DocuSign Envelope ID: DC3D475C-36E5-4FC4-9976-EDA506D33B54

INDEX OF SHEETS

SEE SHEET NO. 2

STATE OF TEXAS
DEPARTMENT OF TRANSPORTATION

PLANS OF PROPOSED
HIGHWAY ROUTINE MAINTENANCE CONTRACT

FHWA TEXAS DIVISION	MAINTENANCE PROJECT NO.		SHEET NO.
	RMC 641453001		1
STATE	DISTRICT	COUNTY	
TEXAS	BMT	LIBERTY	
CONTROL	SECTION	JOB	HIGHWAY NO.
6414	53	001	BS105T, ETC

MGR. NO. 052

MAINT. SECTION 05

TYPE OF WORK:

BASE REPAIR & OVERLAY, MBGF, EROSION REPAIR, SIGNING

PROJECT NO. : RMC 641453001
HIGHWAY : BS 105T, ETC.
LIBERTY COUNTY

LIMITS OF WORK
FROM: 0.1 MI WEST OF SH 105, EAST
TO: US 59, ETC.

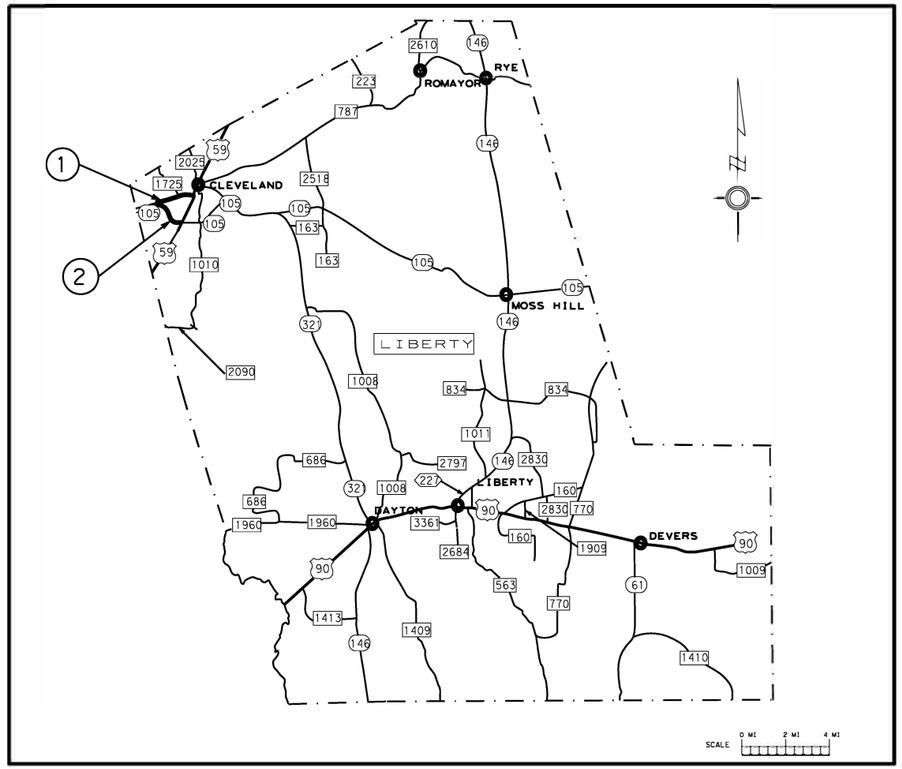
AREA OF DISTURBED SOIL = 0.75 ACRES

BS 105T, ETC
ROADWAY LENGTH= 1.947 MI 10,281 FT
BRIDGE LENGTH = 0.218 MI 1,154 FT

SH 105 BYPASS
ROADWAY LENGTH= 1.746 MI 9,220 FT
BRIDGE LENGTH = 0.356 MI 1,882 FT

PROJ REF NO.	HIGHWAY	LENGTH FT. MI	LIMITS STA TO STA REF MARK TO REF MARK
(1)	BS 105T	11,435 2.17	FROM 0.1MI W OF SH 105, E TO US 59 6+70 TO 121+05 712+1.427 TO 714+1.594
(2)	SH 105 (BYPASS)	11,102 2.10	FROM BS 105T BYPASS (WEST END), S TO US 59 1319+00 TO 1430+02 712+1.608 TO 714+1.786

PROJECT LENGTH 4.27 Miles



* SEE LOCATION MAP FOR LIMITS OF WORK

EXCEPTIONS: NONE
EQUATIONS: NONE
RAILROAD CROSSINGS: NONE

SPEED BS 105-T BUSINESS 65,55,45 MPH
AADT 2023 10205

SPEED SH 105-T BYPASS 65 MPH
AADT 2023 6559

SPECIFICATIONS ADOPTED BY THE STATE OF TEXAS DEPARTMENT OF TRANSPORTATION NOVEMBER 1, 2014, AND SPECIAL SPECIFICATION ITEMS IN THE CONTRACT SHALL GOVERN ON THIS PROJECT

© 2023
BY TEXAS DEPARTMENT OF TRANSPORTATION
ALL RIGHTS RESERVED.

FINAL PLANS

DATE LET : _____

DATE WORK BEGAN: _____

DATE WORK COMPLETED: _____

CONTRACTOR: _____

USED ____ OF ____ DAYS ALLOTTED

PROJECT COST: _____

PROJECT CONSTRUCTED AND FINAL PLANS PREPARED BY:

_____ _____
DATE

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

Texas Department of Transportation

SUBMITTED FOR LETTING: 5/22/2023
DocuSigned by: Richard J. McGowan 557D9606A1B04CF...
FOR AREA ENGINEER

RECOMMENDED FOR LETTING: 5/22/2023
DocuSigned by: Keith Howe 7EC0206FBBC7468...
FOR DIRECTOR OF MAINT.

APPROVED FOR LETTING: 5/22/2023
DocuSigned by: Mark W. York, P.E. 878CD7692606DAF0...
DISTRICT ENGINEER

DATE: 5/19/2023 1:11:45 PM
FILE: Y:\LOCAL\LIBERTY AO RMC SUBMITTALS\FY 23\FY 23 RMC 6414-53-001 SH 105T AND BYPASS\Design\DGN\General\General Sheets.dgn

	SHEET	DESCRIPTION
		GENERAL
	1	TITLE SHEET
	2	INDEX OF SHEETS
	3	LOCATION MAP
	4-12	TYPICAL SECTIONS
	13-17	GENERAL NOTES
	18-19	ESTIMATE & QUANTITY SHEET
	20-22	QUANTITY SUMMARIES
	23-27	SUMMARY OF SMALL SIGNS
		TRAFFIC CONTROL PLAN STANDARDS
••	28-39	BC (1)-21 THRU BC (12)-21
••	40	TCP (2-1)-18
••	41	TCP (2-2)-18
••	42	TCP (3-1)-13
••	43	TCP (3-3)-13
••	44	TCP (6-2)-12
••	45	TCP (6-3)-12
••	46	TCP (6-4)-12
••	47	WZ(RS)-22
••	48	WZ(STPM)-23
••	49	WZ(UL)-13
		ROADWAY DETAILS
	50-61	BS 105-T LAYOUT
	62-74	SH 105 (BYPASS) LAYOUT
	75	TYPICAL BASE REPAIR DETAILS
	76	DRAINAGE REPAIR DETAIL
	77	DRAINAGE REPAIR DETAIL
	78	DRIVEWAY DETAILS
••	79	TREATMENT FOR VARIOUS EDGE CONDITIONS
••	80	TE (HMAC)-11
••	81	GF(31)-19
••	82	GF(31)DAT-19
••	83	GF(31)MS-19
••	84	SGT(10S)31-16
••	85	SGT(11S)31-18
••	86	SGT(12S)31-18
••	87	D & OM (2)-20
••	88	D & OM (VIA)-20
••	89	RS (3)-23
••	90	RS (4)-23
	91	TYPICAL TIE-IN DETAIL
••	92	SMD (GEN)-08
••	93	SMD (SLIP-1)-08
••	94	SMD (SLIP-2)-08
••	95	SMD (SLIP-3)-08
••	96	SMD (TY-G)-08
••	97	JS-14
••	98	PM (1)-22
••	99	PM (2)-22
••	100	PM (3)-22
		ENVIRONMENTAL
••	101	EC(2)-16
	102	EPIC

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

INDEX OF SHEETS

Texas Department of Transportation

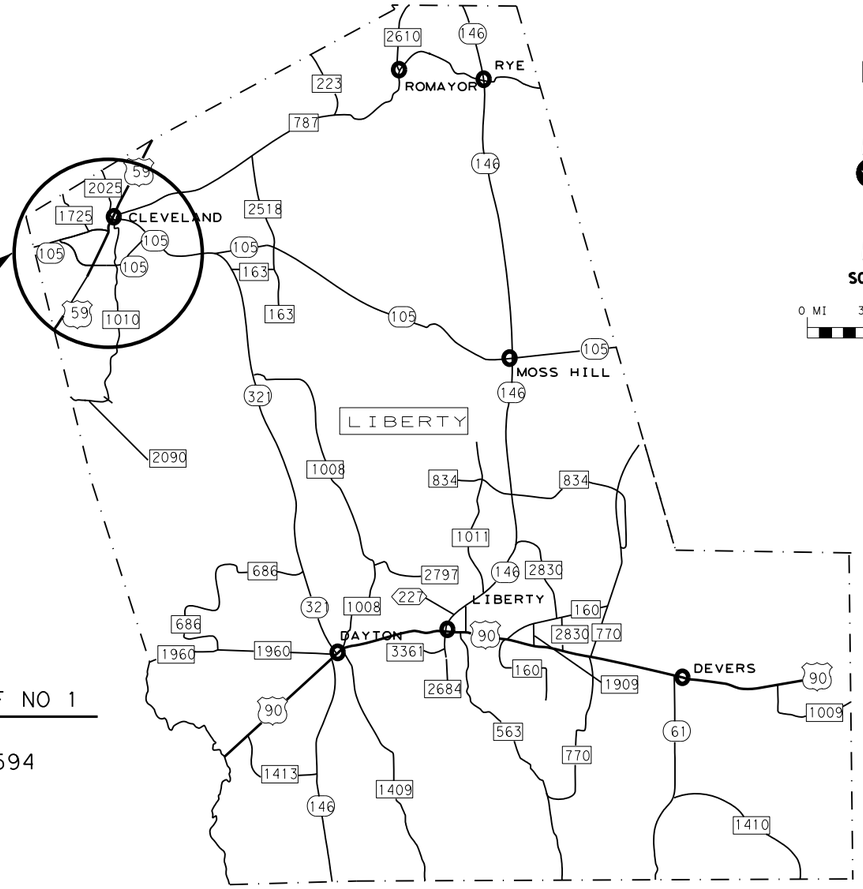
FED. RD. DIV. NO.	MAINTENANCE PROJECT		SHEET NO.
6			2
STATE	DISTRICT	COUNTY	
TEXAS	BMT	LIBERTY	
CONTROL	SECTION	JOB	HIGHWAY NO.
6414	53	001	BS105T,ETC

FILE: Y:\LOCAL\LIBERTY AO RMC SUBMITTALS\FY 23\FY 23 RMC 6414-53-001 SH 105T AND BYPASS\Design\DGN\General\General Sheets.dgn
DATE: 5/19/2023

POL

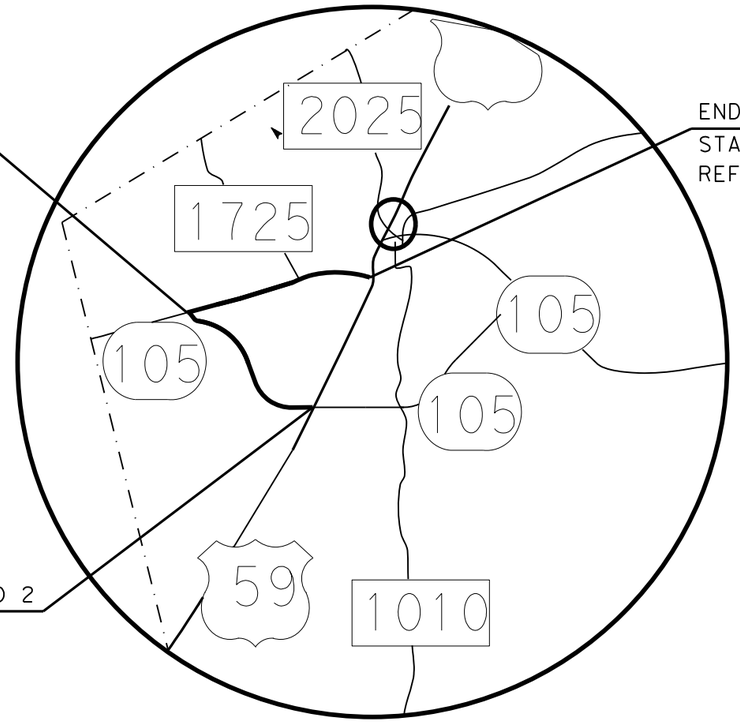
FILE: Y:\LOCAL\LIBERTY AO RMC SUBMITTALS\FY 23\FY 23 RMC 6414-53-001 SH 105T AND BYPASS\Design\DGN\General\General Sheets.dgn
DATE: 5/19/2023 5:34:08 PM

SEE DETAIL- A



STA: 6+70
REF MRK: 712+1.427
BEGIN PROJECT REF NO 2
STA: 1319+00
REF MRK: 712+1.608

END PROJECT REF NO 1
STA: 121+05
REF MRK: 714+1.594



END PROJECT REF NO 2
STA: 1430+02
REF MRK: 714+1.786

DETAIL - A

N. T. S.

STATE OF TEXAS
DANIEL DUKE THOMPSON
122541
LICENSED PROFESSIONAL ENGINEER

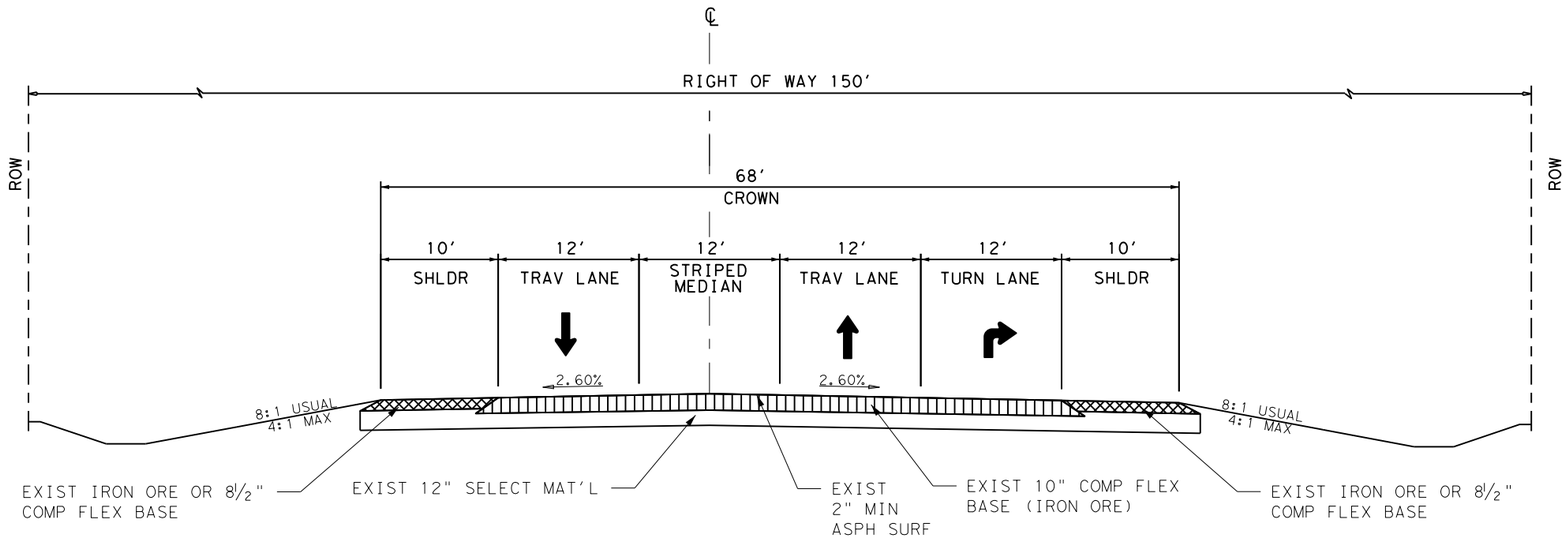
Daniel Duke Thompson

The seal appearing on this document was authorized by DANIEL THOMPSON, P.E. 122541 on 05/10 ,2023 . Alteration of a sealed document without proper notification to the responsible engineer is an offense under the Texas Engineering Practice Act.

LOCATION MAP

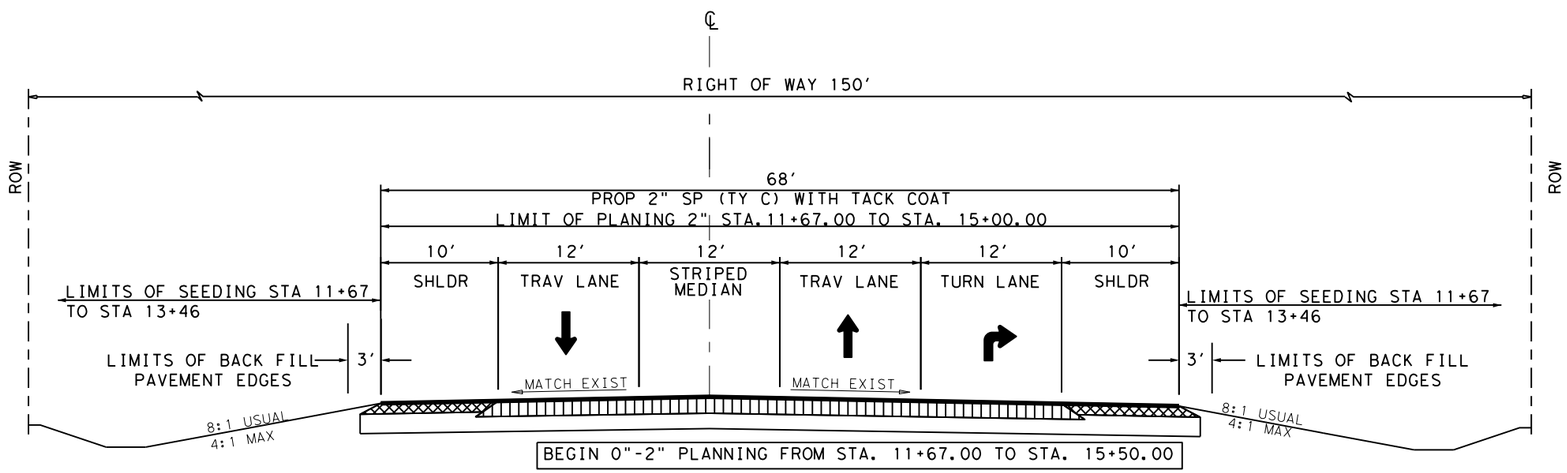
Texas Department of Transportation

FED. RD. DIV. NO.			SHEET NO.
6			3
STATE	DIST.	COUNTY	
TEXAS	BMT	LIBERTY	
CONT.	SECT.	JOB	HIGHWAY NO.
6414	53	001	BS105T, ETC



BS 105-T
SH 105-T
EXISTING SECTION

STA 11+67 TO STA 13+46



BS 105-T
SH 105-T
PROPOSED SECTION

STA 11+67 TO STA 13+46

Daniel Duke Thompson

The seal appearing on this document was authorized by DANIEL THOMPSON, P.E. 122541 on 05/10 ,2023 . Alteration of a sealed document without proper notification to the responsible engineer is an offense under the Texas Engineering Practice Act.

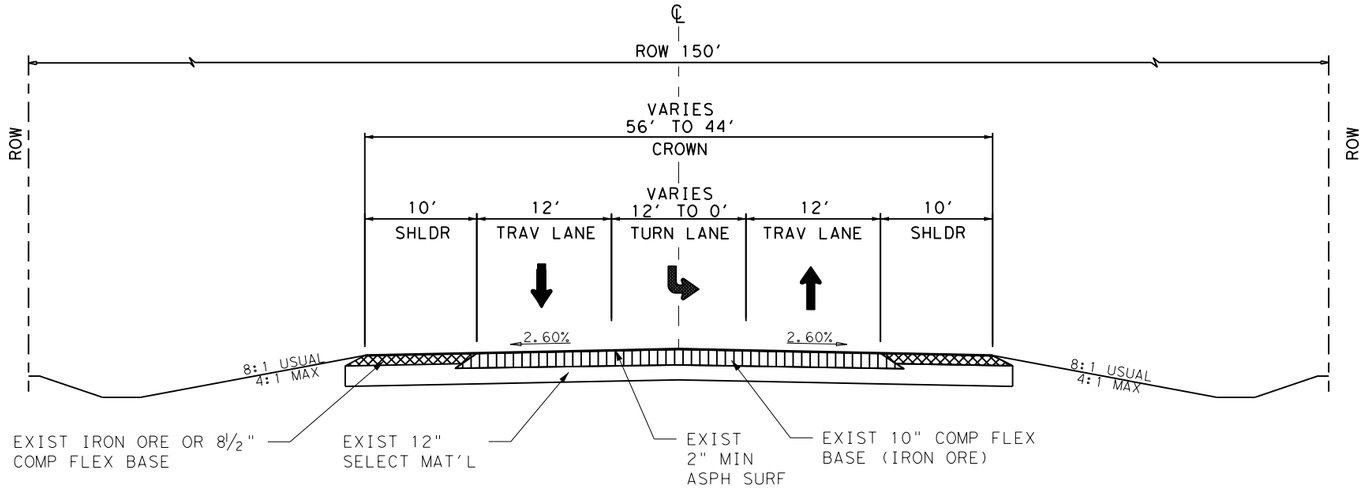
TYPICAL SECTIONS

Texas Department of Transportation

SCALE NTS

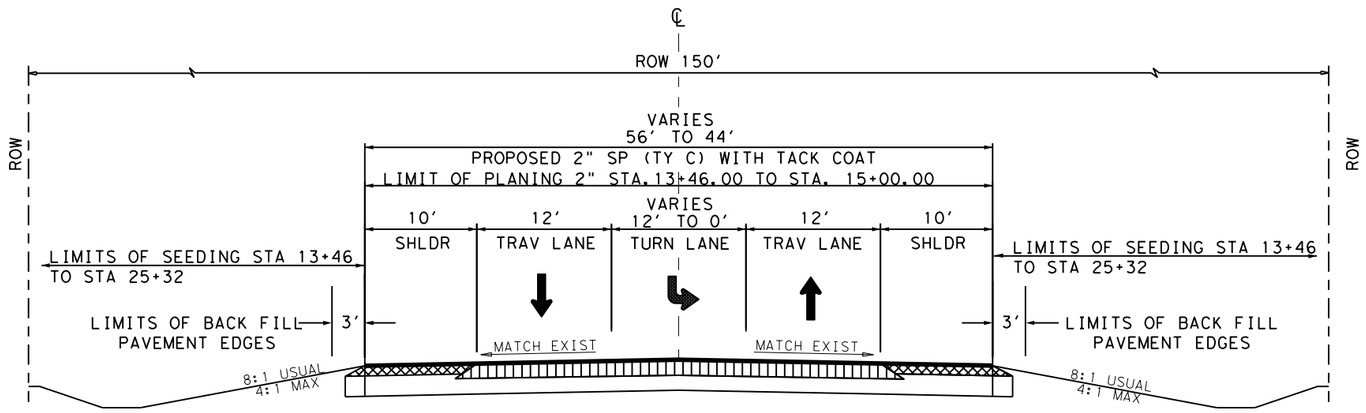
SHEET 1 OF 9

FED. RD. DIV. NO.			SHEET NO.
6			4
STATE	DIST.	COUNTY	
TEXAS	BMT	LIBERTY	
CONT.	SECT.	JOB	HIGHWAY NO.
6414	53	001	BS105T, ETC



BS 105-T
SH 105-T
EXISTING SECTION

STA 13+46 TO STA 25+32



BS 105-T
SH 105-T
PROPOSED SECTION

STA 13+46 TO STA 25+32

STATE OF TEXAS
DANIEL DUKE THOMPSON
122541
LICENSED
PROFESSIONAL ENGINEER

Daniel Duke Thompson

The seal appearing on this document was authorized by DANIEL THOMPSON, P.E. 122541 on 05/10 ,2023 . Alteration of a sealed document without proper notification to the responsible engineer is an offense under the Texas Engineering Practice Act.

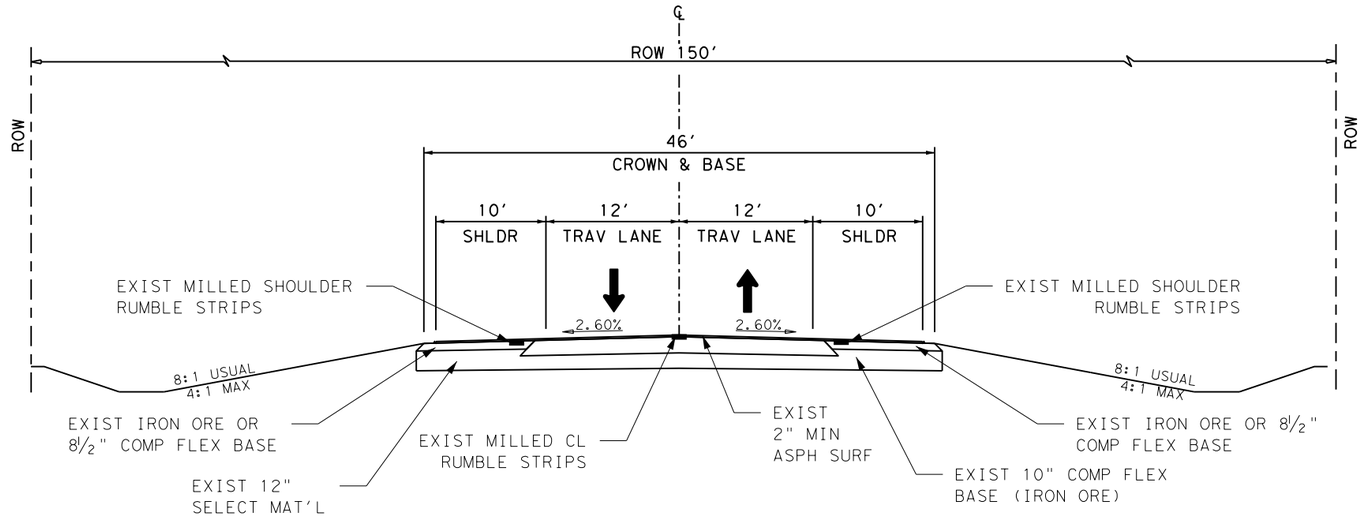
TYPICAL SECTIONS

SCALE NTS

Texas Department of Transportation

SHEET 2 OF 9

FED.RD. DIV.NO.			SHEET NO.
6			5
STATE	DIST.	COUNTY	
TEXAS	BMT	LIBERTY	
CONT.	SECT.	JOB	HIGHWAY NO.
6414	53	001	BS105T, ETC

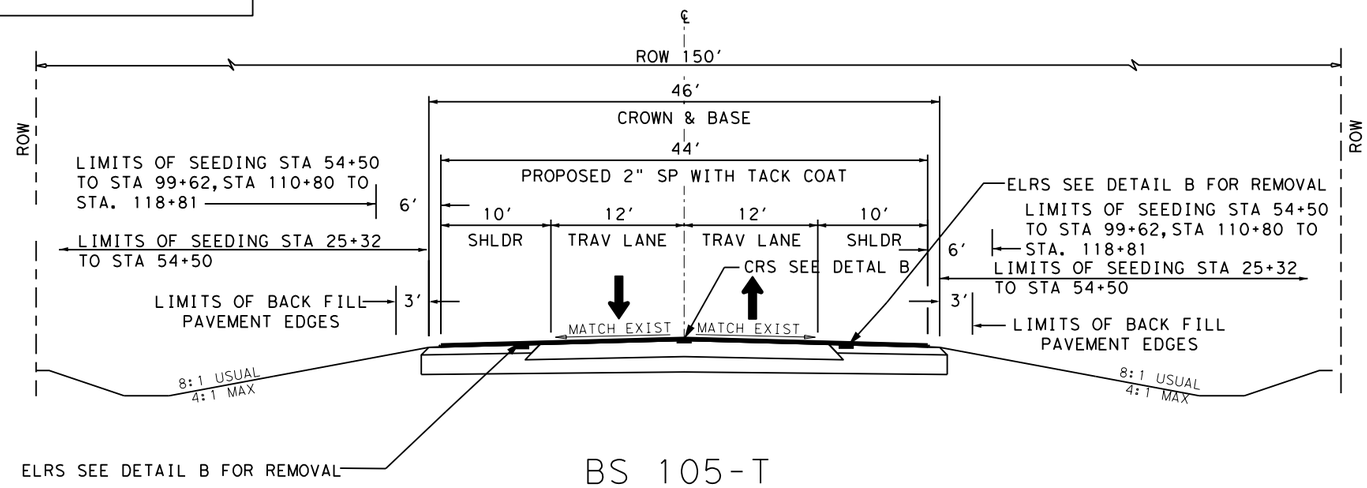


BS 105-T
EXISTING SECTION

STA 25+32 TO STA 99+62
STA 110+82 TO STA 118+81

SAN JACINTO RIVER BRIDGE (STRIPING ONLY)
STA 97+87 TO STA 110+82

EDGE LINE RUMBLE STRIPS (ERLS), TO BE REMOVED AND REPLACED WITH RAISED PROFILE PAV. MRKR.

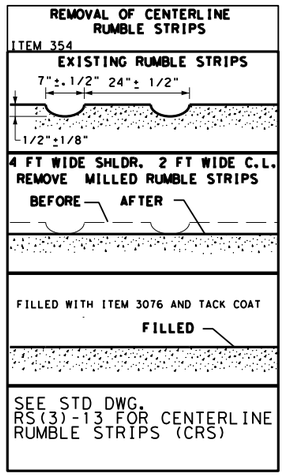


BS 105-T
PROPOSED SECTION

STA 25+32 TO STA 99+62
STA 110+82 TO STA 118+81

SAN JACINTO RIVER BRIDGE (STRIPING ONLY)
STA 97+87 TO STA 110+82

DETAIL B



STATE OF TEXAS
DANIEL DUKE THOMPSON
122541
LICENSED PROFESSIONAL ENGINEER

Daniel Duke Thompson

The seal appearing on this document was authorized by DANIEL THOMPSON, P.E. 122541 on 05/10 ,2023 . Alteration of a sealed document without proper notification to the responsible engineer is an offense under the Texas Engineering Practice Act.

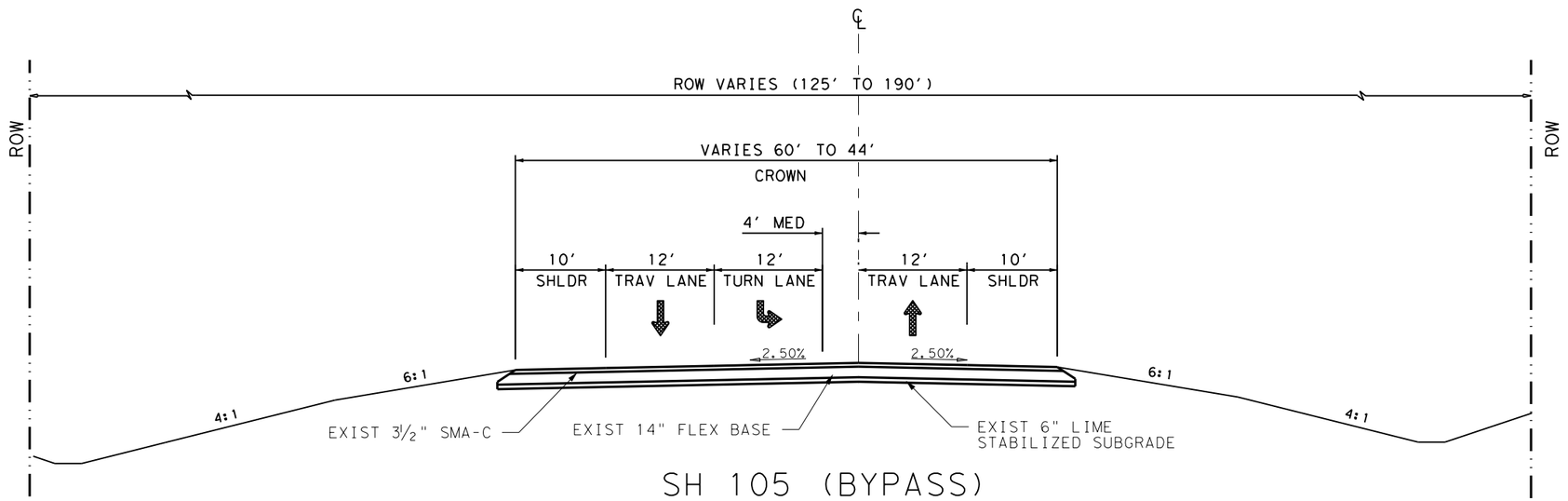
TYPICAL SECTIONS

SCALE NTS

Texas Department of Transportation

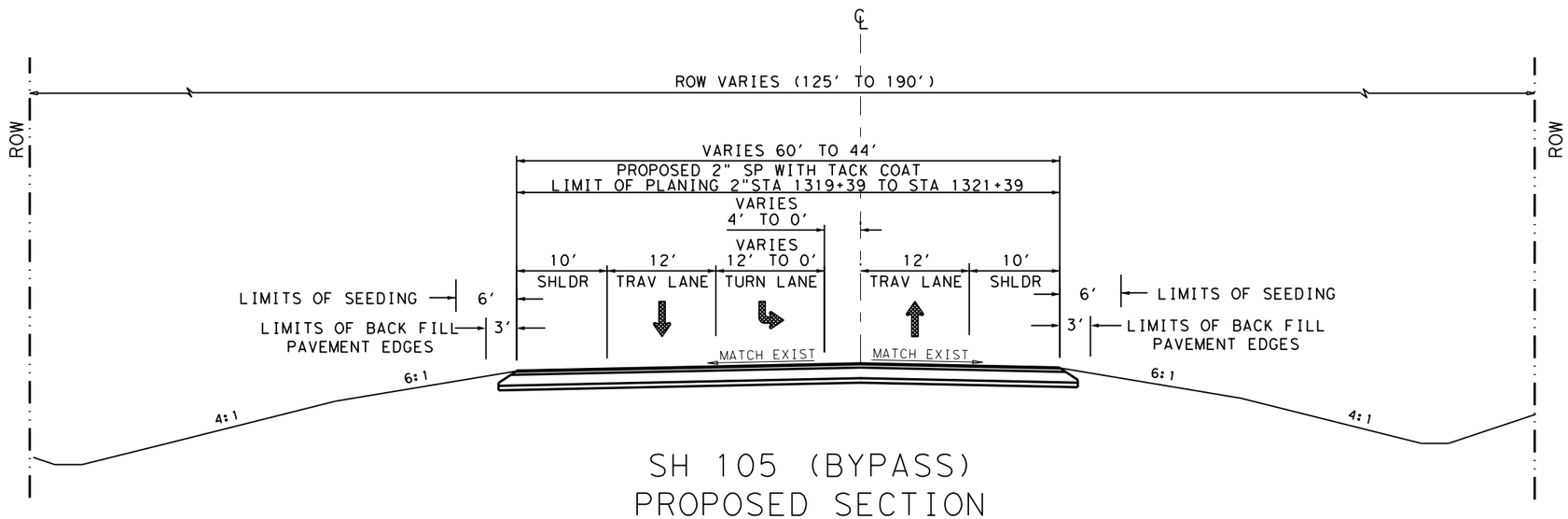
SHEET 3 OF 9

FED. RD. DIV. NO.			SHEET NO.
6			6
STATE	DIST.	COUNTY	
TEXAS	BMT	LIBERTY	
CONT.	SECT.	JOB	HIGHWAY NO.
6414	53	001	BS105T, ETC



SH 105 (BYPASS)
EXISTING SECTION

STA 1319+00 TO STA 1332+26



SH 105 (BYPASS)
PROPOSED SECTION

STA 1319+00 TO STA 1332+26

STATE OF TEXAS
DANIEL DUKE THOMPSON
122541
LICENSED PROFESSIONAL ENGINEER

Daniel Duke Thompson

The seal appearing on this document was authorized by DANIEL THOMPSON, P.E. 122541 on 05/10 ,2023 . Alteration of a sealed document without proper notification to the responsible engineer is an offense under the Texas Engineering Practice Act.

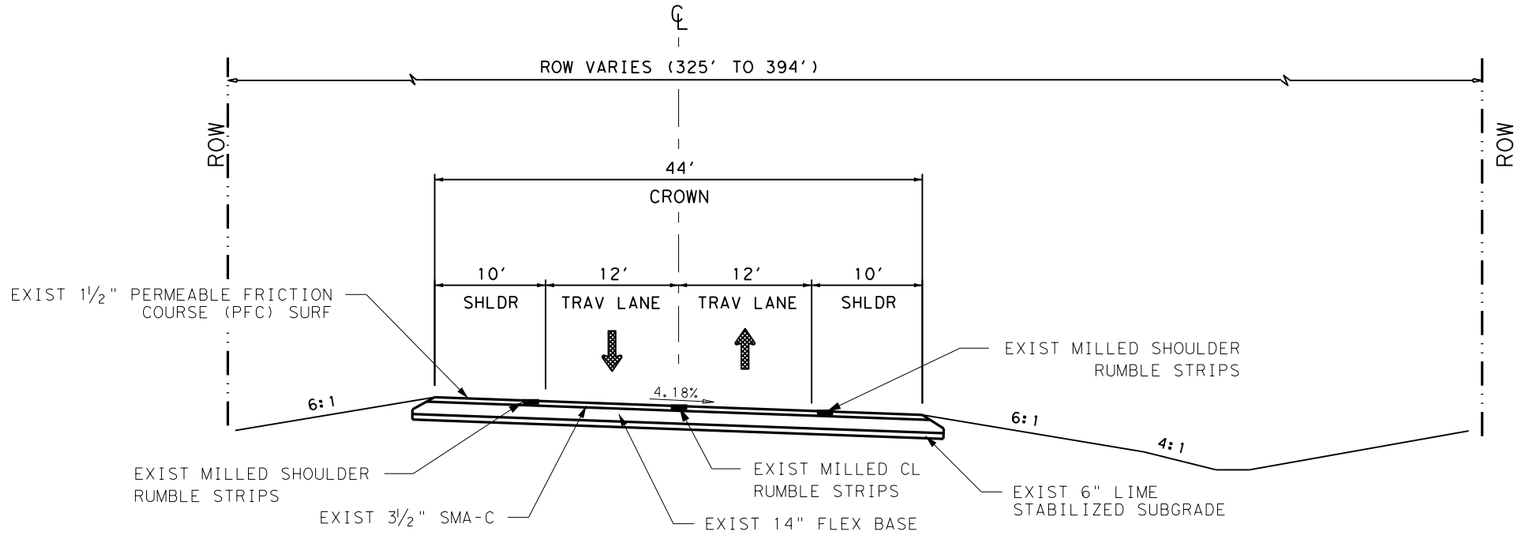
TYPICAL SECTIONS

Texas Department of Transportation

SCALE NTS

SHEET 4 OF 9

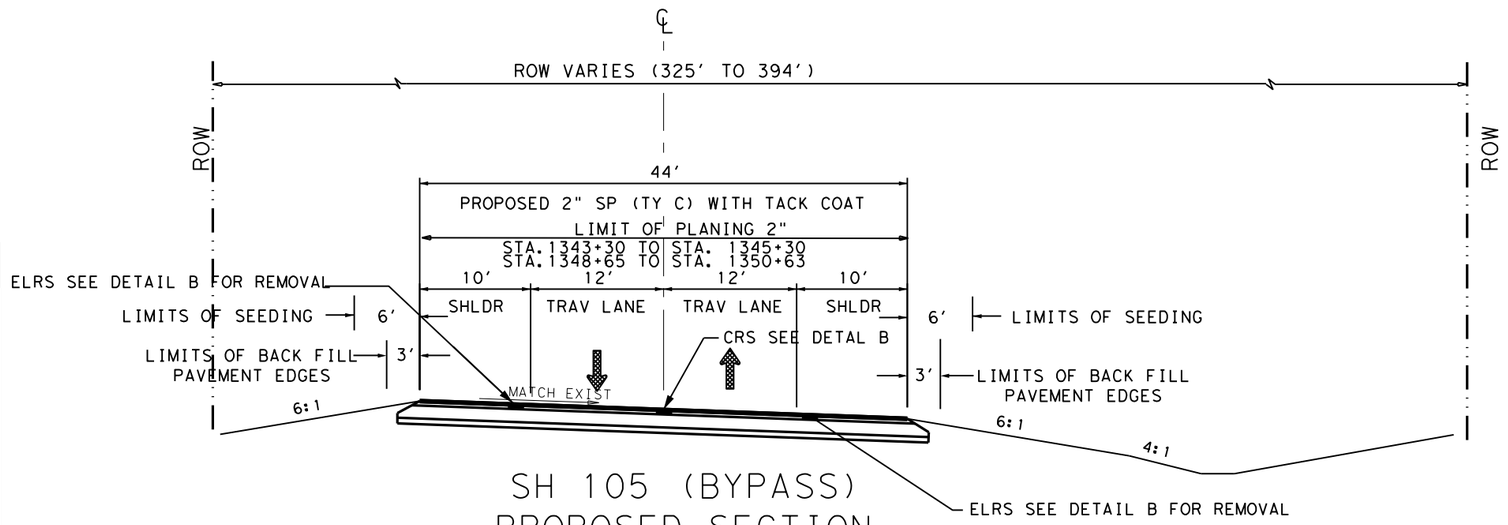
FED. RD. DIV. NO.			SHEET NO.
6			7
STATE	DIST.	COUNTY	
TEXAS	BMT	LIBERTY	
CONT.	SECT.	JOB	HIGHWAY NO.
6414	53	001	BS105T, ETC



SH 105 (BYPASS)
EXISTING SECTION

STA 1332+26 TO STA 1345+83
STA 1348+43 TO STA 1373+26

EDGE LINE RUMBLE STRIPS (ERLS), TO BE REMOVED AND REPLACED WITH RAISED PROFILE PAV. MRKR.

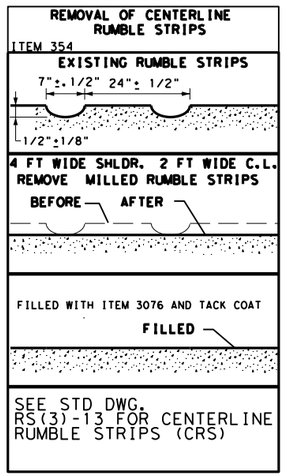


SH 105 (BYPASS)
PROPOSED SECTION

STA 1332+26 TO STA 1345+83
STA 1348+43 TO STA 1373+26

BRIDGE EXCEPTION: STA 1345+83 TO STA 1348+43
(STRIPING ONLY)

DETAIL B



STATE OF TEXAS
DANIEL DUKE THOMPSON
122541
LICENSED PROFESSIONAL ENGINEER

Daniel Duke Thompson

The seal appearing on this document was authorized by DANIEL THOMPSON, P.E. 122541 on 05/10 ,2023 . Alteration of a sealed document without proper notification to the responsible engineer is an offense under the Texas Engineering Practice Act.

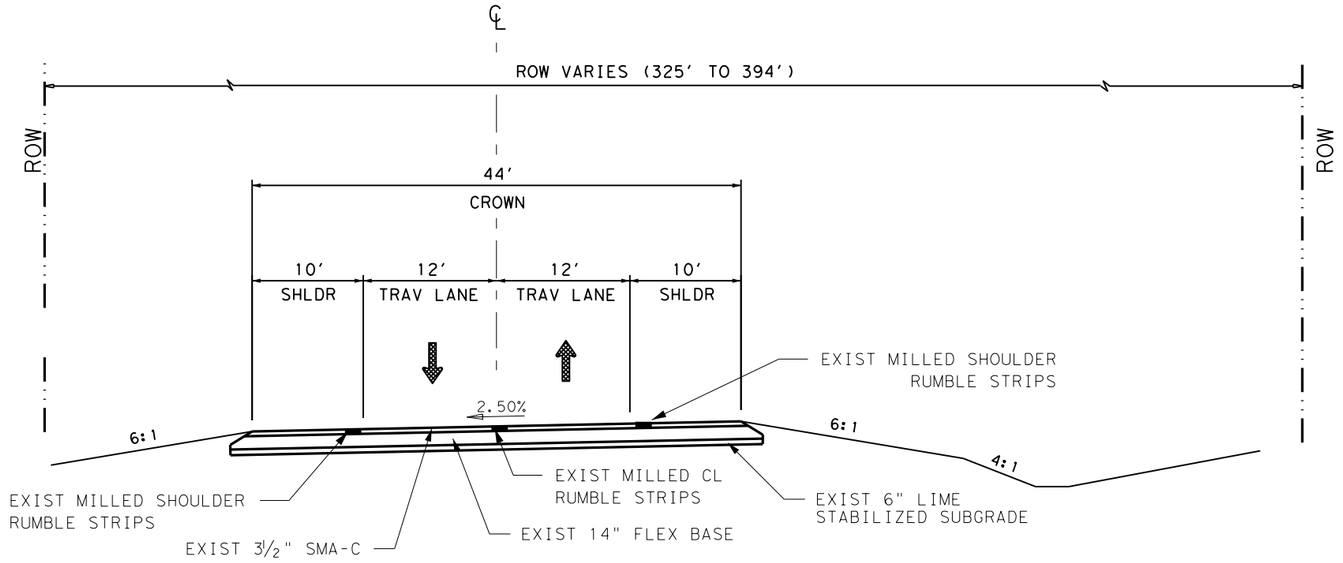
TYPICAL SECTIONS

Texas Department of Transportation

SCALE NTS

SHEET 5 OF 9

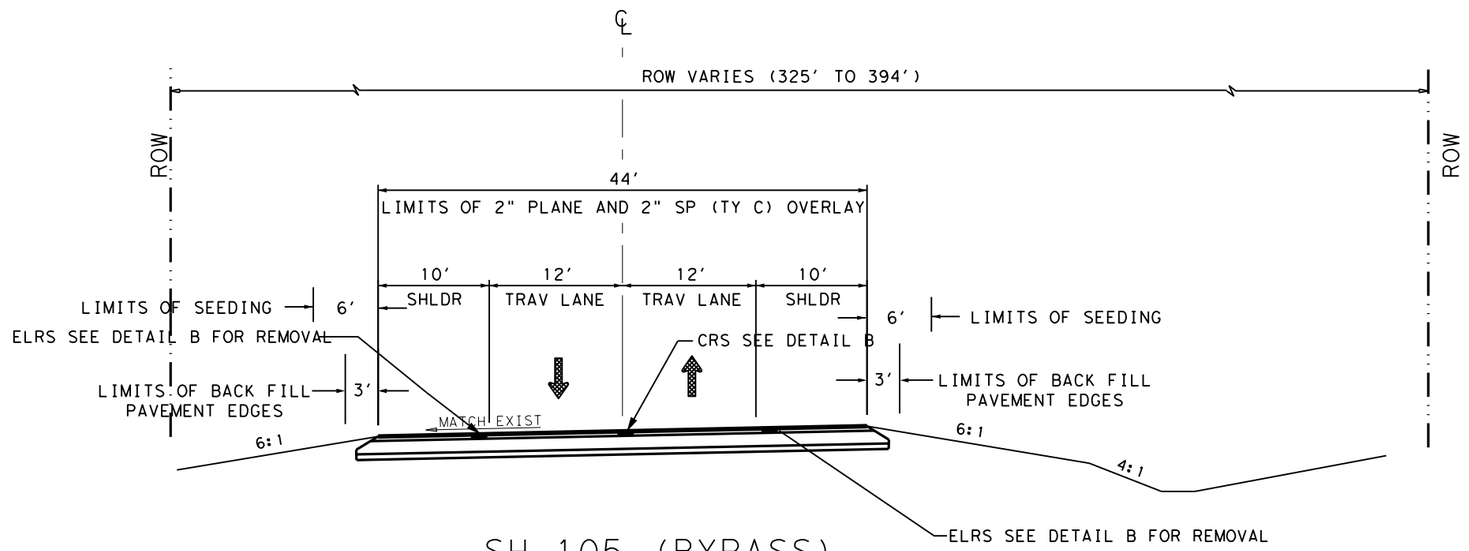
FED. RD. DIV. NO.			SHEET NO.
6			8
STATE	DIST.	COUNTY	
TEXAS	BMT	LIBERTY	
CONT.	SECT.	JOB	HIGHWAY NO.
6414	53	001	BS105T, ETC



SH 105 (BYPASS)
EXISTING SECTION

STA 1373+26 TO STA 1385+95

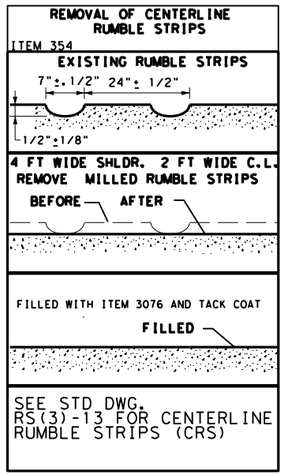
EDGE LINE RUMBLE STRIPS (ERLS), TO BE REMOVED AND REPLACED WITH RAISED PROFILE PAV. MRKR.



SH 105 (BYPASS)
PROPOSED SECTION

STA 1373+26 TO STA 1385+95

DETAIL B



STATE OF TEXAS
DANIEL DUKE THOMPSON
122541
LICENSED
PROFESSIONAL ENGINEER
Daniel Duke Thompson

The seal appearing on this document was authorized by DANIEL THOMPSON, P.E. 122541 on 05/10 ,2023 . Alteration of a sealed document without proper notification to the responsible engineer is an offense under the Texas Engineering Practice Act.

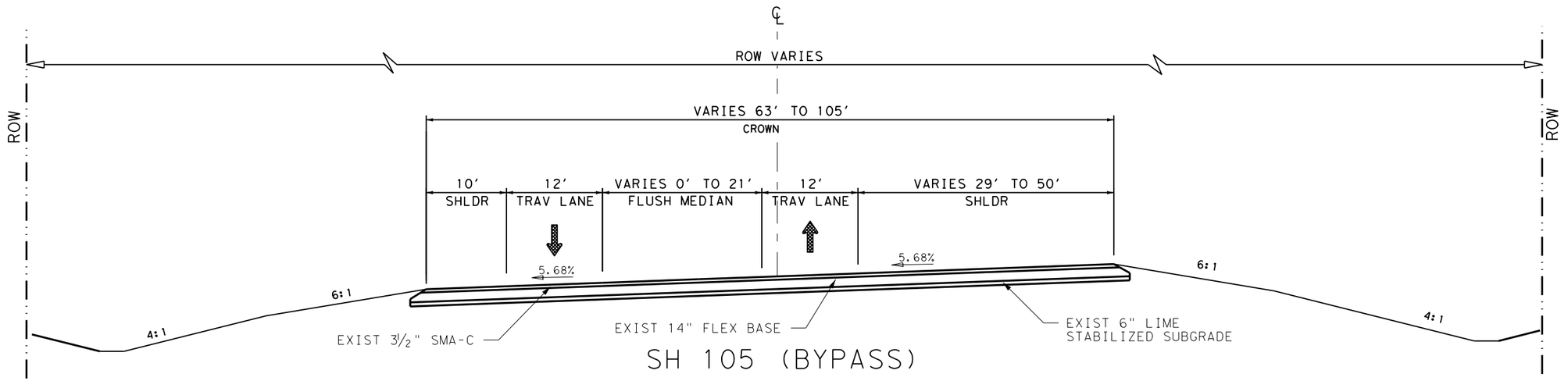
TYPICAL SECTIONS

SCALE NTS

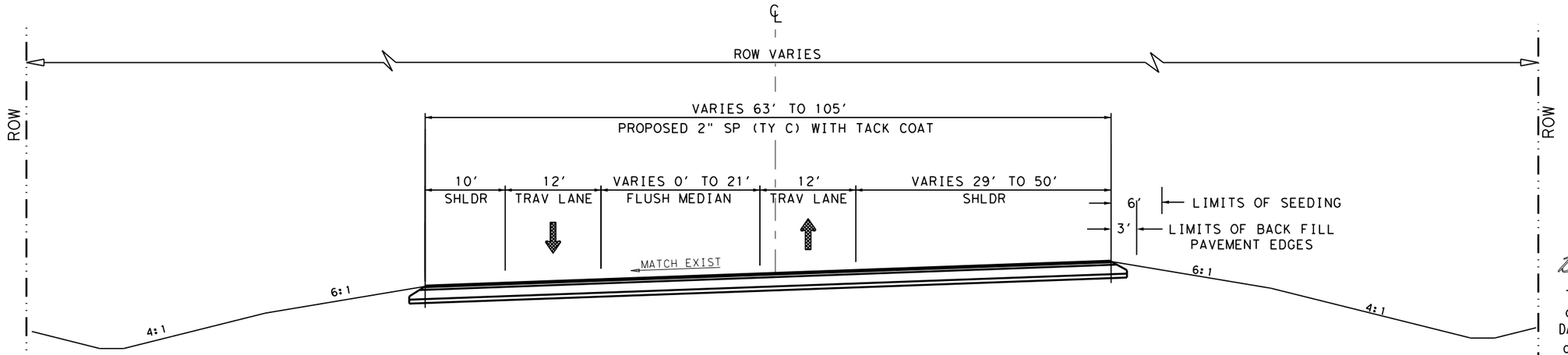
Texas Department of Transportation

SHEET 6 OF 9

FED. RD. DIV. NO.			SHEET NO.
6			9
STATE	DIST.	COUNTY	
TEXAS	BMT	LIBERTY	
CONT.	SECT.	JOB	HIGHWAY NO.
6414	53	001	BS105T, ETC



SH 105 (BYPASS)
EXISTING SECTION
STA 1386+95 TO STA 1392+10



SH 105 (BYPASS)
PROPOSED SECTION
STA 1386+95 TO STA 1392+10

BEGIN 0"-2" PLANNING FROM STA. 1392+03 TO STA. 1394+13

STATE OF TEXAS
DANIEL DUKE THOMPSON
122541
LICENSED PROFESSIONAL ENGINEER

Daniel Duke Thompson

The seal appearing on this document was authorized by DANIEL THOMPSON, P.E. 122541 on 05/10 ,2023 . Alteration of a sealed document without proper notification to the responsible engineer is an offense under the Texas Engineering Practice Act.

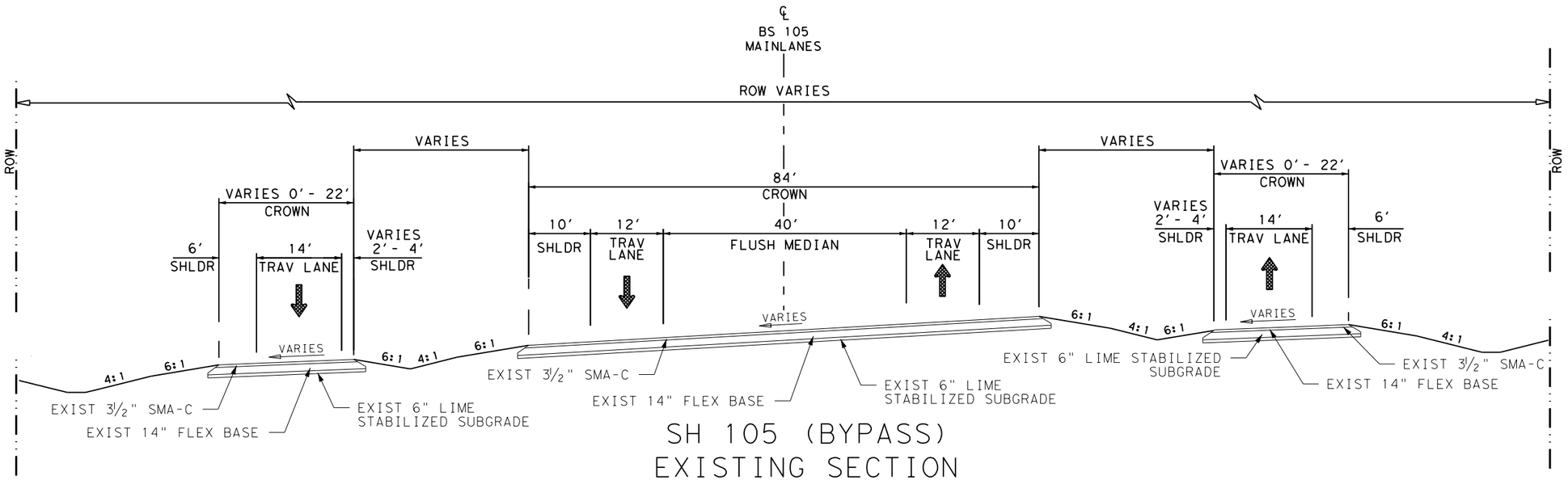
TYPICAL SECTIONS

Texas Department of Transportation

SCALE NTS

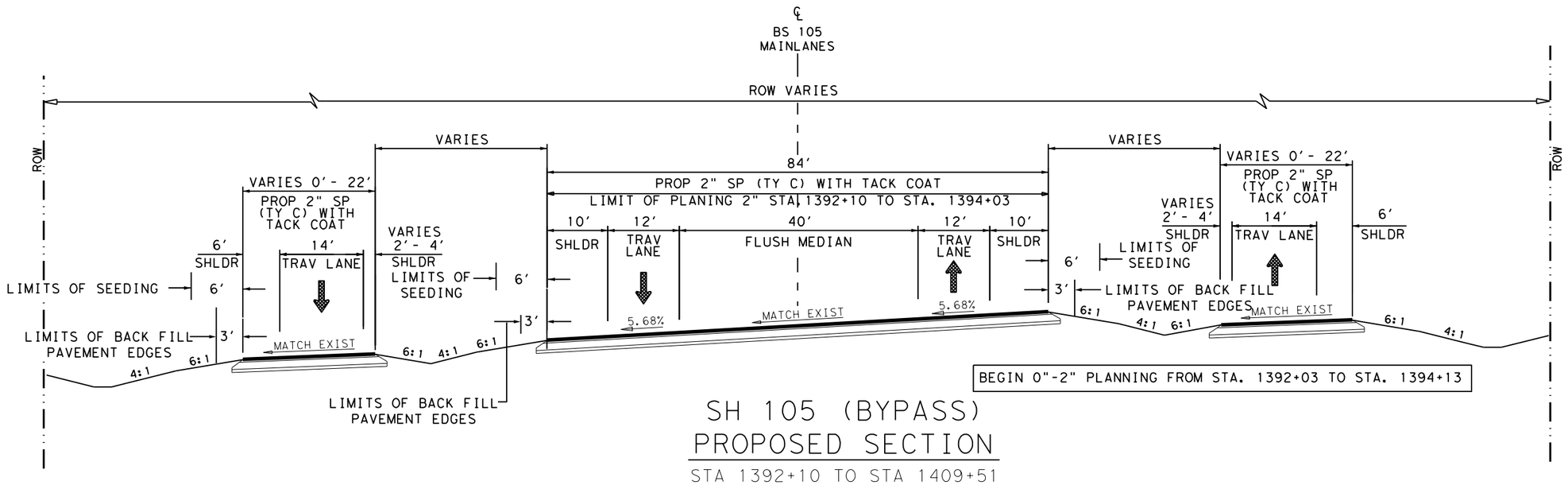
SHEET 7 OF 9

FED. RD. DIV. NO.			SHEET NO.
6			10
STATE	DIST.	COUNTY	
TEXAS	BMT	LIBERTY	
CONT.	SECT.	JOB	HIGHWAY NO.
6414	53	001	BS105T, ETC



SH 105 (BYPASS)
EXISTING SECTION

STA 1392+10 TO STA 1409+51



BEGIN 0"-2" PLANNING FROM STA. 1392+03 TO STA. 1394+13

SH 105 (BYPASS)
PROPOSED SECTION

STA 1392+10 TO STA 1409+51

BRIDGE (STRIPING ONLY)
STA 1394+09 TO STA 1409+51

STATE OF TEXAS
DANIEL DUKE THOMPSON
122541
LICENSED
PROFESSIONAL ENGINEER

Daniel Duke Thompson

The seal appearing on this document was authorized by DANIEL THOMPSON, P.E. 122541 on 05/10 ,2023 . Alteration of a sealed document without proper notification to the responsible engineer is an offense under the Texas Engineering Practice Act.

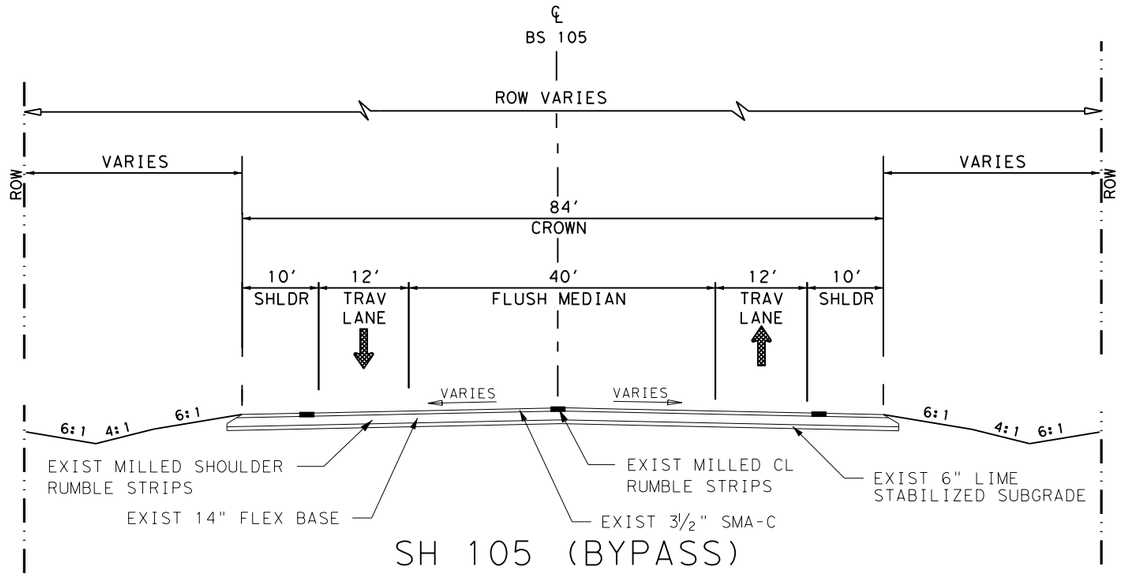
TYPICAL SECTIONS

Texas Department of Transportation

SCALE NTS

SHEET 8 OF 9

FED. RD. DIV. NO.			SHEET NO.
6			11
STATE	DIST.	COUNTY	
TEXAS	BMT	LIBERTY	
CONT.	SECT.	JOB	HIGHWAY NO.
6414	53	001	BS105T, ETC

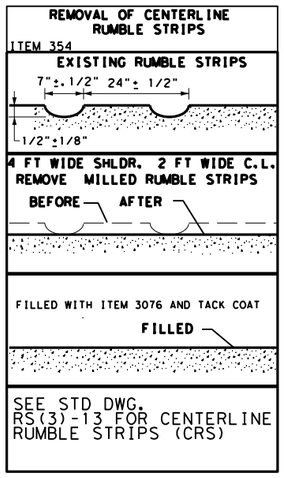


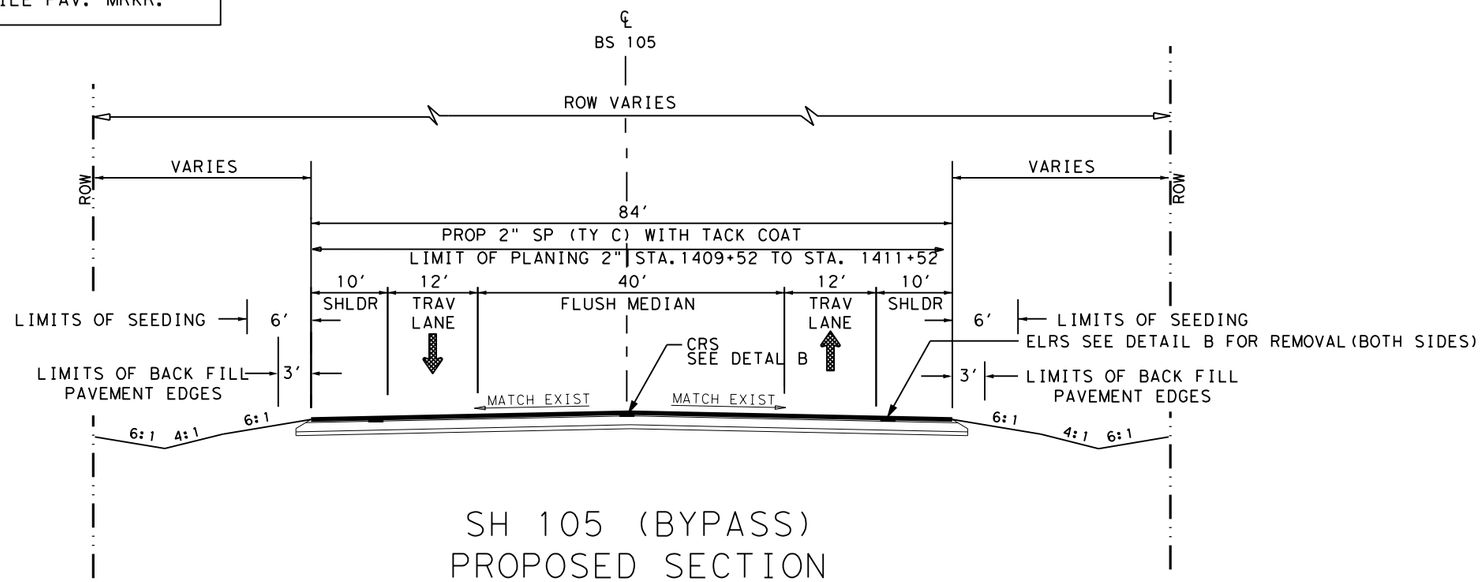
SH 105 (BYPASS)
EXISTING SECTION

STA 1409+51 TO STA 1427+52

EDGE LINE RUMBLE STRIPS (ERLS), TO BE REMOVED AND REPLACED WITH RAISED PROFILE PAV. MRKR.

DETAIL B





SH 105 (BYPASS)
PROPOSED SECTION

STA 1409+51 TO STA 1430+02

BRIDGE

1416+32 TO 1419+72 (STRIPING ONLY)

STATE OF TEXAS
DANIEL DUKE THOMPSON
122541
LICENSED
PROFESSIONAL ENGINEER

Daniel Duke Thompson

The seal appearing on this document was authorized by DANIEL THOMPSON, P.E. 122541 on 05/10 ,2023 . Alteration of a sealed document without proper notification to the responsible engineer is an offense under the Texas Engineering Practice Act.

TYPICAL SECTIONS

Texas Department of Transportation

SCALE NTS

SHEET 9 OF 9

FED.RD. DIV.NO.			SHEET NO.
6			12
STATE	DIST.	COUNTY	
TEXAS	BMT	LIBERTY	
CONT.	SECT.	JOB	HIGHWAY NO.
6414	53	001	BS105T, ETC

General:

This project includes plans, which are not part of the bid proposal. Plans may be viewed online or downloaded from the website at:

http://www.txdot.gov/business/contractors_consultants/plans_online.htm

Plans may be ordered from any of the plan reproduction companies shown on the web at:

http://www.txdot.gov/business/contractors_consultants/repro_companies.htm

Contractor questions on this project are to be addressed to the following individuals:

Email Roberto.Rodriguez@txdot.gov
Name Roberto Rodriguez, P.E.

Email Nyemb.Nyemb@txdot.gov
Name Nyemb Nyemb, P.E.

Questions may be submitted via the Letting Pre-Bid Q&A web page. This webpage can be accessed from the Notice to Contractors dashboard located at the following Address:

https://tableau.txdot.gov/views/ProjectInformationDashboard/NoticetoContractors

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

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

Prior to beginning work, the Contractor is required to attend a preconstruction meeting in the office of the Liberty Area Engineer located at 209 Layl Drive.

The Contractor will notify the Engineer or TxDOT representative by 8:15 A.M. of that working day if no work is to be performed during that day.

Arrange work so that no machinery or equipment will be closer than 30 feet to the roadway after sunset unless authorized.

Work on this Contract is not to be considered complete until the Contractor receives written notification from the Area Engineer. Contractor will not demobilize from project until this written notification has been presented. Oral notification will not constitute official notification that work is complete.

Item 5: Control of the Work

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

Item 6: Control of Materials

Flammable/combustible materials must be stored at a designated location as approved.
Do not store flammable/combustible materials under or adjacent to Bridge class structures. Daily removal of these materials will be considered incidental work.

Item 7: Legal Relations and Responsibilities

The Contractor will comply with all ordinances and regulations of local, municipal, and county governments as well as the Texas Natural Resources Conservation Commission/Texas Commission on Environmental Quality which may be applicable to this Contract.

Protect all areas of the Right of Way which are not included in the actual limits of the proposed construction areas from destruction. Restore any damaged areas to as good or better. No payment will be made for this work.

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

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

Notify the Engineer immediately if the standard traffic control plans do not adequately cover the proposed repair. The Engineer will develop additional traffic control details to cover these specific locations. Any additional cost incurred by the Contractor will be paid for in accordance with Article 9.7, “Payment for Extra Work and Force Account Method”.

Item 8 Prosecution and Progress

Law enforcement will be considered for this Contract under the following conditions unless otherwise directed:

- Traffic shifts at intersections where unexpected or sudden queuing is anticipated;

Provide one full-time off-duty uniformed officer, with transportation jurisdiction and full police powers in the county or city in which the project is located, during construction as directed. The officers must be able to show proof of certification by the Texas Commission on Law

Enforcement Officers Standards. Coordinate with local law enforcement and arrange for law enforcement as directed or agreed. Complete the daily tracking form 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. Peace Officer will be paid by force account, and must be approved.

The vehicle used must be a marked law enforcement vehicle in the city or county where the project is located.

There will be no lane closures during major holidays as directed.

Unless otherwise directed, all work will be performed during the daytime hours as per Section 8.3.1.4, Standard Workweek as defined in the Standard Specifications for Construction and Maintenance of Highways, Streets, and Bridges.

Submit a schedule of the proposed work to the Area Engineer at the preconstruction meeting. If at any time during the Contract the work progress is behind the initial schedule, submit documentation indicating how the project will be accelerated to ensure project completion in the remaining Contract time.

The Contractor will be responsible for making all arrangements for equipment and storage areas. No storage of equipment and materials will be permitted at Maintenance Section yards, District Office, or highway right of way.

The Contractor must maintain a fluent English-Speaking person or have an answering system to answer the telephone between the hours of 8:00 am and 5:00 pm Monday through Friday. It is the Contractor's responsibility to keep the Engineer notified of the correct telephone number.

Ensure enough workers, equipment and materials are available to continuously and diligently prosecute the work to conclusion. Not enough resources resulting in poor performance may be grounds for default.

Adjoining projects may be in progress during the construction of a portion of this project. Plan and prosecute the sequence of construction and the traffic control plan with adjacent construction projects, if applicable. Manage construction of all phases to minimize disruption to traffic.

Schedule work such that all traffic lanes are open at the end of each defined work day.

No work will begin on this project before September 1, 2023, unless otherwise directed.

HURRICANE

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

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

Item 110 Excavation

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

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

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

Item 132 Embankment

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

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

Embankment Type C will conform to the following specification requirements:

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

Item 134: Backfilling Pavement Edges

Embankment quantity by station includes both sides of the roadway. As base is placed for repairs, backfill the pavement edges daily so that no drop-off conditions exist.

Furnish Type A or B material. Excavated material from base repairs can be used.

Item 351: Flexible Pavement Structure Repair

Minimum patch sizes will be one full lane in width and 10' in length.

Provide Flexible Pavement Repair with Item 3076, Type B (PG 64-22) unless approved otherwise. Place Hot Mix with a constant longitudinal surface grade and tie in flush with the existing surface at each end and both sides of the repair area.

Match the existing cross slope in the repair areas, unless directed otherwise.

All repair locations must be filled the same day they are excavated. No open cut areas will be allowed overnight.

All excavated materials will be removed from the project daily.

Ordinary compaction will be used on this project.

Station limits may be adjusted as directed to meet varying field conditions

The Contractor will repair locations as shown on the plans.

Item 354: Planing and Texturing Pavement

Where the underlying flexible base is exposed during the planing operation, prime this area with an asphalt at a rate as directed and patch with an approved HMA material, at the end of the day's operation in which it occurs. These items of work will not be paid for directly but will be subsidiary to Item 354.

Contact Area Engineer for location of stockpile location.

Item 480: Cleaning Existing Culverts

Material removed from culverts will become property of the Contractor and must be disposed off of State ROW. Disposal of material will be subsidiary to Item 480.

Use high pressure water/water jetting method that will not damage the pipe or safety end treatment.

Item 502: Barricades, Signs, and Traffic Handling

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

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

Provide all flaggers and pilot vehicle drivers with two-way radio communication capability. Provide flaggers at each side road intersection.

Provide Type "C" flashing arrow panel to be used in connection with the lane closure signing. Furnishing, maintaining, and operating these devices in a manner acceptable to the Engineer will be at the Contractor's expense.

Item 504: Field Office and Laboratory

Provide Type B Structure Laboratory Field Office for Asphalt Testing.

Furnish and install adequate equipment, outlets, lighting, air-conditioning, heating, and ventilation. Provide partitioned restroom furnished with restroom supplies, a lavatory, and a flush toilet connected to a sewer or septic tank.

Additional required appurtenances:

1. Additional workbench and tables at least 3 ft. wide, 6 ft. long, and 3 ft. high.
2. Minimum two chairs and one desk, filing cabinets, solar screen blinds or shades.
3. An operational telephone system.
4. Water fountain or bottled water fountain able to provide cold water and have cup dispenser and cups.
5. Use an internet service provider (ISP) that can provide more than one computer access to ISP account at one time. ISP provider must be able to supply a minimum 100 gigabyte download speed per account.
6. Adequately power ventilate the room for the ignition oven. Provide a NEMA 6-50R (208/240-volt, 50 amp) outlet within 2.25 ft. of the ignition oven location and an independent exhaust outlet to the outside.
7. located a maximum of 8 ft. from the oven. Provide a level, sturdy and fireproof surface for the ignition oven with a minimum of 6 in. clearance between the furnace and other vertical surfaces.

8. Door openings must be 48-inches minimum width. If steps are required to gain access to the facility's 48-inch doors provide a landing dock with minimum dimension of 60 inches wide by 60 inches deep. The strong floor and landing of the facility will support the weight of all equipment and personnel providing a stable, essentially zero deflection during testing operations, acceptable to the Engineer.
9. Shared SuperPave Gyratory Compactor will be furnished to the Engineer under the asphalt concrete pavement.

Item 506: Temporary Erosion, Sedimentation, and Environmental Controls

It is not anticipated that any erosion, sedimentation, or environmental control devices will be need on this project. The SW3P for this project will consist of the use of any temporary erosion control measures deemed necessary and as specified under this Item. This work will be paid for in accordance with Article 9.7., "Payment for Extra Work and Force Account Method."

Item 533: Rumble Strips

A self-propelled milling machine capable of creating uniform rumble strips is required. Use of trailer mounted grinding equipment will not be allowed.

Item 540 Metal Beam Guard Fence

Provide Type II galvanization metal beam rail elements.

Provide round timber posts.

Provide timber posts on all metal beam guard fence installations except where CRT low-fill culvert posts are required in accordance with details shown on the Long Span Metal Beam Guard Fence standard sheet.

Field fabricate low-fill culvert posts to insure proper metal beam guard fence height.

Item 585: Ride Quality for Pavement Surfaces

Use Surface Test Type B – Schedule 3 to evaluate ride quality of "Ride Quality for Pavement Surfaces."

Item 658: Delineator and Object Marker Assemblies

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

Install delineators when directed. This may require installation of delineators on portions of guardrail and bridge rail that is not being repaired in order to maintain consistency with adjacent sections.

MBGF will receive GF2 delineators installed on 100' maximum spacing.

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

Item 666: Reflectorized Pavement Markings

Furnish Type II drop-on glass beads.

The Contractor will furnish the Engineer a sketch showing existing pavement marking configuration prior to beginning the work. The Contractor will match existing configuration unless otherwise directed.

Item 760: Ditch Cleaning and Reshaping

Clean all and reshape ditches.

