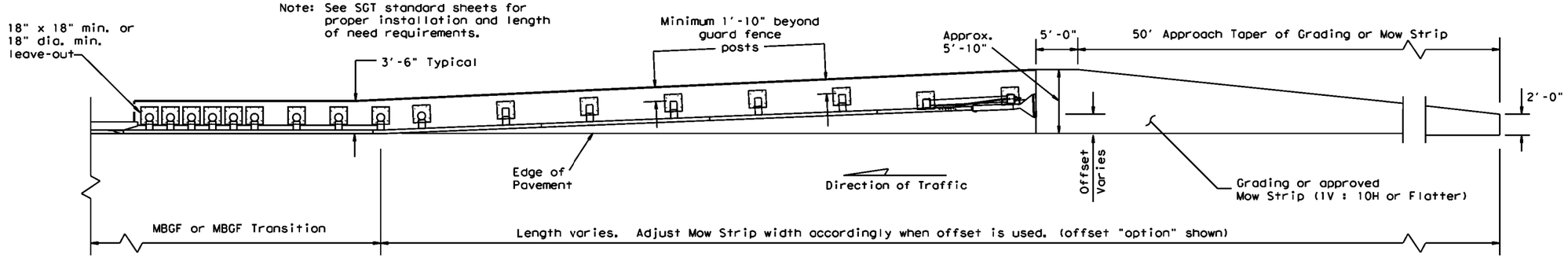
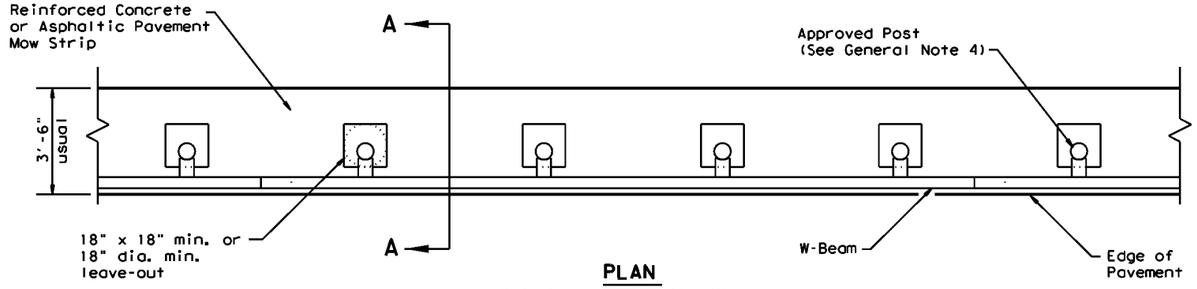
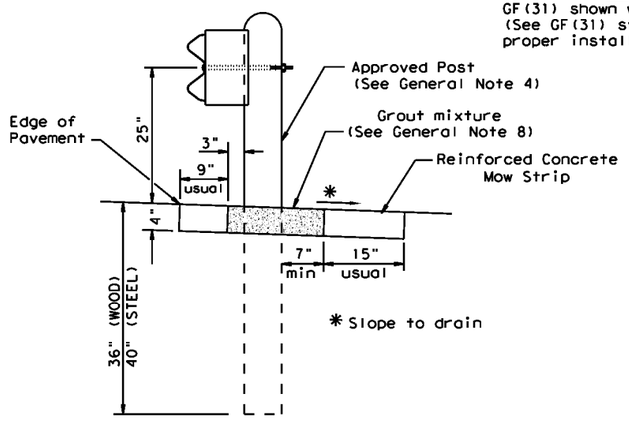


GRADING AND MOW STRIP AT GUARDRAIL END TREATMENTS



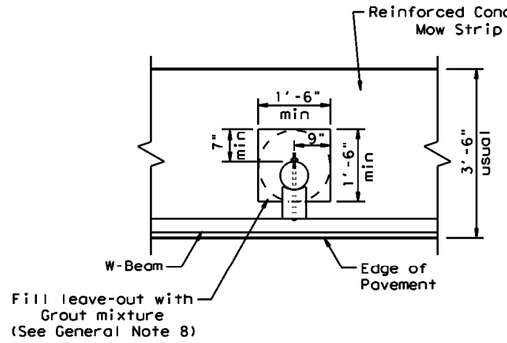
PLAN

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



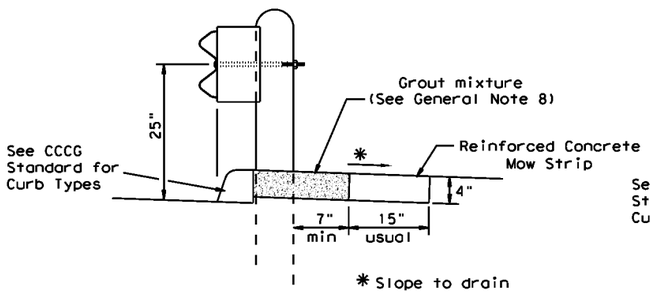
SECTION A-A

Typical



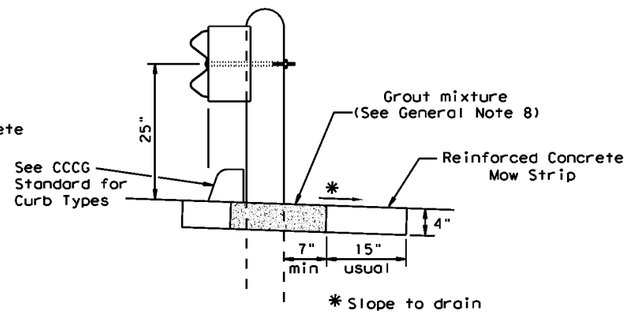
MOW STRIP DETAIL

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



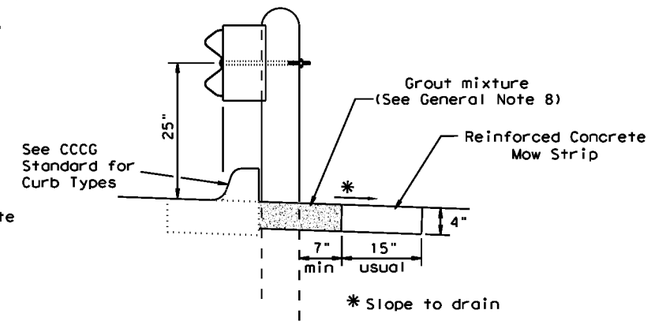
CURB OPTION (1)

This option will increase the post embedment throughout the system.



CURB OPTION (2)

Curb shown on top of mow strip



CURB OPTION (3)

Note: Site Condition(s)

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

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

GENERAL NOTES

1. This mow strip design is for use with metal beam guard fence, guard fence transitions, and guard fence end treatments. See applicable GF(31) MBGF or GF(31) Transition Standard sheet for additional information.
2. Mow strips shall be reinforced concrete with (wire mesh or synthetic fiber), as shown on the plans and will be paid for under the pertinent bid item. Reinforced concrete shall be placed in accordance with Item 432, "Riprap." The use of the synthetic fiber in lieu of steel reinforcing is acceptable, provided the fiber producer is on the Department Material Producer List (MPL), maintained by TxDOT, Construction Division.
3. The leave-out behind the post shall be a minimum of 7".
4. Only steel (W6 x 8.5 or W6 x 9.0), or 7 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

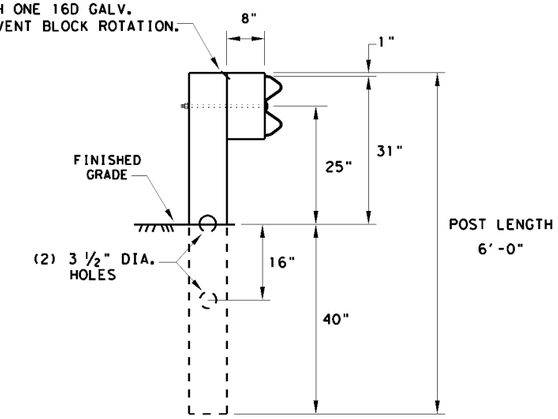
METAL BEAM GUARD FENCE (MOW STRIP) TL-3 MASH COMPLIANT

GF(31)MS-19

FILE: gf31ms19.dgn	DN: TxDOT	CK: KM	DW: VP	CK: CGL/AG
©TxDOT: NOVEMBER 2019	CONT	SECT	JOB	HIGHWAY
REVISIONS	0018	05	090	IH35 WFR
	DIST	COUNTY		SHEET NO.
	22	WEBB		68

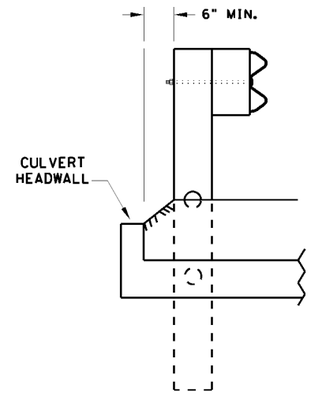
DATE: 11/27/2023
FILE: c:\txdot\pw_online\txdot5\krystal.hernandez\d1042306\gf31is19.dgn

NOTE: TOENAIL WITH ONE 16D GALV. NAIL TO PREVENT BLOCK ROTATION.



RECTANGULAR CRT POST (6"X 8" X 6' LONG)

(6) CRT REQUIRED
SEE ELEVATION DETAIL FOR LOCATIONS



LATERAL OFFSET BETWEEN THE GUARDRAIL AND THE CULVERT HEADWALL

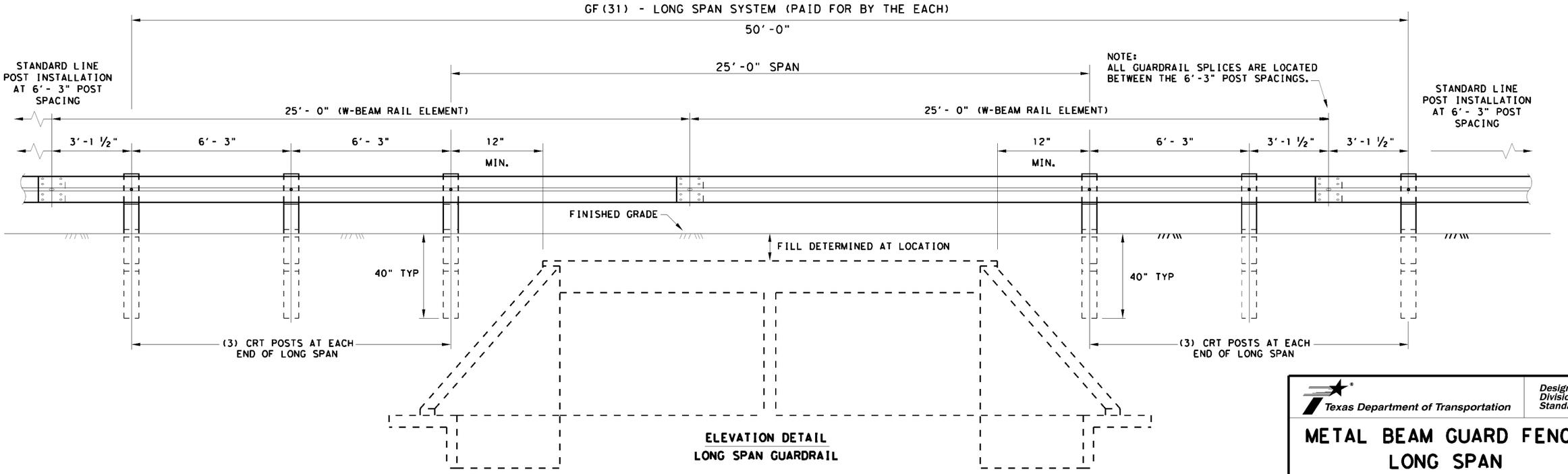
GENERAL NOTES

1. THE TYPE OF LINE POST (ROUND WOOD POST, RECTANGULAR WOOD POST, OR STEEL POST) WILL BE AS SHOWN IN THE PLANS. THE EXACT POSITION OF THE TRANSITIONS SHALL BE AS SHOWN IN THE PLANS OR AS DIRECTED BY THE ENGINEER. STEEL POSTS TO BE GALVANIZED IN ACCORDANCE WITH ITEM 445, "GALVANIZING."
2. RAIL ELEMENT SHALL MEET ALL REQUIREMENTS OF ITEM 540, "METAL BEAM GUARD FENCE" EXCEPT AS MODIFIED ON THE PLANS. THE CONTRACTOR MAY FURNISH RAIL ELEMENTS OF 12'- 6" OR 25'- 0" NOMINAL LENGTHS.
3. RAIL POST HOLES ARE OFFSET 3'- 1 ½" FROM STANDARD GUARDRAIL TO ACCOMMODATE THE MIDSPAN SPLICING.
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 NO MORE THAN 1" BEYOND IT.
5. FITTINGS (BOLTS, NUTS, AND WASHERS) SHALL BE GALVANIZED IN ACCORDANCE WITH ITEM 445, "GALVANIZING". FITTINGS SHALL BE SUBSIDIARY TO THE BID ITEM.
6. WHERE SOLID ROCK IS ENCOUNTERED, CONTACT THE DESIGN DIVISION FOR ADDITIONAL GUIDANCE. (512) 416-2678
7. POSTS SHALL NOT BE SET IN CONCRETE, OF ANY DEPTH.
8. REFER TO GF(31) STANDARD SHEET FOR ADDITIONAL DETAILS.
9. FLAME CUTTING OF HOLES IN GUARDRAIL SHALL NOT BE PERMITTED. IF YOU ENCOUNTER MIS-ALIGNED BOLT HOLES IN GUARDRAIL CONTACT THE DESIGN DIVISION FOR ADDITIONAL INFORMATION & OPTIONS.

NOTE: SEE GF(31) STANDARD FOR STANDARD LINE POSTS.

DIRECTION OF TRAFFIC

GF(31) - LONG SPAN SYSTEM (PAID FOR BY THE EACH)



ELEVATION DETAIL
LONG SPAN GUARDRAIL

Texas Department of Transportation

Design Division Standard

METAL BEAM GUARD FENCE LONG SPAN TL-3 MASH COMPLIANT

GF(31)LS-19

FILE: gf31is19.dgn	DN: TxDOT	CK: KM	DW: VP	CK: CGL/AG
©TxDOT: NOVEMBER 2019	CONT	SECT	JOB	HIGHWAY
REVISIONS	0018	05	090	IH35 WFR
	DIST	COUNTY		SHEET NO.
	22	WEBB		69

DATE: 11/27/2023
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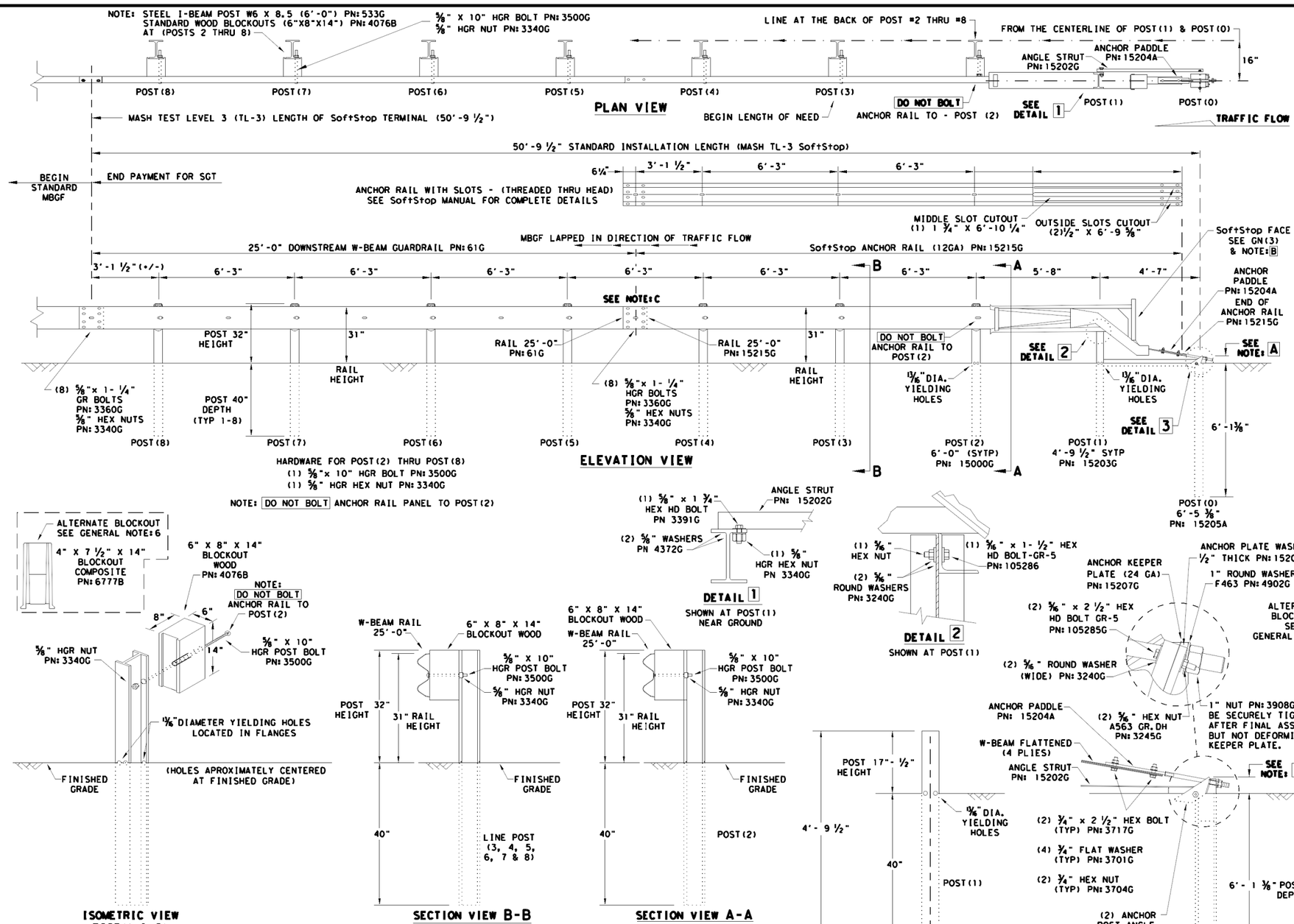

GENERAL NOTES

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	⅝" 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	0018	05	090	IH35 WFR
	DIST	COUNTY		SHEET NO.
	22	WEBB		70

DATE: 11/27/2023
FILE: c:\txdot\pw_online\txdot5\krystol.hernandez\d1042306\sgt11s3118.dgn

(SEE GN NOTE 15)
STANDARD 31" MBGF

ITEM (6)
INNER SIDE SLIDER
(ISS) PANEL FOR RAIL 3

FIELD-SIDE
(RAIL 3)

NOTE:
RECESSED HEX NUTS FACING
TRAFFIC-SIDE SEE DETAIL (C)

REFERENCE LINE USED TO INSTALL
LINE POST(9) THRU POST(2)

POST 1 OFFSET DISTANCE MEASURED
7-⅝" FROM REFERENCE LINE

POST 9 | POST 8 | POST 7 | POST 6 | POST 5 | POST 4 | POST 3 | POST 2

RAIL 4 | RAIL 3 | RAIL 2 | RAIL 1

ITEM (10)
CABLE ASSEMBLY

ITEM (2)
GROUNDSTRUT

NO BLOCKOUT
AT (POST 1)

CABLES

ITEM (5)
TRAFFIC SIDE SLIDER
(TSS) PANEL FOR RAIL 2

NOTE: SECURE THE (TSS) PANEL TO OUTSIDE
OF RAIL 2 WITH THE PANEL ARROWS
POINTING TOWARDS THE HEAD.

PLAN VIEW

NOTES:
1. ITEM (12) COMPOSITE BLOCKOUTS INSTALLED AT LINE POST(9) THRU LINE POST(2).
2. DO NOT INSTALL A BLOCKOUT AT LINE POST(1).

MBGF
RAIL 2

INSTALL GUARD FENCE RECESSED
HEX NUTS ON TRAFFIC-SIDE

MBGF
RAIL 1

DETAIL (C)

TRAFFIC FLOW

ITEM (25)
MAX-TENSION HEAD
SEE DETAIL (A)

DO NOT BOLT
RAIL TO POST 6

END PAYMENT (SGT) BY EACH

BEGIN LENGTH OF NEED

INSTALLATION LENGTH 55'- ½"

49'-8 ⅝"

6'-3" | 6'-3" | 6'-3" | 6'- ¾" | 6'-3" | 6'-3" | 6'-3" | 37 ½" | 5'-3 ⅞"

RAIL HEIGHT
31"

ARROWS

RAIL HEIGHT
31"

HEAD HEIGHT
32-¼"

ITEM (13) RAIL 4 | ITEM (13) RAIL 3 | ITEM (13) RAIL 2 | ITEM (13) RAIL 1

DETAIL (D)

DETAIL (B)

FINISHED GRADE

CABLES

FINISHED GRADE

ITEM (10)
CABLE ASSEMBLY

ITEM (2)
GROUNDSTRUT

68-⅛"

POST 9 | POST 8 | POST 7 | POST 6 | POST 5 | POST 4 | POST 3 | POST 2 | POST 1
ITEM (4)
I-BEAM
W6 X 9
NO BLOCKOUT
AT (POST 1)

SOIL
ANCHOR POST
ITEM (1)

(8) X-LITE LINE POST - ITEM (11)

ELEVATION VIEW

A

A

TSS PANEL
GALVANIZED
ITEM (5)

RSS PLATE
GALVANIZED
ITEM (8)

INSTALL THE TSS AND RSS
WITH THE ARROWS POINTING
TOWARDS THE MAX-HEAD

TSS PANEL AND RSS PLATE
DETAIL (D)

NOTE:
USE THE MASH APPROVED
X-TENSION CABLE ASSEMBLY.

7 ⅝"
2 ⅛"

UPPER CABLE
(BACK SIDE)

LOWER CABLE
(TRAFFIC SIDE)

DETAIL (B)

HEAD
HEIGHT
32-¼"

TOP OF POST

31-⅞"

FINISHED
GRADE

40-⅛"

68-⅛"
ANCHOR POST
DEPTH

ITEM (1)
ANCHOR

ITEM (11)
LINE POSTS
2 THRU 9
(NOTE: ITEM (4) POST 1 (NOT SHOWN),
TO BE INSTALLED AT SAME DEPTH
AS LINE POSTS.)

SOIL ANCHOR, POST 1
& LINE POST 2 THRU 9

SECTION VIEW A-A

CABLE
FRICTION PLATE
HEAD UNIT
ITEM (9)

NOTE:
INSTALL ⅝" RECESSED HEX
NUTS ON TRAFFIC SIDE.

ITEM (24)
ITEM (21)

ITEM (20)
8X

ITEM (17)
8X

ITEM (23)
6X
3 SCREWS
EACH SIDE

(RAIL 1)

ITEM (22)
BRACKET
SHIPPED FLAT

ITEM (3)

ITEM (16)
4X

* ITEM (25)
HIGH INTENSITY
REFLECTIVE SHEETING
NOTE: DELINEATION MARKER IN
ACCORDANCE WITH TEXAS MUTCD.

SPLICE FOR IMPACT-HEAD
TO GUARD FENCE (RAIL1)

DETAIL (A)

* TO BE PROVIDED BY DISTRIBUTOR
OR CONTRACTOR.

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

APPROX 5'-10"

5'-0"

50' APPROACH GRADING

STANDARD
MBGF

2'-0"

TRAFFIC FLOW

EDGE OF PAVEMENT

NOTE: ADJUST WIDTH ACCORDINGLY WHEN OFFSET IS USED. (OFFSET "OPTION" SHOWN)

2'-0" MAX.
RAIL OFFSET

APPROACH GRADING
(1V:10H OR FLATTER)
SEE PRODUCT ASSEMBLY MANUAL
FOR ADDITIONAL GUIDANCE.

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

APPROACH GRADING AT GUARDRAIL END TREATMENTS

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

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

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	0018	05	090	IH35 WFR
	DIST	COUNTY		SHEET NO.
	22	WEBB		71

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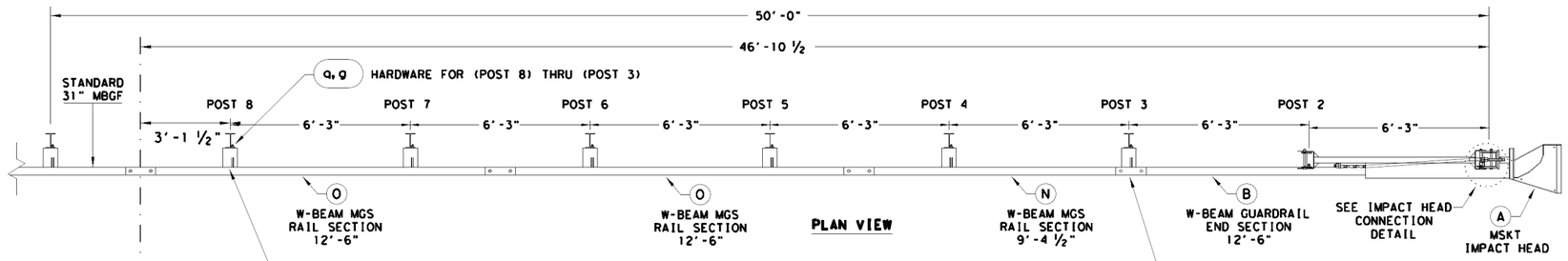
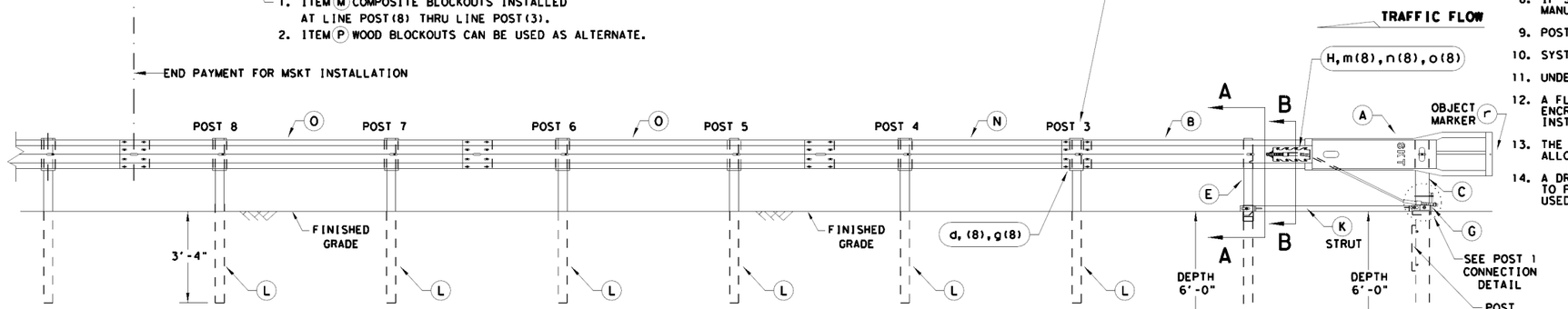
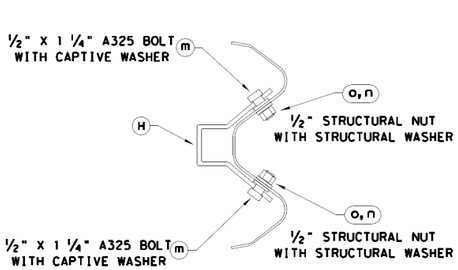


PLAN VIEW

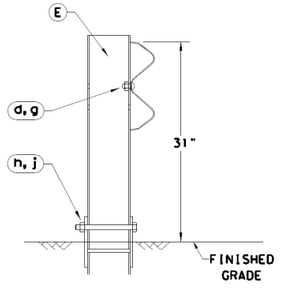


ELEVATION VIEW

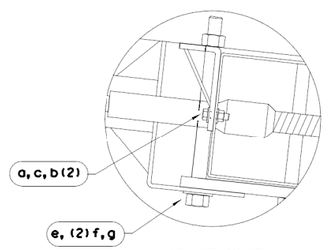
NOTE: SEE (GENERAL NOTE 14) FOR DRIVING CAP INFORMATION.



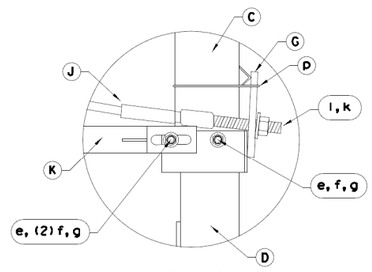
SECTION B-B
ANCHOR BRACKET



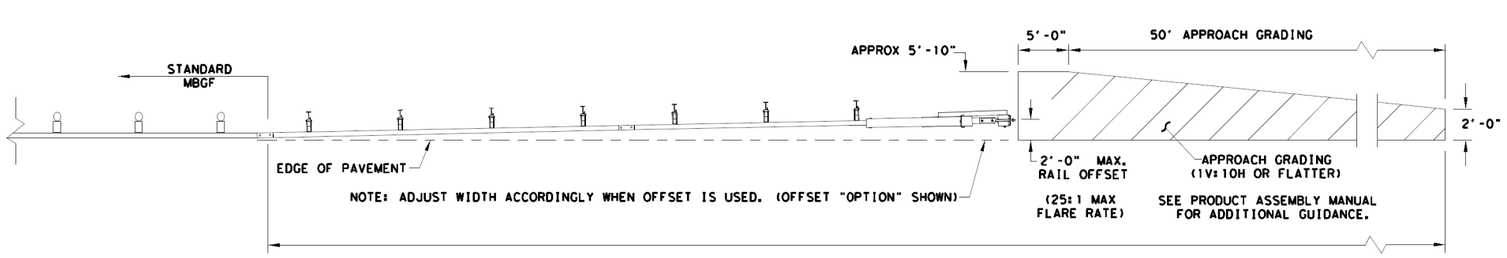
POST 2
SECTION A-A



IMPACT HEAD
CONNECTION DETAIL



POST 1
CONNECTION DETAIL



APPROACH GRADING AT GUARDRAIL END TREATMENTS

TRAFFIC FLOW

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.

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 ⅛" 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 ½")	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	⅝" x 1" HEX BOLT (GRD 5)	B5160104A
b	4	⅝" WASHER	W0516
c	2	⅝" HEX NUT	N0516
d	25	⅝" Dia. x 1 ¼" SPLICE BOLT (POST 2)	B580122
e	2	⅝" Dia. x 9" HEX BOLT (GRD A449)	B580904A
f	3	⅝" WASHER	W050
g	33	⅝" Dia. H.G.R NUT	N050
h	1	¾" Dia. x 8 ½" HEX BOLT (GRD A449)	B340854A
j	1	¾" Dia. HEX NUT	N030
k	2	1 ANCHOR CABLE HEX NUT	N100
l	2	1 ANCHOR CABLE WASHER	W100
m	8	½" x 1 ¼" A325 BOLT WITH CAPTIVE WASHER	SB12A
n	8	½" STRUCTURAL NUTS	N012A
o	8	1 1/16" O.D. x ⅜" I.D. STRUCTURAL WASHERS	W012A
p	1	BEARING PLATE RETAINER TIE	CT-100ST
q	6	⅝" 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

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	0018	05	090		IH35 WFR
	DIST	COUNTY			SHEET NO.
	22	WEBB			72

DATE: 11/27/2023
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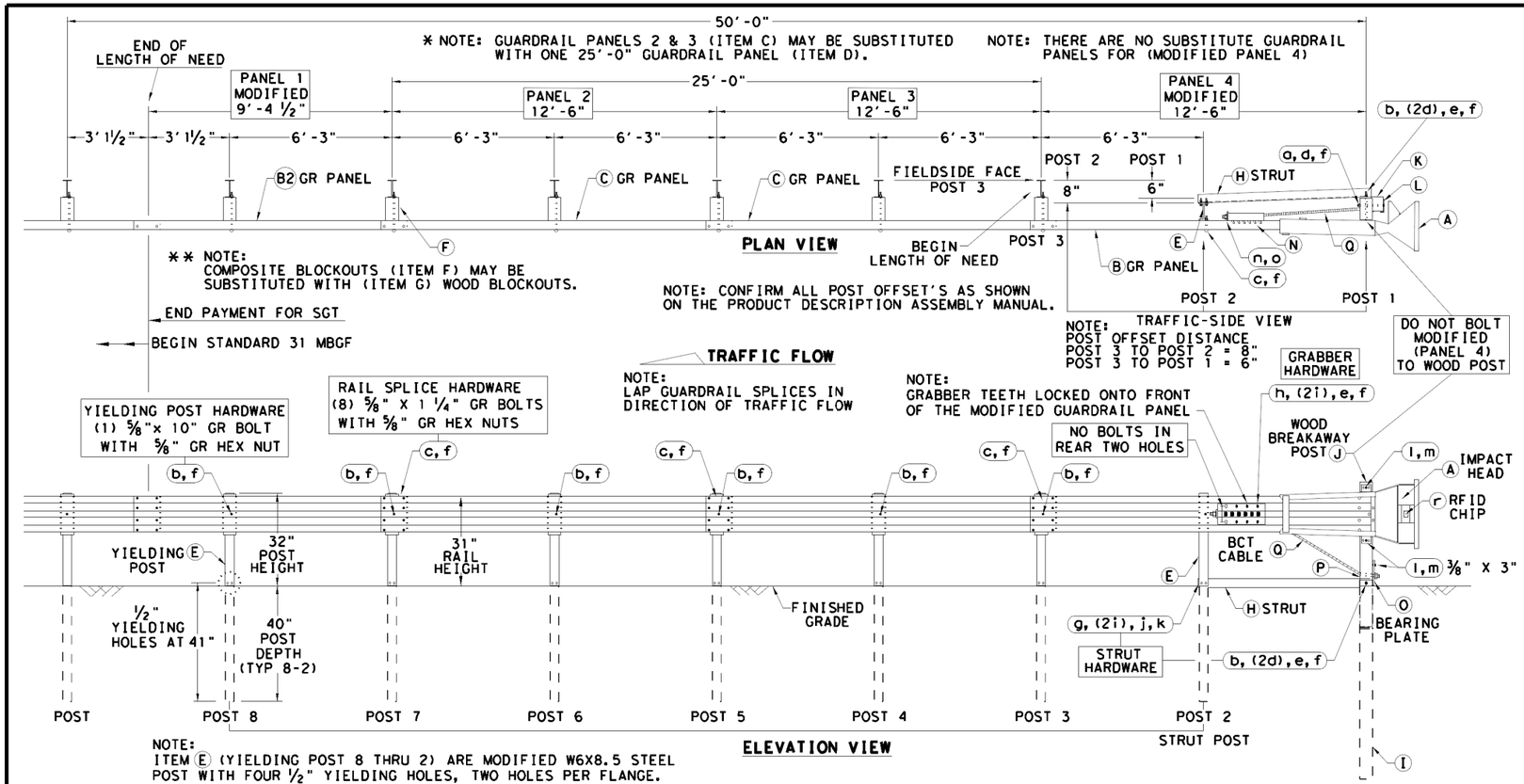
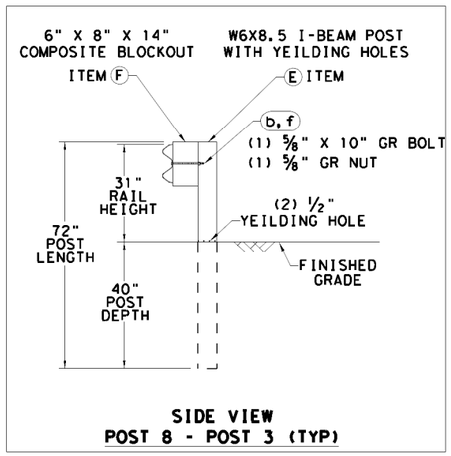


GENERAL NOTES

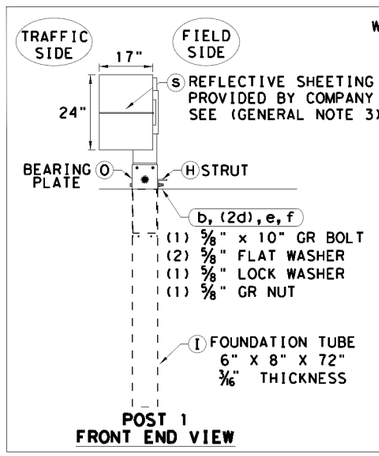
1. FOR SPECIFIC INFORMATION REGARDING INSTALLATION AND TECHNICAL GUIDANCE OF THE SYSTEM, CONTACT: SPIG INDUSTRY, INC. AT 1(267) 644-9510. 14675 INDUSTRIAL PARK RD; BRISTOL, VA 24202
2. FOR INSTALLATION, REPAIR AND MAINTENANCE REFER TO THE MANUFACTURER'S; SGET END TERMINAL, PRODUCT DESCRIPTION ASSEMBLY 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

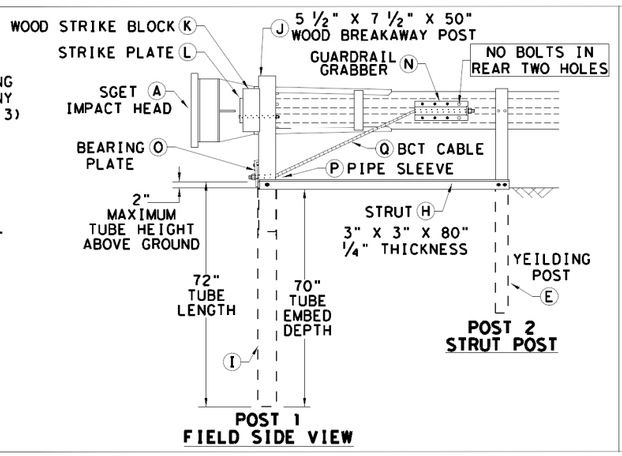
ALTERNATIVE ITEMS
* D
** G
NOTE: SEE PLAN VIEW



SIDE VIEW
POST 8 - POST 3 (TYP)

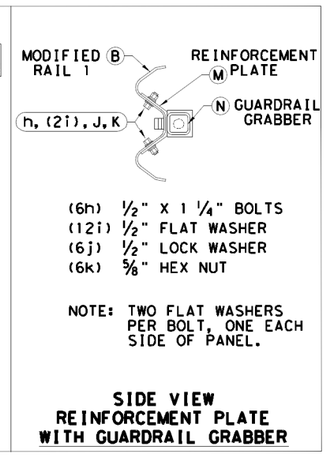


POST 1
FRONT END VIEW

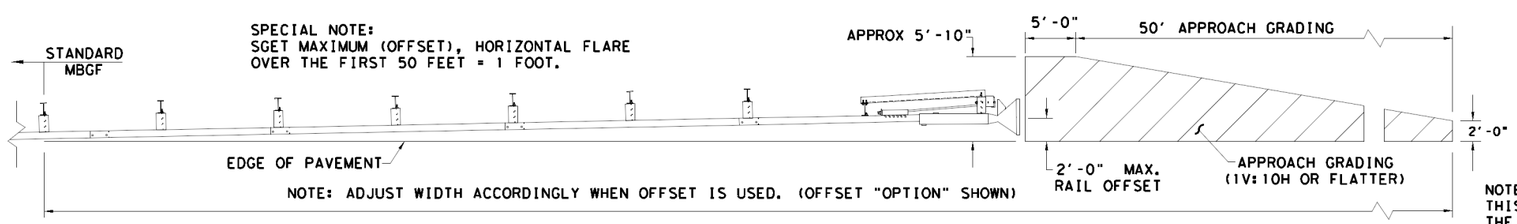


POST 1
FIELD SIDE VIEW

POST 2
STRUT POST



SIDE VIEW
REINFORCEMENT PLATE
WITH GUARDRAIL GRABBER



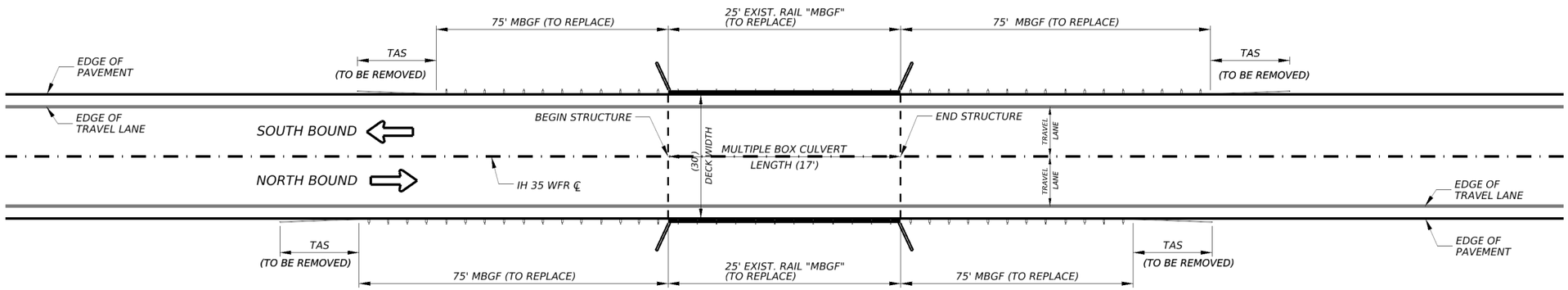
APPROACH GRADING AT GUARDRAIL END TREATMENTS

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

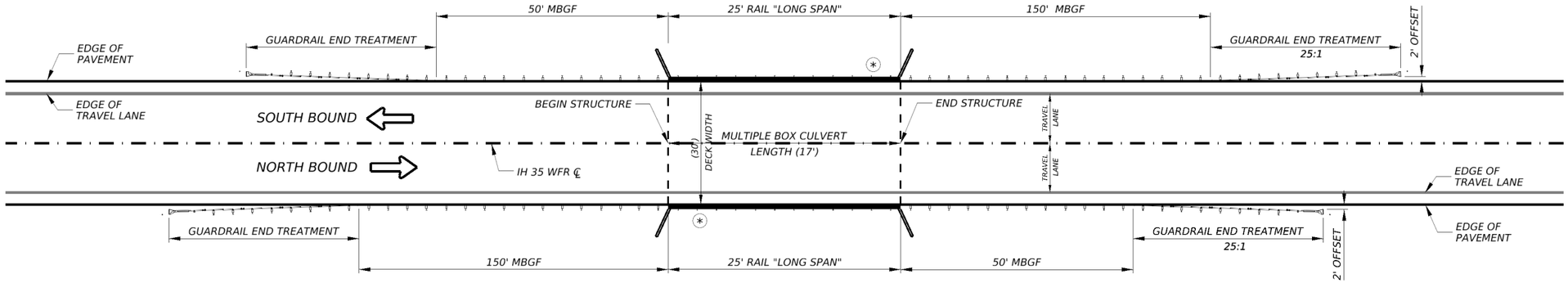
Texas Department of Transportation
Design Division Standard

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	0018	05	090	IH35 WFR
	DIST	COUNTY		SHEET NO.
	22	WEBB		73



SMALL STRUCTURE (PLAN VIEW) 530+11
EXISTING MBGF, RAIL & TERMINAL

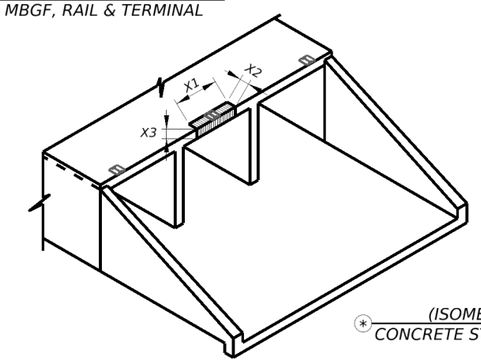


SMALL STRUCTURE (PLAN VIEW) 530+11
PROPOSED MBGF, RAIL & TERMINAL

NOTES:

1. MBGF, AND SGT INSTALLATION IS TO BE CONSTRUCTED IN SECTIONS (APPROACH UPSTREAM TRAFFIC, DEPARTURE DOWNSTREAM TRAFFIC). EACH SECTION WILL BE COMPLETED BEFORE THE END OF THE WORKING DAY ON WHICH IT WAS INITIATED. CONSTRUCTION OF A SECOND APPROACH/DEPARTURE SECTION MAY NOT COMMENCE UNTIL CONSTRUCTION OF A COMPLETE SECTION (THRIE-BEAM TRANSITION, MBGF, AND TERMINAL) IS COMPLETE. IF UNDER EXTREME CIRCUMSTANCES, A SECTION CAN NOT BE COMPLETED BEFORE THE END OF THE WORKING DAY, THE BLUNT, EXPOSED END WILL BE TIED DOWN AND/OR TIED TO THE REMAINING EXISTING MBGF APPURTENANCES (IF THEY ARE STILL IN PLACE) AT THE END OF THE WORKING DAY.
2. REFER TO TXDOT STANDARDS GF(31)-19, GF(31)MS-19, GF(31)LS-19, SGT(10S)31-16, SGT(11S)31-18, SGT(12S)31-18, SGT(15)31-20 AND "ROADWAY MISCELLANEOUS DETAILS" SHEET(S) FOR MORE INFORMATION.

(*) 3. FOLLOW PROCEDURES AS PER THE CONCRETE REPAIR MANUAL CHAPTER 3 FOR ITEM 429 REPAIR DETAIL AND INSTRUCTIONS FOR THE REMOVAL, CLEANING, FORMS, POURING AND MIXING NEW MATERIAL, CURING AND FINISH FOR THE CONCRETE REPAIR.



(*) (ISOMETRIC VIEW)
CONCRETE STRUCTURE REPAIR

CULVERT 1 REPAIRS	1 LOCATION	2 LOCATION
	FEET	FEET
X1	3	3
X2	1	1
X3	1	1
TOTAL SF.	9	9

STRUCTURE: CULVERT 1
(2 - 8'x8' MBC)

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MISAEL AGUILAR
150329
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PROFESSIONAL ENGINEER

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IH 35 WFR

CULVERT LAYOUTS

SHEET 1 OF 3

CONT	SECT	JOB	HIGHWAY
0018	05	090	IH35 WFR
DIST	COUNTY		SHEET NO.
22	WEBB		74

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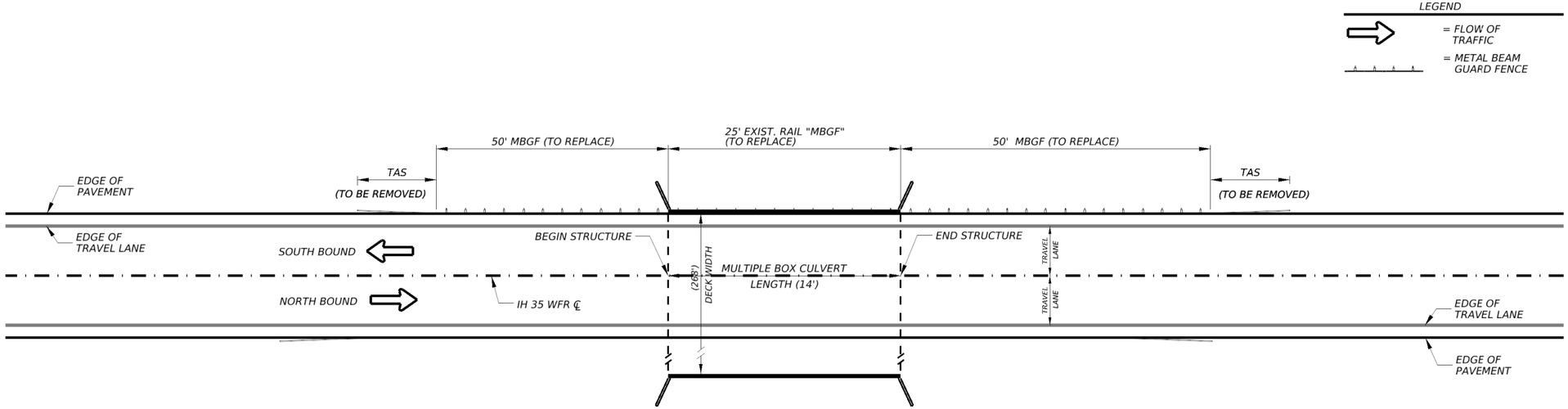
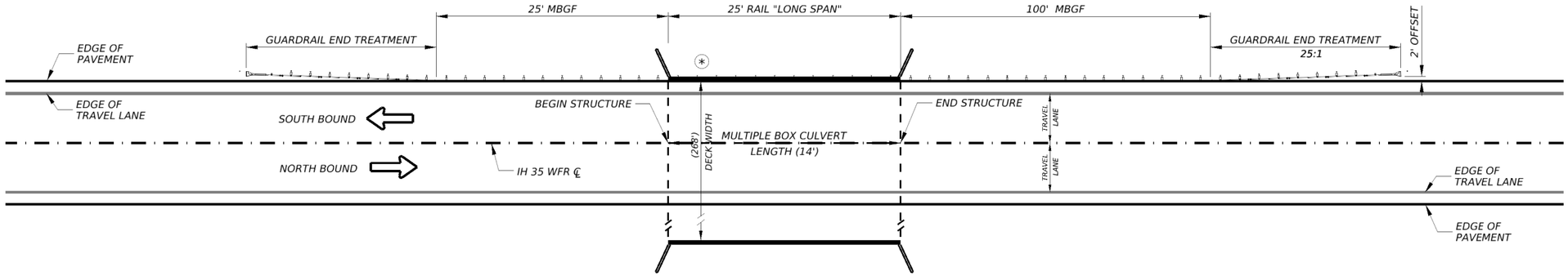


SMALL STRUCTURE (PLAN VIEW) 569+40
EXISTING MBGF, RAIL & TERMINAL

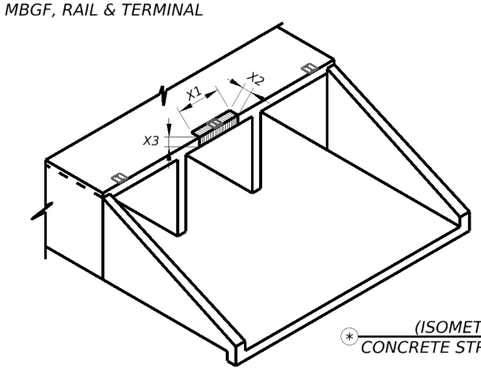


SMALL STRUCTURE (PLAN VIEW) 569+40
PROPOSED MBGF, RAIL & TERMINAL

NOTES:

1. MBGF, AND SGT INSTALLATION IS TO BE CONSTRUCTED IN SECTIONS (APPROACH UPSTREAM TRAFFIC, DEPARTURE DOWNSTREAM TRAFFIC). EACH SECTION WILL BE COMPLETED BEFORE THE END OF THE WORKING DAY ON WHICH IT WAS INITIATED. CONSTRUCTION OF A SECOND APPROACH/DEPARTURE SECTION MAY NOT COMMENCE UNTIL CONSTRUCTION OF A COMPLETE SECTION (THRIE-BEAM TRANSITION, MBGF, AND TERMINAL) IS COMPLETE. IF UNDER EXTREME CIRCUMSTANCES, A SECTION CAN NOT BE COMPLETED BEFORE THE END OF THE WORKING DAY, THE BLUNT, EXPOSED END WILL BE TIED DOWN AND/OR TIED TO THE REMAINING EXISTING MBGF APPURTENANCES (IF THEY ARE STILL IN PLACE) AT THE END OF THE WORKING DAY.
2. REFER TO TXDOT STANDARDS GF(31)-19, GF(31) MS-19, GF(31)LS-19, SGT(10S)31-16, SGT(11S)31-18, SGT(12S)31-18, SGT(15)31-20 AND "ROADWAY MISCELLANEOUS DETAILS" SHEET(S) FOR MORE INFORMATION.