Restrict work to one side of the roadway at a time.

Transition the ditch grades and channel bottom widths at structure locations.

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

Item 3076 Dens Graded Hot Mix Asphalt

Prepare Mix Designs and QC testing using the Superpave Gyratory compactor.

To be used for rumble strip fill.

Item 3077: Superpave Mixtures

Provide mix designs. Mix designs must be verified and approved.

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

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

Do not place longitudinal joints in the wheel path.

If RAP is used, aggregate must meet the requirements of Table 1, Item 3077 of the Special Specification.

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

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

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

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

Item 6001: Portable Changeable Message Sign

Portable changeable message signs (PCMS) will be required while work is taking place.

Message on the sign will be as specified on BC(6)-21, Provide screen type "Continuous Line Matrix".

More than one PCMS may be required on this project. Payment for PCMS's will be per day.

When possible, PCMS units should be located in advance of the last available alternate route before lane closure. They may also be relocated to improve advance warning in case of unanticipated queuing or congestion.

Item 6185. Truck Mounted Attenuators (TMA)

Provide shadow vehicles with Certified Truck Mounted Attenuators (TMA) for lane closures during construction.

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

In addition to the shadow vehicles with TMA that are specified as being required on the traffic control plan for this project, provide one additional shadow vehicle with TMA for paving operations and one for striping operations.

The Contractor will use the same additional TMA for both of these operations.

Estimate & Quantity Sheet

CONTROLLING PROJECT ID 6414-53-001 **DISTRICT** Beaumont **COUNTY** Liberty
HIGHWAY BS 105T

						TOTAL EST.	TOTAL FINAL
		CONTROL SECTION JOB		**6414-53-001**			
		PROJECT ID		**A00190127**			
		COUNTY		**Liberty**			
		HIGHWAY		**BS 105T, ETC**			
ALT	**BID CODE**	**DESCRIPTION**	**UNIT**	EST.	FINAL		
	110-6002	EXCAVATION (CHANNEL)	CY	210.000		210.000	
	132-6003	EMBANKMENT (FINAL)(ORD COMP)(TY B)	CY	190.000		190.000	
	134-6004	BACKFILL (TY A OR B)	STA	148.000		148.000	
	158-6003	SPEC EXCAV WORK (HYD EXCAVATOR)	HR	40.000		40.000	
	164-6009	BROADCAST SEED (TEMP) (WARM)	SY	24,764.000		24,764.000	
	168-6001	VEGETATIVE WATERING	MG	35.000		35.000	
	351-6004	FLEXIBLE PAVEMENT STRUCTURE REPAIR(8")	SY	450.000		450.000	
	354-6021	PLANE ASPH CONC PAV(0" TO 2")	SY	16,712.000		16,712.000	
	354-6043	PLANE ASPH CONC PAV (1")	SY	13,154.000		13,154.000	
	432-6024	RIPRAP (STONE COMMON)(DRY)(12 IN)	CY	110.000		110.000	
	432-6026	RIPRAP (STONE COMMON)(DRY)(18 IN)	CY	200.000		200.000	
	432-6027	RIPRAP (STONE COMMON)(DRY)(24 IN)	CY	475.000		475.000	
	432-6045	RIPRAP (MOW STRIP)(4 IN)	CY	43.000		107.000	
	432-6060	RIPRAP (STONE TY R)(GROUT)(24 IN)	CY	240.000		240.000	
	459-6009	GABIONS (3' X 3')(GALV)	CY	127.000		127.000	
	459-6011	GABIONS (5'X 3')(GALV)	CY	324.000		324.000	
	480-6001	CLEAN EXIST CULVERTS	EA	3.000		3.000	
	500-6001	MOBILIZATION	LS	1.000		1.000	
	502-6001	BARRICADES, SIGNS AND TRAFFIC HANDLING	MO	3.000		3.000	
	506-6001	ROCK FILTER DAMS (INSTALL) (TY 1)	LF	10.000		10.000	
	506-6002	ROCK FILTER DAMS (INSTALL) (TY 2)	LF	80.000		80.000	
	506-6011	ROCK FILTER DAMS (REMOVE)	LF	90.000		90.000	
	506-6037	SANDBAGS FOR EROSION CONTROL (12")	LF	480.000		480.000	
	530-6005	DRIVEWAYS (ACP)	SY	2,149.000		2,149.000	
	533-6002	RUMBLE STRIPS (CENTERLINE)	LF	10,849.000		10,849.000	
	540-6001	MTL W-BEAM GD FEN (TIM POST)	LF	725.000		675.000	
	540-6042	TL-3 31" SHORT RADIUS (END ANCHOR)	EA	2.000		1.000	
	544-6001	GUARDRAIL END TREATMENT (INSTALL)	EA	3.000		3.000	
	644-6009	IN SM RD SN SUP&AM TY10BWG(1)SB(P)	EA	44.000		44.000	
	644-6039	IN SM RD SN SUP&AM TYS80(1)SB(P)	EA	4.000		4.000	
	644-6044	IN SM RD SN SUP&AM TYS80(1)SB(U)	EA	7.000		7.000	
	658-6062	INSTL DEL ASSM (D-SW)SZ 1(BRF)GF2(BI)	EA	20.000		18.000	
	662-6008	WK ZN PAV MRK NON-REMOV (W)6"(SLD)	LF	5,510.000		5,510.000	
	662-6017	WK ZN PAV MRK NON-REMOV (W)(ARROW)	EA	4.000		4.000	
	662-6035	WK ZN PAV MRK NON-REMOV (Y)6"(BRK)	LF	1,360.000		1,360.000	
	662-6037	WK ZN PAV MRK NON-REMOV (Y)6"(SLD)	LF	22,220.000		22,220.000	
	662-6041	WK ZN PAV MRK NON-REMOV (Y)24"(SLD)	LF	48.000		48.000	

Estimate & Quantity Sheet

CONTROLLING PROJECT ID 6414-53-001 **DISTRICT** Beaumont **COUNTY** Liberty
HIGHWAY BS 105T

						TOTAL EST.	TOTAL FINAL
		CONTROL SECTION JOB		**6414-53-001**			
		PROJECT ID		**A00190127**			
		COUNTY		**Liberty**			
		HIGHWAY		**BS 105T, ETC**			
ALT	**BID CODE**	**DESCRIPTION**	**UNIT**	EST.	FINAL		
	666-6035	REFL PAV MRK TY I (W)8"(SLD)(090MIL)	LF	1,810.000		1,810.000	
	666-6225	PAVEMENT SEALER 6"	LF	12,008.000		12,008.000	
	666-6285	REF PROF PAV MRK TY I(W)6"(SLD)(090MIL)	LF	43,034.000		43,034.000	
	666-6317	RE PM W/RET REQ TY I (Y)6"(BRK)(090MIL)	LF	1,359.000		1,359.000	
	666-6320	RE PM W/RET REQ TY I (Y)6"(SLD)(090MIL)	LF	40,043.000		40,043.000	
	668-6076	PREFAB PAV MRK TY C (W) (24") (SLD)	LF	104.000		104.000	
	668-6077	PREFAB PAV MRK TY C (W) (ARROW)	EA	7.000		7.000	
	668-6085	PREFAB PAV MRK TY C (W) (WORD)	EA	10.000		10.000	
	668-6092	PREFAB PAV MRK TY C (W) (36")(YLD TRI)	EA	10.000		10.000	
	668-6106	PREFAB PAV MRK TY C (Y) (12") (SLD)	LF	115.000		115.000	
	668-6108	PREFAB PAV MRK TY C (Y) (24") (SLD)	LF	104.000		104.000	
	672-6007	REFL PAV MRKR TY I-C	EA	122.000		122.000	
	672-6009	REFL PAV MRKR TY II-A-A	EA	771.000		771.000	
	677-6001	ELIM EXT PAV MRK & MRKS (4")	LF	12,008.000		12,008.000	
	760-6001	DITCH CLEANING AND RESHAPING (FOOT)	LF	10,796.000		10,796.000	
	2005-6001	FILTER FABRIC (TY 2)	SY	850.000		850.000	
	3076-6035	D-GR HMA TY-D PG64-22	TON	738.000		738.000	
	3076-6066	TACK COAT	GAL	546.000		546.000	
	3077-6033	SP MIXESSP-CSAC-A PG76-22	TON	13,584.000		13,584.000	
	3077-6075	TACK COAT	GAL	8,415.000		8,415.000	
	6001-6001	PORTABLE CHANGEABLE MESSAGE SIGN	DAY	200.000		309.000	
	6185-6002	TMA (STATIONARY)	DAY	100.000		100.000	
	6185-6005	TMA (MOBILE OPERATION)	DAY	11.000		11.000	

ROADWAY	STATION			LENGTH	AVERAGE PAVEMENT WIDTH	SURFACE AREA		110	132	134	164	168	351	354	354	530	533
								6002	6003	6004	6009	6001	6004	6021	6043	6005	6002
								CHANNEL EXCAVATION	EMBANKMENT (FINAL(ORD COMP)(TYB)	BACKFILL (TY A OR B)	BROADCAST SEED (TEMP) (WARM)	VEGETATIVE WATERING (1.4 GAL/SY)	FLEXIBLE PAVEMENT STRUCTURE REPAIR(8")	PLANE ASPH CONC PAV (0" TO 2")	PLANE ASPH CONC PAV (1")	DRIVEWAYS (ACP)	RUMBLE STRIPS (CENTERLINE)
BASIS OF ESTIMATE								.				6.788 MG/AC					
BS 105-T BUSINESS	UNIT OF MEASURE			LF	LF	SY		CY	CY	STA	SY	MG	SY	SY	SY	SY	LF
	11+67	TO	25+32	1365	56	8493		0		14	4450	6.2	106	2565	0	0	0
	25+32	TO	99+62	7430	44	36324		0		74	10667	14.933	53	981	6528	1533	5876
	99+62	TO	110+82	1120	44	5476		60		0	0	0	0	0	0	0	0
	110+82	TO	118+81	799	46	4084		0		8	61	0.086	0	2160	0	616	0
	118+81	TO	119+43	62	60	413		0		0	0	0.000	0	0	0	0	0
	1319+33	TO	1320+21	88	68	665		0		15	0	0.000	0	725	0	0	0
						TOTAL		60	0	111	15178	21	159	6431	6528	2149	5876
SH 105-T BYPASS	1320+21	TO	1332+23	1284	55	7847		0		13	1790	2.506			0	0	0
	1332+23	TO	1345+30	1307	44	6390		0		0	1743	2.440		821	1389	0	1096
	1345+30	TO	1348+63	333	44	1628		0		0	0	0.000		0	0	0	0
	1348+63	TO	1385+78	3715	44	18162		0		0	4953	6.935	291	973	4456	0	3515
	1385+78	TO	1394+03	825	86	7883		10	110	8	1100	1.540		960	0	0	362
	1394+03	TO	1409+52	1539	110	18810		90	80	0	0	0.000	0	1954	0	0	0
	1409+52	TO	1416+37	685	84	6393		50		7	0	0.000		1874	352	0	0
	1416+37	TO	1419+70	333	84	3108		0		0	0	0.000	0	0	0	0	0
	1419+70	TO	1427+52	782	84	7299				8	0	0.000		3699	430	0	0
							TOTAL	150	190	37	9586	13	291	10281	6626	0	4973
							GRAND TOTAL	210	190	148	24764	35	450	16712	13154	2149	10849

ROADWAY ITEMS CON'T

ROADWAY	STATION			LENGTH	AVERAGE PAVEMENT WIDTH	SURFACE AREA	658	3076	3076	3077	3077	6001	6185	6185
							6062	6035	6066	6033	6075	6001	6002	6005
							INST DEL ASSM (D-SW)SZ 1(BRF) GF2(BI)	D-GR HMA TY-D PG64-22	TACK CPAT	SP MIXES SP-C SAC-A PG76-22	TACK COAT	PORTABLE CHANGEABLE MESSAGE SIGN	TMA (STATIONARY)	TMA (MOBIL)
BASIS OF ESTIMATE								113 LBS / SY	.07 GAL/SY	226 LBS / SY	.07 GAL/SY			
BS 105T BUSINESS	UNIT OF MEASURE			LF	LF	SY	EA	TON	GAL	TON	GAL	DAY	DAY	DAY
	11+67	TO	25+32	1365	56	8493				959.7	594.5	100	50	5
	25+32	TO	99+62	7430	44	36612	18.0	369	456.9	4137.2	2562.8			
	99+62	TO	110+82	1120	44	5477		0	0.0	0.0	0.0			
	110+82	TO	118+81	799	46	4085			0.0	461.6	286.0			
	118+81	TO	119+43	62	60	413		0	0.0	0.0	0.0			
	1319+33	TO	1320+21	88	68	1519		0	0.0	171.6	106.3			
						TOTAL	18	369	457	5730	3550	100	50	5
SH 105T BYPASS	1320+21	TO	1332+23	1284	55	7847			0	887	549	100	50	6
	1332+23	TO	1345+30	1307	44	6390		78	10	722	447			
	1345+30	TO	1348+63	333	44	1628		0		0	0			
	1348+63	TO	1385+78	3715	44	18162		252	31	2052	1271			
	1385+78	TO	1394+03	825	86	7883		0	0	891	552			
	1394+03	TO	1409+52	1539	110	18810		0	0	2126	1317			
	1409+52	TO	1416+37	685	84	6393		18	22	0	0			
	1416+37	TO	1419+70	333	84	3108		0	0	351	218			
	1419+70	TO	1427+52	782	84	7299		21	26	825	511			
						TOTAL		369	89	7853	4865	100	50	6
						GRAND TOTAL	18	738	546	13584	8415	200	100	11

QUANTITY SUMMARIES

Texas Department of Transportation

SHEET 1 OF 3

FHWA TEXAS DIVISION		SHEET NO.
		20

STATE	DISTRICT	COUNTY	
TEXAS	BMT	LIBERTY	
CONTROL	SECTION	JOB	HIGHWAY NO.
6414	53	001	BS105T, ETC

WORK ZONE PAVEMENT MARKINGS

ROADWAY	STATION			662	662	662	662	662
				6008	6017	6035	6037	6041
				WK ZN PAV MRK NON-REMOV (W)6"(SLD)	WK ZN PAV MRK NON-REMOV ARROW	WK ZN PAV MRK NON-REMOV (Y)6"(BRK)	WK ZN PAV MRK NON-REMOV (Y)6"(SLD)	WK ZN PAV MRK NON-REMOV (W)24"(SLD)
	UNIT OF MEASURE			EA	EA	LF	LF	LF
BS 105-T BUSINESS	11+67	TO	25+32	600	2		500	36
	25+32	TO	99+62	400		1363	4400	12
	99+62	TO	110+82					
	110+82	TO	118+81	800			1250	
	118+81	TO	119+43	1400			120	
	1319+33	TO	1320+21	350			180	
			TOTAL	3550	2	1360	6450	48
SH 105-T BYPASS	1320+21	TO	1332+23	360	2		180	
	1332+23	TO	1345+30	400			3650	
	1345+30	TO	1348+63					
	1348+63	TO	1385+78	400			7430	
	1385+78	TO	1394+03	400			1670	
	1394+03	TO	1409+52					
	1409+52	TO	1416+37				1370	
	1416+37	TO	1419+70				670	
	1419+70	TO	1427+52	400			800	
			TOTAL	1960	2	0	15770	0
			GRAND TOTAL	5510	4	1360	22220	48

METAL BEAM GUARD FENCE

ROADWAY	STATION			432	540	540	540	544	658
				6045	6001	6016	6042	6001	6062
				RIPRAP (MOW STRIP)(4 IN)	MTL W-BEAM GD FEN (TIM POST)	DOWNSTREAM ANCHOR TERMINAL SECTION	TL-3 SHORT RADIUS END ANCHOR	GUARDTAIL END TREATMENT INSTALL	INST DEL ASSM (D-SW)SZ 1(BRF) GF2(BI)
	UNIT OF MEASURE			CY	LF	EA	EA	EA	EA
SH 105T	25+32	TO	99+62	43	725	2	2	3	20
				0	0	0	0	0	0
			TOTAL	43	725	2	2	3	20

EROSION ITEMS

ROADWAY	STATION			158	432	432	432	432	459	459	480	506	506	760	506	760	2005
				6003	6024	6026	6027	6060	6009	6011	6001	6001	6002	6011	6037	6001	6001
				SPEC EXCAV WORK (HYD EXCAVATOR)	RIPRAP (STONE COMMON)(DRY)(12IN)	RIPRAP (STONE COMMON) (DRY) (18IN)	RIPRAP (STONE COMMON) (DRY) (24IN)	RIPRAP (STONE TY R)(GROUT)(24 IN)	GABIONS (3'X3')(GALV)	GABIONS (5'X3')(GALV)	CLEAN EXIST CULVERTS	ROCK FILTER DAMS INSTALL TY 1	ROCK FILTER DAMS INSTALL TY 2	ROCK FILTER DAMS REMOVED	SANDBAGS FOR EROSION CONTROL 12"	DITCH CLEANING AND RESHAPING (FOOT)	FILTER FAB TY 2
	UNIT OF MEASURE			HR	CY	CY	CY	CY	CY	CY	EA	LF	LF	LF	LF	LF	SY
BS 105T BUSINESS	11+67	TO	25+32										40	40		7396	
	25+32	TO	99+62								1		20	20		2600	
	99+62	TO	110+82	16			210		27	47							205
	110+82	TO	118+81														
	118+81	TO	119+43														
	1319+33	TO	1320+21														
			TOTAL	16	0	0	210	0	27	47	1	0	60	60	0	9996	205
SH 105T BYPASS	1320+21	TO	1332+23								2	10	10	20		800	
	1332+23	TO	1345+30														
	1345+30	TO	1348+63														
	1348+63	TO	1385+78														
	1385+78	TO	1394+03		50												40
	1394+03	TO	1409+52	24	60	200	265	100	100	277			10	10	480		605
	1409+52	TO	1416+37														
	1416+37	TO	1419+70														
	1419+70	TO	1427+52														
			TOTALS	24	110	200	265	240	100	277	2	10	20	30	480	800	645
			GRAND TOTAL	40	110	200	475	240	127	324	3	10	80	90	480	10796	850

QUANTITY SUMMARIES

Texas Department of Transportation

FHWA TEXAS DIVISION			SHEET NO. 21
STATE	DISTRICT	COUNTY	
TEXAS	BMT	LIBERTY	
CONTROL	SECTION	JOB	HIGHWAY NO.
6414	53	001	BS105T, ETC

PERMANENT PAVEMENT MARKINGS

ROADWAY	STATION			LENGTH	666					668			
					6035	6225	6285	6317	6320	6076	6077	6085	6092
					REFL PAV MRK TY I (W)8"(SLD)(090MIL)	PAVEMENT SEALER 6"	REF PROF PAVMRK TY I(W)6"(SLD)(090MIL)	RE PM W/RET REQ TY I (Y)6"(BRK)(090 MIL)	RE PM W/RET REQ TY I (Y)6"(SLD)(090 MIL)	PREFAB PAV MRK TY C (W) (24") (SLD)	PREFAB PAV MRK TY C (W) (ARROW)	PREFAB PAV MRK TY C (W) (WORD)	PREFAB PAV MRK TY C (W) (36")(YLD TRI)
BS 105T BUINESS	UNIT OF MEASURE			LF	LF	LF	LF	LF	LF	LF	EA	EA	EA
	11+67	TO	25+32	1365	1220		2538	0	3698	48	3	4	5
	25+32	TO	99+62	7430			14748	1359	5805	0	0	2	0
	99+62	TO	110+82	1120	0	4480	2240	0	2240	0	0	0	0
	110+82	TO	118+81	799	0		1358	0	2246	12	0	0	0
	118+81	TO	119+43	62	0		30	0	278	12	0	0	0
	1319+33	TO	1320+21	88			176	0	686	12	2	2	5
				TOTAL	1220	4480	21090	1359	14953	84	5	8	10
SH 105T BYPASS	1320+21	TO	1332+23	1284	340		2568	0	4290	0	2	2	0
	1332+23	TO	1345+30	1307	0		2614	0	2614	0	0	0	0
	1345+30	TO	1348+63	333	0	1332	666	0	672	0	0	0	0
	1348+63	TO	1385+78	3715	0		7430	0	7416	0	0	0	0
	1385+78	TO	1394+03	825	0		1650	0	2548	0	0	0	0
	1394+03	TO	1409+52	1549	250	6196	3416	0	3954	20	0	0	0
	1409+52	TO	1416+37	685	0		1370	0	1357	0	0	0	0
	1416+37	TO	1419+70	333	0		666	0	681	0	0	0	0
	1419+70	TO	1427+52	782	0		1564	0	1558	0	0	0	0
				TOTAL	590	7528	21944	0	25090	20	2	2	0
				GRAND TOTA	1810	12008	43034	1359	40043	104	7	10	10

PERMANENT PAVEMENT MARKINGS

ROADWAY	STATION			LENGTH	668	668	672	672	677
					6106	6108	6007	6009	6001
					PREFAB PAV MRK TY C (Y) (12") (SLD)	PREFAB PAV MRK TY C (Y) (24") (SLD)	REFL PAV MRKR TY I-C	REFL PAV MRKR TY II-A-A	ELIM EXT PAV MRK & MRKS (4")
BS 105T BUINESS	UNIT OF MEASURE			LF	LF	LF	EA	EA	LF
	11+67	TO	25+32	1365	0		48	164	
	25+32	TO	99+62	7430	0	0	0	33	
	99+62	TO	110+82	1120	0	0	0	28	4480
	110+82	TO	118+81	799	0	0	0	70	
	118+81	TO	119+43	62	0		0	12	
	1319+33	TO	1320+21	88	40	104	14	38	
				TOTAL	40	104	62	345	4480
SH 105T BYPASS	1320+21	TO	1332+23	1284	75		20	207	
	1332+23	TO	1345+30	1307	0	0	0	2	
	1345+30	TO	1348+63	333	0	0	0	0	1332
	1348+63	TO	1385+78	3715	0	0	0	0	
	1385+78	TO	1394+03	825	0	0	0	85	
	1394+03	TO	1409+52	1549	0		40	61	6196
	1409+52	TO	1416+37	685	0		0	27	
	1416+37	TO	1419+70	333	0		0	13	
	1419+70	TO	1427+52	782	0		0	31	
				TOTAL	75	0	60	426	7528
				GRAND TOTA	115	104	122	771	12008

SIGN ITEMS

	644	644	644
	6009	6039	6044
ssoss sheets	IN SM RD SN SUP&AM TY 10BWG(1)SB(P)	IN SM RD SN SUP&AM TY S80(1)SB(P)	IN SM RD SN SUP&AM TY S80(1)SB(U)
SHEET 23	10	1	2
SHEET 24	2	3	4
SHEET 25	10		
SHEET 26	14		1
SHEET 27	8		
TOTAL	44	4	7

QUANTITY SUMMARIES

Texas Department of Transportation

FHWA TEXAS DIVISION			SHEET NO. 22
STATE	DISTRICT	COUNTY	
TEXAS	BMT	LIBERTY	
CONTROL	SECTION	JOB	HIGHWAY NO.
6414	53	001	BS105T, ETC

SUMMARY OF SMALL SIGNS

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

PLAN SHEET NO.	SIGN NO.	SIGN NOMENCLATURE	SIGN	DIMENSIONS	FLAT ALUMINUM (TYPE A)	EXAL ALUMINUM (TYPE G)	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
48	1											
50	16	R2-1	SPEED LIMIT 65	24" X 30"	X		10BWG	1				
54	19							1	SA	P		
67	46							1				
								1				
		M4-2	BUSINESS	24" X 12"	X							
48	2						S80	1	SA	P		
		M3-4	WEST	24" X 12"	X							
		M1-6T	105 TEXAS	24" X 24"	X							
		M6-3		21" X 15"	X							
48	3											
49	15	8MS-R3	ONLY ONLY	36" X 36"	X		10BWG	1	SA	P		
61	39											
48	4	R3-7L	RIGHT LANE MUST TURN RIGHT	30" X 30"	X		10BWG	1	SA	P		
48	11							1				
60	37							1				
					X							
		M4-2	BUSINESS	24" X 12"	X							
		M3-2	EAST	24" X 12"	X							
48	5	M1-6T	105 TEXAS	24" X 24"	X							
		M6-3		21" X 15"	X							
48	6				X							
		M4-2	BY-PASS	24" X 12"								
		M3-2	EAST	24" X 12"	X							
		M1-6T	105 TEXAS	24" X 24"	X							
		M6-1R		21" X 15"			S80	1	SA	U		

ALUMINUM SIGN BLANKS THICKNESS	
	Minimum Thickness
	0.080"
	0.100"
	0.125"

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

Square Tubes: https://www.txdot.gov/

Less than 7.5

7.5 to 15

Greater than 15

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).

STATE OF TEXAS
DANIEL DUKE THOMPSON
122541
LICENSED PROFESSIONAL ENGINEER

Daniel Duke Thompson

The seal appearing on this document was authorized by DANIEL THOMPSON, P.E. 122541 on 05/10 ,2023 .
Alteration of a sealed document without proper notification to the responsible engineer is an offense under the Texas Engineering Practice Act.

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		6414	53	001	BS105T,ETC
4-16		DIST	COUNTY		SHEET NO.
8-16		BMT	LIBERTY		23

TB

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

DATE: DATE/TIME 5:35:02 PM
FILE: DGN:E:\PROPERTY AO RMC SUBMITTALS\FY 23\FY 23 RMC 6414-53-001 SH 105T AND BYPASS\GENERAL\GENERAL\sheets\sums16.dgn

SUMMARY OF SMALL SIGNS

PLAN SHEET NO.	SIGN NO.	SIGN NOMENCLATURE	SIGN	DIMENSIONS	FLAT ALUMINUM (TYPE A)	EXAL ALUMINUM (TYPE G)	SM RD SGN ASSM TY XXXXX (X) XX (X-XXXX) POST TYPE	POSTS	ANCHOR TYPE	MOUNTING DESIGNATION PREFABRICATED	MOUNTING DESIGNATION 1EXT or 2EXT = # of Ext BM = Extruded Wind Beam WC = 1.12 #/ft Wing Channel EXAL= Extruded Alum Sign Panels	BRIDGE MOUNT CLEARANCE SIGNS (See Note 2) TY = TYPE
							FRP = Fiberglass TWT = Thin-Wall 10BWG = 10 BWG S80 = Sch 80	1 or 2	UA=Universal Conc UB=Universal Bolt SA=Slipbase-Conc SB=Slipbase-Bolt WS=Wedge Steel WP=Wedge Plastic	P = "Plain" T = "T" U = "U"		TY N TY S
48	7	R1-2	YIELD	30" X 30"	X							
	8			30" X 30"	X		10BWG	1	SA	P		
		M3-4	WEST	24" X 12"	X							
48	9	M1-6T	105 TEXAS	24" X 24"	X							
		M6-1L		21" X 15"	X							
		M4-2	BUSINESS EAST	24" X 12"	X							
48	10	M3-2		24" X 12"	X							
		M1-6T	105 TEXAS	24" X 24"	X							
		M6-1R		21" X 15"	X		S80	1	SA	U		
		M4-2	BY-PASS EAST	24" X 12"	X							
49	12	M3-2		24" X 12"	X							
		M1-6T	105 TEXAS	24" X 24"	X							
		M6-1L		21" X 15"	X							
		M3-4	WEST	24" X 12"	X							
49	13	M1-6T	105 TEXAS	24" X 24"	X							
		M6-3		21" X 15"	X		S80	1	SA	U		
		M4-2	BUSINESS EAST	24" X 12"	X							
49	14	M3-2		24" X 12"	X							
57	28							1				
56	53	M1-6T	105 TEXAS	24" X 12"	X		S80	1	SA	P		

ALUMINUM SIGN BLANKS THICKNESS	
	Minimum Thickness
	0.080"
	0.100"
	0.125"

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

http://www.txdot.gov/

Square Feet	NOTE:
Less than 7.5	
7.5 to 15	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.
Greater than 15	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).

STATE OF TEXAS
DANIEL DUKE THOMPSON
122541
LICENSED PROFESSIONAL ENGINEER

Daniel Duke Thompson

The seal appearing on this document was authorized by DANIEL THOMPSON, P.E. 122541 on 05/10 ,2023 . Alteration of a sealed document without proper notification to the responsible engineer is an offense under the Texas Engineering Practice Act.

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		6414	53	001	BS105T,ETC
4-16		DIST	COUNTY		SHEET NO.
8-16		BMT	LIBERTY		24

18

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

DATE: DATE/20YR 5:35:03 PM
FILE: DOCUMENT NAME C:\PROJECTS\LIBERTY AO RMC SUBMITTALS\FY 23\FY 23 RMC 6414-53-001 SH 105T AND BS105T\SOSS\sums16.dgn

SUMMARY OF SMALL SIGNS

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

PLAN SHEET NO.	SIGN NO.	SIGN NOMENCLATURE	SIGN	DIMENSIONS	FLAT ALUMINUM (TYPE A)	EXAL ALUMINUM (TYPE G)	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
49	17	M4-2	BY-PASS JCT 105 TEXAS	24" X 12"	X		10BWG	1	SA	P		
		M2-1		21" X 15"	X							
		M1-6T		24" X 24"	X							
49 61	18 40	M3-3		36" X 36"	X		10BWG	2	SA	P		
54 55 57	20 22 29	R2-1	SPEED LIMIT 55	24" X 30"	X		10BWG	1	SA	P		
55	21	M2-1	JCT	21" X 15"	X							
		M1-6F	FARM 1725 ROAD	24" X 24"	X		10BWG	1	SA	P		
56	23 35	M4-2	BUSINESS WEST	24" X 12" 24" X 12"	X X		10BWG	2	SA	P		
		M1-6T	105 TEXAS	24" X 24"	X							
56	24	M4-2	NORTH	24" X 12"								
		M1-6F	FARM 1725 ROAD	24" X 24"			10BWG	1	SA	P		
		M6-1L		21" X 15"								

ALUMINUM SIGN BLANKS THICKNESS	
	Minimum Thickness
	0.080"
	0.100"
	0.125"

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

http://www.txdot.gov/

Square Feet

Less than 7.5

7.5 to 15

Greater than 15

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).

STATE OF TEXAS
DANIEL DUKE THOMPSON
122541
LICENSED PROFESSIONAL ENGINEER

Daniel Duke Thompson

The seal appearing on this document was authorized by DANIEL THOMPSON, P.E. 122541 on 05/10 ,2023 . Alteration of a sealed document without proper notification to the responsible engineer is an offense under the Texas Engineering Practice Act.

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	6414	53	001	BS105T,ETC
4-16 8-16	DIST	COUNTY		SHEET NO.
	BMT	LIBERTY		25

18

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

DATE: DATE/2015 5:35:04 PM
FILE: DOCUMENT NAME RMC SUBMITTALS\FY 23\FY 23 RMC 6414-53-001 SH 105T AND BS105T\SOSS\Design\sums16.dgn
USER: LIBERTY AO

SUMMARY OF SMALL SIGNS

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

PLAN SHEET NO.	SIGN NO.	SIGN NOMENCLATURE	SIGN	DIMENSIONS	FLAT ALUMINUM (TYPE A)	EXAL ALUMINUM (TYPE G)	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
56	25	M4-2 M1-6T	BUSINESS 105 TEXAS	24" X 12" 24" X 24"	X X							
48 56	52 26	W1-7T		96" X 36"	X		S80	1	SA	U		
56 59 62 63 67 70	27 33 42 43 45 47	W8-13	BRIDGE ICES BEFORE ROAD	36" X 36"	X		10BWG	6	SA	P		
57	30	W12-2	17'-4"	36" X 36"	X		10BWG	1	SA	P		
57 59	31 34	R2-1	SPEED LIMIT 45	24" X 30"	X		10BWG	1	SA	P		
57	14	M2-1 M1-4	JCT 59	21" X 15" 24" X 24"	X X		10BWG	1	SA	P		
59	36	R2-1	SPEED LIMIT 35	24" X 30"	X		10BWG	1 1	SA	P		
60	38	M4-2 M3-2 M1-6T	BY-PASS EAST 105 TEXAS	24" X 12" 24" X 12" 24" X 24"	X X X		10BWG	1	SA	P		

ALUMINUM SIGN BLANKS THICKNESS	
	Minimum Thickness
	0.080"
	0.100"
	0.125"

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

http://www.txdot.gov/

Square Feet

Less than 7.5

7.5 to 15

Greater than 15

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).

STATE OF TEXAS
DANIEL DUKE THOMPSON
122541
LICENSED PROFESSIONAL ENGINEER

Daniel Duke Thompson

The seal appearing on this document was authorized by DANIEL THOMPSON, P.E. 122541 on 05/10 ,2023 . Alteration of a sealed document without proper notification to the responsible engineer is an offense under the Texas Engineering Practice Act.

Texas Department of Transportation

Traffic Operations Division Standard

SUMMARY OF SMALL SIGNS

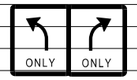
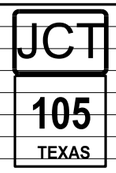
SOSS

FILE:	sums16.dgn	DN: TxDOT	CK: TxDOT	DW: TxDOT	CK: TxDOT
©TxDOT	May 1987	CONT	SECT	JOB	HIGHWAY
REVISIONS		6414	53	001	BS105T, ETC
4-16		DIST	COUNTY		SHEET NO.
8-16		BMT	LIBERTY		26

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

DATE: DATE/TIME
FILE: DOCUMENT NAME
SUBMITTALS FY 23 RMC 6414-53-001 SH 105 FY 23 RMC SUBMITTALS FY 23 AO RMC 5:35:05 PM
LIBERTY

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	POSTS	ANCHOR TYPE	MOUNTING DESIGNATION		BRIDGE MOUNT CLEARANCE SIGNS (See Note 2) TY = TYPE
							FRP = Fiberglass TWT = Thin-Wall 10BWG = 10 BWG S80 = Sch 80	1 or 2	UA=Universal Conc UB=Universal Bolt SA=Slipbase-Conc SB=Slipbase-Bolt WS=Wedge Steel WP=Wedge Plastic	PREFABRICATED P = "Plain" T = "T" U = "U"	1EXT or 2EXT = # of Ext BM = Extruded Wind Beam WC = 1.12 #/ft Wing Channel EXAL= Extruded Alum Sign Panels	TY N TY S
61	39	R3-8DT		36" X 36"	X		10BWG	1	SA	P		
62	41	M2-1 M1-6T		21" X 15" 24" X 24"	X X		10BWG	1	SA	P		
67	44	M4-5 M1-4		24" X 12" 24" X 24"	X X		10BWG	1	SA	P		
70	48	W3-1S		36" X 36"	X		10BWG	1	SA	P		
72	50	W4-1		36" X 36"	X		10BWG	1	SA	P		
58	51	W3-5		36" X 36"	X		10BWG	1	SA	P		
56	54	R1-1										
56	55	R1-1		30" X 30"	X		10BWG	1	SA	P		

ALUMINUM SIGN BLANKS THICKNESS	
	Minimum Thickness
	0.080"
	0.100"
	0.125"

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

http://www.txdot.gov/

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

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).

STATE OF TEXAS
DANIEL DUKE THOMPSON
122541
LICENSED PROFESSIONAL ENGINEER

Daniel Duke Thompson

The seal appearing on this document was authorized by DANIEL THOMPSON, P.E. 122541 on 05/10 ,2023 . Alteration of a sealed document without proper notification to the responsible engineer is an offense under the Texas Engineering Practice Act.

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		6414	53	001	BS105T,ETC
4-16		DIST	COUNTY		SHEET NO.
8-16		BMT	LIBERTY		27

18

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

DATE: DATE/TIME 5:35:06 PM
FILE: DOCUMENT NAME=Y:\SUBMITTALS\FY 23\RMC 6414-53-001 SH 105\RTY AO RMC SUMMARY OF SMALL SIGNS.dgn

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

DATE: 5/19/2023 5:35:12 PM
FILE: Y:\LOCAL\LIBERTY AO RMC SUBMITTALS\FY 23\FY 23 RMC 6414-53-001 SH 105T AND BYPASS\Design\DGN\Standards\Master Standards File.dgn

BARRICADE AND CONSTRUCTION (BC) STANDARD SHEETS GENERAL NOTES:

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

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

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

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

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

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

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

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

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

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

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

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

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

WORKER SAFETY NOTES:

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

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

COMPLIANT WORKZONE TRAFFIC CONTROL DEVICES

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

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

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

SHEET 1 OF 12

Texas Department of Transportation

Traffic Safety Division Standard

BARRICADE AND CONSTRUCTION GENERAL NOTES AND REQUIREMENTS

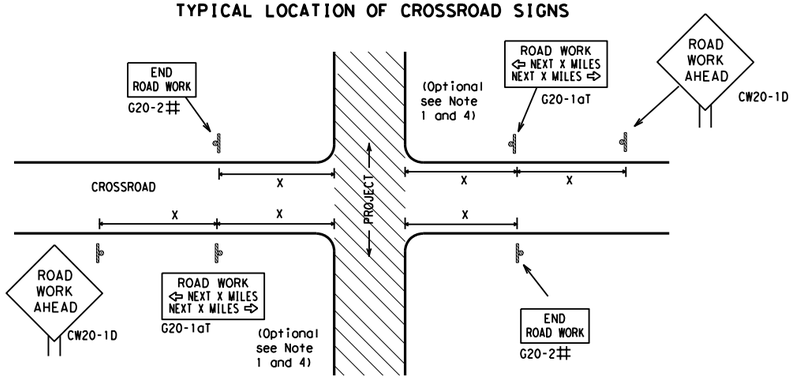
BC(1)-21

FILE: bc-21.dgn	DN: TxDOT	CK: TxDOT	DW: TxDOT	CK: TxDOT
©TxDOT November 2002	CONT	SECT	JOB	HIGHWAY
REVISIONS 4-03 7-13	6414	53	001	BS105T,ETC
9-07 8-14	DIST	COUNTY		SHEET NO.
5-10 5-21	BMT	LIBERTY		28

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

DATE: 5/19/2023 5:35:13 PM
FILE: Y:\LOCAL\LIBERTY AO RMC SUBMITTALS\FY 23\FY 23 RMC 6414-53-001 SH 105T AND BYPASS\Design\DGN\Standards\Master Standards File.dgn

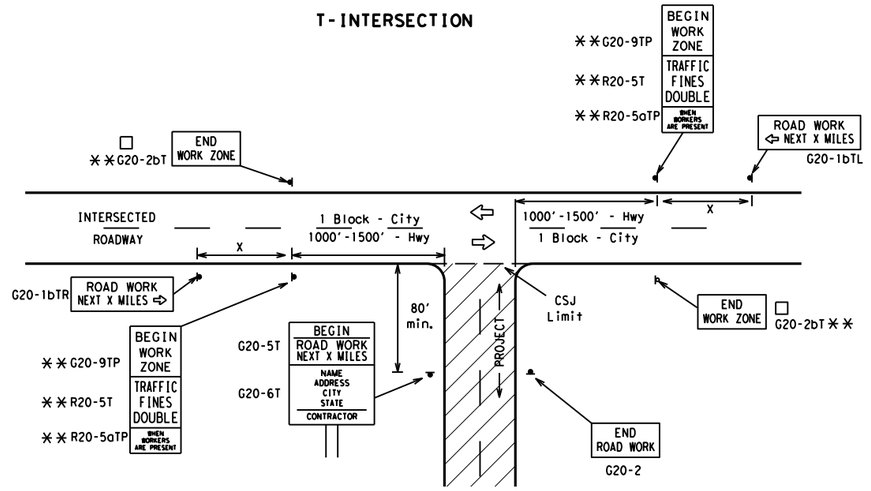
TYPICAL LOCATION OF CROSSROAD SIGNS



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

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

T-INTERSECTION



CSJ LIMITS AT T-INTERSECTION

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

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

SIZE

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

SPACING

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

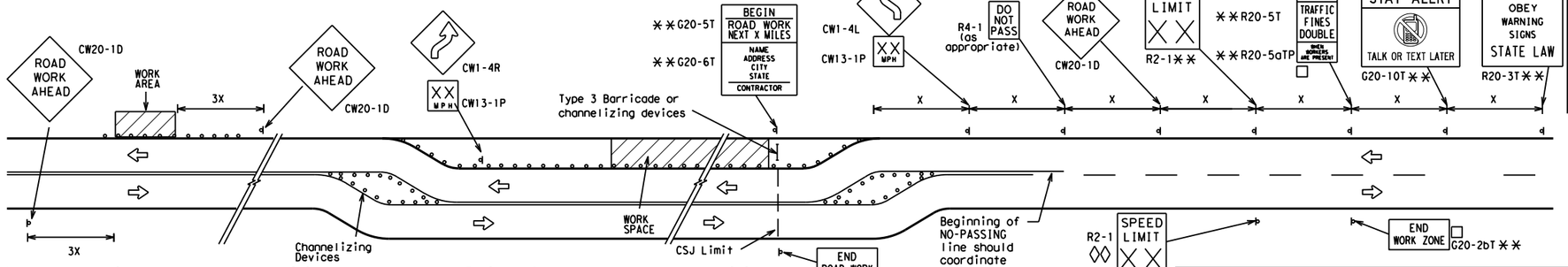
* For typical sign spacings on divided highways, expressways and freeways, see Part 6 of the "Texas Manual on Uniform Traffic Control Devices" (TMUTCD) typical application diagrams or TCP Standard Sheets.

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

GENERAL NOTES

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

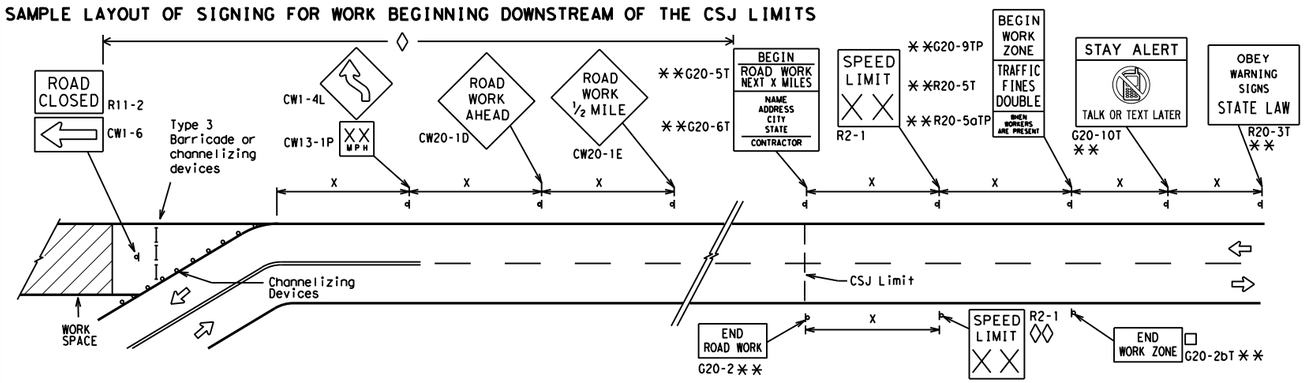
WORK AREAS IN MULTIPLE LOCATIONS WITHIN CSJ LIMITS



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

SAMPLE LAYOUT OF SIGNING FOR WORK BEGINNING AT THE CSJ LIMITS

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



NOTES

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

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

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

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

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

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

Texas Department of Transportation

Traffic Safety Division Standard

BARRICADE AND CONSTRUCTION PROJECT LIMIT

BC(2)-21

FILE: bc-21.dgn	DN: TxDOT	CK: TxDOT	DW: TxDOT	CK: TxDOT
©TxDOT November 2002	CONT	SECT	JOB	HIGHWAY
REVISIONS	6414	53	001	BS105T,ETC
9-07 8-14	DIST	COUNTY		SHEET NO.
7-13 5-21	BMT	LIBERTY		29

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

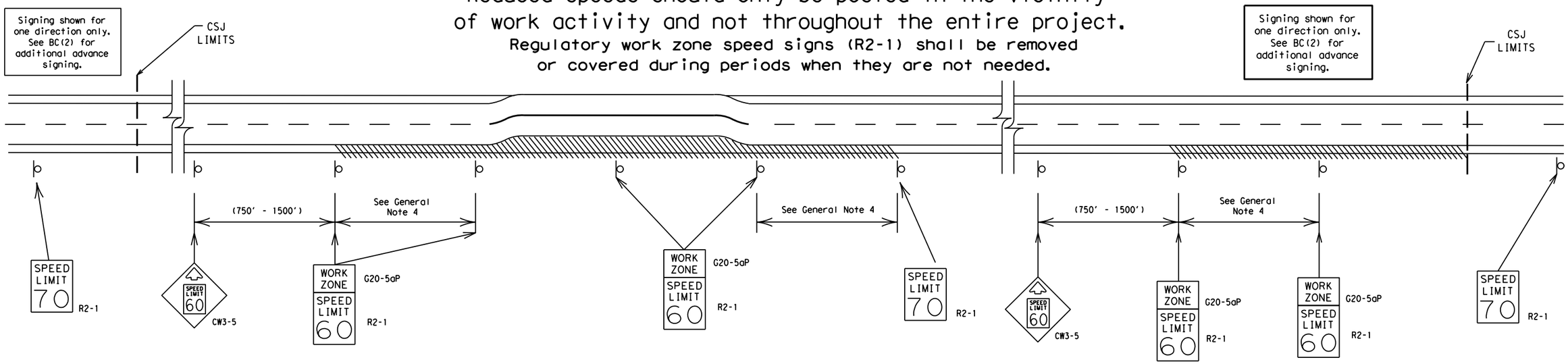
DATE: 5/19/2023 5:35:14 PM
FILE: Y:\LOCAL\LIBERTY AO RMC SUBMITTALS\FY 23\FY 23 RMC 6414-53-001 SH 105T AND BYPASS\Design\Standards\bc-21.dgn

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

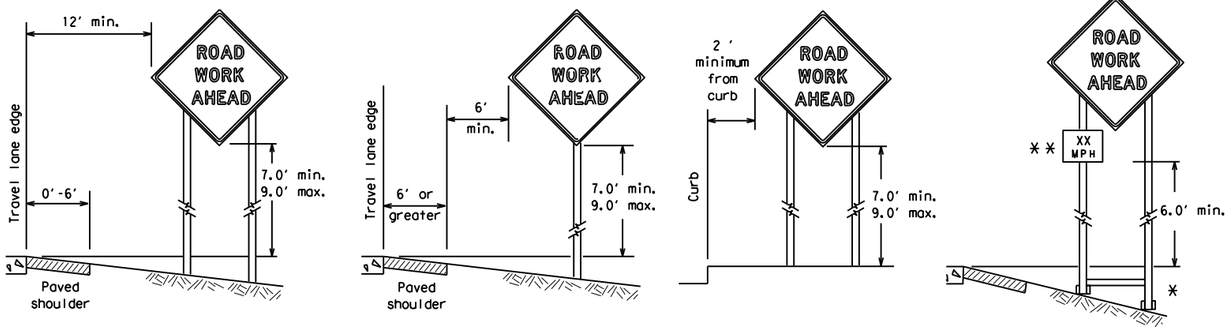
BC(3)-21

FILE: bc-21.dgn	DN: TxDOT	CK: TxDOT	DW: TxDOT	CK: TxDOT
©TxDOT November 2002	CONT	SECT	JOB	HIGHWAY
REVISIONS	6414	53	001	BS105T,ETC
9-07 8-14	DIST	COUNTY		SHEET NO.
7-13 5-21	BMT	LIBERTY		30

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

DATE: 5/19/2023 5:35:15 PM
FILE: Y:\LOCAL\LIBERTY AO RMC SUBMITTALS\FY 23\FY 23 RMC 6414-53-001 SH 105T AND BYPASS\Design\DGN\Standards\Master Standards File.dgn

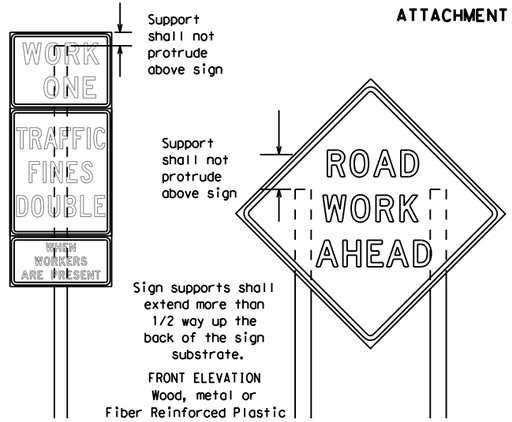
TYPICAL MINIMUM CLEARANCES FOR LONG TERM AND INTERMEDIATE TERM SIGNS

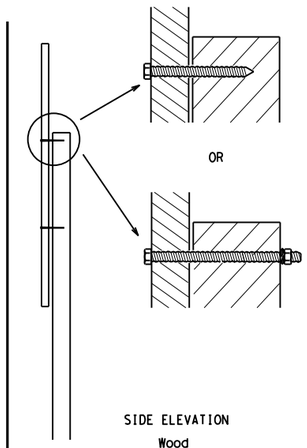


* When placing skid supports on unlevel ground, the leg post lengths must be adjusted so the sign appears straight and plumb. Objects shall NOT be placed under skids as a means of leveling.

** 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





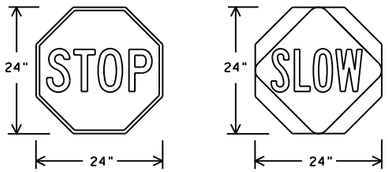
Attachment to wooden supports will be by bolts and nuts or screws. Use TxDOT's or manufacturer's recommended procedures for attaching sign substrates to other types of sign supports

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.

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.

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.

      more than one hour.
   c. Short-term stationary - daytime work that occupies a location for more than 1 hour in a single daylight period.
   d. Short, duration - work that occupies a location up to 1 hour.
   e. Mobile - work that moves continuously or intermittently (stopping for up to approximately 15 minutes.)

SIGN MOUNTING HEIGHT

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

SIZE OF SIGNS

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

SIGN SUBSTRATES

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

REFLECTIVE SHEETING

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

SIGN LETTERS

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

REMOVING OR COVERING

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

SIGN SUPPORT WEIGHTS

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

FLAGS ON SIGNS

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

Texas Department of Transportation

Traffic Safety Division Standard

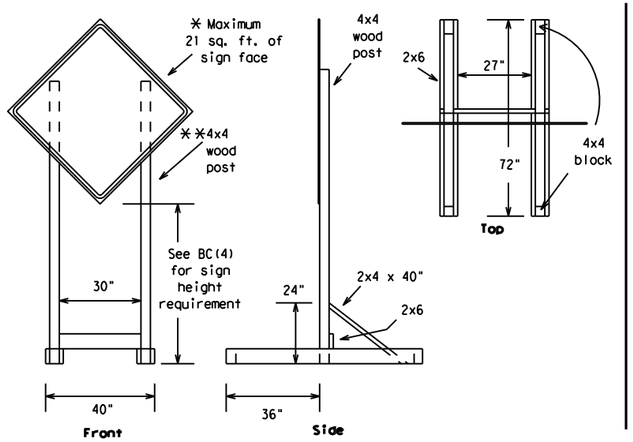
BARRICADE AND CONSTRUCTION TEMPORARY SIGN NOTES

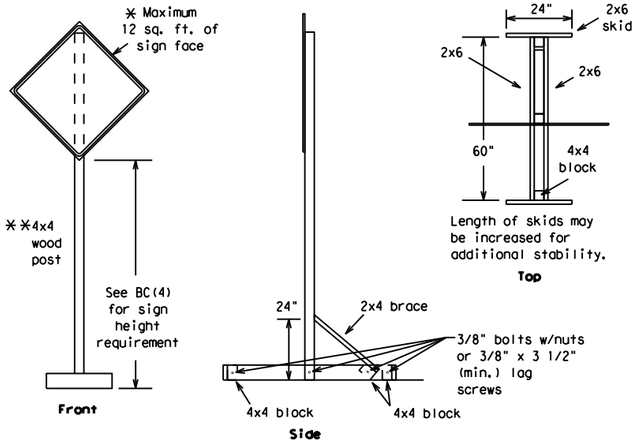
BC(4)-21

FILE: bc-21.dgn	DN: TxDOT	CK: TxDOT	DW: TxDOT	CK: TxDOT
©TxDOT November 2002	CONT	SECT	JOB	HIGHWAY
REVISIONS	6414	53	001	BS105T,ETC
9-07 8-14	DIST	COUNTY		SHEET NO.
7-13 5-21	BMT	LIBERTY		31

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

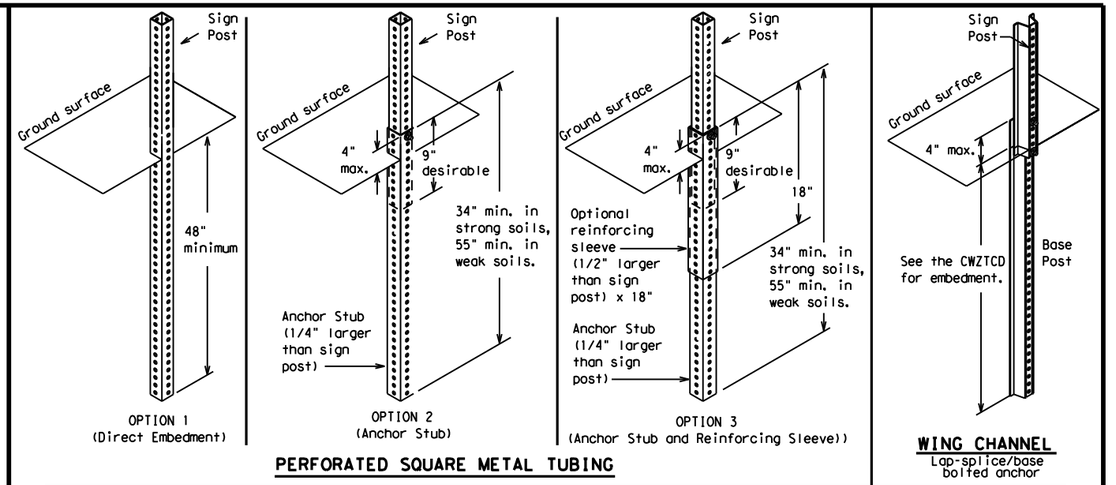
DATE: 5/19/2023 5:35:16 PM
FILE: Y:\LOCAL\LIBERTY AO RMC SUBMITTALS\FY 23\FY 23 RMC 6414-53-001 SH 105T AND BYPASS\Design\DGN\Standards\Master Standards File.dgn





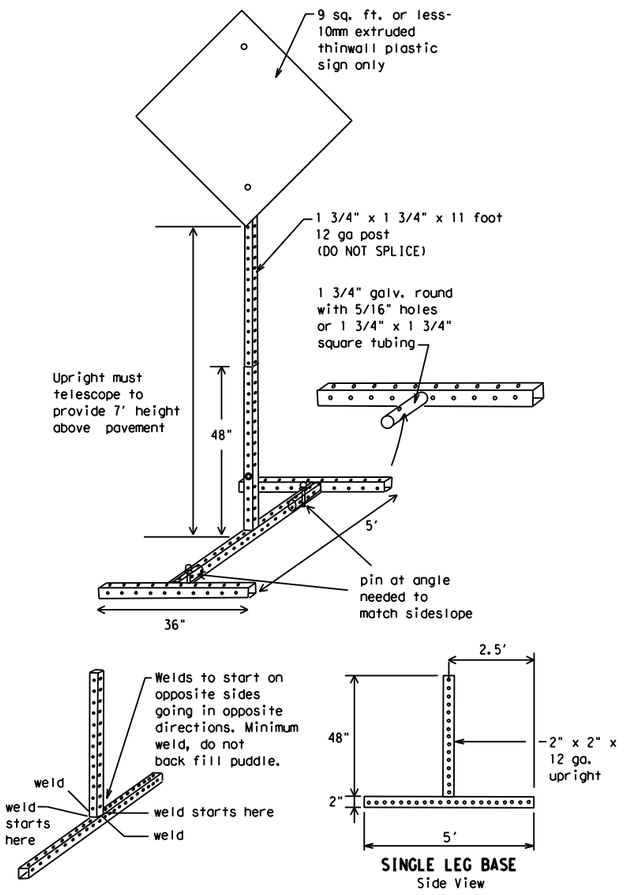
SKID MOUNTED WOOD SIGN SUPPORTS

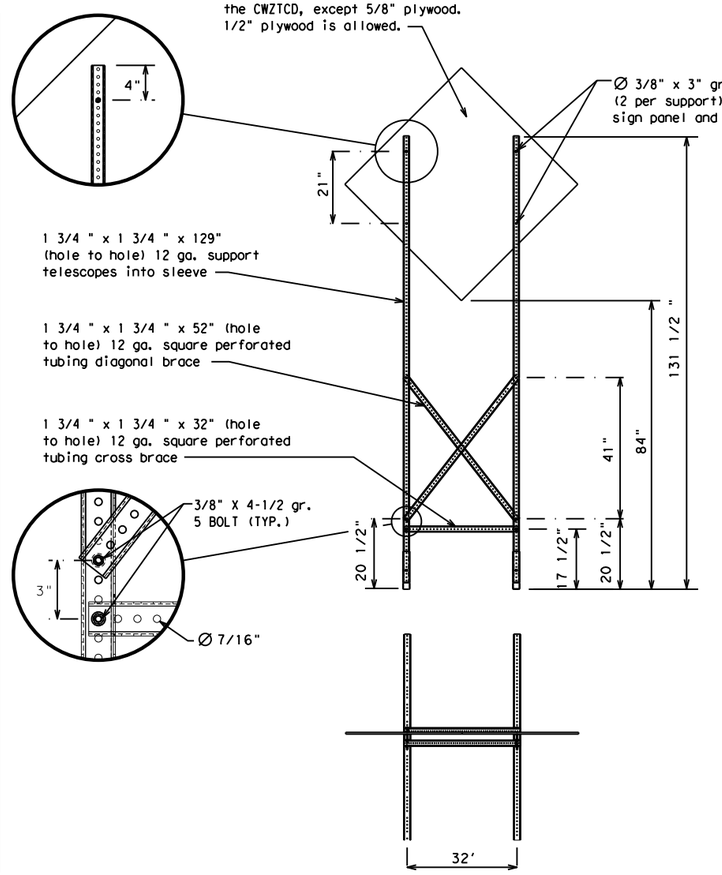
* LONG/INTERMEDIATE TERM STATIONARY - PORTABLE SKID MOUNTED SIGN SUPPORTS

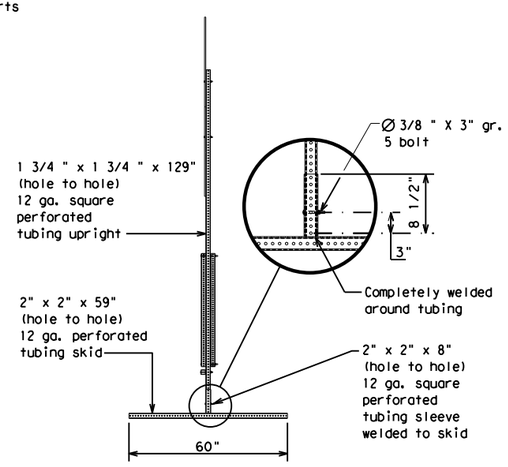


GROUND MOUNTED SIGN SUPPORTS

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







SKID MOUNTED PERFORATED SQUARE STEEL TUBING SIGN SUPPORTS

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

WEDGE ANCHORS

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

OTHER DESIGNS

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

GENERAL NOTES

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

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

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

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

Texas Department of Transportation | Traffic Safety Division Standard

BARRICADE AND CONSTRUCTION TYPICAL SIGN SUPPORT

BC(5)-21

FILE: bc-21.dgn	DN: TxDOT	CK: TxDOT	DW: TxDOT	CK: TxDOT
©TxDOT November 2002	CONT	SECT	JOB	HIGHWAY
REVISIONS	6414	53	001	BS105T,ETC
8-14	DIST	COUNTY		SHEET NO.
7-13 5-21	BMT	LIBERTY		32

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

DATE: 5/19/2023 5:35:17 PM
FILE: Y:\LOCAL\LIBERTY AO RMC SUBMITTALS\FY 23\FY 23 RMC 6414-53-001 SH 105T AND BYPASS\Design\DGN\Standards\Master Standards File.dgn

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

PORTABLE CHANGEABLE MESSAGE SIGNS

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

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

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

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

RECOMMENDED PHASES AND FORMATS FOR PCMS MESSAGES DURING ROADWORK ACTIVITIES

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

Phase 1: Condition Lists

Road/Lane/Ramp Closure List

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

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

Phase 2: Possible Component Lists

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

** See Application Guidelines Note 6.

APPLICATION GUIDELINES

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

WORDING ALTERNATIVES

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

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

FULL MATRIX PCMS SIGNS

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

Texas Department of Transportation

Traffic Safety Division Standard

BARRICADE AND CONSTRUCTION PORTABLE CHANGEABLE MESSAGE SIGN (PCMS)

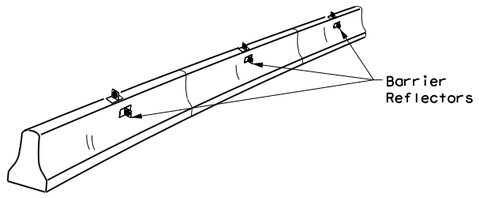
BC(6)-21

FILE: bc-21.dgn	DN: TxDOT	CK: TxDOT	DW: TxDOT	CK: TxDOT
© TxDOT November 2002	CONT	SECT	JOB	HIGHWAY
REVISIONS	6414	53	001	BS105T,ETC
9-07 8-14	DIST	COUNTY		SHEET NO.
7-13 5-21	BMT	LIBERTY		33

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

DATE: 5/19/2023 5:35:18 PM
FILE: Y:\LOCAL\LIBERTY AO RMC SUBMITTALS\FY 23\FY 23 RMC 6414-53-001 SH 105T AND BYPASS\BYPASS\Design\DGN\Standards\Master Standards File.dgn

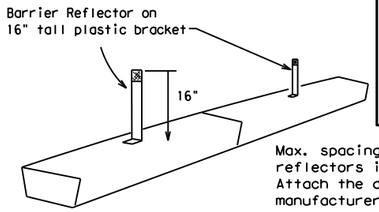
1. Barrier Reflectors shall be pre-qualified, and conform to the color and reflectivity requirements of DMS-8600. A list of prequalified Barrier Reflectors can be found at the Material Producer List web address shown on BC(1).
2. Color of Barrier Reflectors shall be as specified in the TMUTCD. The cost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



CONCRETE TRAFFIC BARRIER (CTB)

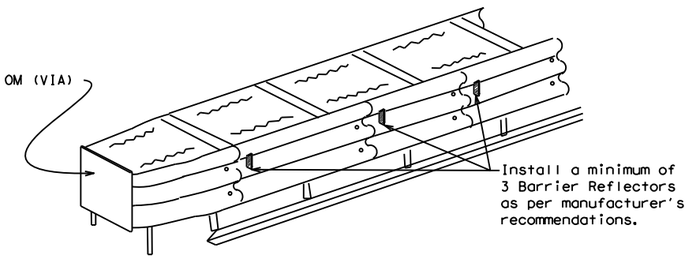
3. Where traffic is on one side of the CTB, two (2) Barrier Reflectors shall be mounted in approximately the midsection of each section of CTB.

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



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

LOW PROFILE CONCRETE BARRIER (LPCB)



DELINEATION OF END TREATMENTS

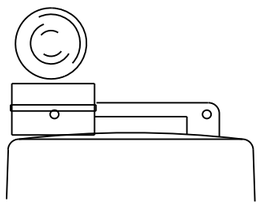
LOW PROFILE CONCRETE BARRIER (LPCB) USED IN WORK ZONES

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

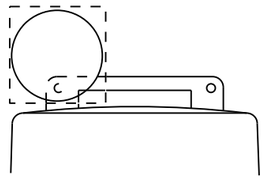
END TREATMENTS FOR CTB'S USED

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,

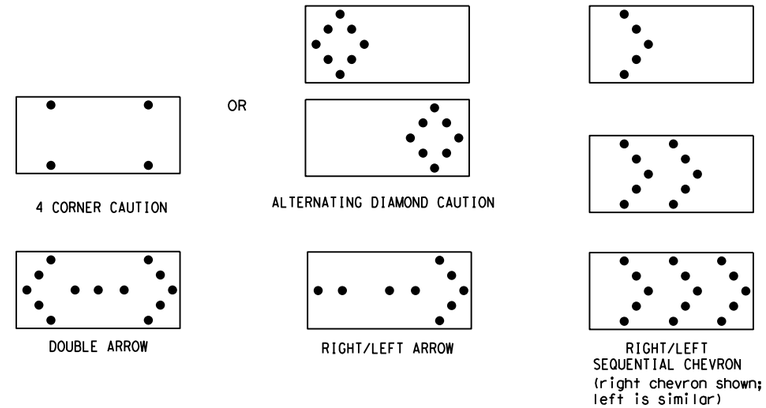
   order to identify the desired vehicle path. The rate of flashing for each light shall be 65 flashes per minute, plus or minus 10 flashes.
4. Type C and D steady-burn warning lights are intended to be used in a series to delineate the edge of the travel lane on detours, on lane changes, on lane closures, 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

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

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

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



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

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

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

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

FLASHING ARROW BOARDS

TRUCK-MOUNTED ATTENUATORS

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

Texas Department of Transportation

Traffic Safety Division Standard

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

BC(7)-21

FILE: bc-21.dgn	DN: TxDOT	CK: TxDOT	DW: TxDOT	CK: TxDOT
© TxDOT November 2002	CONT	SECT	JOB	HIGHWAY
REVISIONS	6414	53	001	BS105T, ETC
9-07 8-14	DIST	COUNTY		SHEET NO.
7-13 5-21	BMT	LIBERTY		34

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

DATE: 5/19/2023 5:35:19 PM
FILE: Y:\LOCAL\LIBERTY A0 RMC SUBMITTALS\FY 23\FY 23 RMC 6414-53-001 SH 105T AND BYPASS\Design\DGN\Standards\Master Standards File.dgn

GENERAL NOTES

1. For long term stationary work zones on freeways, drums shall be used as the primary channelizing device.
2. For intermediate term stationary work zones on freeways, drums should be

   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).

   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

   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.

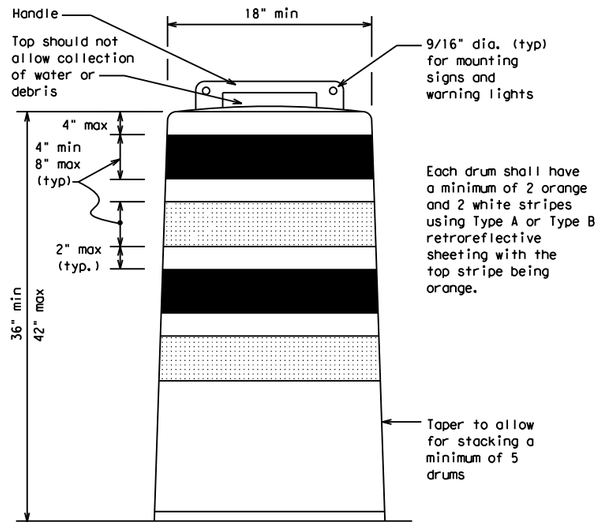
   inches, and a minimum of two footholds of sufficient size to allow base to be held down while separating the drum body from the base.
8. Plastic drums shall be constructed of ultra-violet stabilized, orange, high-density polyethylene (HDPE) or other approved material.
9. Drum body shall have a maximum unballasted weight of 11 lbs.
10. Drum and base shall be marked with manufacturer's name and model number.

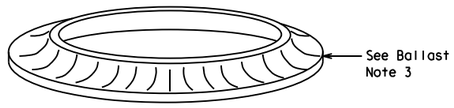
RETROREFLECTIVE SHEETING

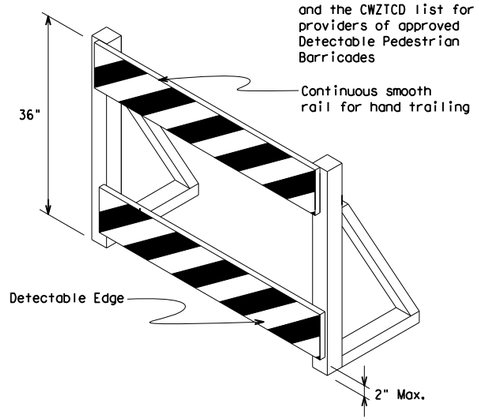
1. The stripes used on drums shall be constructed of sheeting meeting the color and retroreflectivity requirements of Departmental Materials Specification DMS-8300, "Sign Face Materials." Type A or Type B reflective sheeting shall be supplied unless otherwise specified in the plans.
2. The sheeting shall 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.

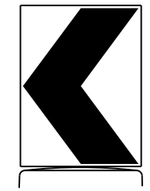




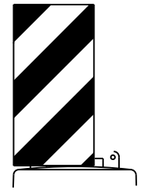


DETECTABLE PEDESTRIAN BARRICADES

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
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.

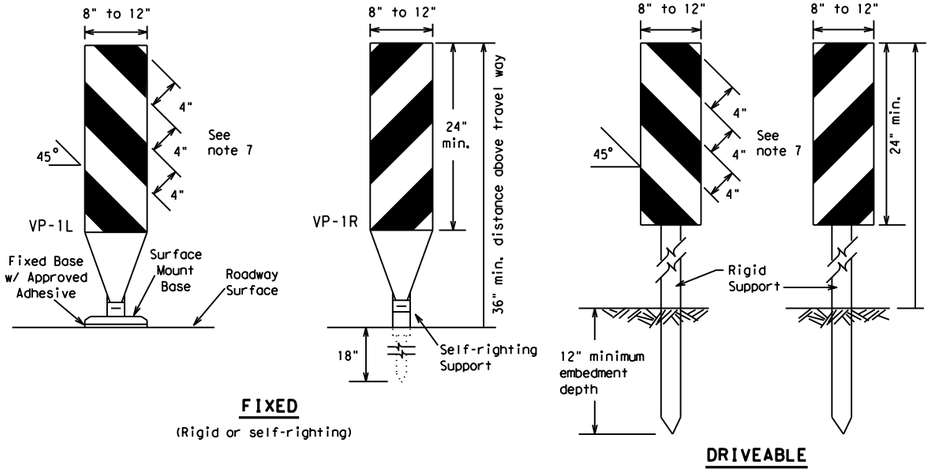
BARRICADE AND CONSTRUCTION CHANNELIZING DEVICES

BC(8)-21

bc-21.dgn	DN: TxDOT	CK: TxDOT	DW: TxDOT	CK: TxDOT
©TxDOT November 2002	CONT	JOB	HIGHWAY	
REVISIONS	6414 53	001	BS105T,ETC	
4-03 8-14	DIST	COUNTY	SHEET NO.	
9-07 5-21	BMT	LIBERTY	35	
7-13				

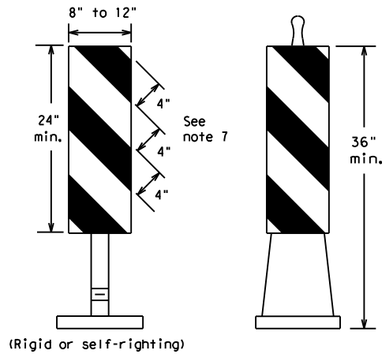
DISCLAIMER:
The use of this standard is governed by the "Texas Engineering Practice Act". No warranty of any kind is made by TxDOT for any purpose whatsoever. TxDOT assumes no responsibility for the conversion of this standard to other formats or for incorrect results or damages resulting from its use.

DATE: 5/19/2023 5:35:20 PM
FILE: Y:\LOCAL\LIBERTY AO RMC SUBMITTALS\FY 23\FY 23 RMC 6414-53-001 SH 105T AND BYPASS\Design\DGN\Standards\Master Standards File.dgn



FIXED
(Rigid or self-righting)

DRIVEABLE

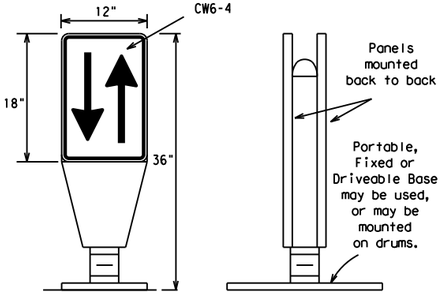


(Rigid or self-righting)

PORTABLE

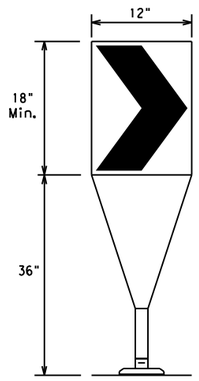
VERTICAL PANELS (VPs)

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



OPPOSING TRAFFIC LANE DIVIDERS (OTLD)

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



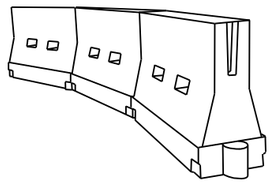
Fixed Base w/ Approved Adhesive (Driveable Base, or Flexible Support can be used)

1. The chevron shall be a vertical rectangle with a minimum size of 12 by 18 inches.
2. Chevrons are intended to give notice of a sharp change of alignment with the direction of travel and provide additional emphasis and guidance for vehicle operators with regard to changes in horizontal alignment of the roadway.
3. Chevrons, when used, shall be erected on the outside of a sharp curve or turn, or on the far side of an intersection. They shall be in line with and at right angles to approaching traffic. Spacing should be such that the motorist always has three in view, until the change in alignment eliminates its need.
4. To be effective, the chevron should be visible for at least 500 feet.
5. Chevrons shall be orange with a black nonreflective legend. Sheeting for the chevron shall be retroreflective Type B 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
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

Texas Department of Transportation | Traffic Safety Division Standard

BARRICADE AND CONSTRUCTION CHANNELIZING DEVICES

BC(9)-21

FILE: bc-21.dgn	DN: TxDOT	CK: TxDOT	TxDOT	CK: TxDOT
© TxDOT November 2002	CONT	SECT	JOB	HIGHWAY
REVISIONS 9-07 8-14 7-13	6414	53	001	BS105T, ETC
	DIST	COUNTY		SHEET NO.
	BMT	LIBERTY		36

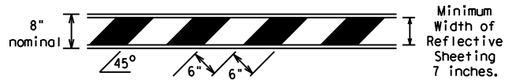
DISCLAIMER:
The use of this standard is governed by the "Texas Engineering Practice Act". No warranty of any kind is made by TxDOT for any purpose whatsoever. TxDOT assumes no responsibility for the conversion of this standard to other formats or for incorrect results or damages resulting from its use.

DATE: 5/19/2023 5:35:21 PM
FILE: Y:\LOCAL\LIBERTY AO RMC SUBMITTALS\FY 23\FY 23 RMC 6414-53-001 SH 105T AND BYPASS\Design\DGN\Standards\Master Standards File.dgn

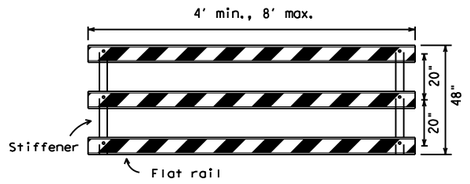
TYPE 3 BARRICADES

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

Barricades shall NOT be used as a sign support.



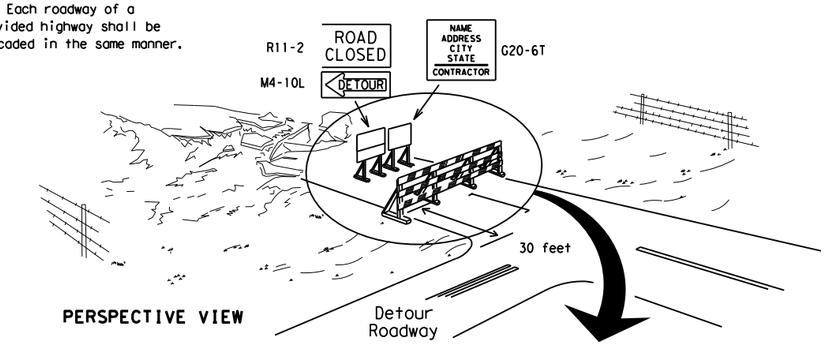
TYPICAL STRIPING DETAIL FOR BARRICADE RAIL



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

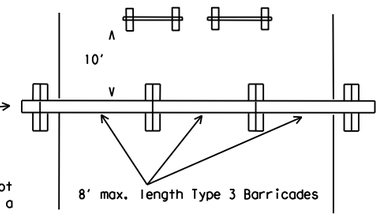
TYPICAL PANEL DETAIL FOR SKID OR POST TYPE BARRICADES

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



PERSPECTIVE VIEW

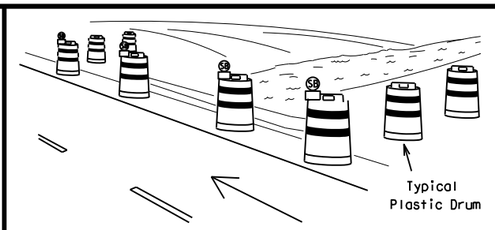
The three rails on Type 3 barricades shall be reflectorized orange and reflective white stripes on one side facing one-way traffic and both sides for two-way traffic.
Barricade striping should slant downward in the direction of detour.



PLAN VIEW

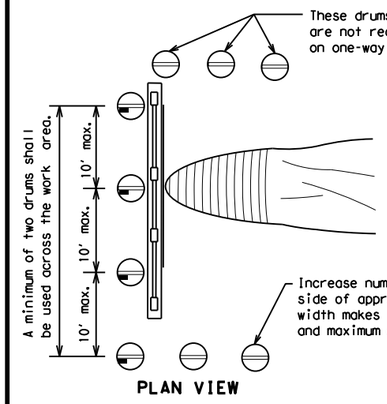
1. Signs should be mounted on independent supports at a 7 foot mounting height in center of roadway. The signs should be a minimum of 10 feet behind Type 3 Barricades.
2. Advance signing shall be as specified elsewhere in the plans.

TYPE 3 BARRICADE (POST AND SKID) TYPICAL APPLICATION



PERSPECTIVE VIEW

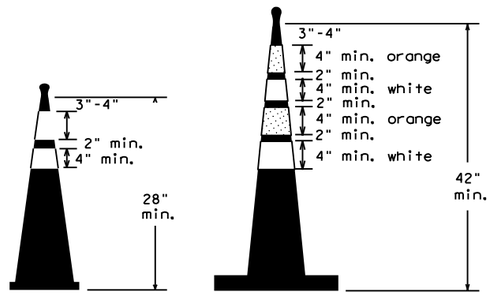
1. Where positive redirectional capability is provided, drums may be omitted.
2. Plastic construction fencing may be used with drums for safety as required in the plans.
3. Vertical Panels on flexible support may be substituted for drums when the shoulder width is less than 4 feet.
4. When the shoulder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



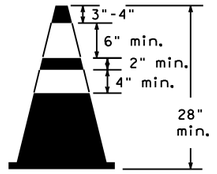
LEGEND	
	Plastic drum
	Plastic drum with steady burn light or yellow warning reflector
SB	Steady burn warning light or yellow warning reflector

PLAN VIEW

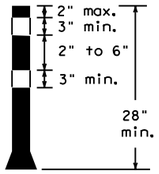
CULVERT WIDENING OR OTHER ISOLATED WORK WITHIN THE PROJECT LIMITS



Two-Piece cones



One-Piece cones

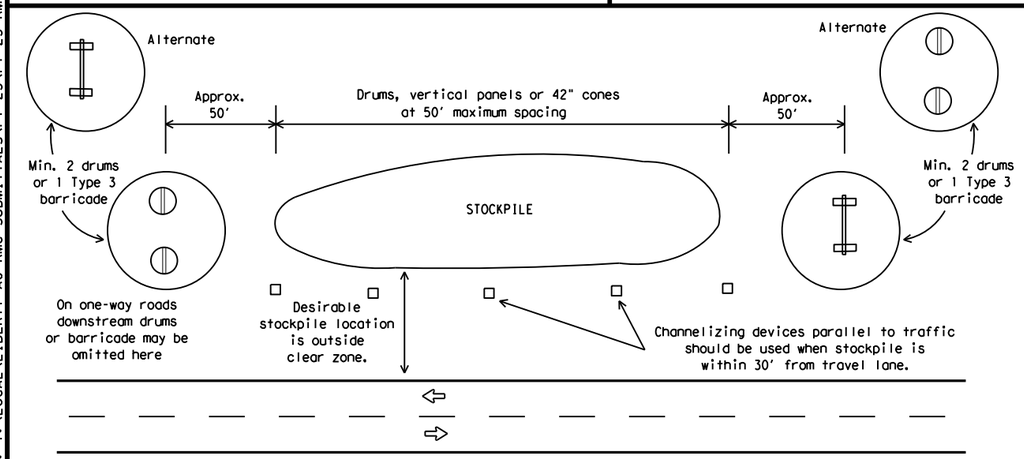


Tubular Marker

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

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

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



TRAFFIC CONTROL FOR MATERIAL STOCKPILES

Texas Department of Transportation — Traffic Safety Division Standard

BARRICADE AND CONSTRUCTION CHANNELIZING DEVICES

BC(10)-21

FILE: bc-21.dgn	DN: TxDOT	CK: TxDOT	DW: TxDOT	CK: TxDOT
© TxDOT November 2002	CONT	SECT	JOB	HIGHWAY
REVISIONS	6414	53	001	BS105T, ETC
9-07 8-14	DIST	COUNTY		SHEET NO.
7-13 5-21	BMT	LIBERTY		37

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

DATE: 5/19/2023 5:35:22 PM
FILE: Y:\LOCAL\LIBERTY AO RMC SUBMITTALS\FY 23\FY 23 RMC 6414-53-001 SH 105T AND BYPASS\Design\DGN\Standards\Master Standards File.dgn

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.

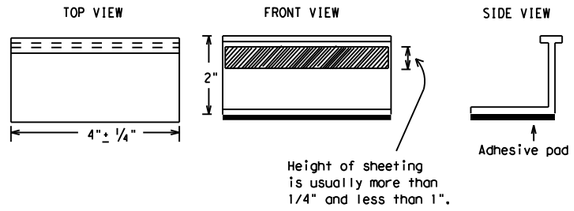
MAINTAINING WORK ZONE PAVEMENT MARKINGS

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	6414	53	001	BS105T,ETC
2-98 9-07 5-21	DIST	COUNTY		SHEET NO.
1-02 7-13	BMT	LIBERTY		38
11-02 8-14				

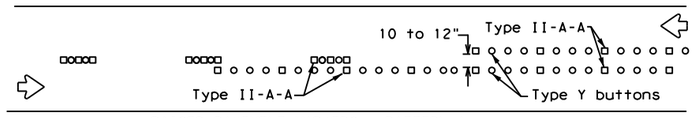
105

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

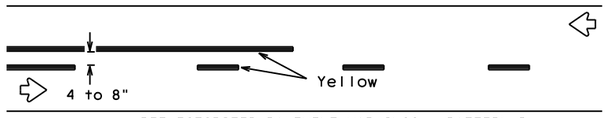
DATE: 5/19/2023 5:35:23 PM
FILE: Y:\LOCAL\LIBERTY AO RMC SUBMITTALS\FY 23\FY 23 RMC 6414-53-001 SH 105T AND BYPASS\Design\DGN\Standards\Master Standards File.dgn

PAVEMENT MARKING PATTERNS

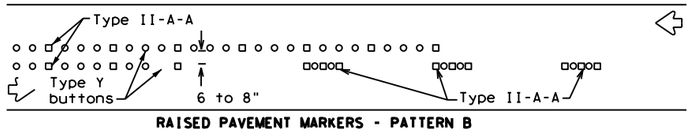
REFLECTORIZED PAVEMENT MARKINGS - PATTERN A



RAISED PAVEMENT MARKERS - PATTERN A



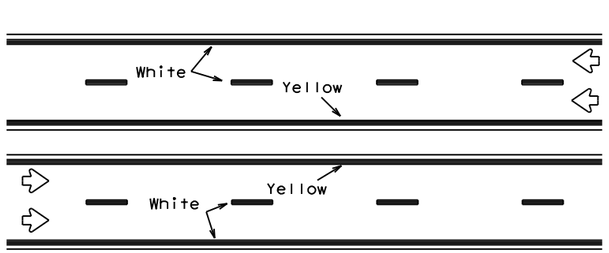
REFLECTORIZED PAVEMENT MARKINGS - PATTERN B



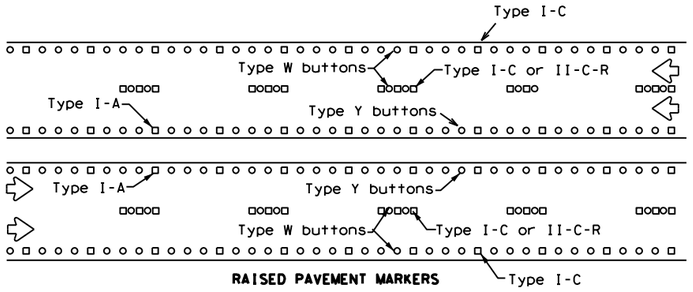
RAISED PAVEMENT MARKERS - PATTERN B

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

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



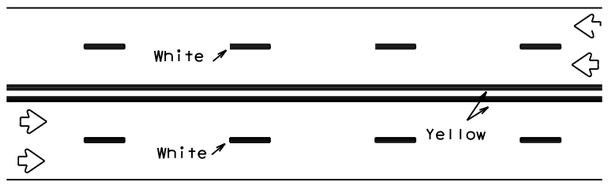
REFLECTORIZED PAVEMENT MARKINGS



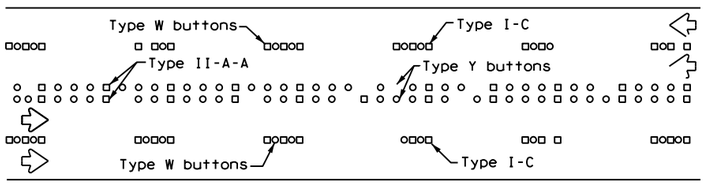
RAISED PAVEMENT MARKERS

Prefabricated markings may be substituted for reflectorized pavement markings.

EDGE & LANE LINES FOR DIVIDED HIGHWAY



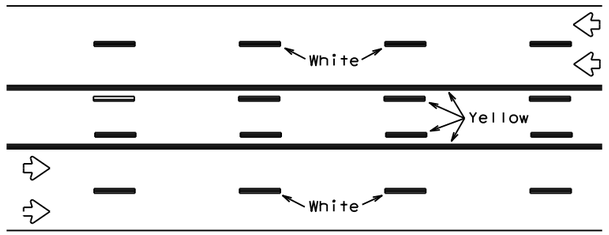
REFLECTORIZED PAVEMENT MARKINGS



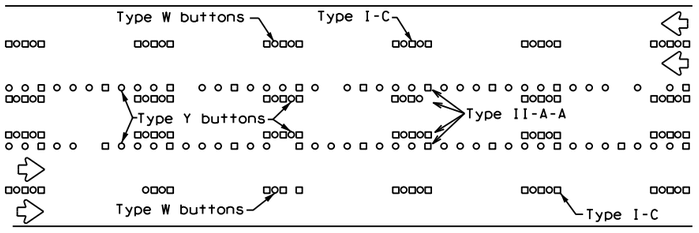
RAISED PAVEMENT MARKERS

Prefabricated markings may be substituted for reflectorized pavement markings.

LANE & CENTER LINES FOR MULTILANE UNDIVIDED HIGHWAYS



REFLECTORIZED PAVEMENT MARKINGS



RAISED PAVEMENT MARKERS

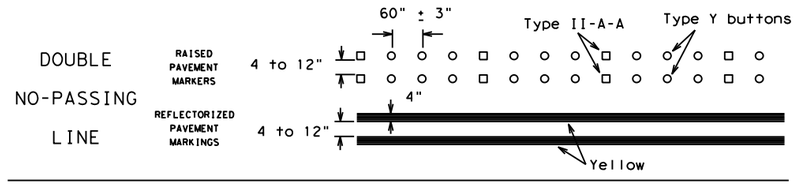
Prefabricated markings may be substituted for reflectorized pavement markings.

TWO-WAY LEFT TURN LANE

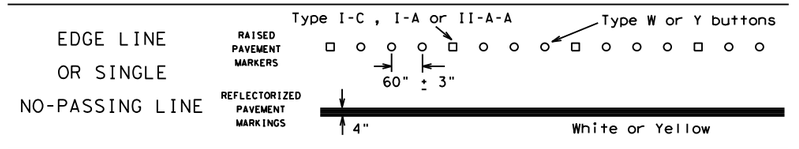
STANDARD WORK ZONE PAVEMENT MARKINGS DETAILS

SOLID LINES

DOUBLE NO-PASSING LINE

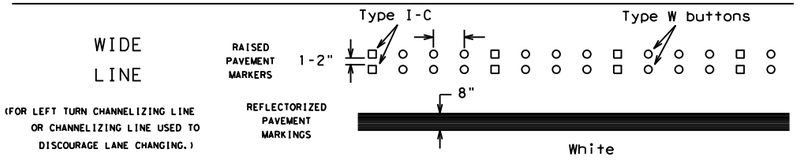


EDGE LINE OR SINGLE NO-PASSING LINE



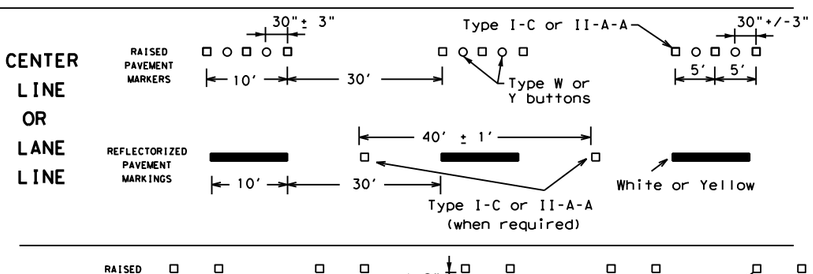
WIDE LINE

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

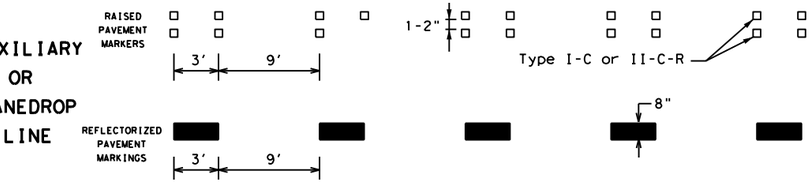


BROKEN LINES

CENTER LINE OR LANE LINE

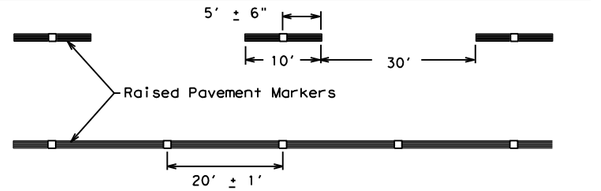


AUXILIARY OR LANEDROP LINE



REMOVABLE MARKINGS WITH RAISED PAVEMENT MARKERS

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



Centerline only - not to be used on edge lines

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

Texas Department of Transportation

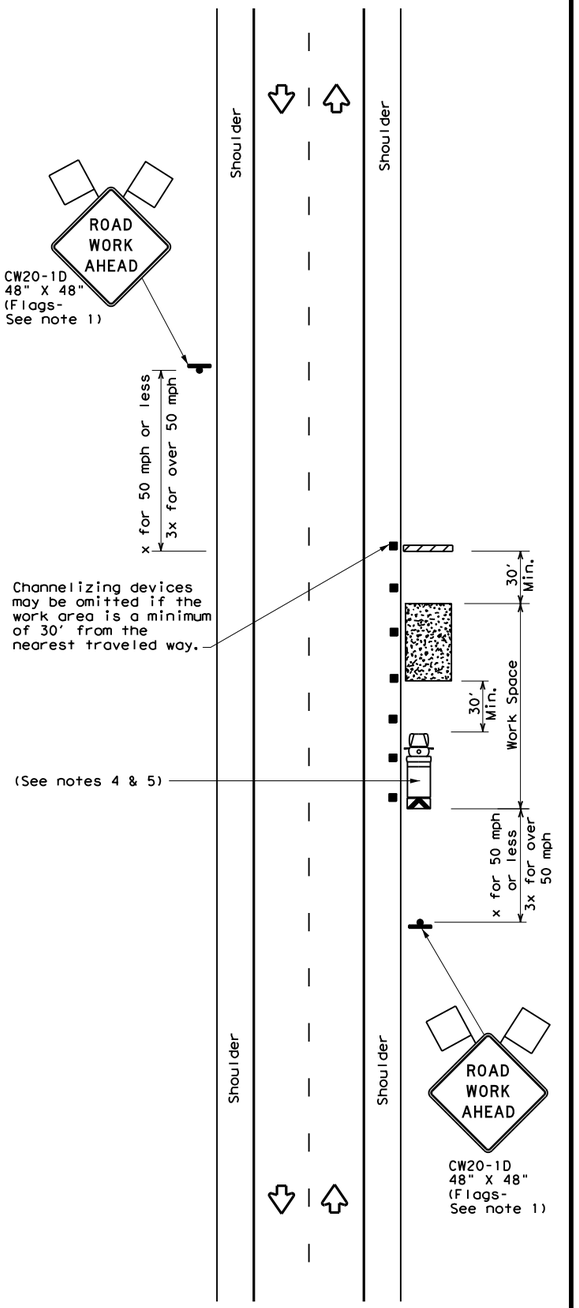
Traffic Safety Division Standard

BARRICADE AND CONSTRUCTION PAVEMENT MARKING PATTERNS

BC(12)-21

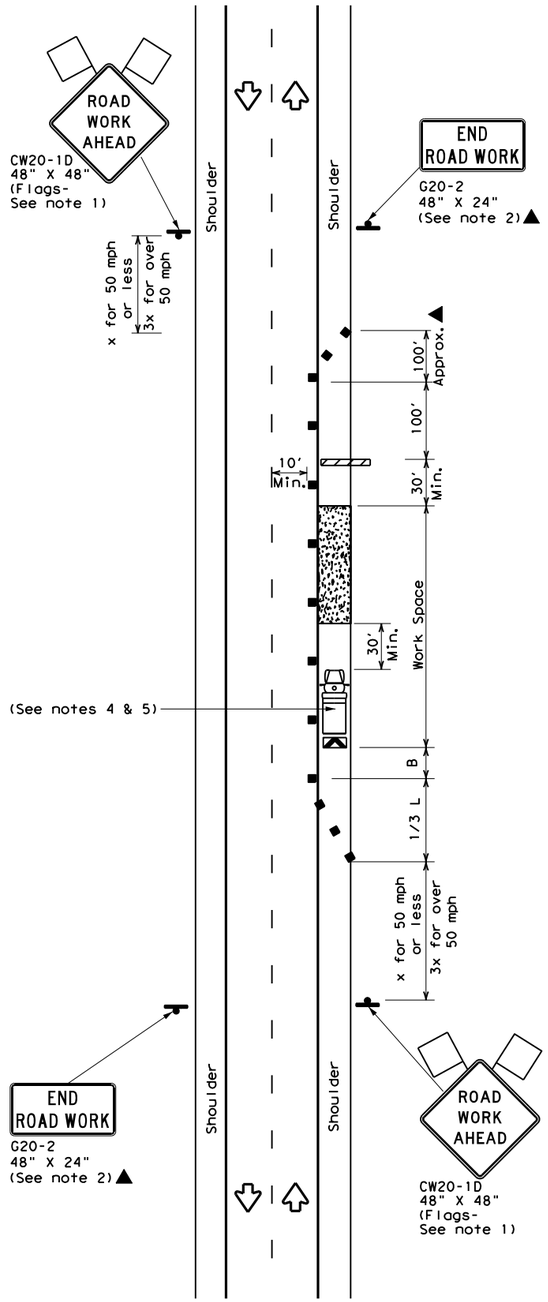
FILE: bc-21.dgn	DN: TxDOT	CK: TxDOT	DW: TxDOT	CK: TxDOT
© TxDOT February 1998	CONT	SECT	JOB	HIGHWAY
REVISIONS 1-97 9-07 5-21 2-98 7-13 11-02 8-14	6414	53	001	BS105T, ETC
	DIST	COUNTY		SHEET NO.
	BMT	LIBERTY		39

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



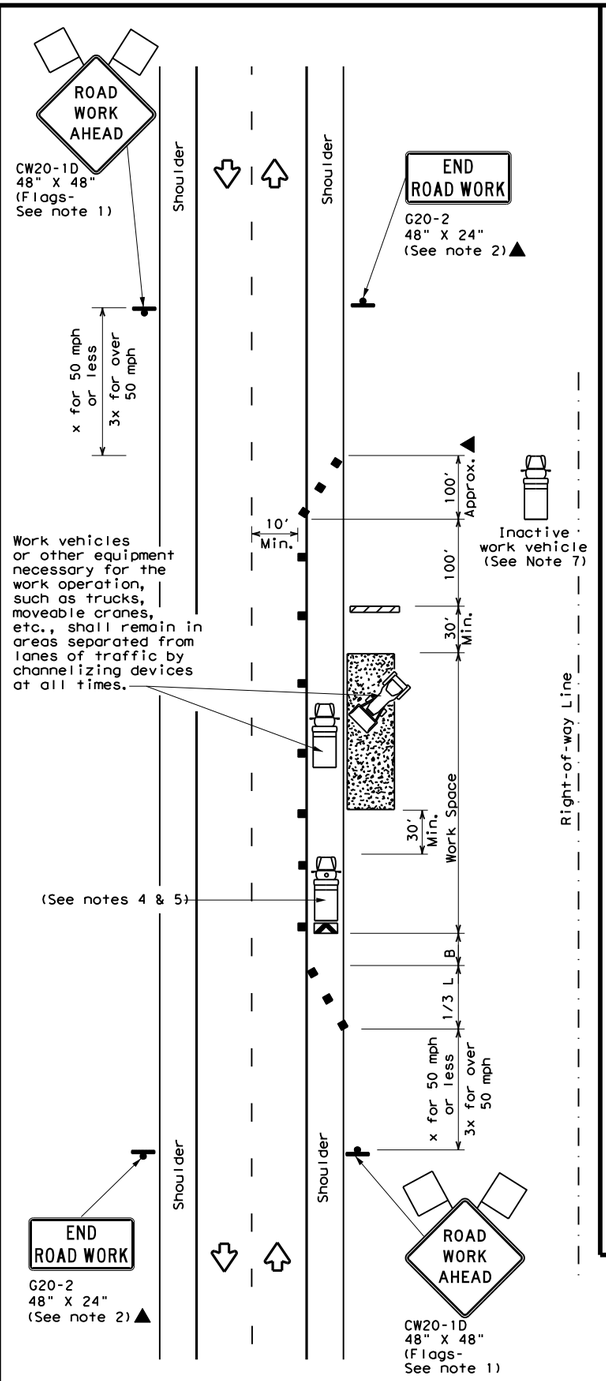
TCP (2-1a)

WORK SPACE NEAR SHOULDER
Conventional Roads



TCP (2-1b)

WORK SPACE ON SHOULDER
Conventional Roads



TCP (2-1c)

WORK VEHICLES ON SHOULDER
Conventional Roads

DATE:
FILE:

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

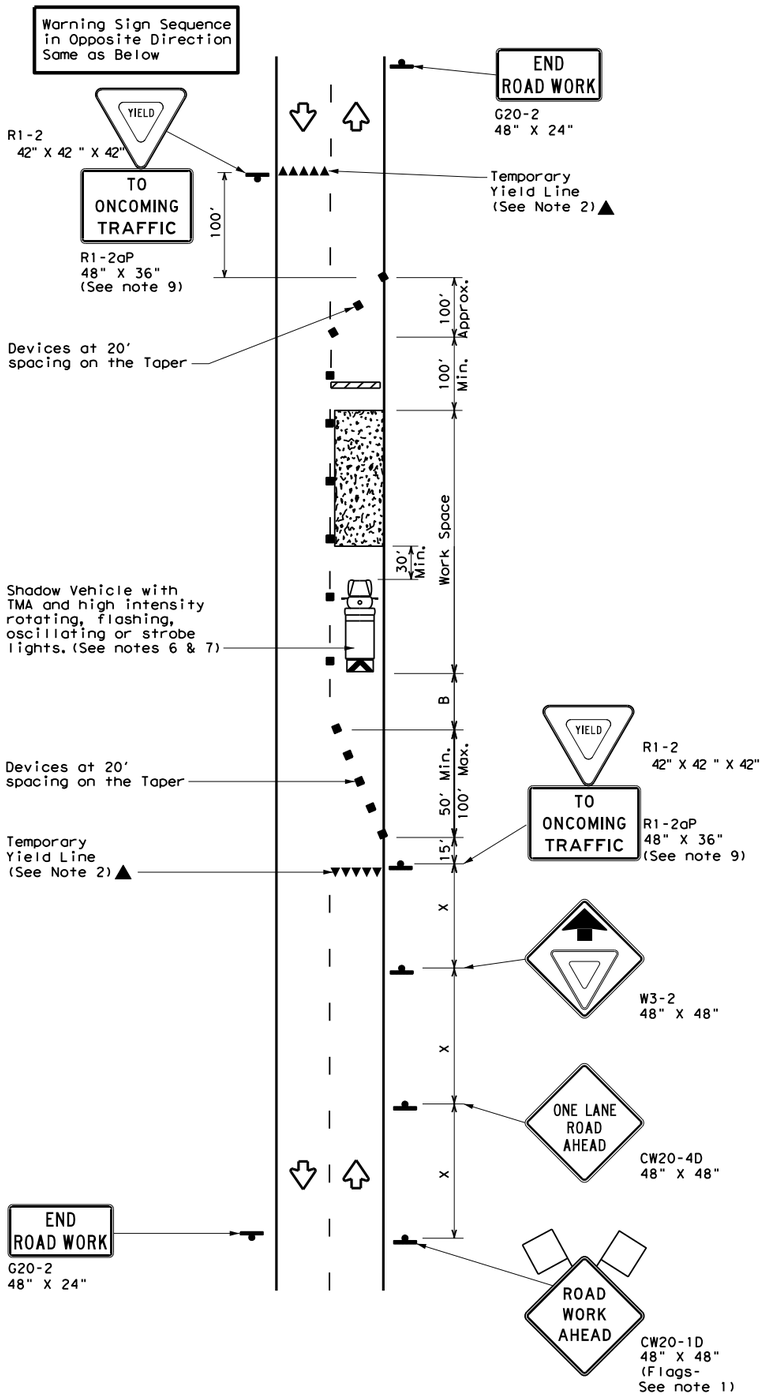
TRAFFIC CONTROL PLAN CONVENTIONAL ROAD SHOULDER WORK

TCP(2-1)-18

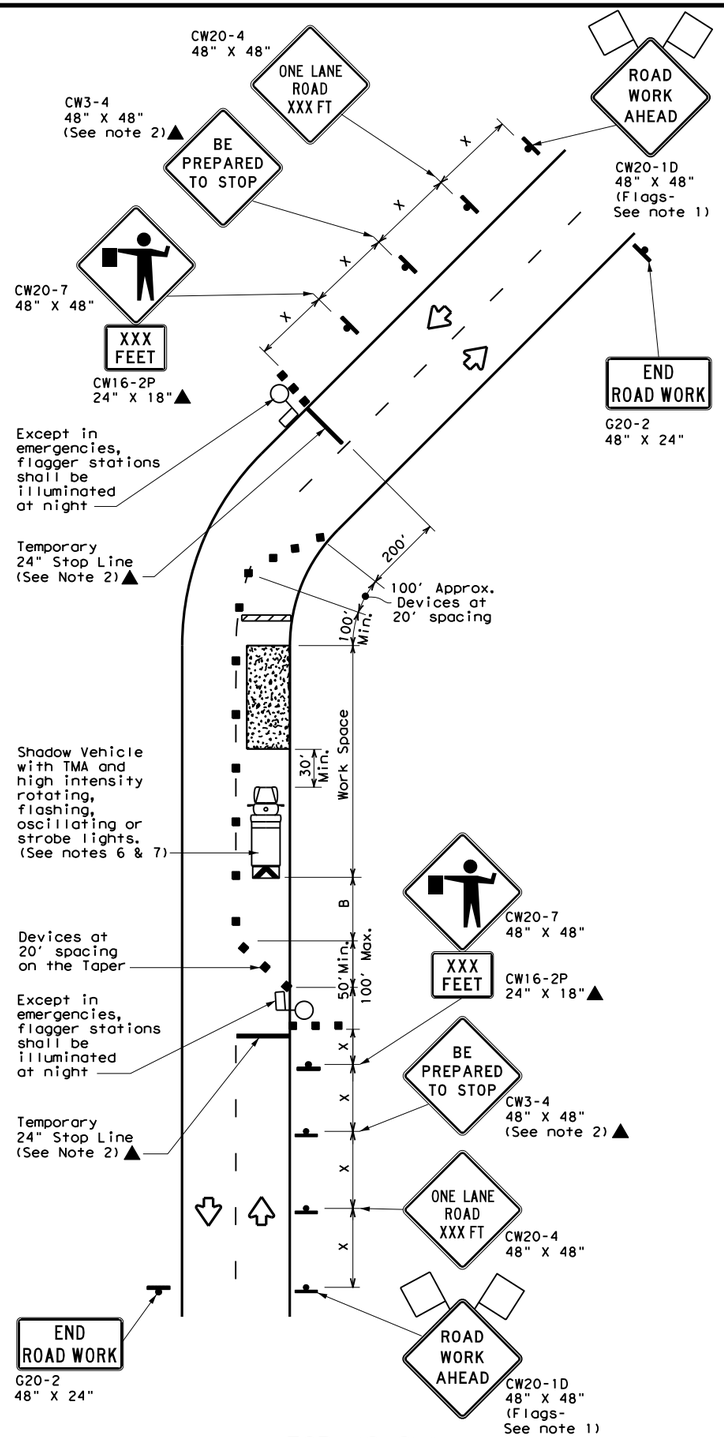
FILE: tcp2-1-18.dgn	DN:	CK:	DW:	CK:
© TxDOT December 1985	CONT	SECT	JOB	HIGHWAY
REVISIONS	6414	53	001	BS105T,ETC
2-94 4-98	DIST	COUNTY		SHEET NO.
8-95 2-12	BMT	LIBERTY		40
1-97 2-18				

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

DATE:
FILE:



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

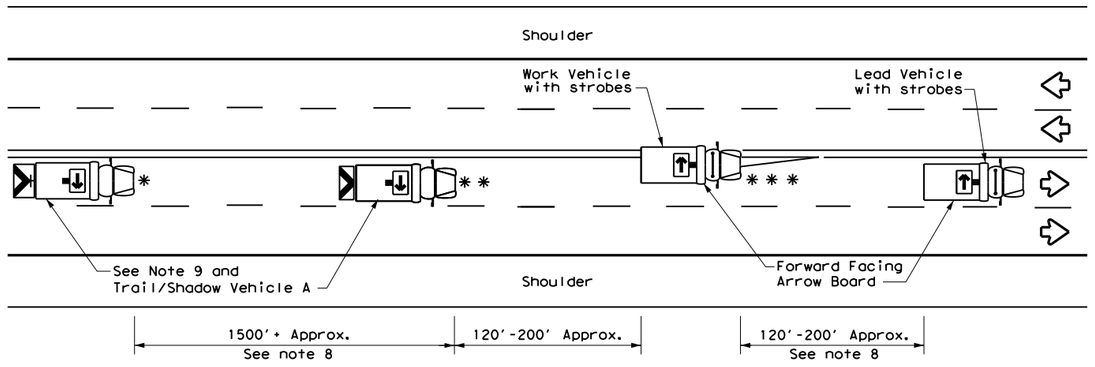
TRAFFIC CONTROL PLAN
ONE-LANE TWO-WAY
TRAFFIC CONTROL

TCP(2-2)-18

FILE: tcp2-2-18.dgn	DN:	CK:	DW:	CK:
©TxDOT December 1985	CONT	SECT	JOB	HIGHWAY
REVISIONS 8-95 3-03	6414	53	001	BS105T,ETC
1-97 2-12	DIST	COUNTY		SHEET NO.
4-98 2-18	BMT	LIBERTY		41

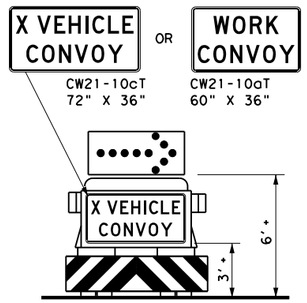
DISCLAIMER:
The use of this standard is governed by the "Texas Engineering Practice Act". No warranty of any kind is made by TxDOT for any purpose whatsoever. TxDOT assumes no responsibility for the conversion of this standard to other formats or for incorrect results or damages resulting from its use.

DATE:
FILE:



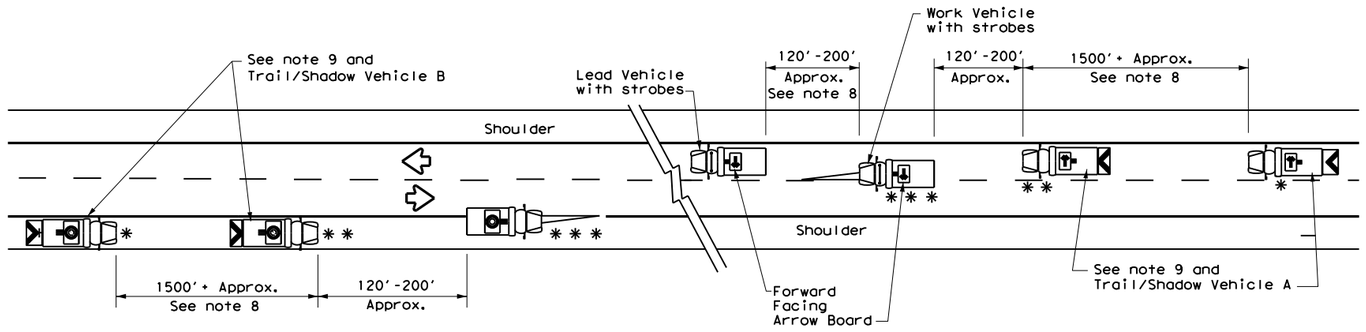
TCP (3-1a)

UNDIVIDED MULTILANE ROADWAY



TRAIL/SHADOW VEHICLE A

with RIGHT Directional display Flashing Arrow Board

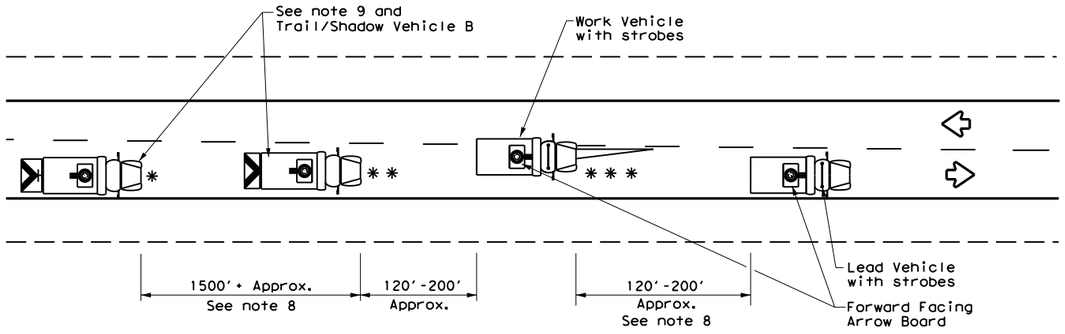


WORK ON SHOULDER

WORK ON TRAVEL LANE

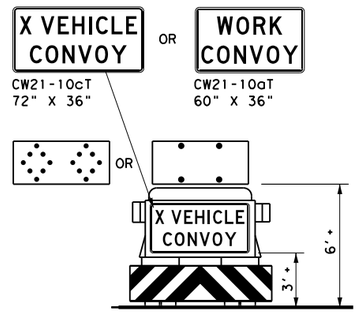
TCP (3-1b)

TWO-WAY ROADWAY WITH PAVED SHOULDERS



TCP (3-1c)

TWO-WAY ROADWAY WITHOUT PAVED SHOULDERS



TRAIL/SHADOW VEHICLE B

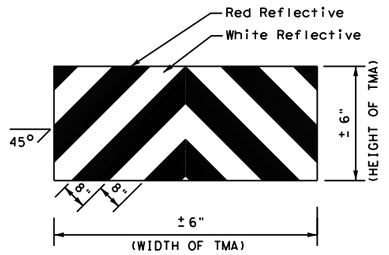
with Flashing Arrow Board in CAUTION display

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

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

GENERAL NOTES

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



STRIPING FOR TMA

Texas Department of Transportation

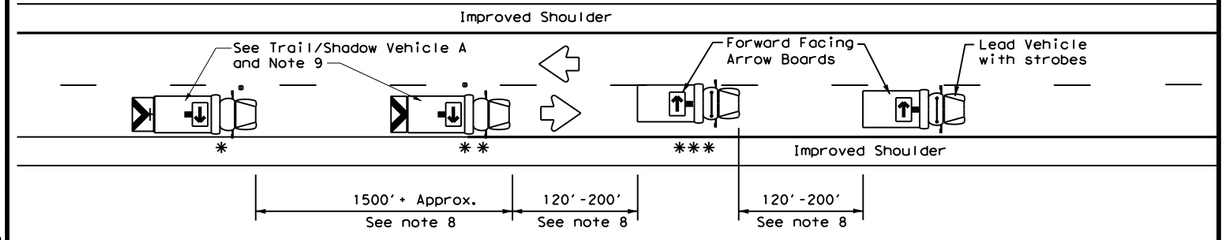
Traffic Operations Division Standard

TRAFFIC CONTROL PLAN MOBILE OPERATIONS UNDIVIDED HIGHWAYS

TCP(3-1)-13

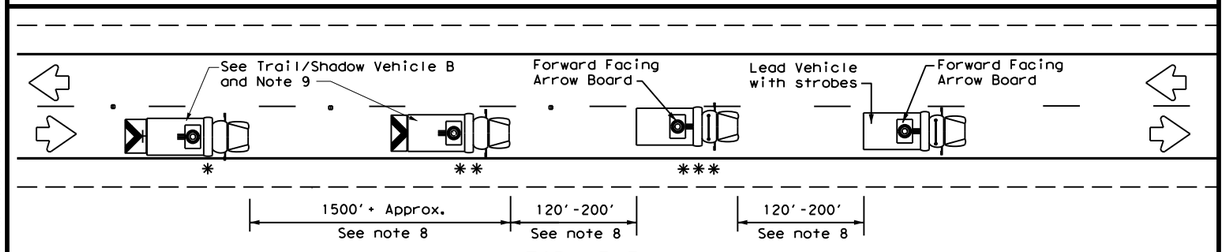
FILE: tcp3-1.dgn	DN: TxDOT	CK: TxDOT	DW: TxDOT	CK: TxDOT
© TxDOT December 1985	CONT	SECT	JOB	HIGHWAY
REVISIONS 2-94 4-98 8-95 7-13 1-97	6414	53	001	BS105T,ETC
	DIST	COUNTY		SHEET NO.
	BMT	LIBERTY		42

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



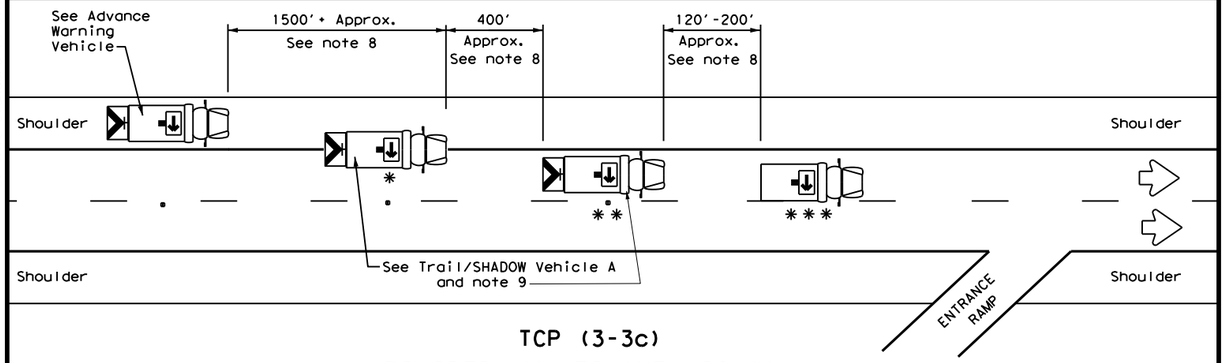
TCP (3-3a)

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



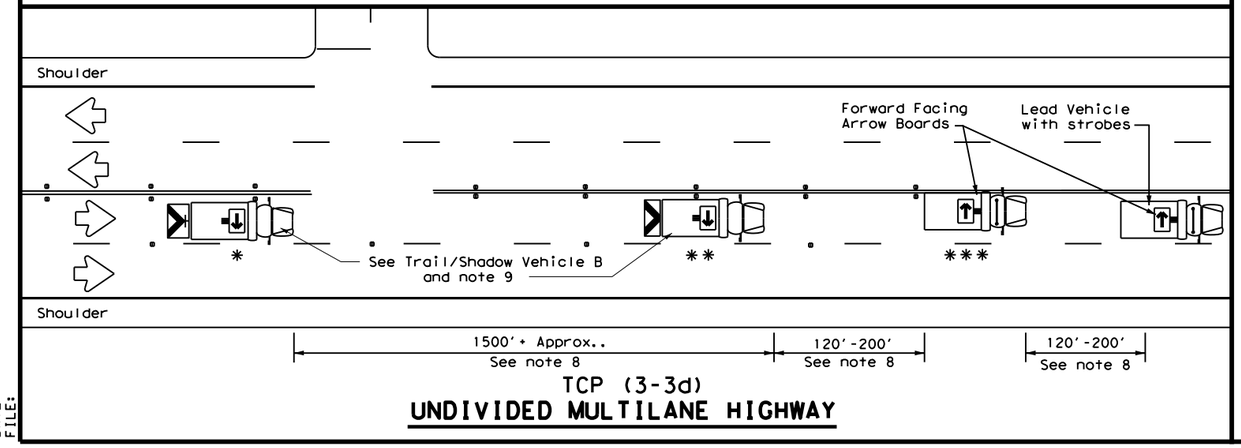
TCP (3-3b)

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



TCP (3-3c)

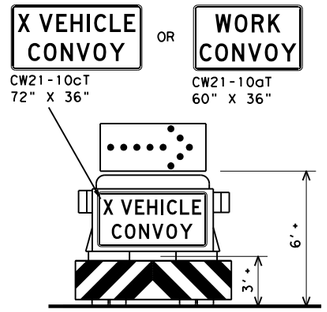
DIVIDED MULTILANE HIGHWAY



TCP (3-3d)

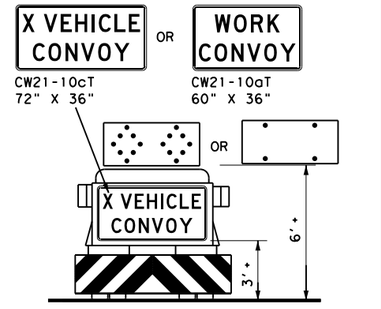
UNDIVIDED MULTILANE HIGHWAY

DATE:
FILE:



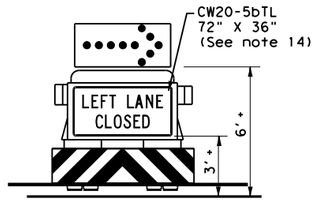
TRAIL/SHADOW VEHICLE A

with RIGHT Directional display
Flashing Arrow Board

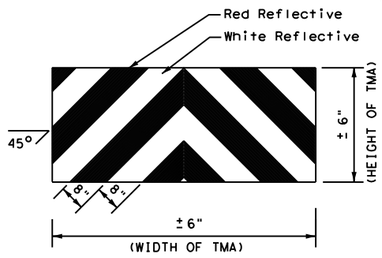


TRAIL/SHADOW VEHICLE B

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

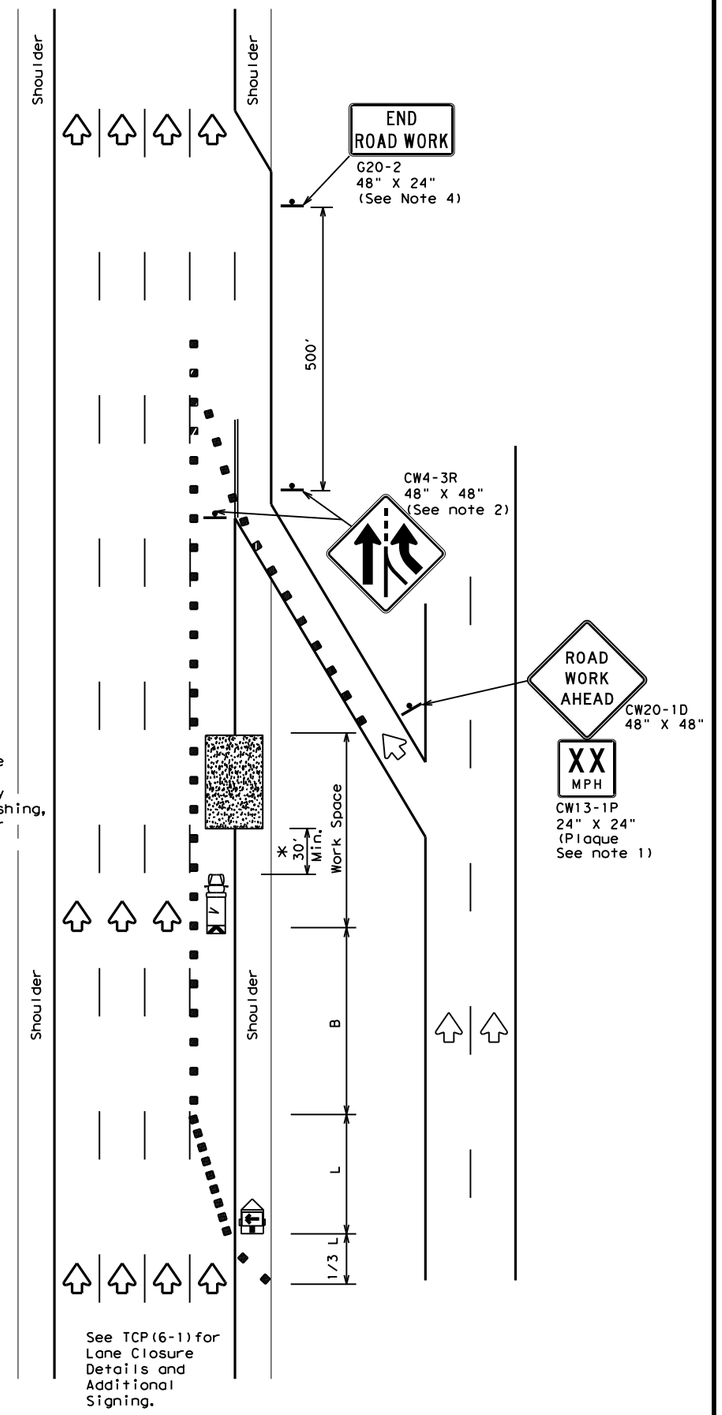
Traffic Operations Division Standard

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

FILE: tcp3-3.dgn	DN: TxDOT	CK: TxDOT	DW: TxDOT	CK: TxDOT
©TxDOT September 1987	CONT	SECT	JOB	HIGHWAY
REVISIONS	6414	53	001	BS105T,ETC
2-94 4-98	DIST	COUNTY		SHEET NO.
8-95 7-13	BMT	LIBERTY		43
1-97 7-14				

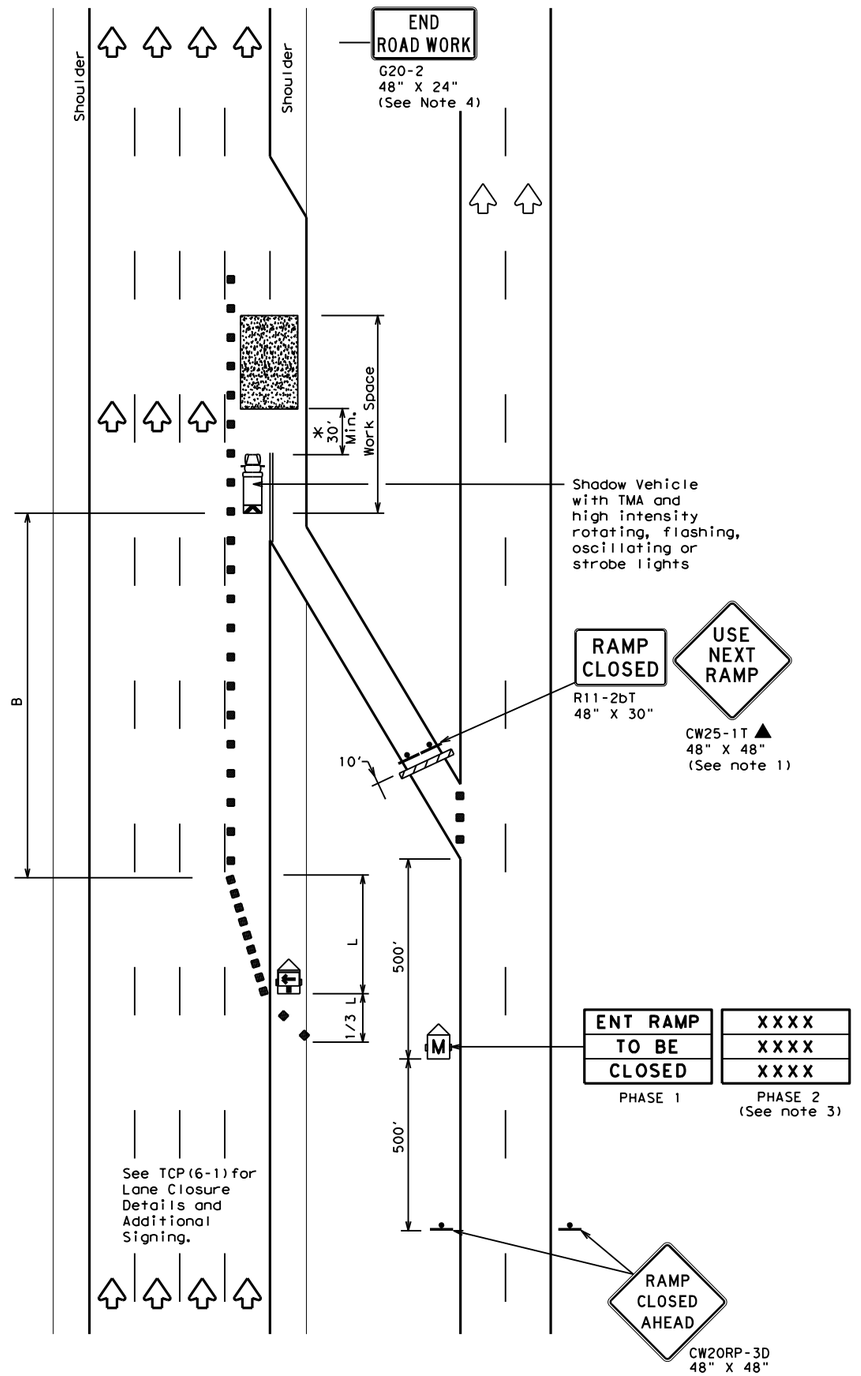
DISCLAIMER:
The use of this standard is governed by the "Texas Engineering Practice Act". No warranty of any kind is made by TxDOT for any purpose whatsoever. TxDOT assumes no responsibility for the conversion of this standard to other formats or for incorrect results or damages resulting from its use.

DATE:
FILE:



TCP (6-2a)

ENTRANCE RAMP OPEN
WORK WITHIN 500' OF RAMP



TCP (6-2b)

ENTRANCE RAMP CLOSED

LEGEND

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

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

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

TYPICAL USAGE

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

GENERAL NOTES

1. All traffic control devices illustrated are REQUIRED. Devices denoted with the triangle symbol may be omitted when stated elsewhere in the plans.
2. ADDED LANE Symbol (CW4-3) sign may be omitted when sign between ramp and mainlane can be seen from both roadways.
3. See "Advance Notice List" on BC(6) for recommended date and time formatting options for PCMS Phase 2 message.
4. The END ROAD WORK (G20-2) sign may be omitted when it conflicts with G20-2 signs already in place on the project.

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

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

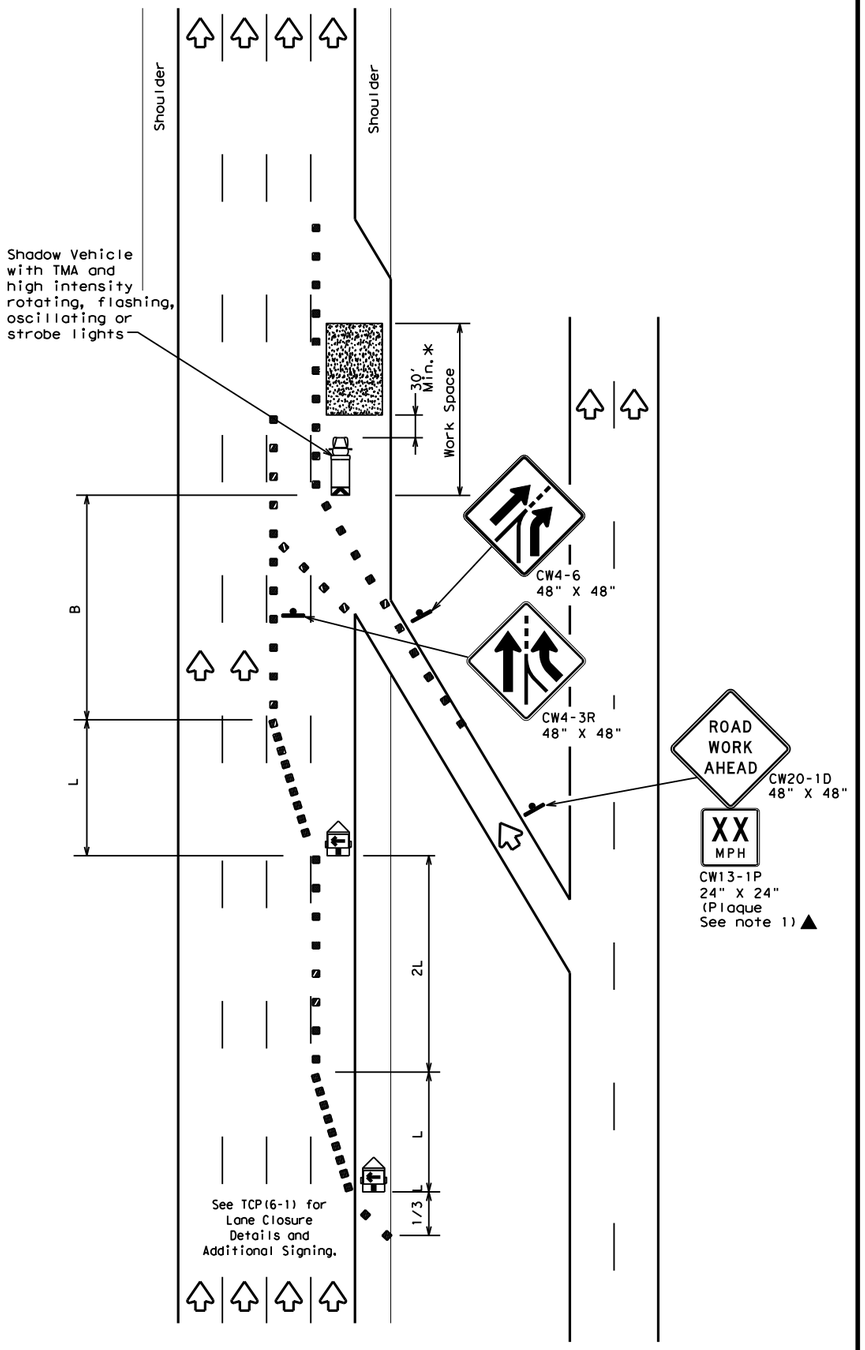
Texas Department of Transportation
Traffic Operations Division Standard

TRAFFIC CONTROL PLAN
WORK AREA NEAR RAMP

TCP(6-2)-12

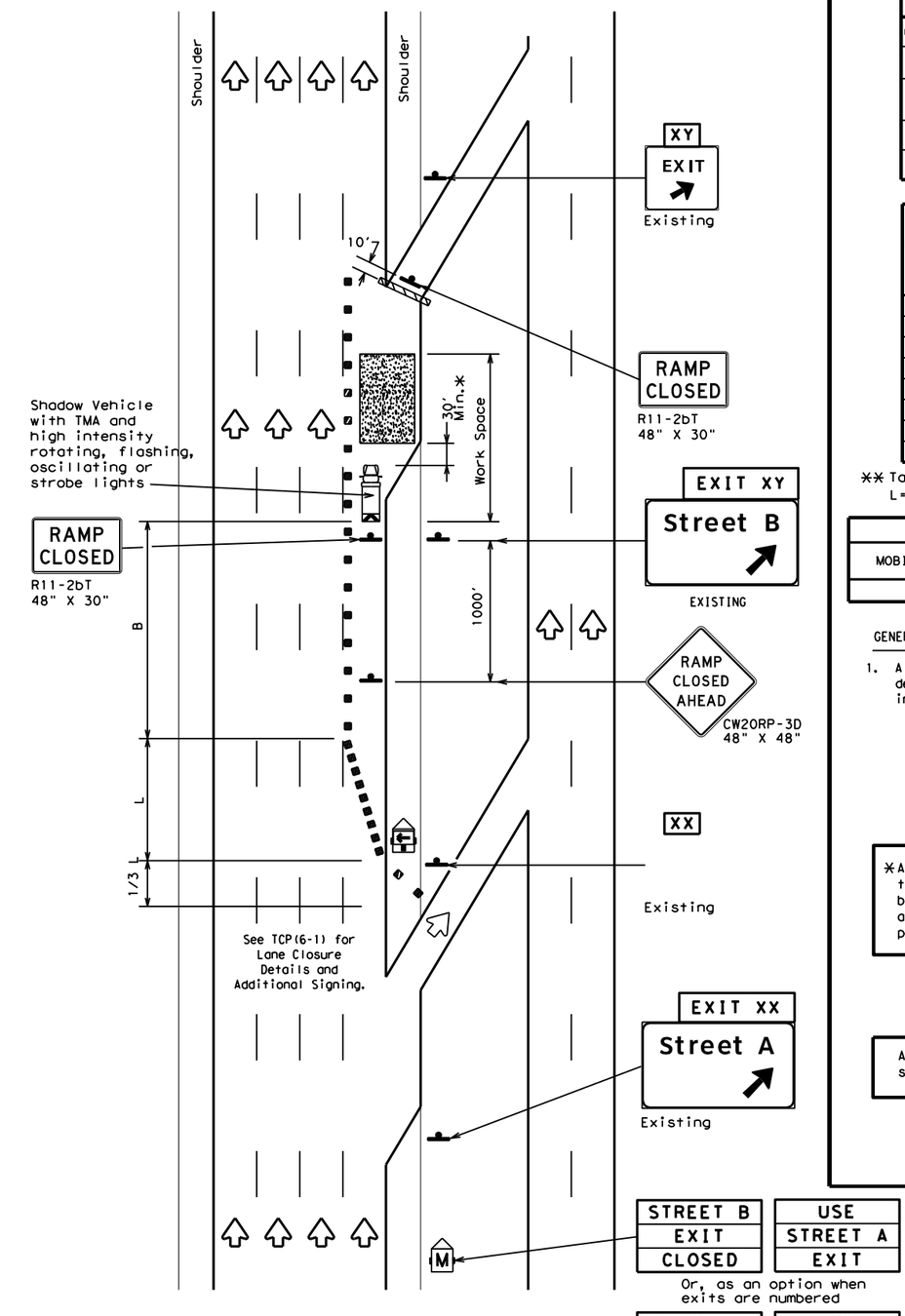
FILE: tcp6-2.dgn	DN: TxDOT	CK: TxDOT	DW: TxDOT	CK: TxDOT
©TxDOT February 1994	CONT	SECT	JOB	HIGHWAY
REVISIONS	6414	53	001	BS105T,ETC
1-97 8-98	DIST	COUNTY		SHEET NO.
4-98 8-12	BMT	LIBERTY		44

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



TCP (6-3a)

ENTRANCE RAMP OPEN



STREET B	USE
EXIT	STREET A
CLOSED	EXIT

Or, as an option when exits are numbered

EXIT XY	USE
CLOSED	EXIT XX

Place 1 mile (approx.) in advance of Street A exit.

TCP (6-3b)

EXIT RAMP CLOSED
TRAFFIC EXITS PRIOR TO CLOSED RAMP

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

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

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

GENERAL NOTES:

1. All traffic control devices illustrated are REQUIRED. Devices denoted with the triangle symbol may be omitted when stated elsewhere in the plans.

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

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

Texas Department of Transportation
Traffic Operations Division Standard

TRAFFIC CONTROL PLAN
WORK AREA BEYOND RAMP

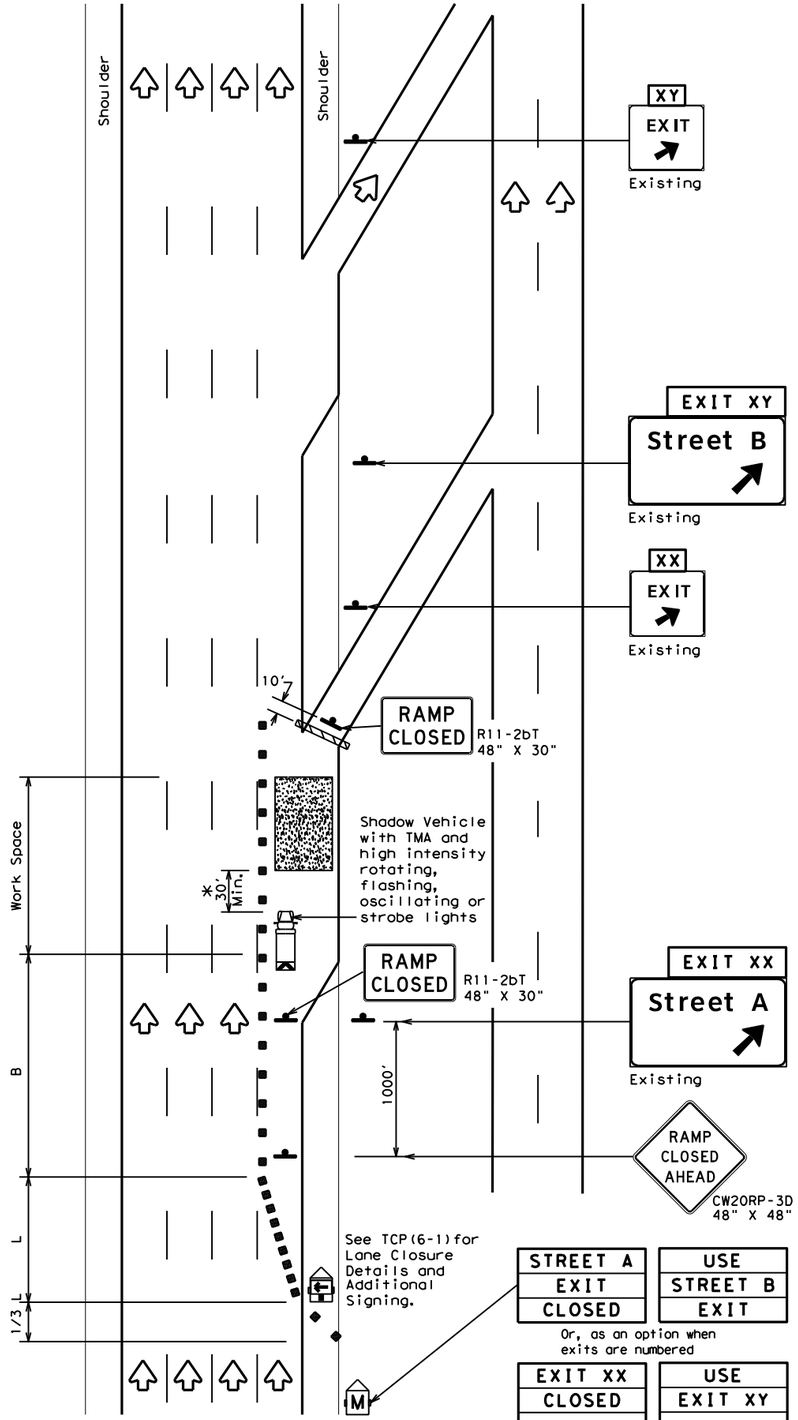
TCP(6-3)-12

FILE: tcp6-3.dgn	DN: TxDOT	CK: TxDOT	DW: TxDOT	CK: TxDOT
©TxDOT February 1994	CONT	SECT	JOB	HIGHWAY
REVISIONS	6414	53	001	BS105T,ETC
1-97 8-98	DIST	COUNTY		SHEET NO.
4-98 8-12	BMT	LIBERTY		45

DATE:
FILE:

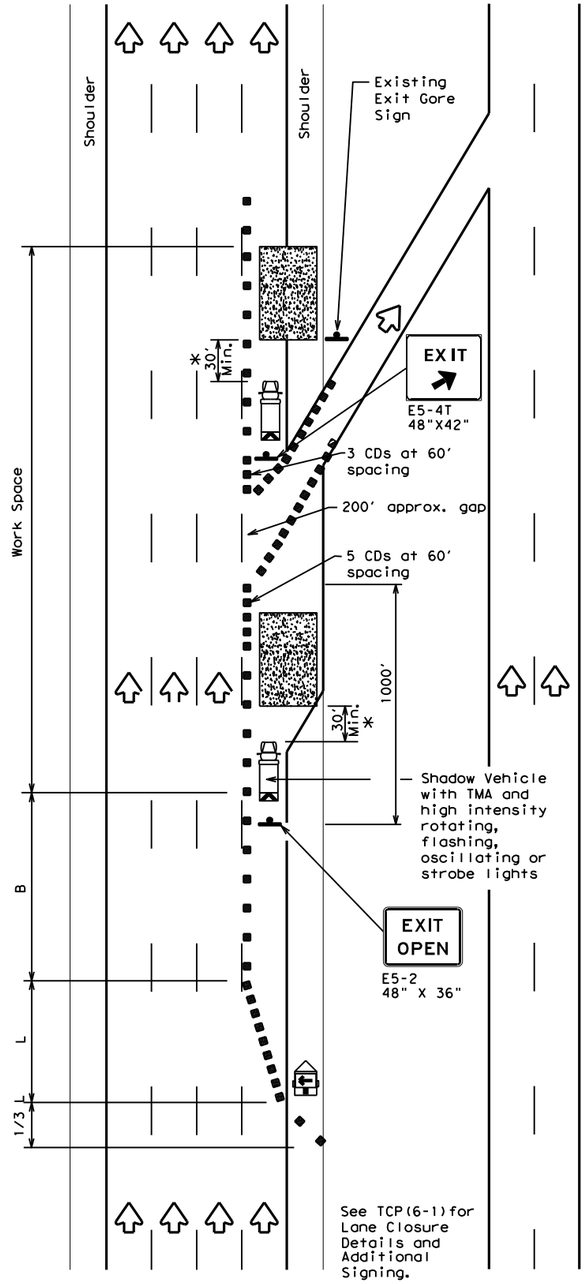
DISCLAIMER:
The use of this standard is governed by the "Texas Engineering Practice Act". No warranty of any kind is made by TxDOT for any purpose whatsoever. TxDOT assumes no responsibility for the conversion of this standard to other formats or for incorrect results or damages resulting from its use.

DATE:
FILE:



TCP (6-4a)

EXIT RAMP CLOSED
TRAFFIC EXITS PAST CLOSED RAMP



TCP (6-4b)

EXIT RAMP OPEN

LEGEND

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

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

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

TYPICAL USAGE

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

GENERAL NOTES

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

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

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

Texas Department of Transportation
Traffic Operations Division Standard

TRAFFIC CONTROL PLAN
WORK AREA AT EXIT RAMP

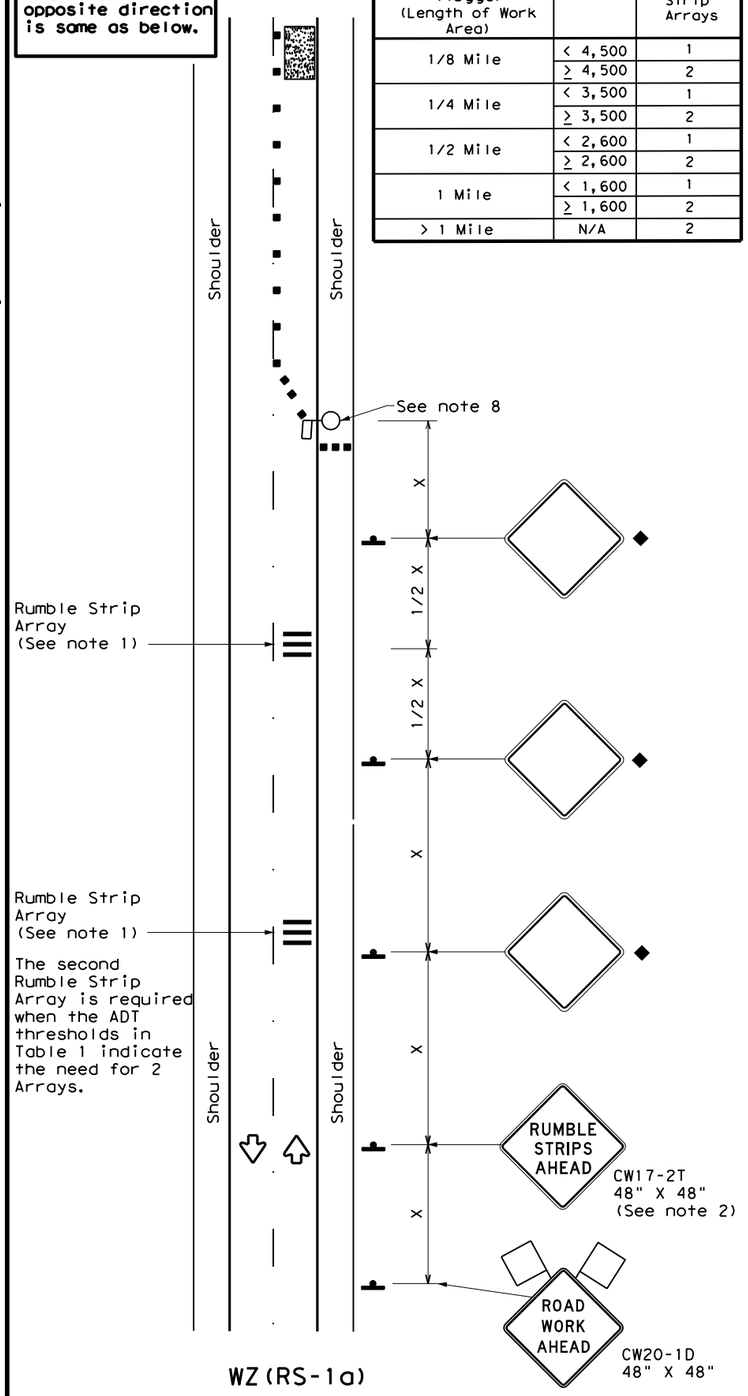
TCP(6-4)-12

FILE: tcp6-4.dgn	DN: TxDOT	CK: TxDOT	DW: TxDOT	CK: TxDOT
©TxDOT Feburary 1994	CONT	SECT	JOB	HIGHWAY
REVISIONS	6414	53	001	BS105T,ETC
1-97 8-98	DIST	COUNTY		SHEET NO.
4-98 8-12	BMT	LIBERTY		46

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

DATE:
FILE:

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

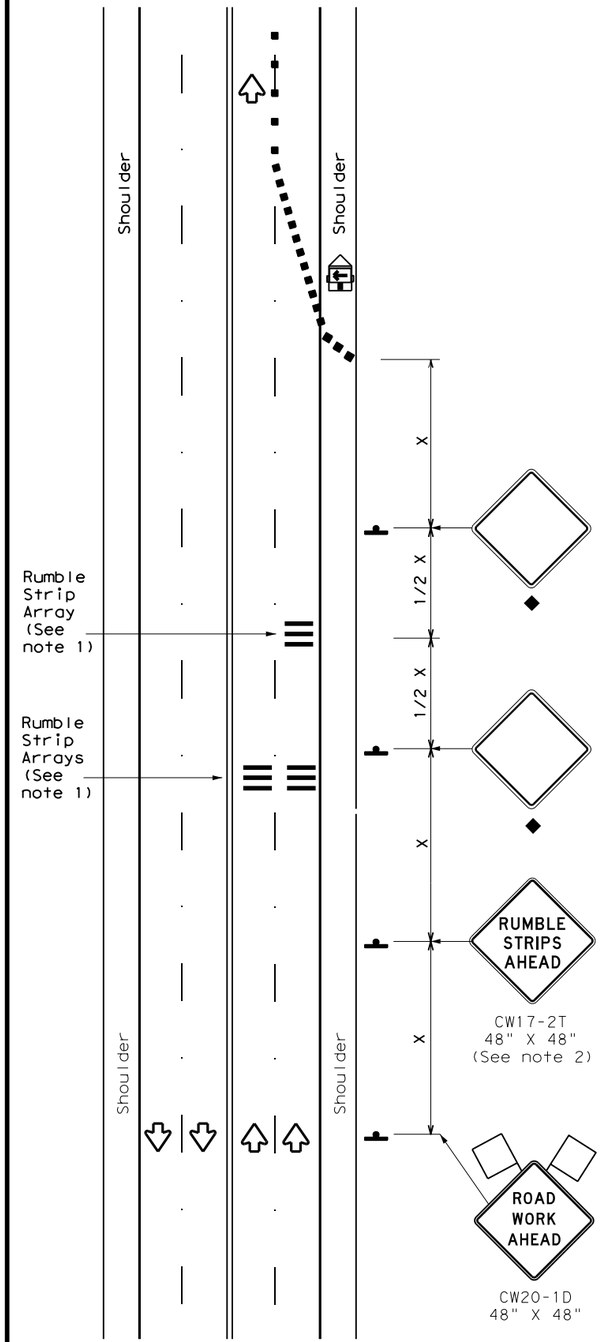


WZ(RS-1a)

RUMBLE STRIPS ON ONE-LANE TWO-WAY APPLICATION

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-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

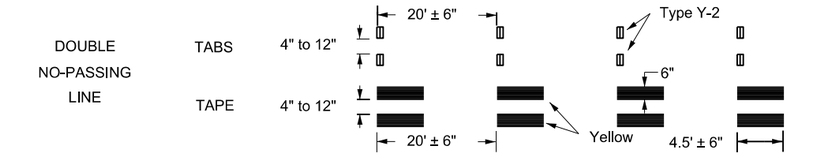
TEMPORARY RUMBLE STRIPS

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	6414	53	001	BS105T,ETC
	DIST	COUNTY		SHEET NO.
	BMT	LIBERTY		47

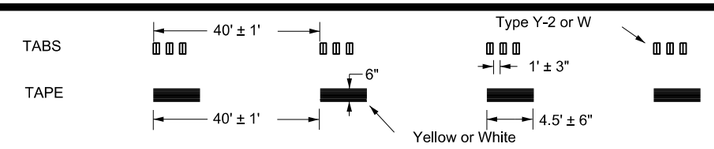
WORK ZONE SHORT TERM PAVEMENT MARKINGS DETAILS

SOLID LINES



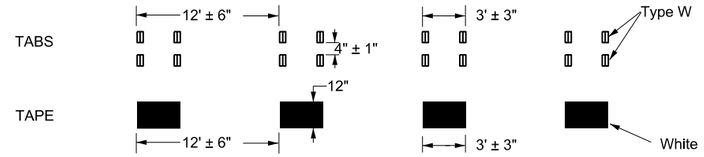
BROKEN LINES

(FOR CENTER LINE OR LANE LINE)

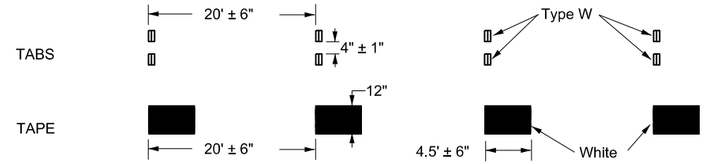


WIDE DOTTED LINES

(FOR LANE DROP LINES)



WIDE GORE MARKINGS



NOTES:

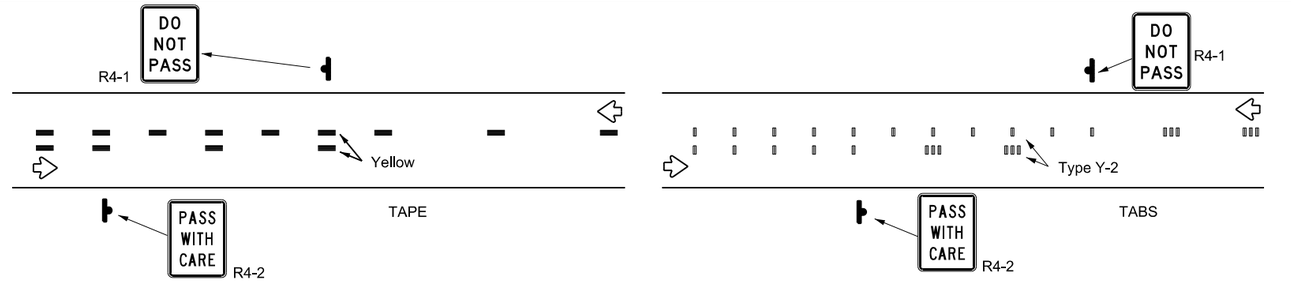
1. Short term pavement markings may be prefabricated markings (stick down tape) or temporary flexible reflective roadway marker tabs unless otherwise specified elsewhere in plans.
2. Short term pavement markings shall NOT be used to simulate edge lines.
3. Dimensions indicated on this sheet are typical 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)

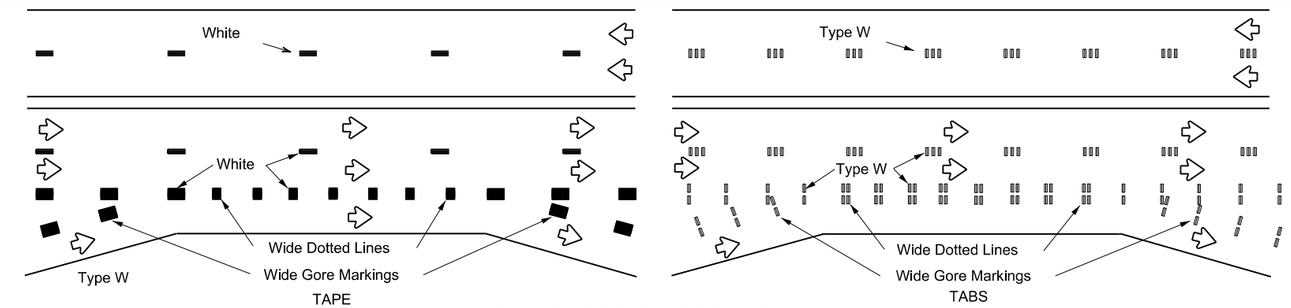
1. Temporary flexible-reflective roadway marker tabs detailed on this sheet will be designated Type Y-2 (two amber reflective surfaces with yellow body); Type Y (one amber reflective surface with yellow body); and Type W (one white or silver reflective surface with white body). Additional details may 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.