(*) 3. FOLLOW PROCEDURES AS PER THE CONCRETE REPAIR MANUAL CHAPTER 3 FOR ITEM 429 REPAIR DETAIL AND INSTRUCTIONS FOR THE REMOVAL, CLEANING, FORMS, POURING AND MIXING NEW MATERIAL, CURING AND FINISH FOR THE CONCRETE REPAIR.



(*) (ISOMETRIC VIEW)
CONCRETE STRUCTURE REPAIR

CULVERT 2 REPAIRS	1 LOCATION FEET	2 LOCATION FEET
X1	4	4
X2	1	1
X3	1	1
TOTAL SF.	12	12

STRUCTURE: CULVERT 2
(2 - 4'x6' MBC)

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CULVERT LAYOUTS

SHEET 2 OF 3

CONT	SECT	JOB	HIGHWAY
0018	05	090	IH35 WFR
DIST	COUNTY		SHEET NO.
22	WEBB		75

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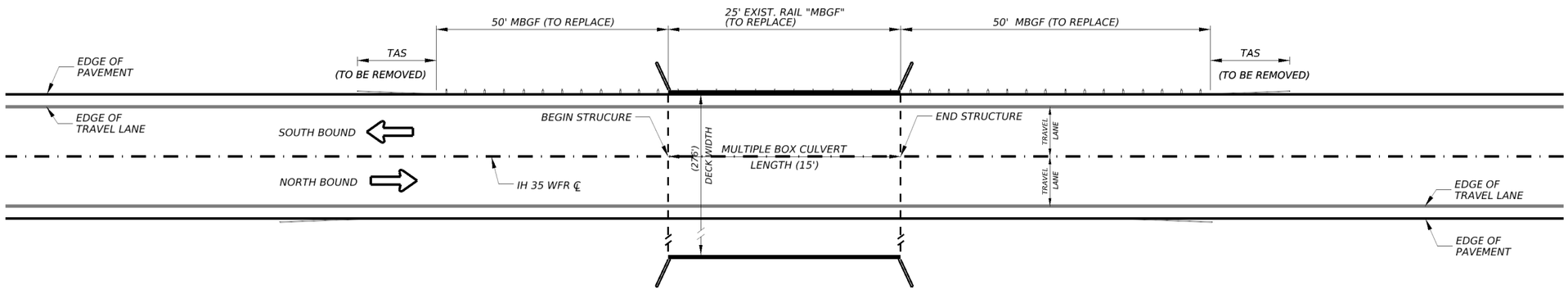
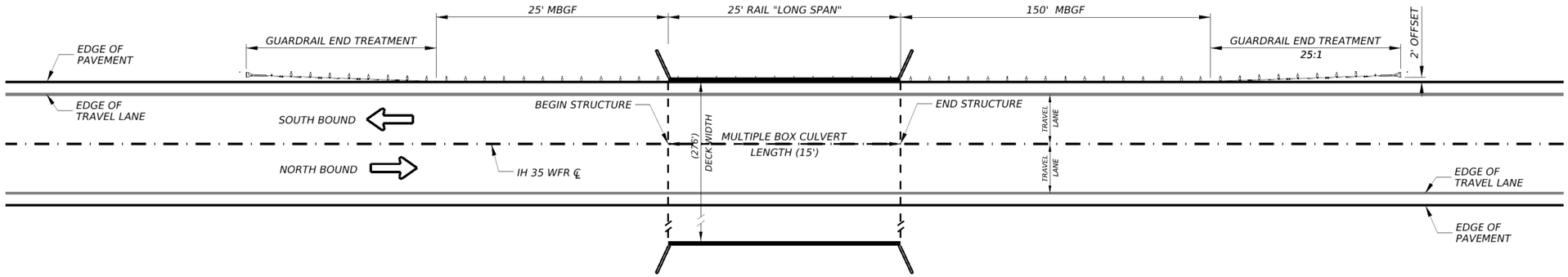


SMALL STRUCTURE (PLAN VIEW) 682+60
EXISTING MBGF, RAIL & TERMINAL



SMALL STRUCTURE (PLAN VIEW) 682+60
PROPOSED MBGF, RAIL & TERMINAL

NOTES:

1. *MBGF, AND SGT INSTALLATION IS TO BE CONSTRUCTED IN SECTIONS (APPROACH UPSTREAM TRAFFIC, DEPARTURE DOWNSTREAM TRAFFIC). EACH SECTION WILL BE COMPLETED BEFORE THE END OF THE WORKING DAY ON WHICH IT WAS INITIATED. CONSTRUCTION OF A SECOND APPROACH/DEPARTURE SECTION MAY NOT COMMENCE UNTIL CONSTRUCTION OF A COMPLETE SECTION (THRIE-BEAM TRANSITION, MBGF, AND TERMINAL) IS COMPLETE. IF UNDER EXTREME CIRCUMSTANCES, A SECTION CAN NOT BE COMPLETED BEFORE THE END OF THE WORKING DAY, THE BLUNT, EXPOSED END WILL BE TIED DOWN AND/OR TIED TO THE REMAINING EXISTING MBGF APPURTENANCES (IF THEY ARE STILL IN PLACE) AT THE END OF THE WORKING DAY.*
2. *REFER TO TXDOT STANDARDS GF(31)-19, GF(31)MS-19, GF(31)LS-19, SGT(10S)31-16, SGT(11S)31-18, SGT(12S)31-18, SGT(15)31-20 AND "ROADWAY MISCELLANEOUS DETAILS" SHEET(S) FOR MORE INFORMATION.*

STRUCTURE: CULVERT 3
(2 - 7'x4' MBC)

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CULVERT LAYOUTS

SHEET 3 OF 3

CONT	SECT	JOB	HIGHWAY
0018	05	090	IH35 WFR
DIST	COUNTY		SHEET NO.
22	WEBB		76

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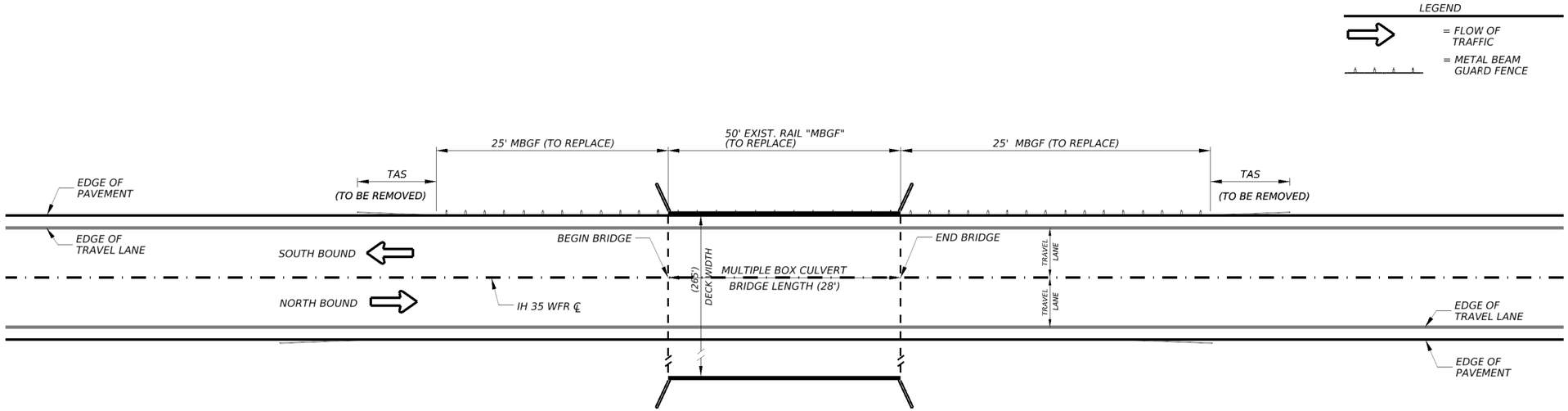
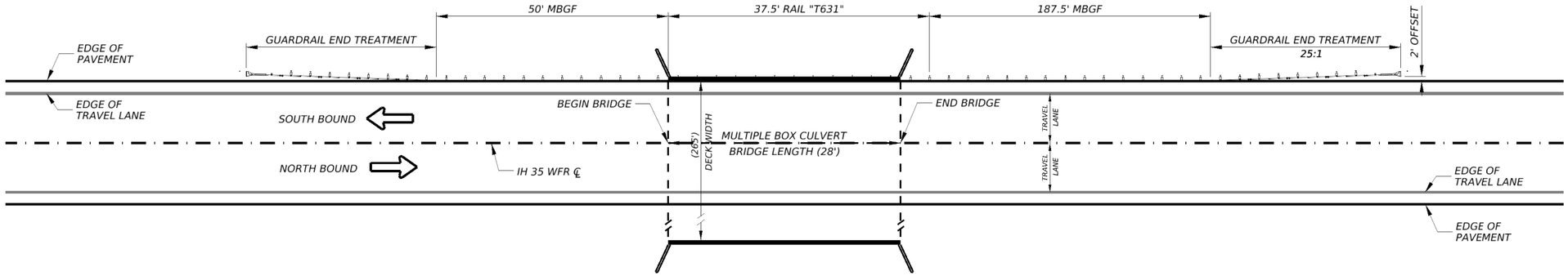


BRIDGE (PLAN VIEW) 551+90
EXISTING MBGF, RAIL & TERMINAL



BRIDGE (PLAN VIEW) 551+90
PROPOSED MBGF, RAIL & TERMINAL

NOTES:

1. MBGF ,AND SGT INSTALLATION IS TO BE CONSTRUCTED IN SECTIONS (APPROACH UPSTREAM TRAFFIC, DEPARTURE DOWNSTREAM TRAFFIC). EACH SECTION WILL BE COMPLETED BEFORE THE END OF THE WORKING DAY ON WHICH IT WAS INITIATED. CONSTRUCTION OF A SECOND APPROACH/DEPARTURE SECTION MAY NOT COMMENCE UNTIL CONSTRUCTION OF A COMPLETE SECTION (THRIE-BEAM TRANSITION, MBGF, AND TERMINAL) IS COMPLETE. IF UNDER EXTREME CIRCUMSTANCES, A SECTION CAN NOT BE COMPLETED BEFORE THE END OF THE WORKING DAY, THE BLUNT, EXPOSED END WILL BE TIED DOWN AND/OR TIED TO THE REMAINING EXISTING MBGF APPURTENANCES (IF THEY ARE STILL IN PLACE) AT THE END OF THE WORKING DAY.
2. REFER TO TXDOT STANDARDS GF(31)-19, GF(31)MS-19, GF(31)LS-19, SGT(10S)31-16, SGT(11S)31-18, SGT(12S)31-18, SGT(15)31-20 AND "ROADWAY MISCELLANEOUS DETAILS " SHEET(S) FOR MORE INFORMATION.

BRIDGE PSN: 22-240-0-0018-05-068
(3 - 6'x3' MBC)

STATE OF TEXAS
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IH 35 WFR

MBGF, RAIL & TERMINAL INSTALLATION LAYOUT

SHEET 1 OF 2

CONT	SECT	JOB	HIGHWAY
0018	05	090	IH35 WFR
DIST	COUNTY		SHEET NO.
22	WEBB		77

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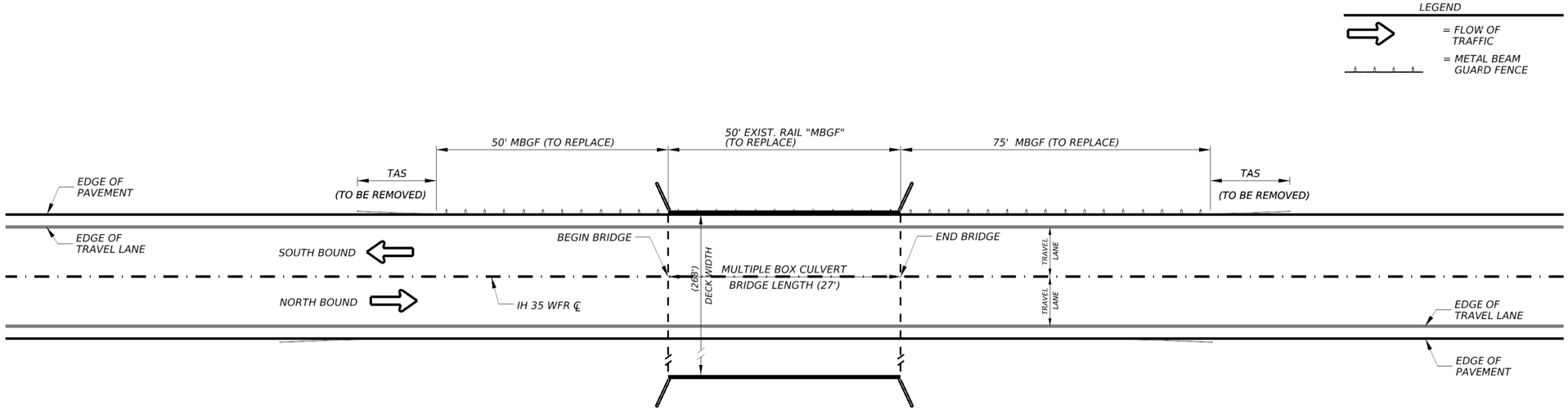
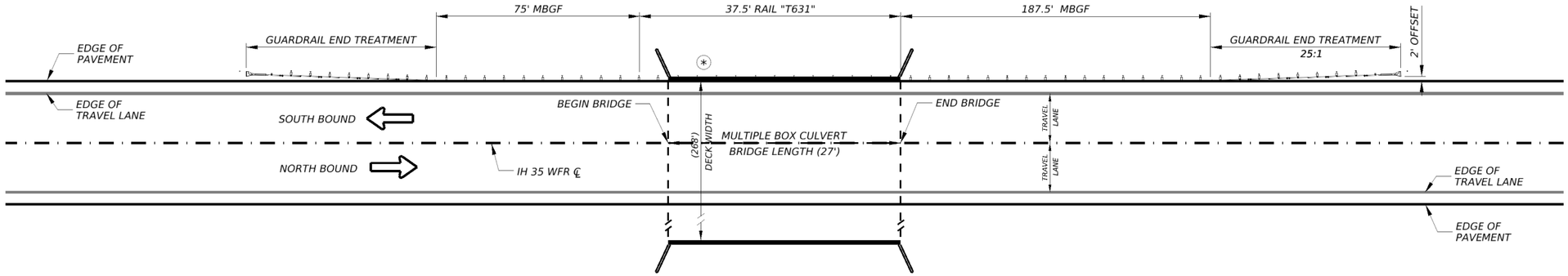


BRIDGE (PLAN VIEW) 624+82
EXISTING MBGF, RAIL & TERMINAL



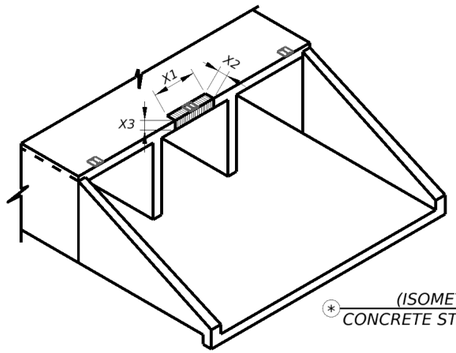
BRIDGE (PLAN VIEW) 624+82
PROPOSED MBGF, RAIL & TERMINAL

NOTES:

1. MBGF ,AND SGT INSTALLATION IS TO BE CONSTRUCTED IN SECTIONS (APPROACH UPSTREAM TRAFFIC, DEPARTURE DOWNSTREAM TRAFFIC). EACH SECTION WILL BE COMPLETED BEFORE THE END OF THE WORKING DAY ON WHICH IT WAS INITIATED. CONSTRUCTION OF A SECOND APPROACH/DEPARTURE SECTION MAY NOT COMMENCE UNTIL CONSTRUCTION OF A COMPLETE SECTION (THRIE-BEAM TRANSITION, MBGF, AND TERMINAL) IS COMPLETE. IF UNDER EXTREME CIRCUMSTANCES, A SECTION CAN NOT BE COMPLETED BEFORE THE END OF THE WORKING DAY, THE BLUNT, EXPOSED END WILL BE TIED DOWN AND/OR TIED TO THE REMAINING EXISTING MBGF APPURTENANCES (IF THEY ARE STILL IN PLACE) AT THE END OF THE WORKING DAY.

2. REFER TO TXDOT STANDARDS GF(31)-19, GF(31)MS-19, GF(31)LS-19, SGT(10S)31-16, SGT(11S)31-18, SGT(12S)31-18, SGT(15)31-20 AND "ROADWAY MISCELLANEOUS DETAILS " SHEET(S) FOR MORE INFORMATION.

(*) 3. FOLLOW PROCEDURES AS PER THE CONCRETE REPAIR MANUAL CHAPTER 3 FOR ITEM 429 REPAIR DETAIL AND INSTRUCTIONS FOR THE REMOVAL, CLEANING, FORMS, POURING AND MIXING NEW MATERIAL, CURING AND FINISH FOR THE CONCRETE REPAIR.



(*) (ISOMETRIC VIEW)
CONCRETE STRUCTURE REPAIR

BRIDGE REPAIRS	1 LOCATION	2 LOCATION	3 LOCATION	4 LOCATION
	FEET	FEET	FEET	FEET
X1	4	4	4	4
X2	2	2	2	2
X3	1	1	1	1
TOTAL SF.	20	20	20	20

BRIDGE PSN: 22-240-0-0018-05-067
(3 - 8'x8' MBC)

STATE OF TEXAS
MISAEL AGUILAR
150329
LICENSED
PROFESSIONAL ENGINEER

DocuSigned by:
MISAEL AGUILAR
8EE5B149888F4E9...
11/27/2023

Texas Department of Transportation

IH 35 WFR

MBGF, RAIL & TERMINAL INSTALLATION LAYOUT

SHEET 2 OF 2

CONT	SECT	JOB	HIGHWAY
0018	05	090	IH35 WFR
DIST	COUNTY		SHEET NO.
22	WEBB		78

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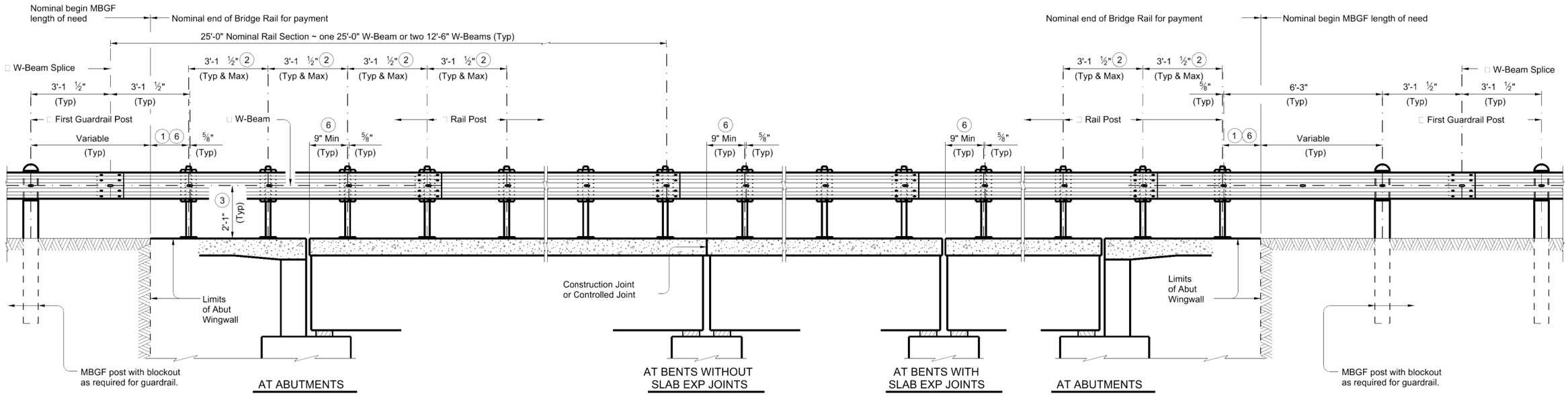
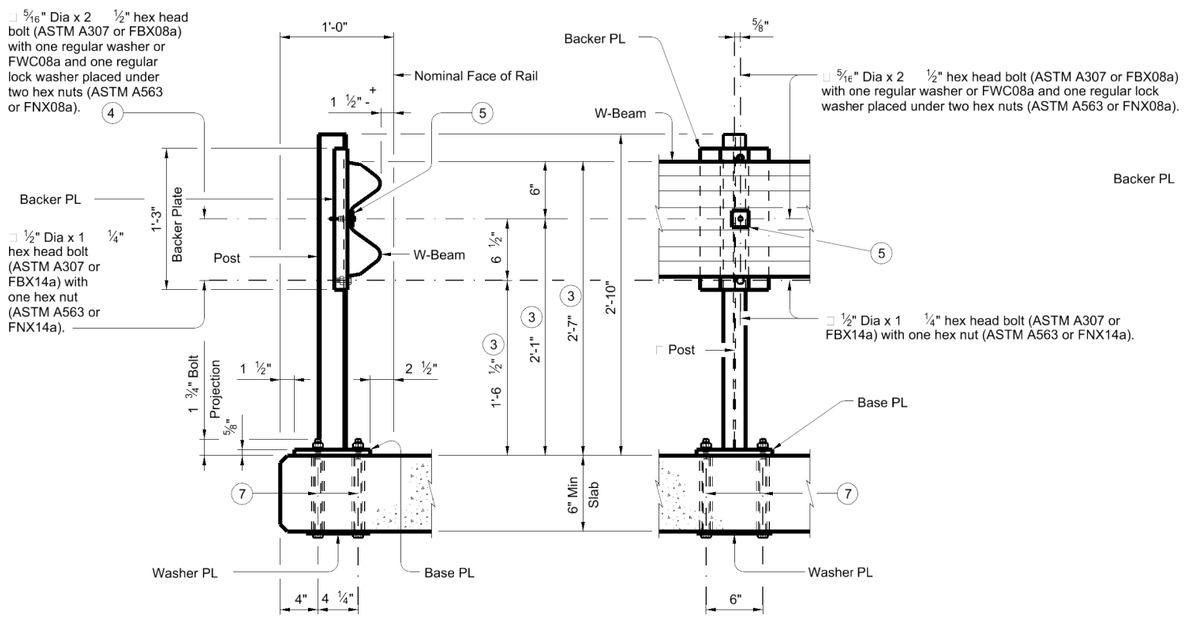


ROADWAY ELEVATION OF RAIL

Showing without overlay.

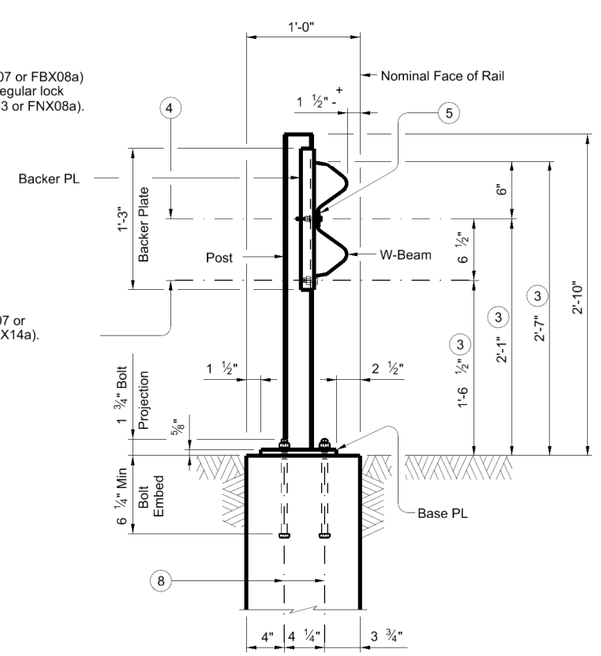


RAIL SECTION

TRAFFIC SIDE RAIL VIEW

RAIL DETAILS ON BRIDGE SLAB

Showing without overlay.



RAIL SECTION ON ABUTMENT WINGWALL

Showing without overlay.

(1) 9" Min, 5'-9" Max

(2) Maintain 3'-1 ½" Rail Post spacing wherever possible for use with nominal 25'-0" or 12'-6" W-Beam sections. Symmetry of post spacing on both sides and along the structure is not necessary.

(3) Increase 2" for structures with overlay.

(4) Tighten the first hex nut by hand until the top and bottom edges of the W-Beam engage the Backer Plate (Backer Plate should be snug against the post). Then tighten hex nut one revolution with wrench and secure with the second hex nut.

(5) PL ⅛ x 1 ¾ x 1 ¾ with ⅜ Dia Hole centered in PL (ASTM A36). Square Guardrail Washer (FWR01).

(6) The post nearest to a slab joint or end of structure may be shifted up to 9" in order to satisfy the minimum offset dimension. Drill a new ¾" Dia hole on the centerline of W-beam for shifted post. Paint hole with two coats of zinc-rich paint conforming to the Item "Galvanizing". All other posts must remain on the typical spacing.

(7) ⅞" Dia formed holes for ⅝" Dia heavy hex head anchor bolt (ASTM F3125 Gr A325 or A449) or threaded rod (ATSM A193 Gr B7 or F1554 Gr 105) with one hardened steel washer (ASTM F436) and one regular lock washer placed under heavy hex nut (ASTM A563). One additional heavy hex nut must be furnished and tack welded for each threaded rod. See "Cast-In-Place & Formed Hole Anchor Bolt Options".

(8) ⅝" Dia heavy hex head anchor bolt (ASTM F3125 Gr A325 or A449) or threaded rod (ATSM A193 Gr B7 or F1554 Gr 105) with one hardened steel washer (ASTM F436) and one regular lock washer placed under heavy hex nut (ASTM A563). One additional heavy hex nut must be furnished and tack welded for each threaded rod. See "Cast-In-Place & Formed Hole Anchor Bolt Options".

Texas Department of Transportation

Bridge Division Standard

TRAFFIC RAIL

TYPE T631

FILE:	DN: TxDOT	CK: AES	DW: JTR	CK: AES
©TxDOT September 2019	CONT	SECT	JOB	HIGHWAY
REVISIONS	0018	05	090	IH35 WFR
07/2020: Allowing 9'-4 ½" or 6'-3" W-Beam sections. 03/2023: MBGF Notes.	DIST	COUNTY		SHEET NO.
	22	WEBB		79

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DATE: 11/27/2023 3:04:58 PM
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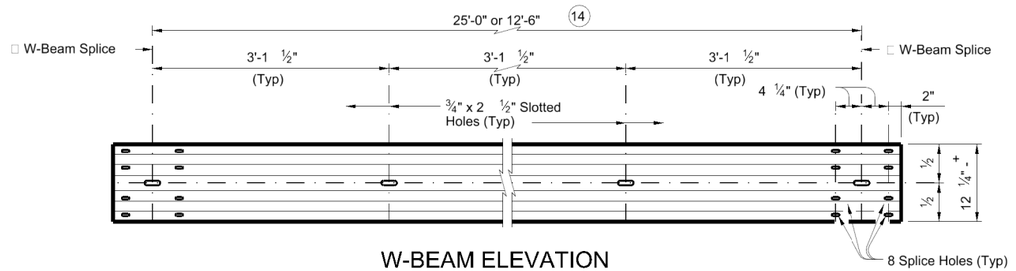
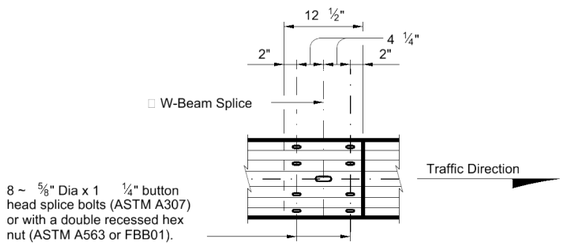
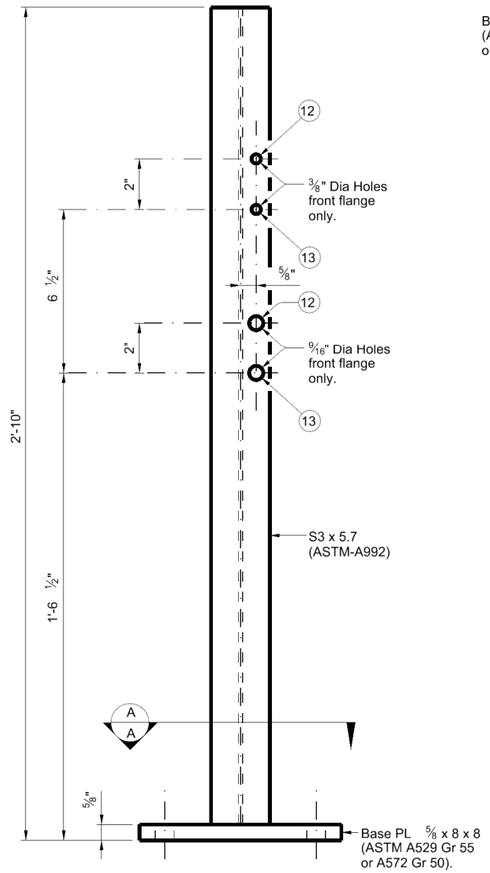


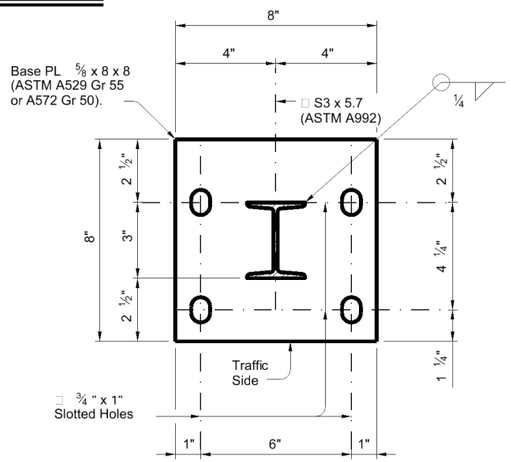
W-BEAM ELEVATION



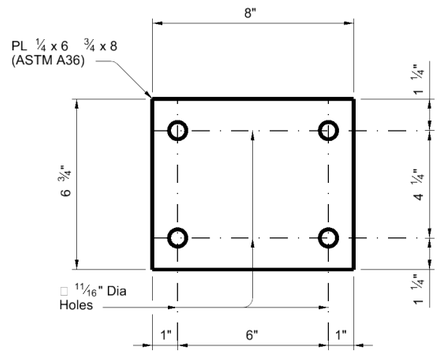
W-BEAM SPLICE ELEVATION



POST ELEVATION

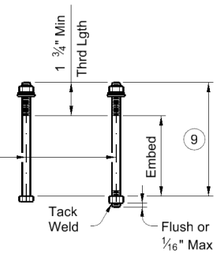


SECTION A-A



WASHER PLATE DETAIL

⅝" Dia heavy hex head anchor bolt (ASTM F3125 Gr A325 or A449) or threaded rod (ATSM A193 Gr B7 or F1554 Gr 105) with one hardened steel washer (ASTM F436) and one regular lock washer placed under heavy hex nut (ASTM A563). One additional heavy hex nut must be furnished and tack welded for each threaded rod.



CAST-IN-PLACE & FORMED HOLE ANCHOR BOLT OPTIONS 10

(9) See "Rail Details On Bridge Slab" and/or "Rail Section On Abutment Wingwall".

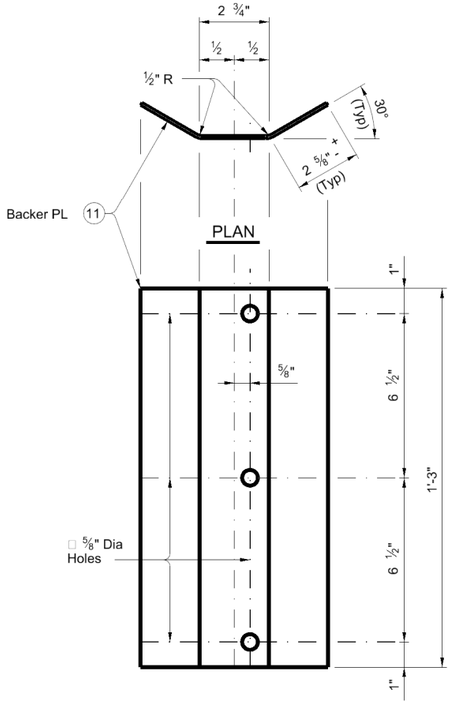
(10) See "Material Notes" for anchor bolt information.

(11) Backer PL ⅛ x 8 x 1'-3" (ASTM A1011 CS or SS Gr 33, or A1008 CS or SS Gr 33 (11 Gage acceptable)).

(12) Used for structures with overlay.

(13) Used for structures without overlay.

(14) At the nominal end of the bridge rail for payment, one 9'-4 ½" or 6'-3" W-beam section is permitted in order to achieve the required W-Beam splice location on the MBGF.



ELEVATION

BACKER PLATE

MBGF AND END TREATMENT NOTES:

This traffic railing must be anchored by metal beam guard fence (MBGF) and guard fence end treatments. Determine MBGF length of need in accordance with the Roadway Design Manual, unless otherwise specified. The minimum MBGF length of need required for anchoring the railing is 25' of MBGF plus the appropriate end treatment installed tangent to the primary roadway.

CONSTRUCTION NOTES:

Face of rail post must be plumb unless otherwise approved by the Engineer. Post must be perpendicular to adjacent roadway grade. Use epoxy mortar under post base plates if gaps larger than 1/16" exist.

Fully anchored guardrail must be attached to each end of rail. A metal beam guard fence transition is not used with this rail.

At the Contractor's option anchor bolts may be an adhesive anchor system. See "Material Notes".

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.

It is recommended to show a Rail Layout with rail posts and W-beam splices. Fabricator must submit erection drawings to the Engineer for approval.

Round or chamfer exposed edges of rail post and backer plate to approximately 1/16" by grinding.

Shop drawings are not required for this rail.

MATERIAL NOTES:

Galvanize all steel components.

Anchor bolts for base plate must be ⅝" Dia ASTM F3125 Gr A325 or A449 bolts (or ASTM A193 Gr B7 or F1554 Gr 105 threaded rods with one tack welded heavy hex nut each) 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.

Optional adhesive anchorage system must be ⅝" 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."

W-beam must 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" (Nominal) lengths and a single rail element of 9'-4 ½" or 6'-3" (Nominal) length. W-Beam must have slotted holes at 3'-1 ½".

Some part numbers from the "Task Force 13" Guide to Standardized Highway Barrier Hardware have been furnished for quick reference.

GENERAL NOTES:

This railing has been successfully evaluated by full-scale crash test to meet MASH TL-3 criteria. This railing can be used for speeds of 50 mph and greater.

This rail is designed to deflect approximately 4' to 4'-6" as it contains and redirects the errant vehicle. This rail may not be installed on top of or behind curbs that project above finished grade, on bridges with expansion joints providing more than 5" movement, on retaining walls, or on grade separations and interchanges.

Repairs to impact-damaged post and base plate unit are not permitted. Replace all impact-damaged posts with a new post and base plate unit.

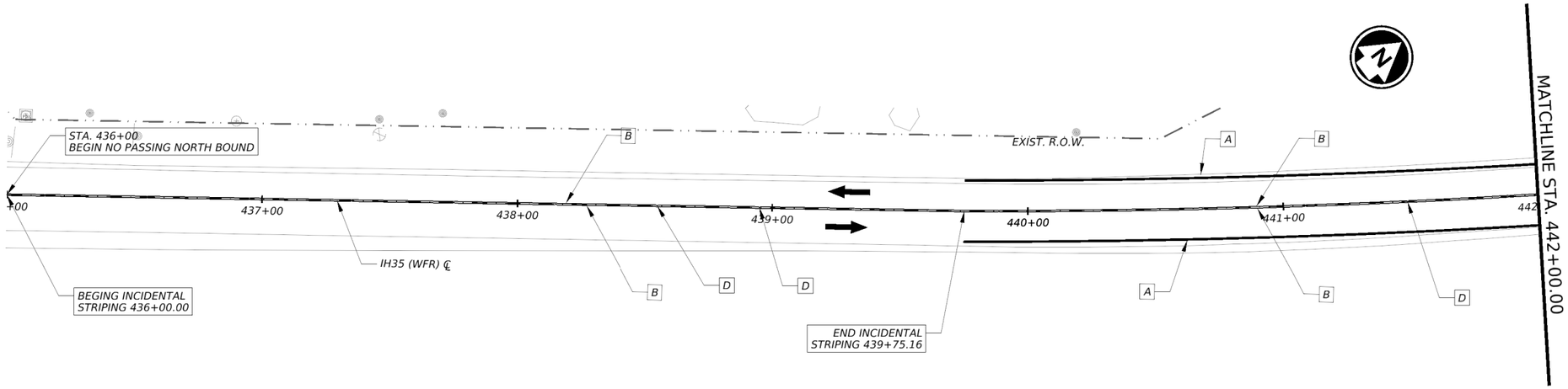
Average weight of railing with no overlay: 20 plf total.

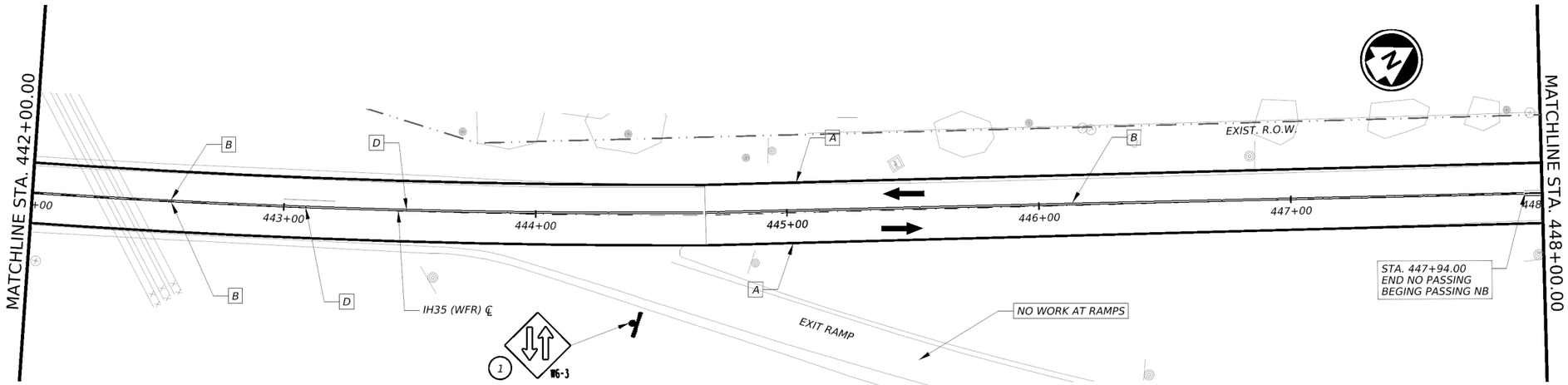
Texas Department of Transportation — Bridge Division Standard

TRAFFIC RAIL

TYPE T631

FILE:	DN: TxDOT	CK: AES	DW: JTR	CK: AES
©TxDOT September 2019	CONT	SECT	JOB	HIGHWAY
REVISIONS	0018	05	090	IH35 WFR
07/2020: Allowing 9'-4 ½" or 6'-3" W-Beam sections. 03/2023: MBGF Notes.	DIST	COUNTY		SHEET NO.
	22	WEBB		80





PAVEMENT MARKINGS LEGEND

(THERMOPLASTIC)

- A — 6" WHITE SOLID
- B — 6" YELLOW SOLID
- C — 6" YELLOW BROKEN
- D — PAVEMENT MARKER TYPE II-A-A @ 40 FEET C-C
- E — PAVEMENT MARKER TYPE II-A-A @ 80 FEET C-C

— DIRECTION OF TRAFFIC

SIGNING LEGEND

- — PROPOSED SMALL SIGN
- — EXISTING SMALL SIGN TO BE REMOVED & RELOCATE
- — EXISTING SMALL SIGN TO BE REMOVED
- — PROPOSED DELINEATOR (D-SW)SZ 1(TYC)GF1(BI)
- — PROPOSED OBJECT MARKER (OM-2Z)(FLX)(GND)(BI)
- — SIGN POST

STATE OF TEXAS
LUIS C. URBINA
117019
LICENSED
PROFESSIONAL ENGINEER

DocuSigned by: 11/27/2023
98C72D65D494466...

SCALE 1"=50'

Texas Department of Transportation

IH 35 WFR

PAVEMENT MARKING DETAILS

SHEET 1 OF 23

CONT	SECT	JOB	HIGHWAY
0018	05	090	IH35 WFR
DIST	COUNTY		SHEET NO.
22	WEBB		81

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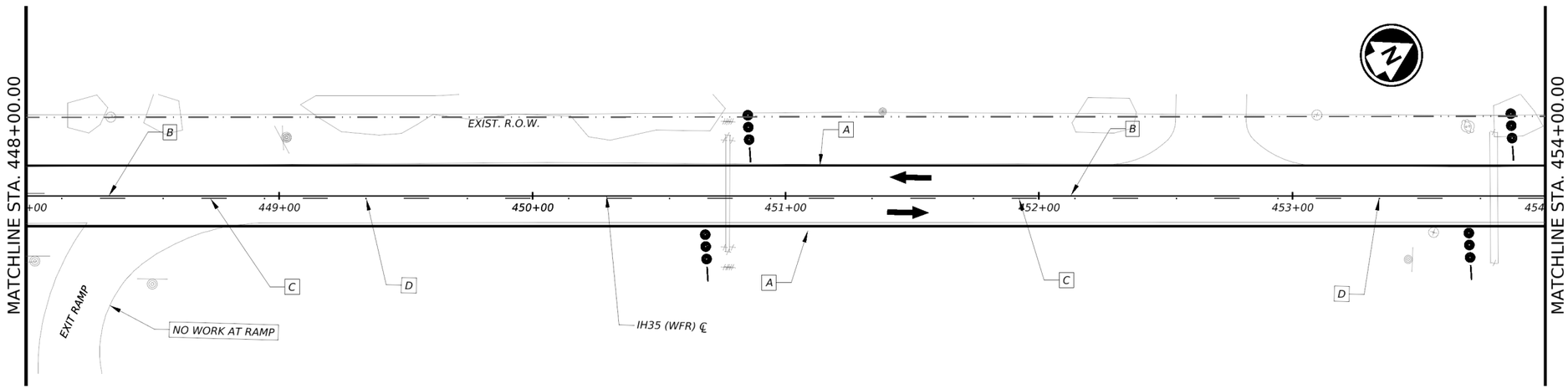

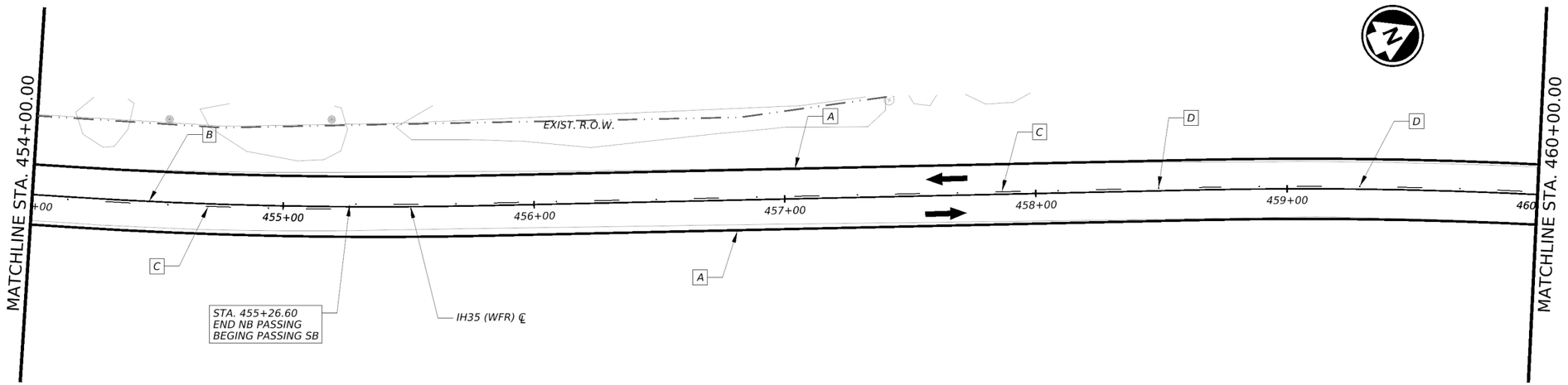

PAVEMENT MARKINGS LEGEND

(THERMOPLASTIC)

- A — 6" WHITE SOLID
- B — 6" YELLOW SOLID
- C — 6" YELLOW BROKEN
- D — PAVEMENT MARKER TYPE II-A-A @ 40 FEET C-C
- E — PAVEMENT MARKER TYPE II-A-A @ 80 FEET C-C

— DIRECTION OF TRAFFIC

SIGNING LEGEND

- — PROPOSED SMALL SIGN
- — EXISTING SMALL SIGN TO BE REMOVED & RELOCATE
- — EXISTING SMALL SIGN TO BE REMOVED
- — PROPOSED DELINEATOR (D-SW)SZ 1(TYC)GF1(BI)
- — PROPOSED OBJECT MARKER (OM-2Z)(FLX)(GND)(BI)
- — SIGN POST

STATE OF TEXAS
LUIS C. URBINA
117019
LICENSED
PROFESSIONAL ENGINEER

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98C72D65D494466...
11/27/2023

SCALE 1"=50'

Texas Department of Transportation

IH 35 WFR

PAVEMENT MARKING DETAILS

CONT	SECT	JOB	HIGHWAY
0018	05	090	IH35 WFR
DIST	COUNTY		SHEET NO.
22	WEBB		82

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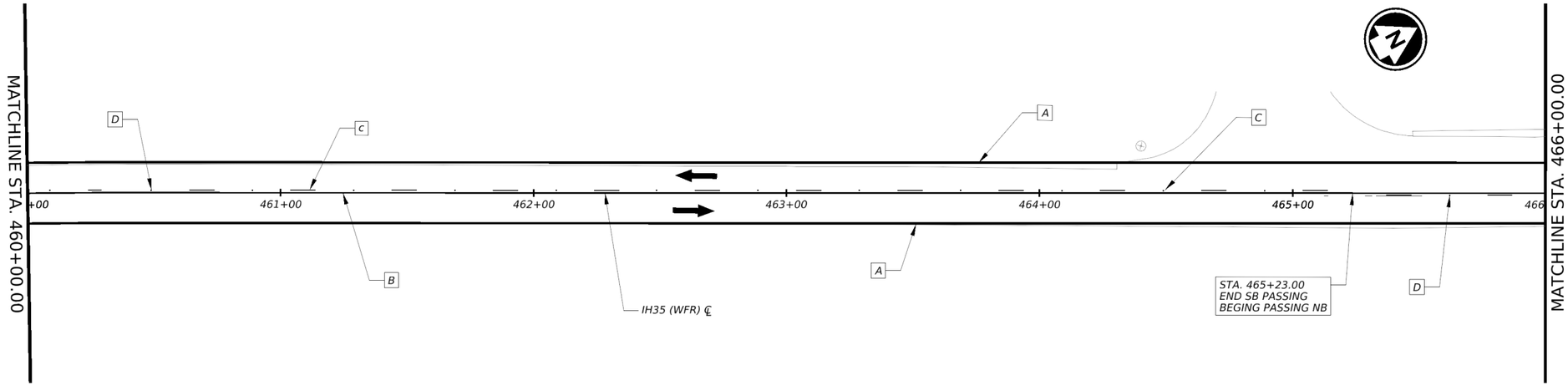

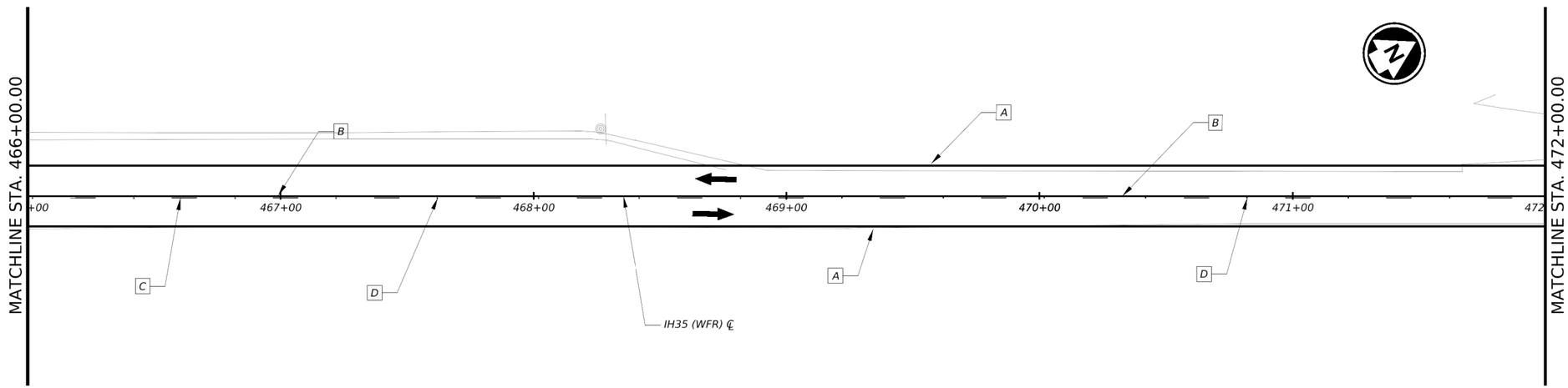

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— DIRECTION OF TRAFFIC

SIGNING LEGEND

- — PROPOSED SMALL SIGN
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- — PROPOSED DELINEATOR (D-SW)SZ 1(TYC)GF1(BI)
- — PROPOSED OBJECT MARKER (OM-2Z)(FLX)(GND)(BI)
- — SIGN POST

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LUIS C. URBINA
117019
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PROFESSIONAL ENGINEER

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98C72D65D494466...

SCALE 1"=50'

Texas Department of Transportation

IH 35 WFR

PAVEMENT MARKING DETAILS

SHEET 3 OF 23

CONT	SECT	JOB	HIGHWAY
0018	05	090	IH35 WFR
DIST	COUNTY		SHEET NO.
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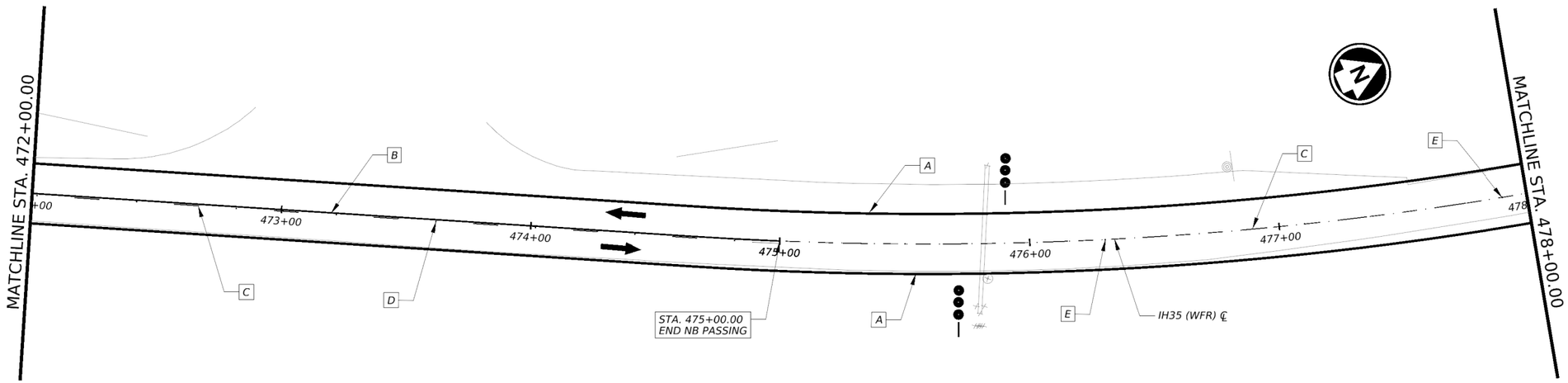

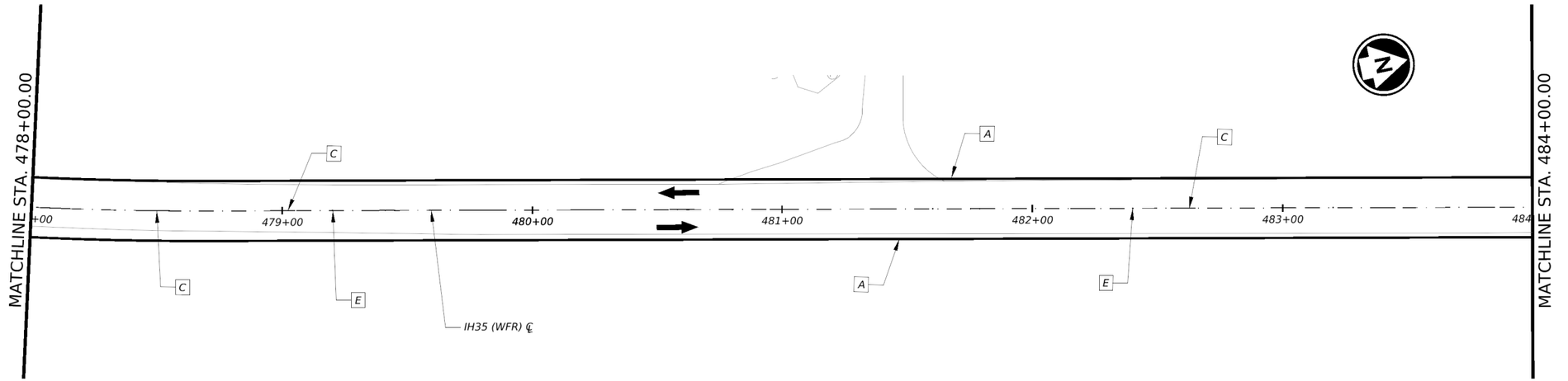

PAVEMENT MARKINGS LEGEND

(THERMOPLASTIC)

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- — PROPOSED DELINEATOR (D-SW)SZ 1(TYC)GF1(BI)
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- — SIGN POST

STATE OF TEXAS
LUIS C. URBINA
117019
LICENSED PROFESSIONAL ENGINEER

DocuSigned by: 11/27/2023
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SCALE 1"=50'

Texas Department of Transportation

IH 35 WFR

PAVEMENT MARKING DETAILS

CONT	SECT	JOB	HIGHWAY
0018	05	090	IH35 WFR
DIST	COUNTY		SHEET NO.
22	WEBB		84

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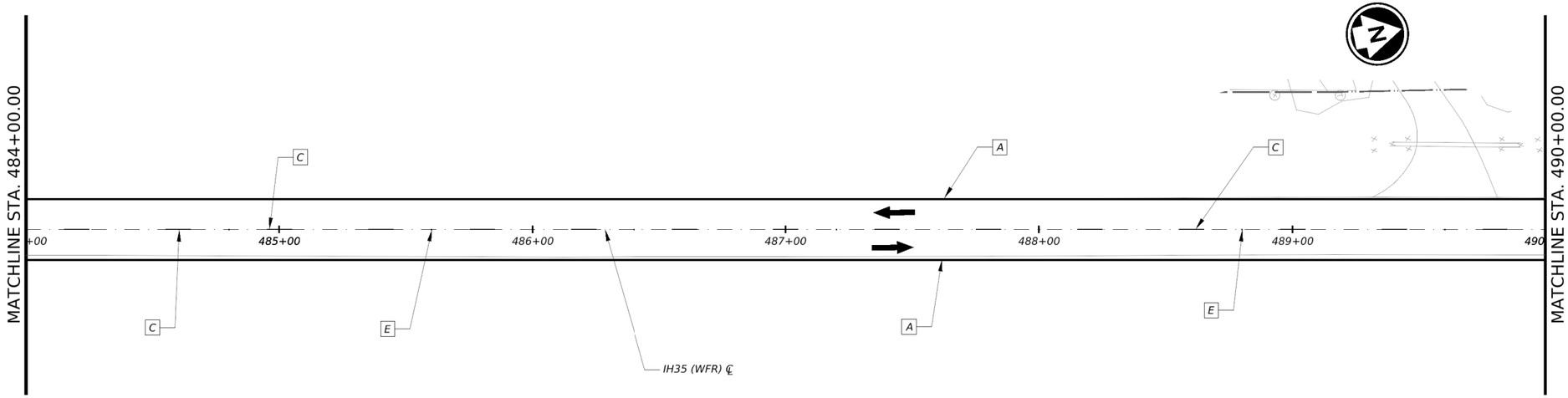

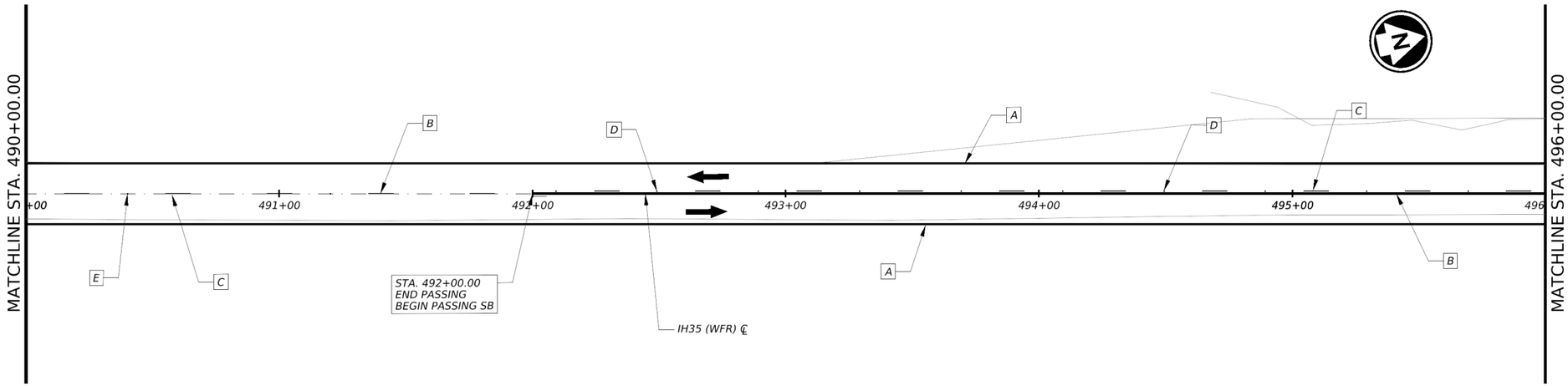

PAVEMENT MARKINGS LEGEND

(THERMOPLASTIC)

- [A] — 6" WHITE SOLID
- [B] — 6" YELLOW SOLID
- [C] — 6" YELLOW BROKEN
- [D] — PAVEMENT MARKER TYPE II-A-A @ 40 FEET C-C
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STATE OF TEXAS
LUIS C. URBINA
117019
LICENSED
PROFESSIONAL ENGINEER

DocuSigned by: 11/27/2023
98C72D65D494466...

SCALE 1"=50'

Texas Department of Transportation

IH 35 WFR

PAVEMENT MARKING DETAILS

CONT	SECT	JOB	HIGHWAY
0018	05	090	IH35 WFR
DIST	COUNTY		SHEET NO.
22	WEBB		85

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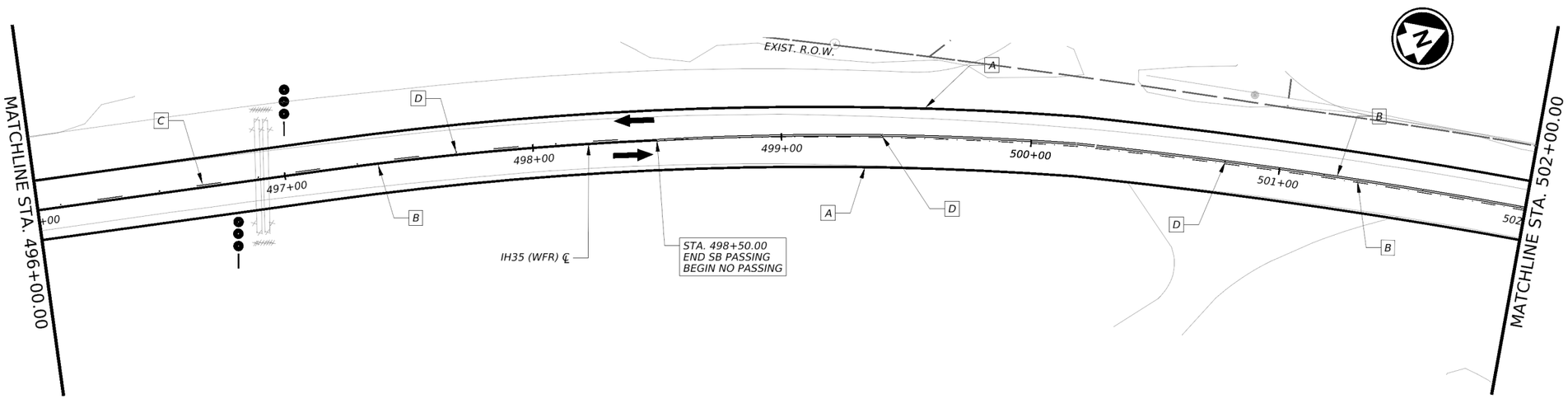

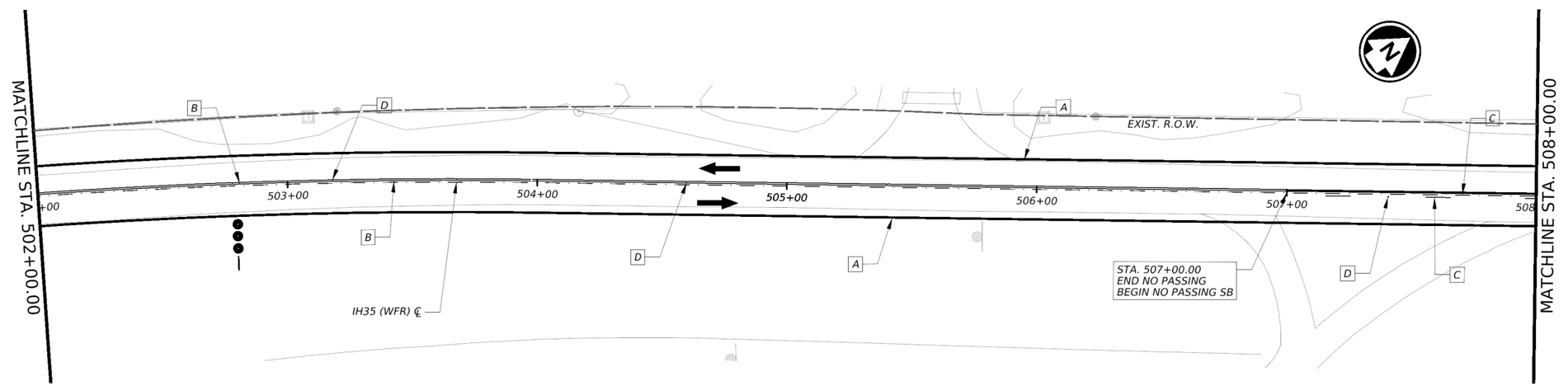

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- — EXISTING SMALL SIGN TO BE REMOVED
- — PROPOSED DELINEATOR (D-SW)SZ 1(TYC)GF1(BI)
- — PROPOSED OBJECT MARKER (OM-2Z)(FLX)(GND)(BI)
- — SIGN POST

STATE OF TEXAS
LUIS C. URBINA
117019
LICENSED
PROFESSIONAL ENGINEER

DocuSigned by:
98C72D65D494466...
11/27/2023

SCALE 1"=50'

Texas Department of Transportation

IH 35 WFR

PAVEMENT MARKING DETAILS

SHEET 6 OF 23

CONT	SECT	JOB	HIGHWAY
0018	05	090	IH35 WFR
DIST	COUNTY		SHEET NO.
22	WEBB		86

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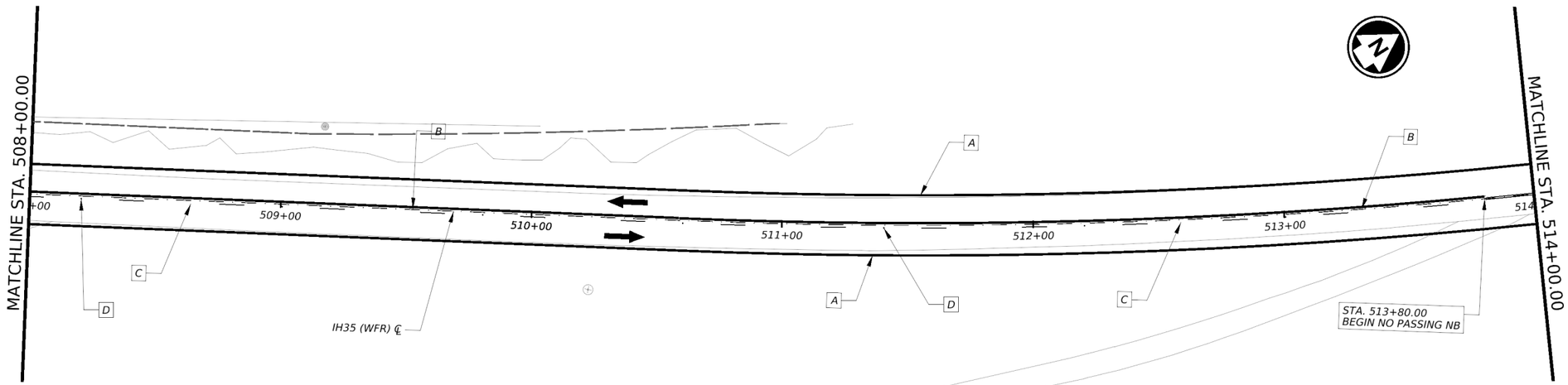

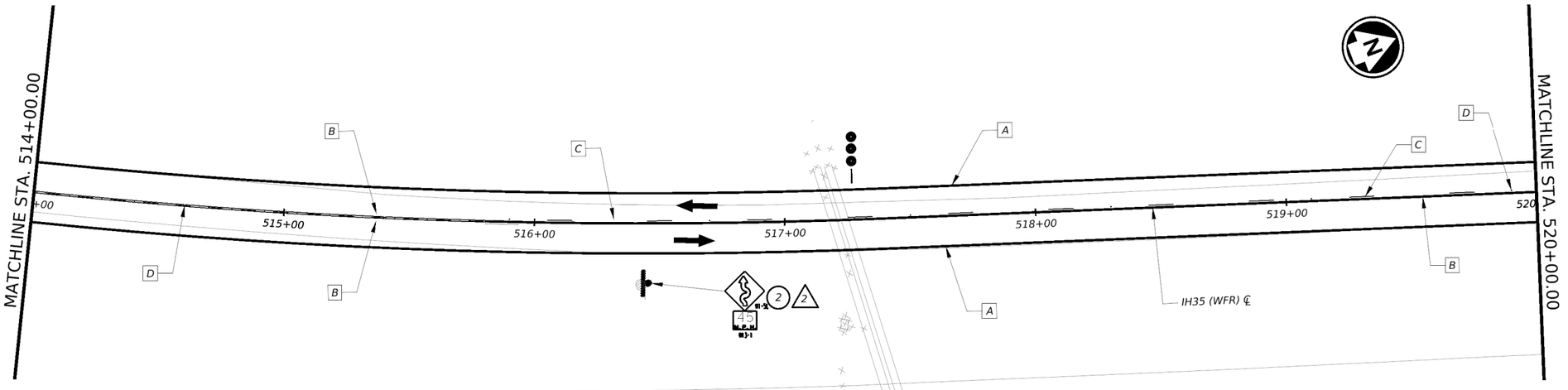

PAVEMENT MARKINGS LEGEND

(THERMOPLASTIC)

- [A] — 6" WHITE SOLID
- [B] — 6" YELLOW SOLID
- [C] — 6" YELLOW BROKEN
- [D] — PAVEMENT MARKER TYPE II-A-A @ 40 FEET C-C
- [E] — PAVEMENT MARKER TYPE II-A-A @ 80 FEET C-C

— DIRECTION OF TRAFFIC

SIGNING LEGEND

- — PROPOSED SMALL SIGN
- — EXISTING SMALL SIGN TO BE REMOVED & RELOCATE
- — EXISTING SMALL SIGN TO BE REMOVED
- — PROPOSED DELINEATOR (D-SW)SZ 1(TYC)GF1(BI)
- — PROPOSED OBJECT MARKER (OM-2Z)(FLX)(GND)(BI)
- — SIGN POST

STATE OF TEXAS
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SCALE 1"=50'

Texas Department of Transportation

IH 35 WFR

PAVEMENT MARKING DETAILS

CONT	SECT	JOB	HIGHWAY
0018	05	090	IH35 WFR
DIST	COUNTY		SHEET NO.
22	WEBB		87

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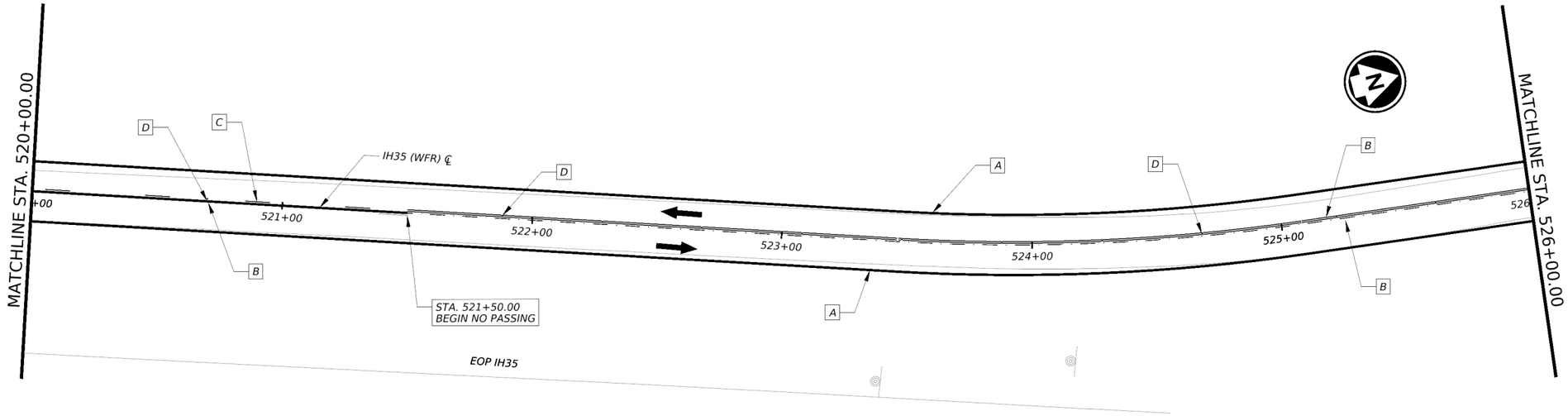

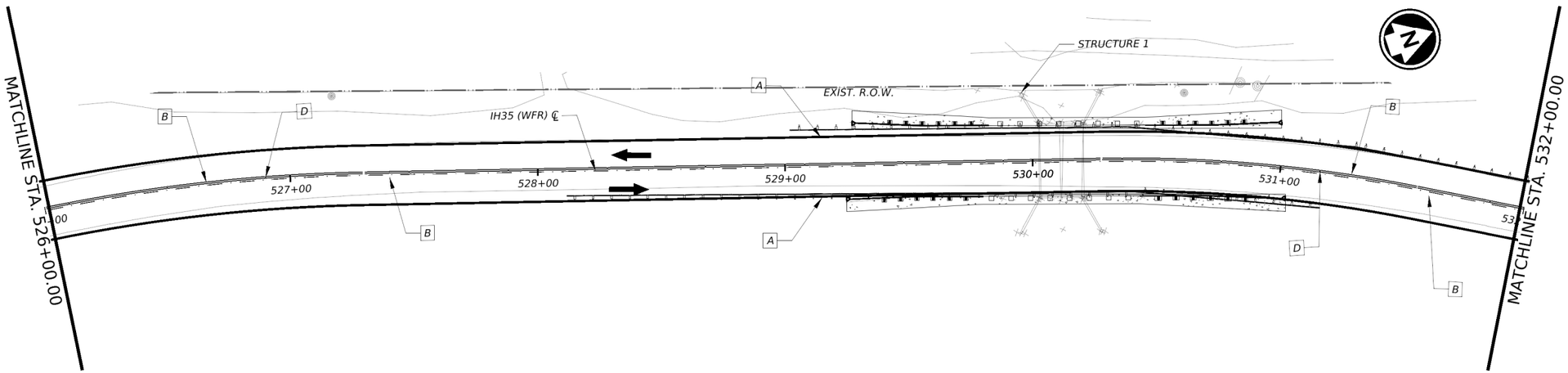

PAVEMENT MARKINGS LEGEND

(THERMOPLASTIC)

- A — 6" WHITE SOLID
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- C — 6" YELLOW BROKEN
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— DIRECTION OF TRAFFIC

SIGNING LEGEND

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- — EXISTING SMALL SIGN TO BE REMOVED
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SCALE 1"=50'

Texas Department of Transportation

IH 35 WFR

PAVEMENT MARKING DETAILS

SHEET 8 OF 23

CONT	SECT	JOB	HIGHWAY
0018	05	090	IH35 WFR
DIST	COUNTY		SHEET NO.
22	WEBB		88

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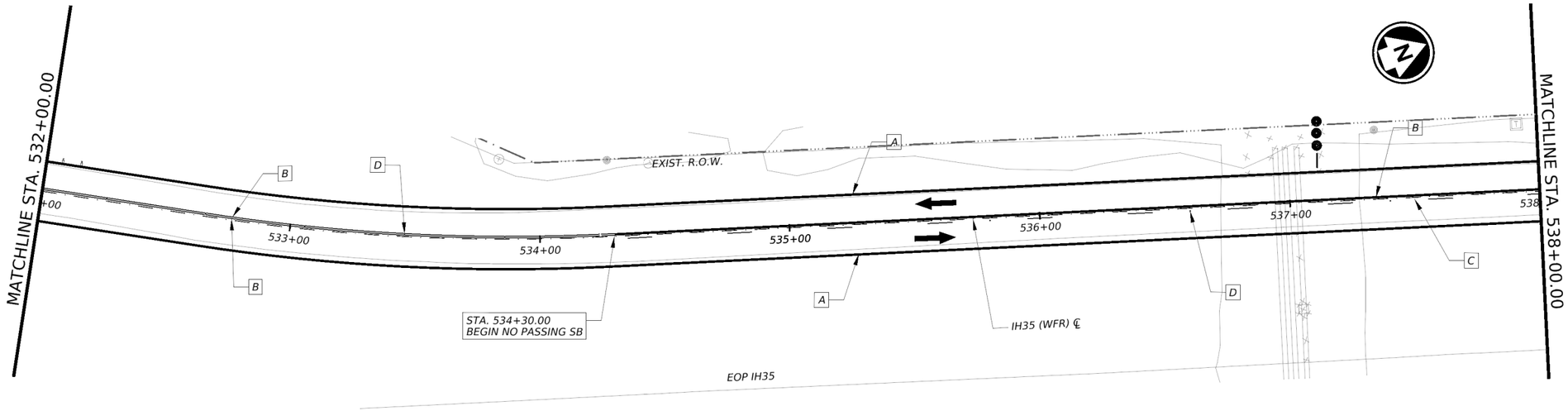

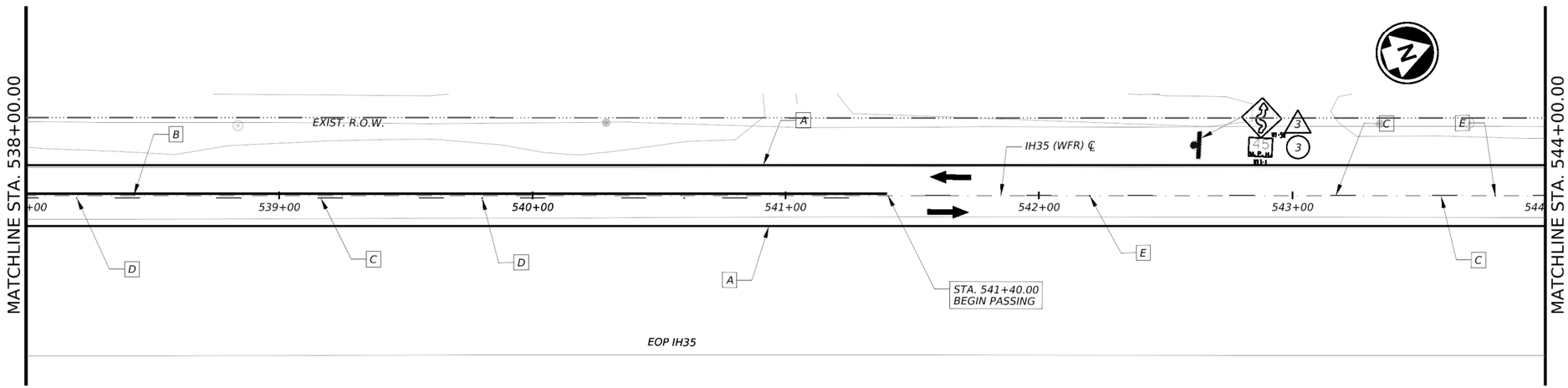

PAVEMENT MARKINGS LEGEND

(THERMOPLASTIC)

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— DIRECTION OF TRAFFIC

SIGNING LEGEND

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SCALE 1"=50'

Texas Department of Transportation

IH 35 WFR

PAVEMENT MARKING DETAILS

CONT	SECT	JOB	HIGHWAY
0018	05	090	IH35 WFR
DIST	COUNTY		SHEET NO.
22	WEBB		89

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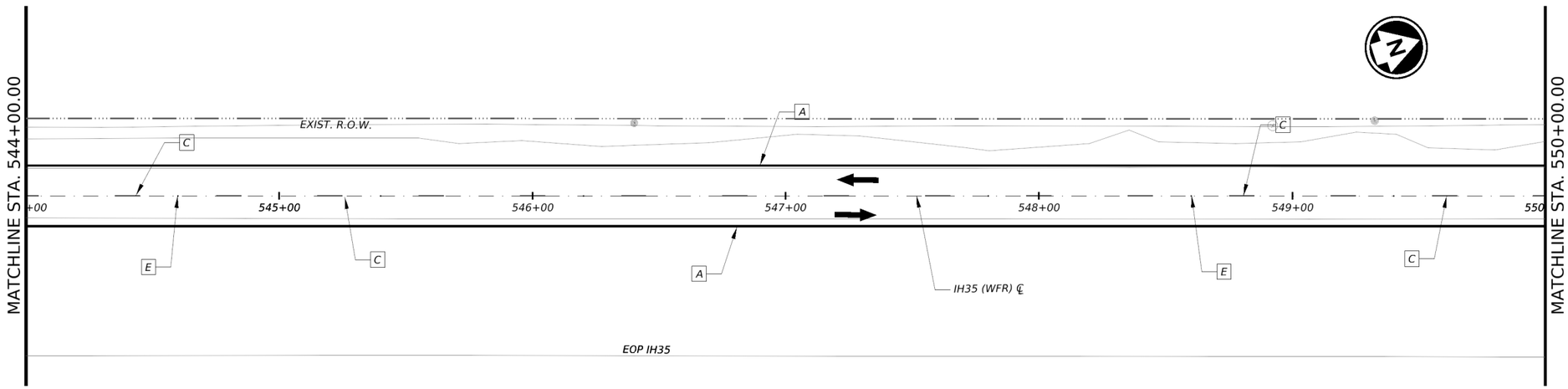

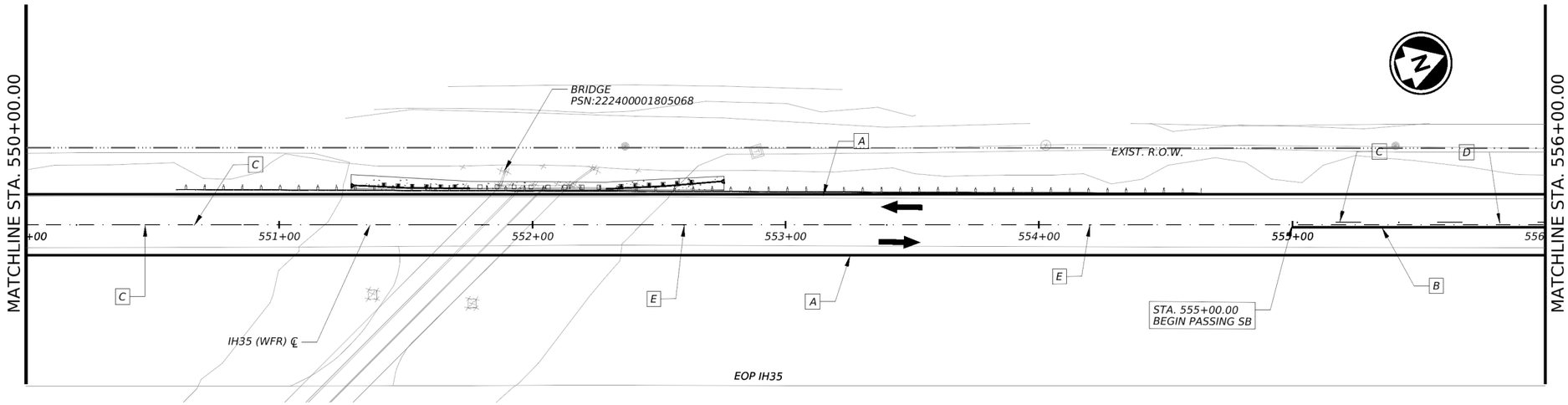

PAVEMENT MARKINGS LEGEND

(THERMOPLASTIC)

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- [C] — 6" YELLOW BROKEN
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- [E] — PAVEMENT MARKER TYPE II-A-A @ 80 FEET C-C

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SIGNING LEGEND

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Texas Department of Transportation

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PAVEMENT MARKING DETAILS

CONT	SECT	JOB	HIGHWAY
0018	05	090	IH35 WFR
DIST	COUNTY		SHEET NO.
22	WEBB		90

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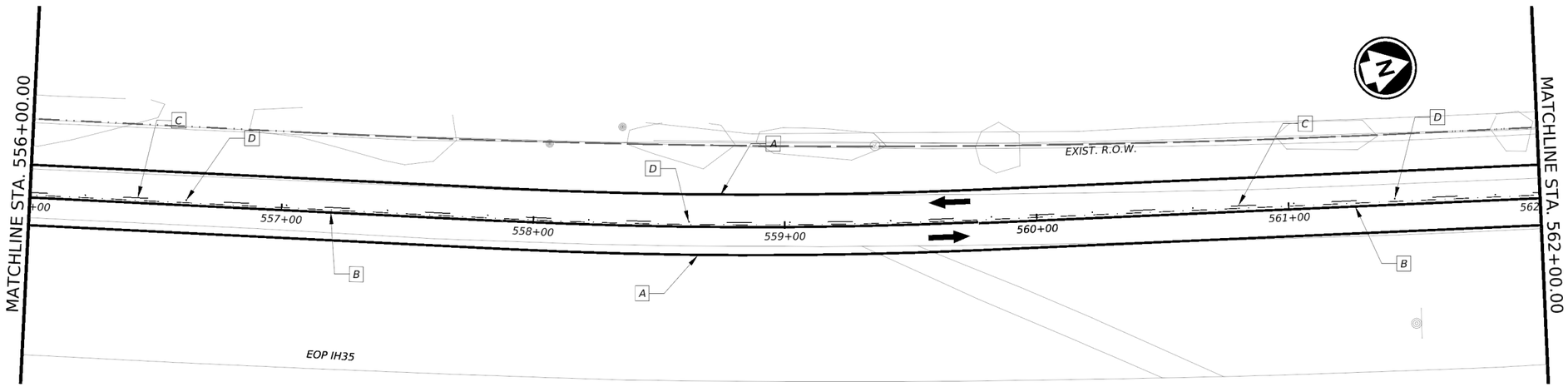

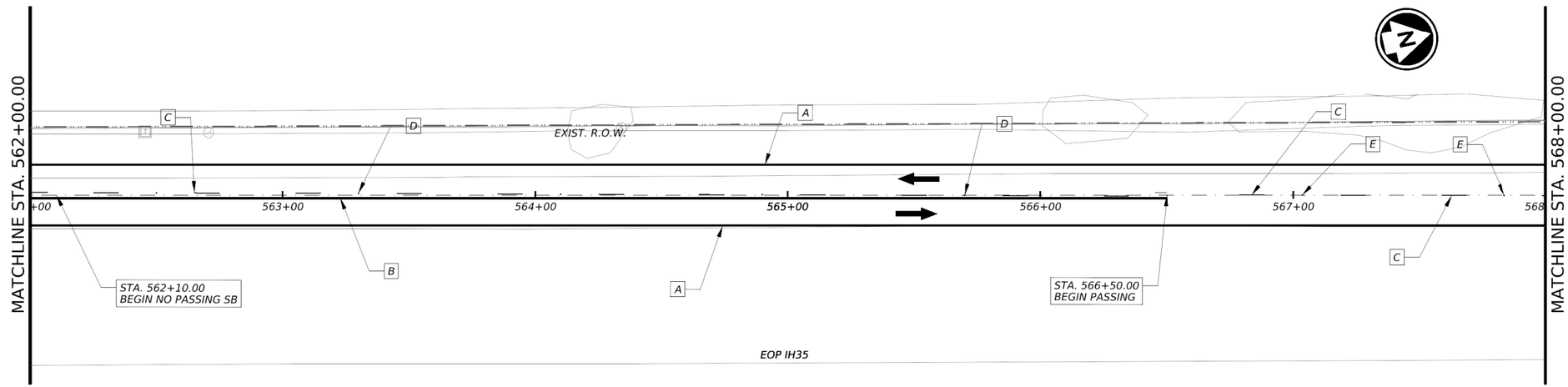

PAVEMENT MARKINGS LEGEND

(THERMOPLASTIC)

- [A] — 6" WHITE SOLID
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- [C] — 6" YELLOW BROKEN
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— DIRECTION OF TRAFFIC

SIGNING LEGEND

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SCALE 1"=50'

Texas Department of Transportation

IH 35 WFR

PAVEMENT MARKING DETAILS

SHEET 11 OF 23

CONT	SECT	JOB	HIGHWAY
0018	05	090	IH35 WFR
DIST	COUNTY		SHEET NO.
22	WEBB		91

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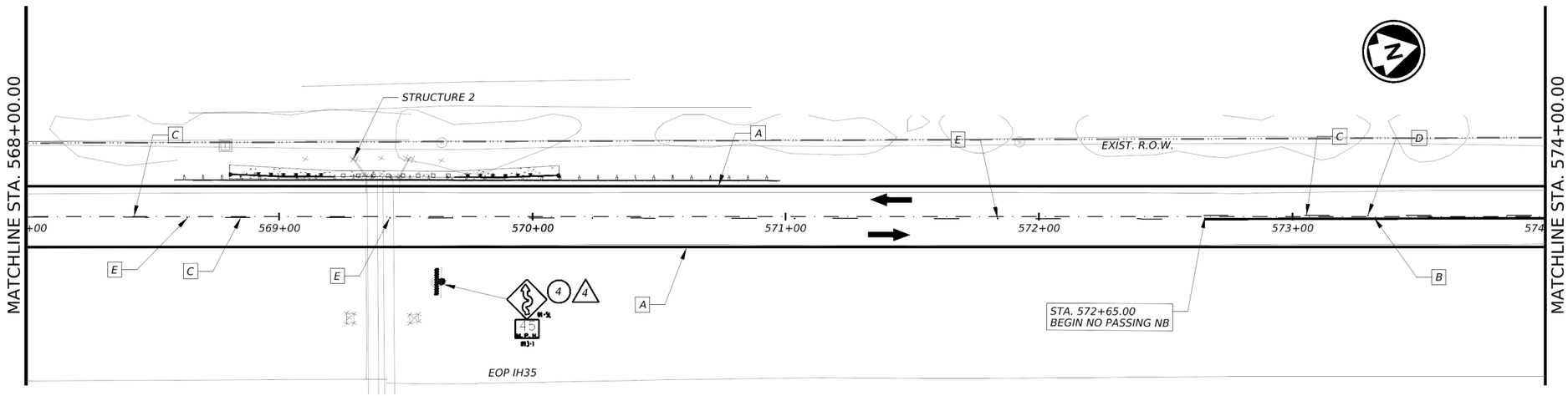

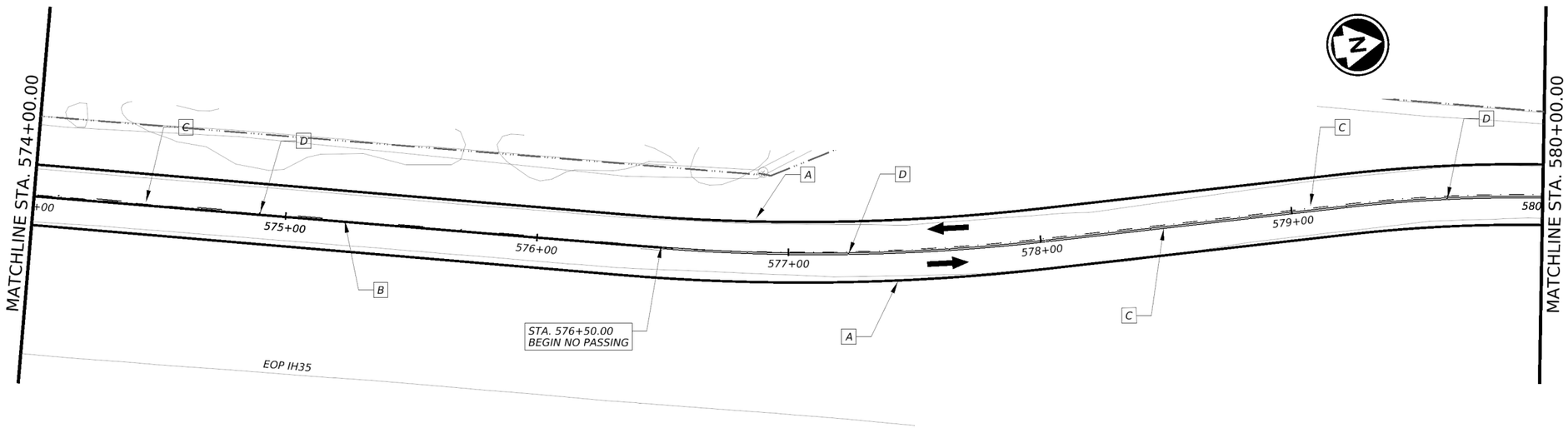

PAVEMENT MARKINGS LEGEND

(THERMOPLASTIC)

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— DIRECTION OF TRAFFIC

SIGNING LEGEND

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STATE OF TEXAS
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11/27/2023

SCALE 1"=50'

Texas Department of Transportation

IH 35 WFR

PAVEMENT MARKING DETAILS

CONT	SECT	JOB	HIGHWAY
0018	05	090	IH35 WFR
DIST	COUNTY		SHEET NO.
22	WEBB		92

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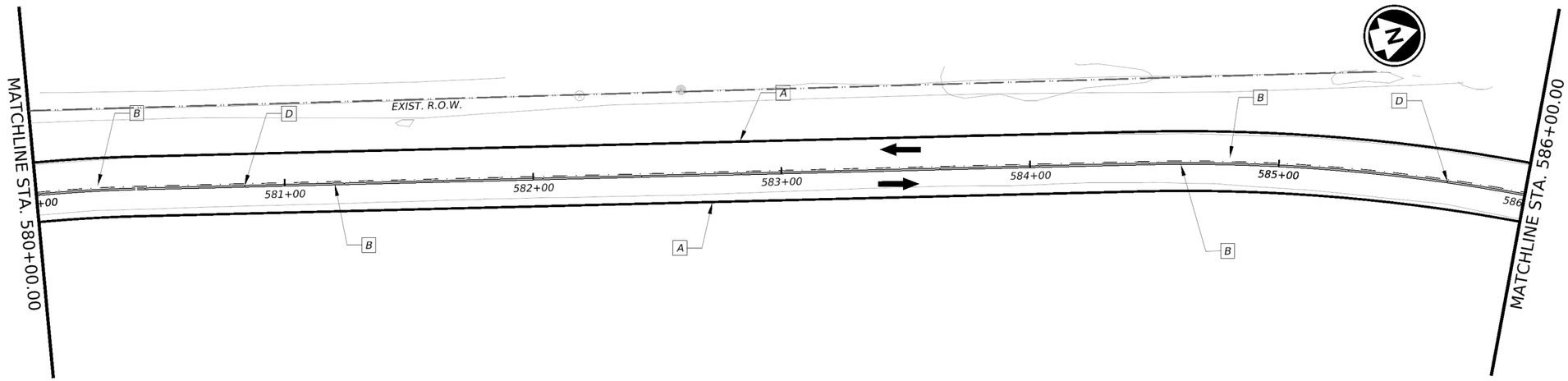

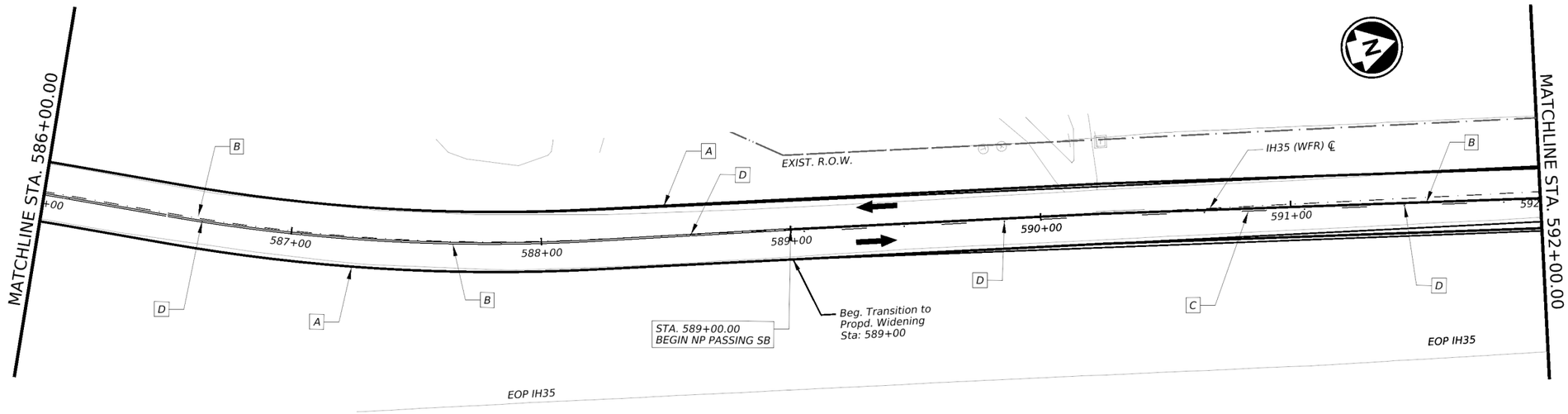

PAVEMENT MARKINGS LEGEND

(THERMOPLASTIC)