DATE:
FILE:

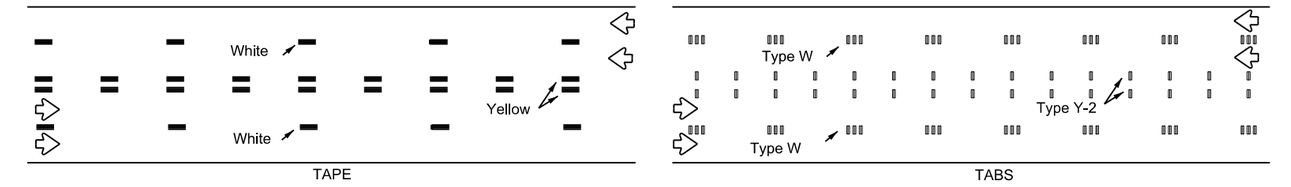
WORK ZONE SHORT TERM PAVEMENT MARKINGS PATTERNS



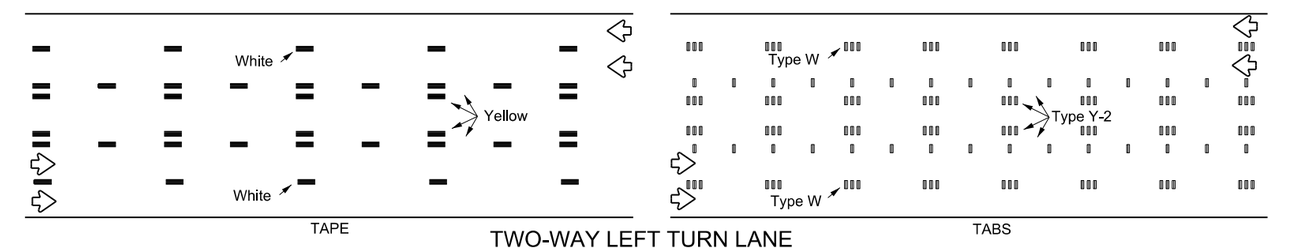
CENTER LINE & NO-PASSING ZONE BARRIER LINES FOR TWO LANE TWO-WAY HIGHWAYS



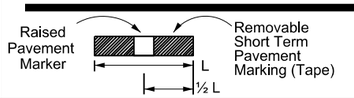
LANE LINES FOR DIVIDED HIGHWAY



LANE & CENTER LINES FOR MULTILANE UNDIVIDED HIGHWAYS



TWO-WAY LEFT TURN LANE



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

PREFABRICATED PAVEMENT MARKINGS

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

RAISED PAVEMENT MARKERS

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

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

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

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

Texas Department of Transportation

Traffic Safety Division Standard

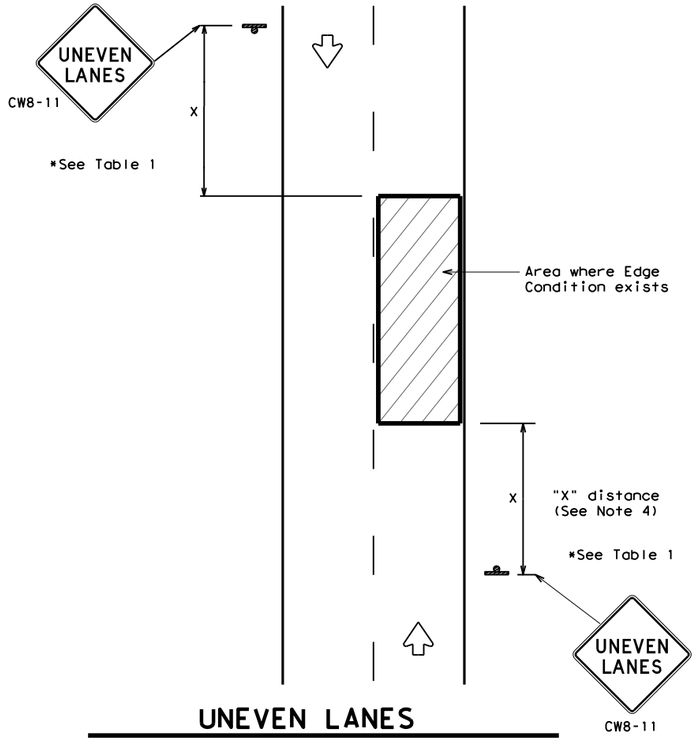
WORK ZONE SHORT TERM PAVEMENT MARKINGS

WZ(STPM)-23

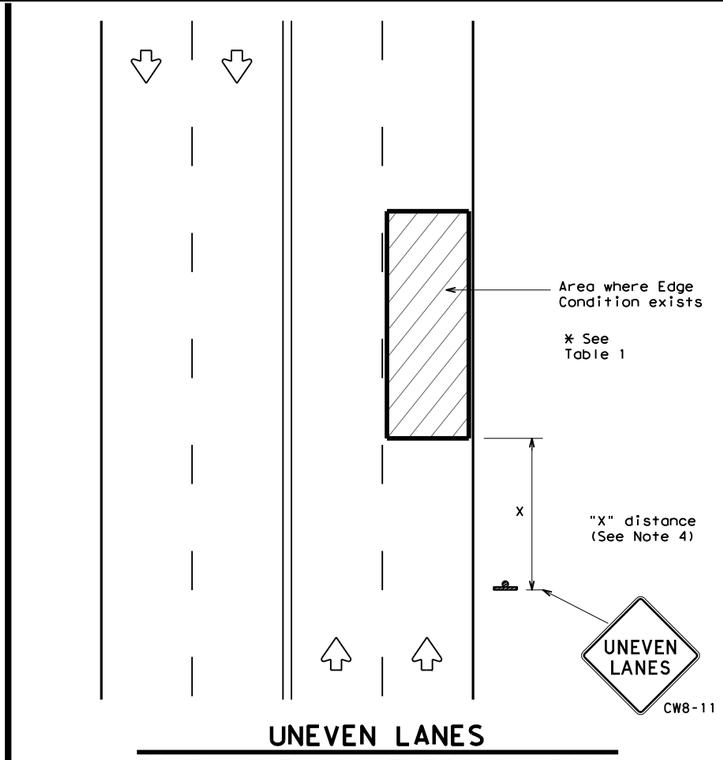
FILE: wzstpm-23.dgn	DN:	CK:	DW:	CK:
© TxDOT February 2023	CONT	SECT	JOB	HIGHWAY
REVISIONS	6414	53	001	BS105T,ETC
4-92 7-13 1-97 2-23 3-03	DIST	COUNTY		SHEET NO.
	BMT	LIBERTY		48

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

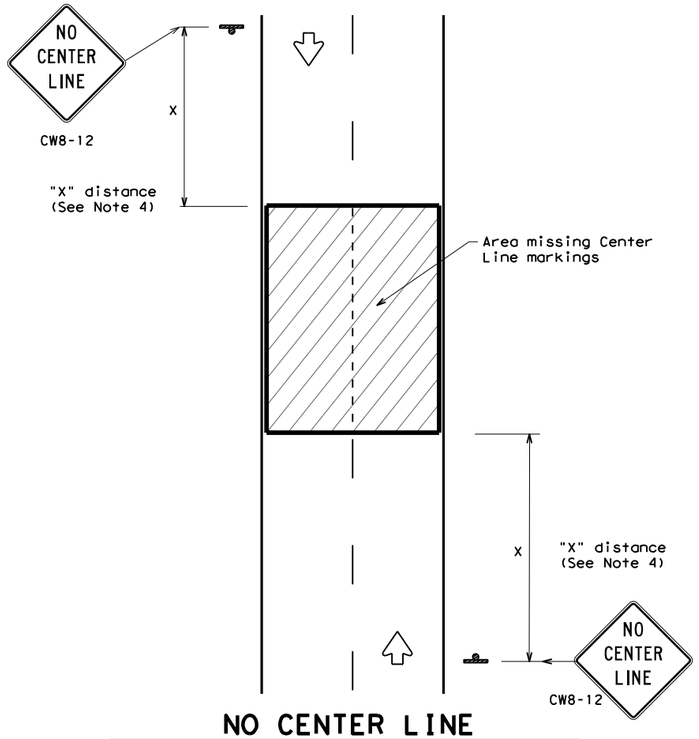
DATE:
FILE:



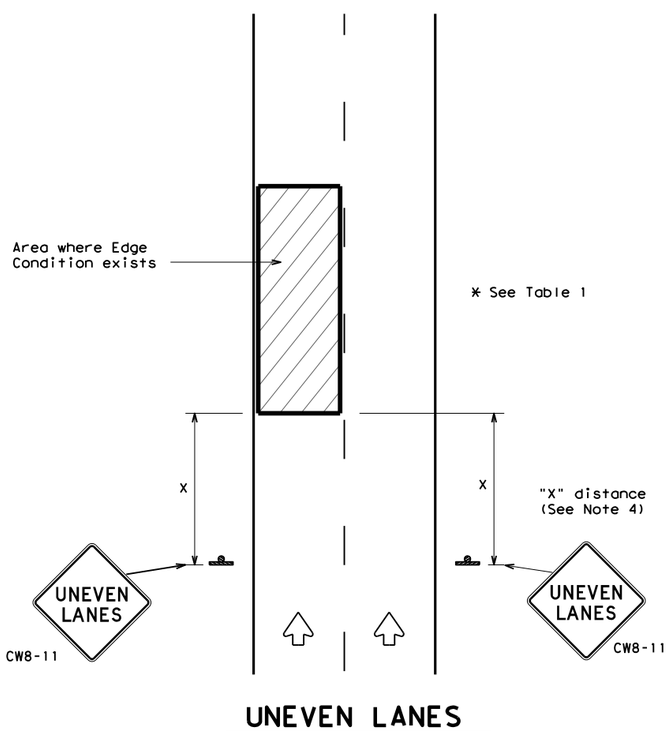
UNEVEN LANES
TWO LANE CONVENTIONAL ROAD



UNEVEN LANES
FOUR LANE CONVENTIONAL ROAD



NO CENTER LINE
TWO LANE CONVENTIONAL ROAD



UNEVEN LANES
DIVIDED ROADWAY

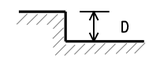
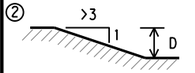
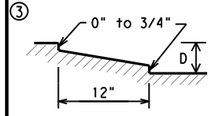
DEPARTMENTAL MATERIAL SPECIFICATIONS	
PERMANENT PREFABRICATED PAVEMENT MARKINGS	DMS-8240
TEMPORARY (REMOVABLE) PREFABRICATED PAVEMENT MARKINGS	DMS-8241
SIGN FACE MATERIALS	DMS-8300

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"

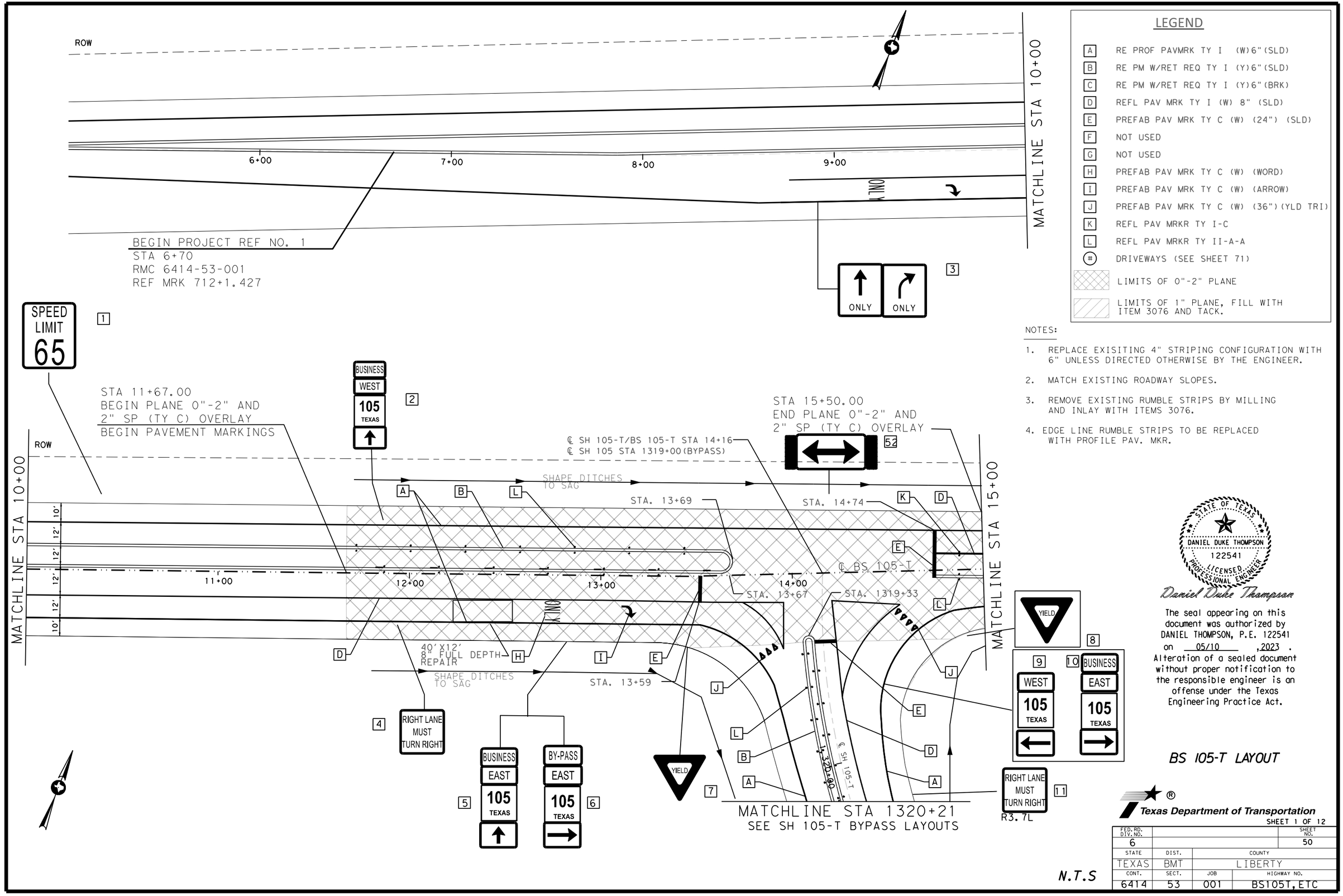
Texas Department of Transportation

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
REVISIONS		6414	53	001	BS105T,ETC
8-95 2-98 7-13		DIST	COUNTY		SHEET NO.
1-97 3-03		BMT	LIBERTY		49



LEGEND

A	RE PROF PAVMRK TY I (W)6"(SLD)
B	RE PM W/RET REQ TY I (Y)6"(SLD)
C	RE PM W/RET REQ TY I (Y)6"(BRK)
D	REFL PAV MRK TY I (W) 8" (SLD)
E	PREFAB PAV MRK TY C (W) (24") (SLD)
F	NOT USED
G	NOT USED
H	PREFAB PAV MRK TY C (W) (WORD)
I	PREFAB PAV MRK TY C (W) (ARROW)
J	PREFAB PAV MRK TY C (W) (36")(YLD TRI)
K	REFL PAV MRKR TY I-C
L	REFL PAV MRKR TY II-A-A
(#)	DRIVEWAYS (SEE SHEET 71)

LIMITS OF 0"-2" PLANE

LIMITS OF 1" PLANE, FILL WITH ITEM 3076 AND TACK.

NOTES:

1. REPLACE EXISITING 4" STRIPING CONFIGURATION WITH 6" UNLESS DIRECTED OTHERWISE BY THE ENGINEER.
2. MATCH EXISTING ROADWAY SLOPES.
3. REMOVE EXISTING RUMBLE STRIPS BY MILLING AND INLAY WITH ITEMS 3076.
4. EDGE LINE RUMBLE STRIPS TO BE REPLACED WITH PROFILE PAV. MKR.

STATE OF TEXAS
DANIEL DUKE THOMPSON
122541
LICENSED PROFESSIONAL ENGINEER

Daniel Duke Thompson

The seal appearing on this document was authorized by DANIEL THOMPSON, P.E. 122541 on 05/10 ,2023 . Alteration of a sealed document without proper notification to the responsible engineer is an offense under the Texas Engineering Practice Act.

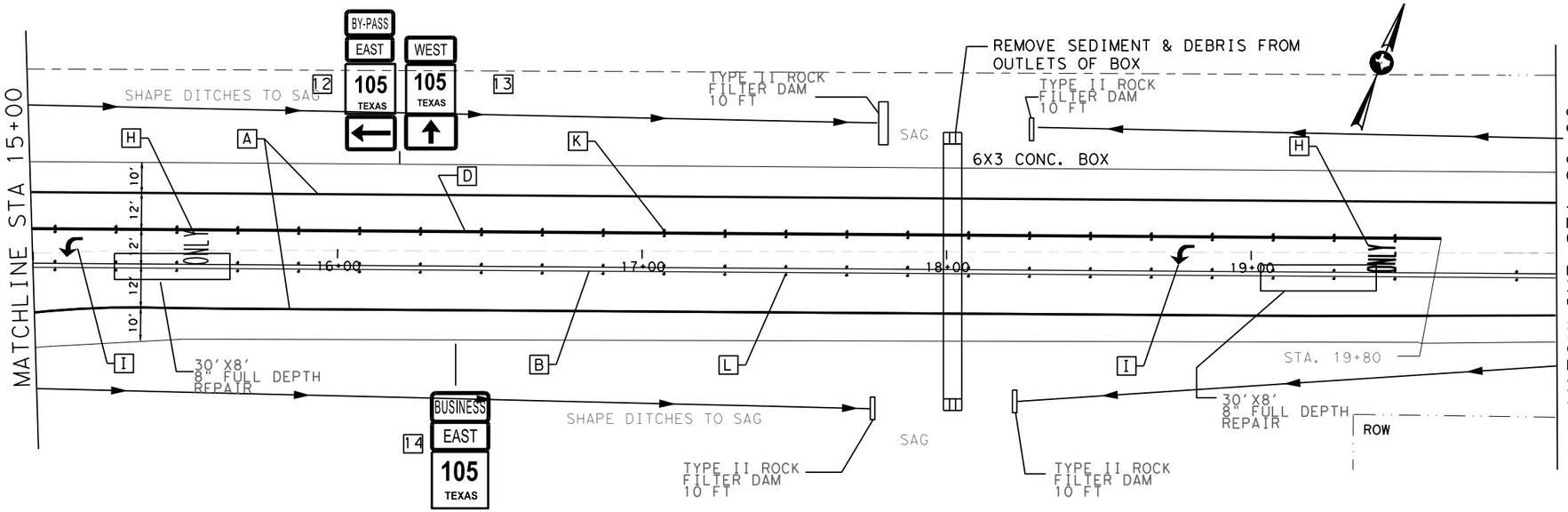
BS 105-T LAYOUT

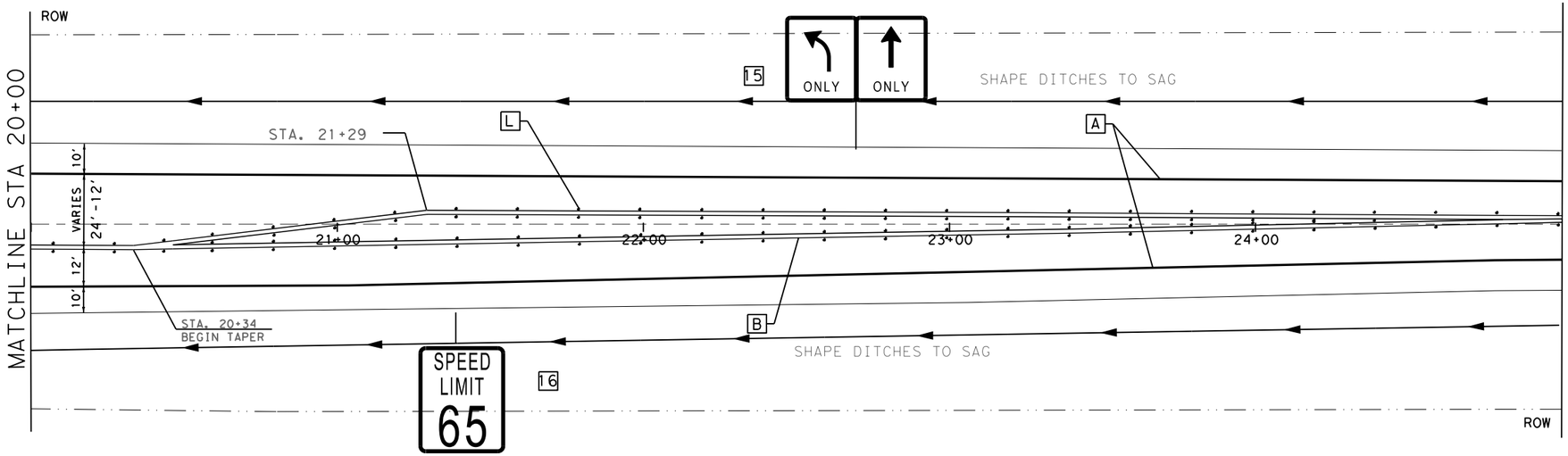
Texas Department of Transportation

SHEET 1 OF 12

FED.RD. DIV.NO.			SHEET NO.
6			50
STATE	DIST.	COUNTY	
TEXAS	BMT	LIBERTY	
CONT.	SECT.	JOB	HIGHWAY NO.
6414	53	001	BS105T,ETC

N.T.S





LEGEND

A	RE PROF PAVMRK TY I (W)6"(SLD)
B	RE PM W/RET REQ TY I (Y)6"(SLD)
C	RE PM W/RET REQ TY I (Y)6"(BRK)
D	REFL PAV MRK TY I (W) 8" (SLD)
E	PREFAB PAV MRK TY C (W) (24") (SLD)
F	NOT USED
G	NOT USED
H	PREFAB PAV MRK TY C (W) (WORD)
I	PREFAB PAV MRK TY C (W) (ARROW)
J	PREFAB PAV MRK TY C (W) (36")(YLD TRI)
K	REFL PAV MRKR TY I-C
L	REFL PAV MRKR TY II-A-A
#	DRIVEWAYS (SEE SHEET 71)
	LIMITS OF 0"-2" PLANE
	LIMITS OF 1" PLANE, FILL WITH ITEM 3076 AND TACK.

NOTES:

1. REPLACE EXISITING 4" STRIPING CONFIGURATION WITH 6" UNLESS DIRECTED OTHERWISE BY THE ENGINEER.
2. MATCH EXISTING ROADWAY SLOPES.
3. REMOVE EXISTING RUMBLE STRIPS BY MILLING AND INLAY WITH ITEMS 3076.
4. EDGE LINE RUMBLE STRIPS TO BE REPLACED WITH PROFILE PAV. MKR.

STATE OF TEXAS
DANIEL DUKE THOMPSON
122541
LICENSED PROFESSIONAL ENGINEER

Daniel Duke Thompson

The seal appearing on this document was authorized by DANIEL THOMPSON, P.E. 122541 on 05/10 ,2023 . Alteration of a sealed document without proper notification to the responsible engineer is an offense under the Texas Engineering Practice Act.

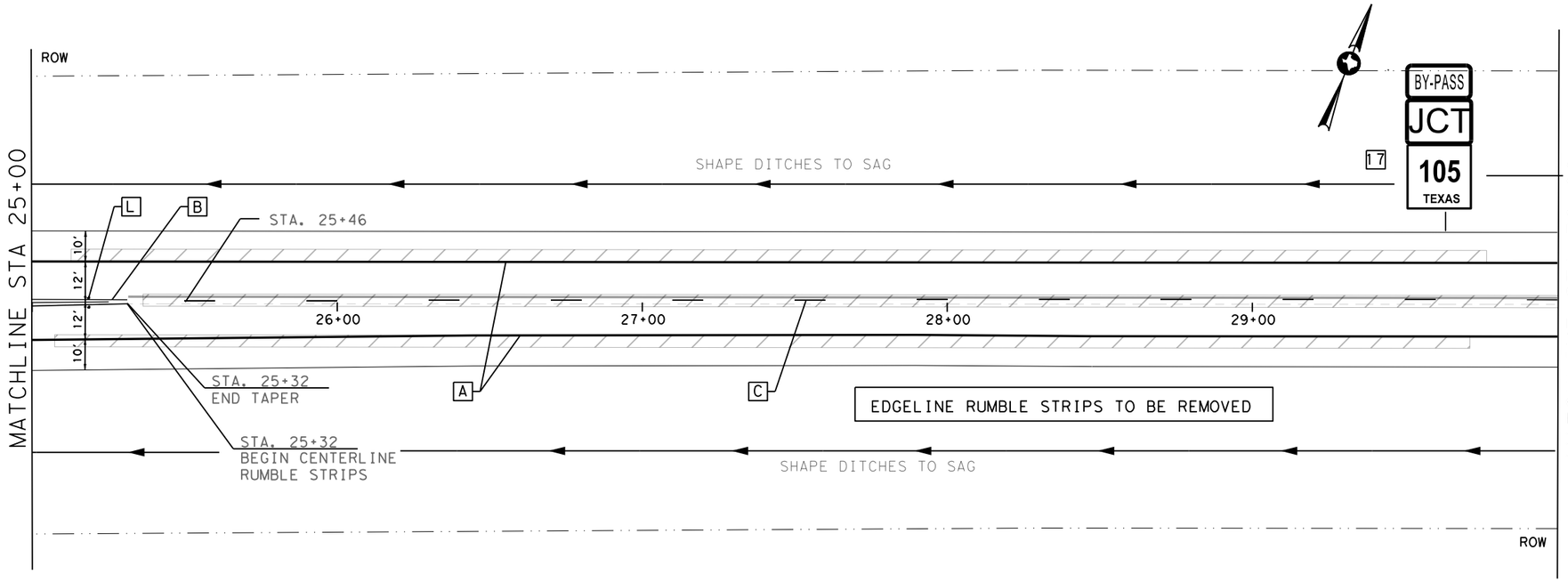
BS 105-T LAYOUT

Texas Department of Transportation

SHEET 2 OF 12

FED.RD. DIV.NO.			SHEET NO.
6			51
STATE	DIST.	COUNTY	
TEXAS	BMT	LIBERTY	
CONT.	SECT.	JOB	HIGHWAY NO.
6414	53	001	BS105T, ETC

N.T.S

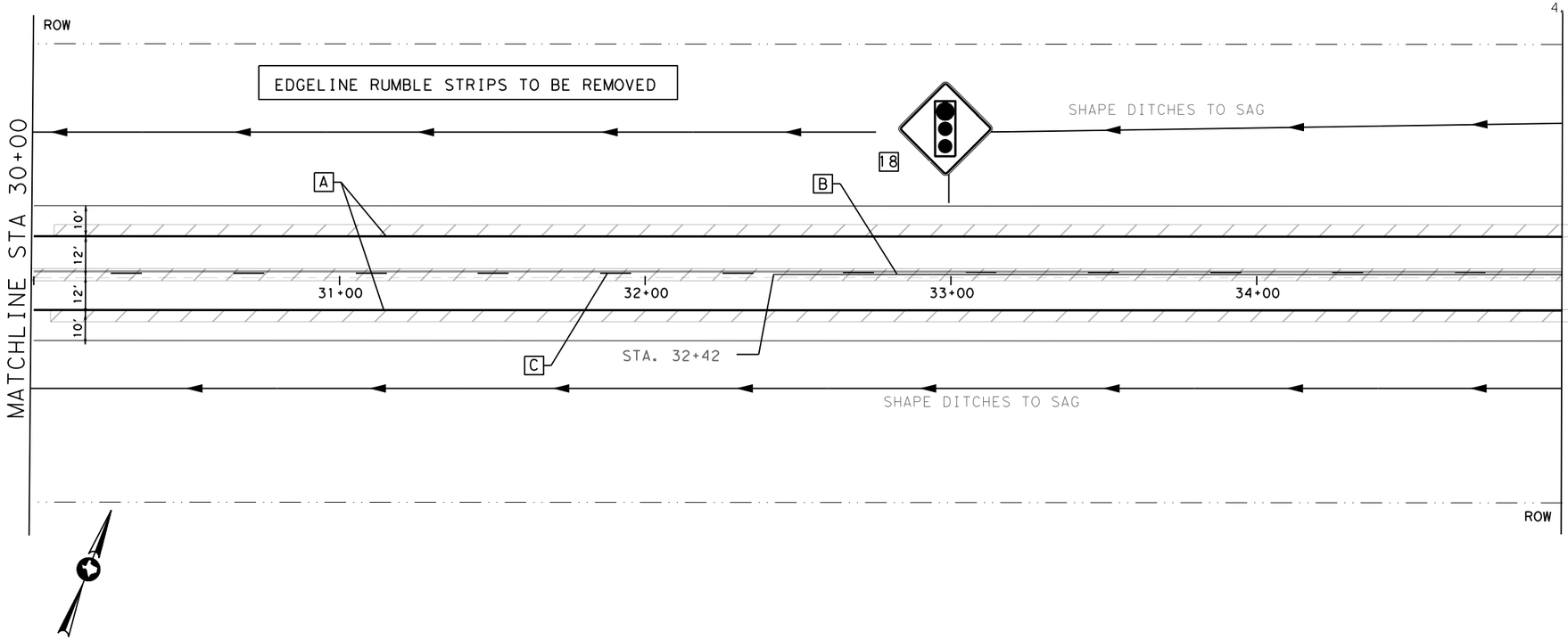


LEGEND

A	RE PROF PAVMRK TY I (W)6"(SLD)
B	RE PM W/RET REQ TY I (Y)6"(SLD)
C	RE PM W/RET REQ TY I (Y)6"(BRK)
D	REFL PAV MRK TY I (W) 8" (SLD)
E	PREFAB PAV MRK TY C (W) (24") (SLD)
F	NOT USED
G	NOT USED
H	PREFAB PAV MRK TY C (W) (WORD)
I	PREFAB PAV MRK TY C (W) (ARROW)
J	PREFAB PAV MRK TY C (W) (36")(YLD TRI)
K	REFL PAV MRKR TY I-C
L	REFL PAV MRKR TY II-A-A
(#)	DRIVEWAYS (SEE SHEET 71)
	LIMITS OF 0"-2" PLANE
	LIMITS OF 1" PLANE, FILL WITH ITEM 3076 AND TACK.

NOTES:

1. REPLACE EXISITING 4" STRIPING CONFIGURATION WITH 6" UNLESS DIRECTED OTHERWISE BY THE ENGINEER.
2. MATCH EXISTING ROADWAY SLOPES.
3. REMOVE EXISTING RUMBLE STRIPS BY MILLING AND INLAY WITH ITEMS 3076.
4. EDGE LINE RUMBLE STRIPS TO BE REPLACED WITH PROFILE PAV. MKR.



STATE OF TEXAS
DANIEL DUKE THOMPSON
122541
LICENSED PROFESSIONAL ENGINEER

Daniel Duke Thompson

The seal appearing on this document was authorized by DANIEL THOMPSON, P.E. 122541 on 05/10 ,2023 . Alteration of a sealed document without proper notification to the responsible engineer is an offense under the Texas Engineering Practice Act.

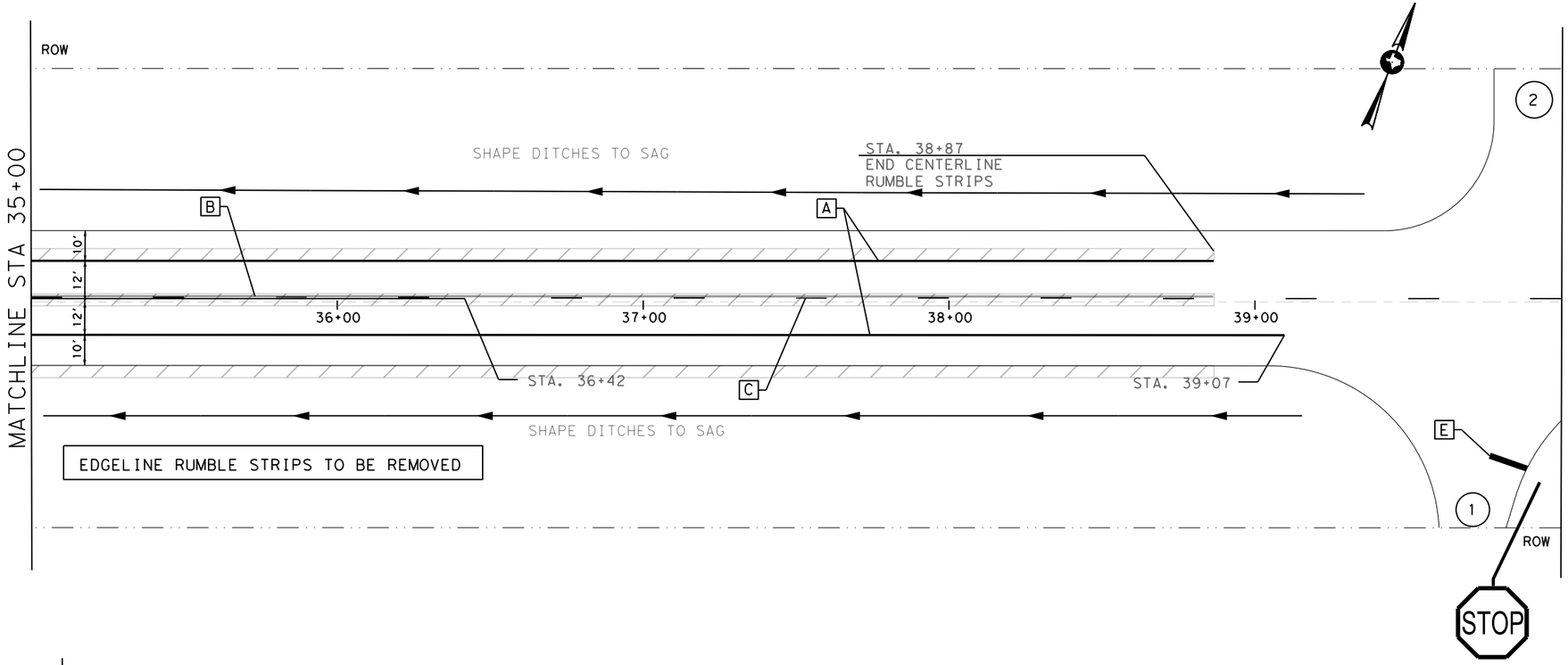
BS 105-T LAYOUT

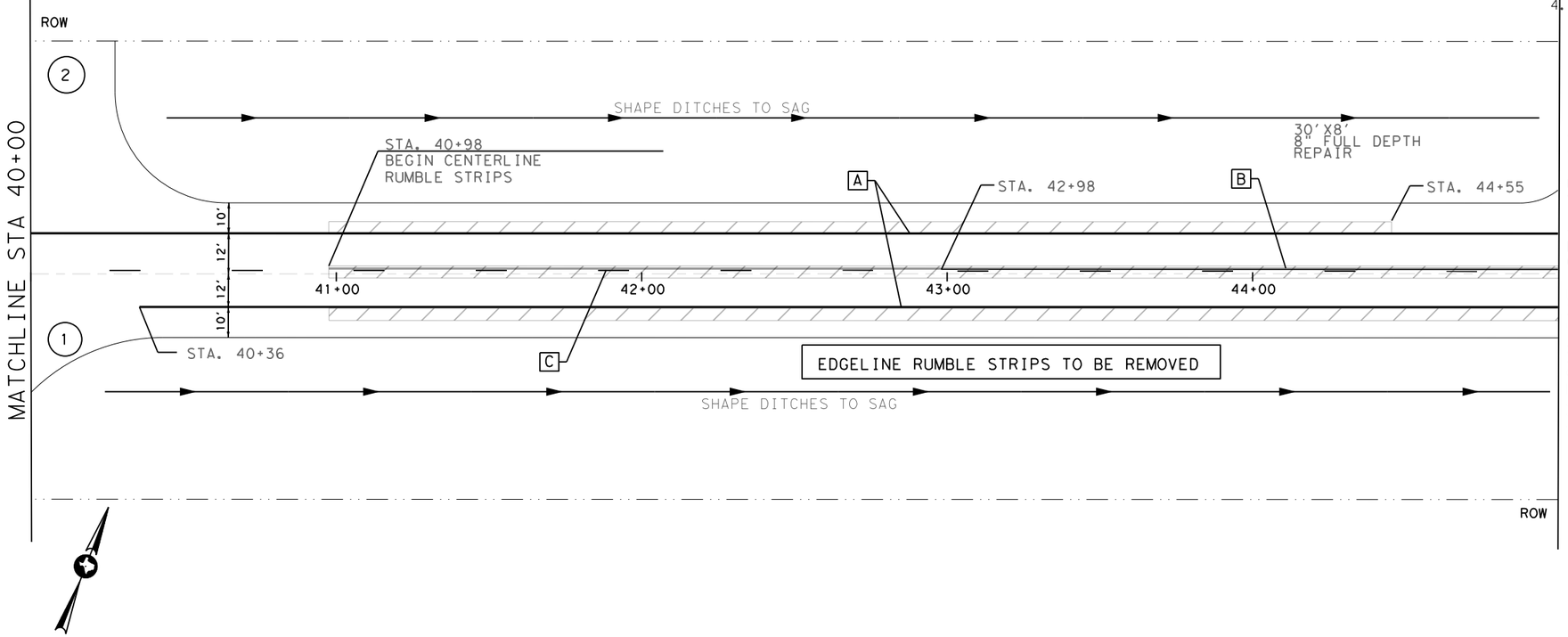
N.T.S

Texas Department of Transportation

SHEET 3 OF 12

FED.RD. DIV.NO.			SHEET NO.
6			52
STATE	DIST.	COUNTY	
TEXAS	BMT	LIBERTY	
CONT.	SECT.	JOB	HIGHWAY NO.
6414	53	001	BS105T, ETC





LEGEND

A	RE PROF PAVMRK TY I (W)6"(SLD)
B	RE PM W/RET REQ TY I (Y)6"(SLD)
C	RE PM W/RET REQ TY I (Y)6"(BRK)
D	REFL PAV MRK TY I (W) 8" (SLD)
E	PREFAB PAV MRK TY C (W) (24") (SLD)
F	NOT USED
G	NOT USED
H	PREFAB PAV MRK TY C (W) (WORD)
I	PREFAB PAV MRK TY C (W) (ARROW)
J	PREFAB PAV MRK TY C (W) (36")(YLD TRI)
K	REFL PAV MRKR TY I-C
L	REFL PAV MRKR TY II-A-A
#	DRIVEWAYS (SEE SHEET 71)
	LIMITS OF 0"-2" PLANE
	LIMITS OF 1" PLANE, FILL WITH ITEM 3076 AND TACK.

NOTES:

1. REPLACE EXISITING 4" STRIPING CONFIGURATION WITH 6" UNLESS DIRECTED OTHERWISE BY THE ENGINEER.
2. MATCH EXISTING ROADWAY SLOPES.
3. REMOVE EXISTING RUMBLE STRIPS BY MILLING AND INLAY WITH ITEMS 3076.
4. EDGE LINE RUMBLE STRIPS TO BE REPLACED WITH PROFILE PAV. MKR.

STATE OF TEXAS
DANIEL DUKE THOMPSON
122541
LICENSED PROFESSIONAL ENGINEER

Daniel Duke Thompson

The seal appearing on this document was authorized by DANIEL THOMPSON, P.E. 122541 on 05/10 ,2023 . Alteration of a sealed document without proper notification to the responsible engineer is an offense under the Texas Engineering Practice Act.

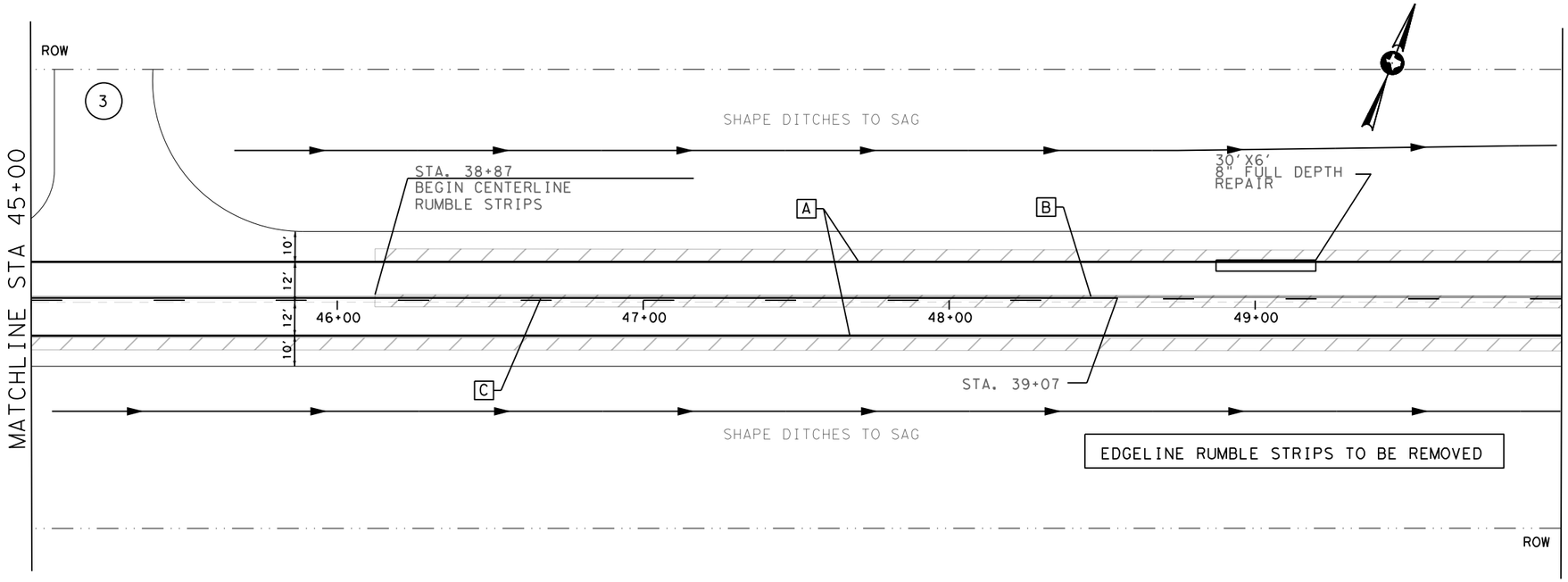
BS 105-T LAYOUT

N.T.S

Texas Department of Transportation

SHEET 4 OF 12

FED.RD. DIV.NO.			SHEET NO.
6			53
STATE	DIST.	COUNTY	
TEXAS	BMT	LIBERTY	
CONT.	SECT.	JOB	HIGHWAY NO.
6414	53	001	BS105T, ETC

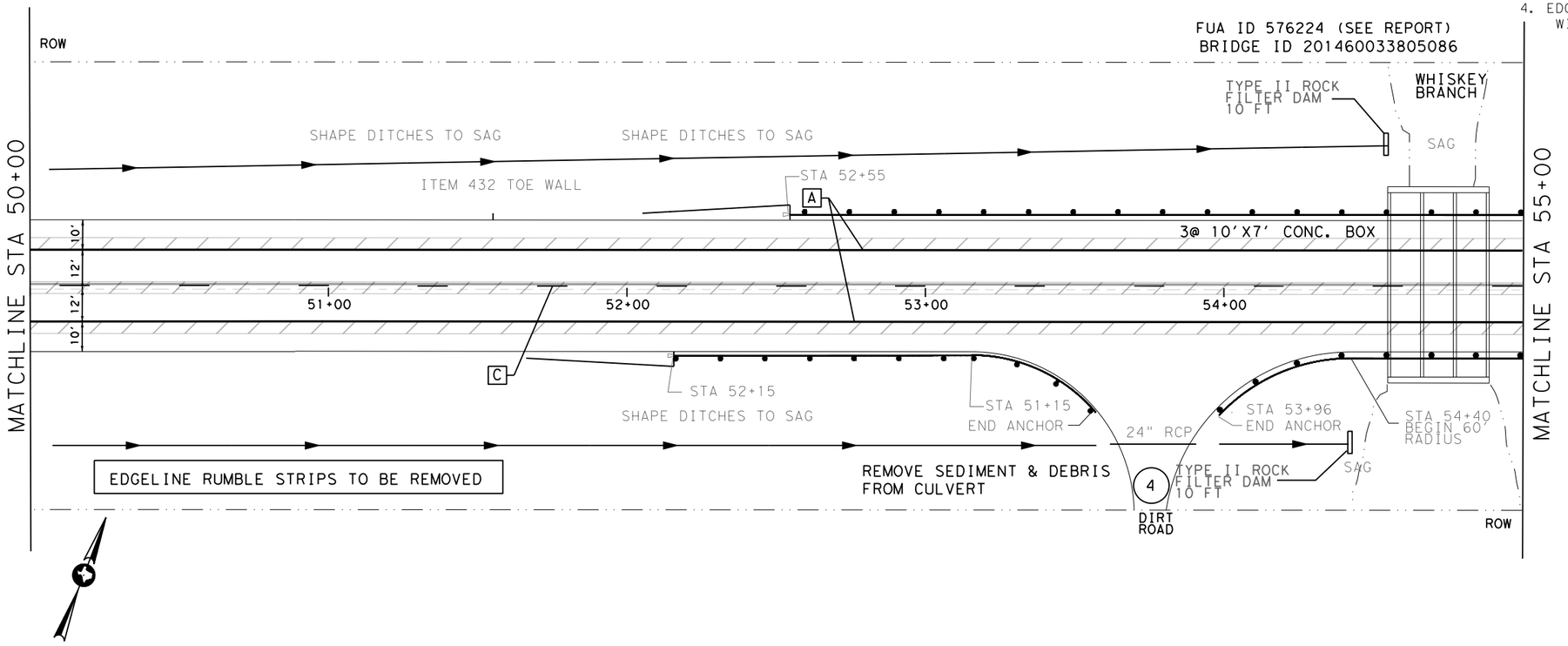


LEGEND

A	RE PROF PAVMRK TY I (W)6"(SLD)
B	RE PM W/RET REQ TY I (Y)6"(SLD)
C	RE PM W/RET REQ TY I (Y)6"(BRK)
D	REFL PAV MRK TY I (W) 8" (SLD)
E	PREFAB PAV MRK TY C (W) (24") (SLD)
F	NOT USED
G	NOT USED
H	PREFAB PAV MRK TY C (W) (WORD)
I	PREFAB PAV MRK TY C (W) (ARROW)
J	PREFAB PAV MRK TY C (W) (36")(YLD TRI)
K	REFL PAV MRKR TY I-C
L	REFL PAV MRKR TY II-A-A
#	DRIVEWAYS (SEE SHEET 71)
	LIMITS OF 0"-2" PLANE
	LIMITS OF 1" PLANE, FILL WITH ITEM 3076 AND TACK.

NOTES:

1. REPLACE EXISITING 4" STRIPING CONFIGURATION WITH 6" UNLESS DIRECTED OTHERWISE BY THE ENGINEER.
2. MATCH EXISTING ROADWAY SLOPES.
3. REMOVE EXISTING RUMBLE STRIPS BY MILLING AND INLAY WITH ITEMS 3076.
4. EDGE LINE RUMBLE STRIPS TO BE REPLACED WITH PROFILE PAV. MKR.



STATE OF TEXAS
DANIEL DUKE THOMPSON
122541
LICENSED PROFESSIONAL ENGINEER

Daniel Duke Thompson

The seal appearing on this document was authorized by DANIEL THOMPSON, P.E. 122541 on 05/10 ,2023 . Alteration of a sealed document without proper notification to the responsible engineer is an offense under the Texas Engineering Practice Act.

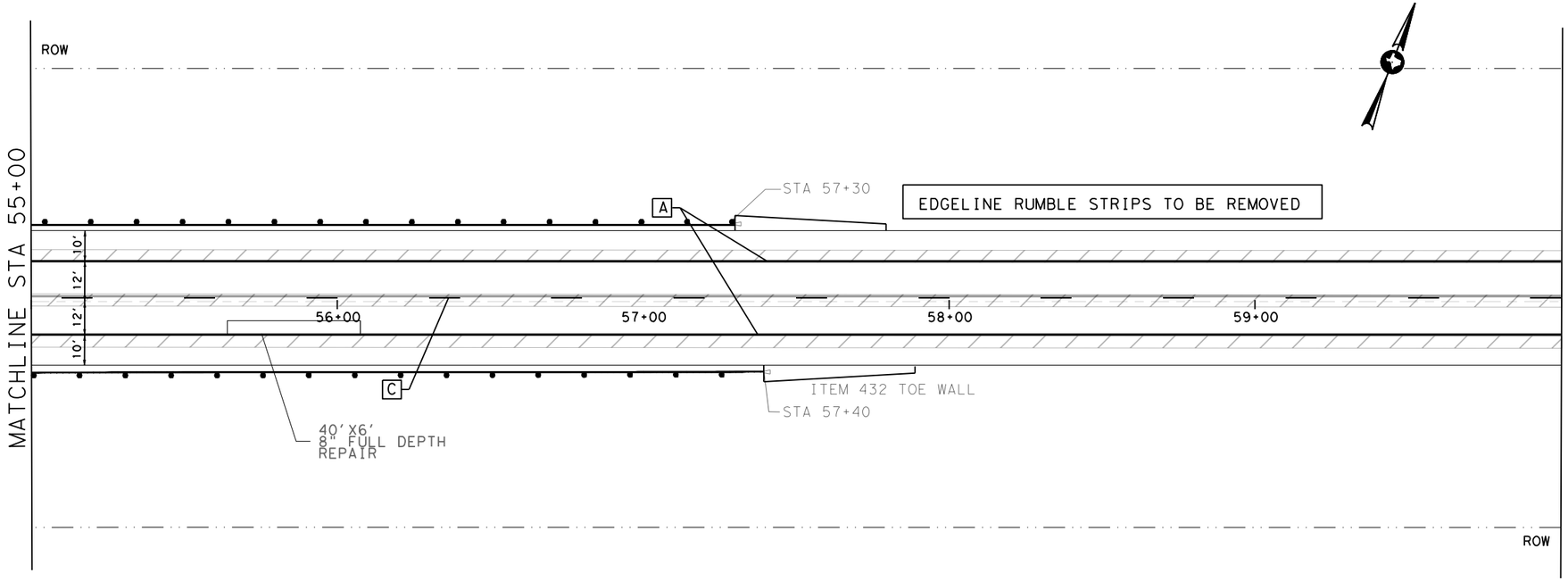
BS 105-T LAYOUT

Texas Department of Transportation

SHEET 5 OF 12

FED.RD. DIV.NO.			SHEET NO.
6			54
STATE	DIST.	COUNTY	
TEXAS	BMT	LIBERTY	
CONT.	SECT.	JOB	HIGHWAY NO.
6414	53	001	BS105T,ETC

N.T.S

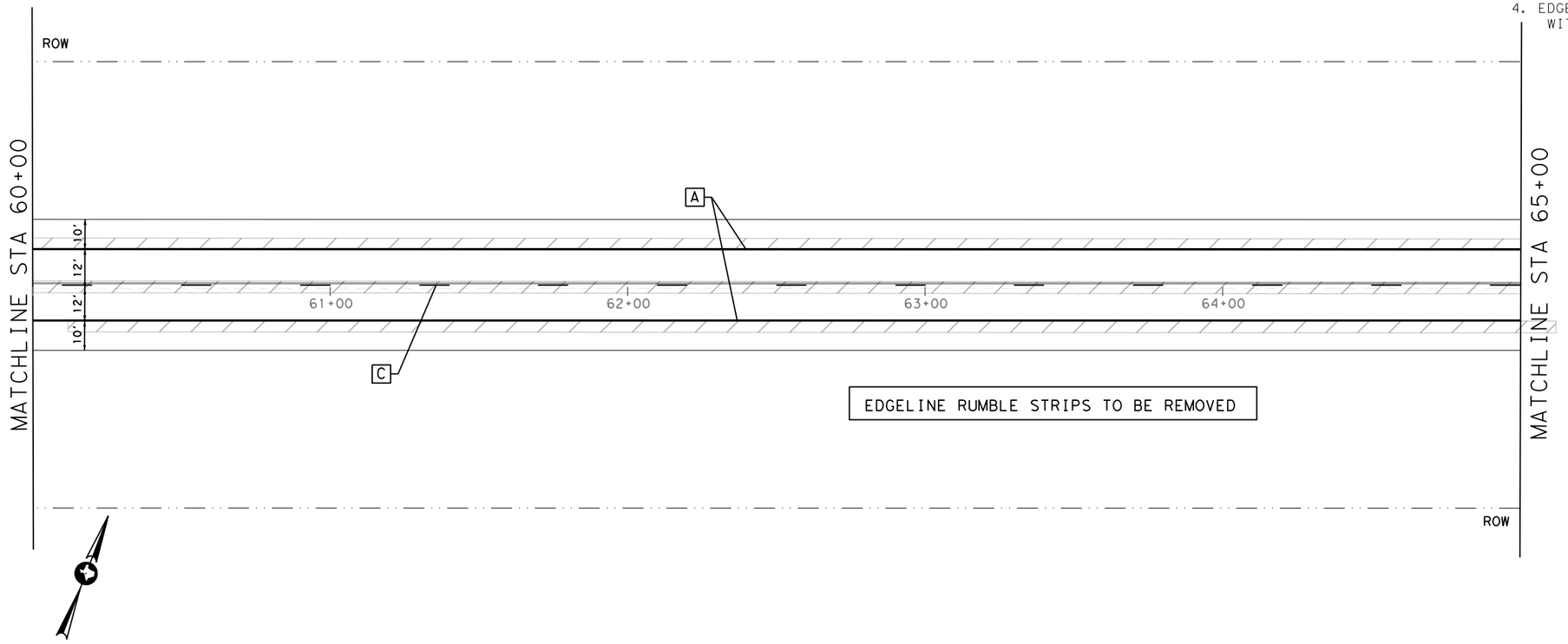


LEGEND

A	RE PROF PAVMRK TY I (W)6"(SLD)
B	RE PM W/RET REQ TY I (Y)6"(SLD)
C	RE PM W/RET REQ TY I (Y)6"(BRK)
D	REFL PAV MRK TY I (W) 8" (SLD)
E	PREFAB PAV MRK TY C (W) (24") (SLD)
F	NOT USED
G	NOT USED
H	PREFAB PAV MRK TY C (W) (WORD)
I	PREFAB PAV MRK TY C (W) (ARROW)
J	PREFAB PAV MRK TY C (W) (36")(YLD TRI)
K	REFL PAV MRKR TY I-C
L	REFL PAV MRKR TY II-A-A
#	DRIVEWAYS (SEE SHEET 71)
	LIMITS OF 0"-2" PLANE
	LIMITS OF 1" PLANE, FILL WITH ITEM 3076 AND TACK.

NOTES:

1. REPLACE EXISITING 4" STRIPING CONFIGURATION WITH 6" UNLESS DIRECTED OTHERWISE BY THE ENGINEER.
2. MATCH EXISTING ROADWAY SLOPES.
3. REMOVE EXISTING RUMBLE STRIPS BY MILLING AND INLAY WITH ITEMS 3076.
4. EDGE LINE RUMBLE STRIPS TO BE REPLACED WITH PROFILE PAV. MKR.



STATE OF TEXAS
DANIEL DUKE THOMPSON
122541
LICENSED PROFESSIONAL ENGINEER

Daniel Duke Thompson

The seal appearing on this document was authorized by DANIEL THOMPSON, P.E. 122541 on 05/10 ,2023 . Alteration of a sealed document without proper notification to the responsible engineer is an offense under the Texas Engineering Practice Act.

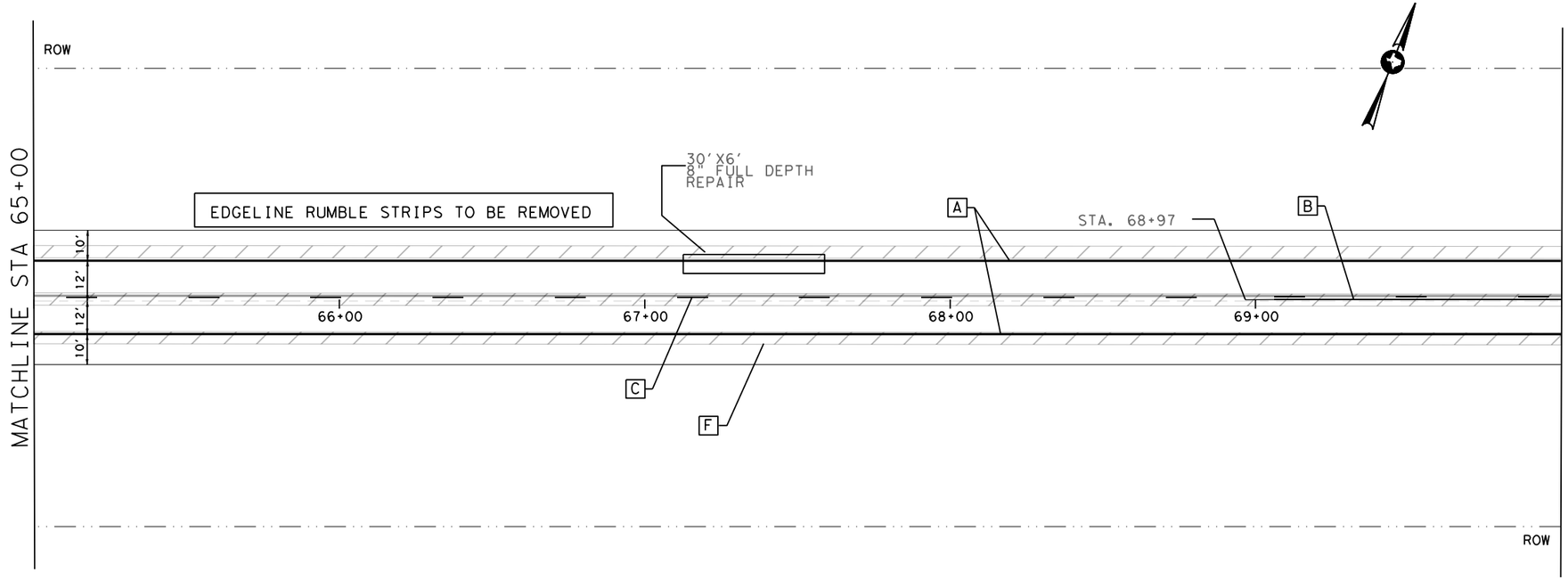
BS 105-T LAYOUT

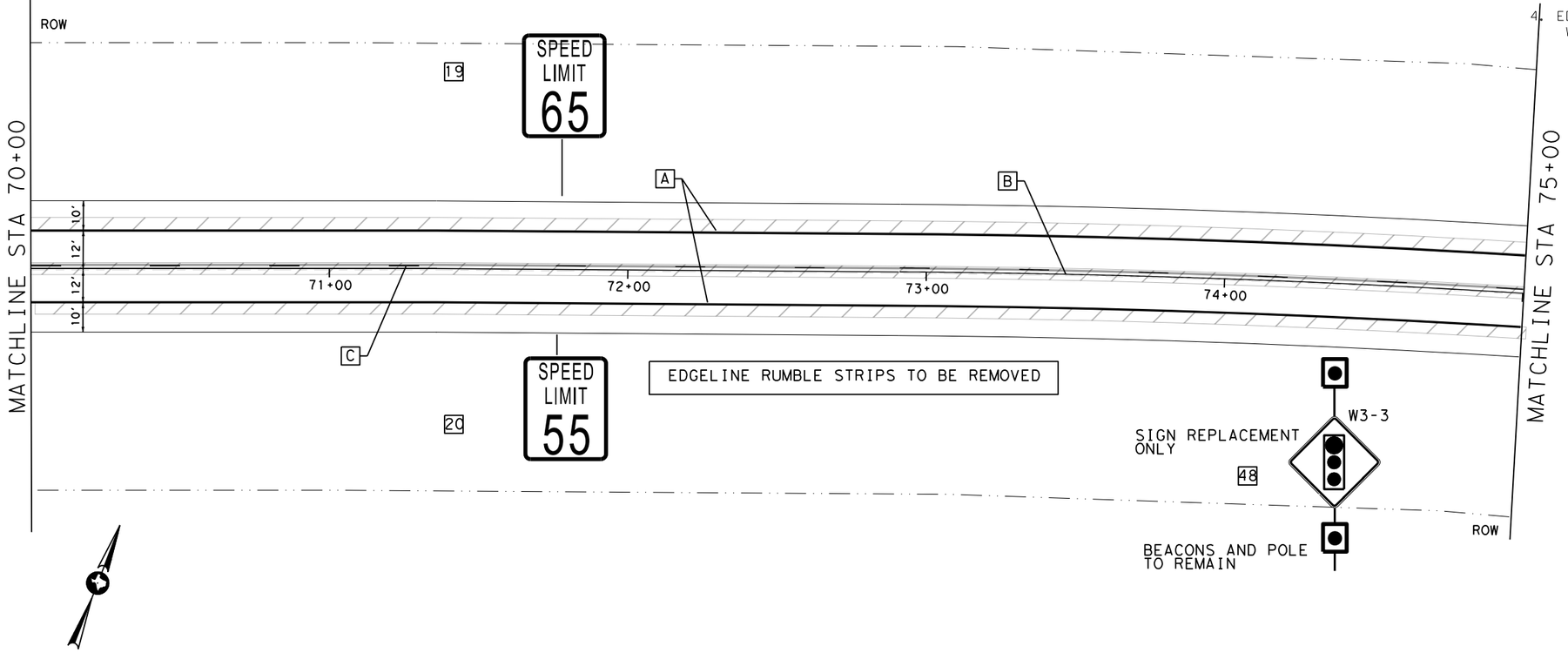
N.T.S

Texas Department of Transportation

SHEET 6 OF 12

FED.RD. DIV.NO.			SHEET NO.
6			55
STATE	DIST.	COUNTY	
TEXAS	BMT	LIBERTY	
CONT.	SECT.	JOB	HIGHWAY NO.
6414	53	001	BS105T, ETC





LEGEND

A	RE PROF PAVMRK TY I (W)6"(SLD)
B	RE PM W/RET REQ TY I (Y)6"(SLD)
C	RE PM W/RET REQ TY I (Y)6"(BRK)
D	REFL PAV MRK TY I (W) 8" (SLD)
E	PREFAB PAV MRK TY C (W) (24") (SLD)
F	NOT USED
G	NOT USED
H	PREFAB PAV MRK TY C (W) (WORD)
I	PREFAB PAV MRK TY C (W) (ARROW)
J	PREFAB PAV MRK TY C (W) (36")(YLD TRI)
K	REFL PAV MRKR TY I-C
L	REFL PAV MRKR TY II-A-A
(#)	DRIVEWAYS (SEE SHEET 71)
	LIMITS OF 0"-2" PLANE
	LIMITS OF 1" PLANE, FILL WITH ITEM 3076 AND TACK.

NOTES:

1. REPLACE EXISITING 4" STRIPING CONFIGURATION WITH 6" UNLESS DIRECTED OTHERWISE BY THE ENGINEER.
2. MATCH EXISTING ROADWAY SLOPES.
3. REMOVE EXISTING RUMBLE STRIPS BY MILLING AND INLAY WITH ITEMS 3076.
4. EDGE LINE RUMBLE STRIPS TO BE REPLACED WITH PROFILE PAV. MKR.

STATE OF TEXAS
DANIEL DUKE THOMPSON
122541
LICENSED PROFESSIONAL ENGINEER

Daniel Duke Thompson

The seal appearing on this document was authorized by DANIEL THOMPSON, P.E. 122541 on 05/10 ,2023 .
Alteration of a sealed document without proper notification to the responsible engineer is an offense under the Texas Engineering Practice Act.

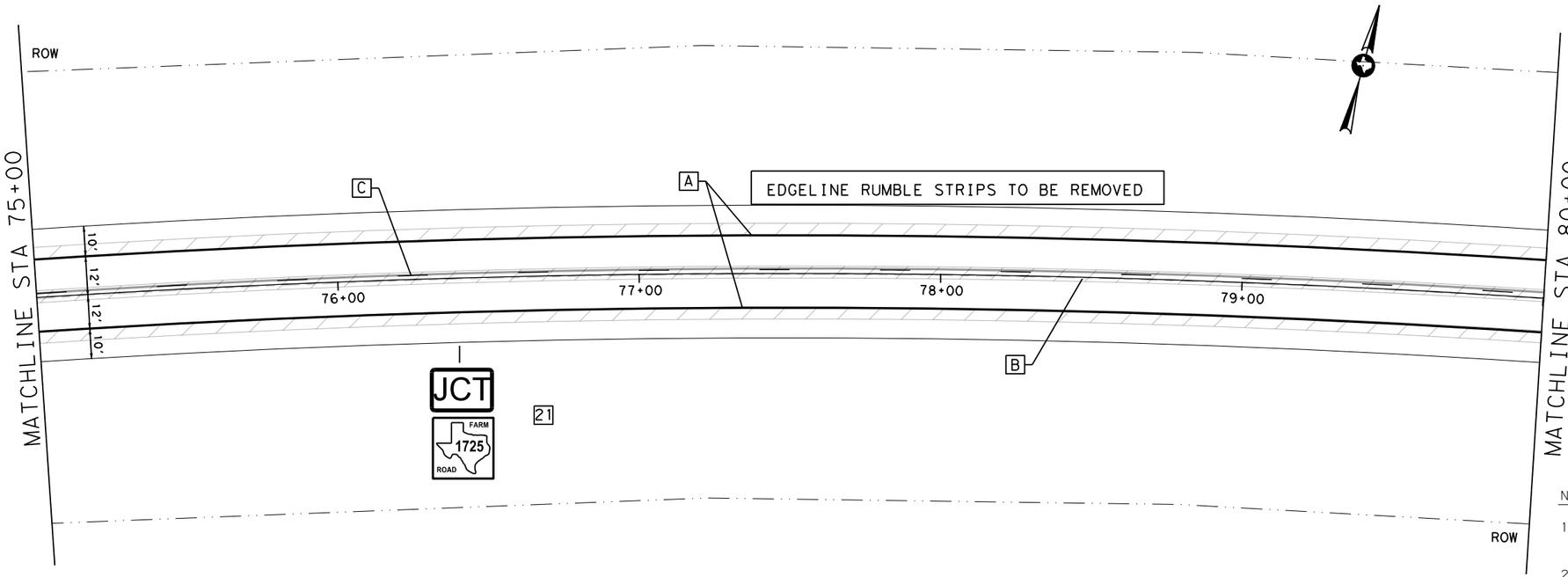
BS 105-T LAYOUT

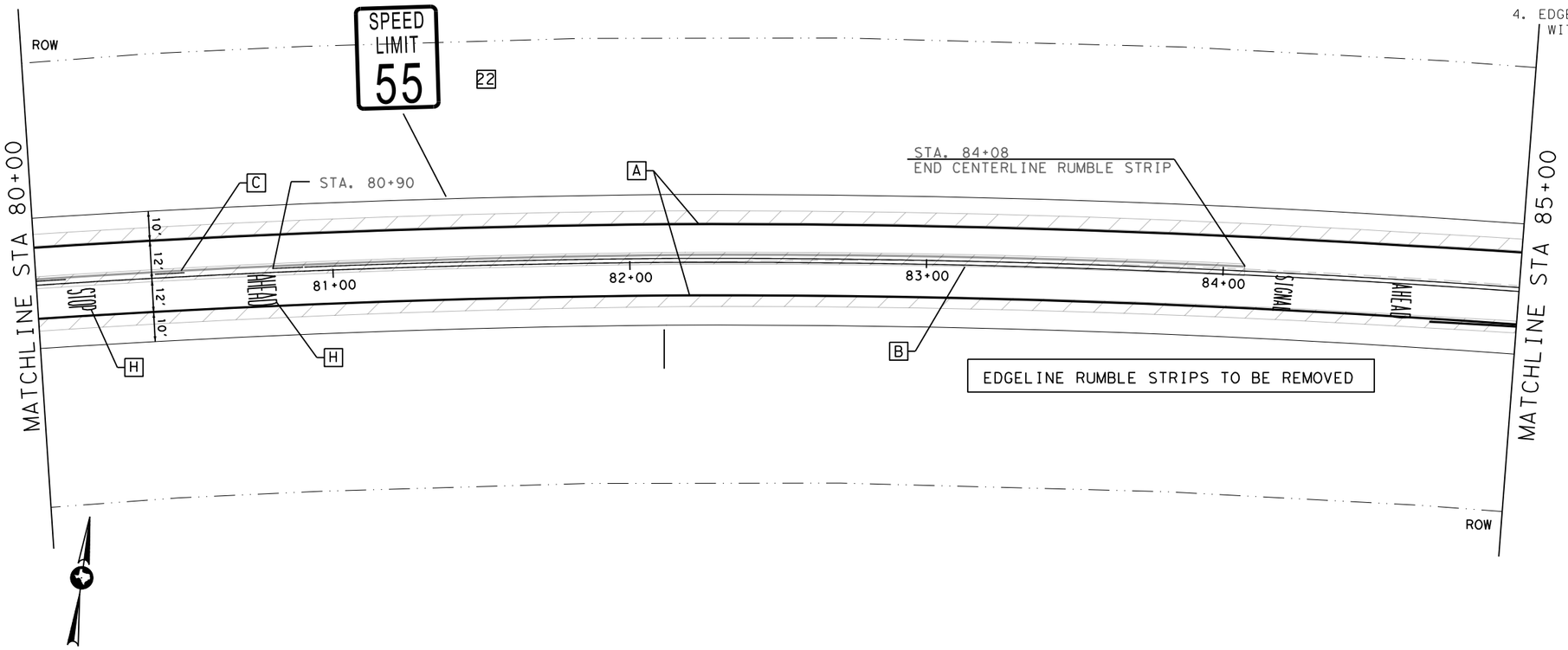
N.T.S

Texas Department of Transportation

SHEET 7 OF 12

FED.RD. DIV.NO.			SHEET NO.
6			56
STATE	DIST.	COUNTY	
TEXAS	BMT	LIBERTY	
CONT.	SECT.	JOB	HIGHWAY NO.
6414	53	001	BS105T, ETC





LEGEND

A	RE PROF PAVMRK TY I (W)6"(SLD)
B	RE PM W/RET REQ TY I (Y)6"(SLD)
C	RE PM W/RET REQ TY I (Y)6"(BRK)
D	REFL PAV MRK TY I (W) 8" (SLD)
E	PREFAB PAV MRK TY C (W) (24") (SLD)
F	NOT USED
G	NOT USED
H	PREFAB PAV MRK TY C (W) (WORD)
I	PREFAB PAV MRK TY C (W) (ARROW)
J	PREFAB PAV MRK TY C (W) (36")(YLD TRI)
K	REFL PAV MRKR TY I-C
L	REFL PAV MRKR TY II-A-A
(#)	DRIVEWAYS (SEE SHEET 71)
	LIMITS OF 0"-2" PLANE
	LIMITS OF 1" PLANE, FILL WITH ITEM 3076 AND TACK.

NOTES:

1. REPLACE EXISITING 4" STRIPING CONFIGURATION WITH 6" UNLESS DIRECTED OTHERWISE BY THE ENGINEER.
2. MATCH EXISTING ROADWAY SLOPES.
3. REMOVE EXISTING RUMBLE STRIPS BY MILLING AND INLAY WITH ITEMS 3076.
4. EDGE LINE RUMBLE STRIPS TO BE REPLACED WITH PROFILE PAV. MKR.

STATE OF TEXAS
DANIEL DUKE THOMPSON
122541
LICENSED
PROFESSIONAL ENGINEER

Daniel Duke Thompson

The seal appearing on this document was authorized by DANIEL THOMPSON, P.E. 122541 on 05/10 ,2023 . Alteration of a sealed document without proper notification to the responsible engineer is an offense under the Texas Engineering Practice Act.

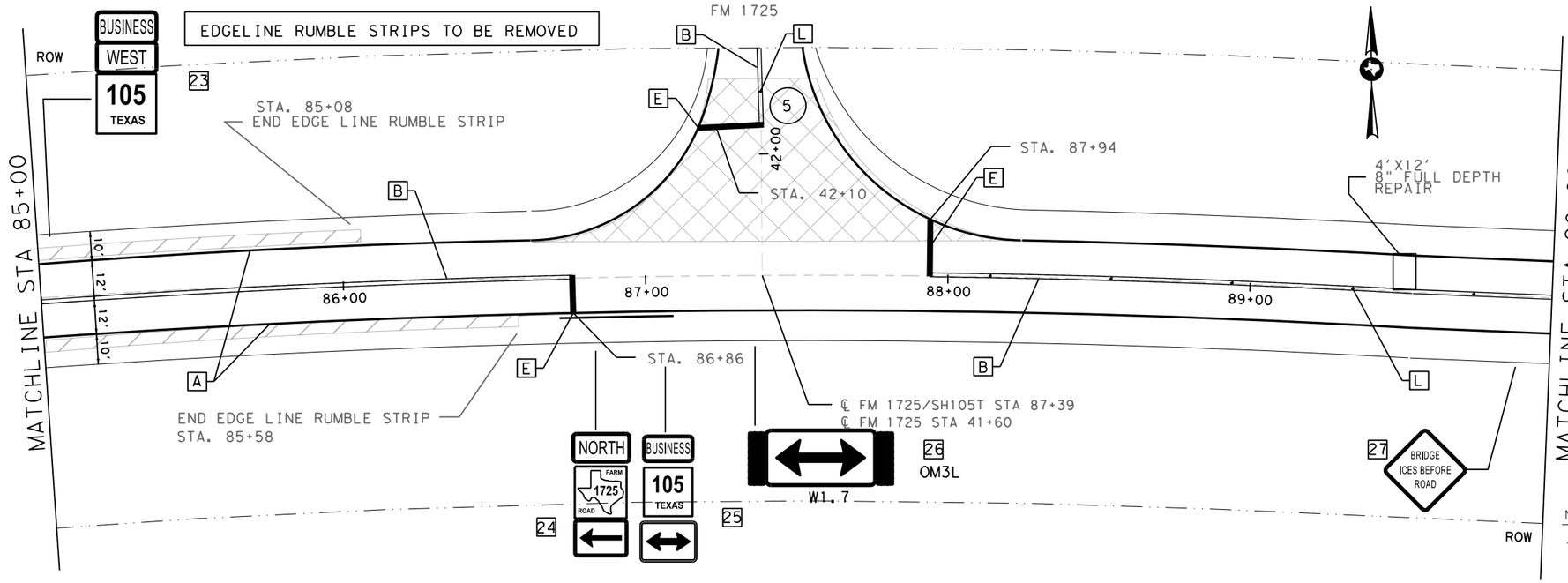
N.T.S

BS 105-T LAYOUT

Texas Department of Transportation

SHEET 8 OF 12

FED. RD. DIV. NO.			SHEET NO.
6			57
STATE	DIST.	COUNTY	
TEXAS	BMT	LIBERTY	
CONT.	SECT.	JOB	HIGHWAY NO.
6414	53	001	BS105T, ETC

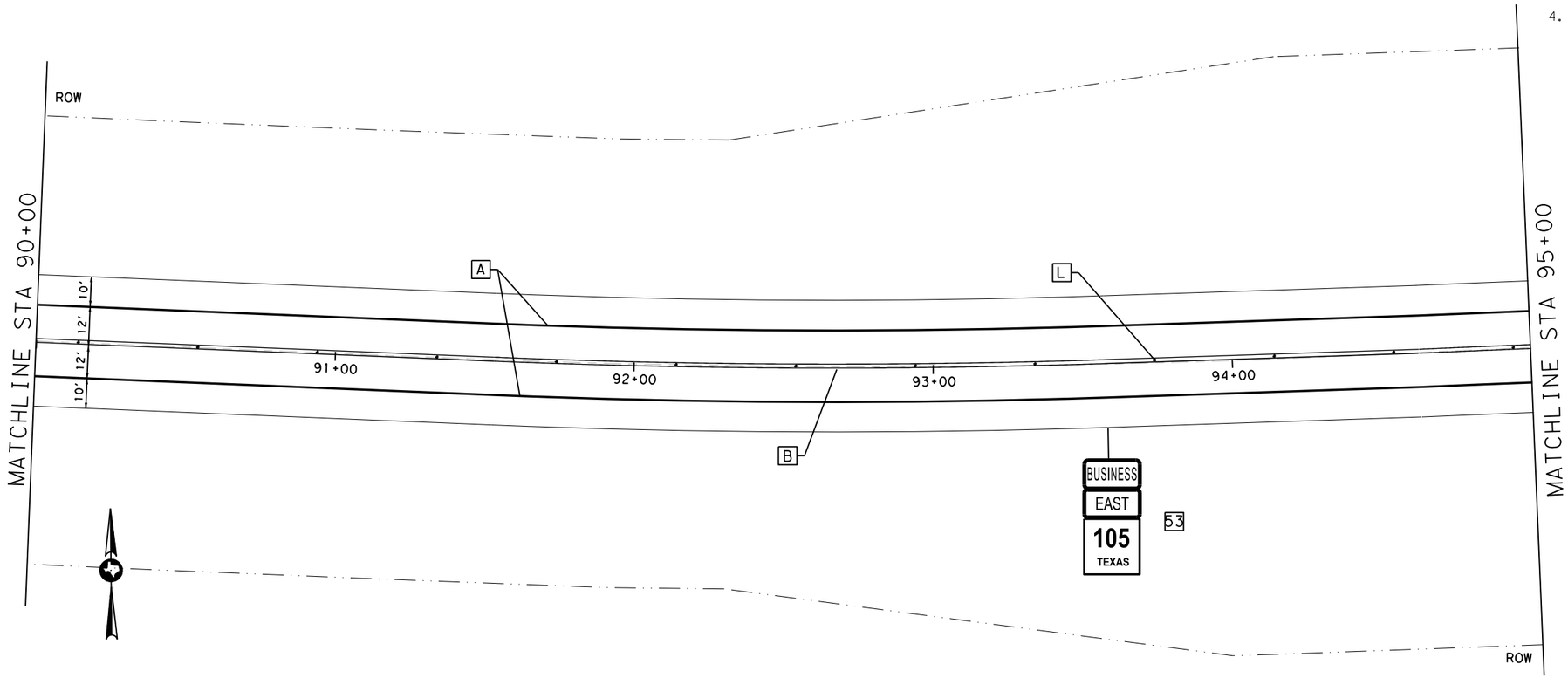


LEGEND

A	RE PROF PAVMRK TY I (W)6"(SLD)
B	RE PM W/RET REQ TY I (Y)6"(SLD)
C	RE PM W/RET REQ TY I (Y)6"(BRK)
D	REFL PAV MRK TY I (W) 8" (SLD)
E	PREFAB PAV MRK TY C (W) (24") (SLD)
F	NOT USED
G	NOT USED
H	PREFAB PAV MRK TY C (W) (WORD)
I	PREFAB PAV MRK TY C (W) (ARROW)
J	PREFAB PAV MRK TY C (W) (36")(YLD TRI)
K	REFL PAV MRKR TY I-C
L	REFL PAV MRKR TY II-A-A
(#)	DRIVEWAYS (SEE SHEET 71)
	LIMITS OF 0"-2" PLANE
	LIMITS OF 1" PLANE, FILL WITH ITEM 3076 AND TACK.

NOTES:

1. REPLACE EXISITING 4" STRIPING CONFIGURATION WITH 6" UNLESS DIRECTED OTHERWISE BY THE ENGINEER.
2. MATCH EXISTING ROADWAY SLOPES.
3. REMOVE EXISTING RUMBLE STRIPS BY MILLING AND INLAY WITH ITEMS 3076.
4. EDGE LINE RUMBLE STRIPS TO BE REPLACED WITH PROFILE PAV. MKR.



STATE OF TEXAS
DANIEL DUKE THOMPSON
122541
LICENSED
PROFESSIONAL ENGINEER

Daniel Duke Thompson

The seal appearing on this document was authorized by DANIEL THOMPSON, P.E. 122541 on 05/10 ,2023 . Alteration of a sealed document without proper notification to the responsible engineer is an offense under the Texas Engineering Practice Act.

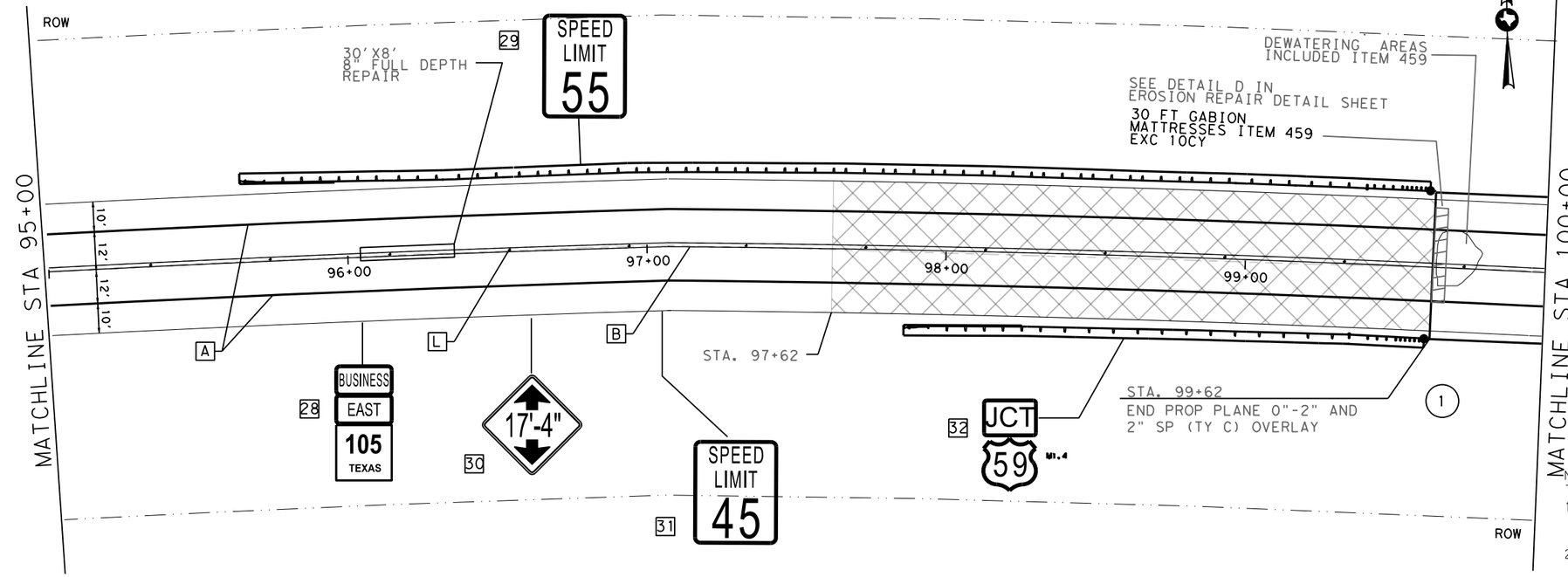
BS 105-T LAYOUT

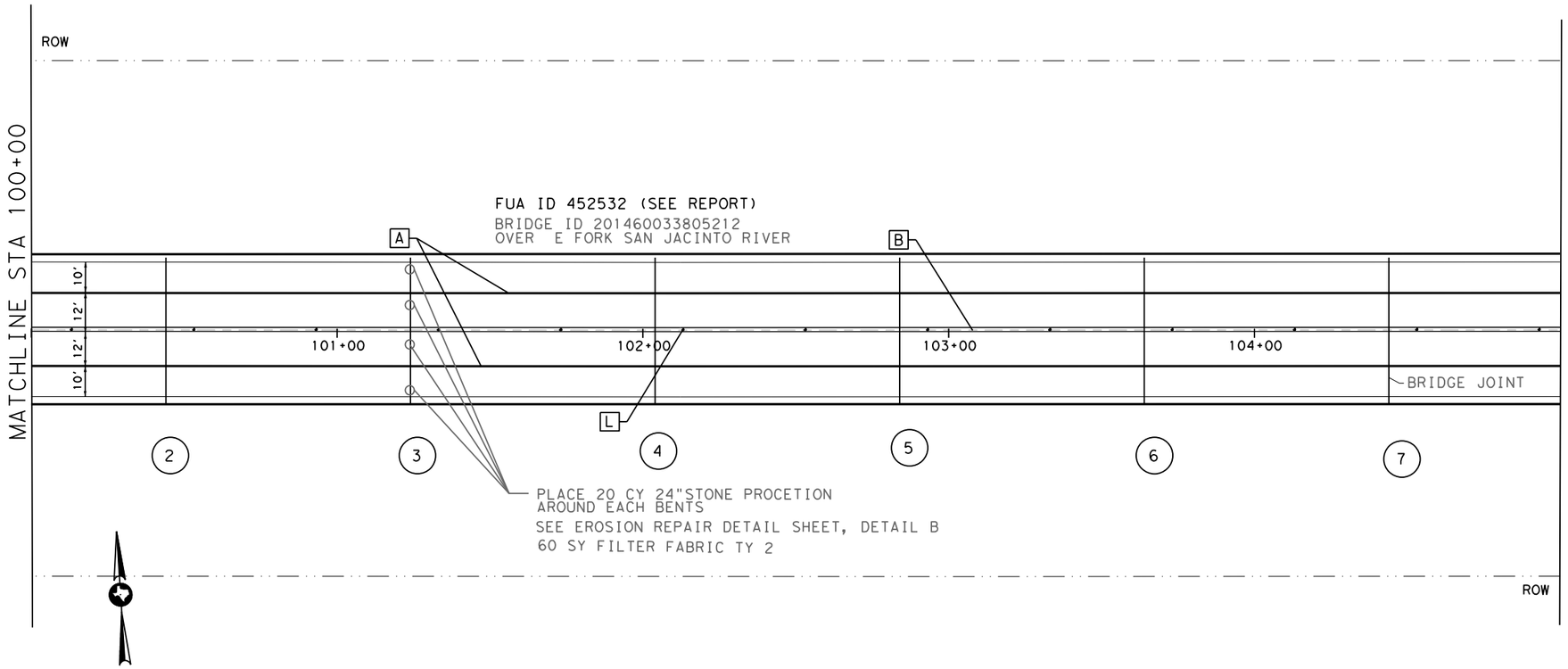
Texas Department of Transportation

SHEET 9 OF 12

FED. RD. DIV. NO.			SHEET NO.
6			58
STATE	DIST.	COUNTY	
TEXAS	BMT	LIBERTY	
CONT.	SECT.	JOB	HIGHWAY NO.
6414	53	001	BS105T, ETC

N.T.S





LEGEND

A	RE PROF PAVMRK TY I (W)6"(SLD)
B	RE PM W/RET REQ TY I (Y)6"(SLD)
C	RE PM W/RET REQ TY I (Y)6"(BRK)
D	REFL PAV MRK TY I (W) 8" (SLD)
E	PREFAB PAV MRK TY C (W) (24") (SLD)
F	NOT USED
G	NOT USED
H	PREFAB PAV MRK TY C (W) (WORD)
I	PREFAB PAV MRK TY C (W) (ARROW)
J	PREFAB PAV MRK TY C (W) (36")(YLD TRI)
K	REFL PAV MRKR TY I-C
L	REFL PAV MRKR TY II-A-A
(#)	DRIVEWAYS (SEE SHEET 71)
	LIMITS OF 0"-2" PLANE
	LIMITS OF 1" PLANE, FILL WITH ITEM 3076 AND TACK.

NOTES:

1. REPLACE EXISITING 4" STRIPING CONFIGURATION WITH 6" UNLESS DIRECTED OTHERWISE BY THE ENGINEER.
2. MATCH EXISTING ROADWAY SLOPES.
3. REMOVE EXISTING RUMBLE STRIPS BY MILLING AND INLAY WITH ITEMS 3076.
4. EDGE LINE RUMBLE STRIPS TO BE REPLACED WITH PROFILE PAV. MKR.

STATE OF TEXAS
DANIEL DUKE THOMPSON
122541
LICENSED PROFESSIONAL ENGINEER

Daniel Duke Thompson

The seal appearing on this document was authorized by DANIEL THOMPSON, P.E. 122541 on 05/10 ,2023 . Alteration of a sealed document without proper notification to the responsible engineer is an offense under the Texas Engineering Practice Act.

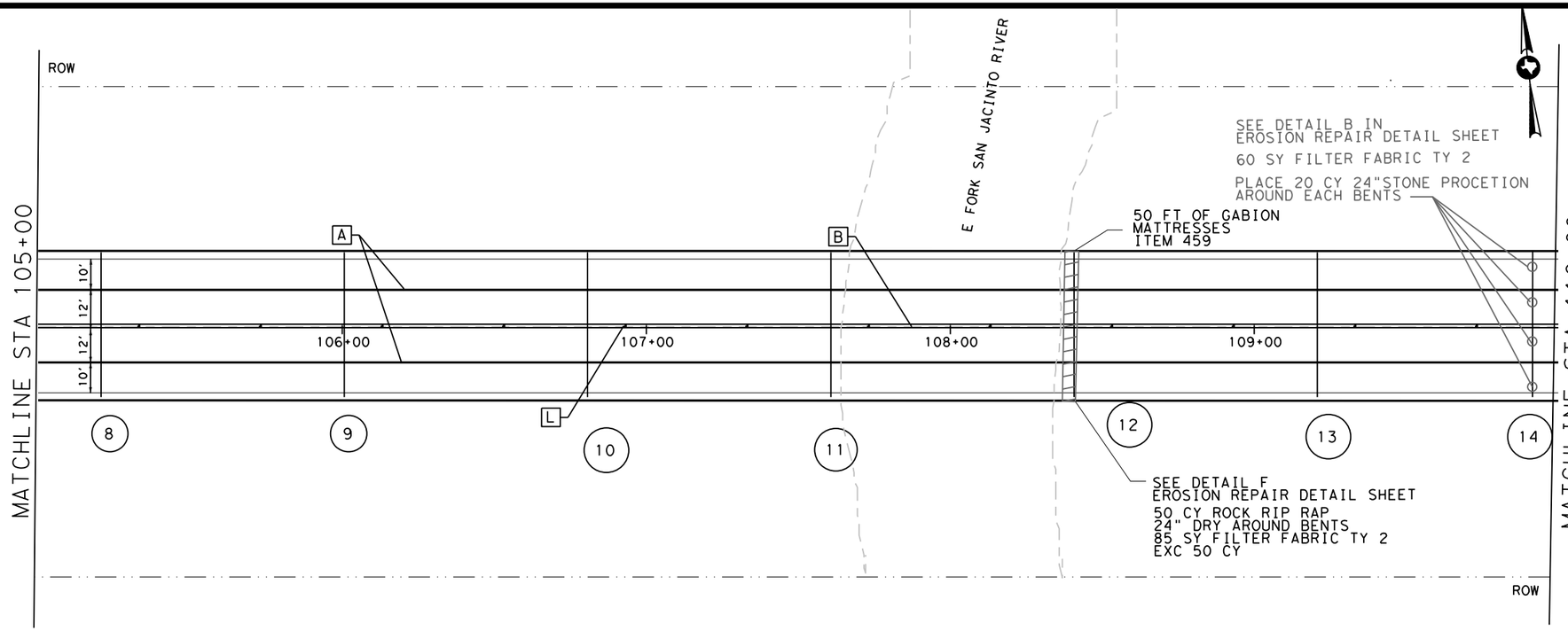
BS 105-T LAYOUT

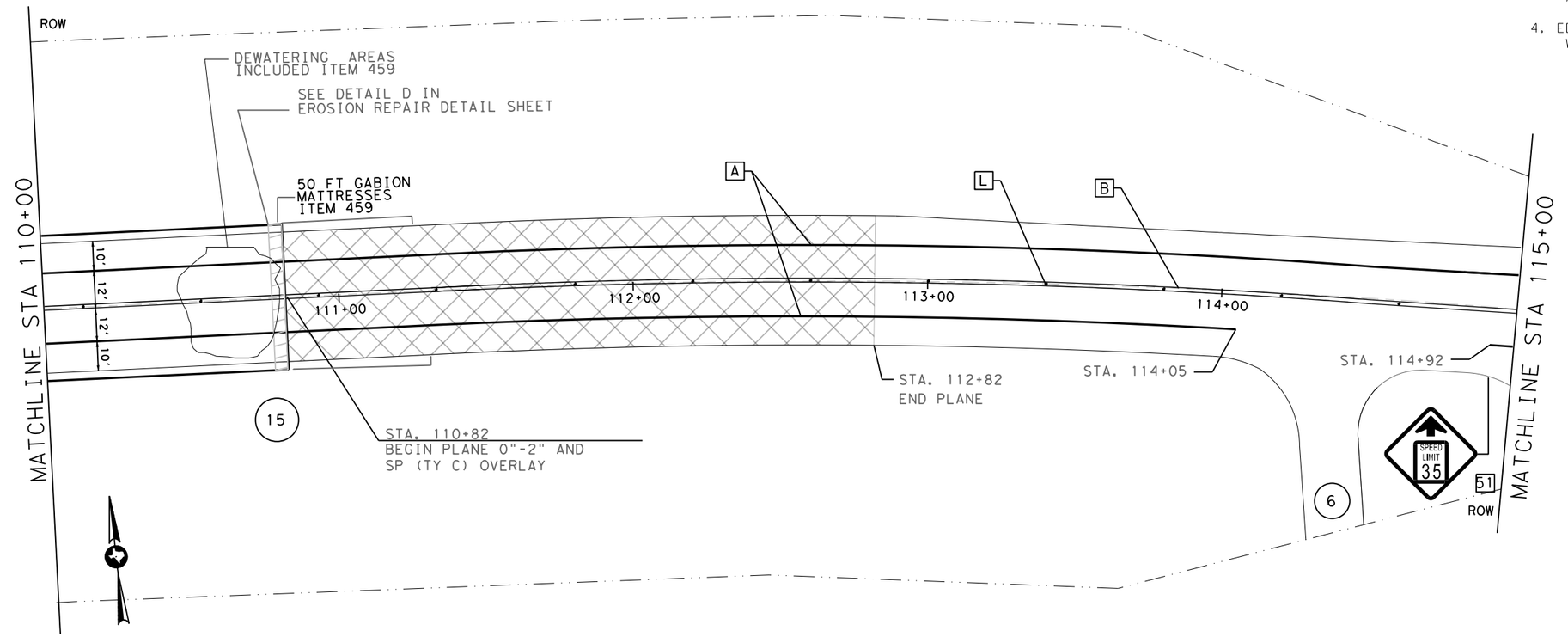
N.T.S

Texas Department of Transportation

SHEET 10 OF 12

FED. RD. DIV. NO.			SHEET NO.
6			59
STATE	DIST.	COUNTY	
TEXAS	BMT	LIBERTY	
CONT.	SECT.	JOB	HIGHWAY NO.
6414	53	001	BS105T, ETC





LEGEND

A	RE PROF PAVMRK TY I (W)6"(SLD)
B	RE PM W/RET REQ TY I (Y)6"(SLD)
C	RE PM W/RET REQ TY I (Y)6"(BRK)
D	REFL PAV MRK TY I (W) 8" (SLD)
E	PREFAB PAV MRK TY C (W) (24") (SLD)
F	NOT USED
G	NOT USED
H	PREFAB PAV MRK TY C (W) (WORD)
I	PREFAB PAV MRK TY C (W) (ARROW)
J	PREFAB PAV MRK TY C (W) (36")(YLD TRI)
K	REFL PAV MRKR TY I-C
L	REFL PAV MRKR TY II-A-A
#	DRIVEWAYS (SEE SHEET 71)

LIMITS OF 0"-2" PLANE

LIMITS OF 1" PLANE, FILL WITH ITEM 3076 AND TACK.

NOTES:

1. REPLACE EXISITING 4" STRIPING CONFIGURATION WITH 6" UNLESS DIRECTED OTHERWISE BY THE ENGINEER.
2. MATCH EXISTING ROADWAY SLOPES.
3. REMOVE EXISTING RUMBLE STRIPS BY MILLING AND INLAY WITH ITEMS 3076.
4. EDGE LINE RUMBLE STRIPS TO BE REPLACED WITH PROFILE PAV. MKR.

STATE OF TEXAS
DANIEL DUKE THOMPSON
122541
LICENSED
PROFESSIONAL ENGINEER

Daniel Duke Thompson

The seal appearing on this document was authorized by DANIEL THOMPSON, P.E. 122541 on 05/10 ,2023 . Alteration of a sealed document without proper notification to the responsible engineer is an offense under the Texas Engineering Practice Act.

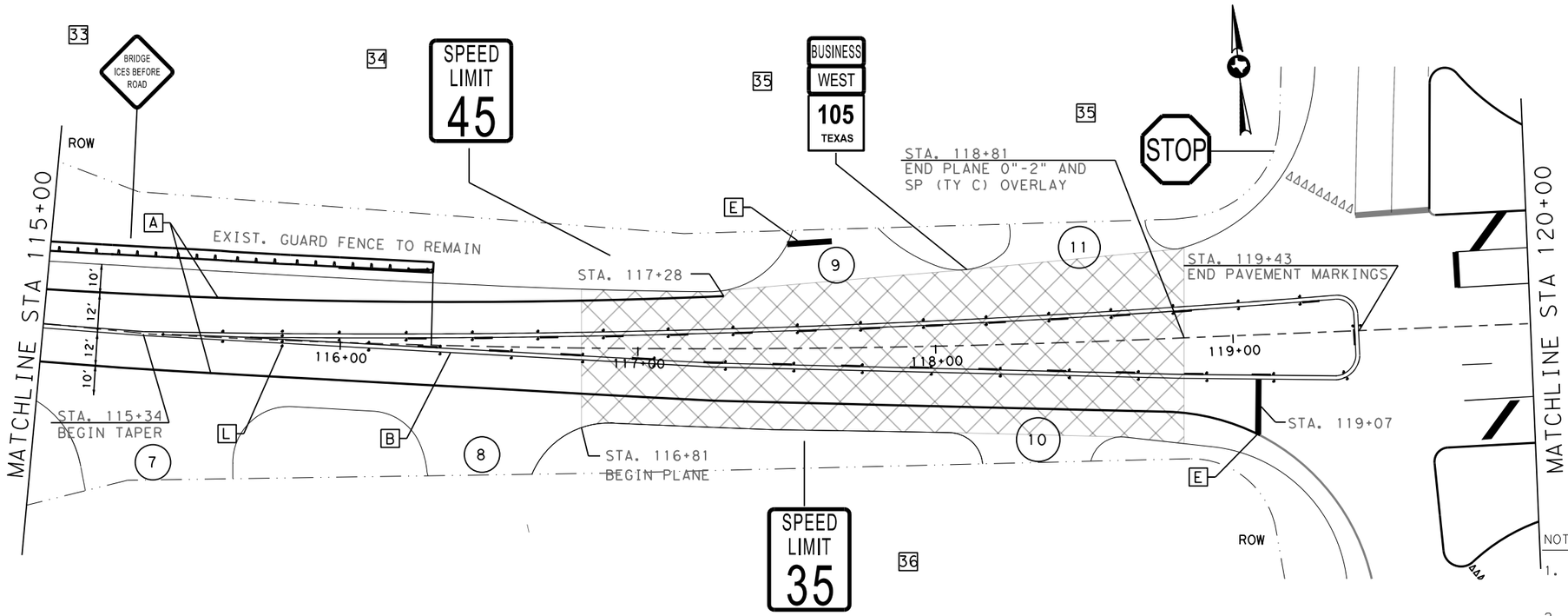
BS 105-T LAYOUT

N.T.S

Texas Department of Transportation

SHEET 11 OF 12

FED.RD. DIV.NO.			SHEET NO.
6			60
STATE	DIST.	COUNTY	
TEXAS	BMT	LIBERTY	
CONT.	SECT.	JOB	HIGHWAY NO.
6414	53	001	BS105T, ETC

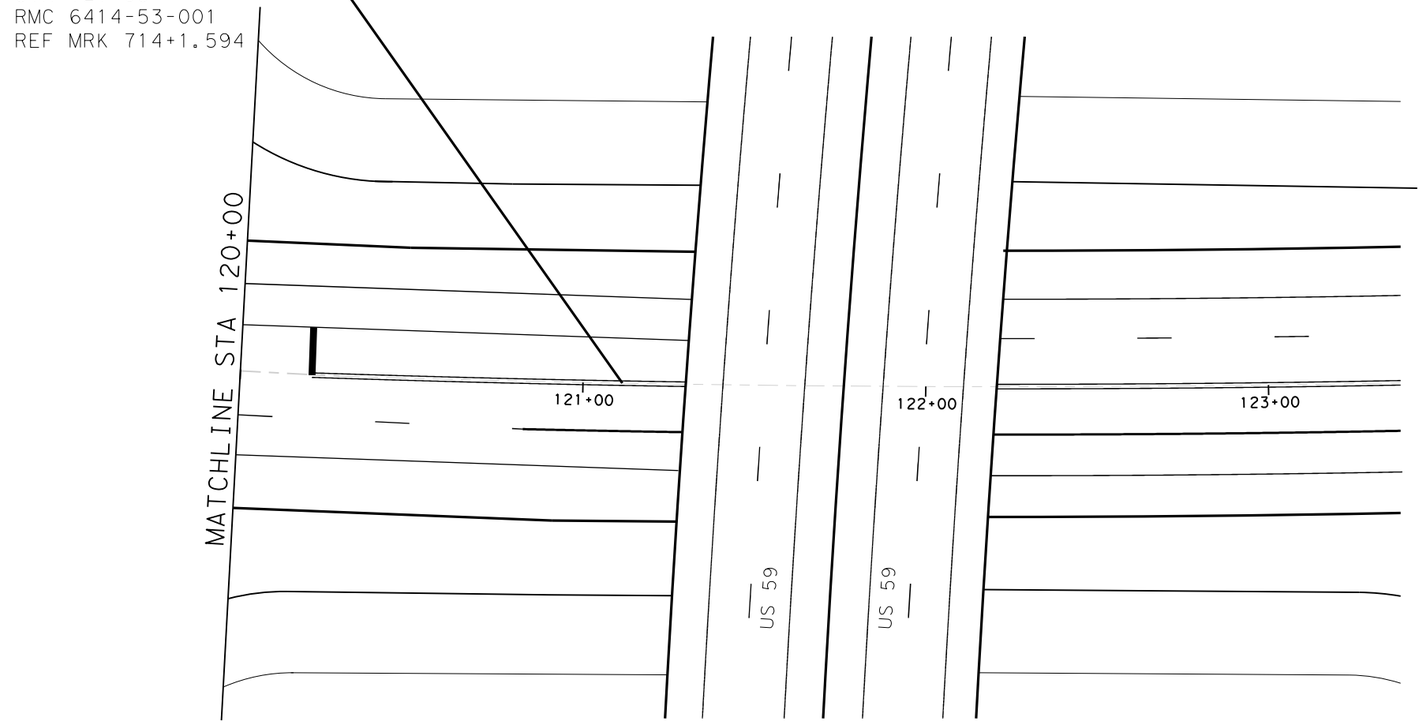


LEGEND

A	RE PROF PAVMRK TY I (W)6"(SLD)
B	RE PM W/RET REQ TY I (Y)6"(SLD)
C	RE PM W/RET REQ TY I (Y)6"(BRK)
D	REFL PAV MRK TY I (W) 8" (SLD)
E	PREFAB PAV MRK TY C (W) (24") (SLD)
F	NOT USED
G	NOT USED
H	PREFAB PAV MRK TY C (W) (WORD)
I	PREFAB PAV MRK TY C (W) (ARROW)
J	PREFAB PAV MRK TY C (W) (36")(YLD TRI)
K	REFL PAV MRKR TY I-C
L	REFL PAV MRKR TY II-A-A
(#)	DRIVEWAYS (SEE SHEET 71)
	LIMITS OF 0"-2" PLANE
	LIMITS OF 1" PLANE, FILL WITH ITEM 3076 AND TACK.

NOTES:

1. REPLACE EXISITING 4" STRIPING CONFIGURATION WITH 6" UNLESS DIRECTED OTHERWISE BY THE ENGINEER.
2. MATCH EXISTING ROADWAY SLOPES.
3. REMOVE EXISTING RUMBLE STRIPS BY MILLING AND INLAY WITH ITEMS 3076.
4. EDGE LINE RUMBLE STRIPS TO BE REPLACED WITH PROFILE PAV. MKR.



STATE OF TEXAS
DANIEL DUKE THOMPSON
122541
LICENSED PROFESSIONAL ENGINEER

Daniel Duke Thompson

The seal appearing on this document was authorized by DANIEL THOMPSON, P.E. 122541 on 05/10 ,2023 . Alteration of a sealed document without proper notification to the responsible engineer is an offense under the Texas Engineering Practice Act.

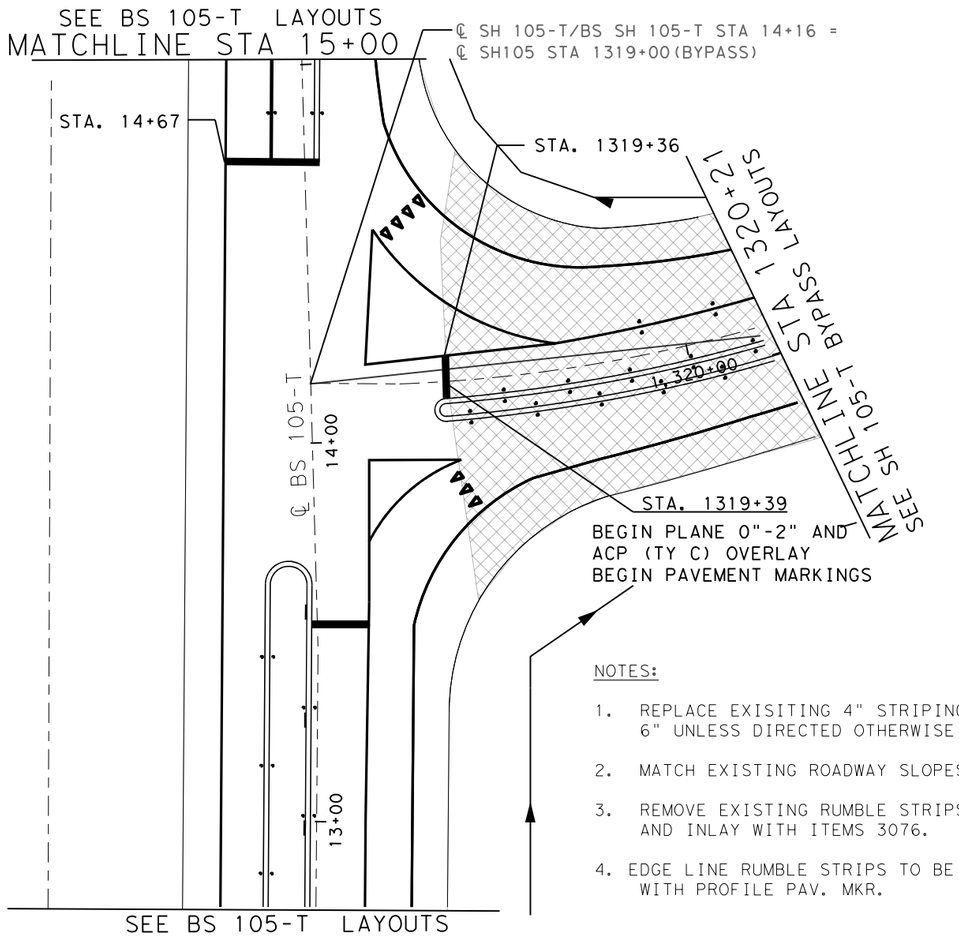
BS 105-T LAYOUT

N.T.S

Texas Department of Transportation

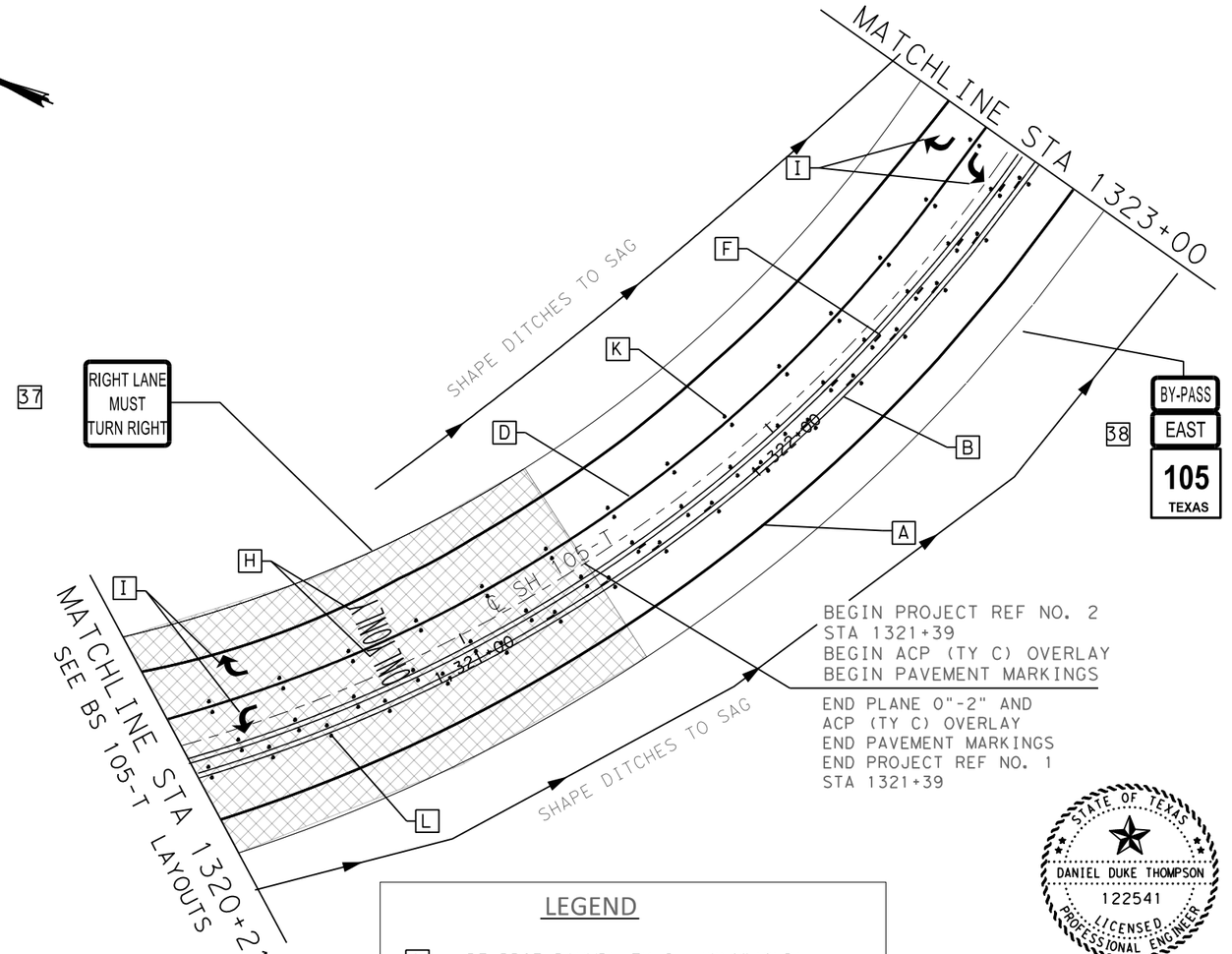
SHEET 12 OF 12

FED.RD. DIV. NO.			SHEET NO.
6			61
STATE	DIST.	COUNTY	
TEXAS	BMT	LIBERTY	
CONT.	SECT.	JOB	HIGHWAY NO.
6414	53	001	BS105T, ETC



NOTES:

1. REPLACE EXISITING 4" STRIPING CONFIGURATION WITH 6" UNLESS DIRECTED OTHERWISE BY THE ENGINEER.
2. MATCH EXISTING ROADWAY SLOPES.
3. REMOVE EXISTING RUMBLE STRIPS BY MILLING AND INLAY WITH ITEMS 3076.
4. EDGE LINE RUMBLE STRIPS TO BE REPLACED WITH PROFILE PAV. MKR.



LEGEND

A	RE PROF PAVMRK TY I (W)6"(SLD)
B	RE PM W/RET REQ TY I (Y)6"(SLD)
C	RE PM W/RET REQ TY I (Y)6"(BRK)
D	REFL PAV MRK TY I (W) 8" (SLD)
E	PREFAB PAV MRK TY C (W) (24") (SLD)
F	NOT USED
G	NOT USED
H	PREFAB PAV MRK TY C (W) (WORD)
I	PREFAB PAV MRK TY C (W) (ARROW)
J	PREFAB PAV MRK TY C (W) (36")(YLD TRI)
K	REFL PAV MRKR TY I-C
L	REFL PAV MRKR TY II-A-A
#	DRIVEWAYS (SEE SHEET 71)
	LIMITS OF 0"-2" PLANE
	LIMITS OF 1" PLANE, FILL WITH ITEM 3076 AND TACK.

N.T.S

STATE OF TEXAS
DANIEL DUKE THOMPSON
122541
LICENSED
PROFESSIONAL ENGINEER

Daniel Duke Thompson

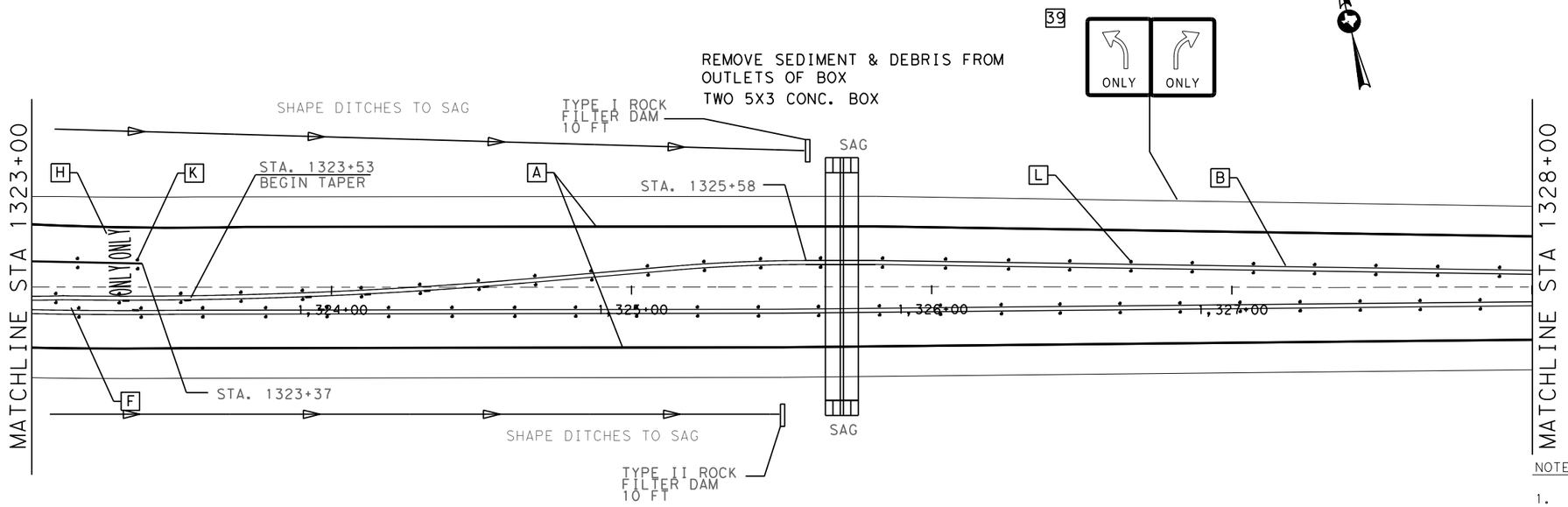
The seal appearing on this document was authorized by DANIEL THOMPSON, P.E. 122541 on 05/10 ,2023 . Alteration of a sealed document without proper notification to the responsible engineer is an offense under the Texas Engineering Practice Act.

INTERSECTION LAYOUT

SH 105-T/SH 105 BYPASS

Texas Department of Transportation

FED. RD. DIV. NO.			SHEET NO.
6			62
STATE	DIST.	COUNTY	
TEXAS	BMT	LIBERTY	
CONT.	SECT.	JOB	HIGHWAY NO.
6414	53	001	BS105T,ETC

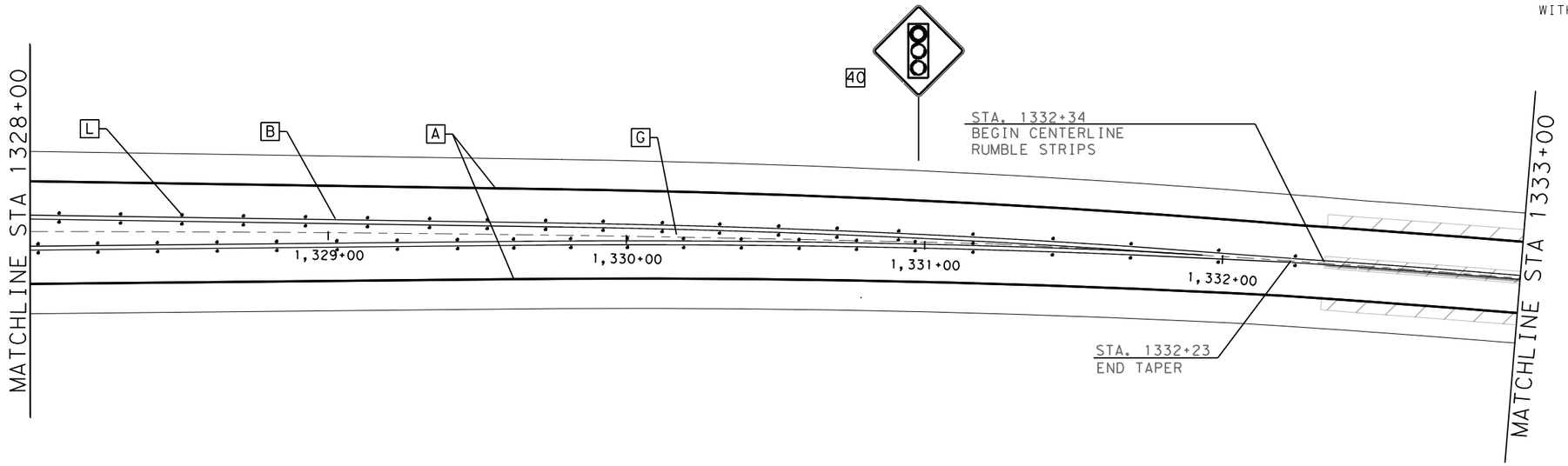


LEGEND

A	RE PROF PAVMRK TY I (W)6"(SLD)
B	RE PM W/RET REQ TY I (Y)6"(SLD)
C	RE PM W/RET REQ TY I (Y)6"(BRK)
D	REFL PAV MRK TY I (W) 8" (SLD)
E	PREFAB PAV MRK TY C (W) (24") (SLD)
F	NOT USED
G	NOT USED
H	PREFAB PAV MRK TY C (W) (WORD)
I	PREFAB PAV MRK TY C (W) (ARROW)
J	PREFAB PAV MRK TY C (W) (36")(YLD TRI)
K	REFL PAV MRKR TY I-C
L	REFL PAV MRKR TY II-A-A
	LIMITS OF 0"-2" PLANE
	LIMITS OF 1" PLANE, FILL WITH ITEM 3076 AND TACK.

NOTES:

1. REPLACE EXISITING 4" STRIPING CONFIGURATION WITH 6" UNLESS DIRECTED OTHERWISE BY THE ENGINEER.
2. MATCH EXISTING ROADWAY SLOPES.
3. REMOVE EXISTING RUMBLE STRIPS BY MILLING AND INLAY WITH ITEMS 3076.
4. EDGE LINE RUMBLE STRIPS TO BE REPLACED WITH PROFILE PAV. MKR.



N.T.S

STATE OF TEXAS
DANIEL DUKE THOMPSON
122541
LICENSED
PROFESSIONAL ENGINEER

Daniel Duke Thompson

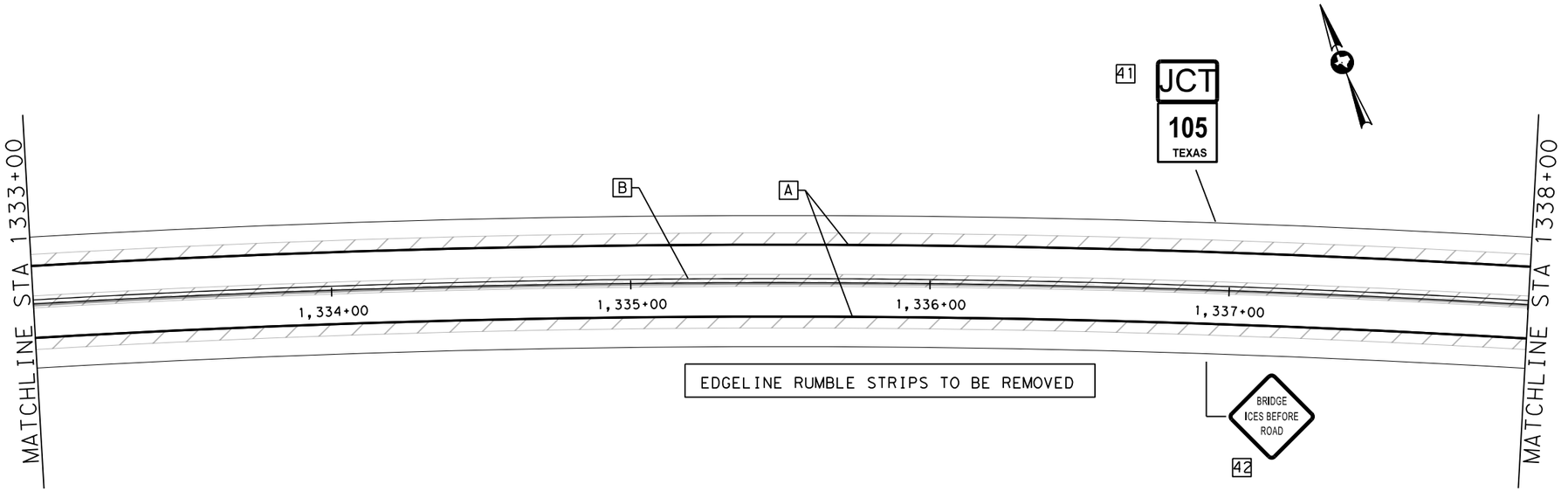
The seal appearing on this document was authorized by DANIEL THOMPSON, P.E. 122541 on 05/10 ,2023 . Alteration of a sealed document without proper notification to the responsible engineer is an offense under the Texas Engineering Practice Act.

SH 105 (BYPASS) LAYOUT

Texas Department of Transportation

SHEET 2 OF 13

FED. RD. DIV. NO.			SHEET NO.
6			63
STATE	DIST.	COUNTY	
TEXAS	BMT	LIBERTY	
CONT.	SECT.	JOB	HIGHWAY NO.
6414	53	001	BS105T, ETC

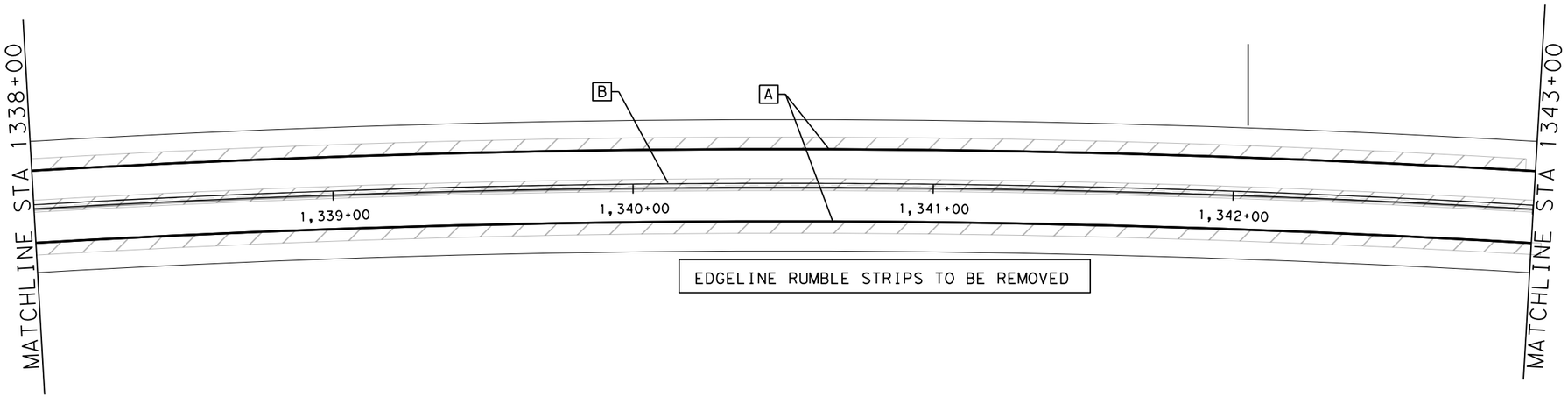


LEGEND

A	RE PROF PAVMRK TY I (W)6"(SLD)
B	RE PM W/RET REQ TY I (Y)6"(SLD)
C	RE PM W/RET REQ TY I (Y)6"(BRK)
D	REFL PAV MRK TY I (W) 8" (SLD)
E	PREFAB PAV MRK TY C (W) (24") (SLD)
F	NOT USED
G	NOT USED
H	PREFAB PAV MRK TY C (W) (WORD)
I	PREFAB PAV MRK TY C (W) (ARROW)
J	PREFAB PAV MRK TY C (W) (36")(YLD TRI)
K	REFL PAV MRKR TY I-C
L	REFL PAV MRKR TY II-A-A
	LIMITS OF 0"-2" PLANE
	LIMITS OF 1" PLANE, FILL WITH ITEM 3076 AND TACK.

NOTES:

1. REPLACE EXISITING 4" STRIPING CONFIGURATION WITH 6" UNLESS DIRECTED OTHERWISE BY THE ENGINEER.
2. MATCH EXISTING ROADWAY SLOPES.
3. REMOVE EXISTING RUMBLE STRIPS BY MILLING AND INLAY WITH ITEMS 3076.
4. EDGE LINE RUMBLE STRIPS TO BE REPLACED WITH PROFILE PAV. MKR.



STATE OF TEXAS
DANIEL DUKE THOMPSON
122541
LICENSED PROFESSIONAL ENGINEER

Daniel Duke Thompson

The seal appearing on this document was authorized by DANIEL THOMPSON, P.E. 122541 on 05/10 ,2023 . Alteration of a sealed document without proper notification to the responsible engineer is an offense under the Texas Engineering Practice Act.

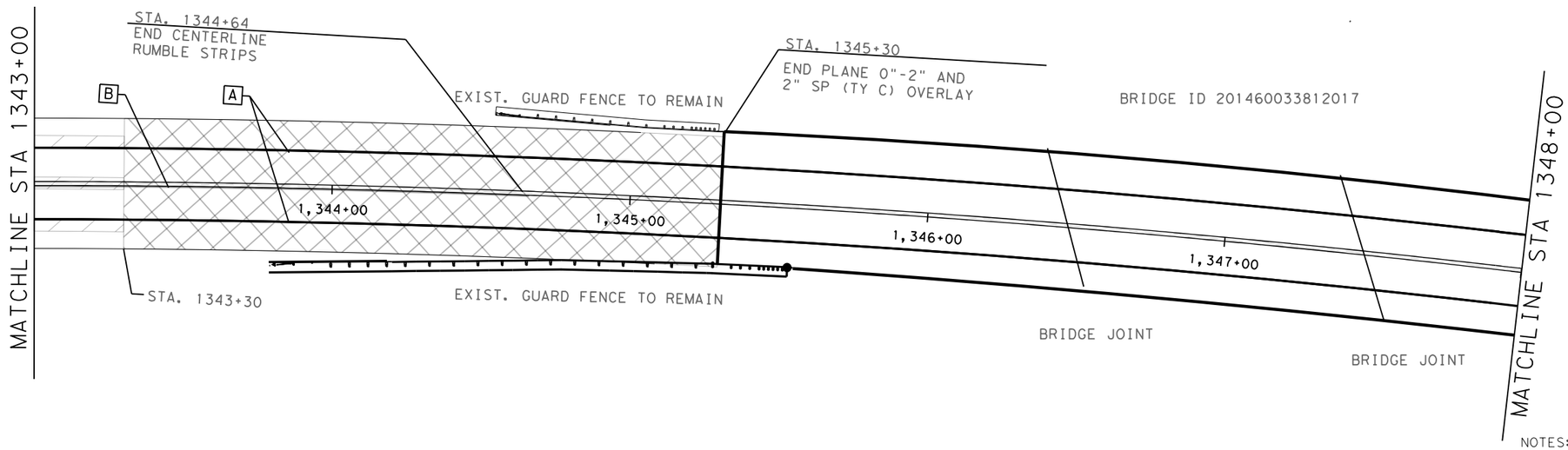
SH 105 (BYPASS) LAYOUT

Texas Department of Transportation

SHEET 3 OF 13

N.T.S

FED.RD. DIV.NO.			SHEET NO.
6			64
STATE	DIST.	COUNTY	
TEXAS	BMT	LIBERTY	
CONT.	SECT.	JOB	HIGHWAY NO.
6414	53	001	BS105T, ETC



LEGEND

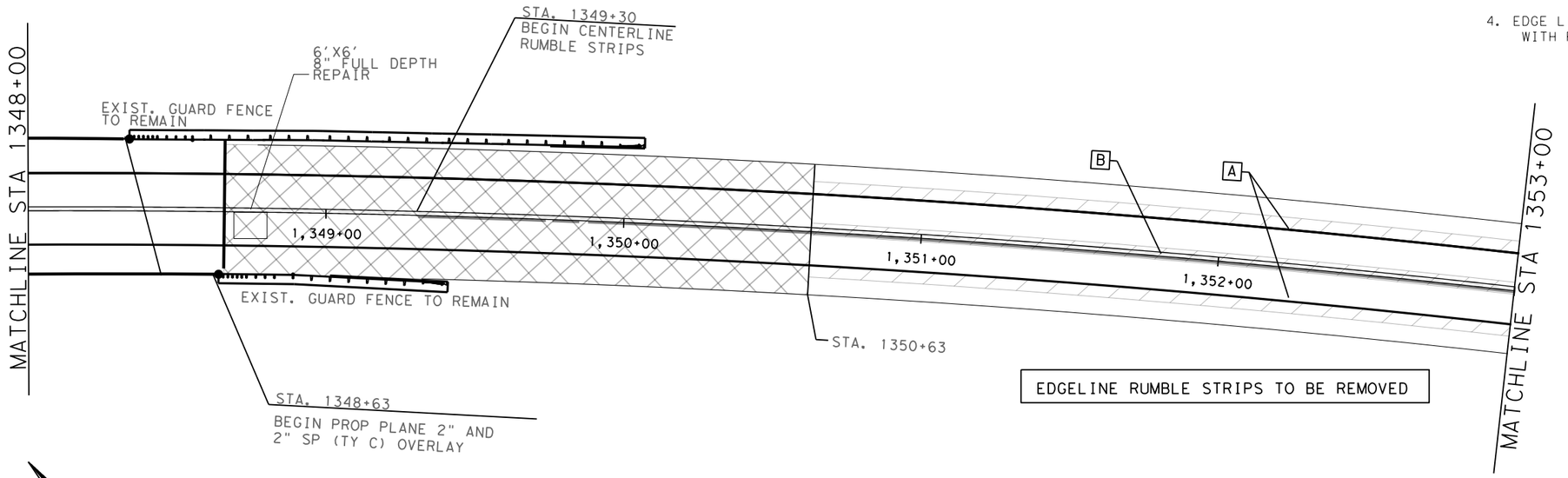
A	RE PROF PAVMRK TY I (W)6"(SLD)
B	RE PM W/RET REQ TY I (Y)6"(SLD)
C	RE PM W/RET REQ TY I (Y)6"(BRK)
D	REFL PAV MRK TY I (W) 8" (SLD)
E	PREFAB PAV MRK TY C (W) (24") (SLD)
F	NOT USED
G	NOT USED
H	PREFAB PAV MRK TY C (W) (WORD)
I	PREFAB PAV MRK TY C (W) (ARROW)
J	PREFAB PAV MRK TY C (W) (36")(YLD TRI)
K	REFL PAV MRKR TY I-C
L	REFL PAV MRKR TY II-A-A

LIMITS OF 0"-2" PLANE

LIMITS OF 1" PLANE, FILL WITH ITEM 3076 AND TACK.

NOTES:

1. REPLACE EXISITING 4" STRIPING CONFIGURATION WITH 6" UNLESS DIRECTED OTHERWISE BY THE ENGINEER.
2. MATCH EXISTING ROADWAY SLOPES.
3. REMOVE EXISTING RUMBLE STRIPS BY MILLING AND INLAY WITH ITEMS 3076.
4. EDGE LINE RUMBLE STRIPS TO BE REPLACED WITH PROFILE PAV. MKR.



EDGELINE RUMBLE STRIPS TO BE REMOVED

STATE OF TEXAS
DANIEL DUKE THOMPSON
122541
LICENSED
PROFESSIONAL ENGINEER

Daniel Duke Thompson

The seal appearing on this document was authorized by DANIEL THOMPSON, P.E. 122541 on 05/10 ,2023 . Alteration of a sealed document without proper notification to the responsible engineer is an offense under the Texas Engineering Practice Act.

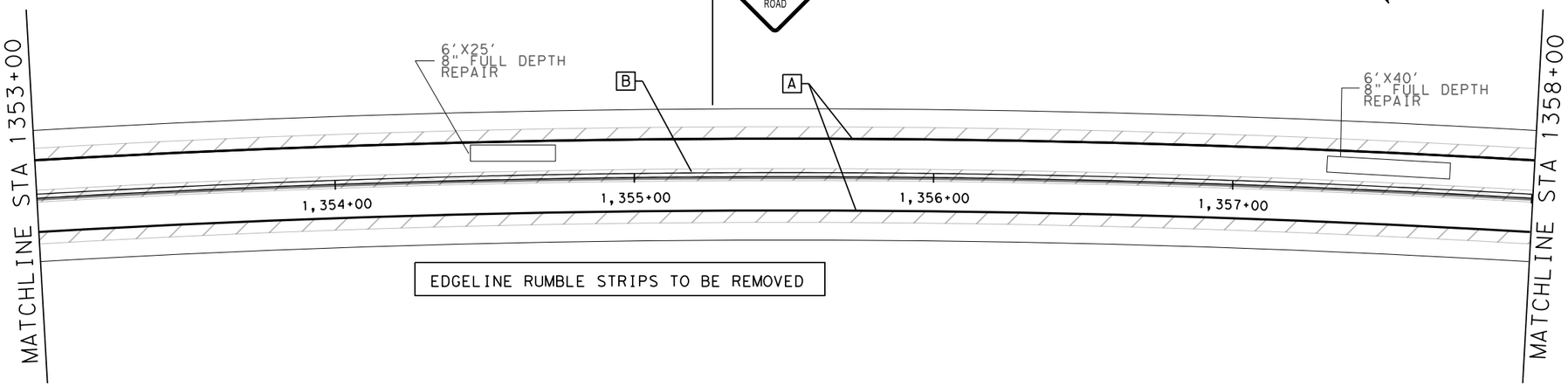
SH 105 (BYPASS) LAYOUT

N.T.S

Texas Department of Transportation

SHEET 4 OF 13

FED.RD. DIV.NO.			SHEET NO.
6			65
STATE	DIST.	COUNTY	
TEXAS	BMT	LIBERTY	
CONT.	SECT.	JOB	HIGHWAY NO.
6414	53	001	BS105T, ETC

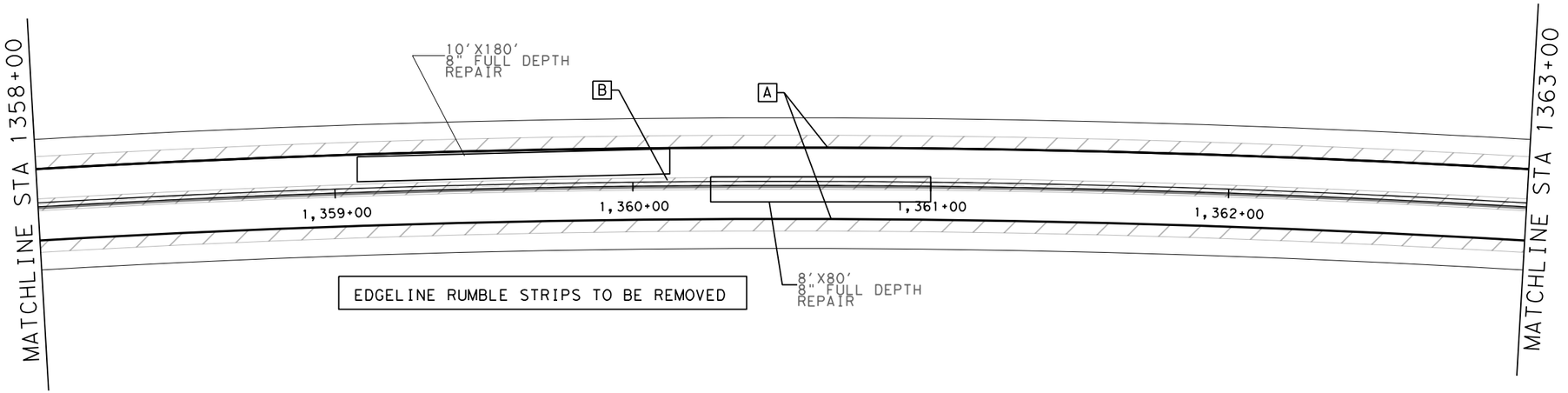


LEGEND

A	RE PROF PAVMRK TY I (W)6"(SLD)
B	RE PM W/RET REQ TY I (Y)6"(SLD)
C	RE PM W/RET REQ TY I (Y)6"(BRK)
D	REFL PAV MRK TY I (W) 8" (SLD)
E	PREFAB PAV MRK TY C (W) (24") (SLD)
F	NOT USED
G	NOT USED
H	PREFAB PAV MRK TY C (W) (WORD)
I	PREFAB PAV MRK TY C (W) (ARROW)
J	PREFAB PAV MRK TY C (W) (36")(YLD TRI)
K	REFL PAV MRKR TY I-C
L	REFL PAV MRKR TY II-A-A
#	DRIVEWAYS (SEE SHEET 71)
	LIMITS OF 0"-2" PLANE
	LIMITS OF 1" PLANE, FILL WITH ITEM 3076 AND TACK.

NOTES:

1. REPLACE EXISITING 4" STRIPING CONFIGURATION WITH 6" UNLESS DIRECTED OTHERWISE BY THE ENGINEER.
2. MATCH EXISTING ROADWAY SLOPES.
3. REMOVE EXISTING RUMBLE STRIPS BY MILLING AND INLAY WITH ITEMS 3076.
4. EDGE LINE RUMBLE STRIPS TO BE REPLACED WITH PROFILE PAV. MKR.



STATE OF TEXAS
DANIEL DUKE THOMPSON
122541
LICENSED PROFESSIONAL ENGINEER

Daniel Duke Thompson

The seal appearing on this document was authorized by DANIEL THOMPSON, P.E. 122541 on 05/10 ,2023 . Alteration of a sealed document without proper notification to the responsible engineer is an offense under the Texas Engineering Practice Act.

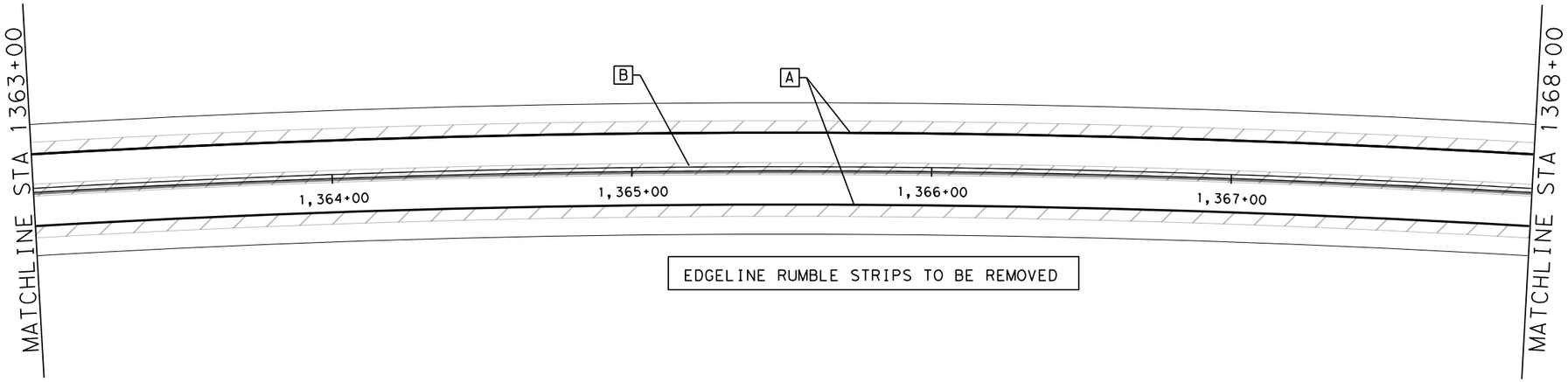
SH 105 (BYPASS) LAYOUT

N.T.S

Texas Department of Transportation

SHEET 5 OF 13

FED. RD. DIV. NO.			SHEET NO.
6			66
STATE	DIST.	COUNTY	
TEXAS	BMT	LIBERTY	
CONT.	SECT.	JOB	HIGHWAY NO.
6414	53	001	BS105T, ETC



LEGEND

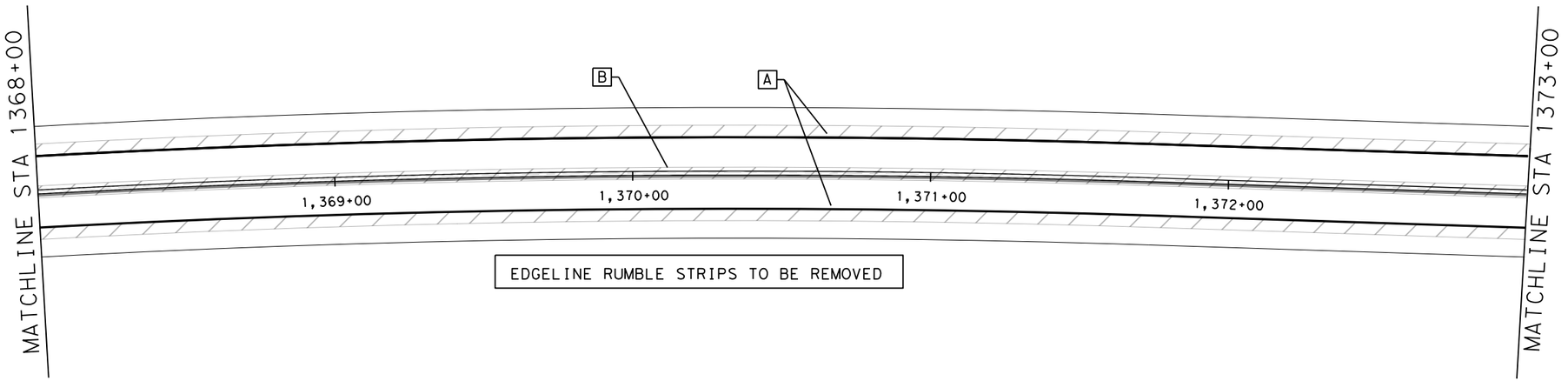
A	RE PROF PAVMRK TY I (W)6"(SLD)
B	RE PM W/RET REQ TY I (Y)6"(SLD)
C	RE PM W/RET REQ TY I (Y)6"(BRK)
D	REFL PAV MRK TY I (W) 8" (SLD)
E	PREFAB PAV MRK TY C (W) (24") (SLD)
F	NOT USED
G	NOT USED
H	PREFAB PAV MRK TY C (W) (WORD)
I	PREFAB PAV MRK TY C (W) (ARROW)
J	PREFAB PAV MRK TY C (W) (36")(YLD TRI)
K	REFL PAV MRKR TY I-C
L	REFL PAV MRKR TY II-A-A

LIMITS OF 0"-2" PLANE

LIMITS OF 1" PLANE, FILL WITH ITEM 3076 AND TACK.

NOTES:

1. REPLACE EXISITING 4" STRIPING CONFIGURATION WITH 6" UNLESS DIRECTED OTHERWISE BY THE ENGINEER.
2. MATCH EXISTING ROADWAY SLOPES.
3. REMOVE EXISTING RUMBLE STRIPS BY MILLING AND INLAY WITH ITEMS 3076.
4. EDGE LINE RUMBLE STRIPS TO BE REPLACED WITH PROFILE PAV. MKR.



STATE OF TEXAS
DANIEL DUKE THOMPSON
122541
LICENSED PROFESSIONAL ENGINEER

Daniel Duke Thompson

The seal appearing on this document was authorized by DANIEL THOMPSON, P.E. 122541 on 05/10 ,2023 . Alteration of a sealed document without proper notification to the responsible engineer is an offense under the Texas Engineering Practice Act.

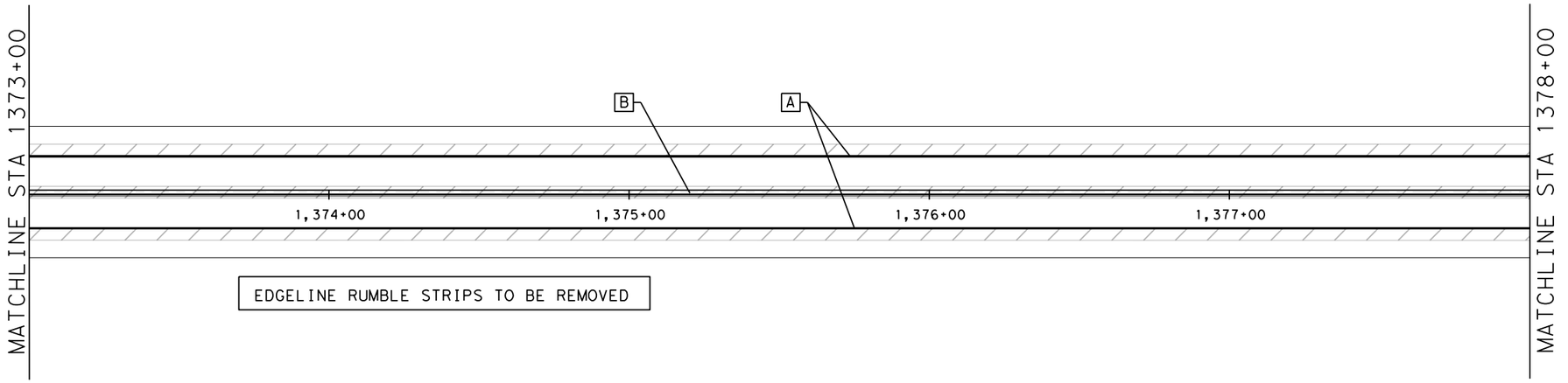
SH 105 (BYPASS) LAYOUT

N.T.S

Texas Department of Transportation

SHEET 6 OF 13

FED. RD. DIV. NO.			SHEET NO.
6			67
STATE	DIST.	COUNTY	
TEXAS	BMT	LIBERTY	
CONT.	SECT.	JOB	HIGHWAY NO.
6414	53	001	BS105T, ETC



LEGEND

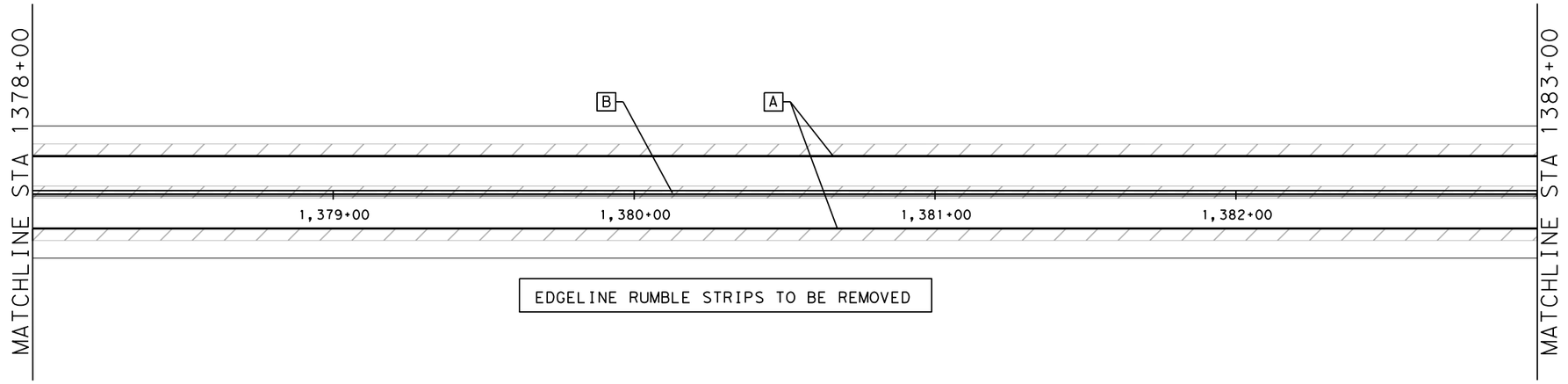
- [A] RE PROF PAVMRK TY I (W)6"(SLD)
- [B] RE PM W/RET REQ TY I (Y)6"(SLD)
- [C] RE PM W/RET REQ TY I (Y)6"(BRK)
- [D] REFL PAV MRK TY I (W) 8" (SLD)
- [E] PREFAB PAV MRK TY C (W) (24") (SLD)
- [F] NOT USED
- [G] NOT USED
- [H] PREFAB PAV MRK TY C (W) (WORD)
- [I] PREFAB PAV MRK TY C (W) (ARROW)
- [J] PREFAB PAV MRK TY C (W) (36")(YLD TRI)
- [K] REFL PAV MRKR TY I-C
- [L] REFL PAV MRKR TY II-A-A

LIMITS OF 0"-2" PLANE

LIMITS OF 1" PLANE, FILL WITH ITEM 3076 AND TACK.

NOTES:

1. REPLACE EXISITING 4" STRIPING CONFIGURATION WITH 6" UNLESS DIRECTED OTHERWISE BY THE ENGINEER.
2. MATCH EXISTING ROADWAY SLOPES.
3. REMOVE EXISTING RUMBLE STRIPS BY MILLING AND INLAY WITH ITEMS 3076.
4. EDGE LINE RUMBLE STRIPS TO BE REPLACED WITH PROFILE PAV. MKR.



STATE OF TEXAS
DANIEL DUKE THOMPSON
122541
LICENSED PROFESSIONAL ENGINEER

Daniel Duke Thompson

The seal appearing on this document was authorized by DANIEL THOMPSON, P.E. 122541 on 05/10 ,2023 . Alteration of a sealed document without proper notification to the responsible engineer is an offense under the Texas Engineering Practice Act.