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— DIRECTION OF TRAFFIC

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- — EXISTING SMALL SIGN TO BE REMOVED
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SCALE 1"=50'

Texas Department of Transportation

IH 35 WFR

PAVEMENT MARKING DETAILS

SHEET 13 OF 23

CONT	SECT	JOB	HIGHWAY
0018	05	090	IH35 WFR
DIST	COUNTY		SHEET NO.
22	WEBB		93

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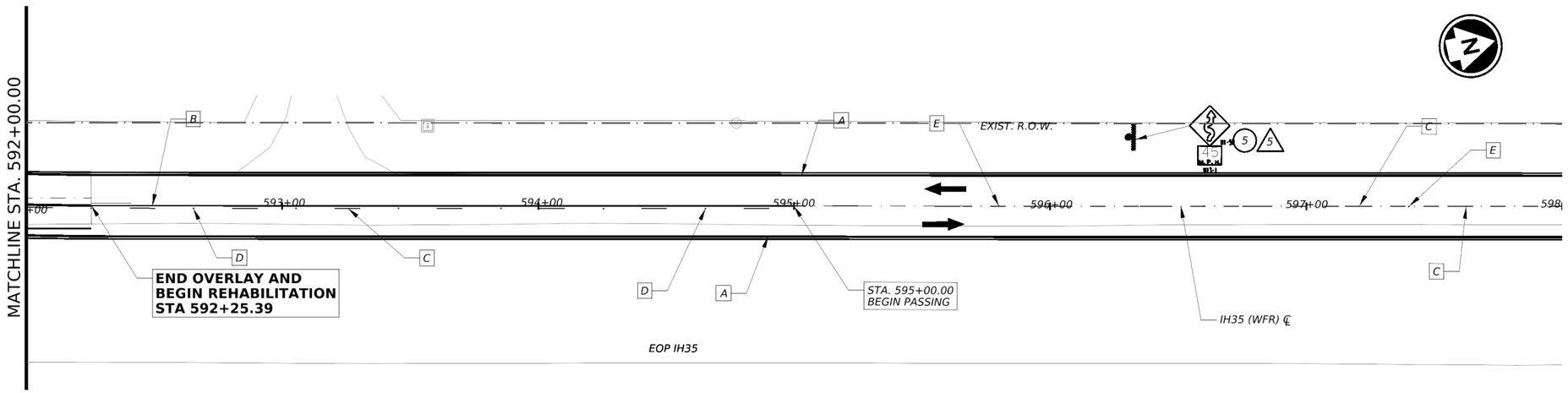

PAVEMENT MARKINGS LEGEND

(THERMOPLASTIC)

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Texas Department of Transportation

IH 35 WFR

PAVEMENT MARKING DETAILS

SHEET 14 OF 23

CONT	SECT	JOB	HIGHWAY
0018	05	090	IH35 WFR

DIST	COUNTY	SHEET NO.
22	WEBB	94

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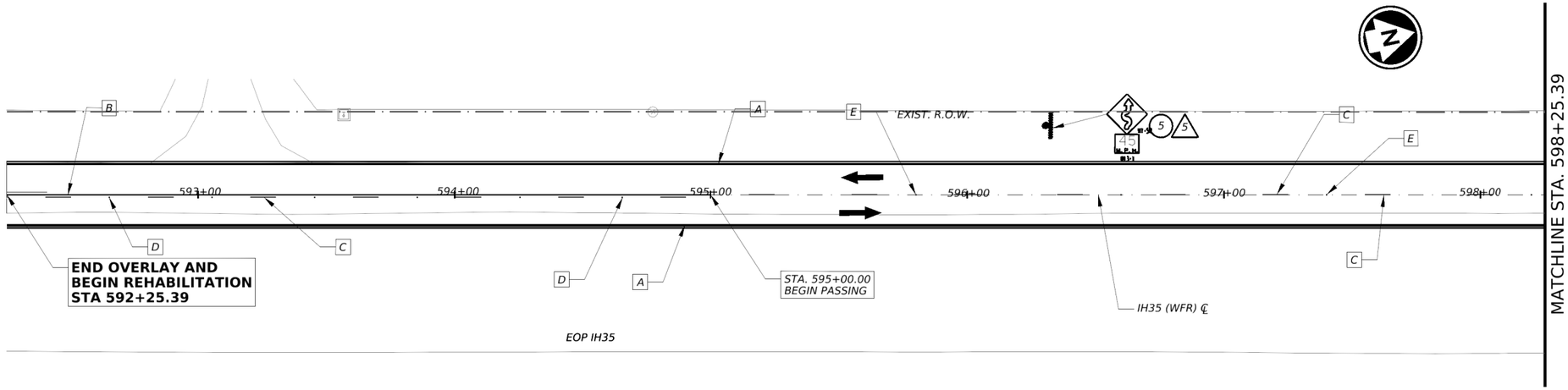

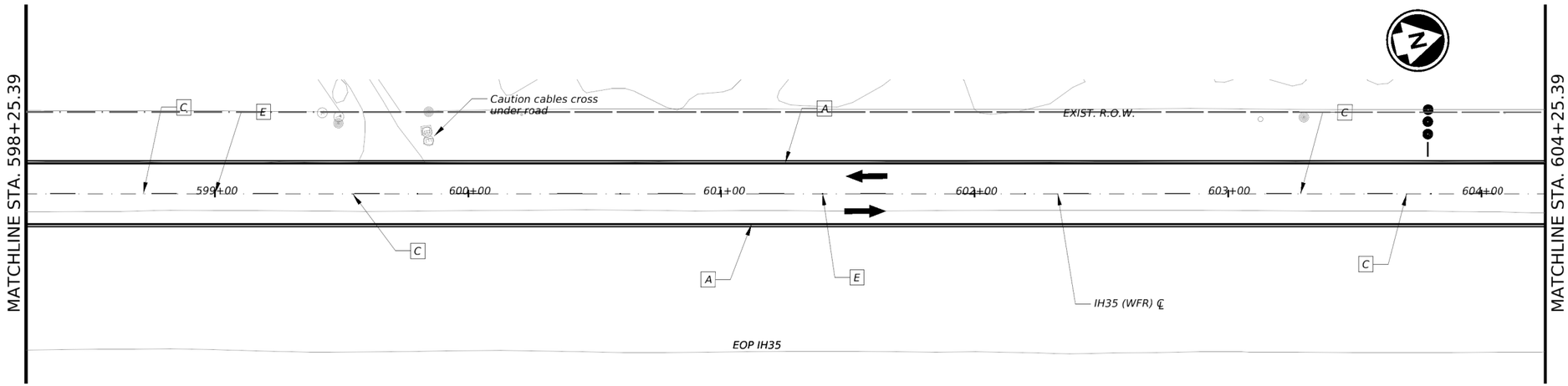

PAVEMENT MARKINGS LEGEND

(THERMOPLASTIC)

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- [D] — PAVEMENT MARKER TYPE II-A-A @ 40 FEET C-C
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SIGNING LEGEND

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IH 35 WFR

PAVEMENT MARKING DETAILS

CONT	SECT	JOB	HIGHWAY
0018	05	090	IH35 WFR
DIST	COUNTY		SHEET NO.
22	WEBB		95

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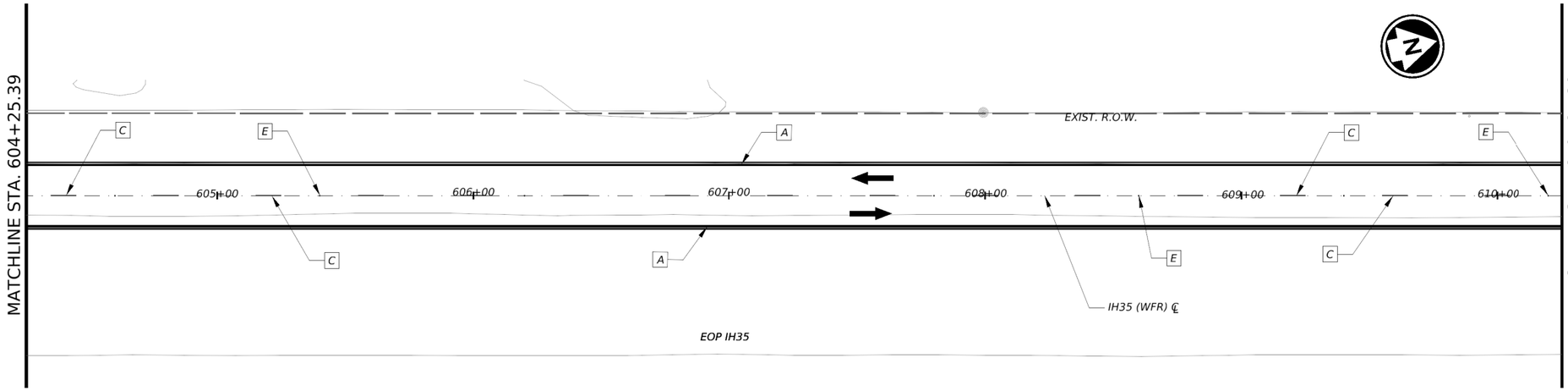

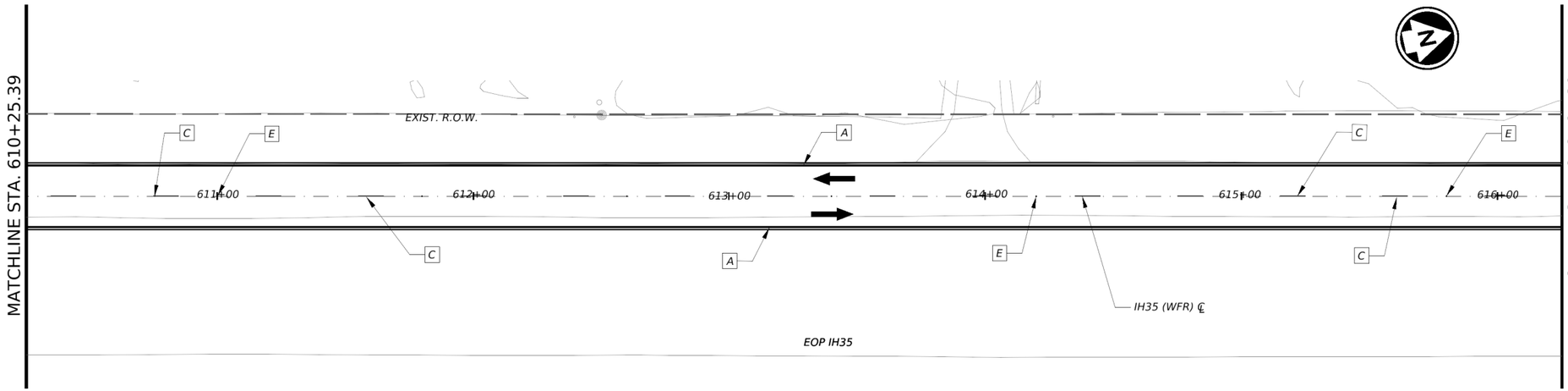

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Texas Department of Transportation

IH 35 WFR

PAVEMENT MARKING DETAILS

SHEET 16 OF 23

CONT	SECT	JOB	HIGHWAY
0018	05	090	IH35 WFR
DIST	COUNTY		SHEET NO.
22	WEBB		96

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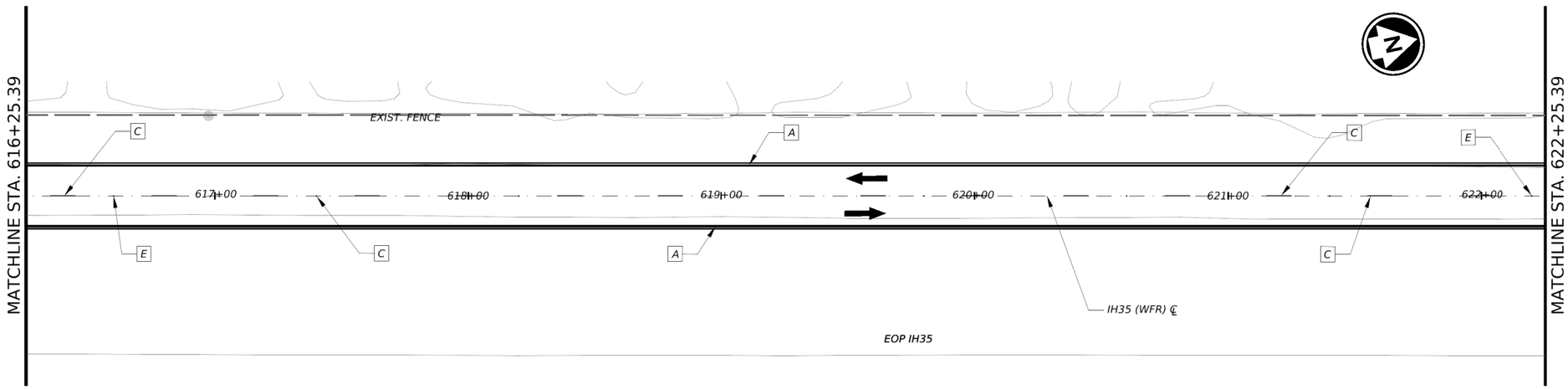

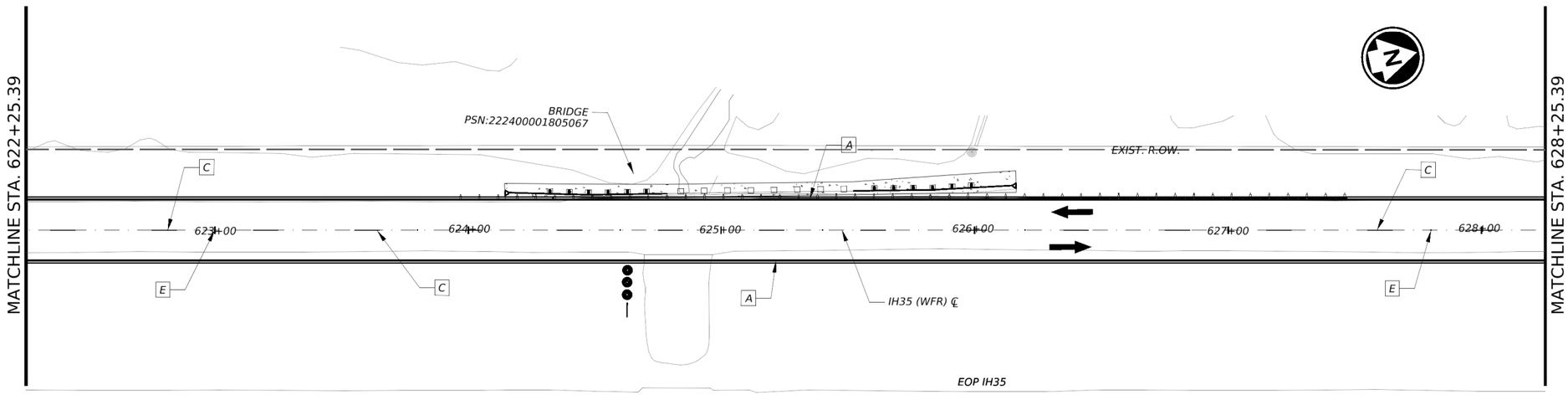

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SCALE 1"=50'

Texas Department of Transportation

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PAVEMENT MARKING DETAILS

CONT	SECT	JOB	HIGHWAY
0018	05	090	IH35 WFR
DIST	COUNTY		SHEET NO.
22	WEBB		97

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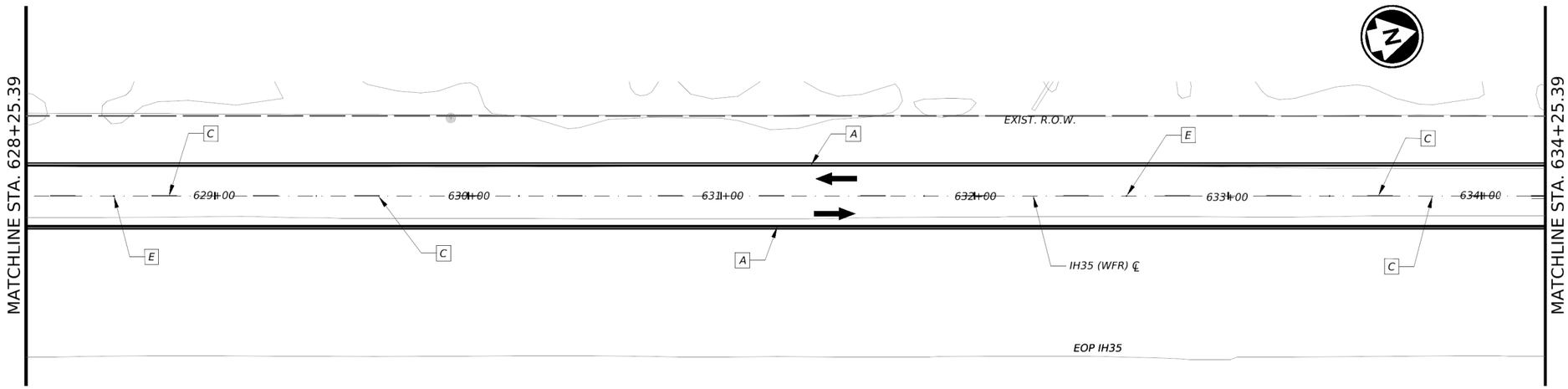

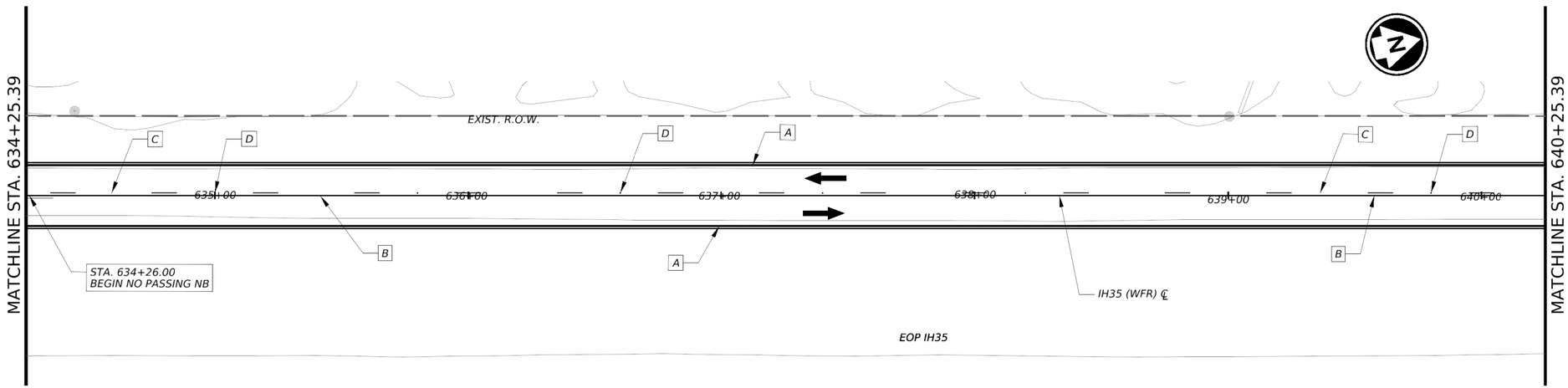

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11/27/2023

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Texas Department of Transportation

IH 35 WFR

PAVEMENT MARKING DETAILS

SHEET 18 OF 23

CONT	SECT	JOB	HIGHWAY
0018	05	090	IH35 WFR
DIST	COUNTY		SHEET NO.
22	WEBB		98

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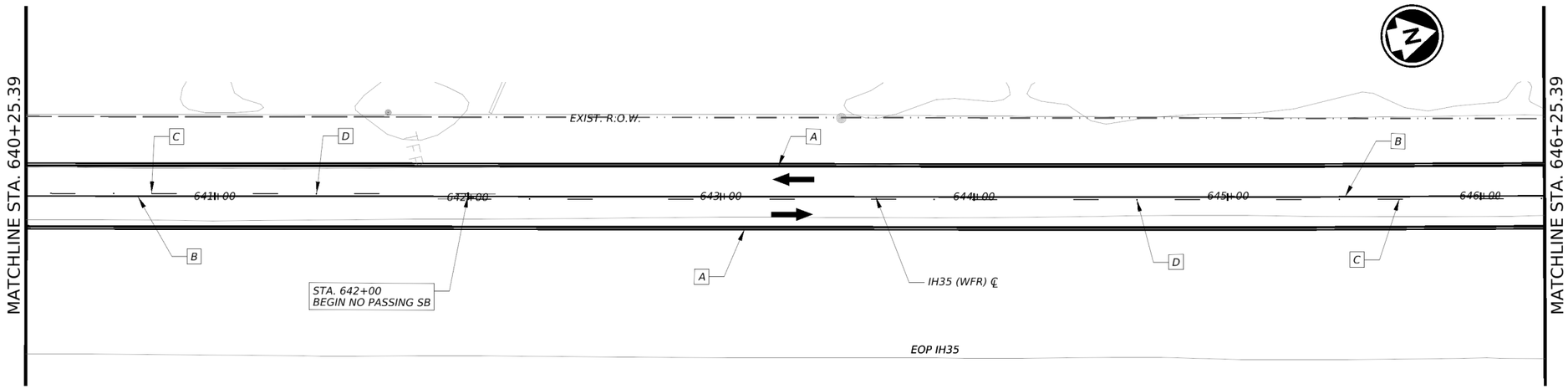

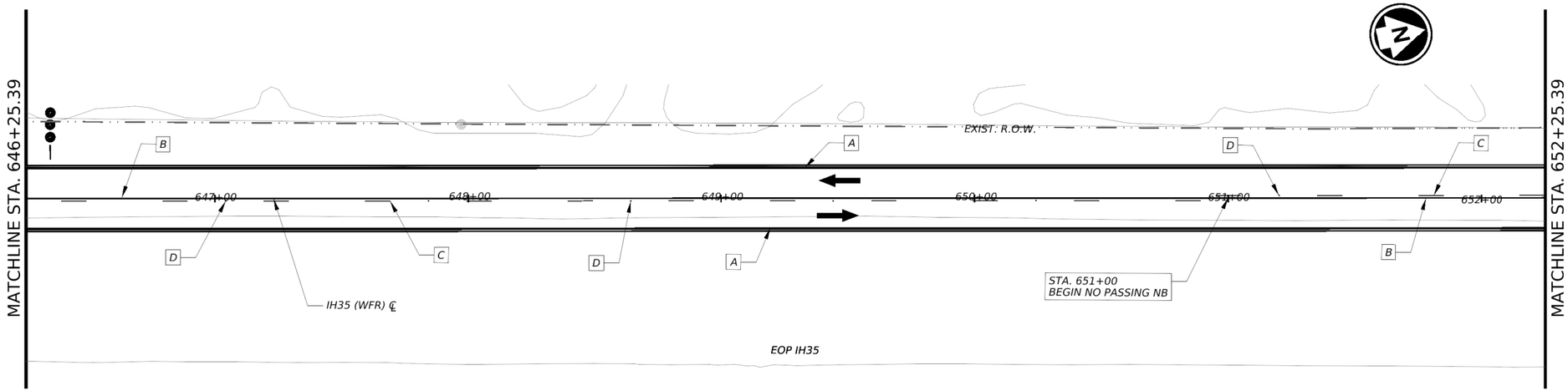

PAVEMENT MARKINGS LEGEND

(THERMOPLASTIC)

- [A] — 6" WHITE SOLID
- [B] — 6" YELLOW SOLID
- [C] — 6" YELLOW BROKEN
- [D] — PAVEMENT MARKER TYPE II-A-A @ 40 FEET C-C
- [E] — PAVEMENT MARKER TYPE II-A-A @ 80 FEET C-C

— DIRECTION OF TRAFFIC

SIGNING LEGEND

- — PROPOSED SMALL SIGN
- — EXISTING SMALL SIGN TO BE REMOVED & RELOCATE
- — EXISTING SMALL SIGN TO BE REMOVED
- — PROPOSED DELINEATOR (D-SW)SZ 1(TYC)GF1(BI)
- — PROPOSED OBJECT MARKER (OM-2Z)(FLX)(GND)(BI)
- — SIGN POST

STATE OF TEXAS
LUIS C. URBINA
117019
LICENSED PROFESSIONAL ENGINEER

DocuSigned by: 11/27/2023
98C72D65D494466...

SCALE 1"=50'

Texas Department of Transportation

IH 35 WFR

PAVEMENT MARKING DETAILS

SHEET 19 OF 23

CONT	SECT	JOB	HIGHWAY
0018	05	090	IH35 WFR
DIST	COUNTY		SHEET NO.
22	WEBB		99

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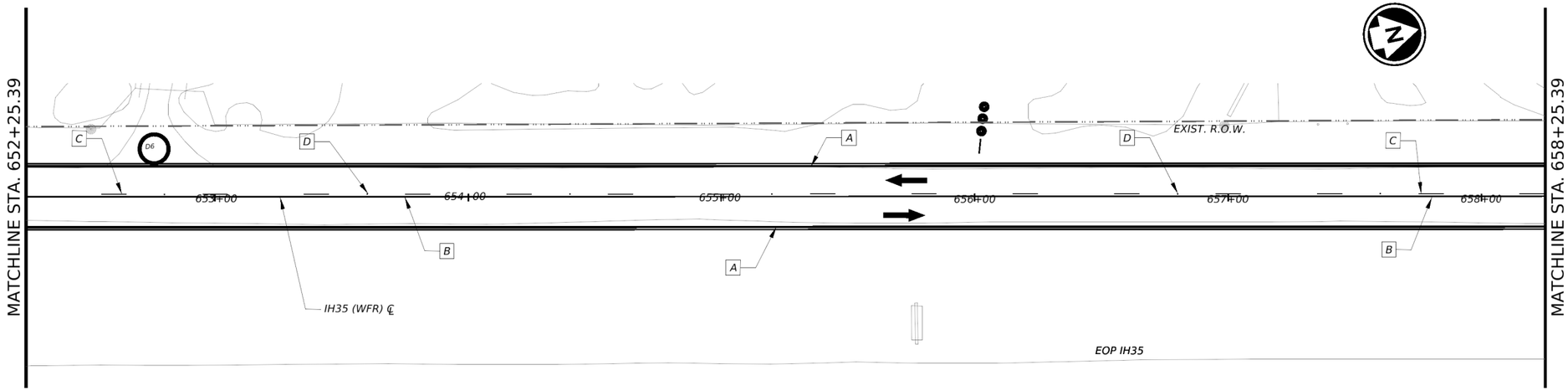

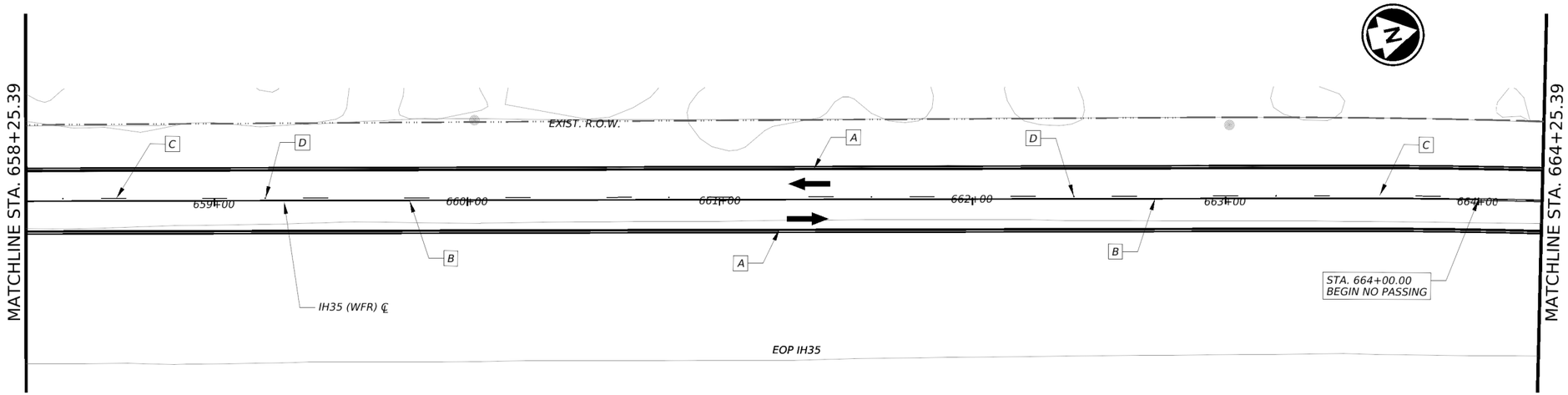

PAVEMENT MARKINGS LEGEND

(THERMOPLASTIC)

- A — 6" WHITE SOLID
- B — 6" YELLOW SOLID
- C — 6" YELLOW BROKEN
- D — PAVEMENT MARKER TYPE II-A-A @ 40 FEET C-C
- E — PAVEMENT MARKER TYPE II-A-A @ 80 FEET C-C

— DIRECTION OF TRAFFIC

SIGNING LEGEND

- — PROPOSED SMALL SIGN
- — EXISTING SMALL SIGN TO BE REMOVED & RELOCATE
- — EXISTING SMALL SIGN TO BE REMOVED
- — PROPOSED DELINEATOR (D-SW)SZ 1(TYC)GF1(BI)
- — PROPOSED OBJECT MARKER (OM-2Z)(FLX)(GND)(BI)
- — SIGN POST

STATE OF TEXAS
LUIS C. URBINA
117019
LICENSED
PROFESSIONAL ENGINEER

DocuSigned by: 11/27/2023
98C72D65D494466...

SCALE 1"=50'

Texas Department of Transportation

IH 35 WFR

PAVEMENT MARKING DETAILS

SHEET 20 OF 23

CONT	SECT	JOB	HIGHWAY
0018	05	090	IH35 WFR
DIST	COUNTY		SHEET NO.
22	WEBB		100

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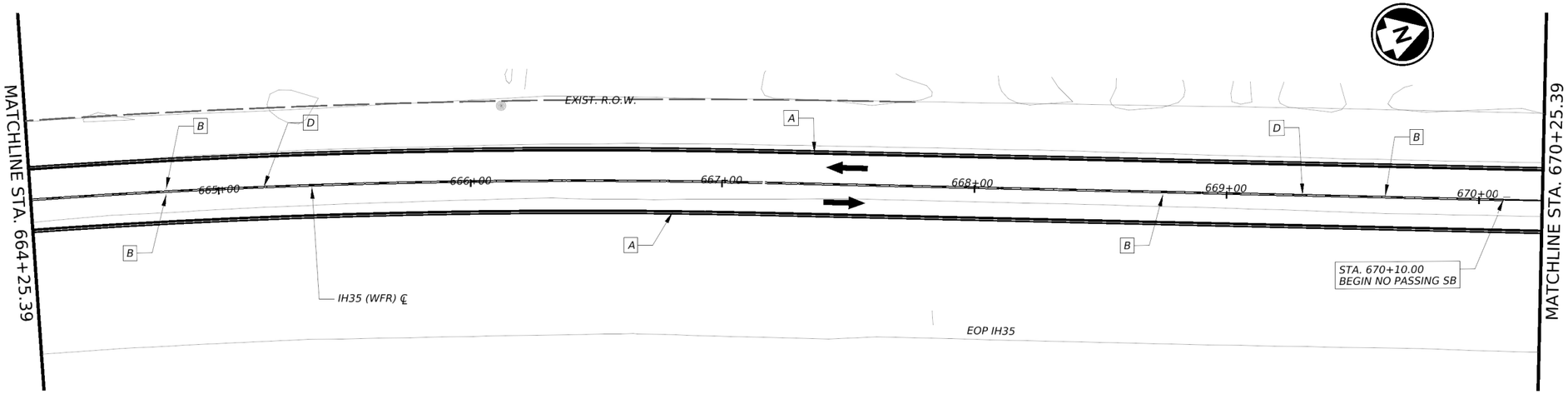

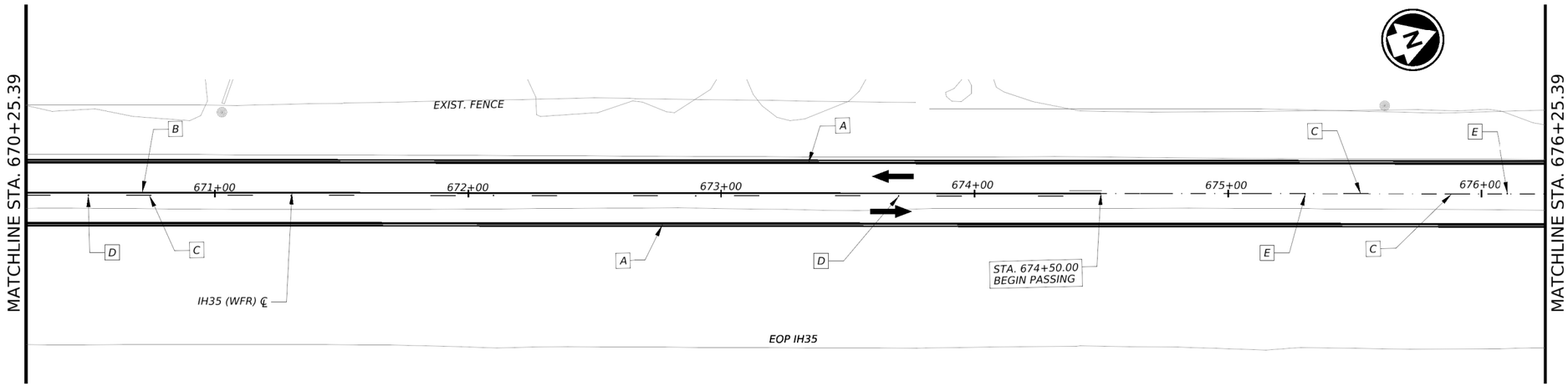

PAVEMENT MARKINGS LEGEND

(THERMOPLASTIC)

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- B — 6" YELLOW SOLID
- C — 6" YELLOW BROKEN
- D — PAVEMENT MARKER TYPE II-A-A @ 40 FEET C-C
- E — PAVEMENT MARKER TYPE II-A-A @ 80 FEET C-C

— DIRECTION OF TRAFFIC

SIGNING LEGEND

- — PROPOSED SMALL SIGN
- — EXISTING SMALL SIGN TO BE REMOVED & RELOCATE
- — EXISTING SMALL SIGN TO BE REMOVED
- — PROPOSED DELINEATOR (D-SW)SZ 1(TYC)GF1(BI)
- — PROPOSED OBJECT MARKER (OM-2Z)(FLX)(GND)(BI)
- — SIGN POST

STATE OF TEXAS
LUIS C. URBINA
117019
LICENSED PROFESSIONAL ENGINEER

DocuSigned by:
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11/27/2023

SCALE 1"=50'

Texas Department of Transportation

IH 35 WFR

PAVEMENT MARKING DETAILS

CONT	SECT	JOB	HIGHWAY
0018	05	090	IH35 WFR
DIST	COUNTY		SHEET NO.
22	WEBB		101

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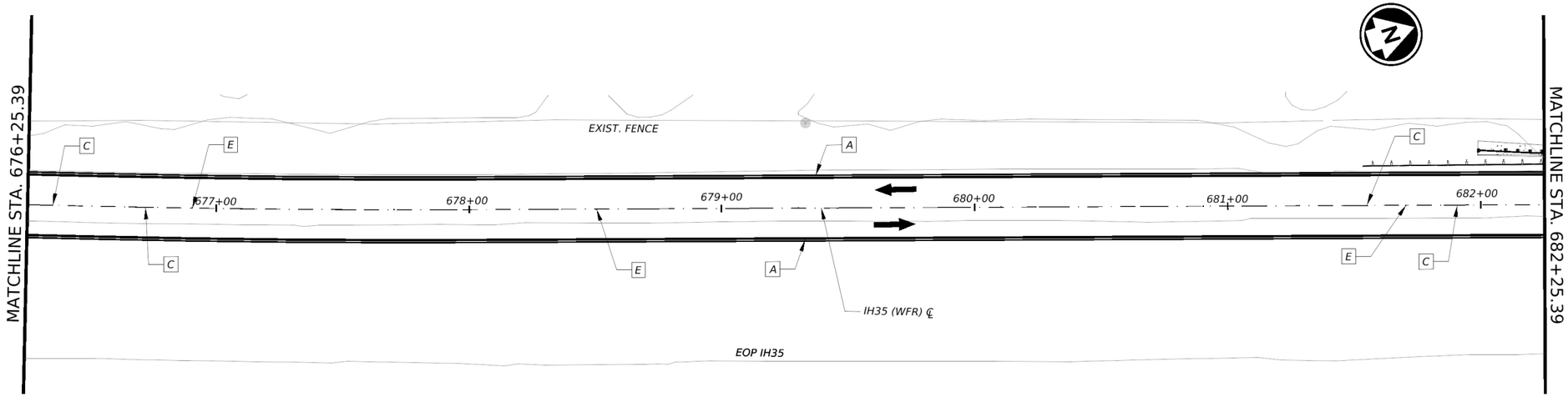

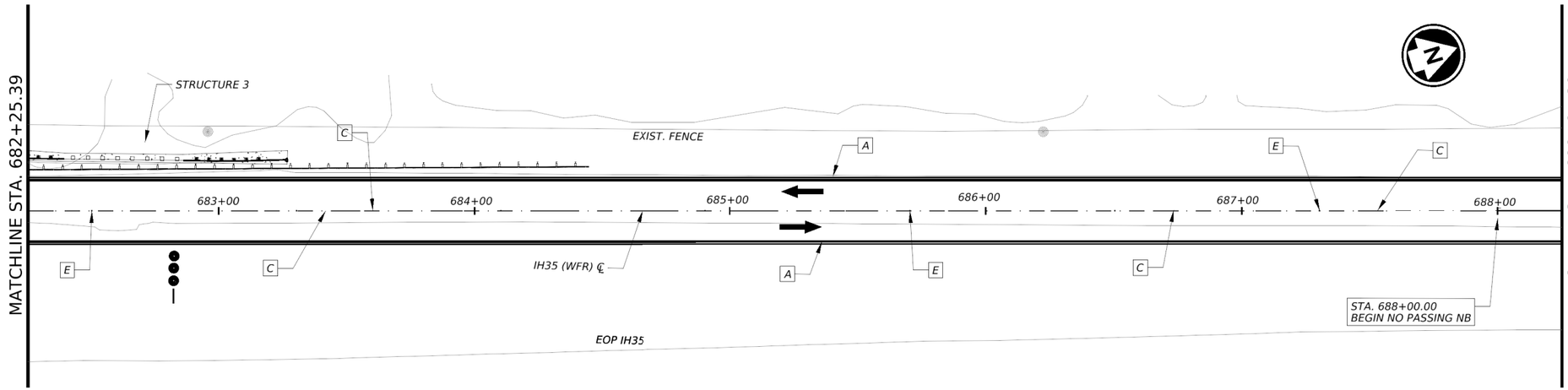

PAVEMENT MARKINGS LEGEND

(THERMOPLASTIC)

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- [B] — 6" YELLOW SOLID
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— DIRECTION OF TRAFFIC

SIGNING LEGEND

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- — EXISTING SMALL SIGN TO BE REMOVED & RELOCATE
- — EXISTING SMALL SIGN TO BE REMOVED
- — PROPOSED DELINEATOR (D-SW)SZ 1(TYC)GF1(BI)
- — PROPOSED OBJECT MARKER (OM-2Z)(FLX)(GND)(BI)
- — SIGN POST

STATE OF TEXAS
LUIS C. URBINA
117019
LICENSED
PROFESSIONAL ENGINEER

DocuSigned by:
98C72D65D494466...
11/27/2023

SCALE 1"=50'

Texas Department of Transportation

IH 35 WFR

PAVEMENT MARKING DETAILS

CONT	SECT	JOB	HIGHWAY
0018	05	090	IH35 WFR
DIST	COUNTY		SHEET NO.
22	WEBB		102

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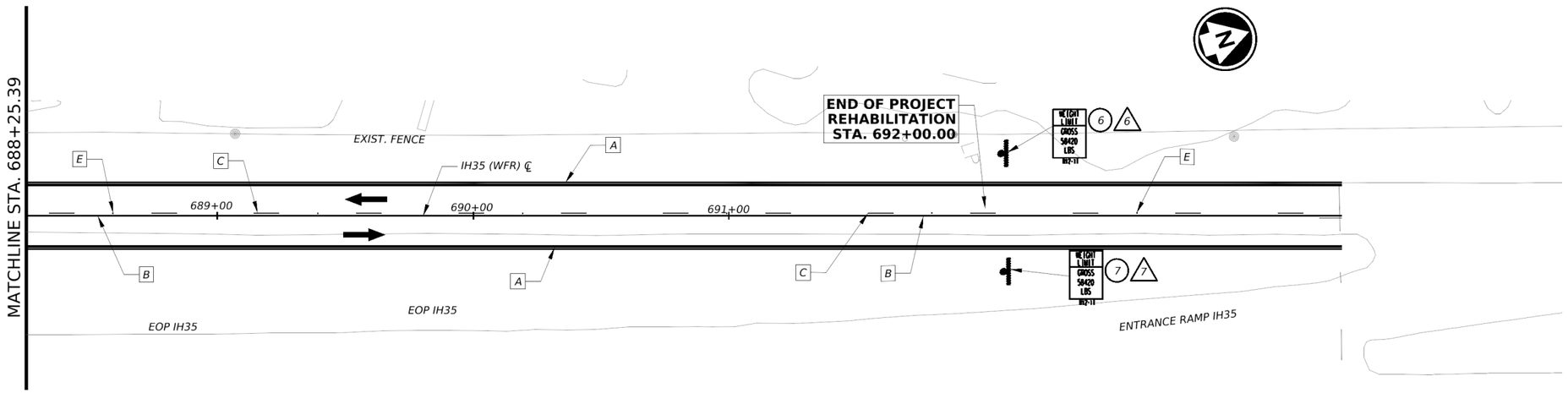

PAVEMENT MARKINGS LEGEND

(THERMOPLASTIC)

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- B — 6" YELLOW SOLID
- C — 6" YELLOW BROKEN
- D — PAVEMENT MARKER TYPE II-A-A @ 40 FEET C-C
- E — PAVEMENT MARKER TYPE II-A-A @ 80 FEET C-C

— DIRECTION OF TRAFFIC

SIGNING LEGEND

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- — PROPOSED DELINEATOR (D-SW)SZ 1(TYC)GF1(BI)
- — PROPOSED OBJECT MARKER (OM-2Z)(FLX)(GND)(BI)
- — SIGN POST

STATE OF TEXAS
LUIS C. URBINA
117019
LICENSED PROFESSIONAL ENGINEER

DocuSigned by:
98C72D65D494466...
11/27/2023

SCALE 1"=50'

Texas Department of Transportation

IH 35 WFR

PAVEMENT MARKING DETAILS

SHEET 23 OF 23

CONT	SECT	JOB	HIGHWAY
0018	05	090	IH35 WFR
DIST	COUNTY		SHEET NO.
22	WEBB		103

DATE: 11/27/2023 12:08:56 PM
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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"	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
81	1	W6-3	SYMBOL - TWO WAY TRAFFIC	36 x 36	1		10BWG	1	SA	T		
87	2	W1-5L W13-1P	SYMBOL - WINDING ROAD LEFT (SPEED) MPH <ADVISORY SPEED PLAQUE>	36 x 36 18 x 18	1		10BWG	1	SA	T		
89	3	W1-5R W13-1P	SYMBOL - WINDING ROAD RIGHT (SPEED) MPH <ADVISORY SPEED PLAQUE>	36 x 36 18 x 18	1		10BWG	1	SA	T		
92	4	W1-5L W13-1P	SYMBOL - WINDING ROAD LEFT (SPEED) MPH <ADVISORY SPEED PLAQUE>	36 x 36 18 x 18	1		10BWG	1	SA	T		
94-95	5	W1-5R W13-1P	SYMBOL - WINDING ROAD RIGHT (SPEED) MPH <ADVISORY SPEED PLAQUE>	36 x 36 18 x 18	1		10BWG	1	SA	T		
102	6	R12-1T	WEIGHT LIMIT/GROSS (WEIGHT) LBS	24 x 36	1		10BWG	1	SA	T		
102	7	R12-1T	WEIGHT LIMIT/GROSS (WEIGHT) LBS	24 x 36	1		10BWG	1	SA	T		

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		0018	05	090	IH35 WFR
4-16		DIST	COUNTY		SHEET NO.
8-16		22	WEBB		104

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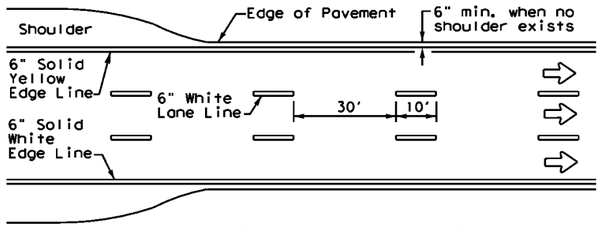
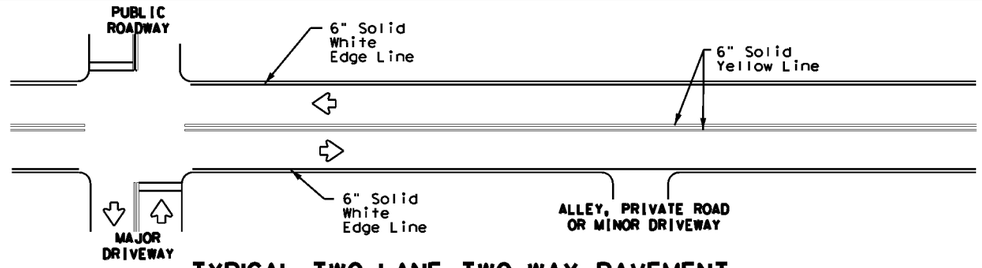
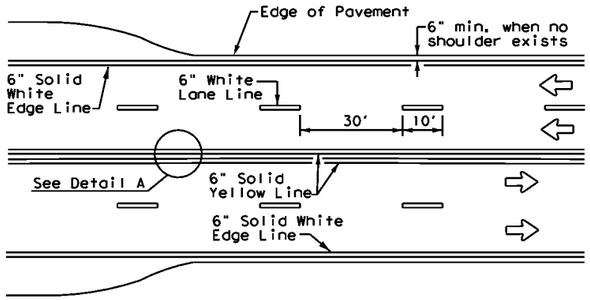
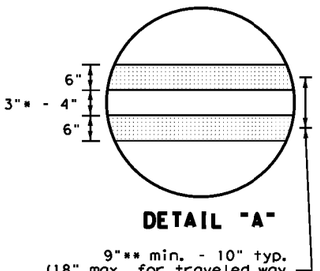


EDGE LINE AND LANE LINES ONE-WAY ROADWAY WITH OR WITHOUT SHOULDERS



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

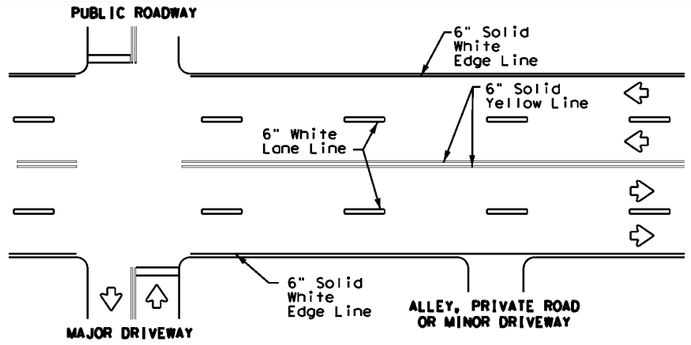




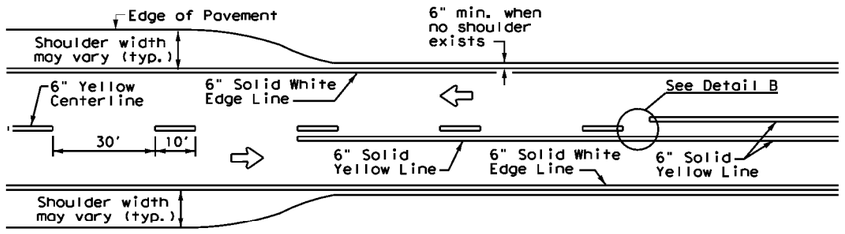
CENTERLINE AND LANE LINES FOUR LANE TWO-WAY ROADWAY WITH OR WITHOUT SHOULDERS

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

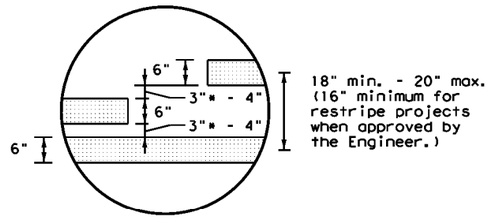
** 8" minimum for restripe projects when approved by the Engineer.