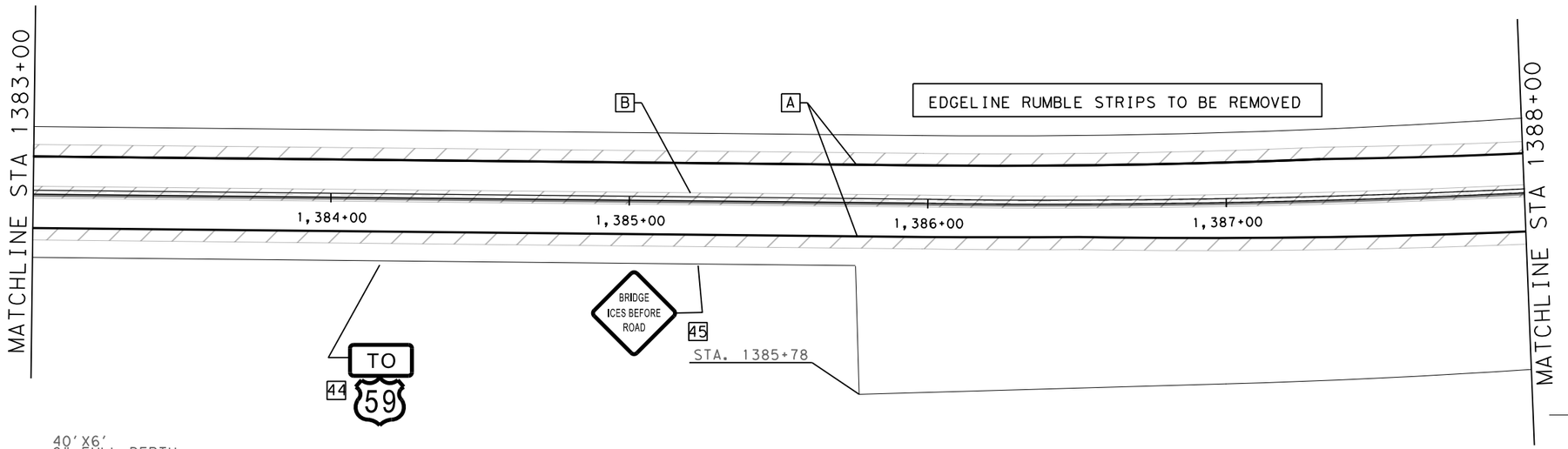
SH 105 (BYPASS) LAYOUT

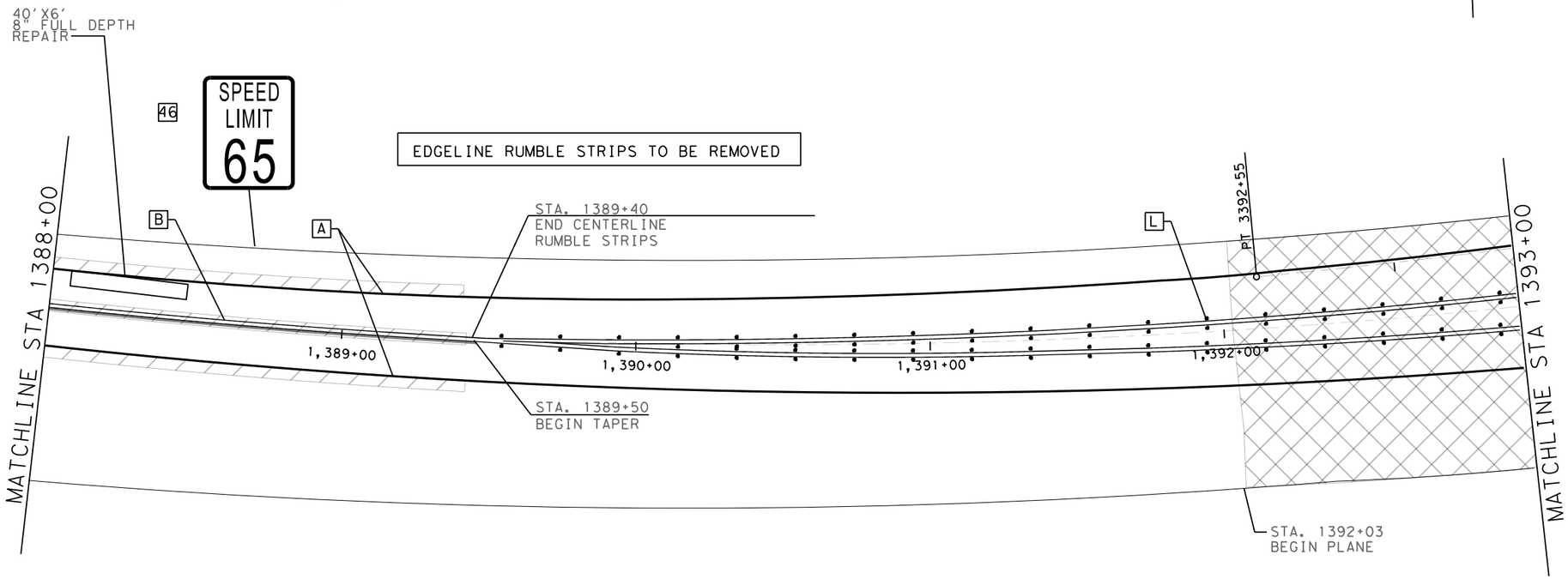
N.T.S

Texas Department of Transportation

SHEET 7 OF 13

FED.RD. DIV.NO.			SHEET NO.
6			68
STATE	DIST.	COUNTY	
TEXAS	BMT	LIBERTY	
CONT.	SECT.	JOB	HIGHWAY NO.
6414	53	001	BS105T, ETC





LEGEND

A	RE PROF PAVMRK TY I (W)6"(SLD)
B	RE PM W/RET REQ TY I (Y)6"(SLD)
C	RE PM W/RET REQ TY I (Y)6"(BRK)
D	REFL PAV MRK TY I (W) 8" (SLD)
E	PREFAB PAV MRK TY C (W) (24") (SLD)
F	NOT USED
G	NOT USED
H	PREFAB PAV MRK TY C (W) (WORD)
I	PREFAB PAV MRK TY C (W) (ARROW)
J	PREFAB PAV MRK TY C (W) (36")(YLD TRI)
K	REFL PAV MRKR TY I-C
L	REFL PAV MRKR TY II-A-A

LIMITS OF 0"-2" PLANE

LIMITS OF 1" PLANE, FILL WITH ITEM 3076 AND TACK.

STATE OF TEXAS
DANIEL DUKE THOMPSON
122541
LICENSED PROFESSIONAL ENGINEER

Daniel Duke Thompson

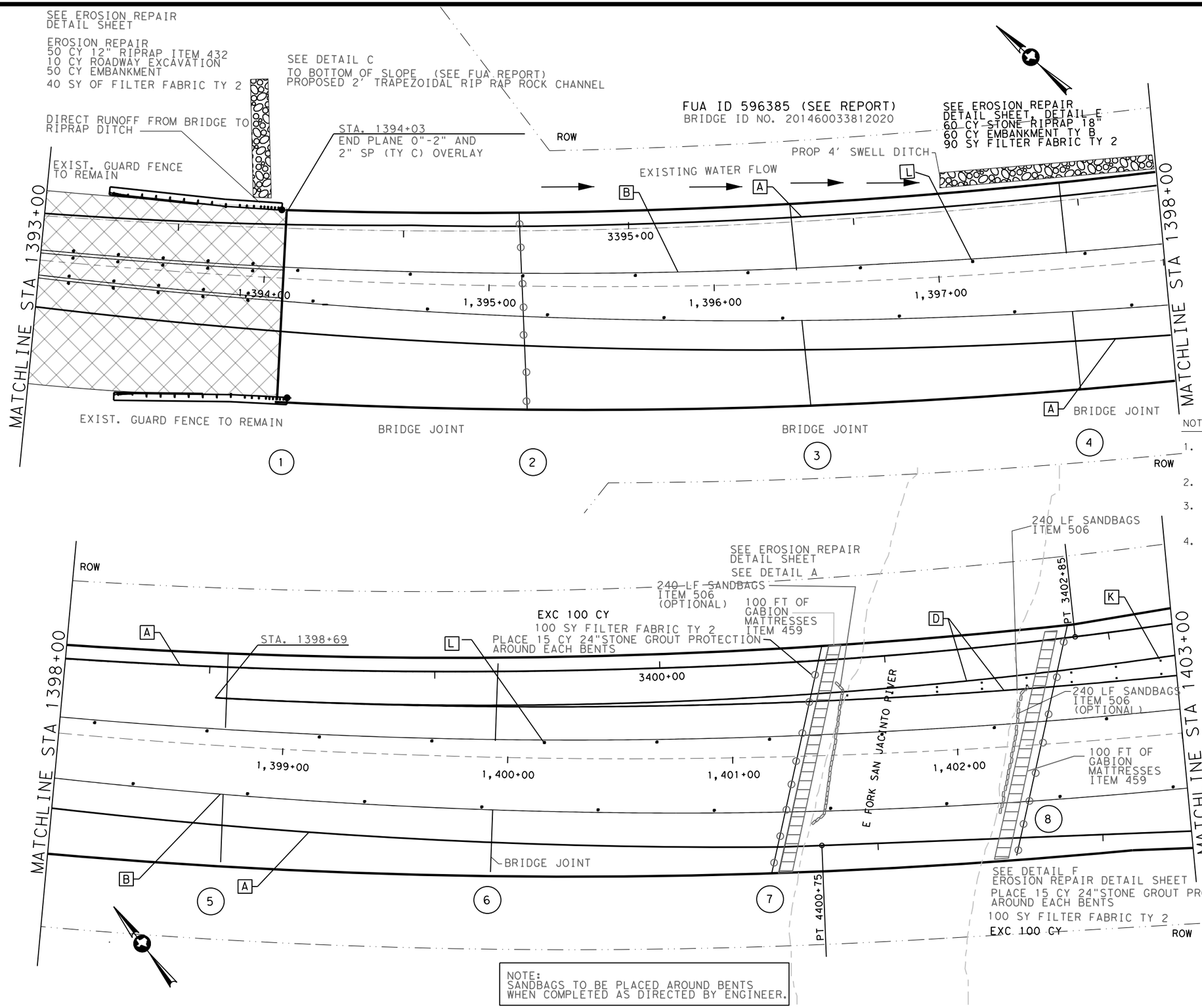
The seal appearing on this document was authorized by DANIEL THOMPSON, P.E. 122541 on 05/10 ,2023 . Alteration of a sealed document without proper notification to the responsible engineer is an offense under the Texas Engineering Practice Act.

SH 105 (BYPASS) LAYOUT

N.T.S

Texas Department of Transportation

FED. RD. DIV. NO.			SHEET NO.
6			69
STATE	DIST.	COUNTY	
TEXAS	BMT	LIBERTY	
CONT.	SECT.	JOB	HIGHWAY NO.
6414	53	001	BS105T, ETC



NOTE:
SANDBAGS TO BE PLACED AROUND BENTS
WHEN COMPLETED AS DIRECTED BY ENGINEER.

LEGEND

A	RE PROF PAVMRK TY I (W)6"(SLD)
B	RE PM W/RET REQ TY I (Y)6"(SLD)
C	RE PM W/RET REQ TY I (Y)6"(BRK)
D	REFL PAV MRK TY I (W) 8" (SLD)
E	PREFAB PAV MRK TY C (W) (24") (SLD)
F	NOT USED
G	NOT USED
H	PREFAB PAV MRK TY C (W) (WORD)
I	PREFAB PAV MRK TY C (W) (ARROW)
J	PREFAB PAV MRK TY C (W) (36")(YLD TRI)
K	REFL PAV MRKR TY I-C
L	REFL PAV MRKR TY II-A-A

LIMITS OF 0"-2" PLANE

LIMITS OF 1" PLANE, FILL WITH ITEM 3076 AND TACK.

NOTES:

1. REPLACE EXISITING 4" STRIPING CONFIGURATION WITH 6" UNLESS DIRECTED OTHERWISE BY THE ENGINEER.
2. MATCH EXISTING ROADWAY SLOPES.
3. REMOVE EXISTING RUMBLE STRIPS BY MILLING AND INLAY WITH ITEMS 3076.
4. EDGE LINE RUMBLE STRIPS TO BE REPLACED WITH PROFILE PAV. MKR.

STATE OF TEXAS
DANIEL DUKE THOMPSON
122541
LICENSED
PROFESSIONAL ENGINEER

Daniel Duke Thompson

The seal appearing on this document was authorized by DANIEL THOMPSON, P.E. 122541 on 05/10 ,2023 . Alteration of a sealed document without proper notification to the responsible engineer is an offense under the Texas Engineering Practice Act.

SH 105 (BYPASS) LAYOUT

N.T.S

Texas Department of Transportation

SHEET 9 OF 13

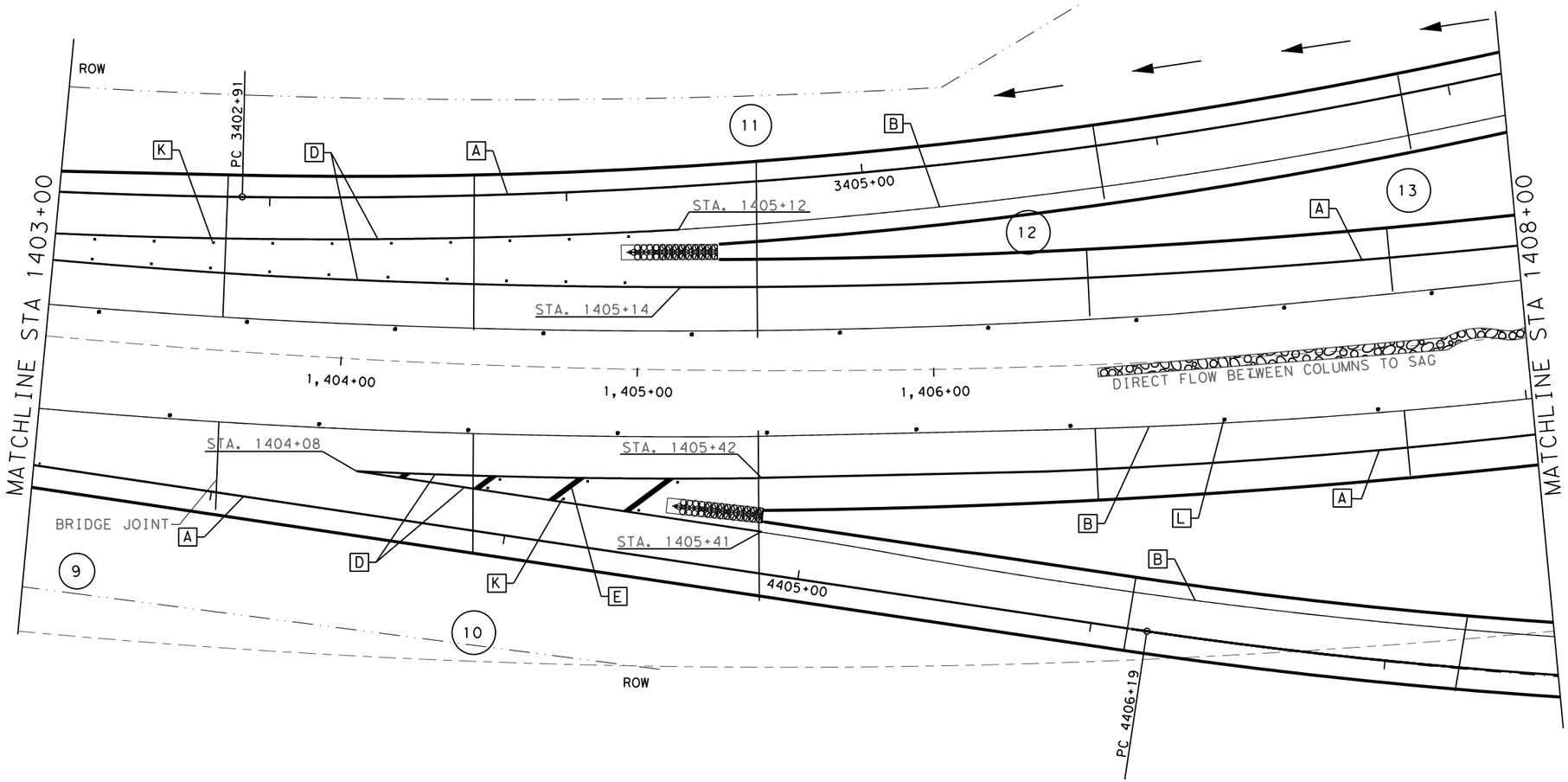
FED. RD. DIV. NO.			SHEET NO.
6			70
STATE	DIST.	COUNTY	
TEXAS	BMT	LIBERTY	
CONT.	SECT.	JOB	HIGHWAY NO.
6414	53	001	BS105T, ETC

NOTES:

1. REPLACE EXISITING 4" STRIPING CONFIGURATION WITH 6" UNLESS DIRECTED OTHERWISE BY THE ENGINEER.
2. MATCH EXISTING ROADWAY SLOPES.
3. REMOVE EXISTING RUMBLE STRIPS BY MILLING AND INLAY WITH ITEMS 3076.
4. EDGE LINE RUMBLE STRIPS TO BE REPLACED WITH PROFILE PAV. MKR.

LEGEND

- [A] RE PROF PAVMRK TY I (W)6"(SLD)
- [B] RE PM W/RET REQ TY I (Y)6"(SLD)
- [C] RE PM W/RET REQ TY I (Y)6"(BRK)
- [D] REFL PAV MRK TY I (W) 8" (SLD)
- [E] PREFAB PAV MRK TY C (W) (24") (SLD)
- [F] NOT USED
- [G] NOT USED
- [H] PREFAB PAV MRK TY C (W) (WORD)
- [I] PREFAB PAV MRK TY C (W) (ARROW)
- [J] PREFAB PAV MRK TY C (W) (36")(YLD TRI)
- [K] REFL PAV MRKR TY I-C
- [L] REFL PAV MRKR TY II-A-A
- LIMITS OF 0"-2" PLANE
- LIMITS OF 1" PLANE, FILL WITH ITEM 3076 AND TACK.



N.T.S

STATE OF TEXAS
DANIEL DUKE THOMPSON
122541
LICENSED PROFESSIONAL ENGINEER

Daniel Duke Thompson

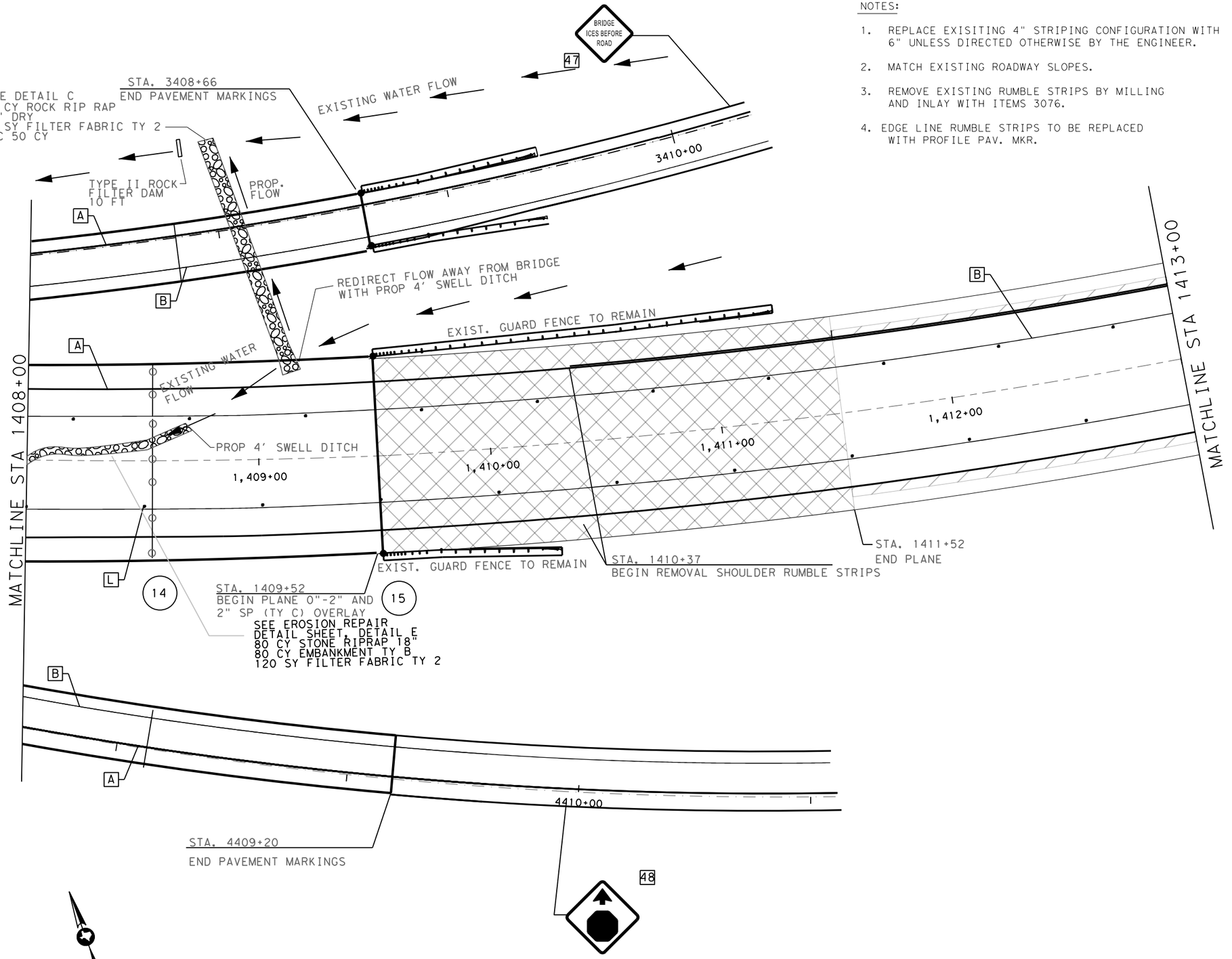
The seal appearing on this document was authorized by DANIEL THOMPSON, P.E. 122541 on 05/10 ,2023 . Alteration of a sealed document without proper notification to the responsible engineer is an offense under the Texas Engineering Practice Act.

SH 105 (BYPASS) LAYOUT

Texas Department of Transportation

SHEET 10 OF 13

FED.RD. DIV.NO.			SHEET NO.
6			71
STATE	DIST.	COUNTY	
TEXAS	BMT	LIBERTY	
CONT.	SECT.	JOB	HIGHWAY NO.
6414	53	001	BS105T, ETC



NOTES:

1. REPLACE EXISITING 4" STRIPING CONFIGURATION WITH 6" UNLESS DIRECTED OTHERWISE BY THE ENGINEER.
2. MATCH EXISTING ROADWAY SLOPES.
3. REMOVE EXISTING RUMBLE STRIPS BY MILLING AND INLAY WITH ITEMS 3076.
4. EDGE LINE RUMBLE STRIPS TO BE REPLACED WITH PROFILE PAV. MKR.

LEGEND

A	RE PROF PAVMRK TY I (W)6"(SLD)
B	RE PM W/RET REQ TY I (Y)6"(SLD)
C	RE PM W/RET REQ TY I (Y)6"(BRK)
D	REFL PAV MRK TY I (W) 8" (SLD)
E	PREFAB PAV MRK TY C (W) (24") (SLD)
F	NOT USED
G	NOT USED
H	PREFAB PAV MRK TY C (W) (WORD)
I	PREFAB PAV MRK TY C (W) (ARROW)
J	PREFAB PAV MRK TY C (W) (36")(YLD TRI)
K	REFL PAV MRKR TY I-C
L	REFL PAV MRKR TY II-A-A

LIMITS OF 0"-2" PLANE

LIMITS OF 1" PLANE, FILL WITH ITEM 3076 AND TACK.

STATE OF TEXAS
DANIEL DUKE THOMPSON
122541
LICENSED PROFESSIONAL ENGINEER

Daniel Duke Thompson

The seal appearing on this document was authorized by DANIEL THOMPSON, P.E. 122541 on 05/10 ,2023 . Alteration of a sealed document without proper notification to the responsible engineer is an offense under the Texas Engineering Practice Act.

SH 105 (BYPASS) LAYOUT

N.T.S

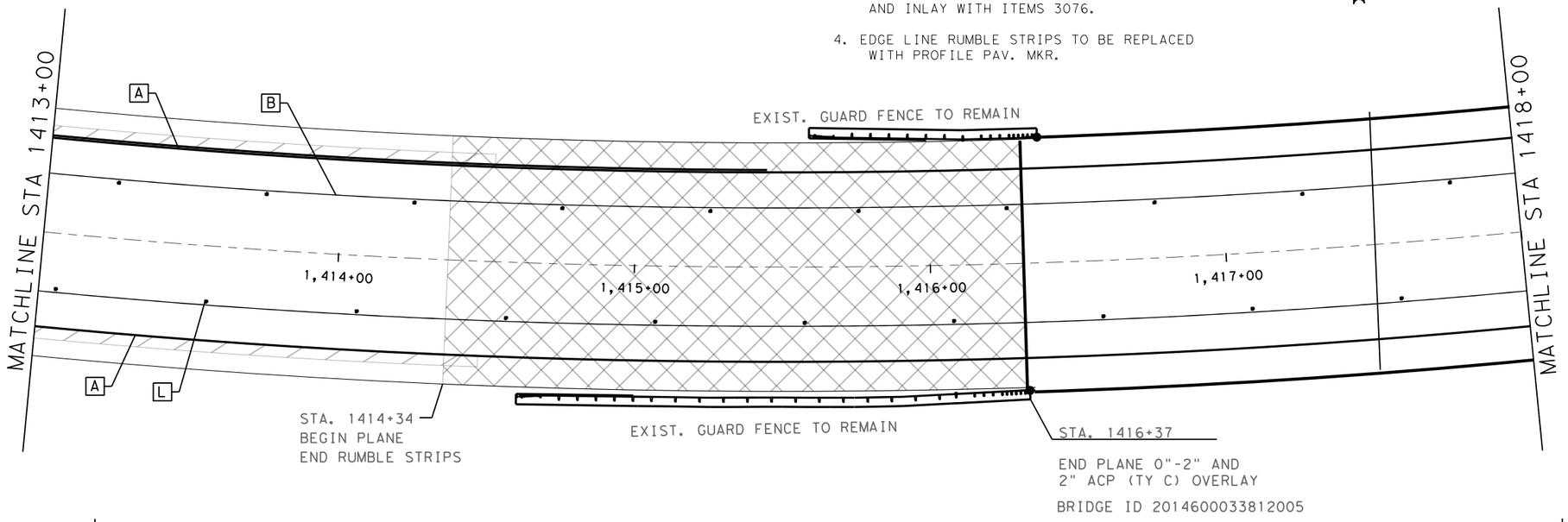
Texas Department of Transportation

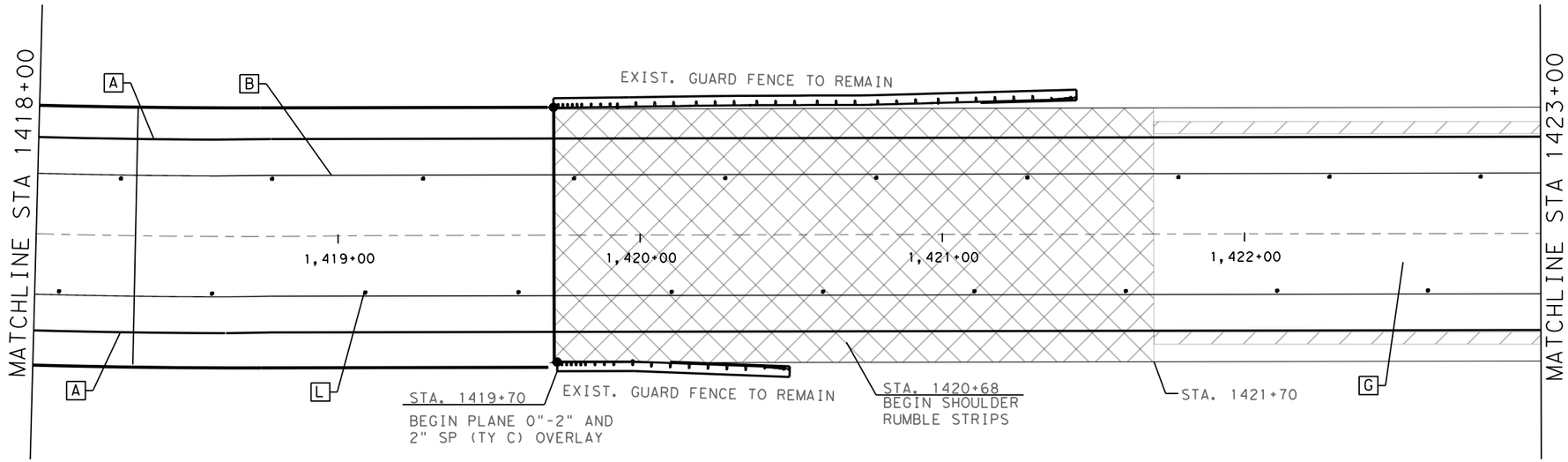
SHEET 11 OF 13

FED.RD. DIV.NO.			SHEET NO.
6			72
STATE	DIST.	COUNTY	
TEXAS	BMT	LIBERTY	
CONT.	SECT.	JOB	HIGHWAY NO.
6414	53	001	BS105T, ETC

NOTES:

1. REPLACE EXISITING 4" STRIPING CONFIGURATION WITH 6" UNLESS DIRECTED OTHERWISE BY THE ENGINEER.
2. MATCH EXISTING ROADWAY SLOPES.
3. REMOVE EXISTING RUMBLE STRIPS BY MILLING AND INLAY WITH ITEMS 3076.
4. EDGE LINE RUMBLE STRIPS TO BE REPLACED WITH PROFILE PAV. MKR.





LEGEND

A	RE PROF PAVMRK TY I (W)6"(SLD)
B	RE PM W/RET REQ TY I (Y)6"(SLD)
C	RE PM W/RET REQ TY I (Y)6"(BRK)
D	REFL PAV MRK TY I (W) 8" (SLD)
E	PREFAB PAV MRK TY C (W) (24") (SLD)
F	NOT USED
G	NOT USED
H	PREFAB PAV MRK TY C (W) (WORD)
I	PREFAB PAV MRK TY C (W) (ARROW)
J	PREFAB PAV MRK TY C (W) (36")(YLD TRI)
K	REFL PAV MRKR TY I-C
L	REFL PAV MRKR TY II-A-A
	LIMITS OF 0"-2" PLANE
	LIMITS OF 1" PLANE, FILL WITH ITEM 3076 AND TACK.

STATE OF TEXAS
DANIEL DUKE THOMPSON
122541
LICENSED PROFESSIONAL ENGINEER

Daniel Duke Thompson

The seal appearing on this document was authorized by DANIEL THOMPSON, P.E. 122541 on 05/10 ,2023 . Alteration of a sealed document without proper notification to the responsible engineer is an offense under the Texas Engineering Practice Act.

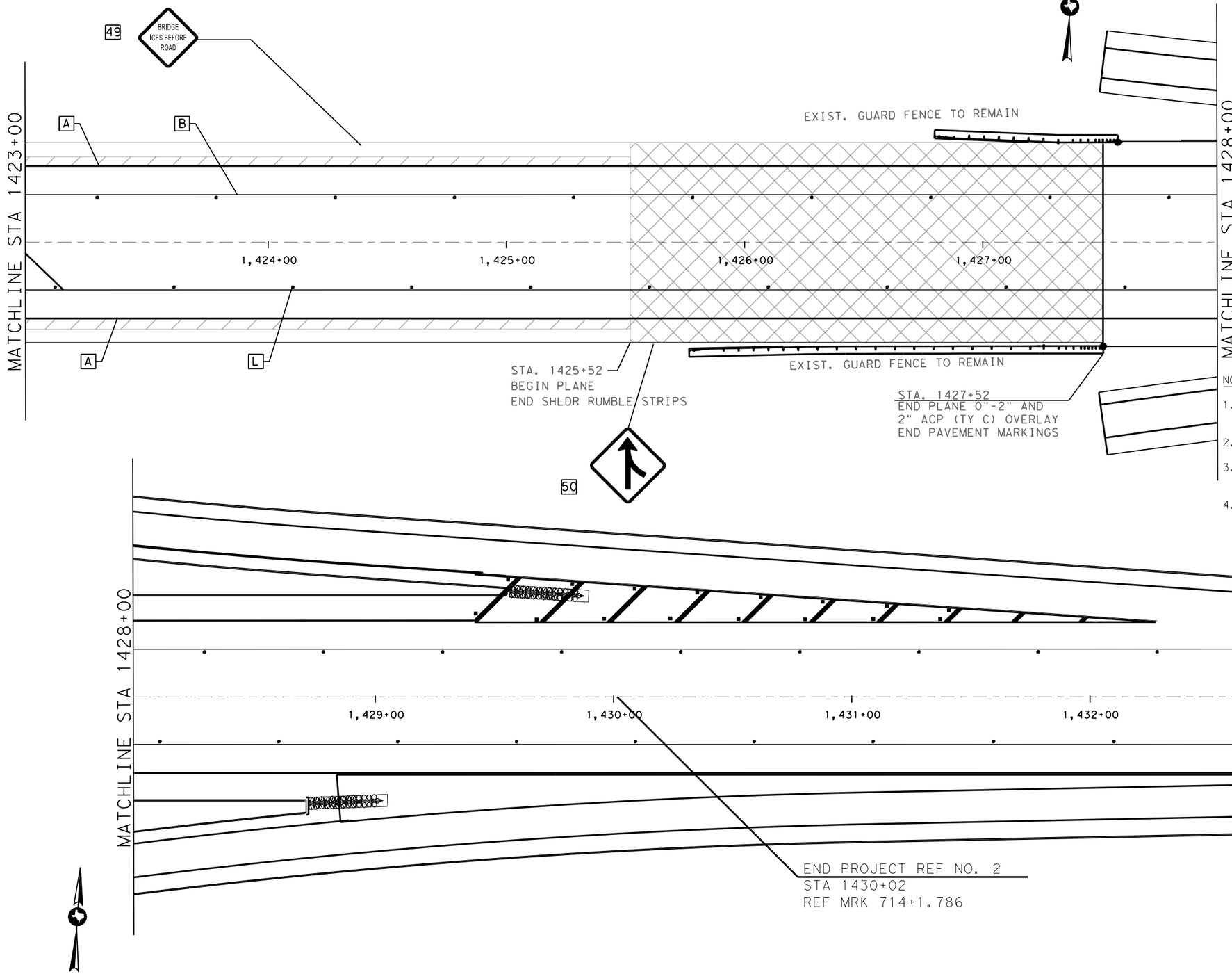
N.T.S

SH 105 (BYPASS) LAYOUT

Texas Department of Transportation

SHEET 12 OF 13

FED.RD. DIV.NO.			SHEET NO.
6			73
STATE	DIST.	COUNTY	
TEXAS	BMT	LIBERTY	
CONT.	SECT.	JOB	HIGHWAY NO.
6414	53	001	BS105T, ETC



LEGEND

A	RE PROF PAVMRK TY I (W)6"(SLD)
B	RE PM W/RET REQ TY I (Y)6"(SLD)
C	RE PM W/RET REQ TY I (Y)6"(BRK)
D	REFL PAV MRK TY I (W) 8" (SLD)
E	PREFAB PAV MRK TY C (W) (24") (SLD)
F	NOT USED
G	NOT USED
H	PREFAB PAV MRK TY C (W) (WORD)
I	PREFAB PAV MRK TY C (W) (ARROW)
J	PREFAB PAV MRK TY C (W) (36")(YLD TRI)
K	REFL PAV MRKR TY I-C
L	REFL PAV MRKR TY II-A-A

LIMITS OF 0"-2" PLANE

LIMITS OF 1" PLANE, FILL WITH ITEM 3076 AND TACK.

NOTES:

1. REPLACE EXISITING 4" STRIPING CONFIGURATION WITH 6" UNLESS DIRECTED OTHERWISE BY THE ENGINEER.
2. MATCH EXISTING ROADWAY SLOPES.
3. REMOVE EXISTING RUMBLE STRIPS BY MILLING AND INLAY WITH ITEMS 3076.
4. EDGE LINE RUMBLE STRIPS TO BE REPLACED WITH PROFILE PAV. MKR.

STATE OF TEXAS
DANIEL DUKE THOMPSON
122541
LICENSED PROFESSIONAL ENGINEER

Daniel Duke Thompson

The seal appearing on this document was authorized by DANIEL THOMPSON, P.E. 122541 on 05/10 ,2023 . Alteration of a sealed document without proper notification to the responsible engineer is an offense under the Texas Engineering Practice Act.

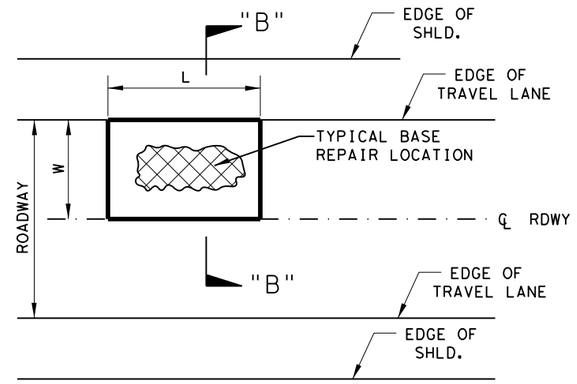
SH 105 (BYPASS) LAYOUT

N.T.S

Texas Department of Transportation

SHEET 13 OF 13

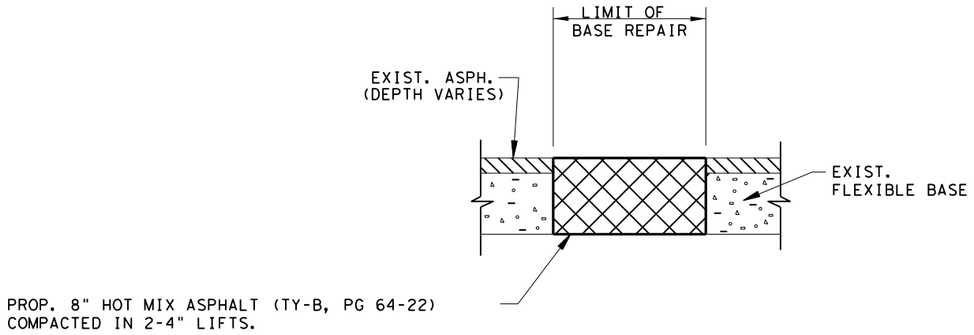
FED.RD. DIV.NO.			SHEET NO.
6			74
STATE	DIST.	COUNTY	
TEXAS	BMT	LIBERTY	
CONT.	SECT.	JOB	HIGHWAY NO.
6414	53	001	BS105T,ETC



TYPICAL BASE REPAIR

LOCATIONS ALSO IN LAYOUT SHEETS

SIZE	SHEET
40' X 12'	50
30' X 8'	51
30' X 8'	51
30' X 8'	53
40' X 6'	55
30' X 6'	56
4' X 12'	58
30' X 8'	59
6' X 6'	65
25' X 6'	66
40' X 6'	66
80' X 8'	66
80' X 10'	66



SECTION "B-B"

GENERAL NOTES:

1. HOT MIX ASPHALT WILL BE COMPACTED TO MAX 4" LIFTS.
2. DEPTH FOR SOME PATCHES MAY VARY AS DETERMINED.
3. THE CONTRACTOR WILL REPAIR AND OPEN THE SECTION TO TRAFFIC THE SAME DAY THE AREA IS EXCAVATED. IF THE CONTRACTOR HAS TO PLACE ANY TYPE OF TEMPORARY MATERIAL IN THE EXCAVATED AREA TO OPEN THE LANE TO TRAFFIC, IT WILL BE AT THEIR EXPENSE.
4. THE ENGINEER WILL COORDINATE WITH THE MAINTENANCE SUPERVISOR TO IDENTIFY AND MARK THE REQUIRED REPAIR LOCATIONS PRIOR TO BEGINNING WORK.

STATE OF TEXAS
DANIEL DUKE THOMPSON
122541
LICENSED PROFESSIONAL ENGINEER

Daniel Duke Thompson

The seal appearing on this document was authorized by DANIEL THOMPSON, P.E. 122541 on 05/10 ,2023 . Alteration of a sealed document without proper notification to the responsible engineer is an offense under the Texas Engineering Practice Act.

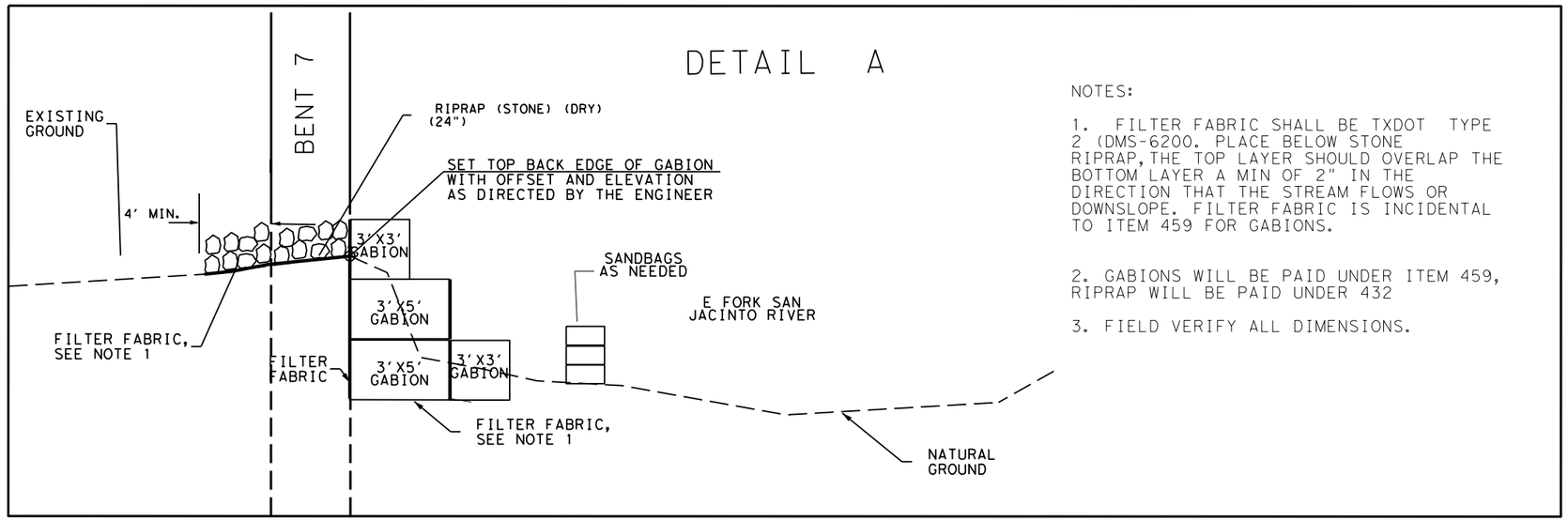
TYPICAL BASE REPAIR DETAILS N.T.S.

©2023 Texas Department of Transportation

FED. RD. DIV. NO.	STATE	MAINTENANCE PROJECT NO.			SHEET NO.
6	TEXAS				75
STATE DIST. NO.	COUNTY	CONT.	SECT.	JOB	HWY. NO.
BMT	LIBERTY	6414	53	001	BS105T,ETC

5/19/2023 5:36:09 PM
Y:\LOCAL\LIBERTY AO RMC SUBMITTALS\FY 23\FY 23 RMC 6414-53-001 SH 105T AND BYPASS\Design\DGN\General\General Sheets.dgn

DETAIL A



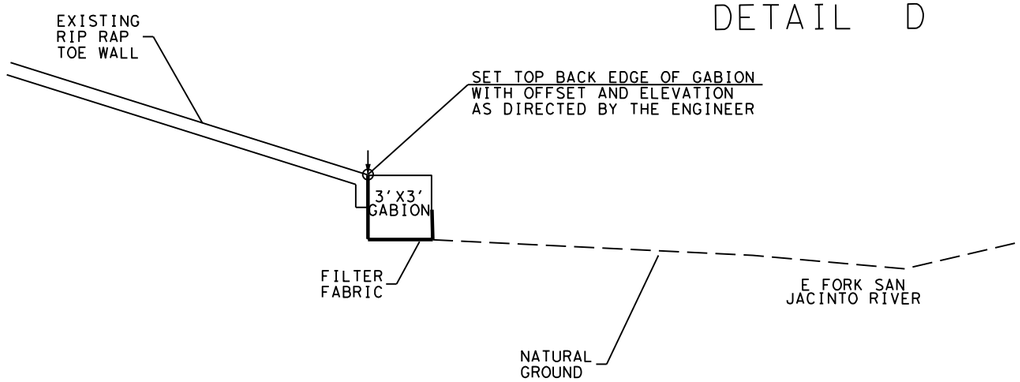
NOTES:

1. FILTER FABRIC SHALL BE TXDOT TYPE 2 (DMS-6200. PLACE BELOW STONE RIPRAP, THE TOP LAYER SHOULD OVERLAP THE BOTTOM LAYER A MIN OF 2" IN THE DIRECTION THAT THE STREAM FLOWS OR DOWNSLOPE. FILTER FABRIC IS INCIDENTAL TO ITEM 459 FOR GABIONS.

2. GABIONS WILL BE PAID UNDER ITEM 459, RIPRAP WILL BE PAID UNDER 432

3. FIELD VERIFY ALL DIMENSIONS.

DETAIL D



NOTES:

1. FILTER FABRIC SHALL BE TXDOT TYPE 2 (DMS-6200. PLACE BELOW STONE RIPRAP, THE TOP LAYER SHOULD OVERLAP THE BOTTOM LAYER A MIN OF 2" IN THE DIRECTION THAT THE STREAM FLOWS OR DOWNSLOPE. FILTER FABRIC IS INCIDENTAL TO ITEM 459 FOR GABIONS.

2. GABIONS WILL BE PAID UNDER ITEM 459, RIPRAP WILL BE PAID UNDER 432

3. FIELD VERIFY ALL DIMENSIONS.

STATE OF TEXAS
DANIEL DUKE THOMPSON
122541
LICENSED PROFESSIONAL ENGINEER

Daniel Duke Thompson

The seal appearing on this document was authorized by DANIEL THOMPSON, P.E. 122541 on 05/10 ,2023 . Alteration of a sealed document without proper notification to the responsible engineer is an offense under the Texas Engineering Practice Act.

SH 105•T DRAINAGE REPAIR DETAIL

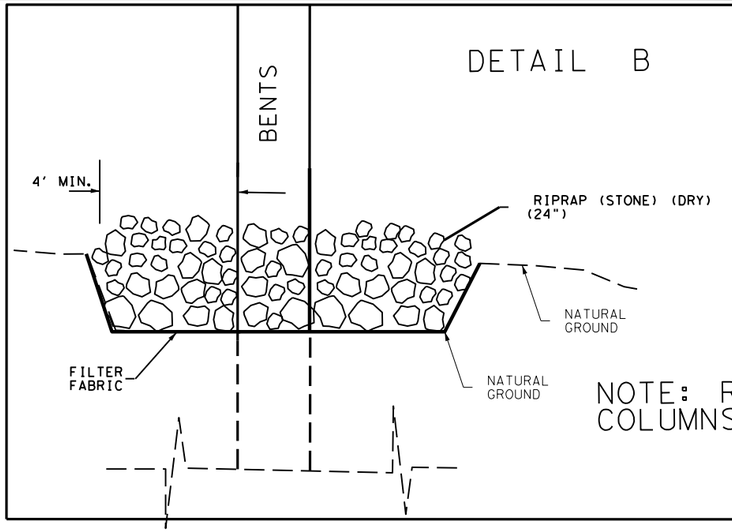
SHEET 1 OF 2

SCALE: N.T.S.

Texas Department of Transportation

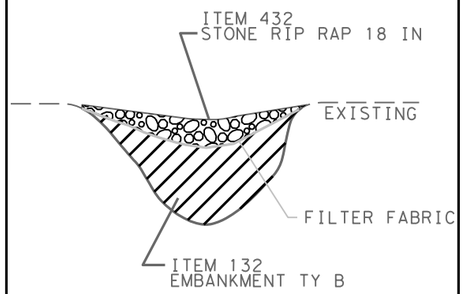
FED. RD. DIV. NO.			SHEET NO.
6			76
STATE	DIST.	COUNTY	
TEXAS	BMT	LIBERTY	
CONT.	SECT.	JOB	HIGHWAY NO.
6414	53	001	BS105T, ETC

DETAIL B



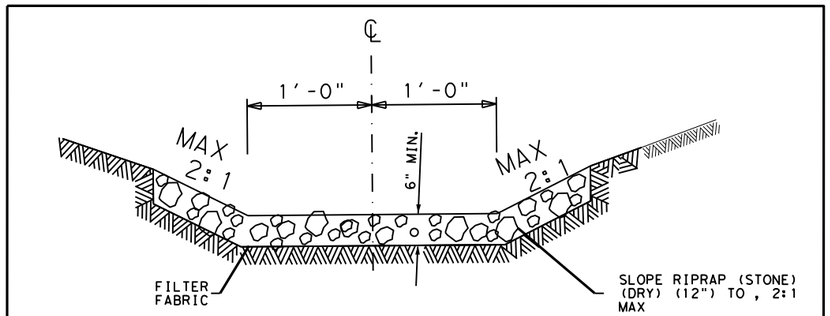
NOTE: RIPRAP MAY BE PLACED AROUND COLUMNS AS DIRECTED BY INSPECTOR

DETAIL E

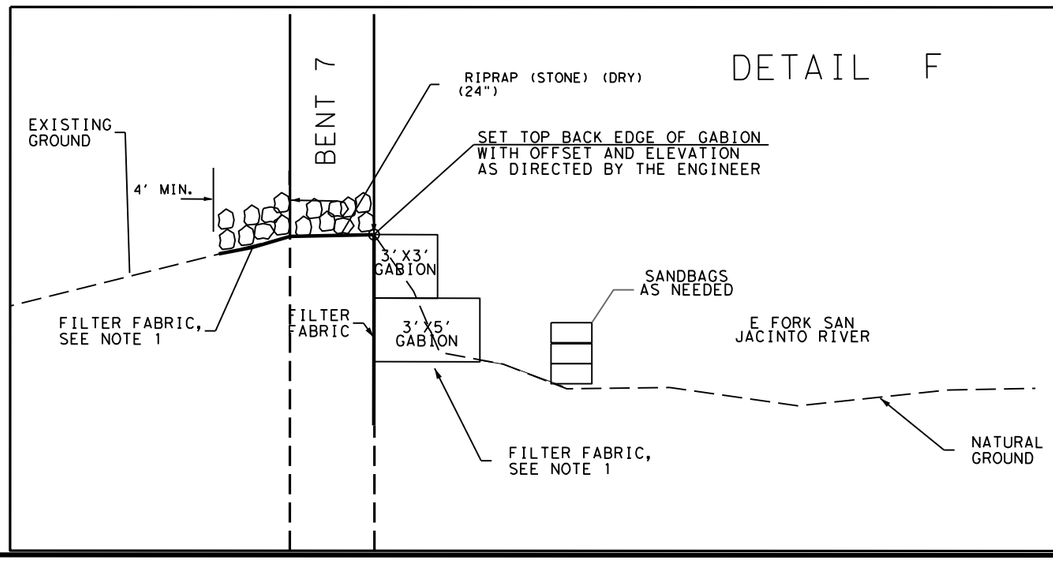


SEE FUA FOR MORE INFORMATION

DETAIL C



DETAIL F



NOTES:

1. FILTER FABRIC SHALL BE TXDOT TYPE 2 (DMS-6200. PLACE BELOW STONE RIPRAP, THE TOP LAYER SHOULD OVERLAP THE BOTTOM LAYER A MIN OF 2" IN THE DIRECTION THAT THE STREAM FLOWS OR DOWNSLOPE. FILTER FABRIC IS INCIDENTAL TO ITEM 459 FOR GABIONS.

2. GABIONS WILL BE PAID UNDER ITEM 459, RIPRAP WILL BE PAID UNDER 432

3. FIELD VERIFY ALL DIMENSIONS.

STATE OF TEXAS
DANIEL DUKE THOMPSON
122541
LICENSED PROFESSIONAL ENGINEER

Daniel Duke Thompson

The seal appearing on this document was authorized by DANIEL THOMPSON, P.E. 122541 on 05/10 ,2023 . Alteration of a sealed document without proper notification to the responsible engineer is an offense under the Texas Engineering Practice Act.

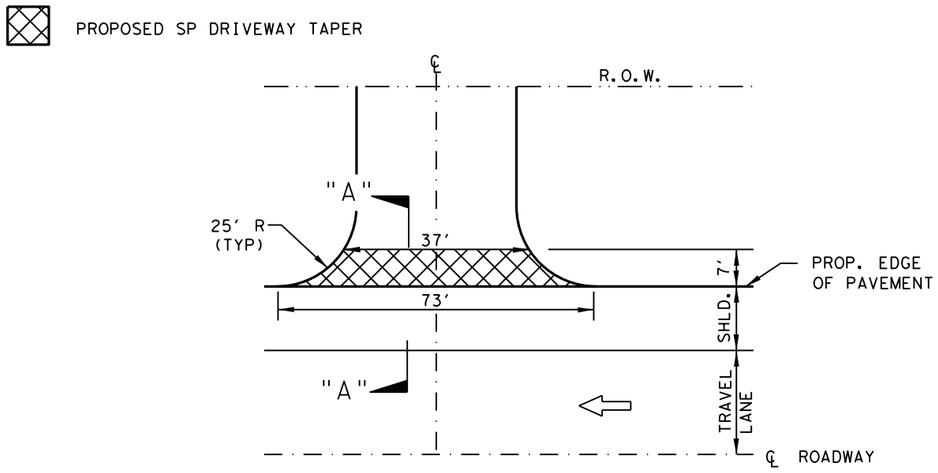
SH 105-T DRAINAGE REPAIR DETAIL

SHEET 2 OF 2

Texas Department of Transportation

SCALE: N.T.S.

FED.RD. DIV.NO.			SHEET NO.
6			77
STATE	DIST.	COUNTY	
TEXAS	BMT	LIBERTY	
CONT.	SECT.	JOB	HIGHWAY NO.
6414	53	001	BS105T, ETC

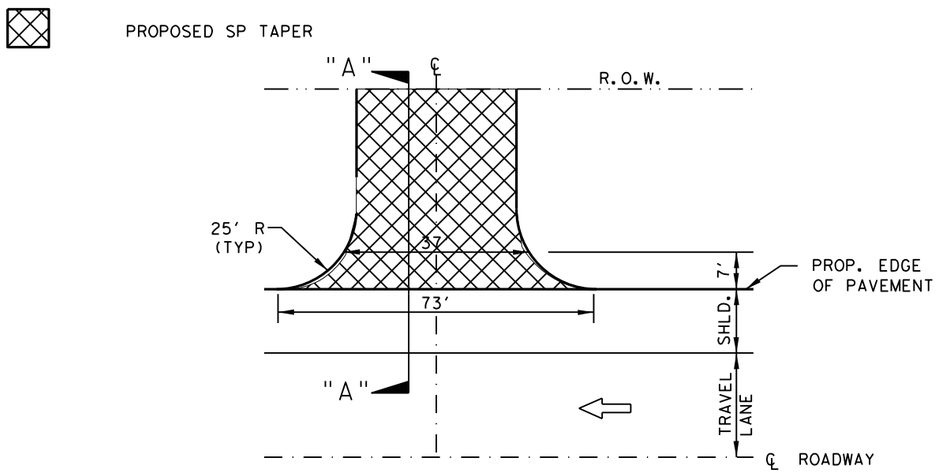


TYPICAL PLAN @ ASPHALT DRIVEWAYS

NOTES:

MATERIAL SPECIFICATIONS, TYPES AND RATES SHALL CONFORM TO ITEM 3077.

REMOVAL AND DISPOSAL OF PORTIONS OF EXISTING DRIVEWAYS WILL NOT BE PAID FOR DIRECTLY, BUT WILL BE CONSIDERED SUBSIDIARY TO VARIOUS BID ITEMS.

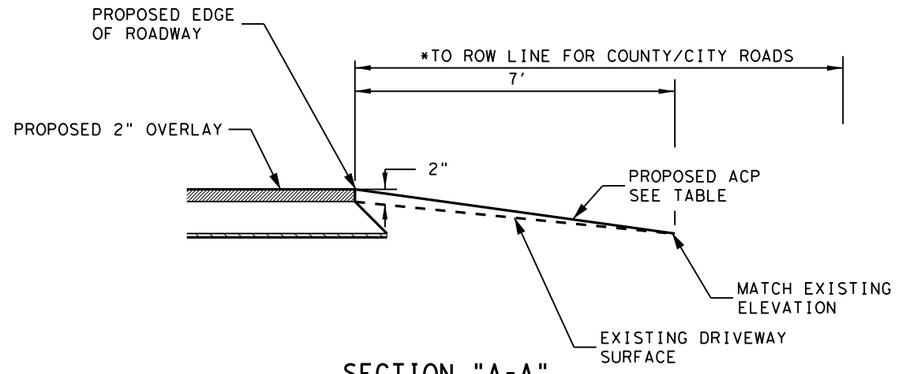


TYPICAL PLAN @ ASPHALT COUNTY ROADS AND CITY STREETS

NOTES:

MATERIAL SPECIFICATIONS, TYPES AND RATES SHALL CONFORM TO ITEM 3077.

REMOVAL AND DISPOSAL OF PORTIONS OF EXISTING DRIVEWAYS WILL NOT BE PAID FOR DIRECTLY, BUT WILL BE CONSIDERED SUBSIDIARY TO VARIOUS BID ITEMS.



SECTION "A-A"

SH 105-T			
DRIVEWAYS	STATION/LEFT/RIGHT	MATERIAL	AREA SY
1*	39+71 R	ASPHALT	292
2	40+03 L	ASPHALT	353
3	45+24 L	ASPHALT	256
4	53+75 R	ASPHALT	223
5*	87+39 L	ASPHALT	409
6*	114+44 R	ASPHALT	157
7	115+41 R	ASPHALT	189
8	116+48 R	ASPHALT	102
9*	117+67 L	ASPHALT	70
10	118+33 R	ASPHALT	44
11	118+49 L	ASPHALT	54
		ASPHALT TOTAL	2149

* PAVE ROADWAY TO ROW

STATE OF TEXAS
DANIEL DUKE THOMPSON
122541
LICENSED PROFESSIONAL ENGINEER

Daniel Duke Thompson

The seal appearing on this document was authorized by DANIEL THOMPSON, P.E. 122541 on 05/10 ,2023 . Alteration of a sealed document without proper notification to the responsible engineer is an offense under the Texas Engineering Practice Act.

TYPICAL DRIVEWAY DETAILS

NTS

Texas Department of Transportation

FED.RD. DIV.NO.			SHEET NO.
6			78
STATE	DIST.	COUNTY	
TEXAS	BMT	LIBERTY	
CONT.	SECT.	JOB	HIGHWAY NO.
6414	53	001	BS105T,ETC

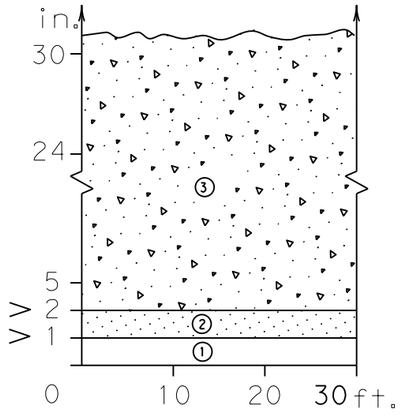
DATE: 5/19/2023
FILE: Y:\LOCAL\LIBERTY AO RMC SUBMITTALS\FY 23\FY 23 RMC 6414-53-001 SH 105T AND BYPASS\Design\DGN\Standards\Master Standards File.dgn

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

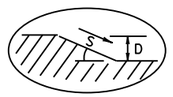
DATE:
FILE:

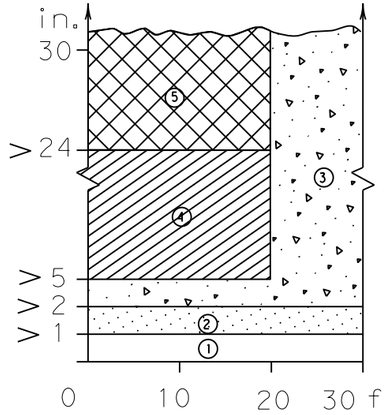
DEFINITION OF TREATMENT ZONES FOR VARIOUS EDGE CONDITIONS

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

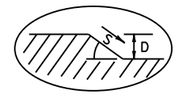


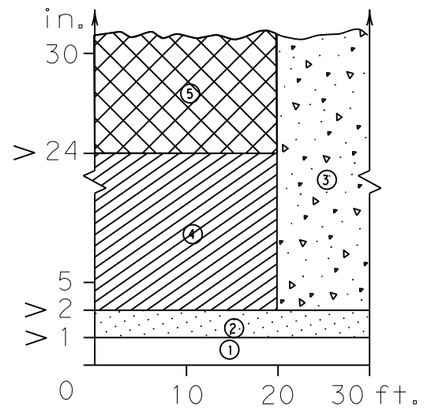
Edge Condition I
S = (3:1) (or flatter)



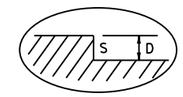


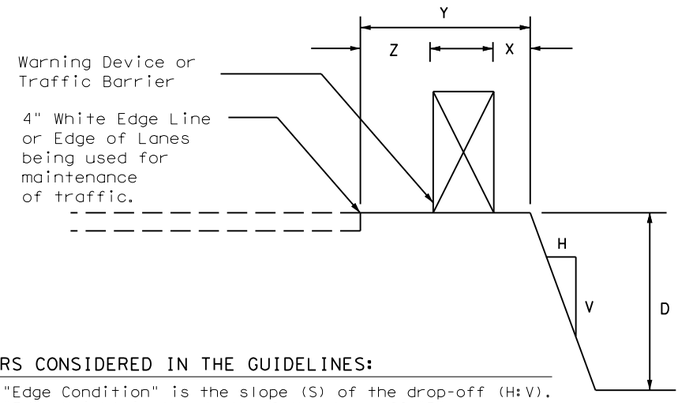
Edge Condition II
S = ((2.99):1) to (1:1)





Edge Condition III
S is steeper than (1:1)





FACTORS CONSIDERED IN THE GUIDELINES:

1. The "Edge Condition" is the slope (S) of the drop-off (H:V). The "Edge Height is the depth of the drop-off "D".

2. Distance "X" is to be the maximum practical under job conditions. Two feet minimum for high speed conditions. Distance "Y" is the lateral clearance from edge of travel lane to edge of dropoff. Distance "Z" does not have a minimum.

3. In addition to the factors considered in the guidelines, each construction zone drop-off situation should be analyzed individually, taking into account other variables, such as: traffic mix, posted speed in the construction zone, horizontal curvature, and the practicality of the treatment options.

4. The conditions for indicating the use of positive or protective barriers are given by Zone-5 and Figure-1. Traffic barriers are primarily applicable for high speed conditions. Urban areas with speeds of 30 mph or less may have a lesser need for signing, delineation, and barriers. Right-angled edges, however, with "D" greater than 2 inches and located within a lateral offset of 6 feet, may indicate a higher level of treatment.

5. If the distance "Y" must be less than 3 feet, the use of a positive barrier may not be feasible. In such a case, consider either: 1) narrowing the lanes to a desired 11 to 12 feet or 10 foot minimum (see CW20-8 sign), or 2) provide an edge slope such as Edge Condition I.

Zone	Treatment Types Guidelines:
①	No treatment
②	CW 8-11 "Uneven Lanes" signs.
③	CW 8-9a Shoulder Drop-Off" or CW 8-11 signs plus vertical panels.
④	CW8-9a or CW 8-11, signs plus drums. Where restricted space precludes the use of drums, use vertical panels. An edge slope to that of the profered Edge Condition I.
⑤	Check indications (Figure-1) for possitive barrier. Where positive barrier is not indicated, the treatment shown above for Zone-4 may be used after consideration of other applicable factors.

Edge Condition Notes:

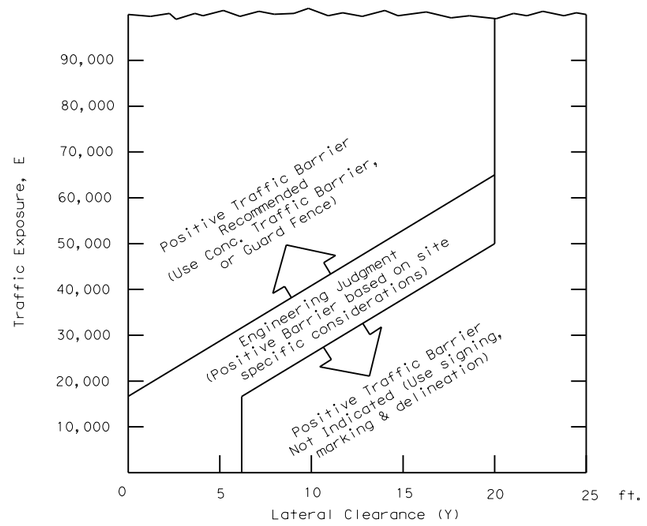
1. Edge Condition I: Most vehicles are able to traverse an edge condition with a slope rate of (3 to 1) or flatter. The slope must be constructed with a compacted material capable of supporting vehicles.

2. Edge Condition II: Most vehicles are able to traverse an edge condition with a slope between (2.99 to 1) and (1 to 1) so long as "D" does not exceed 5 inches. Under-carriage drag on most automobiles will occur when "D" exceeds 6 inches. As "D" exeeds 24 inches, the possibility for rollover is greater in most vehicles.

3. Edge Condition III: When slopes are greater than (1 to 1) and where "D" is greater than 2 inches, a more difficult control factor may exist for some vehicles, if not properly treated. For example, where "D" is greater than 2 inches and up to 24 inches different types of vehicles may experience different steering control at different edge heights. Automobiles might experience more steering control differential when "D" is greater than 2 inches and up to 5 inches. Trucks, particularly those with high loads, have more steering control differential when "D" is greater than 5 inches and up to 24 inches. When "D" exceeds 24 inches, the possibility of rollover is greater for most vehicles.

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

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



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

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

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

These guidelines apply to temporary traffic control areas or work zones where continuous pavement edges or drop-offs exists parallel and adjacent to a lane used by traffic. The edge conditions may be present between shoulders and travel lanes, between adjacent or opposing travel lanes, or at intermediate points across the width of the paved surface. Due to the variability in construction operations, tolerances in the variables may be allowed by the engineer. These guidelines do not apply to short term operations. These guidelines do not constitute a rigid standard or policy; rather, they are guidance to be used in conjunction with engineering judgement. These guidelines may be updated on the Design Division's on-line manuals.

Engineer's Seal

STATE OF TEXAS
DANIEL DUKE THOMPSON
122541
LICENSED
PROFESSIONAL ENGINEER

Daniel Duke Thompson

The seal appearing on this document was authorized by DANIEL THOMPSON, P.E. 122541 on 05/10 ,2023 . Alteration of a sealed document without proper notification to the responsible engineer is an offense under the Texas Engineering Practice Act.

Texas Department of Transportation

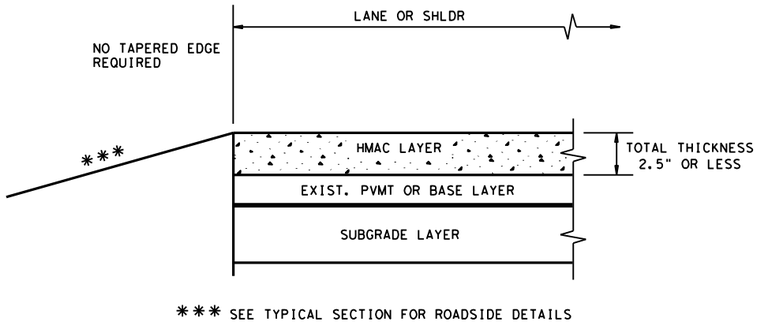
Traffic Safety Division Standard

TREATMENT FOR VARIOUS EDGE CONDITIONS

FILE: edgecon.dgn	DN:	CK:	DW:	CK:
©TxDOT August 2000	CONT	SECT	JOB	HIGHWAY
REVISIONS	6414	53	001	BS105T,ETC
03-01 08-01 9-21	DIST	COUNTY		SHEET NO.
	BMT	LIBERTY		79

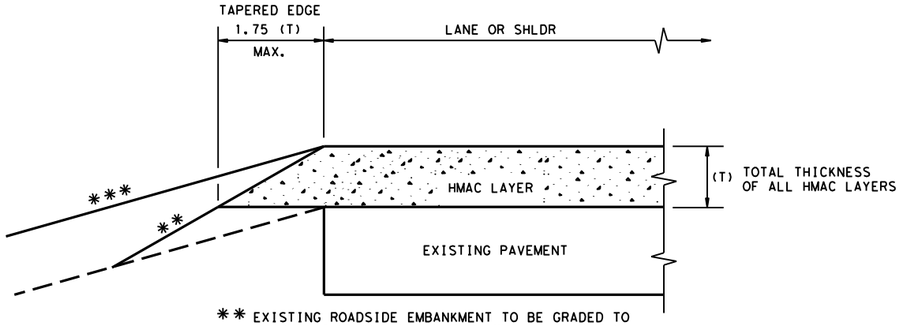
DISCLAIMER:
The use of this standard is governed by the "Texas Engineering Practice Act". No warranty of any kind is made by TxDOT for any purpose whatsoever. TxDOT assumes no responsibility for the conversion of this standard to other formats or for incorrect results or damages resulting from its use.

DATE:
FILE:



*** SEE TYPICAL SECTION FOR ROADSIDE DETAILS

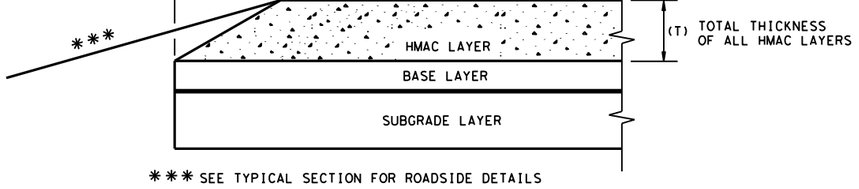
CONDITION - 1
THIN HMAC SURFACES OR HMAC OVERLAY WITH THICKNESS OF 2.5" OR LESS



** EXISTING ROADSIDE EMBANKMENT TO BE GRADED TO PRODUCE A SMOOTH LEVEL SURFACE FOR PLACEMENT OF TAPERED EDGE. THIS WORK IS SUBSIDIARY TO THE VARIOUS BID ITEMS.

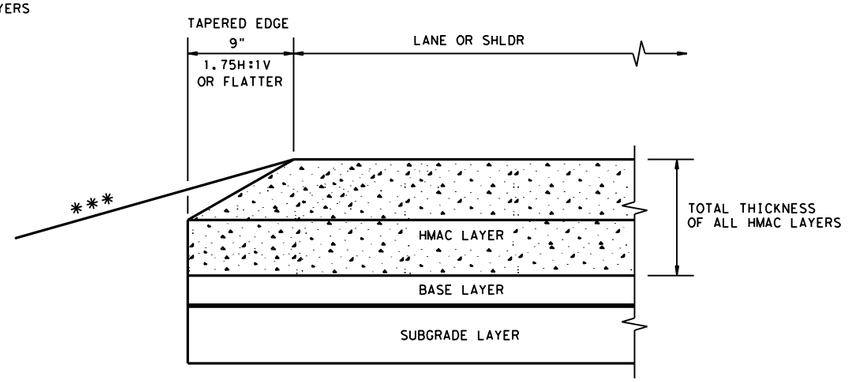
*** SEE TYPICAL SECTION FOR ROADSIDE DETAILS

CONDITION - 2
OVERLAY OF EXISTING PAVEMENT HMAC THICKNESS 2.5" TO 5"



*** SEE TYPICAL SECTION FOR ROADSIDE DETAILS

CONDITION - 3
NEW OR RECONSTRUCTED PAVEMENT HMAC THICKNESS 2.5" TO 5"



*** SEE TYPICAL SECTION FOR ROADSIDE DETAILS

CONDITION - 4
NEW OR RECONSTRUCTED PAVEMENT HMAC THICKNESS 5" OR GREATER

(NOT TO SCALE)

GENERAL NOTES

1. UNLESS OTHERWISE SHOWN IN THE PLANS, A VERTICAL EDGE IS PERMISSIBLE FOR HMAC PLACED GREATER THAN 5" BELOW THE EDGE OF PAVEMENT AND FOR THICKNESS OF HMAC LESS THAN 2.5".
2. FOR FURTHER INFORMATION REGARDING THE ROADSIDE AND PAVEMENT DETAILS, SEE TYPICAL SECTIONS.
3. PAYMENT FOR TAPERED EDGE WILL BE IN ACCORDANCE WITH APPLICABLE ITEMS IN THE CONTRACT.
4. THE SLOPE OF THE TAPERED EDGE SHALL BE 1.75H:1V OR FLATTER.
5. THE TAPERED EDGE SHALL BE PRODUCED BY USE OF A SCREED ATTACHMENT CAPABLE OF PRODUCING A SMOOTH COMPACTED SURFACE. ADDITIONAL COMPACTING EFFORT BEHIND THE SCREED IS NOT REQUIRED.

Texas Department of Transportation

Design Division Standard

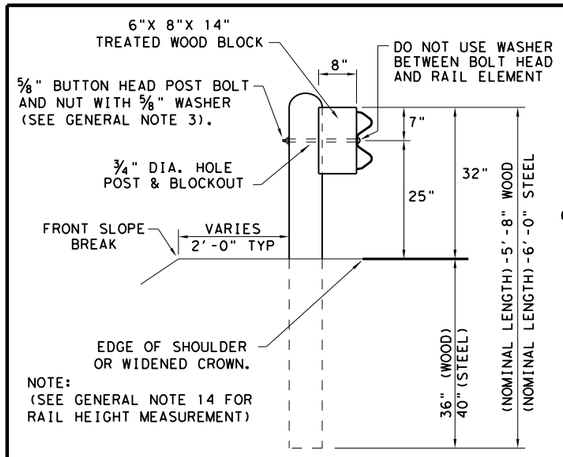
TAPERED EDGE DETAILS HMAC PAVEMENT

TE(HMAC)-11

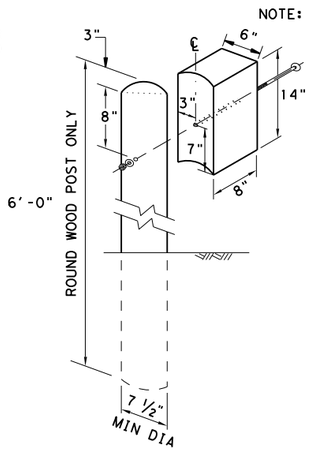
FILE: tehmac11.dgn	DN: TxDOT	CK: RL	DW: KB	CK:		
© TxDOT January 2011	CONT	SECT	JOB	HIGHWAY		
REVISIONS	6414	53	001	BS105T,ETC		
	DIST	COUNTY		SHEET NO.		
	BMT	LIBERTY		80		

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

DATE:
FILE:

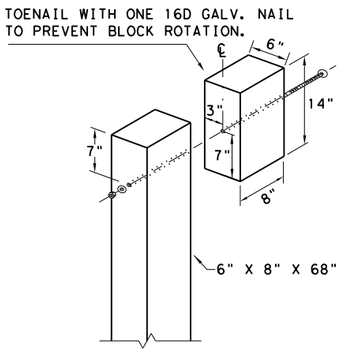


TYPICAL POST PLACEMENT

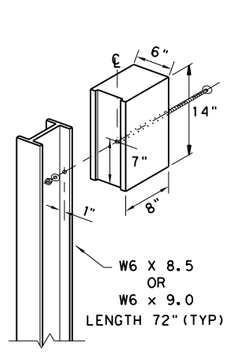


WOOD BLOCK TO ROUND WOOD POST

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

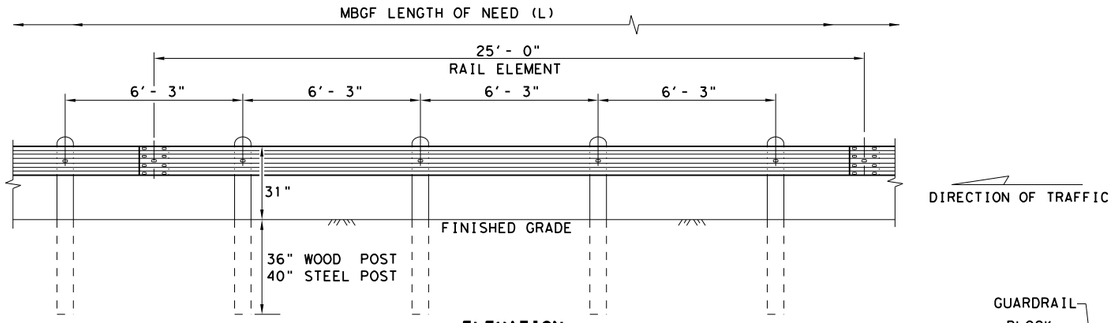


WOOD BLOCK TO RECTANGULAR WOOD POST



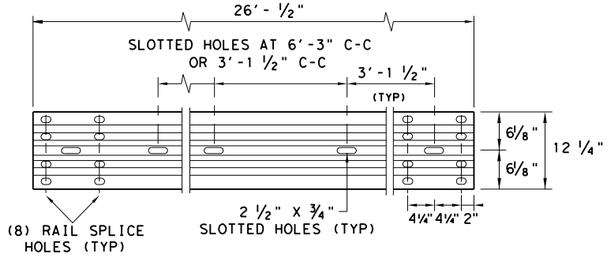
ROUTED WOOD BLOCK TO I-BEAM STEEL POST

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



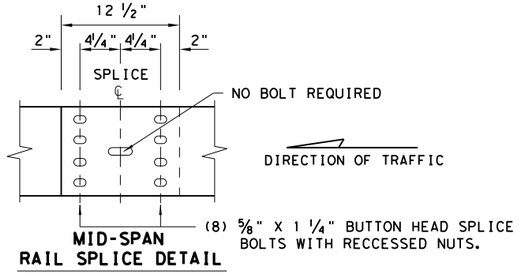
ELEVATION MID-SPAN RAIL SPLICE

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



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

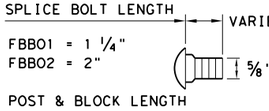
NOTES: SEE GENERAL NOTE 2 FOR ALLOWABLE RAIL TYPES.
SEE RAIL SPLICE DETAIL FOR REQUIRED HARDWARE.