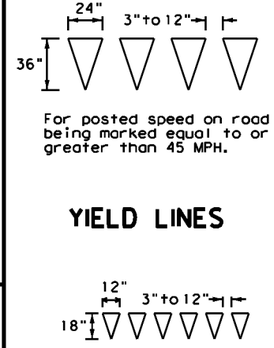
TYPICAL MULTI-LANE, TWO-WAY PAVEMENT MARKINGS THROUGH INTERSECTIONS

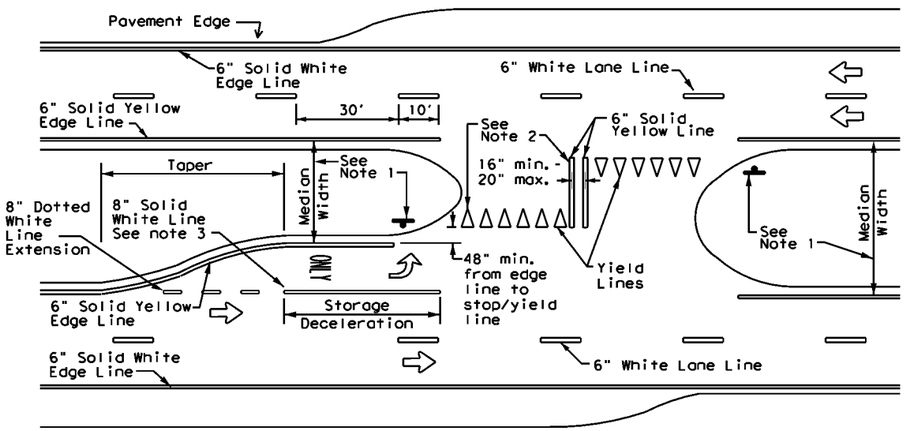


TWO LANE TWO-WAY ROADWAY WITH OR WITHOUT SHOULDERS



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





FOUR LANE DIVIDED ROADWAY CROSSOVERS

NOTES

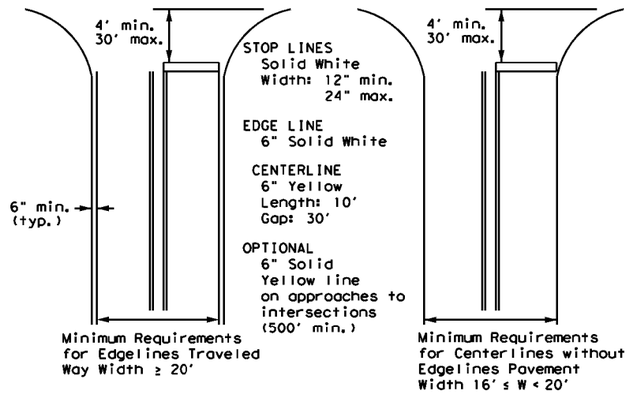
1. Where divided highways are separated by median widths at the median opening itself of 30 feet or more, median openings shall be signed as two separate intersections. Each median opening has two width measurements, with one measurement for each approach. The narrow median width will be the controlling width to determine if signs are required. Yield signs are the typical intersection control. Stop signs and stop bars are optional as determined by the Engineer.
2. Install median striping (double yellow centerlines and stop lines/yield lines) when a 50' or greater median centerline can be placed. Stop lines shall only be used with stop signs. Yield lines shall only be used with yield signs.
3. Length of turn bays, including taper, deceleration, and storage lengths shall be as shown on the plans or as directed by the Engineer.

GENERAL NOTES

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

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

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



NOTE: Traveled way is exclusive of shoulder widths. Refer to General Note 2 for additional details.

GUIDE FOR PLACEMENT OF STOP LINES, EDGE LINE & CENTERLINE

Based on Traveled Way and Pavement Widths for Undivided Roadways

Texas Department of Transportation

Traffic Safety Division Standard

TYPICAL STANDARD PAVEMENT MARKINGS

PM(1)-22

FILE: pm1-22.dgn	DN:	CK:	DW:	CK:
©TxDOT December 2022	CONT	SECT	JOB	HIGHWAY
REVISIONS	0018	05	090	IH35 WFR
11-78 8-00 6-20	DIST	COUNTY		SHEET NO.
8-95 3-03 12-22	22	WEBB		105
5-00 2-12				

22A

DATE: 11/27/2023 3:13:41 PM
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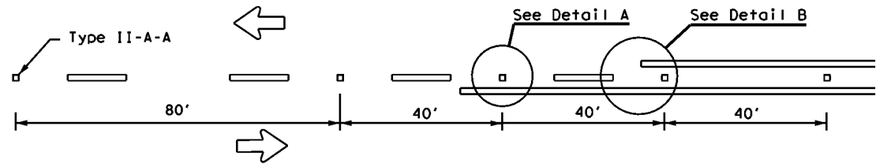
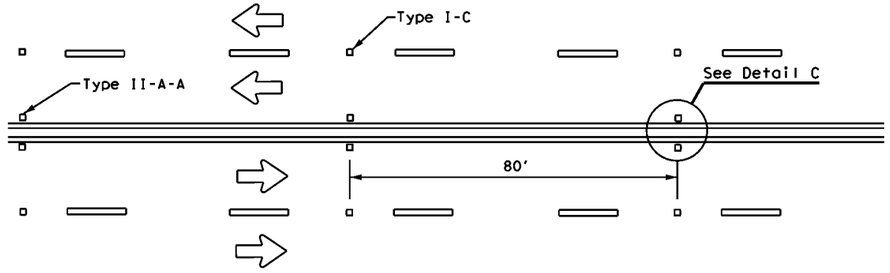
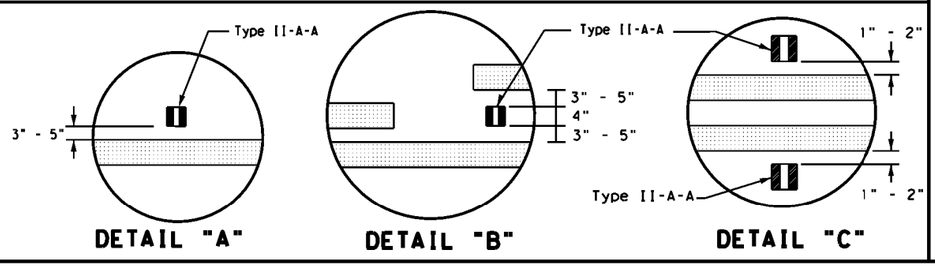
REFLECTIVE RAISED PAVEMENT MARKERS FOR VEHICLE POSITIONING GUIDANCE

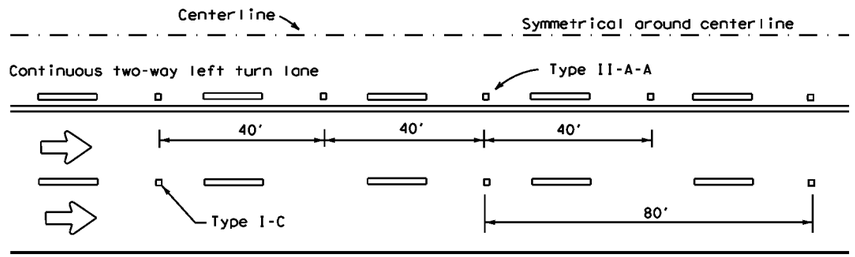


CENTERLINE FOR ALL TWO LANE TWO-WAY ROADWAYS

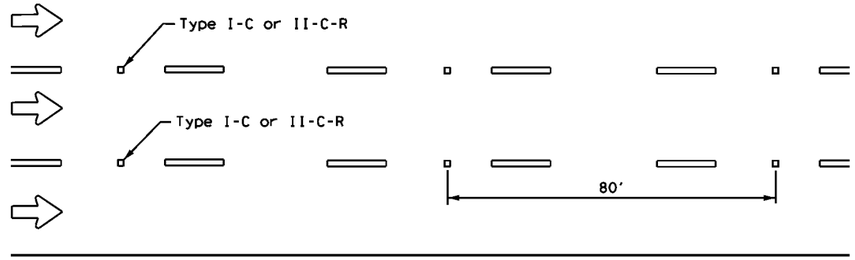


CENTERLINE & LANE LINES FOR FOUR LANE TWO-WAY ROADWAYS





CENTERLINE AND LANE LINES FOR TWO-WAY LEFT TURN LANE



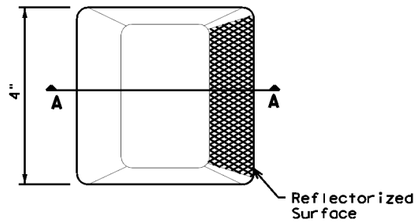
LANE LINES FOR ONE-WAY ROADWAY (NON-FREEWAY FACILITIES)

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

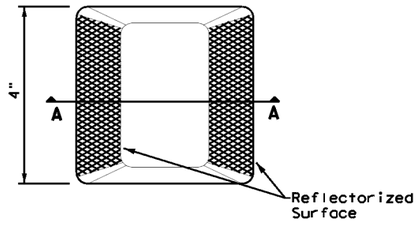
See Note 3.

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

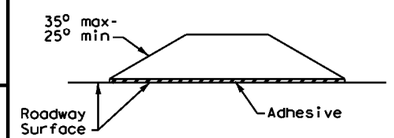
All pavement marking materials shall meet the required Departmental Material Specifications as specified by the plans.



Type I (Top View)

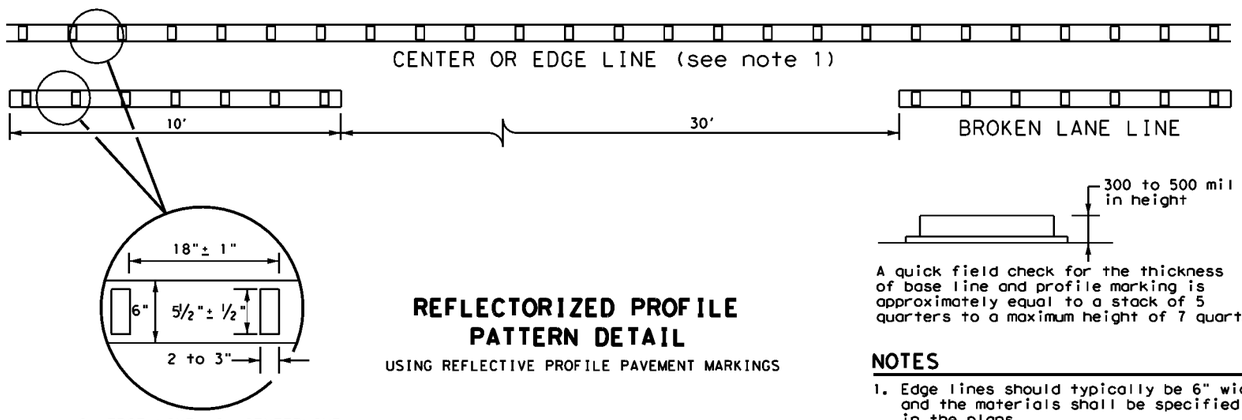


Type II (Top View)



SECTION A

RAISED PAVEMENT MARKERS



6" EDGE LINE, 6" CENTERLINE OR 6" LANE LINE

REFLECTORIZED PROFILE PATTERN DETAIL

USING REFLECTIVE PROFILE PAVEMENT MARKINGS

A quick field check for the thickness of base line and profile marking is approximately equal to a stack of 5 quarters to a maximum height of 7 quarters.

NOTES

1. Edge lines should typically be 6" wide and the materials shall be specified in the plans.
2. Profile markings shall not be placed on roadways with a posted speed limit of 45 MPH or less.

GENERAL NOTES

1. All raised pavement markers placed along broken lines shall be placed in line with and midway between the stripes.
2. On concrete pavements the raised pavement markers should be placed to one side of the longitudinal joints.
3. Use raised pavement marker Type I-C with undivided roadways, flush medians and two way left turn lanes. Use raised pavement marker Type II-C-R with divided highways and raised medians.

Texas Department of Transportation

Traffic Safety Division Standard

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

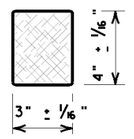
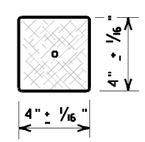
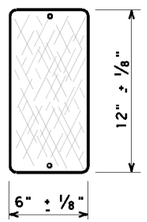
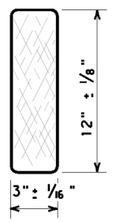
FILE: pm2-22.dgn	DN:TXDOT	CK:TXDOT	DW:TXDOT	CK:TXDOT
©TxDOT December 2022	CONT	SECT	JOB	HIGHWAY
REVISIONS	0018	05	090	IH35 WFR
4-77 8-00 6-20	DIST	COUNTY		SHEET NO.
4-92 2-10 12-22	22	WEBB		106
5-00 2-12				

22B

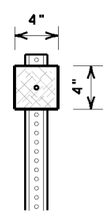
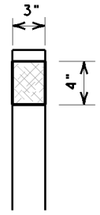
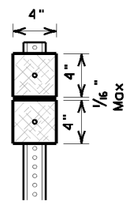
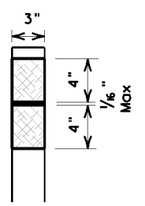
DATE: 11/27/2023 3:13:56 PM
FILE: c:\txdot\pw_online\txdot5\krystal.hernandez\d1044194\pm2-22.dgn

DATE: 11/27/2023 3:14:15 PM
FILE: c:\txdot\pw_online\txdot5\krystal.hernandez\d1044194\dom1-20.dgn

REFLECTOR UNIT SIZES FOR DELINEATORS AND OBJECT MARKERS

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

DELINEATORS

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

D & OM DESCRIPTIVE CODES

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

NUMBER OF REFLECTORS
S = Single
D = Double

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

REFLECTOR UNIT SIZE
1 or 2

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

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

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

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

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

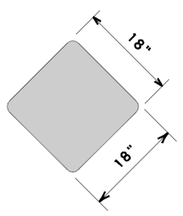
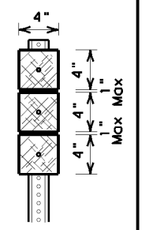
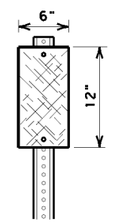
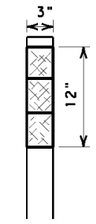
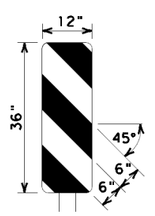
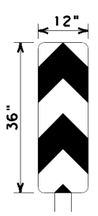
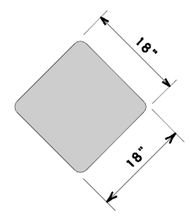
NUMBER OF REFLECTORS OR DIRECTION
X = 3-Size 2 reflector units (Type 2 only)
Y = 1-Size 3 reflector unit (Type 2 only)
Z = 3-Size 1 or 1-Size 4 reflector unit(s)(Type 2 only)
L = Left Side (Type 3 Object Marker only)
R = Right Side (Type 3 Object Marker only)
C = Center (Type 3 Object Marker only)

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

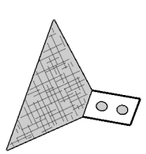
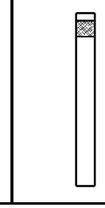
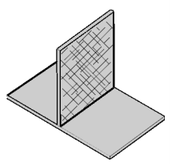
TYPE OF MOUNT
GND = Embedded (drivable)
SRF = Surface Mount
WAS = Wedge Anchor Steel
WAP = Wedge Anchor Plastic

DIRECTION
If Required
BI = Bi-Directional

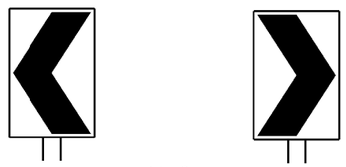
OBJECT MARKERS

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

BARRIER REFLECTORS (BRF)

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

CHEVRONS

DEVICE	 W1-8			
SIZE (W x L)	18"x 24" (Conventional)	24"x 30" (Conventional Oversize)	30"x 36" (Expressway)	36" x 48" (Freeway)
MOUNTING HEIGHT	4'-0" or 7'-0"		7'-0" Only	
NOTE	1. CHEVRON (W1-8) signs and ONE DIRECTION LARGE ARROW (W1-6) Signs shall be installed per Sign Mounting Details (SMD) Standard Sheets and paid under Item 644 (Small Roadside Sign Assemblies). 2. When there is a need to increase conspicuity, the Texas version of the ONE DIRECTION LARGE ARROW sign (W1-9T) may be used instead of the ONE DIRECTION LARGE ARROW (W1-6).			

ONE DIRECTION LARGE ARROW

DEVICE	 W1-6	
SIZE (W x L)	48" x 24" (Conventional)	60" x 30" (Expressway & Freeway)
MOUNTING HEIGHT	7'-0"	

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

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

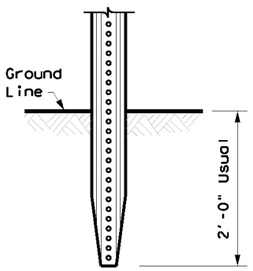
D & OM(1)-20

FILE: dom1-20.dgn	DN: TXDOT	CK: TXDOT	DW: TXDOT	CK: TXDOT
©TxDOT August 2004	CONT	SECT	JOB	HIGHWAY
REVISIONS	0018	05	090	IH35 WFR
10-09 3-15	DIST	COUNTY		SHEET NO.
4-10 7-20	22	WEBB		107

POST TYPE AND SUPPORT FOUNDATION DETAILS

WING CHANNEL (WC)

GND

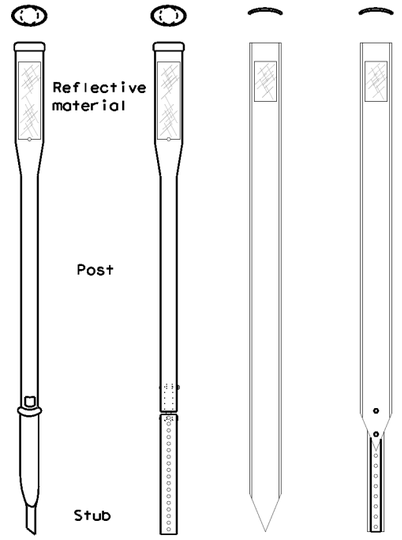


NOTES

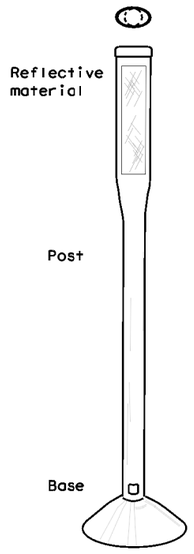
1. Embedded Wing Channel (WC) post option may be used for Type 2 Object Markers and Delineators only.
2. 1.12 lbs/ft steel per ASTM A 1011 SS Gr. 50, or ASTM A499.

FLEXIBLE POSTS (YFLX, WFLX)

GND



SRF



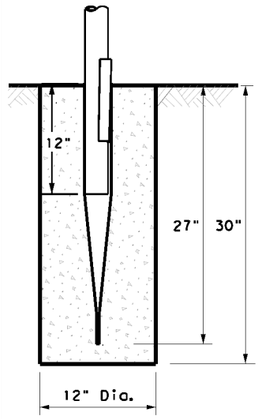
EMBEDDED | SURFACE MOUNT

NOTES

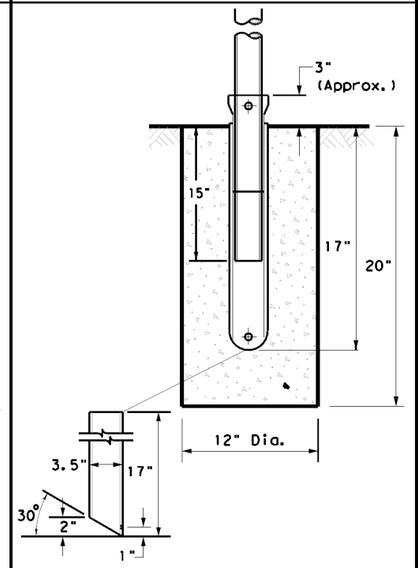
1. See "Flexible Delineator and Object Marker Posts" Material Producer List for approved devices.
2. Install per manufacturer's recommendations.
3. Post length may vary to meet field conditions.
4. When using yellow delineators with flexible posts to separate opposing direction of travel, such as centerline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

WEDGE ANCHOR SYSTEMS

WAS



WAP



STEEL | PLASTIC

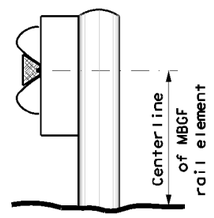
NOTE

1. Install per manufacturer's recommendations.

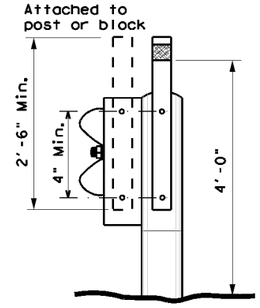
TYPE OF BARRIER MOUNTS

GUARD FENCE ATTACHMENT

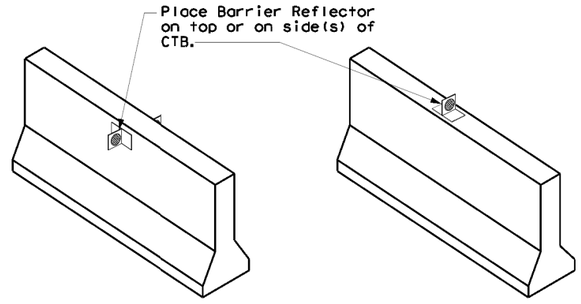
GF1



GF2



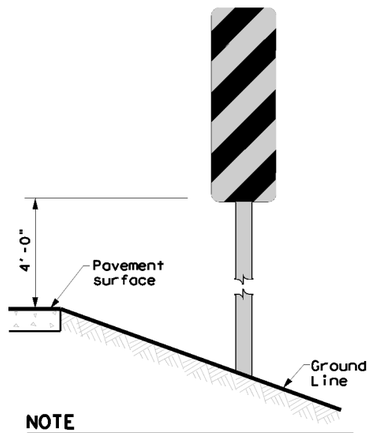
CONCRETE TRAFFIC BARRIER (CTB)



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.

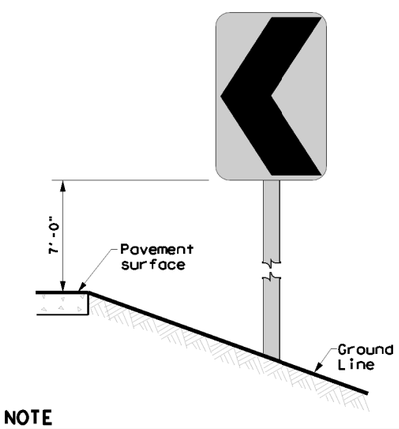
TYPES 1, 3, AND 4 OBJECT MARKERS AND CHEVRONS



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)

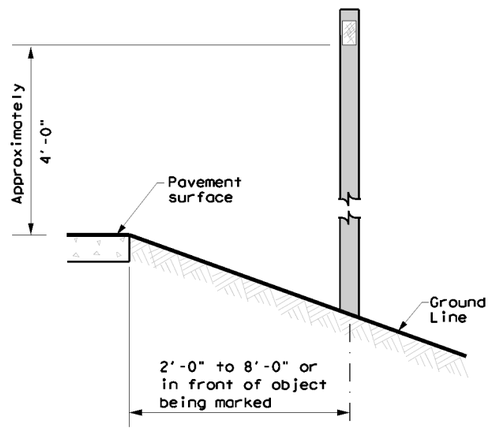
CHEVRONS AND ONE DIRECTION LARGE ARROW SIGN



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

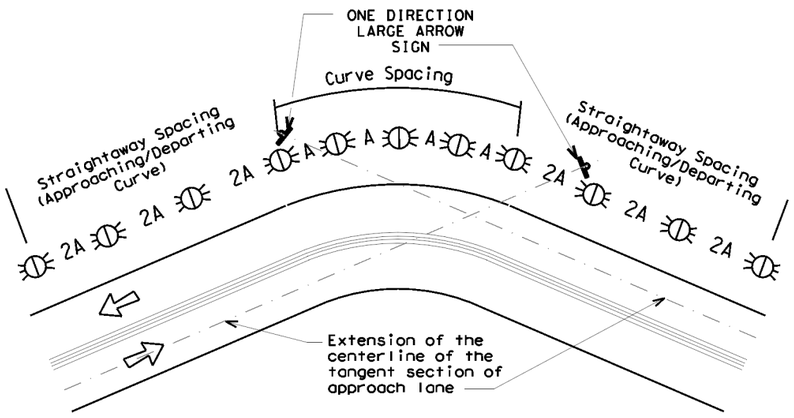
FILE: dom2-20.dgn	DN: TxDOT	CK: TxDOT	DW: TxDOT	CK: TxDOT
© TxDOT August 2004	CONT	SECT	JOB	HIGHWAY
REVISIONS	0018	05	090	IH35 WFR
10-09 3-15	DIST	COUNTY		SHEET NO.
4-10 7-20	22	WEBB		108

208

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

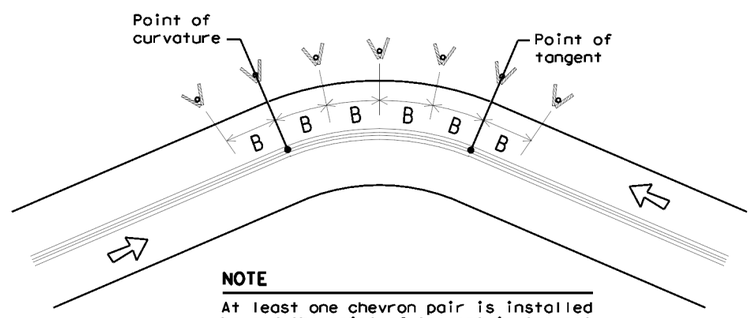
SUGGESTED SPACING FOR DELINEATORS ON HORIZONTAL CURVES



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	0018	05	090	IH35 WFR
3-15 8-15	DIST	COUNTY		SHEET NO.
8-15 7-20	22	WEBB		109

20C

DATE: 11/27/2023 3:14:54 PM
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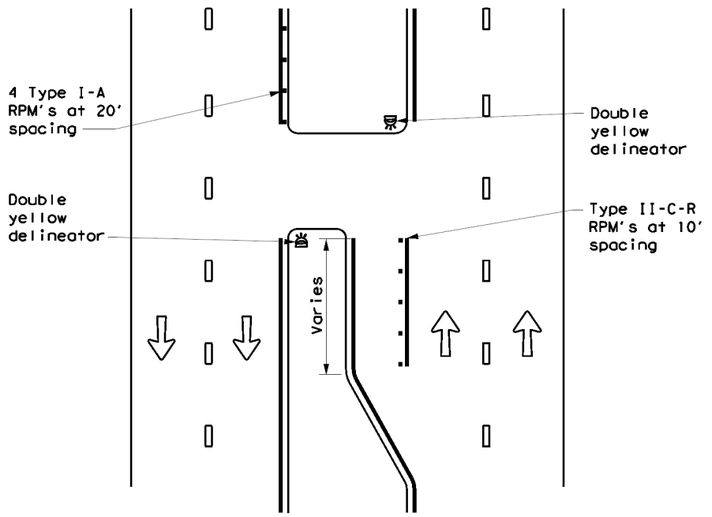
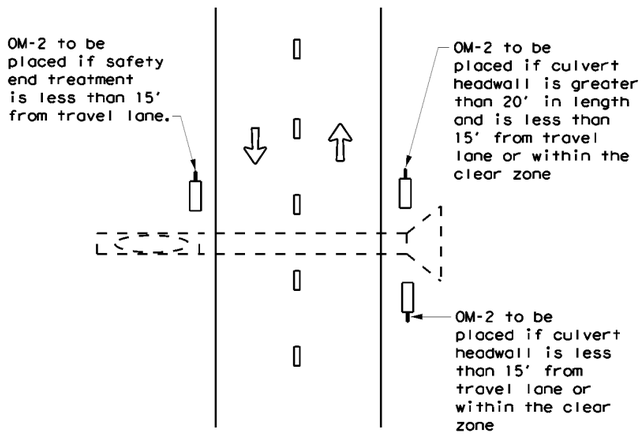
CROSSOVERS



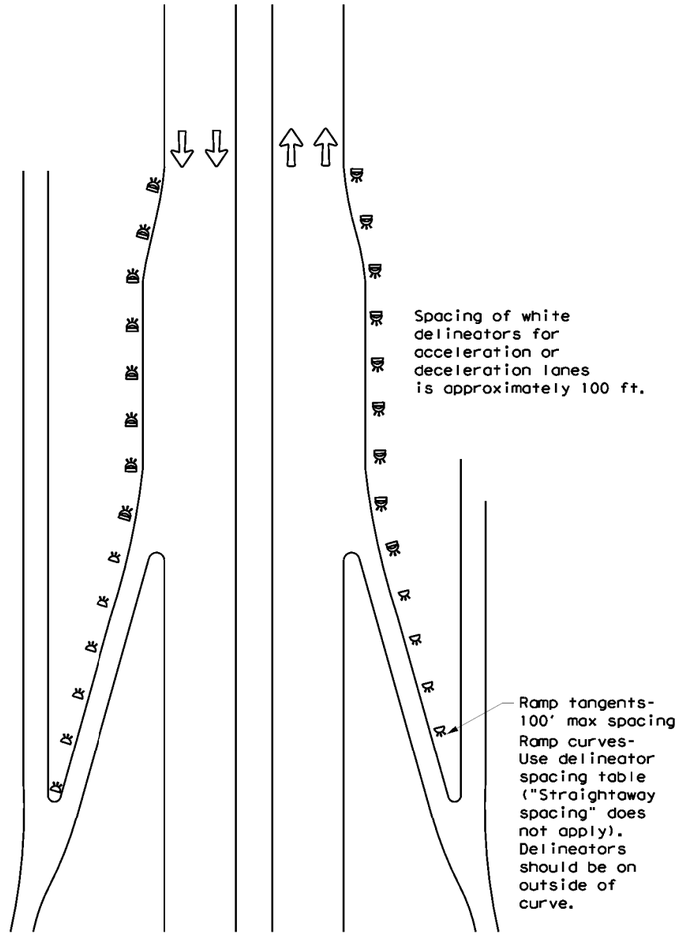
DETAIL 1

FOR CULVERTS WITHOUT MBGF



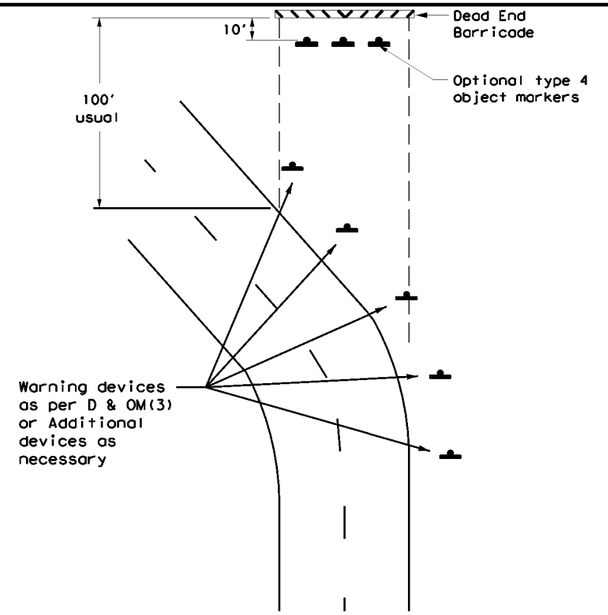
DETAIL 2

FREEWAY DELINEATION FOR RAMPS AND ACCELERATION/DECELERATION LANES



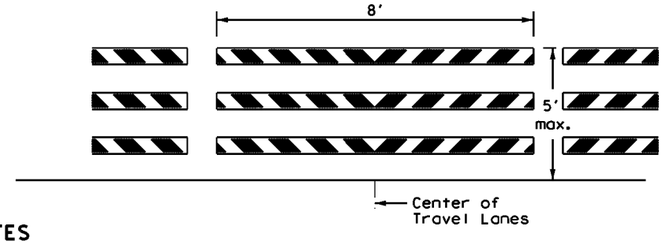
DETAIL 3

TYPICAL APPLICATION OF DEAD END BARRICADE



DETAIL 4

TYPICAL DEAD END BARRICADE INSTALLATION



NOTES

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

DETAIL 5

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

Texas Department of Transportation

Traffic Safety Division Standard

DELINEATOR & OBJECT MARKER PLACEMENT DETAILS

D & OM(4)-20

FILE: dom4-20.dgn	DN: TXDOT	CK: TXDOT	DW: TXDOT	CK: TXDOT
© TxDOT August 2004	CONT	SECT	JOB	HIGHWAY
REVISIONS	0018	05	090	IH35 WFR
3-15	DIST	COUNTY		SHEET NO.
7-20	22	WEBB		110

200

DATE: 11/27/2023 3:15:28 PM
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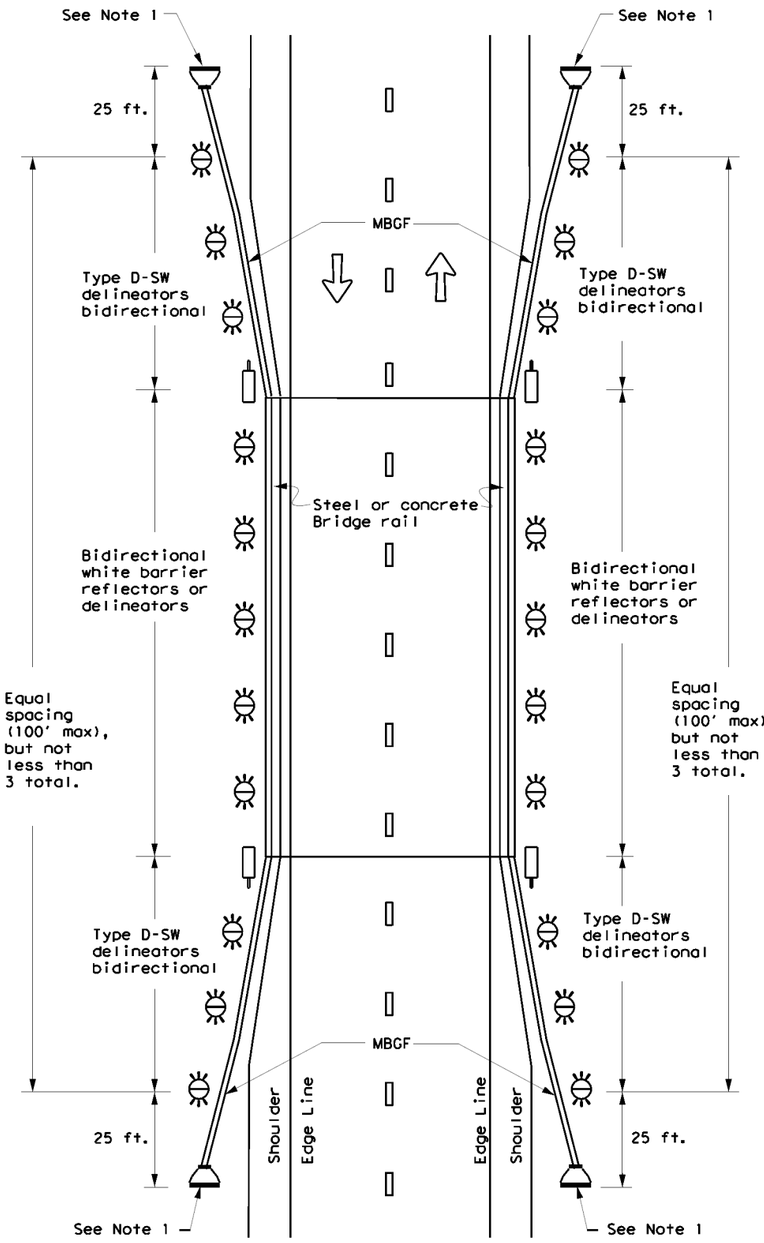
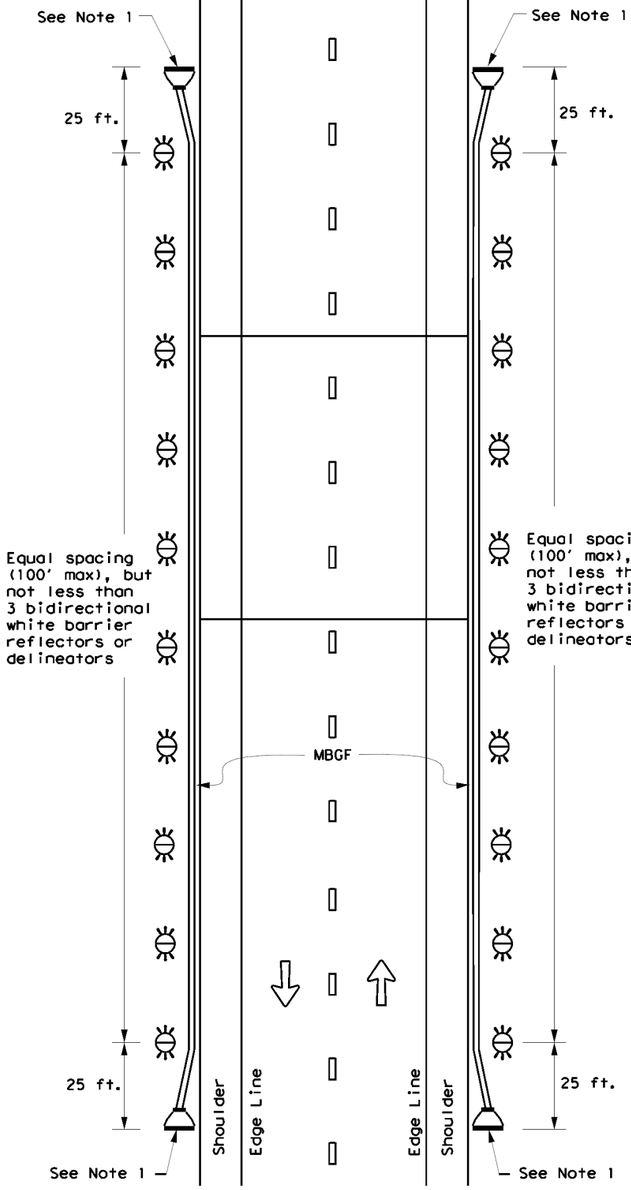
TWO-WAY, TWO LANE ROADWAY WITH REDUCED WIDTH APPROACH RAIL



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.

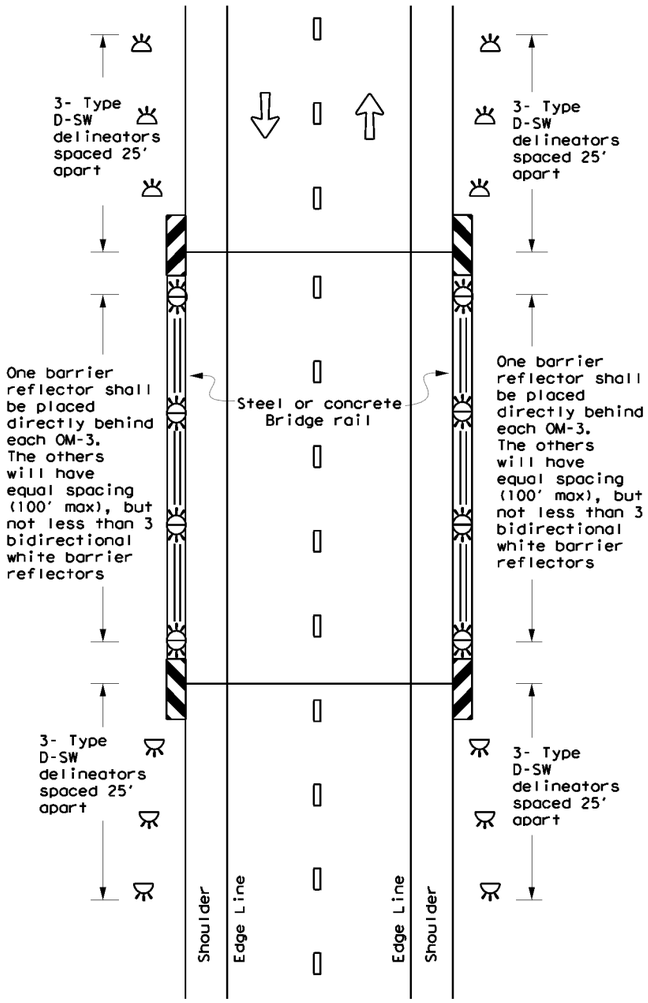
TWO-WAY, TWO LANE ROADWAY WITH METAL BEAM GUARD FENCE (MBGF)



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

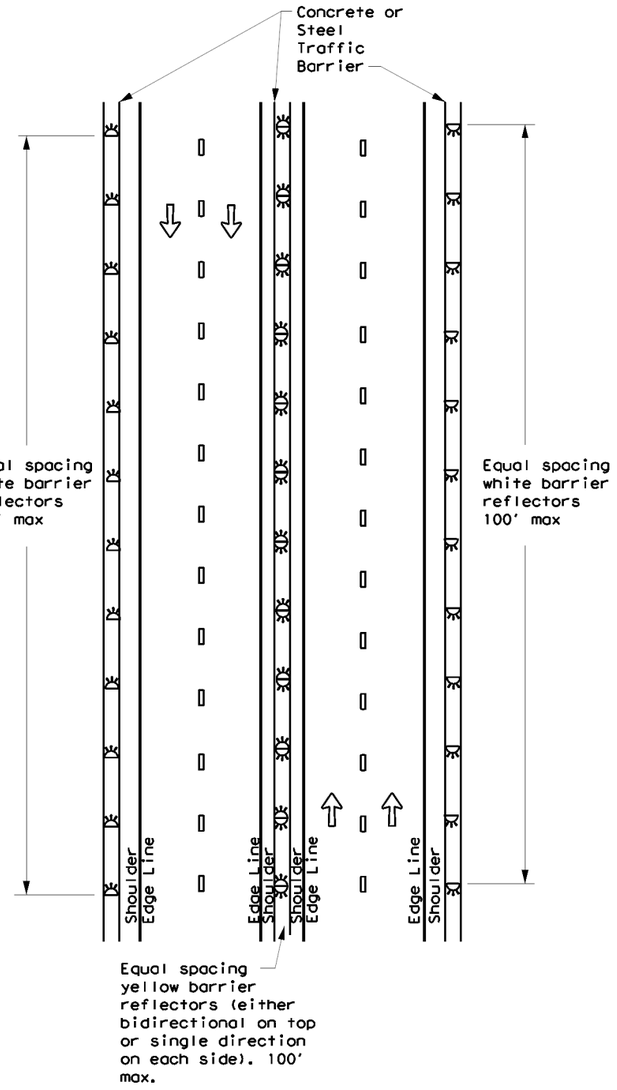
DELINEATOR & OBJECT MARKER PLACEMENT DETAILS

D & OM(5)-20

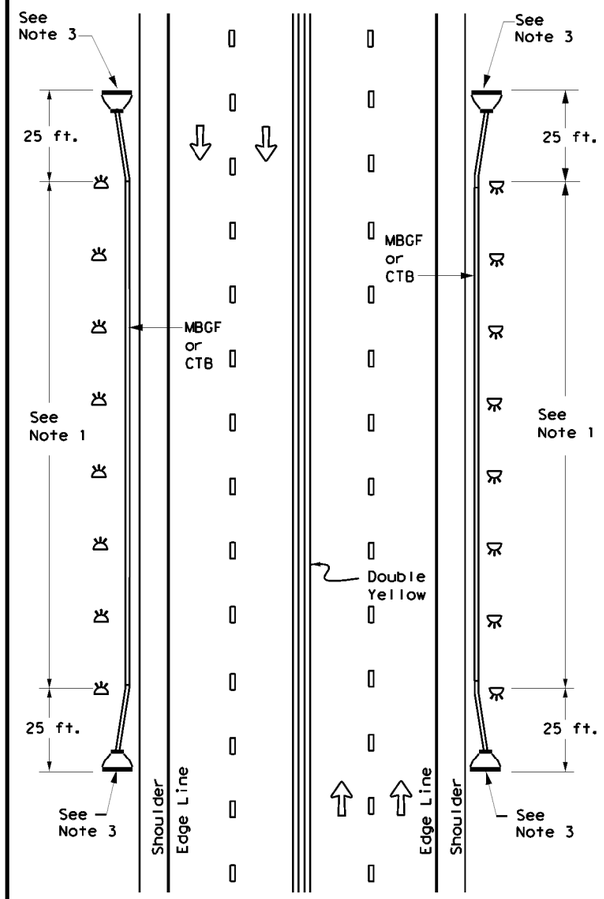
FILE: dom5-20.dgn	DN: TxDOT	CK: TxDOT	DW: TxDOT	CK: TxDOT
© TxDOT August 2015	CONT	SECT	JOB	HIGHWAY
REVISIONS	0018	05	090	IH35 WFR
7-20	DIST	COUNTY		SHEET NO.
	22	WEBB		111

20E

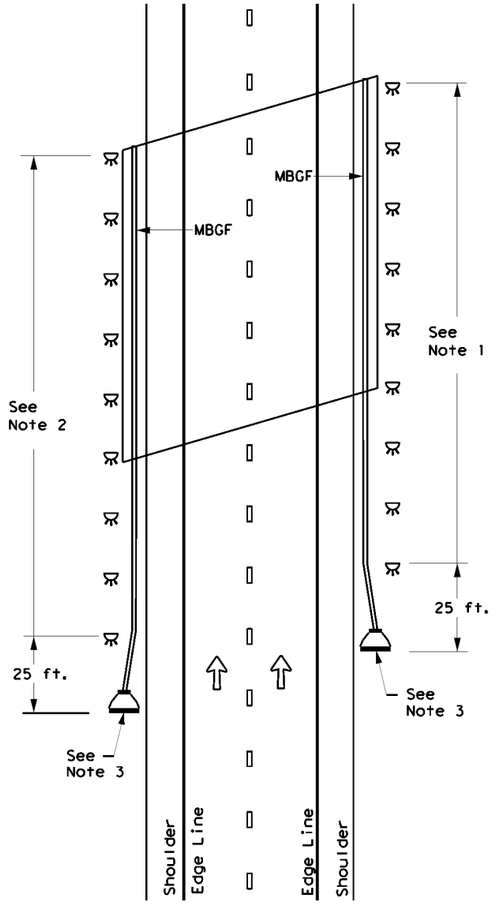
CONTINUOUS CONCRETE OR STEEL BARRIER



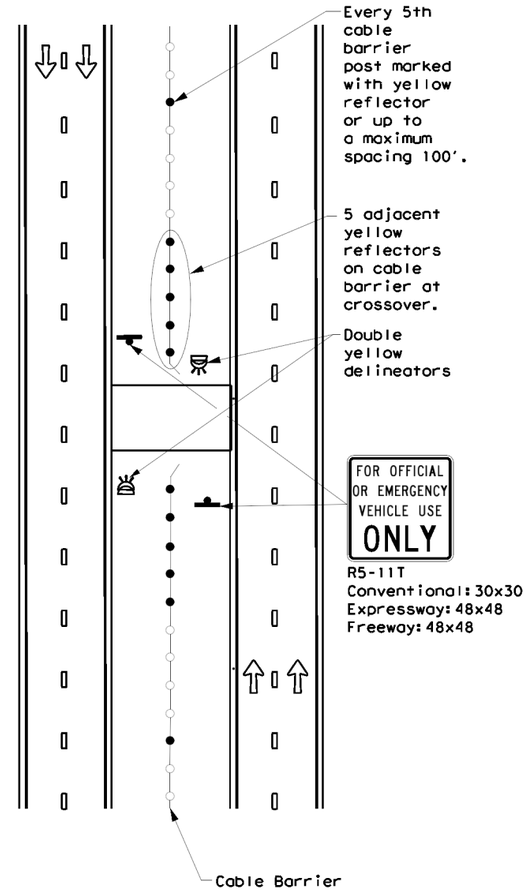
MULTI-LANE UNDIVIDED, TWO-WAY ROADWAY WITH METAL BEAM GUARD FENCE (MBGF)



DIVIDED ROADWAY WITH METAL BEAM GUARD FENCE (MBGF)



EMERGENCY CROSSOVER



NOTES

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

LEGEND

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

Texas Department of Transportation

Traffic Safety Division Standard

DELINEATOR & OBJECT MARKER PLACEMENT DETAILS

D & OM(6)-20

FILE: dom6-20.dgn	DN: TxDOT	CK: TxDOT	DW: TxDOT	CK: TxDOT
©TxDOT August 2015	CONT	SECT	JOB	HIGHWAY
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	22	WEBB		112

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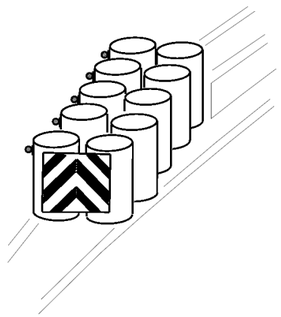
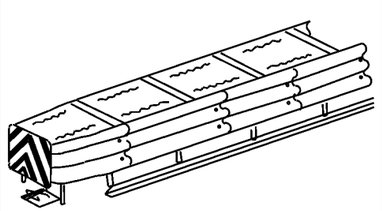
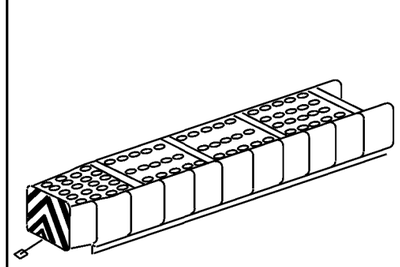
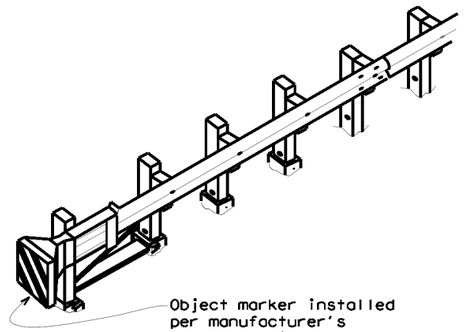
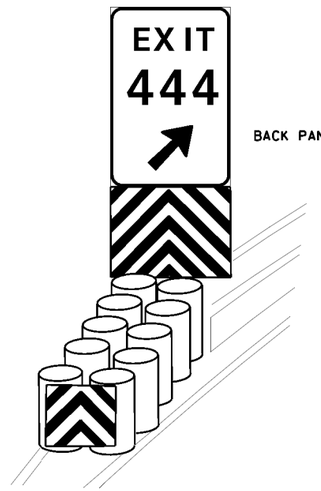




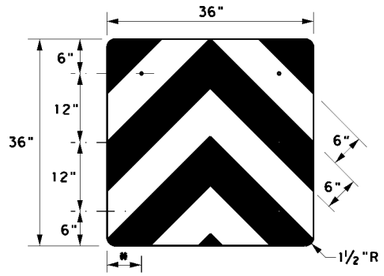


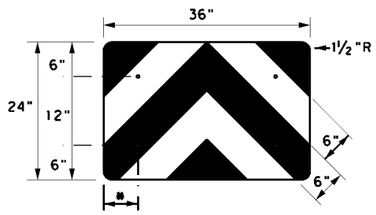


Object marker installed per manufacturer's recommendations.

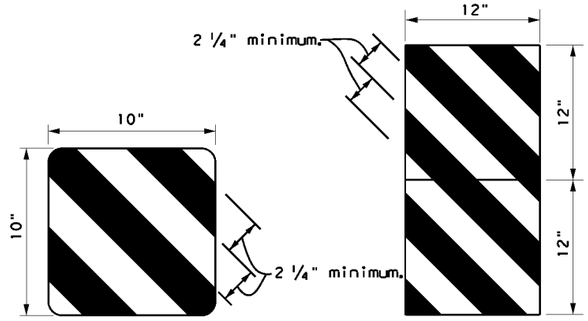


BACK PANEL (OPTIONAL)

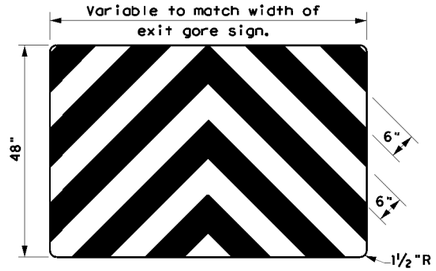


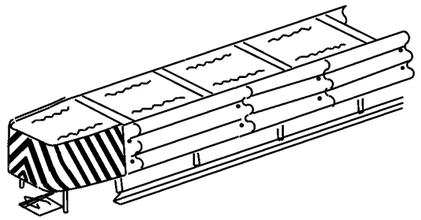


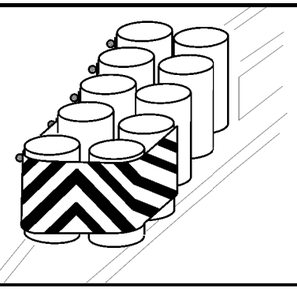
* Adjust to fit attenuator per manufacturer's recommendation, or as directed by the Engineer

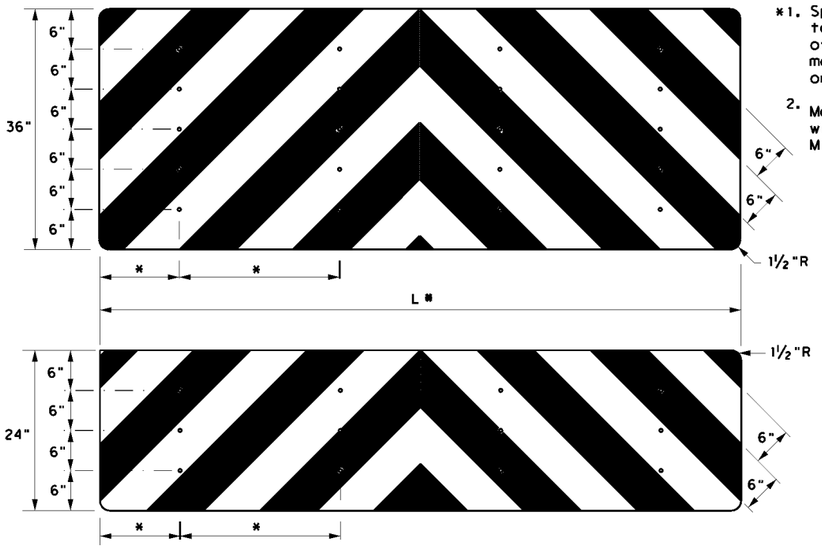


OBJECT MARKERS SMALLER THAN 3 FT^2









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

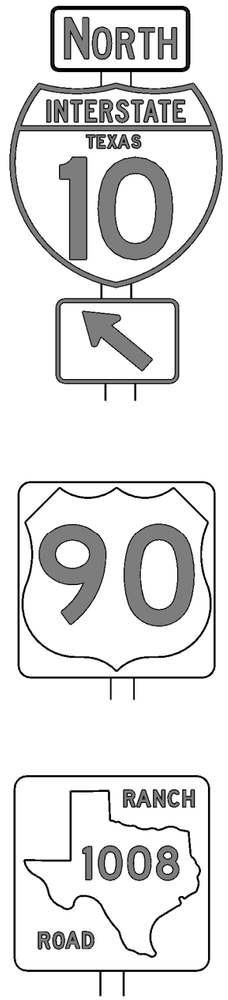
FILE: domvia20.dgn	DN: TXDOT	CK: TXDOT	DW: TXDOT	CK: TXDOT
© TxDOT December 1989	CONT	SECT	JOB	HIGHWAY
REVISIONS	0018	05	090	IH35 WFR
4-92 8-04	DIST	COUNTY		SHEET NO.
8-95 3-15	22	WEBB		113
4-98 7-20				

20G

DATE: 11/27/2023 3:16:21 PM
FILE: c:\txdot\pw_online\txdot5\krystal.hernandez\d1044194\tsr3-13.dgn

REQUIREMENTS FOR INDEPENDENT MOUNTED ROUTE SIGNS

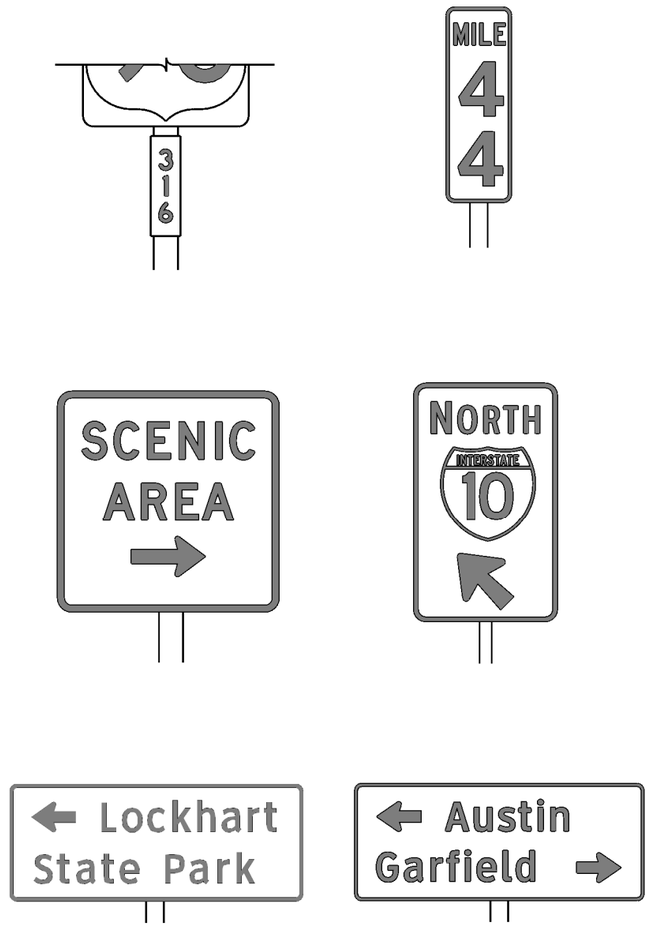
SHEETING REQUIREMENTS		
USAGE	COLOR	SIGN FACE MATERIAL
BACKGROUND	WHITE	TYPE A SHEETING
BACKGROUND	ALL OTHERS	TYPE B OR C SHEETING
LEGEND & BORDERS	WHITE	TYPE A SHEETING
LEGEND & BORDERS	BLACK	ACRYLIC NON-REFLECTIVE FILM
LEGEND & BORDERS	ALL OTHERS	TYPE B or C SHEETING



TYPICAL EXAMPLES

REQUIREMENTS FOR BLUE, BROWN & GREEN D AND I SERIES GUIDE SIGNS

SHEETING REQUIREMENTS		
USAGE	COLOR	SIGN FACE MATERIAL
BACKGROUND	ALL	TYPE B OR C SHEETING
LEGEND & BORDERS	WHITE	TYPE D SHEETING
LEGEND, SYMBOLS & BORDERS	ALL OTHERS	TYPE B OR C SHEETING



TYPICAL EXAMPLES

GENERAL NOTES

1. Signs to be furnished shall be as detailed elsewhere in the plans and/or as shown on sign tabulation sheet. Standard sign designs and arrow dimensions can be found in the "Standard Highway Sign Designs for Texas" (SHSD).

2. White legend shall use the Clearview Alphabet. The following Clearview fonts shall be used to replace the existing white Federal Highway Administration (FHWA) Standard Highway Alphabets, when not specified in the SHSD, or in the plans.

B	CV-1W
C	CV-2W
D	CV-3W
E	CV-4W
Emod	CV-5WR
F	CV-6W

3. Route sign legend (ie. IH, US, SH and FM shields) shall use the Federal Highway Administration (FHWA) Standard Highway Alphabets B, C, D, E, Emod or F).

4. Lateral spacing between letters and numerals shall conform with the SHSD, and any approved changes thereto. Lateral spacing of legend shall provide a balanced appearance when spacing is not shown.

5. Independent mounted route sign with white or colored legend and borders shall be applied by screening process with transparent color ink, transparent colored overlay film to white background sheeting or cut-out white sheeting to colored background sheeting, or combination thereof. White legend, symbols and borders on all other signs shall be cut-out white sheeting applied to colored background sheeting.

6. Information regarding borders and radii for signs is found in the "Standard Highway Sign Designs for Texas". Dimensions shown and described for borders and corner radii on parent sign are nominal. Borders may vary in width as much as 1/2 inch. Corner radii above 3 inches may vary in width as much as 1 inch. Borders and corner radii within a parent sign must be of matching widths. The sign area outside the corner radius should be trimmed or rounded.

7. Sign substrate shall be any material that meets the Departmental Material Specification requirements of DMS-7110 or approved alternative.

8. Mounting details of roadside signs are shown in the "SMD series" Standard Plan Sheets.

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

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/

Texas Department of Transportation

Traffic Operations Division Standard

TYPICAL SIGN REQUIREMENTS

TSR(3)-13

FILE: tsr3-13.dgn	DN: TxDOT	CK: TxDOT	DW: TxDOT	CK: TxDOT
©TxDOT October 2003	CONT	SECT	JOB	HIGHWAY
REVISIONS	0018	05	090	IH35 WFR
12-03 7-13	DIST	COUNTY		SHEET NO.
9-08	22	WEBB		114

DATE: 11/27/2023 3:16:38 PM
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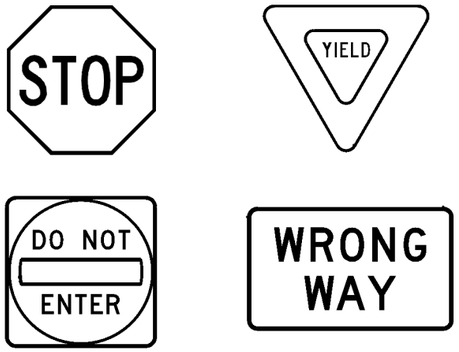
REQUIREMENTS FOR RED BACKGROUND REGULATORY SIGNS

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



REQUIREMENTS FOR FOUR SPECIFIC SIGNS ONLY

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

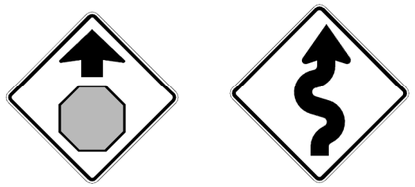
REQUIREMENTS FOR WHITE BACKGROUND REGULATORY SIGNS

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

TYPICAL EXAMPLES

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

REQUIREMENTS FOR WARNING SIGNS



TYPICAL EXAMPLES

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

REQUIREMENTS FOR SCHOOL SIGNS

TYPICAL EXAMPLES

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

GENERAL NOTES

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

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

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

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

http://www.txdot.gov/

Texas Department of Transportation

Traffic Operations Division Standard

TYPICAL SIGN REQUIREMENTS

TSR(4)-13

FILE: tsr4-13.dgn	DN: TxDOT	CK: TxDOT	DW: TxDOT	CK: TxDOT
©TxDOT October 2003	CONT	SECT	JOB	HIGHWAY
REVISIONS 12-03 7-13 9-08	0018	05	090	IH35 WFR
	DIST	COUNTY		SHEET NO.
	22	WEBB		115

DATE: 11/27/2023 3:16:55 PM
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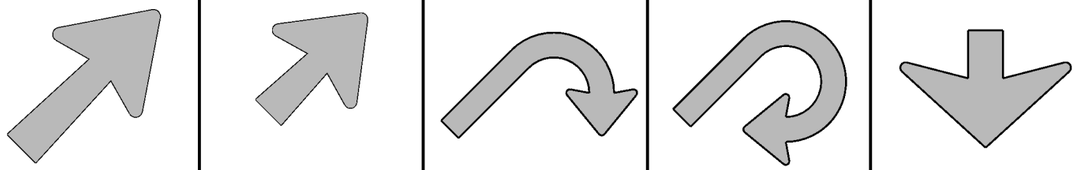
ARROW DETAILS

for Large Ground-Mounted and Overhead Guide Signs



TYPE	LETTER SIZE	USE
A-1	10.67" U/L and 10" Caps	Single Lane Exits
A-2	13.33" U/L and 12" Caps	
A-3	16" & 20" U/L	
B-1	10.67" U/L and 10" Caps	Multiple Lane Exits
B-2	13.33" U/L and 12" Caps	
B-3	16" & 20" U/L	

CODE	USED ON SIGN NO.
E-3	E5-1aT
E-4	E5-1bT

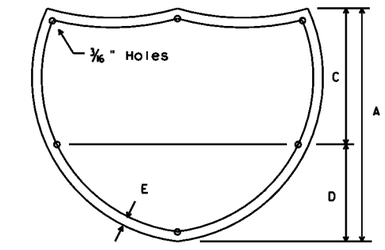
NOTE

Arrow dimensions are shown in the "Standard Highway Sign Designs for Texas" manual.

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

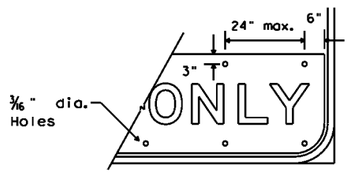
http://www.txdot.gov/

SIGN BLANK PUNCHING DETAILS FOR ATTACHMENTS WHEN SPECIFIED TO BE TYPE A ALUMINUM SIGNS (FOR MOUNTING TO GUIDE SIGN FACE)

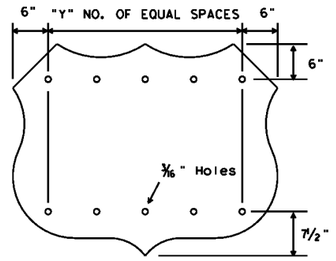


INTERSTATE ROUTE MARKERS

A	C	D	E
36	21	15	1 1/2
48	28	20	1 3/4

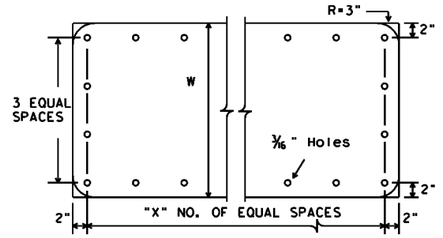


EXIT ONLY PANEL



U.S. ROUTE MARKERS

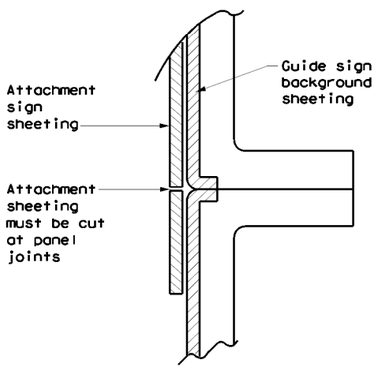
Sign Size	"Y"
24x24	2
30x24	3
36x36	3
45x36	4
48x48	4
60x48	5



STATE ROUTE MARKERS

No. of Digits	W	X
4	24	4
4	36	5
4	48	6
3	24	3
3	36	4
3	48	5

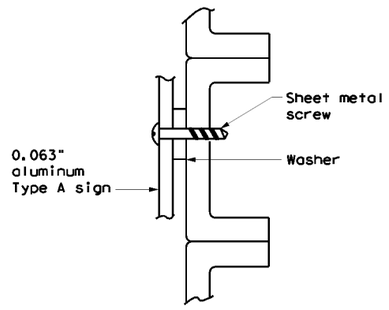
MOUNTING DETAILS OF ATTACHMENTS TO GUIDE SIGN FACE ("EXIT ONLY" AND "LEFT EXIT" PANELS, ROUTE MARKERS AND OTHER ATTACHMENTS)



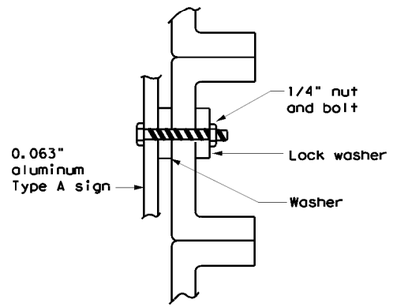
DIRECT APPLIED ATTACHMENT

NOTE:

1. Sheeting for legend, symbols, and borders must be cut at panel joints.
2. Direct applied attachment signs will be subsidiary to "Aluminum Signs" or "Fiberglass Signs".



SCREW ATTACHMENT



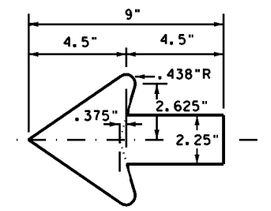
NUT/BOLT ATTACHMENT

NOTE:

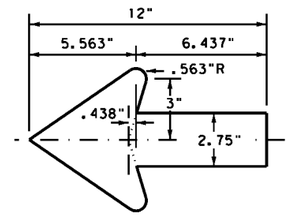
Furnish Type A aluminum sign attachments only when specified in the plans. These signs will be paid for under "Aluminum Signs".

ARROW DETAILS

for Destination Signs (Type D)



Standard arrow to be used with 6 inch letters.



Standard arrow to be used with 8 inch letters.

Texas Department of Transportation

Traffic Operations Division Standard

TYPICAL SIGN REQUIREMENTS

TSR(5)-13

FILE: tsr5-13.dgn	DN: TxDOT	CK: TxDOT	DW: TxDOT	CK: TxDOT
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12-03 7-13	DIST	COUNTY		SHEET NO.
9-08	22	WEBB		116

5

SIGN SUPPORT DESCRIPTIVE CODES

(Descriptive Codes correspond to project estimate and quantities sheets)

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

Post Type

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

Number of Posts (1 or 2)

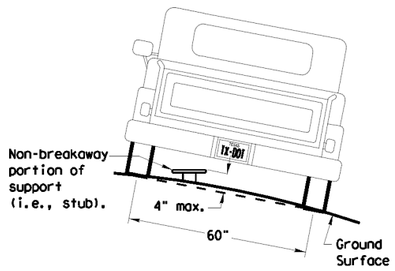
Anchor Type

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

Sign Mounting Designation

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

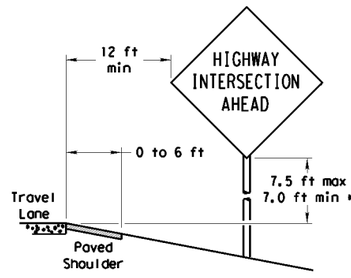
REQUIRED CLEARANCE FOR BREAKAWAY SUPPORT



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

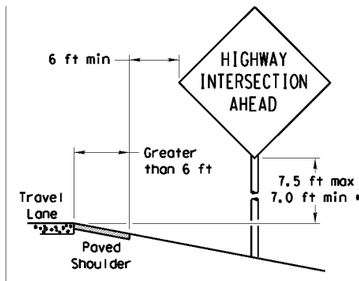
SIGN LOCATION

PAVED SHOULDERS



LESS THAN 6 FT. WIDE

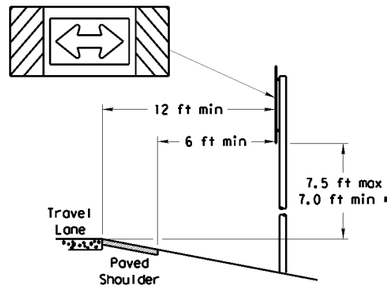
When the shoulder is 6 ft. or less in width, the sign must be placed at least 12 ft. from the edge of the travel lane.



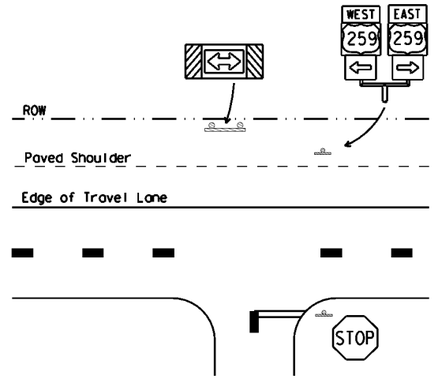
GREATER THAN 6 FT. WIDE

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

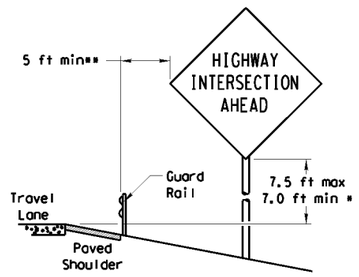
T-INTERSECTION



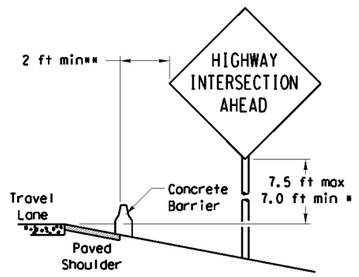
When this sign is needed at the end of a two-lane, two way roadway, the right edge of the sign should be in line with the centerline of the roadway. Place as close to ROW as practical.



BEHIND BARRIER



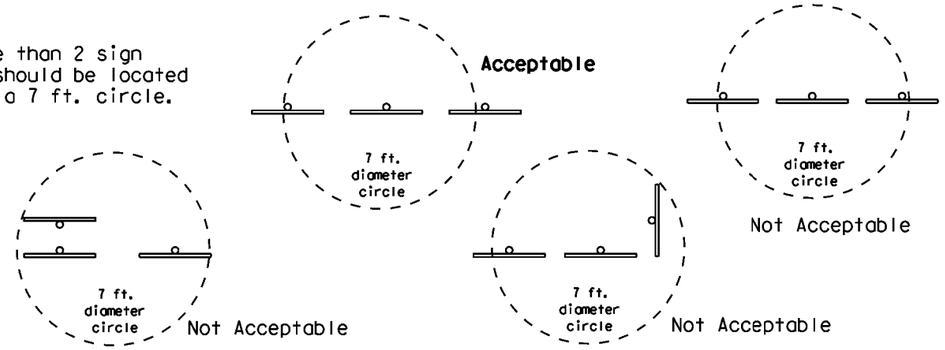
BEHIND GUARDRAIL



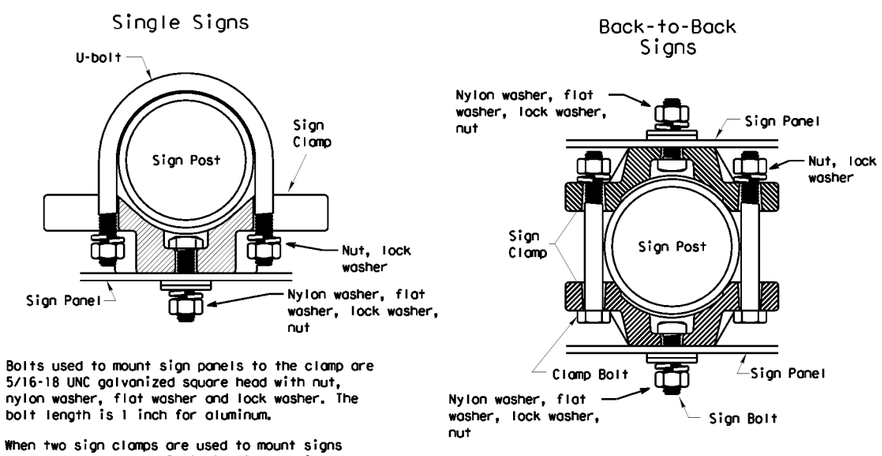
BEHIND CONCRETE BARRIER

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

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



TYPICAL SIGN ATTACHMENT DETAIL



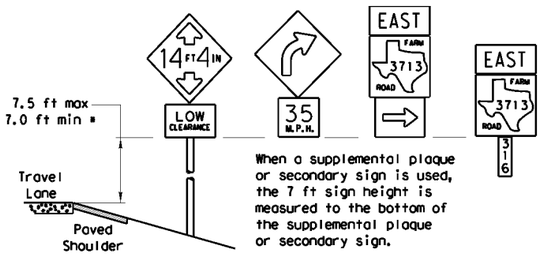
Bolts used to mount sign panels to the clamp are 5/16-18 UNC galvanized square head with nut, nylon washer, flat washer and lock washer. The bolt length is 1 inch for aluminum.

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

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

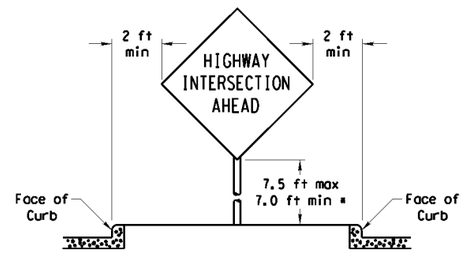
Pipe Diameter	Approximate Bolt Length	
	Specific Clamp	Universal Clamp
2" nominal	3"	3 or 3 1/2"
2 1/2" nominal	3 or 3 1/2"	3 1/2 or 4"
3" nominal	3 1/2 or 4"	4 1/2"

SIGNS WITH PLAQUES



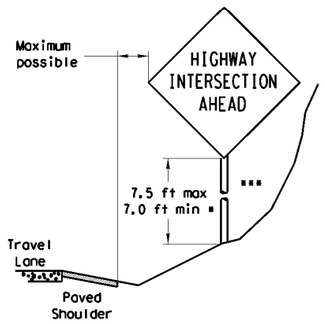
When a supplemental plaque or secondary sign is used, the 7 ft sign height is measured to the bottom of the supplemental plaque or secondary sign.

CURB & GUTTER OR RAISED ISLAND



RESTRICTED RIGHT-OF-WAY

(When 6 ft min. is not possible.)



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

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

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

* Signs shall be mounted using the following condition that results in the greatest sign elevation:

(1) a minimum of 7 to a maximum of 7.5 feet above the edge of the travel lane or

(2) a minimum of 7 to a maximum of 7.5 feet above the grade at the base of the support when sign is installed on the backslope.

The maximum values may be increased when directed by the Engineer.

See the Traffic Operations Division website for detailed drawings of sign clamps, Triangular Slipbase System components and Wedge Anchor System components.

The website address is:
http://www.txdot.gov/publications/traffic.htm

Texas Department of Transportation
Traffic Operations Division

SIGN MOUNTING DETAILS SMALL ROADSIDE SIGNS GENERAL NOTES & DETAILS

SMD(GEN)-08

DN: TXDOT	CK: TXDOT	DW: TXDOT	CK: TXDOT

REVISIONS	CONT	SECT	JOB	HIGHWAY
9-08	0018	05	090	IH35 WFR
	DIST	COUNTY		SHEET NO.
	22	WEBB		117

DATE: 11/27/2023 3:17:14 PM
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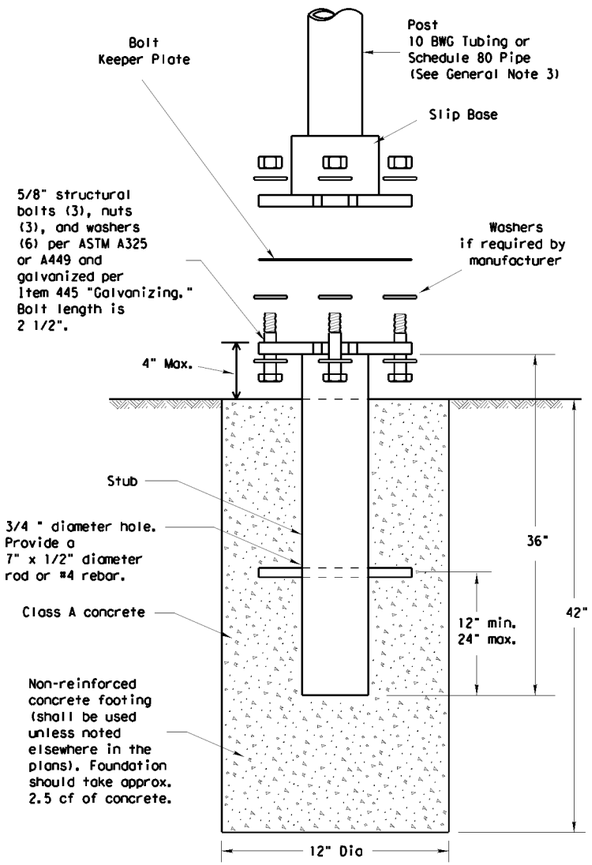
TRIANGULAR SLIPBASE INSTALLATION GENERAL REQUIREMENTS



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

NOTE

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

GENERAL NOTES:

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.

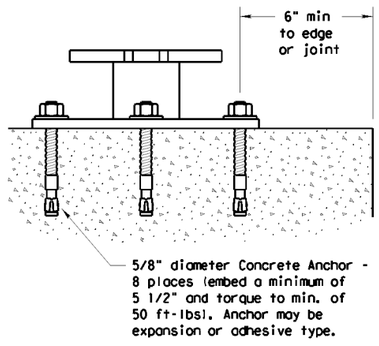
   Schedule 80 Pipe (2.875" outside diameter)
   - 0.276" nominal wall thickness
   - Steel tubing per ASTM A500 Gr C
   - Other seamless or electric-resistance welded steel tubing or pipe with equivalent outside diameter and wall thickness may be used if they meet the following:
     - 46,000 PSI minimum 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	CONT	SECT	JOB	HIGHWAY
9-08	0018	05	090	IH35 WFR
	DIST	COUNTY		SHEET NO.
	22	WEBB		118

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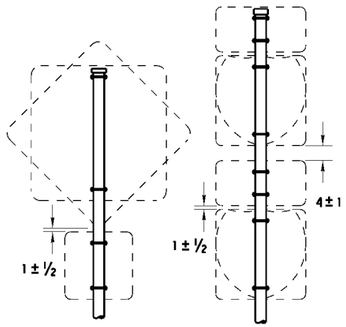
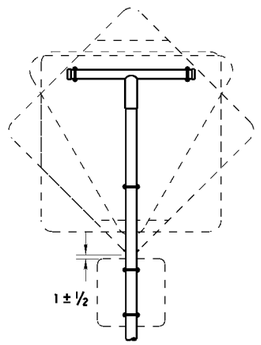
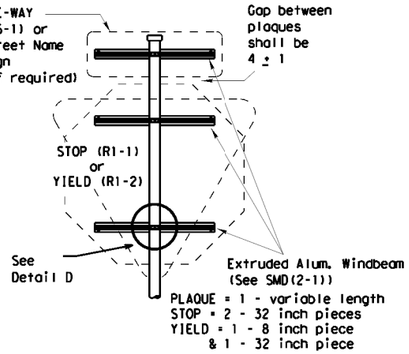


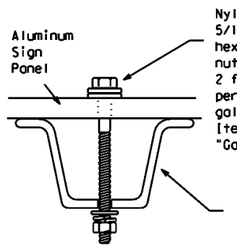
SM RD SGN ASSM TY XXXXX(1)XX(P)



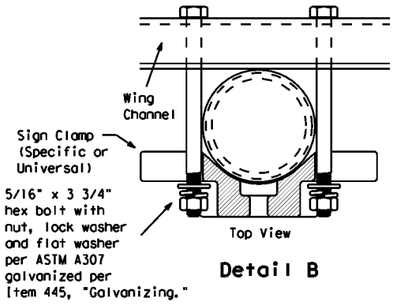
SM RD SGN ASSM TY XXXXX(1)XX(T)



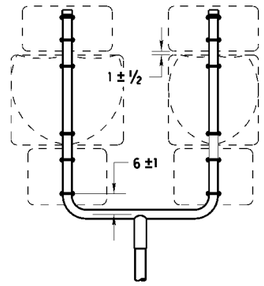
SM RD SGN ASSM TY XXXXX(1)XX(P-BM)



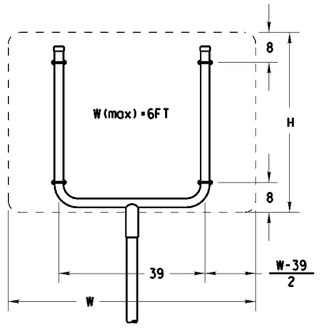
Detail A



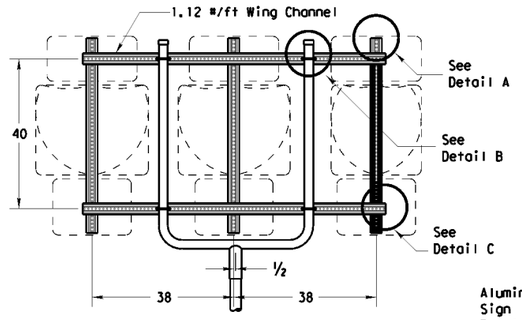
Detail B



SM RD SGN ASSM TY XXXXX(1)XX(U)



SM RD SGN ASSM TY XXXXX(1)XX(U)



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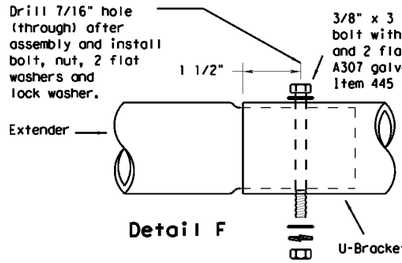
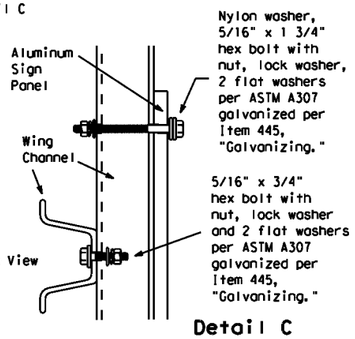
(See Note 11)

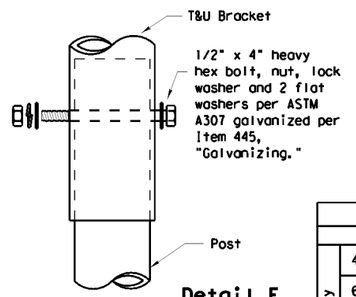


Detail F

Splices shall only be allowed behind the sign substrate.



Detail C



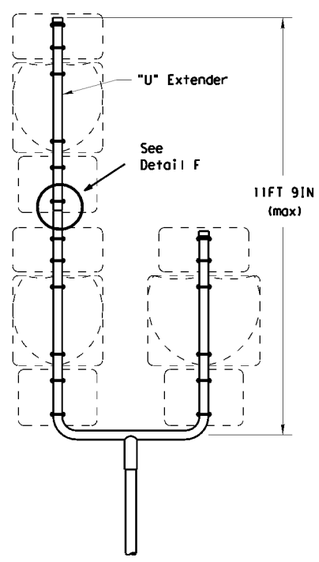
Detail E

GENERAL NOTES:

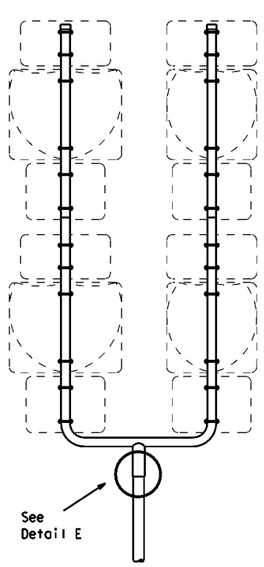
1.

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.



SM RD SGN ASSM TY S80(1)XX(U-1EXT)



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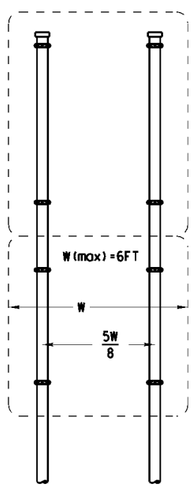
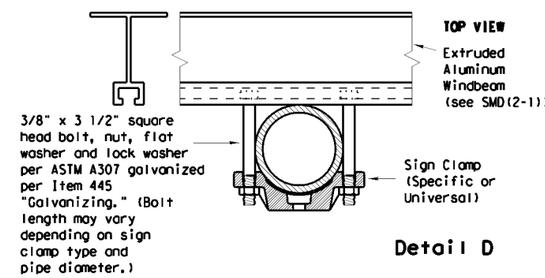
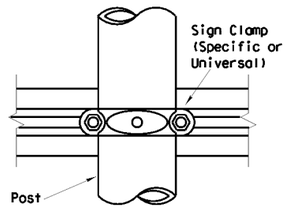


SM RD SGN ASSYM TY XXXXX(2)XX(P)

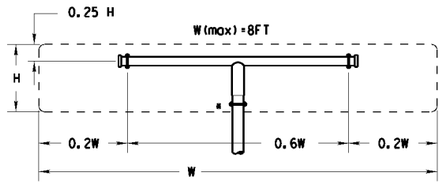
SIDE VIEW



Detail D



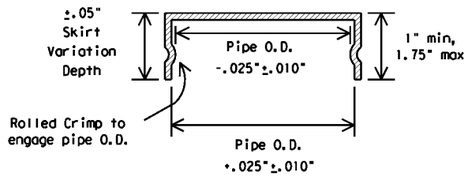
REQUIRED SUPPORT		
	SIGN DESCRIPTION	SUPPORT
Regulatory	48-inch STOP sign (R1-1)	TY 10BWG(1)XX(T) TY 10BWG(1)XX(P-BM)
	60-inch YIELD sign (R1-2)	TY 10BWG(1)XX(T) TY 10BWG(1)XX(P-BM)
	48x16-inch ONE-WAY sign (R6-1)	TY 10BWG(1)XX(T) TY 10BWG(1)XX(P-BM)
	36x48, 48x36, and 48x48-inch signs	TY 10BWG(1)XX(T)
	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)



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.

Texas Department of Transportation
Traffic Operations Division

SIGN MOUNTING DETAILS SMALL ROADSIDE SIGNS TRIANGULAR SLIPBASE SYSTEM

SMD(SLIP-2)-08

DN: TxDOT	CK: TxDOT	DW: TxDOT	CK: TxDOT
CONT	SECT	JOB	HIGHWAY
001805		090	IH35 WFR
DIST	COUNTY		SHEET NO.
22	WEBB		119

9-08 REVISIONS

DATE: 11/27/2023 3:17:51 PM
FILE: c:\txdot\pw_online\txdot5\krystal.hernandez\d1044194\smds2.dgn

DATE: 11/27/2023 3:18:09 PM
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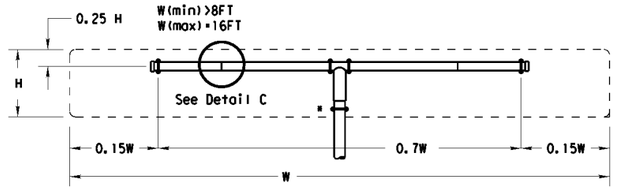
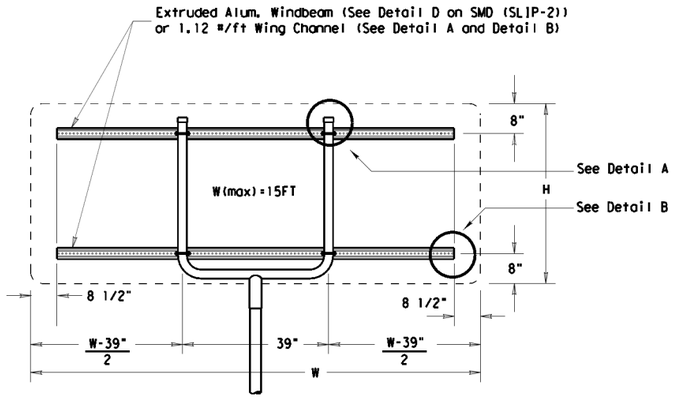
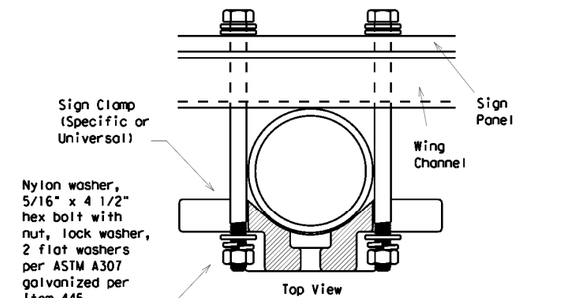


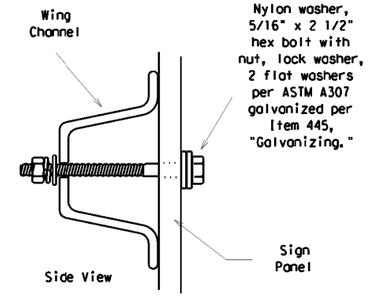
SM RD SGN ASSM TY XXXXX(1)XX(T-2EXT)
(* - See Note 12)



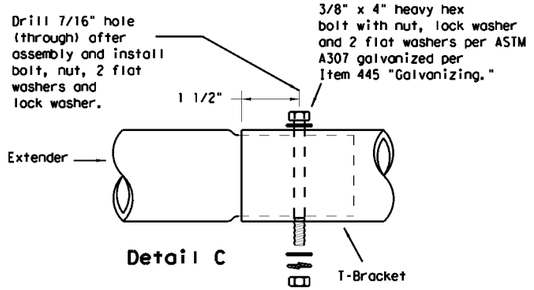
SM RD SGN ASSM TY XXXXX(1)XX(U-XX)



Detail A

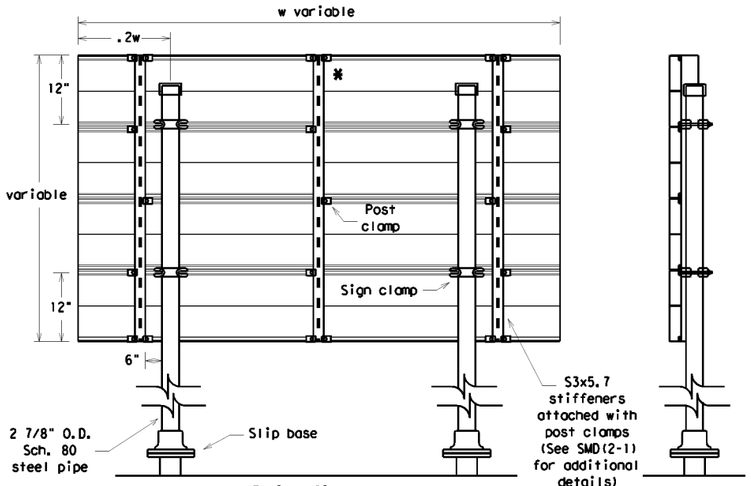


Detail B



Detail C

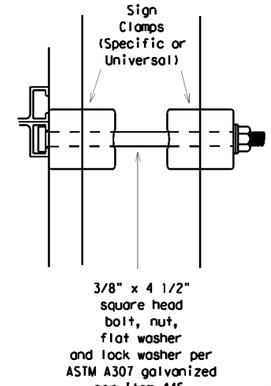
Splices shall only be allowed behind the sign substrate.



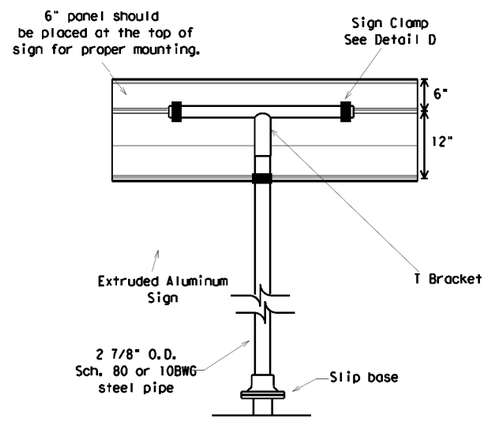
Typical Sign Mount

SM RD SGN ASSM TY S80(2)XX(P-EXAL)

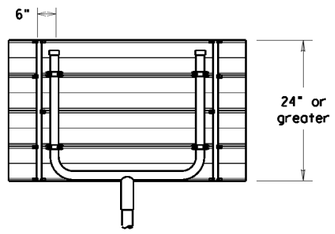
* Additional stiffener placed at approximate center of signs when sign width is greater than 10'.



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

Detail D
EXTRUDED ALUMINUM SIGN WITH T BRACKET

GENERAL NOTES:

SIGN SUPPORT	# OF POSTS	MAX. SIGN AREA
10 BWG	1	16 SF
10 BWG	2	32 SF
Sch 80	1	32 SF
Sch 80	2	64 SF

1. 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.
2. Sign supports shall not be spliced except where shown. Sign support posts shall not be spliced.
3. 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.
4. Signs that require specific supports due to reasons in addition to windloading are indicated on the "REQUIRED SUPPORT" table on this sheet.
5. 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.
6. 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.
7. Wing channel shall meet ASTM A 1011 SS Gr 50 and be galvanized per ASTM A 123.
8. 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."
9. Sign blanks shall be the sizes and shapes shown on the plans.
10. 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.
11. 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)
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	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
0018	50	090	IH35 WFR
DIST	COUNTY		SHEET NO.
22	WEBB		120

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. City of Laredo

2.