MID-SPAN RAIL SPLICE DETAIL

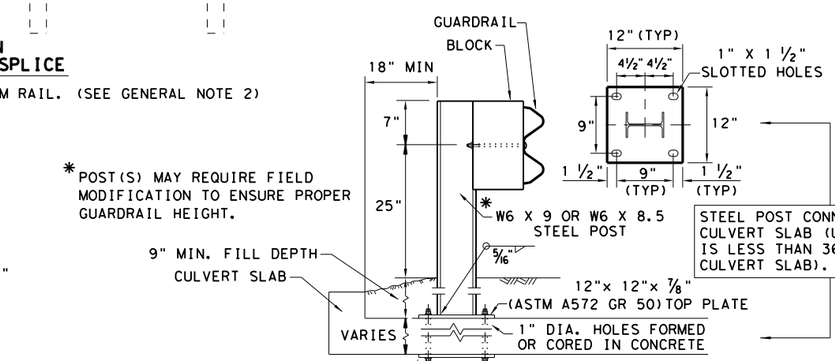
NOTE: GF(31), MID-SPAN RAIL SPLICES ARE REQUIRED WITH 6'-3" POST SPACINGS.

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



BUTTON HEAD BOLT

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



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

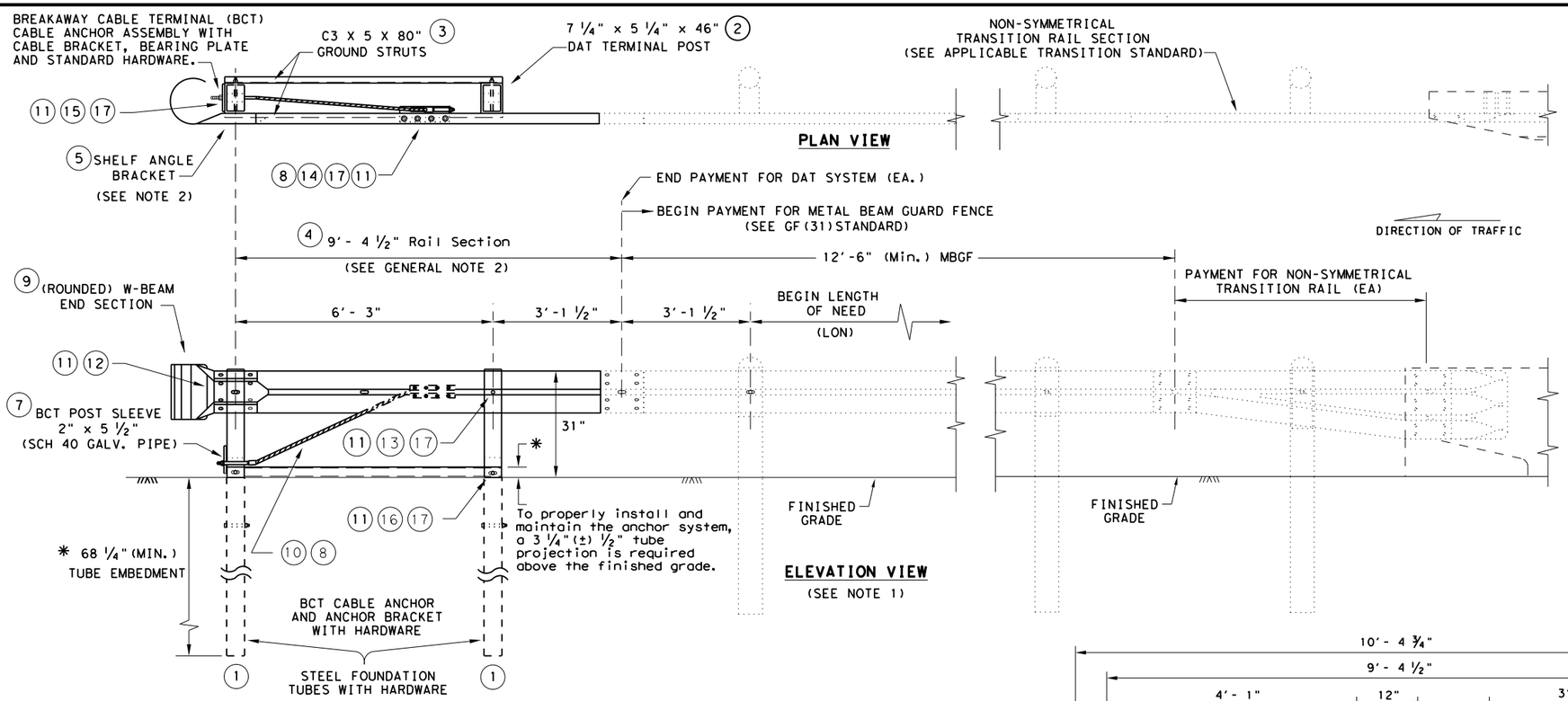
Design Division Standard

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	6414	53	001	BS105T,ETC
	DIST	COUNTY		SHEET NO.
	BMT	LIBERTY		81

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

DATE:
FILE:



DOWNSTREAM ANCHOR TERMINAL (DAT)

NOTE: ONLY FOR DOWNSTREAM USE, WHEN LOCATED OUTSIDE THE HORIZONTAL CLEARANCE AREA OF OPPOSING TRAFFIC.

GENERAL NOTES

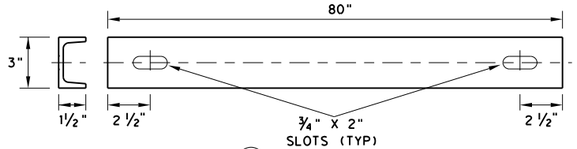
1. THE DETAIL SHOWN IS THE MINIMUM LENGTH OF NEED (LON) FOR A DOWNSTREAM ANCHOR TERMINAL (DAT) CONNECTED TO A CONCRETE RAIL.
2. THE RAIL SECTION AT THE END POST IS SUPPORTED BY THE SHELF ANGLE BRACKET. THE RAIL ELEMENT IS NOT ATTACHED TO THE END POST.
3. THE FOUNDATION TUBES SHALL NOT PROJECT MORE THAN 3 3/4" ABOVE THE FINISHED GRADE.
4. ALL HARDWARE FOR DAT SHALL BE ASTM A307 UNLESS OTHERWISE SHOWN.
5. REFER TO GF(31) SHEET FOR TERMINAL CONNECTION DETAILS.

MOW STRIP INSTALLATION

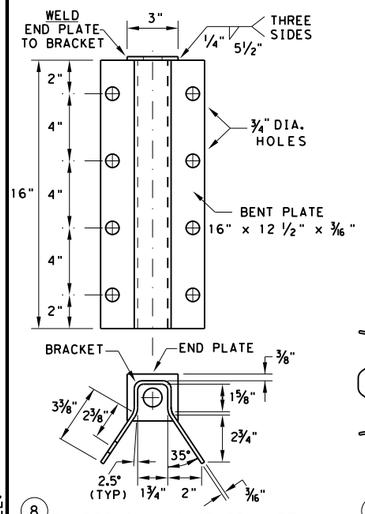
IF A MOW STRIP IS REQUIRED WITH THE DAT INSTALLATION THE LEAVE-OUT AREA AROUND THE STEEL FOUNDATION TUBES AND THE TWO CHANNEL STRUTS MAY BE OMITTED. THIS WILL REQUIRE A FULL POUR AT THE FOUNDATION TUBES.

#	(DAT) PARTS LIST	QTY
(1)	STEEL FOUNDATION TUBE	2
(2)	DAT TERMINAL POST	2
(3)	CHANNEL STRUT	2
(4)	TERMINAL RAIL ELEMENT	1
(5)	SHELF ANGLE BRACKET	1
(6)	BCT BEARING PLATE	1
(7)	BCT POST SLEEVE	1
(8)	GUARDRAIL ANCHOR BRACKET	1
(9)	(ROUNDED) W-BEAM END SECTION	1
(10)	BCT CABLE ANCHOR	1
(11)	RECESSED NUT, GUARDRAIL	20
(12)	1 1/4" BUTTON HEAD BOLT	4
(13)	10" BUTTON HEAD BOLT	2
(14)	5/8" X 2" HEX HEAD BOLT	8
(15)	5/8" X 8" HEX HEAD BOLT	4
(16)	5/8" X 10" HEX HEAD BOLT	2
(17)	5/8" FLAT WASHER	18

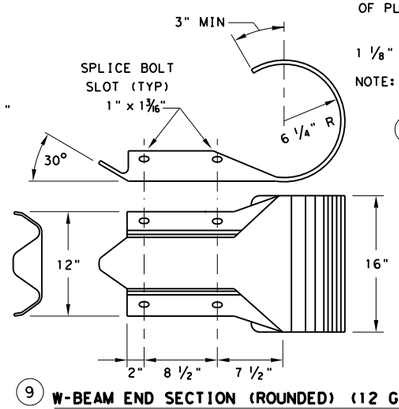
(4) TERMINAL RAIL ELEMENT FOR DAT



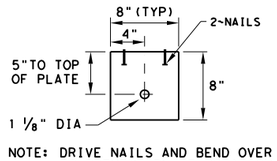
(3) CHANNEL STRUT
C3 X 5 X 80", GRADE A36



(8) GUARDRAIL ANCHOR BRACKET

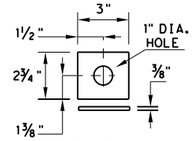


(9) W-BEAM END SECTION (ROUNDED) (12 GA.)

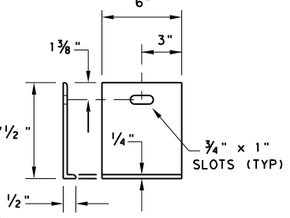


NOTE: DRIVE NAILS AND BEND OVER TO PREVENT PLATE ROTATION

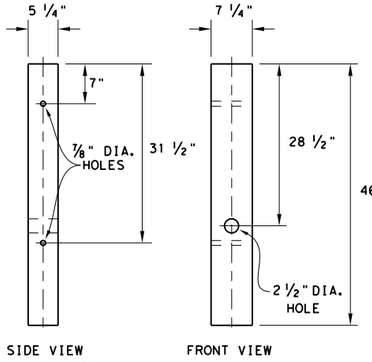
(6) BEARING PLATE
8"x 8"x 5/8" R



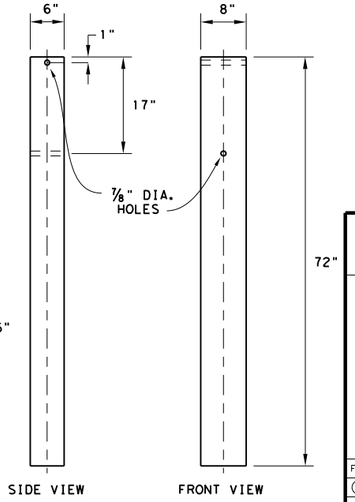
END PLATE



(5) SHELF ANGLE BRACKET



(2) TERMINAL POST
7 1/4"x 5 1/4"x 46" WOOD POST



(1) STEEL FOUNDATION TUBE
6"x 8"x 1/8" x 72" STEEL TUBE

Texas Department of Transportation — Design Division Standard

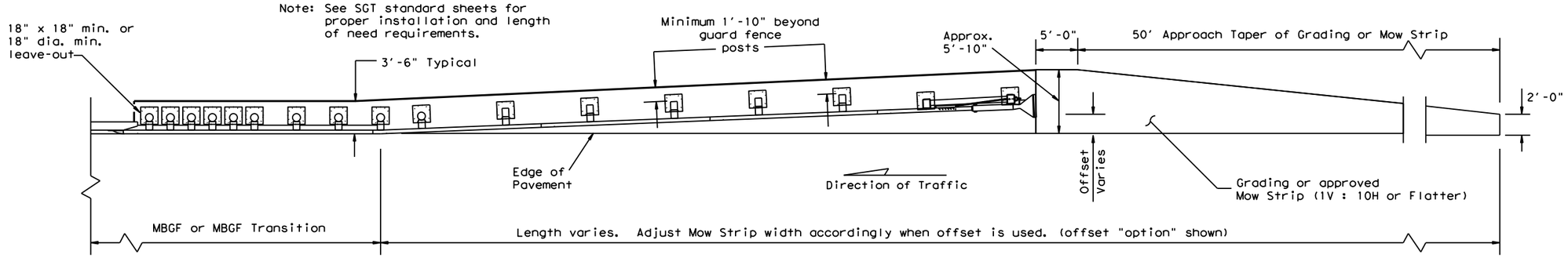
METAL BEAM GUARD FENCE
(DOWNSTREAM ANCHOR TERMINAL)
TL-3 MASH COMPLIANT

GF(31)DAT-19

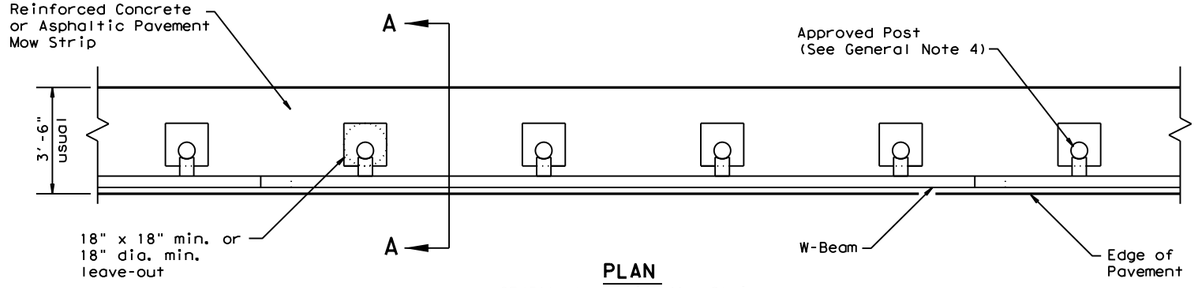
FILE: gf31dat19.dgn	DN: TxDOT	CK: KM	DW: VP	CK: CGL/AG
©TxDOT: NOVEMBER 2019	CONT	SECT	JOB	HIGHWAY
REVISIONS	6414	53	001	BS105T, ETC
	DIST	COUNTY		SHEET NO.
	BMT	LIBERTY		82

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

DATE:
FILE:

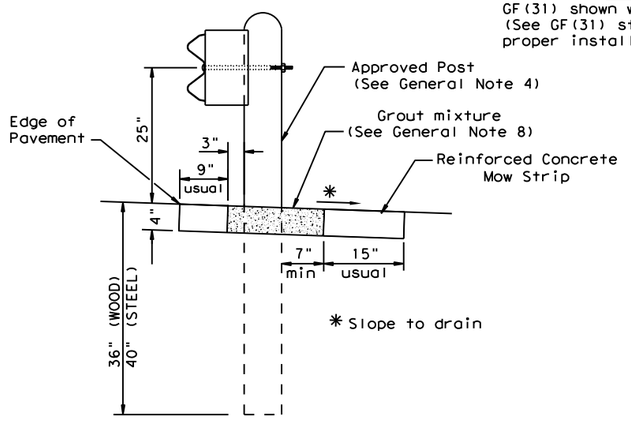


GRADING AND MOW STRIP AT GUARDRAIL END TREATMENTS



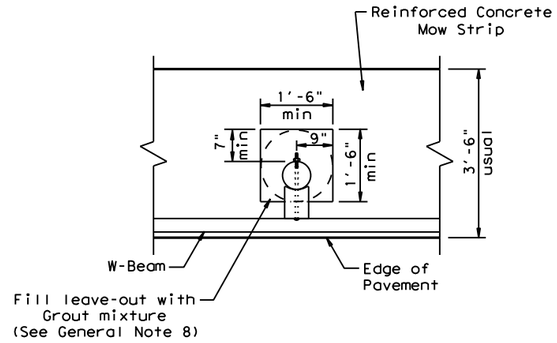
PLAN

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.

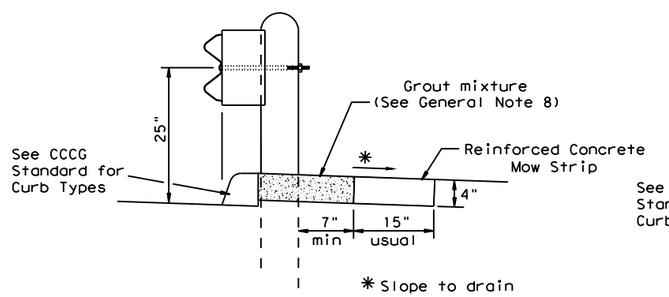
Note: Site Condition(s)

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.

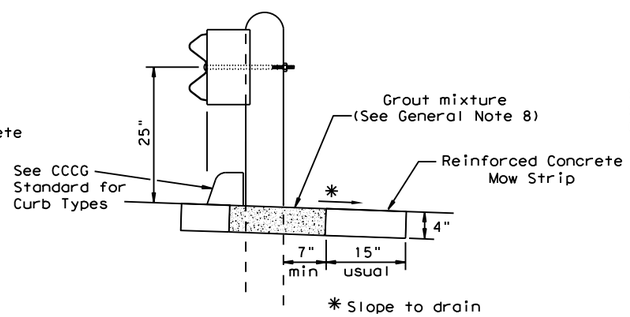
GENERAL NOTES

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.



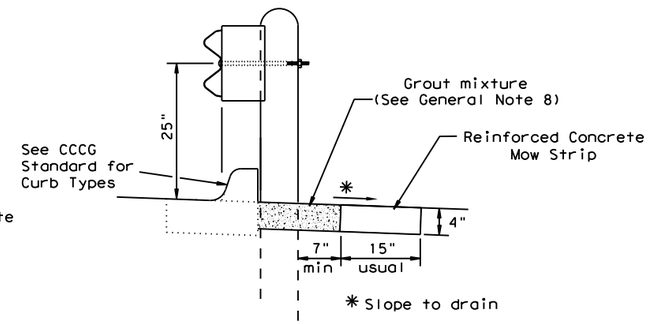
CURB OPTION (1)

This option will increase the post embedment throughout the system.



CURB OPTION (2)

Curb shown on top of mow strip



CURB OPTION (3)

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	6414	53	001	BS105T,ETC
	DIST	COUNTY		SHEET NO.
	BMT	LIBERTY		83

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

DATE:
FILE:

NOTE: STEEL I-BEAM POST W6 X 8.5 (6'-0") PN: 533G
STANDARD WOOD BLOCKOUTS (6"X8"X14") PN: 4076B
AT (POSTS 2 THRU 8)

⅝" X 10" HGR BOLT PN: 3500G
⅝" HGR NUT PN: 3340G

LINE AT THE BACK OF POST #2 THRU #8

FROM THE CENTERLINE OF POST(1) & POST(0)

ANGLE STRUT PN: 15202G

ANCHOR PADDLE PN: 15204A

16"

POST(8) POST(7) POST(6) POST(5) POST(4) POST(3)

DO NOT BOLT ANCHOR RAIL TO - POST (2)

SEE DETAIL 1

POST(1) POST(0)

TRAFFIC FLOW

PLAN VIEW

MASH TEST LEVEL 3 (TL-3) LENGTH OF SoftStop TERMINAL (50'-9 ½")

BEGIN LENGTH OF NEED

50'-9 ½" STANDARD INSTALLATION LENGTH (MASH TL-3 SoftStop)

BEGIN STANDARD MBGF

END PAYMENT FOR SGT

6¼" 3'-1 ½" 6'-3" 6'-3"

ANCHOR RAIL WITH SLOTS - (THREADED THRU HEAD)
SEE SoftStop MANUAL FOR COMPLETE DETAILS

MIDDLE SLOT CUTOUT (1) 1 ¾" X 6'-10 ¼"

OUTSIDE SLOTS CUTOUT (2)1½" X 6'-9 ⅝"

SoftStop FACE SEE GN(3) & NOTE:B

MBGF LAPPED IN DIRECTION OF TRAFFIC FLOW

25'-0" DOWNSTREAM W-BEAM GUARDRAIL PN: 61G

SoftStop ANCHOR RAIL (12GA) PN: 15215G

3'-1 ½"(+/-) 6'-3" 6'-3" 6'-3" 6'-3" 6'-3" 6'-3" 5'-8" 4'-7"

SEE NOTE:C

ANCHOR PADDLE PN: 15204A

END OF ANCHOR RAIL PN: 15215G

SEE NOTE: A

POST 32" HEIGHT

31" RAIL HEIGHT

RAIL 25'-0" PN: 61G

RAIL 25'-0" PN: 15215G

31" RAIL HEIGHT

DO NOT BOLT ANCHOR RAIL TO POST(2)

SEE DETAIL 2

13/16" DIA. YIELDING HOLES

13/16" DIA. YIELDING HOLES

SEE DETAIL 3

6'-1⅜"

(8) ⅝"x 1-¼" GR BOLTS PN: 3360G
⅝" HEX NUTS PN: 3340G

POST 40" DEPTH (TYP 1-8)

(8) ⅝"x 1-¼" HGR BOLTS PN: 3360G
⅝" HEX NUTS PN: 3340G

POST(8) POST(7) POST(6) POST(5) POST(4) POST(3)

POST(2) 6'-0" (SYTP) PN: 15000G

POST(1) 4'-9 ½" SYTP PN: 15203G

POST(0) 6'-5 ⅜" PN: 15205A

ELEVATION VIEW

HARDWARE FOR POST(2) THRU POST(8)
(1) ⅝"x 10" HGR BOLT PN: 3500G
(1) ⅝" HGR HEX NUT PN: 3340G

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

ALTERNATE BLOCKOUT SEE GENERAL NOTE:6

4" X 7 ½" X 14" BLOCKOUT COMPOSITE PN: 6777B

6" X 8" X 14" BLOCKOUT WOOD PN: 4076B

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

8" 6" 14"

⅝" HGR NUT PN: 3340G

⅝" X 10" HGR POST BOLT PN: 3500G

13/16" DIAMETER YIELDING HOLES LOCATED IN FLANGES

FINISHED GRADE

(HOLES APROXIMATELY CENTERED AT FINISHED GRADE)

ISOMETRIC VIEW POST(1 & 2)

W6 X 8.5 I-BEAM POST SHOWING STANDARD WOOD BLOCKOUT

NOTE: NO BLOCKOUT INSTALLED AT POST(1)

(1) ⅝" x 1 ¾" HEX HD BOLT PN 3391G

ANGLE STRUT PN: 15202G

(2) ⅝" WASHERS PN 4372G

(1) ⅝" HGR HEX NUT PN 3340G

DETAIL 1

SHOWN AT POST(1) NEAR GROUND

(1) ⅝" HEX NUT

(1) ⅝" x 1-½" HEX HD BOLT-GR-5 PN: 105286

(2) ⅝" ROUND WASHERS PN: 3240G

DETAIL 2

SHOWN AT POST(1)

ANCHOR KEEPER PLATE (24 GA) PN: 15207G

ANCHOR PLATE WASHER ½" THICK PN: 15206G

1" ROUND WASHER F463 PN: 4902G

(2) ⅝" x 2 ½" HEX HD BOLT GR-5 PN: 105285G

ALTERNATE BLOCKOUT SEE GENERAL NOTE:6

(2) ⅝" ROUND WASHER (WIDE) PN: 3240G

ANCHOR PADDLE PN: 15204A

(2) ⅝" HEX NUT A563 GR.DH PN: 3245G

1" NUT PN: 3908G SHALL BE SECURELY TIGHTENED AFTER FINAL ASSEMBLY, BUT NOT DEFORMING THE KEEPER PLATE.

W-BEAM FLATTENED (4 PLIES)

ANGLE STRUT PN: 15202G

SEE NOTE: A

(2) ¾" x 2 ½" HEX BOLT (TYP) PN: 3717G

(4) ¾" FLAT WASHER (TYP) PN: 3701G

(2) ¾" HEX NUT (TYP) PN: 3704G

6'-1 ⅜" POST DEPTH

(2) ANCHOR POST ANGLE PN: 15201G

DETAIL 3 AT POST(0)

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

TRAFFIC FLOW

W-BEAM RAIL 25'-0"

6" X 8" X 14" BLOCKOUT WOOD

⅝" X 10" HGR POST BOLT PN: 3500G

⅝" HGR NUT PN: 3340G

POST HEIGHT 32"

31" RAIL HEIGHT

40"

LINE POST (3, 4, 5, 6, 7 & 8)

FINISHED GRADE

SECTION VIEW B-B

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

6" X 8" X 14" BLOCKOUT WOOD

W-BEAM RAIL 25'-0"

⅝" X 10" HGR POST BOLT PN: 3500G

⅝" HGR NUT PN: 3340G

POST 32" HEIGHT

31" RAIL HEIGHT

40"

POST(2)

FINISHED GRADE

SECTION VIEW A-A

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

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

POST 17"- ½" HEIGHT

4'-9 ½"

13/16" DIA. YIELDING HOLES

40"

POST(1)

FRONT VIEW POST(1)

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

NOTE: NO BLOCKOUT INSTALLED AT POST(1)

APPROX 5'-10"

5'-0"

50' APPROACH GRADING

STANDARD MBGF

2'-0"

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.

APPROACH GRADING AT GUARDRAIL END TREATMENTS

GENERAL NOTES

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

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

PART	QTY	MAIN SYSTEM COMPONENTS
620237B	1	PRODUCT DESCRIPTION ASSEMBLY MANUAL (LATEST REV.)
15208A	1	SoftStop HEAD (SEE MANUAL FOR RIGHT-LEFT APPROACH)
15215G	1	SoftStop ANCHOR RAIL (12GA) WITH CUTOUT SLOTS
61G	1	SoftStop DOWNSTREAM W-BEAM RAIL (12GA) (25'- 0")
15205A	1	POST #0 - ANCHOR POST (6'- 5 ⅞")
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	6414	53	001	BS105T,ETC		
	DIST	COUNTY		SHEET NO.		
	BMT	LIBERTY		84		

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

DATE:
FILE:

(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.

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).

PLAN VIEW

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)

END PAYMENT (SGT) BY EACH

DO NOT BOLT
RAIL TO POST 6

BEGIN LENGTH OF NEED

INSTALLATION LENGTH 55'- ½"

49'-8 9/16"

6'-3" | 6'-3" | 6'-3" | 6'- ¾" | 6'-3" | 6'-3" | 6'-3" | 37 ½" | 5'-3 11/16"

RAIL
HEIGHT
31"

ARROWS

RAIL
HEIGHT
31"

HEAD
HEIGHT

DETAIL (B)

32-¼"

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

DETAIL (D)

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)

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

ELEVATION VIEW

SOIL
ANCHOR POST
ITEM (1)

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)

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

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

7 5/16"

2 ⅛"

UPPER CABLE
(BACK SIDE)

LOWER CABLE
(TRAFFIC SIDE)

DETAIL (B)

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)

APPROX 5'-10"

5'-0"

50' APPROACH GRADING

STANDARD
MBGF

2'-0"

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

TRAFFIC FLOW

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

GENERAL NOTES

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

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

* TO BE PROVIDED BY DISTRIBUTOR OR CONTRACTOR.

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

Texas Department of Transportation

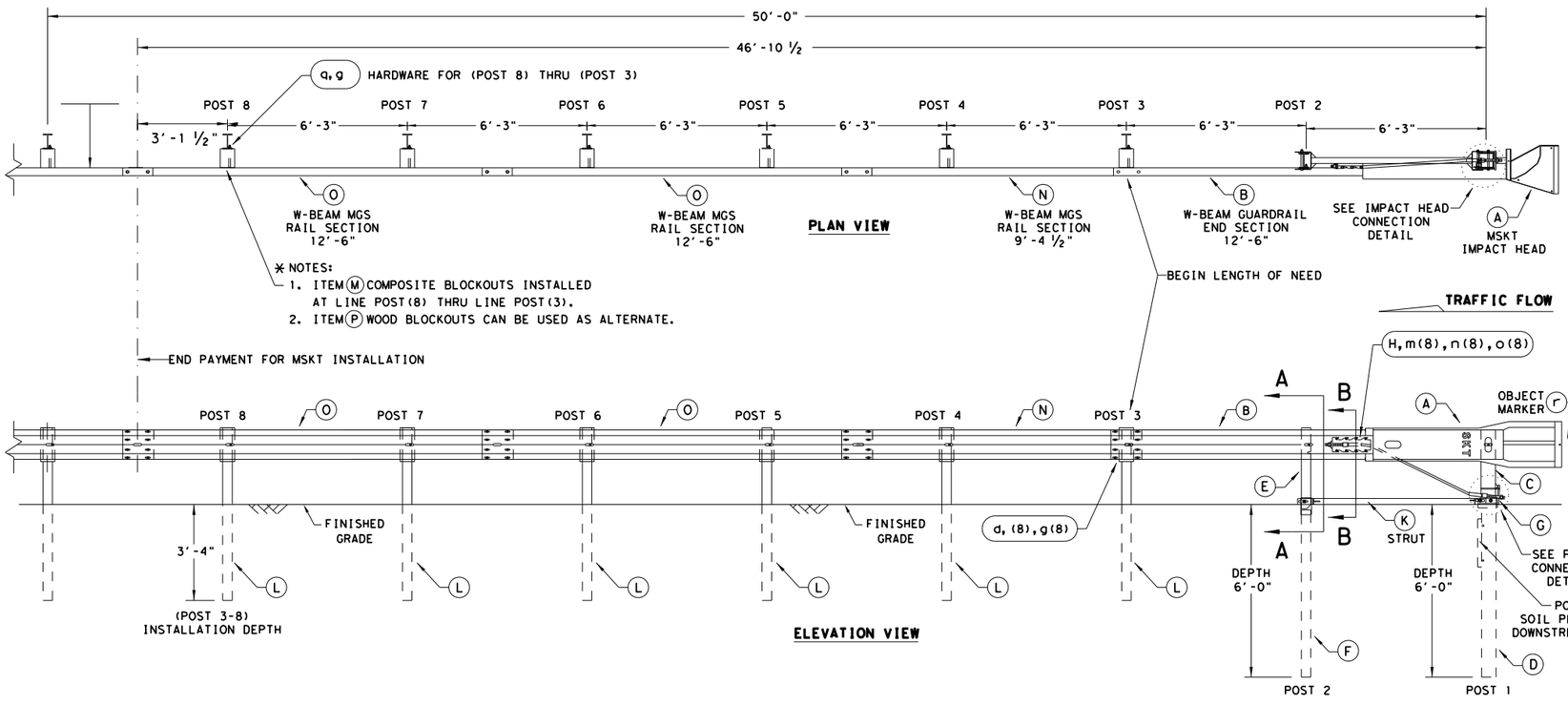
Design Division Standard

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

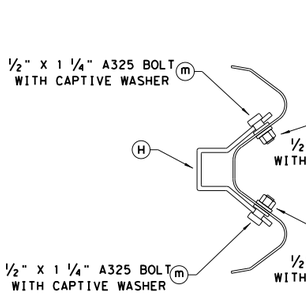
FILE: sgt11s3118.dgn	DN: TxDOT	CK: KM	DW: TxDOT	CK: CL
© TxDOT: FEBRUARY 2018	CONT	SECT	JOB	HIGHWAY
REVISIONS	6414	53	001	BS105T,ETC
	DIST	COUNTY		SHEET NO.
	BMT	LIBERTY		85

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

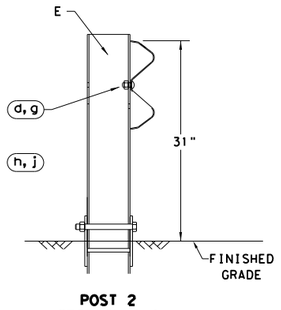
DATE:
FILE:



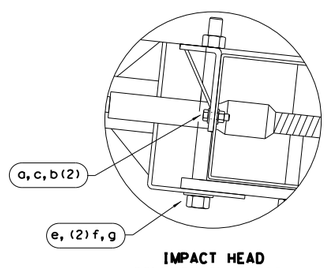
NOTE: SEE (GENERAL NOTE 14) FOR DRIVING CAP INFORMATION.



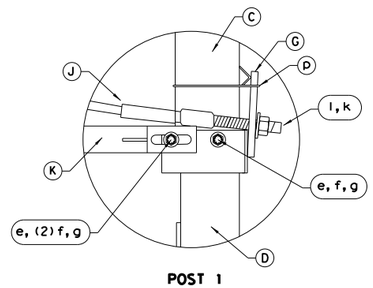
SECTION B-B
ANCHOR BRACKET



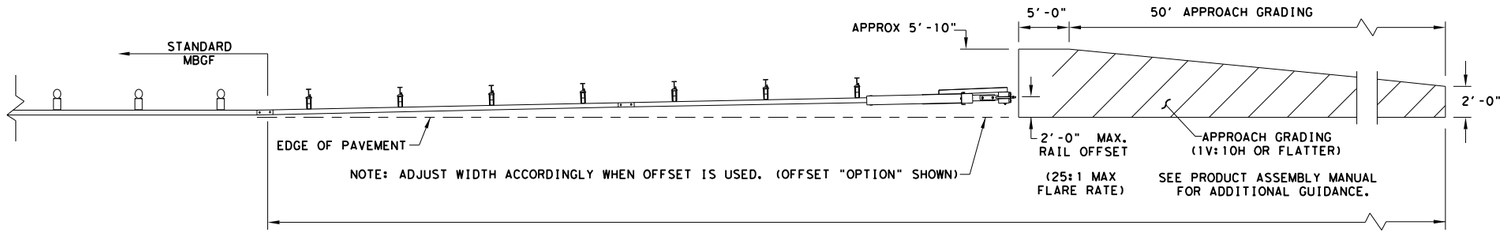
POST 2
SECTION A-A



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 9/16" 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

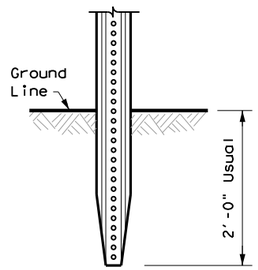
FILE: sgt12s3118.dgn	DN: TxDOT	CK: KM	DW: VP	CK: CL	
© TxDOT: APRIL 2018	CONT	SECT	JOB	HIGHWAY	
REVISIONS	6414	53	001	BS105T, ETC	
	DIST	COUNTY		SHEET NO.	
	BMT	LIBERTY		86	

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

POST TYPE AND SUPPORT FOUNDATION DETAILS

WING CHANNEL (WC)

GND

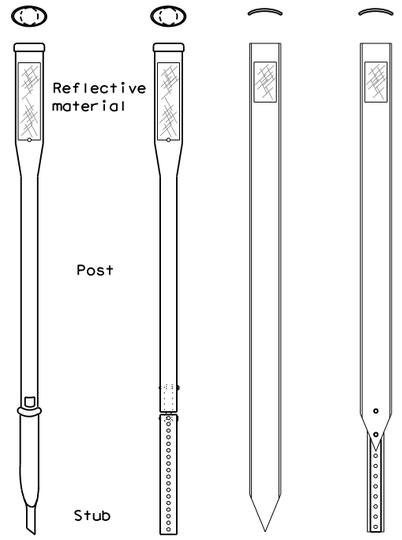


NOTES

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

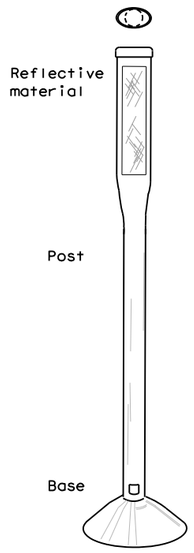
FLEXIBLE POSTS (YFLX, WFLX)

GND



EMBEDDED

SRF



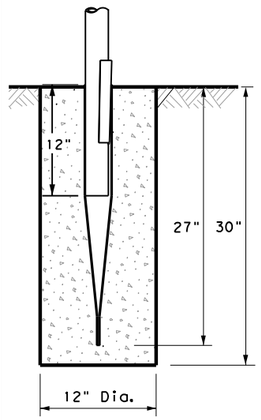
SURFACE MOUNT

NOTES

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

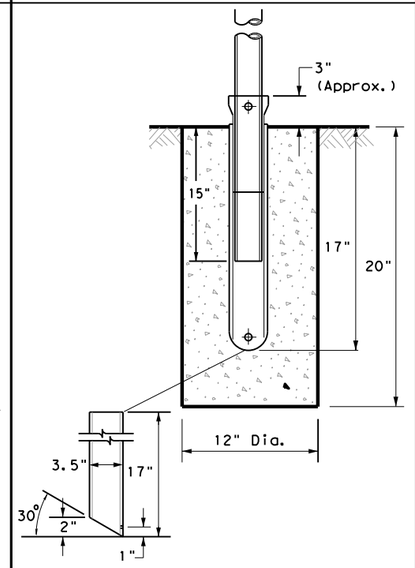
WEDGE ANCHOR SYSTEMS

WAS



STEEL

WAP



PLASTIC

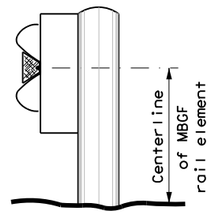
NOTE

1. Install per manufacturer's recommendations.

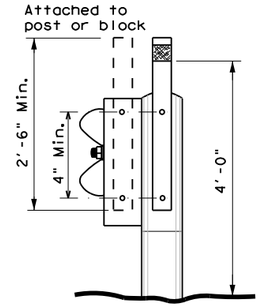
TYPE OF BARRIER MOUNTS

GUARD FENCE ATTACHMENT

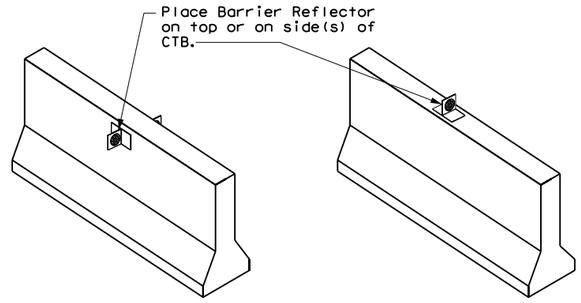
GF1



GF2



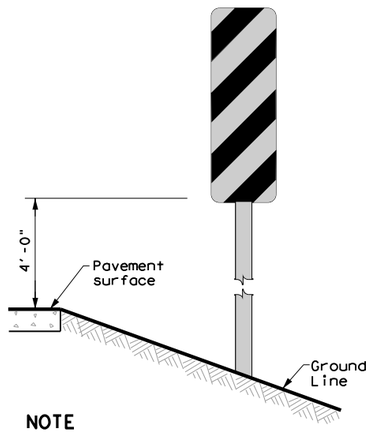
CONCRETE TRAFFIC BARRIER (CTB)



GENERAL NOTES

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

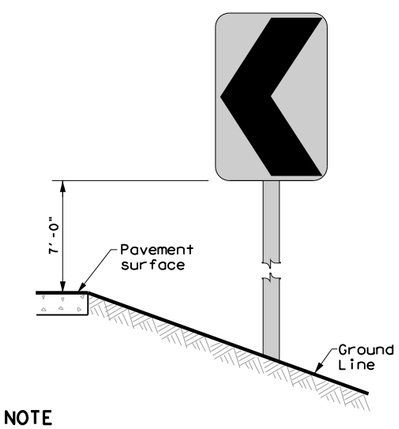
TYPES 1, 3, AND 4 OBJECT MARKERS AND CHEVRONS



NOTE

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

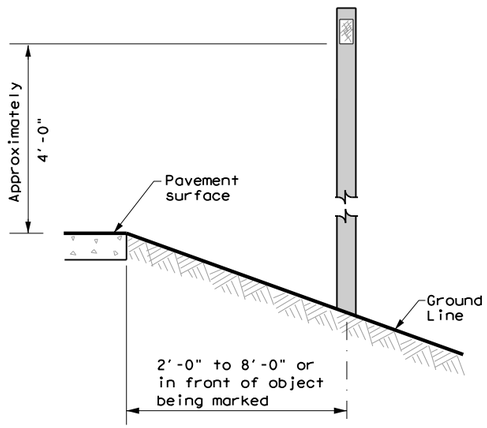
CHEVRONS AND ONE DIRECTION LARGE ARROW SIGN



NOTE

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

DELINEATORS AND TYPE 2 OBJECT MARKERS



See general notes 1, 2 and 3.

Texas Department of Transportation

Traffic Safety Division Standard

DELINEATOR & OBJECT MARKER INSTALLATION

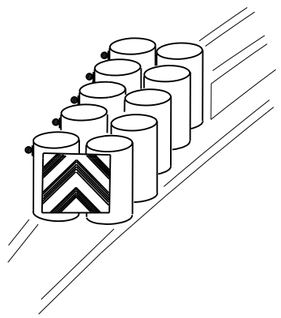
D & OM(2)-20

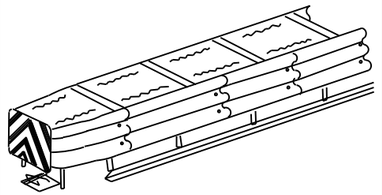
FILE: dom2-20.dgn	DN: TXDOT	CK: TXDOT	DW: TXDOT	CK: TXDOT
© TxDOT August 2004	CONT	SECT	JOB	HIGHWAY
REVISIONS	6414	53	001	BS105T,ETC
10-09 3-15	DIST	COUNTY		SHEET NO.
4-10 7-20	BMT	LIBERTY		87

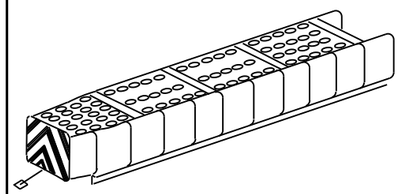
20B

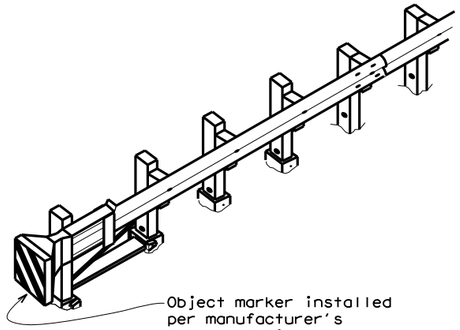
DATE:
FILE:

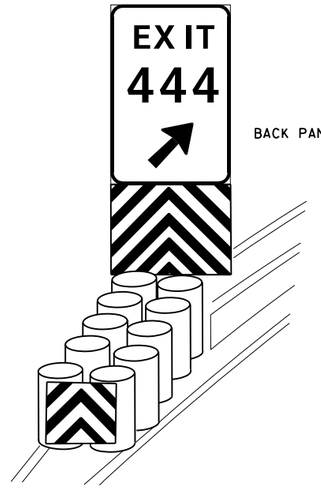
DISCLAIMER:
The use of this standard is governed by the "Texas Engineering Practice Act". No warranty of any kind is made by TxDOT for any purpose whatsoever. TxDOT assumes no responsibility for the conversion of this standard to other formats or for incorrect results or damages resulting from its use.

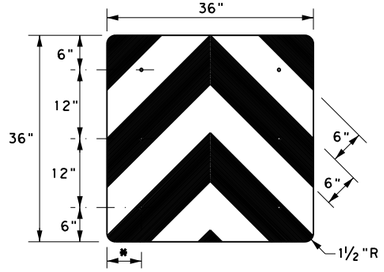


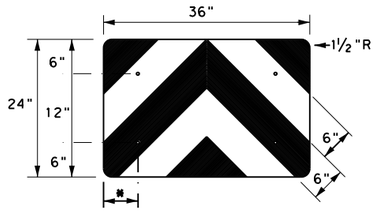




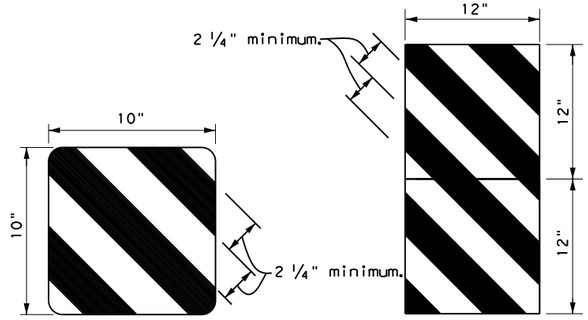




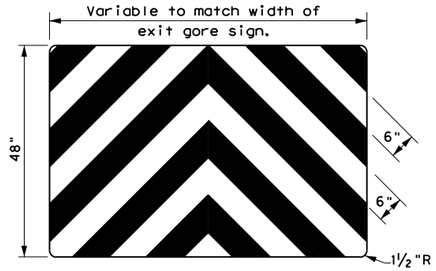


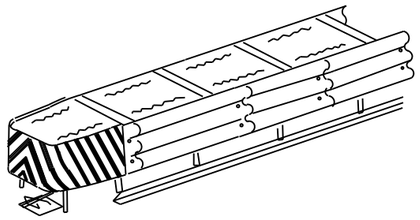


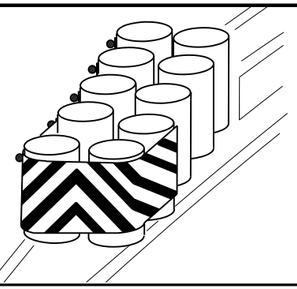
* Adjust to fit attenuator per manufacturer's recommendation, or as directed by the Engineer

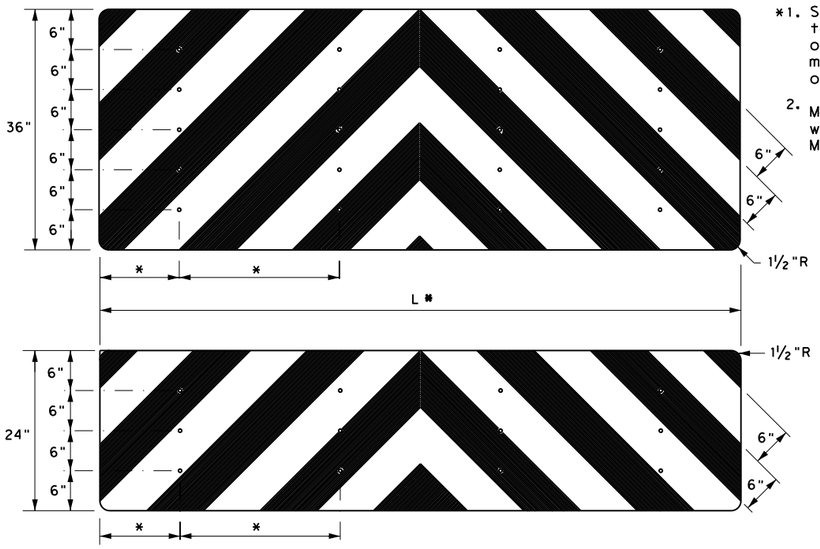


OBJECT MARKERS SMALLER THAN 3 FT^2









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	6414	53	001	BS105T,ETC
4-92 8-04	DIST	COUNTY		SHEET NO.
8-95 3-15	BMT	LIBERTY		88
4-98 7-20				

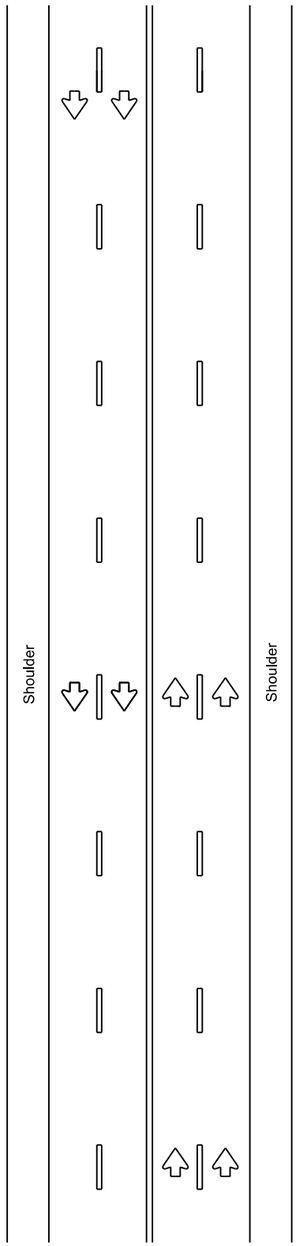
20G

DATE:
FILE:

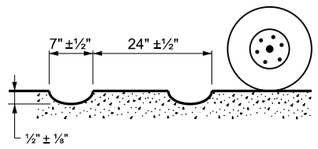
DISCLAIMER:
The use of this standard is governed by the "Texas Engineering Practice Act". No warranty of any kind is made by TxDOT for any purpose whatsoever. TxDOT assumes no responsibility for the conversion of this standard to other formats or for incorrect results or damages resulting from its use.

DATE:
FILE:

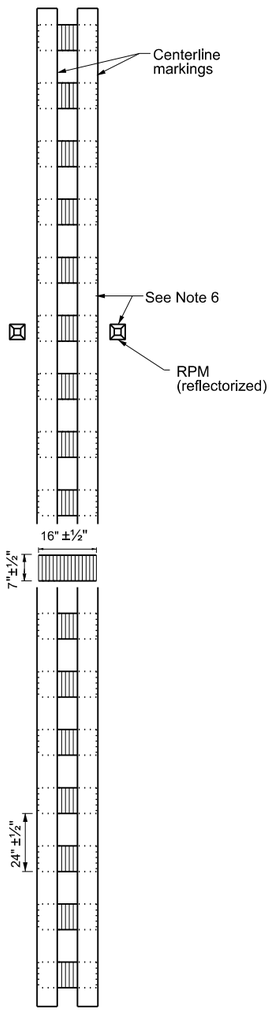
CENTERLINE RUMBLE STRIPS



MULTILANE UNDIVIDED HIGHWAY WITH SHOULDER

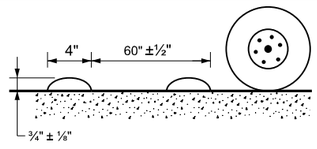


PROFILE VIEW

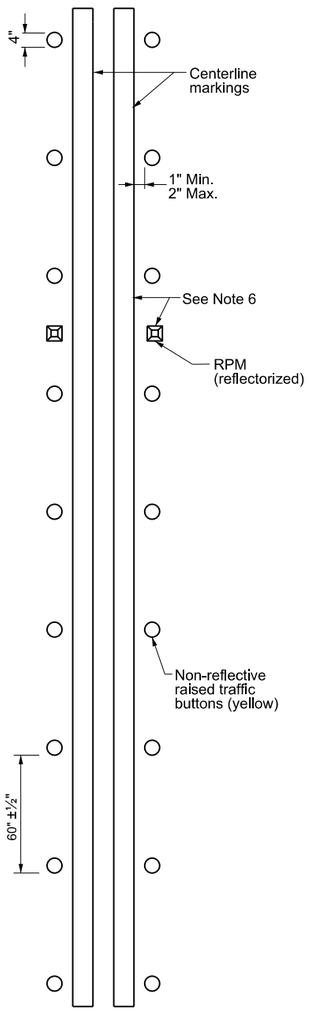


PLAN VIEW
OPTION 1

MILLED CENTERLINE RUMBLE STRIPS

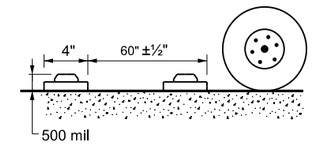


PROFILE VIEW

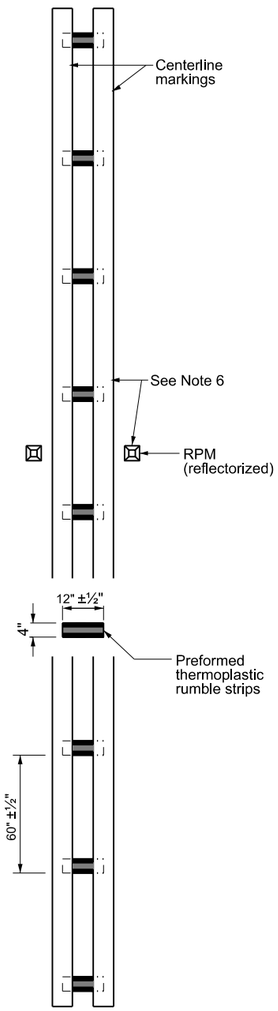


PLAN VIEW
OPTION 2

RAISED CENTERLINE RUMBLE STRIPS

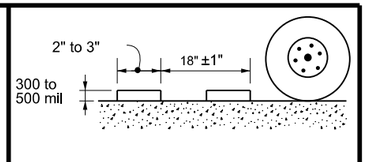


PROFILE VIEW

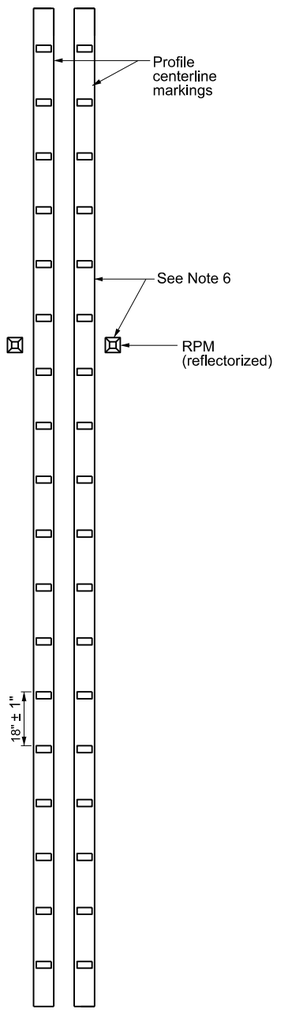


PLAN VIEW
OPTION 3

PREFORMED THERMOPLASTIC RUMBLE STRIPS



PROFILE VIEW



PLAN VIEW
OPTION 4

PROFILE CENTERLINE MARKINGS

GENERAL NOTES

1. This standard sheet provides guidelines for installing centerline rumble strips on multilane undivided highways.
2. Centerline and edge line rumble strips or profile markings shall not be placedon roadways with a posted speed limit of 45 MPH or less.
3. Milled rumble strips are preferred when adequate pavement depth is available. If pavement thickness is less than 2 inches, milled rumble strips shall not be used. Rumble strips shall not be milled or depressed into bridge decks.
4. See dimensions for milled rumble strips. Other shapes and dimensions may beused if approved by the Traffic Safety Division.
5. Breaks in milled centerline rumble strips shall occur at least 50 feet and nomore than 150 feet in advance of bridges, railroad crossing, intersections ordriveways with high usage of large trucks.
6. Use standard sheet PM(2) for positioning, dimensioning, and spacing of all reflective raised pavement markers, pavement markings and profile markings.
7. Consideration should be given to noise levels when centerline rumble strips are to be installed near residential areas, schools, churches, etc. A 3/8 inch deep (minimum) milled rumble strip may be considered in these areas.
8. Pavement markings must be applied over milled centerline rumble strips for normal centerline spacing. For wider medians, specify in the plans the exact placement of the rumble strips. Place the rumble strips under each centerline marking or centered in the middle of the median.

WHEN INSTALLING CENTERLINE RUMBLE STRIPS:

9. Raised rumble strips consisting of non-reflective raised traffic buttons may be used. Non-reflective raised traffic buttons can be affixed to asphalt or concrete with bitumen or adhesives, as per manufacturer's recommendations.
10. When using non-reflective raised traffic buttons as a centerline rumble strip, the button shall be placed adjacent to the pavement marking delineating the centerline. The color of the button should be yellow for a continuous no passing roadway. The button will be paid for under Item 672, "Raised Pavement Markers." Non-reflective traffic buttons must meet the requirements of DMS-4300.
11. Consideration shall be given to bicyclists. See RS(6).

WHEN INSTALLING EDGE LINE RUMBLE STRIPS WITH OR WITHOUT CENTERLINE RUMBLE STRIPS ON UNDIVIDED HIGHWAYS:

12. See standard sheet RS(2).

Texas Department of Transportation

Traffic Safety Division Standard

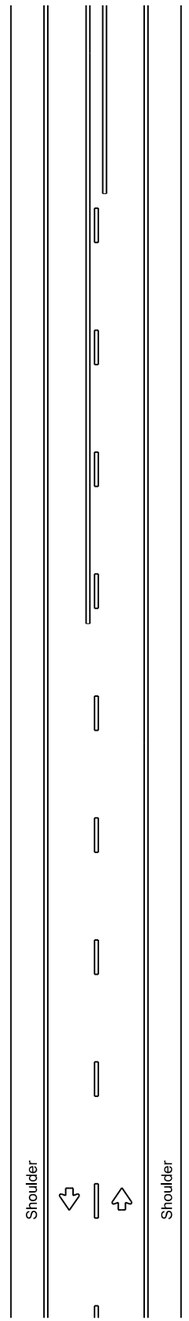
CENTERLINE RUMBLE STRIPS ON MULTILANE UNDIVIDED HIGHWAYS RS(3)-23

FILE: rs(3)-23.dgn	DN: TxDOT	CK: TxDOT	DW: TxDOT	CK: TxDOT
© TxDOT January 2023	CONT	SECT	JOB	HIGHWAY
REVISIONS	6414	53	001	BS105T,ETC
10-13	DIST	COUNTY		SHEET NO.
1-23	BMT	LIBERTY		89

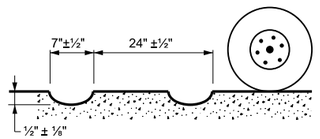
DISCLAIMER:
The use of this standard is governed by the "Texas Engineering Practice Act". No warranty of any kind is made by TxDOT for any purpose whatsoever. TxDOT assumes no responsibility for the conversion of this standard to other formats or for incorrect results or damages resulting from its use.

DATE:
FILE:

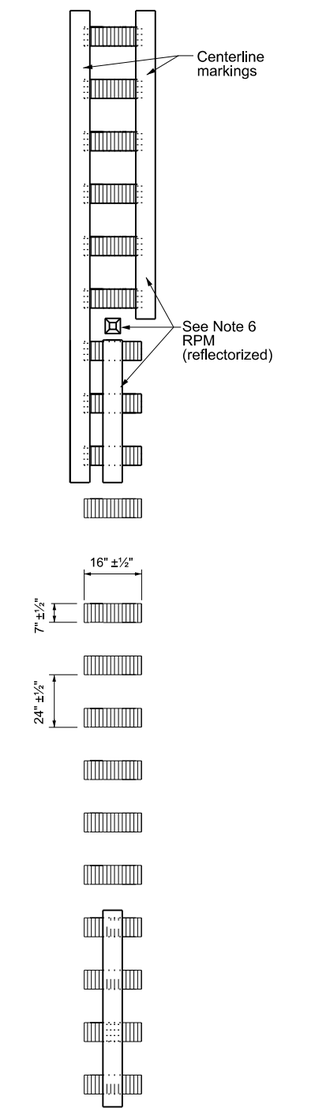
CENTERLINE RUMBLE STRIPS



TWO LANE TWO-WAY HIGHWAYS

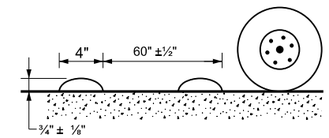


PROFILE VIEW

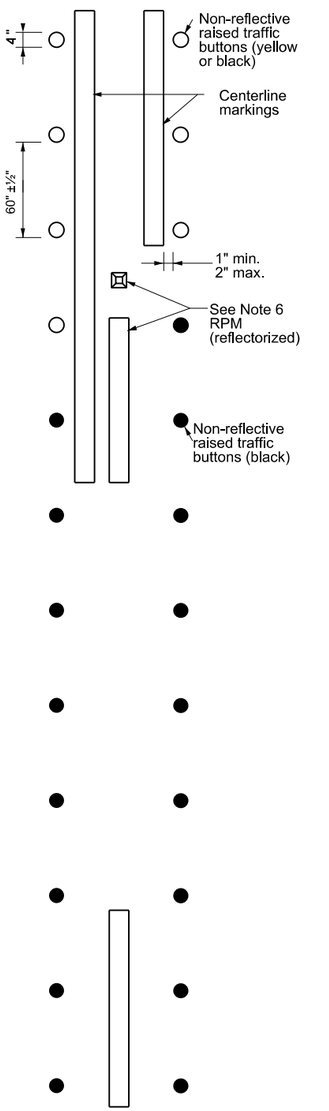


PLAN VIEW
OPTION 1

MILLED CENTERLINE RUMBLE STRIPS

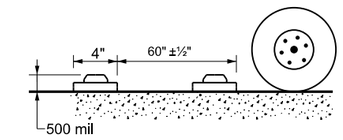


PROFILE VIEW

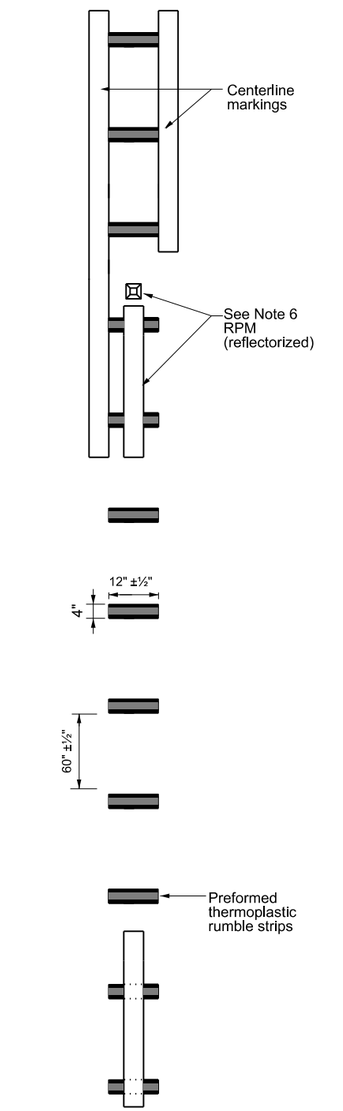


PLAN VIEW
OPTION 2

RAISED CENTERLINE RUMBLE STRIPS

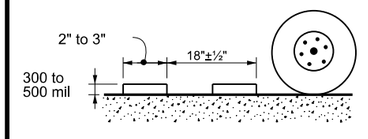


PROFILE VIEW

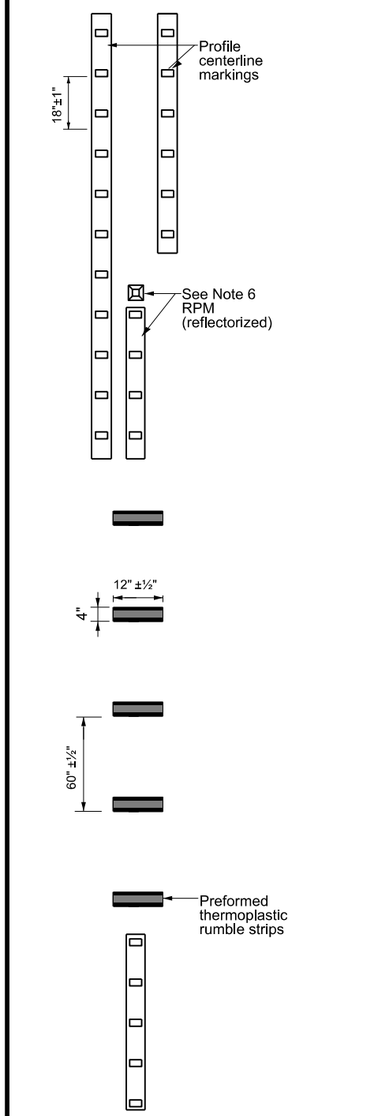


PLAN VIEW
OPTION 3

PREFORMED THERMOPLASTIC RUMBLE STRIPS



PROFILE VIEW



PLAN VIEW
OPTION 4

PROFILE CENTERLINE MARKINGS AND PREFORMED THERMOPLASTIC RUMBLE STRIPS

GENERAL NOTES

1. This standard sheet provides guidelines for installing centerline rumble strips on two-lane highways with or without shoulders.
2. Centerline and edge line rumble strips or profile markings shall not be placed on roadways with a posted speed limit of 45 MPH or less.
3. Milled rumble strips are preferred when adequate pavement depth is available. If pavement thickness is less than 2 inches, milled rumble strips shall not be used. Rumble strips shall not be milled or depressed into bridge decks.
4. See dimensions for milled rumble strips. Other shapes and dimensions may be used if approved by the Traffic Safety Division.
5. Breaks in milled centerline rumble strips shall occur at least 50 feet and no more than 150 feet in advance of bridges, railroad crossings, intersections or driveways with high usage of large trucks.
6. Use standard sheet PM(2) for positioning, dimensioning, and spacing of all reflective raised pavement markers, pavement markings and profile markings.
7. Consideration should be given to noise levels when centerline rumble strips are to be installed near residential areas, schools, churches, etc. A 3/8 inch deep (minimum) milled rumble strip may be considered in these areas.
8. Pavement markings must be applied over milled centerline rumble strips.

WHEN INSTALLING CENTERLINE RUMBLE STRIPS:

9. Raised rumble strips consisting of non-reflective raised traffic buttons may be used. Non-reflective raised traffic buttons can be affixed to asphalt or concrete with bitumen or adhesives, as per manufacturer's recommendations.
10. When using non-reflective raised traffic buttons as a centerline rumble strip, the button shall be placed adjacent to the pavement marking delineating the centerline. The buttons will be paid for under Item 672, "Raised Pavement Markers." Non-reflective traffic buttons must meet the requirements of DMS-4300.
11. The color of the button should be yellow for a continuous no passing roadway. Black buttons should be used in areas where passing is allowed.
12. Consideration shall be given to bicyclists. See RS(6).

WHEN INSTALLING EDGE LINE RUMBLE STRIPS WITH OR WITHOUT CENTERLINE RUMBLE STRIPS ON UNDIVIDED HIGHWAYS:

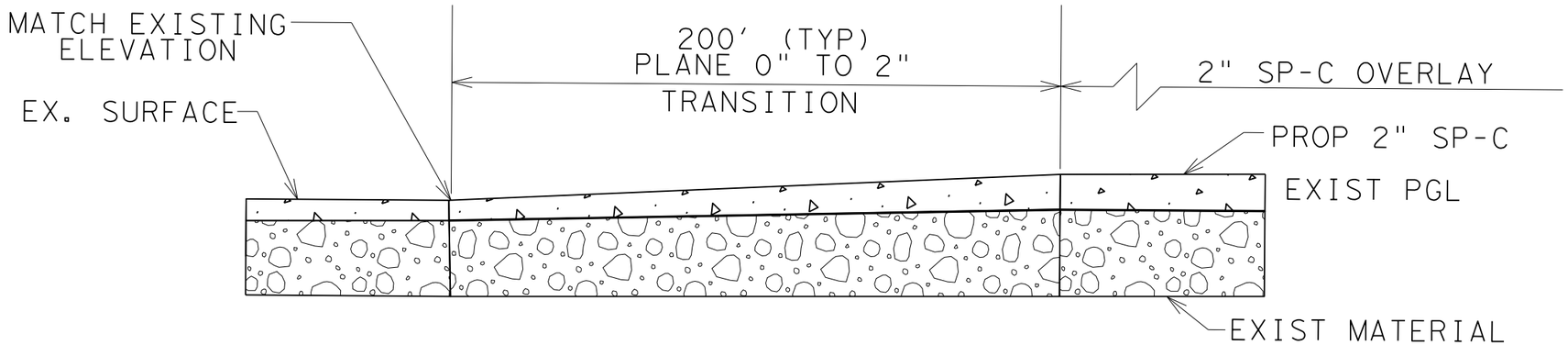
13. See standard sheet RS(2).

Texas Department of Transportation

Traffic Safety Division Standard

CENTERLINE RUMBLE STRIPS ON TWO LANE TWO-WAY HIGHWAYS RS(4)-23

FILE: rs(4)-23.dgn	DN: TxDOT	CK: TxDOT	DW: TxDOT	CK: TxDOT
©TxDOT January 2023	CONT	SECT	JOB	HIGHWAY
REVISIONS	6414	53	001	BS105T,ETC
10-13	DIST	COUNTY		SHEET NO.
1-23		LIBERTY		90



TYPICAL TIE-IN DETAIL

NOTE:
CONTRACTOR SHALL PLANE 0"-2" OF EXISTING MATERIAL AND PLACE SP-C.

STATE OF TEXAS
DANIEL DUKE THOMPSON
122541
LICENSED PROFESSIONAL ENGINEER

Daniel Duke Thompson

The seal appearing on this document was authorized by DANIEL THOMPSON, P.E. 122541 on 05/10 ,2023 . Alteration of a sealed document without proper notification to the responsible engineer is an offense under the Texas Engineering Practice Act.

TYPICAL TIE-IN DETAIL

Texas Department of Transportation

FED. RD. DIV. NO.			SHEET NO.
6			91
STATE	DIST.	COUNTY	
TEXAS	BMT	LIBERTY	
CONT.	SECT.	JOB	HIGHWAY NO.
6414	53	001	BS105T,FIC

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

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)

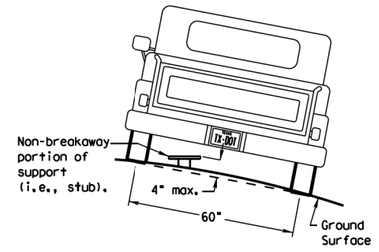
Anchor Type

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))

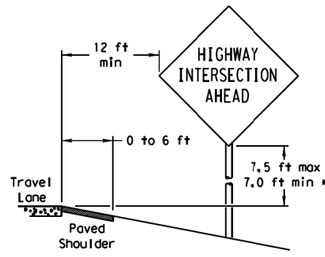
REQUIRED CLEARANCE FOR BREAKAWAY SUPPORT



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).

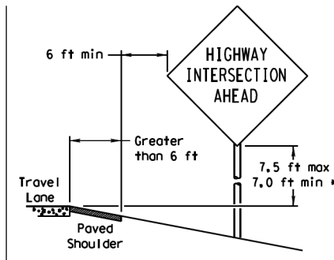
SIGN LOCATION

PAVED SHOULDERS



LESS THAN 6 FT. WIDE

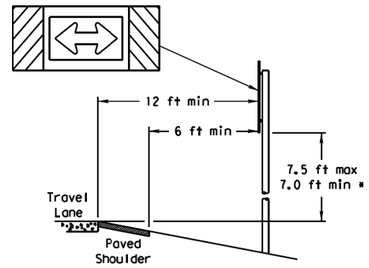
When the shoulder is 6 ft. or less in width, the sign must be placed at least 12 ft. from the edge of the travel lane.



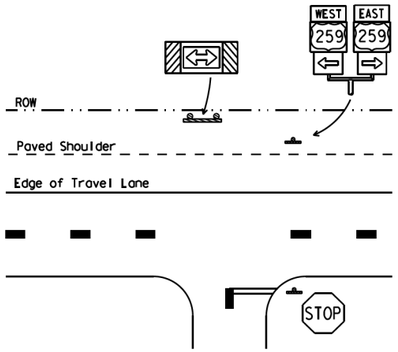
GREATER THAN 6 FT. WIDE

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.

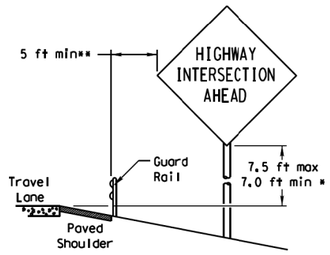
T-INTERSECTION



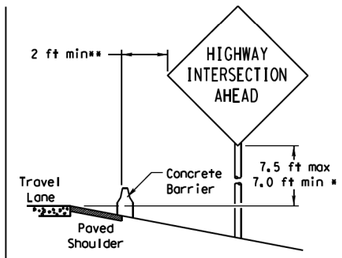
When this sign is needed at the end of a two-lane, two way roadway, the right edge of the sign should be in line with the centerline of the roadway. Place as close to ROW as practical.



BEHIND BARRIER



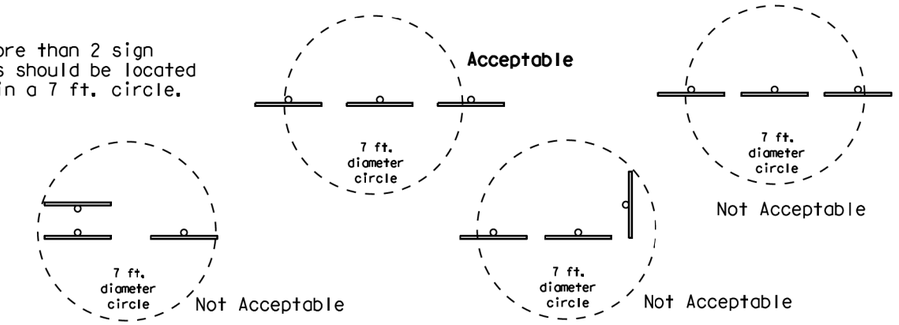
BEHIND GUARDRAIL



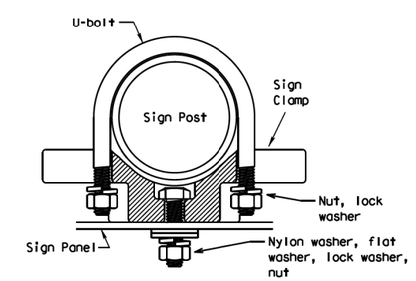
BEHIND CONCRETE BARRIER

**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.



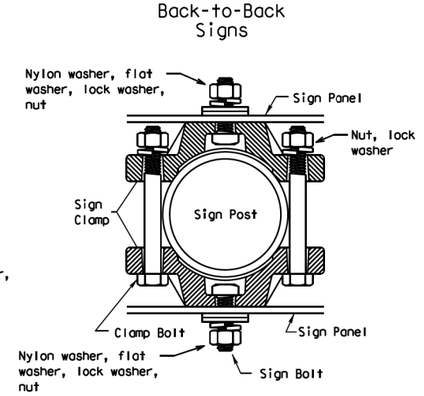
TYPICAL SIGN ATTACHMENT DETAIL



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.

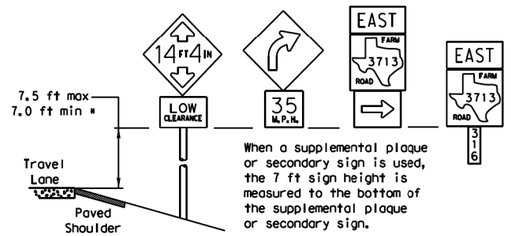
When two sign clamps are used to mount signs back-to-back, use a 5/16-18 UNC galvanized hex head per ASTM A307 with nut and helical-spring lock washer. The approximate bolt lengths for various post sizes and sign clamp types are given in the table at right. The bolt length may need to be adjusted depending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

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



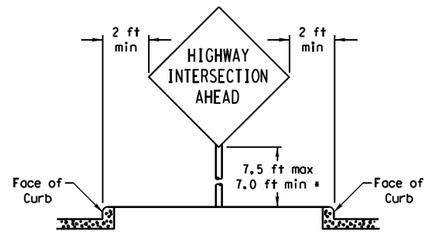
Pipe Diameter	Approximate Bolt Length	
	Specific Clamp	Universal Clamp
2" nominal	3"	3 or 3 1/2"
2 1/2" nominal	3 or 3 1/2"	3 1/2 or 4"
3" nominal	3 1/2 or 4"	4 1/2"

SIGNS WITH PLAQUES



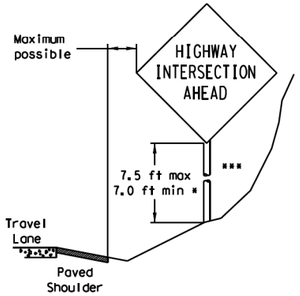
When a supplemental plaque or secondary sign is used, the 7 ft sign height is measured to the bottom of the supplemental plaque or secondary sign.