☐ No Action Required ☒ Required Action

Action No.

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

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

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

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

☒ No Permit Required
☐ Nationwide Permit 14 - PCN not Required (less than 1/10th acre waters or wetlands affected)
☐ Nationwide Permit 14 - PCN Required (1/10 to <1/2 acre, 1/3 in tidal waters)
☐ Individual 404 Permit Required
☐ Other Nationwide Permit Required: NWP# _____

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

1.
2.
3.
4.
5.
6.
7.

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

Best Management Practices:

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

III. CULTURAL RESOURCES

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

☒ No Action Required ☐ Required Action

Action No.

1.

2.

IV. VEGETATION RESOURCES

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

☒ No Action Required ☐ Required Action

Action No.

1.

2.

3.

4.

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

☒ No Action Required ☐ Required Action

Action No.

1. Texas Horned Lizard - The Contractor will avoid harvester ant mound in the selection of PSLs where feasible
2. Texas Tortoise -The Contractor should cover utility trenches overnight, and should visually inspect all trenches before filling.
3. Reticulated Collared Lizard - This lizard may potentially occur in the project area. The Contractor shall avoid harming or handeling this species.
4. Texas Indigo Snake - This snake may potentially occur in the project area. The Contractor shall avoid harming or handeling this species.

If any of the listed species are observed, cease work in the immediate area, do not disturb species or habitat and contact the Engineer immediately. The work may not remove active nests from bridges and other structures during nesting season of the birds associated with the nests. If caves or sinkholes are discovered, cease work in the immediate area, and contact the Engineer immediately.

LIST OF ABBREVIATIONS

BMP:	Best Management Practice	SPCC:	Spill Prevention Control and Countermeasure
CGP:	Construction General Permit	SW3P:	Storm Water Pollution Prevention Plan
DSHS:	Texas Department of State Health Services	PCN:	Pre-Construction Notification
FHWA:	Federal Highway Administration	PSL:	Project Specific Location
MOA:	Memorandum of Agreement	TCEQ:	Texas Commission on Environmental Quality
MOU:	Memorandum of Understanding	TPDES:	Texas Pollutant Discharge Elimination System
MS4:	Municipal Separate Stormwater Sewer System	TPWD:	Texas Parks and Wildlife Department
MBTA:	Migratory Bird Treaty Act	TxDOT:	Texas Department of Transportation
NOT:	Notice of Termination	T&E:	Threatened and Endangered Species
NWP:	Nationwide Permit	USACE:	U.S. Army Corps of Engineers
NOI:	Notice of Intent	USFWS:	U.S. Fish and Wildlife Service

VI. HAZARDOUS MATERIALS OR CONTAMINATION ISSUES

General (applies to all projects):

Comply with the Hazard Communication Act (the Act) for personnel who will be working with hazardous materials by conducting safety meetings prior to beginning construction and making workers aware of potential hazards in the workplace. Ensure that all workers are provided with personal protective equipment appropriate for any hazardous materials used.

Obtain and keep on-site Material Safety Data Sheets (MSDS) for all hazardous products used on the project, which may include, but are not limited to the following categories: Paints, acids, solvents, asphalt products, chemical additives, fuels and concrete curing compounds or additives. Provide protected storage, off bare ground and covered, for products which may be hazardous. Maintain product labelling as required by the Act.

Maintain an adequate supply of on-site spill response materials, as indicated in the MSDS. In the event of a spill, take actions to mitigate the spill as indicated in the MSDS, in accordance with safe work practices, and contact the District Spill Coordinator immediately. The Contractor shall be responsible for the proper containment and cleanup of all product spills.

Contact the Engineer if any of the following are detected:

- Dead or distressed vegetation (not identified as normal)
- Trash piles, drums, canister, barrels, etc.
- Undesirable smells or odors
- Evidence of leaching or seepage of substances

Does the project involve any bridge class structure rehabilitation or replacements (bridge class structures not including box culverts)?

☐ Yes ☒ No

If "No", then no further action is required.
If "Yes", then TxDOT is responsible for completing asbestos assessment/inspection.

Are the results of the asbestos inspection positive (is asbestos present)?

☐ Yes ☒ No

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

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

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

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

☒ No Action Required ☐ Required Action

Action No.

1.

2.

3.

VII. OTHER ENVIRONMENTAL ISSUES

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

☒ No Action Required ☐ Required Action

Action No.

1.

2.

3.

Texas Department of Transportation

Design Division Standard

ENVIRONMENTAL PERMITS, ISSUES AND COMMITMENTS

EPIC

FILE: epic.dgn	DN: TxDOT	CK: RG	DW: VP	CK: AR		
©TxDOT: February 2015	CONT	SECT	JOB		HIGHWAY	
REVISIONS 12-12-2011 (DS) 05-07-14 ADDED NOTE SECTION IV. 01-23-2015 SECTION I (CHANGED ITEM 1122 TO ITEM 506, ADDED GRASSY SWALES.	0018	05	090		IH-35	
	DIST	COUNTY			SHEET NO.	
	LAREDO	WEBB			121	

STORMWATER POLLUTION PREVENTION PLAN (SWP3):

This SWP3 has been developed in accordance with the TPDES Construction General Permit TXR150000 (CGP). The Texas Department of Transportation (TxDOT) ensures that project specifications include adequate best management practices (BMPs) for this project.

This SWP3 is consistent with requirements specified in applicable stormwater plans and the projects environmental permits, issues, and commitments (EPICs). A copy of the CGP is included in Attachment 2.12 of the SWP3 binder.

1.0 SITE/PROJECT DESCRIPTION

1.1 PROJECT CONTROL SECTION JOB (CSJ):

CSJ: 0018-05-090

1.2 PROJECT LIMITS:

From: 0.09 MI N OF UNIROYAL DRIVE (WFR)

To: 0.40 MI S OF HWY US 83 (WFR)

1.3 PROJECT COORDINATES:

BEGIN: (Lat) 27.6864151 ,(Long) -99.4621048

END: (Lat) 27.7525357 ,(Long) -99.4397949

1.4 TOTAL PROJECT AREA (Acres): 6.30

1.5 TOTAL AREA TO BE DISTURBED (Acres): 6.30

1.6 NATURE OF CONSTRUCTION ACTIVITY:

FOR THE CONSTRUCTION OF THE REHABILITATION OF EXISTING ROADWAY TREAT EXIST SUBGRADE, TREAT FLEXBASE, HMA SUPERPAVE TYC, MBGF, & PAVEMENT MARKINGS WITH 2" HMA OVERLAY

1.7 MAJOR SOIL TYPES:

Soil Type	Description
HIGH PLASTICITY CLAY	HOLDS MORE WATER THAN SANDY 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:

- [X] 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 2.5.)

- [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
- [X] 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
- [X] 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:

- [X] Sediment laden stormwater from stormwater conveyance over disturbed area
- [X] Fuels, oils, and lubricants from construction vehicles, equipment, and storage
- [X] Solvents, paints, adhesives, etc. from various construction activities
- [X] Transported soils from offsite vehicle tracking
- [X] Construction debris and waste from various construction activities
- [X] Contaminated water from excavation or dewatering pump-out water
- [X] Sanitary waste from onsite restroom facilities
- [X] Trash from various construction activities/receptacles
- [X] Long-term stockpiles of material and waste
- [X]
- [ ] 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] Submit Notice of Intent (NOI) to TCEQ (≥5 acres)
- [X] Post Construction Site Notice
- [X] Submit NOI/CSN to local MS4
- [X] Perform SWP3 inspections
- [X] Maintain SWP3 records and update to reflect daily operations
- [X] Complete and submit Notice of Termination to TCEQ
- [X] Maintain SWP3 records for 3 years
- [ ] Other: _____
- [ ] Other: _____
- [ ] Other: _____

1.13 ROLES AND RESPONSIBILITIES: CONTRACTOR

- [X] Day To Day Operational Control
- [X] Submit Notice of Intent (NOI) to TCEQ (≥5 acres)
- [X] Post Construction Site Notice
- [X] Submit NOI/CSN to local MS4
- [X] Maintain schedule of major construction activities
- [X] Install, maintain and modify BMPs
- [X] Complete and submit Notice of Termination to TCEQ
- [X] Maintain SWP3 records for 3 years
- [ ] Other: _____
- [ ] Other: _____
- [ ] Other: _____

1.14 LOCAL MUNICIPAL SEPARATE STORM SEWER SYSTEM (MS4) OPERATOR COORDINATION:

MS4 Entity

STORMWATER POLLUTION PREVENTION PLAN (SWP3)

Texas Department of Transportation

FED. RD. DIV. NO.	PROJECT NO.		SHEET NO.
6	C18-5-90		122
STATE	STATE DIST.	COUNTY	
TEXAS	22	WEBB	
CONT.	SECT.	JOB	HIGHWAY NO.
0018	05	090	IH35 WFR

STORMWATER POLLUTION PREVENTION PLAN (SWP3):

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

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

2.1 EROSION CONTROL AND SOIL STABILIZATION BMPs:

T / P

- X X Protection of Existing Vegetation
- ☐ ☐ Vegetated Buffer Zones
- ☐ ☐ Soil Retention Blankets
- ☐ ☐ Geotextiles
- ☐ ☐ Mulching/ Hydromulching
- ☐ ☐ Soil Surface Treatments
- ☐ ☐ Temporary Seeding
- X X 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
- X X 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
- 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

Sediment control BMPs requiring design capacity calculations (See SWP3 Attachment 1.3.):

T / P

- ☐ ☐ Sediment Trap
  - ☐ Calculated volume runoff from 2-year, 24-hour storm for each acre of disturbed area
  - ☐ 3,600 cubic feet of storage per acre drained
- ☐ ☐ Sedimentation Basin
  - ☐ Not required (<10 acres disturbed)
  - ☐ Required (>10 acres) and implemented.
    - ☐ Calculated volume runoff from 2-year, 24-hour storm for each acre of disturbed area
    - ☐ 3,600 cubic feet of storage per acre drained
  - ☐ Required (>10 acres), but not feasible due to:
    - ☐ Available area/Site geometry
    - ☐ Site slope/Drainage patterns
    - ☐ Site soils/Geotechnical factors
    - ☐ Public safety
    - ☐ Other: _____

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
- ☐ Loaded haul trucks to be covered with tarpaulin
- X Stabilized construction exit
- ☐ Daily street sweeping
- ☐ Other: _____
- ☐ Other: _____
- ☐ Other: _____
- ☐ Other: _____

2.5 POLLUTION PREVENTION MEASURES:

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

2.9 INSPECTIONS:

2.10 MAINTENANCE:

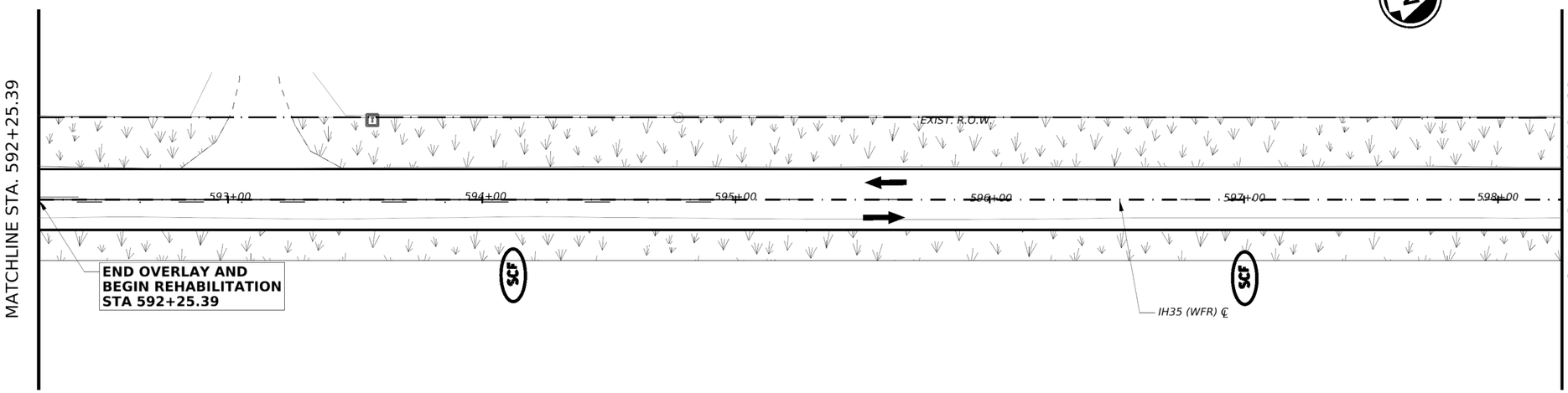
Control measures shall be properly installed according to specifications. If it is determined that a BMP or control measure is not operating effectively, maintenance must be accomplished as soon as possible and before the next anticipated rain event, but in no case later than 7 calendar days after being 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 2.5 of this SWP3.

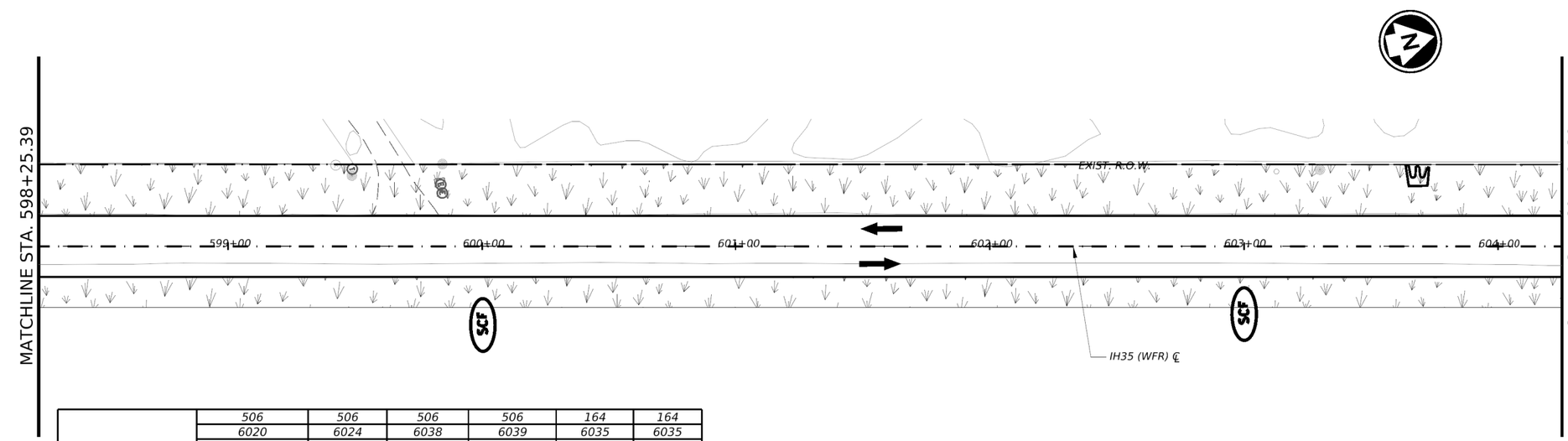
STORMWATER POLLUTION PREVENTION PLAN (SWP3)

Sheet 2 of 2

Texas Department of Transportation

FED. RD. DIV. NO.	PROJECT NO.		SHEET NO.
6	C18-5-90		123
STATE	STATE DIST.	COUNTY	
TEXAS	22	WEBB	
CONT.	SECT.	JOB	HIGHWAY NO.
0018	05	090	IH35 WFR





LOCATION	506 6020 CONSTRUCTION EXIST (INSTALL TY 1) SY	506 6024 CONSTRUCTION EXITS (REMOVE) SY	506 6038 TEMP SEDMT CONT FENCE (INSTALL) LF	506 6039 TEMP SEDMT CONT FENCE (REMOVE) LF	164 6035 DRILL SEEDING (PERM) (RURAL) (CLAY) SY	164 6035 DRILL SEEDING (PERM) (WARM OR COOL) SY
592+25.39 to 604+25.39			80	80	3200	3200

LEGEND

SCF — SEDIMENT CONTROL FENCE (TYPICAL 20' SPACED @300')

DRAINAGE FLOW

SEEDING

NOTES:

ALL SW3P MEASURES ARE TO BE PLACED WITHIN TXDOT RIGHT OF WAY AND AS SHOWN IN STANDARDS EC(1) - EC(3).

SILT FENCE ONCE INSTALLED, SHALL REMAIN IN PLACE THROUGHOUT ALL REMAINING PHASES OF CONSTRUCTION, OR AS DIRECTED.

THE CONSTRUCTION EXIT AGGREGATE MATERIAL WILL REMAIN THE PROPERTY OF THE STATE UPON COMPLETION OF THE PROPOSED CONSTRUCTION. THESE MATERIALS WILL BE PLACED AT AREAS WITHIN THE ENGINEER UPON REMOVAL. ALL EQUIPMENT, LABOR, AND INCIDENTALS REQUIRED FOR THE RELOCATION OF THESE MATERIALS WILL NOT BE PAID FOR BUT WILL BE SUBSIDIARY TO ITEM 506 REMOVAL ITEMS.

L = LENGTH OF BRIDGE

STATE OF TEXAS
LUIS C. URBINA
117019
LICENSED
PROFESSIONAL ENGINEER

DocuSigned by:
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11/27/2023

SCALE 1" = 50'

Texas Department of Transportation

IH35 WFR

SW3P LAYOUTS

SHEET 1 OF 9

CONT	SECT	JOB	HIGHWAY
0018	05	090	IH35 WFR
DIST	COUNTY		SHEET NO.
22	WEBB		124

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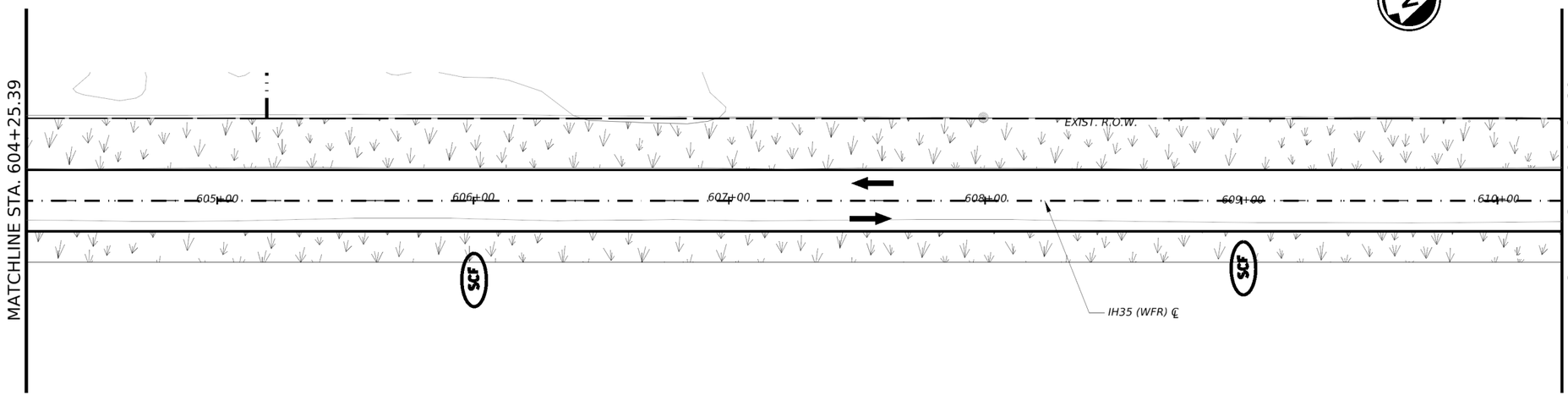


LEGEND

- SCF — *SEDIMENT CONTROL FENCE (TYPICAL 20' SPACED @300')*
- *DRAINAGE FLOW*
- *SEEDING*

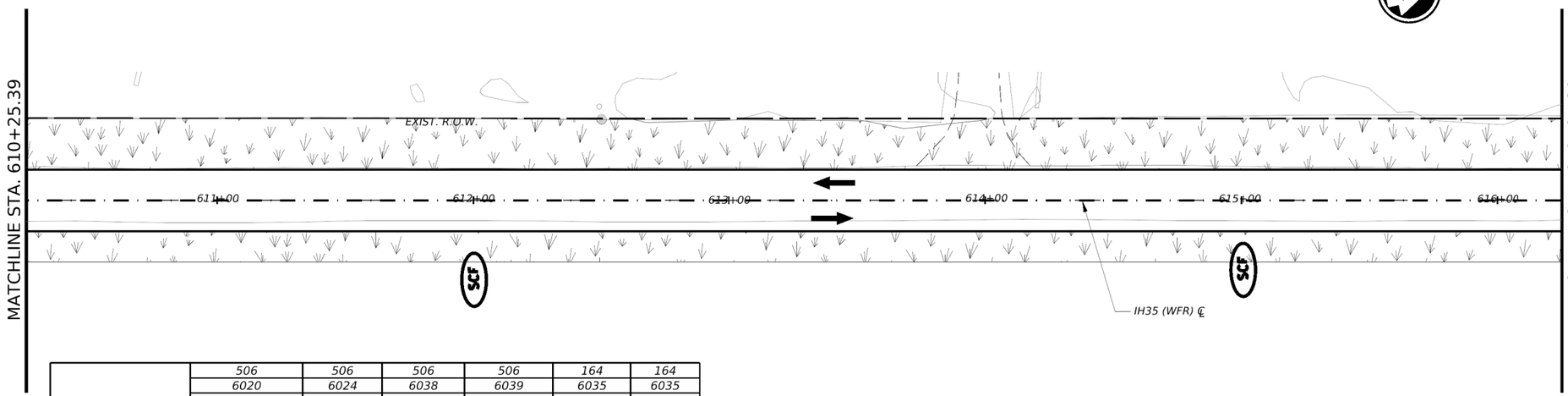
NOTES:

ALL SW3P MEASURES ARE TO BE PLACED WITHIN TXDOT RIGHT OF WAY AND AS SHOWN IN STANDARDS EC(1) - EC(3).

SILT FENCE AND ROCK FILTER DAMS, ONCE INSTALLED, SHALL REMAIN IN PLACE THROUGHOUT ALL REMAINING PHASES OF CONSTRUCTION, OR AS DIRECTED.

THE ROCK BERM AND CONSTRUCTION EXIT AGGREGATE MATERIAL WILL REMAIN THE PROPERTY OF THE STATE UPON COMPLETION OF THE PROPOSED CONSTRUCTION. THESE MATERIALS WILL BE PLACED AT AREAS WITHIN THE ENGINEER UPON REMOVAL. ALL EQUIPMENT, LABOR, AND INCIDENTALS REQUIRED FOR THE RELOCATION OF THESE MATERIALS WILL NOT BE PAID FOR BUT WILL BE SUBSIDIARY TO ITEM 506 REMOVAL ITEMS.

L = LENGTH OF BRIDGE



LOCATION	506	506	506	506	164	164
	6020	6024	6038	6039	6035	6035
	CONSTRUCTION EXIST (INSTALL TY 1)	CONSTRUCTION EXITS (REMOVE)	TEMP SEDMT CONT FENCE (INSTALL)	TEMP SEDMT CONT FENCE (REMOVE)	DRILL SEEDING (PERM) (RURAL) (CLAY)	DRILL SEEDING (PERM) (WARM OR COOL)
	SY	SY	LF	LF	SY	SY
604+25.39 to 616+25.39			80	80	3200	3200

STATE OF TEXAS
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SCALE 1" = 50'

Texas Department of Transportation

IH 35 WFR

SW3P LAYOUTS

SHEET 2 OF 9

CONT	SECT	JOB	HIGHWAY
0018	05	090	IH35 WFR
DIST	COUNTY		SHEET NO.
22	WEBB		125

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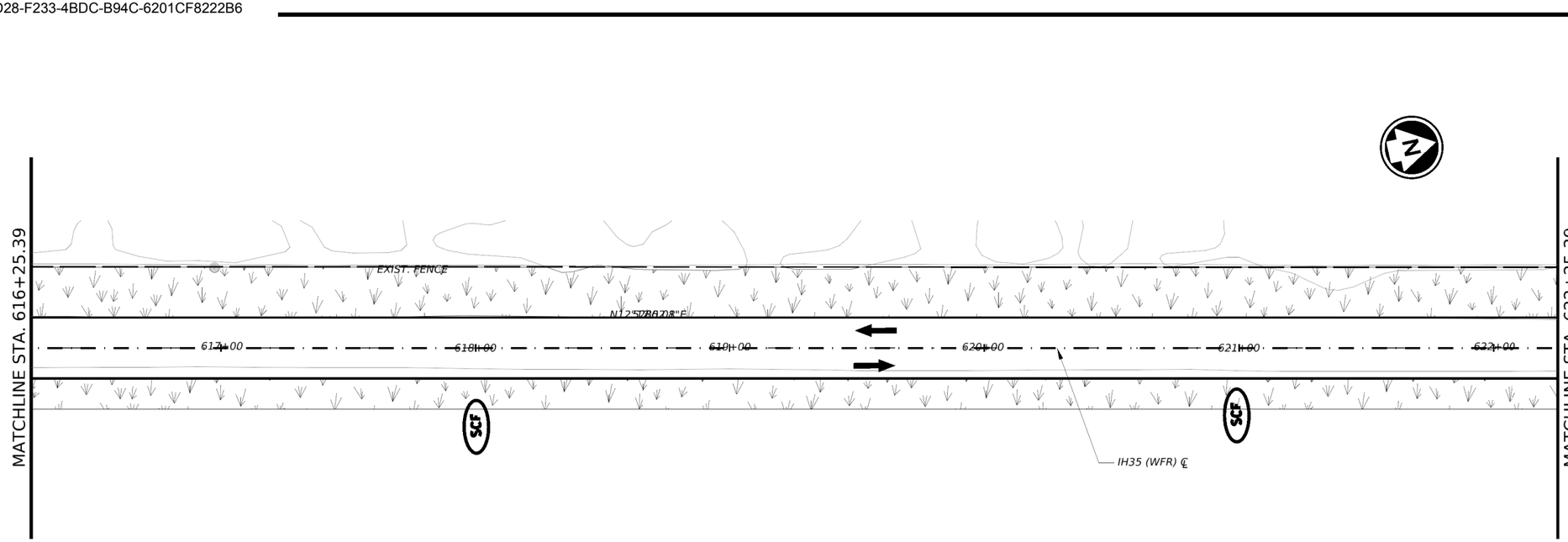

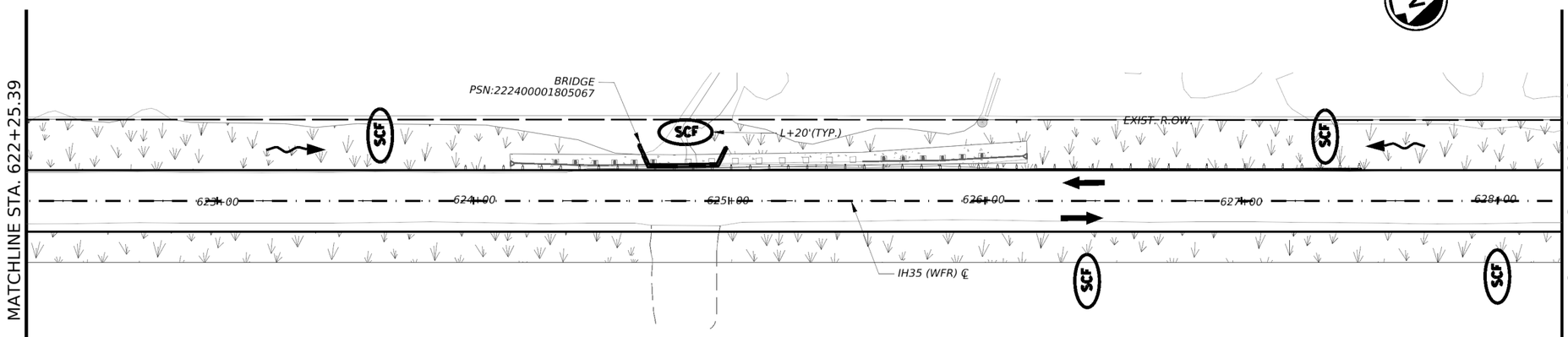

LOCATION	506	506	506	506	164	164
	6020	6024	6038	6039	6035	6035
	CONSTRUCTION EXIST (INSTALL TY 1)	CONSTRUCTION EXITS (REMOVE)	TEMP SEDMT CONT FENCE (INSTALL)	TEMP SEDMT CONT FENCE (REMOVE)	DRILL SEEDING (PERM) (RURAL) (CLAY)	DRILL SEEDING (PERM) (WARM OR COOL)
	SY	SY	LF	LF	SY	SY
616+25.39 to 628+25.39	50	50	167	167	3200	3200

LEGEND

- SCF — SEDIMENT CONTROL FENCE (TYPICAL 20' SPACED @300')
- DRAINAGE FLOW
- SEEDING

NOTES:

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L = LENGTH OF BRIDGE

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LUIS C. URBINA
117019
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SCALE 1" = 50'

Texas Department of Transportation

IH 35 WFR

SW3P LAYOUTS

CONT	SECT	JOB	HIGHWAY
0018	05	090	IH35 WFR
DIST	COUNTY		SHEET NO.
22	WEBB		126

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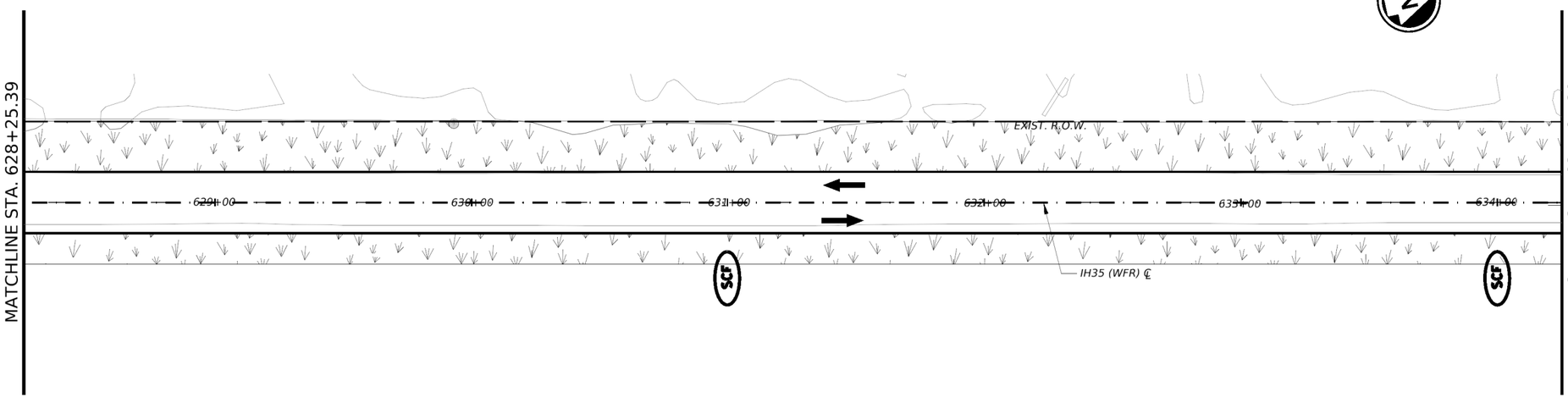

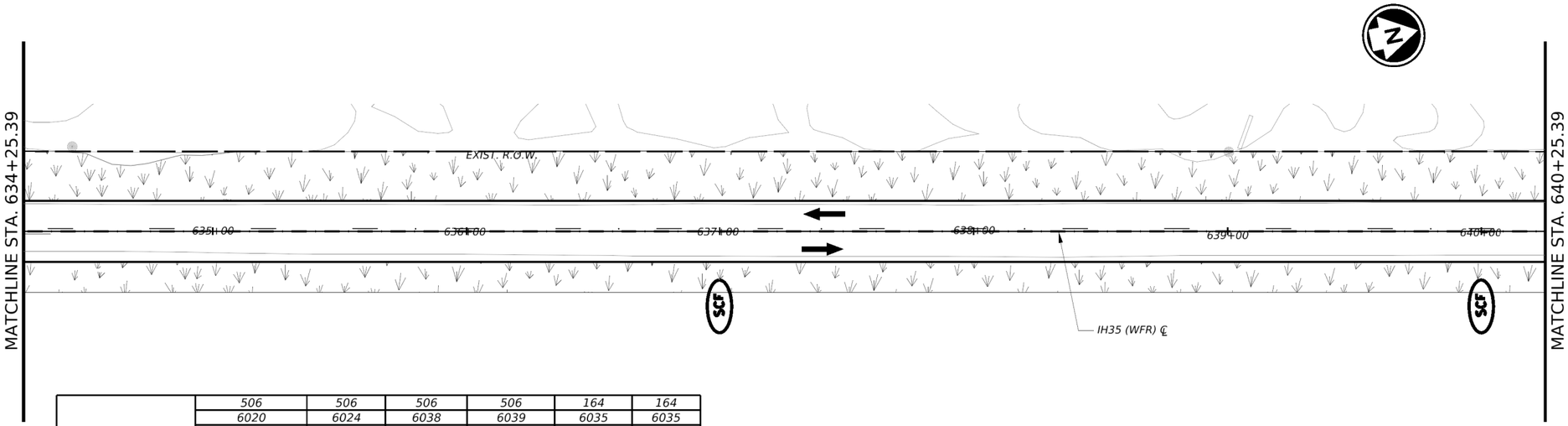

LEGEND

- SCF — *SEDIMENT CONTROL FENCE (TYPICAL 20' SPACED @300')*
- *DRAINAGE FLOW*
- *SEEDING*

NOTES:

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L = LENGTH OF BRIDGE

LOCATION	506	506	506	506	164	164
	6020	6024	6038	6039	6035	6035
	CONSTRUCTION EXIST (INSTALL TY 1)	CONSTRUCTION EXITS (REMOVE)	TEMP SEDMT CONT FENCE (INSTALL)	TEMP SEDMT CONT FENCE (REMOVE)	DRILL SEEDING (PERM) (RURAL) (CLAY)	DRILL SEEDING (PERM) (WARM OR COOL)
	SY	SY	LF	LF	SY	SY
628+25.39 to 640+25.39			80	80	3200	3200

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11/27/2023

SCALE 1" = 50'

Texas Department of Transportation

IH 35 WFR

SW3P LAYOUTS

SHEET 4 OF 9

CONT	SECT	JOB	HIGHWAY
0018	05	090	IH35 WFR
DIST	COUNTY		SHEET NO.
22	WEBB		127

DATE: 11/27/2023 12:10:42 PM
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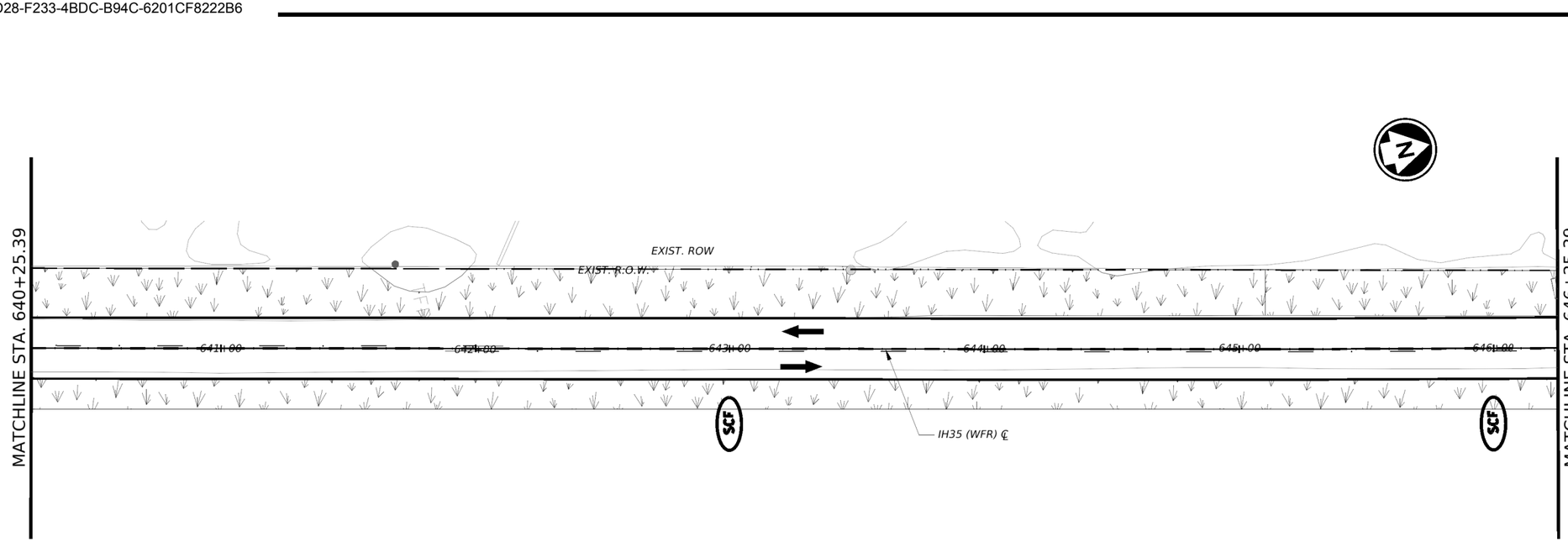

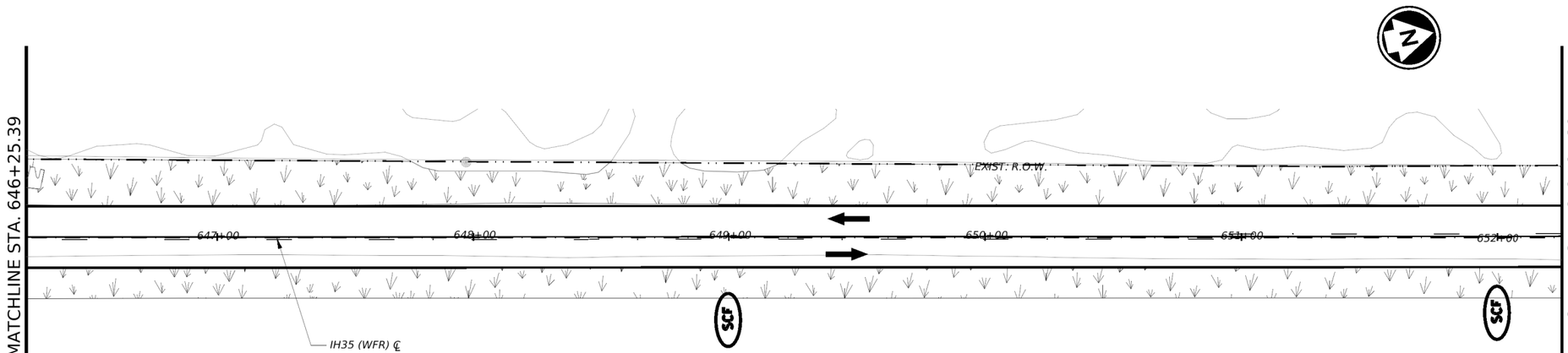

LEGEND

- SCF — SEDIMENT CONTROL FENCE (TYPICAL 20' SPACED @300')
- DRAINAGE FLOW
- SEEDING

NOTES:

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L = LENGTH OF BRIDGE

LOCATION	506 6020 CONSTRUCTION EXIST (INSTALL TY 1) SY	506 6024 CONSTRUCTION EXITS (REMOVE) SY	506 6038 TEMP SEDMT CONT FENCE (INSTALL) LF	506 6039 TEMP SEDMT CONT FENCE (REMOVE) LF	164 6035 DRILL SEEDING (PERM) (RURAL) (CLAY) SY	164 6035 DRILL SEEDING (PERM) (WARM OR COOL) SY
640+25.39 to 652+25.39			80	80	3200	3200

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STATE OF TEXAS

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11/27/2023

SCALE 1" = 50'

Texas Department of Transportation

IH 35 WFR

SW3P LAYOUTS

SHEET 5 OF 9

CONT	SECT	JOB	HIGHWAY
0018	05	090	IH35 WFR
DIST	COUNTY		SHEET NO.
22	WEBB		128

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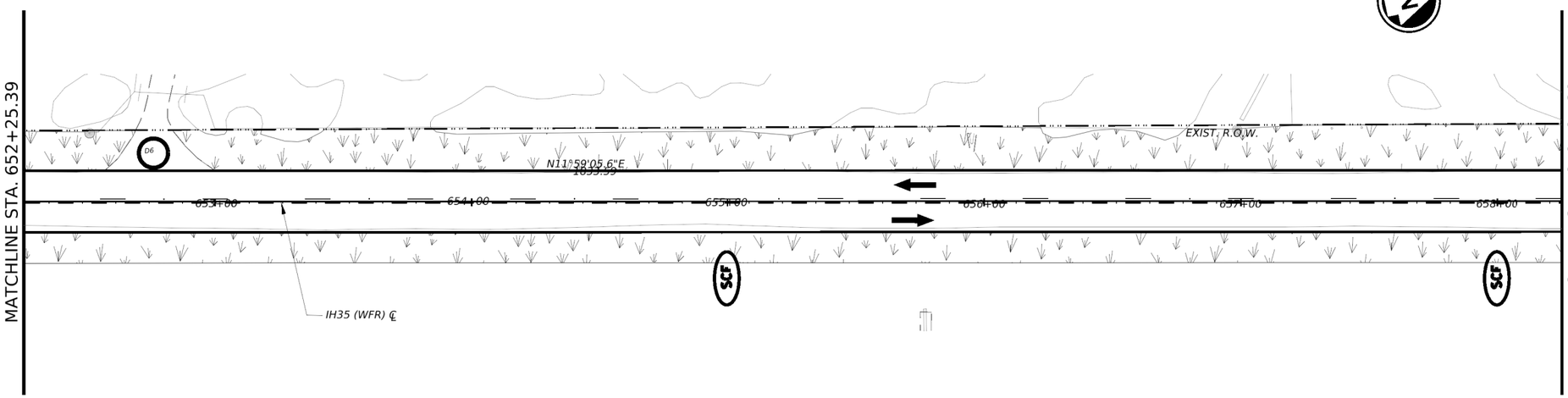

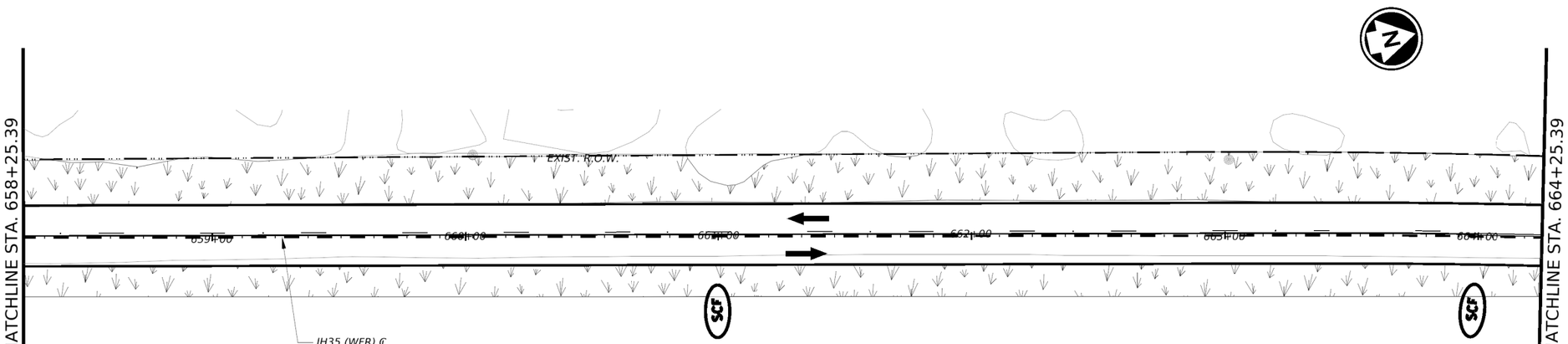

LOCATION	506 6020 CONSTRUCTION EXIST (INSTALL TY 1) SY	506 6024 CONSTRUCTION EXITS (REMOVE) SY	506 6038 TEMP SEDMT CONT FENCE (INSTALL) LF	506 6039 TEMP SEDMT CONT FENCE (REMOVE) LF	164 6035 DRILL SEEDING (PERM) (RURAL) (CLAY) SY	164 6035 DRILL SEEDING (PERM) (WARM OR COOL) SY
652+25.39 to 664+25.39			80	80	3200	3200

LEGEND

- SCF — SEDIMENT CONTROL FENCE (TYPICAL 20' SPACED @300')
- DRAINAGE FLOW
- SEEDING

NOTES:

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L = LENGTH OF BRIDGE

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11/27/2023

SCALE 1" = 50'

Texas Department of Transportation

IH 35 WFR

SW3P LAYOUTS

CONT	SECT	JOB	HIGHWAY
0018	05	090	IH35 WFR
DIST	COUNTY		SHEET NO.
22	WEBB		129

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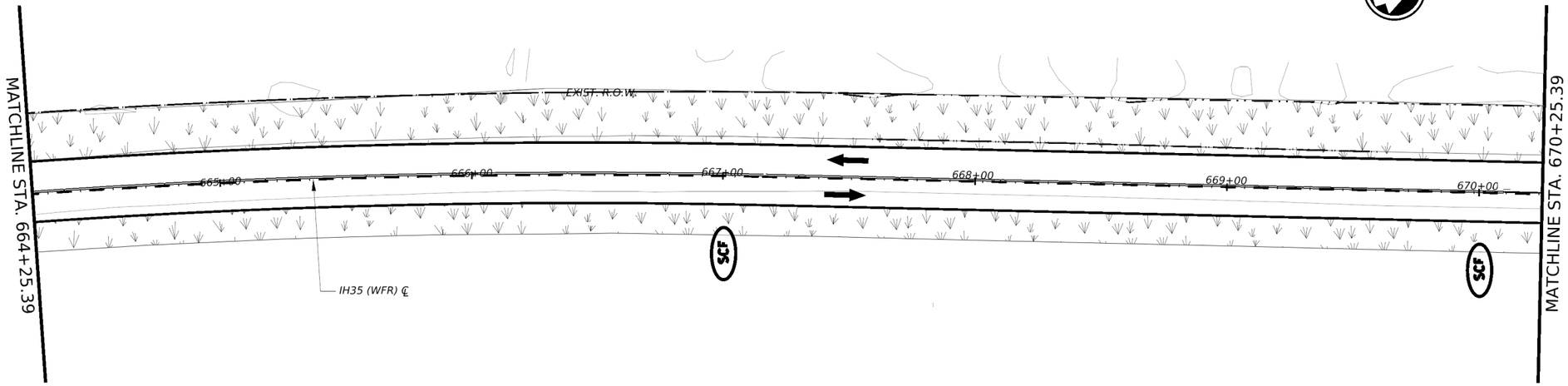


LEGEND

- SCF — SEDIMENT CONTROL FENCE (TYPICAL 20' SPACED @300')
- DRAINAGE FLOW
- SEEDING

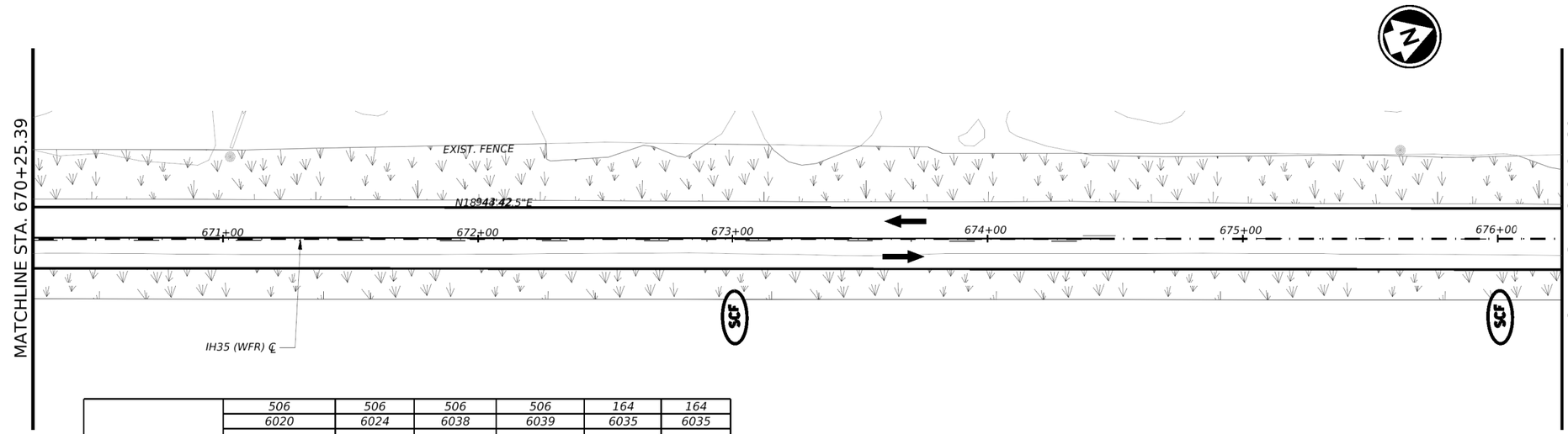
NOTES:

ALL SW3P MEASURES ARE TO BE PLACED WITHIN TXDOT RIGHT OF WAY AND AS SHOWN IN STANDARDS EC(1) - EC(3).