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

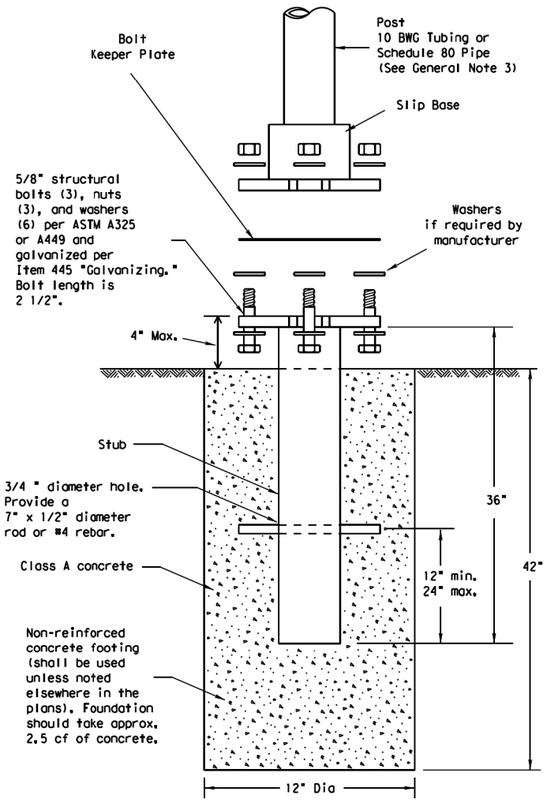
©TxDOT July 2002	DN: TXDOT	CK: TXDOT	DW: TXDOT	CK: TXDOT
9-08 REVISIONS	CONT	SECT	JOB	HIGHWAY
	6414	53	001	BS105T,ETC
	DIST	COUNTY		SHEET NO.
	BMT	LIBERTY		92

DATE:
FILE:

26A

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

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.

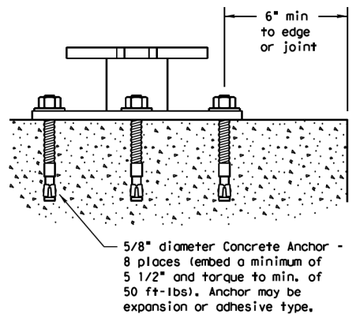
   Schedule 80 Pipe (2.875" outside diameter)
   - 0.276" nominal wall thickness
   - Steel tubing per ASTM A500 Gr C
   - Other seamless or electric-resistance welded steel tubing or pipe with equivalent outside diameter and wall thickness may be used if they meet the following:
     - 46,000 PSI minimum 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:
   https://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.

DATE:
FILE:

Texas Department of Transportation
Traffic Operations Division

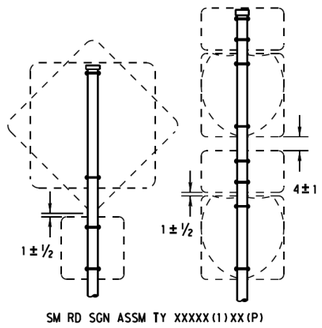
SIGN MOUNTING DETAILS SMALL ROADSIDE SIGNS TRIANGULAR SLIPBASE SYSTEM

SMD(SLIP-1)-08

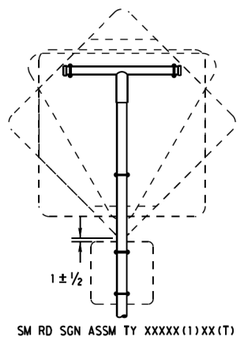
©TxDOT July 2002

REVISIONS	DN: TXDOT	CK: TXDOT	DW: TXDOT	CK: TXDOT
9-08	CONT	SECT	JOB	HIGHWAY
	6414	53	001	BS105T, ETC
	DIST	COUNTY		SHEET NO.
	BMT	LIBERTY		93

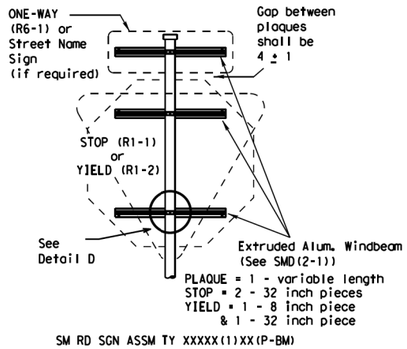
DISCLAIMER: The use of this standard is governed by the "Texas Engineering Practice Act". No warranty of any kind is made by TxDOT for any purpose whatsoever. TxDOT assumes no responsibility for the conversion of this standard to other formats or for incorrect results or damages resulting from its use.



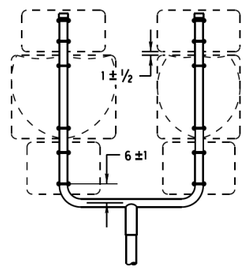
SM RD SGN ASSM TY XXXXX(1)XX(P)



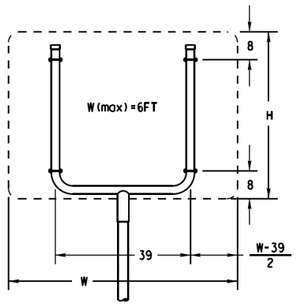
SM RD SGN ASSM TY XXXXX(1)XX(T)



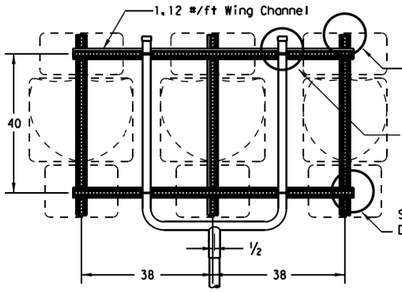
SM RD SGN ASSM TY XXXXX(1)XX(P-BM)



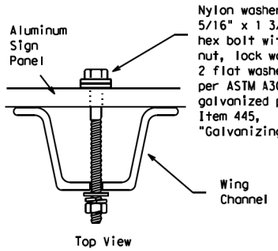
SM RD SGN ASSM TY XXXXX(1)XX(U)



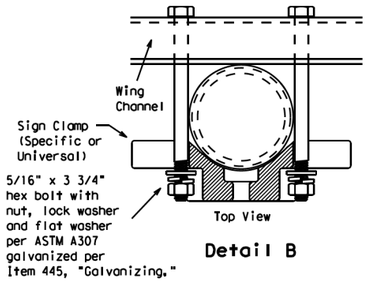
SM RD SGN ASSM TY XXXXX(1)XX(U)



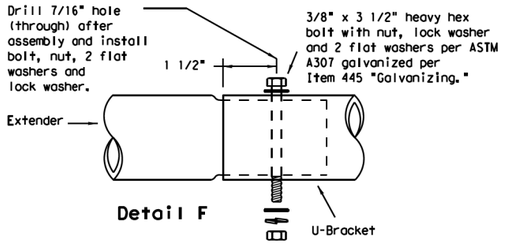
SM RD SGN ASSM TY XXXXX(1)XX(U-WC)
(See Note 11)



Detail A

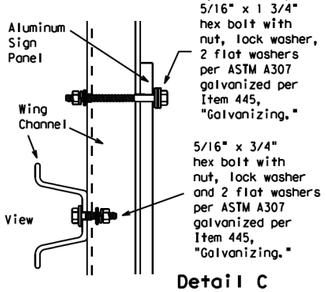


Detail B

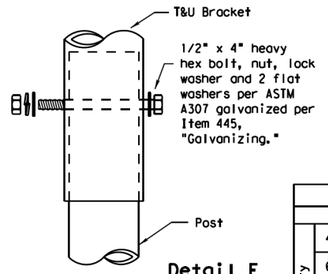


Detail F

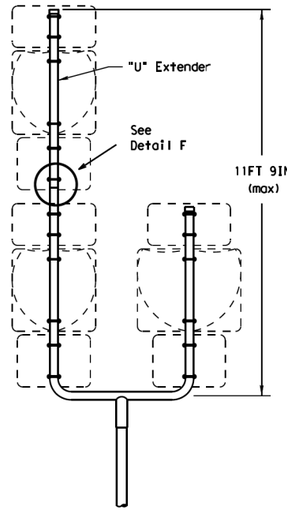
Splices shall only be allowed behind the sign substrate.



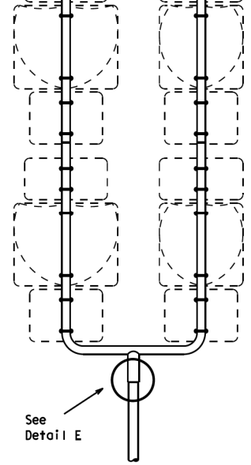
Detail C



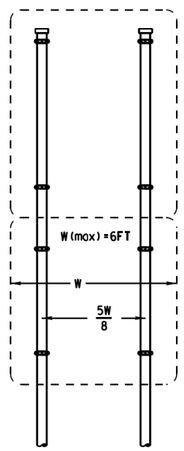
Detail E



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

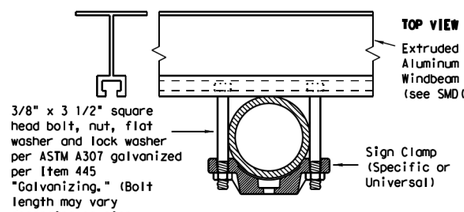


SM RD SGN ASSM TY S80(1)XX(U-2EXT)

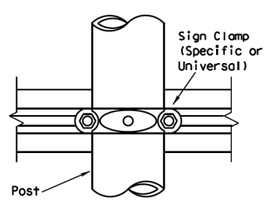


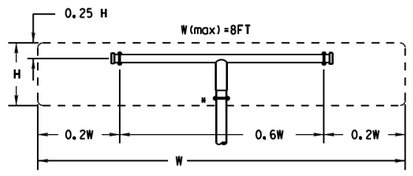
SM RD SGN ASSYM TY XXXXX(2)XX(P)

SIDE VIEW



Detail D

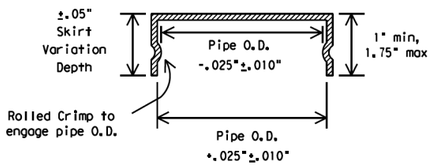




SM RD SGN ASSM TY XXXXX(1)XX(T)
(* - See Note 12)

All dimensions are in english unless detailed otherwise.

FRICTION CAP DETAIL



Friction caps may be manufactured from hot rolled or cold rolled steel sheets. The minimum sheet metal thickness shall be 24 gauge for all cap sizes.

The rim edges shall be reasonably straight and smooth. Caps shall be sized and formed in such a manner as to produce a drive-on friction fit and have no tendency to rock when seated on the pipe. The depth shall be sufficient to give positive protection against entrance of rainwater. They shall be free of sharp creases or indentations and show no evidence of metal fracture.

Caps shall have an electrodeposited coating of zinc in accordance with the requirements of ASTM B633 Class FE/ZN 8.

GENERAL NOTES:

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

REQUIRED SUPPORT

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

Texas Department of Transportation
Traffic Operations Division

SIGN MOUNTING DETAILS SMALL ROADSIDE SIGNS TRIANGULAR SLIPBASE SYSTEM

SMD(SLIP-2)-08

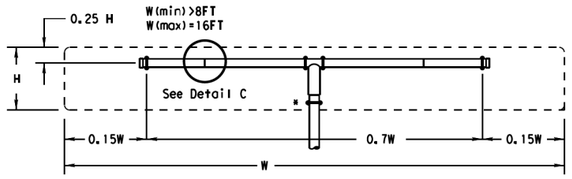
©TxDOT July 2002

REVISIONS	DN: TXDOT	CK: TXDOT	DW: TXDOT	CK: TXDOT
9-08	CONT	SECT	JOB	HIGHWAY
	6414	53	001	BS105T, ETC
	DIST	COUNTY		SHEET NO.
	BMT	LIBERTY		94

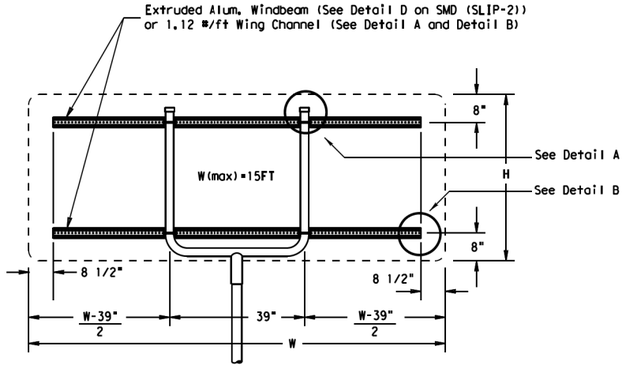
DATE:
FILE:

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

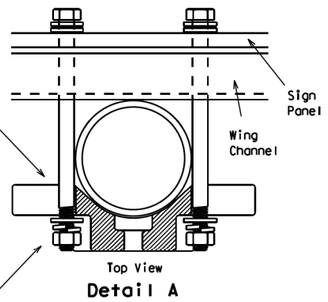
DATE:
FILE:



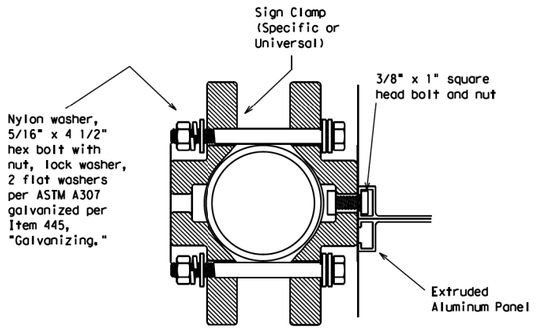
SM RD SGN ASSM TY XXXXX(1)XX(T-2EXT)
(* - See Note 12)



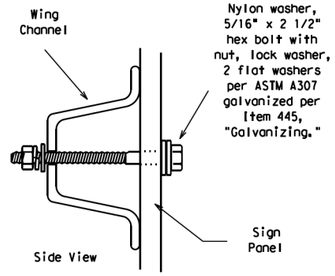
SM RD SGN ASSM TY XXXXX(1)XX(U-XX)



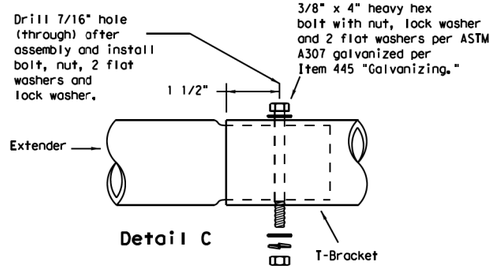
Detail A



Detail D
EXTRUDED ALUMINUM SIGN WITH T BRACKET

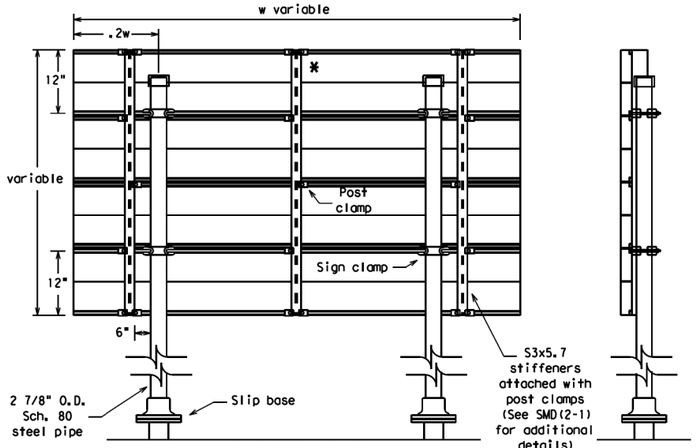


Detail B



Detail C

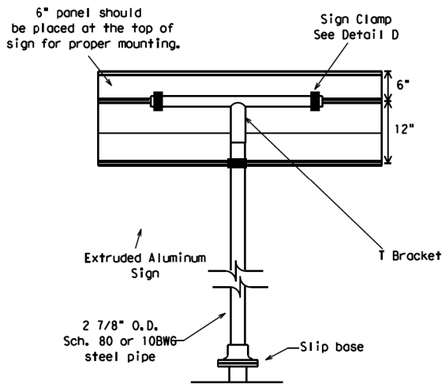
Splices shall only be allowed behind the sign substrate.



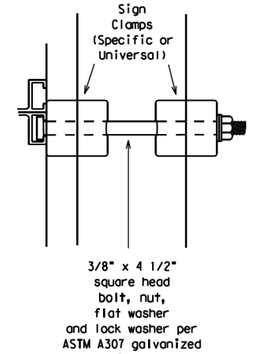
Typical Sign Mount

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

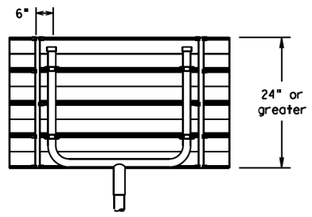
* Additional stiffener placed at approximate center of signs when sign width is greater than 10'.



Extruded Aluminum Sign
With T Bracket



Detail E



Use Extruded Alum. Windbeam as stiffeners
See SMD (2-1) for additional details

See Detail E
for clamp installation

GENERAL NOTES:

1.

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

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

REQUIRED SUPPORT

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

Texas Department of Transportation
Traffic Operations Division

SIGN MOUNTING DETAILS SMALL ROADSIDE SIGNS TRIANGULAR SLIPBASE SYSTEM

SMD(SLIP-3)-08

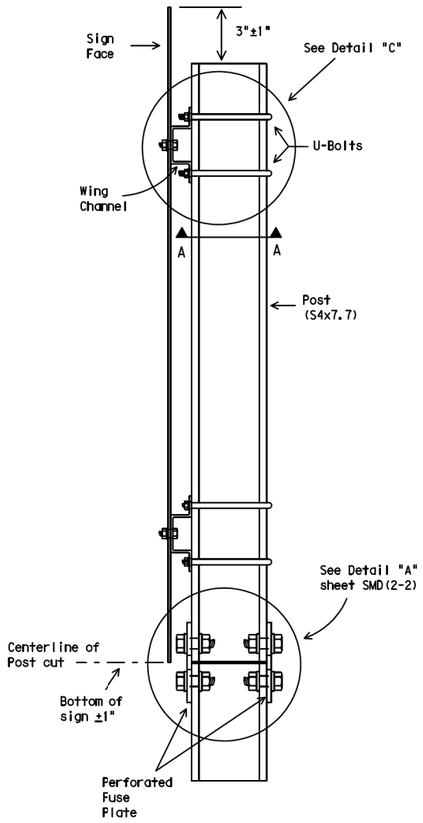
© TxDOT July 2002

REVISIONS	DN: TXDOT	CK: TXDOT	DW: TXDOT	CK: TXDOT
9-08	CONT	SECT	JOB	HIGHWAY
	641453		001	BS105T, ETC
	DIST	COUNTY		SHEET NO.
	BMT	LIBERTY		95

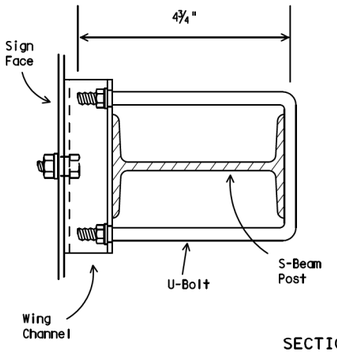
26D

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

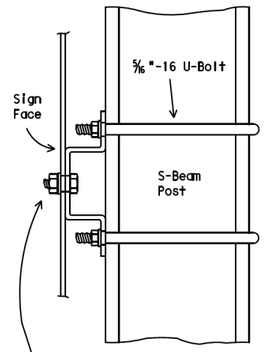
WING CHANNEL CLAMP DETAIL FOR TYPE G MOUNT



SIDE VIEW

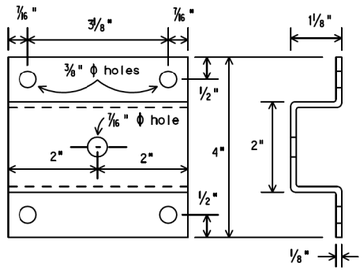


SECTION A-A



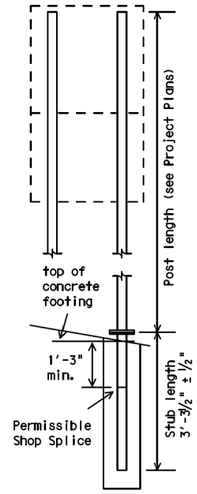
Galvanized steel or aluminum self-locking hex. head nut. 3/8 " - 16 x 3/4 " hex. head bolt for sheet metal. 3/8 " - 16 x 1 1/4 " hex. head bolt for plywood. 3/8 " galvanized medium washer.

DETAIL "C"

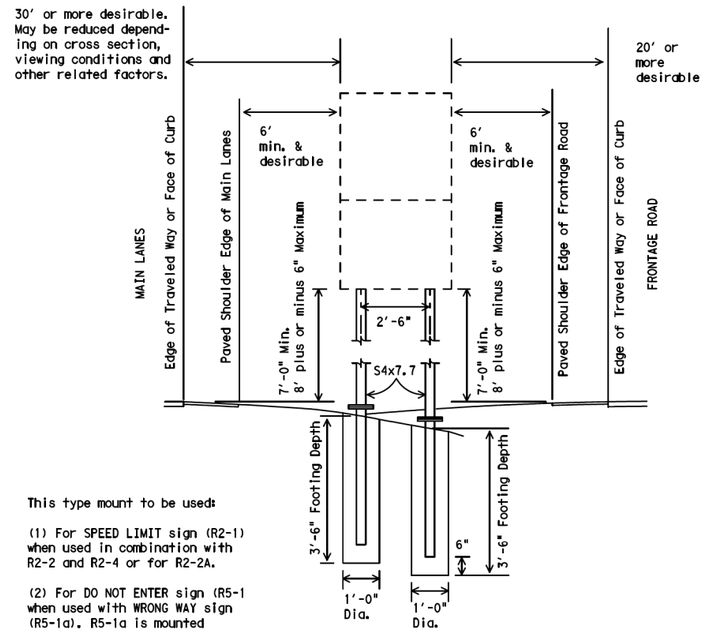


WING CHANNEL

Wing channel, 4" width x 1⅛" depth x ⅛" thickness, shall be aluminum (ASTM B221 6061-T6 or B308 6061-T6), galvanized steel (ASTM A36) or stainless steel (ASTM A167 type 304, No. 2B finish).



The weight of one S4x7.7 post is equal to 112.2 lbs. plus 7.7 lbs./ft x (post length in feet minus 10 ft). The weight of 112.2 lbs. includes 10 feet of post length, post foundation stub, related connection plates, friction fuse plate, and all high strength bolts, nuts and washers.



This type mount to be used:

(1) For SPEED LIMIT sign (R2-1) when used in combination with R2-2 and R2-4 or for R2-2A.

(2) For DO NOT ENTER sign (R5-1 when used with WRONG WAY sign (R5-1a). R5-1a is mounted above R5-1.

DEPARTMENTAL MATERIAL SPECIFICATIONS
SIGN HARDWARE DMS-7120

GENERAL NOTES:

1. Design conforms with AASHTO Specifications for the design and construction of structural supports for highway signs.
2. Materials and fabrication shall conform to the requirements of the Department material specifications.
3. Structural steel shall be "Low-Alloy Steel" for non-bridge structures per Item 442, "Metal For Structures."
4. Parts shall be saw cut either before galvanizing and the galvanized cut cleaned of zinc build-up, or saw cut after galvanizing and the cut surface repaired per Item 445, "Galvanizing." (Cut surface will not be treated until plate is installed and all bolts fully tightened.)

Texas Department of Transportation
Traffic Operations Division

SIGN MOUNTING DETAILS, TYPE G SUPPORT

SMD(TY G)-08

© TxDOT August 1995

DN: TXDOT	CK: TXDOT	DW: TXDOT	CK: TXDOT
CONT	SECT	JOB	HIGHWAY
641453	001	BS105T,ETC	
DIST	COUNTY		SHEET NO.
BMT	LIBERTY		96

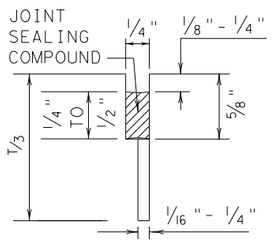
REVISIONS
1-97
9-08

DATE:
FILE:

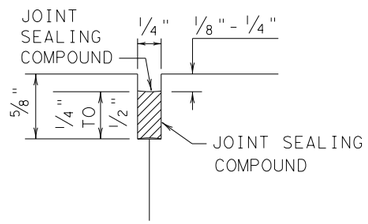
DISCLAIMER:
The use of this standard is governed by the "Texas Engineering Practice Act". No warranty of any kind is made by TxDOT for any purpose whatsoever. TxDOT assumes no responsibility for the conversion of this standard to other formats or for incorrect results or damages resulting from its use.

DATE: 5/19/2023
FILE: Y:\LOCAL\LIBERTY AO RMC SUBMITTALS\FY 23\FY 23 RMC 6414-53-001 SH 105T AND BYPASS\Design\DGN\Standards\js14.dgn

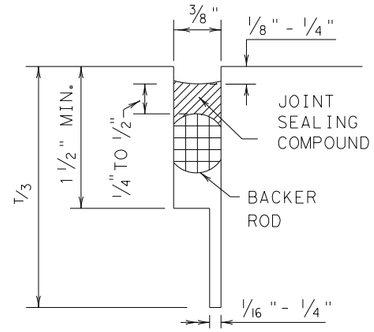
METHOD B: JOINT SEALING COMPOUND



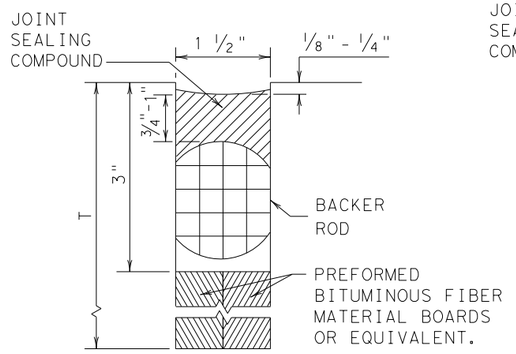
LONGITUDINAL SAWED
CONTRACTION JOINT



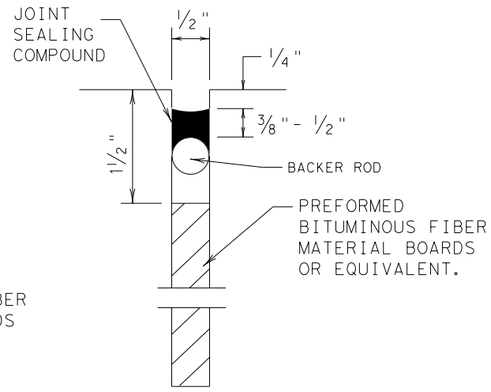
LONGITUDINAL OR TRANSVERSE
CONSTRUCTION JOINT



TRANSVERSE SAWED
CONTRACTION JOINT

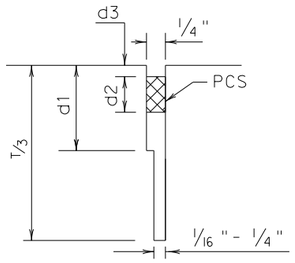


TRANSVERSE FORMED
EXPANSION JOINT

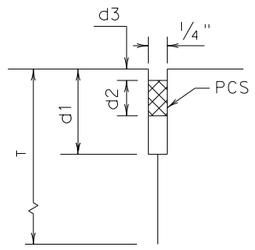


FORMED
ISOLATION JOINT

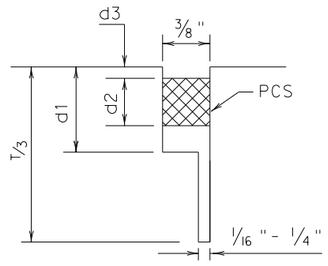
METHOD A: PREFORMED COMPRESSION SEALS (PCS)(DMS-6310 CLASS 6)



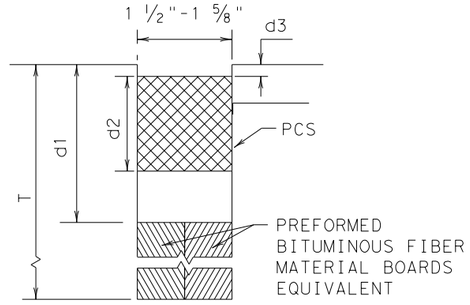
LONGITUDINAL SAWED
CONTRACTION JOINT



LONGITUDINAL
CONSTRUCTION JOINT



TRANSVERSE SAWED
CONTRACTION JOINT



TRANSVERSE FORMED
EXPANSION JOINT

GENERAL NOTES

1. UNLESS OTHERWISE SHOWN IN THE PLANS, EITHER METHOD "A" OR METHOD "B" MAY BE USED.
2. THE LOCATION OF JOINTS SHALL BE AS SHOWN ELSEWHERE IN THE PLANS.
3. THE JOINT RESERVOIR FOR SEALANT OR PCS SHALL BE SAWED UNLESS OTHERWISE SHOWN ON THE PLANS FOR THE LONGITUDINAL AND TRANSVERSE CONSTRUCTION JOINTS AND THE SAWED JOINTS.
4. DIMENSIONS d1, d2, AND d3 SHOWN IN METHOD A SHALL BE IN ACCORDANCE WITH THE PREFORMED COMPRESSION SEAL MANUFACTURER'S RECOMMENDATION.
5. REFER TO DMS-6310 "JOINT SEALANTS AND FILLERS" FOR THE CLASSIFICATIONS.
6. FOR SAWED LONGITUDINAL JOINT, LONGITUDINAL OR TRANSVERSE CONSTRUCTION JOINT, USE JOINT SEALANT CLASS 5 OR 8 UNLESS OTHERWISE SHOWN ON THE PLAN OR APPROVED.
7. FOR TRANSVERSE SAWED CONTRACTION, TRANSVERSE FORMED EXPANSION JOINT, AND ISOLATION JOINT USE JOINT SEALANT CLASS 5 OR 8 AT NEW JOINTS. USE JOINT SEALANT CLASS 4,5,7,OR 8 FOR MAINTAINING EXISTING JOINTS.
8. THE JOINTS SHALL BE CLEANED IN ACCORDANCE WITH THE ITEM 438 "CLEANING AND SEALING JOINTS" OR ITEM 713 "CLEANING AND SEALING JOINTS AND CRACKS (CONCRETE PAVEMENT)".
9. ISOLATION JOINTS ACCOMMODATE HORIZONTAL AND VERTICAL MOVEMENTS THAT OCCUR BETWEEN A PAVEMENT AND A STRUCTURE. ISOLATION JOINTS MAY BE USED FOR BRIDGE ABUTMENTS, INTERSECTIONS, CURB AND GUTTER, OLD AND NEW PAVEMENTS, OR AROUND DRAINAGE INLETS, MANHOLES, FOOTINGS AND LIGHTING STRUCTURES.

Texas Department of Transportation

Design Division Standard

CONCRETE PAVING DETAILS

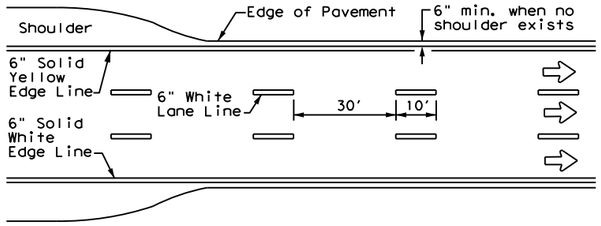
JOINT SEALS

JS-14

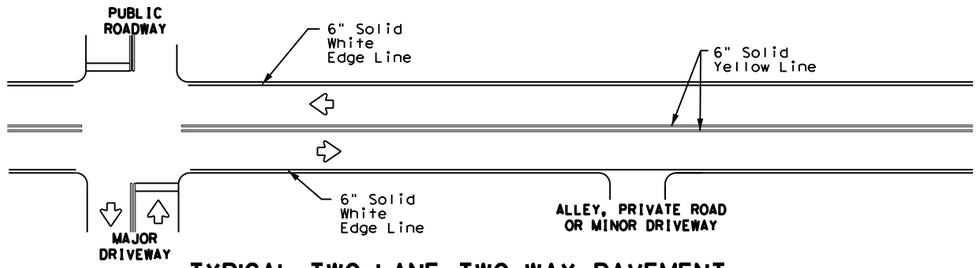
FILE: js14.dgn	DN: TxDOT	DN: HC	DW: HC	CK: AN
©TxDOT: DECEMBER 2014	CONT	SECT	JOB	HIGHWAY
REVISIONS	6414	53	001	BS105T, ETC
	DIST	COUNTY		SHEET NO.
	BMT	LIBERTY		97

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

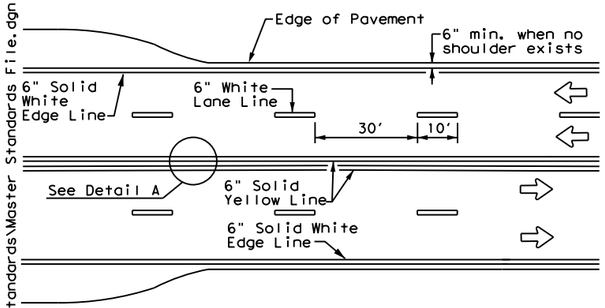
DATE: 5/19/2023 5:37:06 PM
FILE: Y:\LOCAL\LIBERTY AO RMC SUBMITTALS\FY 23\FY 23 RMC 6414-53-001 SH 105T AND BYPASS\Design\DGN\Standards\Master Standards File.dgn
5/19/2023 5:37:07 PM
Y:\LOCAL\LIBERTY AO RMC SUBMITTALS\FY 23\FY 23 RMC 6414-53-001 SH 105T AND BYPASS\Design\DGN\Standards\Master Standards File.dgn

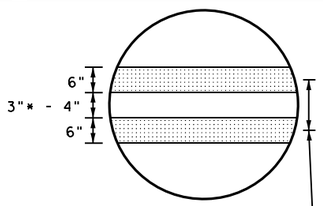


EDGE LINE AND LANE LINES ONE-WAY ROADWAY WITH OR WITHOUT SHOULDERS



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





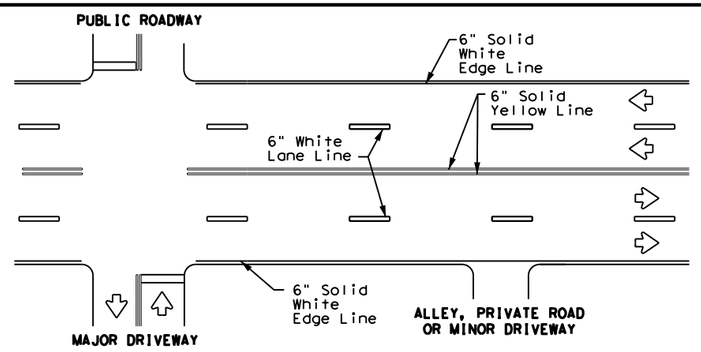
DETAIL "A"

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

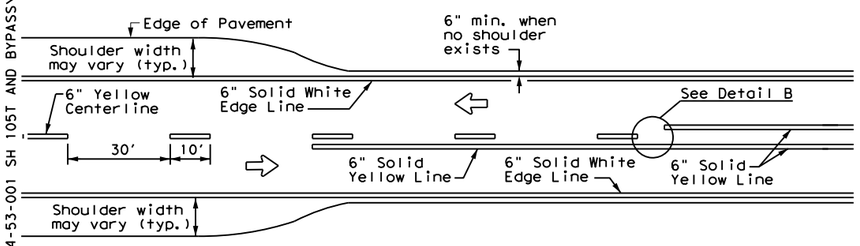
CENTERLINE AND LANE LINES FOUR LANE TWO-WAY ROADWAY WITH OR WITHOUT SHOULDERS

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

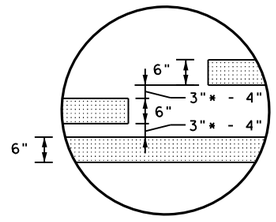
** 8" minimum for restripe projects when approved by the Engineer.



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



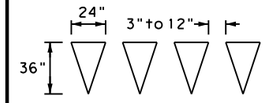
TWO LANE TWO-WAY ROADWAY WITH OR WITHOUT SHOULDERS



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

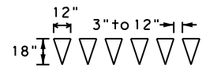
DETAIL "B"

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

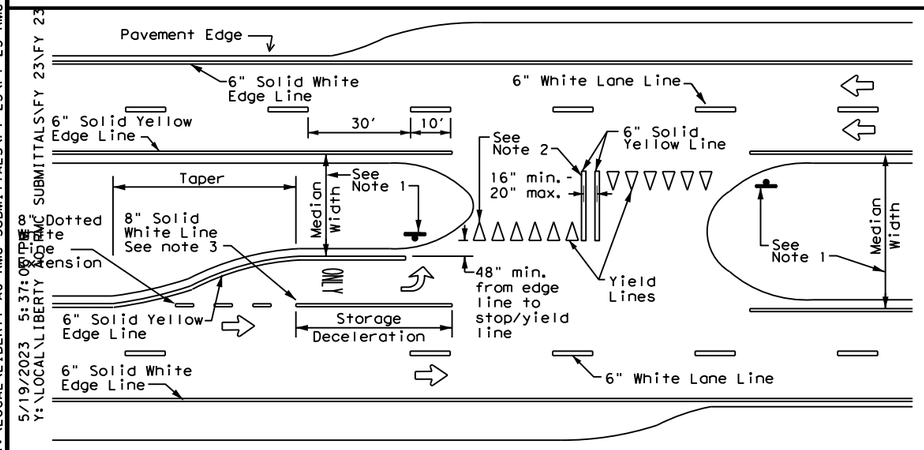


For posted speed on road being marked equal to or greater than 45 MPH.

YIELD LINES



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



FOUR LANE DIVIDED ROADWAY CROSSOVERS

NOTES

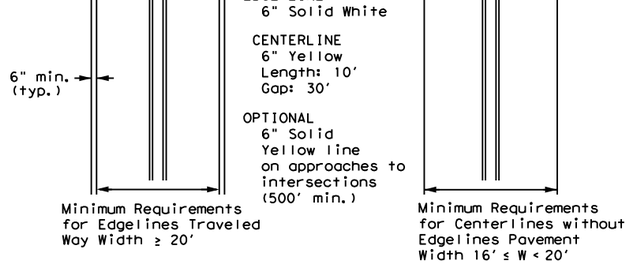
1. Where divided highways are separated by median widths at the median opening itself of 30 feet or more, median openings shall be signed as two separate intersections. Each median opening has two width measurements, with one measurement for each approach. The narrow median width will be the controlling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

GENERAL NOTES

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

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

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



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

GUIDE FOR PLACEMENT OF STOP LINES, EDGE LINE & CENTERLINE

Based on Traveled Way and Pavement Widths for Undivided Roadways

Texas Department of Transportation

Traffic Safety Division Standard

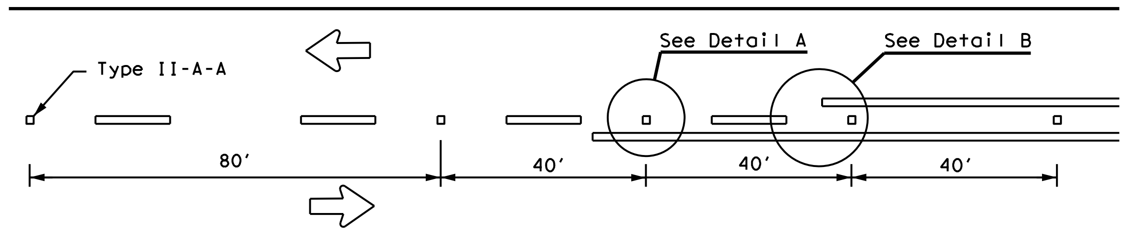
TYPICAL STANDARD PAVEMENT MARKINGS

PM(1)-22

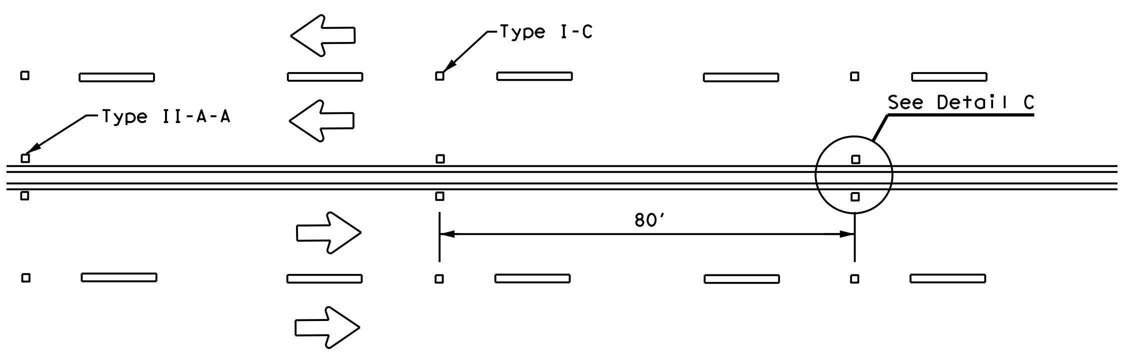
FILE: pm1-22.dgn	DN:	CK:	DW:	CK:
© TxDOT December 2022	CONT	SECT	JOB	HIGHWAY
REVISIONS 11-78 8-00 6-20 8-95 3-03 12-22 5-00 2-12	6414	53	001	BS105T, ETC
	DIST	COUNTY		SHEET NO.
	BMT	LIBERTY		98

22A

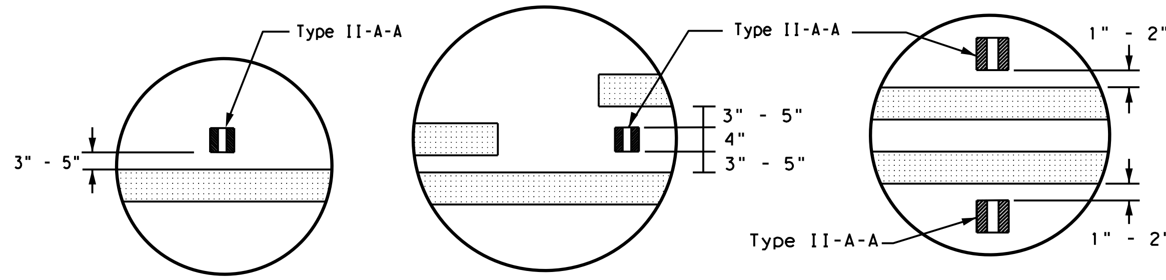
REFLECTIVE RAISED PAVEMENT MARKERS FOR VEHICLE POSITIONING GUIDANCE

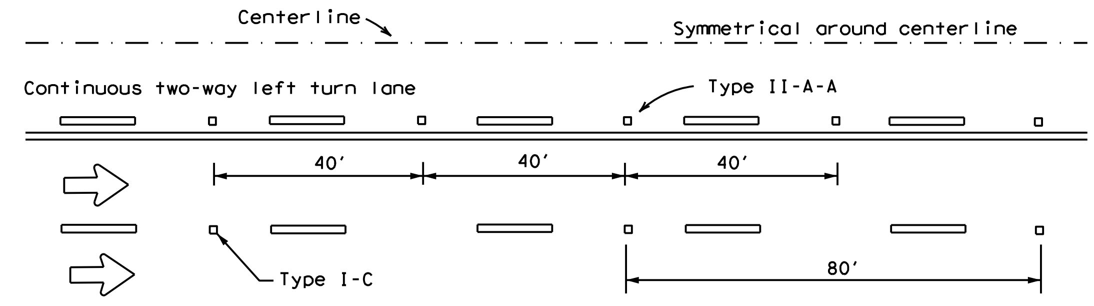


CENTERLINE FOR ALL TWO LANE TWO-WAY ROADWAYS

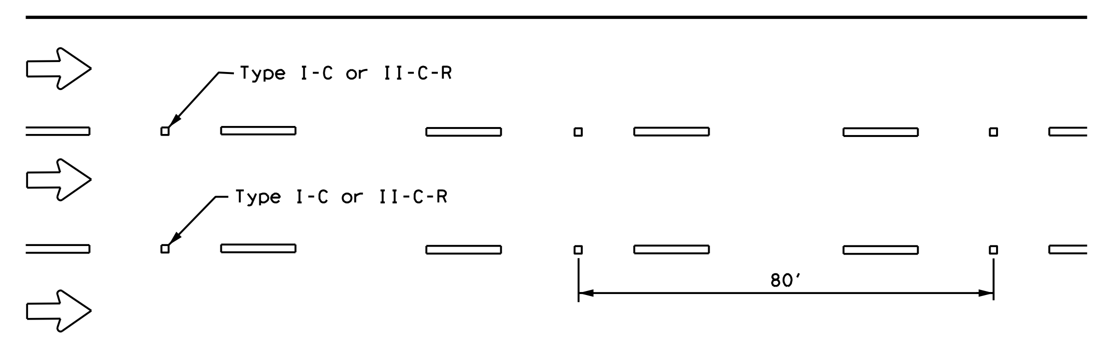


CENTERLINE & LANE LINES FOR FOUR LANE TWO-WAY ROADWAYS





CENTERLINE AND LANE LINES FOR TWO-WAY LEFT TURN LANE



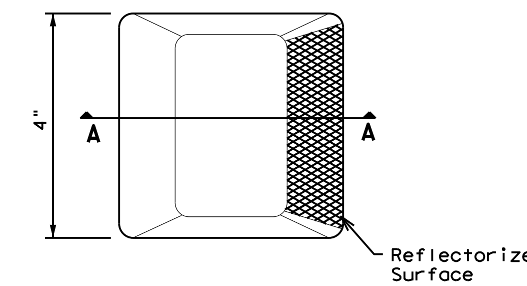
LANE LINES FOR ONE-WAY ROADWAY (NON-FREEWAY FACILITIES)

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

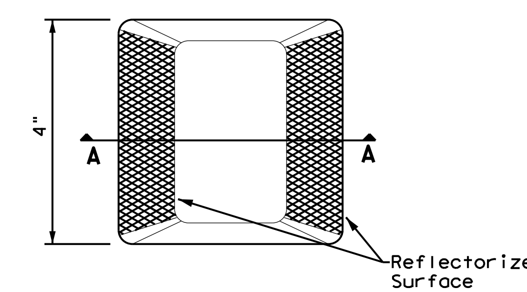
See Note 3.

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

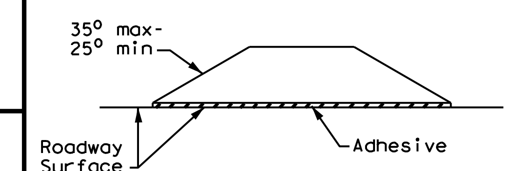
All pavement marking materials shall meet the required Departmental Material Specifications as specified by the plans.



Type I (Top View)

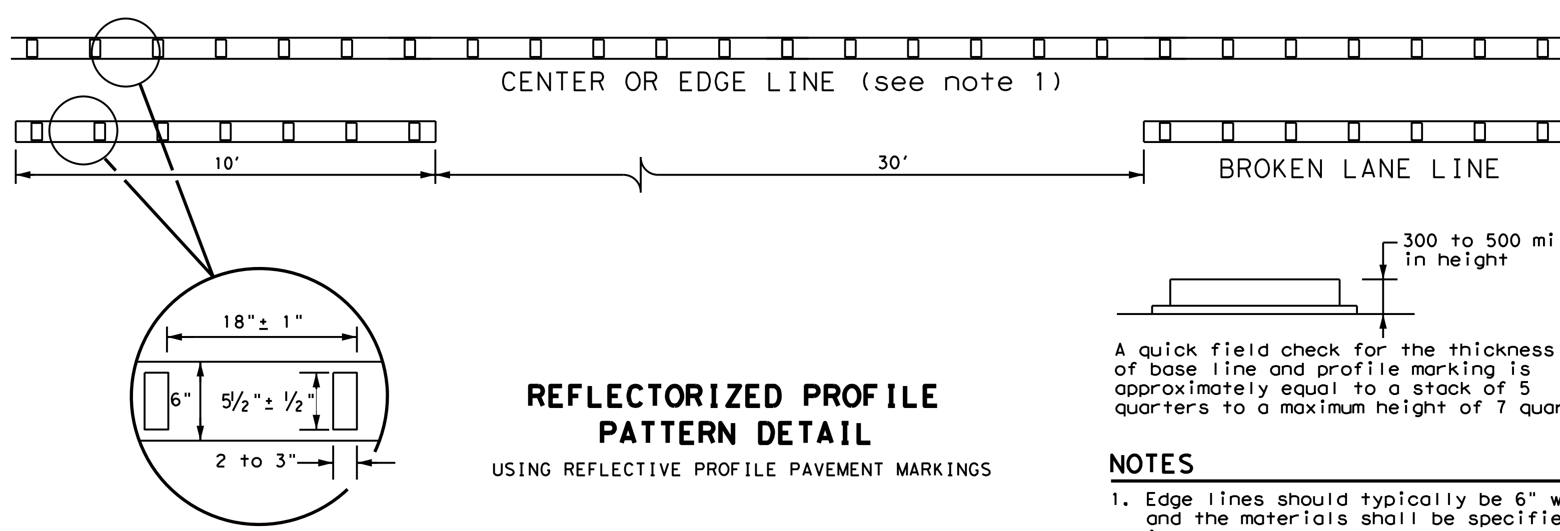


Type II (Top View)



SECTION A

RAISED PAVEMENT MARKERS



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

REFLECTORIZED PROFILE PATTERN DETAIL

USING REFLECTIVE PROFILE PAVEMENT MARKINGS

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

NOTES

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

GENERAL NOTES

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

Texas Department of Transportation — Traffic Safety Division Standard

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

FILE: pm2-22.dgn	DN:	CK:	DW:	CK:
©TxDOT December 2022	CONT 6414	SECT 53	JOB 001	HIGHWAY BS105T,ETC
REVISIONS 4-77 8-00 6-20; 4-92 2-10 12-22; 5-00 2-12	DIST BMT		COUNTY LIBERTY	SHEET NO. 99

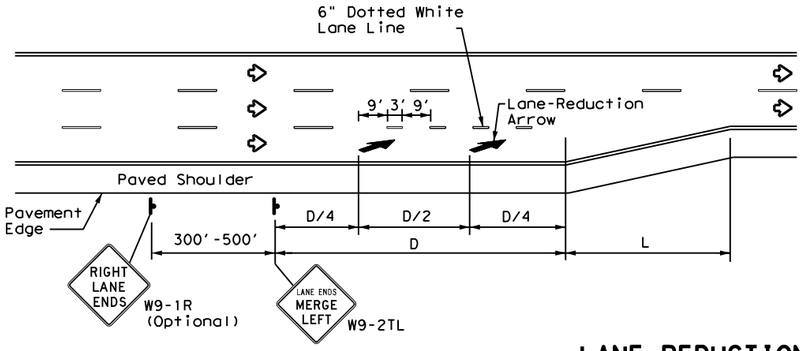
22B

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

DATE: 5/19/2023 5:37:06 PM
FILE: Y:\LOCAL\LIBERTY AO RMC SUBMITTALS\FY 23\FY 23 RMC 6414-53-001 SH 105T AND ...

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

DATE: 5/19/2023 5:37:07 PM
FILE: Y:\LOCAL\LIBERTY AO RMC SUBMITTALS\FY 23\FY 23 RMC 6414-53-001 SH 105\PM AND BMP\SKETCHES\pm3-22.dgn

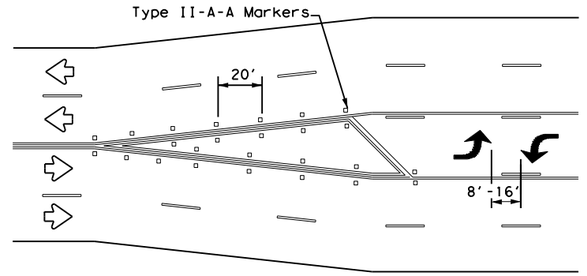


LANE REDUCTION

NOTES

1. Lane reduction pavement markings are used where the number of through lanes is reduced because of narrowing of the roadway or because of a section of on-street parking in what would otherwise be a through lane. For Texas Super 2 Passing Lanes, see TS2(PL) standard sheets.
2. On divided highways, an additional RIGHT LANE ENDS (W9-1R) sign may be installed in the median aligned with the W9-1R sign on the right side of the highway.
3. Lane reduction arrows are required for speeds of 45 mph or greater. An optional third lane reduction arrow may be added based on engineering judgement. If used, the optional third lane reduction arrow should be centered between the first and last lane reduction arrows.
4. For lane reductions on Freeways and Expressways, signing shall conform to the TxDOT Freeway Signing Handbook.

ADVANCED WARNING SIGN DISTANCE (D)		
Posted Speed	D (ft)	L (ft)
30 MPH	460	$L=\frac{WS^2}{60}$
35 MPH	565	
40 MPH	670	
45 MPH	775	L=WS
50 MPH	885	
55 MPH	990	
60 MPH	1,100	
65 MPH	1,200	
70 MPH	1,250	
75 MPH	1,350	



A two-way left-turn (TWLT) lane-use arrow pavement marking should be used at or just downstream from the beginning of a two-way left-turn lane within a corridor. Repeating the marking after each intersection or dedicated turn bay is not required unless stated elsewhere in the plans.

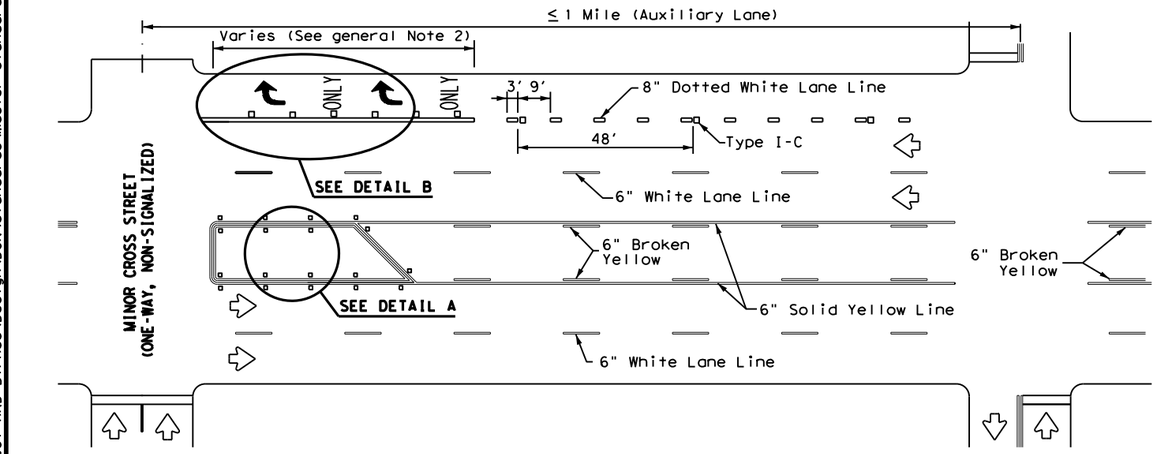
TYPICAL TRANSITION FOR TWLTL AND DIVIDED HIGHWAY

GENERAL NOTES

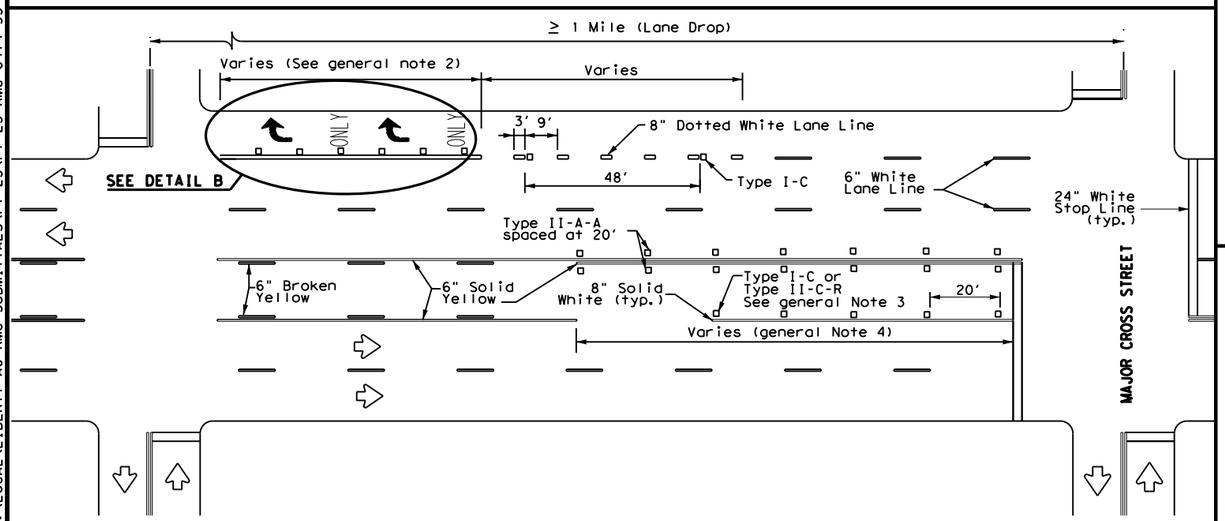
1. Lane use word and arrow markings shall be used where through lanes approaching an intersection become mandatory turn lanes. Lane use word and arrow markings should be used in auxiliary lanes of substantial length. Lane use arrow markings or word and arrow markings may be used in other lanes and turn bays for emphasis. Details for words and arrows are as shown in the Standard Highway Sign Designs for Texas.
2. When lane-use words and arrow markings are used, two sets of arrows should be used if the length of the bay is greater than 180 feet. When a single lane use arrow or word and arrow marking is used for a short turn lane, it should be located at or near the upstream end of the full-width turn lane.
3. Use raised pavement marker Type I-C with undivided highways, flush medians and two way left turn lanes. Use raised pavement marker Type II-C-R with divided highways and raised medians.
4. Length of turn bays, including taper, deceleration, and storage lengths shall be as shown on the plans or as directed by the Engineer. See Chapter 3 of the Roadway Design Manual for additional information on turning lanes or storage lengths.

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

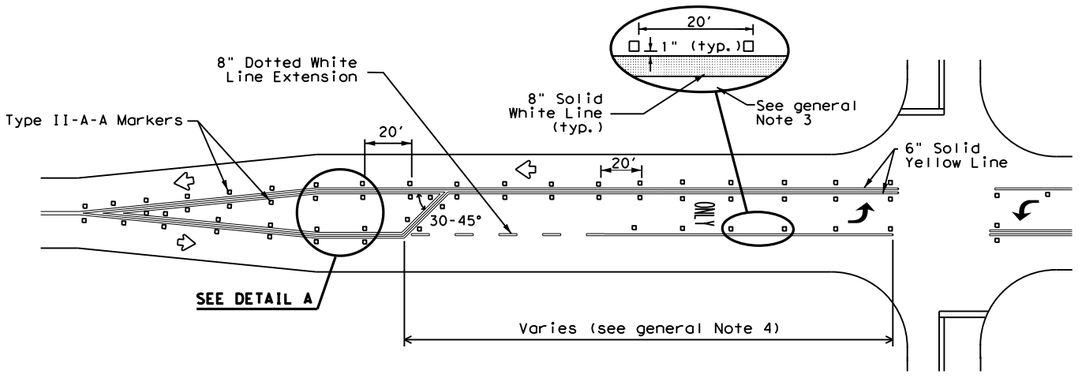
All pavement marking materials shall meet the required Departmental Material Specifications as specified by the plans.



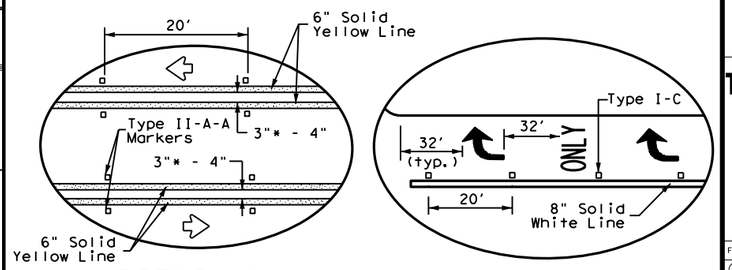
TYPICAL TWLTL AT ONE-WAY STREET AND RIGHT TURN AUXILIARY LANE



TYPICAL TWLTL AT TWO-WAY CROSS STREET AND RIGHT TURN LANE DROP



TYPICAL TWO-LANE ROADWAY INTERSECTION WITH LEFT TURN BAYS



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

Texas Department of Transportation

Traffic Safety Division Standard

TWO-WAY LEFT TURN LANES, RURAL LEFT TURN BAYS, AND LANE REDUCTION PAVEMENT MARKINGS

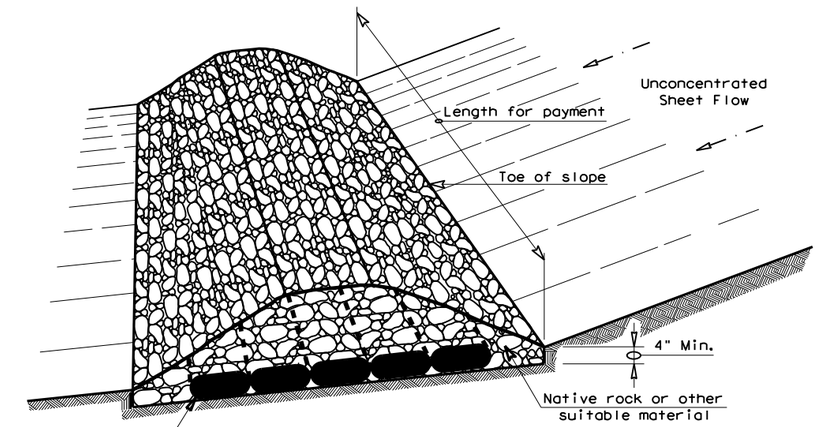
PM(3)-22

FILE: pm3-22.dgn	DN:	CK:	DW:	CK:
©TxDOT December 2022	CONT	SECT	JOB	HIGHWAY
REVISIONS 4-98 3-03 6-20 5-00 2-10 12-22 8-00 2-12	6414	53	001	BS105T,ETC
	DIST	COUNTY		SHEET NO.
	BMT	LIBERTY		100

22C

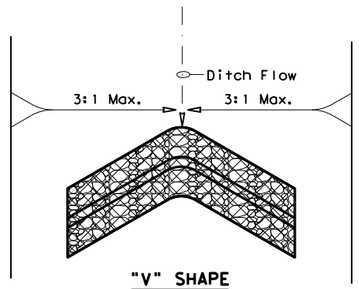
DISCLAIMER:
The use of this standard is governed by the "Texas Engineering Practice Act". No warranty of any kind is made by TxDOT for any purpose whatsoever. TxDOT assumes no responsibility for the conversion of this standard to other formats or for incorrect results or damages resulting from its use.

DATE:
FILE:

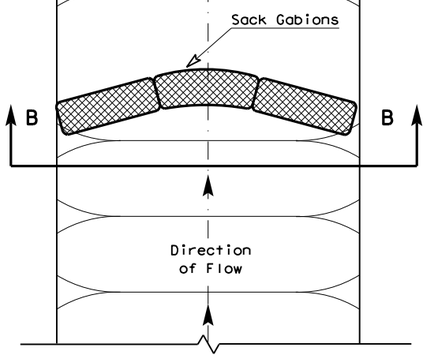


FILTER DAM AT TOE OF SLOPE

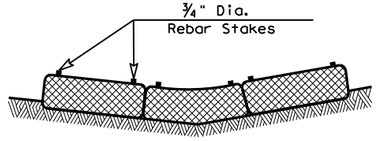
RFD1



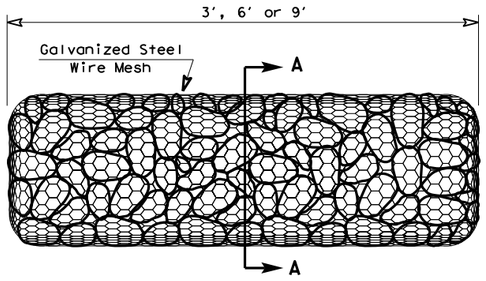
"V" SHAPE PLAN VIEW



PLAN VIEW

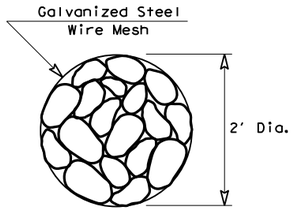


SECTION B-B

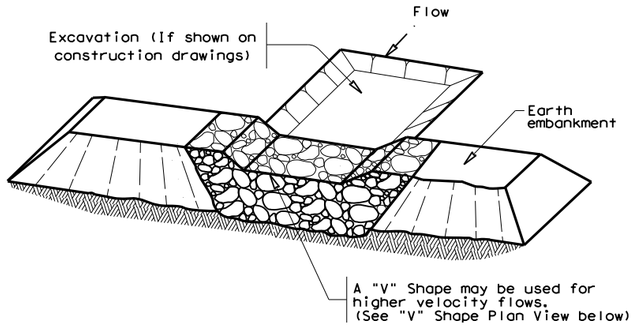


TYPE 4 (SACK GABIONS)

RFD4

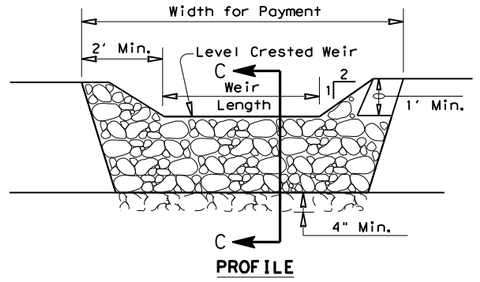


SECTION A-A

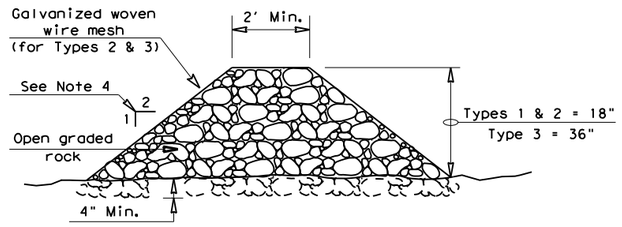


FILTER DAM AT SEDIMENT TRAP

RFD1 OR RFD2



PROFILE



SECTION C-C

ROCK FILTER DAM USAGE GUIDELINES

Rock Filter Dams should be constructed downstream from disturbed areas to intercept sediment from overland runoff and/or concentrated flow. The dams should be sized to filter a maximum flow through rate of 60 GPM/FT^2 of cross sectional area. A 2 year storm frequency may be used to calculate the flow rate.

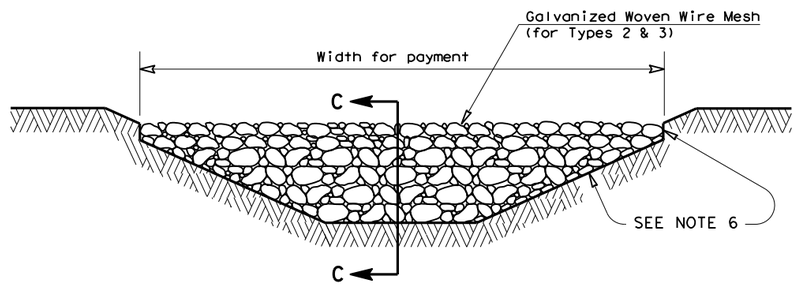
Type 1 (18" high with no wire mesh) (3" to 6" aggregate): Type 1 may be used at the toe of slopes, around inlets, in small ditches, and at dike or swale outlets. This type of dam is recommended to control erosion from a drainage area of 5 acres or less. Type 1 may not be used in concentrated high velocity 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.



FILTER DAM AT CHANNEL SECTIONS

RFD1 OR RFD2 OR RFD3

GENERAL NOTES

1. If shown on the plans or directed by the Engineer, filter dams should be placed near the toe of slopes where erosion is anticipated, upstream and/or downstream at drainage structures, and in roadway ditches and channels to collect sediment.
2. Materials (aggregate, wire mesh, sandbags, etc.) shall be as indicated by the specification for "Rock Filter Dams for Erosion and Sedimentation Control".
3. The rock filter dam dimensions shall be as indicated on the SW3P plans.
4. Side slopes should be 2:1 or flatter. Dams within the safety zone shall have sideslopes of 6:1 or flatter.
5. Maintain a minimum of 1' between top of rock filter dam weir and top of embankment for filter dams at sediment traps.
6. Filter dams should be embedded a minimum of 4" into existing ground.
7. The sediment trap for ponding of sediment laden runoff shall be of the dimensions shown on the plans.
8. Rock filter dam types 2 & 3 shall be secured with 20 gauge galvanized woven wire mesh with 1" diameter hexagonal openings. The aggregate shall be placed on the mesh to the height & slopes specified. The mesh shall be folded at the upstream side over the aggregate and tightly secured to itself on the downstream side using wire ties or hog rings. For in stream use, the mesh should be secured or staked to the stream bed prior to aggregate placement.
9. Sack Gabions should be staked down with 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	6414	53	001	BS105T, ETC
	DIST	COUNTY		SHEET NO.
	BMT	LIBERTY		101

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

DATE: 4/24/2023 2:32:53 PM
FILE: Y:\LOCAL\LIBERTY AO RMC SUBMITTALS\FY 23\FY 23 RMC 6414-53-001 SH 105T\...

I. STORMWATER POLLUTION PREVENTION-CLEAN WATER ACT SECTION 402

TPDES TXR 150000: Stormwater Discharge Permit or Construction General Permit required for projects with 1 or more acres disturbed soil. Projects with any disturbed soil must protect for erosion and sedimentation in accordance with Item 506.

List MS4 Operator(s) that may receive discharges from this project. They may need to be notified prior to construction activities.

1. TxDOT - Beaumont District
2. City of Beaumont

☐ No Action Required ☒ Required Action

Action No.

1. Prevent stormwater pollution by controlling erosion and sedimentation in accordance with TPDES Permit TXR 150000
2. Comply with the SW3P and revise when necessary to control pollution or as required by the Engineer.
3. The project is estimated to involve less than one acre of soil disturbance. In the event the project disturbance acreage becomes equal to or greater than one acre, the CGP is applicable. Contact TxDOT project inspector for coordination with DEQC for necessary action.
4. Take measures to prevent construction materials and debris including, but not limited to wastewater (i.e., cooling liquid, etc.) associated with concrete removal from entering any inlets, ditches, or waterways.

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

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

The Contractor must adhere to all of the terms and conditions, including Regional conditions for the State of Texas, associated with the following permit(s):

☒ No Permit Required

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

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

☐ Individual 404 Permit Required: Permit # _______

☐ Other Nationwide Permit Required: NWP# _______

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

1. Maintain a neat and clean worksite next to the water and do not allow any debris to fall into the water.
2. Comply with "Work In or Near Waters/Wetlands Regulatory Requirements and Best Management Practices" section found in the Beaumont District Environmental Field Guide.

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

Best Management Practices:

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

III. CULTURAL RESOURCES

☐ No Action Required ☒ Required Action

Action No.

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

IV. VEGETATION RESOURCES

☐ No Action Required ☒ Required Action

Action No.

1. No vegetation removal of trimming of any kind is allowed. Exceptions are allowed for mowed and maintained grass.

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

☐ No Action Required ☒ Required Action

Action No.

1. If any animal enters the work area, do not harm, harrass, or attempt to handle; let the animal leave on its own. Avoid unnecessary impacts to dens of animals if found.
2. If caves or sinkholes are discovered on site, cease work in the area and contact the TxDOT Inspector or DEQC for guidance.
3. Comply with "Wildlife: Regulatory Requirements and Best Management Practices" section found in the Beaumont District Environmental Field Guide.
4. Contractor shall maintain compliance with the Migratory Bird Treaty Act (MBTA) and Texas Parks and Wildlife (TPW) Code Section 64.002. The full MBTA guidance may be found here: http://ftp.dot.state.tx.us/pub/txdot-info/env/toolkit/350-01-gui.pdf.
5. Resource specific BMPs (Section 1) from the "Updated Best Management Practices (BMPs) for TxDOT Maintenance Activities' guidance under the TXDOT Maintenance Program EA shall be reviewed and implemented where appropriate.

LIST OF ABBREVIATIONS

BMP:	Best Management Practice	SPCC:	Spill Prevention Control and Countermeasure
CGP:	Construction General Permit	SW3P:	Storm Water Pollution Prevention Plan
DEQC:	District Environmental Quality Coordinator	PCN:	Pre-Construction Notification
DSHS:	Texas Department of State Health Services	PSL:	Project Specific Location
EA:	Environmental Assessment	TCEQ:	Texas Commission on Environmental Quality
FHWA:	Federal Highway Administration	TPDES:	Texas Pollutant Discharge Elimination System
MOA:	Memorandum of Agreement	TPWD:	Texas Parks and Wildlife Department
MOU:	Memorandum of Understanding	TSS:	Total Suspended Solids
MS4:	Municipal Separate Stormwater Sewer System	TxDOT:	Texas Department of Transportation
MBTA:	Migratory Bird Treaty Act	T&E:	Threatened and Endangered Species
NOT:	Notice of Termination	USACE:	U.S. Army Corps of Engineers
NWP:	Nationwide Permit	USFWS:	U.S. Fish and Wildlife Service
NOI:	Notice of Intent		

VI. HAZARDOUS MATERIALS OR CONTAMINATION ISSUES

☐ No Action Required ☒ Required Action

General (applies to all projects):

Comply with the Hazard Communication Act (the Act) for personnel who will be working with hazardous materials by conducting safety meetings prior to beginning construction and making workers aware of potential hazards in the workplace. Ensure that all workers are provided with personal protective equipment appropriate for any hazardous materials used.

Obtain and keep on-site Material Safety Data Sheets (MSDS) for all hazardous products used on the project, which may include, but are not limited to the following categories: Paints, acids, solvents, asphalt products, chemical additives, fuels and concrete curing compounds or additives. Provide protected storage, off bare ground and covered, for products which may be hazardous. Maintain product labelling as required by the Act.

Maintain an adequate supply of on-site spill response materials, as indicated in the MSDS. In the event of a spill, take actions to mitigate the spill as indicated in the MSDS, in accordance with safe work practices, and contact the District Spill Coordinator immediately. The Contractor shall be responsible for the proper containment and cleanup of all product spills.

Contact the Engineer if any of the following are detected:

* Dead or distressed vegetation (not identified as normal)
* Trash piles, drums, canister, barrels, etc.
* Undesirable smells or odors
* Evidence of leaching or seepage of substances
* Any other evidence indicating possible hazardous materials or contamination discovered on site.

List below any bridge class structure(s), not including box culverts, being replaced, rehabilitated, removed, extended or modified as part of this project, or state "None", if applicable.
If "None", then no further action is required. Otherwise TxDOT is responsible for completing asbestos assessment/inspection and evaluation for presence of lead.

Provide results below:

Structure Location	PSN	Element	Lead	Asbestos
None				

If Asbestos is present, then TxDOT must retain a DSHS licensed asbestos consultant to assist with the notification, develop abatement/mitigation procedures, and perform management activities as necessary.

If Asbestos is not present, then TxDOT is still required to notify DSHS prior to any scheduled demolition.

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

Hazardous Materials or Contamination Issues Specific to this Project:

Action No.

1. Comply with TxDOT Standard Specification 7.12 and Special Provision 006-012 if evidence of hazardous materials or contamination is noted during construction.
2. Notify TxDOT Inspector or DEQC of any hazardous materials spills including fuel, hydraulic fluid, etc.

VII. OTHER ENVIRONMENTAL ISSUES

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

☐ No Action Required ☒ Required Action

Action No.

1. Comply with "General Construction" section found in the Beaumont District Environmental Field Guide.

APPROVED BY | DATE

DISTRICT ENVIRONMENTAL DEPARTMENT

Texas Department of Transportation

Beaumont District Standard

ENVIRONMENTAL PERMITS, ISSUES AND COMMITMENTS EPIC

FILE: epic.dgn	DN: TxDOT	CK: AM	DW: VP	CK: AR
©TxDOT February 2019	CONT	SECT	JOB	HIGHWAY
	6414	53	001	BS 105T,ETC
	DIST		COUNTY	SHEET NO.
	BMT		LIBERTY	102