SILT FENCE ONCE INSTALLED, SHALL REMAIN IN PLACE THROUGHOUT ALL REMAINING PHASES OF CONSTRUCTION, OR AS DIRECTED.

THE CONSTRUCTION EXIT AGGREGATE MATERIAL WILL REMAIN THE PROPERTY OF THE STATE UPON COMPLETION OF THE PROPOSED CONSTRUCTION. THESE MATERIALS WILL BE PLACED AT AREAS WITHIN THE ENGINEER UPON REMOVAL. ALL EQUIPMENT, LABOR, AND INCIDENTALS REQUIRED FOR THE RELOCATION OF THESE MATERIALS WILL NOT BE PAID FOR BUT WILL BE SUBSIDIARY TO ITEM 506 REMOVAL ITEMS.

L = LENGTH OF BRIDGE



LOCATION	506 6020 CONSTRUCTION EXIST (INSTALL TY 1) SY	506 6024 CONSTRUCTION EXITS (REMOVE) SY	506 6038 TEMP SEDMT CONT FENCE (INSTALL) LF	506 6039 TEMP SEDMT CONT FENCE (REMOVE) LF	164 6035 DRILL SEEDING (PERM) (RURAL) (CLAY) SY	164 6035 DRILL SEEDING (PERM) (WARM OR COOL) SY
664+25.39 to 676+25.39			80	80	3200	3200

STATE OF TEXAS
LUIS C. URBINA
117019
LICENSED
PROFESSIONAL ENGINEER

DocuSigned by:
98C72D65D494466...
11/27/2023

SCALE 1" = 50'

Texas Department of Transportation

IH 35 WFR

SW3P LAYOUTS

SHEET 7 OF 9

CONT	SECT	JOB	HIGHWAY
0018	05	090	IH35 WFR
DIST	COUNTY		SHEET NO.
22	WEBB		130

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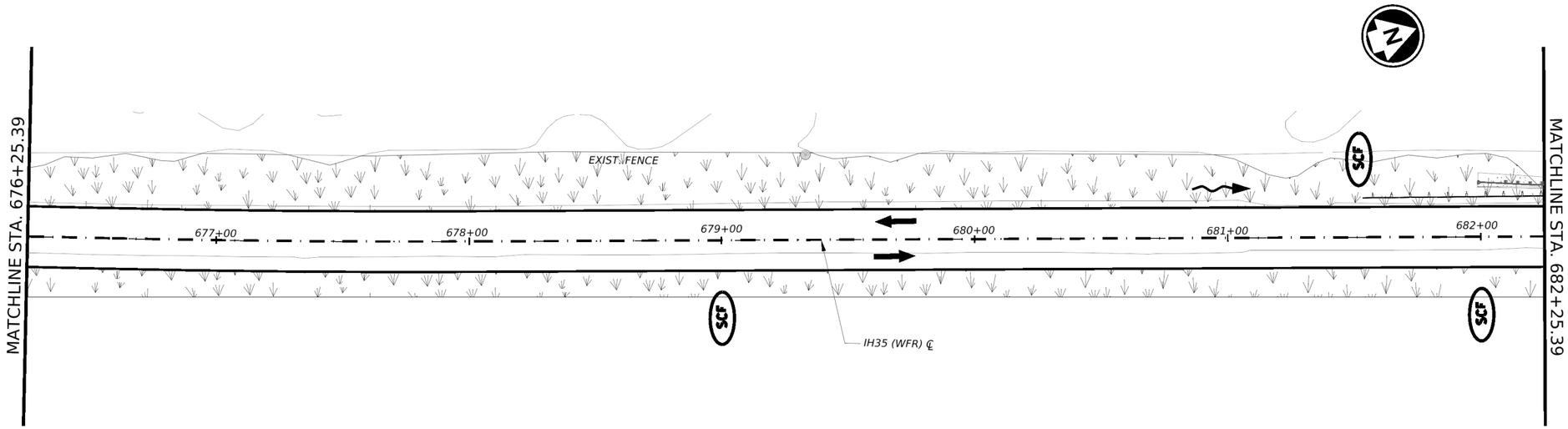

LEGEND

- SCF — SEDIMENT CONTROL FENCE (TYPICAL 20' SPACED @300')
- DRAINAGE FLOW
- SEEDING

NOTES:

ALL SW3P MEASURES ARE TO BE PLACED WITHIN TXDOT RIGHT OF WAY AND AS SHOWN IN STANDARDS EC(1) - EC(3).

SILT FENCE ONCE INSTALLED, SHALL REMAIN IN PLACE THROUGHOUT ALL REMAINING PHASES OF CONSTRUCTION, OR AS DIRECTED.

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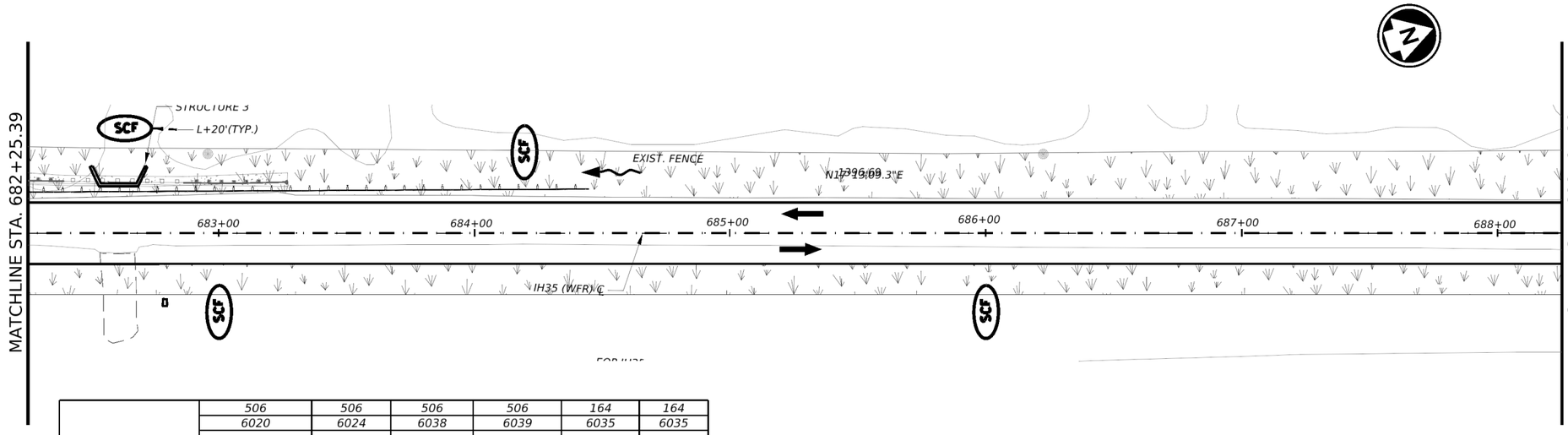
L = LENGTH OF BRIDGE



LOCATION	506 6020 CONSTRUCTION EXIST (INSTALL TY 1) SY	506 6024 CONSTRUCTION EXITS (REMOVE) SY	506 6038 TEMP SEDMT CONT FENCE (INSTALL) LF	506 6039 TEMP SEDMT CONT FENCE (REMOVE) LF	164 6035 DRILL SEEDING (PERM) (RURAL) (CLAY) SY	164 6035 DRILL SEEDING (PERM) (WARM OR COOL) SY
676+25.39 to 688+25.39	50	50	155	155	3200	3200

STATE OF TEXAS
LUIS C. URBINA
117019
LICENSED
PROFESSIONAL ENGINEER

DocuSigned by:
98C72D65D494466...
11/27/2023

SCALE 1" = 50'

Texas Department of Transportation

IH 35 WFR

SW3P LAYOUTS

SHEET 8 OF 9

CONT	SECT	JOB	HIGHWAY
0018	05	090	IH35 WFR
DIST	COUNTY		SHEET NO.
22	WEBB		131

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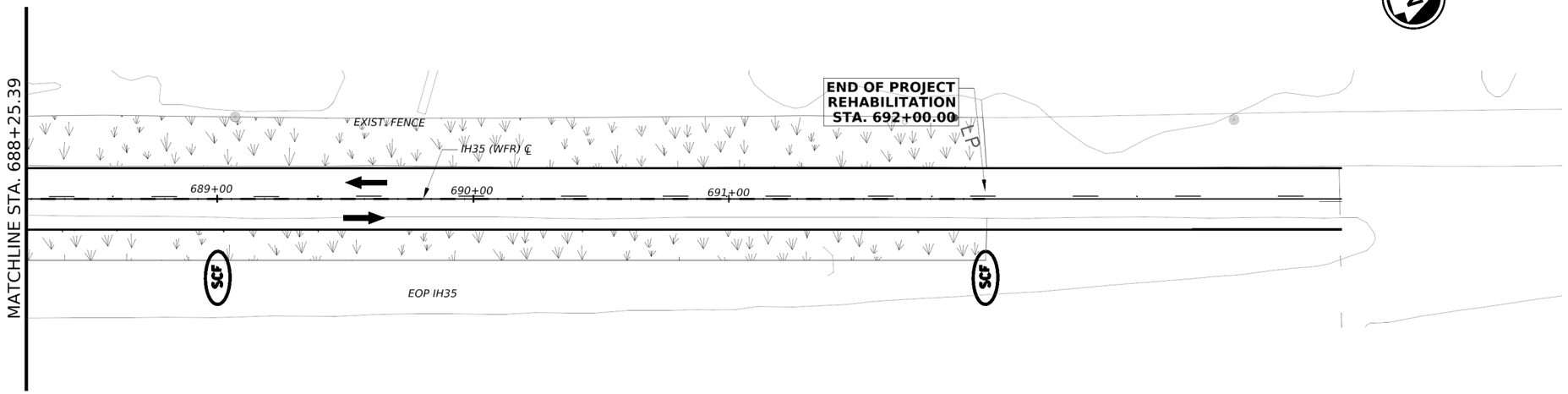

LEGEND

SCF — *SEDIMENT CONTROL FENCE (TYPICAL 20' SPACED @300')*

DRAINAGE FLOW

SEEDING

NOTES:

ALL SW3P MEASURES ARE TO BE PLACED WITHIN TXDOT RIGHT OF WAY AND AS SHOWN IN STANDARDS EC(1) - EC(3).

SILT FENCE ONCE INSTALLED, SHALL REMAIN IN PLACE THROUGHOUT ALL REMAINING PHASES OF CONSTRUCTION, OR AS DIRECTED.

THE CONSTRUCTION EXIT AGGREGATE MATERIAL WILL REMAIN THE PROPERTY OF THE STATE UPON COMPLETION OF THE PROPOSED CONSTRUCTION. THESE MATERIALS WILL BE PLACED AT AREAS WITHIN THE ENGINEER UPON REMOVAL. ALL EQUIPMENT, LABOR, AND INCIDENTALS REQUIRED FOR THE RELOCATION OF THESE MATERIALS WILL NOT BE PAID FOR BUT WILL BE SUBSIDIARY TO ITEM 506 REMOVAL ITEMS.

L = LENGTH OF BRIDGE

LOCATION	506	506	506	506	164	164
	6020	6024	6038	6039	6035	6035
	CONSTRUCTION EXIST (INSTALL TY 1)	CONSTRUCTION EXITS (REMOVE)	TEMP SEDMT CONT FENCE (INSTALL)	TEMP SEDMT CONT FENCE (REMOVE)	DRILL SEEDING (PERM) (RURAL) (CLAY)	DRILL SEEDING (PERM) (WARM OR COOL)
	SY	SY	LF	LF	SY	SY
688+25.39 to 692+00.00			40	40	1066	1066

STATE OF TEXAS
LUIS G. URBINA
117019
LICENSED
PROFESSIONAL ENGINEER

DocuSigned by:
11/27/2023
98C72D65D494466...

SCALE 1" = 50'

Texas Department of Transportation

IH 35 WFR

SW3P LAYOUTS

SHEET 9 OF 9

CONT	SECT	JOB	HIGHWAY
0018	05	090	IH35 WFR
DIST	COUNTY		SHEET NO.
22	WEBB		132

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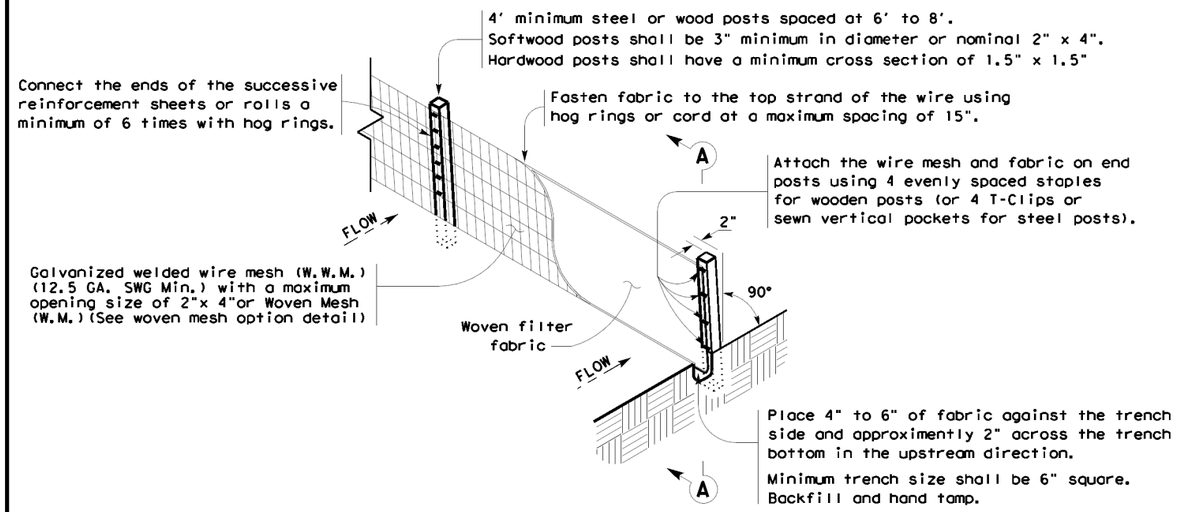
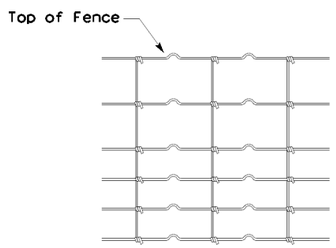
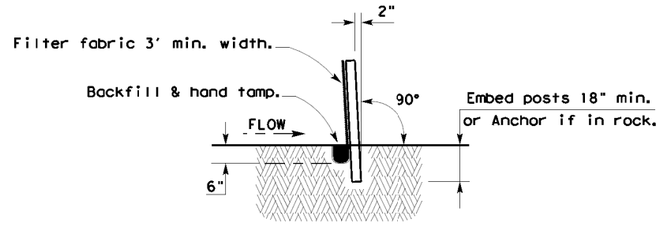


TEMPORARY SEDIMENT CONTROL FENCE

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.

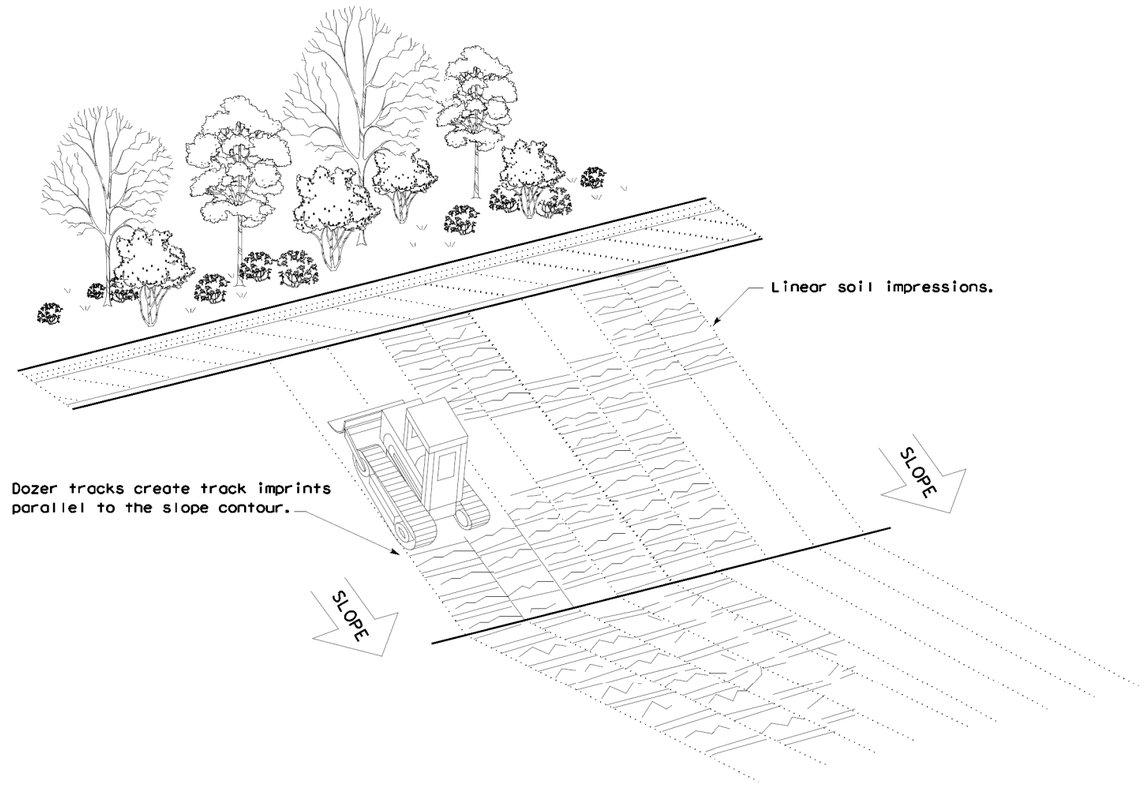
LEGEND

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	0018	05	090	IH35 WFR
	DIST	COUNTY		SHEET NO.
	22	WEBB		133

DATE: 11/27/2023
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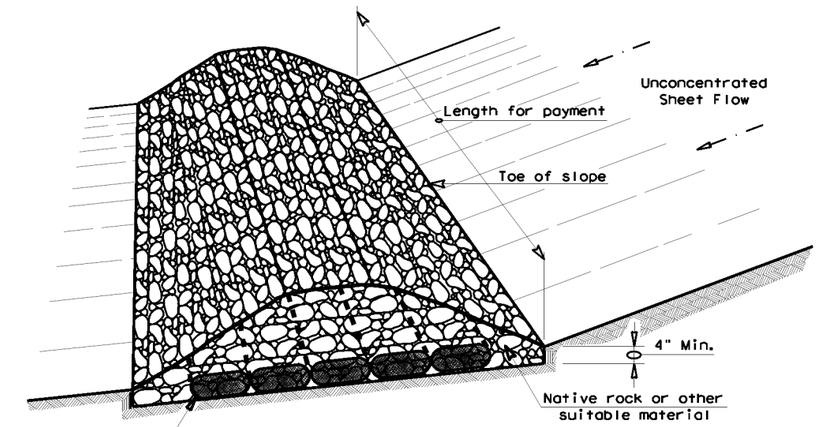
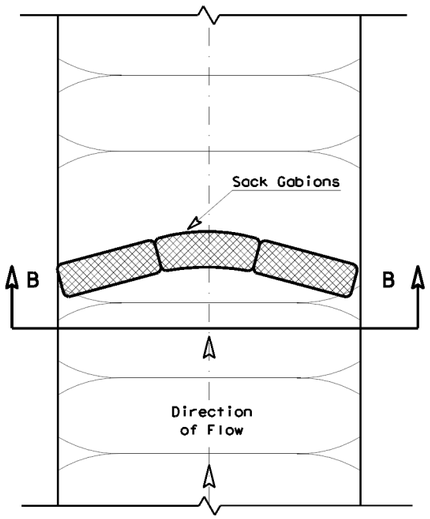
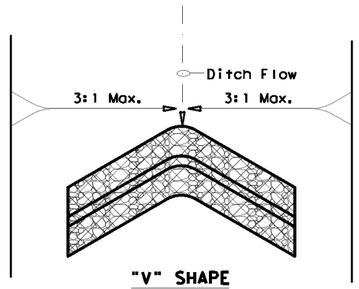


FILTER DAM AT TOE OF SLOPE

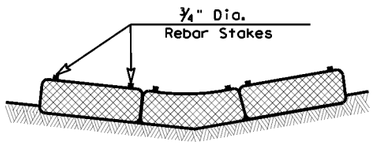
RFD1



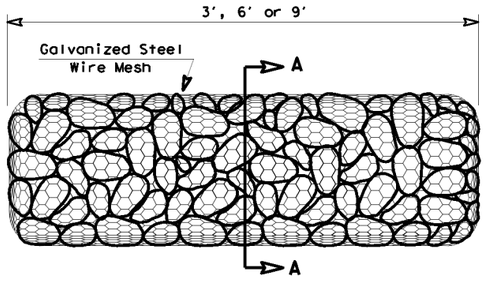
PLAN VIEW



"V" SHAPE PLAN VIEW

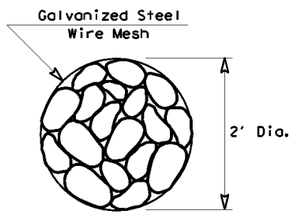


SECTION B-B

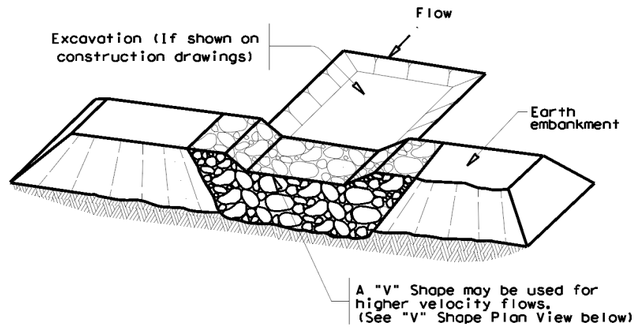


TYPE 4 (SACK GABIONS)

RFD4

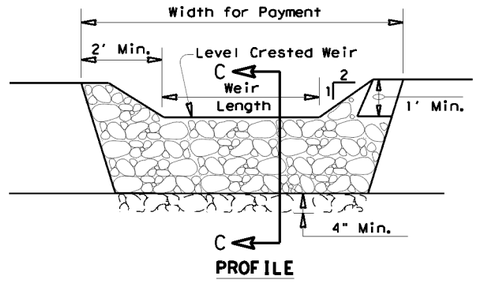


SECTION A-A



FILTER DAM AT SEDIMENT TRAP

RFD1 — OR — RFD2



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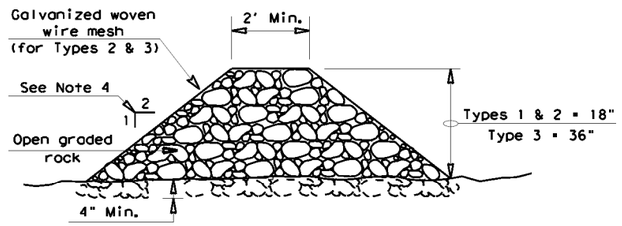
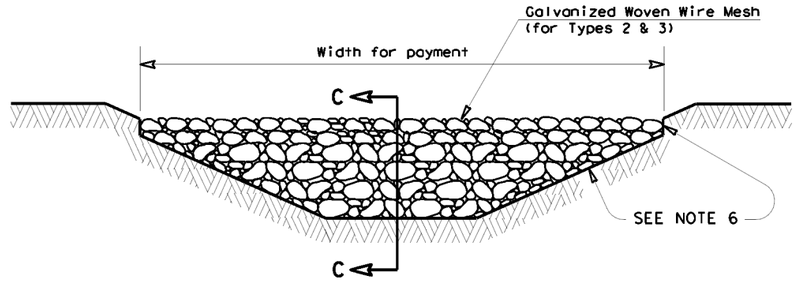


SECTION C-C



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	0018	05	090		IH35 WFR	
	DIST	COUNTY			SHEET NO.	
	22	WEBB			134	

DATE: 11/27/2023
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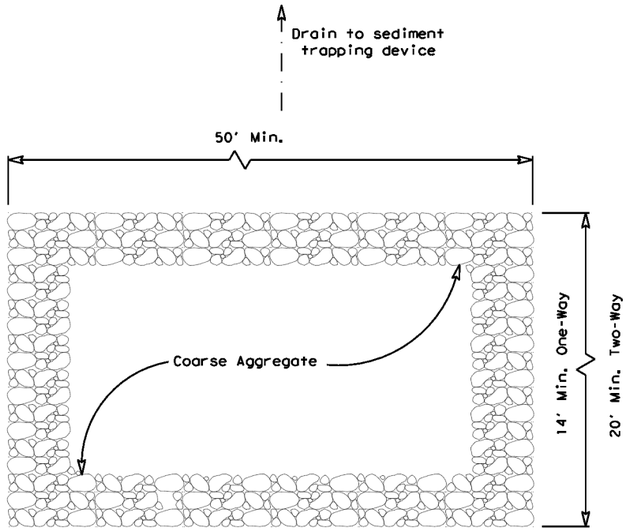
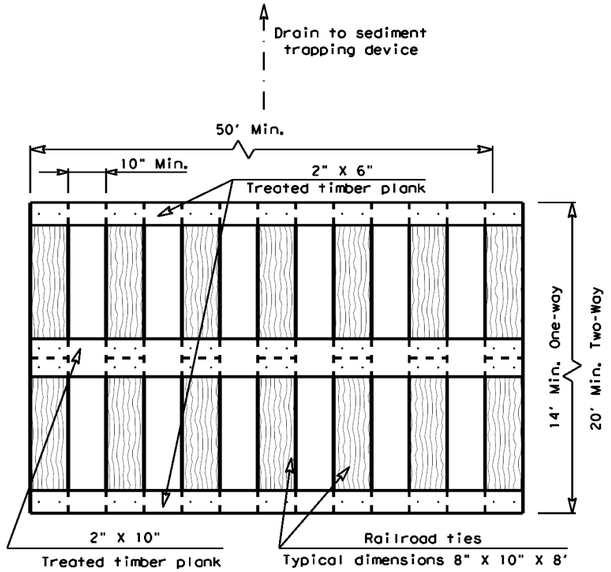
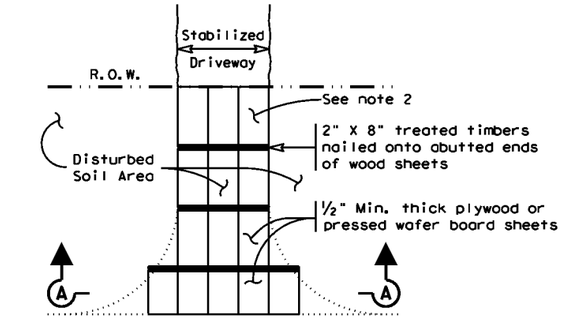


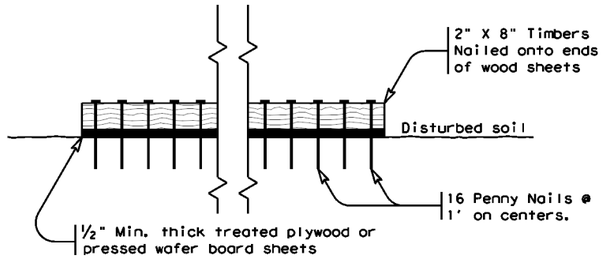
PLAN VIEW



PLAN VIEW



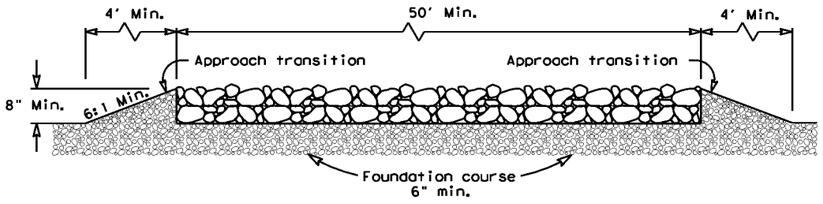
PLAN VIEW



SECTION A-A

CONSTRUCTION EXIT (TYPE 3)

SHORT TERM



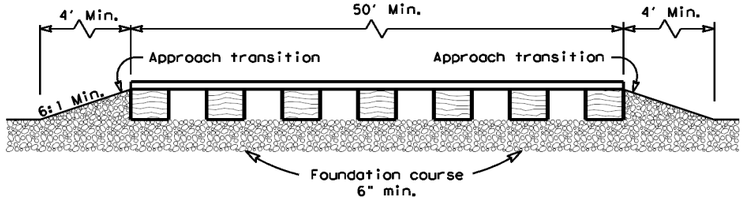
ELEVATION VIEW

CONSTRUCTION EXIT (TYPE 1)

ROCK CONSTRUCTION (LONG TERM)

GENERAL NOTES (TYPE 1)

1. The length of the type 1 construction exit shall be as indicated on the plans, but not less than 50'.
2. The coarse aggregate should be open graded with a size of 4" to 8".
3. The approach transitions should be no steeper than 6:1 and constructed as directed by the Engineer.
4. The construction exit foundation course shall be flexible base, bituminous concrete, portland cement concrete or other materialas approved by the Engineer.
5. The construction exit shall be graded to allow drainage to a sediment trapping device.
6. The guidelines shown hereon are suggestions only and may be modified by the Engineer.
7. Construct exits with a width of at least 14 ft. for one-way and 20 ft. for two-way traffic for the full width of the exit, or as directed by the engineer.



ELEVATION VIEW

CONSTRUCTION EXIT (TYPE 2)

TIMBER CONSTRUCTION (LONG TERM)

GENERAL NOTES (TYPE 2)

1. The length of the type 2 construction exit shall be as indicated on the plans, but not less than 50'.
2. The treated timber planks shall be attached to the railroad ties with ½"x 6" min. lag bolts. Other fasteners may be used as approved by the Engineer.
3. The treated timber planks shall be #2 grade min., and should be free from large and loose knots.
4. The approach transitions shall be no steeper than 6:1 and constructed as directed by the Engineer.
5. The construction exit foundation course shall be flexible base, bituminous concrete, portland cement concrete or other material as approved by the Engineer.
6. The construction exit should be graded to allow drainage to a sediment trapping device.
7. The guidelines shown hereon are suggestions only and may be modified by the Engineer.
8. Construct exits with a width of at least 14 ft. for one-way and 20 ft. for two-way traffic for the full width of the exit, or as directed by the engineer.

GENERAL NOTES (TYPE 3)

1. The length of the type 3 construction exit shall be as shown on the plans, or as directed by the Engineer.
2. The type 3 construction exit may be constructed from open graded crushed stone with a size of two to four inches spread a min. of 4" thick to the limits shown on the plans.
3. The treated timber planks shall be #2 grade min., and should be free from large and loose knots.
4. The guidelines shown hereon are suggestions only and may be modified by the Engineer.

Texas Department of Transportation

Design Division Standard

TEMPORARY EROSION, SEDIMENT AND WATER POLLUTION CONTROL MEASURES

CONSTRUCTION EXITS

EC(3)-16

FILE: ec316	DN: TxDOT	CK: KM	DW: VP	DN/CK: LS
© TxDOT: JULY 2016	CONT	SECT	JOB	HIGHWAY
REVISIONS	0018	05	090	IH35 WFR
	DIST	COUNTY		SHEET NO.
	22	WEBB		135

DRILL SEEDING WITH STRAW/HAY MULCH

PREFERRED RURAL/SMALL URBAN SEEDING METHOD

RECOMMENDED USES:
- PERMANENT SEEDING (BARE SOIL) (YEAR-ROUND)

REQUIRED BID ITEMS:

164 6001 DRILL SEEDING (PERM) (RURAL) (SANDY)
OR
164 6003 DRILL SEEDING (PERM) (RURAL) (CLAY)
OR
164 6005 DRILL SEEDING (PERM) (URBAN) (SANDY)
OR
164 6007 DRILL SEEDING (PERM) (URBAN) (CLAY)
AND
164 6045 STRAW OR HAY MULCHING
AND

CONSTRUCTION SEQUENCE:

- **Refer** to Items 162 & 164 of the Texas Standard Specifications for Construction of Highways, Streets, and Bridges 2014 for specifications, dimensions, volumes and measurements that have been modified or not shown.

1. **Distribute topsoil**
   Refer to Item 160 for instructions and requirements. Uniformly distribute topsoil at a thickness of 6 inches unless otherwise specified in the plans.
2. **Prepare seed bed**
   Refer to section 164.3 for instructions.
3. **Apply seed mixture**
   Refer to Item 164 for instructions. Refer to "Seed Mix" shown on sheet 2 of 2 for a list of species and rates.
4. **Apply fertilizer**
   Refer to Item 166 for instructions.
5. **Apply straw/hay mulch & emulsion**
   Refer to section 164.3.E for instructions.
   Anchor mulch with emulsion (SS-1, CSS-1, MS-2, CMS-2); undiluted, at the following rates:
   Hay - 0.15 gallons/sy
   Straw - 0.30 gallons/sy

*Vegetative watering is not required unless otherwise specified in the general notes under Item 168.

STRAW/HAY MULCH SEEDING

PREFERRED RURAL/SMALL URBAN SEEDING METHOD

RECOMMENDED USES:
- PERMANENT SEEDING (BARE SOIL) (YEAR-ROUND)
- TEMPORARY SEEDING (BARE SOIL) (YEAR-ROUND)

REQUIRED BID ITEMS:

164 6013 STRAW / HAY MLCH SEED (PERM) (RURAL) (SANDY)
OR
164 6015 STRAW / HAY MLCH SEED (PERM) (RURAL) (CLAY)
OR
164 6017 STRAW / HAY MLCH SEED (PERM) (URBAN) (SANDY)
OR
164 6019 STRAW / HAY MLCH SEED (PERM) (URBAN) (CLAY)
OR
164 6029 STRAW / HAY MLCH SEED (TEMP) (WARM)
OR
164 6031 STRAW / HAY MLCH SEED (TEMP) (COOL)
AND

CONSTRUCTION SEQUENCE:

- **Refer** to Items 162 & 164 of the Texas Standard Specifications for Construction of Highways, Streets, and Bridges 2014 for specifications, dimensions, volumes and measurements that have been modified or not shown.

1. **Distribute topsoil**
   Refer to Item 160 for instructions and requirements. Uniformly distribute topsoil at a thickness of 6 inches unless otherwise specified in the plans.
2. **Prepare seed bed**
   Refer to section 164.3 for instructions.
3. **Apply seed mixture**
   Refer to Item 164 for instructions. Refer to "Seed Mix" shown on sheet 2 of 2 for a list of species and rates.
4. **Apply fertilizer**
   Refer to Item 166 for instructions.
5. **Apply straw/hay mulch & emulsion**
   Refer to section 164.3.B for instructions.
   Anchor mulch with emulsion (SS-1, CSS-1, MS-2, CMS-2); undiluted, at the following rates:
   Hay - 0.15 gallons/sy
   Straw - 0.30 gallons/sy

*Vegetative watering is not required unless otherwise specified in the general notes under Item 168.

CELLULOSE FIBER MULCH SEEDING

PREFERRED LARGE URBAN SEEDING METHOD

RECOMMENDED USES:
- TEMPORARY SEEDING (BARE SOIL) (COOL ONLY)
- OVERSEEDING PERMANENT GRASSES INTO TEMP GRASSES (YEAR-ROUND)

REQUIRED BID ITEMS:

164 6031 CELL FBR MLCH SEED (TEMP) (COOL)
OR
164 6021 CELL FBR MLCH SEED (PERM) (RURAL) (SANDY)
OR
164 6023 CELL FBR MLCH SEED (PERM) (RURAL) (CLAY)
OR
164 6025 CELL FBR MLCH SEED (PERM) (URBAN) (SANDY)
OR
164 6027 CELL FBR MLCH SEED (PERM) (URBAN) (CLAY)

CONSTRUCTION SEQUENCE:

- **Refer** to Items 162 & 164 of the Texas Standard Specifications for Construction of Highways, Streets, and Bridges 2014 for specifications, dimensions, volumes and measurements that have been modified or not shown.

1. **Distribute topsoil**
   Refer to Item 160 for instructions and requirements. Uniformly distribute topsoil at a thickness of 6 inches unless otherwise specified in the plans.
2. **Prepare seed bed**
   Refer to section 164.3 for instructions.
   Prior to seeding:
   - If seeding into bare ground - till soil to a 4 inch depth.
   - If seeding into temporary vegetation cover - mow at a height range of 4-7 inches.
3. **Apply seed, fertilizer, mulch mixture, & emulsion**
   Refer to Items 164 and 166 for instructions.
   Refer to "Seed Mix" shown on sheet 2 of 2 for a list of species and rates.
   Use the 2-step method in which the seed and less than 10% of the required mulch is applied in the first application. The remainder of the mulch and is then applied in the subsequent applications.
4. **Begin Vegetative Watering**
   Initiate vegetative watering as follows:
   Cool temporary vegetation - within 5 days of placing the seed.
   Permanent vegetation - delay watering until after next rainfall of 1/2" or greater or as directed by the Area Engineer.

BROADCAST SEEDING

RECOMMENDED USES:
- TEMPORARY SEEDING (BARE SOIL) (COOL ONLY)
- OVERSEEDING PERMANENT GRASSES INTO TEMP GRASSES (YEAR-ROUND)

REQUIRED BID ITEMS:

164 6011 BROADCAST SEED (TEMP) (COOL)
OR
164 6001 BROADCAST SEED (PERM) (RURAL) (SANDY)
OR
164 6003 BROADCAST SEED (PERM) (RURAL) (CLAY)
OR
164 6005 BROADCAST SEED (PERM) (URBAN) (SANDY)
OR
164 6007 BROADCAST SEED (PERM) (URBAN) (CLAY)

CONSTRUCTION SEQUENCE:

- **Refer** to Items 162 & 164 of the Texas Standard Specifications for Construction of Highways, Streets, and Bridges 2014 for specifications, dimensions, volumes and measurements that have been modified or not shown.

1. **Distribute topsoil**
   Refer to Item 160 for instructions and requirements. Uniformly distribute topsoil at a thickness of 6 inches unless otherwise specified in the plans.
2. **Prepare seed bed**
   Refer to section 164.3 for instructions.
   Prior to seeding:
   If seeding into bare ground - till soil to a 4 inch depth.
   If seeding into temporary vegetation cover - mow at a height range of 4-7 inches.
3. **Apply seed mixture**
   Refer to Items 164 and 166 for instructions.
   Refer to "Seed Mix" shown on sheet 2 of 2 for a list of species and rates.
4. **Apply fertilizer**
   Refer to Item 166 for instructions.
5. **Begin Vegetative Watering**
   Initiate vegetative watering as follows:
   Cool temporary vegetation - within 5 days of placing the seed.
   Permanent vegetation - delay watering until after next rainfall of 1/2" or greater or as directed by the Area Engineer.

DRILL SEEDING

PREFERRED RURAL/URBAN OVER-SEEDING METHOD

RECOMMENDED USES:
- OVERSEEDING PERMANENT GRASSES INTO TEMP GRASSES (YEAR-ROUND)

REQUIRED BID ITEMS:

164 6034 DRILL SEEDING (PERM) (RURAL) (SANDY)
OR
164 6036 DRILL SEEDING (PERM) (RURAL) (CLAY)
OR
164 6038 DRILL SEEDING (PERM) (URBAN) (SANDY)
OR
164 6040 DRILL SEEDING (PERM) (URBAN) (CLAY)

CONSTRUCTION SEQUENCE:

- **Refer** to Items 162 & 164 of the Texas Standard Specifications for Construction of Highways, Streets, and Bridges 2014 for specifications, dimensions, volumes and measurements that have been modified or not shown.

1. **Distribute topsoil**
   Refer to Item 160 for instructions and requirements. Uniformly distribute topsoil at a thickness of 6 inches unless otherwise specified in the plans.
2. **Prepare seed bed**
   Refer to section 164.3 for instructions.
   Prior to seeding:
   If seeding into bare ground - till soil to a 4 inch depth.
   If seeding into temporary vegetation cover - mow at a height range of 4-7 inches.
3. **Apply seed mixture**
   Refer to Items 164 and 166 for instructions.
   Refer to "Seed Mix" shown on sheet 2 of 2 for a list of species and rates.
4. **Apply fertilizer**
   Refer to Item 166 for instructions.
5. **Begin Vegetative Watering**
   Initiate vegetative watering as follows:
   Cool temporary vegetation - within 5 days of placing the seed.
   Permanent vegetation - delay watering until after next rainfall of 1/2" or greater.

TEXAS DEPARTMENT OF TRANSPORTATION
LAREDO DISTRICT

SHEET 1 OF 2

REVEGETATION NOTES AND SPECIFICATIONS

© TxDOT JANUARY 2002	DN: -	CK: -	DW: -	CK: -
REVISIONS	STATE DISTRICT: 22	FEDERAL REGION: 6	FEDERAL AID PROJECT	SHEET: 136
	COUNTY: WEBB	CONTROL: 0018	SECTION: 05	JOB: 090	HIGHWAY: IH35 WFF

DN:
CK:
DW:
DATE: 11/27/2023
ACC:
FILE: c:\txdot\pw_online\txdot5\krystol.hernandez\d1042307\5090_REVEGETATION NOTES_LRD.dgn

LEVELS DISPLAYED
1 2 3 4 5 6 7 8 9 10 11 12 13 14 15 16 17 18 19 20 21 22 23 24 25 26 27 28 29 30 31 32 33 34 35 36 37 38 39 40 41 42 43 44 45 46 47 48 49 50 51 52 53 54 55 56 57 58 59 60 61 62

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PERMANENT SOIL STABILIZATION

PERMANENT SEED MIX

January 15 thru May 1

RURAL

■ Clay Soils	*
Green Sprangletop (Van Horn)	1.0
Sideoats Grama (South Texas)	1.0
Texas Grama (Atascosa)	1.0
Slender Grama (Dilley)	1.0
Shortspike Windmillgrass (Welder)	0.2
Pink Pappusgrass (Maverick)	0.6
Halls Panicum (Oso)	0.2
Plains Bristlegrass(Catarina Blend)	0.2
False Rhodes Grass (Kinney)	0.1
Hooded Windmillgrass (Mariah)	0.2
Arizona Cottontop (La Salle)	0.2

■ Sandy Soils	*
Green Sprangletop (Van Horn)	1.0
Slender Grama (Dilley)	1.0
Shortspike Windmillgrass (Welder)	0.2
Pink Pappusgrass (Maverick)	0.6
Halls Panicum (Oso)	0.2
Plains Bristlegrass(Catarina Blend)	0.2
False Rhodes Grass (Kinney)	0.1
Hooded Windmillgrass (Mariah)	0.2
Arizona Cottontop (La Salle)	0.2

URBAN

■ Clay Soils	*
Green Sprangletop (Van Horn)	0.3
Sideoats Grama (South Texas)	4.5
Buffalograss (Texoka)	1.6
Bermudagrass	1.8

■ Sandy Soils	*
Green Sprangletop (Van Horn)	0.3
Buffalograss (Texoka)	1.6
Bermudagrass	3.6
Sand Dropseed	0.4

May 2 thru August 31

RURAL

■ Clay Soils	*
Green Sprangletop (Van Horn)	0.3
Sideoats Grama (South Texas)	3.6
Plains Bristlegrass(Catarina Blend)	1.2
Buffalograss (Texoka)	1.6
Bermudagrass	1.2
Illinois Bundleflower	1.0
Foxtail Millet	9.0

■ Sandy Soils	*
Green Sprangletop (Van Horn)	0.3
Bermudagrass	0.6
Sand Dropseed	0.4
Lehmans Lovegrass	0.2
Purple Prairieclover	0.5
Foxtail Millet	9.0

URBAN

■ Clay Soils	*
Green Sprangletop (Van Horn)	0.3
Sideoats Grama (South Texas)	4.5
Buffalograss (Texoka)	1.6
Bermudagrass	1.2
Foxtail Millet	9.0

■ Sandy Soils	*
Green Sprangletop (Van Horn)	0.3
Bermudagrass	0.8
Buffalograss (Texoka)	3.2
Sand Dropseed	0.3
Foxtail Millet	9.0

September 1 thru January 14

RURAL

■ Clay Soils	*
Green Sprangletop (Van Horn)	0.3
Sideoats Grama (South Texas)	3.6
Plains Bristlegrass(Catarina Blend)	0.2
Buffalograss (Texoka)	1.6
Bermudagrass	1.2
Illinois Bundleflower	1.0
Oats	40.0

■ Sandy Soils	*
Green Sprangletop (Van Horn)	1.0
Bermudagrass	0.6
Sand Dropseed	0.2
Lehmans Lovegrass	0.2
Purple Prairieclover	0.5
Oats	40.0

URBAN

■ Clay Soils	*
Green Sprangletop (Van Horn)	0.3
Sideoats Grama (South Texas)	4.5
Buffalograss (Texoka)	1.6
Bermudagrass	1.8
Oats	40.0

■ Sandy Soils	*
Green Sprangletop (Van Horn)	0.3
Bermudagrass	0.8
Buffalograss (Texoka)	3.2
Sand Dropseed	0.3
Oats	40.0

TEMPORARY SOIL STABILIZATION

TEMPORARY SEED MIX

February 15 thru September 31

WARM SEASON

Foxtail Millet	34.0 Lbs PLS/Acre

October 1 thru February 14

COOL SEASON

Oats	72.0

* SEED QUANTITIES ARE POUNDS PURE LIVE SEED (PLS) PER ACRE.

VEGETATIVE WATERING FOR SEED AND SOD

ITEM 168---VEGETATIVE WATERING

RURAL---NO VEGETATIVE WATERING

URBAN---TEMPORARY IRRIGATION---REFER TO IRRIGATION PLAN SHEETS FOR ZONE TIMES.

URBAN---TRUCK IRRIGATION---REFER TO WATERING SCHEDULE BELOW:

WATERING SCHEDULE

	DAYS 1-14	DAYS 15-28	DAYS 29-42	TOTAL CYCLES
Seeded Sites	Twice per day	Twice per day	Once per day	70
Sodded Sites	Twice per day	Once per day	———	42

Standard watering rate is 1/4 inch per cycle. However, rate and frequency may be adjusted, with the approval of the engineer, to meet site conditions.

SEEDING NOTES:

1. All seed shall meet labeling, delivery, analysis, and testing requirements as described in Item 164.2.
2. All drill seeding shall be accomplished using a pasture or rangeland type drill seeder. Grain drills or Brillion seeders are not acceptable. Seedbed prep is required, even for no-till drill seeders, when seeding into bare soil.
3. All seed shall be drilled to a depth of 1/4 inch to 1/3 inch.
4. Seeding with compost:
   - Prior to seeding, one inch of compost shall be applied to the soil followed by an application of fertilizer. Refer to Item 166 Fertilizer for specifications and application rate.
   - Compost/fertilizer shall be tilled into the soil to a depth of four inches. Seed into prepared seedbed.
5. Where drill seeding is specified, and site conditions prevent it, broadcast seeding is permitted as approved by the engineer.
6. CELL FIBER MULCH SEEDING shall only be used where site conditions prevent drill seeding (refer to plan sheets for type of seeding). Seeding shall be a two-step process as detailed above.
7. Vegetative watering shall be paid for under Item 168. Watering rate and specifications shall be as shown on sheet 2 of 2 under Item 168.

TEXAS DEPARTMENT OF TRANSPORTATION
LAREDO DISTRICT

SHEET 2 OF 2

REVEGETATION
NOTES AND SPECIFICATIONS

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REVISIONS	STATE DISTRICT: 22	FEDERAL REGION: 6	FEDERAL AID PROJECT	SHEET: 137
	COUNTY: WEBB	CONTROL: 0018	SECTION: 05	JOB: 090
				HIGHWAY: IH35 WFR

LEVELS DISPLAYED
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